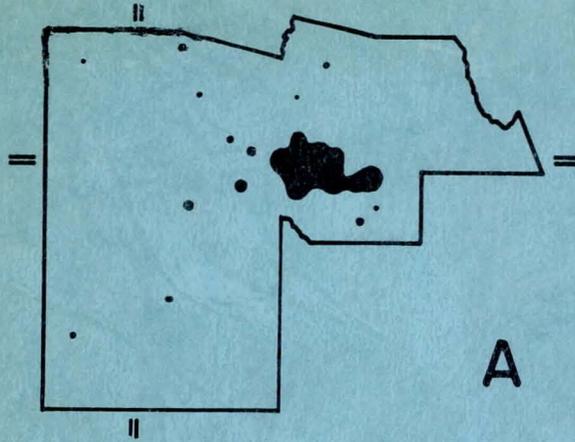


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PART I

A PART OF THE
COMPREHENSIVE PLAN FOR
MARICOPA COUNTY, ARIZONA

- HISTORY
- ECONOMICS
- PHYSICAL FEATURES

By

THE MARICOPA COUNTY PLANNING AND ZONING DEPARTMENT

1963

Price: Five Dollars

MARICOPA COUNTY

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PREFACE

This report is Part 1 of a comprehensive plan for Maricopa County. It is concerned primarily with information and data basic to determination of land-use objectives and policies thereunder. This report contains a brief history of Maricopa County, economic trends, and major physical features that influence physical planning in the county.

Part 2 will contain an analysis of population and land use for unincorporated as well as incorporated areas. For incorporated areas this work will primarily consist of consolidating in one volume the proposed land-use plans that have been prepared for various communities. Since 1958 the County has prepared physical plans or parts thereof for nine (9) of the eighteen (18) incorporated towns, the Salt River Indian Reservation, and the Gila River Indian Reservation. In addition, the County Planning Department and City of Phoenix Planning Department jointly prepared population and land-use studies for the Phoenix urban area. Wilbur Smith and Associates prepared a system of major streets and highways designed primarily to serve the future urban area, and Western Management Consultants prepared several economic studies for various geographical areas in the County. The aforementioned work has been carefully coordinated and undertaken in logical sequence.

Part 1 is a summary of certain information that has been compiled by this Department and presented by maps, graphs, tables and corresponding text. The history chapter uses information from secondary sources and is

not a work of basic research. The economics chapter is a collection of information published by the U.S. Census Bureau, the Valley National Bank, the Arizona Employment Security Commission, and the Arizona Bureau of Business and Public Research. The chapter can be considered as supplementary to the Economic Analysis and Projection for Phoenix and Maricopa County, by Western Management Consultants. The physical features chapter provides information which has been obtained from the U.S. Weather Bureau, Arizona Bureau of Mines, U.S. Geological Survey, U.S. Department of Agriculture, Bureau of Reclamation, Salt River Project, Maricopa County Flood Control Department and other various offices.

This report is designed to portray the historical, economic and physical background of the County and is based on factual information that is readily obtained from various private and governmental organizations. For example, economic data are primarily from U.S. Census sources. Comparability between census years is not always exact.

In seeking and analyzing detailed information, it was found that sufficient information is not always available to provide a complete analysis for the development of a comprehensive plan. Other studies that are necessary and which should be obtained include: (1) A ground-water resource study for the County, (2) A review and extension of the "Economic Analysis and Projection for Phoenix and Maricopa County" prepared by Western Management Consultants, Inc. and published November 11, 1959.

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SUMMARY OF MAJOR FINDINGS

History

- (1) Maricopa County has had a long history of Indian settlement and Spanish exploration .
- (2) The Indian civilization known as the Hohokam reached a high level of stone-age culture , which included a system of elaborate irrigation works in the Salt River Valley . For reasons such as drought or invasion by hostile tribes, they abandoned their fields and villages about 200 years prior to the first Spanish exploration .
- (3) The Spanish never made permanent settlement in the present boundaries of Maricopa County . However, the geography of the area was known to missionaries and army officers stationed to the south in the Tucson-Tubac area .
- (4) Anglo-American settlement was hampered by remoteness from other civilized areas . Many years passed before effective governmental administration was organized and adequate transportation facilities were established .
- (5) Early farmers in Maricopa County were plagued by alternate conditions of drought and flood . The system of dams on the Verde and Salt Rivers stabilized the environment for agriculture , thus providing the economic base that is largely responsible for the urban development present today .

Economics

- (1) General economic trends for the County have been similar to those of the State in the last two decades, with the exception of mining.
- (2) In 1960 the County accounted for seventy per cent of the State's manufacturing income, fifty per cent of the State's income from agriculture and tourism, and fifty per cent of the State's population.
- (3) From 1939 to 1958, Maricopa County's rate of growth in such economic indices as value added by manufacture, retail sales, wholesale sales, and receipts from selected services far exceeded the national average. However, the County is below the national average in per capita value added by manufacture and in per capita wholesale sales.
- (4) From 1940 to 1960, Maricopa County's population growth was 256 per cent, the labor force growth was 267 per cent, and employment grew at 329 per cent.
- (5) Unemployment in Maricopa County dropped from 7 per cent of its total population in 1940 to 2 per cent for 1960. In spite of heavy migration to the County the rate of unemployment has dropped, indicating that migrants are finding employment and suggesting that economics plays a greater role in stimulating the County's growth than is commonly supposed.
- (6) In 1940 the three major industries within the County were agriculture, trade and services, with each heading over 20 per cent of the County's total employment. By 1960 agriculture had dropped to 8 per cent and was surpassed in rating by manufacturing at 16 per cent.

- (7) Over the past 20 years considerable change has occurred in the type of products manufactured as shown by the change in employment distribution. However, in spite of recent improvement, Maricopa County has a long way to go to reach maturity as a manufacturing employment center.
- (8) Trade employment for the County is above the national level but a small relative decline has taken place in the last ten years. A further decline can be expected but not to any proportion that will seriously affect the economy or land-use trends of the County.
- (9) The County has experienced a relative decline in personal service employment and a relative increase in professional service employment. These trends should continue for the next ten to twenty years as national trends are definitely set in this direction.
- (10) In general, the County is very similar in employment distribution as compared to other metropolitan areas studied within this report. The County is not different from other areas within the Mountain States Region, but the Region does differ from the Nation.

Physical Features

- (1) In general, climatic conditions do not restrict or indicate the necessity of a specific type of urban development within the County. However, due to low annual rainfall, irrigation is necessary for agriculture.
- (2) Daily and annual temperature variations within the County are rather mild as compared to the below-zero to above-100-degree temperatures of some northern areas. The efficient use of air conditioning, mild winters, and dry climate makes the County attractive for industry and urban living.
- (3) A large variety of surface and subsurface soils and geological conditions exist within the County which present general development problems in certain areas.
- (4) In Maricopa County there is over 7,000 feet difference between the points of highest and lowest elevations. Topography and slope variations are quite extensive throughout the County and restrict general urban development in certain areas.
- (5) Water is the most important resource of the County. Water quantity and quality have become an increasing problem in the development of certain outlying areas. A detailed investigation is needed of the County's water problems and general future outlook.
- (6) Drainage and flooding problems can occur in certain parts of the County. These problems are being compounded with rapid urban development that takes place with little regard to the natural drainage system. A flood control and conservation study is being undertaken to correct existing conditions and prevent the development of additional flood problems within the County.

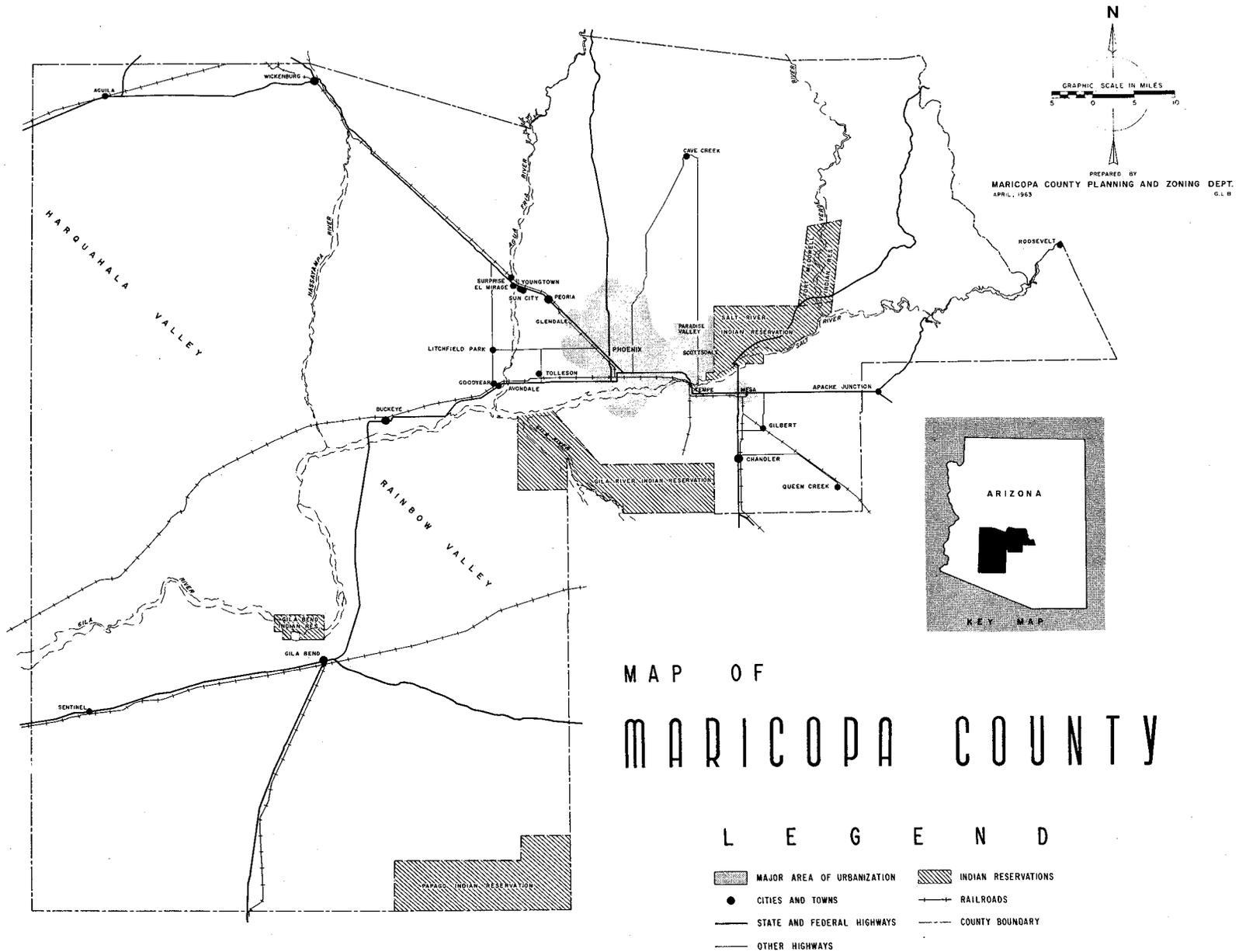


PLATE I

CHAPTER 1

HISTORY

Maricopa County was organized by the Territorial Legislature of Arizona in 1871, eight years after the separation of Arizona from New Mexico Territory (in 1863), and twenty-three years after the acquisition of the area by the United States (in 1848). The village of Phoenix, located in the middle of the Salt River Valley, was designated as the original county seat. Unlike many other counties throughout the United States, the county seat of Maricopa County has remained in one place since the inception of its government. Phoenix was incorporated as a city in 1881, and growth of both City and County has been significant and continuous to the present day. Plate 1 shows the location of present-day cities and towns.

This chapter presents the subject of State and County history in broad and general terms, beginning with prehistoric Indian inhabitation and continuing through the Spanish and Anglo-American periods to the present day. Historical treatment cannot be completed in Chapter 1; an economic history from 1940 to 1960 is contained in Chapter 2.

Indian Civilizations

Various Indian tribes inhabited Arizona and Maricopa County from very early times, possibly as early as 9,000 B.C.⁽¹⁾ Undoubtedly many tribes passed this way in making their way from Alaska to Mexico, Central and South America. But the nomadic life of these ancient people kept their settlements from becoming a permanent part of the landscape, and consequently nothing is known as to who they were, where they were going or what they carried with them.

The Canal Builders or Hohokam

The first known permanent dwellers of the Salt River Valley and nearby portions of the Gila Valley were the people designated today as the Hohokam.⁽²⁾ Although these people attained a high degree of stone-age civilization as determined by archeological evidence, they had no alphabet or written language, and therefore left no narrative or story in writing to be deciphered, as in the case of other ancient civilizations in Mexico or Egypt.

It is now believed that the Hohokam settled in the middle Gila Valley about two thousand years ago. Probably they had a relatively well developed culture at the time of their entrance into the central Arizona area.⁽³⁾ At the

(1) Pages 12-14, The March of Arizona History, and Pages 3-4, Arizona, Its People and Resources.

(2) Hohokam is a Pima Indian word meaning "The Ancient Ones," or "Those Who Have Gone."

(3) Page 37, Arizona, American Guide Series; and Pages 20-22, The March of Arizona History.

earliest stage of their occupancy they lived in small farming villages, widely distributed over the region. Their dwellings consisted of shallow rectangular pit houses, built for the most part below the surface of the ground and consisting of poles, brush, and mud plaster.

The development of their culture continued within the region, although they gradually withdrew from outlying districts and concentrated their settlement into larger, but fewer in number, villages. Their dwellings evolved from the pit house to structures built above the ground, and their villages came to be surrounded by walls.

In the neighborhood of 1300 A.D. it is believed that the Hohokam was invaded by Plateau people to the north.⁽⁴⁾ Consequently, a great compound type of dwelling was constructed for protection and to house the influx of peaceful migrants, the best example remaining today being the Casa Grande ruin near Coolidge.

Through the years, which may have been about 13 centuries in all, extensive irrigation works were gradually developed in the Gila and Salt River Valleys utilizing surface water from those rivers. The largest of canals approached 30 feet in width at the top and 7 feet in depth.⁽⁵⁾ Lateral or side canals provided a complicated irrigation network over suitable lands. One of the principal areas was the Salt River Valley, the present site of Phoenix, Tempe and Mesa. It has been estimated that the

(4) Page 37, Arizona, American Guide Series, and Pages 31-33, The March of Arizona History.

(5) Page 37, Arizona, American Guide Series.

Hohokam canals in this area totaled to a length of 125 miles. Their settlement area covered much of the Valley, as shown by Plate 2.

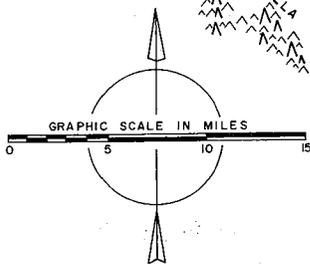
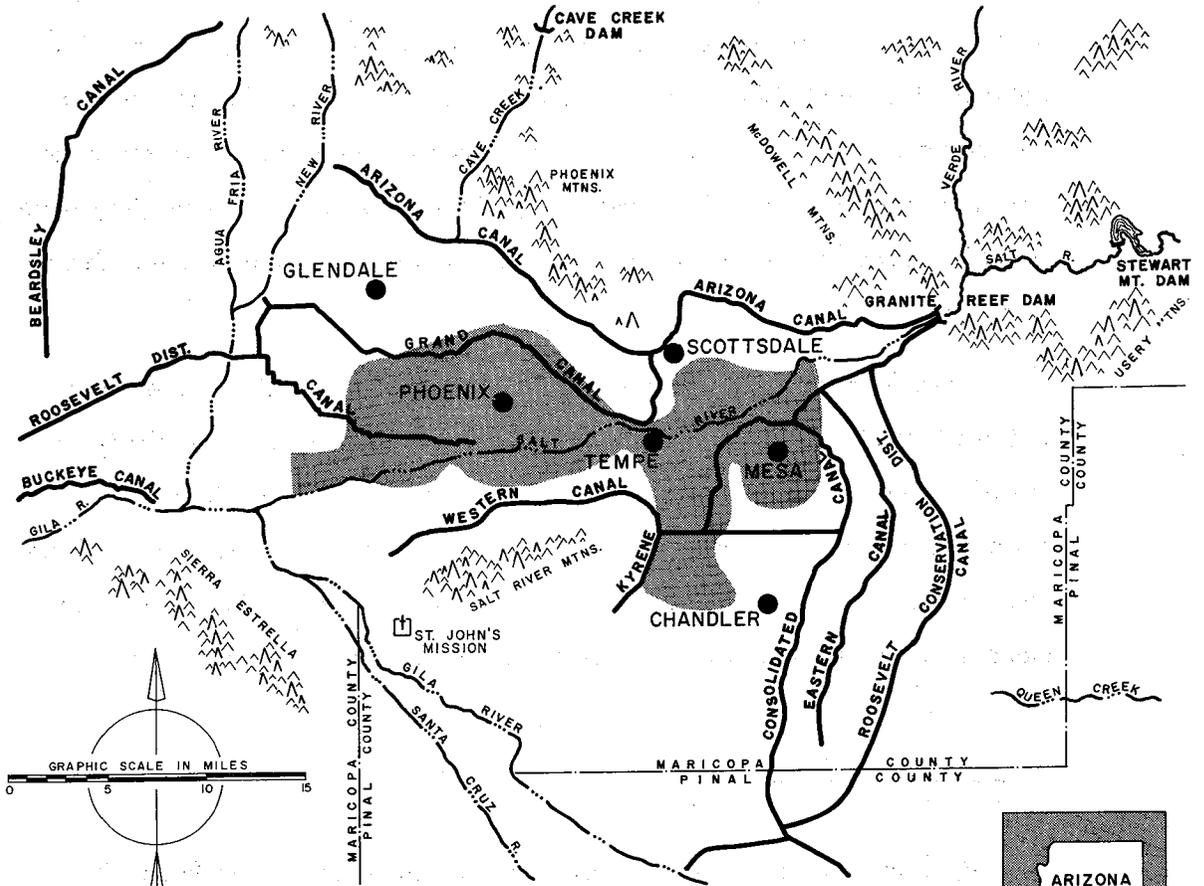
Many of today's canals follow the ancient alignment. In fact, the early Anglo-American settlers are reported to have cleaned out and used canals that had been idle for 500 years.⁽⁶⁾

It is not known how long the Hohokam lived in the Salt River Valley. Undoubtedly, they started out slowly and built up to the development shown by Plate 2. Sometime during the 1300's the Hohokam abandoned their fields and their villages and left for parts unknown. It remains a mystery why they left and what became of their people. Some experts believe the Pima Indians are their descendents, but nothing definite has been established concerning this idea. As to their leaving, it has been theorized that Apaches or other warlike Indians drove them out or that drought prevailed long enough to take its effect, or that waterlogging (or alkalization) of irrigated land rendered cultivation difficult or impossible.⁽⁷⁾

Certainly, the civilization of the Hohokam was significant at the peak of its development, the remains of which were obvious at the time of American settlement. It would do well for persons today to reflect upon their accomplishments. As to their decline, poor planning and inadequate utilization of their resources may have been the principal cause.

(6) Page 280, The Handbook to Arizona, 1877.

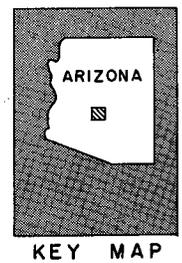
(7) Page 403, Arizona, American Guide Series; Pages 35-36, The March of Arizona History; and Page 29, The Southwest, Old and New. Early in the 1900's American farmers experienced a similar waterlogging problem in the districts closest to the river.



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SOURCES:
 SALT RIVER PROJECT, MAJOR FACTS IN BRIEF
 U.S. GEOLOGICAL SURVEY MAPS

- L E G E N D**
- HOHOKAM IRRIGATION AREA
 - EXISTING MAJOR CANALS
 - EXISTING URBAN CENTERS



HOHOKAM SETTLEMENT

COMPARED TO SALT RIVER VALLEY IRRIGATION SYSTEM

Recent Civilization, the Maricopa and Pima Tribes

Since the departure of the Hohokam, no Indian tribe has truly dominated the area that is now Maricopa County. Prior to 1800, a tribe known as the Maricopa (part of the Yuma-Cocopah family) lived and hunted in the territory along the Gila River from present day Gila Bend to Yuma, their domain extending approximately 120 miles in length. Between 1750 and 1800, pressures from the Yuma tribe to the west forced an eastward migration of the Maricopa to become neighbors with the Pima tribe, in the vicinity of the present day Pima villages. Although they have lived in peace next to the Pima, the Maricopa tribe retains its own identity to this day. ⁽⁸⁾

When first found by the Spanish in the Sixteenth Century, the Pima Indians lived in villages scattered along the Gila River in the vicinity of the old Hohokam territory. ⁽⁹⁾ By their tradition, the Pimas claim to have been driven northward from Mexico to central Arizona. Probably the Pimas were mystified by the remains of the Hohokam culture, much in the same manner as experienced by the Spanish and Americans who came later.

(8) Page 360-362, The Handbook to Arizona, 1877; and Page 28, Arizona, American Guide Series.

(9) Page 363, The Handbook to Arizona, 1877

The Pimas have consistently lived by irrigated farming and learned at an early date to weave cotton. Although their culture provides for a peaceful existence, they always proved themselves to be good warriors in resisting the Apache. In the early days of American settlement, the Pimas provided the best security for the traveler from Yuma to Tucson.

At the present time the Indian population of Maricopa County numbers about 8,000. Almost 1,000 Pima and Maricopa Indians live on the Gila River Reservation in the vicinity of the St. John's Mission, while another 1,400 live on the Salt River Reservation. About 200 Apache and Yavapai Indians live nearby to the north on the Fort McDowell Reservation, and 200 Papagos live on the Gila Bend Reservation five miles north of Gila Bend.⁽¹⁰⁾ The remaining 5,000 Indians live off the reservations at points scattered throughout the County, with nearly 3,000 of them living in the Phoenix Metropolitan Area. Plate 1 shows the location of present day Indian reservations.

(10) Page 69, Arizona, Its People and Resources.

Spanish and Mexican Colonization

From 1540 to 1821 the area now known as Arizona and Maricopa County was claimed by the Spanish crown. Then, for a short 30-year period, the area was recognized as a portion of the new Republic of Mexico. But neither Spain nor Mexico settled Arizona to its full extent, and very little permanent occupation occurred in the Salt and Gila Valleys.

The Spanish Exploration

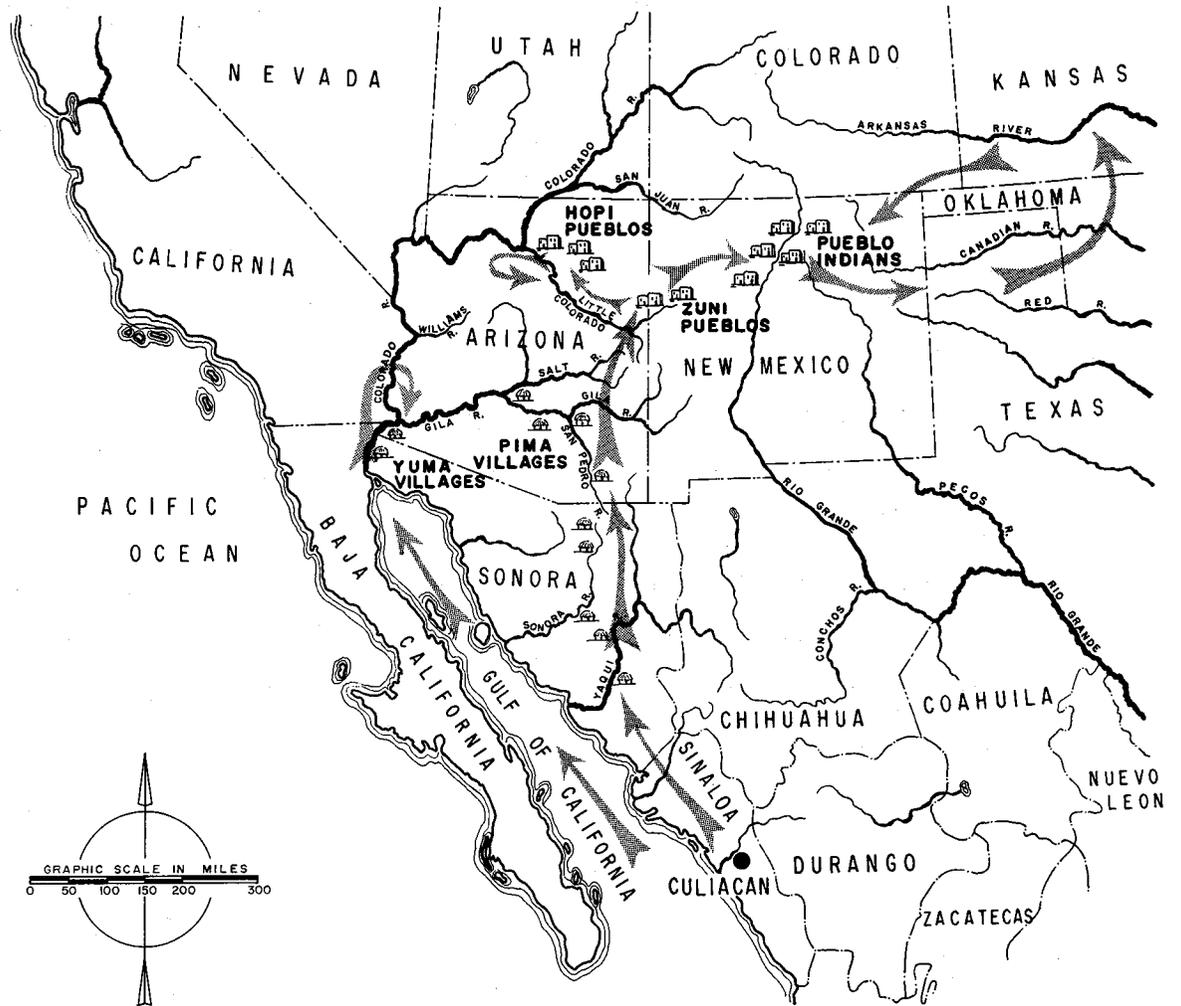
Spanish explorers of the Sixteenth Century crossed Arizona a number of times, and several persons are accredited with the distinction of being the first white man to set foot inside the present boundaries of the State. Plate 3 shows most of the area involved.

The Gulf of California was discovered shortly after the Spanish conquest of Mexico in 1519-21 and named after Cortes.⁽¹¹⁾ But the area of northern Mexico was not explored until 20 years later. It has been reported, but evidently not fully substantiated, that one of Cortes' lieutenants, Jose de Basconales, came up from Mexico in 1526 and went as far as the Zuni pueblo.⁽¹²⁾

The account of Cabeza de Vaca's travels is well-known and established, except there is confusion as to the route actually followed. In 1528, an expedition led by Panfilo de Narvaz attempted to land on the west coast of Florida with intentions of conquering the lands to the north. Disaster struck and only a small party survived. For eight years they wandered about toward the Pacific and finally arrived at Culiacan, near the entrance to the Gulf of California. De Vaca, the Negro slave Esteban, and two others were the

(11) Page 384, The Handbook to Arizona, 1877; and Page 53, The March of Arizona History. The Gulf of California was originally called "The Sea of Cortes."

(12) Page 40, Arizona, American Guide Series.



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SOURCES:
 ARIZONA, THE HISTORY OF A FRONTIER STATE
 ARIZONA, ITS PEOPLE AND RESOURCES

- L E G E N D**
- SPANISH TOWNS
 - ▣ INDIAN PUEBLOS
 - ▤ INDIAN VILLAGES
 - EXPLORATION ROUTES

SPANISH EXPLORATION

1539 - 1542

sole survivors. This expedition had far-reaching effects, however, because the travelers brought with them substantial accounts of the legendary cities of Cibola. They actually hadn't visited the "seven cities" but heard reports along the way.

Early in 1539, the Franciscan friar, Marcos de Niza, left Mexico City in search of the cities, guided by Esteban. The Negro went ahead, blazing a trail for De Niza. When Esteban reached the Pima villages in the Gila Valley success seemed imminent because he received directions that Cibola lay to the northeast.

Reports indicate that Esteban found the nearest of the seven cities and forcibly entered the place. On approaching the city, De Niza heard of Esteban's death at the hands of the Indians. The friar remained long enough to ascertain the existence of an Indian pueblo, and then retreated to Mexico reporting that he had seen the roofs "glitter with gold." Many historians today believe that De Niza barely crossed into Arizona and never saw the city at all. (13)

The next year, in 1540, De Niza guided an expedition of over a thousand men under the command of Vasquez de Coronado to Cibola. Their route followed the San Pedro River to the Gila, then north to the source of the Little Colorado River and into the Zuni country. Cibola proved to be a pueblo of mud houses reaching 3 or 4 stories in height, but there was no gold or other precious metal.

(13) Page 14, Arizona, Its People and Resources.

Coronado spent over a year exploring the country before he returned to Mexico in 1542. One of his lieutenants, Pedro de Tovar, explored the Hopi country; and another, Lopez de Gardenas, found the Grand Canyon and explored along its rim in attempting to find a way down to the Colorado River. The upper extremities of the Gulf of California, including the lower Colorado River, were navigated and explored by Hernando de Alarcon. But the failure to find gold and silver at hand resulted in Spanish withdrawal from the area, and no settlement took place. It remained for missionary activity to continue Spanish influence within Arizona, although even here the influence was small as far as the whole territory was concerned.

