The New Wichita Municipal Airport

A $10 Million Model Facility Built from Scratch in 3 ½ years

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Dedication of Wichita's beautiful, functional new municipal airport will be a definite milestone in the history of aviation across the Middlewest.

The dedication follows completion of the terminal building, which is the final major structure to be built at the airport. Runways and utility buildings were completed first.

Leadership in the aviation world has become a tradition in Wichita. The old municipal airport southeast of the city was a Class Six airport and was considered one of the finest facilities of its type in the nation.

When it became evident that the City of Wichita would have to accede to the federal government's demands in relinquishing its 1,890-acre municipal airport, located southeast of the city for an Air Force training base, steps were initiated immediately by the board of park commissioners to locate a site for a new municipal airport.

Selecting New Site

However, the operation of two airports within the same general area could not be easily separated, for each required an area much larger than the landing field in which to operate. A safety restriction of a 10-mile lateral separation between instrument runways on the two airports limited possible sites to locations west of the city, since in an easterly direction site would be in Butler county, at least 14 miles from downtown Wichita.

Comprehensive studies were made and two possible sites were found, meeting in general the major requirements for an airport. The site finally chosen is located some 6 1/2 miles southwest of downtown Wichita.

In evaluating the two sites, it was evident that the selected site had the advantages of shorter and better highway routes to the city; closer to available utilities; no serious obstructions to flight in the immediate proximity, and an estimated lower cost of site preparation over other sites considered.

Acquisition of Site

It was finally determined that approximately 1,921 acres would be needed to accommodate the present and future needs of an airport for Wichita. This land was acquired through eminent domain by condemnation and the court awarded a sum of $1,182,922.44 to approximately 30 different landowners.

Planning

The general planning of the airport, especially with respect to the relationship of the runway layout to other functional units, had to be determined concurrently with the choosing of the site.

To prevent possible accidents between the airplanes with pilots flying "blind" on the two instrument landing approaches, the instrument landing runway on the proposed airport had to be within a few degrees of parallel with that of the air base. This meant that the main runway should be located in a general direction between 12° to 20° east of north, or north-northeast-south-southwest.

Consultants, Engineers, Architects

The park board approached the planning problem of the new airport using the basic determination of the Civil Aeronautics Administration that Wichita would need a "continental" class airport, serving aircraft making long, nonstop, domestic flights. The CAA assisted with working out many details and setting up standards of construction, based on its many years of experience in civil aviation, and the results of a recent economic study of Wichita projecting and predicting the city's future growth in airport traffic.

The park board undertook the construction of the new airport under extreme difficulties. The federal government's condemnation case was still in litigation, and the final award of the amount of money for the old airport that the city would have for construction purposes was not known. Further, after taking title to the airport, the Air Force immediately set up a "phasing" out schedule to remove all civil aircraft from the air base at the earliest possible moment. This hurried the planning and made it necessary to make final decisions on plans and specifications of many items, where several alternates were worthy of further consideration.

Leigh Fisher and Associates. A planning consultant, Leigh Fisher and Associates, South Bend, Indiana, was employed by the board to prepare a terminal building analysis and traffic study, to determine space requirements and design criteria of the airline terminal building. This firm also prepared certain financial data estimating construction costs, cost of operation, maintenance and supervision of the terminal after constructed, and set certain proposed rental fees and charges for tenants, giving the board valuable information in limiting the terminal facilities to the actual needs of the community, and well within the airport's ability to finance its operation.

W.R. Fleck, chief engineer for the board of park commissioners, played an important part in coordinating the planning.

The Ediger Engineering Company. The Ediger Engineering Company was employed by the park board as consulting engineers to do the engineering work on the airport. This firm made preliminary tests and surveys, and prepared plans for the construction on the airfield to the park board's specifications.

Architects. The architectural firm of Thomas-Harris-Calvin and Associates was awarded the contract to prepare the plans for the 1.8 million dollar terminal building. In addition to the terminal building, this firm also designed and prepared plans for the Administration-Service Building, the United States Weather Bureau Building, the National Flying Farmers Office Building, the Water Supply Building, the Remote Radio and Receiver Stations and the Airlines' Service Building.

The architects developed a unique scheme on the Wichita airport in using the same low, flat, modernistic type of construction for all of the above-mentioned buildings, employing the same building material.

