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ECONOMIC DEVELOPMENT ASPECTS OF THE  
OKLAHOMA AIRPORT SYSTEM.

The University of Oklahoma, Ph. D., 1968  
Economics, general

University Microfilms, Inc., Ann Arbor, Michigan

THE UNIVERSITY OF OKLAHOMA  
GRADUATE COLLEGE

ECONOMIC DEVELOPMENT ASPECTS OF THE  
OKLAHOMA AIRPORT SYSTEM

A DISSERTATION  
SUBMITTED TO THE GRADUATE FACULTY  
in partial fulfillment of the requirements for the  
degree of  
DOCTOR OF PHILOSOPHY

BY  
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Norman, Oklahoma  
1968

ECONOMIC DEVELOPMENT ASPECTS OF THE  
OKLAHOMA AIRPORT SYSTEM

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## ACKNOWLEDGMENTS

I am grateful for the assistance and guidance of Dr. W. N. Peach, Chairman of the dissertation committee. I also wish to thank the members of the committee, Dr. James A. Constantin, Dr. J. Paul Duncan, Dr. A. J. Kondonassis, Dr. Jim E. Reese, and Dr. Jack L. Robinson, for their suggestions and helpful criticism.

Among the large number of persons who have assisted with the study, I am especially grateful to Professor Joseph E. Coulter, Chairman of the Department of Aviation and Manager of Max Westheimer Airport; Mr. Joe Cox, Airport Engineer for the Federal Aviation Administration Airport District Office in Oklahoma City; Mr. James E. Gourley, Chief of the Library Branch of the FAA Academy; Mr. W. Lloyd Lain, Manager of the Federal Aviation Administration Aeronautical Center; Mr. Keith Lutz, Director of the Oklahoma Aeronautics Commission; and Mr. Lester Robinson, Chief of the FAA Aircraft Registration Branch.

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ECONOMIC DEVELOPMENT ASPECTS OF THE  
OKLAHOMA AIRPORT SYSTEM

CHAPTER 1

INTRODUCTION

In the past two decades aviation has become an important mode of transportation. In the United States airlines now provide over one-half of all common carrier, intercity passenger miles.<sup>1</sup> General aviation (all civil aviation other than airline aviation) accounts for somewhat more than 19 million flight hours.<sup>2</sup>

The development of transportation facilities is given high priority in current programs for the economic development of countries and areas within countries. As Wilfred Owen has noted, "The obstacles to overcoming

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<sup>1</sup>Civil Aeronautics Board, Handbook of Airline Statistics (Washington, D.C.: Government Printing Office, 1966), p. 97.

<sup>2</sup>Federal Aviation Agency, Aviation Forecasts: Fiscal Years, 1967-1977 (Washington, D.C.: Government Printing Office, 1967), p. 27.

poverty are no longer insurmountable. Poor transport is one of the most important of these obstacles."<sup>3</sup> The possible contribution of aviation to economic development has been recognized.

In underdeveloped countries, where most forms of transportation are rudimentary, the most often cited advantage of aviation development is that airports do not require the large amounts of resources needed to provide roadbeds and canals. The construction of one airport can immediately connect a community with all other communities having airports. In the United States, with its highly developed transportation system, the most frequent argument for local airport development is cast in terms of holding existing firms and attracting new ones.

The Utility Airplane Council of the Aerospace Industries Association is currently distributing a promotion kit, entitled "Eight Steps to Airport Development: Airports mean Business," to business and civic groups.<sup>4</sup> This organization also has placed full-page advertisements in business and aviation magazines to promote airport development. One such advertisement is headed by the sentence, "Unless there is a place for airplanes to land near

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<sup>3</sup>"Technology to Fight Poverty," Transportation Journal, III (Fall, 1963), p. 14.

<sup>4</sup>(Washington, D.C.: Utility Airplane Council, 1966).

your industrial area, your community may miss its growth potential."<sup>5</sup>

Civil aviation is divided into two broad categories: air carrier aviation and general aviation. Air carrier aviation includes all common carrier aviation which requires certificates of public convenience and necessity issued by the Civil Aeronautics Board. General aviation includes all other civil aviation.<sup>6</sup>

The major types of flying included in the general aviation category are executive transportation, business, instruction, personal, agricultural application, air taxi, and industrial.<sup>7</sup> Executive transportation and business flying are the most rapidly expanding segments of general aviation. General aviation was relatively unimportant until recent years. However, in the last few years it has become an important part of our air transportation system, and its importance is rapidly increasing.

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<sup>5</sup>Airways, I (May, 1967), back cover.

<sup>6</sup>CAB certificates of public convenience and necessity are required for all air common carriers which operate aircraft with gross weights of over 12,500 pounds in interstate commerce. The activities of intrastate common carriers or interstate common carriers which operate only aircraft with gross weights of 12,500 pounds or less are in the general aviation category.

<sup>7</sup>These types of flying are discussed in greater detail in Chapter 6.

Just as civil aviation is divided into air carrier and general aviation, airports are divided in air carrier and general aviation categories. An air carrier airport is an airport used by airlines on a regularly scheduled basis. All other civil airports are general aviation airports. Although airline aircraft generally use only air carrier airports, general aviation aircraft use both general aviation airports and air carrier airports.

The value of air carrier service to the development of a community or region has been recognized for several years. The idea that general aviation airports are now important and will become more important to local development because of their increasing use by business firms has more recently gained attention. Among the major trends supporting this contention are the increased use and usefulness of general aviation aircraft, decentralization of industry, and provision of airports as a major facility in new industrial tracts.

General aviation aircraft capabilities have been greatly increased in the last decade. Technological improvements have changed the small general aviation aircraft from an interesting toy into a serviceable tool. Improvements in airports and navigational facilities have also increased the reliability, convenience, and effectiveness of general aviation transport. This increase in usefulness has been paralleled by increased use of general

aviation aircraft and by the use of these aircraft by firms.

In 1965 there were about 2,300 air carrier aircraft and 95,000 general aviation aircraft in the United States.<sup>8</sup> Almost two-thirds of all civil aviation hours flown are accounted for by general aviation aircraft, and about 94 per cent of the airports on record with the FAA are general aviation airports.<sup>9</sup> Estimated miles flown by general aviation aircraft operated by firms increased from about one billion in 1956 to about two billion in 1966. FAA projections indicate that this figure may double again in the next 10 years, and possibly much sooner.<sup>10</sup>

Currently, general aviation activity is increasing more rapidly than had been expected. About 16.5 million hours were flown in general aviation in 1965. Also in 1965 the FAA published an aviation forecast which indicated that the total number of hours flown in general aviation would probably reach 20 million by 1969.<sup>11</sup> In late 1966 the FAA

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<sup>8</sup> Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), p. 65.

<sup>9</sup> Ibid., p. 97 and Federal Aviation Agency, 1965 National Airport Plan (Washington, D.C.: Government Printing Office, 1965).

<sup>10</sup> Federal Aviation Agency, General Aviation: A Study and Forecast of the Fleet and Its Use in 1975 (Washington, D.C.: FAA, 1966), pp. 30-31; and Aviation Forecasts: Fiscal Years, 1967-1977 (Washington, D.C.: Government Printing Office, 1967), pp. 25-27.

<sup>11</sup> Aviation Forecasts: Fiscal Years 1966-1971 (Washington, D.C.: FAA, 1965), p. 24.

revised its projection to account for faster aviation growth rates. The revised forecast indicated that general aviation would probably account for 20 million hours by 1968.<sup>12</sup> When the preliminary data for total hours flown in general aviation during 1966 became available in June, 1967, it was discovered that the total number of hours flown had increased by more than 25 per cent from the previous year and had already exceeded the 20 million hour level.

Another trend, which is tending to increase business use of general aviation aircraft, is that fewer and fewer communities are being served by airlines. Because the aircraft used by airlines is increasing in size and cost, many communities which now have airline service are expected to lose it or receive reduced service during the next decade. The newer and larger airline aircraft (1) require longer and stronger runways, (2) are more expensive to operate per flight hour, and (3) operate less efficiently on short flights than the older and smaller airline aircraft. As aircraft operating costs rise, the number of passengers (paying relatively fixed rates) required to cover costs increases.

Part of the increased use of general aviation

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<sup>12</sup> Aviation Forecasts: Fiscal Years 1967-1977  
(Washington, D.C.: FAA, 1967), p. 25.

aircraft is related to decentralization of industry. Firms in large cities are not only moving or expanding their operations to other large cities, they are also tending to move to smaller cities and towns which do not have airline service.<sup>13</sup> Firms which are expanding into new geographic areas and firms in the newer industries have higher rates of general aviation aircraft utilization than the rate for all business firms.<sup>14</sup>

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<sup>13</sup>Professor James A. Constantin of the University of Oklahoma has discovered indications that, "the small town areas may be in process of having their viability restored by industrial migration." See "An Approach to the Rationalization of the Motor Carrier Industry," A paper prepared for the forthcoming issue of the Transportation Center Monograph Series, University of Southern California, Los Angeles. One of his findings is that a large portion of the goods used in manufacturing activities is being shipped to places which are not in the Standard Metropolitan Statistical Areas (cities or concentrations of population with 50,000 or more inhabitants). For example, in one of the production areas used in the Census of Transportation (Production Area 15—the Chicago area) 22.3 per cent of the "sheet and strip iron and steel," 45.0 per cent of the "nonferrous basic metal shapes," and 40.3 per cent of the "general industrial machinery and equipment" shipped from the area was shipped to places not within the SMSA's. This is not a special case.

Professor Constantin also cites some of the findings of a questionnaire survey made by the American Trucking Associations, Inc. About half of the firms responding (somewhat more than 1,200 firms responded) had moved during the period from mid-1955 through 1959. Slightly more than 40 per cent of these firms reported that their expansions or moves were to small town or rural areas. Professor Constantin states, "It is not possible to draw reasonably positive conclusions about the importance of the firms which moved," because they were not identified in terms of size.

<sup>14</sup>See Tri-State Transportation Committee, General Aviation and the Nation's Business Aircraft Fleet (New York: Tri-State Transportation Committee, 1964).

Planners of industrial parks have recognized the need for general aviation airport facilities. A recent innovation has been to design industrial parks around an airport as the key facility.<sup>15</sup> These facilities are called airport industrial parks.

The conclusion drawn from current trends by airport promotional groups is that the lack of adequate general aviation airport facilities may often result in local firms relocating or in communities being passed over as a possible location for new firms.

Private airport development interest groups have conducted studies to support their arguments. Usually the methodology involves surveys of firms known to operate aircraft or case studies of either (1) firms which operate aircraft and have recently located a facility in a new community or (2) airports which are used by business firms. All of the studies by private airport interest groups reviewed by this writer concluded that adequate airport facilities were an important factor in industrial location.

There are difficulties with much of this research. For example, a study may indicate that the primary factor involved in the construction of a new potato processing

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<sup>15</sup>For a description of several of these facilities see Federal Aviation Agency, Planning the Airport Industrial Park (Washington, D.C.: FAA, 1965).

plant in Idaho was the availability of an adequate airport. Although the selection of the particular community may have been connected with airport facilities, it is doubtful the decision to locate in Idaho was.<sup>16</sup>

Often the surveys of firms fail to distinguish clearly between firms whose activities are directly related to aviation (such as aircraft equipment manufacturers) and firms whose activities are not directly related to aviation.<sup>17</sup> The case studies are concerned with the successful cases of airport's attraction of industry.<sup>18</sup> The failures are not presented.

Although there are a large number of FAA publications containing discussions about the economic importance of air carrier and general aviation airports to the economic

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<sup>16</sup> See Airport Operators Council of the American Association of Airport Executives, "The Value of the Airport to the Community it Serves," reprinted in Airports Mean Business, Section 2 (Washington, D.C.: Utility Airplane Council, 1966).

<sup>17</sup> Although it is not a private study, one of the best examples is found in Missouri Commerce and Industrial Development Division, "Airports and Industry," Missouri Industrial News (Jefferson City, Mo., June, 1962). The Missouri study used a questionnaire survey of the corporations listed in Fortune's 500 in an attempt to ascertain the airport needs of large corporations. One of the findings was that 85 per cent of the firms responding indicated that convenient airport facilities would be an essential requirement for new plant locations.

<sup>18</sup> See Leslie L. Thomason, "Airport Study," an unpublished report to the Utility Airplane Council, (Wichita, Kansas, Mimeographed, 1964).

development of cities, towns, and areas, there is only one FAA published study dealing with this relationship.<sup>19</sup> This study suffers from some of the difficulties found in the studies by private promotional groups. It was based on an examination of trends in general aviation, a questionnaire survey of fifty firms known to operate executive aircraft, and several case studies of general aviation airports in smaller cities in the Northeast.

The major conclusions drawn from the study were:

(1) because aircraft are "necessary to business," the "airport is a direct economic asset" to the community; (2) numerous cases can be documented "where the existence or non-existence of adequate airport facilities has been the controlling factor in industry decisions to move into or out of a community. There are numerous other cases where it was an important contributing factor;" and (3) poor planning or the lack of planning very often "results in a serious shortcoming in achieving optimum . . . airport development."<sup>20</sup>

The economic development importance of general aviation airport facilities relative to the importance of other factors has not been clearly demonstrated. It has

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<sup>19</sup>Eastern Region Airports Division, General Aviation and Its Relationship to Industry and the Community, 2nd revised edition (Jamaica, New York, 1964).

<sup>20</sup>Ibid., p. 1.

been demonstrated, however, that airports are important in a large number of cases.<sup>21</sup> From the short-run point of view, it is more certain that poor airport facilities in a community or area tend to retard economic development than that good airport facilities assure development. Although it appears unlikely that in the next decade general aviation will rival the automobile or airlines as a mode of across-country travel, it appears likely that general aviation will continue to increase rapidly.

The FAA, charged with a dual role of aviation regulation and promotion, emphasizes airport planning. The following statements are from the 1965 National Airport Plan:

Some of the Nation's larger companies are locating new industrial plants in independent cities. With increasing dependence on business flying and air cargo transport, the small town's general aviation airport can be a decisive factor in attracting new industrial development. Clearly, investments in airport development can pay off in accelerated community development, but only if such investments are wisely conceived. The community planning program is the first step in determining the wisdom of building a new airport or expanding an existing airport.<sup>22</sup>

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<sup>21</sup> A similar conclusion was reached by Norman E. Danier, "The Role of Indiana's State Government in Airport Development," an unpublished Ph.D. thesis, Indiana University (Bloomington, Indiana, 1965), p. 12.

<sup>22</sup> (Washington, D.C.: Government Printing Office, 1965), p. 15.

The FAA has become increasingly active in promoting airport planning at the local and regional levels. In 1960 the FAA began to prepare and distribute a series of general aviation airport planning publications. This series dealt with factors involved in planning individual airports. The following year the FAA and the Civil Aeronautics Board released a joint statement of policy. It stated that in the future the development of regional airports to serve two or more cities would, ". . . be an increasingly important factor in considering applications for Federal funds for airport construction purposes. . . ." <sup>23</sup>

In 1965 the FAA published a planning guide for metropolitan airport systems. <sup>24</sup> A year later, the FAA encouraged states to include airport planning in their comprehensive planning program. <sup>25</sup> Early in 1967 the FAA distributed a publication informing local and state governments of the federal policy of regional airport development, particularly air carrier airports.

Airport planning is beginning to occur at the state level. States which have contracted for research into their aviation facilities include Arkansas, California,

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<sup>23</sup>Reprinted in Federal Aviation Agency, Regional Air Carrier Airport Planning, AC 150/5090 (Washington, D.C.: FAA, 1967), p. 9.

<sup>24</sup>Planning the Metropolitan Airport System, AC 150/5070-2 (Washington, D.C.: FAA, 1965)

<sup>25</sup>Airport Planning as a Part of Comprehensive State Planning Programs, AC 150/5050-1 (Washington, D.C.: FAA, 1966).

Maryland and New Hampshire. The Maryland and New Hampshire studies are primarily concerned with air carrier service.<sup>26</sup> The California study deals with general aviation airports, but is limited to an inventory of aviation facilities.<sup>27</sup> The Arkansas study is the most comprehensive of these state studies.<sup>28</sup> It emphasizes air carrier aviation, but also includes descriptions of general aviation airports.

A different approach was taken by New York, New Jersey, and Connecticut. Because of their common interests in the New York City area, these states formed a Tri-State Transportation Committee. This group is primarily concerned with airport planning and the coordination of air travel with other transportation modes. Airport research has not been published by the committee.

Oklahoma has about 200 airports on record with the

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<sup>26</sup> See Maryland Air Transportation Survey Commission, Report on Air Transportation Service Needs in Maryland, (Annapolis, 1963); and New Hampshire State Planning and Development Commission, Air Transport in New Hampshire, Prepared by M. L. Lindahl, (Concord, 1961).

<sup>27</sup> See Walter E. Gillfillan, California Airports: Facilities Inventory, Air Traffic, and Land-Use Protection, A Report to the California Legislature (Berkeley, California: University of California. Institute of Transportation, 1965).

<sup>28</sup> State of Arkansas Air Transportation Study, Prepared by Leigh Fisher Associates, Inc. (Little Rock: Arkansas Planning Commission, 1965). This study describes the individual airports as they are grouped in the five regions used by the Comprehensive State Plan.

FAA. About two-thirds of these airports could be considered small by almost any standard.

It is difficult to compare Oklahoma's airport system with those of other states due to inadequate information. However, the data which are available indicate that Oklahoma, while not "a leading aviation state," ranks higher among the states in several aspects of aviation than it ranks in population. Oklahoma ranks around twenty-eighth in population. However, it ranks sixteenth in terms of the number of airports within the states and twelfth in the number of airports with lighted, paved runways.<sup>29</sup>

In terms of aircraft per 1,000 square miles, Oklahoma ranks twenty-third.<sup>30</sup> Three of the states surrounding Oklahoma rank higher (Kansas, Louisiana, and Missouri), and one neighboring state (Texas) ranks almost as high as Oklahoma.

When the states are ranked according to aircraft per 10,000 population, Oklahoma's position is thirteenth from the top.<sup>31</sup> Only two of the surrounding states have

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<sup>29</sup>Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), pp. 9 and 11. At the end of 1965 there were 47 airports in Oklahoma with lighted, paved runways. There were 49 in Kansas, 55 in Missouri, and 164 in Texas. There were less than 47 in the other states surrounding Oklahoma.

<sup>30</sup>Ibid., p. 74. There are about 31 aircraft per 1,000 square miles in Oklahoma.

<sup>31</sup>Ibid. There are about 8.5 aircraft per 10,000 inhabitants in Oklahoma.

higher rankings (Kansas and New Mexico). Three of the other surrounding states (Arkansas, Colorado, and Texas) have almost as many aircraft per 10,000 inhabitants as Oklahoma.

### Purpose and Scope

Although limited information about Oklahoma airports is published for users, a detailed and systematic examination of the Oklahoma airport system has not been made.

The purpose of this study is to examine the nature of the Oklahoma airport system and its regional aspects. Emphasis is given to the general aviation aspects of the system, rather than the air carrier aspects. The scope is limited to Oklahoma airports on record with the FAA.

One of the important aspects of an airport system is the characteristics of its users. Information was obtained about the primary users of Oklahoma airports, Oklahoma aircraft registrants.

### Method

The primary data sources are (1) records of the FAA District Airport Office in Oklahoma City and (2) records of the FAA Aircraft Registration Branch. These sources were supplemented by personal interviews with pilots, aircraft-owning firms, airport managers, firms in

the aviation industry, state and federal aviation personnel, and other persons involved in civil aviation activities. Visits were made to 28 airports of various types, and the writer audited the two basic aviation courses (flight instruction and ground school) offered by the University of Oklahoma's Department of Aviation. Also, a computer listing of information from the records of the FAA Airman Registration Branch was obtained. Data were compiled from the listing to provide additional background information.

A classification system was developed for the 199 civil airports in Oklahoma which were on record with the FAA on October 1, 1966. Data concerning the general nature of each airport, its aviation facilities, and its aviation activity were compiled by type of airport from duplicates of the FAA airport records.

After an examination of the location and nature of Oklahoma airports, the state was divided into seven regions. Airport data were then compiled by region.

The airport-use data provided by the FAA airport records are limited. To provide additional information about the nature of Oklahoma airport users, a computer printout of the FAA Aircraft Registration Master File was obtained for Oklahoma aircraft registrants. This permitted data concerning the nature and amount of aircraft use to be compiled by type of aircraft, by type of owner, and by

principle aircraft use. More detailed descriptions of method are given at the beginning of Chapters 4, 5, and 6.

In Chapters 2 and 3 there is a discussion of the development of airport policy in the United States and in Oklahoma. Characteristics of the Oklahoma airport system are presented in Chapter 4; and in Chapter 5 the regional aspects of the system are examined. In Chapter 6 information about the flight activity of Oklahoma aircraft registrants is provided.

## CHAPTER 2

### THE DEVELOPMENT OF FEDERAL CIVIL AIRPORT POLICIES

Federal airport policies have developed in a sporadic fashion. Although federal airport policies, since their beginning, have usually been explicitly concerned with economic development, the nature and impact of federal policies has changed several times. The development of these policies, some of the arguments for civil airport development, and the nature of current policies are discussed in this chapter.

#### Federal Airport Policies Before World War II

The earliest airport legislation was enacted two months after the first passenger flew in an airplane. In July, 1908, the City Council of Kissimee, Florida, enacted an ordinance which set standards and required the licensing of barns and garages within the city limits used to shelter

aircraft.<sup>1</sup>

During World War I aviation legislation was enacted by states and municipalities across the nation. Generally, this legislation was either directed at prohibiting aviation, because it was dangerous or a public nuisance, or directed at making a state or city attractive as a site for Army airfields.

All airports, other than military airfields, were privately owned until 1919 when Atlantic City, New Jersey, constructed a municipal airport. In the decade that followed many cities vied for air mail service. They repealed the earlier prohibitive legislation and enacted regulatory and promotional ordinances.

Domestic scheduled air-passenger service was initiated in 1914.<sup>2</sup> In 1920 there was scheduled passenger service to Cuba, and by the end of 1926 interstate passenger service was offered by several firms in conjunction with air mail contracts. Federal aviation legislation, however, was concerned only with air mail and military aviation until the Air Commerce Act of 1926.

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<sup>1</sup>The Council also provided for license fees from operators of future flying machines which would carry as many as 1,000 passengers. See Civil Aeronautics Board, "Chronologies of Air-Transport Events," Part VII, Handbook of Airline Statistics (Washington, D.C.: Government Printing Office, 1965), p. 445.

<sup>2</sup>Ibid., pp. 446-447.

The promotional role of the Federal government in civil aviation was established in the Air Commerce Act in 1926. It authorized the Secretary of Commerce to, "foster air commerce; to designate and establish civil airways; to establish, operate, and maintain aids to air navigation; to issue airworthiness certificates for aircraft and major aircraft components; and to investigate accidents."<sup>3</sup> The direct establishment or promotion of airports, however, was explicitly excluded from the authority given. It was expected that other aviation promotional activity would lead to the development of an adequate private airport system.

Federal participation in the development of airport facilities began in 1933. Federal aid was extended to public airports through the Civil Works Administration. The aid was more directly aimed at providing emergency unemployment relief than at the development of a national system of airports.<sup>4</sup> By 1940, \$139 million of federal funds had been matched by about \$187 million of state and local funds for airport development under the programs of

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<sup>3</sup>Ellmore A. Champie, Associate Historian for the Federal Aviation Administration, "Background of the Federal Government's Role in Civil Aviation," an unpublished paper written in 1964. The Act also established that the Federal Government has exclusive sovereignty over the lands and waters of the United States. A. J. Thomas Jr., Economic Regulation of Scheduled Air Transport (Buffalo, N.Y.: Dennis & Co., 1951), p. 5.

<sup>4</sup>Federal Aviation Agency, Twentieth Annual Report of Operations Under the Federal Airport Act (Washington, D.C.: FAA, 1965), p. 4.

successive federal works agencies.<sup>5</sup>

During the 1930's airports were regarded as similar to public utilities. With the development of municipal airports and programs providing financial assistance from Federal and local government, the provision and operation of public airports began to be viewed as being within the concepts of public interest and general welfare.

The Civil Aeronautics Act of 1938 created the Civil Aeronautics Authority (CAA) to foster civil aeronautics and commerce, to promote safety, and to regulate economic aspects of airline activities. Unlike the Air Commerce Act of 1926, airports were not excluded from the promotional responsibilities of the CAA.<sup>6</sup>

The Civil Aeronautics Act also directed the CAA, ". . . to conduct a survey of the existing airport system to determine whether or not the Federal Government should participate in its construction, improvement, development, operation and maintenance, and if so, the extent and manner of such participation."<sup>7</sup> The CAA reported that the existing system of airports was highly inadequate to

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<sup>5</sup>Charles L. Dearing and Wilfred Owen, National Transportation Policy (Washington, D.C.: The Brookings Institution, 1949), p. 31.

<sup>6</sup>Federal Aviation Agency, Historical Fact Book: A Chronology, 1926-1963 (Washington, D.C.: Government Printing Office, 1966), pp. 14-15.

<sup>7</sup>Federal Aviation Agency, Twentieth Annual, op. cit., p. 4.

meet the needs of commerce and defense. It recommended that the development and maintenance of an adequate system of airports should be recognized as a matter of national concern and a proper object of federal expenditure.<sup>8</sup>

In 1940 Congress appropriated \$40 million ". . . for construction, improvement, and repair of up to 250 public airports after determination should be made that they were necessary for national defense."<sup>9</sup> This was the first Congressional appropriation made directly to a federal civil aviation agency for airport construction.

When the United States entered World War II, federal appropriations for the development and improvement of civil airports with potential military use increased rapidly. Total investment in airports open to the public was almost \$1 billion by the end of the war. About 80 per cent of funds had been furnished by the Federal government, about 8 per cent was from private sources, and the remainder was from state and municipal governments.<sup>10</sup>

Federal Airport Policies From  
World War II Through 1957

In 1946 Congress passed the Federal Airport Act.

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<sup>8</sup>Federal Aviation Agency, Historical Fact Book, op. cit., p. 16.

<sup>9</sup>Ibid., p. 17.

<sup>10</sup>Federal Aviation Agency, Twentieth Annual, op. cit., p. 5.

It provided for the development of a national system of public-use airports by establishing a program of federal aid and national airport planning.

The Act charged the CAA with a continuing responsibility to develop annually, publish, and revise a national airport plan.<sup>11</sup> Until the early 1960's, the plan consisted largely of a listing of proposed new airports and improvements of existing airports without a serious attempt to develop a system of airports.

The recent plans identify the communities where new airports are needed or existing airports require expansion ". . . if the nation's airports are to keep pace with the rapid evolution of the new aviation age."<sup>12</sup> The plans also specify what major facilities need to be developed at individual airports. The criteria for assessing airport needs center around the development of what is considered to be an adequate system of airports rather than ". . . the community's ability to undertake the recommended work, or the availability of Federal funds. . . ."<sup>13</sup>

The Federal Airport Act of 1946 established the Federal Aid to Airport Program (FAAP). It authorized

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<sup>11</sup>This responsibility was transferred to the Federal Aviation Agency when it was created in 1958.

<sup>12</sup>Federal Aviation Agency, 1966/1967 National Airport Plan (Washington, D.C.: Government Printing Office, 1967), p. 1.

<sup>13</sup>Ibid., p. 2.

appropriations of \$500 million for the continental United States over a period of seven years beginning July 1, 1946. The federal assistance was to be matched by local funds.

After administrative expenses were deducted, 75 per cent of the FAAP funds were divided among the states on the basis of population and area. The remaining 25 per cent was placed in a fund to be used at airports chosen at the discretion of the CAA administrator. Federal funds could be used for one-half of the airport construction costs, other than land acquisition costs, for smaller airports.<sup>14</sup> In states where 5 per cent or more of the total area is Federal land, Federal participation could be as high as three-fourths of construction costs. In the case of larger airports, Federal funds could be used to match 50 per cent of the first \$5 million of construction costs. The Federal share declined above that amount to 20 per cent of the total cost which exceeded \$11 million.

To be eligible for FAAP assistance, an airport project must be included in the current National Airport Plan. This provision was expected to guard against the haphazard airport development which occurred under the Civil Works Administration programs.<sup>15</sup>

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<sup>14</sup>The Federal share in the cost of land acquisition was limited to 25 per cent for all airports.

<sup>15</sup>Charles L. Dearing and Wilfred Owen, National Transport Policy (Washington, D.C.: The Brookings Institution, 1949), pp. 32-33.

After World War II, many surplus military airports were transferred to local communities for use as civil airports. In 1947 Congress enacted Public Law 289, an amendment to the Surplus Property Act of 1944, to allow the transfer of surplus personal property used at airports to state and local governments.<sup>16</sup> The surplus personal property program is still operating, and the practice of transferring surplus military airports to civil government operation has also continued. Since the end of World War II, about 500 military airports have been transferred to public-use status.<sup>17</sup>

During the 20 years since the establishment of the FAAP, the amount of federal funds allocated has varied from zero in 1954 to \$76 million in 1964.<sup>18</sup> Although \$500 million had been originally authorized, about \$206 million was actually allocated during the initial seven year period.<sup>19</sup>

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<sup>16</sup>Federal Aviation Agency, Federal Surplus Personal Property for Public Airport Purposes (Washington, D.C.: FAA, 1962), pp. 1-2.

<sup>17</sup>Federal Aviation Agency, Twentieth Annual, op. cit., p. 5.

<sup>18</sup>Federal Aviation Agency, Historical Fact Book, op. cit., p. 101. The Bureau of the Budget did not permit any requests for airport aid funds for fiscal year 1954. See U.S., Congress, House, Committee on Government Operations, Federal Role in Aviation, 84th Cong., 2nd Sess., H.R. 2949, 1956, p. 11.

<sup>19</sup>Federal Aviation Agency, Historical, op. cit., p. 101.

In 1954 Congress introduced changes in the FAAP. Federal assistance in airport development was reduced to 25 per cent of the cost of projects and was "to be used primarily for improvements contributing most directly to safety and to national defense."<sup>20</sup> Almost all the assistance was to go to large air carrier airports. The construction of buildings was excluded from items for which assistance could be received.

In 1955 the program was changed again to make all types and sizes of publicly owned airports eligible for assistance, rather than just those considered most important for national defense. Also, airport buildings were made eligible items for development.

#### Federal Airport Policies After 1957

During 1956 and 1957 Congressional dissatisfaction with civil aviation programs and agencies increased.<sup>21</sup> The multiplicity of government agencies involved in aviation had always made the development of policy difficult. Congressional and Presidential study groups concluded that governmental organizations and programs had not developed

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<sup>20</sup>Ibid., p. 35.

<sup>21</sup>U.S. Congress, Federal Role. . . op. cit.; and Donald R. Whitnah, Safer Skyways: Federal Control of Aviation, 1926-1966 (Ames, Iowa: Iowa State University Press, 1966), pp. 213-241.

as rapidly as aviation in the last decade.<sup>22</sup> An independent agency with centralized aviation functions was recommended.

In May, 1958, Senator Monroney introduced Senate Bill 3880, ". . . to create an independent Federal Aviation Agency . . . ." <sup>23</sup> The Federal Aviation Act was signed into law four months later. The Act established the Federal Aviation Agency (FAA) as a successor to the CAA and outlined the powers and responsibilities of the FAA Administrator as follows: <sup>24</sup>

- "(a) The regulation of air commerce in such manner as to best promote its development and safety and fulfill the requirements of national defense;
- "(b) The promotion, encouragement, and development of civil aeronautics;
- "(c) The control of the use of the navigable airspace in the interest of the safety and efficiency of both;
- "(d) The consolidation of research and development with respect to air navigation facilities, as well as the installation and operation thereof;
- "(e) The development of a common system of air traffic control and navigation for both military and civil aircraft."

President Eisenhower appointed Elwood Quesada, a retired U.S. Air Force General, as the first FAA Administrator in November, 1958. Two months later Quesada

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<sup>22</sup> See U.S. House of Representatives, Committee on Government Operations, Hearings on the Federal Role in Aviation, 84th Cong., 2nd Sess., 1956.

<sup>23</sup> Cited in Federal Aviation Agency, Historical, op. cit., p. 41.

<sup>24</sup> Ibid., p. 42.

submitted to Congress draft legislation to extend the FAAP for a four year period and to authorize \$200 million for the program. Quesada's plan was to effect ". . . an orderly withdrawal of Government from the airport grant program."<sup>25</sup> It also included an increase from 25 to 50 per cent in the proportion of funds which would be allocated at the discretion of the FAA Administrator.

Compromise legislation extended the FAAP for two years and authorized \$63 million for each year. In 1961 the FAAP was extended again with authorized annual appropriations of \$75 million for the following four fiscal years. The program was extended in 1965 and \$75 million annual appropriations were authorized.<sup>26</sup>

The cumulative federal assistance granted under the FAAP from 1946 to June 1, 1965, was \$862 million (Table 1). About 86 per cent of the funds went to air carrier airports, and an additional 11 per cent went to non-air carrier airports which either relieved air traffic

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<sup>25</sup>Ibid., p. 43.