The Mission Period

In 1582, Antonio de Espejo was called upon to leave Mexico and go northward with the purpose of rescuing two priests held by the Indians in the upper Rio Grande area.⁽¹⁴⁾ Espejo entered Arizona from the east and explored to the Bill Williams River where he found silver ore. Accounts say he visited the Hopi villages, the San Francisco Peaks near Flagstaff, and the Verde and Salt Rivers.

Although Juan de Onate colonized the Rio Grande Valley of New Mexico in the 1590's, little missionary activity occurred in Arizona until the time of Father Kino, starting in 1692; and then the area was primarily confined to the lower Santa Cruz Valley south of Tucson.

(14) Pages 32-35, Arizona, the History of a Frontier State; Page 42, Arizona, American Guide Series; and Page 388, The Handbook to Arizona, 1877.

The extent of Father Kino's domain is shown by Plate 4. He founded 24 missions during a 24-year period, 7 of which were in the boundaries of present day Arizona. Only 3 of the Arizona missions, Guevavi, Tumacori and San Xavier del Bac, were in full operation at the time of his death in 1711.

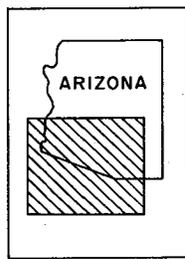
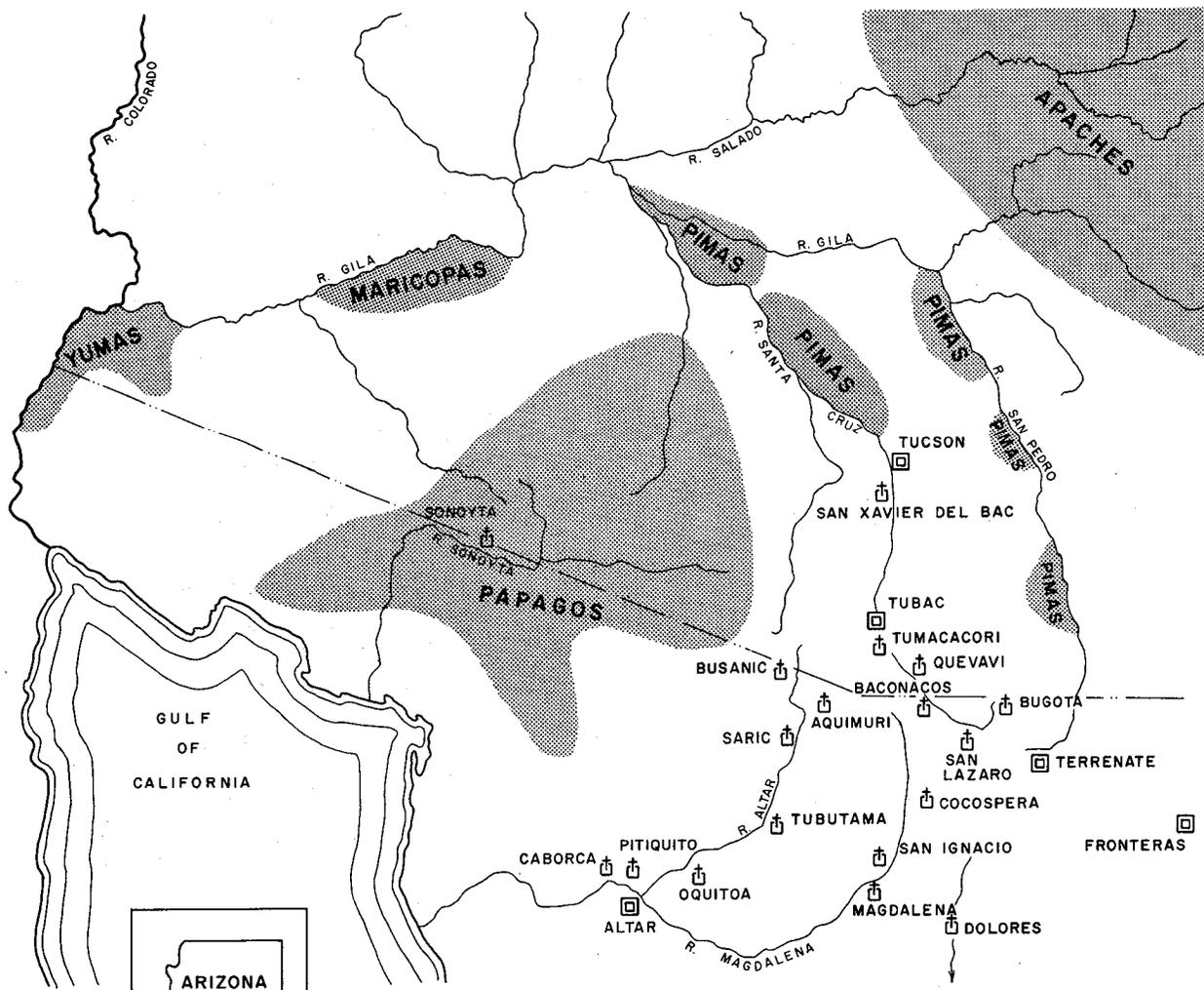
Father Kino made journeys beyond the realm of his mission empire; he visited the Casa Grande ruin for the first time in 1694. Evidently, this visit was white man's first look at the ruin.⁽¹⁵⁾ He journeyed along the Santa Cruz, San Pedro and Gila Rivers; and his explorations from 1698 to 1704 proved that Lower California was a peninsula, and not an island.⁽¹⁶⁾

Mission activity was continuous until 1751 when an uprising of the Pimas and Papagos drove the Spanish from Arizona. Mining operations, which may have started as early as 1736, were also suspended.⁽¹⁷⁾ In 1752 a presidio, or garrison, was established at Tubac, and the priests returned to the missions. It is generally recognized that Tubac at this time was the first permanent village founded by Europeans within Arizona. In 1776 the presidio was removed to the present site of downtown Tucson.

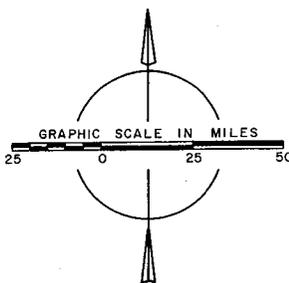
(15) Page 43, Arizona, American Guide Series. Further details may be found in the diary of Capt. Manje who accompanied Father Kino on many of his journeys; refer to Luz de Tierra Incognita, translated by Karns.

(16) Page 391, The Handbook to Arizona, 1877

(17) Page 43, Arizona, American Guide Series.



KEY MAP



LEGEND

-  MISSION SITES
-  PRESIDIO SITES
-  OUTLYING INDIAN TRIBAL AREAS

SOURCES:

ARIZONA HIGHWAYS, MARCH 1961
 ARIZONA, ITS PEOPLE AND RESOURCES
 LUZ DE TIERRA INCOGNITA: UNKNOWN
 ARIZONA AND SONORA; 1693-1721

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THE MISSION PERIOD

1687 - 1827

An expedition led by Captain Juan Bautista de Anza, in 1774, laid out an overland route between Tubac and the new missions of California. The trail followed the Gila River to the Colorado, then crossed to San Gabriel near Los Angeles on the Pacific. This effort probably was the first attempt to establish permanent communications through central Arizona, including parts of Maricopa County.

During these years, Father Garces visited the Hopi villages by using friendly Yavapai Indians as guides. Thus, the north-central portion of Arizona was re-explored. He also visited the Havasupai Indians who lived, as they do now, in the depths of a portion of the Grand Canyon.

The Spanish waged a vigorous campaign against the Apache, beginning in 1786, but growing uncertainties in Mexico caused the decline of their activities in Sonora and Arizona. Mission activity as well as ranching and mining became an extremely hazardous occupation - even more so than during the previous century. Missionaries lingered on until 1827 when Mexico expelled the Franciscan order; and the mission era came to an end. (18)

Mexican Re-settlement

At the time of Mexican independence in 1822, the ranches of the Santa Cruz and San Pedro Valleys had probably been abandoned, and there is some question as to the extent of inhabitation in the villages of Tubac and Tucson.

(18) The Jesuit order, who had initiated the Sonora and Arizona Missions, were expelled earlier, in 1767.

Gradually, from the 1820's to the 1840's, Mexican interests moved back from Sonora into the Santa Cruz Valley, but the ever present Apache checked the small scale operations. If their attempts at settlement had been on a larger scale, perhaps the Mexicans would have been more successful in their mining and ranching activities.

Mexican authority north of Tucson, including the area now embraced by Maricopa County, was non-existent, although civilized life was maintained by the Pima and Maricopa Indians.⁽¹⁹⁾ At the time of the Mexican War in 1846-48 Tucson had a population of about 500, being protected from the Apaches by a small garrison. The Treaty of Guadalupe Hidalgo, signed on February 2, 1848, ended the Mexican War and transferred that portion of Arizona north of the Gila River to the United States. The acquisition of territory from Mexico was completed by the Gadsden Purchase in 1853, which included the Santa Cruz Valley and the Pima Indian lands south of the Gila.

(19) Page 46, Arizona, American Guide Series. One of Col Kearny's men, on their expedition across Arizona in 1846, wrote: "To us it was a rare sight to be thrown in the midst of a large nation of what are termed wild Indians surpassing many of the Christian nations in agriculture, little behind them in the useful arts and immeasurably before them in honesty and virtue. During the whole of yesterday our camp was full of men, women and children who wandered among our packs unwatched and not a single instance of theft was reported."

For a time during the 1850's civil order prevailed to the extent that Mexicans were encouraged to move into the Tubac-Tucson area. In 1858 Tubac is reported to have had a population of 800; five-sixths were Mexican.⁽²⁰⁾ Tucson had a population of 915 according to the U.S. Census of 1860.⁽²¹⁾

Because of the difficulty of holding onto the Santa Cruz Valley, settlers from Mexico never penetrated the Gila and Salt River Valleys during Spanish or Mexican rule. After the American Civil War, both Mexicans and Anglo-Americans settled in the Salt River Valley. By 1876 Phoenix was estimated to have a population of 500, with one-half being Mexican.⁽²²⁾

Persons from Mexico have periodically continued to move into Arizona and Maricopa County. In 1960, Maricopa County had at least 80,000 persons known to be of Mexican descent (Spanish Surname, U.S. Census of Population), which represented 12 per cent of the county's total population.

(20) Page 49, Arizona, American Guide Series.

(21) See table opposite page 98, Arizona, A Century of Growth.

(22) Page 259, The Handbook to Arizona, 1877.

Anglo-American Settlement

Intensive settlement of the Salt River Valley, that area now being the heavily populated part of Maricopa County, did not commence until after the formation of Arizona Territory in 1863 and the end of the Civil War in 1866. Although Pima Indians cultivated portions of the middle Gila Valley and their activities extended northward to the Salt River, the area now occupied by Phoenix, Tempe and Mesa was essentially vacant when Americans arrived for settlement.

American Exploration

The first Americans to visit central Arizona were the trappers who had drifted into the Rio Grande Valley during the 1820's and then moved along the Gila, Salt and Colorado Rivers after beaver and game. Sylvester Pattie and his party crossed Arizona on their way to the Pacific Ocean by way of the Gila River in 1824-26.⁽²³⁾ Bill Williams was among the more famous of these trappers or "mountain-men". His imprint is well stamped upon Arizona; a city, mountain and river all bear his name. Kit Carson explored and trapped along the Gila during this period, as well.⁽²⁴⁾

During the Mexican War, two major expeditions crossed the territory. Col. Stephen W. Kearny led an expedition from New Mexico along the Gila Valley to California. On the heels of Kearny came the Mormon Battalion, a Unit of the U.S. Army, led by Lt. Col. Phillip St. George Cooke.

(23) Page 29, The Handbook to Arizona, 1877

(24) Pages 105-106, The March of Arizona History.

The second expedition had a wagon train containing the first vehicles to traverse Arizona. Plate 5 shows the location of this early wagon road.

After the discovery of gold in California, the Gila Valley became a highway for the hardiest adventurers. The Oatman massacre occurred at this time, in 1851, near present day Gila Bend. In spite of Indian raids, it has been estimated that by 1851 over 60,000 persons had passed through the Gila Valley to California.⁽²⁵⁾

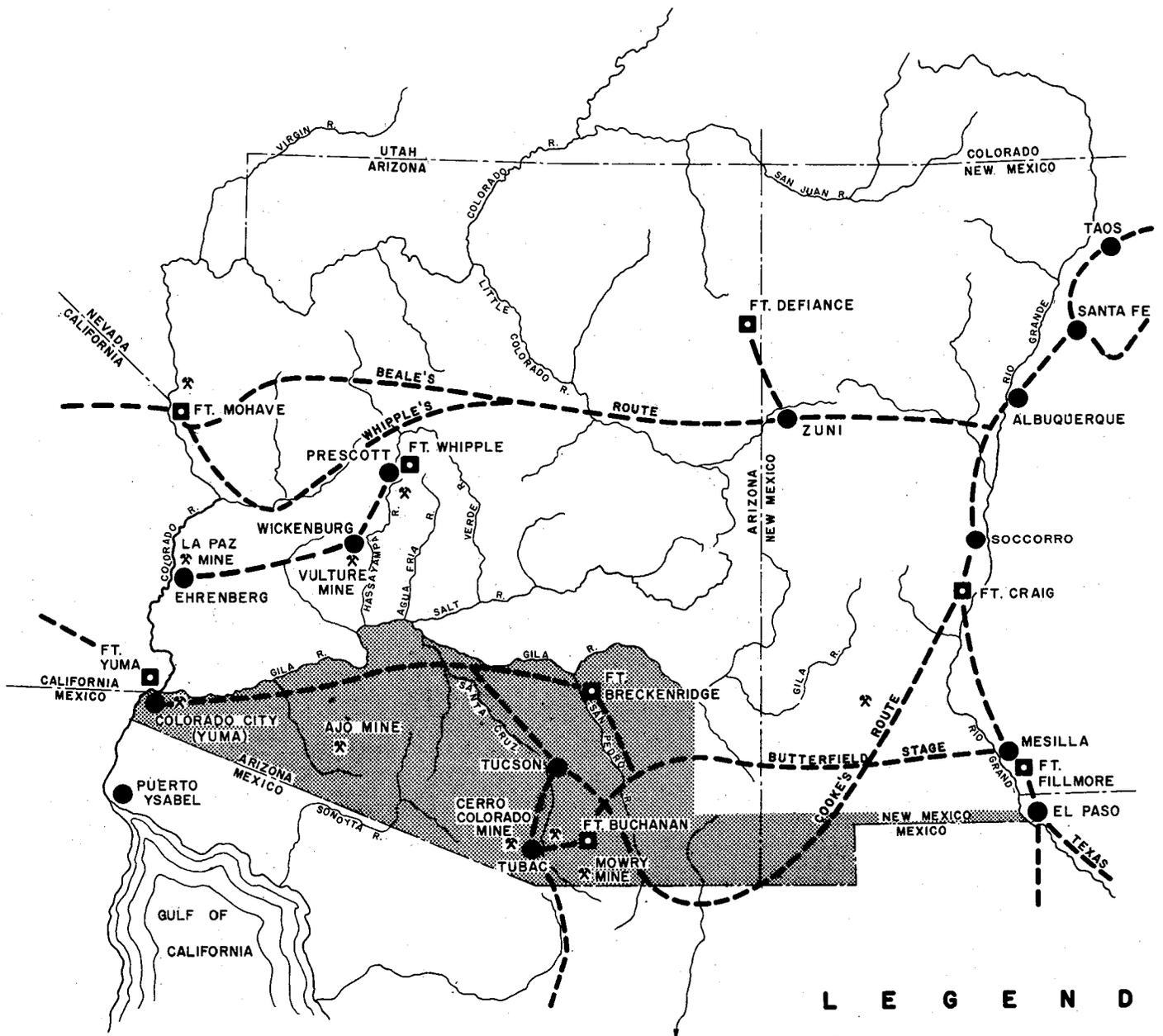
Because the Gila River provided the only low elevation route from the eastern United States to California, the Gadsden Purchase was made in 1853.⁽²⁶⁾ Soon after, boundary and railroad surveys were made. Lt. Whipple surveyed northern Arizona, the route being used later by the Santa Fe Railroad. Lt. Beale, using camels for pack animals, crossed northern Arizona in both summer and winter. The camels thrived in the desert, but the Americans didn't like to use them. Several parties surveyed southern Arizona, along or near the Gila. For example, Lt. Gray went from Marshall, Texas, to El Paso, and then to Tubac, where he surveyed one branch south to the Gulf of California and a second branch to Fort Yuma and then over to San Diego.⁽²⁷⁾

The Salt River Valley was in between and not on either northern or southern route. Canyons of the Salt River east of Phoenix would hardly permit the location of a rail line. The early stage routes did not penetrate Central Maricopa County; instead they went south near the Pima villages and through the Gila Bend area. In 1857 the San Antonio and San Diego Stage Company began semi-monthly operations. A short time later, the

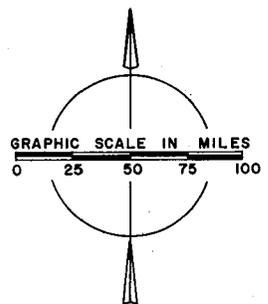
(25) Page 47, Arizona, American Guide Series.

(26) For a statement on the value of the Gila Valley with regard to transportation and national unity, see Page 71, The Handbook to Arizona, 1877.

(27) Page 32, The Handbook to Arizona, 1877.



- L E G E N D**
- TOWNS
 - FORTS
 - ⚒ MINES
 - - - WAGON ROADS
 - ▨ GADSDEN PURCHASE



PREPARED BY
MARICOPA COUNTY PLANNING AND ZONING DEPT.
APRIL, 1963 G.L.B.

SOURCES:
ARIZONA, ITS PEOPLE AND RESOURCES
ARIZONA, HISTORY OF A FRONTIER STATE
THE TERRITORY OF ARIZONA, AUSTIN SURVEYS AND MAPS

ANGLO AMERICAN SETTLEMENT

1846 - 1864

Butterfield Company took over and continued service until the Civil War started in 1861. The route extended from St. Louis to San Francisco, via El Paso, Tucson, Yuma and Los Angeles; service was twice a week; and the trip time was 22 to 25 days for the entire journey. Gila Ranch, near the bend in the Gila River, served as a station along this route.

The stage route across Arizona was primarily a mail and passenger route for the fastest service available from east coast to west coast and return. Very little freight came this way in the early days. Most of the freight to and from California used ocean transportation by going around South America or crossing the isthmus at Panama. Freight bound for early day Arizona came by ocean steamer up the Gulf of California to Puerto Ysabel at the mouth of the Colorado River. Then the freight was transferred to light steamer bound for ports along the river. Yuma was the transfer point to wagon train for destinations in central or southern Arizona. Ore was shipped out from the mines at Ajo via this route as early as 1853.⁽²⁸⁾

(28) Page 102, Arizona, A Century of Growth; and Page 36, The Handbook to Arizona, 1877.

Establishment of Law and Order

Charles D. Poston, the "Father of Arizona," wrote of Tubac in 1858

"We had no law but love, and no occupation but labor; no government, no taxes, no public debt, no politics. It was a community in a perfect state of nature. As syndic under New Mexico, I opened a book of records, performed the marriage ceremony, baptized the children, and granted the divorce."⁽²⁹⁾

But Tucson and Tubac were 250 miles from their county seat at Mesilla, on the Rio Grande, and over 500 miles from Santa Fe. Law and order were virtually non-existent; New Mexico Territory was too large for efficient administration over in Arizona. During the next two years, Arizona's first newspaper, the Arizonian, published at Tubac, rallied the cry for separation from New Mexico. Several attempts were made in Congress to create Arizona Territory, but all were failures until the middle of the Civil War, when it became apparent to the Union that something had to be done.

Conventions at Tucson and Mesilla in 1861 declared the southern portion of Arizona and New Mexico to be Confederate territory, and admission was secured as a territory to the Confederacy in January, 1862. The Union army had deserted the area, many joining the Confederate forces. After a few months of occupation and squirmishes, the Confederate forces abandoned Arizona and New Mexico, and Union forces from California and Colorado took control.

Congress suddenly realized the gold fields of Arizona were receiving publicity, and in order to establish local government Arizona Territory was formed on February 23, 1863, with its boundaries essentially as they are today (except for a portion taken by Nevada in 1866). Poston had lobbied

(29) Page 49, Arizona, American Guide Series.

intensively in Washington for territorial status and was soon elected as the delegate to Congress. Army posts sprang up at scattered points, and the first territorial legislature sat at Prescott from September 26 to November 10, 1864.

Arizona originally had four counties: Yavapai, Mohave, Yuma and Pima. At that time there was no white settlement of any size in present-day Maricopa County. But events moved swiftly, especially upon the discovery of gold and silver. Prospectors abounded in central Arizona, and in 1863 Henry Wickenburg discovered the Vulture mine, about 15 miles west of the Hassayampa River. During the next year the town of Wickenburg sprang up as a supply point for the mine. The town grew up on the banks of the Hassayampa rather than next to the mine, which lacked a water supply.⁽³⁰⁾

Permanent settlement occurred at Gila Bend as a station point along the stage line through the Gila Valley, although the townsite shifted when the railroad came through in 1879.⁽³¹⁾

Camp McDowell, on the west bank of the Verde River, was founded by several companies of California volunteers in 1865.⁽³²⁾ It remained as a permanent military post until 1890, and was the only fort inside the present boundaries of Maricopa County.

(30) Page 357, Arizona, American Guide Series.

(31) Pages 6-7; A Planning Report for Gila Bend.

(32) Page 313, The Handbook to Arizona, 1877.

The presence of Camp McDowell was the impetus for settlement in the Salt River Valley. Soon after the camp's establishment, John Y. T. Smith started growing hay in the Valley as forage for the camp. Jack Swilling, a prospector from Wickenburg, visited the Smith ranch in 1867 and became interested in agricultural possibilities for the area. He returned to Wickenburg, interested others in the scheme and formed an irrigation company with a capital of \$10,000.⁽³³⁾ Within six months several miles of canal were completed, and several ranches were established. Soon the first crop was harvested, and the Valley was on its way to becoming a rich agricultural area.

The first nucleus of settlement developed at the head of the irrigation ditch, near the present site of Washington and 24 Street. The settlement was known as "Salt River Community" for census purposes in 1870, and had a population of 240.⁽³⁴⁾ In October, 1870, a townsite was laid out two miles west of this irrigated area, which marked the beginnings of downtown Phoenix. Soon a store and several houses appeared on the site.

Settlement in the Salt River Valley was permanent, based upon an agricultural economy; and on February 12, 1871, Maricopa County was created to serve the growing population. The original county was created

(33) Page 219, Arizona, American Guide Series.

(34) Pages 88-89; Arizona, A Century of Growth.

from the southern portion of Yavapai County, see Plate 6. Additional territory was added from Pima County in 1873. Changes were fast in those days; part of Maricopa County went to create Pinal County in 1875, and some more was lost to Gila County in 1881. Since then, the County's boundaries have remained substantially the same.

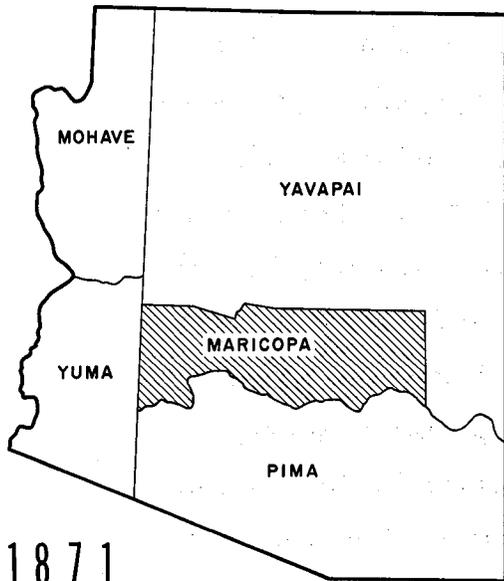
In 1872 the County Assessor estimated Maricopa County's population at 1,156 persons.⁽³⁵⁾ The estimation of 1875-76 placed the County's population at 3,702; and the U.S. Census of 1880 gave the County an official population of 5,689. Phoenix and Wickenburg were enumerated at 1,708 and 104, respectively, at the time.

The lessening of danger from Indian raids encouraged many new settlers to come to Arizona, especially to the Salt River Valley where the danger lessened considerably with General George Crook's campaigns of 1872-73 against the Apache. The Indian Wars were then over as far as Maricopa County was concerned, although Geronimo terrorized much of southeastern Arizona during the period of 1881-86. Once again General Crook, the most successful of all Indian fighters, was called upon to subdue the Apache. With the surrender of Geronimo in 1886 the war was at an end, with law and order finally being established.⁽³⁶⁾

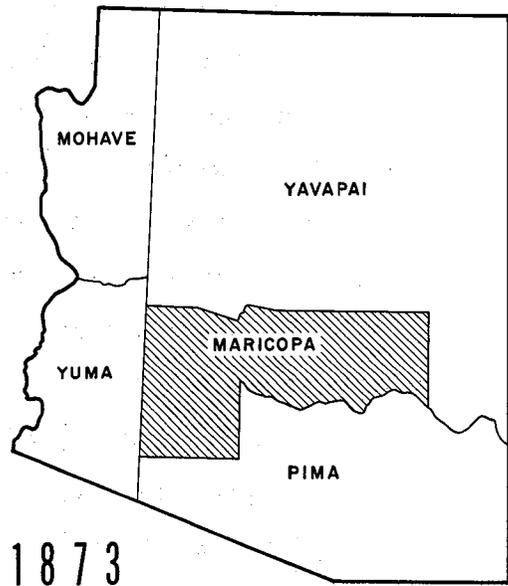
(35) Page 44, The Handbook to Arizona, 1877.

(36) Page 376, Arizona, American Guide Series.

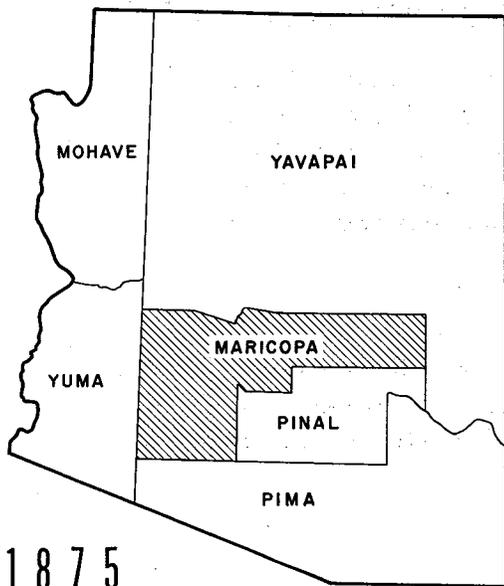
DEVELOPMENT OF MARICOPA COUNTY



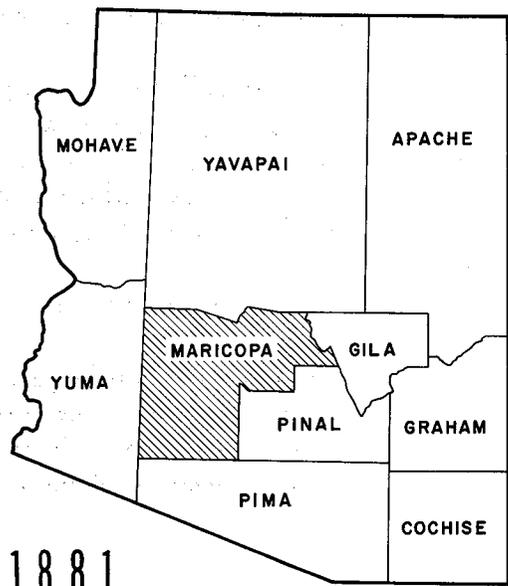
FORMATION of MARICOPA COUNTY



ADDITION to MARICOPA COUNTY
from PIMA COUNTY



FORMATION of PINAL COUNTY



FORMATION of APACHE, COCHISE,
GILA and GRAHAM COUNTIES

SOURCES:
ARIZONA, A CENTURY OF GROWTH
HANDBOOK TO ARIZONA, 1877

Development of Maricopa County

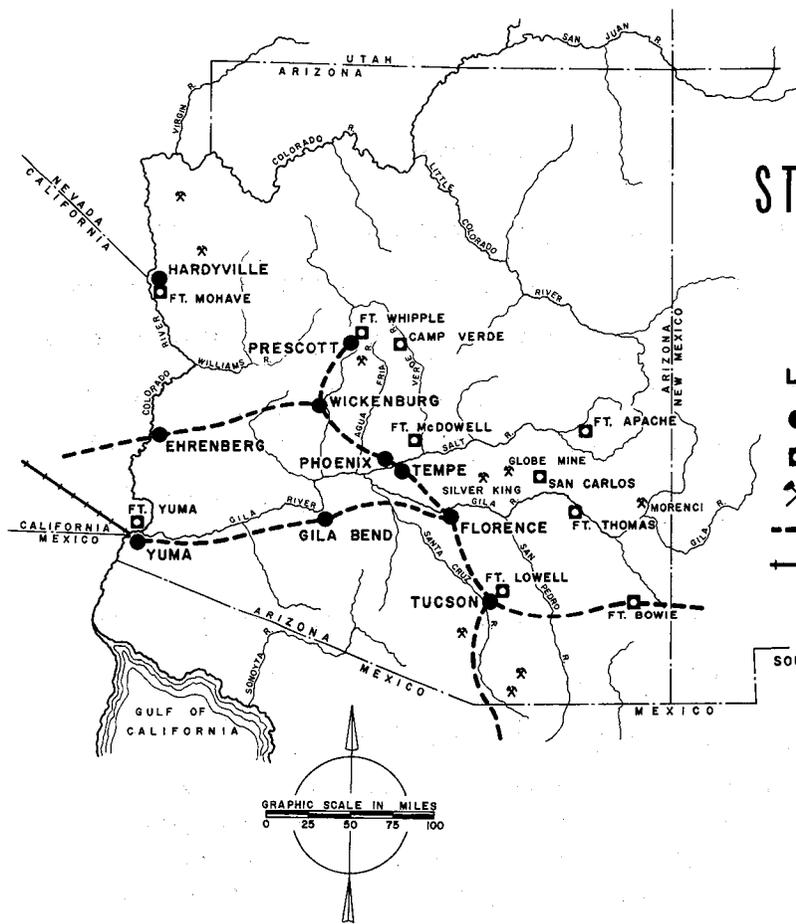
It would do well to reflect upon the situation in the late 1870's. Settlements were present at Phoenix, East Phoenix (referred to above as "Salt River Community"), Hayden's Ferry (Tempe); and Mormons were beginning to settle in the Mesa area. Charles T. Hayden had established a flour mill and ferry across the Salt River at the present site of Tempe in 1871. Another flour mill was located near East Phoenix and several more were near Phoenix. The stage route went from Tucson to Florence, then to Hayden's Ferry, East Phoenix, Phoenix and northwestward to Wickenburg and Prescott, see Plate 7. The Southern Pacific Railroad, coming from California, had reached Yuma by 1878. River boats continued to ply the Colorado from Yuma to Ehrenberg and up to Hardyville in Mohave County. The railroad was laid through the Gila Valley during this period but didn't reach Tucson until 1880. Phoenix was straining at the leash, trying to grow and manipulating to bring the territorial capital from Prescott to its doorstep. In 1889 the capital finally moved to Phoenix.