Advisory and Technical Assistance

The complete history of the planning and construction of the Wichita municipal airport cannot be told without mentioning certain other individuals and firms who made substantial contributions.

Professor C. H. Scholer, Kansas State College, a national authority on concrete pavement, assisted in setting up specifications for the runways, taxiways and other concrete areas on the airport. Guy M. Shelley, consulting structural engineer, designed the hangars and the bulk fuel plant. Carl Green, electrical consultant, designed the primary electrical system, substations, runway lighting systems, parking lighting, etc. The Tulsa Testing Laboratories made extensive soil investigations and tests. The Wichita Chemical and Testing Laboratories made numerous concrete and material tests. The Kansas State Highway Commission assisted in making several thousand tests of stone and cement.

Trans World Airlines, Inc., and Braniff International Airways, Inc., furnished technical assistants to work with the board and consultants in determining the airlines' needs. Mention is due Roland M. Lewis, director of airports and facilities, Braniff International Airways, Inc.; and James A. Mandigo, functional engineer, Trans World Airlines, Inc.

The Wichita Chamber of Commerce set up a special airport advisory committee to work with the park board and the airlines, and gave freely of their time in assisting to interpret the community's needs and desires.

The litigation with the federal government in the taking of the old airport, and the condemnation of the land for the new airport, was handled by special legal counsel composed of Fred W. Aley, Lawrence E. Curfman, Paul J. Donaldson and Robert B. Morton.

Special Features and Design

Airports are pretty much the same over the country, with runways, taxiways, and certain other facilities to handle passengers and aircraft. Most of these airports were conceived and planned some 20 to 25 years ago.

Wichita had a rare opportunity of planning and building an airport from scratch, wherein many of the weaknesses, deficiencies and accumulated obsolescences on the old airport could be eliminated, and many of the new and modern concepts of airports incorporated into the new airport design to more closely fit the needs of aviation today.

It is not possible to report all of the reasons why certain characteristics were incorporated into the plans and specifications, but it is important to understand that there is a good reason for nearly every feature planned for the new airport, some of the most unusual of which are, as follows:

1. **Runways.** Only two runways were planned for the immediate future, with a possibility of additional runways provided for in the master plan. These two runways are laid out in the shape of a "V" with the apex end kept open, and connected with taxi strips. The legs of the "V" form an angle of 50°. Technically this layout is called a non-intersecting, diverging runway system. Superimposing the "wind rose" on the runway design, and using a conservative cross wind component of 15 miles per hour, these two runways, one the instrument runway in a north-east-southwest direction, and the other in a northwest-

southeast direction will accommodate all traffic on the airport for 97 per cent of flying weather. Aircraft landing and taking off under high velocity east and west winds, which may occur as much as three per cent of the time, will be accommodated through the use of a short east-west runway.

By not intersecting the two main runways, it is possible to use them both simultaneously so that an airplane can be landing on one runway at the same time that another airplane can be taking off on the other runway.

The instrument runway, which is 20° east of north is 7,300 feet long, and can be easily extended to 8,000 feet. This runway is almost level, having but one-foot difference in elevation from end to end. The second runway, extending 30° west of north is 6,300 feet long, and can be extended to 7,000 feet. Sufficient land is provided at the end of each runway for adequate clearance to protect the glide path as established by the Civil Aeronautics Administration.

The runways are constructed of 10-inch, reinforced concrete pavement, on a 4-inch crushed rock base—being 12 inches thick at all taxi strip intersections, and for the first 300 feet on the runway ends.

Both runways are equipped with high intensity lights, each with its own regulation transformer. Transformers are arranged for quick change over in case of a failure in either transformer.

The instrument landing system, together with the high intensity lights, lowers the visibility and ceiling restrictions established by the CAA, wherein aircraft coming into the airport are cleared for landing under weather conditions, with a visibility of approximately three-quarters of a mile, and a ceiling of approximately 300 feet.

2. **Taxiways.** All taxiways were constructed of 12-inch reinforced concrete pavement, on a 4-inch crushed rock base. This is the first known airport wherein a crushed rock base course was used, and which meets the highest standard of construction recommended by concrete pavement authorities.

Taxiways serve the purpose of furnishing a connecting link between the runways and the various functional areas. Generous spacing was provided between the runways and service areas, permitting construction of two parallel taxiways along each runway.

