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A Downtown Airpark for Albuquerque, New Mexico

Richard Walter Waggoner

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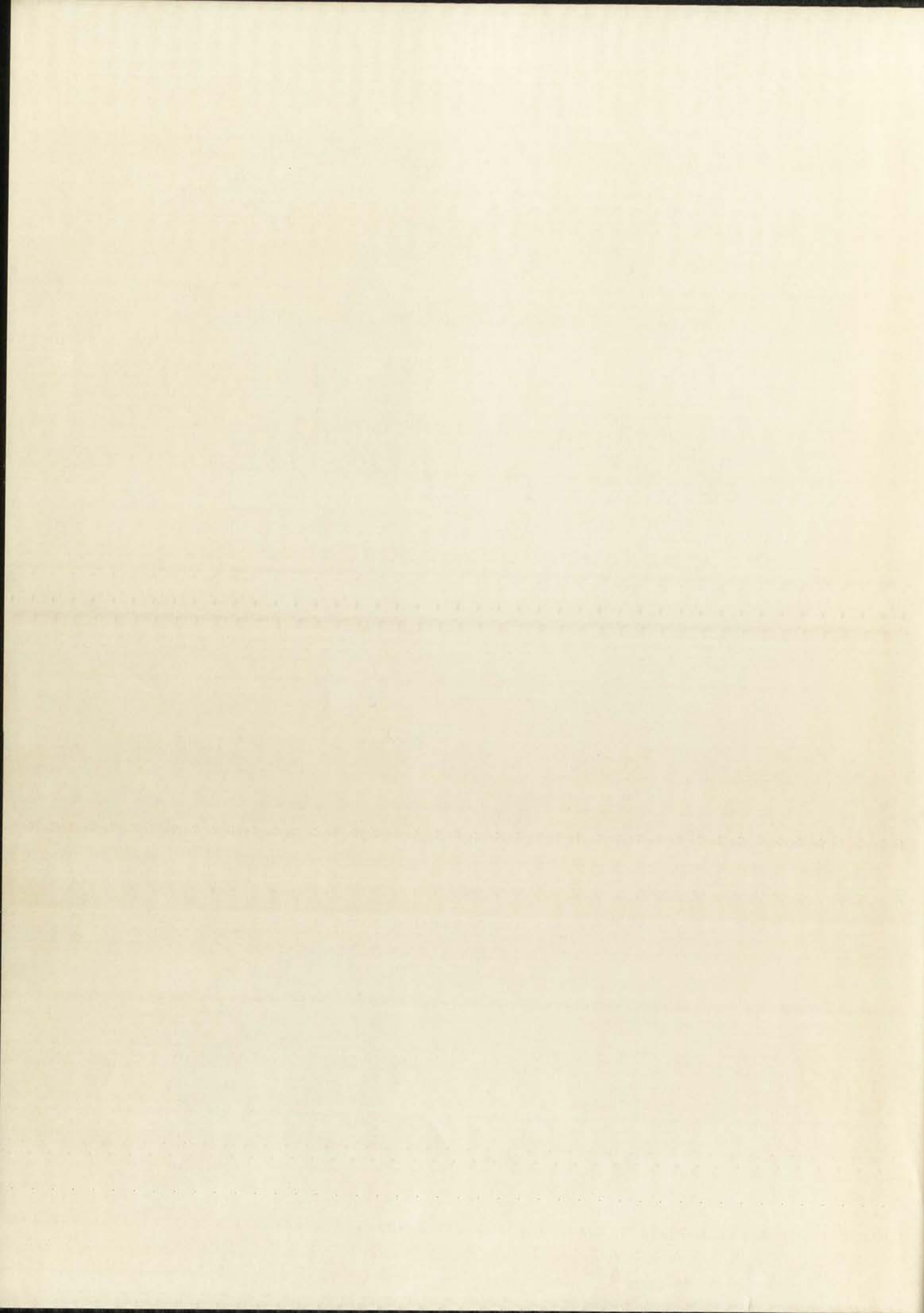
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A
DOWNTOWN AIRPARK
FOR
ALBUQUERQUE, NEW MEXICO

BY
RICHARD WALTER WAGGONER

BACHELOR'S THESIS

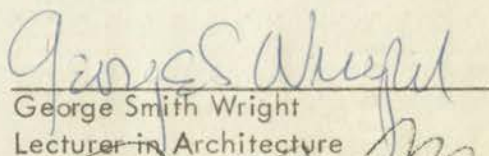
Presented to the Faculty of the Department of Architecture,
University of New Mexico, in partial fulfillment of the re-
quirements for the degree of Bachelor of Architecture.

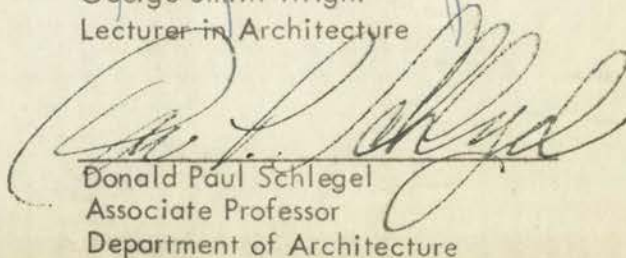
The University of New Mexico

June 5, 1962

THESIS COMMITTEE:


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An airport is much like a telephone--it has little use by itself, but becomes increasingly useful as its numbers grow.

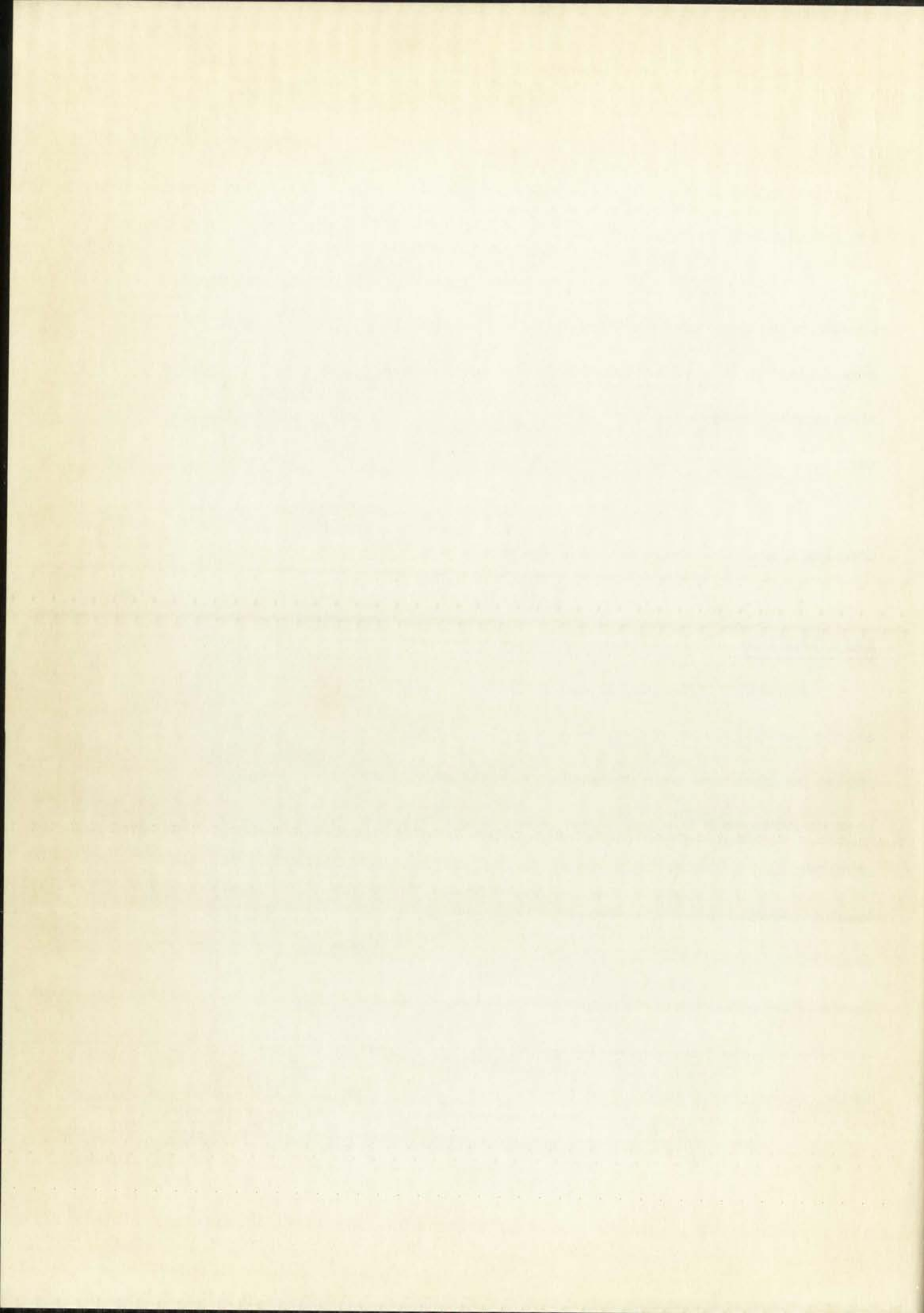
The time interval in aircraft improvement will be shortened to a degree comparable to the time mastery of the principle of aviation itself. Consequently, for airport planning it is not enough to base judgment on decadent gradualism. Today's plans must be based on the fact that the future growth of air traffic will be phenomenal.

The accommodation of present demands with sufficient facilities to service anticipated growth is the backbone of this thesis.

BACKGROUND

At present, Albuquerque must attribute a sizeable portion of its population and the exploitation of its potential to aviation. In many instances, World War II service personnel who were stationed at Kirtland Air Force Base or Sandia Base have stayed to make this their home, or have since returned. Not only has Albuquerque climatological attractions, but also future growth potential unlimited. Due to its location between the middle eastern United States and the west coast, the available space for living and working is becoming a growing drawing card. It is also ideally located for the civilian and commercial air traveler as a stopping point. Clear skies, a predominance of calm sunny weather and a certain remoteness from nearby population centers confirm this.

However, Albuquerque does not at present have the facilities grouped together



together to serve general aviation. (General aviation being that which includes all flying by civil aircraft except air carriers.) There are five general aviation airports located on the periphery of the population center. The municipal airport is a bi-functional operation in that it shares runways and other operations with the United States Air Force. The others are composed of civilian operations. To bring the problem into finer focus, a breakdown of existing facilities has been presented in graph form. (See Fig. 2.) Additional pertinent information is also necessary to yield the complete picture.

West Mesa Airport

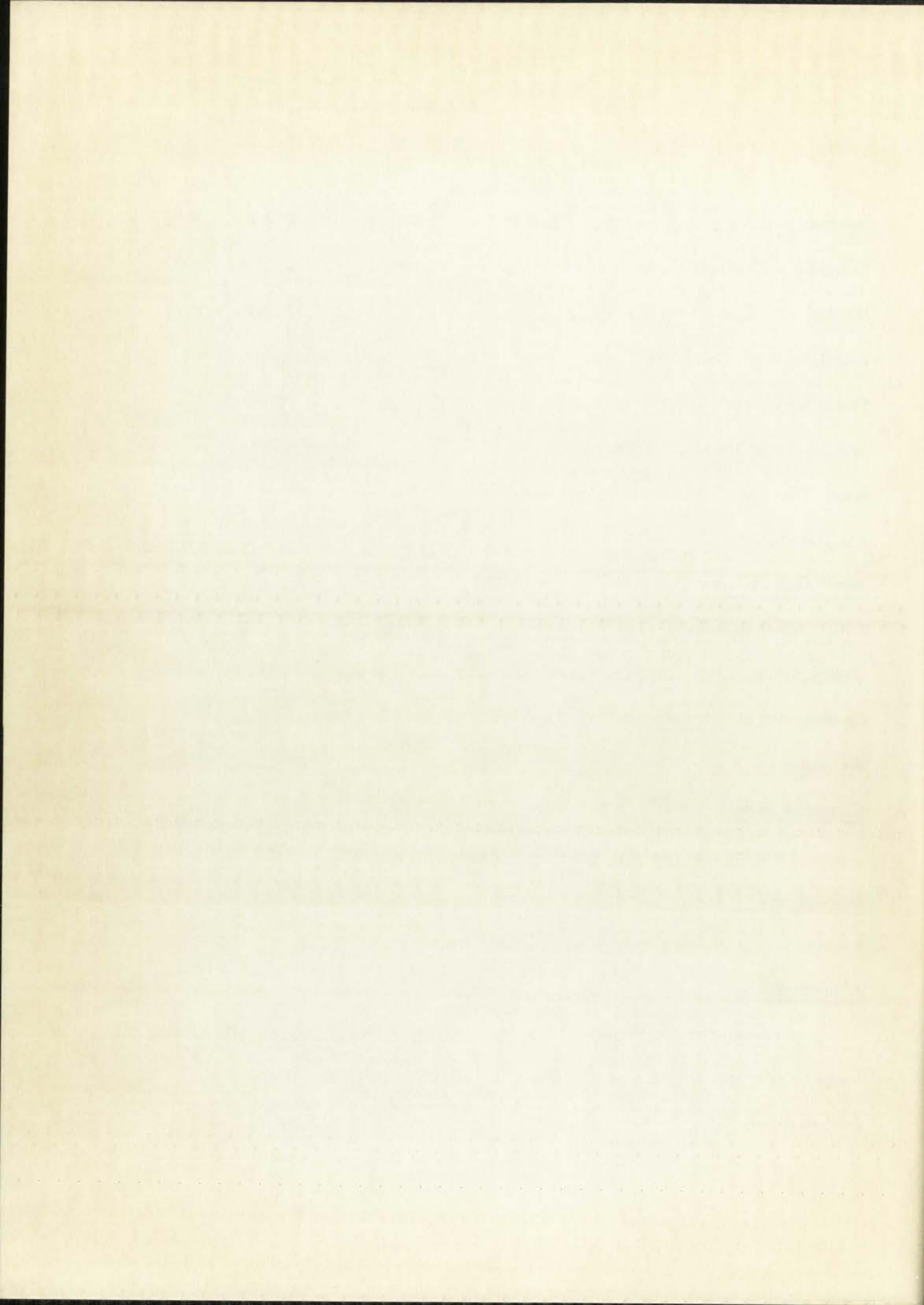
Thirty years old; runways not paved; closed at night; no runway improvement contemplated. High tension lines and drive-in theater provide obstacles on the southern end of the main runway. However, most complete maintenance facility in the region.