<sup>26</sup> Although the FAAP is large in absolute terms, it is small relative to other federal transportation assistance programs. For example, in fiscal 1967 federal assistance given for airport construction projects amounted to \$59 million, and the assistance given for highway construction projects was about 4.2 billion (about 70 times greater than airport assistance). It is interesting to note that in the same year Congressional appropriations for an additional program dealing with highway beautification (\$80 million) were greater than the appropriations for airport construction. The Budget of the United States Government for the Fiscal Year Ending June 30, 1968 (Washington, D.C.: Government Printing Office, 1967), pp. 320-323.

TABLE 1  
CUMULATIVE FEDERAL FINANCIAL ASSISTANCE UNDER THE FEDERAL  
AIRPORT ACT, BY AIRPORT CATEGORY, AS OF JUNE 1, 1965

Airport Category	Number of Airports	Total Assistance (Millions of Dollars)	Per Cent	Average Assistance (Thousands of Dollars)
Trunk Air Carrier	240	\$607	70.4	\$2,530
Local Air Carrier	476	137	15.9	288
Air Carrier "Reliever" <sup>1</sup>	74	48	5.6	650
General Aviation, Commercial <sup>2</sup>	815	51	5.9	63
General Purpose <sup>3</sup>	401	19	2.2	47
Total or Average	2,006	862	100.0	430

Source: Federal Aviation Agency, Twentieth Annual Report of Operations Under the Federal Airport Act (Washington, D.C.: FAA, 1966), p. 6.

<sup>1</sup>General Aviation airports which divert air traffic from heavily used air carrier airports.

<sup>2</sup>General aviation airports in communities which do not have airline service but are connected to air carrier airports by a posted-fare air-taxi service.

<sup>3</sup>All other general aviation airports.

congestion at air carrier airports or provided posted-fare air taxi service to air carrier airports.

Federal aviation policies have emphasized the development of air carrier and military aviation. General aviation (all civil aviation other than air carrier aviation) has been neglected. From World War II to the early 1960's, the administrators of federal agencies concerned with aviation (CAA, FAA, and CAB) were often former, high-ranking military personnel.<sup>27</sup> Coordinating, investigatory, and advisory civil aviation committees were generally composed of military officers and executives from airlines, large aircraft manufacturing firms, and air carrier airports.<sup>28</sup> These groups viewed civil aviation problems almost completely as air carrier and national defense problems.

The common, general outlook on aviation problems is

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<sup>27</sup>From the creation of the Civil Aeronautics Administration in 1940 to the present, all but one of the 11 administrators of the CAA and its successor, the FAA, have had military backgrounds. The group includes two retired generals, a former Deputy Chief of Naval Communications, a former Deputy Assistant Secretary for Defense, and four former officers in military transport organizations. Many of the administrators also had been associated with airline companies. One administrator held an executive position with a military aircraft manufacturing firm during three of his four years as CAA Administrator. See Federal Aviation, Historical Fact Book, op. cit., pp. 17, 20, 21, 28, 31, 32, 34-35, 38, 39, 42-43, and 52; and Donald R. Whitnah, Safer Skyways, op. cit., pp. 214-215 and 332-333.

<sup>28</sup>Ibid., pp. 213-296; and U.S. Congress, Federal Role, op. cit., pp. 10-11.

not difficult to understand. Until the latter 1950's, general aviation was largely a matter of instructional and pleasure flying and was not directly relevant to national defense. The officials with military backgrounds tended to view all problems in terms of national defense and saw the air carrier airports and aircraft as valuable supplements to national defense capabilities.<sup>29</sup> The airline officials realized that, as had generally been the case in the past, the future air carrier aircraft, flight instruments, and airway facilities which they wanted would be developed initially for the military. The large aircraft manufacturers depended on military expenditures for most of their research and development activities and a major portion of their revenues. Their second major market was the airlines. Aircraft designs developed for the military could be modified and offered to the airlines. The executives of the large air carrier airports recognized the applicability to their problems of technology developed for the military. General aviation aircraft tend to congest air carrier airport facilities and make more difficult what air carrier airport executives perceive to be their

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<sup>29</sup>See Frederick C. Thayer, Jr., Air Transport Policy and National Security: A Political, Economic and Military Analysis (Chapel Hill, N.C.: University of North Carolina Press, 1965), pp. 67-227.

primary job—managing facilities for air carrier service.<sup>30</sup>

Until the early 1960's general aviation and general aviation airports were treated as an after-thought. Non-air carrier civil aviation received so little attention in federal aviation policy that there was no commonly used name for this segment of aviation until the latter 1950's.<sup>31</sup> No particular recognition of this segment of aviation was given in the organization of the FAA until 1962 when an Office of General Aviation Affairs was created.<sup>32</sup>

Two of the major factors influencing the attention currently being given to general aviation are: (1) changes in the viewpoint of the FAA and (2) the rapid growth of general aviation. In 1961 President Kennedy asked N. E. Halaby, the FAA Administrator to, ". . . develop for my consideration a statement of national aviation goals . . . ." <sup>33</sup>

<sup>30</sup>Interviews with several airport executives at the American Association of Airport Executives', "1966 National Airports Conference," at the University of Oklahoma, Norman, October 9-11.

<sup>31</sup>See the remarks of Mr. Frank Martin, Vice President of Cessna Aircraft Company, in General Aviation Today and Tomorrow, the transcript of the September 14, 1965, Utility Airplane Council's "Conference on General Aviation," (Washington, D.C.: Utility Airplane Council of the Aerospace Industries Association), pp. 131-132.

<sup>32</sup>Federal Aviation Agency, Fifth Annual Report, 1963 (Washington, D.C.: Government Printing Office, 1964), pp. 71-72.

<sup>33</sup>President Kennedy's letter to Halaby requesting the study is reprinted in Report of the Task Force on National Aviation Goals (Washington, D.C.: Government Printing Office, 1961), p. iii.

Halaby appointed an Advisory Board to prepare the statement. This Board, however, was composed not only of former military personnel and airline executives, but also included several persons interested in general aviation.<sup>34</sup> The report of the Board included an extensive discussion of the importance of general aviation and general aviation airports.<sup>35</sup>

Also in 1961 the President directed the FAA Administrator to prepare a long-range plan to insure efficient and safe control of all air traffic in the United States. Another task force was appointed, and their report included statements about the importance of providing general aviation airports.<sup>36</sup> Upon receipt of the report, the President asked the FAA Administrator to, ". . . begin at once to carry out those recommendations of the report which you believe will move the airways program forward rapidly and efficiently."<sup>37</sup>

In 1962 the FAA was reorganized, and a top-level Office of General Aviation Affairs was created. The number

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<sup>34</sup>Ibid., p. 235.

<sup>35</sup>Ibid., pp. 86-106.

<sup>36</sup>Report of the Task Force on Air Traffic Control (Washington, D.C.: FAA, 1961), p. 70.

<sup>37</sup>Quoted in Federal Aviation Agency, Design for the National Airspace Utilization System (Washington, D.C.: Government Printing Office, 1962), p. ix.

of items in the series of general aviation airport planning publications, which began in late 1960, increased and general aviation airports were included as an important aspect of the national air traffic system.<sup>38</sup>

In 1940 about 3 million miles were flown in general aviation (Table 2). During World War II attention was attracted to aviation due to extensive use of aircraft and rapid improvements in aviation technology. Predictions were made that the privately owned airplane would soon become almost as common as the automobile.<sup>39</sup>

General aviation hours flown increased to about 16 million in 1947, but the predicted common use of private

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<sup>38</sup>Ibid., pp. 108-109, 334-340.

<sup>39</sup>For example, see Lynn L. Bollinger, Alan Passen, and R. E. McElfresh, Terminal Airport Financing and Management (Boston, Mass.: Harvard University Graduate School of Business Administration, 1946), p. 4. Anticipating a rapid increase in the importance of private flying, several rather extensive research and instructional programs were established at Harvard during 1945 and 1946. In 1945 the Civil Aeronautics Administration published what it termed a conservative estimate of the number of private aircraft in the United States in 1955. The CAA estimated a private aircraft fleet of 400,000 airplanes. In 1955 there were actually about 60,000 active general aviation aircraft. Parts of a study made by Victor Perlo for the War Production Board, Research Coordination Staff in 1945 were quoted in the CAA publication. Perlo concluded that "We can confidently set forth a goal of a million private airplane users by the end of the post war decade." He predicted that there would be 1,120,000 family-size aircraft by 1955. Others predicted even larger numbers. See Civil Aeronautics Board, Civil Aviation and the National Economy (Washington, D.C.: Government Printing Office, 1945), pp. vii, 40-41.

TABLE 2

ESTIMATED HOURS AND MILES FLOWN IN GENERAL AVIATION,  
BY TYPE OF FLYING, SELECTED YEARS, 1940-1965

Years	Thousands of Hours				Millions of Miles			
	Total <sup>#</sup>	Business and Com- mercial	Instruc- tional	Personal and Other	Total <sup>#</sup>	Business and Com- mercial	Instruc- tional	Personal and Other
1940	3,200	692	1,529	970	264	58	126	80
1947	16,334	3,245	10,353	2,736	1,502	378	849	275
1951	8,451	4,534	1,902	2,015	975	570	190	215
1956	10,200	6,600	1,500	2,100	1,315	919	158	238
1960	13,121	8,064	1,828	3,229	1,769	1,180	194	395
1965	16,733	9,205	3,346	4,182	2,563	1,665	359	539

Source: Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), pp. 97-98.

<sup>#</sup>Components may not add to totals due to rounding.

aircraft did not occur. Three major factors involved in the rapid increase in general aviation activity in the late 1940's were: (1) a large number of pilots were trained during the war, (2) a large number of former service men took flight training financed by the federal veterans education program, and (3) a large number of relatively inexpensive aircraft was available from military surplus stocks.

About 60 per cent of the hours flown in general aviation in 1947 were flown for instructional purposes. However, in 1948 and 1949, payment of flight instruction fees was removed from the veterans education program. General aviation instructional flying decreased from about 10 million hours in 1947 to about 2 million in 1951.

The number of airports increased rapidly after World War II. In 1949, there were about 6,400 airports on record with the Civil Aeronautics Administration (Table 3). Three factors involved in the increase in civil airports in the four years following World War II were: (1) the transfer of surplus military air fields to local governments, (2) the construction of new airports with funds provided by the FAAP, and (3) the establishment of a large number of landing strips at the edge of municipalities.

A pilot could buy a surplus military aircraft for as little as \$200 to \$800, and rent a field or pasture at the edge of a city or town. Other owners of similar

TABLE 3  
AIRPORTS ON RECORD WITH THE FEDERAL AVIATION AGENCY,  
SELECTED YEARS, 1949-1966<sup>a</sup>

Year	Airports	Airports with Runway Lights	Airports with Paved Runways
1949	6,414	1,521	1,357
1953	6,042	1,858	1,498
1955	6,977	1,108	1,084
1958	6,412	1,713	1,496
1961	6,881	2,133	1,893
1963	8,084	2,481	2,355
1966	9,566	2,878	2,747

Source: Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), p. 7.

<sup>a</sup>For the years before 1958, airport records were maintained by the Civil Aeronautics Administration.

aircraft might share the expense of the airport and base their aircraft there. As the suburbs expanded, it became too expensive to maintain many airports of this type. For example, a landing strip which might have been rented for \$500 a year could be turned into a housing development with lot sales of \$200,000.

Although the total number of airports decreased from 1949 to 1953, the number of airports, with such facilities as lighted runways and paved runways, increased. The total hours flown in general aviation decreased from about 16 million in 1947 to about 8 million in 1952, but general aviation business and commercial flight hours increased throughout the period. Many of the army surplus aircraft purchased for personal flying proved to be too expensive to maintain and were salvaged in the early 1950's.<sup>40</sup>

In 1947 business and commercial flying accounted for about one-fifth of total general aviation activity, but since 1950 over one-half of the general aviation flight hours have been in aircraft used primarily for business and commercial purposes.

General aviation has been growing rapidly in the past three years. The number of active general aviation aircraft increased from about 85,000 at the beginning of

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<sup>40</sup>Interviews with several pilots and former owners of army surplus aircraft.

1964 to about 104,000 at the beginning of 1967.<sup>41</sup> The number of active general aviation aircraft is expected to reach 180,000 by 1977.<sup>42</sup> About 17 million hours were flown in general aviation during 1966, and about 35 million hours per year are expected to be flown before 1977.<sup>43</sup> The 12 per cent increase between 1960 and 1965 in the number of airports on record with the FAA has been almost completely due to the increase in general aviation activity.<sup>44</sup>

As has been the case since 1946, state or local governments (the public agencies are called sponsors) apply for federal assistance for specific airport projects. The projects are selected from the applications for those airports included in the current National Airport Plan.<sup>45</sup> Since the establishment of the FAA, however, there has been a change in the process of determining which airports and what type of facilities are to be developed. As mentioned

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<sup>41</sup>Federal Aviation Agency, Aviation Forecasts: Fiscal Years, 1967-1977 (Washington, D.C.: FAA, 1967), p. 25.

<sup>42</sup>Ibid. As was noted earlier, FAA forecasts made in the past few years have proved to be extremely conservative.

<sup>43</sup>Ibid., p. 27.

<sup>44</sup>National Business Aircraft Association, "Business Flying," Special Report 67-6 (Washington, D.C., March, 1967), p. 22.

<sup>45</sup>See Federal Aviation Agency, Information on the Federal-Aid Airport Program (FAAP) (Washington, D.C.: FAA, 1965); and Federal-Aid Airport Program: Procedures Guide for Sponsors (Washington, D.C.: FAA, 1966).

earlier, the recent National Airport Plans have resulted from a serious effort to provide for a national system of airports. Likewise, the criteria for federal assistance under the FAAP have recently been improved.

The FAA is currently emphasizing the need for better airport planning. Socio-economic criteria are increasingly being used in the National Airport Plan and the FAAP, ". . . to predict airport requirements, thus making it possible to anticipate, rather than merely to meet, the airport needs of the nation's communities."<sup>46</sup> Also, efforts are being made to bring together federal, state, and local planning interests in order to integrate airport planning with other planning. This integration is required to bring about coordinated state, regional, and national airport systems.

Under the current FAAP, assistance is to go to those projects which contribute directly to safety and all-weather operations. The criteria for selection of individual projects for assistance have been made more rigorous, by requiring consideration of alternative sites, comparative cost studies, and more strict justification of need. The FAA examines closely ". . . the size and type of proposed airport improvements against the best scientific forecasts of the number and type of aircraft

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<sup>46</sup>Federal Aviation Agency, Twentieth Annual, op. cit., p. 2.

operations which the project is expected to support. A more sophisticated analysis is now made concerning the relationship of proposed improvements to potential requirements."<sup>47</sup> Communities are now required to consider the possibility of area or regional airports before they submit requests for aid.<sup>48</sup>

The Federal Aviation Agency became part of the new Department of Transportation in late 1966. Alan S. Boyd, former chairman of the CAB and Undersecretary of Commerce for Transportation, became Secretary of Transportation in November of 1966. On April 1, 1967 the FAA's name was changed to the Federal Aviation Administration. Not enough time has elapsed to know what influence the recent organizational changes will have on federal airport policies.

Development of The Concept of a General  
Aviation Airport System

During the past decade, the concept of a general aviation airport system has been developing. Two of the major factors involved in the formation of the concept are: (1) the rapidly increasing across-country travel capabilities of general aviation aircraft, and (2) the

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<sup>47</sup>Ibid., p. 6.

<sup>48</sup>Federal Aviation Agency, Information on the, op. cit., p. 3.

increased usefulness of general aviation travel which has resulted from the increased federal attention given to general aviation.

Before World War II that portion of aviation which is now called general aviation was not generally expected to develop into a serious mode of travel. The small aircraft owned by individuals were primarily used for recreational purposes. The relatively small number of aircraft-owning business firms, whose activities were not directly related to aviation, often operated the same type of aircraft that the airlines used. Since general aviation activities accounted for little long distance travel, general aviation airports were oriented toward local flights (those which end at the airport from which they begin). Almost all attention given to the provision of a system of civil airports in the decade before World War II was in terms of air carrier aviation.

During and immediately following World War II, the notion that aircraft could be used for family transportation purposes was relatively common. It was expected that there would be a rapid transition toward family aircraft as a common mode of travel. However, the production of aircraft suitable for family transportation did not occur, and surplus army aircraft were not satisfactorily adaptable to such use. Moreover, the system of airports and airways which existed then, in combination with the lack

of suitable aircraft, did not permit general aviation to be a safe, reliable, and efficient mode of transportation.

In the latter 1940's and early 1950's, the less expensive aircraft, such as the Piper Cub, could not be used satisfactorily for travel. They usually had only two seats and little provision for baggage, were uncomfortable, had relatively slow cruising speeds (85 to 110 miles per hour), and a fuel range of 150 miles or less. Moreover, general aviation travel was unreliable. Most of the aircraft were equipped only for fair-weather, daylight flight; the information available about airport conditions and facilities was unsatisfactory; weather information was inadequate; there were relatively few airports with lighted, paved runways; and generally, other airport facilities were limited.

In the decade following World War II the provision of facilities for a system of air carrier airports continued to dominate the attention given to civil airports at the federal level. Although it was recognized that development of general aviation airport facilities was needed, attention given to these airports was focused on the needs of local flight activity at individual communities, rather than the provision of a system of airports needed for travel.

In 1961 President Kennedy requested a statement of national aviation goals. The members of the group

which prepared the report recognized that general aviation aircraft were becoming an important part of the air transportation system. Their report included the following statement:

The time to begin proper planning for major air terminals for the 1970 period has already passed, and an immediate assessment of needs in this area must be made. To accommodate the indicated need during the 1960's, planning should be crystallized now for a minimum of 5 additional major airports and an additional 150 airports suitable to serve significant general aviation activities. There is an additional requirement for airstrips geographically located to provide national air accessibility comparable to that provided to the automobile user by our roads and highways . . . . Over the next decade the airplane will mean much to the growth and development of the Nation, and its ability to contribute fully to important areas away from the main traffic centers must be assured.<sup>49</sup>

The statement of national aviation goals and its general acceptance was an important factor in the increased attention recently given to general aviation. Attention was given to general aviation as a system of transportation, rather than treating general aviation as an after-thought following consideration of the national defense and transportation aspects of air carrier aviation.

General aviation has been growing rapidly in the past few years. (General aviation flight hours

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<sup>49</sup>Report of the Task Force on National Aviation Goals (Washington, D.C.: Government Printing Office, 1961), pp. 89-90.

increased more than 25 per cent from 1965 to 1966.) Most of the growth has been related to the increased effectiveness of general aviation as a mode of travel. Recent technological improvements in general aviation aircraft, together with the recent improvement of navigation systems and weather, traffic, and airport information, have greatly increased the usefulness and reliability of general aviation. Although most of the adventure which was involved in general aviation travel a decade ago has been lost, most of the uncertainty has been removed also. Since 1961 the FAA (with cooperation from the U. S. Weather Bureau and other government organizations) has greatly increased the navigation facilities, and weather, traffic, and airport information available to general aviation. Today the general aviation pilot has almost as much information and almost as many flight services as the airline pilot. The improvements in flight facilities and services provided by the FAA has radically improved the transportation ability of general aviation.

There are conflicts between the development of airports as provided for in the FAAP and the efficient development of a system of general aviation airports. The FAAP is directed toward individual municipalities. If a community is unable or unwilling to initiate requests for federal funds, provide the local share of the costs of airport projects, or meet the airport design standards of the

FAA, airport facilities probably will not be provided. Often individual communities do not understand the nature of their present or future airport needs, and they can not be expected to consider how local airport development influences state and national airport systems. Furthermore, since the initiation of airport development is usually at the municipal level, it is difficult to provide airports which can serve two communities in an area. Regional or multi-community airports could, in many cases, provide better airport facilities for the communities involved at less cost than several less adequate airports at each of the individual communities.

Some of the problems in the FAAP approach to providing a system of airport facilities were recognized in the report on national aviation goals requested by President Kennedy in 1961. The report stated that: "The complexity and number of factors involved in air terminal and facility planning, combined with the substantial number of years intervening between the time a particular community or region faces a new airport problem, make it difficult to accumulate community expertise in planning and designing airports."<sup>50</sup> It was recommended that the FAA should play a more important role in airport planning. Although the FAA has increased the amount of planning assistance and

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<sup>50</sup>Ibid., p. 94.

information available to municipalities since 1961, it does not have the power to force local communities to cooperate in their airport planning and construction activities.

## CHAPTER 3

### OKLAHOMA AIRPORT POLICIES

Because airport development has largely been a matter of municipal and federal concern, state governments until recently have typically played a minor role in airport programs. All but six states, however, have some agency or department dealing primarily with aviation.<sup>1</sup> In states without a separate aviation department or commission, the organization dealing with aviation is usually in the department which is primarily concerned with industrial development.

Some state aviation agencies have either regulatory or promotional responsibilities, and some have both. Often the purposes and responsibilities of the agencies are ambiguous.<sup>2</sup> In some states, aircraft registration with the state aviation organization is required, and the

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<sup>1</sup>Donald W. Dean (ed.), World Aviation Directory (Washington, D.C.: American Aviation Publications, Inc., 1966).

<sup>2</sup>See Norman F. Danier, "The Role of Indiana's State Government in Airport Development," unpublished Ph.D. dissertation, Indiana University, 1965, pp. 147-161.

registration fees imposed are used to help finance the agency.

The trend toward comprehensive state planning, increased general aviation flying, area and regional airports, and cooperative federal, state, and local airport planning, have increased the importance of state aviation agencies in the formation and execution of airport policy. The development of aviation policies in Oklahoma, current activities of the Oklahoma Aeronautics Commission, and some of the general aspects of aviation in Oklahoma are discussed in this chapter.

#### Development of Oklahoma Airport Policies

In 1931 the Oklahoma Legislature enacted a law requiring that pilots and aircraft be licensed.<sup>3</sup> Enforcement of the statute was the duty of the Highway Commission.

During 1940, 1941, and 1942 communities across the United States vied for Army air fields. In 1941 the Oklahoma Legislature gave municipalities certain powers of eminent domain with respect to airport, flight training airfields, bombing ranges, and structural hazards near airports.<sup>4</sup> In 1943, however, this legislation was repealed.<sup>5</sup>

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<sup>3</sup>Session Laws, 1931, pp. 193-195.

<sup>4</sup>Session Laws, 1941, pp. 5-6.

<sup>5</sup>Session Laws, 1943, p. 15.

In 1943 a statute was enacted to allow counties having a population of more than 244,000 (in 1940) to join with adjacent counties in forming an airport district and a regional airport commission.<sup>6</sup> The districts could own and operate airports. The only county which came within the scope of the legislation was Oklahoma County with a population of 244,159 in 1940. The law was repealed in 1963.

The National Institute of Municipal Law Officers drafted the first Model Airport Zoning Act in 1938.<sup>7</sup> By the time the fifth revision was published in 1944, 12 states had passed similar acts. The Civil Aeronautics Administration redrafted the 1944 Model Airport Act in 1946 to promote uniform state legislation enabling cities, towns, or other political subdivisions to build and operate airports and to obtain aid under the Federal Airport Act.<sup>8</sup>

The 1944 Oklahoma Legislature passed an act generally similar to the 1944 Model Airport Act. It gave municipalities ". . . power to acquire, own, operate, improve and maintain, within or without the corporate limits . . . real estate, buildings, improvements and facilities for . . . airports and rights of way therefor."<sup>9</sup> The Act

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<sup>6</sup>Ibid., pp. 1-14.

<sup>7</sup>Federal Aviation Agency, Historical Fact Book: A Chronology, 1926-1963 (Washington, D.C.: Government Printing Office, 1966), p. 16.

<sup>8</sup>Ibid., p. 25.

<sup>9</sup>Session Laws, 1945, p. 20.

also provided municipalities with the power of eminent domain for airport purposes, and the right to issue bonds to finance airport construction.

In 1947 the Oklahoma Municipal Airports Act became law. The Act was similar to the CAA redraft of the 1944 Model Airport Act.<sup>10</sup> In addition to the powers given to municipalities by the legislature, power to contract with federal and state agencies was granted to municipalities and counties. Public agencies were given the right to own and operate airports jointly.<sup>11</sup>

The importance of airports to the State's economic development was recognized in the early 1940's. In 1945 the Oklahoma Planning and Resources Board's Division of Industrial and State Planning published a study of the state's transportation facilities.<sup>12</sup> Airports were considered to be important to industrial development. A list of 109 airports available for public use was published as an inventory of Oklahoma's airport facilities.<sup>13</sup>

The Oklahoma Aviation Commission was created in

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<sup>10</sup>Session Laws, 1947, pp. 14-24.

<sup>11</sup>The only exception to the joint operation provision is institutions of higher education. Ibid., p. 20.

<sup>12</sup>"Transportation, 1945," (Oklahoma City, Mimeographed, 1945).

<sup>13</sup>Ibid., pp. 25-27.

1947.<sup>14</sup> Eight of the nine members of the Commission were appointed by the Governor. The other member was the Chairman of the Planning and Resources Board. The commission appointed a director to carry out the provisions of the Oklahoma Aeronautics Commission Act. The director was to devote full time to his office and receive a salary of \$4,800. If there was no regularly employed director, the Chairman of the Oklahoma Planning and Resources Board was required to serve as director without additional salary.

The declared purpose of the Act was to promote aviation safety, assist in the development of a statewide system of airports, and encourage and develop aeronautics. The Commission had both promotional and regulatory duties. The Act required the registration of pilots and aircraft; required the reporting of all aviation accidents in the state; empowered the Commission to hold investigations into the cause of accidents; and made reckless operation of an aircraft unlawful. The appropriations made to the Commission were small, relative to the duties imposed by the Act.

In 1959 the Legislature enacted legislation allowing Boards of County Commissioners to construct airports if Federal funds were available for the project, and there was no hardsurfaced airport in the county with a runway

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<sup>14</sup>Session Laws, 1947, pp. 8-14.

of 2,600 feet or more.<sup>15</sup> The airports could be constructed on land owned by a county or a municipality.

The Act allowed the value of the services and materials provided by Boards of County Commissioners, in cases which met the requirements of the Act, to be part of the local funds used to match Federal assistance granted under the FAAP. This writer did not find a case in which the authority had been used.

In 1963 the Legislature abolished the Oklahoma Aviation Commission and created the Oklahoma Aeronautics Commission. The purpose of the act is given below.

It is hereby declared that the purpose of this act is to further the public interest in aeronautical progress:

(a) by granting to a state agency such powers and imposing upon it such duties that the state may properly perform its functions relative to aeronautics; effectively assist in the development of a statewide system of airports, cooperate with and assist the municipalities of this state and others engaged in aeronautics and encourage and develop aeronautics in all its phases in this state; (b) by providing for the protection of persons and property through the promotion of safety in aeronautics; and (c) by providing for cooperation with federal authorities in the development of a national system of civil aviation and for coordination of the aeronautical activities of those authorities of this state by assisting in accomplishing the purposes of federal

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<sup>15</sup>Session Laws, 1959, p. 29.

legislation and eliminating costly and unnecessary duplication of functions in the province of federal agencies.<sup>16</sup>

The specific powers and duties of the Commission include: (1) providing engineering and technical services to anyone in connection with airport planning, acquisition, construction, improvement, maintenance, or operation; (2) giving financial assistance by grant or loan (or both) to municipalities for purposes of airport planning, construction, improvement or operation; (3) to act as an agent of a municipality in connection with Federal airport aid funds; and (4) to own and operate both airports and air navigation facilities. The Commission was not given any regulatory authority over aircraft or pilots.

The Commission is authorized to construct an airport in any county in which there is not an active airport. In counties in which there are active airports but none with hardsurfaced runways of at least 2,600 feet, the Commission is authorized to construct an airport with a hardsurfaced runway. However, the Commission can only repair or construct airports if federal funds are available for the project. This requirement results in the Commission being dependent upon local government to initiate all airport construction or repair activities.

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<sup>16</sup>Oklahoma Statutes, 1965 Supplement, pp. 61-62.

The Commission is composed of six members appointed by the Governor. There is a Commissioner from each of the six Congressional Districts. The Commission is responsible for hiring a full-time director whose salary is statutorily set at \$10,000.

Activities of the Oklahoma  
Aeronautics Commission

The activities of the Commission are restricted by limited funds. In fiscal year 1966, the Commission's total expenditures were less than \$130,000.<sup>17</sup> Of this amount, about \$88,000 was granted to municipalities for airport construction and repair. Although most of the Commission Director's in-state travel is to and from airports, and the Director is an experienced pilot, he travels by automobile because Oklahoma is one of the few states which does not provide an aircraft for its aviation agency.

Some of the major activities of the Commission are:

- (1) administering a state-aid program of airport development,
- (2) coordinating and assisting in the activities of various private aviation groups,
- (3) sponsoring pilot seminars and flight instructor refresher clinics,
- (4) providing a state and regional defense airlift plan,
- (5) working with the FAA in the development of Oklahoma aspects of

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<sup>17</sup>Oklahoma Aeronautics Commission, Aviation in Oklahoma: Annual Report of the Aeronautics Commission (Oklahoma City, 1966), p. 15.

the National Airport Plan, (6) advising and assisting public organizations in the development of airports, and (7) assisting municipalities in obtaining Federal surplus equipment. Although the Commission manages to engage in several types of activity, the appropriations are far too limited to allow it to perform adequately the duties outlined in the Oklahoma Aeronautics Commission Act.

From 1946 to 1966, 73 Oklahoma airports have received about \$22 million from the FAAP for 188 projects.<sup>18</sup> In fiscal year 1965 slightly less than \$800,000 was allocated to projects in the State.<sup>19</sup> In fiscal years 1964, 1965, and 1966, the Commission approved almost \$300,000 of airport development assistance under the State-aid programs of the Oklahoma Aeronautics Commission.<sup>20</sup> The

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<sup>18</sup> Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), p. 15.

<sup>19</sup> Federal Aviation Agency, Twentieth Annual Report of Operations Under the Federal Airport Act (Washington, D.C.: FAA, 1966), Appendix A, p. 1. Twenty-six states received larger FAAP allocations than Oklahoma in fiscal 1965. About 63 per cent of the FAAP grant agreement funds in effect with Oklahoma airports in fiscal 1965 went to Oklahoma City's Will Rogers World Airport, and Tulsa International Airport.

<sup>20</sup> Oklahoma Aeronautics Commission, op. cit., p. 12. Norman E. Danier found that in fiscal 1963 more than one-half the states had programs of financial assistance for airport development. The amount of state assistance ranged from \$50,000 to more than \$2 million. About 60 per cent of all state appropriations to aviation agencies were for

Legislature appropriated \$100,000 for fiscal year 1967 for airport development.

The current policy of the Commission is to limit the assistance given to individual projects to \$5,000. If it does not exceed \$5,000, the Commission will grant assistance of up to one-fourth of the total cost of approved airport development projects or up to one-half of approved repair or maintenance projects. Repair and maintenance projects are not eligible for federal assistance.

Airports are important to the economic development of Oklahoma in two general ways: (1) the provision of facilities needed for local commercial aviation activities, and (2) the provision of connecting links in the national air transportation system between Oklahoma communities and communities in the rest of the nation.

Oklahoma airport policies have mainly developed in response to federal policies. As mentioned in Chapter 1, the FAA has recently recommended that states engage in airport planning and that such planning be a part of comprehensive state, regional, and local economic planning.

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airport development programs. About 58 per cent of the total funds available to all state aviation agencies were appropriations from the state general fund, about 33 per cent came from aviation fuel taxes, and about 9 per cent came from license and registration fees. "The Role of Indiana's State Government in Airport Development," Unpublished Ph.D. dissertation, Indiana University, 1965.

However, the statutory limitations placed on the Oklahoma Aeronautics Commission, in combination with the small appropriations to the Commission, preclude a planned, coordinated effort to provide the airport facilities needed now and in the future. The Commission is largely dependent upon municipal initiation of airport projects. Most of the appropriations to the Commission are for state aid to airports projects (which have received FAAP approval).

A state airport plan providing more than a listing of existing airports and their facilities and one which is integrated with comprehensive state planning, is needed.<sup>21</sup> As is true in the case of highways, if facilities are to be provided when and where they are needed, planning is required on a wider level than the local community. Since future airport needs depend upon the development goals, policies, and circumstances of Oklahoma's communities and regions, the provision of adequate airport facilities requires that airport planning be integrated

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<sup>21</sup>Federal assistance (authorized in Section 701 of the Housing Act of 1954) may be obtained for a state airport planning program when it is a part of the state's comprehensive planning program. A state airport plan could specify where and what types of airport facilities are needed and will be needed in the next decade. The plan could also explain why the development projects specified are or will be needed.

into comprehensive state and regional economic planning.

The Oklahoma Aeronautics Commission needs substantially greater appropriations from the legislature, if it is to accomplish the stated aims of the 1963 Aeronautics Commission Act. The Commission also needs authority to initiate needed airport projects (including projects for which FAAP funds are not available). Greater state aid is needed for communities which have difficulty providing the matching funds needed for FAAP assistance. Also, provision needs to be made for requiring greater consideration of airport development which can serve two or more communities.