The capacity of the runway system was materially increased by designing high speed, 45° "bleed offs" each 1,500 feet along the runways to reduce the amount of time necessary for an airplane to occupy the runway.

3. **Parking Aprons and Ramps.** Two large concrete aprons were constructed adjacent to each other to park, load, unload and service airplanes.

Controls to the "wind tee" indicator and the high intensity runway lights are located in the Tower cab.

4. **Buildings.** The location of the buildings was carefully planned to develop utility and convenience to users, as well as economy in construction. Rather than to concentrate all the various functions of the airport within one large building, separate facilities were constructed to decentralize the units in order to place them in locations convenient to their respective operations.

The building plan locates all of the operating units along the west edge of the taxi strip that serves the main or instrument runway. This is advantageous to the operators in

that access is convenient from the access road by automobile, and by aircraft on the field side.

Adding to the unusualness of the building program was the board's ability to adhere to the same style of architecture and use of building materials in the various functional areas. Low, flat, modernistic buildings, with large glass areas, framed with salmon pink brick, and blue terra cotta, determined the basic design around the terminal and service area.

Buildings

Terminal Building. The Terminal Building located near the center of the airport is designed to house the airline ticket offices, communications, reservations, passengers, luggage, mail, air freight, food, etc. It is an ultra-modern structure streamlined for comfort, efficiency and functional operation. The access road from the north curves to the west and makes an east approach along the front, or north side of the building, discharging passengers along the airline wing.

All operations are from a single level, except that there is a second story above the airline wing for offices, and the separate seven-story Control Tower is connected by a concourse.

Passengers are completely separated from vehicular traffic on the terminal apron through a tunnel extending from beneath the lobby to the gate positions. Escalators raise and lower passengers to and from the lobby, and an attractive passageway gradually ramps up to the six gate positions.

The comfort and convenience of the passengers and visitors were well planned for. The restaurant, coffee shop, private dining rooms, public telephones, lobby, car rental, taxi and limousine service and baggage claim area are all conveniently located. The public restrooms are far more spacious than commonly found in public buildings. An infants' nursery is available to traveling parents with small children. Recessed lighted show-cases are built into the walls for displays and advertising local firms.

The restaurant has a south exposure looking over the terminal apron and most of the airport. Each row of tables is terraced or elevated to provide an unobstructed view from any location in the room. Special furnishings were designed with recess pinpoint lighting to attempt to eliminate light reflections, making it possible to see through the glass exposures at night. Several small private dining rooms are available, separated by accordion type folding doors, so that space may be increased to handle up to 250 people.

The entire building is air conditioned with modern equipment which handles a 500 gallon per minute well and a 250 horsepower motor and compressor. The discharged water can be used for irrigation or piped directly to replenish the water in artificial lakes located north of the terminal in an area planned for park and recreation use.

The casual visitor to the airport gets an excellent view of the terminal apron activities from the spectators promenade deck located on the south edge of the roof of the terminal. A portion of the deck is sheltered by a canopy.

The high fidelity public address system, with low modulated speakers at 20-foot intervals recessed in the ceiling, will "pipe" background music throughout most of the building.

The entrance will be landscaped and beautified with open lawn areas backed up with shrubs, flower gardens and ornamented trees.

Hot water pipes are embedded in the sidewalk along the front of the building for radiant heating, to remove snow and ice.

Administration-Service Building. A separate building was planned for the airport manager's office and service functions. The Administration-Service building is on ground level, adjacent to the east automobile parking lot, and the west transient and itinerant airplane parking apron. Park board personnel, responsible for the supervision and maintenance of the airport, is housed in this building. A bombproof shelter was built into the basement to serve as the civilian defense central control station. The building also houses the electrical transformers, voltage regulators**,** switches and standby generator for the field. A second 75 KW standby generator is located in the basement of the Terminal Building as an auxiliary power supply in the event of interruption of the electric supply.

Weather Bureau Building. Directly north of the Administration building and abutting the transient apron, the Weather Bureau is housed in a separate structure. It is the only facility of its kind, which has been specifically designed for weather bureau activities. It is easily accessible to the public and to the pilots of aircraft. Equipped with radar and the latest in meteorological equipment this building provides a model facility for aviation weather reporting.