Coronado Airport

Eighteen months old; two paved runways aligned slightly crosswind; ravine on north end of runway; runways too narrow; planes tied down too close to major runway; poorly laid out; expansion contemplated.

Alameda Airport

Twelve years old; mostly utilized by flying enthusiasts of gliders and experimental crafts; quite remote for city use; near new housing development and small industrial park, could possibly serve this community; at present very limited.



South Valley Airport

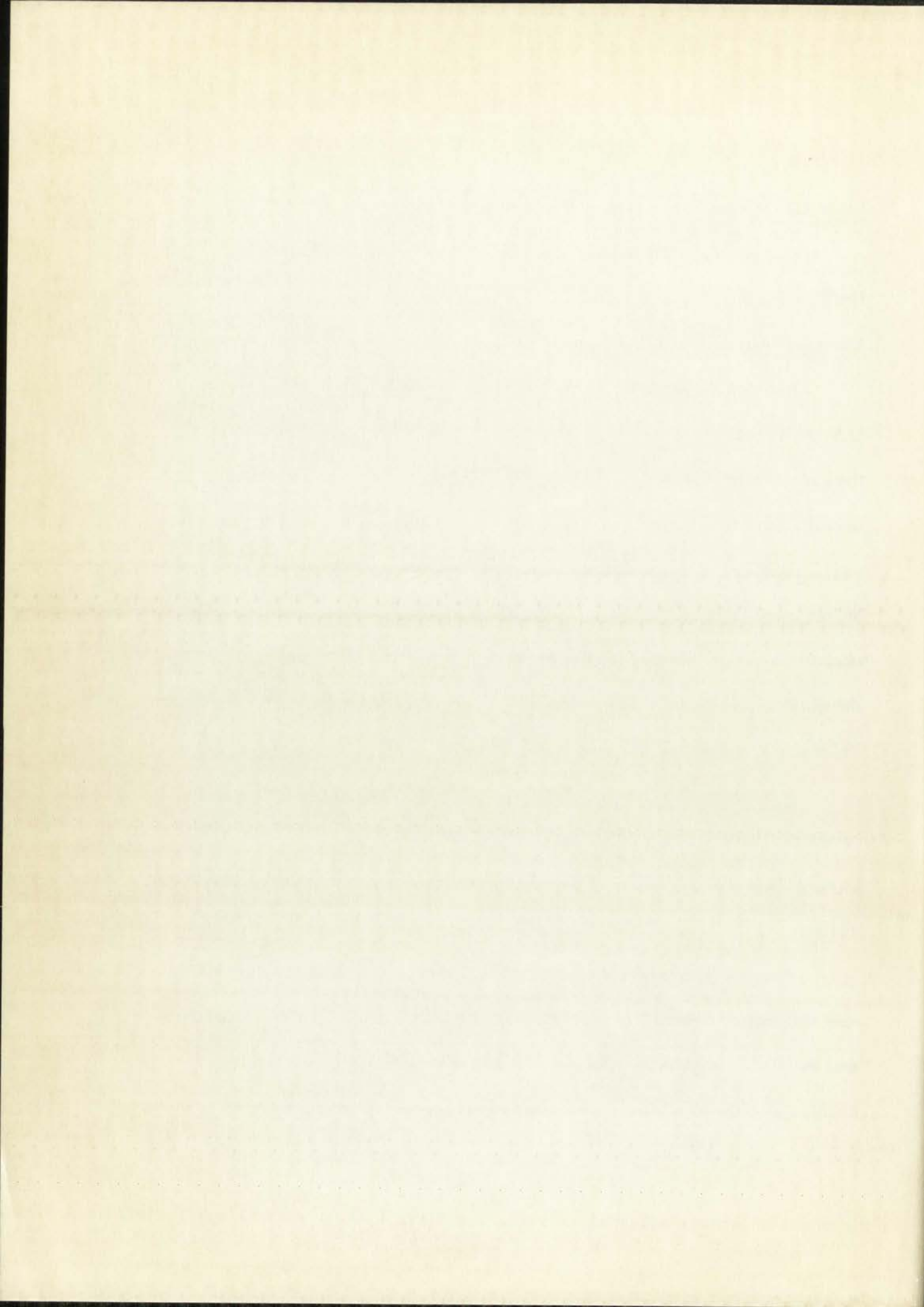
Four years old; shoestring operation; hard to reach from ground difficult to find from the air; future dubious.

Municipal-Kirtland Air Force Base

Twenty-five years old; outdated; size attributed to World War II and present U.S. Air Force use. Most heavily used due to its facilities, which are marginal to the business aircraft traveler. Corridor problems exist due to military aircraft, private aircraft, commercial scheduled and non-scheduled airlines, all using the same runways. Location centralized somewhat in past few years. Major attractions consist of instrument let-down runways, 24-hour service, tower control, food facilities, access to overnight hostelry (by extremely high priced taxi-cab franchise). Little thought has been given to private aircraft and these listed facilities exist because of its being a commercial port.

It is obvious that no real effort has been made to attract or evenly properly furnish the business aircraft user any complete facilities in the local area. It should be noted here that as many people travel by private aircraft as travel by commercial airlines.

President Kennedy's "Project Horizon," which sets the aviation goals for the next ten years, forecasts that by 1970, 65% of all flying hours will be done by general aviation. To meet this need calls for 150 more airports suitable to serve general aviation requirements. Also, a system of airstrips geographically located to provide national air accessibility comparable to that provided for automobile users by our



roads and highways is recommended.

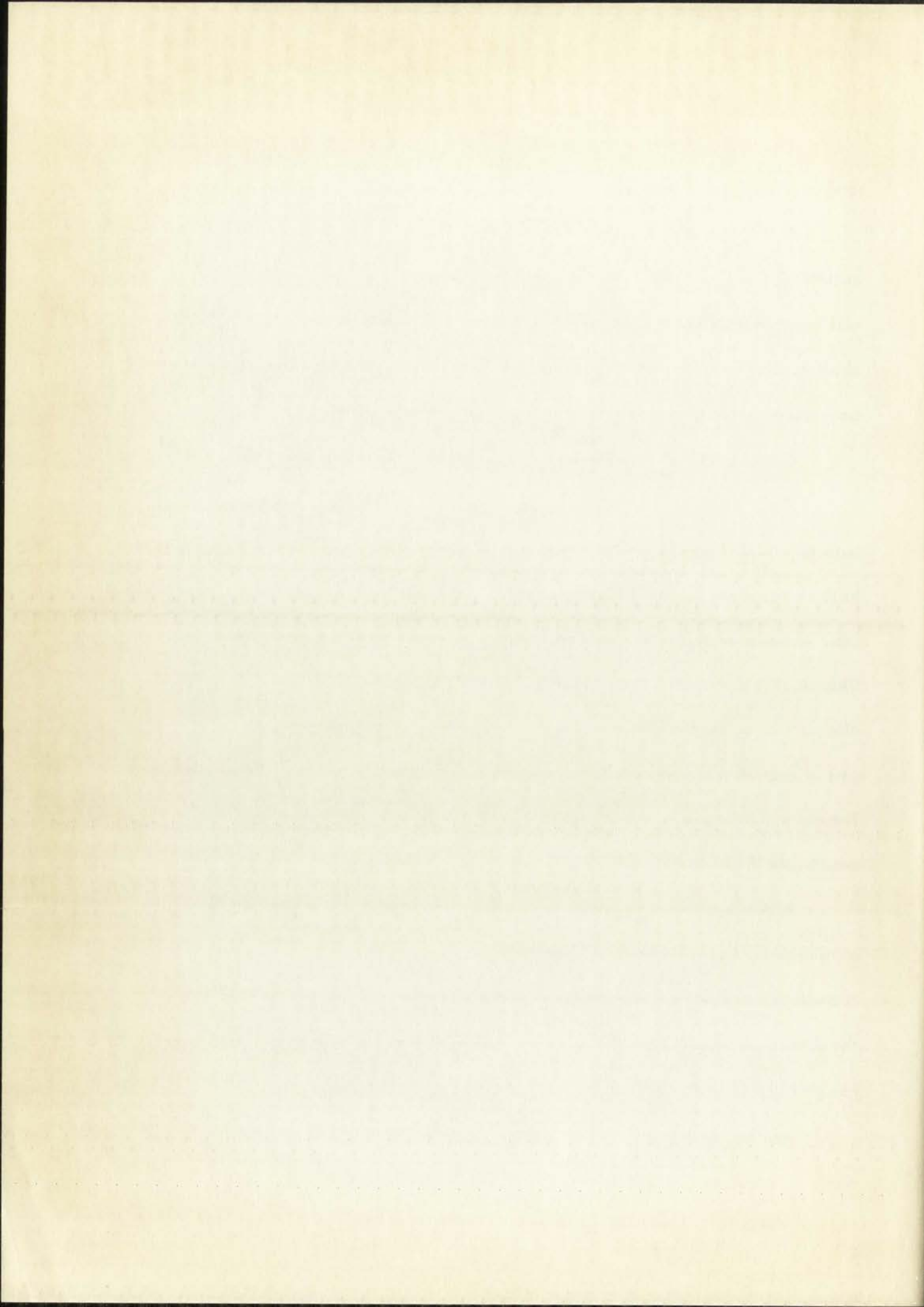
By 1970 general aviation will grow from its present 12.2 million hours to exceed 18.5 million hours. At the same time, it is anticipated that business flying will increase from 5.3 million hours to 7 million. This is a decrease from 43% to 38% of all general aviation, which is accounted for by the fact that business aircraft will carry more people per plane farther in a shorter period of time.

Closer examination of projected goals is set out in Figs. 3 and 4.

There exists at this time a feeling that helicopters could handle all of the business aircraft from the existing ports to downtown. There are extreme disadvantages to this arrangement. The difficulty of parking and making arrangements for the aircraft while it remains at the landing point; deplaning and changing over of baggage is irksome as is the rental of cab or car; obtaining a ride if no available cars or cabs after arrival at the heliport; finding a place to stay if remaining overnight. The cost of each of these operations can only be absorbed by the private aircraft traveler. Therefore, helicopters are fine for other uses, but in this sense, they only tend to complicate the problem.

Albuquerque is not individualistic in this problem. Other population centers of the United States find themselves in the this same predicament. However, there is a solution and it has been applied with positive results. The answer is logically the downtown airport, and it is commonly referred to as the "airpark." Albuquerque can participate in this obvious answer to its problem with ease.