Phoenix was described by The Handbook to Arizona, 1877, as having

"six or more stores...a good public school...a public library of 250 volumes, owned by a literary association. The houses are nearly all constructed of adobe, lumber being expensive; the streets are named after Indian tribes and old Spanish explorers; they are very wide, and bordered by cottonwoods and other trees."

Tempe was described as

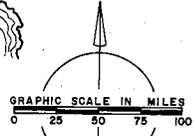
"a flour mill and large store building, with a half dozen dwellings... East Phoenix is a very pretty little hamlet...with water running on either side of its only street, which for half a mile is also lined with young cottonwood trees."



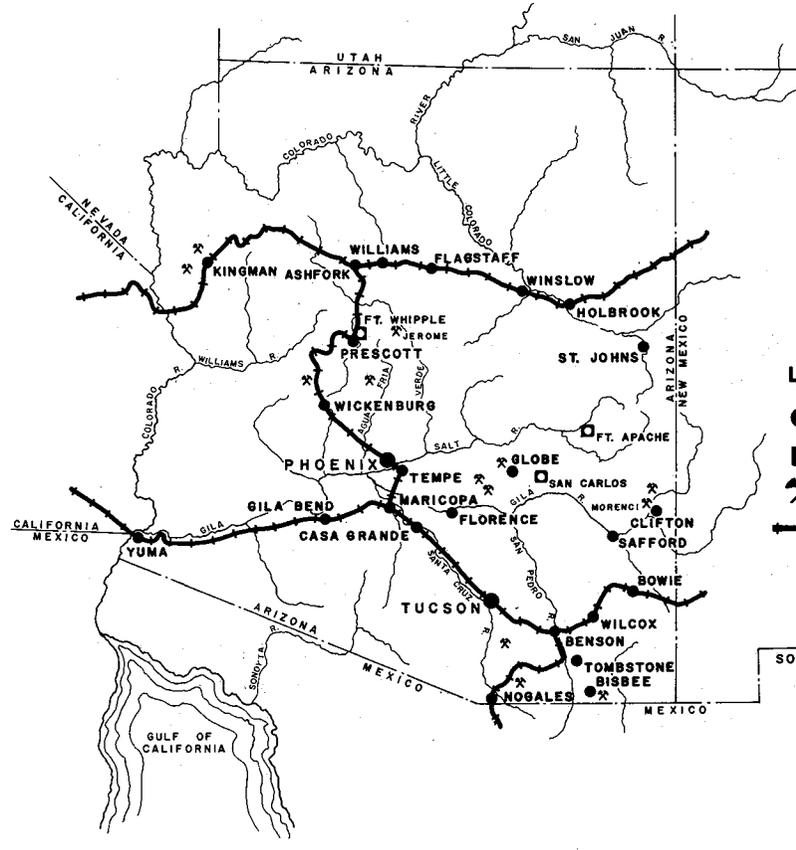
STAGE LINES 1878

- L E G E N D**
- TOWNS
 - FORTS
 - ⌘ MINES
 - - - PRINCIPAL STAGE LINES
 - +— RAILROADS

SOURCES:
THE HANDBOOK TO ARIZONA, 1877
ARIZONA, ITS PEOPLE AND RESOURCES



MARICOPA COUNTY PLANNING AND ZONING DEPT.
APRIL, 1963
J. W. S.



RAILROADS 1895

- L E G E N D**
- TOWNS
 - FORTS
 - ⌘ MINES
 - +— RAILROADS

SOURCES:
ARIZONA, AMERICAN GUIDE SERIES
ARIZONA, ITS PEOPLE AND RESOURCES

Even in those days, agricultural activity was greater in the Salt River Valley than in any other portion of Arizona. Over 9,000 acres of land were reported to be cultivated, primarily in wheat and barley, as well as peaches, grapes, tomatoes, melons, sweet potatoes, sugarcane, cotton and tobacco. "There are, too, prospective hints about oranges and olives."⁽³⁷⁾ One of the main canals was reported to be nine miles in length, and a second at six miles in length.

A hint into the attitudes of the people with regard to farming may be gathered from the Arizona Miner; a correspondent wrote:

"It is well for Phoenix that some of the land cormorants of California were not among the first settlers of Salt River Valley. For instead of beholding, as you do now, on every quartersection a neat adobe cottage, with the family of the peasant proprietor or small farmer; about half a dozen elegant residents, with their bloated and pampered inmates, would constitute the population, with hordes of Chinamen to make it more revolting."⁽³⁸⁾

As to the Mormon colony at Mesa, the Miner continues:

"The work done by these people is simply astounding, and the alacrity and vim with which they go at it is decidedly in favor of co-operation...Irrespective of capital invested, all share equally in the returns...The diagram of the settlement as it is to be represents a mile square enclosed by an adobe wall about seven feet high. In the center is a square or plaza, around which are buildings fronting outward. The middle of the plaza represents the back yards...They are intelligent, and all American."

(37) Pages 258, 280; The Handbook to Arizona, 1877.

(38) Page 280; The Handbook to Arizona, 1877. Landgrabbing attempts were made during this period, however. For a complete story of one of these attempts refer to The Peralta Grant, by Powell.

Developments came fast during the late 1870's and 80's. Charles E. McClintock started Phoenix's first newspaper in 1878, the weekly Salt River Valley Herald. Ice was manufactured for the first time a year later, to help out during the hot summers. Grade schools were organized into a unified system during the years of 1883-87; and in 1885 the Arizona Normal School, later to be Arizona State University, opened its doors at Tempe.

Phoenix's first railroad, the Maricopa and Phoenix, entered in 1887, providing a connection from the Valley to the Southern Pacific at Maricopa. The same year, a narrow-gauge street railway was opened, using open cars drawn by mules. The electric system was installed six years later, (and was finally abandoned in 1946). In 1895, Phoenix was connected to the northern transcontinental route at Ashfork via the Santa Fe, Prescott and Phoenix Railroad.

In all this growth and development, serious water problems remained, threatening the existence of the County's mainstay - agriculture. The situation ranged from drought to flood. The crisis came with the flood during the spring of 1891. Warm rains fell on the deep snows along the Mogollon Rim, and all the moisture came down the river at once. The southern section of Phoenix was swept away, and the water reached the downtown area, over a mile from the river bed. It has been said the Adams Hotel was flooded, and water covered the desks of offices nearby. (39)

(39) Page 89, Arizona, A Century of Growth; and Page 221 Arizona, American Guide Series.

After a long, hard fight the Reclamation Act was passed by Congress in 1902. The completion of Theodore Roosevelt Dam in 1911 basically solved the drought problem and ended the threat to serious flooding. ?

The Salt River Valley grew rapidly after 1911, and Statehood for Arizona in 1912 certainly aided the cause. Gradually, agriculture expanded to cover much of the Valley. As indicated earlier, Mesa, on the east side, was founded in 1878. Glendale and Peoria were founded during the 1890's. Scottsdale was named in 1896, although the town grew slowly until after World War II when suburban growth took hold. Gilbert was founded in 1902, with the construction of a railroad from Mesa to mining districts in eastern Pinal County and southern Gila County. Chandler was settled in 1912, when agriculture expanded into that area, and the limits of cultivation extended over to the Queen Creek area during the 1920's.

To the west end of the Valley, settlement took place in the Buckeye area as early as 1885. Goodyear Farms, in 1916, helped to stimulate the Litchfield-Avondale area. Tolleson was founded in 1912. The building of Carl Pleasant Dam in 1927 aided agriculture in the Beardsley, Agua Fria River area. The towns of El Mirage and Surprise started in the late 1930's or early 1940's as did Goodyear to the south.

Since World War II, agriculture has expanded in the Gila Bend area, the Harquahala and Rainbow Valleys, near Aguila, and north of Phoenix along the Black Canyon Highway. On the other hand, urban expansion has removed acreage now encompassed by Phoenix, Glendale, Scottsdale, Tempe and Mesa.

It is interesting to note early opinions concerning agricultural capabilities of Maricopa County, especially in the Salt River Valley. In 1877 it was believed that there was sufficient water in the river to irrigate 500,000 acres, while it was expressed that 250,000 acres in the central valley would support a population of 50,000.⁽⁴⁰⁾ The County passed this population mark sometime between 1910 and 1920, and during the last 10 years agricultural acreage has averaged at about 500,000 acres. It must be remembered that ground water from wells provides much of the water for irrigation.

As to transportation, the importance of the Salt River Valley could not be denied, and in 1926 a main line of the Southern Pacific Railroad was completed through Phoenix from Yuma to Tucson. Arizonans were treated to their first look at airplane flights at Phoenix in February 1910; and regularly scheduled passenger and express plane service began in November 1927, with tri-weekly service from Los Angeles through Phoenix to Tucson. The schedule became daily about a year later.⁽⁴¹⁾ Airline service at the Phoenix Sky Harbor Airport has gradually increased to include three transcontinental systems and four regional systems.

Improved highways for automobile travel were slow in coming to Arizona, and it was not until after World War I that road-building began in earnest. The Maricopa County bond issue of 1919 laid the foundation for a system of County highways, and the automobile came into common usage. By the late 1930's Phoenix was connected by paved road to Los Angeles and San Diego to the west; Flagstaff and the Grand Canyon

(40) Pages 258, 280; The Handbook to Arizona, 1877.

(41) Pages 114, 115, and 222; Arizona, American Guide Series.

to the north; Tucson and Nogales to the south; and Globe, Safford, El Paso and most points east. ⁽⁴²⁾

Highway improvements have come rapidly since World War II, thereby increasing the dependence upon automobiles, trucks and buses. Of special significance to Maricopa County has been the recent completion of the Black Canyon Highway to Prescott, Flagstaff, etc. and opening of the Bee-Line Highway to Payson. Therefore, persons from the Salt River Valley can easily get to the summer resort areas in the high mountains to the north and east. Improvements on the Superior-Globe and Globe-Show Low highways have aided greatly in this respect, as well. Paved highways, recently constructed to the south, connect Phoenix with the Gulf of California and the west coast resort areas of Mexico. The year 1961 marked the beginnings of the first urban freeway, with limited access control, to serve the Phoenix Urban Area.

Maricopa County has come to be a complex area of urban and rural development exceeding 700,000 in population. Agriculture has been the economic base of the area, and the early communities grew up to serve as trade and distribution centers for the farm population. Winter tourism became important in certain places during the 1920's. World War II brought in large-scale military operations, as well as manufacturing oriented toward defense. Williams and Luke Airfields have remained in operation, as well as the Naval Air Facility at Goodyear. The two retirement communities of Youngtown and Sun City were founded during the 1950's. Throughout the County, the trade and service industries have broadened and taken on added importance.

(42) Texaco Touring Map, Arizona, 1939.

Manufacturing has diversified somewhat, and the tourist industry is trying to attract summer visitors, as well as the traditional winter visitor.

It can be seen that many problems that have faced Maricopa County have been solved, partially if not completely. Settlement and growth could not occur until law and order were established. Agriculture could not be stabilized until the Salt River was controlled. Full benefits of modern-day movement, for material goods as well as people, could not be realized until the transportation system was built, and then improved.⁽⁴³⁾ An honest appraisal of conditions today would uncover more problems than achievements, but it is hoped that a look into the past will stimulate faith into the future.

(43) For a story of transportation hardships and related problems refer to Vanished Arizona, by Summerhayes.

CHAPTER 2

ECONOMICS

In order to plan for the physical environment of Maricopa County it is necessary to anticipate its future population and to assess its economic potential.

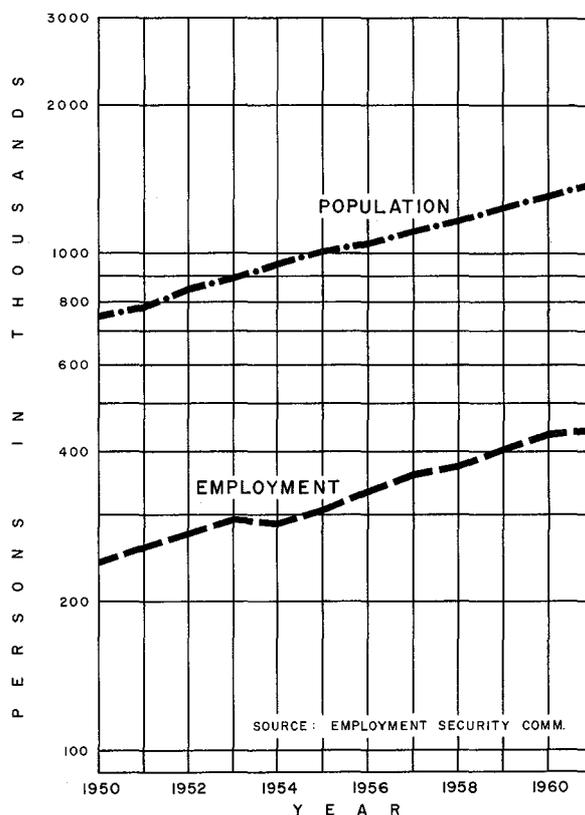
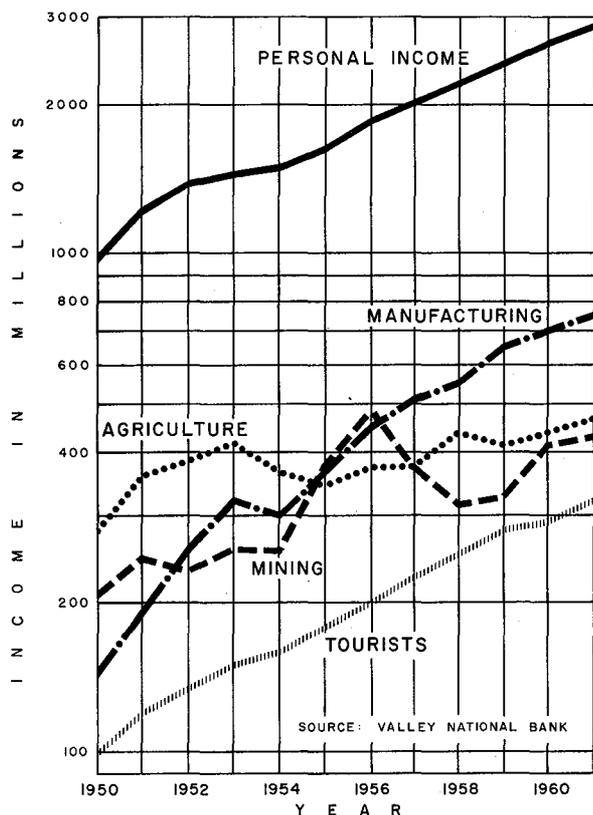
A number of population estimates for the years 1970, 1980 and beyond have been published. Previous studies for the County in 1959 by Western Management Consultants established population estimates for the periods 1965-70 and 1975-80 as a basis for planning in the Phoenix urban area.

From U.S. Census information, employment and economic trends are herein compared with the County's population growth. Maricopa County is compared with other similar urban areas, regions, and the nation as a whole.

Employment statistics contained herein will be valuable for future studies and reports, and will aid in the development of land-use estimates for industrial and commercial purposes. Employment is the major topic discussed herein, and to further round out the economic picture other indices and comparison charts have been included. Summary statistics for dollar value added by manufacture, retail and wholesale sales, and receipts from service industries have been illustrated to show the dynamic quality of Maricopa County's economy over the past twenty years.

Economic Trends

The State of Arizona's economy is briefly presented by Plate 8. Similar graphic illustrations for Maricopa County follow, thereby providing a comparison between the County and the State. The remaining part of this section compares the economy of Maricopa County to other similar metropolitan areas.



E C O N O M I C T R E N D S

STATE OF ARIZONA

PLATE 8

State of Arizona

Agriculture, mining, manufacturing and tourism are the principal sources of income for the State as disclosed by the Valley National Bank.⁽¹⁾ Plate 8 shows that revenue from these sources has been increasing through the past twelve years.⁽²⁾ However, the trends have been different for each item. The rise in manufacturing income is especially noticeable from 1950 to 1953 with an annual increase at about 35 per cent. From 1953 to 1962 the annual increase dropped to about 15 per cent. Agricultural income has remained rather static from 1950 to 1962 while mining income has fluctuated considerably.⁽³⁾ Income from tourism shows a steady increase of approximately 15 per cent per year. In the past twelve years manufacturing has risen from third place to become the leading source of income for the state.⁽⁴⁾

Personal income has risen significantly over the past twelve years.⁽⁵⁾ This trend is similar to the trends developed by manufacturing and tourism and reflects the overall prosperity of the state.

The second part of Plate 8 shows that employment is keeping pace with the population increase and that a good recovery has been made from the dip indicated in 1954.⁽⁶⁾

(1) Arizona Statistical Review, 1962, Valley National Bank

(2) Plates 8 and 10 use the semi-log projection. A trend with a constant annual rate of change appears as a straight line on this projection.

(3) Income from mining is keyed very closely with the price of copper.

(4) Plates 8, 9, and 10 contain raw values as provided by the Valley National Bank. No correction for inflationary tendencies has been made.

(5) For a breakdown of personal income in Arizona, refer to Arizona Statistical Review, 1956-62, Valley National Bank. Original source of data is the U.S. Department of Commerce, Survey of Current Business.

(6) Employment includes wage and salary workers, self-employed and unpaid family workers.

Plate 8 reveals that personal income is growing slightly faster than the population, thereby the overall income per capita is increasing by approximately 5 per cent each year.. Plate 9 reveals that per capita retail sales and per capita bank deposits are individually growing at about 35 dollars per year; per capita income is growing at 70 dollars per year and per capita insurance in force is increasing at 160 dollars per year.

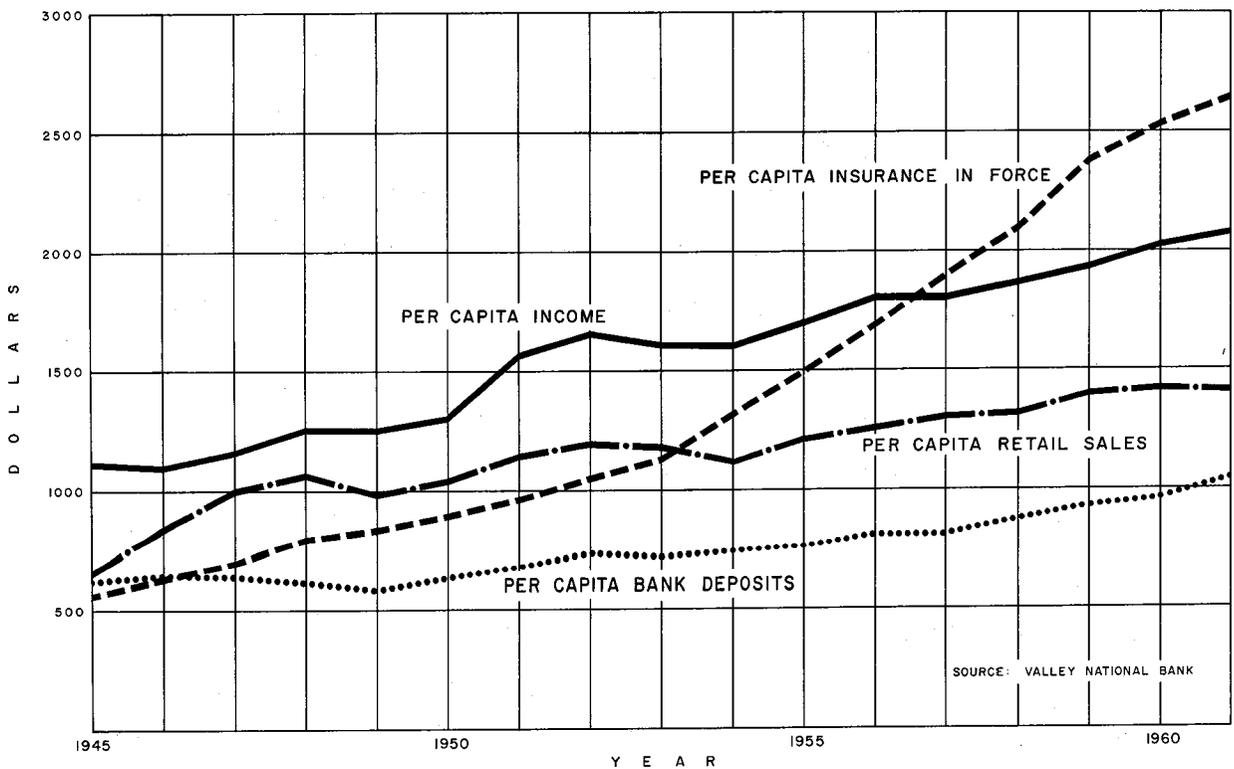
Maricopa County

Economic trends for the County have been similar to those of the State during the 1950's. However, as shown by Plate 10, the major sources of Maricopa County's income include only agriculture, manufacturing and tourism.⁽⁷⁾ Mining sales are insignificant for the County, being only about 2 per cent of the state total, and therefore mining is not included on the graph. On the other hand, no other basic sources have been added. Unfortunately, no comparable statistics for personal income are available at the county level. Consequently, the per capita income of Maricopa County is unknown and cannot be compared with the state or the nation.

The rise in manufacturing income for the County has averaged at almost 25 per cent annually which is somewhat higher than the rise for the State. By 1960, the County accounted for 70 per cent of the State's manufacturing income as compared to 50 per cent in 1950. On the other hand, the county's share of agricultural and tourist income held constantly near 50 per cent. The County increased relatively in population, gaining from 44.3 per cent in 1950 to 51.0 per cent in 1960.⁽⁸⁾

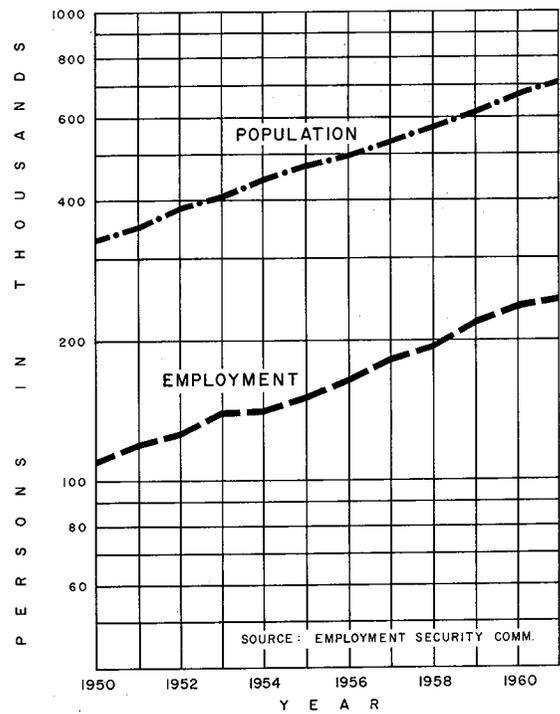
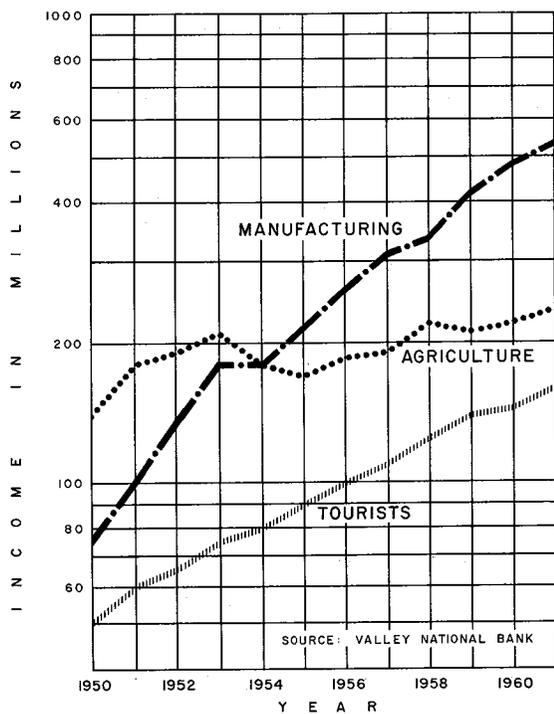
(7) The statistics shown by Plate 10 have been prepared by the Valley National Bank's research department as a special service to the County.

(8) See Table 1, A Report Upon 1960 Census of Population, Maricopa County, or Page 28, Inside Phoenix, 1963.