National Flying Farmers Building. North of the Weather Bureau building is the National Flying Farmers' office building. This location has the same advantages as the Weather Bureau building. The location of the National Flying Farmers Association headquarters on the airport is in keeping with the national prominence which Wichita has in the aviation industry. The Flying Farmers financed the construction of the building and will retain title as long as their national headquarters are located in Wichita.

Hangars. In constructing the T-hangars and fixed-base operators' sales and service buildings, the board departed from brick construction in favor of tilt-up and prefabricated concrete structures. These buildings were designed by Guy Shelley; consulting engineer, and while substantial, were less expensive than conventional construction for their particular use.

The full glass fronted show rooms, and the radiant heating in the floors of the fixed-base operators' hangars, are improvements designed into the facility not common to most airports. Attractive office space was provided which can readily be air conditioned if desired by the operator.

A total of six T-hangars, housing 10 planes each, were built adjacent to the three fixed-base operators buildings. Each operator will have 20 T-hangar units to sublet to customers, providing a direct sales exposure and customer contact not experienced on airports where the management and control of t-hangars are separate from the operator. These too are concrete buildings, somewhat larger then any of the prefabricated T-hangars on the market. They will accommodate all of the single engine aircraft in use today. Each of the hangar units is separated with a concrete firewall, making them as nearly fireproof as possible.

Four large sales and service buildings have been completed and a fifth is in the planning stage.

Airlines Maintenance Building. The service and storage operations of the airlines are separated from the Terminal Building in an Airlines Service Building, located immediately west of the Terminal Building. This building is the first stage of a future cargo depot.

Utilities

Water Supply Facilities. North of the Flying Farmers headquarters building is the airport water supply facilities. Although the water is of excellent quality, it is chlorinated with modern equipment as an additional health precaution. There seems to be an unlimited water supply for airport needs close beneath the airport surface. A

complete distribution system including mains, laterals, and fire plugs serves the entire building area.

Water Works System. The source of supply for the airport is from a 116-foot, 30-inch gravel wall well located in the water works building. The pumping equipment consists of one 875 gpm low service well pump equipped with dual drive, electric motor, and gas-gasoline engine, and one 500 gpm high service pump with space provided for two future pumps of the same capacity. The water storage for fire protection consists of a 200,000 gallon underground concrete reservoir. The distribution system is comprised of a 5,000 gallon pressure tank, 3,400 feet of 8-inch cast iron main, 1,600 feet of 6-inch submain, and 625 feet of 4-inch and smaller service lines. There are 14 fire hydrants installed at pertinent locations on the airport.

Gas Service Lines. The gas supply for the airport is purchased from the Gas Service Company near the intersection of Wheeler Avenue (north property line) and the access road. The distribution system contains 5,685 lineal feet of 6-inch welded steel pipe, 280 feet of 4-inch welded steel pipe and 700 lineal feet of 2-inch welded steel pipe.

Electrical System. The electrical supply is purchased from the Kansas Gas and Electric Company at a substation located on Harry Street. All electric lines are underground, in conduit or direct burial, and consist of over 60,000 lineal feet of electric cable of different voltages with varying numbers of conductors. There are over six miles of conduit under concrete roads, runways and taxiways. All installations on the secondary side of the substation were constructed by the park board.

Sewage Disposal Plant. Across the airport to the east is located the sewage disposal plant for the entire airport, which can be enlarged when necessary. The plant is a standard Imhoff system consisting of a complete treatment plant having a designed capacity of 500 population, a 9,290 lineal feet of vitrified clay sanitary sewer lines and 27 manholes.

Other Construction

In connection with the development of the new airport certain other major construction work was involved, as follows:

Clearing of Site. Approximately 30 acres of wooded area was cleared, and 52,000 lineal feet (nearly 10 miles) of hedge was removed. Some 74,000 lineal feet of fence was removed, a length equal to the distance between Mulvane and Wichita.

Drainage. Reinforced concrete storm sewers, sizes 12-inch to 66-inch, and 32,400 feet long (approximately 6 miles) were constructed. Some 4,575 lineal feet of corrugated metal pipe, cast iron pipe and vitrified clay pipe were also installed. The storm sewer system also includes 81 inlets and manholes and over a mile of open drainage ditch.

Grading. The total amount of grading on the complete airport site amounts to approximately 2,660,000 cubic yards of earth.