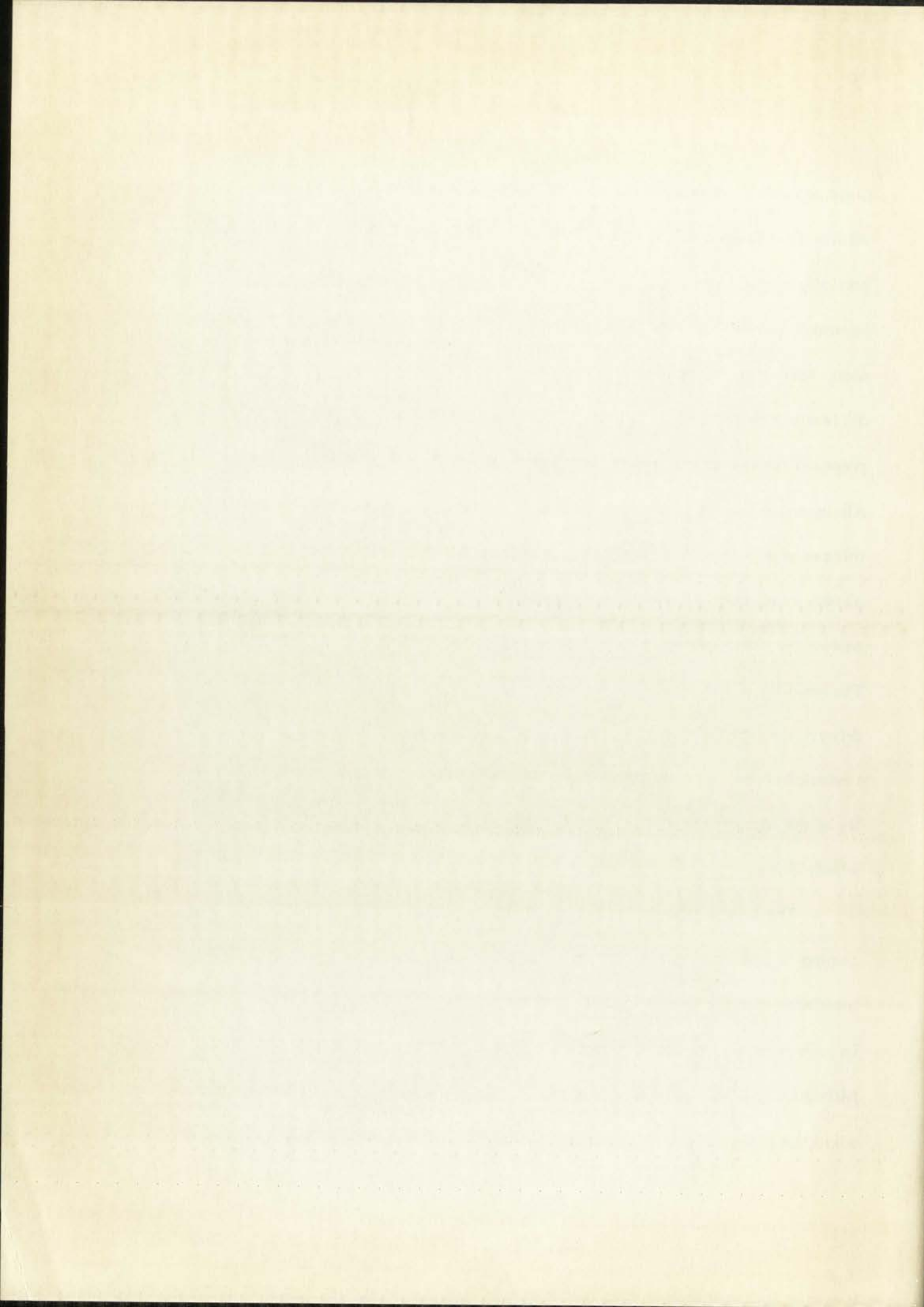
Realism dictates that it be located where people live and participate in



civic activities, which would make its logical placement the downtown area.

Within a twelve block distance from the central business district lies an unused and partially forgotten piece of land. It will accommodate a 5000 foot runway with clear approaches on either end. Guest room facilities, hangars, restaurant, tie-down area, taxi strip, minor recreational facilities, transportation, and parking areas are all feasible on this site. There is a large city recreation area within four blocks. The proposed runway location is at least three blocks from any residential areas. The Albuquerque Country Club is within three blocks. There remains on the boundary of this proposed site an artificial lake, which could be revitalized and brought into the airpark complex as an additional attraction. A large baseball stadium is an integral part of the adjoining recreational park along with the city zoo and swimming pools. The majority of the city's industry and wholesale outlets are within a five minute drive. The heart of the city predominantly composed of offices for fast-growing financial centers and extensive governmental space is within eight blocks. The majority of the aircraft users, the large corporations, have their offices within a two minute drive.

The airpark should be planned and built to serve the needs of executives coming to and leaving the city to transact business, sales representatives, tourists, transients, the suburban shopper, and the commuter. Airparks have been erected in such cities as St. Louis, Oklahoma City, Wichita, Cleveland, Chicago, Milwaukee, Los Angeles and several others. These airparks were largely built to solve the same problem Albuquerque faces at this time. Many unique innovations



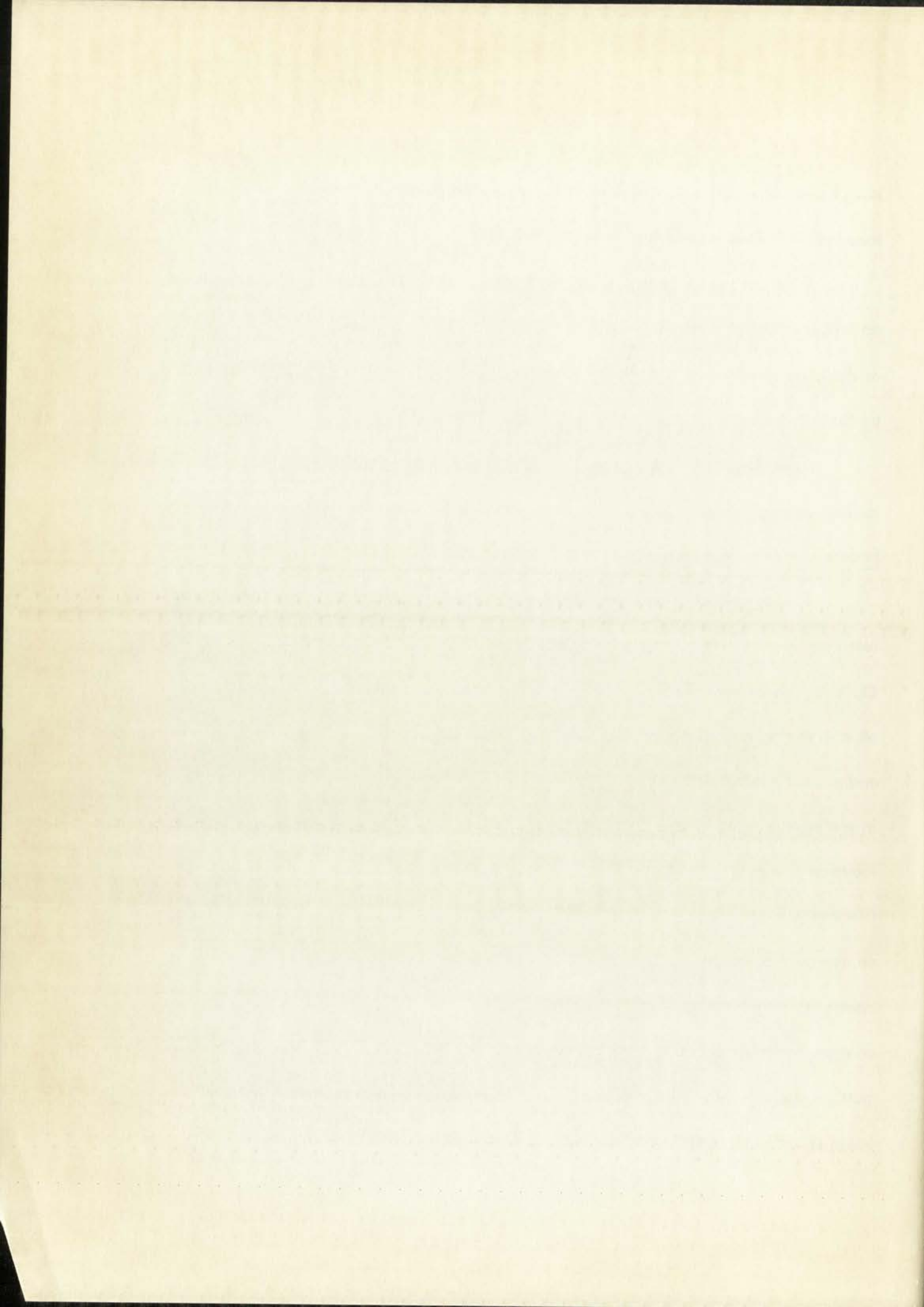
have been proposed to accommodate landing space, such as underground hangars, runways built over drainage canals or elevated over railroad yards.

Albuquerque's site is geographically bordered on the north by U.S. Highway 66 bridge (Central Avenue West), on the south by U.S. Highway 85 bridge (Barales Bridge), on the west by the western bank of the Rio Grande River, and on the east by the city recreation park and zoo and Rio Grande Park.

Development of the site would include cooperation of the following organizations and personnel:

Federal Aviation Authority

This organization and several of its controlling personnel in the local offices felt that this solution to the existing problem was valid and that the site had merit. Opinion was expressed that actually no other useful and flexible location was available in the downtown area. The safety officials stated that with proper air corridoring and ground control, this airpark would be used by the majority of the civilian aircraft in preference to other existing facilities within a very short time, primarily due to its location and additional attractions. A left hand 500 foot pattern must be established. Clearance for this was obtained from local FAA traffic directorate. Slope patterns on approaches would be along the river bed and permissible at a 50 to 1 glide ratio. However, care must be exercised on the approach to the south. On take-offs, turns must be made out of the pattern within two miles. On landings, entry and letdown must be made within this same limit. This is governed by the fact that Kirtland runway could possibly interfere beyond this distance and above a 500 foot pattern. This is



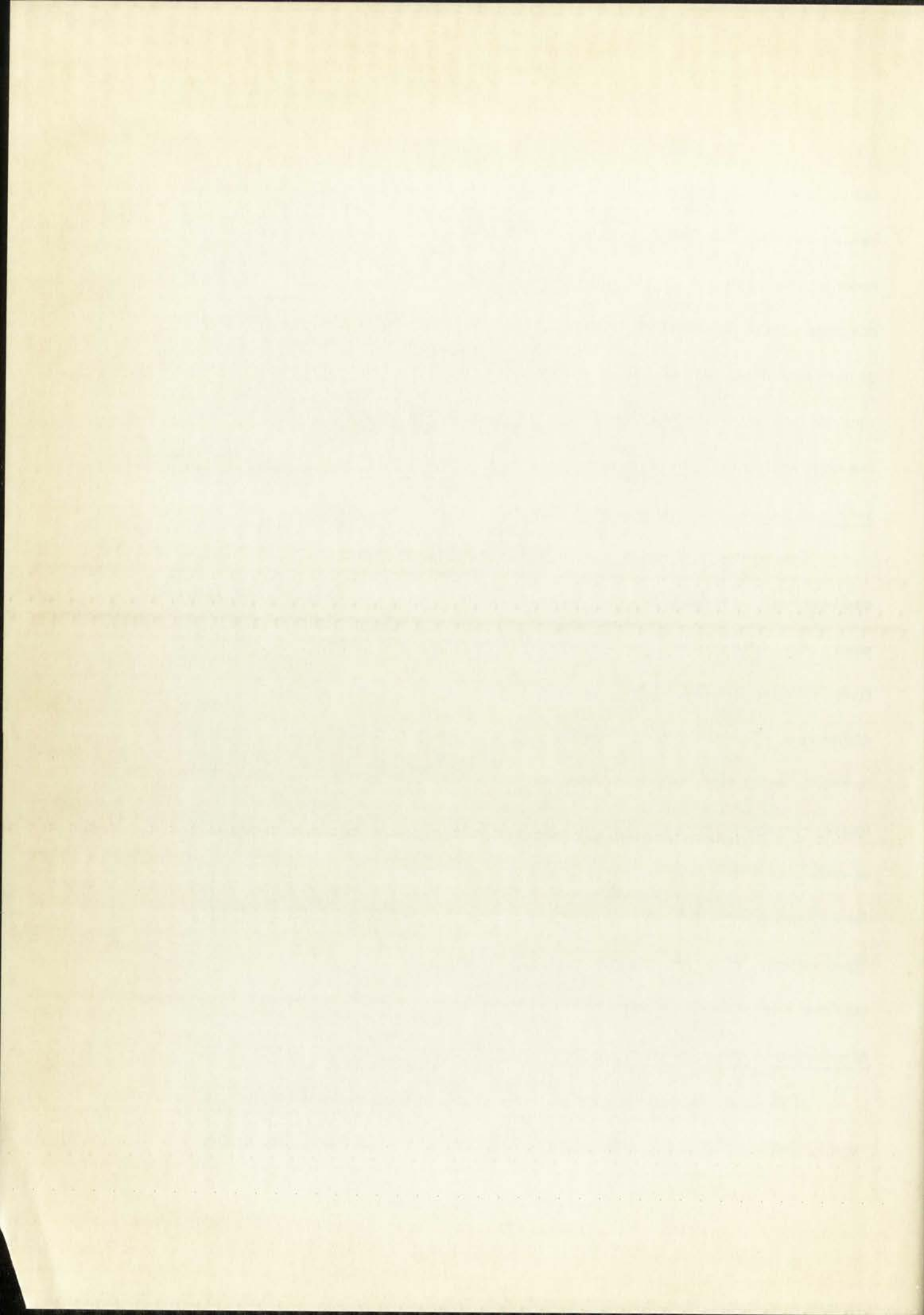
not an unusual condition; however, other airports in extremely heavy air traffic centers exercise more stringent controls. They also recommended an interlocking radar pattern approach control with Kirtland's tower. This would give a much more accurate accounting of air traffic within the city core, thus insuring better control of both facilities. A check with the prevailing wind pattern in this locale indicated that the site was properly oriented. In the morning the prevailing winds are from the northwest, and in the afternoon from the southeast.

Bureau of Reclamation--U.S. Army Engineers

Due to the fact that this organization is principally concerned with maintenance and repair of the river bank, and obligated to the river bed owner, the U.S. Government, very little comment was received. It was proposed, however, to channel the river between the two bridges, line the channel with concrete and place an apron on either end. (See site plan.) There was some concern with silt deposit, but after further investigation, it was ascertained that by channeling the river, it would move faster, thereby carrying the silt with it. It would not endanger the area in question or otherwise affect the river or its banks in any adverse manner. In the very near future, two dams will have been completed on the upper Rio Grande controlling flood waters. With this information in mind, the east bank of the river was felt to be safe and would remain so to be used for an airpark.