When compared to the direct costs of highways, airports are relatively inexpensive. Generally, the construction costs for a large airport, such as Oklahoma City's Wiley Post, is less than the construction costs involved in two to five miles of interstate highway. Because airports occupy relatively large land areas, land acquisition is typically one of the major airport cost items (often the major item). In many cases a large portion of this cost could be avoided by long-term planning. Since land acquisition costs usually vary directly with the distance from the center of a community, an airport designed to serve two or more communities often can be located where land acquisition costs are relatively low.

In some cases multi-community or area-service airports could provide better aviation facilities at less cost for the communities involved than individual airports with less adequate facilities in each community. The lack of coordinated planning at the state and regional level can lead to inefficiency and waste in the provision of airport facilities.

Selected Aspects of Aviation  
in Oklahoma

FAA records indicate that among the states, Oklahoma ranks fourteenth in the number of civil aircraft, fifteenth in the number of civil pilots, and sixteenth in the number of civil airports.<sup>22</sup> There are about 200 civil airports and 2,500 active general aviation aircraft in Oklahoma on record with the FAA. The number of active general aviation aircraft registered in Oklahoma has increased about 20 per cent in the past three years. The number of airports in Oklahoma which are on record with the FAA increased from 143 at the beginning of 1963 to 195 at the beginning of 1966.

In the 1966/1967 National Airport Plan, the FAA has recommended that 29 new airports be built in Oklahoma and that major improvements be made at 90 existing airports

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<sup>22</sup>Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), pp. 11, 68, 85.

between now and fiscal 1972.<sup>23</sup> The total estimated cost of the recommended projects is about \$21 million. Twenty-five Oklahoma municipalities currently have applications pending for fiscal 1968 FAAP funds.

About 8,700 Oklahomans hold some type of FAA pilot certificate (Table 4). About 26 per cent of the certificates are student pilot ratings, 42 per cent are private pilot ratings, and 27 per cent are commercial ratings. Females account for four per cent of the certificates.

Eleven Oklahoma communities have airline service (Table 5). Oklahoma City and Tulsa account for slightly more than 9 out of 10 Oklahoma airline passenger originations. Three communities, Guymon, McAlester, and Muskogee, average less than four passenger originations a day, and the need for service at these communities is being investigated by the Civil Aeronautics Board. The Board's "use it or lose it" policy requires a daily average of at least five passenger originations if airline service is to be maintained. As is often the case when the Department of Defense recommends that a military installation be abandoned, pressures from local groups often can delay or prevent a CAB elimination of airline service recommendation from being executed after the service can not be justified

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<sup>23</sup>(Washington, D. C.: Government Printing Office, 1967), pp. 160-163.

TABLE 4

OKLAHOMA PILOTS, BY SEX AND BY PERIOD OF LAST AVIATION MEDICAL  
EXAMINATION, AS OF JUNE 1, 1966

Class of Certificate	Total	Male	Female	Last Aviation Medical Examination		
				Total	June 1, 1964 to June 1, 1966	June 1, 1963 to June 1, 1964
Student	2,285	2,084	201	2,285	1,951	334
Private	3,701	3,573	128	3,701	2,834	867
Commercial	2,336	2,310	26	2,336	1,962	374
Airline Transport	399	397	2	399	379	20
Total	8,721	8,364	357	8,721	7,126	1,595

Source: Compiled from the records of the FAA Airman Registration Branch,  
Aeronautical Center, Oklahoma City.

TABLE 5

OKLAHOMA CERTIFICATED ROUTE AIR CARRIER AIRCRAFT DEPARTURES AND  
PASSENGER ORIGINATIONS, BY CITY, 1965

City	Total Aircraft Departures Performed in Scheduled Service	Average Daily Aircraft Departures Performed in Scheduled Service	Revenue Passenger Origina- tions	Average Daily Revenue Passenger Origina- tions	Per Cent of Oklahoma Revenue Passenger Origina- tions
Bartlesville	1,125	3.1	2,899	7.9	0.4
Duncan	1,351	3.7	2,132	5.8	0.3
Enid	1,359	3.7	2,134	5.8	0.3
Guymon	658	1.8	571	1.6	0.1
Lawton	3,492	9.6	28,470	78.0	4.1
McAlester	697	1.9	1,360	3.7	0.2
Muskogee	708	1.9	1,000	2.7	0.1
Oklahoma City	17,609	48.2	342,966	939.6	49.6
Ponca City	1,331	3.6	2,347	6.5	0.3
Stillwater	1,361	3.7	3,123	8.6	0.4
Tulsa	17,853	48.9	303,603	831.8	43.9
Total or Average <sup>#</sup>	47,544	130.2	690,632	1,892.1	100.0

Source: Compiled from U.S. Civil Aeronautics Board and Federal Aviation Agency. Airport Activity Statistics of Certificated Route Air Carriers (Washington, D.C.: Government Printing Office, 1966), pp. 139-140.

<sup>#</sup>Components may not add to totals due to rounding.

under the CAB's criteria.

About 7,400 tons of air freight, express, and mail were shipped by airlines from Oklahoma's air carrier airports in 1965 (Table 6). Oklahoma City and Tulsa accounted for 93 per cent of the total.

TABLE 6

OKLAHOMA CERTIFICATED ROUTE AIR CARRIER FREIGHT, EXPRESS,  
AND MAIL ORIGINATIONS, BY CITY, 1965

City	Originations (Tons)			Total <sup>#</sup>
	Freight	Express	Mail	
Bartlesville	36	18	34	87
Duncan	55	4	11	69
Enid	42	6	12	60
Guymon	1	**	3	4
Lawton	38	9	92	139
McAlester	15	4	14	33
Muskogee	18	7	15	40
Oklahoma City	1,736	318	1,383	3,437
Ponca City	30	6	6	42
Stillwater	2	3	7	12
Tulsa	2,749	209	512	3,470
Total <sup>#</sup>	4,723	583	2,087	7,393

Source: U.S. Civil Aeronautics Board and the Federal Aviation Agency. Airport Activity Statistics of Certificated Route Air Carriers (Washington, D.C.: Government Printing Office, 1966), pp. 139-140.

<sup>#</sup>Components may not add to totals due to rounding.

\*\*Less than one-half ton.

## CHAPTER 4

### CHARACTERISTICS OF THE OKLAHOMA AIRPORT SYSTEM

Airports in Oklahoma range in size from the large air carrier airports, such as Oklahoma City's Will Rogers World Airport, to small, privately owned grass strips. The facilities available vary from the most modern and complete to the provision of a landing strip and wind indicator.

Selected characteristics of Oklahoma airports are examined in this chapter. Airports in the Oklahoma system are discussed in terms of their ability to provide general aviation connecting links with communities in Oklahoma and the nation. Attention is given to the nature of an airport system, general characteristics of different types of Oklahoma airports, their aviation facilities and activity; and the general relationship between income, population, and type of airport. Regional aspects of the Oklahoma airport system are discussed in Chapter 5.

#### The Nature of an Airport System

Although all airports provide terminal facilities for aircraft, the primary aeronautical function of airports

may differ. For example, Oklahoma City's Wiley Post Airport is primarily used by business and commercial aircraft, while the primary use of Turner's Lodge Airport in Love County is associated with recreation, and Davis Airport in Muskogee is chiefly used by air carrier aircraft. Some airports are operated principally as a base for agricultural application activities, and some are primarily operated for the use of personal aircraft owners.

The different types of airport users can be divided into two broad categories: (1) those whose flight activities occur mainly in the local area, and (2) those whose flight activities usually involve travel from one community to another. The types of airport users in the first category include recreational flyers and firms offering flight instruction or aerial application services. Flights by these groups usually end at the airport at which they begin. The adequacy of facilities at airports other than the ones from which they fly is not as important to this category of users as it is to the second category.

Aircraft users in the second category use aircraft for transportation from one airport to another. The adequacy of facilities at different airports in the system determines their access to communities in the state and nation and the usefulness of their aircraft. The types of airport users in the second category include business firms which use aircraft to transport their employees and

equipment, personal aircraft owners, and firms offering charter, aerial ambulance, and transmission-line patrol services.

Most airports can serve more than one type of airport user. For example, an airport in Tillman County operated by a firm offering agricultural application services may occasionally be used by air taxi aircraft based in Oklahoma City to transport people to and from the community in which the airport is located. Most of the larger airports serve many types of airport users. For example, the University of Oklahoma's Max Westheimer Field provides facilities for aircraft used to give flight instruction, aircraft used to gather data about severe storms, aircraft used for military training by a military reserve unit, aircraft used for business transportation, aircraft used for personal travel and recreational flying, and aircraft used for aircraft design experimentation and testing.

General aviation airports can provide access to communities not served by airlines. An air traveler can use private aircraft or air taxi service to reach communities which have airports with adequate facilities to accommodate the aircraft used. For example, business executives from New York or Chicago or San Francisco may wish to visit the Goodyear plant at Miami, Oklahoma. They can travel to Tulsa on scheduled airlines and then proceed to Miami by air taxi.

Aircraft owned by business firms, for the transportation of their personnel, account for about one-half of the miles flown in general aviation aircraft. These aircraft are often used to reach communities not served by airlines. For example, representatives of businesses on the East or West coast may use private aircraft to visit the Sequoyah Mills plant in Anadarko. If a small, single-engine airplane is used, the Anadarko airport can be used. If a light, twin-engine airplane is used, the Chickasha airport, about 20 miles away, can be used. However, if the aircraft is a jet or turbo-prop executive aircraft, an airport in Oklahoma City would probably be used.<sup>1</sup> The trip could then be completed by surface transportation or air taxi.

#### Sources of Airport Information

The main purpose of the FAA airport record system is to provide current information for the safety and convenience of airport users. Airport location and major facilities are published in aeronautical charts and in the Airman's Information Manual.<sup>2</sup> Changes which might affect

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<sup>1</sup>The large aircraft owned by business firms for executive transportation usually fly to and from air carrier airports. The justification for use of these aircraft usually run in terms of flexibility and time saved because airline schedules and connecting flights are inadequate at most air carrier airports.

<sup>2</sup>Federal Aviation Administration (Washington, D.C.: Government Printing Office and FAA). Different parts of the Manual are published regularly at different intervals. The more urgent supplements are printed by the FAA.

aviation safety are compiled daily and are published as "Notices to Airman" and "Airmen Advisories." These are supplements to the Airman's Information Manual.

Another objective of the system is to provide information needed by the FAA for its regulatory and administrative activities. Although the exact number of airports in Oklahoma is not known, the FAA record system is designed to include all airports which are significant to air travelers.

In the broadest sense, an airport is any place where an aircraft takes-off or lands. According to this definition, there are several airports in Oklahoma which are not on record with the FAA.<sup>3</sup> These airports, however, differ in character from those which are on record. Some are temporary landing strips used at construction sites or by agricultural applicators. Some are fields or pastures used by student pilots to practice soft-field or emergency procedures, and others are unmarked pastures used by farmers or ranchers who park their aircraft in a hay barn.

Two types of reporting forms are used to obtain information for the FAA's airport record system. One type is for airports which (1) are open to the public, at least in cases of emergency, (2) have a wind indicator, and

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<sup>3</sup>This writer knows of more than 15 of these airports.

(3) are distinguishable from the air as an airport. Another form is used for airports which may or may not be open to the public but which do not have a wind indicator or which are not distinguishable from the air as an airport. If owners of this kind of airport request that their airports be placed on aeronautical charts, the request is granted.<sup>4</sup>

Airports, for which the second type of reporting form is used, have no commonly accepted name but are called Group Five airports in this study. On October 1, 1966 there were 27 Group Five airports and 172 airports of other types in Oklahoma on record with the FAA. Data for Group Five airport records are obtained from information supplied by airport operators on questionnaire reporting forms. These forms provide more than 60 items of information. The operator is expected to make a new report when changes occur which significantly affect the information required by the FAA.

The records for other types of airports are obtained from annual inspection visits by FAA engineers. Engineer visits may extend over several days for some of the larger airports. Airport operators are expected to report any changes from the operational characteristics

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<sup>4</sup>Personal interviews with Mr. Joe Cox, Airport Engineer for the FAA District Airport Office, Oklahoma City.

indicated on the inspection reports.

Irregular airport inspections are also made in cases of significant changes occurring between regular inspections. The inspection reports provide more than 120 items of information.

Duplicate copies of the inspection and questionnaire report forms for airports on record October 1, 1966 were obtained from the District Airport Office in Oklahoma City. (There was a small number of irregularities in reporting and omissions. These were dealt with by consulting the inspecting engineer or the airport operator.)

Heliports and seaplane bases are not included in this study. Because helicopters do not require runways and other facilities needed by fixed-wing aircraft, the FAA maintains records for heliports only when they are separate from other airport facilities. The only Oklahoma heliport on record which is not located at an airport is on top of the Oklahoma Publishing Company Building in Oklahoma City. It has no based aircraft, offers no facilities other than a landing place, and is rarely used.

Although seaplanes may land on many Oklahoma lakes and streams, the only regularly operated seaplane base is in Delaware County. The base is located on Grand Lake at Monkey Island and is the operations center for the Grand River Dam Authority's seaplane patrol. The base also serves tourists and is used by Miami Aircraft Company to

offer seaplane instruction. The FAA does not maintain separate records for the seaplane base. It is operated in conjunction with Monkey Island Airport and shares its facilities. The airport is included in the study.

Three types of data were abstracted from the report forms: (1) general information about the airport, (2) airport facilities, and (3) aviation activity. The data were placed on worksheets, and tabulations were made from the worksheets. The data are presented by six types of airports.

The 11 Air Carrier airports are treated as a separate category. These airports are important not only because of the air carrier services offered, but also because of the large amount of general aviation activity they accommodate. Due to their air carrier status, these airports receive more FAA assistance with planning and traffic matters, and more funds from the Federal Aid to Airports Program than general aviation airports.

The 27 Group Five general aviation airports also constitute a separate category. They are private, small, not identifiable from the air as airports, and less information is available about them.

The remaining 161 airports were ranked according to the amount of flight activity indicated by estimated annual general aviation operations.<sup>5</sup> Four distinct groups

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<sup>5</sup>Either a take-off or a landing is an aircraft operation.

were indicated by the ranking. These groups are designated as Groups One, Two, Three, and Four. The class intervals are: Group One, over 10,000 annual operations; Group Two, from 4,000 to 9,999; Group Three, from 1,000 to 3,999; and Group Four, less than 1,000.

Annual general aviation operations data are obtained from counts of take-offs and landings at airports which have FAA operated control towers. For airports without control towers, estimates are made by the inspecting engineer.

The estimates are based on several factors: (1) the opinions of the airport manager or attendant, persons flying into and out of the airport, and fixed base operators; (2) records of such transactions as gasoline sales and storage rentals; (3) indications of seasonality; and (4) national data for operations related to different types of aircraft, aircraft uses, and aircraft owners.<sup>6</sup> The estimate of annual general aviation operations is made after all other aspects of the investigation have been completed.

In the few cases in which the estimated annual operations of an airport were at a class limit, attention was also given to other activity characteristics such as

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<sup>6</sup>Personal interviews with Mr. Joe Cox, Airport Engineer for the FAA district Airport Office, Oklahoma City.

based aircraft and estimated itinerant operations.

A great deal of information concerning Oklahoma airports, and aircraft registrants, which was not previously available, was compiled for this study. For the convenience of some users, additional tables are included as appendices to this chapter, Chapter 5, and Chapter 6.

### General Characteristics

#### Type of Airport

With the exception of Davis Field in McAlester and Halliburton Field in Duncan, each of the Air Carrier airports could also qualify as Group One general aviation airports. Estimates of annual operations are not made for Group Five airports. Other characteristics, however, indicate that these airports account for less flight activity than any other group.

The number of aircraft operations is usually directly related to the number of aircraft based at an airport. For example, Air Carrier airports account for about one-fourth of the aircraft based at Oklahoma airports and about one-third of the general aviation operations. There are 19 Group One airports, and they account for almost one-half the number of based aircraft and almost one-half the general aviation operations.

Thirty-six airports are in the Group Two general aviation category. About 16 per cent of the aircraft

based in Oklahoma are based at these airports, and about 13 per cent of the general aviation operations occur at them.

There are more airports in Groups Three and Four than in any other category. There are 51 Group Three and 55 Group Four airports. Although the two groups account for more than one-half the number of airports in Oklahoma, they account for slightly less than 10 per cent of estimated general aviation operations. About eight per cent of the aircraft based in Oklahoma are based at Group Three airports, and about three per cent are based at Group Four airports. The 27 Group Five airports account for about one per cent of Oklahoma based aircraft.

Air Carrier airports generally serve several types of users other than airlines. This is usually true also for Group One and Group Two general aviation airports.

One or two types of users typically account for most of the operations at Group Three airports. The dominant groups vary from airport to airport. For example, at one Group Three airport the major user group may be personal aircraft owners; at another airport the major user may be a firm offering flight instruction or a firm offering agricultural application services; and at another airport the major types of users may be personal aircraft owners and business aircraft owners.

At Group Four and Five airports, personal aircraft

owners usually account for most of the activity. However, at about one-fifth of the Group Four airports, firms offering aviation services, such as agricultural application or flight instruction, account for more than one-half of the operations.

Sixteen civil airports in Oklahoma were originally constructed and operated by the military. Since World War II, fifteen of these airports were turned over to municipalities, and one (Max Westheimer) was turned over to the University of Oklahoma. The military origin of the airports influences summary data concerning airport physical features. For example, these airports usually have more runways and occupy relatively larger land areas than would probably have been provided by a municipally constructed airport at the same location. Three of the airports are now Air Carrier airports; seven are Group One general aviation airports; five are Group Two airports; and one is a Group Three airport.

### Ownership

Although about 60 per cent of the number of airports on record with the FAA in the United States are private, the provision of adequate airports is generally considered to be a public responsibility.<sup>7</sup> The resources

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<sup>7</sup>See Federal Aviation Administration, 1966/1967 National Airport Plan (Washington, D.C.: Government Printing Office, 1967), pp. 1-2.

required for full development of landing area facilities are so great that the provision of major airports has generally been left to government.

There are few privately owned airports in the United States which receive enough revenue from user charges to cover costs.<sup>8</sup> Furthermore, private airports are not eligible to participate in the Federal Aid to Airports Program. One of the arguments for their ineligibility is that the continued existence and use of a site for airport purposes cannot be guaranteed. Municipalities, unlike private owners, can provide for airport approach zones through zoning regulations and can acquire land for airport expansion through their power of eminent domain.

Most of the private airports have limited facilities and are operated in conjunction with the owner's other activities. If facilities are offered to the public, it is usually an attempt to defray part of the operating expense of the airport.

There are, however, a few large, private airports. Downtown Airpark in Oklahoma City has almost twice as many aircraft operations as any other private airport in Oklahoma. Downtown Airpark accounts for an estimated 56,000

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<sup>8</sup>See the statements of Leigh Fisher, former owner of Leigh Fisher & Associates, Inc. (the largest U.S. airport consulting firm) in an article by Richard Bach, "The Man from Skywest," Flying, LXXVI (June, 1965), pp. 59-60.

annual operations. Wiley Post, however, owned by Oklahoma City, has over 160,000 annual operations.

Although public airports accommodate more aviation activity than private airports, private airports constitute an important segment of the nation's and Oklahoma's airport system. They often provide the only landing facility in a community. In communities where there are public airports, they often provide facilities for a significant portion of total aviation activity.

About one-half the number of Oklahoma airports are privately owned (Table 7). All Air Carrier airports are municipally owned, and most of the Group One and Group Two airports are publicly owned.

There are seven state owned airports. Four of them are owned by the Oklahoma Industrial Development and Park Department and are located at state parks. Two are in Norman and are owned by the University of Oklahoma. One is owned by the Oklahoma Aeronautics Commission. There are three federally owned airports. Although they are owned by the Army Corps of Engineers, they are considered civil airports. They do not accommodate military aircraft operations and are open to the public.

There is only one county owned airport. It is a Group One airport, operated by the Mayes County Public Works Authority and is located in Pryor's Mid-America Industrial District.

TABLE 7  
OKLAHOMA AIRPORTS, BY TYPE OF OWNER, OCTOBER 1, 1966

Type of Owner	Total	Air Carrier	General Aviation				
			Group				
			( One	Two	Three	Four	) Five
Government							
Municipal	82	11	14	22	25	10	*
County	1	*	*	1	*	*	*
State	7	*	1	1	3	2	*
Federal	3	*	*	*	1	2	*
Total Public	93	11	15	24	29	14	*
Private	106	*	4	12	22	41	27
Total	199	11	19	36	51	55	27

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

Although most private airports are owned by individuals or business firms, some airports are owned by nonprofit organizations. For example, the only airport on record in Harper County is owned by the Harper County Agriculture Improvement Association, Inc., a private organization concerned with improving the economic conditions of local agriculture.

#### Public Use Status

About 90 per cent of Oklahoma airports are open to the public (Table 8). The other 10 per cent are smaller airports which require special permission from the owner for use.

#### Airport Surface Area

An airport's capacity for aviation activity is limited by its surface area. The surface area data collected by the FAA represent the area under the control of the airport owner which can be used for aviation activities. Only part of this area may presently be used for airport purposes.

Surface area data are available for 172 airports (Table 9). They range in size from 7 acres to more than 5,000 acres. As might be expected, the size of the surface area tends to vary directly with the volume of operations. But there are exceptions. For example, there are 10 Group Three and Four airports with surface areas of 300

TABLE 8  
PUBLIC USE STATUS OF OKLAHOMA AIRPORTS, OCTOBER 1, 1966

Public Use Status <sup>1</sup>	Total	Air Carrier	General Aviation				
			( Group )				
			One	Two	Three	Four	Five
Open to Public	180	11	19	36	50	48	16
Not Open to Public	19	*	*	*	1	7	11
Total	199	11	19	36	51	55	27
Per Cent							
Open to Public	90.5	100.0	100.0	100.0	98.0	87.3	59.3
Not Open to Public	9.5	*	*	*	2.0	12.7	40.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>1</sup> Airports open to the public in emergency cases only are included in the "Not Open to Public" category.

\*None.

TABLE 9  
SURFACE AREA OF OKLAHOMA AIRPORTS, OCTOBER 1, 1966

Number of Acres	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Less than 20	20	*	*	4	8	8	NA
20 - 30.9	24	*	*	2	10	12	NA
40 - 50.9	13	*	*	2	3	8	NA
60 - 79.9	13	*	*	1	6	6	NA
80 - 99.9	17	*	1	4	7	5	NA
100 - 139.9	16	*	2	3	6	5	NA
140 - 179.9	17	1	2	7	5	2	NA
180 - 219.9	4	*	*	2	*	2	NA
220 - 259.9	2	*	1	*	*	1	NA
260 - 299.9	3	*	*	1	2	*	NA
300 - 539.9	16	2	5	4	1	4	NA
540 - 1,040	15	3	4	4	3	1	NA
More than 1,040	12	5	4	2	*	1	NA
Total	172	11	19	36	51	55	

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

NA Not available.

or more acres. These airports are located on large farms and ranches.

Owners of some of the smaller airports acquire only enough land to provide a landing strip and perhaps a hangar. Although terrain and adjoining land use patterns often present barriers to the expansion of airports, many of the smaller airports could be expanded to handle increased activity.

#### Distance From Associated Municipality

One problem in airport planning is to determine the appropriate distance to locate the airport from the population center it serves. Generally, the farther the airport is from a municipality the greater the time required for surface transportation to the traveler's ultimate destination. However, the nearer the airport is to a municipality, the greater are the land acquisition costs and the inconvenience caused by aircraft noise.

About 35 per cent of Oklahoma's airports are located less than two miles from the municipality with which they are associated (Table 10). All but one of the Air Carrier and Group One general aviation airports are located from 2 to 12 miles from the municipality they serve. Because of the greater activity at these airports, more noise is generated and more surface area is required.

TABLE 10

OKLAHOMA AIRPORTS, BY DISTANCE FROM ASSOCIATED  
MUNICIPALITY, OCTOBER 1, 1966

Distance (miles)	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Less than 2	70	*	1	15	27	20	7
2 - 3.9	59	7	9	13	12	16	2
4 - 5.9	32	2	5	5	7	8	5
6 - 7.9	19	2	2	3	3	4	5
8 - 9.9	9	*	1	*	1	4	3
10 - 12.0	4	*	1	*	*	1	2
More than 12	6	*	*	*	1	2	3
Total	199	11	19	36	51	55	27

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

### Distance From Nearest Civil Airport

Air traffic, like highway and rail traffic, tends to converge at population centers. Airports, the terminal facilities of the airways, tend to be clustered around cities. For example, there are 13 airports in the Oklahoma City area and 8 in the Tulsa area. Because of the concentration of airports around cities in Oklahoma, about one-third of the airports are less than 8 miles from another civil airport (Table 11).

### Aviation Facilities

As previously mentioned, the system of connecting links to the national air transportation system provided by Oklahoma airports is an increasingly important factor in the economic development of Oklahoma. The activities of local-flight airport users are also significant to the Oklahoma economy. Generally, the adequacy of the Oklahoma airport system depends upon the provision of airport facilities needed by users where they are needed. This section of Chapter 4 deals with Oklahoma airport facilities. Broad locational aspects of these facilities are discussed in the following chapter.

### Runway Facilities

The dominant feature of an airport is the runway facilities it provides. The length, surface type and

TABLE 11  
OKLAHOMA AIRPORTS, BY DISTANCE FROM NEAREST CIVIL  
AIRPORT, OCTOBER 1, 1966

Distance by Air (miles)	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Less than 4	29	1	3	6	10	7	2
4 - 7.9	43	5	4	6	14	8	6
8 - 11.9	45	1	5	5	11	16	7
12 - 15.9	30	2	4	6	7	8	3
16 - 20.0	32	*	3	10	4	11	4
More than 20	20	2	*	3	5	5	5
Total	199	11	19	36	51	55	27

Source: Compiled from records of the FAA Airport District Office, Oklahoma City; U.S. Coast and Geodetic Survey, 1966 Aeronautical Charts covering Oklahoma, Washington, D.C.

The data are for airports on record with the FAA.

\*No airports.

strength, and lighting characteristics of an airport's runway facilities determine which aircraft can use the airport and when they can use it. For example, the large jet aircraft operated by the airlines usually require paved runways which are more than 7,000 feet long and have sufficient strength to accommodate aircraft weights of up to 350,000 pounds. At the other extreme, an agricultural application airplane can usually take-off and land on an unpaved airstrip which is less than 2,000 feet long.

Runway Length. Current airport planning practice is to design Air Carrier airports for particular airline aircraft and to design general aviation airport runways according to the requirements of the groups of aircraft generally expected to use the airport.<sup>9</sup>

Airports with runways of less than 2,000 feet in length can accommodate only the smallest and slowest one-fourth of the general aviation fleet.<sup>10</sup> The minimum length of the runway and primary surface which is acceptable for FAAP projects is 2,200 feet.<sup>11</sup>

Currently, Oklahoma airports with 3,000 foot

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<sup>9</sup>See Federal Aviation Agency, Runway Length Requirements for Airport Design (Washington, D.C.: FAA, 1965).

<sup>10</sup>Federal Aviation Agency, VFR Airports (Washington, D.C.: FAA, 1963). Exact runway length requirements vary with aircraft design, atmospheric temperature, airport elevation, and loaded aircraft weight.

<sup>11</sup>Ibid., p. 9.

runways can accommodate about three-fourths of the general aviation fleet. Airports with runways in the 3,500 to 4,000 foot range can accommodate about 95 per cent of the general aviation aircraft. Executive jet and turbo-prop aircraft, and the large transport aircraft in the general aviation fleet, often require longer runways.<sup>12</sup>

The size and speed of new aircraft have tended to increase during aviation's brief history. Often airport runways have had to be increased in length and load-bearing strength to accommodate the newer aircraft. These trends are expected to continue.

Most of the aircraft primarily used for local flights are small and can be accommodated by airports with runways which are from 2,000 to 3,000 feet long.<sup>13</sup> The major activities associated with local flights are flight instruction, agricultural application, and recreational flying.

More than one-third of the nation's executive and business transportation aircraft, about one-fourth of the air taxi aircraft, and about one-fifth of the personal aircraft usually require runway lengths of more than 3,000 feet. About three-fifths of Oklahoma airports have

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<sup>12</sup>The FAA expects some of the executive jet aircraft which are currently in the design stage to require runway lengths of up to 9,000 feet.

<sup>13</sup>A local flight is a flight made completely within a 20 mile radius of the airport from which it began.

principal runways which are 3,000 feet or less in length (Table 12).<sup>14</sup> As might be expected, most of these airports (all but 18) are in Groups Three, Four, and Five. The smaller airports often provide adequate facilities for local users but do not provide satisfactory facilities for air access to the communities in which they are located.

Runway Surface. The characteristics of a runway's surface determine the aircraft weights it can support and the weather conditions in which it can be used.<sup>15</sup> Usually the larger airports have paved runways; while runways at smaller airports are unpaved. Many unpaved runways cannot be used during wet weather.

The principal runway of 71 Oklahoma airports is paved with asphalt or concrete (Table 12).<sup>16</sup> All but one of the Air Carrier and Group One airports have paved runways, and there are paved runways at about one-half of the Group Two airports. About one-third of the Group Three airports have paved runways, and only a few (seven) of the

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<sup>14</sup>See Table 20, in the appendix to this chapter, for additional information about the length of runways at Oklahoma airports.

<sup>15</sup>See Federal Aviation Agency, Airport Paving (Washington, D.C.: FAA, 1964).

<sup>16</sup>For more detailed information about the runway surfaces of Oklahoma airports, see Table 21, in the appendix to this chapter. The proportion of Oklahoma airports which have paved runways (about 36 per cent) is higher than the proportion for the United States (about 29 per cent). Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), p. 7.

TABLE 12  
SELECTED RUNWAY CHARACTERISTICS OF OKLAHOMA  
AIRPORTS, OCTOBER 1, 1966

Type of Airport	Number of Airports	Number of Airports Having:			
		More Than One Runway	Principal Runway More Than 3,000 Feet Long	Paved Principal Runway	Runway Lights
Air Carrier	11	9	11	11	11
General Aviation					
Group One	19	14	18	18	18
Group Two	36	23	19	17	19
Group Three	51	30	12	18	12
Group Four	55	7	9	6	4
Group Five	27	5	4	1	1
Total	199	78	73	71	65

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

Group Four and Five airports have paved runways.

Runway Lighting. Because airport lighting facilities allow flights to begin or end at night, they are important to general aviation travelers. Airport lighting is not as important to airport users who primarily engage in local flights, since local flights usually occur during daylight.

Just as the larger airports are generally the ones with the longer and paved runways, they are usually the airports which have runway lighting facilities. However, there are a few exceptions (Table 12). Twelve of the 51 Group Three airports and 5 of the 82 Group Four and Five airports have runway lights.<sup>17</sup> All but one of the Air Carrier and Group One airports have runway lights.

#### Other Facilities

Although runway facilities determine if and when aircraft can use an airport, other facilities provide the complementary goods and services required for an airport system. For example, if the owner of a well drilling firm in Tulsa wishes to use his aircraft to visit an oil field near Ardmore and then negotiate with persons in Shawnee, he will probably need aircraft fuel, storage or tie-down services, and surface transportation. As is true with

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<sup>17</sup> Additional information about lighting facilities at Oklahoma airports is presented in Table 22 in the appendix to this chapter.

runway facilities generally, only the larger municipal airports have sufficient aviation activity and the resources needed to provide a full complement of non-runway facilities.

Availability of an Airport Attendant. The availability of an airport attendant is important to an air traveler. Attendants can help with such matters as weather information, fuel, repairs, aircraft storage, and surface transportation.

All of Oklahoma's Air Carrier and Group One general aviation airports have attendants available daily, at least during the daylight hours.<sup>18</sup> One-half of these airports are attended 24 hours per day. As might be expected, most of the Group Three, Four, and Five airports do not have attendants available.

Aircraft Fuel. Piston-engine aircraft fuel is produced with different octane or power ratings. Aircraft can use fuel with higher ratings than that required for their engines but not fuel with lower ratings. Because aircraft fuel must be extremely pure, it is more costly to store and dispense than automobile fuel.

Primarily because of the expense involved, most of the smaller airports do not provide fuel. The smaller

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<sup>18</sup>Detailed information about the availability of attendants at Oklahoma airports is presented in Table 24 in the appendix to this chapter.

airports which do provide aircraft fuel usually have only the fuel required by smaller aircraft. The larger airports usually provide a variety of fuel. All but four of the Oklahoma Air Carrier and Group One and Two airports provide some type of aviation fuel.<sup>19</sup> Fuel for the higher-performance, piston-engine aircraft is available at all but two of the Air Carrier and Group One airports and at two-thirds of the Group Two airports. Fuel for the jet and turbo-prop executive aircraft is available at four Air Carrier airports and four Group One airports.

Repair Services. Federal Air Regulations require that repairs other than routine maintenance be made by certified aircraft mechanics. The FAA tests and certifies two general types of aircraft mechanics: airframe and power plant. Many mechanics hold both ratings.

All Oklahoma Air Carrier airports and nearly all Group One general aviation airports have both minor and major airframe and power plant repair services available.<sup>20</sup> Repair services of any type are available at only a few of the Group Three, Four, and Five airports.