Runways and Taxiways. The total paved area of the runways and taxiways amounts to 117 acres. Of this, 208,307 square yards are 12-inch reinforced concrete pavement, 336,960 square yards are 10-inch reinforced concrete pavement, 38,660 square yards are 8-inch reinforced concrete pavement, and 15,618 square yards are 6-inch reinforced concrete pavement. The runways and taxiways are supported on a sub-base of crushed limestone 4-inch thick, which amounts to some 1,849 carloads.

Access Roads and Parking Lots. Access roads and parking lots are constructed of 6-inch and 8-inch reinforced concrete pavement and comprise some 12 1/2 acres in area. The 8-inch reinforced concrete pavement amounts to 45,900 square yards (access roads), and the 6-inch reinforced concrete pavement amounts to 23,180 square yards (parking lots). The area is curbed with an 8-inch integral curb amounting to 32,000 lineal feet. The area is drained with its own storm sewer which contains 8,960 lineal

feet of storm sewer pipe, 72 inlets and 18 manholes. There are over 8,000 lineal feet of 4-inch concrete sidewalk in the area.

Designed for Future

City officials anticipate that the new municipal airport will have a decided effect on Wichita's stature as an aviation center. Every functional unit of the airport was designed for easy expansion when necessary. The adequacy of the airport is projected well into the future and is expected to serve Wichita's needs for many years.

By 1960, the air trade committee of the Wichita Chamber of Commerce believes that air traffic in general will be about 65 per cent higher than it was in 1949.

Airliner schedules are expected to increase about a third. Non-scheduled flights, with a marked increase in private airplane activity, are expected to increase some 30 per cent.

Airliners using the local port are expected to be larger, increasing from the present 27.5 passenger capacity to 45 on the average.

The 48,637 incoming air passengers of 1949 are expected to increase 65 per cent. The 141 tons of air cargo are expected to jump 60 per cent. Express and air cargo are expected to jump from the 225 tons of 1949 to a figure as high as 1,728 tons.

The new Wichita Municipal airport is acknowledged to be one of the model airports of the United States.

Statement of Cost of New Airport

Land (1,921 acres) $1,182,922.44

Airfield

Land improvement—seeding, boundary fencing, other..... $97,118.97

Runways, taxiways & aprons—earth work, drainage of runways, taxiways, aprons 4,127,546.64

Safety, lighting & communication—Safety, lighting, marking & zoning 73,451.07

*Remote radio building—receiver
*Remote radio building—transmitter 19,633.19

Material yard buildings 990.06

Building Area No. 1

Land improvement

Ramps & aprons—small hangar area, lighting

Roads, walks, fencing, etc. 13,931.32

Rented Buildings

Hangars—Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9..... 704,558.28

*Weather Bureau Building

[1]Flying Farmers Building

[2]Airline Maintenance Building

[2]Standard Products Building 135,118.19

Terminal Building

Roads, walks, fencing, etc., main parking area

Building—tunnel, escalators, other—

Includes control tower main building $2,165,109.76

Fuel Sales & Services

Bulk plan—main bulk station

Spur track

Stationary service equipment—pumps, motors, etc.

Service & administration building, furniture & fixtures 220,789.63

Miscellaneous Indirect

Administration 47,687.06

Engineering—plans, specifications, etc., supervision & inspection, testing materials, other 301,817.73

Equipment, public roads, access roads, lighting, landscaping parks & grounds, fire protection 470,200.38

Sewers & utility lines—

a. sewage disposal plant, b. gas lines, c. water lines, d. electric service, e. water supply 349,934.46

Office furniture & fixtures 1,645.67

Airport manager's residence 914.36

Total..... $9,985,688.21

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*The Federal Government through the CAA and U.S. Weather Bureau installed equipment on the airport estimated to cost $400,000.

[1]The Flying Farmers paid an additional $10,000 on this building and rentals will amortize the city's investment.

[2]These buildings are rented to amortize the cost in 10 to 12 years.

Annual Budget for New Airport

The annual budget for the new airport anticipates revenues totaling $314,548.68, which includes $130,000 from rentals, $25,000 net from sale of gasoline and other commodities, $15,000 from concessions, $70,000 from landing field charge, and $74,548.68 from other income, but no general property tax money.

Annual airport operating expenses are estimated at $314,548.68, which includes $47,706 administration, $150,307.68 maintenance, and $116,535 depreciation.

The budget for the last full year of the old airport totaled $297,039.50.