Middle Rio Grande Conservancy District

This land in question is the property of the United States Government and is legally dedicated as a navigable river. This is a point of law only, as the depth is

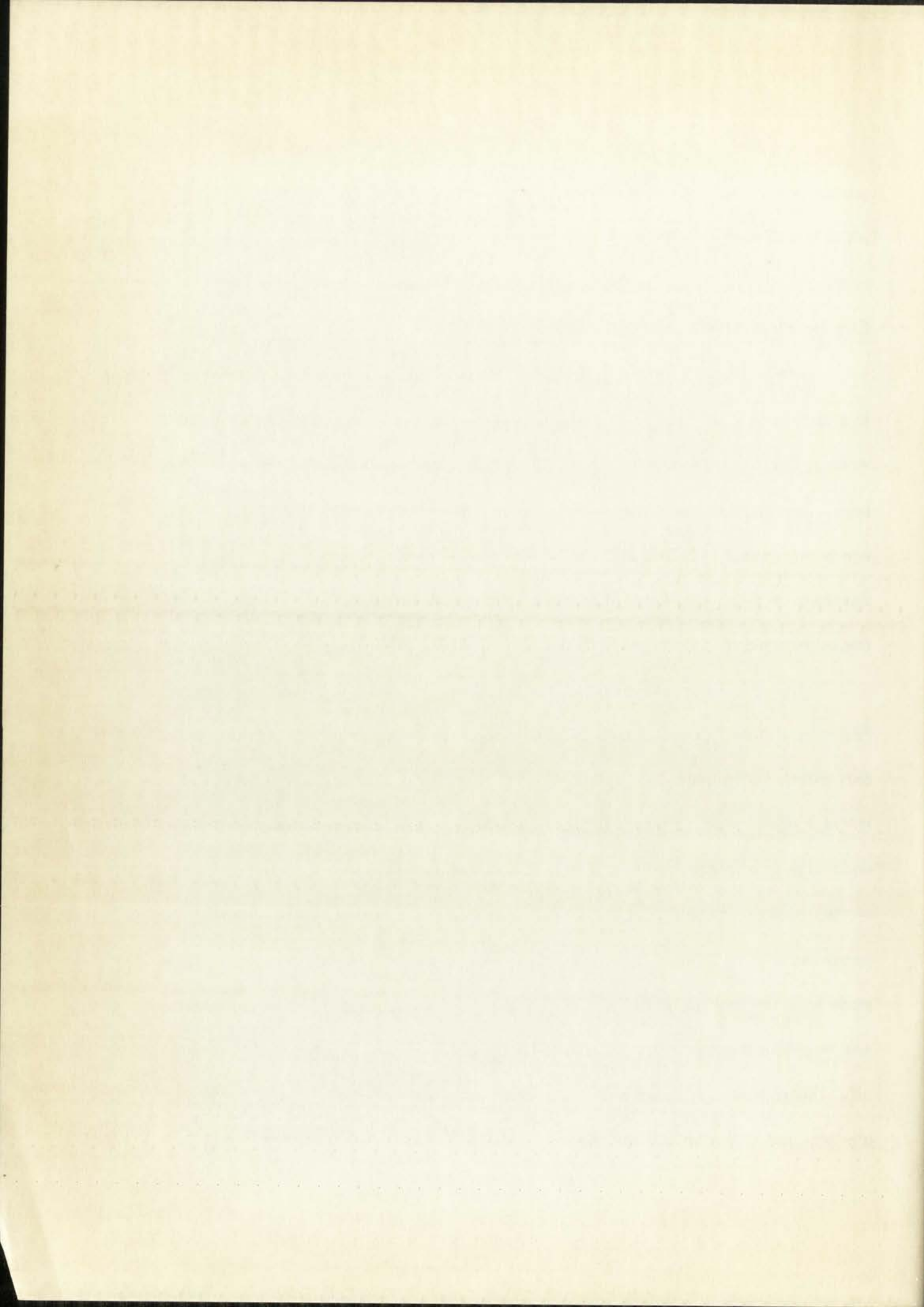


seldom over six to eight feet at its deepest point. The surrounding drainage ditches, which the Conservancy District controls, can be dealt with as an interesting accent to the overall complex, and the cooperation of this organization was assured.

City Planning Director and City Manager

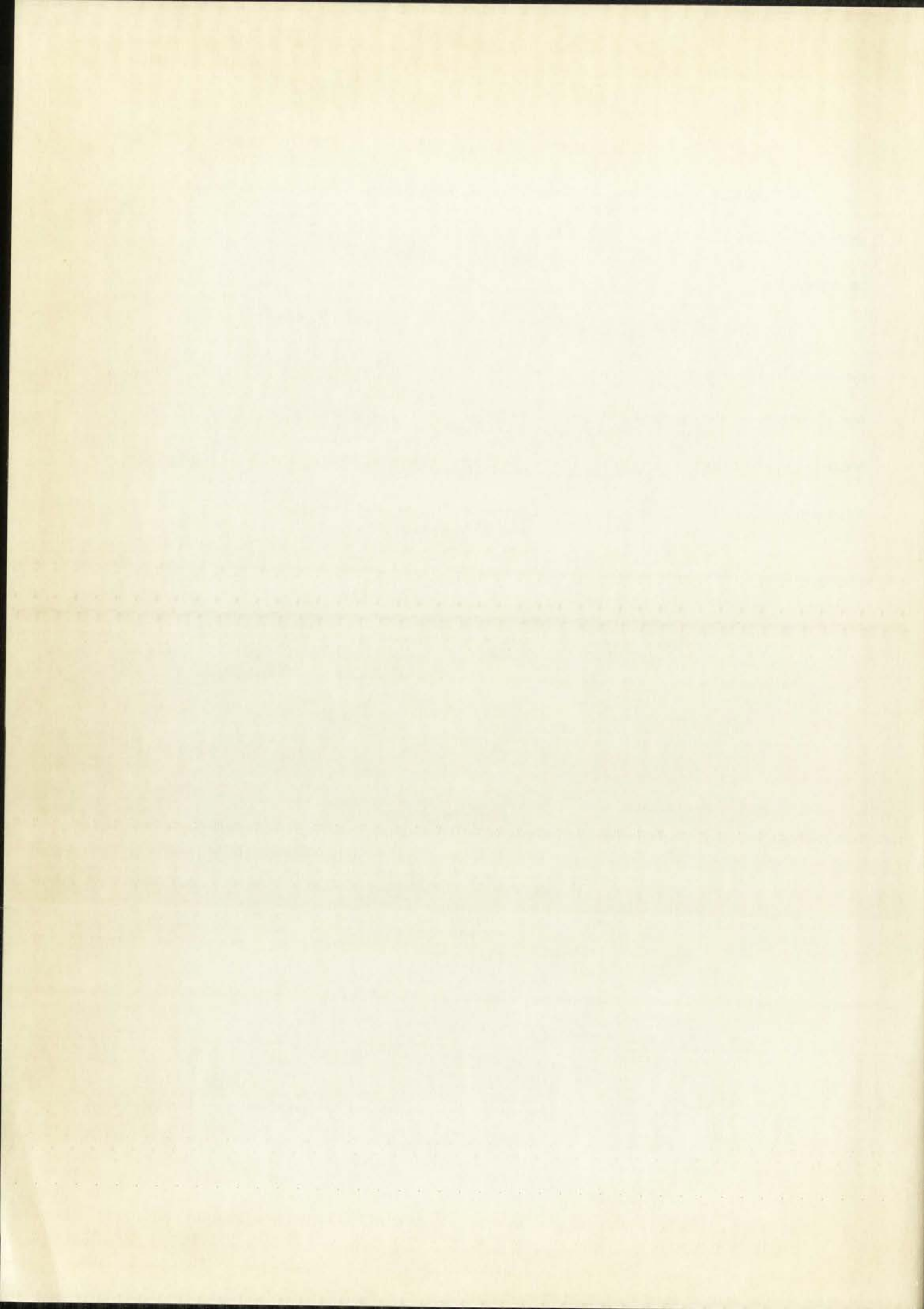
The principal financial gains would be derived from the administration buildings and storage facilities at the airpark. These facilities would lie on city property, whereas the runway and taxi strip would be on the government side next to the river bank. The city felt the project would enhance the downtown core and bring in a handsome revenue. Future planning in this area is primarily along future recreation development lines which ties in with a portion of the airpark's intent. An all around favorable acceptance was given to the project by the city personnel.

The acquisition of funds could be handled in the following manner: The Federal Aviation Authority has available funds to assist airport building, but they are only allotted on a matching basis to airports qualified and licensed by FAA. Therefore, the city would have to supply sufficient funds to erect the administration buildings and hangars, whereas the Federal Aviation Authority would supply funds for construction of the runway and channeling the river. It is assumed that these costs would be approximately the same. To properly allot these funds, careful cost studies must be made prior to construction to insure complete project coverage. A bonded indebtedness would be the most efficient source for the city funds, and could easily be paid off. This statement is based on the fact that the operation of the airpark be placed on a private enterprise basis, with the city as lessee.



With all of these considerations in mind and complete participating organizational cooperation, the complex, including river channelization, could possibly be completed in 18 months at the most.

Structures will be of concrete. Prestressed, post-tensioned load-balancing systems will be employed. Due to the availability of this material in this area, and the plasticity of shapes that can be formed, concrete is the most logical material. Modular application of shapes should be seriously considered due to anticipated future expansion and cost.



BUILDING REQUIREMENTS

Administration Facilities:

Manager's Office -----	200 sq. ft.
Assistant Manager's Office -----	200 sq. ft.
Secretary -----	200 sq. ft.
Restaurant -----	3,500 sq. ft.
Cocktail Lounge -----	2,000 sq. ft.
Rooms -----	60 @ 200 sq. ft. each
Lobbies -----	3,000 sq. ft.

Rental Offices

Sales Area -----	1,200 sq. ft.
Daily Rental Offices -----	150 sq. ft.
Small Lecture Room -----	700 sq. ft.

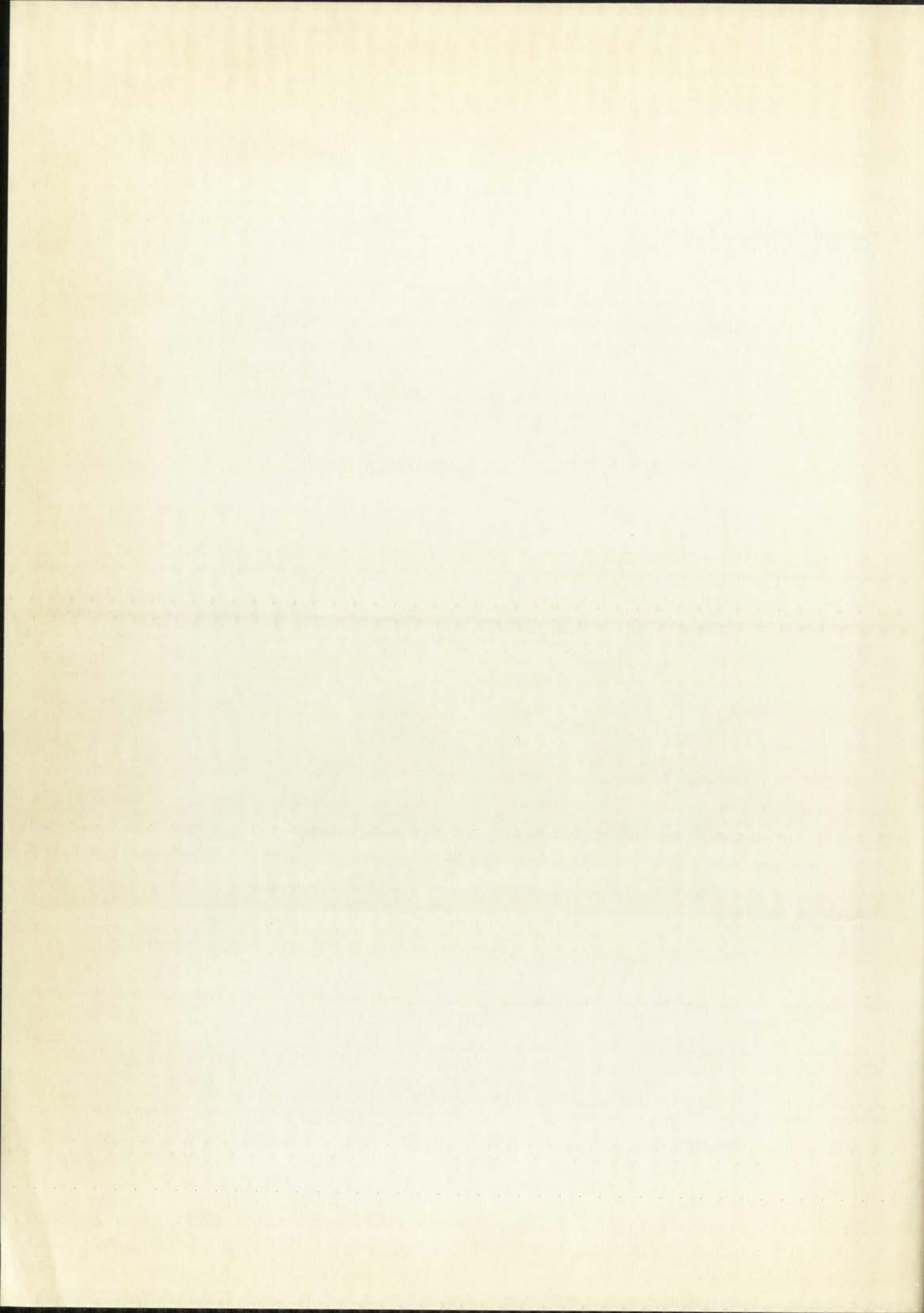
Restroom Facilities

Parking for 200 cars

Aviation Facilities:

Maintenance Hangar -----	11,000 sq. ft.
Tee Hangars -----	88 @ 1000 sq. ft. each
Maintenance Office -----	200 sq. ft.
Storage Hangar -----	11,000 sq. ft.