P E R C A P I T A S T A T I S T I C S
STATE OF ARIZONA

PLATE 9



E C O N O M I C T R E N D S
MARICOPA COUNTY

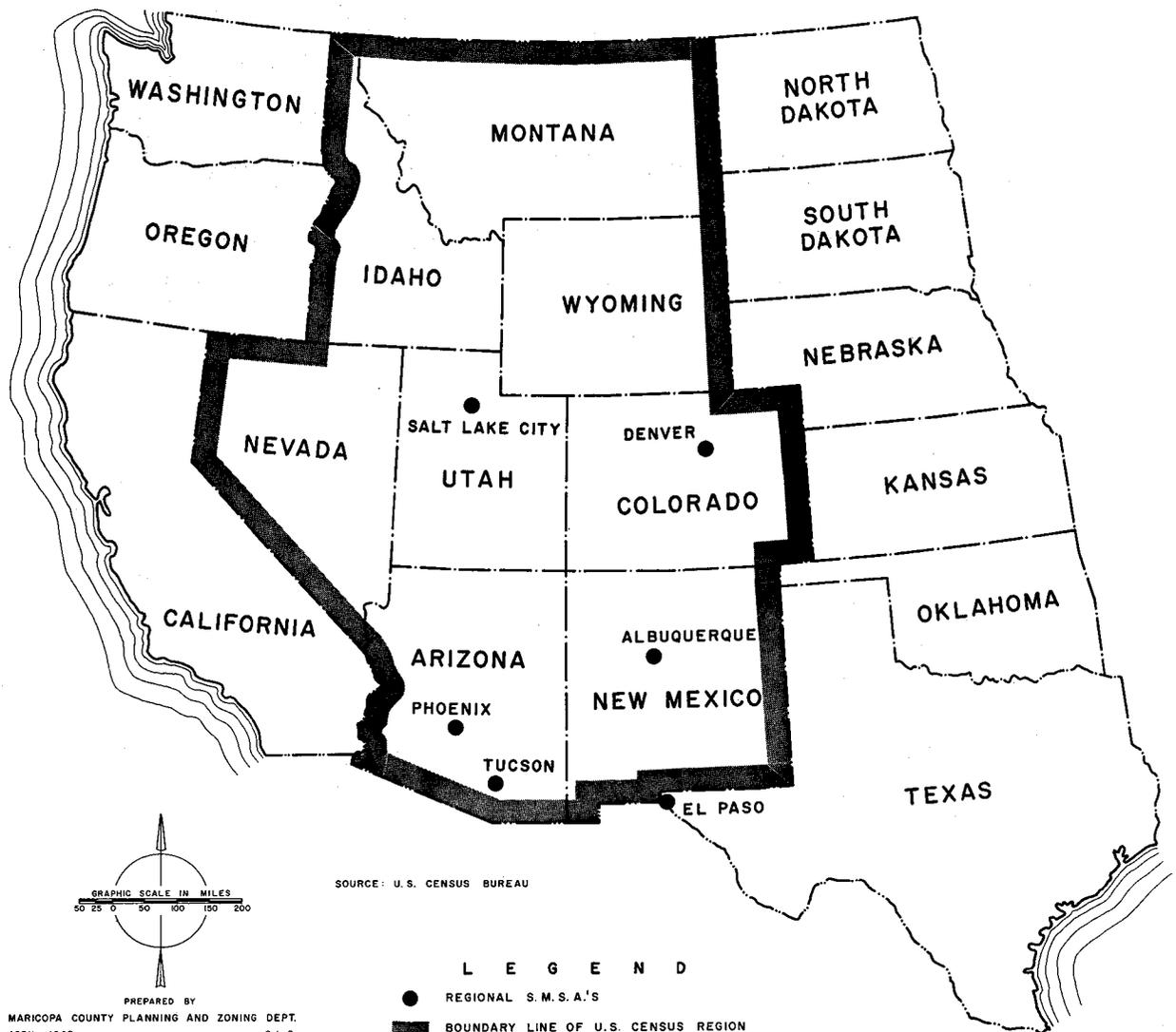
PLATE 10

Metropolitan Areas Compared to Maricopa County

Five similar urban areas have been chosen for comparison with the Phoenix SMSA,⁽⁹⁾ which includes all of Maricopa County. Plate 11 shows their location. All metropolitan districts are located in arid or semi-arid regions where irrigated agriculture has played a vital part in the economic development of the area. Agriculture is located in a few favored valleys, and the rural population is not evenly distributed over the landscape as in the South or Middle West. In most of these areas tourism, cattle, mining, transportation and trade have important roles. During and since World War II military establishments have boosted the economy of each area. Manufacturing, usually associated with defense contracts, has arrived only recently to become significant. Obviously each area differs from the other, but similarities are sufficient enough to justify a regional analysis.⁽¹⁰⁾

(9) The terminology of SMSA means Standard Metropolitan Statistical Area as defined by the U.S. Census Bureau. Briefly, each SMSA is a whole county that contains at least one city of 50,000 or more inhabitants. If certain criteria are met, adjacent counties to the central county may be included. For further details, see Page XXIV, PC (1), 1A, U.S., United States Census of Population, 1960

(10) For a detailed analysis of the economy in the Mountain States Census Region refer to America's New Frontier, the Mountain West, 1950. The book is out of date, of course, because the electronic industry was not significant in Phoenix at this time.

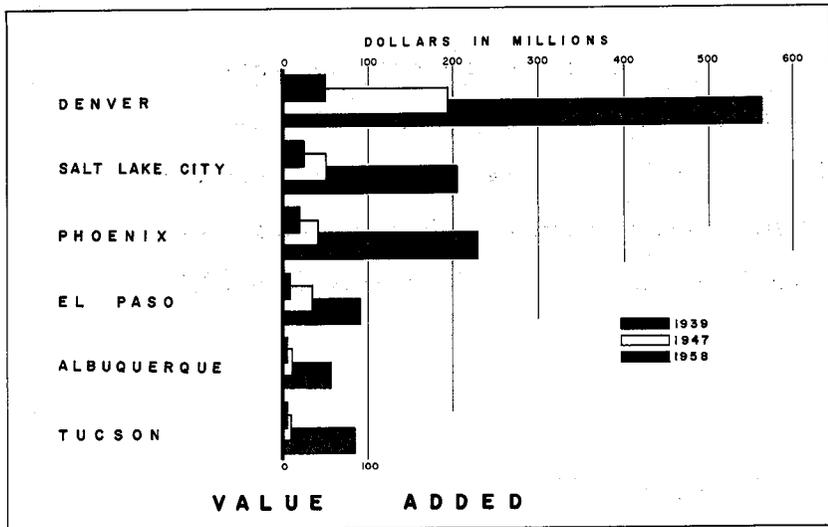


MOUNTAIN STATES REGION

Plate 12, "Value Added by Manufacture," indicates that all six SMSA's experienced substantial growth in the manufacturing industry from 1939 to 1958. Denver was at first place in 1939 with 48 million dollars and remained at first place in 1958 with 563 million dollars. Phoenix was at third place in 1939 with 8 million dollars and moved to second place in 1958 with 228 million dollars.

The second part of Plate 12 indicates that all SMSA's exceeded the national rate of growth most of the time. Phoenix and El Paso had the highest rate from 1939 to 1947 at 375 per cent. Tucson had the highest rate from 1947 to 1958 at 1,295 per cent, with Phoenix being third at 474 per cent.

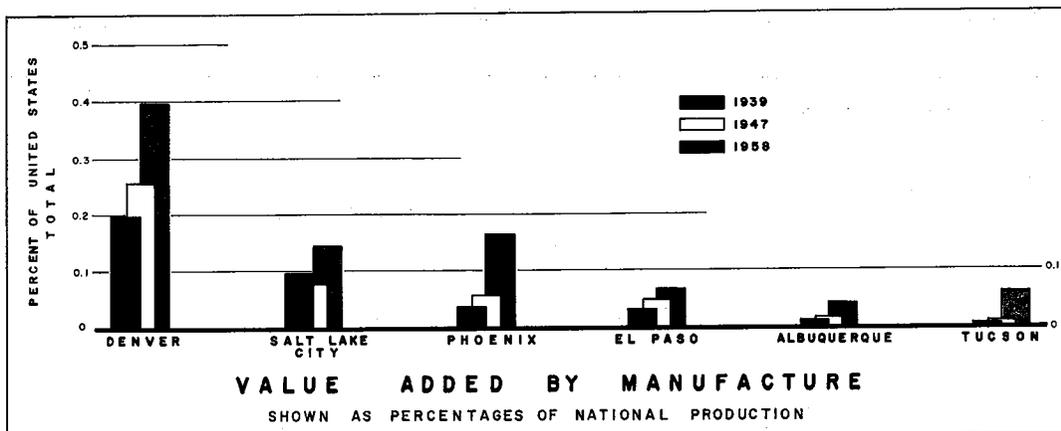
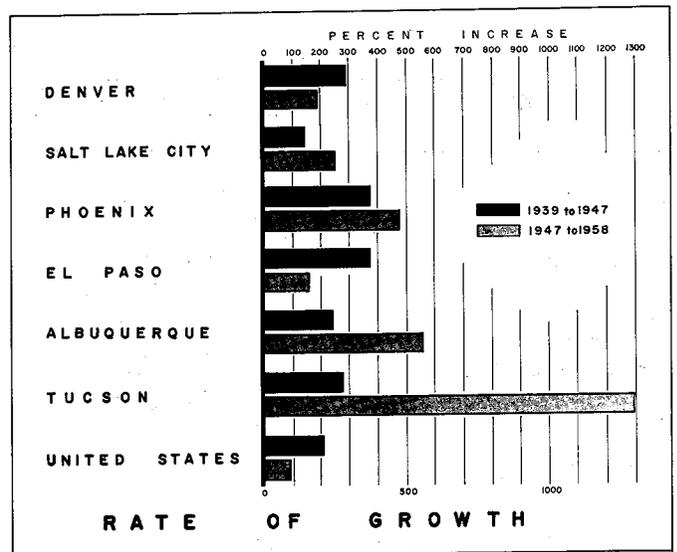
The bottom part of Plate 12 shows the position of each SMSA with respect to the nation's total and indicates that all made gains from 1939 to 1958.



VALUE ADDED
by
MANUFACTURE

SMSA'S IN THE
MOUNTAIN STATES REGION

SOURCE:
U.S. CENSUS OF MANUFACTURES



The population of each SMSA grew faster than the national average during this period, see Table 1. Per capita values for value added by manufacture are listed in Table 2. In 1958, Denver was in first place with a per capita value of 650 dollars, while Phoenix was in third place with 381 dollars. All SMSA's studied were below the national average of 817 dollars.

TABLE 1
POPULATION
Phoenix SMSA Compared to Other Western Cities

SMSA	Total Number of Persons			Per Cent Increase	
	1940	1950	1960	1940-50	1950-60
PHOENIX	186,193	331,770	663,510	78.2	100.0
Albuquerque	69,391	145,673	262,199	109.9	80.0
Denver	445,206	612,128	929,383	37.5	51.8
El Paso	131,067	194,968	314,070	48.8	61.1
Salt Lake City	211,623	274,895	383,035	29.9	39.3
Tucson	72,838	141,216	265,660	93.9	88.1
TOTAL (6 SMSA's)	1,116,318	1,700,650	2,817,857	52.3	65.7
UNITED STATES SMSA's (212 SMSA's)	72,834,468	89,316,903	112,885,178	22.6	26.4
UNITED STATES TOTAL (50 STATES)	132,164,569	151,325,798	179,323,175	14.5	18.5

Source: U.S. Census of Population

TABLE 2

PER CAPITA VALUES
1958Phoenix SMSA Compared with Other Western Cities
and the United States' Average

SMSA	Dollars Per Person			
	Value Added By Manufacture	Retail Sales	Wholesale Sales	Receipts From Service Industries
PHOENIX	381	1,228	1,482	201
Albuquerque	239	1,291	1,314	183
Denver	650	1,366	2,781	224
El Paso	314	1,116	1,732	144
Salt Lake City	564	1,274	2,456	223
Tucson	348	1,200	666	196
UNITED STATES	817	1,155	1,648	135

RATING SCALE

Per Capita Value Analysis
Phoenix SMSA Compared with Other Western Cities⁽¹⁾

1958:	Phoenix	Albuquerque	Denver	El Paso	Salt Lake City	Tucson
All Economic Indices	14.0	10.0	23.5	8.0	19.5	9.0
Manufacturing	4.0	1.0	6.0	2.0	5.0	3.0
Retail Sales	3.0	5.0	6.0	1.0	4.0	2.0
Wholesale Sales	3.0	2.0	6.0	4.0	5.0	1.0
Service Receipts	4.0	2.0	5.5	1.0	5.5	3.0

Note: (1) Point Ratings; 6 points for first place, 5 points for second, 4 points for third, etc.

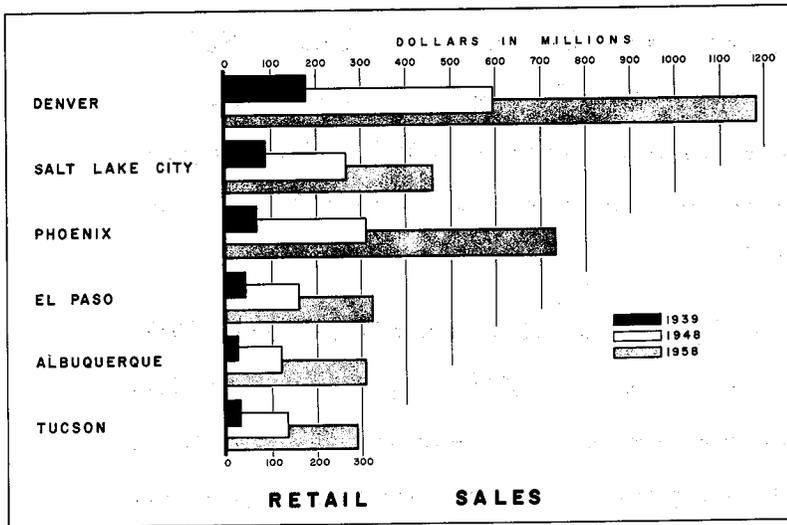
Source: Computations were made by the Advanced Planning Division, based on information from U.S. Bureau of Census.

Plate 13, "Retail Sales," shows Denver at first place in 1939 with 178 million dollars and remained at first place in 1958 with 1.2 billion dollars. Phoenix was at third place in 1939 with 67 million dollars and moved to second place in 1958 with a total of 733 million dollars.

The growth rates for all SMSA's exceeded that of the nation and all followed the national trend with greater rates of growth during the first period than during the second. Of the six SMSA's studied, Albuquerque had the highest rate of growth from 1939 to 1948 at 382 per cent, while Phoenix was third at 367 per cent. From 1948 to 1959, Albuquerque remained first at 153 per cent, while Phoenix was second at 136 per cent.

The bottom part of Plate 13 shows that all SMSA's gained on the nation from 1939 to 1958, although the gain for Salt Lake City was very slight, from 0.21 to 0.23 per cent. Phoenix gained from 0.16 to 0.37 per cent.

Per capita values for 1958 retail sales are shown in Table 2. Denver was in first place with 1,366 dollars, while Phoenix was in fourth place with 1,228 dollars. El Paso was the only SMSA below the national average of 1,155 dollars.



RETAIL SALES

SMSA'S IN THE MOUNTAIN STATES REGION

SOURCE:
U.S. CENSUS OF BUSINESS

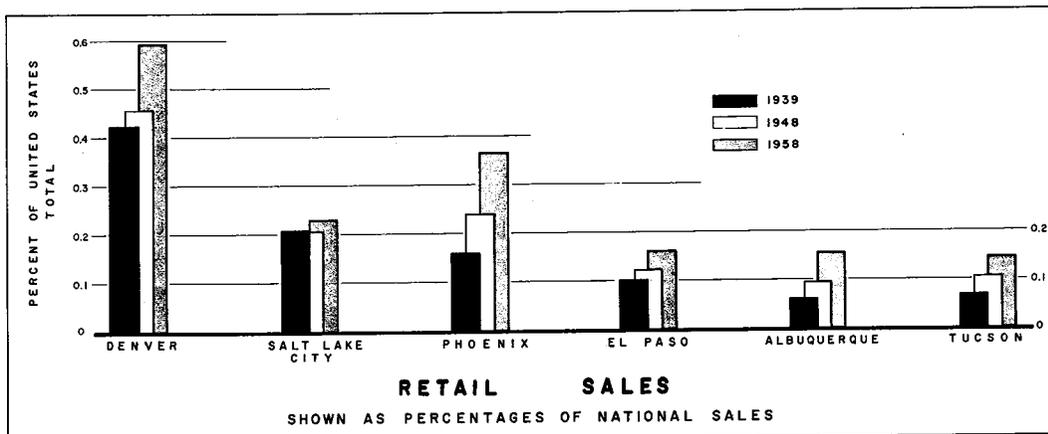
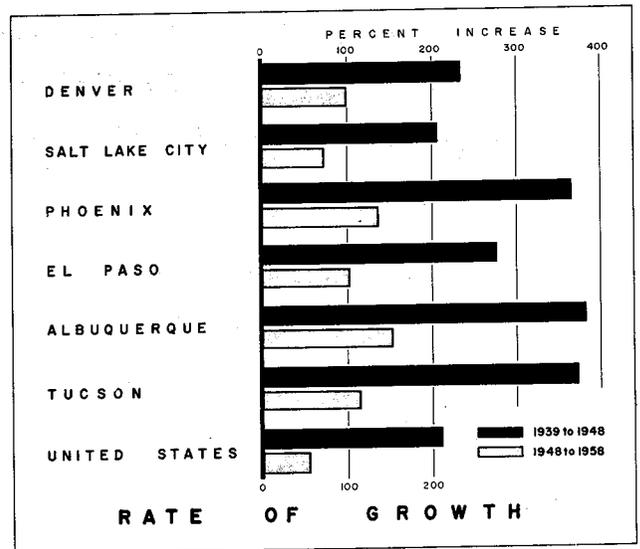
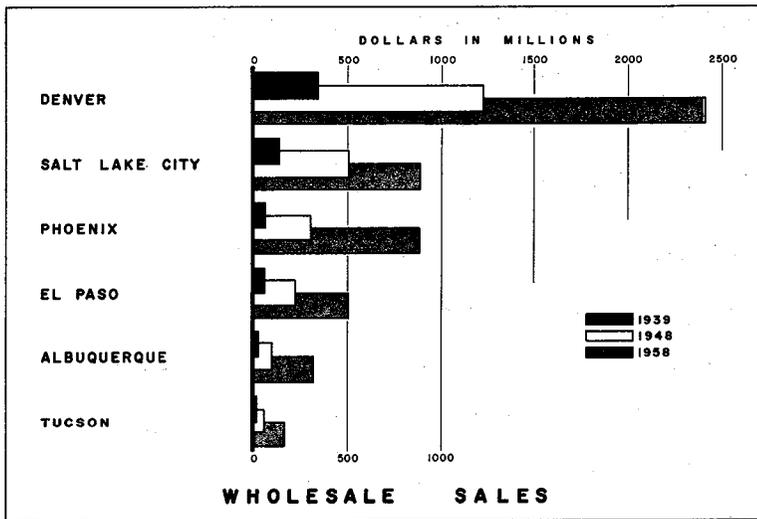


Plate 14, "Wholesale Sales," shows Denver at first place in 1939 with 341 million dollars and remaining at first place in 1958 with 2.4 billion dollars. Phoenix remained at third place, with 61 million dollars in 1939 and 885 million dollars in 1958. However, by 1958 Phoenix had nearly overtaken Salt Lake City.

Phoenix was first in rate of growth at 395 per cent from 1939 to 1948 but dropped to third from 1948 to 1958. All SMSA's exceeded the national rate of growth from 1939 to 1958 and followed the national trend of higher rates of growth in wholesale sales during the first period than during the second.

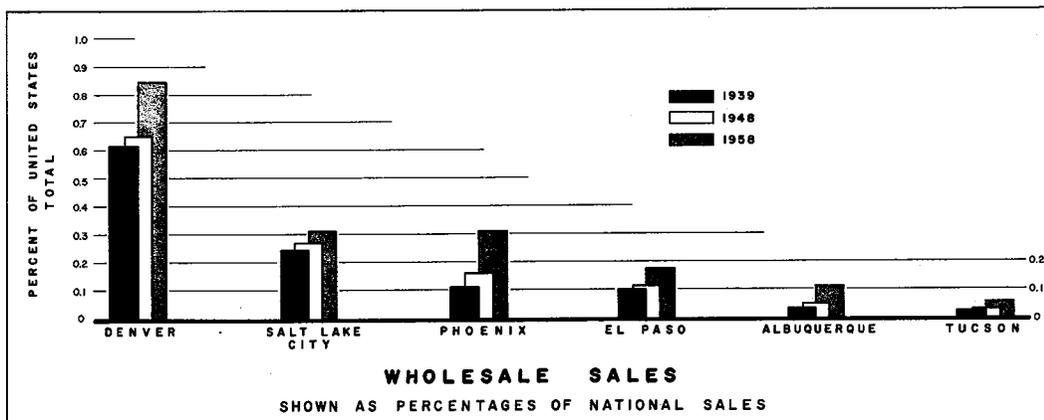
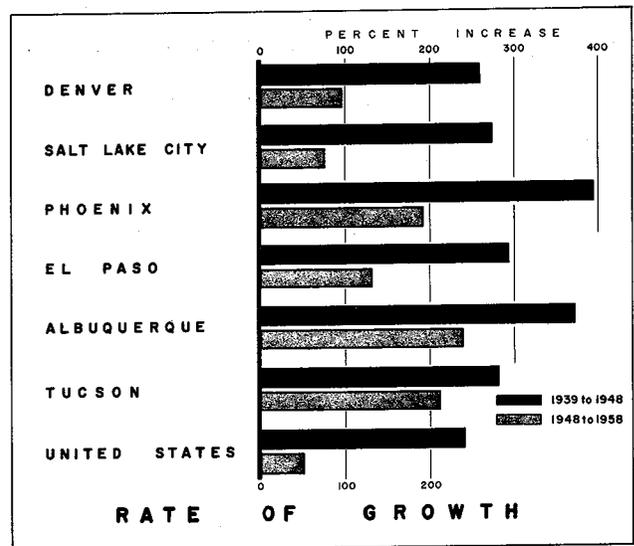
All SMSA's studied gained on the nation's total in wholesale sales from 1939 to 1958. Per capita values, Table 2, show Denver in first place at 2,781 dollars, with Phoenix in fourth place at 1,482 dollars. Only Denver, Salt Lake City and El Paso were above the national average of 1,648 dollars.



WHOLESALE SALES

SMSA'S IN THE MOUNTAIN STATES REGION

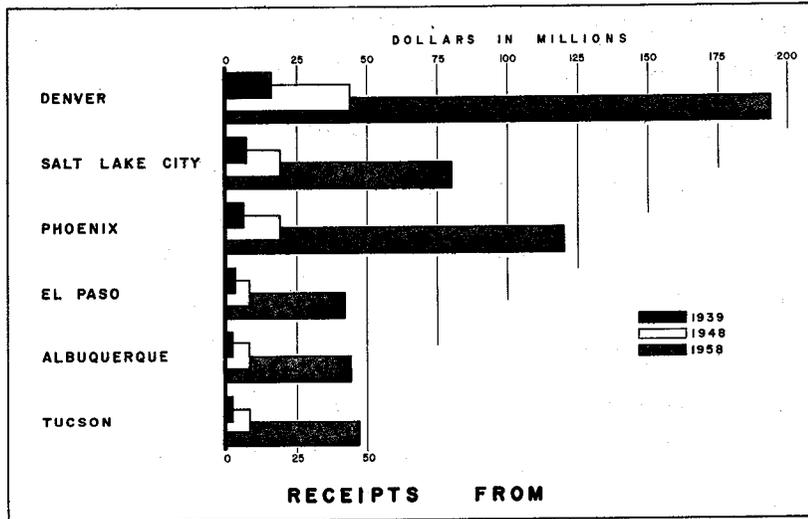
SOURCE:
U.S. CENSUS OF BUSINESS



Trends of the six SMSA's for "Receipts from Selected Service Trades," Plate 15, are somewhat similar to those of the other economic indices. Denver gained from 16 million dollars in 1939 to 194 million dollars in 1958; Phoenix gained from 6 million to 120 million during this period.

The Phoenix SMSA grew at 218 per cent from 1939 to 1948 for third place, behind Tucson at 292 per cent and Albuquerque at 334 per cent. From 1948 to 1958, Phoenix was in first place at 528 per cent. With the exception of El Paso during the period of 1939 to 1948, all six SMSA's exceeded the national rate of growth during the study period.

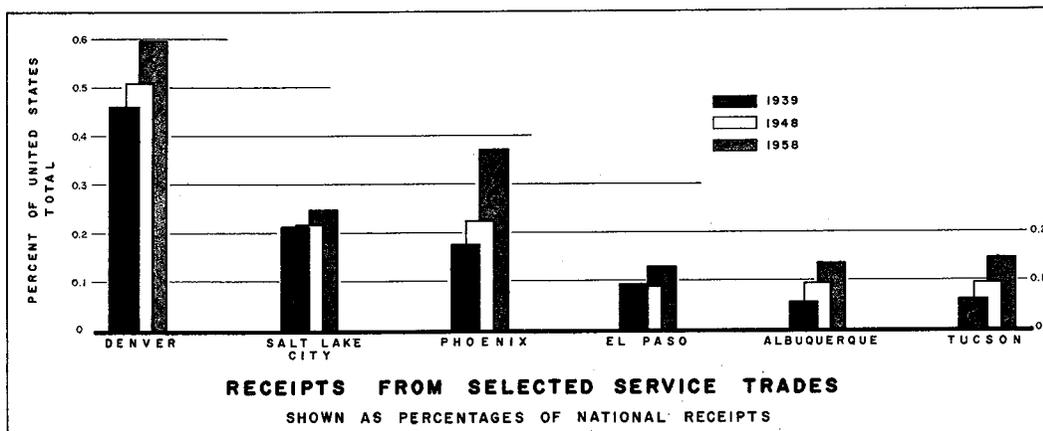
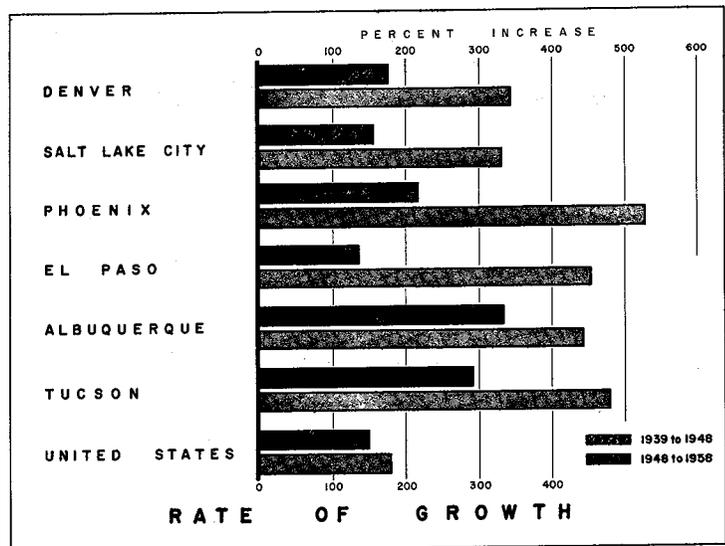
All SMSA's gained on the nation from 1939 to 1958; and Denver and Salt Lake City have the highest per capita receipts at 223 to 224 dollars, see Table 2. Phoenix was next with 201 dollars per person. All SMSA's were above the national average of 135 dollars.



SOURCE:
U.S. CENSUS OF BUSINESS

SELECTED SERVICE TRADES

SMSA'S IN THE
MOUNTAIN STATES REGION



The rates of growth and per capita statistics are perhaps the most important when comparing Phoenix to the other SMSA's. Denver tends to be the leader in per capita statistics, as well as being the largest SMSA of the group. Salt Lake City is second and Phoenix third in per capita statistics. On the other hand, Phoenix, Albuquerque and Tucson, starting from small bases in 1939, tend to show the greatest rates of growth during the study period. Phoenix varies from first to third place concerning rates of growth, see Table 3. Being neither the consistent leader nor the laggard, in terms of growth and per capita standing, the Phoenix SMSA is comparable to other metropolitan areas within the geographic region.

The strongest features of the Phoenix SMSA are in retail sales and receipts from selected service trades. Phoenix and Tucson have had rather insignificant positions in wholesale sales although trends of growth appear favorable, while both SMSA's experienced a good rise in manufacturing from 1947 to 1958.

TABLE 3
 RATING SCALE
 Rate of Growth Analysis
 Phoenix SMSA Compared with Other Western Cities⁽¹⁾

	Phoenix	Albuquerque	Denver	El Paso	Salt Lake City	Tucson
1939 to 1958:						
All Economic Indices	38.5	39.0	18.0	24.5	12.0	36.0
Manufacturing	9.5	7.0	6.0	6.5	4.0	9.0
Retail	9.0	12.0	4.0	6.0	2.0	9.0
Wholesale	10.0	11.0	3.0	7.0	3.0	8.0
Service	10.0	9.0	5.0	5.0	3.0	10.0
1939 to 1948:						
All Economic Indices	19.5	19.0	10.0	13.5	6.0	16.0
Manufacturing(2)	5.5	2.0	4.0	5.5	1.0	3.0
Retail	4.0	6.0	2.0	3.0	1.0	5.0
Wholesale	6.0	5.0	1.0	4.0	2.0	3.0
Service	4.0	6.0	3.0	1.0	2.0	5.0
1948 to 1958:						
All Economic Indices	19.0	20.0	8.0	11.0	6.0	20.0
Manufacturing(2)	4.0	5.0	2.0	1.0	3.0	6.0
Retail	5.0	6.0	2.0	3.0	1.0	4.0
Wholesale	4.0	6.0	2.0	3.0	1.0	5.0
Service	6.0	3.0	2.0	4.0	1.0	5.0

Notes: (1) Point Ratings; 6 points for first place, 5 points for second, 4 points for third, etc.

(2) Periods of time for Manufacturing are from 1939 to 1947 and from 1947 to 1958.

Source: Computations were made by the Advanced Planning Division, based on information from U.S. Bureau of Census.

Labor Force Trends

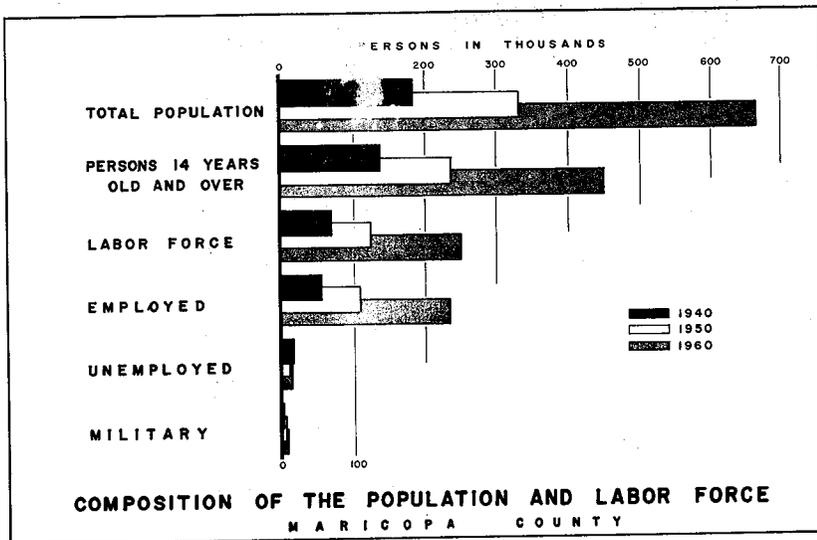
This section summarizes trends of the labor force for Maricopa County from 1940 to 1960 with respect to the total population. The labor force is further categorized into groups of employed persons, unemployed and the military.⁽¹¹⁾ Persons of proper age not in the labor force include students, housewives, retired workers and persons unable to work because of illness or disability.