Aircraft Storage. Because aircraft on the ground

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<sup>19</sup>See Table 25, in the appendix to this chapter, for more detailed information about fuel available at Oklahoma airports.

<sup>20</sup>Additional information about the repair services available at Oklahoma airports is presented in Table 26 in the appendix to this chapter.

are vulnerable to being moved or turned over by wind when not in use, they are usually tied down or stored in a building. All but two of the 66 Air Carrier, Group One, and Group Two airports have both hangar and tie-down storage facilities available.<sup>21</sup> At the other extreme, there are no storage facilities at one-third of the Group Four and Group Five airports.

Electronic Navigational Aids. Many important navigational aids, such as the magnetic compass and the aeronautical chart, are relatively simple. It is the complex electronic aids, however, which have greatly increased the reliability and usefulness of general aviation aircraft in recent years. These aids make air travel possible during weather conditions which would have precluded flight a few years ago.

The "very high frequency omnidirectional range" system of navigation (usually called "omni" or VOR) is a recent innovation for general aviation use. It is more convenient and reliable than older electronic navigational systems. The instrument landing system (ILS) allows aircraft to land when visibility is limited.

Radio communication is becoming increasingly important in general aviation travel. FAA operated control

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<sup>21</sup>Detailed information about the aircraft storage facilities available at Oklahoma airports is presented in Table 27 in the appendix to this chapter.

towers provide traffic direction through two-way radio facilities at congested airports. The FAA has established a nation wide system of flight service stations (FSS) to provide pilots with in-flight information about weather and traffic conditions to be expected along their routes, as well as several other types of needed information and services. Flight service stations are located at airports. However, they can be used by aircraft traveling between airports without flight service stations because of the relatively long distance air-to-ground communication capability of the equipment used.

Unicom is another two-way radio aviation communication system. It is an unofficial system in the sense that unicom communication does not occur between an FAA employee and a pilot. It is similar to the surface citizens band system. Although not usually considered to be a navigational aid, it is often used to obtain information about traffic and weather conditions at airports which do not have control towers. It is also used during flight to arrange for fuel, repair services, or surface transportation to be available when the aircraft lands.

Since the early 1950's an increasing number of aviation aircraft have been equipped with electronic navigational equipment. Continued technological improvements have increased the capability of the equipment and have reduced costs. In early 1962 about 67 per cent of general aviation aircraft had two-way radio equipment

needed for unicom and control tower communication.<sup>22</sup> About the same proportion had VOR equipment, and 17 per cent were equipped for instrument landing capability. The trend toward improved navigation systems and improved electronic equipment in an increasing number of general aviation aircraft is expected to continue. Also, an increasing number of pilots are being trained to fly by instruments.

Whether or not an airport qualifies for a FAA operated control tower depends upon the nature and extent of aircraft activity at the airport. Presently five Oklahoma Air Carrier airports and three Group One airports have control towers.<sup>23</sup> Tulsa International and Oklahoma City's Will Rogers World are the only Oklahoma airports providing instrument landing facilities. There are 11 Oklahoma airports with VOR stations. Eight of these are Air Carrier airports. Unicom facilities are available at about one-half of Oklahoma's Air Carrier, Group One and Two airports.

Because there is less need for all-weather capability for local flights, airports principally serving local flight activity will probably continue to have few electronic navigational aids. However, the provision of such aids will probably be an increasingly significant factor

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<sup>22</sup>Federal Aviation Agency, General Aviation Aircraft Radio Equipment (Washington, D.C.: FAA, 1962), p. 3.

<sup>23</sup>See Table 28, in the appendix to this chapter, for additional information about selected electronic navigational aids at Oklahoma airports.

in the development of adequate all-weather airports for general aviation.

Convenience Facilities. The provision of convenience facilities, such as telephones, restrooms, food, and surface transportation, is an important aspect of airport service to the general aviation traveler. New convenience facilities are being added to those usually found at the larger airports. For example, when a new terminal building was recently constructed at Max Westheimer Field, a conference room was provided so that business conferences could be held at the airport. However, the more ordinary convenience facilities are often not available at the smaller airports.

Except for runway facilities, a telephone is often the most important facility at an airport. It can be used to obtain surface transportation, make business calls, and obtain weather information. Unlisted telephone numbers, used to file flight plans and obtain weather information, are published in the FAA's Airman's Information Manual.<sup>24</sup> Despite the importance of a telephone, about one-fourth of the Oklahoma airports do not provide transient airport users with a telephone.<sup>25</sup> All of these airports are in Groups

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<sup>24</sup>Airports often provide direct line telephone service to FAA flight service stations.

<sup>25</sup>For detailed information about selected convenience facilities available at Oklahoma airports, see Table 29 in the appendix to this chapter.

Three, Four, and Five.

As expected, there are more convenience facilities at the larger airports than there are at the smaller airports. However, there are exceptions. Six of the Group Three and Four airports provide telephone, restroom, food, and surface transportation facilities.

### Aviation Activity

#### Fixed Base Operators

Retail firms which offer general aviation services, sell aircraft, parts, accessories, and fuel, and which base their activities at an airport are called fixed base operators. These firms range in size from one-man operations to firms which operate at several airports in different states.<sup>26</sup> A fixed base operator may offer only one service or several. For example, one operator may engage only in agricultural application, while another may offer flight instruction, aerial survey, advertising, and charter services.

There are more than 130 fixed base operators in Oklahoma (Table 13). Fifty of these firms are located at Air Carrier and Group One general aviation airports. Generally, the firms at the larger airports offer more services

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<sup>26</sup>The FAA has prepared advisory minimum standards for fixed base operators at public airports. See Minimum Standards for Commercial Aeronautical Activities on Public Airports, AC 150/5190-1 (Washington, D.C.: FAA, 1966).

TABLE 13

FIXED BASE OPERATORS AND AVIATION SERVICES AVAILABLE  
AT OKLAHOMA AIRPORTS, OCTOBER 1, 1966

Fixed Base Operators and Services Available <sup>1</sup>	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Fixed Base Operators	132	18	42	35	27	10	NA
Airports not having Fixed Base Operators	76	*	*	4	27	45	NA
Services Available							
Advertising	18	3	8	6	*	1	NA
Agricultural Applica- tion	57	7	9	19	14	8	NA
Ambulance	9	2	5	2	*	*	NA
Patrol	27	6	8	10	2	1	NA
Survey	19	5	7	7	*	*	NA
Charter	54	11	17	16	7	3	NA
Sales	32	7	14	7	3	1	NA
Flight Instruction	58	10	18	22	6	2	NA
Other	11	1	3	3	3	1	NA

Source: Compiled from records of the FAA District Airport Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>1</sup> Aircraft repair and modification, and fuel sales are not included.

\*None.

NA Not available.

than the firms at the smaller airports. There are no fixed base operators at 72 of the 106 Group Three and Group Four airports.

The services most frequently offered by fixed base operators are flight instruction, agricultural application, and aircraft charter (air taxi and rental). Aircraft charter services are available at all of Oklahoma's Air Carrier airports and all but one of the Group One general aviation airports.

Air taxi services are rapidly becoming an important part of the air transportation system as an increasing number of persons are becoming aware of the availability and usefulness of the service. Revenues from all air taxi services in the United States have been increasing by more than 30 per cent each year since 1962.<sup>27</sup> Typical air taxi rates range from about \$25 per flight hour for small, single-engine aircraft to more than \$100 per flight hour for the larger twin-engine aircraft which require both a pilot and co-pilot.

Airline passengers can use air taxi services to reach most of the other Oklahoma airports. Operators of large aircraft which can only be accommodated at one of the larger airports can also use air taxi services to

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<sup>27</sup>Personal interview with Mr. Lloyd Catlin, President of the National Air Taxi Conference and Catlin Aviation Incorporated.

reach Oklahoma communities served by smaller airports.

### Based Aircraft

There are about 2,500 aircraft based at Oklahoma airports (Table 14). Four-fifths of these aircraft are single-engine, fixed-wing airplanes.

Air Carrier and Group One airports account for about three out of four based aircraft. They also account for most of the larger aircraft (90 per cent of the multi-engine aircraft) and helicopters (about 90 per cent). Generally, only the larger airports can accommodate the larger aircraft.

At the Air Carrier, Group One, and Group Two airports, there are more four place or more, single-engine aircraft than the smaller, less than four place aircraft. The reverse is true, however, for Group Three, Four, and Five airports. Some of the smaller airports do not have runways which can satisfactorily be used by large single-engine aircraft. Also, at some of these airports most of the single-engine aircraft with one or two seats are used for agricultural application or flight instruction rather than travel.

### General Aviation Operations

The aircraft operation, a take-off or landing, is the unit of account for airport activity statistics. The FAA attempts to divide aircraft operations into two

TABLE 14

ESTIMATED BASED AIRCRAFT AT OKLAHOMA AIRPORTS,  
BY TYPE OF AIRCRAFT, OCTOBER 1, 1966

Aircraft Type	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Fixed Wing							
Single Engine							
Under four place	2,138	{150 310	390	172	119	34	25
Four place & more			620	196	89	33	
Multi-engine	352	173	144	29	3	2	1
Helicopter	41	3	34	4	*	*	*
Total	2,531	636	1,188	401	211	69	26
Per Cent							
Fixed Wing							
Single Engine	84.4	18.2	39.9	14.5	8.2	2.6	1.0
Multi-engine	13.8	6.8	5.7	1.1	0.1	0.1	**
Helicopter	1.6	0.1	1.3	0.2	*	*	*
Total <sup>#</sup>	100.0	25.1	46.9	15.8	8.3	2.7	1.0

103

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*No aircraft.

\*\*Less than 0.05 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

categories: local and itinerant. The definitions of these categories are not precise.

"Local operations are performed by aircraft which: (a) operate in the local traffic pattern or within sight of the tower, or (b) are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the control tower, or execute simulated instrument approaches or low passes at the airport. Itinerant operations: All aircraft arrivals and departures other than local operations."<sup>28</sup> The definitions usually used by inspection engineers to estimate these two types of operations at airports without control towers are: (1) take-offs or landings associated with flights which never extend beyond 20 miles from the airport are local operations, and (2) itinerant operations are take-offs or landings associated with all other flights.<sup>29</sup> The data for local and itinerant operations, because of the definitional ambiguity, is not as strong as the data for total aircraft operations.

Aircraft instruction flights account for a large portion of local operations. Student pilots, when not on authorized cross-country flights, are required by Federal

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<sup>28</sup>Federal Aviation Agency, Statistical Handbook of Aviation (Washington, D.C.: Government Printing Office, 1966), p. 228.

<sup>29</sup>Personal interviews with Mr. Joe Cox, Airport Engineer for the FAA District Airport Office, Oklahoma City.

Air Regulations to remain within a practice area within 20 miles from the airport they fly from. Among other activities often within the definition of local operations are: aerial application flights, short pleasure flights, practice flights, flights in demonstration aircraft, and aircraft test flights.

There are more than 2,000,000 annual aircraft operations at Oklahoma civil airports. Military aircraft using civil airports account for about 118,000 of these operations, and general aviation aircraft account for about 1,775,000. The remaining operations are performed by air carrier aircraft.

Slightly more than half the estimated annual general aviation operations are local (Table 15).<sup>30</sup> Only the Air Carrier category has more itinerant than local operations. The 66 Air Carrier, Group One, and Group Two general aviation airports accommodate about 9 out of 10 itinerant operations. These airports account for most of the aviation activity in Oklahoma because they generally have better facilities and because they are usually located at places people wish to visit: population centers.

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<sup>30</sup> Although estimates of operations are not made for Group Five airports, other characteristics indicate that they account for less than one per cent of total Oklahoma operations.

TABLE 15

ESTIMATED ANNUAL GENERAL AVIATION OPERATIONS  
AT OKLAHOMA AIRPORTS, OCTOBER 1, 1966  
(Thousands of Operations)

Annual Operations	Total <sup>#</sup>	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Local	923	234	459	150	64	15	NA
Itinerant	852	348	350	89	54	11	NA
Total <sup>#</sup>	1,775	582	809	238	118	27	NA
Per Cent							
Local	52.0	13.2	25.9	8.4	3.6	0.9	NA
Itinerant	48.0	19.6	19.7	5.0	3.0	0.6	NA
Total	100.0	32.8	45.6	13.4	6.6	1.5	NA

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

NA Not available.

<sup>#</sup>Components may not add to totals due to rounding.

Income, Population, and Airport Type

One of the basic considerations used by the FAA in its airport system planning is that "General aviation and air carrier activities are responsive to the same basic social and economic factors: the volume and distribution of population and purchasing power."<sup>31</sup> Population and income are two of the most important factors explaining the number and type of airports found in Oklahoma communities.

Because population centers are the places air travelers most often wish to visit, and because these centers have more of the resources needed to provide airport facilities, the larger cities usually have better airports than do the smaller cities and towns. Since general aviation travel is relatively expensive, business aircraft are usually provided only for personnel with relatively high incomes, and persons who own aircraft are typically in the upper income groups. Generally, the larger the community's population and the larger the number of persons in the upper income groups, the better the airport facilities provided are.

The larger communities with higher incomes have far less difficulty in providing airport facilities than

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<sup>31</sup> Federal Aviation Agency, Economic Planning for General Aviation Airports (Washington, D.C.: FAA, 1960), p. 3.

the smaller, lower income communities. As noted in earlier chapters, (1) about 90 per cent of the FAAP funds go to communities with air carrier airports, (2) state law requires that even before assistance from the small state aid program can be given, the project must be approved for FAAP funds, and (3) the local matching funds must usually be raised through a special municipal bond election. Also, in an attempt to upgrade the nation's airports, the FAA has raised the design standards (and consequently the costs) of projects for which FAAP funds can be given.

Since many small and relatively low income communities are far from Air Carrier airports and have little ability to provide matching funds even for small airport projects, they often cannot provide adequate airport facilities for local needs. For example, in 1966 two small Oklahoma municipalities became convinced that they needed an airport. They are 9 miles from each other, have a combined population of about 3,500 persons, and are more than 25 miles from an adequate airport. They investigated the possibility of obtaining FAAP funds. The most recent National Airport Plan recommended that a new airport be built at one of the municipalities. However, when the design requirements for projects which could qualify for FAAP funds were examined, the community leaders discovered that they could not afford such an airport. One of the major requirements was the acquisition of at least 320

acres of land. Because of the Oklahoma statutory requirement that FAAP funds be approved before state aid can be given, even the meager amount of state aid allowed (up to \$5,000) could not be obtained.

Although the example is representative of the difficulties encountered by small communities in obtaining airport facilities, the subsequent action taken by the two communities in early 1967 is not typical. Several citizens and community leaders, the Chambers of Commerce of the two municipalities, and the local County Commissioner voluntarily pooled their labor, funds, and equipment to construct a paved airport midway between the two towns.

#### Income and Airport Type

Median Family Income. When ranked according to 1959 median family income, the top 40 per cent of Oklahoma counties account for one-half of the total number of Oklahoma airports and about three-fourths of the Air Carrier and Group One general aviation airports—the larger and better equipped airports (Table 16).

Slightly more than two-fifths of the Air Carrier and Group One airports are located in the nine highest median family income counties. The 19 lowest median family income counties do not have any Air Carrier or Group One airports.

Communities in the lower median family income counties tend to be relatively small and have few families

TABLE 16

OKLAHOMA AIRPORTS, BY COUNTY MEDIAN FAMILY  
INCOME CLASS, OCTOBER 1, 1966

Median Family Income Class <sup>1</sup>	Counties in Class	Number of Airports	Air Carrier	General Aviation				
				(	Group	)		
				One	Two	Three	Four	Five
Below \$2,000	2	4	*	*	*	1	*	3
2,000 - 2,499	10	15	*	*	2	3	8	2
2,500 - 2,999	7	10	*	*	2	6	2	*
3,000 - 3,499	10	27	1	1	5	5	6	9
3,500 - 3,999	17	41	1	4	11	13	11	1
4,000 - 4,499	16	46	1	6	9	11	12	7
4,500 - 4,999	6	24	2	1	3	7	7	4
5,000 and Above	9	32	6	7	4	5	9	1
Total	77	199	11	19	36	51	55	27

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Source: Compiled from records of the FAA Airport District Office, Oklahoma City; U.S. Bureau of the Census, U.S. Census of Population: 1960. Vol. I, Characteristics of the Population. Part 38, Oklahoma (Washington, D.C.: Government Printing Office, 1963), pp. 38-142 and 38-143.

The data are for airports on record with the FAA.

<sup>1</sup>In 1959.

\*No airports.

in the upper income groups. In these cases, the need for airport facilities for local aviation activities is usually less than it is in other communities, and these communities have fewer resources with which airport facilities can be provided.

Number of Families with Incomes of \$15,000 or More.

Two-thirds of the number of Air Carrier and Group One airports are in counties which in 1959 had 200 or more families with incomes of \$15,000 or more (Table 17). Twenty Oklahoma counties each have less than 50 families with incomes of \$15,000 or more in 1959. There are no Air Carrier or Group One airports in these counties.

County population and the number of families in a county with incomes of \$15,000 or more is generally related. However, there are several exceptions. For example, Washington County is one of the four counties in Oklahoma which had 500 or more families with incomes of \$15,000 or more in 1959.<sup>32</sup> However, Washington County ranks eighth in population, and there are five counties with almost as many inhabitants as Washington County.

The major offices of Phillips Petroleum Company are located in Bartlesville, the county seat of Washington

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<sup>32</sup>Washington County has more than 700 such families. The other three counties and the number of families living in them with incomes of \$15,000 or more are: Oklahoma, about 5,400; Tulsa, about 5,400; and Comanche, about 550.

TABLE 17

NUMBER OF FAMILIES IN EACH COUNTY IN OKLAHOMA WITH INCOMES OF \$15,000  
OR MORE, AND NUMBER AND TYPE OF AIRPORTS, OCTOBER 1, 1966

Number of Families in each County with Incomes of \$15,000 or More <sup>1</sup>	Number of Counties	Number of Airports	Air Carrier	General Aviation				
				( One	Two	Group Three	Four	Five
Less than 50	20	28	*	*	3	10	10	5
50 - 99	29	75	1	1	17	18	20	18
100 - 149	6	17	*	3	5	3	5	1
150 - 199	7	17	1	4	3	7	2	*
200 - 299	5	21	*	2	4	4	9	2
300 - 399	4	13	3	3	*	3	3	1
400 - 499	2	6	2	*	2	1	1	*
More than 500	4	22	4	6	2	5	5	*
Total	77	199	11	19	36	51	55	27

Source: Compiled from records of the FAA Airport District Office, Oklahoma City; U.S. Bureau of the Census, U.S. Census of Population: 1960. Vol. I, Characteristics of the Population. Part 38, Oklahoma (Washington, D.C.: Government Printing Office, 1963), pp. 38-229 through 38-234.

The data are for airports on record with the FAA.

<sup>1</sup>In 1959.

\*No airports.

County. There is a relatively large amount of aviation activity in the Bartlesville area. Phillips and other firms located in Bartlesville operate several general aviation aircraft. Also, there is a relatively large number of persons in the upper income group who live in Bartlesville and operate aircraft for recreation and personal travel.

Several sparsely populated counties in the northwest and north central areas of Oklahoma have more families in the upper income groups than many of the more populous rural counties in the rest of the state. The sparsely populated counties with relatively large numbers of families in the upper income groups generally account for more aviation activity and have better airport facilities in proportion to their populations than the counties with fewer families in the upper income groups.

#### County Population and Airport Type

Only 7 of Oklahoma's 77 counties have populations of 50,000 or more (Table 18). These counties, however, account for about one-half of the Air Carrier and Group One general aviation airports and about one-sixth of all Oklahoma airports.

There are 26 Oklahoma counties with populations of 12,000 or less. Although these counties account for about one-fourth of total Oklahoma airports, 80 per cent of the airports in these counties are in Groups Three, Four, and Five.

TABLE 18

## OKLAHOMA AIRPORTS, BY COUNTY POPULATION CLASS, OCTOBER 1, 1966

County Population Class <sup>1</sup> (thousands)	Number of Counties in Class	Number of Airports	Air Carrier	General Aviation				
				(	Group	)		
				One	Two	Three	Four	Five
Less than 8	12	27	*	*	4	10	6	7
8 - 11.99	14	26	*	*	6	3	9	8
12 - 15.99	13	31	1	2	4	11	10	3
16 - 19.99	7	14	*	1	4	6	3	*
20 - 29.99	10	19	*	3	8	4	3	1
30 - 39.99	10	41	2	3	6	6	16	8
40 - 49.99	4	8	2	2	1	2	1	*
More than 50	7	33	6	8	3	9	7	*
Total	77	199	11	19	36	51	55	27

Source: Compiled from records of the FAA Airport District Office, Oklahoma City; Oklahoma Employment Security Commission, "Oklahoma Population Estimates for the State, Standard Metropolitan Statistical Areas and Counties," (Oklahoma City, 1967), p. 2.

The data are for airports on record with the FAA.

<sup>1</sup>1966.

\*No airports.

Although county population and type of airport facilities are generally related, there are several exceptions. For example, Woods County ranks 51st in population, but there are six airports in the County, including one Group One general aviation airport. There is a relatively high degree of interest in aviation in the County and a relatively large number of families in the upper income group.<sup>33</sup>

#### Municipal Population and Airport Type

Airport type is more closely related to the population of the associated municipality than with county population. Oklahoma has several counties which do not have any large towns or cities, but have several small towns. These counties often have as many inhabitants as counties with large towns or small cities, but due to the lack of population concentration, the airports located in these counties are usually small and offer few facilities.

Oklahoma has 13 municipalities with 20,000 or more inhabitants. These cities account for 21 of the 30 Air Carrier and Group One general aviation airports (Table 19).

Ninety-five Oklahoma municipalities with populations of less than 5,000 in 1960 have airports associated

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<sup>33</sup>In 1959, there were 102 families in Woods County with incomes of \$10,000 or more and 27 families with incomes of \$15,000 or more.

TABLE 19

OKLAHOMA AIRPORTS, BY POPULATION CLASS OF  
ASSOCIATED MUNICIPALITY, OCTOBER 1, 1966

Population Class of Associated Municipality <sup>1</sup> (thousands)	Asso- ciated Munici- palities	Number of Air- ports	Air Carrier	General Aviation				
				(	Group	)		
				One	Two	Three	Four	Five
Less than 1	30	44	*	*	3	10	15	16
1 - 1.99	28	31	*	*	3	12	12	4
2 - 2.99	19	23	*	*	3	5	13	2
3 - 3.99	10	14	*	1	5	6	2	*
4 - 4.99	8	12	*	*	3	7	1	1
5 - 9.99	23	30	1	4	13	5	5	2
10 - 14.99	6	10	*	3	3	2	2	*
15 - 19.99	2	2	1	*	1	*	*	*
20 - 24.99	6	12	3	3	1	1	2	2
25 - 34.99	2	5	1	1	1	1	1	*
35 - 45.00	2	4	2	1	*	1	*	*
More than 45	3	12	3	6	*	1	2	*
Total	139	199	11	19	36	51	55	27

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Source: Compiled from records of the FAA Airport District Office, Oklahoma City; U.S. Bureau of the Census, U.S. Census of Population: 1960. Vol. I, Characteristics of the Population. Part 38, Oklahoma (Washington, D.C.: Government Printing Office, 1963), pp. 38-12 through 38-18.

The data are for airports on record with the FAA.

<sup>1</sup>In 1960.

\*No airports.

with them. These municipalities account for about 80 per cent of the smaller airports (Groups Three, Four, and Five). Although many of these municipalities are attempting to attract new firms, often they have only limited non-airport facilities to offer in the competition for new firms. Usually their airport facilities are also limited.

A satisfactory airport system must not only provide adequate facilities; it must also provide them where they are needed. In the following chapter, broad comparisons of the airports in seven Oklahoma regions are made.

## APPENDIX

TABLE 20

OKLAHOMA AIRPORTS, BY LENGTH OF PRINCIPAL  
RUNWAY, OCTOBER 1, 1966

Length of Principal Runway (feet)	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Less than 1,500	6	*	*	*	*	2	4
1,500 - 1,999	21	*	*	*	3	11	7
2,000 - 2,499	60	*	*	7	18	26	9
2,500 - 2,999	39	*	1	10	18	7	3
3,000 - 3,499	32	*	6	11	5	7	3
3,500 - 3,999	8	*	2	3	2	*	1
4,000 - 4,499	9	2	4	1	2	*	*
4,500 - 4,999	3	1	*	*	2	*	*
5,000 and More	21	8	6	4	1	2	*
Total	199	11	19	36	51	55	27

619

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

TABLE 21

OKLAHOMA AIRPORTS, BY SURFACE TYPE OF PRINCIPAL  
RUNWAY, OCTOBER 1, 1966

Surface of Principal Runway	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Bare, Grass or Sod	120	*	1	18	29	47	25
Improved (oil or gravel)	8	*	*	1	4	2	1
Paved (asphalt or concrete)	71	11	18	17	18	6	1
Total	199	11	19	36	51	55	27
Per Cent							
Bare, Grass or Sod	60.3	*	5.3	50.0	56.9	85.4	92.6
Improved (oil or gravel)	4.0	*	*	2.8	7.8	3.6	3.7
Paved (asphalt or concrete)	35.7	100.0	94.7	47.2	35.3	10.1	3.7
Total <sup>#</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0

120

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 22  
LIGHTING FACILITIES AT OKLAHOMA AIRPORTS,  
BY TYPE OF FACILITY, OCTOBER 1, 1966

Type of Lighting	Total	Air Carrier	General Aviation				
			( Group )				
			One	Two	Three	Four	Five
None	129	*	1	12	39	51	26
Runway	65	11	18	19	12	4	1
Beacon	53	11	14	21	6	1	*
Taxiway	8	3	2	2	*	*	1
Approach	4	3	1	*	*	*	*

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*None.

TABLE 23

## OKLAHOMA AIRPORTS, BY NUMBER OF ACTIVE RUNWAYS, OCTOBER 1, 1966

Number of Runways	Total	Air Carrier	General Aviation				
			(		Group	)	
			One	Two	Three	Four	Five
One	121	2	5	13	21	48	22
Two	40	3	5	11	12	6	3
Three	28	4	3	11	7	1	2
Four	8	1	5	1	1	*	*
Five	2	1	1	*	*	*	*
Total	199	11	19	36	51	55	27

122

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

TABLE 24

## AVAILABILITY OF ATTENDANTS AT OKLAHOMA AIRPORTS, OCTOBER 1, 1966

Availability of Attendant	Total	Air Carrier	General Aviation				
			Group				
			(One	Two	Three	Four	Five)
Unattended	108	*	*	9	30	44	25
Seasonally Attended During Daylight Hours	3	*	*	1	2	*	*
Attended Daily During Daylight Hours	41	1	11	11	7	9	2
Attended Six Days Per Week During Daylight Hours	3	*	*	*	3	*	*
Attended Daily During Daylight Hours and Part of Night	4	2	*	2	*	*	*
Attended 24 Hours Per Day	40	8	8	13	9	2	*
Total	199	11	19	36	51	55	27

123

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

TABLE 25  
AIRCRAFT FUEL AVAILABLE AT OKLAHOMA AIRPORTS,  
BY TYPE OF FUEL, OCTOBER 1, 1966

Fuel Available	Total	Air Carrier	General Aviation				
			(		Group		)
			One	Two	Three	Four	Five
None	91	1	1	2	21	40	26
Piston Engine: <sup>1</sup>							
80	6	2	*	2	1	1	*
80/87	100	10	18	30	29	12	1
91/97	4	1	1	2	*	*	*
100/130	69	10	18	26	11	4	*
115/145	4	3	*	*	1	*	*
Turbine Engine	8	4	4	*	*	*	*

124

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>1</sup>Octane or power rating.

\*None.

TABLE 26

AIRCRAFT REPAIR SERVICES AVAILABLE AT OKLAHOMA  
AIRPORTS, OCTOBER 1, 1966

Repair Services Available	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
None	140	1	1	17	41	54	26
Airframe							
Minor Only	11	*	*	7	2	1	1
Minor and Major	44	10	16	11	7	*	*
Power Plant							
Minor Only	13	*	*	8	3	1	1
Minor and Major	46	10	18	11	7	*	*

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*None.

TABLE 27

OKLAHOMA AIRPORTS, BY AIRCRAFT STORAGE FACILITIES  
AVAILABLE, OCTOBER 1, 1966

Aircraft Storage Facilities Available	Total	Air Carrier	General Aviation				
			( Group )				
			One	Two	Three	Four	Five
None	30	*	*	1	1	14	14
Tiedowns Only	19	*	*	1	5	6	7
T Hangar Only	22	*	*	*	4	13	5
Conventional Hangar Only	10	*	*	*	6	4	*
Airports with Two Types of Storage	75	4	6	20	26	18	1
Airports with Three Types of Storage	43	7	13	14	9	*	*
Total	199	11	19	36	51	55	27

126

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

TABLE 28

## SELECTED NAVIGATIONAL AIDS AT OKLAHOMA AIRPORTS, OCTOBER 1, 1966

Navigational Aid	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Instrument Landing System	2	2	*	*	*	*	*
Control Tower	8	5	3	*	*	*	*
Very High Frequency Omnidirectional Range	11	8	1	1	1	*	*
Unicom <sup>1</sup>	45	8	12	18	6	1	*
Airports with None of the Above	147	*	4	17	45	54	27

127

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

\*None.

<sup>1</sup>Although unicom is not usually considered as a navigational aid, it is often by persons not familiar with an airport to obtain information about traffic and runway conditions.

TABLE 29

OKLAHOMA AIRPORTS, BY SELECTED CONVENIENCE  
FACILITIES AVAILABLE, OCTOBER 1, 1966

Convenience Facilities Available	Total	Air Carrier	General Aviation				
			(	Group			)
			One	Two	Three	Four	Five
Telephone, Restrooms, Food, and Surface Transportation#	36	8	12	10	3	3	*
Three of the Following: Telephone, Restrooms, Food, and Surface Transportation#	38	3	6	17	8	3	1
Telephone Only	40	*	*	4	13	16	7
Telephone and Rest- rooms Only	16	*	1	2	6	4	3
Telephone and Surface Transportation# Only	12	*	*	2	9	*	1
Restrooms and Surface Transportation# Only	2	*	*	1	1	*	*
Surface Transportation# Only	1	*	*	*	1	*	*
None	54	*	*	*	10	29	15
Total Airports	199	11	19	36	51	55	27

128

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

#Automobile rental, taxi, or courtesy car.

\*None.

## CHAPTER 5

### REGIONAL ASPECTS OF THE OKLAHOMA AIRPORT SYSTEM

General aviation airport use and facilities differ from community to community and from area to area. However, it is beyond the scope of the study to discuss the nature of individual airports. In this chapter, broad comparisons of airport use and facilities in different areas of Oklahoma are made.

An investigation of the locational aspects of airport use, aircraft, and aircraft use characteristics indicated seven general areas with broadly differing aviation characteristics. Precise boundaries of these areas are not always distinguishable and in many ways the areas overlap.<sup>1</sup>

The state was divided into seven regions to allow broad comparison of airport characteristics and use patterns

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<sup>1</sup>The lack of precise boundaries is a frequent problem in regional analysis. The approach used in this study (attempting to deal with several characteristics which overlap geographic areas) is similar to the one used by Howard W. Ottoson, E. M. Birch, Phillip A. Henderson, and A. H. Anderson, Land and People in the North Plains Transition Area University of Nebraska: University of Nebraska Press, 1961), pp. 1-115.