Restroom Facilities



Aviation Facilities (continued)

Pilots' Lounge ----- 800 sq. ft.

Employees' Lounge ----- 400 sq. ft.

100 Tie Spaces

Gasoline and Oil Facility

5500 Foot Runway 150 Feet Wide

5000 Foot Taxiway With Four Turn-offs

Tower

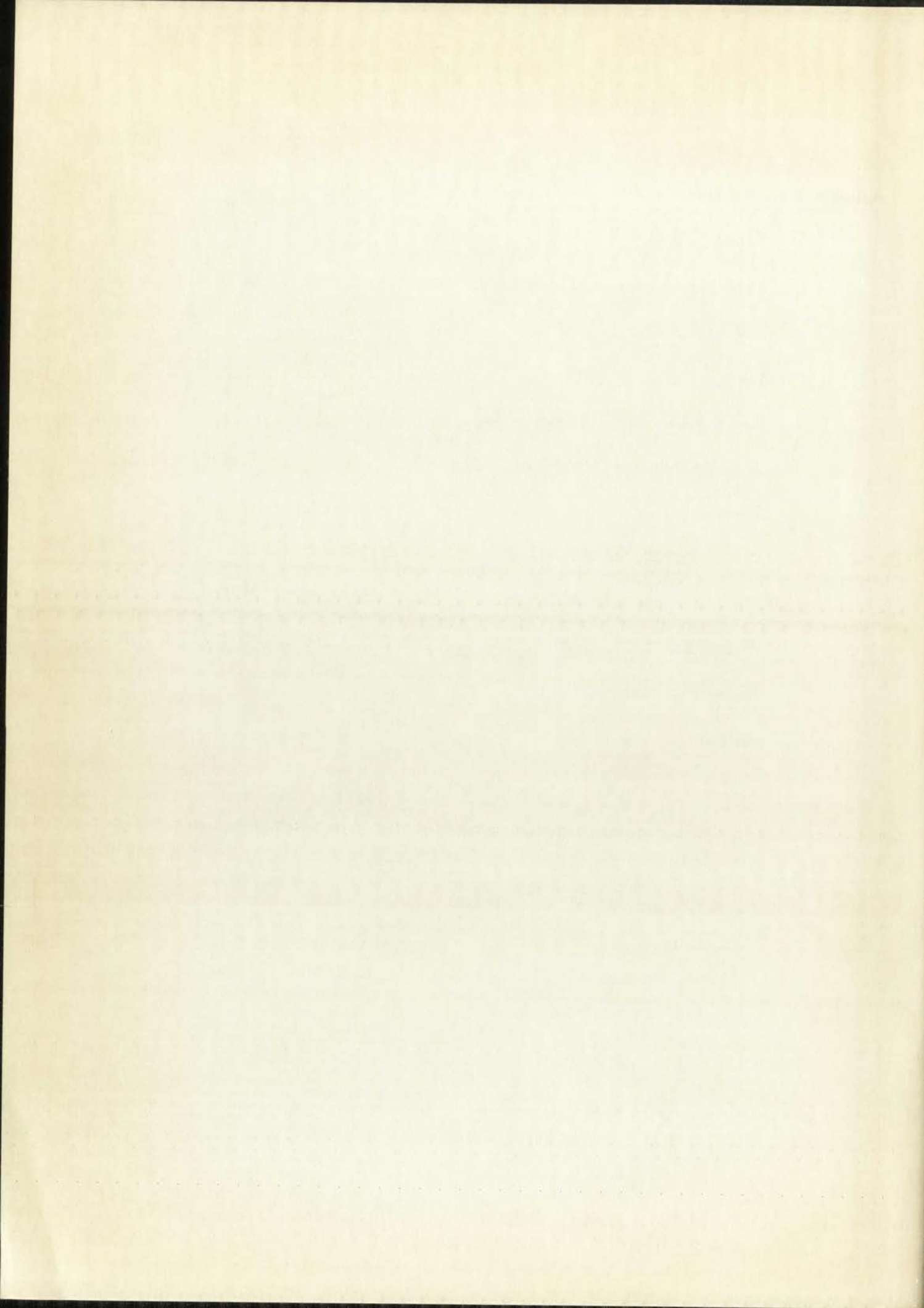
Parking for 50 Cars (Employees)