Plate 16 shows the number of persons for Maricopa County by each category mentioned above. Growth has been considerable for all categories except the unemployed and the military. Total population grew from 186,000 in 1940 to 664,000 in 1960 while the labor force grew from 68,000 to 250,000 during the same period. Therefore, population grew at a rate of 256 per cent for the twenty-year period, the labor force grew at 267 per cent and employment grew at 329 per cent. Unemployment for the County dropped from 13,000 in 1940 to 9,500 in 1950, then increased to 11,000 in 1960. Unemployment in 1940 included workers on federal relief programs such as the Civilian Conservation Corps and the Public Works Administration.

Plate 16, second part, shows the relative position of all categories with respect to the County's total population. The proportion of persons 14 years old and over has dropped from 73 per cent in 1940 to 68 per cent in 1960, thus reflecting a relative as well as numerical increase in children during this period.⁽¹²⁾

(11) By definition of the Census Bureau, persons under 14 cannot be included in the labor force.

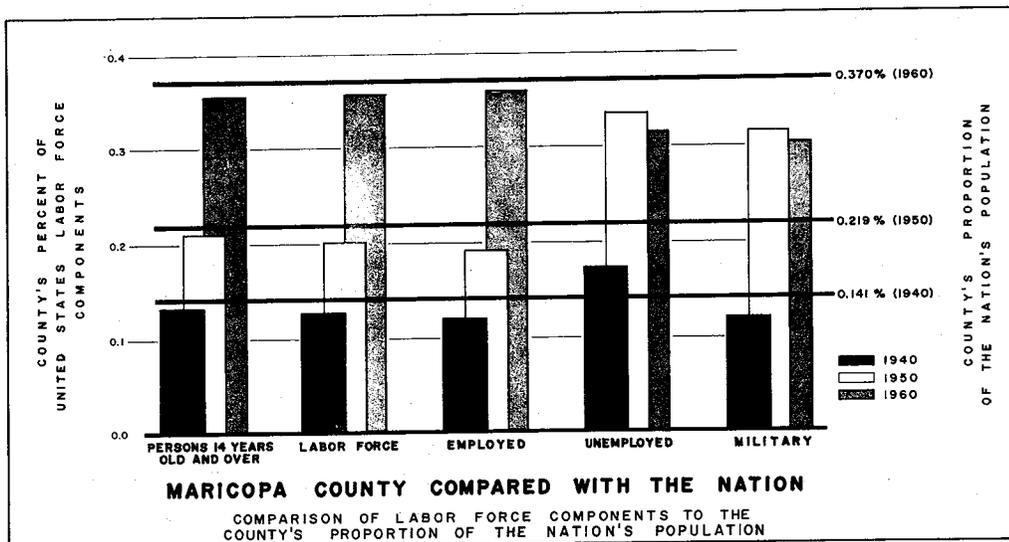
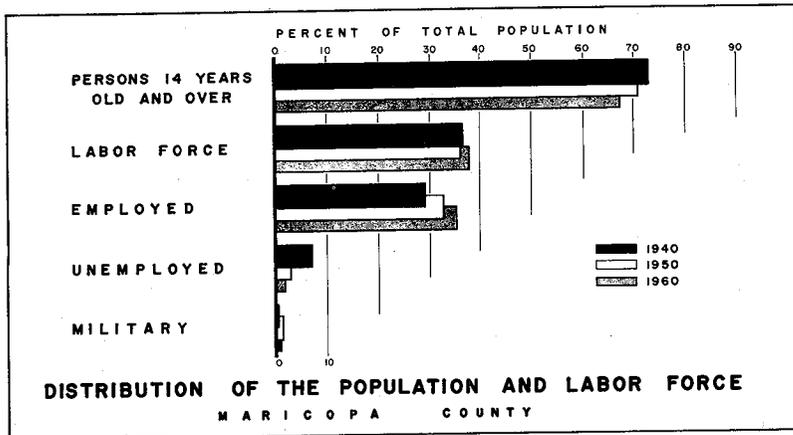
(12) For further details concerning age composition of Maricopa County, refer to A Report Upon 1960 Census of Population, Maricopa County or to Arizona County Base Book, 1962.



LABOR FORCE TRENDS

1940 - 1960

SOURCE:
U.S. CENSUS OF POPULATION



The proportion of persons in the labor force has remained almost constant, 37 per cent in 1940 and 38 per cent in 1960, while the proportion of the employed has increased, from 29 per cent in 1940 to 35 per cent in 1960. Unemployment has dropped from 7 per cent in 1940 to 2 per cent in 1960; the military increased from 0.2 per cent in 1940 to 1.0 per cent in 1950, then dropped to 0.8 per cent in 1960.⁽¹³⁾

Maricopa County's share of the nation's total population is shown at the bottom of Plate 16. The County's proportion gained from 0.141 per cent in 1940 to 0.370 per cent in 1960. By using 0.141 per cent in 1940, 0.219 per cent in 1950 and 0.370 per cent in 1960 as the standard for comparison, each labor force component of Maricopa County can be compared to its respective national average for that particular year. Plate 16 indicates that the County was constantly below average in the first three categories: persons 14 years old and over, the labor force, and persons employed.

Maricopa County was above the national average in unemployment in 1940 and 1950 but dropped to be below average in 1960. This decrease may be considered a surprising result in view of the rapid population growth during this same period. In spite of heavy migration to Maricopa County, the rate of unemployment has dropped, indicating that migrants are eventually finding employment opportunities. Consequently, economics may play a greater role in stimulating the County's growth than is commonly supposed by previous reports.⁽¹⁴⁾ This impact stems mostly from nation-wide influences, however. See Table A in the appendix for supporting data.

(13) The military statistic represents the number of persons quartered on military installations in Maricopa County; Page IX PC(1), IA, U.S., United States Census of Population, 1960.

(14) Reference is made especially to "Recent Migration to Arizona," by Ralph C. Hook, Jr. and Paul D. Simpkins, Arizona Business Bulletin, June 1959. For example, a statement on page 6 says, "one-half of the recent migrants to Arizona cited climate or its influence on health as a major cause of their migration."

Employment Trends

This section summarizes employment trends for Maricopa County from 1940 to 1960 for general occupation and industry groups. Occupation has been classified into ten major headings, while industry is subdivided from its ten major headings into several smaller sub-groups.

Comparisons are made between the industry groups of Maricopa County and selected similar SMSA's. The section concludes with a preliminary employment forecast for the ten major industrial headings which will provide a background for population forecasts and land-use plans.

Employment by Occupation Groups

The occupation classification system used by the U.S. Census Bureau explains what kind of work a person does; i.e. a laborer, a craftsman, or a professional, etc.

Plate 17 shows that all occupation groups of Maricopa County experienced an increase in persons employed from 1940 to 1960, with the exception of farmers and farm managers. Clerical and sales workers⁽¹⁵⁾ show the greatest numerical increase, from 10,000 in 1940 to 54,000 in 1960. Professional and technical workers show an important increase, from 5,000 in 1940 to 28,000 in 1960. Farmers and farm managers dropped from 3,100 in 1940 to 2,700 in 1960.

In general, employment increases were greater from 1950 to 1960 than from 1940 to 1950, matching the greater population increase for the second decade. For example, clerical and sales workers increased by 13,000 from 1940 to 1950 and by 31,000 from 1950 to 1960. The increase for professional and technical workers was 6,000 for the first decade and 17,000 for the second decade. A similar trend is indicated for craftsmen and operatives as well. For personal service workers the change was not quite so noticeable; the increases were 6,000 and 11,000 for 1940-50 and 1950-60, respectively.

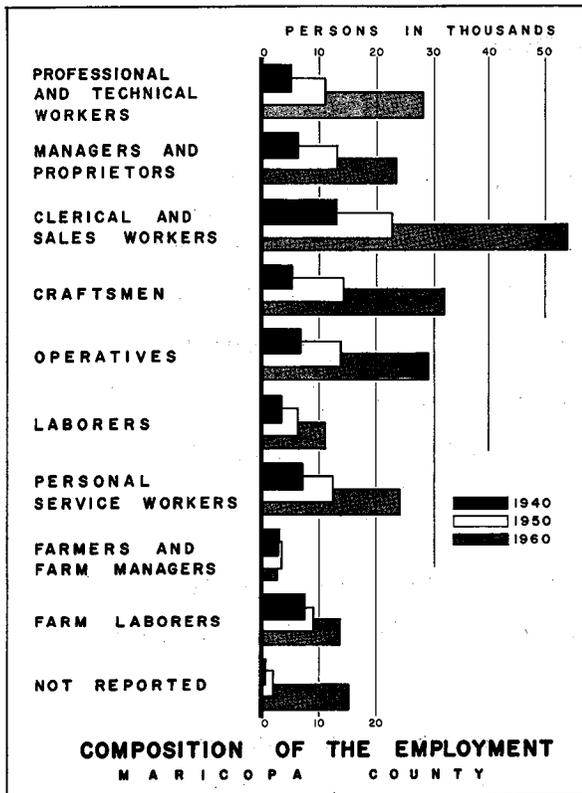
The per cent distribution for each occupation group is shown on Plate 17, second part. This plate reveals that professional, clerical and sales, and craftsmen are the only groups that show percentage increases for each census period; for example, professional and technical workers increased from 9.1 per cent in 1940 to 12.0 per cent in 1960, while craftsmen increased from 9.4 per cent in 1940 to 13.7 per cent in 1960, but most of the increase

(15) For Maricopa County, clerical and sales workers were not separated in the 1940 census; therefore, data from the two groups were combined into one category for 1950 and 1960 to provide continuity from 1940-60.

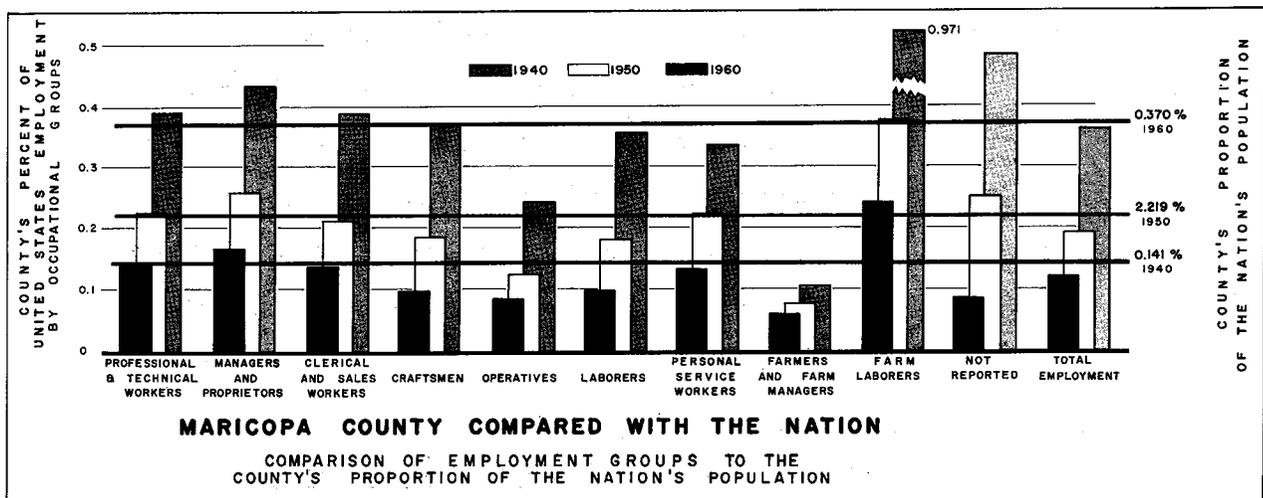
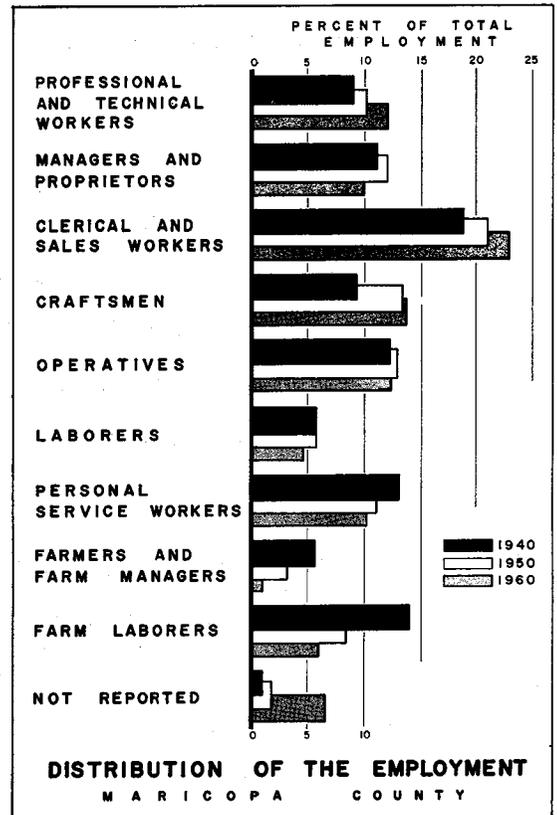
EMPLOYMENT TRENDS

by OCCUPATIONAL GROUPS

1940 - 1960



SOURCE:
U. S. CENSUS OF POPULATION



is for 1940-50. Two groups, managers and operatives, increased from 1940 to 1950, but decreased from 1950 to 1960; for example, managers increased from 11.2 per cent in 1940 to 12.0 per cent in 1950 but dropped to 10.0 per cent in 1960. The proportion of laborers, personal service workers, farmers and farm managers, and farm laborers dropped in each decade. Personal service workers dropped from 13.1 per cent in 1940 to 11.7 per cent in 1950 and to 10.3 per cent in 1960.

In general, the nation's white collar workers are relatively increasing while blue collar workers and farmers are decreasing.⁽¹⁶⁾ For Maricopa County white collar workers increased from 39.2 per cent in 1940 to 45.0 per cent in 1960, while the trend for blue collar workers differed from the national trend as it increased from 40.5 per cent in 1940 to 41.1 per cent in 1960. Farmers dropped from 19.7 per cent in 1940 to 7.1 per cent in 1960.

Maricopa County is compared to the nation by Plate 17, third part. In 1940, managers and farm laborers were the only groups above their respective national averages, although professional, clerical and personal service workers were very near average. Twenty years later, in 1960, managers and farm laborers were still above average while professional and clerical groups had gained to be above average as well. Craftsmen and laborers had gained to be near their average mark. See Table B in the appendix for supporting data.

A significant fact is that by 1960 all white collar groups were above their respective national averages. However, in 1960, the farm laborer group had the highest share of the nation's total at 0.971 per cent, while farmers and farm managers had the lowest at 0.106 per cent. The dominance of corporate farm holdings accounts in part for this occurrence. Although the relative proportion of farm laborers to total employment has dropped from 14.0 per cent in 1940 to 6.0 per cent in 1960, the County's share of the nation's farm laborers is still significant.

(16) See Page XXXI, PC (1), IC, U.S., United States Census of Population, 1960.

Employment by Industry Group

Employment is classified by the U.S. Census Bureau into basic industry groups, which are further classified into sub-groups when warranted. ⁽¹⁷⁾ This report catalogs employment into the following ten basic groups: agriculture, mining, construction, manufacturing, transportation, trade, finance, services, public administration, and not reported.

An attempt has been made by this report to simplify the terminology used by the Census Bureau. For example, the "transportation" heading includes transportation, communications and public utilities as listed by census publications; "trade" includes retail and wholesale trade; "finance" includes finance, insurance and real estate; and "agriculture" includes agriculture, forestry and fisheries, of which forestry and fishery employment is insignificant in the County. When necessary, consideration for sub-categories is provided and an analysis follows the general discussion.

(17) A complete reference on industrial classification is the Standard Industrial Classification Manual. A comparison between this classification and the system used by the Census Bureau may be found on page XXXIII, PC (1), IC, U.S., United States Census of Population, 1960.

Plate 18 shows that all industry groups of Maricopa County, with the exception of mining, experienced an increase in employment from 1940 to 1960. Manufacturing employment grew from 4,000 in 1940 to 36,000 in 1960; trade employment grew from 13,000 in 1940 to 48,000 in 1960; and services grew from 13,000 in 1940 to 54,000 in 1960. Agricultural employment grew within the county, from 12,000 in 1940 to 19,000 in 1960, whereas agriculture has declined in the nation from 8,500,000 in 1940 to 4,500,000 in 1960.

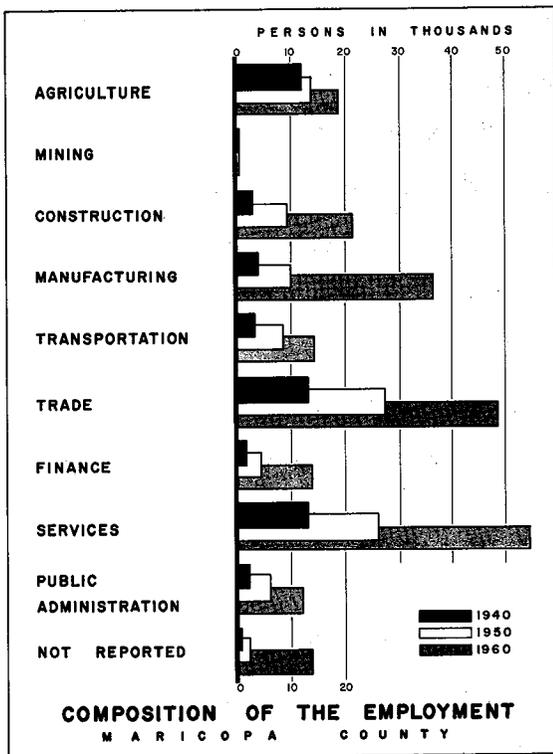
Significant gains in employment from 1950-60 were made in construction, manufacturing and finance. Finance grew from 1,800 in 1940 to 4,500 in 1950, then jumped to 14,000 by 1960.

The per cent of total employment for each industry group is illustrated on Plate 18, second part. In 1940, the three major industries of Maricopa County were agriculture, trade and services, each having 20 per cent or more of the total employment. By 1960, agriculture had dropped to 8.1 per cent, being replaced in importance by manufacturing at 15.6 per cent. Trade and services remained at a relatively high level when compared to the U.S. percentage; in 1960 the trade percentages were 20.7 and 18.2 and the service percentages were 23.0 and 21.0 for the county and nation respectively.

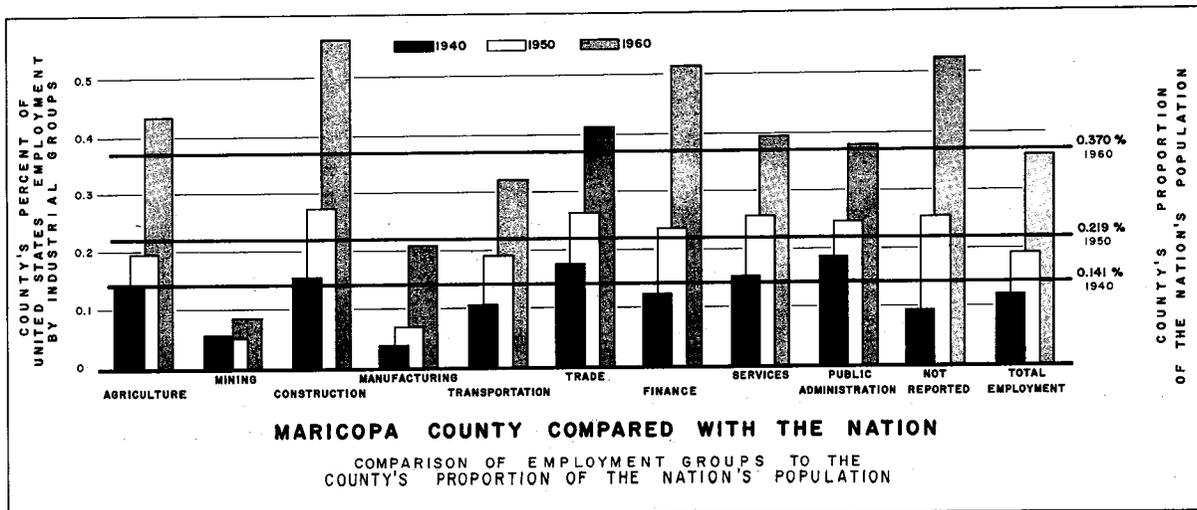
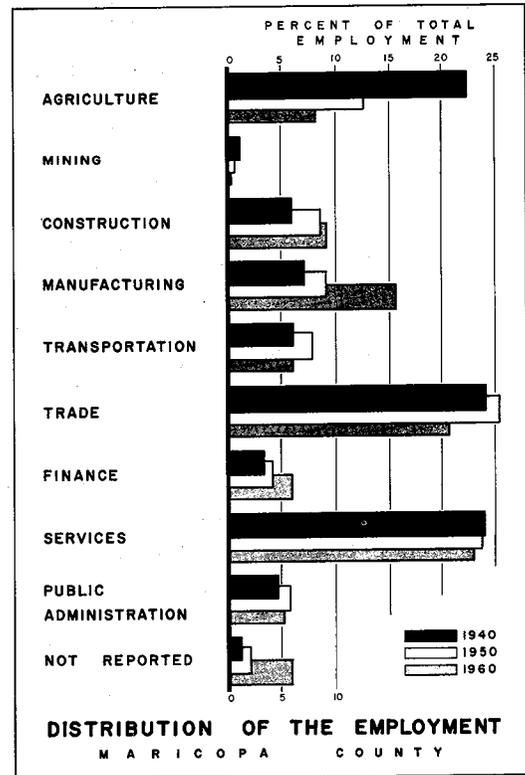
Construction, manufacturing and finance all show relative gains in employment for both periods. The change in manufacturing is especially significant, from 7.2 per cent in 1940 to 9.2 per cent in 1950, then jumps to 15.6 per cent in 1960. Transportation, trade and public administration gained from 1940 to 1950 but dropped slightly from 1950 to 1960. The proportionation of service employment has changed very little over the twenty-year period. Agriculture and mining have dropped with the passing of each decade; the proportional drop in agriculture is especially noticeable even though the actual number employed increased.

EMPLOYMENT TRENDS by INDUSTRIAL GROUPS

1940 - 1960



SOURCE:
U.S. CENSUS OF POPULATION



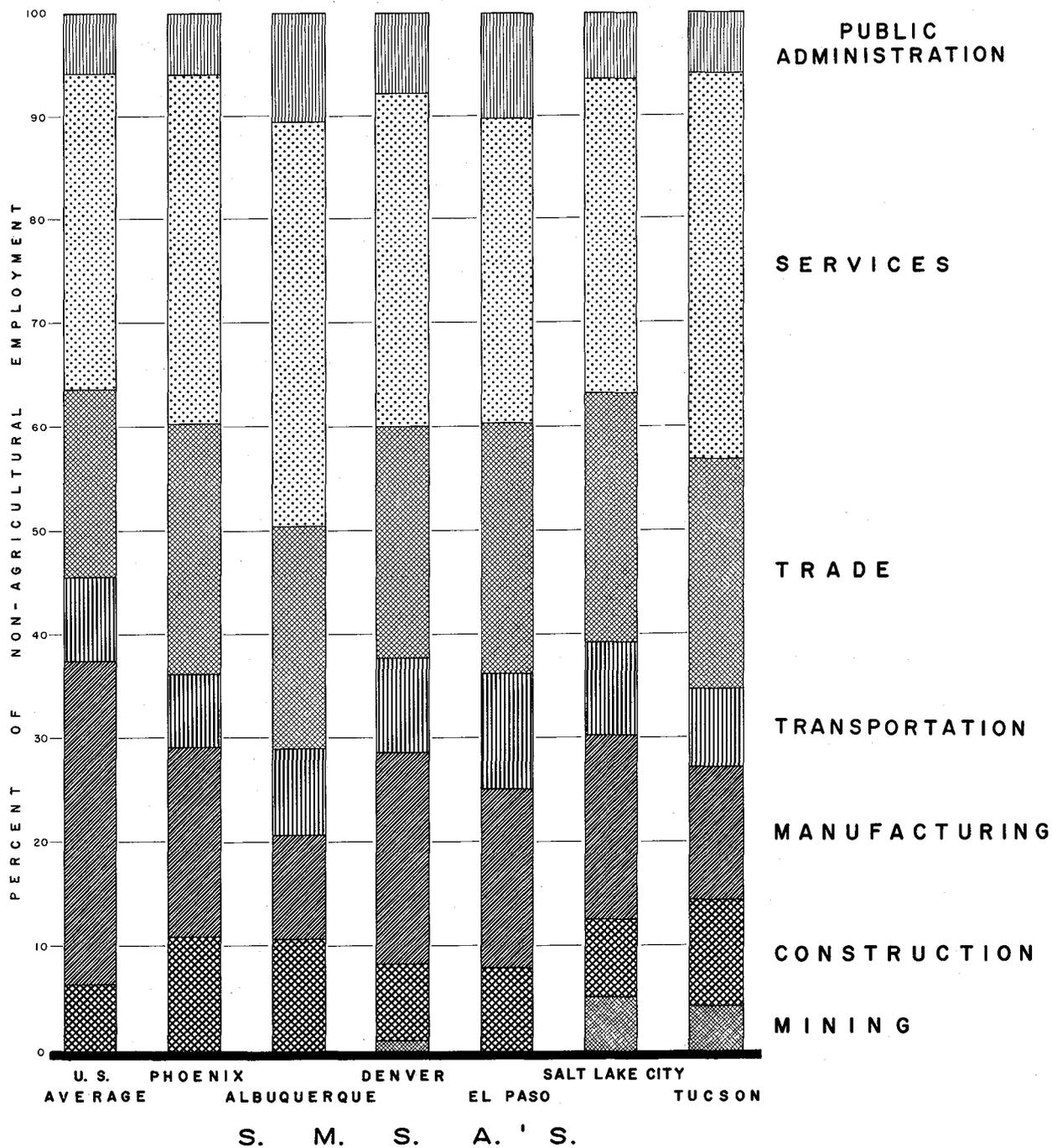
Maricopa County is compared to the nation by Plate 18, bottom part. Maricopa County has been consistently above the national average in construction, trade, services and public administration. Finance was below average in 1940, but has been above average since 1950. Agriculture was just at the national average in 1940, dropped below in 1950, and gained back above by 1960. The County has been consistently below average in mining, transportation and manufacturing, although manufacturing made considerable gains from 1950 to 1960. See Table C in the appendix for supporting data.

Plate 19 compares the 1960 non-agricultural employment distribution of Maricopa County (the Phoenix SMSA) with five other similar western SMSA's and the national average for all SMSA's of 250,000 or more population.⁽¹⁸⁾

Plate 19 shows that mining employment is insignificant for all 6 cities and only appears on the graph for Denver, Salt Lake City and Tucson. The percentage of mining employment for these cities ranges from one to five per cent; the percentage for Phoenix, Albuquerque and El Paso, as well as the national average, is 0.5 per cent or less. Manufacturing employment is below the national average for all six cities; Denver has the highest percentage of the cities at 20.3 per cent, while Albuquerque has the lowest at 10.0 per cent. The Phoenix SMSA has 18 per cent of its employment in manufacturing as compared to the national average of 31.1 per cent.

(18) The category "Industry Not Reported" has not been included in this analysis, as well as agricultural employment. The 8.1 percentage of agricultural employment in the Phoenix SMSA is unusually high when compared to the 1.5 per cent for the SMSA national average. A similar situation occurs when the Phoenix SMSA is compared to the five other SMSA's. To improve the accuracy of the analysis, assuming that distortion would occur with the inclusion of non-urban industries like agriculture, non-agricultural employment has been used instead of total employment.

SOURCE: U.S. CENSUS OF POPULATION



COMPARISON of EMPLOYMENT DISTRIBUTION — 1960

All six cities studied are above or near the national average in construction, transportation, trade and public administration. Phoenix has the highest percentage in construction at 10.7 per cent, while Denver, El Paso and Salt Lake City are all at 7 per cent compared to the national average of 5.9 per cent. El Paso has the highest percentage in transportation employment at 11.2 per cent while Phoenix has the lowest at 7.1 per cent compared to the national average of 8.1 per cent. Phoenix, El Paso and Salt Lake City have the highest percentage in trade employment at 24 per cent, while Albuquerque has the lowest at 21.4 per cent compared to the national average of 20.1 per cent. Albuquerque has the highest percentage in public administration at 10.5 per cent, while Phoenix and Tucson have the lowest at 6.0 per cent compared to the national average of 5.9 per cent.

All six cities are above the national average in services which include finance employment in this analysis. The Phoenix SMSA is third in service employment at 33.6 per cent, while Albuquerque is highest at 39.0 per cent and El Paso is lowest at 29.3 per cent compared to the national average of 28.4 per cent.