(Figure 1). County boundary lines were used to provide clearly defined regions.<sup>2</sup> In a few cases, the decision to place a county in one region or another was necessarily somewhat arbitrary.<sup>3</sup>

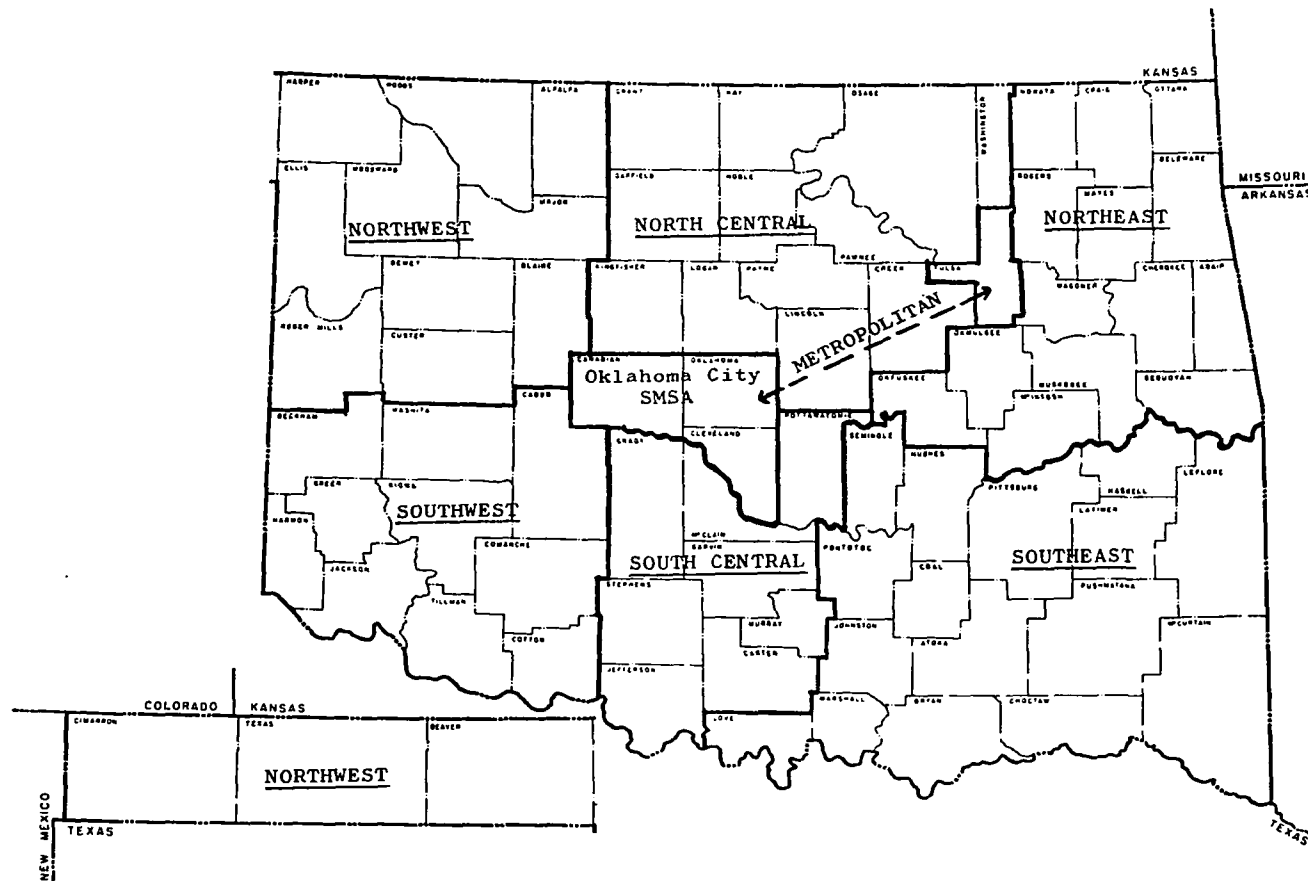
Three airports are not located in the same county as the communities they serve. Frank Phillips Airport is owned by the City of Bartlesville and is the major airport serving Bartlesville. It is located in Osage County, just across the county line from Bartlesville in Washington County. Sims Airport is the only airport in the Sand Springs community. Sand Springs is in Tulsa County, but Sims Airport is five miles northwest of Sand Springs in Osage County. Chattanooga is located in a corner of Comanche County. The municipal airport, Chattanooga Sky Harbor, is four miles southwest of Chattanooga in Tillman

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<sup>2</sup>As Morris Ullman and Robert Klove noted, "If precisely defined areas do not exist, they must be defined, usually by combining areas for which statistics are available, such as county blocks, census tracts, minor civil divisions, or counties." "The Geographic Area in Regional Economic Research," Regional Income, Volume 21 in the National Bureau of Economic Research's Studies in Income and Wealth (Princeton, New Jersey: Princeton University Press, 1957), p. 96.

<sup>3</sup>Because county lines usually do not correspond to activity boundaries, some writers argue against their use. Karl Fox and T. Krishna Kumar argue that functional economic areas should be delineated. "The Functional Economic Area: Delineation and Implications for Economic Analysis and Policy," Papers of the Regional Science Association, XV (1965), pp. 57-85. Virtually exhaustive data, however, is required to construct such regions.

FIGURE 1  
OKLAHOMA AIRPORT REGIONS



County. Four county and regional data tabulations, each airport has been included in the county in which the city it serves is located.

The most marked differences in airport facility and use patterns occur between the Oklahoma City and Tulsa areas and the rest of the state. An exception to the general practice of providing area contiguity was made in defining a metropolitan region. Due to their similarity, Tulsa County and the Oklahoma City Standard Metropolitan Statistical Area are treated as one region. The Oklahoma City SMSA was used rather than Oklahoma County because many of the aircraft based at airports in Canadian and Cleveland Counties are registered to individuals and organizations in Oklahoma County. One of the airports in Canadian County is owned by Oklahoma City.

The Metropolitan region accounts for about 39 per cent of state population.<sup>4</sup> The 13 counties in the Northwest region have a total population of 127,700 (about 5 per cent of the state total), and the total population of the 10 counties in the Southwest region is about 251,300 (about 10 per cent of the state total).

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<sup>4</sup>Oklahoma State Employment Security Commission, "Oklahoma Population Estimates for the State, Standard Metropolitan Statistical Areas and Counties" (Oklahoma City, Mimeographed, 1967), p. 2. The population estimates were for July 1, 1966.

The North Central region is the most populous of the non-metropolitan regions. The 12 counties account for about 14 per cent of state population (about 357,100 inhabitants). The eight counties in the South Central region have about 209,900 inhabitants and account for about 9 per cent of state population.

About 23 per cent of the state's inhabitants live in the two eastern regions. Although there are 16 counties in the Southeast region and 14 in the Northeast region, about 33,000 more people live in the Northeast. This region accounts for about 12 per cent (304,200) of the state population, and the Southeast accounts for about 11 per cent (270,900).

Although one-fourth of the airports in Oklahoma are in the Metropolitan region, the region accounts for about one-half of the general aviation operations. The largest Air Carrier and Group One airports are in this region, and they accommodate a wide variety of aviation activities. Two-thirds of the aircraft registered in Oklahoma which have executive transportation as their principal use are registered in the Metropolitan region.

In the sparsely populated Northwest region, there are more aircraft and airports in proportion to population than in any other area of the state. The region accounts for about 5 per cent of state population and about 16 per cent (31) of the airports in Oklahoma. Many of the

aircraft are owned by farmers and ranchers. More than one-half of the area in the Northwest region is more than 100 miles from a city with 50,000 or more inhabitants.

There are 32 airports in the Southwest region. Eight of these airports are principally used by agricultural applicators, and 17 of the 24 fixed base operators in the Southwest offer agricultural application services. These services also account for a significant part of the general aviation activity in the South Central region. There are fewer fixed base operators in the South Central region offering agricultural application services (seven) than there are in the Southwest. However, there are a few more agricultural application aircraft registered in the South Central than are registered in the Southwest.

There are fewer airports in the South Central region (19) than in any other region. However, there are almost as many aircraft registered in the region as there are in the Northwest and more than are registered in either the Northeast or Southeast regions.

The North Central region accounts for more airports (37) and more general aviation activity than any of the other non-metropolitan regions. Also, there is more variation in type of aviation activity than in any region other than the Metropolitan region. The amount of and variation in aviation activity in the region are related to the region's relatively large population, relatively

high income, and relatively greater variation in the types of economic activities which occur in the region.

There are 25 airports in the Northeast region. Eight of these airports are located in recreational areas, and five of these eight airports are operated in conjunction with private resorts. There are fewer aircraft in proportion to population in the Northeast than in any other region except the Southeast.

Although there are more airports (30) in the Southeast region than there are in three of the other regions, the Southeast accounts for less general aviation activity than any other region. Also, the activity is less varied than it is in other regions. In the Southeast, average incomes are relatively low; there are relatively few families in the upper income group; and there are relatively few business firms which use aircraft. The proportion of aircraft registered in the Southeast which are principally used for business and commercial purposes (about 40 per cent) is lower than it is in any of the other six regions. None of the aircraft registered in the Southeast are reported to have executive transportation, air taxi, or aerial patrol or survey as their principal use.

#### Type of Airport

There is at least one Air Carrier airport in each region (Table 30). The two Air Carrier airports in the

TABLE 30  
OKLAHOMA AIRPORTS, BY REGION, OCTOBER 1, 1966

Region	Total	Air Carrier	General Aviation				
			Group				
			( One	Two	Three	Four	Five )
Metropolitan <sup>+</sup>	25	2	8	3	6	6	*
Northwest	31	1	1	6	9	9	5
Southwest	32	1	3	7	10	5	6
North Central	37	4	1	6	7	13	6
South Central	19	1	3	2	4	6	3
Northeast	25	1	2	7	8	6	1
Southeast	30	1	1	5	7	10	6
Total	199	11	19	36	51	55	27

136

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No airports.

Metropolitan region (Will Rogers World Airport in Oklahoma City and Tulsa International), however, account for more than 9 out of 10 Oklahoma air carrier revenue passenger originations.

Three of the communities which have air carrier service are presently under investigation by the Civil Aeronautics Board to determine if there is enough need for air carrier transportation to justify continuation of airline service. The communities are Guymon in the Northwest, McAlester in the Southeast, and Muskogee in the Northeast (Figure 2). Although a final decision has not been made, the Civil Aeronautics Board recently recommended that air carrier service at Guymon and Duncan (in the South Central region) be discontinued.<sup>5</sup> If the current CAB recommendations are followed and the communities presently under CAB investigation lose air carrier service, there will be no airline service in four of the seven Oklahoma regions.

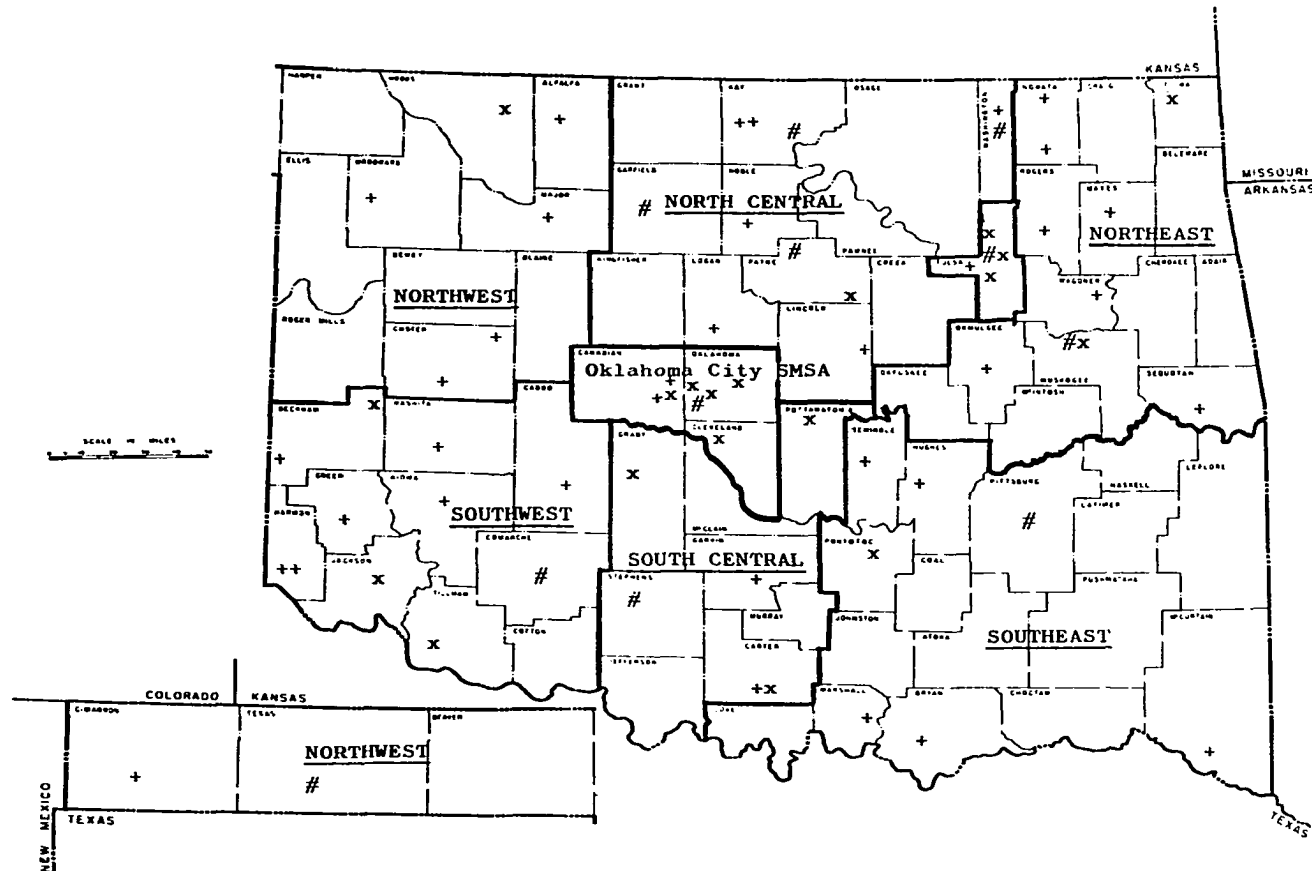
As airline aircraft become larger, many of the smaller communities in the United States, which currently have airline service, are expected either to lose all

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<sup>5</sup>Presumably, the Duncan community would be served by air carrier service available at Lawton, and Guymon would be served by air carrier flights at Liberal, Kansas. Norman Transcript (June 23, 1967), p. 3.

FIGURE 2

OKLAHOMA AIR CARRIER, GROUP ONE AND TWO GENERAL  
AVIATION AIRPORTS, OCTOBER 1, 1966



- # Air Carrier Airports
- x Group One General Aviation Airports
- + Group Two General Aviation Airports

service or receive less service. This trend, combined with decentralization of industry and increasing usefulness of general aviation aircraft as a mode of travel, is an important part of the reasoning underlying the expectation that business firms will continue to make increasing use of general aviation as a mode of travel. If these trends continue, the links with the air transportation system which are provided by general aviation airport facilities will become increasingly important to the economic development of communities and regions (those with and those without airline service).

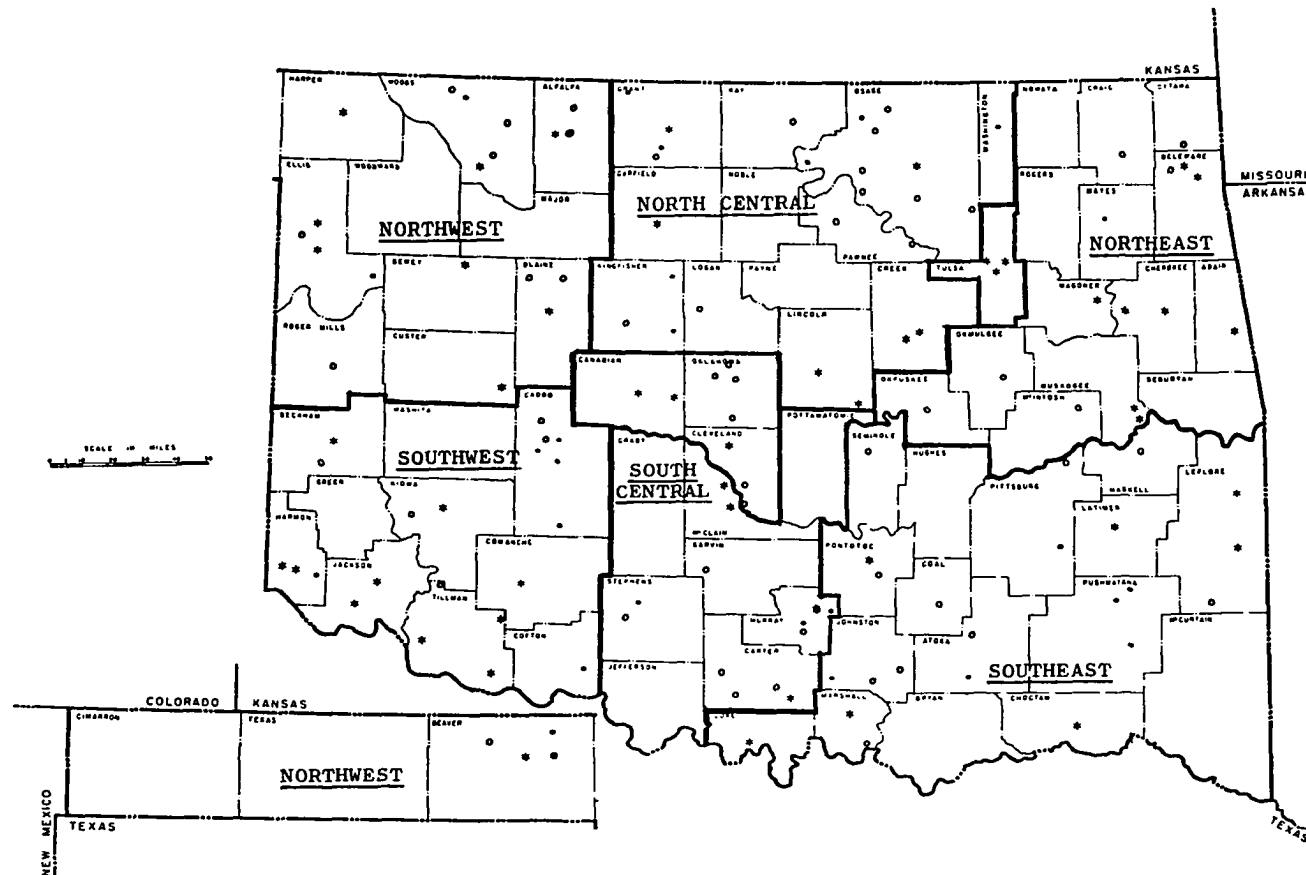
Slightly more than one-half of the airports in the Metropolitan region are in the larger airport categories (Air Carrier, Group One and Group Two general aviation). In the non-metropolitan regions the proportion of airports in the larger airport categories ranges from less than one-fourth in the Southeast to two-fifths in the Northeast.

Group Three, Four, and Five airports are more widely dispersed across the state than Air Carrier and Group One airports (Figure 3). Slightly more than one-half of the airports in the North Central and Southeast regions are Group Four and Five airports.

Jefferson County, in the South Central region, is the only county in Oklahoma in which there is not an airport

FIGURE 3

OKLAHOMA GROUP THREE, FOUR, AND FIVE GENERAL  
AVIATION AIRPORTS, OCTOBER 1, 1966



- \* Group Three Airports
- ° Group Four Airports
- Group Five Airports

on record with the FAA.<sup>6</sup> There is only one airport in each of 26 of Oklahoma's 77 counties, and in 12 counties all of the airports are in the Group Four and Five categories. There are more counties in these two groups in the Southeast than there are in any other region.

The amount and distribution of population and income are usually directly related to the type of airport provided in Oklahoma communities. This is true both among regions and within regions.

In terms of facilities and services, generally, better aviation access is provided to communities in the Northwest, Southwest, and North Central regions than there is to communities in the South Central, Northeast, and Southeast regions. There are fewer municipalities with 1,000 or more inhabitants which do not have some type of airport in each of the regions in the first group (Northwest, 3; Southwest, 5; and North Central, 6) than there are in any of the regions in the second group (South Central, 11; Northeast, 11; and Southeast, 14). Airports with paved runways at least during daylight hours can accommodate more than three-fourths of the general aviation aircraft in the United States, day or night, wet or dry. The Metropolitan region accounts for more of these airports (nine) than any other

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<sup>6</sup>See Table 42 in the appendix to this chapter for a distribution of Oklahoma airports by type and county.

region. There are seven of these airports in the North Central region, six in the Northwest, six in the Southwest, four in the South Central region, five in the Northeast, and five in the Southeast. Generally, there is less aviation access to communities in the Southeast than there is to communities in any other region.

More detailed information, which was not available before this study, is presented in the remainder of the chapter.

### General Characteristics

#### Ownership

The proportion of airports which are publicly owned varies from about one-third in the Metropolitan region to about three-fifths in the Northeast (Table 31). The number of publicly owned airports in an area or community is important for airport planning and development purposes for two major reasons. First, only publicly owned airports are eligible for FAAP assistance for improvement or expansion. Second, the life span of the smaller privately owned airports is often relatively short. Planners cannot depend upon existing private airports to continue providing service during the planning period. It can be expected that some of the private airports will be abandoned and new ones will be established during the

TABLE 31

OKLAHOMA AIRPORTS, BY TYPE OF OWNER,  
BY REGION, OCTOBER 1, 1966

Owner	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Government								
Municipal	82	6	14	15	17	8	12	10
County	1	*	*	*	*	*	1	*
State	7	2	1	*	*	2	1	1
Federal	3	*	*	*	*	*	1	2
Total Public	93	8	15	15	17	10	15	13
Private	106	17	16	17	20	9	10	17
Total Airports	199	25	31	32	37	19	25	30

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No airports.

next few years. However, which ones will be abandoned and how many airports will be established (and where) is unknown. It is likely that almost all publicly owned airports will continue to provide service in the next few years.

Business firms and individuals may establish a private airport to accommodate their own aviation activity when an adequate public airport is not available. For example, Coddling Cattle Research Incorporated (an affiliate of Armour Inc.) operates an airport in Osage county. The airport is open to the public and has a 3,200 foot paved, lighted runway. However, there are no aircraft based at the airport. It was established to provide access to Coddling's facilities for those who wish to travel to Coddling's remote location seven miles south of Foraker. It is more than 35 miles to an airport which can accommodate the aircraft which are typically used to visit Coddling's Osage County site.

Southerland Well Service Incorporated operates an airport located two miles northeast of Heaton in Carter County. Because this is the only airport within a radius of more than 20 miles which is open to the public and has a runway of more than 2,000 feet in length, it is one of the few, small private airports which are included in the National Airport Plan.

### Public Use Status

The nineteen airports which are not open to the public are scattered across the non-metropolitan regions (Table 32). Fourteen of these airports are small private landing strips which would provide only limited access to the areas in which they are located if they were open to the public.

### Airport Surface Area

It might be expected that airports in the two eastern regions would tend to have smaller surface areas than the airports in the other non-metropolitan regions, because the terrain in the eastern regions is generally more wooded and hilly than it is in the other regions. However, this is not necessarily the situation (Table 33). For example, 62 per cent of the airports in the Northwest have surface areas of less than 100 acres; while 54 per cent of the airports in the Southeast are in that size category. In the Northeast the proportion of airports which have surface areas of less than 100 acres is the same as it is in the Northwest (62 per cent). In the Southwest, however, 42 per cent of the airports are in that size category. Generally airport surface area in Oklahoma is more directly related with the nature and amount of activity the airport was designed to accommodate

TABLE 32

OKLAHOMA AIRPORTS, BY PUBLIC USE STATUS,  
BY REGION, OCTOBER 1, 1966

Public Use Status	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Open to Public	180	25	28	29	34	16	23	25
Not Open to Public	19	*	3	3	3	3	2	5
Total	199	25	31	32	37	19	25	30
Per Cent								
Open to Public	90.5	100.0	90.3	90.6	91.9	84.2	92.0	80.0
Not Open to Public	9.5	*	9.7	9.4	8.1	15.8	8.0	20.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*None.

TABLE 33

OKLAHOMA AIRPORTS, BY SURFACE AREA,  
BY REGION, OCTOBER 1, 1966

Number of Acres	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Less than 20	20	1	2	5	2	3	5	2
20 - 39	24	5	3	3	3	3	2	5
40 - 59	13	1	3	*	2	2	3	2
60 - 79	13	1	4	*	3	1	2	2
80 - 99	17	3	4	3	2	*	3	2
100 - 139	16	4	*	*	7	*	3	2
140 - 179	17	1	2	7	3	1	*	3
180 - 219	4	*	1	*	2	*	*	1
220 - 259	2	*	1	1	*	*	*	*
260 - 299	3	*	1	1	*	*	1	*
300 - 539	16	3	2	1	2	3	3	2
540 - 1,039	15	2	2	3	3	2	1	2
1,040 and More	12	4	1	2	2	1	1	1
Not Available <sup>1</sup>	27	*	5	6	6	3	1	6
Total	199	25	31	32	37	19	25	30

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No airports.

<sup>1</sup>Data concerning surface area is not available for Group One general aviation airports.

than the terrain of the area in which it is located.

Distance from Associated Municipality

Only 10 airports are 10 or more miles from the municipality with which they are associated (Table 34). Seven of these airports are in the Northwest region. Although five of the seven airports are open to the public, they provide only limited access to the areas in which they are located. The limited access provided to the sparsely populated areas they are located in is not the result of their distance from the municipality with which they are associated. They provide limited access because surface transportation is not available, the roads in the area are relatively poor, and the airport facilities are scant.

Distance From Nearest Civil Airport

The geographic concentration of airports is greater in the Metropolitan and Northeast regions than in other regions (Table 35). About three out of four airports in the Metropolitan region and slightly more than one-half of the airports in the Northeast region are less than eight miles from another civil airport. The airports are concentrated around the cities in the Metropolitan region and around the lakes in the Northeast region.

TABLE 34

OKLAHOMA AIRPORTS, BY DISTANCE FROM ASSOCIATED MUNICIPALITY,  
BY REGION, OCTOBER 1, 1966

Distance (miles)	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Less than 2	70	4	13	15	11	4	13	10
2 - 3.9	59	8	8	8	14	7	6	8
4 - 5.9	32	8	*	6	7	3	3	5
6 - 7.9	19	4	3	1	4	1	2	4
8 - 9.9	9	1	*	2	*	2	1	3
10 - 11.9	4	*	2	*	1	1	*	*
12 and More	6	*	5	*	*	1	*	*
Total	199	25	31	32	37	19	25	30

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No airports.

TABLE 35

OKLAHOMA AIRPORTS, BY DISTANCE FROM NEAREST CIVIL AIRPORT,  
BY REGION, OCTOBER 1, 1966

Distance by Air (miles)	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Less than 4	29	6	2	7	4	6	4	*
4 - 7.9	43	12	2	6	5	2	10	6
8 - 11.9	45	6	5	8	11	5	3	7
12 - 15.9	30	1	8	5	9	1	2	4
16 - 19.9	32	*	9	4	4	4	3	8
20 and More	20	*	5	2	4	1	3	5
Total	199	25	31	32	37	19	25	30

Source: Compiled from records of the FAA Airport District Office, Oklahoma City; U.S. Coast and Geodetic Survey, 1966 Aeronautical Charts covering Oklahoma, Washington, D.C.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No airports.

## Aviation Facilities

### Runway Facilities

Runway Length. There are 33 airports in Oklahoma with runways of sufficient length (4,000 feet and longer) to accommodate almost all general aviation aircraft. Six of these airports are in the Metropolitan region, seven are in the Southwest, and six are in the North Central region.<sup>7</sup>

About one-half of the airports in the Northwest, Southwest, and Southeast regions have runways less than 2,500 feet long. Only the smaller general aviation aircraft can use these airports.

Runway Surface. The proportion of airports which have paved principal runways varies from 27 per cent in the North Central region to 42 per cent in the South Central region.<sup>8</sup> The South Central region accounts for four of the eight airports having improved runway surfaces (oil or gravel).

Lighting Facilities. There are more airports with runway lights in the Northeast than in any other region.<sup>9</sup>

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<sup>7</sup>For additional information see Table 43 in the appendix to this chapter.

<sup>8</sup>For additional information see Table 44 in the appendix to this chapter.

<sup>9</sup>For additional information see Table 45 in the appendix to this chapter.

At the other extreme, three out of four airports in the Southwest do not have any type of aviation lighting facilities.

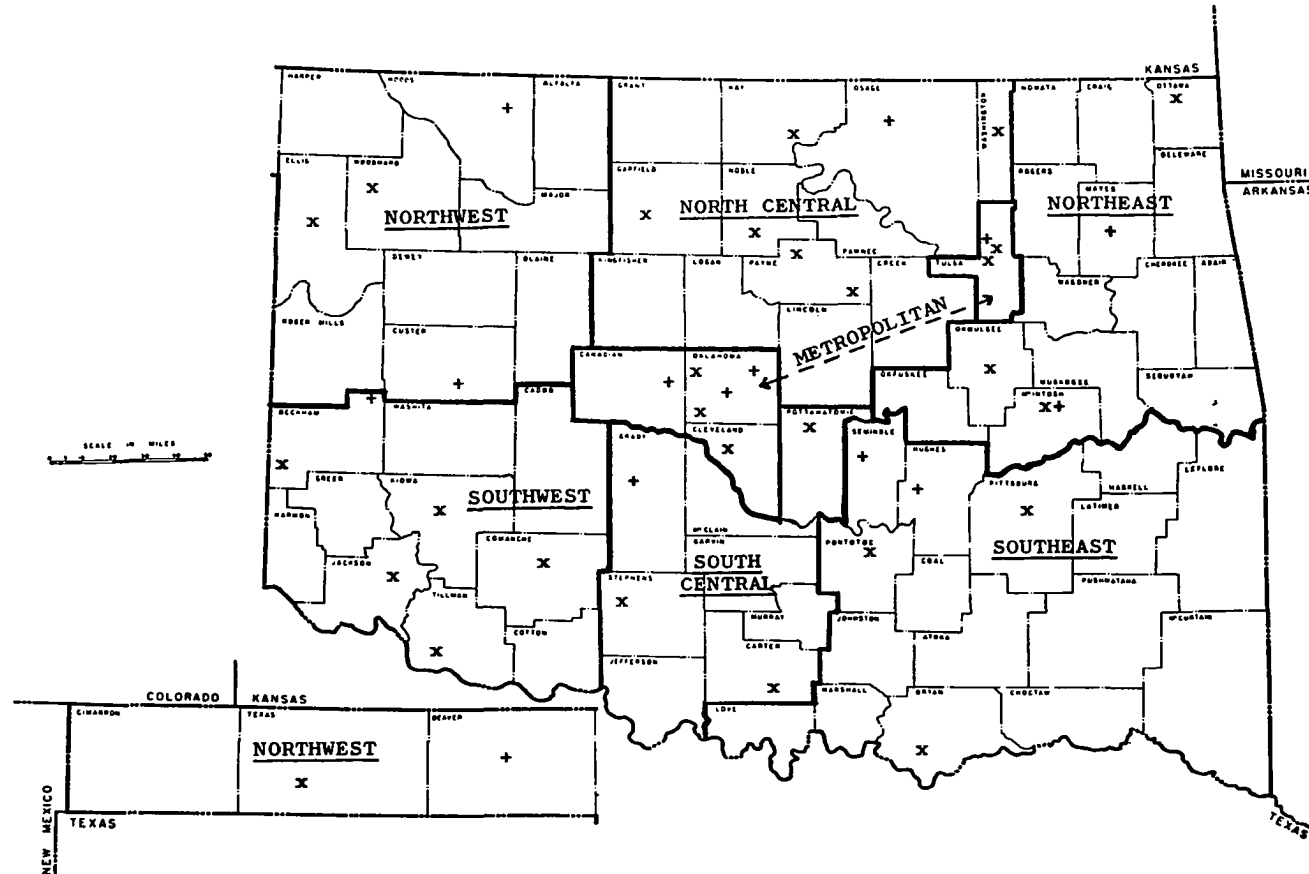
Four Oklahoma airports have runway approach lights. Two of these airports are Tulsa International and Will Rogers World in the Metropolitan region. Ardmore Municipal, in the South Central region, and Muskogee's Davis Field, in the Northeast, are the other two airports with approach lights. The approach lights at these two airports were originally provided when the airports were operated by the military.

As stated previously, in terms of economic development, one of the most important aspects of the Oklahoma airport system is the access it provides in-state and out-of-state business firms and individuals to the State's communities. The access provided depends upon the location of the airports and the facilities.

There are 42 airports in Oklahoma which have lighted, paved runways at least 3,000 feet in length and which have attendants available at least during daylight (Figure 4). Each of these airports can accommodate more than 75 per cent of the general aviation aircraft in the United States, day or night, wet or dry. The Metropolitan region accounts for more of these airports (nine) than any other region. There are seven of these airports in the North Central region, six in the Northwest, six in the

FIGURE 4

OKLAHOMA AIRPORTS WITH LIGHTED, PAVED RUNWAYS AT LEAST 3,000 FEET IN LENGTH AND WHICH HAVE ATTENDANTS AVAILABLE AT LEAST DURING DAYLIGHT, OCTOBER 1, 1966



- + Airports with runways from 3,000 to 3,999 feet in length.
- x Airports with runways 4,000 feet or more in length.

North Central region, six in the Northwest, six in the Southwest, four in the South Central region, five in the Northeast, and five in the Southeast.

Twenty-eight of the 42 airports have runways of 4,000 or more feet in length. Each of these airports accommodates at least 95 per cent of the general aviation aircraft in the United States. Six of these airports are located in the North Central region, five are in the Metropolitan region, and five are in the Southwest. There are three such airports in each of the remaining regions (South Central, Northeast, and Southeast).

#### Other Facilities

Availability of an Airport Attendant. Usually airports which have attendants available also have at least fuel and aircraft storage facilities available. There are more than 80 airports in Oklahoma which have attendants available at least during daylight. One-half of these airports are attended 24 hours per day. The Metropolitan and North Central regions together account for 45 per cent of the airports which are attended at least during daylight (18 each).<sup>10</sup>

There are fewer airports which are attended at

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<sup>10</sup>For additional information see Table 47 in the appendix to this chapter.

least during the daylight hours in the Southeast region (8) than there are in any other region. However, there are more airports attended 24 hours per day in the Southeast than there are in the Northwest, Southwest, or South Central regions.