Wind Directional Indicator

Airport Vehicle Storage

Airport Maintenance Area

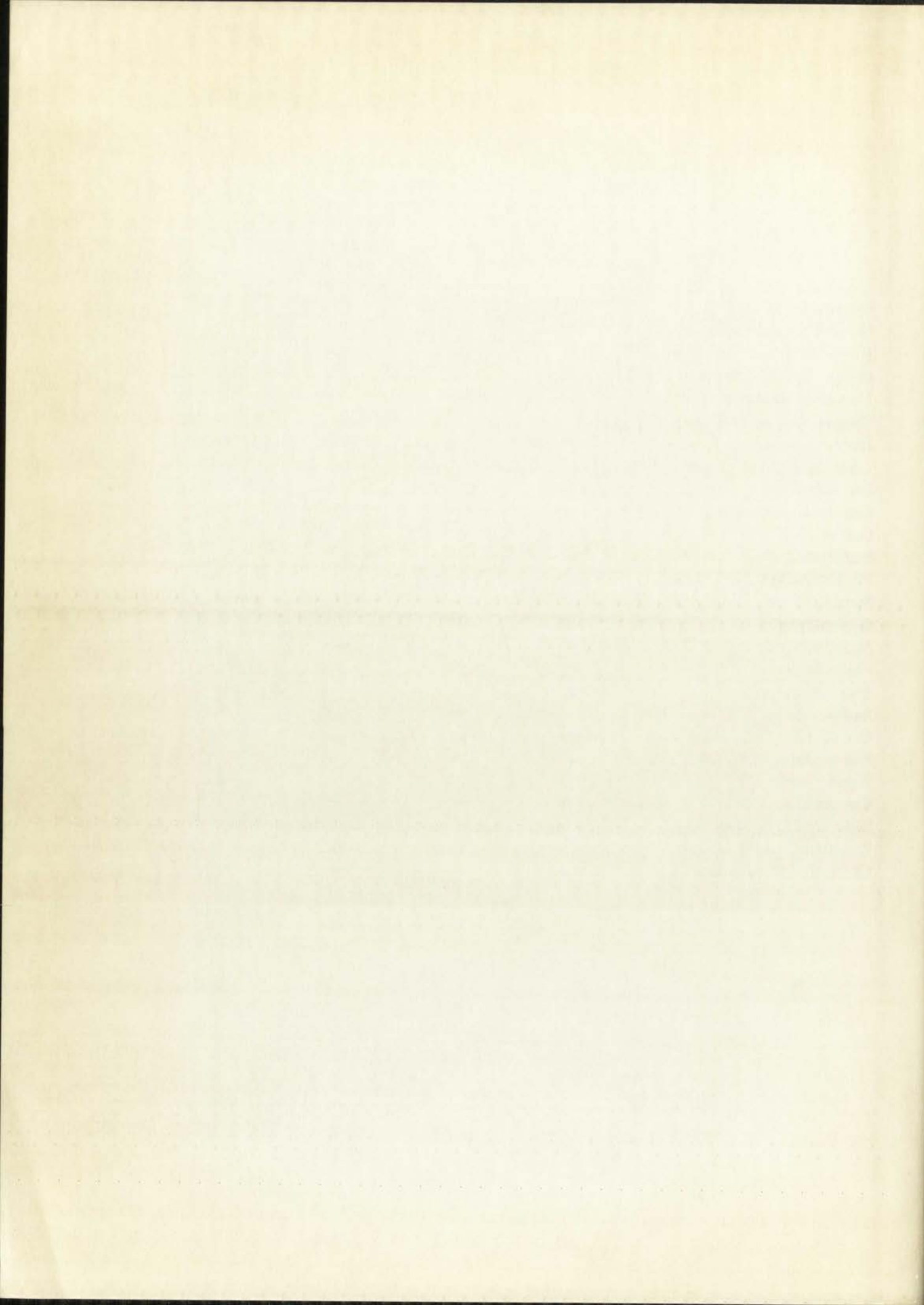
Heliport

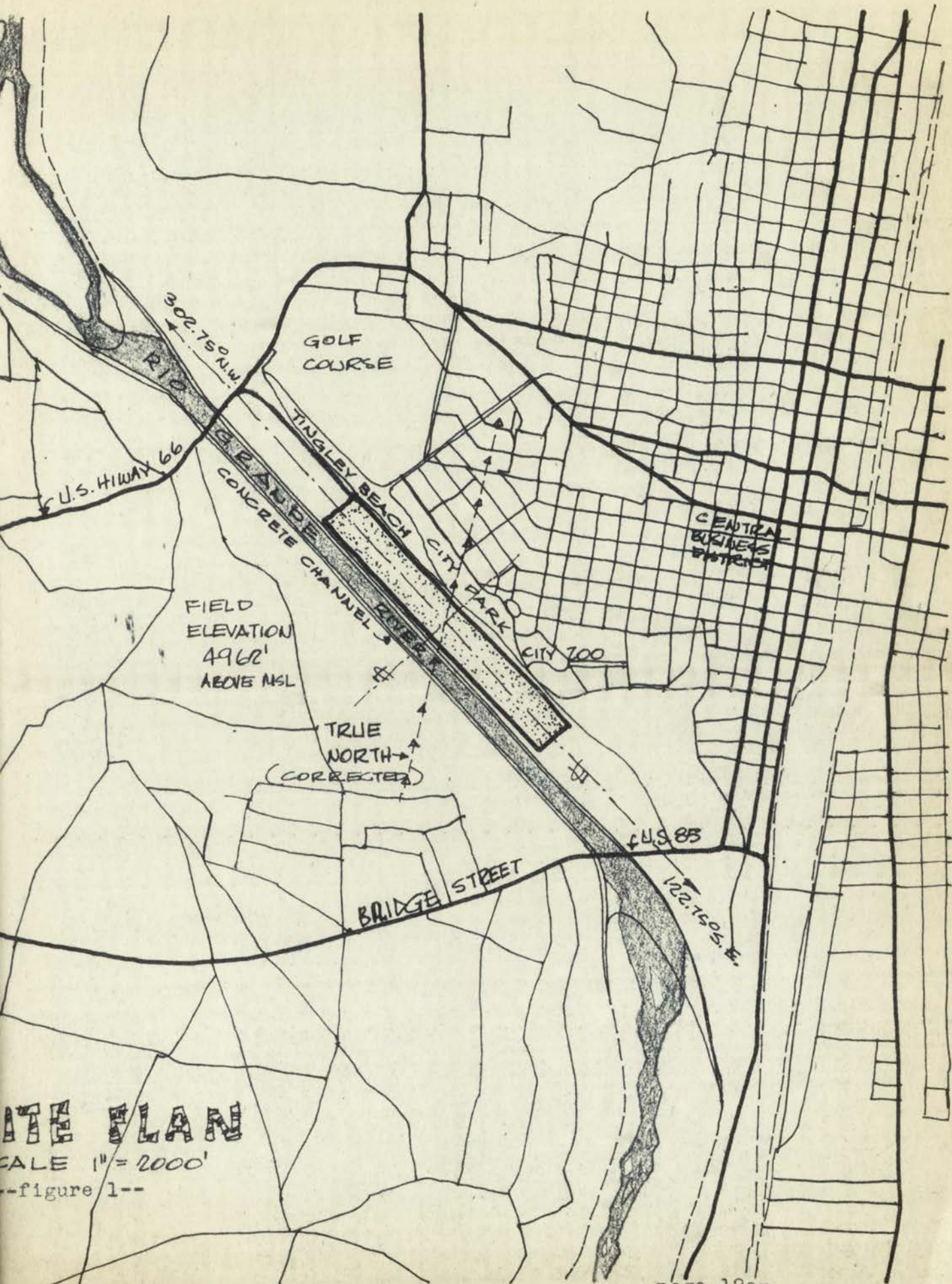


COMPARATIVE CHART SHOWING FACILITIES

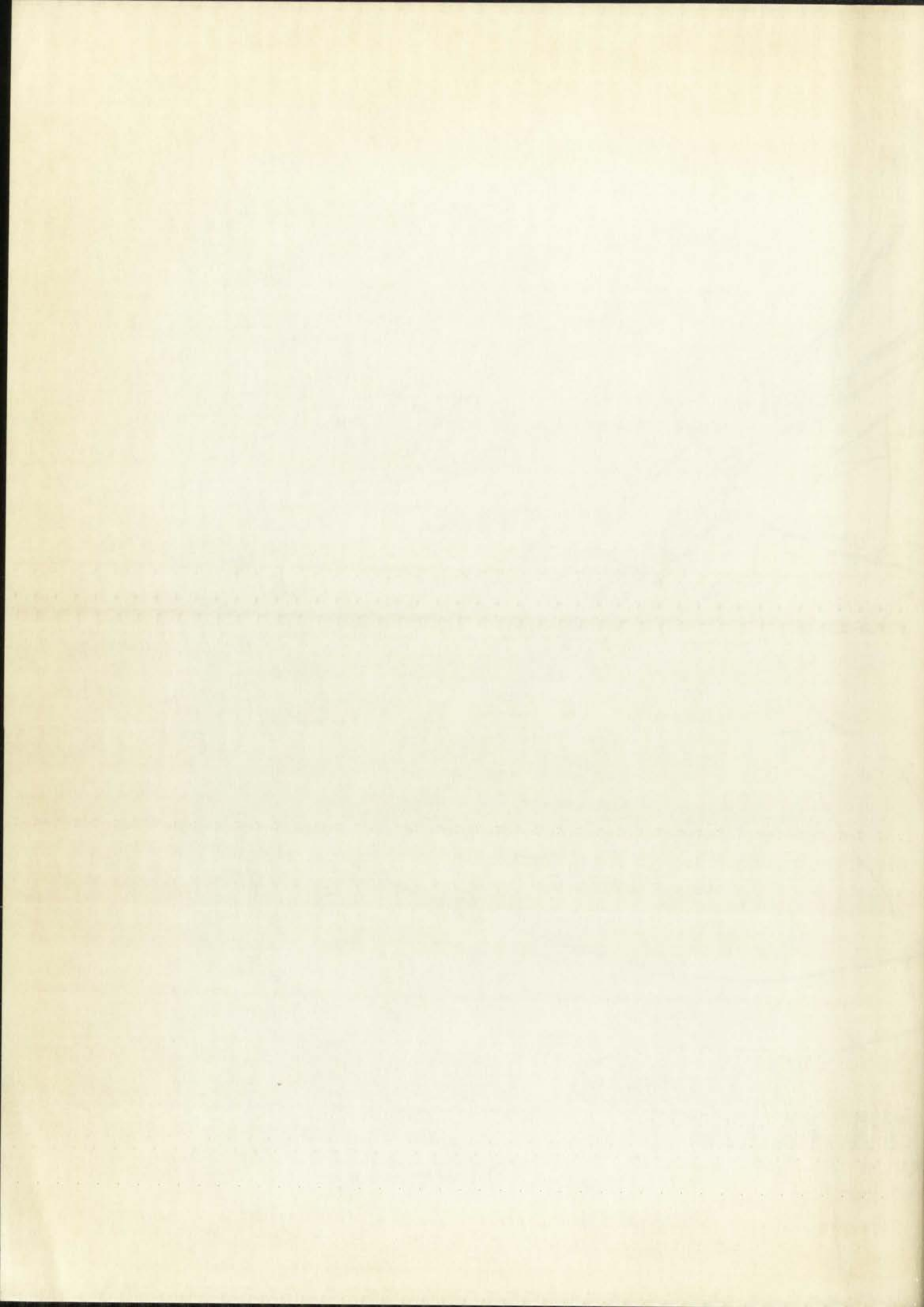
Figure 2

	<u>Municipal</u>	<u>West Mesa</u>	<u>Coronado</u>	<u>Alameda</u>	<u>South Valley</u>
Runway length	10,000	5,000	4,000	4,000	3,000
Number of runways	4	2	2	2	1
Tie-down spaces (permanent)	65	60	80	40	25
Hangar Spaces (permanent)	10	40	75	20	5
Tie-down spaces available	15	20	50	20	10
Hangar spaces available	0	0	5	0	0
Traffic Control	yes	yes	yes	no	no
Overnight guest at port	no	no	no	no	no
Restaurant	yes	no	no	no	no
Cocktail lounge	yes	no	no	no	no
Coffee shop	yes	yes	yes	no	no
Restrooms	yes	yes	yes	yes	yes
Pilot's lounge	yes	yes	yes	no	no
Rental office	no	no	no	no	no
Gas and oil	yes	yes	yes	yes	yes
Maintenance	yes	yes	yes	no	no
Plane sales	yes	yes	yes	no	no
Recreation	no	no	no	no	no
Radio repair	no	yes	yes	no	no
Car rental	yes	yes	no	no	no
Plane rental	yes	yes	yes	no	no
Plane charter	yes	yes	yes	yes	yes
Car parking	yes	yes	yes	yes	yes
Distance from downtown	5 mi.	6 mi.	15 mi.	12 mi.	8 mi.
Prevailing winds lineup	yes	yes	no	yes	no
Obstacles at approach	no	yes	no	no	yes





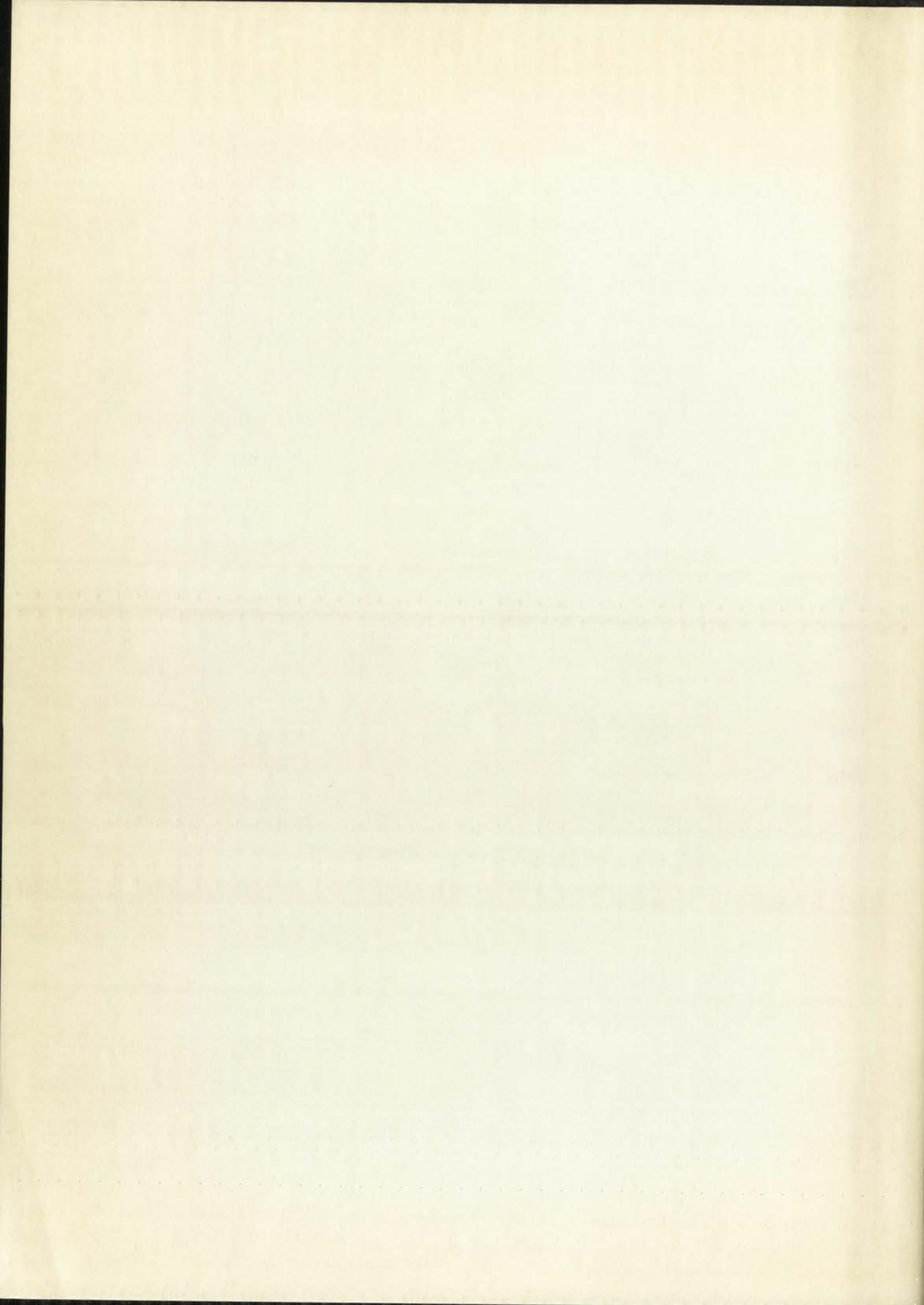
SITE PLAN
 SCALE 1" = 2000'
 --figure 1--



GENERAL AVIATION AIRCRAFT BY CATEGORY

Figure 3

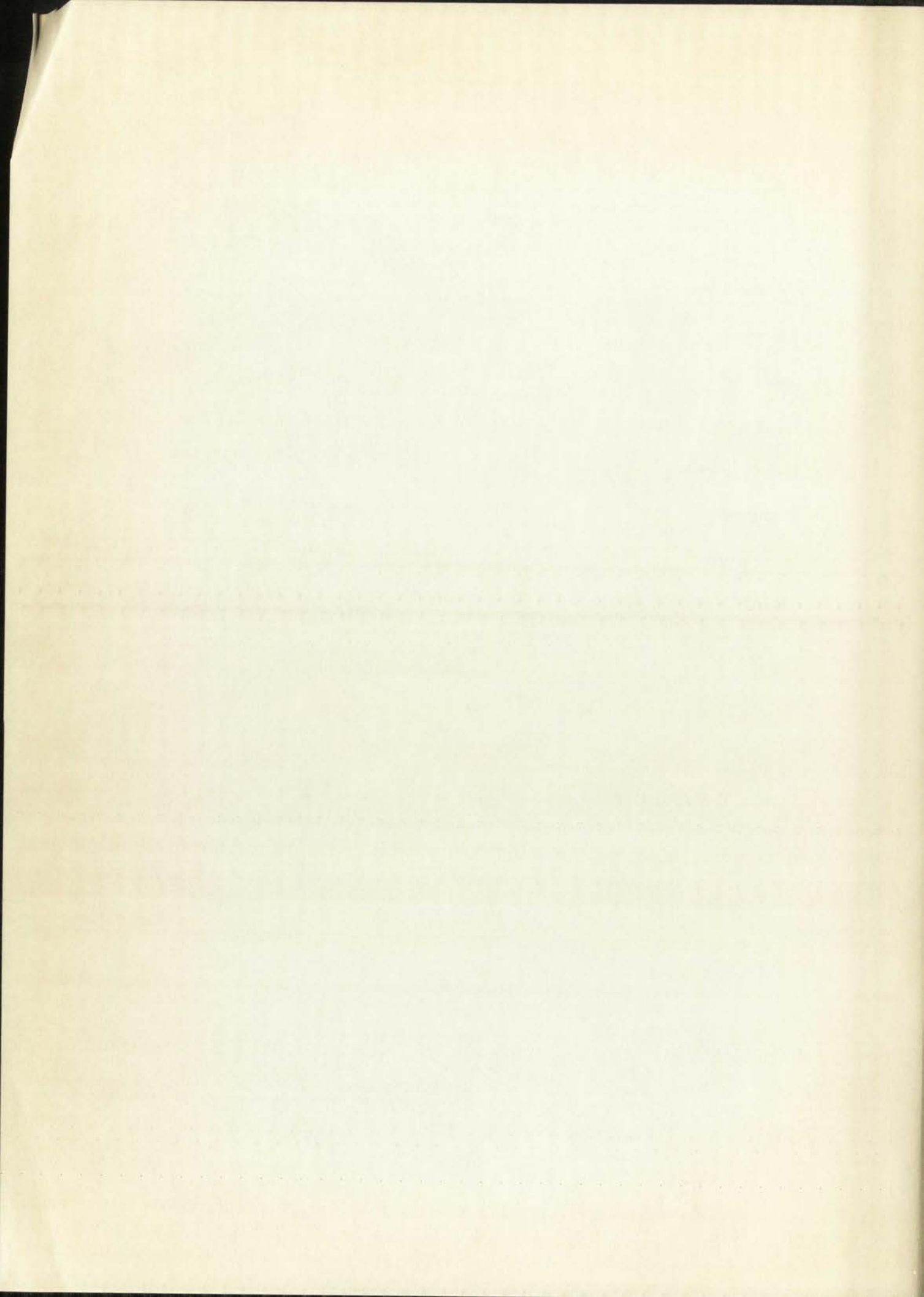
<u>Year</u>	<u>Multi-Engine</u>	<u>Single Engine 4 & 5-Place</u>	<u>Other</u>	<u>Total</u>
1960	6,926	34,478	34,424	75,828
1961	7,700	35,500	33,400	76,600
1962	8,300	37,500	34,100	79,900
1963	8,900	39,500	34,800	83,700
1964	9,500	41,500	35,500	86,500
1965	10,000	44,000	36,000	90,000
1966	10,800	46,400	35,800	93,000
1967	11,600	48,800	35,600	96,000
1968	12,400	51,200	35,400	99,000
1969	13,200	53,600	35,200	102,000
1970	14,000	56,000	35,000	105,000



NUMBER OF DIFFERENT AIRCRAFT USED IN BUSINESS FLYING

Figure 4

<u>Aircraft Types</u>	<u>1960</u>	<u>1965</u>	<u>1970</u>
Turboprop	90	300	400
Small jet	2	50	200
Large jet	0	0	0
Large piston	35	0	0
Rotary Wing	600	1000	2000
Small piston	<u>75,101</u>	<u>88,650</u>	<u>102,400</u>
TOTAL	75,828	90,000	105,000