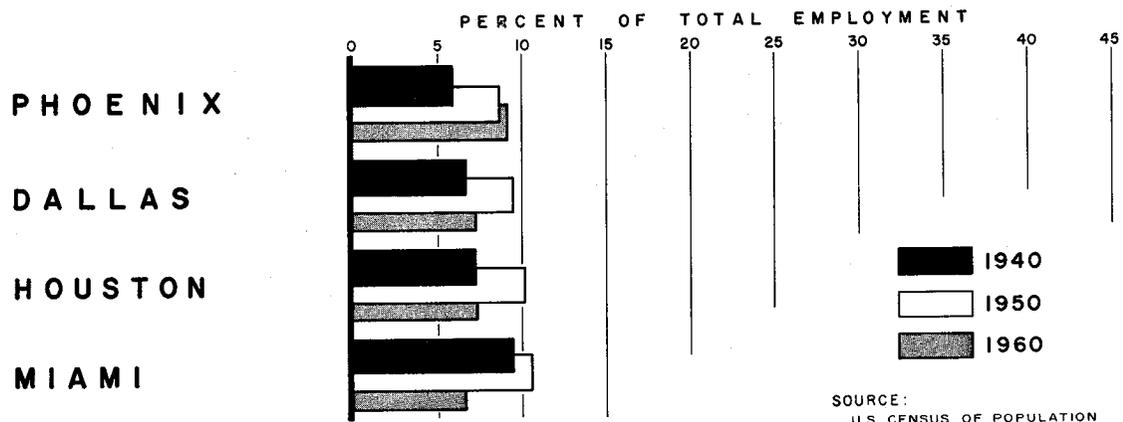
In general, the Phoenix SMSA is very similar in employment distribution to the five other SMSA's included for study in this report, and it is concluded that similar historical and geographical situations ordinarily result in a similar employment structure. All cities considered were below the national average in manufacturing employment but are above in trade and services. All cities are above the national average in construction, but the pattern is not as definite for transportation and public administration.

It is not within the scope of this report to delve into the reasons for the observations made above. However, some general conclusions are as follows: construction employment is relatively high primarily because the growth of these cities is above the average growth of the nation; and service employment is relatively high because of the emphasis on tourism. Ordinarily, the percentage of service employment is directly proportional to the emphasis on tourism. The basic income from mining is important in the Denver, Salt Lake City and Tucson areas, although employment appears to be small. Maricopa County is not different from its region (see Plate 19) but the region does differ somewhat from the nation as a whole.

Construction Employment

Plate 20 provides a comparison of construction employment within the Phoenix SMSA to three other SMSA's each having a similar experience of rapid growth in the past 20 years. Dallas, Houston and Miami SMSA's are all somewhat larger than Phoenix; and, having attained a similar size a decade earlier, the characteristics of these cities today may point the way to Phoenix's characteristics in the next 10 to 20 years. This comparison may be especially true for the construction industry because all four cities have not only grown rapidly, but construction has been large in absolute terms of value and volume, and for all categories such as residential, commercial and industrial.

Dallas, Houston and Miami show the same trend in percentage change of construction employees, with an increase of about three per cent from 1940 to 1950 and then a similar decrease from 1950 to 1960. The net result is that the 1960 percentage is about the same as the 1940 percentage. On the other hand, Phoenix shows an increase during both decades, of three per cent from 1940 to 1950 and then of one-half per cent from 1950 to 1960. It is important to notice that the increase for the latter decade is much less than during the first. Of the four cities, Phoenix had the lowest percentage of construction employees in 1940 at 5.9 per cent but developed to the highest percentage by 1960 with 9.2 per cent. It appears that the trends in Phoenix are lagging behind those of the other cities, and that a leveling off or even a drop appears to be a distinct future possibility.



DISTRIBUTION OF CONSTRUCTION EMPLOYMENT

Manufacturing Employment

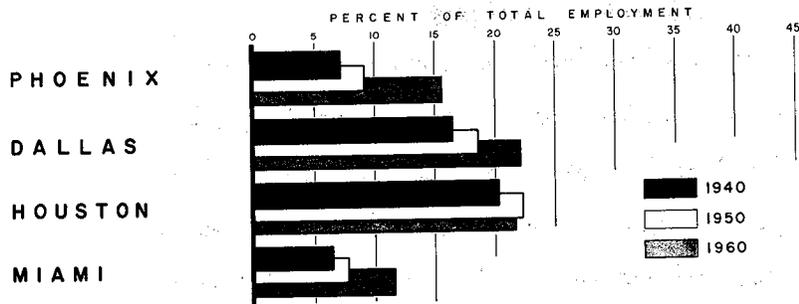
Previous sections of this chapter have illustrated the rapid rise of manufacturing employment in Maricopa County. Plate 21 shows a comparison of the Phoenix SMSA with Dallas, Houston and Miami. The first part of the plate shows total manufacturing, which is then split into durable and non-durable goods for the second and third parts, respectively.⁽¹⁹⁾

For Phoenix, Dallas and Miami the percentage of manufacturing employment has increased in both decades; the increase averaged about 2 per cent for 1940-50 and ranged from 4 to 6 per cent for 1950-60. In all three cases, the increase for the latter period has been greater than that during the former period. Houston is the exception to this trend as it dropped by 0.6 per cent from 1950 to 1960. The gains experienced in total manufacturing employment for Phoenix are especially noticeable, from 1950 to 1960. Phoenix in 1960 almost reached Dallas' level of 1940.

Houston reached its highest level of manufacturing employment at 22.3 per cent in 1950, and it is anticipated that Dallas will not reach much higher than 22 per cent in the future by assuming it will follow the trend set by Houston. Obviously this conclusion is oversimplified, but it appears that 22-23 per cent may be a theoretical limit for cities with a trade-service industry orientation. Phoenix is certainly typical of this situation, and the 1970 census will help clarify the trend.

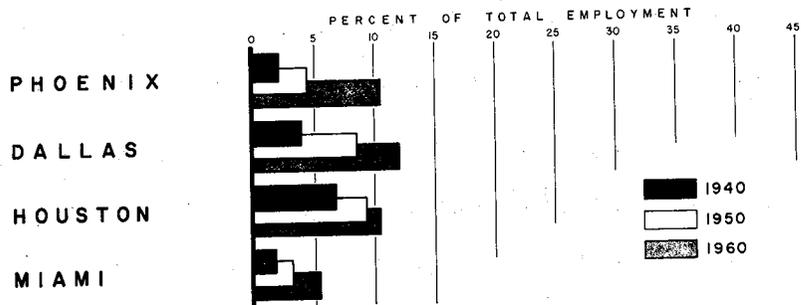
The second part of Plate 21 shows that all four cities made considerable gains in durable goods employment for both decades. Phoenix gained from

(19) Durable goods includes the manufacture of wood and metal products, etc. and non-durable goods includes food and textiles, etc.

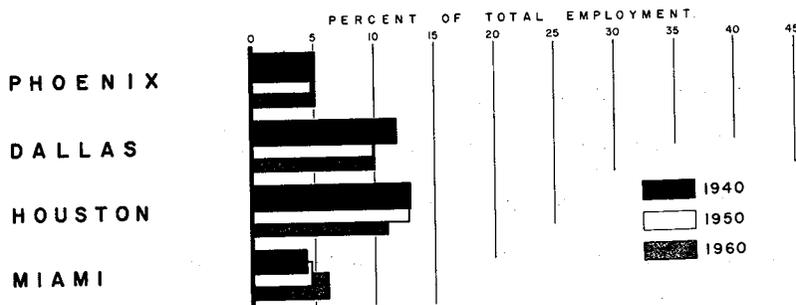


TOTAL MANUFACTURING EMPLOYMENT

SOURCE:
U.S. CENSUS OF POPULATION



DURABLE GOODS EMPLOYMENT



NON-DURABLE GOODS EMPLOYMENT

DISTRIBUTION of
MANUFACTURING EMPLOYMENT

2.1 per cent in 1940 to 4.4 per cent in 1950, then jumped to 10.5 per cent in 1960. Only Miami made consistent gains in non-durable goods, and the increase was much less than that for durable goods. This finding implies that most of the manufacturing employment gains have been made in the durable goods category, with declines or slight relative gains in non-durable goods. Houston made relative gains in durable goods from 1950 to 1960, but experienced losses in non-durable to the extent that total manufacturing declined during the period.

The manufacturing industry of Maricopa County is shown to a fuller extent by Plates 22 and 23. Durable and non-durable employment categories have each been subdivided into six categories.

For durable goods, see Plate 22; wood products, metal products and machinery have held the greatest significance in the past, accounting for 85 per cent of the durable goods employment in 1940 but dropped to 63 per cent by 1960. Therefore, considerable change has occurred over a 20-year period in the emphasis on the type of products manufactured. From 1950 to 1960, other transportation equipment (primarily aircraft) and machinery (primarily electronics) have made the greatest gains, while wood and metal products have lagged behind. Motor vehicles have held no significance for the County, past or present.

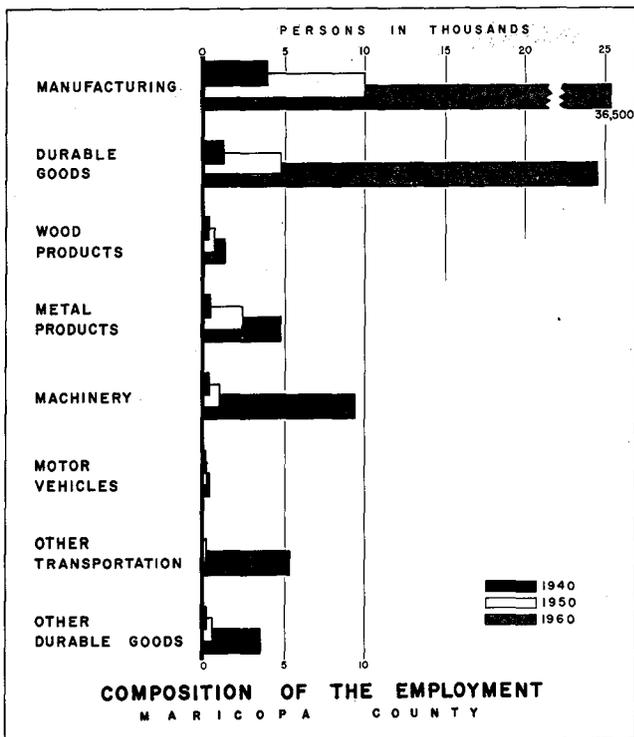
Plate 22, bottom part, compares Maricopa County to the nation. The technique of analysis is the same as in previous sections of this chapter and shows that all categories rate below the national average, past and present, with the exception of other transportation equipment (primarily aircraft) in 1960.

MANUFACTURING EMPLOYMENT

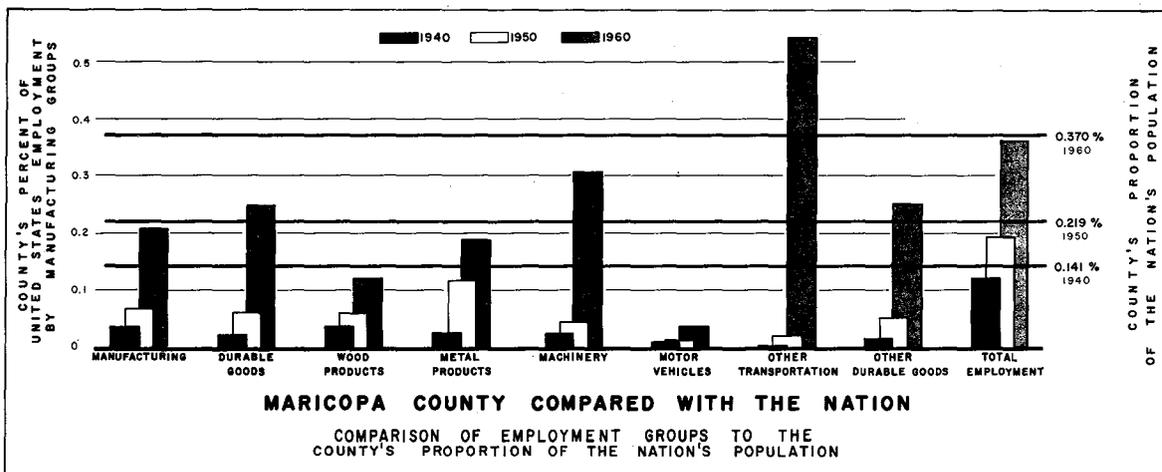
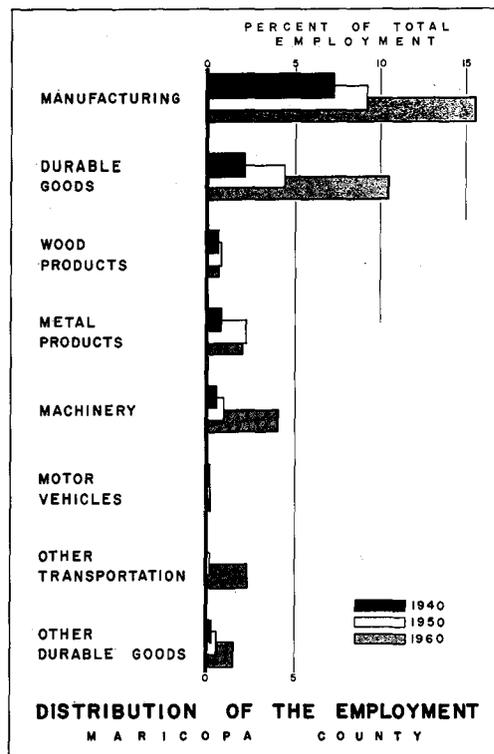
TRENDS

DURABLE GOODS

1940 - 1960



SOURCE:
U.S. CENSUS OF POPULATION



For non-durable goods, see Plate 23; food products, printing and publishing, and chemicals have held the greatest significance in the past, accounting for 90 per cent of the non-durable goods employment in 1940. This percentage had dropped to 78 per cent by 1960; therefore, a change occurred in the emphasis on the type of products manufactured, but the change for non-durable goods has not been as great as that change for durable goods. From 1950 to 1960, apparel, food products, and printing and publishing have made the greatest gains, while chemicals lagged behind. Textiles and other non-durable goods have held little significance for the County, past or present. Food products, printing and publishing have consistently rated near the national average, past and present, while machinery (primarily electronics) has had good development in the last decade. See Tables D and E in the appendix for supporting data.

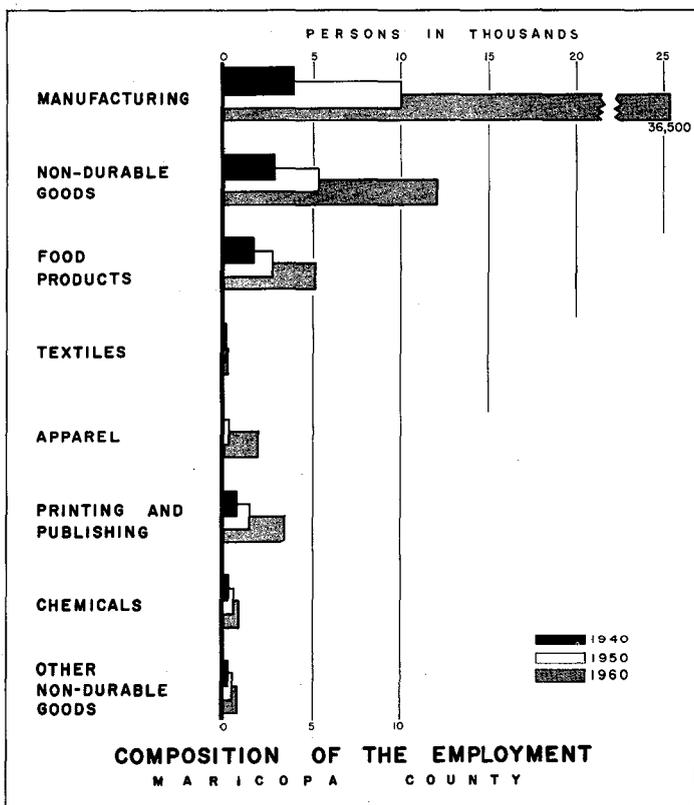
In spite of recent gains it is concluded that Maricopa County has a long way to go to reach full maturity as a manufacturing employment center.

MANUFACTURING EMPLOYMENT

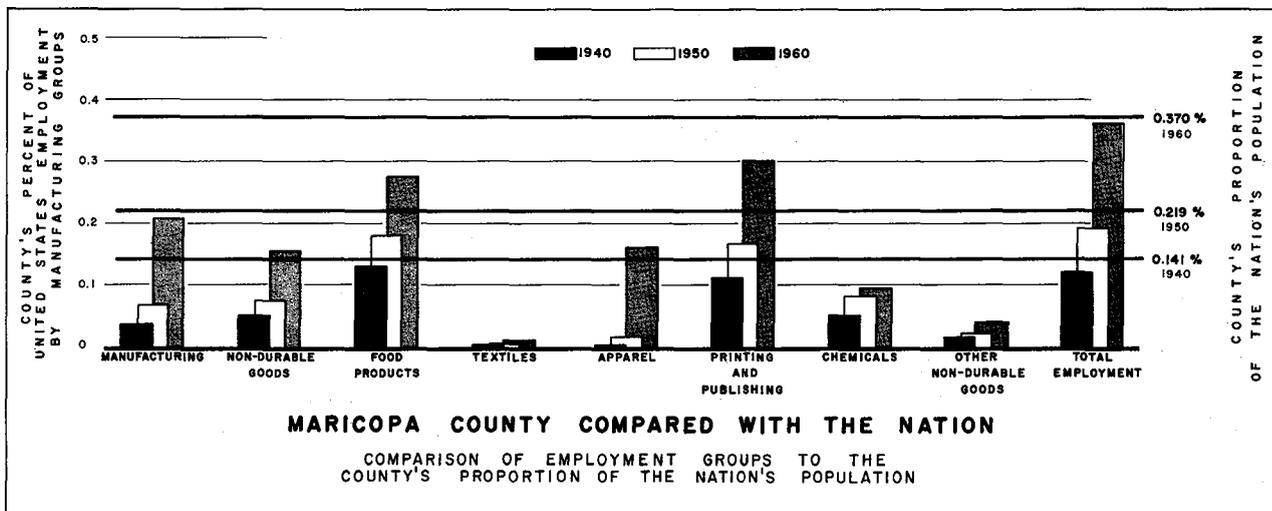
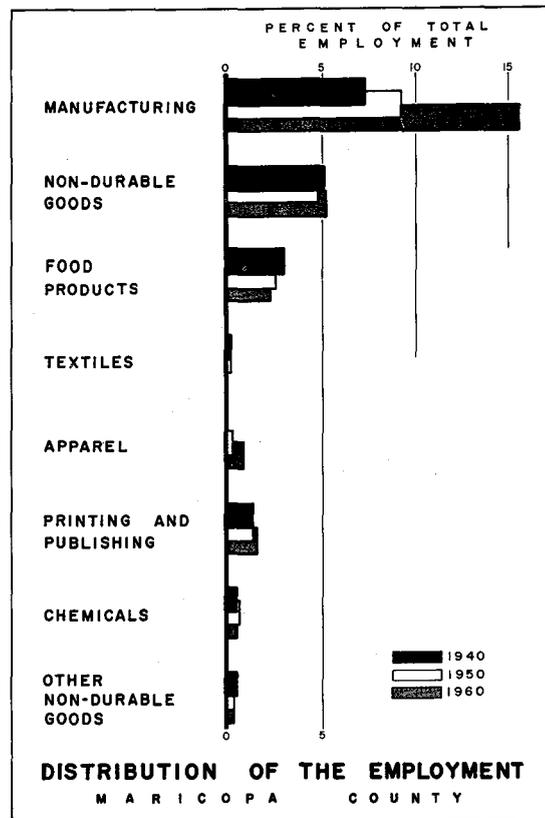
TRENDS

NON-DURABLE GOODS

1940 - 1960



SOURCE:
U.S. CENSUS OF POPULATION



Transportation Employment

This section is concerned with transportation, communication and public utility employment as described by the U.S. Census Bureau.⁽²⁰⁾ Plate 24 shows that transportation employment has consistently held less importance in the Phoenix SMSA than in Dallas, Houston or Miami. In 1960 the transportation percentage of total employment was 6.1 for Phoenix but averaged 9.3 for the other SMSA's. The trends for the past two decades have been the same in all four cities, a rise in percentage from 1940 to 1950 with a decline from 1950 to 1960. Miami experienced the least decline.

Plate 25 subdivides the transportation industry of Maricopa County into five categories: railroads, trucking, other transportation (airlines, for example), communications, and utilities which includes sanitary services. All categories have grown in employment during both census decades, with communications experiencing the greatest growth from 1950 to 1960. The second part of Plate 25 shows that very little change in employment distribution has occurred between 1940 and 1960.

(20) See Page XXXIII; PC (1), IC, U.S., United States Census of Population, 1960.

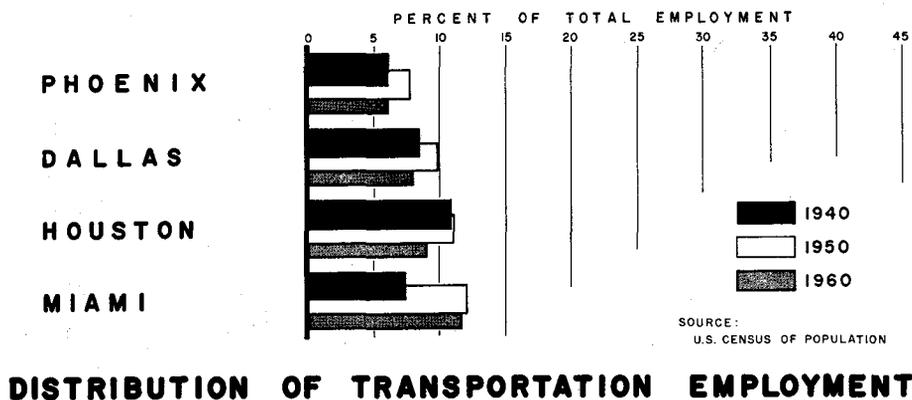
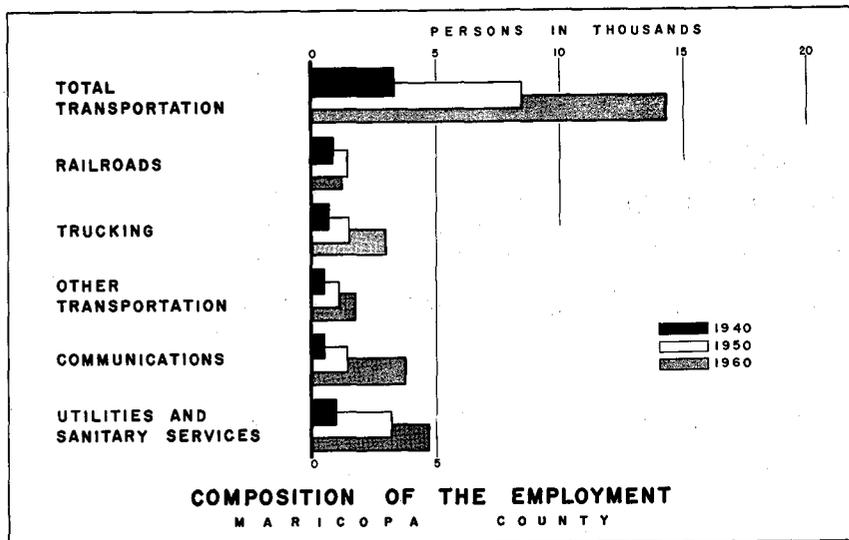


PLATE 24



TRANSPORTATION EMPLOYMENT TRENDS

1940 - 1960

SOURCE:
U.S. CENSUS OF POPULATION

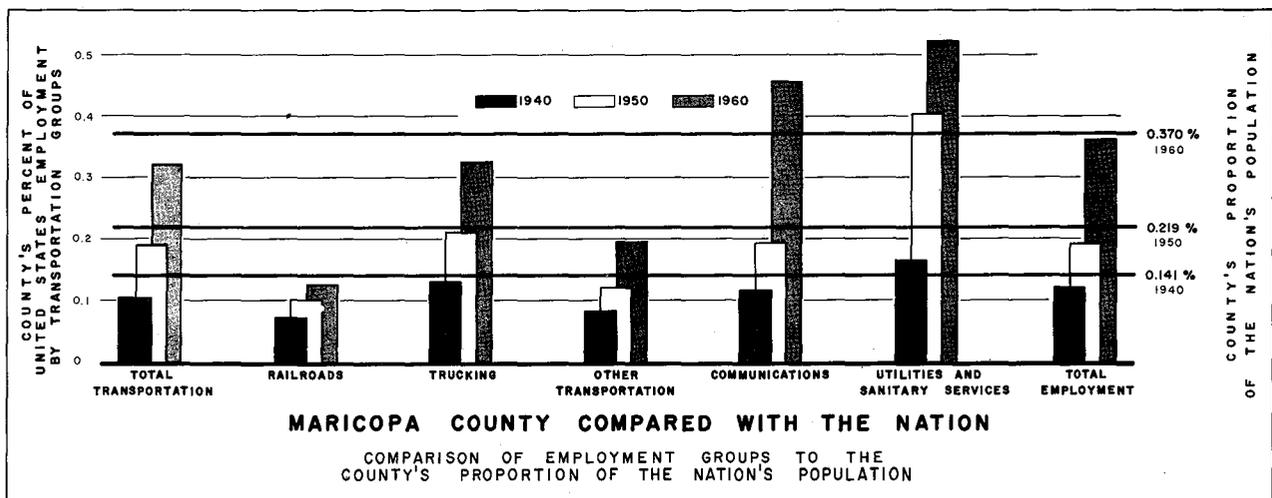
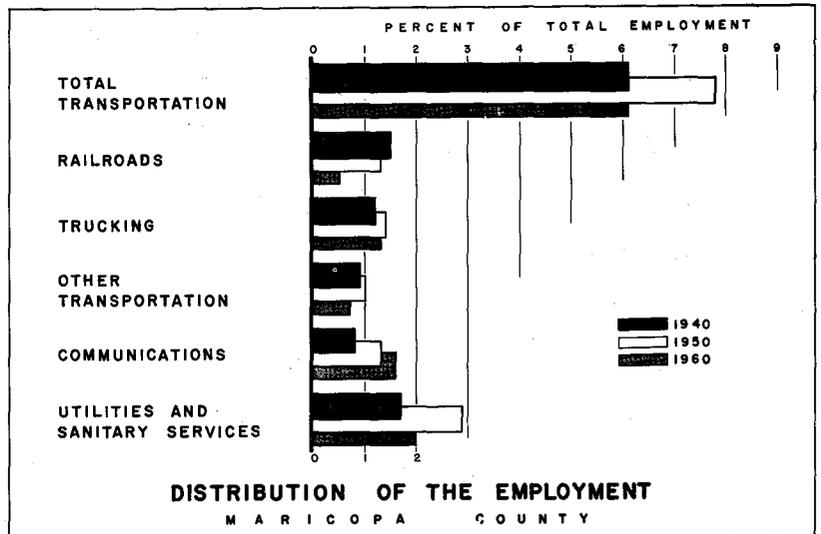


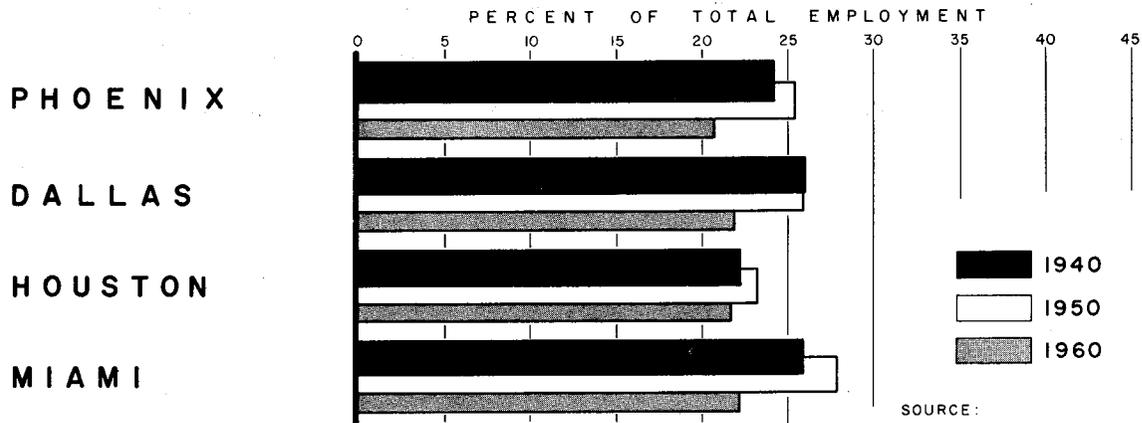
Plate 25, bottom part, provides a comparison which shows that utilities and sanitary services have been consistently above the national employment average while communications, though being below in 1940 and 1950, made gains from 1950 to 1960 to be above average in 1960. Railroad and other transportation categories have been consistently below the national employment average. Although trucking is very important to Maricopa County, employment for this category remains below the national average. See Table F in the appendix for supporting data.