Aircraft Fuel. Fuel for turbine engine aircraft is provided at only eight airports, and five of these are in the Metropolitan region. The other three airports having turbine engine fuel are Ardmore Municipal in the South Central region, Bartlesville's Frank Phillips Airport in the North Central region, and Lawton Municipal in the Southwest. Presently, there are about 1,000 turbine-powered general aviation aircraft in the United States. Almost all of these aircraft are owned by corporations and are used for executive transportation. The number of turbine-powered general aviation aircraft is expected to reach 8,000 by 1977.<sup>11</sup>

Three out of five airports in the Southeast do not provide any aircraft fuel.<sup>12</sup> The 12 airports which provide

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<sup>11</sup>Federal Aviation Agency, Aviation Forecasts: Fiscal Years, 1967-1977 (Washington, D.C.: FAA, 1967), p. 9.

<sup>12</sup>For additional information concerning the availability of fuel in the regions, see Table 48 in the appendix to this chapter.

aircraft fuel are located in 11 of the 16 counties.

Repair Services. In the Metropolitan region major power plant repair services are available at 11 airports. Only six airports in the 30 Northeast and Southeast counties have major power plant and airframe repair services available.<sup>13</sup>

Aircraft Storage. All but one of the 25 airports in the Metropolitan region have some type of aircraft storage building available.<sup>14</sup> At the other extreme fourteen of the 30 airports in the Southeast do not have storage buildings.

Electronic Navigational Aids. Five of the eight airports having FAA control towers are located in the Metropolitan region.<sup>15</sup> Control tower service is a prerequisite for instrument landing systems.

Only the two air carrier airports in Oklahoma City and Tulsa have instrument landing systems. An increasing number of general aviation aircraft are being equipped

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<sup>13</sup>For additional information concerning the availability of repair services in the regions, see Table 49 in the appendix to this chapter.

<sup>14</sup>For additional information concerning the availability of aircraft storage facilities in the regions, see Table 50 in the appendix to this chapter.

<sup>15</sup>For additional information concerning selected electronic navigational aids available in the regions, see Table 51 in the appendix to this chapter.

with the electronic items needed for instrument landings.<sup>16</sup> In fiscal 1962, there were about 7 million instrument operations in the United States at airports with FAA operated control towers, and 26 million are expected by fiscal 1977.<sup>17</sup> Most of the increase is expected to be accounted for by general aviation aircraft.

Convenience Facilities. Slightly more than one-third of the airports in the Northwest and Southeast do not have telephone, restroom, surface transportation or food facilities.<sup>18</sup> These two regions account for 23 of the 54 airports which do not have any of the major convenience facilities. Sixteen of these airports, however, (10 in the Southeast and 6 in the Northwest) are privately owned airports on ranches.

### Aviation Activity

#### Fixed Base Operators

About 26 per cent of Oklahoma fixed base operators

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<sup>16</sup> See Federal Aviation Agency, General Aviation: A Study and Forecast of the Fleet and Its Use in 1957 (Washington, D.C.: FAA, 1966), pp. 101-102.

<sup>17</sup> Federal Aviation Agency, Aviation Forecasts: Fiscal Years, 1967-1977 (Washington, D.C.: FAA, 1967), p. 34.

<sup>18</sup> For additional information concerning convenience facilities available in the regions, see Table 52 in the appendix to this chapter.

are located in the Metropolitan region (Table 36). These businesses tend to have more employees and greater sales than the fixed base operators in the non-metropolitan regions. However, there are exceptions. The American Dusting Company, Chickasha Flying Service Incorporated, and American Flyers Incorporated are three of the exceptions.

Two large aerial application firms operate in Oklahoma. The American Dusting Company operates storage and maintenance facilities at Mustang Field in the Metropolitan region (Canadian County). It bases several aircraft at various airports in the North Central, South Central and Southwest regions. The company owns and operates a general aviation airport in Tillman County in the Southwest. This is the only airport open to the public in the Snyder community.

Chickasha Flying Service Incorporated has its headquarters at Chickasha Municipal Airport in the South Central region. This firm also operates storage and repair facilities for its aircraft at the Chickasha airport.

One of American Flyers' main bases of operation is at Ardmore Municipal Airport in the South Central region.<sup>19</sup>

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<sup>19</sup>American Flyers owned 116 aircraft at the beginning of 1965. It was the third largest supplemental air carrier in terms of aircraft (12 in the over 12,500 pounds category) at that time. The supplemental air carriers are often called nonscheduled airlines. See Civil Aeronautics Board, Handbook of Airline Statistics (Washington, D.C.: Government Printing Office, 1966), pp. 1, 418-419.

TABLE 36

FIXED BASE OPERATORS AND AVIATION SERVICES AVAILABLE AT  
OKLAHOMA AIRPORTS, BY REGION, OCTOBER 1, 1966

Fixed Base Operators and Services Available <sup>1</sup>	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Base Operators	132	34	14	24	27	10	13	10
Services Available								
Flight Instruction	58	9	7	9	13	6	8	6
Agricultural Appli- cation	57	3	8	17	15	7	3	4
Charter	54	11	8	9	11	5	5	5
Sales	32	11	4	3	6	3	3	2
Patrol	27	3	4	3	8	5	3	1
Survey	19	5	1	3	8	1	1	*
Advertising	18	6	1	1	7	2	1	*
Ambulance	9	2	1	1	2	*	3	*
Other	11	3	1	1	3	1	2	*

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for 172 of the 199 airports on record with the FAA. Data are not available for Group Five general aviation airports.

<sup>1</sup>Aircraft repair and modification and fuel sales are not included.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*None.

This firm charters both large and small aircraft and operates one of the larger aviation schools in the United States. The aviation school, located on Ardmore Municipal Airport, trains pilots from across the nation and has its own dormitory and cafeteria system.

#### Based Aircraft

The Metropolitan region accounts for 46 per cent of the estimated based aircraft in Oklahoma (Table 37). About three out of four multi-engine aircraft are based at airports in the region.

The North Central region accounts for more estimated based aircraft than the Northeast and Southeast regions combined. The 30 counties in the two eastern regions account for about 12 per cent of the single engine aircraft based in Oklahoma and about 5 per cent of the multi-engine aircraft.

#### General Aviation Operations

The Metropolitan region accounts for slightly more than one-half of Oklahoma general aviation aircraft operations at airports on record with the FAA (Table 38). About three out of five of the estimated itinerant operations occur at airports in the Metropolitan region.

About 70 per cent of the estimated operations in the South Central region are local operations. The high

TABLE 37

ESTIMATED BASED AIRCRAFT AT OKLAHOMA AIRPORTS, BY TYPE OF AIRCRAFT,  
BY REGION, OCTOBER 1, 1966

Aircraft Type	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Wing								
Single Engine	2,138	891	187	205	370	218	141	126
Multi-engine	352	242	10	8	42	32	14	4
Helicopter	41	30	3	7	1	*	*	*
Total	2,531	1,163	200	220	413	250	155	130
Per Cent								
Fixed Wing								
Single Engine	84.4	35.2	7.3	8.1	14.6	8.6	5.6	5.0
Multi-engine	13.9	9.6	0.4	0.3	1.6	1.3	0.5	0.2
Helicopter	1.6	1.2	0.1	0.3	**	*	*	*
Total <sup>#</sup>	100.0	46.0	7.8	8.7	16.2	9.9	6.1	5.2

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

\*\*Less than 0.05 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 38

ESTIMATED ANNUAL GENERAL AVIATION OPERATIONS AT OKLAHOMA AIRPORTS,  
 BY TYPE OF OPERATION, BY REGION, OCTOBER 1, 1966  
 (Thousands of Operations)

Annual Operations	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Local	923	415	47	115	123	140	53	28
Itinerant	852	496	53	66	94	61	42	39
Total <sup>#</sup>	1,775	911	101	182	218	201	95	67
Per Cent								
Local	52.0	23.4	2.7	6.5	6.9	7.9	3.0	1.6
Itinerant	48.0	27.9	3.0	3.7	5.3	3.4	2.4	2.2
Total <sup>#</sup>	100.0	51.3	5.7	10.2	12.3	11.3	5.3	3.8

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for 172 of the 199 airports on record with the FAA. Data are not available for Group Five general aviation airports.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

<sup>#</sup>Components may not add to totals due to rounding.

ratio of local operations is due to a large number of agricultural application and instruction flights in the region. These flights are also reflected in the annual rate of flight hours by aircraft registered in the region (Figure 5).

#### Income, Population, and Airport Type

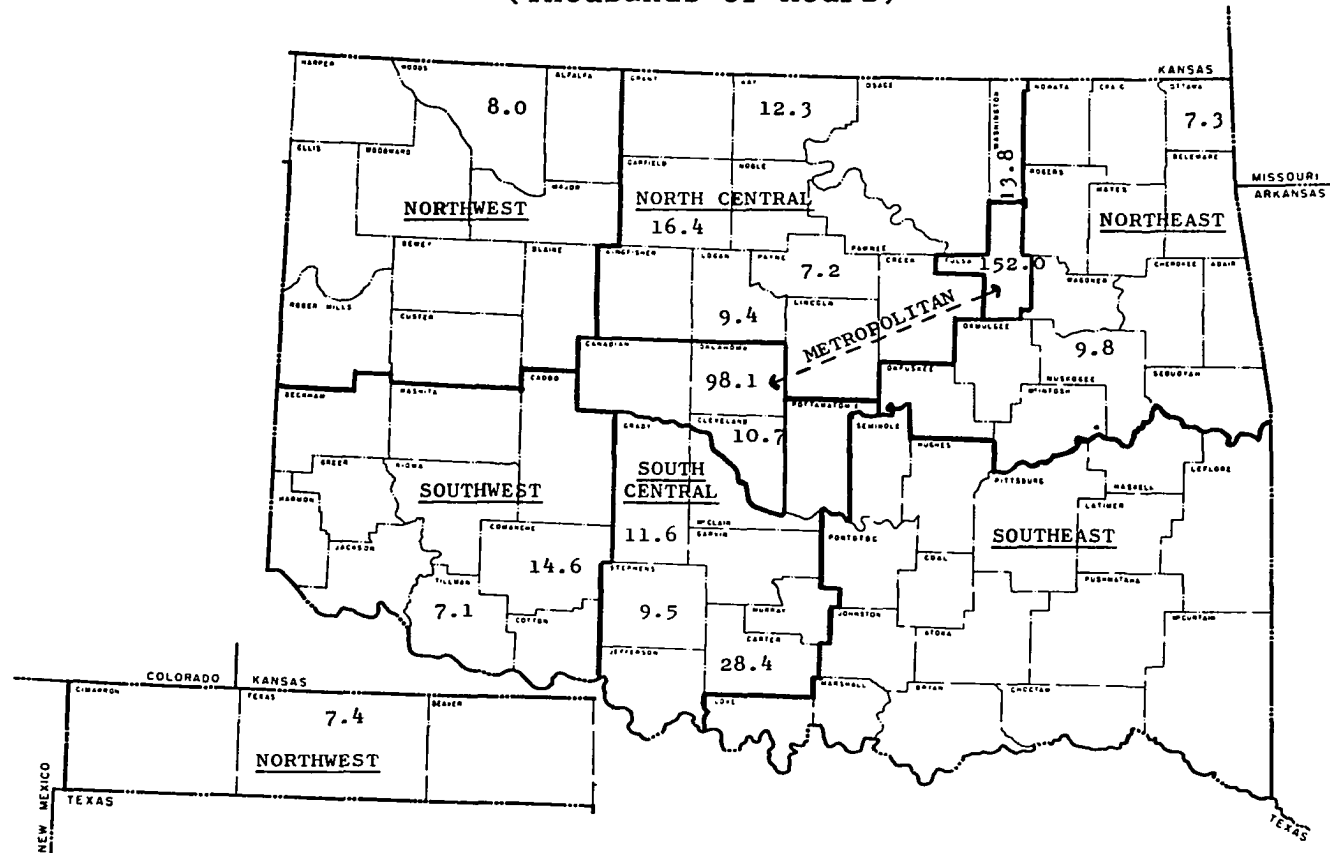
As pointed out in the previous chapter, income and population are two of the most important general factors influencing the type of airport facilities available in a community. Generally, in communities with about the same number of inhabitants, there is more aviation activity and better general aviation facilities available in the higher income communities.

#### Income

The lower income areas of the state, the Northeast and Southeast, have fewer air carrier and primary general aviation airports, estimated based aircraft, and estimated annual operations in proportion to their populations than any of the other regions. The 30 counties in the two regions account for about 23 per cent of state population but only about 11 per cent of estimated based aircraft and 9 per cent of estimated annual general aviation operations.

The Northwest and North Central regions have higher incomes than any of the other non-metropolitan regions.

ANNUAL RATE OF FLIGHT HOURS BY AIRCRAFT REGISTERED IN COUNTIES WHICH  
ACCOUNT FOR ONE PER CENT OR MORE OF TOTAL HOURS FLOWN BY  
OKLAHOMA AIRCRAFT REGISTRANTS, MARCH 1, 1966  
(Thousands of Hours)



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About 19 per cent of Oklahoma's inhabitants live in the 25 counties in these two regions. However, these two regions account for about 24 per cent of the estimated based aircraft in the state, and they account for about 18 per cent of estimated annual general aviation operations.

Slightly more than one-half of the airports in the Northeast and Southeast are in the 12 highest median family income counties in those two regions (Table 39).<sup>20</sup> These 12 counties also account for all of the Air Carrier and Group One general aviation airports and two-thirds of the Group Three general aviation airports in the two regions.

In the Northwest and North Central regions, the 17 highest median family income counties in the two regions account for all of the Air Carrier and Group One general aviation airports (Table 40). Also, these 17 counties account for more than two-thirds of the other types of airports in the two regions.

### Population

Airports and aviation activity tend to be concentrated around population centers. The Metropolitan region accounts for slightly less than 40 per cent of

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<sup>20</sup>Population concentration is also an important factor influencing the availability of general aviation facilities. The major cities in the two regions (Ada, McAlester, Miami, and Muskogee) are in the 12 County group.

TABLE 39

AIRPORTS IN THE NORTHEAST AND SOUTHEAST REGIONS, BY  
COUNTY MEDIAN FAMILY INCOME CLASS, BY TYPE OF  
AIRPORT, OCTOBER 1, 1966

Median Family Income Class <sup>1</sup>	Counties in Class	Number of Air- ports	Air Carrier	General Aviation				
				(	Group	)		
				One	Two	Three	Four	Five
Less than \$2,000	2	4	*	*	*	1	*	3
2,000 - 2,499	10	15	*	*	2	3	8	2
2,500 - 2,999	6	9	*	*	2	6	1	*
3,000 - 3,499	4	10	1	*	3	2	2	2
3,500 - 3,999	5	11	1	2	2	3	3	*
4,000 - 4,499	3	6	*	1	3	*	2	*
4,500 - 5,000	*	*	*	*	*	*	*	*
More than 5,500	*	*	*	*	*	*	*	*
Total	30	55	2	3	12	15	16	7

Source: Compiled from records of the FAA Airport District Office, Oklahoma City; and U.S. Bureau of the Census, U.S. Census of Population: 1960. Vol. I, Characteristics of the Population. Part 38, Oklahoma (Washington, D.C.: Government Printing Office, 1963), pp. 38-142 and 38-143.

The data are for airports on record with the FAA.

<sup>1</sup>In 1959.

\*None.

TABLE 40

AIRPORTS IN THE NORTHWEST AND NORTH CENTRAL REGIONS, BY  
COUNTY MEDIAN FAMILY INCOME CLASS, BY TYPE OF  
AIRPORT, OCTOBER 1, 1966

Median Family Income Class <sup>1</sup>	Counties in Class	Number of Air- ports	Air Carrier	General Aviation				
				(	Group	)		
				One	Two	Three	Four	Five
Less than \$2,000	*	*	*	*	*	*	*	*
2,000 - 2,499	*	*	*	*	*	*	*	*
2,500 - 2,999	1	1	*	*	*	*	1	*
3,000 - 3,499	*	*	*	*	*	*	*	*
3,500 - 3,999	7	14	*	*	4	4	6	*
4,000 - 4,499	8	28	1	2	4	8	6	7
4,500 - 5,000	4	16	1	*	1	3	7	4
More than 5,000	5	9	3	*	3	1	2	*
Total	25	68	5	2	12	16	22	11

Source: Compiled from records of the FAA Airport District Office, Oklahoma City; and U.S. Bureau of the Census, U.S. Census of Population: 1960. Vol. I, Characteristics of the Population. Part 38, Oklahoma (Washington, D.C.: Government Printing Office, 1963), pp. 38-142 and 38-143.

The data are for airports on record with the FAA.

<sup>1</sup>In 1959.

\*None.

Oklahoma population, about one-half of estimated general aviation operations, and one-third of the Air Carrier and Group One general aviation airports. The type of airport provided is also related to population concentration. For example, all of the Air Carrier and Group One general aviation airports are located in communities with 5,000 or more inhabitants.

There are 51 Oklahoma municipalities with 1,000 or more inhabitants which do not have public or private airport facilities which are open to the public (Table 41). Three of these municipalities (Henryetta, Sapulpa, and Wewoka) have more than 4,500 inhabitants.<sup>21</sup> Almost three-fourths of the municipalities which do not have airport facilities are in the South Central, Northeast, and Southeast regions.

Generally, better aviation access is provided to the communities in the Metropolitan area than to communities in any of the other regions. Among the non-metropolitan regions, generally, better access is provided to communities in the Northwest, Southwest, and North Central regions than is provided to communities in the South Central, Northeast, and Southeast regions. Each of the regions in the

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<sup>21</sup>Henryetta is presently completing a new municipal airport, and a new airport is recommended for Sapulpa in the Federal Aviation Administration's 1966/1967 National Airport Plan (Washington, D.C.: Government Printing Office, 1967), p. 163.

TABLE 41

OKLAHOMA MUNICIPALITIES WITH 1,000 OR MORE INHABITANTS  
WITHOUT AN AIRPORT,<sup>1</sup> BY POPULATION CLASS,  
BY REGION, OCTOBER 1, 1966

Population Class <sup>2</sup>	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
1,000 - 1,499	19	*	2	2	1	5	5	4
1,500 - 1,999	14	1	1	1	1	2	3	5
2,000 - 2,499	5	*	*	1	*	1	1	2
2,500 - 3,499	6	*	*	1	1	1	1	2
3,500 - 4,499	4	*	*	*	2	2	*	*
4,500 and More	3	*	*	*	1	*	1	1
Total	51	1	3	5	6	11	11	14

Source: Compiled from records of the Oklahoma District Airport Office, Oklahoma City; and U.S. Bureau of the Census. U.S. Census of Population: 1966. Vol. I, Characteristics of the Population. Part 38, Oklahoma. (U.S. Government Printing Office, Washington, D.C., 1963), Table 7, pp. 38-12 through 39-18.

<sup>1</sup>No municipal airport and more than 10 miles from an airport which is open to the public.

The data are for airports on record with the FAA.

<sup>2</sup>In 1960.

<sup>+</sup>Tulsa County and the Oklahoma SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No municipalities.

first group (Northwest, Southwest, and North Central) has more airports with lighted, paved runways at least 3,000 feet in length and which have attendants available at least during daylight than any of the regions in the second group (South Central, Northeast, and Southeast). Also, there are fewer municipalities without some type of airport in each of the regions in the first group than there are in any of the regions in the second group. Generally, there is less aviation access to communities in the Southeast than there is to communities in any other region.

## APPENDIX

TABLE 42  
OKLAHOMA AIRPORTS, BY REGION AND COUNTY,  
OCTOBER 1, 1966

Region and County	Total	Air Carrier	General Aviation				
			( Group )				
			One	Two	Three	Four	Five
Metropolitan							
Canadian	5	*	1	2	2	*	*
Cleveland	4	*	1	*	1	2	*
Oklahoma	8	1	3	*	*	4	*
Tulsa	8	1	3	1	3	*	*
Total	25	2	8	3	6	6	*
Northwest							
Alfalpa	4	*	*	1	1	1	1
Beaver	4	*	*	*	1	1	2
Blaine	3	*	*	*	1	2	*
Cimarron	1	*	*	1	*	*	*
Custer	3	*	*	2	1	*	*
Dewey	1	*	*	*	1	*	*
Ellis	4	*	*	*	2	1	1
Harper	1	*	*	*	1	*	*
Major	1	*	*	1	*	*	*
Roger Mills	1	*	*	*	*	1	*
Texas	1	1	*	*	*	*	*
Woods	6	*	1	*	1	3	1
Woodward	1	*	*	1	*	*	*
Total	31	1	1	6	9	9	5

(continued)

TABLE 42—Continued

Region and County	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Southwest							
Beckham	4	*	1	1	1	1	*
Caddo	7	*	*	1	*	2	4
Comanche	3	1	*	*	2	*	*
Cotton	1	*	*	*	*	*	1
Greer	1	*	*	1	*	*	*
Harmon	5	*	*	2	2	*	1
Jackson	3	*	1	*	2	*	*
Kiowa	3	*	*	1	1	1	*
Tillman	4	*	1	*	2	1	*
Washita	1	*	*	1	*	*	*
Total	31	1	3	7	10	5	6
North Central							
Creek	2	*	*	*	2	*	*
Garfield	2	1	*	*	1	*	*
Grant	4	*	*	*	1	1	2
Kay	3	1	*	2	*	1	*
Kingfisher	3	*	*	*	*	1	2
Lincoln	3	*	*	1	2	*	*
Logan	2	*	*	1	*	1	*
Noble	1	*	*	1	*	*	*
Osage	9	*	*	*	1	6	2
Pawnee	2	*	*	*	*	2	*

(continued)

TABLE 42—Continued

Region and County	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Payne	2	1	1	*	*	*	*
Washington	3	1	*	1	*	1	*
Total	37	4	1	6	7	13	6
South Central							
Carter	6	*	1	1	1	3	*
Garvin	2	*	*	1	*	1	*
Grady	1	*	1	*	*	*	*
Jefferson	*	*	*	*	*	*	*
McClain	2	*	*	*	2	*	*
Murray	4	*	*	*	1	1	2
Pottawatomie	1	*	1	*	*	*	*
Stephens	3	1	*	*	*	1	1
Total	19	1	3	2	4	6	3
Northeast							
Adair	1	*	*	*	1	*	*
Cherokee	2	*	*	*	2	*	*
Craig	1	*	*	*	*	1	*
Delaware	3	*	*	*	2	1	*
McIntosh	1	*	*	*	*	1	*
Mayes	2	*	*	1	*	*	1
Muskogee	4	1	1	*	2	*	*

(continued)

TABLE 42—Continued

Region and County	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Nowata	2	*	*	2	*	*	*
Okfuskee	1	*	*	*	*	1	*
Okmulgee	2	*	*	1	*	1	*
Ottawa	2	*	1	*	*	1	*
Rogers	1	*	*	1	*	*	*
Sequoyah	1	*	*	1	*	*	*
Wagoner	2	*	*	1	1	*	*
Total	25	1	2	7	8	6	1
Southeast							
Atoka	2	*	*	*	*	1	1
Bryan	1	*	*	1	*	*	*
Choctaw	1	*	*	*	1	*	*
Coal	1	*	*	*	*	1	*
Haskell	1	*	*	*	*	1	*
Hughes	1	*	*	1	*	*	*
Johnston	3	*	*	*	*	2	1
Latimer	1	*	*	*	1	*	*
LeFlore	3	*	*	*	2	1	*
Love	1	*	*	*	1	*	*
McCurtain	1	*	*	1	*	*	*
Marshall	3	*	*	1	1	1	*

(continued)

TABLE 42—Continued

Region and County	Total	Air Carrier	General Aviation				
			(Group)				
			One	Two	Three	Four	Five
Pittsburg	3	1	*	*	*	1	1
Pontotoc	3	*	1	*	1	1	*
Pushmataha	3	*	*	*	*	*	3
Seminole	2	*	*	1	*	1	*
Total	30	1	1	5	7	10	6
Total Oklahoma	199	11	19	36	51	55	27

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Source: Compiled from records of the FAA District Airport Office, Oklahoma City.

The data are for airports on record with the FAA.

\*No airports.

TABLE 43

OKLAHOMA AIRPORTS, BY LENGTH OF PRINCIPAL RUNWAY,  
BY REGION, OCTOBER 1, 1966

Length of Principal Runway (feet)	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Less than 1,500	6	*	2	1	1	*	*	2
1,500 - 1,999	21	*	1	4	5	3	4	4
2,000 - 2,499	60	6	12	13	13	4	4	8
2,500 - 2,999	39	7	3	3	10	5	6	5
3,000 - 3,499	32	5	8	2	2	2	7	6
3,500 - 3,999	8	1	2	2	*	2	1	*
4,000 - 4,499	9	1	1	1	*	1	2	3
4,500 - 4,999	3	*	*	2	1	*	*	*
5,000 and More	21	5	2	4	5	2	1	2
Total	199	25	31	32	37	19	25	30

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No airports.

TABLE 44

OKLAHOMA AIRPORTS, BY SURFACE TYPE OF PRINCIPAL RUNWAY,  
BY REGION, OCTOBER 1, 1966

Surface of Principal Runway	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Bare, Grass, or Sod	120	15	17	20	27	7	16	18
Improved (oil or gravel)	8	*	1	1	*	4	1	1
Paved (asphalt or concrete)	71	10	13	11	10	8	8	11
Total	199	25	31	32	27	19	25	30
Per Cent								
Bare, Grass or Sod	60.3	60.0	54.8	62.5	73.0	36.8	64.0	60.0
Improved (oil or gravel)	4.0	*	3.2	3.1	*	21.0	4.0	3.3
Paved (asphalt or concrete)	35.7	40.0	41.9	34.4	27.0	42.1	32.0	36.7
Total <sup>#</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No airports.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 45  
LIGHTING FACILITIES AT OKLAHOMA AIRPORTS, BY TYPE OF FACILITY,  
BY REGION, OCTOBER 1, 1966

Type of Lighting	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
None	129	14	22	24	25	12	12	20
Runway	65	11	9	7	10	6	13	9
Beacon	53	7	8	7	9	6	8	8
Taxiway	8	3	*	*	1	1	3	*
Approach	4	2	*	*	*	1	1	*

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Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*None.

TABLE 46

OKLAHOMA AIRPORTS, BY NUMBER OF ACTIVE RUNWAYS,  
BY REGION, OCTOBER 1, 1966

Number of Runways	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
One	121	14	15	18	22	13	17	22
Two	40	4	12	6	9	1	6	2
Three	28	2	4	5	5	4	2	6
Four	8	3	*	3	1	1	*	*
Five	2	2	*	*	*	*	*	*
Total	199	25	31	32	37	19	25	30

Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No airports.

TABLE 47

AVAILABILITY OF ATTENDANTS AT OKLAHOMA AIRPORTS,  
BY REGION, OCTOBER 1, 1966

Availability of Attendant	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Unattended	108	7	21	16	19	10	13	22
Seasonally Attended	3	*	*	2	*	*	1	*
During Daylight Hours								
Attended Daily During Daylight Hours	41	6	5	9	9	7	5	*
Attended Six Days Per Week During Daylight Hours	3	2	*	1	*	*	*	*
Attended Daily During Daylight Hours and Part of Night	4	1	1	*	*	*	*	2
Attended 24 Hours Per Day	40	9	4	4	9	2	6	6
Total	199	25	31	32	37	19	25	30

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Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No airports.

TABLE 48

AIRCRAFT FUEL AVAILABLE AT OKLAHOMA AIRPORTS, BY TYPE OF FUEL,  
BY REGION, OCTOBER 1, 1966

Fuel Available	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
None	91	7	15	13	17	10	11	18
Piston Engine: <sup>1</sup>								
80	6	2	*	1	1	*	2	*
80/87	100	15	16	17	20	9	12	11
91/96	4	1	*	1	*	1	*	1
100/130	69	14	12	9	11	6	8	9
115/145	4	2	1	1	*	*	*	*
Turbine Engine	8	5	*	1	1	1	*	*

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>1</sup>Octane or power rating.

<sup>+</sup>Tulsa County and the Oklahoma SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*None.

TABLE 49

REPAIR SERVICES AVAILABLE AT OKLAHOMA AIRPORTS, BY TYPE,  
BY REGION, OCTOBER 1, 1966

Repair Services Available	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
None	140	13	20	22	26	13	20	26
Airframe								
Minor Only	11	1	4	2	2	*	1	1
Minor and Major	44	10	6	7	9	6	3	3
Power Plant								
Minor Only	13	1	5	3	2	*	1	1
Minor and Major	46	11	6	7	9	6	4	3

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*None.

TABLE 50

OKLAHOMA AIRPORTS, BY AIRCRAFT STORAGE FACILITIES AVAILABLE,  
BY REGION, OCTOBER 1, 1966

Aircraft Storage Facilities Available	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
None	30	1	4	6	5	4	1	9
Tiedowns Only	19	*	1	3	3	2	5	5
T Hanger Only	22	5	7	*	3	3	2	2
Conventional Hanger Only	10	1	2	3	1	*	1	2
Airports with Two Types of Storage	75	10	12	11	13	7	14	8
Airports with Three Types of Storage	43	8	5	9	12	3	2	4
Total	199	25	31	32	37	19	25	30

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Source: Compiled from records of the FAA Airport District Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No airports.

TABLE 51  
SELECTED NAVIGATIONAL AIDS AT OKLAHOMA AIRPORTS,  
BY REGION, OCTOBER 1, 1966

Navigational Aids	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Instrument Landing System	2	2	*	*	*	*	*	*
Control Tower	8	5	*	1	1	*	1	*
Very High Frequency Omnidirectional Range	11	2	1	2	3	2	*	1
Unicom	45	7	6	5	10	2	12	3
Airports with None	147	16	25	26	27	15	12	26

Source: Compiled from records of the FAA Airport District Office, Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*None.

TABLE 52

OKLAHOMA AIRPORTS, BY SELECTED CONVENIENCE FACILITIES AVAILABLE,  
BY REGION, OCTOBER 1, 1966

Convenience Facilities Available	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Telephone, Restrooms, Food, and Surface Transportation <sup>#</sup>	36	9	4	2	8	4	6	3
Three of the following: Telephone, Restrooms, Food, and Surface Transportation <sup>#</sup>	38	3	3	10	7	4	6	5
Telephone Only	40	5	8	7	10	4	2	4
Telephone and Restrooms Only	16	2	2	2	3	1	2	4
Telephone and Surface Transportation <sup>#</sup> Only	12	1	2	2	3	*	2	2
Restrooms and Surface Transportation <sup>#</sup> Only	2	*	*	1	*	*	*	1
Surface Transportation <sup>#</sup> Only	1	*	*	*	*	*	1	*
None	54	5	12	8	6	6	6	11
Total Airports	199	25	31	32	37	19	25	30

186

Source: Compiled from records of the Oklahoma District Airport Office,  
Oklahoma City.

The data are for airports on record with the FAA.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

<sup>#</sup>Automobile rental, taxi, or courtesy car.

\*None.

## CHAPTER 6

### FLIGHT ACTIVITY OF OKLAHOMA AIRCRAFT REGISTRANTS

One of the important aspects of an airport system is the nature of airport use and users.<sup>1</sup> Oklahoma airport users can be divided into two broad groups: (1) those who use airports in the state as a base for their aviation activities, and (2) those who base their aircraft at airports outside of the state but who use Oklahoma airport facilities when visiting or passing through the state. The provision of airport facilities for both groups is important to the economic development of Oklahoma and its communities. The first group includes both airport users who principally engage in local flights and airport users who mainly use their aircraft for travel and transport. The second group, out-of-state users of Oklahoma airports, use aircraft for across-country travel and transport purposes.

Information was obtained about the major group of Oklahoma airport users. This group is composed of

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<sup>1</sup>The term airport user is used here to denote individuals and organizations which use general aviation aircraft in connection with airport facilities.

organizations and individuals who have aircraft registered in the state. Virtually all of these registrants report that their aircraft is based in Oklahoma. Most of the general aviation activity in the state is accounted for by this group.<sup>2</sup>

The flight activity of Oklahoma aircraft registrants is examined in this chapter by type of aircraft, by type of owner, and by principal aircraft use. The data are presented by region.

#### Source of Information and Method

The Federal Aviation Administration maintains individual records for each aircraft registered in the United States. These records include such things as the registration papers, applications for airworthiness certificates, mortgages against the aircraft, and aircraft inspection reports. Information from these records is also placed on a computer tape master file according to the registration number assigned to each aircraft.

Federal Air Regulations require general aviation

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<sup>2</sup>One of the findings of a 1961 California study was that about 94 per cent of the flights by state aircraft registrants were made completely within the state. See Walter E. Gilfillan, California General Aviation: Airports, Aircraft, and Flight Activity, A Report to the California Legislature (Berkeley, California: University of California Institute of Transportation and Traffic Engineering, 1961), pp. 18 and 23.

aircraft to be inspected annually by a certified inspector. An Aircraft Use and Inspection Report is prepared for each inspection. The report includes the name and address of the aircraft owner, the manufacturer and model of the aircraft, the primary use of the aircraft, and the hours flown in the previous 12 months.

A printout of the information contained in the aircraft master file for Oklahoma aircraft registrants was obtained for analysis. The information is for March 1, 1967. Data from the printout were transferred to worksheets. Data concerning the type of aircraft owner, type of aircraft, principal aircraft use, and hours flown in the previous 12 months were then tabulated from the worksheets.