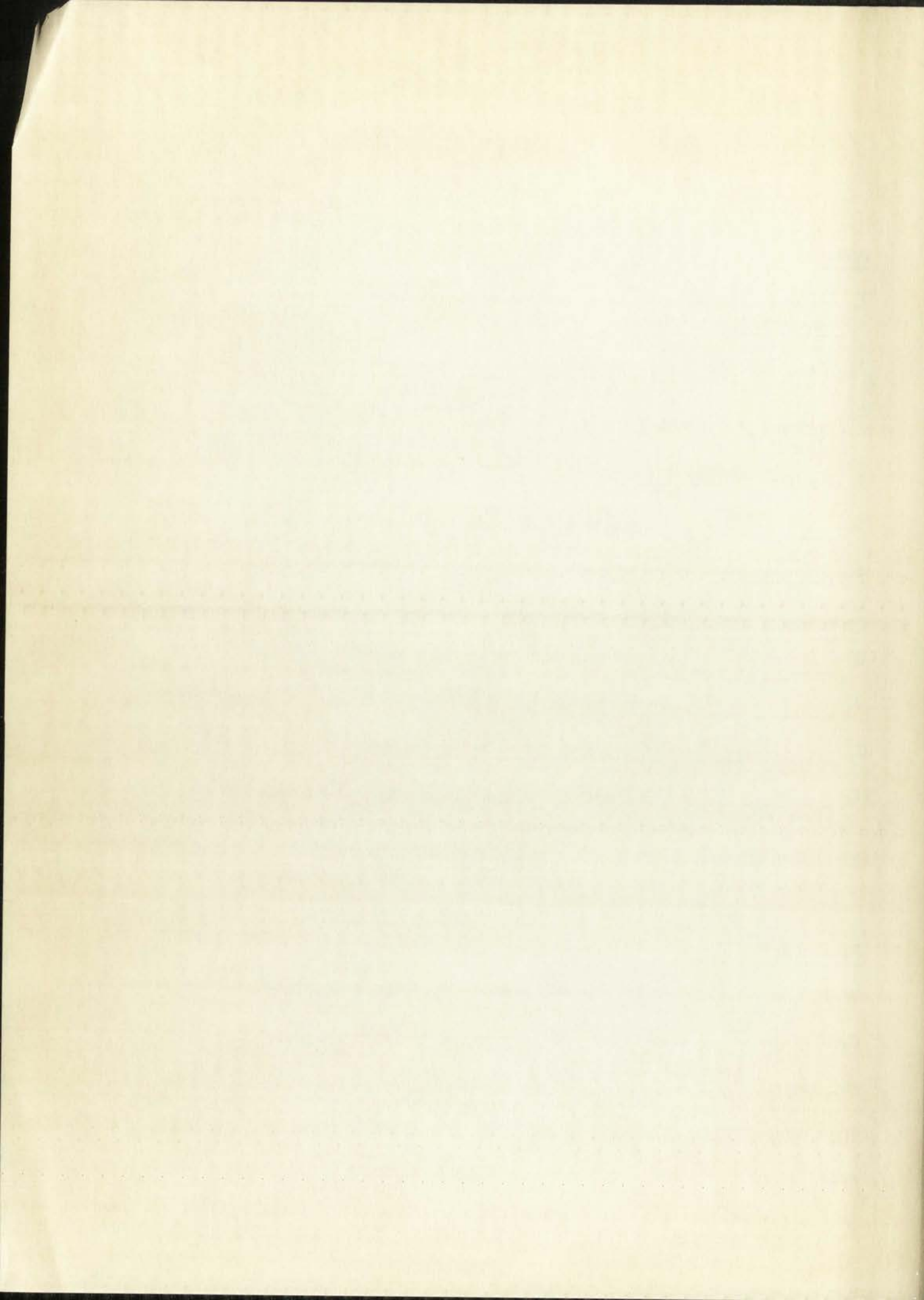
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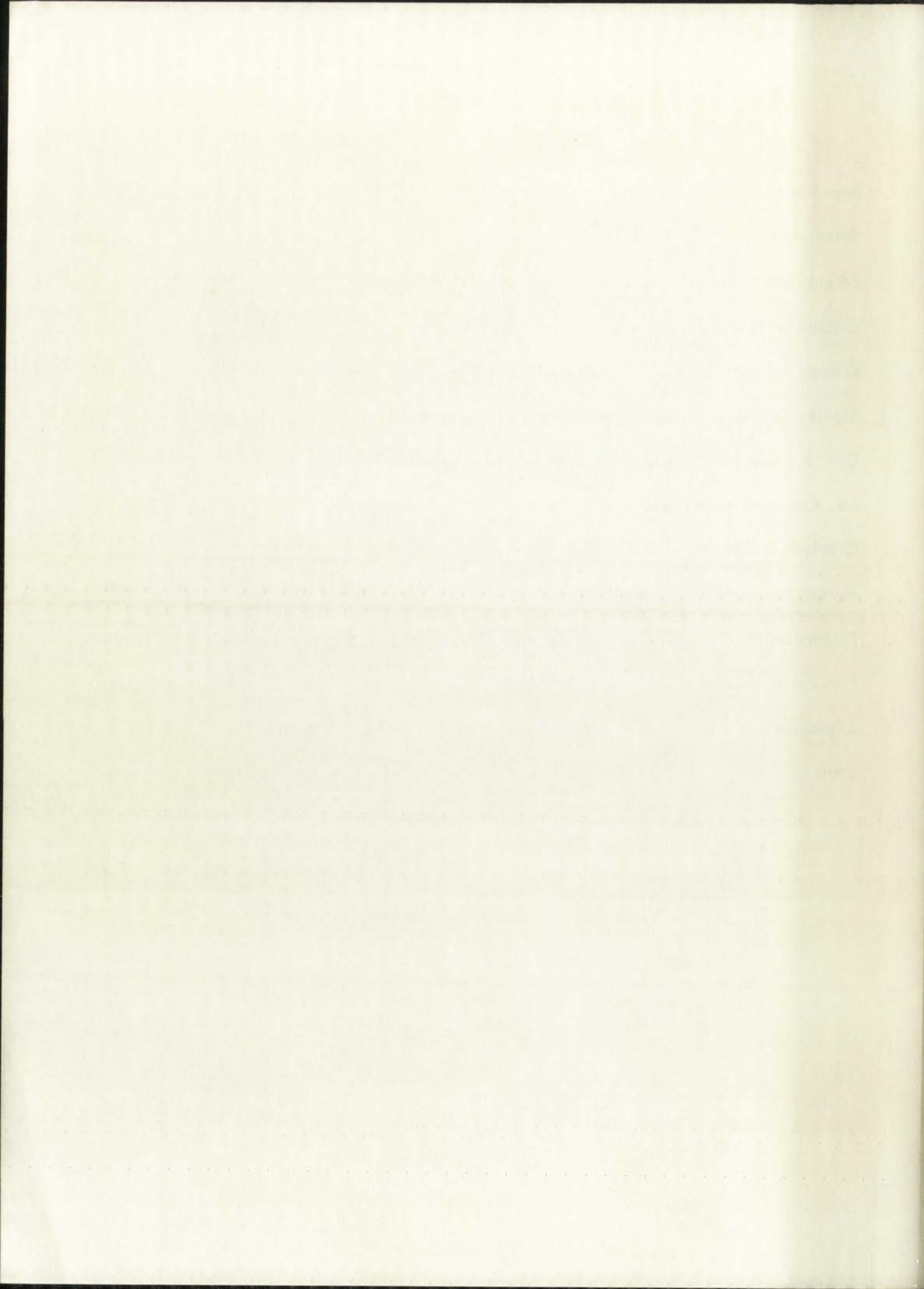
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4. Mauldin, William, Up High unknown
5. _____, Airport Design, U. S. Government Printing Office 1949
6. _____, Airport Turfing (same as No. 5)
7. _____, Airport Drainage, U. S. Government Printing Office 1960
8. _____, Airport Buildings, U. S. Government Printing Office 1957
9. _____, Airport Paving, U. S. Government Printing Office 1956
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12. Froesch, Charles and Prokosch, Walther Airport Planning, John Wiley and Sons 1946

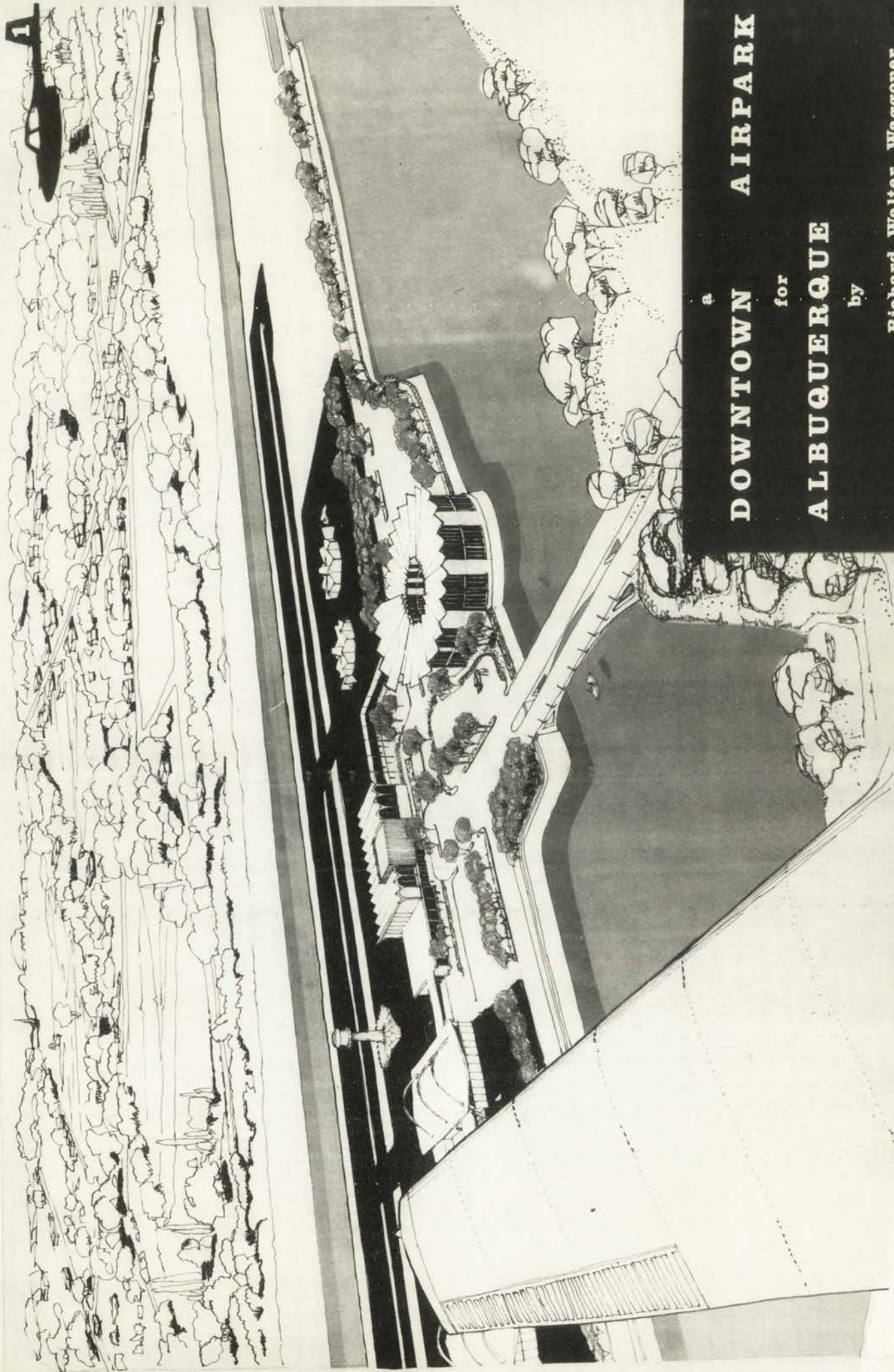
Personal References:

- W. P. Cutter owner and operator of West Mesa Airport
- Carl Ettinger sales manager, Southwestern Skyways, Coronado Airport
- Mr. Burress manager, Coronado Airport
- Bruce Benton instructor pilot and contractor
- Robert W. Fairburn architect, planner and pilot