Phoenix is not an important transportation center although its facilities of air transportation have received widespread publicity. Nevertheless, Phoenix is not a railroad division point, nor is it a junction or terminal point of a mainline railroad. Phoenix is not surrounded by a rail system as in the case of most other large cities, and the city has no hope of obtaining water transportation. Access from Phoenix to its hinterland is primarily by highway, some being of very recent construction where only unsurfaced roads were previously available. Obviously transportation is important to Phoenix and Maricopa County, but it is doubtful that transportation employment, taken as a whole unit, will be above the national average.

Trade Employment

This section is concerned with retail and wholesale employment as described by the U.S. Census Bureau.⁽²¹⁾ Plate 26 shows trade employment as a per cent of total employment, for the Phoenix, Dallas, Houston and Miami SMSA's. Trade is an important segment of the economy in all four cities, with employment distribution being consistently over 20 per cent in each case. However, the percentage shows a decline from 1950 to 1960 in all four cities; for example, Phoenix dropped from 25.4 per cent in 1950 to 20.7 per cent in 1960. The future may hold a further decline, but it appears doubtful that it will be of considerable proportion or seriously affect the economy of the County. For further comparison, trade employment for the United States dropped from 18.6 per cent in 1950 to 18.2 per cent in 1960.

(21) See Page XXXIII; PC (1), IC, U.S., United States Census of Population, 1960.



DISTRIBUTION OF RETAIL AND WHOLESALE TRADE EMPLOYMENT

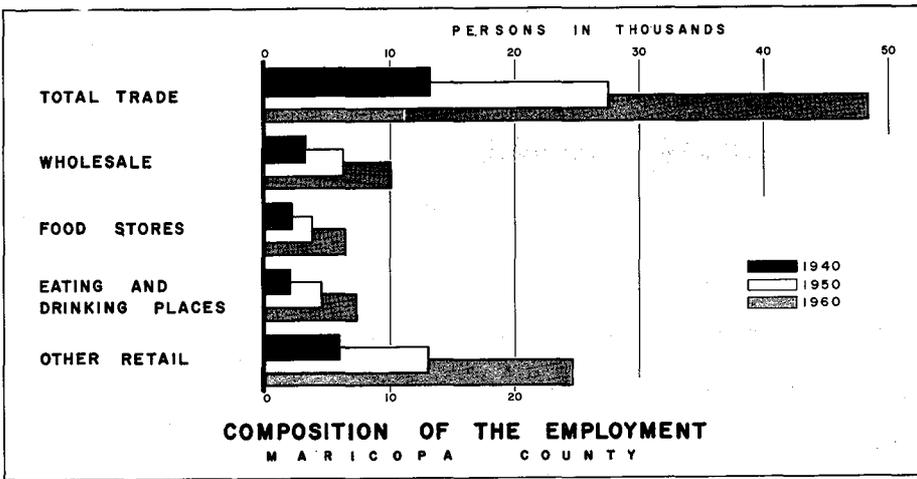
PLATE 26

Plate 27 subdivides the trade industry of Maricopa County into four categories: wholesale, food stores, eating and drinking places, and other retail. All categories have grown in employment during both census decades. The second part of the plate shows little change in employment distribution from 1940 to 1960.

Plate 27, bottom part, shows that all categories of employment are above the national average. Food stores are slightly above average, while wholesale trade has been well above average. See Table G in the appendix for supporting data. The Phoenix SMSA was behind Denver and Salt Lake City in the matter of per capita wholesale sales, as discussed previously, (see Table 2).

Finance Employment

Finance, insurance and real estate are covered by this section. Included are banking and credit agencies, security and investment companies, and insurance and real estate offices. The County's employment in this industry is small when compared to total employment, but it can be a good indicator of the County's growth. Maricopa County was below the national average in 1940, but by 1950 it has risen to be above average (see Plate 18), and it appears that it will remain above average for 10 years or more into the future.



**TRADE
EMPLOYMENT
TRENDS**
1940 - 1960

SOURCE:
U.S. CENSUS OF POPULATION

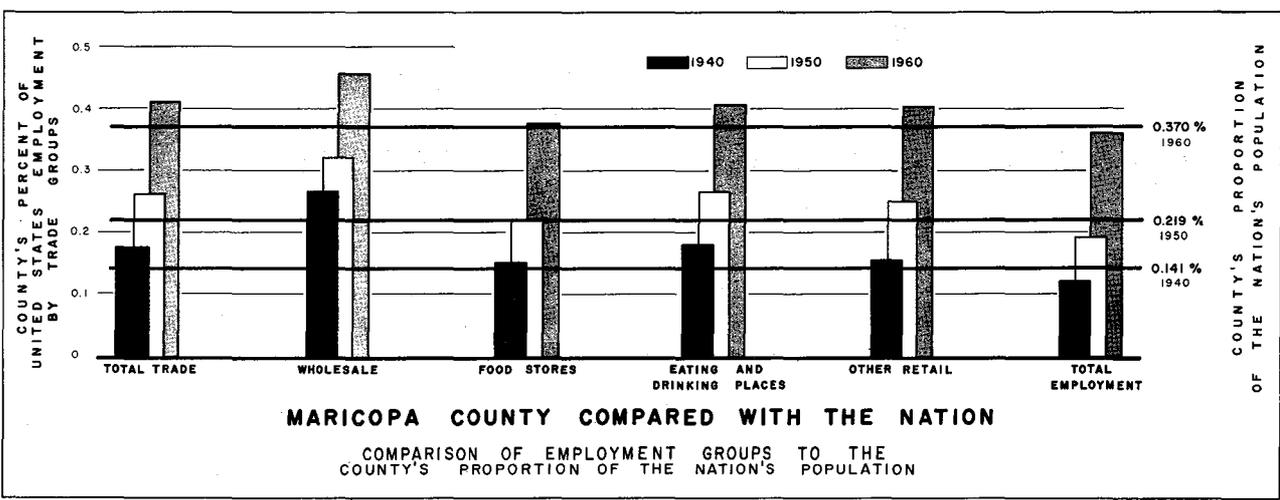
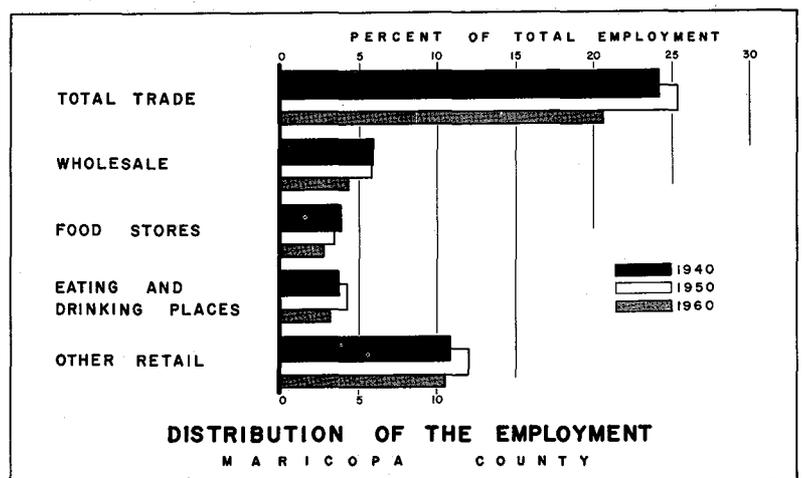
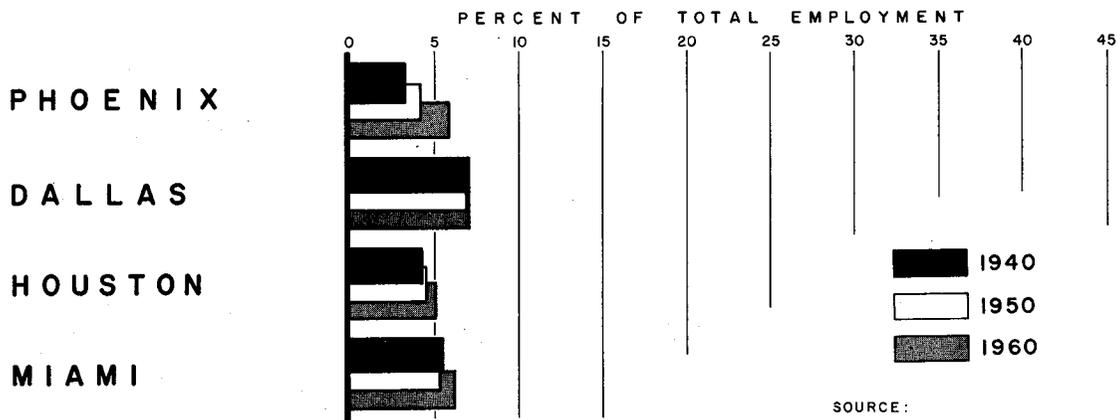


Plate 28 shows finance employment distribution for the Phoenix, Dallas, Houston and Miami SMSA's. Phoenix was low in 1940 with 3.3 per cent, but by 1960 had passed Houston, and is now closely in line with Miami at 5.9 per cent. Finance employment in Dallas has remained static at 7 per cent for 20 years. Therefore, it is concluded that rapid growth does not necessarily indicate an increase in percentage. Phoenix may experience a higher percentage of finance employment in the future, but the increase probably won't be as significant as in the past.



SOURCE:
U.S. CENSUS OF POPULATION

DISTRIBUTION OF FINANCE EMPLOYMENT

PLATE 28

Service Employment

This section includes employment in automobile garages, hotels, private households, laundering and cleaning establishments, hospitals and clinics, schools and professional offices such as legal, engineering, etc. The service industries are subdivided into three categories: business and repair services, personal services and professional services. Entertainment and recreation have been included with professional services for the purpose of this report.

Plate 29 shows the employment distribution, for the Phoenix, Dallas, Houston and Miami SMSA's. The importance of services is obvious in all four cities, with distribution being consistently over 20 per cent in each case. However, the percentage shows a decline from 1940 to 1960 in all cases. Phoenix dropped from 24.0 to 23.0 and Miami dropped from 35.2 to 28.3. Although dropping over the twenty-year period, Dallas and Houston gained slightly from 1950 to 1960, so the trends have not been similar in all cases. The declines experienced by Dallas and Houston from 1940 to 1950 were large enough so that Phoenix moved from fourth place in 1940 to second place, next to Miami, in 1960.

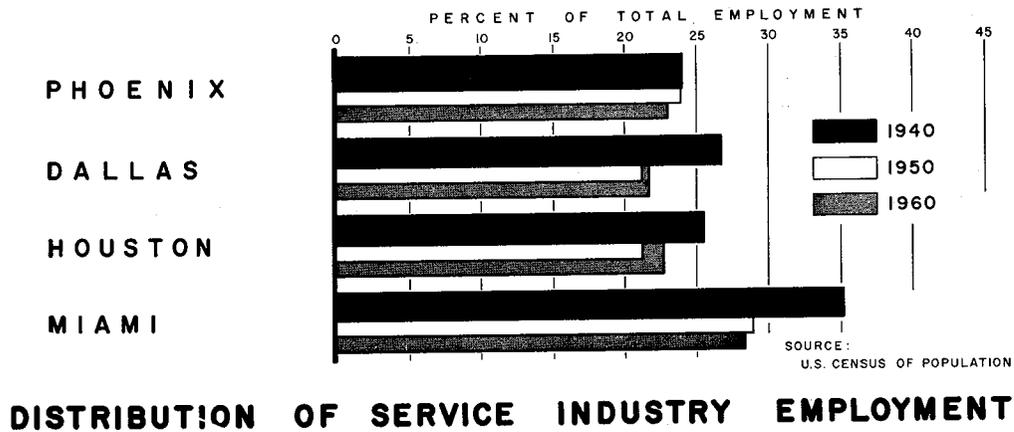
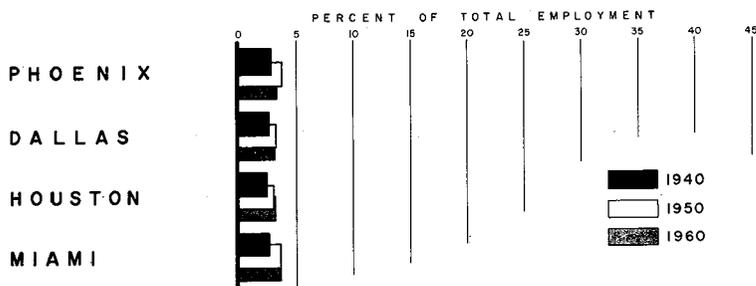


PLATE 29

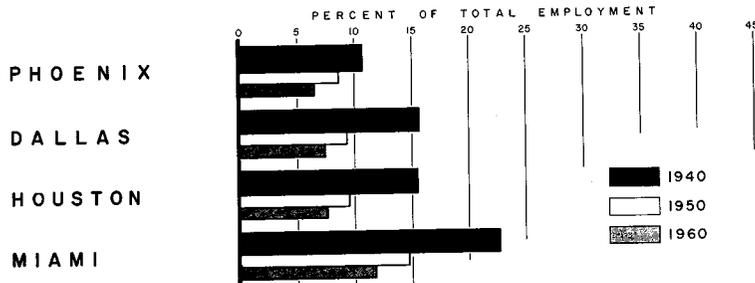
Plate 30 indicates that all cities are static in business and repair services; in each case this category accounts for about 3 per cent of the total employment. All cities show declining percentages in personal service employment. From 1940 to 1960 Miami, in first place, declined from 22.7 to 11.8 per cent, while Phoenix, in fourth place, declined from 10.7 to 6.5 per cent.

Professional service employment increased in all cities studied. From 1940 to 1960 Phoenix SMSA increased from 10.5 to 13.2 per cent, while Houston increased from 7.6 to 12.0.

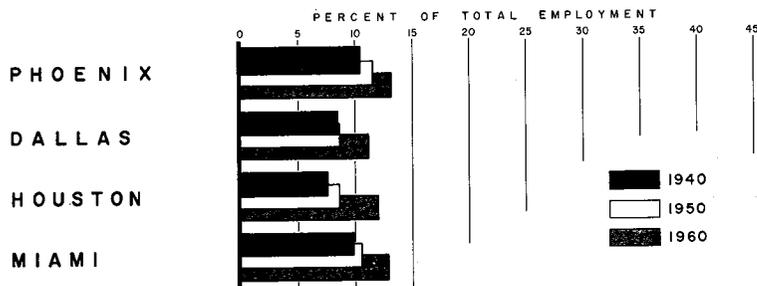


BUSINESS AND REPAIR SERVICE EMPLOYMENT

SOURCE:
U.S. CENSUS OF POPULATION



PERSONAL SERVICE EMPLOYMENT



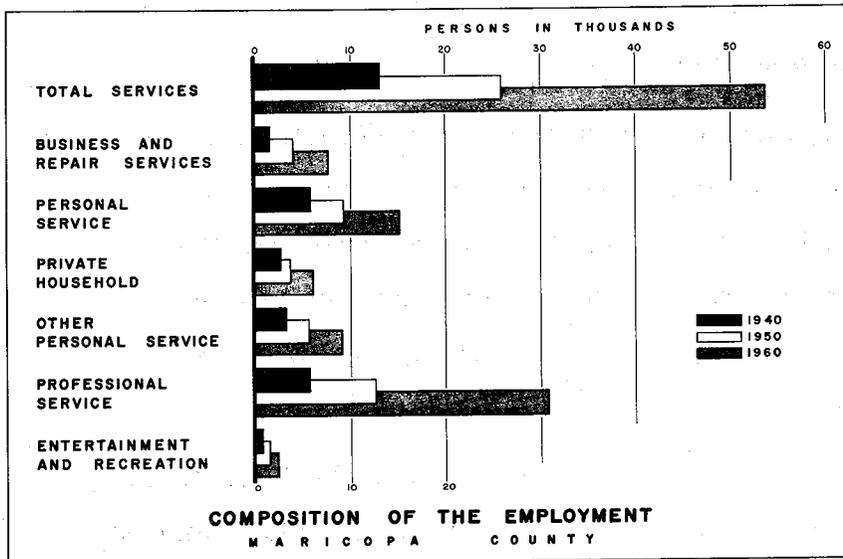
PROFESSIONAL SERVICE EMPLOYMENT

DISTRIBUTION of
SERVICE EMPLOYMENT by GROUPS

Plate 31 subdivides the service industry of Maricopa County into three categories: business and repair services, personal services and professional services. Personal services in turn is divided into two categories: private household and other personal service. A category entitled "entertainment and recreation" is a subdivision of professional services. All categories and sub-categories have grown in employment during both census periods, but the second part of the plate shows a decline in percentage for both private household and other personal services. The percentage of persons employed in entertainment and recreation has remained static during the twenty-year period, at one per cent of total employment.

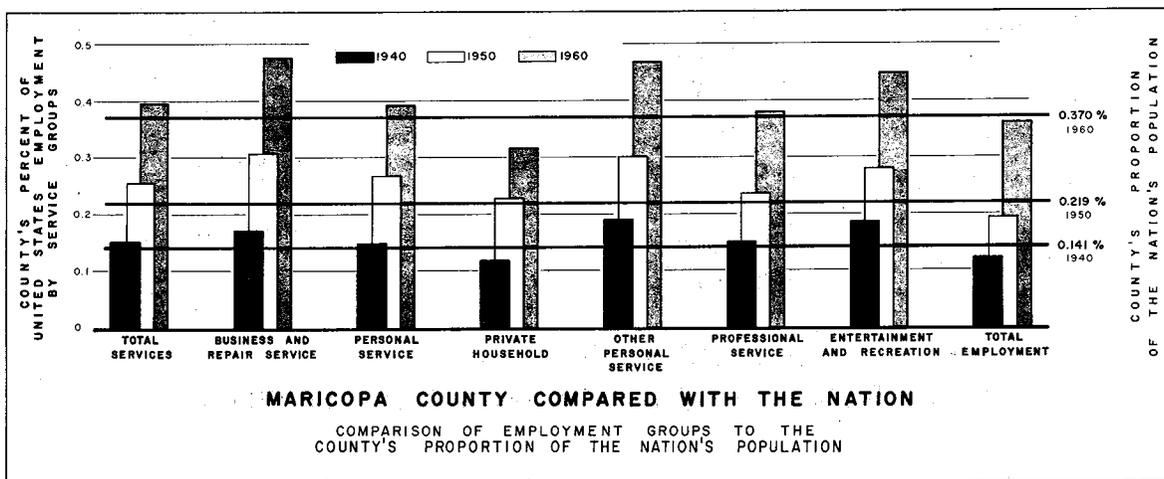
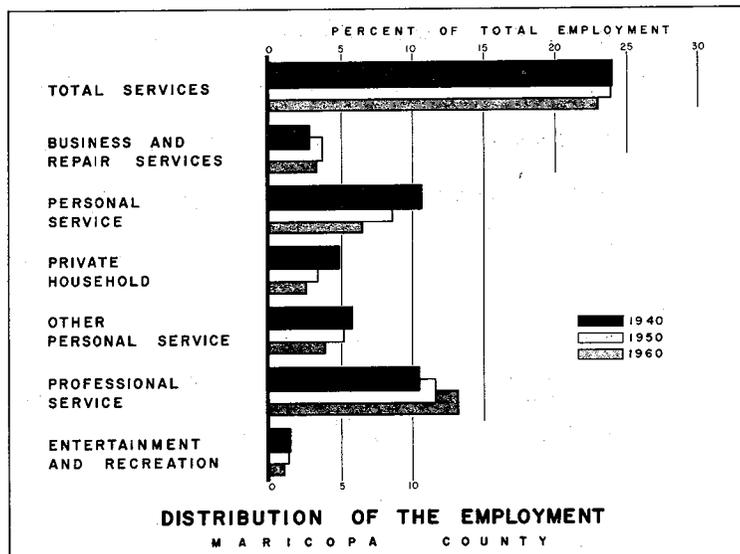
Plate 31, bottom part, provides a comparison which shows that all categories except private household are above the national average. See Table H in the appendix for supporting data.

It is concluded that the relative decline in personal service employment and the relative increase in professional service employment should continue for the next ten to twenty years; these trends are well established but a leveling off tendency may occur, especially in personal services. In all probability, as Maricopa County increases in population, the tourist industry will not be so apparent as in the past. Trends in professional service should continue for many years, as national trends are definitely set in this direction. For further comparison, the percentage for U.S. employment in professional services increased from 8.4 in 1940 to 12.5 in 1960 as compared to 10.5 to 13.2 for the County.



SERVICE EMPLOYMENT TRENDS 1940 - 1960

SOURCE:
U.S. CENSUS OF POPULATION

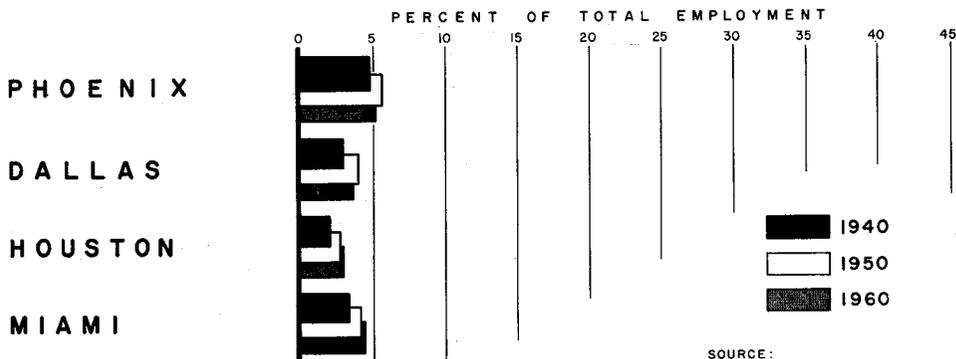


Public Administration Employment

This category includes persons employed in offices performing governmental functions of an administrative nature such as records, finance, personnel, planning, courts and legislation. The category does not include governmental employment in education or medical services. ⁽²²⁾ Maricopa County has tended to be slightly above the national average in public administration (see Plate 18).

Plate 32 shows the employment distribution for the Phoenix, Dallas, Houston and Miami SMSA's. Phoenix is in first place at about 5 per cent while Houston is last at 2 1/2 per cent. Houston and Dallas show slight gains in percentage for each decade, while Phoenix and Dallas show a decline from 1950 to 1960. It is doubtful if Maricopa County's past decline will continue to a greater degree in the future. Governmental employment will grow with the population increase, and the percentage will remain at about 5 per cent.

(22) See Page XXXIII, PC (1), IC, U.S., United States Census of Population, 1960.



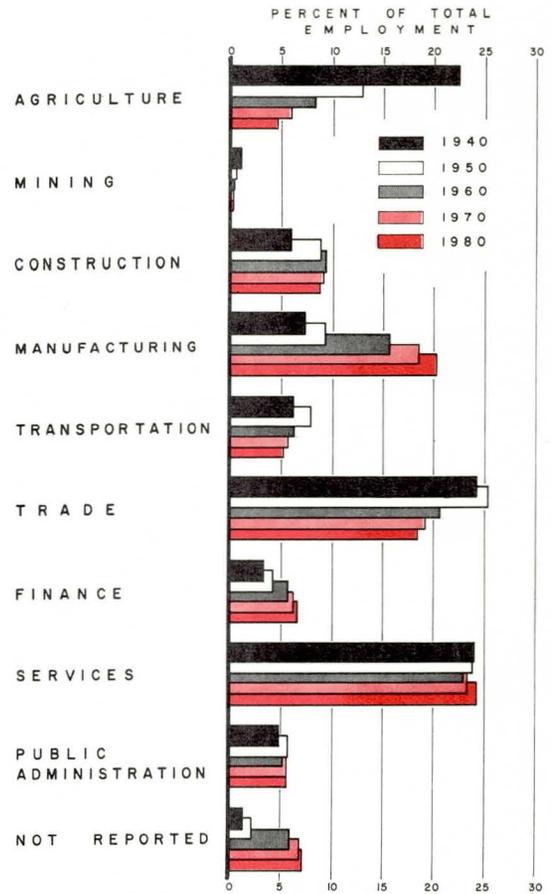
SOURCE:
U.S. CENSUS OF POPULATION

**DISTRIBUTION OF
PUBLIC ADMINISTRATION EMPLOYMENT**

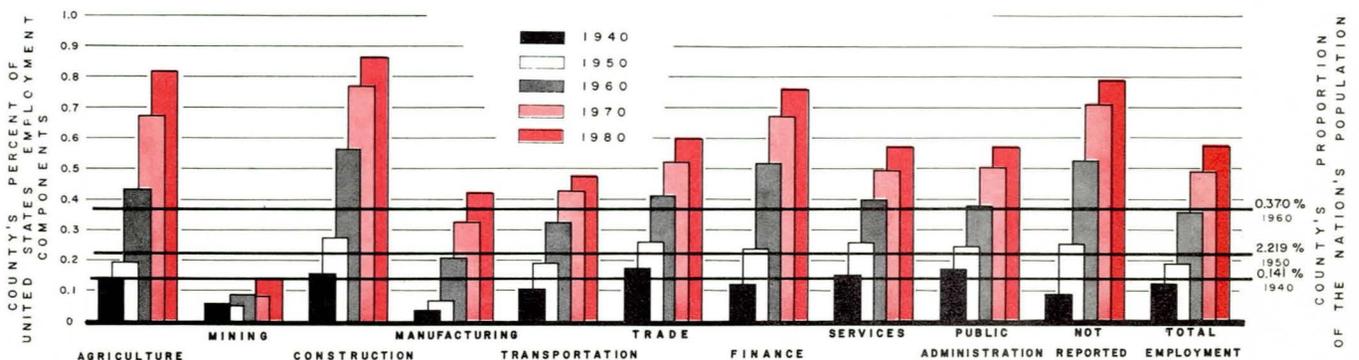
EMPLOYMENT FORECASTS for INDUSTRY GROUPS



COMPOSITION OF THE EMPLOYMENT
MARICOPA COUNTY



DISTRIBUTION OF THE EMPLOYMENT
MARICOPA COUNTY



MARICOPA COUNTY COMPARED WITH THE NATION

COMPARISON OF EMPLOYMENT COMPONENTS TO THE
COUNTY'S PROPORTION OF THE NATION'S POPULATION

The Employment Forecast

Plate 33 illustrates an employment forecast for Maricopa County covering the ten major industrial categories. Projections are made to 1970 and 1980 for each category. This forecast provides a general guide for future employment possibilities and is based upon the population forecast presently recognized by the Maricopa County Planning and Zoning Department. (23)

Trends in employment over the past 20 years are summarized by Plate 33 and have been discussed in greater detail by previous sections of this chapter. It will be observed from Plate 33 that changes have been somewhat uniform and that patterns of change can be recognized. The forecast has been made under the elementary assumption that progress in the next 20 years will not be out of scale with progress of the past 20 years, and that it will follow basic trends which have been established by older similar areas.

Previous sections of this chapter have compared Maricopa County to other SMSA's revealing the County's unique economic characteristics and trends as well as its ordinary qualities. Generally speaking, Maricopa County is very similar to other SMSA's of its geographic region, i.e. Tucson, El Paso, Denver, etc; and it is also very similar in employment distribution to other SMSA's located in warm climatic regions where growth has been a significant feature in the past 20 years, i.e. Dallas, Houston and Miami.

(23) Page 2, Economic Analysis and Projection for Phoenix and Maricopa County, Western Management Consultants, 1959.

In making a general comparison to national employment averages, Maricopa County emphasizes trade and services with a marked deficiency in manufacturing. However, manufacturing income has become the principal source of basic income for the County, and indications for the future hold promise of further increases. How near the County will come to matching the national average in manufacturing employment may be a matter of conjecture. Tables I and J in the appendix show additional mechanics about the projection.

Although any employment forecast is by no means conclusive, the one contained in this chapter does provide an essential impression of the future economic structure of Maricopa County. In addition to supplying general information, the employment forecast will serve to reinforce the population forecast. With reasonable projections of population and employment available, computations for land-use characteristics can be made and thereby a plan can be prepared.

CHAPTER 3

PHYSICAL FEATURES

Natural physical features play an important part in the agricultural and urban development of an area. The weather, terrain, soil, water resources and drainage are all major determinants in the growth of the County and its economy.

Maricopa County is well endowed with a healthful climate and has a reasonable amount of good water, flat land and good soils for productive vegetation.

As evidenced by the rapid population growth of the County there are major physical features which attract people to the County and very few physical features that cannot be overcome. However, there are certain physical features that do limit or prevent general urban or agricultural development throughout parts of the County.