When an aircraft receives an annual inspection, the number of hours flown in the 12 months before the inspection are indicated on the aircraft's flight hour meter. This number is entered on the Aircraft Use and Inspection Report. Since these inspections are given at different times during the year for different aircraft, the flight hour data available at any point in time is for various 12 months periods occurring within the previous 24 months. For example, data concerning flight hours taken from the Aircraft Master File on March 1, 1967, is for aircraft inspected between March 1, 1966, and March 1, 1967. The flight hours reported for aircraft inspected on March 20, 1966, were flown during the 12 months before

that date. Likewise, the flight hours reported for aircraft inspected on February 10, 1967, is for the 12 months preceeding that inspection date.

Aggregate flight hour data from the Aircraft Master File understates the amount of flight activity. Since new aircraft registered for less than one year have not yet had an annual inspection, flight hour information is not available for them. Also, new aircraft tend to be flown more hours per year than older aircraft are.

Although flight hour data is not available for new aircraft, the name and address of the registrant, the type of aircraft, and the type of owner is recorded in the FAA's Aircraft Master File from the aircraft registration document. About 72 per cent of the 240 new aircraft registered in Oklahoma from March 1, 1966, to March 1, 1967, were purchased by corporations (Table 53). Because of the relatively high cost of new aircraft, most of the aircraft purchased by individuals for non-business purposes are used aircraft. The Metropolitan region accounted for about 56 per cent of the new registrations.

About three out of four of the new aircraft registered were fixed-wing, single engine aircraft (Table 54). All but five of the 47 new fixed wing multi-engine aircraft were registered to corporations. Twelve of the 14 new rotocraft were registered to a corporation operating in Lawton.

TABLE 53

NEW AIRCRAFT REGISTERED IN OKLAHOMA FROM MARCH 1, 1966  
TO MARCH 1, 1967, BY TYPE OF REGISTRANT

Type of Registrant	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Individual	48	14	2	3	10	10	5	4
Partnership	9	4	*	1	2	1	1	*
Corporation	172	114	3	23	11	9	9	3
Co-ownership	5	1	3	1	*	*	*	*
Government	6	2	*	*	4	*	*	*
Total	240	135	8	28	27	20	15	7

Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

TABLE 54

NEW AIRCRAFT REGISTERED IN OKLAHOMA FROM MARCH 1, 1966  
TO MARCH 1, 1967, BY TYPE

Aircraft Type	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Wing								
Single Engine								
1-3 Places; 100 Horsepower or Less	54	25	*	7	10	5	5	2
1-3 Places; Over 100 Horsepower	24	17	2	2	3	*	*	*
4 Places or More; 200 Horsepower or Less	52	29	2	2	7	7	2	2
4 Places or More; Over 200 Horse- power	48	26	3	2	6	3	6	2
Multi-engine								
800 Horsepower or Less	38	27	1	3	1	4	2	*
From 800 to 2,000 Horsepower	1	1	*	*	*	*	*	*
2,000 Horsepower and Over	8	8	*	*	*	*	*	*

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(continued)

TABLE 54—Continued

Aircraft Type	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Rotocraft	14	1	*	12	*	1	*	*
Other	1	1	*	*	*	*	*	*
Total	240	135	8	28	27	20	15	7

Source: Compiled from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No aircraft.

The data presented in the remainder of this chapter are for aircraft which have had an annual inspection between February 28, 1966 and March 1, 1967. These aircraft are called active aircraft because they have been flown in the 24 months preceding March 1, 1967. Although virtually all of the new aircraft are currently active, they are not included due to the lack of flight hour information for them.

There are more than 2,500 active general aviation aircraft registered in Oklahoma. One-half of these are single-engine, four or more place, aircraft. Multi-engine aircraft account for about 11 per cent of the total, and helicopters account for about 1 per cent of the total. The remaining aircraft are in the single-engine, less than four place category.

Corporations own about 36 per cent of the aircraft registered in Oklahoma. Individuals own about 54 per cent of the aircraft. However, the general aviation aircraft owned by corporations account for about 54 per cent of total hours flown by active Oklahoma general aviation aircraft, and aircraft owned by individuals account for about 35 per cent of the total.

Slightly more than one-half of the aircraft registrants report that their aircraft is principally engaged in some form of business activity. These aircraft account for three-fourths of the hours flown by Oklahoma general aviation aircraft.

About 30 per cent of the general aviation aircraft registered in Oklahoma are used for business transportation. These aircraft account for a slightly higher proportion of total hours flown than they do of total aircraft. The other business-use aircraft are used for such things as aerial application, flight instruction, aerial survey and patrol, and air taxi. In the remainder of this chapter more detailed information, which was collected for the first time for this study, is presented.

#### Flight Activity by Type of Aircraft

Number of Aircraft. There are about 2,500 active aircraft registered to individuals and civil organizations in Oklahoma (Table 55). Slightly less than four out of five are fixed-wing, single-engine airplanes. There are about 300 multi-engine airplanes and less than 50 rotocraft registered in Oklahoma.

Six aircraft are in the category for gliders, balloons, dirigibles, and blimps. The aircraft registered in Oklahoma in this category are usually called sailplanes. The addresses of all sailplane registrants are in Oklahoma, Cleveland, and Logan Counties. There is a sailplane dealer at Guthrie's Municipal Airport in Logan County.

Slightly less than one-half of Oklahoma aircraft are registered in the Metropolitan region. This region accounts for about 38 per cent of the single-engine airplanes,

TABLE 55

ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA,  
BY TYPE, AS OF MARCH 1, 1967

Type of Aircraft	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Wing								
Single Engine								
1-3 Places; 100 Horsepower or Less	630	275	45	68	104	43	51	44
1-3 Places; Over 100 Horsepower	262	64	20	48	46	53	15	16
4 Places or More; 200 Horsepower or Less	654	296	70	52	98	46	55	37
4 Places or More; Over 200 Horse- power	567	291	57	38	74	36	43	28
Multi-engine								
800 Horsepower or Less	248	172	6	10	21	14	17	8
From 800 to 2,000 Horsepower	8	7	*	*	*	1	*	*
2,000 Horsepower and Over	35	26	*	*	6	3	*	*

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(continued)

TABLE 55—Continued

Type of Aircraft	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Rotocraft	35	23	3	8	*	1	*	*
Other	6	5	*	*	1	*	*	*
Total	2,445	1,159	201	224	350	197	181	133

Source: Compiled from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No aircraft.

70 per cent of the multi-engine airplanes, and 66 per cent of the rotocraft registered in Oklahoma.

A larger proportion of Oklahoma aircraft (about 14 per cent) are registered in the North Central region than in any of the other non-metropolitan regions. The Southeast region accounts for fewer aircraft than any other region (about 5 per cent of Oklahoma aircraft).

The proportion of the United States general aviation fleet which are fixed-wing, single engine airplanes with three or less seats has declined from 69 per cent in 1954 to 34 per cent in 1964.<sup>3</sup> Aircraft in this category are not only used for recreational and travel purposes but also in many commercial aviation activities. Virtually all aircraft used for general aviation flight instruction are in this category. The aircraft used for transmission line patrol and aerial survey work are typically single engine airplanes with three or less seats. Agricultural application aircraft usually have one seat and a single, powerful engine.

About one-fourth of Oklahoma aircraft are in the single engine, one to three place, less than 100 horsepower, category.<sup>4</sup> However, about one-third of the aircraft

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<sup>3</sup>Federal Aviation Agency, General Aviation: A Study and Forecast of the Fleet and Its Use in 1975 (Washington, D.C.: FAA, 1966), p. 107.

<sup>4</sup>More detailed information about the type of aircraft registered in Oklahoma is presented in Tables 64-66 in the appendix to this chapter. A distribution of hours flown by type of aircraft, by county, is included (Table 66).

in the Southeast region are in this category. Although about one-half of the Oklahoma aircraft in this category were manufactured before 1954, about three-fourths of these aircraft registered in the Southeast were manufactured before 1954.

In the Southwest about one-fifth and in the South Central region about one-fourth of the registered aircraft are in the single engine, one to three place, over 100 horsepower, category. About one-half of these are commercial, agricultural application airplanes.

Hours Flown. Aircraft registered in Oklahoma are flown more than 500,000 hours a year (Table 56). Aircraft registered in the Metropolitan region account for about one-half of the hours flown by Oklahoma aircraft registrants. Aircraft registered in the Southeast account for slightly less than four per cent of the hours flown.

About four-fifths of the hours flown by Oklahoma aircraft registrants are in fixed-wing, single engine aircraft. Slightly over 60 per cent of the flight hours are in single engine aircraft with less than 200 horsepower. Generally, these aircraft can operate from airports with runways of 2,500 feet or less.

Aircraft registrants in Tulsa County account for more flight hours than registrants in any other county. About 40 per cent of the Tulsa County aircraft flight hours are flown in fixed-wing, single engine aircraft with 100 horsepower or less. Tulsa is the headquarters for several

TABLE 56

HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA  
DURING THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION, BY TYPE OF  
AIRCRAFT, MARCH 1, 1966-67  
(Hundreds of Hours)

Type of Aircraft	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Wing								
Single Engine								
1-3 Places; 100 Horsepower or Less	1,518	832	50	100	214	209	59	55
1-3 Places; Over 100 Horse- power	499	129	41	86	86	91	52	14
4 Places or More; 200 Horsepower or Less	1,214	518	146	105	164	117	104	60
4 Places or More; Over 200 Horse- power	1,030	528	87	79	141	73	75	45
Multi-engine								
800 Horsepower or Less	666	479	12	32	51	46	35	12
From 800 to 2,000 Horsepower	34	23	*	*	*	10	*	*
2,000 Horsepower and Over	131	74	*	*	38	19	*	*

(continued)

TABLE 56—Continued

Type of Aircraft	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Rotocraft	56	39	6	11	*	1	*	*
Other	8	6	*	*	1	*	*	*
Total <sup>#</sup>	5,156	2,628	343	413	695	566	324	186

Source: Compiled from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No hours.

<sup>#</sup>Components may not add to totals due to rounding.

firms which use small aircraft to patrol transmission lines. Also, a large number of these aircraft are registered to firms who report they principally use their airplanes for flight instruction.

Carter County registrants, in the South Central region, also account for a large number of flight hours in the single engine, under 100 horsepower, category. About 90 per cent of the hours flown by Carter County aircraft registrants in this category are owned by American Flyers and are principally used for flight instruction.

Multi-engine aircraft registrants are concentrated in Oklahoma, Tulsa, Stephens, and Washington Counties. Oklahoma and Tulsa County registrants account for almost 70 per cent of the hours flown in multi-engine aircraft in Oklahoma. Stephens County registrants account for about five per cent, and Washington County registrants account for about six per cent.

The multi-engine aircraft registered in Stephens County belong to the Halliburton Company. In Washington County, about three-fourths of the multi-engine aircraft are registered to Phillips Petroleum Company.

#### Flight Activity by Type of Owner

The Federal Aviation Administration divides civil aircraft registrants into five ownership categories: individual, partnership, corporation, co-ownership, and government. Aircraft used by business firms are found in all

categories other than the government owership category.

If an aircraft is registered to two or more individuals, it is classified as co-owership. An aircraft classified as being owned by a partnership is registered to a legal entity organized as a partnership. More than one-half of the aircraft registered to partnerships are owned by flying clubs.

Number of Aircraft. About one-half of the active aircraft registered in Oklahoma are owned by individuals, and slightly over one-third are owned by corporations (Table 57). Together, partnerships and co-ownerships account for about 10 per cent of Oklahoma aircraft. Aircraft registered to civil governmental agencies account for only about one per cent of the number of aircraft registered in Oklahoma. About one-third of these aircraft are owned by Oklahoma University and Oklahoma State University. Both universities offer flight instruction courses.

The Metropolitan region and the South Central region are the only regions in which there are more aircraft registered to corporations than to individuals. About three-fifths of the corporate Oklahoma aircraft are registered in the Metropolitan region. About 20 per cent of the aircraft registered to corporations in the South Central region are owned by American Flyers and are based at Ardmore Municipal Airport.

The Southeast region has a higher proportion of aircraft individually owned (about three-fourths) than

TABLE 57

ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA, BY TYPE OF  
OWNER, MARCH 1, 1966-67

Type of Owner	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Individual	1,305	518	134	144	213	88	110	98
Partnership	135	53	15	18	23	11	11	4
Corporation	873	522	39	51	92	94	51	24
Co-ownership	103	47	13	10	14	3	9	7
Government	29	19	*	1	8	1	*	*
Total	2,455	1,159	201	224	350	197	181	133

Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from  
March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

any other region (Table 58). This region also has a lower proportion of the aircraft registered to corporations (about 18 per cent) than any other region.

Hours Flown. Corporate general aviation aircraft registered in the Metropolitan region account for one-third of the hours flown by Oklahoma aircraft registrants (Table 59). Aircraft registered to corporations in the South Central region account for about two out of five hours flown by corporate aircraft in the non-metropolitan regions.

There are aircraft owned by individuals in each of Oklahoma's 77 counties.<sup>5</sup> Aircraft belonging to governmental agencies are registered in only six counties.<sup>6</sup> Slightly more than one-half of the hours flown by government-owned aircraft are flown by aircraft registered to the University of Oklahoma in Cleveland County and the Oklahoma State University in Payne County.

Although about one-third of the aircraft registered in Oklahoma are registered to corporations, about 54 per cent of the flight hours by Oklahoma aircraft are

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<sup>5</sup>More detailed information about the types of owners of aircraft registered in Oklahoma is presented in Tables 67-69 in the appendix to this chapter. A distribution of hours flown by type of owner, by county, is included (Table 69).

<sup>6</sup>Federal Aviation Agency aircraft are all registered in Washington, D.C. These aircraft are repaired and modified at the FAA Aeronautical Center in Oklahoma City, and a few FAA aircraft are temporarily based at the Center on Will Rogers World Airport.

TABLE 58

PERCENTAGE DISTRIBUTIONS OF ACTIVE GENERAL AVIATION AIRCRAFT  
REGISTERED IN OKLAHOMA REGIONS, BY TYPE OF OWNER, AS OF  
MARCH 1, 1967

Type of Owner	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Individual	53	45	67	64	61	45	61	74
Partnership	6	5	7	8	7	6	6	3
Corporation	36	45	19	23	26	48	28	18
Co-ownership	4	4	6	4	4	2	5	5
Government	1	2	*	**	2	1	*	*
Total <sup>#</sup>	100	100	100	100	100	100	100	100

Source: Computed from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No aircraft.

\*\*Less than 0.5 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 59

HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA  
IN THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION, BY TYPE OF  
OWNER, MARCH 1, 1966-67  
(Hundreds of Hours)

Type of Owner	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Individual	1,781	664	174	199	341	130	157	116
Partnership	340	141	33	52	54	17	37	6
Corporation	2,757	1,700	91	145	244	412	112	53
Co-ownership	177	62	45	16	19	6	17	11
Government	101	61	*	3	37	1	*	*
Total <sup>#</sup>	5,156	2,628	343	413	695	566	324	186

Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No hours.

<sup>#</sup>Components may not add to totals due to rounding.

accounted for by corporate aircraft. Corporate aircraft account for a higher proportion of total hours flown than their proportion of total aircraft in each of the regions.

Aircraft owned by governmental agencies have higher average annual utilization rates than any other owner category (about 350 hours). This is primarily due to the flight instruction courses offered at the two state universities. Aircraft registered to corporations have the second highest average annual utilization rate, (about 320 hours) and aircraft owned by individuals have the lowest average (about 140 hours).

#### Flight Activity by Principal Aircraft Use

Each time an aircraft is inspected by a certified FAA inspector, the registrant is asked to report the principal use of the aircraft.<sup>7</sup> The Federal Aviation Administration divides general aviation aircraft registrants into eight principal-use categories. These categories are: executive transportation, business, personal, aerial application, instruction, air taxi, industrial special, and other.

The executive transportation and business categories are often combined into a single category called business. The executive transportation category is defined

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<sup>7</sup>Federal Aviation Agency, Aircraft Use and Inspection Report, AC 43.11-1A (Washington, D. C.: FAA, 1965).

as "Any use of an aircraft by a corporation, company, or other organization for the purposes of transporting its employees and/or property not for compensation or hire and employing professional pilots for the operation of the aircraft."<sup>8</sup> The business category includes the use of aircraft by registrants for purposes of transportation by a business in which the registrant is engaged. It does not include business aircraft operated for hire or compensation.

Aircraft principally used for personal purposes not associated with a business or profession and not for hire are placed in the personal category. These aircraft are used for a variety of reasons similar to those involved in the use of a personal automobile.<sup>9</sup>

The use of general aviation aircraft for commercial purposes is divided into four categories: aerial application, instruction, air taxi, and industrial special. The definition used for aerial application is:

Any use of an aircraft for work purposes which concern the production of foods, fibers, and health control in which the aircraft is used in lieu of farm implements or ground vehicles for the particular task accomplished. This includes distribution of chemicals or seeds in agriculture, reforestation, or insect control; it excludes firefighting operations.<sup>10</sup>

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<sup>8</sup> Ibid., Attachment 1, p. 1.

<sup>9</sup> Federal Aviation Agency, 1965 National Airport Plan: Fiscal Years 1966-1970 (Washington, D.C.: Government Printing Office, 1965), p. 26.

<sup>10</sup> Federal Aviation Agency, Aircraft Use and Inspection Report, AC 43.11-1A (Washington, D.C.: FAA, 1965), Attachment, 1, p. 1.

Aircraft primarily used for formal instruction with the flight instructor aboard, or used to execute maneuvers on particular flights specified by the flight instructor are placed in the instruction category.

If an aircraft is principally used by a holder of an Air Taxi Operating Certificate for activities authorized on the certificate, the aircraft is placed in the air taxi category. Air taxi service is usually similar to automobile taxi service; except that air taxi transportation is usually between communities, rather than within a community. However, some air taxi operators offer regularly scheduled transport services between airports.

Aircraft which are principally used for specialized industrial activity (other than for transportation, instruction, or aerial application) are placed in the industrial special category. For example, aircraft principally used in any of the following activities would be placed in this category: pipeline patrol, aerial survey, advertising, aerial ambulance, photography, helicopter hoist, forest patrol, and fire fighting.

Aircraft whose principal use is not specified in any of the categories which have been discussed are placed in a category called "other." Some of the aircraft uses which are included in this category are research and development, aircraft demonstrations, and sport parachuting.

Number of Aircraft. All of the aircraft registered in the executive transportation, business, aerial application

instruction, air taxi, and industrial special categories; and all but a few of the aircraft in the "other" category are reported to be primarily used for some business purpose. About 1,300, or somewhat more than one-half of the aircraft registered in Oklahoma, are in these categories (Table 60). Personal-use aircraft account for slightly less than one-half of Oklahoma aircraft.

Aircraft registered in the Metropolitan region which are in the personal-use category account for about one-fifth of the total Oklahoma aircraft.<sup>11</sup> Executive transportation and business aircraft in this region account for about 15 per cent of all aircraft registered in Oklahoma.

In the Southeast, a higher proportion of the aircraft are in the personal-use category (about two-fifths) than in any other region (Table 61). The region with the lowest proportion of aircraft in this category (somewhat more than one-third) is the South Central region. The proportions of aircraft in this region in the aerial application and instruction categories are higher than in any other region.

Hours Flown. About 130,000 hours are flown annually by aircraft in the personal-use category

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<sup>11</sup>More detailed information about the principal use of aircraft registered in Oklahoma is presented in Tables 70-73 in the appendix to this chapter. A distribution of hours flown by principal aircraft use, by county, is included (Table 73).

TABLE 60

ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA,  
BY PRINCIPAL USE, AS OF MARCH 1, 1967

Principal Aircraft Use	Total	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	69	48	2	*	10	6	3	*
Business	584	327	41	33	69	38	47	29
Personal	1,159	505	122	116	168	69	97	82
Aerial Application	184	28	11	43	35	49	9	9
Instruction	223	98	16	19	40	26	12	12
Air Taxi	64	31	6	12	10	2	3	*
Industrial, Special	14	12	*	*	2	*	*	*
Other	148	110	3	1	16	7	10	1
Total	2,445	1,159	201	224	350	197	181	133

Source compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

TABLE 61

PERCENTAGE DISTRIBUTION OF ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED  
IN OKLAHOMA REGIONS, BY PRINCIPAL USE, AS OF MARCH 1, 1967

Principal Aircraft Use	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	3	5	1	*	3	3	2	*
Business	24	28	20	15	20	19	26	22
Personal	47	44	61	52	48	35	54	62
Aerial Application	8	2	5	19	10	25	5	7
Instruction	9	8	8	8	11	13	7	9
Air Taxi	3	3	3	5	3	1	2	*
Industrial, Special	1	1	*	*	1	*	*	*
Other	6	9	1	**	5	4	6	1
Total <sup>#</sup>	100	100	100	100	100	100	100	100

Source: Computed from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from  
March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

\*\*Less than 0.5 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

(Table 62).<sup>12</sup> About 150,000 hours are flown by registrants reporting executive transportation and business as the principal use of their aircraft.

Personal aircraft account for about one-fourth of the hours flown by Oklahoma aircraft registrants. Aircraft primarily used for flight instruction account for about one-fifth of the flight hours recorded by all Oklahoma registrants.

Slightly more than 10 per cent of the flight hours of Oklahoma general aviation aircraft registrants are flown in aircraft in the "other" category. Most of these hours are flown in aircraft registered to Aero Commander and other aircraft firms which use aircraft for research and development purposes.

Instruction flying accounts for about 45 per cent of the hours flown by aircraft registrants in the South Central region (Table 63). Most of the instructional hours flown in this region are in aircraft based in Ardmore and owned by American Flyers Incorporated,

The proportion of hours flown by aircraft reported

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<sup>12</sup>By 1975, hours flown in personal-use aircraft in the United States are expected to double, hours flown in the air taxi category are expected to almost triple, and hours flown in the executive and business categories are expected to more than double. See Federal Aviation Agency, General Aviation: A Study and Forecast of the Fleet and Its Use in 1975 (Washington, D.C.: FAA, 1966), p. 18.

TABLE 62

HOURS FLOWN IN THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION, BY ACTIVE  
GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA, BY PRINCIPAL  
AIRCRAFT USE, MARCH 1966-67  
(Hundreds of Hours)

Principal Aircraft Use	Total <sup>#</sup>	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	295	198	4	*	51	34	7	*
Business	1,227	699	79	61	140	90	95	62
Personal	1,264	542	160	126	162	83	118	73
Aerial Application	358	80	18	71	66	89	19	15
Instruction	1,138	509	61	89	153	252	40	33
Air Taxi	201	76	17	63	31	8	7	*
Industrial, Special	116	103	*	*	14	*	*	*
Other	556	421	4	2	79	10	37	4
Total <sup>#</sup>	5,156	2,628	343	413	695	566	324	186

Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*None.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 63

PERCENTAGE DISTRIBUTION OF HOURS FLOWN IN THE 12 MONTHS BEFORE LAST  
ANNUAL INSPECTION BY ACTIVE AIRCRAFT REGISTERED IN OKLAHOMA  
REGIONS, BY PRINCIPAL AIRCRAFT USE, MARCH 1966-67

Principal Aircraft Use	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	6	8	1	*	7	6	2	*
Business	24	27	23	15	20	16	29	33
Personal	25	21	47	31	23	15	37	39
Aerial Application	7	3	5	17	9	16	6	8
Instruction	22	19	18	22	22	45	12	18
Air Taxi	4	3	5	15	4	1	2	*
Industrial, Special	2	4	*	*	2	*	*	*
Other	11	16	1	1	11	2	12	2
Total <sup>#</sup>	100	100	100	100	100	100	100	100

Source: Computed from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*None.

<sup>#</sup>Components may not add to totals due to rounding.

to have air taxi service as their principal use is higher in the Southwest than in any other region. Although the proportion for the state is about four per cent of all general aviation aircraft, it is about 15 per cent in the Southwest region. Slightly more than one-half of these hours were flown by aircraft owned by Altair Incorporated.

Although the first two letters in Altair's name are taken from the name of Altus, Oklahoma, the firm's headquarters are at the Frederick Municipal Airport in Tillman County. Altair operated a regularly scheduled transportation service between Frederick, Altus, Oklahoma City, Lawton, Wichita Falls, and Dallas during part of 1966 and 1967. Altair even had airport ticket counters. Even though it was a common carrier operating in interstate commerce, it was not regulated by the Civil Aeronautics Board because none of its aircraft weighed more than 12,500 pounds. Although average air taxi revenues across the nation have been increasing by slightly more than 33 per cent per year since 1963, the Altair scheduled flights did not generate enough passenger revenue to cover operating expenses.<sup>13</sup>

There are no aircraft registered in any of the counties in the Southwest or Southeast regions which have

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<sup>13</sup>Personal interview with Mr. Lloyd Catlin, President of the National Air Taxi Conference and of Catlin Aviation Incorporated.

executive transportation as their principal use. There are not any aircraft registrants reporting that the principal use of their aircraft is for business purposes in one-half of the counties in the Southeast region.

Generally, the aircraft used for business or commercial purposes have much higher annual utilization rates than aircraft in the personal-use category. For example, Oklahoma aircraft in the industrial-special category have an average annual utilization rate of about 850 hours, executive transportation aircraft are flown an average of 420 hours, and flight instruction aircraft are flown an average of about 500 hours. Oklahoma aircraft in the personal-use category, however, are flown an average of only 110 hours per year.

Many pilots have concluded that it is more expensive to own a typical personal-use aircraft than to rent one if the aircraft is not flown at least from 30 to 40 hours per month.<sup>14</sup> Oklahoma aircraft in the personal-use category, however, have an average monthly utilization rate of slightly less than 10 hours.

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<sup>14</sup>Various personal interviews.

## APPENDIX

TABLE 64

PERCENTAGE DISTRIBUTIONS OF ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED  
IN OKLAHOMA REGIONS, BY TYPE OF AIRCRAFT, AS OF MARCH 1, 1967

Type of Aircraft	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Wing								
Single Engine								
1-3 Places; 100 Horsepower or Less	26	24	22	30	30	22	28	33
1-3 Places; Over 100 Horse- power	11	6	10	21	13	27	8	12
4 Places or More; 200 Horsepower or Less	27	26	35	23	28	23	30	28
4 Places or More; Over 200 Horse- power	23	25	28	17	21	18	24	21
Multi-engine								
800 Horsepower or Less	10	14	3	4	6	7	9	6
From 800 to 2,000 Horsepower	**	1	*	*	*	1	*	*
2,000 Horsepower and Over	1	2	*	*	2	2	*	*

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(continued)

TABLE 64—Continued

Type of Aircraft	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Rotocraft	1	2	1	4	*	1	*	*
Other	**	**	*	*	**	*	*	*
Total <sup>#</sup>	100	100	100	100	100	100	100	100

Source: Computed from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No aircraft.

\*\*Less than 0.5 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 65

PERCENTAGE DISTRIBUTIONS OF HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT  
REGISTERED IN OKLAHOMA REGIONS DURING THE 12 MONTHS BEFORE LAST ANNUAL  
INSPECTION, BY TYPE OF AIRCRAFT, MARCH 1, 1966-67

Type of Aircraft	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Fixed Wing								
Single Engine								
1-3 Places; 100 Horsepower or Less	29	32	15	24	31	37	18	30
1-3 Places; Over 100 Horse- power	10	5	12	21	12	16	16	8
4 Places or More; 200 Horsepower or Less	24	20	43	25	24	21	32	32
4 Places or More; Over 200 Horse- power	20	20	25	19	20	13	23	24
Multi-engine								
800 Horsepower or Less	13	18	4	8	7	8	11	6
From 800 to 2,000 Horsepower	1	1	*	*	*	2	*	*
2,000 Horsepower and Over	3	3	*	*	5	3	*	*

(continued)

TABLE 65—Continued

Type of Aircraft	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Rotocraft	1	1	2	3	*	**	*	*
Other	**	**	*	*	**	*	*	*
Total <sup>#</sup>	100	100	100	100	100	100	100	100

Source: Computed from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma Counties).

\*No hours.

\*\*Less than 0.5 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 66

HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN  
OKLAHOMA IN THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION, BY  
REGION AND COUNTY, BY AIRCRAFT TYPE, MARCH 1, 1966-67  
(Hundreds of Hours)

Region and County	Total#	Fixed Wing, Single Engine				Fixed Wing, Multi-engine		Roto- craft	Other
		1-3 Places		4 Places and Over		800 Horse- power or Less	Over 800 Horse- power		
		100 Horse- power or Less	Over 100 Horse- power	200 Horse- power or Less	Over 200 Horse- power				
Metropolitan									
Canadian	24	5	6	9	4	*	1	*	*
Cleveland	107	40	11	35	13	9	*	*	*
Oklahoma	981	162	50	229	272	222	29	11	6
Tulsa	1,516	625	63	245	239	248	67	28	**
Total#	2,628	832	129	518	528	479	97	39	6
Northwest									
Alfalpa	9	*	3	3	2	*	*	*	*
Beaver	9	1	*	5	2	*	*	*	*
Blaine	22	5	7	6	4	*	*	*	*
Cimarron	9	**	*	1	5	2	*	*	*
Custer	42	4	7	21	11	*	*	*	*
Dewey	14	**	*	12	3	*	*	*	*
Ellis	14	**	7	6	*	*	*	*	*
Harper	7	**	4	**	2	*	*	*	*

(continued)

TABLE 66—Continued

Region and County	Total#	Fixed Wing, Single Engine				Fixed Wing, Multi-engine		Roto- craft	Other
		1-3 Places		4 Places and Over		800 Horse- power or Less	Over 800 Horse- power		
		100 Horse- power or Less	Over 100 Horse- power	200 Horse- power or Less	Over 200 Horse- power				
Major	21	2	1	5	9	3	*	*	*
Roger Mills	13	6	2	5	*	*	*	*	*
Texas	74	15	8	25	22	4	*	*	*
Woods	80	15	*	41	18	1	*	6	*
Woodward	30	**	2	16	10	2	*	*	*
Total#	343	50	41	146	87	12	*	6	*
Southwest									
Beckham	35	12	4	8	9	2	*	*	*
Caddo	35	8	14	5	8	*	*	*	*
Comanche	146	38	23	38	26	21	*	**	*
Cotton	5	4	**	*	*	*	*	*	*
Greer	3	**	*	3	*	*	*	*	*
Harmon	23	7	7	7	1	*	*	*	*
Jackson	48	16	14	11	6	*	*	*	*
Kiowa	24	4	6	8	3	2	*	1	*
Tillman	71	2	13	14	25	7	*	10	*
Washita	25	9	5	11	1	*	*	*	*
Total#	413	100	86	105	79	32	*	11	*

(continued)

TABLE 66—Continued

Region and County	Total#	Fixed Wing, Single Engine				Fixed Wing, Multi-engine		Roto- craft	Other
		1-3 Places		4 Places and Over					
		100 Horse- power or Less	Over 100 Horse- power	200 Horse- power or Less	Over 200 Horse- power	800 Horse- power or Less	Over 800 Horse- power		
North Central									
Creek	12	1	1	5	2	2	*	*	*
Garfield	164	30	36	46	33	19	*	*	*
Grant	16	13	**	1	2	*	*	*	*
Kay	123	40	23	30	29	2	*	*	*
Kingfisher	15	2	10	1	2	*	*	*	*
Lincoln	21	11	*	3	6	*	*	*	*
Logan	94	62	4	15	11	*	*	*	1
Noble	15	3	*	6	4	2	*	*	*
Osage	13	1	*	8	4	**	*	*	*
Pawnee	13	3	*	9	**	*	*	*	*
Payne	72	23	7	11	21	11	*	*	*
Washington	138	24	7	28	26	15	38	*	*
Total#	695	214	86	164	141	51	38	*	1
South Central									
Carter	284	177	**	72	13	18	4	1	*
Garvin	21	3	*	7	6	7	*	*	*
Grady	116	12	75	14	14	2	*	*	*

(continued)

TABLE 66—Continued

Region and County	Total <sup>#</sup>	Fixed Wing, Single Engine				Fixed Wing, Multi-engine		Roto- craft	Other
		1-3 Places		4 Places and Over		800 Horse- power or Less	Over 800 Horse- power		
		100	Over	200	Over				
		Horse- power or Less	100 Horse- power	Horse- power or Less	200 Horse- power				
Jefferson	**	**	*	*	*	*	*	*	*
McClain	16	1	5	9	**	*	*	*	*
Murray	3	**	*	1	*	2	*	*	*
Pottawatomie	30	5	*	6	17	2	*	*	*
Stephens	95	10	10	9	23	16	25	*	*
Total <sup>#</sup>	566	209	91	117	73	46	29	1	*
Northeast									
Adair	6	*	*	*	6	*	*	*	*
Cherokee	34	3	6	14	5	6	*	*	*
Craig	16	10	*	5	*	*	*	*	*
Delaware	4	*	3	1	*	*	*	*	*
McIntosh	6	1	*	*	4	1	*	*	*
Mayes	18	7	*	*	9	2	*	*	*
Muskogee	98	7	20	18	36	17	*	*	*
Nowata	7	5	*	2	*	*	*	*	*
Okfuskee	5	**	*	5	*	*	*	*	*
Okmulgee	16	2	*	8	2	3	*	*	*
Ottawa	73	9	23	26	8	6	*	*	*
Rogers	10	4	1	4	1	*	*	*	*

(continued)

TABLE 66—Continued

Region and County	Total <sup>#</sup>	Fixed Wing, Single Engine				Fixed Wing, Multi-engine		Roto- craft	Other
		1-3 Places		4 Places and Over		800 Horse- power or Less	Over 800 Horse- power		
		100 Horse- power or Less	Over 100 Horse- power	200 Horse- power or Less	Over 200 Horse- power				
Sequoyah	23	3	*	17	3	*	*	*	*
Wagoner	9	6	*	3	**	*	*	*	*
Total <sup>#</sup>	324	59	52	104	75	35	*	*	*
Southeast									
Atoka	6	5	1	*	*	*	*	*	*
Bryan	8	2	**	6	**	*	*	*	*
Choctaw	20	9	**	6	5	*	*	*	*
Coal	1	1	*	*	*	*	*	*	*
Haskell	2	*	*	*	2	*	*	*	*
Hughes	11	3	*	4	2	1	*	*	*
Johnston	3	1	*	2	*	*	*	*	*
Latimer	7	1	*	5	1	*	*	*	*
LeFlore	6	**	*	3	*	3	*	*	*
Love	1	*	*	1	*	*	*	*	*
McCurtain	13	5	1	*	5	2	*	*	*
Marshall	9	**	*	4	4	*	*	*	*
Pittsburg	40	7	2	7	19	4	*	*	*
Pontotoc	34	7	9	14	3	1	*	*	*
Pushmataha	12	10	1	1	*	*	*	*	*

(continued)

TABLE 66—Continued

Region and County	Total#	Fixed Wing, Single Engine				Fixed Wing, Multi-engine		Roto- craft	Other
		1-3 Places		4 Places and Over		800 Horse- power or Less	Over 800 Horse- power		
		100 Horse- power or Less	Over 100 Horse- power	200 Horse- power or Less	Over 200 Horse- power				
Seminole	12	3	*	6	2	1	*	*	*
Total#	186	55	14	60	45	12	*	*	*
Total Oklahoma#	5,156	1,518	499	1,214	1,030	666	164	56	8

Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>#</sup>Components may not add to totals due to rounding.