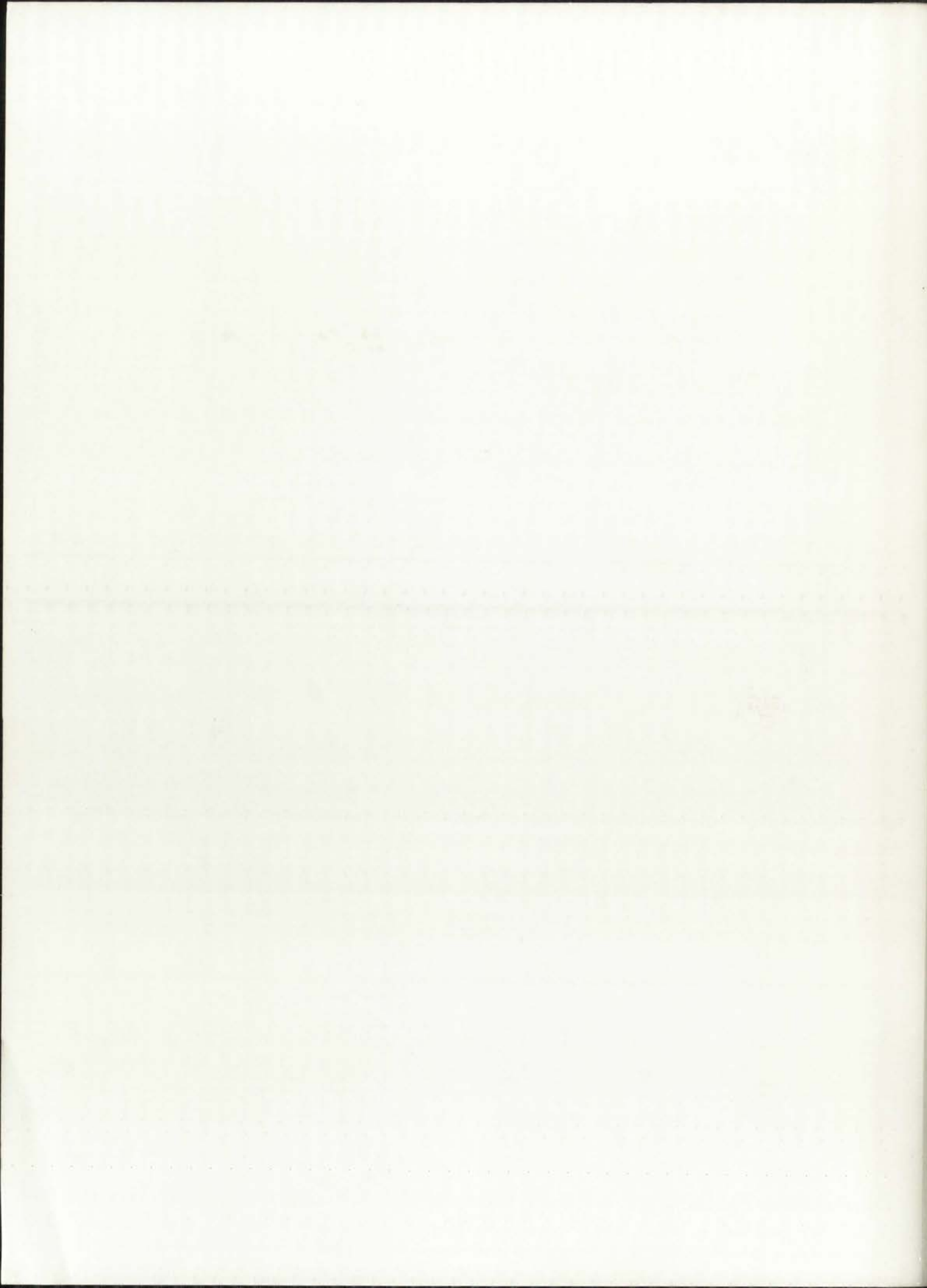
Max Flatow architect, engineer and pilot
 Jason Moore architect, engineer and pilot
 Edward Leach safety director, Federal Aviation Authority
 George Hunsaker traffic director, Federal Aviation Authority
 Edward Sturgess assistant traffic controller, Kirtland Tower, FAA
 Stanley Fish engineer, Bureau of Reclamation
 Col. R. P. Woodson engineer, U. S. Army of Engineers
 Mr. Coe, and Hubert Ball .. Rio Grande Conservancy District
 Charles C. Barnhartattorney, engineer, pilot
 H. O. Waggoner attorney
 Bernard Jones city planning director
 Edmund Engel city manager
 Clyde Sharrar city aviation director
 Louis J. Thompson civil engineer, professor, University of New Mexico



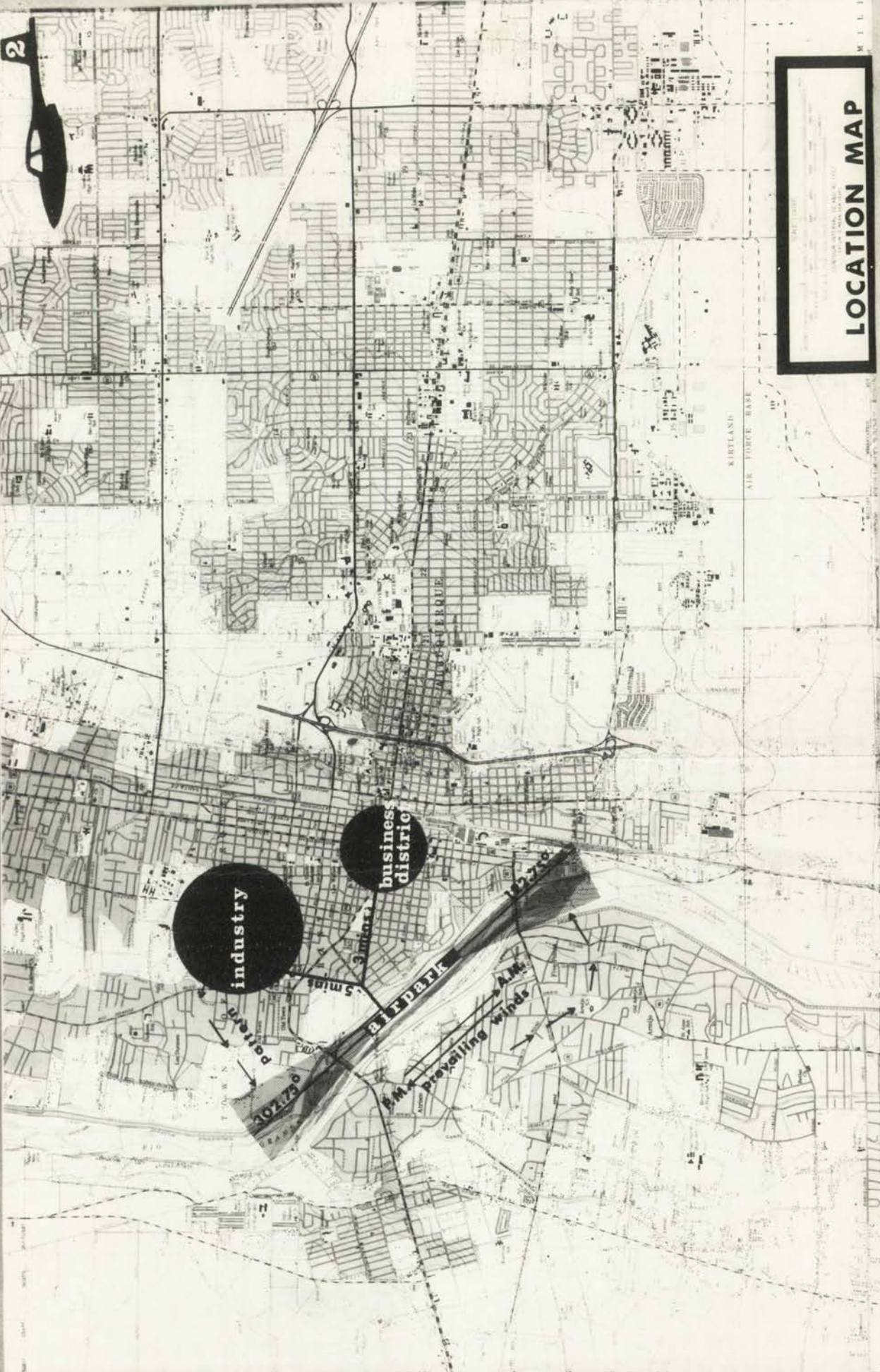


a
DOWNTOWN AIRPARK
for
ALBUQUERQUE

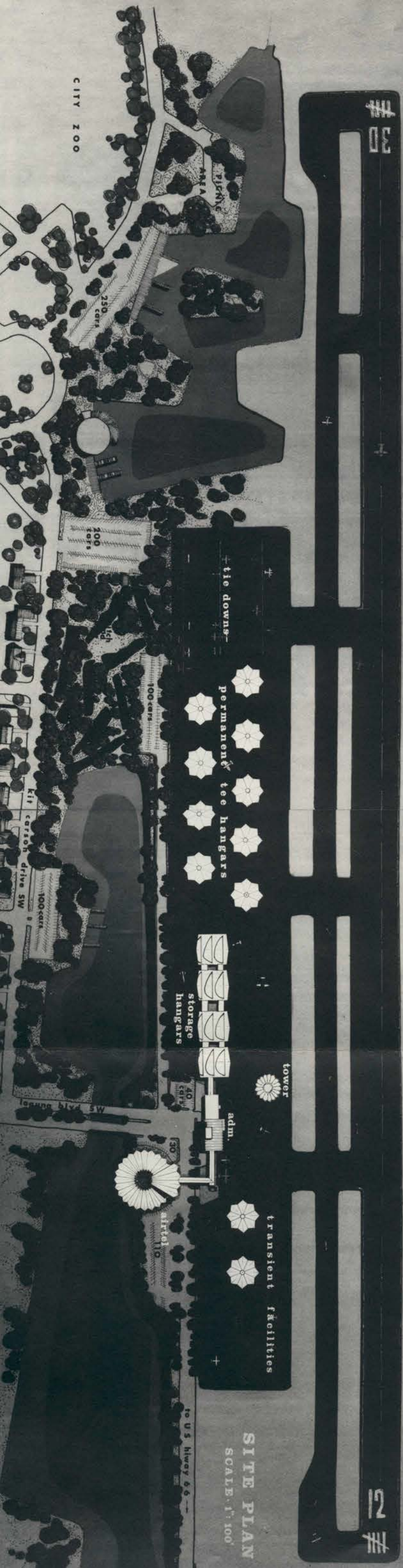
by
Richard Walter Waggoner



2



LOCATION MAP



CITY ZOO

picnic

250 cars

200 cars

100 cars

tie downs

permanent tee hangars

storage hangars

tower

adm.

transient facilities

airtel

to U.S. Hwy. 66

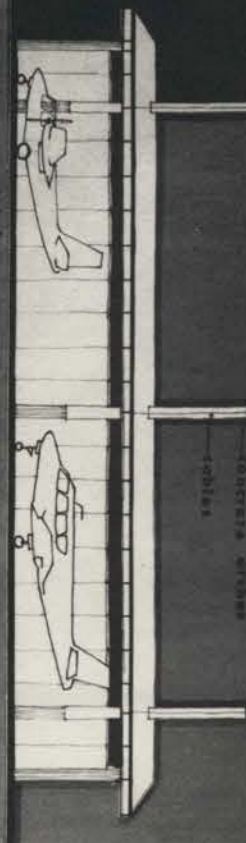
SITE PLAN
SCALE 1" = 100'

RIO GRANDE RIVER



12

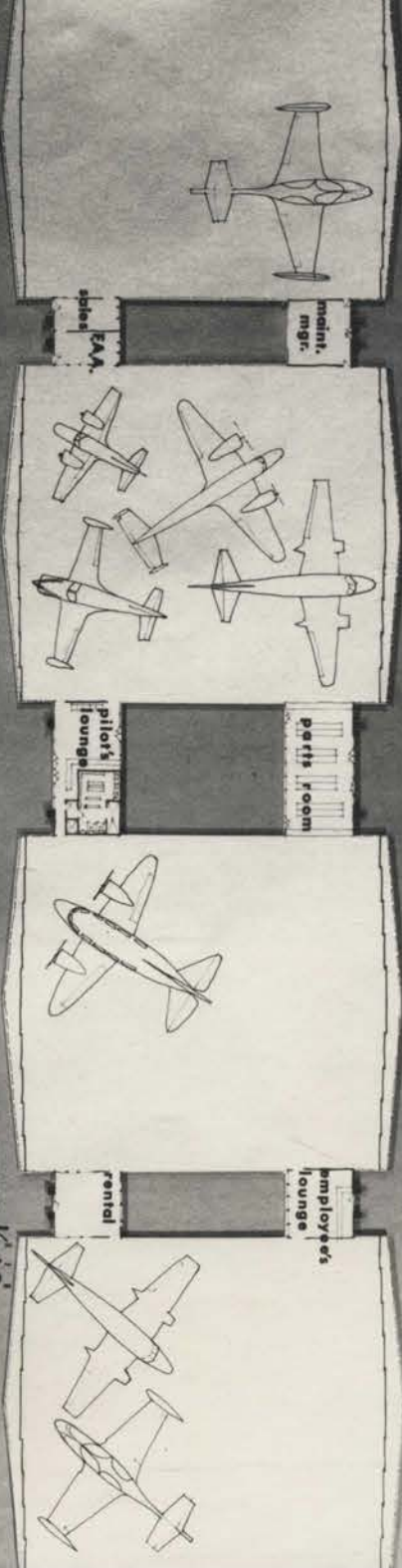
13



SECTION 1/8"-1'-0"



STORAGE & MAINTENANCE HANGARS



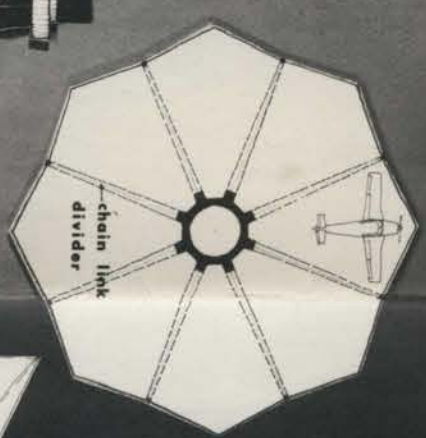
PLANS 1/16"-1'-0"

elevations 1/8"



elevator entry underground

PLAN 1/16"-1'-0"



TEE HANGAR ELEVATION



1/8"-1'-0"

HANGARS