\*No hours.

\*\*Less than 50 hours.

TABLE 67

PERCENTAGE DISTRIBUTIONS OF HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT  
REGISTERED IN OKLAHOMA REGIONS DURING THE 12 MONTHS BEFORE LAST  
ANNUAL INSPECTION, BY TYPE OF OWNER, MARCH 1, 1966-67

Type of Owner	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Individual	35	25	51	48	49	23	48	62
Partnership	7	5	10	13	8	3	11	3
Corporation	54	65	26	35	35	73	35	28
Co-ownership	3	2	13	4	3	1	5	6
Government	2	2	*	1	5	**	*	*
Total <sup>#</sup>	100	100	100	100	100	100	100	100

Source: Computed from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No hours.

\*\*Less than 0.5 per cent.

<sup>#</sup>Components may not add to totals due to rounding.

TABLE 68

AVERAGE HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN  
OKLAHOMA IN THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION,  
BY TYPE OF OWNER, MARCH 1966-67

Type of Owner	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Individual	136	128	130	138	160	147	143	118
Partnership	252	267	219	287	235	158	337	154
Corporation	316	326	234	283	265	438	220	221
Co-ownership	171	133	349	156	136	207	190	157
Government	350	321	*	298	459	69	*	*
Average for All Types	211	227	171	184	199	287	179	140

Source: Computed from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*None.

TABLE 69

HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN  
OKLAHOMA IN THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION, BY  
REGION AND COUNTY, BY TYPE OF OWNER, MARCH 1, 1966-67  
(Hundreds of Hours)

Region and County	Total	Indivi- dual	Partner- ship	Corpor- ation	Co-own- ership	Govern- ment
Metropolitan						
Canadian	24	9	4	8	4	*
Cleveland	107	32	5	42	5	23
Oklahoma	981	226	88	614	15	38
Tulsa	1,516	397	45	1,036	39	*
Total <sup>#</sup>	2,628	664	141	1,700	62	61
Northwest						
Alfalpa	9	9	*	*	*	*
Beaver	9	7	2	*	*	*
Blaine	22	14	*	3	5	*
Cimarron	9	3	*	6	*	*
Custer	42	24	2	17	*	*
Dewey	14	14	*	*	1	*
Ellis	14	4	7	2	*	*
Harper	7	3	*	4	*	*
Major	21	13	1	6	*	*
Roger Mills	13	6	5	*	2	*
Texas	74	29	14	25	6	*
Woods	80	37	1	20	21	*
Woodward	30	11	*	8	11	*
Total <sup>#</sup>	343	174	33	91	45	*

(continued)

TABLE 69—Continued

Region and County	Total	Indivi- dual	Partner- ship	Corpor- ation	Co-own- ership	Govern- ment
<b>Southwest</b>						
Beckham	35	28	2	5	*	*
Caddo	35	30	1	*	4	*
Comanche	146	40	40	57	6	3
Cotton	5	2	3	*	*	*
Greer	3	3	*	*	*	*
Harmon	23	14	*	7	2	*
Jackson	48	22	*	25	*	*
Kiowa	24	17	4	**	3	*
Tillman	71	19	2	49	1	*
Washita	25	24	*	1	*	*
Total <sup>#</sup>	413	199	52	145	16	3
<b>North Central</b>						
Creek	12	9	2	*	1	*
Garfield	164	78	22	53	5	6
Grant	16	10	6	*	1	*
Kay	123	61	7	53	2	*
Kingfisher	15	3	1	10	*	*
Lincoln	21	13	*	7	*	*
Logan	94	64	4	22	4	*
Noble	15	8	1	6	*	*

(continued)

TABLE 69—Continued

Region and County	Total	Indivi- dual	Partner- ship	Corpor- ation	Co-own- ership	Govern- ment
Osage	13	10	*	3	1	*
Pawnee	13	3	*	9	*	*
Payne	72	19	3	17	3	31
Washington	138	63	8	63	4	*
Total <sup>#</sup>	695	341	54	244	19	37
South Central						
Carter	284	26	3	250	5	*
Garvin	21	16	**	5	*	*
Grady	116	36	8	72	*	*
Jefferson	**	**	*	*	*	*
McClain	16	14	*	2	*	*
Murray	3	2	**	*	*	*
Pottawatomie	30	15	*	14	1	*
Stephens	95	19	5	69	*	1
Total <sup>#</sup>	566	130	17	412	6	1
Northeast						
Adair	6	4	*	2	*	*
Cherokee	34	20	4	6	4	*

(continued)

TABLE 69—Continued

Region and County	Total	Indivi- dual	Partner- ship	Corpor- ation	Co-own- ership	Govern- ment
Craig	16	10	*	1	4	*
Delaware	4	1	*	3	*	*
McIntosh	6	5	1	*	*	*
Mayes	18	3	2	13	*	*
Muskogee	98	47	5	45	2	*
Nowata	7	5	*	2	**	*
Okfuskee	5	4	*	2	*	*
Okmulgee	16	9	4	**	3	*
Ottawa	73	12	22	39	*	*
Rogers	10	7	*	*	4	*
Sequoyah	23	23	*	*	*	*
Wagoner	9	9	*	*	*	*
Total <sup>#</sup>	324	157	37	112	17	*
Southeast						
Atoka	6	6	*	*	*	*
Bryan	8	8	*	*	*	*
Choctaw	20	12	*	6	2	*
Coal	1	1	*	*	*	*
Haskell	2	2	*	*	*	*
Hughes	11	6	1	2	1	*
Johnston	3	3	*	*	*	*
Latimer	7	7	*	*	*	*

(continued)

TABLE 69—Continued

Region and County	Total	Indivi- dual	Partner- ship	Corpor- ation	Co-own- ership	Govern- ment
LeFlore	6	3	*	3	*	*
Love	1	1	*	*	*	*
McCurtain	13	7	1	6	*	*
Marshall	9	4	*	5	*	*
Pittsburg	40	24	*	15	1	*
Pontotoc	34	12	4	11	6	*
Pushmataha	12	12	*	*	*	*
Seminole	12	6	*	5	1	*
Total <sup>#</sup>	186	116	6	53	11	*
Total Oklahoma <sup>#</sup>	5,156	1,781	340	2,757	177	101

Source: Compiled from records of the FAA Aircraft Registration Branch, Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period from March 1, 1966 to March 1, 1967.

<sup>#</sup>Components may not add to totals due to rounding.

\*No hours.

\*\*Less than 50 hours.

TABLE 70

PERCENTAGE DISTRIBUTION OF ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED  
IN OKLAHOMA, BY PRINCIPAL USE, AS OF MARCH 1, 1967

Principal Aircraft Use	Total <sup>#</sup>	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	3	2	**	*	**	**	**	*
Business	24	13	2	1	3	2	2	1
Personal	47	21	5	5	7	3	4	3
Aerial Application	8	1	**	2	1	2	**	**
Instruction	9	4	1	1	2	1	**	**
Air Taxi	3	1	**	**	**	**	**	*
Industrial, Special	1	**	*	*	**	*	*	*
Other	6	5	**	**	1	**	**	**
Total <sup>#</sup>	100	47	8	9	14	8	7	5

Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>#</sup>Components may not add to totals due to rounding.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

\*\*Less than 0.5 per cent.

TABLE 71

PERCENTAGE DISTRIBUTION OF HOURS FLOWN IN THE 12 MONTHS BEFORE LAST  
ANNUAL INSPECTION BY ACTIVE AIRCRAFT REGISTERED IN OKLAHOMA,  
BY PRINCIPAL AIRCRAFT USE, MARCH 1966-67

Principal Aircraft Use	Total <sup>#</sup>	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	6	4	**	*	1	1	**	*
Business	24	14	2	1	3	2	2	1
Personal	24	10	3	2	3	2	2	1
Aerial Application	7	2	**	1	1	2	**	**
Instruction	22	10	1	2	3	5	**	**
Air Taxi	4	2	**	1	1	**	**	**
Industrial, Special	2	2	*	*	**	*	*	*
Other	11	8	**	**	2	**	1	**
Total <sup>#</sup>	100	51	7	8	14	11	6	4

Source: Computed from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>#</sup>Components may not add to totals due to rounding.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*None.

\*\*Less than 0.5 per cent.

TABLE 72

AVERAGE HOURS FLOWN BY ACTIVE GENERAL AVIATION AIRCRAFT REGISTERED IN  
OKLAHOMA, BY PRINCIPAL USE, MARCH 1966-67

Principal Aircraft Use	Oklahoma	Metro- politan <sup>+</sup>	North- west	South- west	North Central	South Central	North- east	South- east
Executive Transportation	428	413	210	*	513	572	241	*
Business	210	214	193	185	203	238	202	213
Personal	109	107	131	109	96	120	122	88
Aerial Application	194	286	166	165	187	181	205	168
Instruction	510	519	378	471	284	971	336	275
Air Taxi	314	245	282	526	306	388	224	*
Industrial, Special	832	856	*	*	682	*	*	*
Other	376	387	140	222	492	136	374	366
Average for All Uses	211	277	171	184	199	287	179	140

Source: Computed from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>+</sup>Tulsa County and the Oklahoma City SMSA (Canadian, Cleveland, and Oklahoma  
Counties).

\*No aircraft.

TABLE 73

HOURS FLOWN IN THE 12 MONTHS BEFORE LAST ANNUAL INSPECTION BY ACTIVE  
GENERAL AVIATION AIRCRAFT REGISTERED IN OKLAHOMA, BY REGION  
AND COUNTY, BY PRINCIPAL AIRCRAFT USE, MARCH 1966-67  
(Hundreds of Hours)

Region and County	Total#	Executive Transpor- tation	Busi- ness	Per- sonal	Aerial Appli- cation	Instruc- tion	Air Taxi	Indus- trial, Special	Other
Metropolitan									
Canadian	24	*	2	11	5	4	*	*	1
Cleveland	107	*	14	33	8	47	*	*	6
Oklahoma	981	45	326	228	8	125	39	10	201
Tulsa	1,516	153	357	270	59	333	37	93	213
Total#	2,628	198	700	542	80	509	76	103	421
Northwest									
Alfalpa	9	*	4	4	*	*	*	*	*
Beaver	9	*	4	4	*	*	*	*	*
Blaine	22	*	*	11	7	4	*	*	1
Cimmaron	9	*	5	2	*	*	*	*	1
Custer	42	*	10	20	*	11	2	*	*
Dewey	14	*	*	14	*	*	*	*	*
Ellis	14	*	5	1	7	*	*	*	*
Harper	7	*	2	1	*	4	*	*	*
Major	21	1	12	3	1	2	*	*	2
Roger Mills	13	*	2	8	2	*	*	*	*
Texas	74	*	13	29	**	19	13	*	*

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(continued)

TABLE 73—Continued

Region and County	Total#	Executive Transpor- tation	Busi- ness	Per- sonal	Aerial Appli- cation	Instruc- tion	Air Taxi	Indus- trial, Special	Other
Woods	80	3	12	52	*	11	2	*	*
Woodward	30	*	9	10	1	10	*	*	*
Total#	343	4	80	160	18	61	17	*	4
Southwest									
Beckham	35	*	5	23	4	*	2	*	*
Caddo	35	*	3	17	14	*	*	*	*
Comanche	146	*	20	40	*	58	29	*	*
Cotton	5	*	*	5	*	*	*	*	*
Greer	3	*	3	**	*	*	*	*	*
Harmon	23	*	3	5	14	*	*	*	*
Jackson	48	*	3	11	14	20	*	*	*
Kiowa	24	*	7	10	6	*	*	*	*
Tillman	71	*	14	9	13	*	32	*	2
Washita	25	*	2	7	5	12	*	*	*
Total#	413	*	61	126	71	89	63	*	2
North Central									
Creek	12	*	3	8	1	*	*	*	*
Garfield	164	4	53	33	19	43	6	*	6
Grant	16	*	*	11	*	6	*	*	*
Kay	123	4	12	27	22	25	21	7	5
Kingfisher	15	*	*	5	8	*	1	*	1

(continued)

TABLE 73—Continued

Region and County	Total#	Executive Transpor- tation	Busi- ness	Per- sonal	Aerial Appli- cation	Instruc- tion	Air Taxi	Indus- trial, Special	Other
Lincoln	21	*	6	3	*	11	*	*	*
Logan	94	*	8	6	4	13	*	*	63
Noble	15	*	6	8	*	1	*	*	*
Osage	13	*	1	11	*	*	*	*	1
Pawnee	13	*	8	3	*	2	*	*	*
Payne	72	9	19	20	5	19	*	*	*
Washington	138	34	24	27	7	34	2	7	3
Total#	695	51	140	162	66	153	31	14	79
South Central									
Carter	284	8	24	24	*	227	*	*	**
Garvin	21	*	2	14	*	*	2	*	3
Grady	116	*	9	18	74	10	*	*	6
Jefferson	**	*	*	**	*	*	*	*	*
McClain	16	*	*	7	5	5	*	*	*
Murray	3	*	2	1	*	*	*	*	*
Pottawatomie	30	*	19	7	*	4	*	*	*
Stephens	95	26	34	12	10	7	6	*	1
Total#	566	34	90	83	89	252	8	*	10
Northeast									
Adair	6	*	5	1	*	*	*	*	*
Cherokee	34	*	11	9	*	13	*	*	1

(continued)

TABLE 73—Continued

Region and County	Total #	Executive Transportation	Business	Personal	Aerial Application	Instruction	Air Taxi	Industrial, Special	Other
Craig	16	*	4	6	*	6	*	*	*
Delaware	4	*	*	1	3	*	*	*	*
McIntosh	6	*	5	1	*	*	*	*	*
Mayes	18	*	3	5	*	8	2	*	**
Muskogee	98	3	44	28	16	4	*	*	2
Nowata	7	*	2	4	*	*	*	*	2
Okfuskee	5	*	3	2	*	*	*	*	*
Okmulgee	16	*	3	10	*	1	*	*	2
Ottawa	73	4	12	16	*	7	5	*	28
Rogers	10	*	*	10	*	*	*	*	**
Sequoyah	23	*	2	17	*	2	*	*	2
Wagoner	9	*	1	8	*	*	*	*	*
Total #	324	7	95	118	19	40	7	*	37
Southeast									
Atoka	6	*	*	2	**	3	*	*	*
Bryan	8	*	*	2	*	6	*	*	*
Choctaw	20	*	12	8	*	*	*	*	*
Coal	1	*	*	1	*	*	*	*	*
Haskell	2	*	*	2	*	*	*	*	*
Hughes	11	*	2	6	*	3	*	*	*
Johnston	3	*	*	3	*	*	*	*	*
Latimer	7	*	*	2	*	1	*	*	4

(continued)

TABLE 73—Continued

Region and County	Total <sup>#</sup>	Executive Transpor- tation	Busi- ness	Per- sonal	Aerial Appli- cation	Instruc- tion	Air Taxi	Indus- trial, Special	Other
LeFlore	6	*	4	2	*	*	*	*	*
Love	1	*	*	1	*	*	*	*	*
McCurtain	13	*	6	7	1	*	*	*	*
Marshall	9	*	3	6	*	*	*	*	*
Pittsburg	40	*	27	9	2	2	*	*	*
Pontotoc	34	*	6	13	2	14	*	*	*
Pushmataha	12	*	*	1	11	*	*	*	*
Seminole	12	*	2	7	*	4	*	*	*
Total <sup>#</sup>	186	*	62	73	15	33	*	*	4
Total Oklahoma <sup>#</sup>	5,156	295	1,227	1,264	358	1,138	201	116	556

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Source: Compiled from records of the FAA Aircraft Registration Branch,  
Aeronautical Center, Oklahoma City.

The data are for aircraft which had an annual inspection during the period  
from March 1, 1966 to March 1, 1967.

<sup>#</sup>Components may not add to totals due to rounding

\*None.

\*\*Less than 50 hours.

## CHAPTER 7

### SUMMARY AND CONCLUSIONS

Since World War II, aviation has become an important mode of transportation. Its importance is expected to continue to increase. Air carrier aviation and general aviation (all civil aviation other than airline aviation) activity is expected to more than double in the coming decade.

General aviation was relatively unimportant until recent years. However, in the last few years it has become an important part of the air transportation system. About 96 per cent of the civil aircraft registered in the United States are general aviation aircraft, and general aviation accounts for about two-thirds of the civil aviation hours flown. Currently, general aviation activity is increasing more rapidly than had been expected. Hours flown by general aviation aircraft increased more than 26 per cent (from about 16.5 million to about 21.0 million) from 1965 to 1966. Although economists have given attention to the significance of air carrier aviation to the economic development of communities and areas, the importance of general

aviation has been generally neglected.

General aviation promotion groups have in recent years begun to emphasize the importance of airports to local and regional economic development. They point to the airport facilities provided in a community as an important factor in holding existing business firms and attracting new ones. The promotion groups have undertaken studies to support their claims. Although there are methodological difficulties associated with these studies, they provide support for the statement that the adequacy of airport facilities is an important factor in a relatively large number of business location decisions.

From the short-run point of view, it is more certain that poor airport facilities in a community or area tend to retard economic development than it is that good airport facilities provide a strong inducement to economic development activity.

The use of aircraft by business firms has grown rapidly in the past few years and is expected to continue increasing. For this reason, the importance of airport facilities to local and regional economic development is also expected to increase in coming years. The expectation that business use and operation of aircraft will continue to increase rapidly is based upon at least four major trends. These trends are: (1) the usefulness and reliability of general aviation across-country transport

has increased in the past few years and is expected to continue to increase; (2) many of the communities which now receive scheduled airline service are expected to lost it or receive reduced service in the next few years; (3) the trend toward greater decentralization of industry is expected to continue, and firms which are expanding into new geographic areas have higher rates of general aviation aircraft use than the rate for all business firms; and (4) airports are being established as an important facility in industrial parks.

Airport planning is beginning to occur at the state level. Typically, the state planning studies either emphasize air carrier aviation or merely provide an inventory of aviation facilities listed by airport.

Oklahoma, while not a "leading aviation state," ranks higher in several aspects of aviation than it ranks in population. Although limited information about Oklahoma airports is published for users, the Oklahoma airport system has not been examined in a detailed and systematic manner.

The purpose of this study was to examine the nature of the Oklahoma airport system and its regional aspects. Emphasis was given to the general aviation aspects of the system, rather than the air carrier aspects. The scope was limited to Oklahoma airports on record with the Federal Aviation Administration. (The FAA's name was changed from Federal Aviation Agency on April 1, 1967.)

One of the important aspects of an airport system is the characteristics of its users. It was possible to obtain information about the primary users of Oklahoma airports, Oklahoma aircraft registrants.

The primary data sources were records of the FAA District Airport Office in Oklahoma City and records of the FAA Aircraft Registration Branch. These sources were supplemented by personal interviews, visits to airports, aviation instruction, and compilation of information concerning air carrier activity and airmen (holders of FAA certificates, such as pilots, aircraft mechanics, and flight instructors).

A classification system based on airport type and the amount of aviation activity was developed for the 199 civil airports in Oklahoma which were on record with the FAA on October 1, 1966. Data concerning the general nature of the airport, its aviation facilities, and its aviation activity were compiled by type of airport from duplicates of the FAA airport records.

After an examination of the location and nature of Oklahoma airports, the state was divided into seven regions. Airport data were then compiled by region. The airport-use data provided by the FAA airport records are limited. To provide additional information about the nature of Oklahoma airport users, a computer printout of the FAA Aircraft Registration Master File was obtained. This permitted data

concerning the nature and extent of use of aircraft registered in Oklahoma to be compiled by type of aircraft, by type of owner, and by principal aircraft use.

The discussion of Oklahoma airport system characteristics, regional aspects of the system, and flight activity of Oklahoma aircraft registrants, was preceded by an examination of the development of federal airport policies and Oklahoma airport policies.

In 1946 Congress passed the Federal Airport Act. It provided for the development of a national system of public-use airports by establishing a continuing program of federal aid to airports (FAAP) and national airport planning. From the initiation of the FAAP to June 1, 1965, about \$860 million in federal assistance has been given to about 2,000 airports. More than 85 per cent of the assistance has gone to air carrier airports. The National Airport Plans were little more than listings of existing and proposed airports until recent years.

During 1956 and 1957 Congressional dissatisfaction with civil aviation programs and the multiplicity of governmental agencies involved in aviation increased. In 1958 the Federal Aviation Agency was established. Many of the aviation functions of various governmental agencies were centralized in the FAA. The FAA was an independent agency until the establishment of the Department of Transportation in 1966.

Since its beginning, federal civil aviation policy has been dominated by emphasis on air carrier aviation and the national defense aspects of air carrier aviation. Until the early 1960's general aviation and general aviation airports were treated as an after-thought. However, since the early 1960's, general aviation has received increased attention. Much of the rapid growth of general aviation in recent years may be due to this attention.

In 1961 President Kennedy requested a statement of national goals and a long-range plan for all air traffic. As a result of the implementation of recommendations made in these studies, the FAA was reorganized in 1962 to include a top-level Office of General Aviation Affairs, and a nationwide network of Flight Service Stations (FSS) was established. The FSS network provides general aviation flights with many of the same services and navigational aids formerly available only to airline flights. Also, since the early 1960's planning activity associated with the National Airport Plan has intensified, and the FAA has initiated a series of local and regional airport planning guide publications.

The concept of a system of general aviation airports (similar to the system of air carrier airports) has been developing recently. In early 1967 the FAA recommended that states increase their airport planning and that such planning should be integrated with comprehensive state and

regional planning. State plans could then be coordinated with the National Airport Plan.

Before 1947 Oklahoma aviation legislation was mainly concerned with providing municipalities with the authority to own airport property and enact airport zoning ordinances. During 1947 legislation was enacted which gave municipalities powers to contract with federal and state agencies and to issue bonds for airport purposes (Municipal Airports Act). These provisions allowed Oklahoma municipalities to participate in the FAAP. Also during 1947, the Oklahoma Aviation Commission was created, in part, to assist in the development of a statewide system of airports and to encourage and develop aeronautics. However, the statutorily set salary for the Director of the Commission was low and appropriations to the Commission were small. These restrictions did not allow the stated purposes of the act creating the Commission to be fulfilled.

In 1963 the Oklahoma Aviation Commission was abolished, and the Oklahoma Aeronautics Commission established in its place. The stated purpose of the legislation establishing the Aeronautics Commission is generally similar to the stated purpose of the Aviation Commission. However, the authority and duties of the Aeronautics Commission are not as broad as those given to the Aviation Commission.

The Oklahoma Aeronautics Commission administers a small state-aid to airports program. However, the

Commission can only assist in airport development projects which have been approved for FAAP assistance. Although appropriations to the Commission have been larger (around \$100,000 per year) than those received by its predecessor, they are not large enough to allow the Commission to achieve its statutorily defined aims.

Airport users can be divided into two broad categories: (1) those whose flight activities occur mainly in the local area, and (2) those whose flight activities usually involve travel from one community to another. The types of airport users in the first category include recreational flyers and firms offering flight instruction or aerial application services. Flights by these groups usually end at the airport at which they begin. The adequacy of facilities at airports other than the ones from which they fly is not as important to this category of users as it is to the second category.

Aircraft users in the second category use aircraft for transportation from one airport to another. The adequacy of facilities at different airports in the system determines their access to communities in the state and nation and the usefulness of their aircraft. The types of airport users in the second category include business firms which use aircraft to transport their employees and equipment, personal aircraft owners, and firms offering charter, aerial ambulance, and transmission-line patrol services.

There were 199 airports in Oklahoma on record with the FAA on October 1, 1966. These airports range in size from the large air carrier airports, such as Tulsa International, to small, privately owned grass strips. There are 11 airports which accommodate scheduled air carrier flights. These Air Carrier airports are also important general aviation airports. Among the 188 other airports, there are 19 Group One general aviation airports, each of which accommodates more than 10,000 operations per year. (A take-off or landing is an aircraft operation.) There are 36 Group Two airports which accommodate from 4,000 to 9,999 operations annually. Each of the remaining 133 general aviation airports accommodate from 50 to 3,999 operations per year. (These smaller airports were divided into Groups Three, Four, and Five.)

The Air Carrier, Group One, and Group Two airports accommodate 92 per cent of the general aviation aircraft operations which occur in Oklahoma. About 88 per cent of the aircraft based in Oklahoma are based at these airports. All of the Air Carrier airports are municipally owned, four-fifths of the Group One general aviation airports are publicly owned, and one-half of the Group Three airports are publicly owned.

The larger airports in terms of activity (Air Carrier and Group One general aviation) also tend to be larger in terms of surface area. These airports generally

provide better runway facilities than the smaller airports. All but one of the 30 Air Carrier and Group One airports have paved, lighted runways which are more than 3,000 feet in length. These airports also provide more non-runway facilities, such things as fuel, repairs, and aircraft storage, than the smaller airports. Generally, the smaller airports do not provide the combination of facilities needed to adequately accommodate the across-country air traveler. However, there are several exceptions.

The State was divided into seven regions (Metropolitan, Northwest, Southwest, North Central, South Central, Northeast, and Southeast) to allow broad comparison of the airport facilities in different parts of the State. An exception to the general practice of providing area contiguity was made in defining a metropolitan region. Due to their similarity, Tulsa County and the Oklahoma City Standard Metropolitan Statistical Area were treated as one region.

Although one-fourth of the airports in Oklahoma are in the Metropolitan region, the region accounts for about one-half of the general aviation operations. The largest Air Carrier and Group One airports are in this region, and they accommodate a wide variety of aviation activities. Two-thirds of the aircraft registered in Oklahoma which have executive transportation as their principal use are registered in the Metropolitan region.

In the sparsely populated Northwest region, there are more aircraft and airports in proportion to population than in any other area of the state. The region accounts for about 5 per cent of state population and about 16 per cent (31) of the airports in Oklahoma. Many of the aircraft are owned by farmers and ranchers. More than one-half of the area in the Northwest region is more than 100 miles from a city with 50,000 or more inhabitants.

There are 32 airports in the Southwest region. Eight of these airports are principally used by agricultural applicators, and 17 of the 24 fixed base operators in the Southwest offer agricultural application services. These services also account for a significant part of the general aviation activity in the South Central region. There are fewer fixed base operators in the South Central region offering agricultural application services (seven) than there are in the Southwest. However, there are a few more agricultural application aircraft registered in the South Central region than are registered in the Southwest.

There are fewer airports in the South Central region (19) than in any other region. However, there are almost as many aircraft registered in the region as there are in the Northwest and more than are registered in either the Northeast or Southeast regions.

The North Central regions accounts for more airports (37) and more general aviation activity than any of the

other non-metropolitan regions. Also, there is more variation in type of aviation activity than in any region other than the Metropolitan region. The amount of and variation in aviation activity in the region are related to the region's relatively large population, its relatively high income, and the relatively greater variation in the types of economic activities which occur in the region.

There are 25 airports in the Northeast region. Eight of these airports are located in recreational areas, and five of these eight airports are operated in conjunction with private resorts. There are fewer aircraft in proportion to population in the Northeast than in any other region except the Southeast.

Although there are more airports (30) in the Southeast region than there are in three of the other regions, the Southeast accounts for less general aviation activity than any other region. Also, the activity is less varied than it is in other regions. In the Southeast, average incomes are relatively low, there are relatively few families in the upper income group and relatively few business firms which use aircraft. The proportion of aircraft registered in the Southeast which are principally used for business and commercial purposes (about 40 per cent) is lower than it is in any of the other six regions. None of the aircraft registered in the Southeast are reported to

have executive transportation, air taxi, or aerial patrol or survey as their principal use.

There are 51 Oklahoma municipalities with 1,000 or more inhabitants which do not have public or private airport facilities which are open to the public. Three of these municipalities (Henryetta, Sapulpa, and Wewoka) have more than 4,500 inhabitants. Almost three-fourths of the municipalities which do not have airport facilities are in the South Central, Northeast, and Southeast regions.

Generally, better aviation access is provided to the communities in the Metropolitan area than to communities in any of the other regions. Among the non-metropolitan regions, generally, better access is provided to communities in the Northwest, Southwest, and North Central regions than is provided to communities in the South Central, Northeast, and Southeast regions. Each of the regions in the first group (Northwest, Southwest, and North Central) has more airports with lighted, paved runways at least 3,000 feet in length and which have attendants available at least during daylight than any of the regions in the second group (South Central, Northeast, and Southeast). Also, there are fewer municipalities without some type of airport in each of the regions in the first group than there are in any of the regions in the second group. Generally, there is less aviation access to communities in the Southeast

than there is to communities in any other region.

The amount and distribution of population and income were usually found to be directly related to the type of airport provided in a community. This was true both within the regions and among the regions.

There are more than 2,500 active general aviation aircraft registered in Oklahoma. One-half of these are single-engine, four or more place, aircraft. Multi-engine aircraft account for about 11 per cent of the total, and helicopters account for about 1 per cent of the total. The remaining aircraft are in the single-engine, less than four place category.

Corporations own 36 per cent of the aircraft registered in Oklahoma. Individuals own 54 per cent of the aircraft. However, the general aviation aircraft owned by corporations account for 54 per cent of total hours flown by active Oklahoma general aviation aircraft, and aircraft owned by individuals account for 35 per cent of the total.

Slightly more than half the aircraft registrants report that their aircraft is principally engaged in some form of business activity. These aircraft account for three-fourths of the hours flown by Oklahoma general aviation aircraft.

About 30 per cent of the general aviation aircraft registered in Oklahoma are used for business transportation. These aircraft account for a slightly higher proportion of

total hours flown than they do of total aircraft. The other business-use aircraft are used for such things as aerial application, flight instruction, aerial survey and patrol, and air taxi.

Oklahoma airport policies have mainly developed in response to federal policies. The FAA has recently recommended that states engage in airport planning and that such planning be a part of comprehensive planning. However, the statutory limitations placed on the Oklahoma Aeronautics Commission, in combination with the small legislative appropriations to the Commission, preclude a planned, coordinated effort to provide the airport facilities needed now and in the future. The Commission is largely dependent upon municipal initiation of airport projects. Most of the legislative appropriations to the Commission are for state aid to airport projects (which have received FAAP approval).

A state airport plan, which would provide more than a listing of existing airports and their facilities and which is integrated with comprehensive state planning, is needed. As is true in the case of highways, if facilities are to be provided when and where they are needed, planning is required on a wider level than the local community. Since future airport needs depend upon the development goals, policies, and circumstances in Oklahoma's communities and regions, the provision of adequate airport

facilities requires that airport planning be integrated into comprehensive state and regional economic planning.

The Oklahoma Aeronautics Commission needs substantially greater appropriations from the legislature, if it is to accomplish the stated aims of the 1963 Aeronautics Commission Act. The Commission also needs authority to initiate needed airport projects (including projects for which FAAP funds are not available). Greater state aid is needed for communities which have difficulty providing the matching funds needed for FAAP assistance. Also, provision needs to be made for requiring greater consideration of airport development which can serve two or more communities.

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