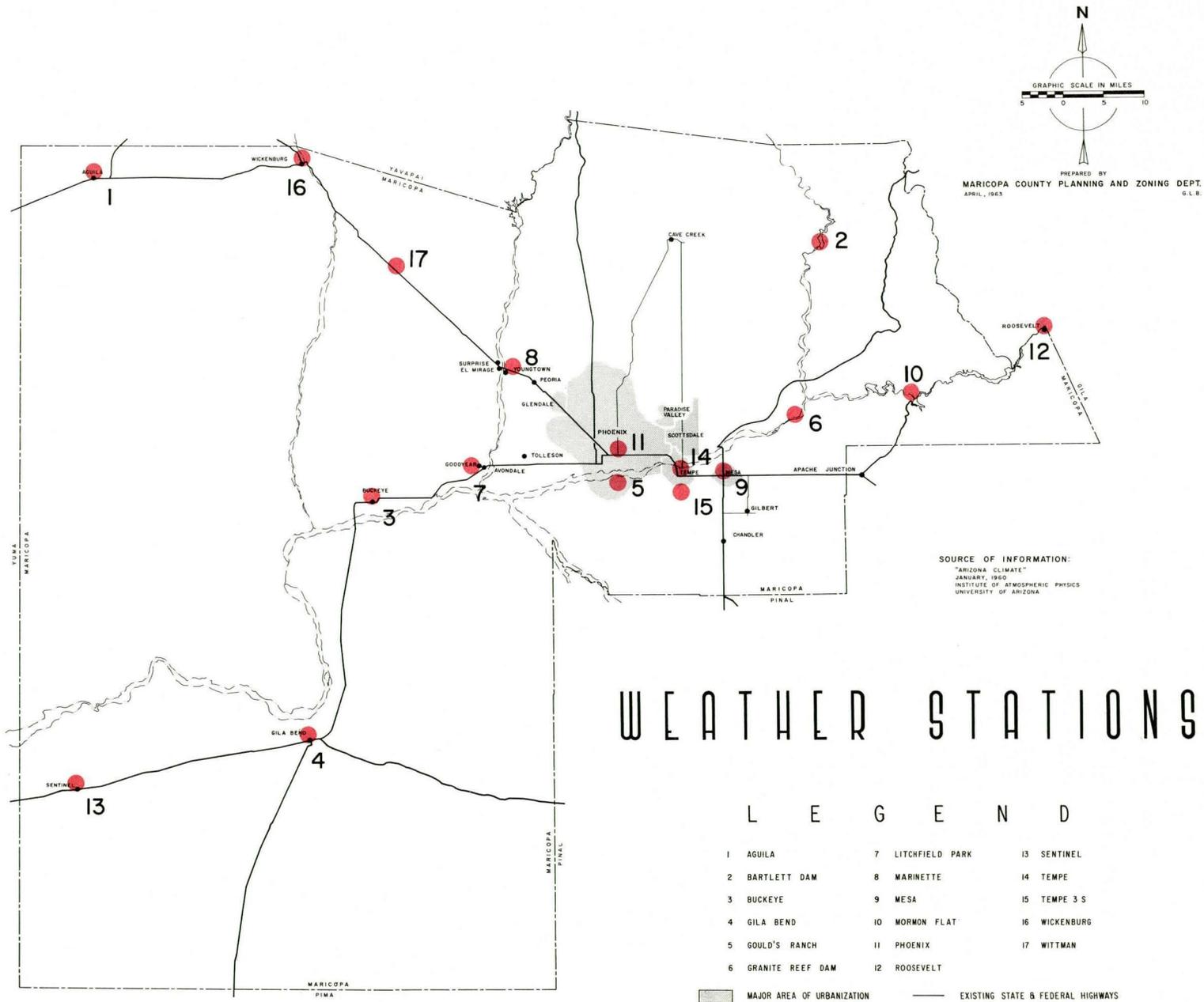
This chapter is concerned with climate, topography, soils, water supply and drainage features that influence land-use planning.

Climate

Climate is a composite of day to day weather conditions, such as temperature, precipitation, humidity and winds. The climate of Maricopa County for the most part is classified as "desert type." It is typified by such conditions as high daytime temperatures, low annual rainfall and low relative humidity. A great deal of the national population and industrial migration to the southwest and Maricopa County can be attributed to its climate.

Climatic conditions are quite variable within the County. Factors that affect the climate are altitude, mountain ranges and general mass air movements which originate from the Pacific Ocean or Gulf of Mexico.

Early records of weather conditions within the County are incomplete. Data that is available has been observed and recorded by various persons and agencies without any coordination of information. In 1954 the Institute of Atmospheric Physics of the University of Arizona started a long-term project of compiling climatic summaries of these various stations within the state and in 1960 published a manual titled "Arizona Climate" which provides valuable detailed climatic summaries for over 150 stations within



WEATHER STATIONS

LEGEND

- | | | |
|--------------------|-------------------|---------------|
| 1 AGUILA | 7 LITCHFIELD PARK | 13 SENTINEL |
| 2 BARTLETT DAM | 8 MARINETTE | 14 TEMPE |
| 3 BUCKEYE | 9 MESA | 15 TEMPE 3 S |
| 4 GILA BEND | 10 MORMON FLAT | 16 WICKENBURG |
| 5 GOULD'S RANCH | 11 PHOENIX | 17 WITTMAN |
| 6 GRANITE REEF DAM | 12 ROOSEVELT | |
-
- | | |
|----------------------------|-----------------------------------|
| MAJOR AREA OF URBANIZATION | EXISTING STATE & FEDERAL HIGHWAYS |
| COUNTY LIMITS | OTHER HIGHWAYS |

the state. Seventeen of these stations are located within the County as indicated on Plate 34.

While climatic conditions often play an important part in the general development of an area, the climate of Maricopa County does not have any adverse conditions which would restrict or indicate a specific type of development. The biggest climatic problem of the County is the existence of large arid areas which are not suitable for any type of physical development unless they can be supplied with adequate water sources.

The following tables summarize major climatic conditions in the County as recorded by each weather station indicated on Plate 34. The majority of these stations have been operating for over 40 years. Phoenix is the oldest station with records covering 64 years, while Sentinel is the youngest with records compiled for only 12 years.

TABLE 4
TEMPERATURE

STATION	ANNUAL AVERAGE			SUMMER AVERAGE			WINTER AVERAGE			RECORD HIGHS AND LOWS			
	High	Low	Mean	High	Low	Mean	High	Low	Mean	High	Date	Low	Date
Aguila	82.8	48.2	65.5	101.1	66.4	83.7	64.3	32.8	48.5	115*	July-57	11	Jan-50
Bartlett Dam	84.6	56.5	70.6	102.3	72.7	87.5	66.7	41.8	54.3	117	Sept-50	24*	Feb-56
Buckeye	87.2	50.8	69.0	104.4	69.5	86.9	69.2	34.8	52.0	121	July-05	11	Jan-13
Gila Bend	89.5	54.4	72.0	107.4	72.8	90.1	70.5	38.4	54.5	121*	June-36	11	Jan-13
Gould's Ranch	86.5	53.1	69.9	103.6	71.1	87.4	68.5	37.5	53.1	118*	Sept-50	19	Jan-50
Granite Reef Dam	85.7	54.6	70.1	103.2	70.8	87.0	64.6	40.2	53.8	121	July-25	13	Jan-13
Litchfield Park	86.6	52.6	69.6	104.1	71.2	87.8	68.3	36.6	52.5	118	July-43	16	Jan-50
Marinette	87.3	51.5	69.4	105.0	69.9	87.4	68.9	35.8	52.3	120*	June-29	17	Jan-37
Mesa	84.6	51.6	68.1	101.8	69.2	85.5	66.8	36.2	51.5	119	July-07	15	Jan-50
Mormon Flat	84.3	59.5	71.9	102.6	76.1	89.4	64.9	43.8	54.4	118*	July-34	20	Jan-37
Phoenix	84.5	56.6	70.5	102.1	74.4	88.2	66.7	40.6	53.7	118*	June-29	16	Jan-13
Roosevelt	80.7	54.6	67.7	99.9	72.5	86.2	60.8	37.9	49.4	116	July-49	18	Dec-08
Sentinel	88.4	54.5	71.5	106.5	73.4	90.1	66.1	38.3	53.9	124	June-17	18*	Dec-16
Tempe	84.8	52.2	68.5	101.4	69.5	85.5	67.2	37.1	52.2	115	June-29	15	Jan-50
Tempe 3 S	84.1	50.5	67.4	102.5	68.1	85.3	65.1	35.4	50.3	119*	July-07	12	Jan-13
Wickenburg	82.7	46.6	64.7	100.5	64.8	82.6	63.1	31.3	48.2	117	July-42	10*	Jan-50
Wittman	84.0	54.0	69.0	102.6	72.8	87.7	65.1	37.6	51.4	117	July-42	16	Jan-37

*Also occurred on other dates.

Temperature

Table 4 provides a summary of average temperature conditions for each station recorded within the County and also indicates the record high and low recorded for each station.

Summer averages indicated on Table 4 are for the months of June, July and August; winter averages include the months of December, January and February.

Annual average temperatures for the County are established in the upper 60's and lower 70's with very little variation between stations throughout the County. Summer temperatures are quite high with all but one of the stations recording average high daytime temperatures over 100 degrees. Winter temperatures are mild with average high daytime temperature above 60 degrees. Seldom do winter daytime temperatures remain below freezing except in the highest elevations. Nighttime temperatures below freezing occasionally occur in the lower elevations during the months of December and January.

Daily and annual temperature variations within the County are quite mild as compared to the below zero to above 100 degree temperatures that are experienced in some northern areas of the nation. The efficient use of air conditioning and the mild winters makes the County attractive for industry and general urban living conditions.

Local temperature conditions provide no adverse affect upon the physical planning and development processes of the County, but tend to stimulate the population growth and the economy.

TABLE 5
PRECIPITATION AND HUMIDITY

Station	PRECIPITATION					RELATIVE HUMIDITY							
	Annual Average In Inches	Annual Maximum Recorded		Annual Minimum Recorded		Annual Average Recorded		Maximum and Minimum Monthly Average Recorded 6 AM and 6 PM					
		Amount in Inches	Year	Amount in Inches	Year	6 AM	6 PM	Maximum			Minimum		
	6 AM							6 PM	Month	6 AM	6 PM	Month	
Agula	19.12 9.12	18.72	1941	2.45	1956	51	21	64	34	Dec.	29	8	June
Bartlett Dam	11.55	24.34	1941	4.37	1948	53	34	65	40	Feb.	35	23	June
Buckeye	7.52	21.80	1905	1.40	1956	55	21	68	38	Dec.	36	9	"
Gila Bend	5.69	13.21	1905	2.02	1956	51	23	64	36	Dec.	34	11	"
Gould's Ranch	7.60	12.29	1951	2.71	1956	58	26	70	39	Dec.	40	13	"
Granite Reef Dam	9.22	18.47	1905	2.89	1956	56	32	66	46	Dec.	40	21	"
Litchfield Park	8.01	18.12	1941	2.57	1950	56	23	67	37	Dec.	36	10	"
Marinette	8.04	16.96	1941	2.72	1953	57	23	70	36	Dec.	36	10	"
Mesa	8.06	20.31	1905	2.83	1956	59	30	70	44	Dec.	40	17	"
Mormon Flat	13.21	22.34	1941	5.09	1956	53	35	63	40	Feb.	35	23	"
Phoenix	7.67	19.73	1905	2.85	1953	56	27	69	41	Dec.	37	14	"
Roosevelt	15.99	33.27	1905	6.86	1956	54	38	65	43	April	37	23	"
Sentinel	4.51	9.93	1959	1.41	1950	51	23	66	27	Nov.	32	11	"
Tempe	7.66	18.08	1941	2.63	1956	59	29	70	42	Dec.	41	16	"
Tempe 3 S	8.64	22.15	1905	4.09	1950	60	29	71	44	Dec.	42	16	"
Wickenburg	10.99	17.62	1951	3.59	1956	55	22	68	35	Dec.	31	9	"
Wittman	9.38	19.35	1941	4.58	1924	52	22	66	36	Dec.	29	10	"

75

Precipitation and Humidity

Table 5 shows the average annual precipitation recorded for each station within the County as well as the annual maximum and minimum precipitation recorded for each station. Table 5 also shows the annual average relative humidity for each station and the maximum and minimum monthly average recorded for each station.

Precipitation averages vary greatly between stations within the County and also vary greatly from year to year for each station. The highest and lowest annual average precipitation ever recorded is 33.27 inches for the Roosevelt Station and 1.40 inches for the Buckeye Station respectively. The highest and lowest annual average recorded for any one station is 33.27 inches and 6.86 inches which was recorded at the Roosevelt Station.

Annual precipitation basically comes in two separate rainfall periods. One occurs during the winter months of November to March when the County is subject to occasional storms from the Pacific Ocean. The second occurs during July and August when the County is subject to thunderstorm activity whose moisture supply originates from the Gulf of Mexico. These storms are widely scattered but are quite intense and often produce flooding conditions in parts of the County. The heaviest 24-hour rainfall recorded at the Phoenix Station was 4.98 inches on July 2, 1911.

Snowfall contributes very little to the annual precipitation of the County. Snowfall rarely occurs at elevations lower than 3,000 feet (see Plate 36). Snowfall occasionally occurs in the higher elevations and often remains for several weeks at elevations over 6,000 feet.

Local snow and rainfall do not create serious problems to the physical planning of the County. However, flooding conditions do occur in parts of the County at times of intense rainfall. Local snow and rainfall do not contribute a great deal to the local agricultural economy. However, the County's population, economy and future urban growth are very much dependent upon the snow and rainfall in the Salt and Verde River watershed areas which supply surface water to the several reservoirs located in the northeast part of the County. (See Plate 39.)

Clear skies, high daytime temperatures and low annual rainfalls create a low average relative humidity within the County. Average annual humidity varies slightly between stations. December is the month of maximum relative humidity for most stations while June is the month of lowest relative humidity for all stations. Summer daytime humidities are often below 20 per cent and it is this low relative humidity which makes air conditioning so efficient, the summers bearable and the area so attractive to people suffering from arthritic, tuberculous and asthmatic conditions.

TABLE 6

WIND AND SKY CONDITIONS
 Monthly Averages observed and recorded at Sky Harbor Airport, Phoenix, Arizona

Month	WIND					SKY CONDITIONS			
	Mean Hourly Speed	Prevailing Direction	Peak Gust			Average Cloud Cover	Average Number of Days		
			Speed	Direction	Year		Clear	Partly Cloudy	Cloudy
January	4.2	East	39	SSE	1957	5.2	13	8	10
February	4.7	East	44	NW	1955	4.4	13	6	9
March	5.6	East	50	WNW	1956	4.3	15	7	9
April	5.7	East	45	NW	1957	3.8	16	8	6
May	5.9	East	59	SSE	1954	2.8	21	7	3
June	5.7	East	43	SE	1957	2.0	23	5	2
July	5.9	West	58	S	1952	4.0	16	10	5
August	5.3	East	60	SSW	1953	3.3	17	10	4
September	4.8	East	75	SW	1950	1.9	22	5	3
October	4.4	East	48	SSW	1956	2.8	20	6	5
November	4.1	East	41	WNW	1956	3.0	19	6	5
December	3.9	East	68	W	1953	3.6	14	7	10

Wind

Wind data for the County is practically non-existent. The Phoenix station located at Sky Harbor Airport is the only weather station recorded within the County equipped to provide wind direction and velocity.

Table 6 provides wind and sky condition data for this station. The Table indicates that wind speeds at the Phoenix station are normally light with average values never exceeding 7 miles per hour, and peak gusts are seldom over 50 miles per hour. Despite the low average wind speed normally found at the Phoenix station, this station does hold the official record for the strongest wind gust ever reported within the state. A speed of 75 miles per hour was reached during a thunderstorm in September of 1950.⁽¹⁾

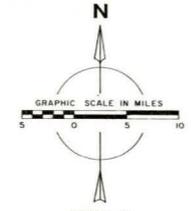
General wind movements for the County are created by high and low barometric pressure areas that cross the state in a northeasterly direction.

Local wind movements are created by rapid temperature changes, elevation and the location of mountainous areas. Ordinarily, local surface winds blow up slope or valley during the day and reverse their direction at night. Normally the daytime winds are two or three times stronger than the nighttime winds.

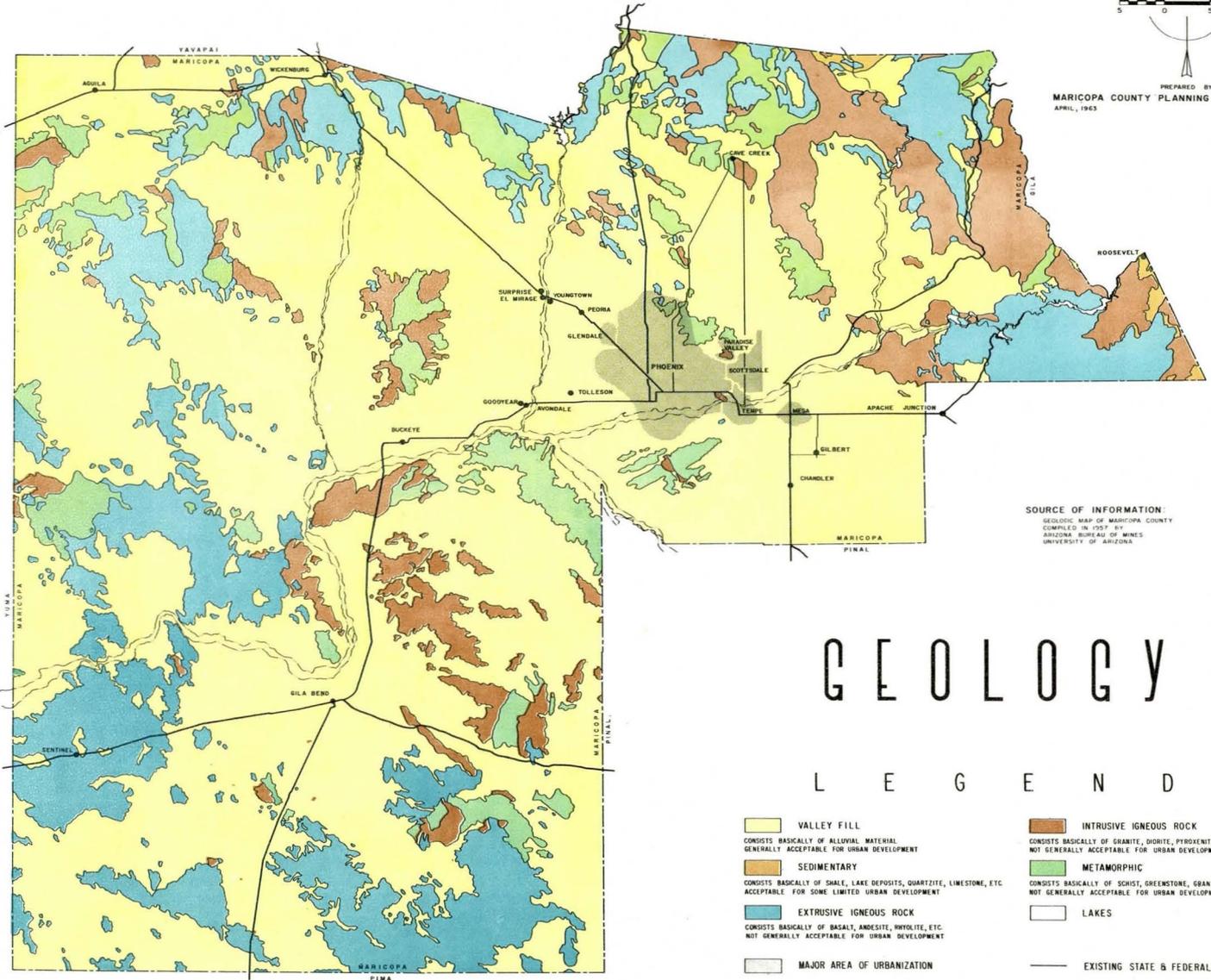
(1) Arizona Climate published by Institute of Atmospheric Physics, University of Arizona, 1960, pp 47.

Wind speeds within the County are of such low magnitude that they do not create an adverse or directional affect upon the physical planning process, but tend to stimulate growth and development by decreasing the number of work days lost in the construction and agricultural industries.

Wind speeds and direction are important to many people in the County and are particularly important in solving air pollution problems. Smog and smust are becoming an ever increasing problem to the Phoenix urban area, and a more extensive collection system of wind data for the County is needed.



PREPARED BY
 MARICOPA COUNTY PLANNING AND ZONING DEPT.
 APRIL, 1963
 S.L.B.



SOURCE OF INFORMATION
 GEOLOGIC MAP OF MARICOPA COUNTY
 COMPILED IN 1957 BY
 ARIZONA BUREAU OF MINES
 UNIVERSITY OF ARIZONA

GEOLOGY

LEGEND

- | | |
|--|--|
| VALLEY FILL
CONSISTS BASICALLY OF ALLUVIAL MATERIAL.
GENERALLY ACCEPTABLE FOR URBAN DEVELOPMENT | INTRUSIVE IGNEOUS ROCK
CONSISTS BASICALLY OF GRANITE, DIORITE, PYROXENITE, ETC.
NOT GENERALLY ACCEPTABLE FOR URBAN DEVELOPMENT |
| SEDIMENTARY
CONSISTS BASICALLY OF SHALE, LAKE DEPOSITS, QUARTZITE, LIMESTONE, ETC.
ACCEPTABLE FOR SOME LIMITED URBAN DEVELOPMENT | METAMORPHIC
CONSISTS BASICALLY OF SCHIST, GREENSTONE, GRANITE, ETC.
NOT GENERALLY ACCEPTABLE FOR URBAN DEVELOPMENT |
| EXTRUSIVE IGNEOUS ROCK
CONSISTS BASICALLY OF BASALT, ANDESITE, RHYOLITE, ETC.
NOT GENERALLY ACCEPTABLE FOR URBAN DEVELOPMENT | LAKES |
| MAJOR AREA OF URBANIZATION | EXISTING STATE & FEDERAL HIGHWAYS |
| COUNTY LIMITS | OTHER HIGHWAYS |

Geology

Geology concerns itself with the composition, structure and history of the earth and how these affect the activities of man.

Physical planning and land-use development are greatly influenced by geology. Surface and subsurface soil and rock formations, topography, drainage and the availability of underground resources such as gas, oil and water influence the general location of man made features and development.

Plate 35 shows the general suitability of land formations of the County for urban and agricultural development based on its geologic nature. The suitability has been based on the occurrences of sedimentary, igneous and metamorphic rocks.

Valley Fill and Sedimentary areas, as shown on Plate 35, have been formed by wind and water erosion and deposited as dust, silt, sand or gravel in the river bed and valley floors. This type of rock or soil makes up approximately 70 per cent of the County area but differs considerably in texture and quality in various areas. All of the County's agricultural development and the majority of its urban development take place on this type of soil.

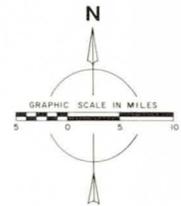
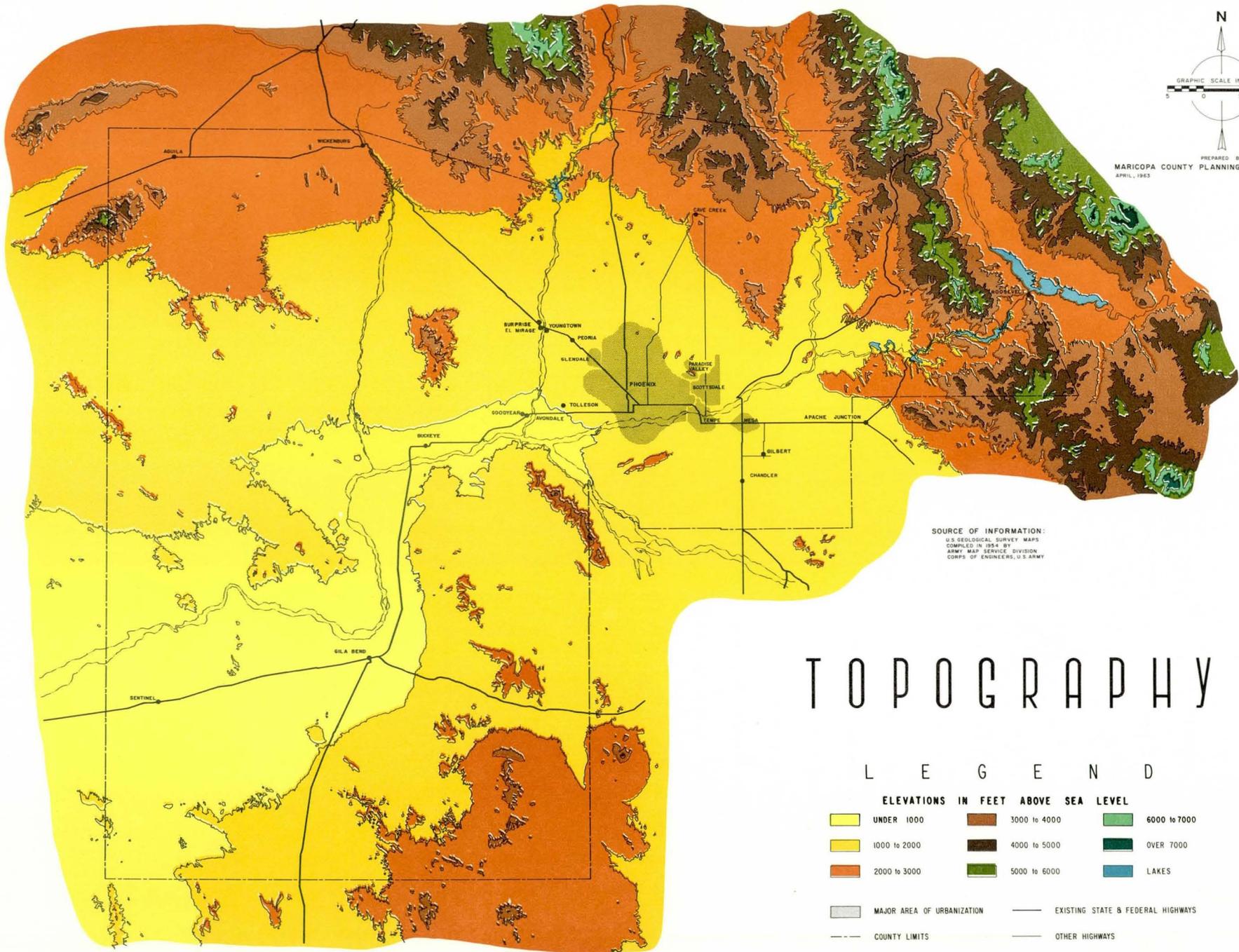
Igneous rocks, which make up approximately 24 per cent of the County, are those rocks which have been formed by the intrusion or extrusion of molten rock material from the depths of the earth. Many of the higher mountains and rock out croppings within the County have been formed in this manner. These areas are shown on Plate 35 and are not suitable for general economic urban development. These areas are characteristically hard and present rough surface areas of steep relief. Some hillside residential development does take place on this type of terrain. But special construction techniques have to be used and the extension

of utilities is very difficult and expensive. In the preparation of a land-use plan these areas would only be suitable for a limited type of urban development.

Metamorphic rocks are those rocks that have been changed in their general composition and/or physical properties by heat, pressure, chemical action, e.g. shale into schist. These rocks are indicated on Plate 35 as to their general location. General development is also limited on this type of rock due to its extreme hardness and variable surface characteristics.

In development of a comprehensive plan, geological information must be considered. As the hardness, texture and load bearing capacity of surface and subsurface soils and rocks determine the general location and type of building construction, they also indicate the feasibility of expanding water and sewer lines and other utilities. The location of underground water basins, their quality and depth must also be considered. Other underground resources such as gas, oil or mineral deposits also have an effect upon land-use development. The location of future highways, streets and roads, railroad extensions, airports and general land-use development will be affected by geologic conditions.

The University of Arizona's Bureau of Mines, established in 1915, has conducted extensive geologic research within the County and State. For more detailed geologic information about the County references should be made to the Director, Arizona Bureau of Mines, University of Arizona, Tucson, Arizona.



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 MARICOPA COUNTY PLANNING AND ZONING DEPT.
 APRIL, 1965
 S.L.B.

SOURCE OF INFORMATION:
 U.S. GEOLOGICAL SURVEY MAPS
 COMPILED IN 1954 BY
 ARMY MAP SERVICE DIVISION
 CORPS OF ENGINEERS, U.S. ARMY

TOPOGRAPHY

L E G E N D

ELEVATIONS IN FEET ABOVE SEA LEVEL

 UNDER 1000	 3000 to 4000	 6000 to 7000
 1000 to 2000	 4000 to 5000	 OVER 7000
 2000 to 3000	 5000 to 6000	 LAKES

 MAJOR AREA OF URBANIZATION	 EXISTING STATE & FEDERAL HIGHWAYS
 COUNTY LIMITS	 OTHER HIGHWAYS

Topography

Topography is a study and description of the physical features of land for a given area. Such features include mountains, flat lands, rolling plains, wash areas and other features that affect the general land appearance.

County topographical features were first established with the beginning of time and have since been changed by faults, volcanic eruptions, wind and water erosion and man's physical urban changes.

The topographical map, Plate 36, indicates that most of the County is situated in a broad flat valley which slopes downward to the southwest from an elevation of approximately 2,000 feet to a few hundred feet above sea level. This valley is accentuated by sharply rising mountains to the north and southeast. Scattered throughout the valley are numerous isolated mountains which rise sharply from the valley floor as shown on Plate 36. Several of these mountains have become famous land marks of the County.

The northeast portion of the County contains the McDowell, Goldfield, Superstition and the Mazatzal Mountains which rise sharply in some places to be above 7,000 feet, while the southeast portion contains the Maricopa, Sand Tank and Saucedo Mountains which rise slightly above 3,000 feet.

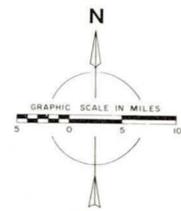
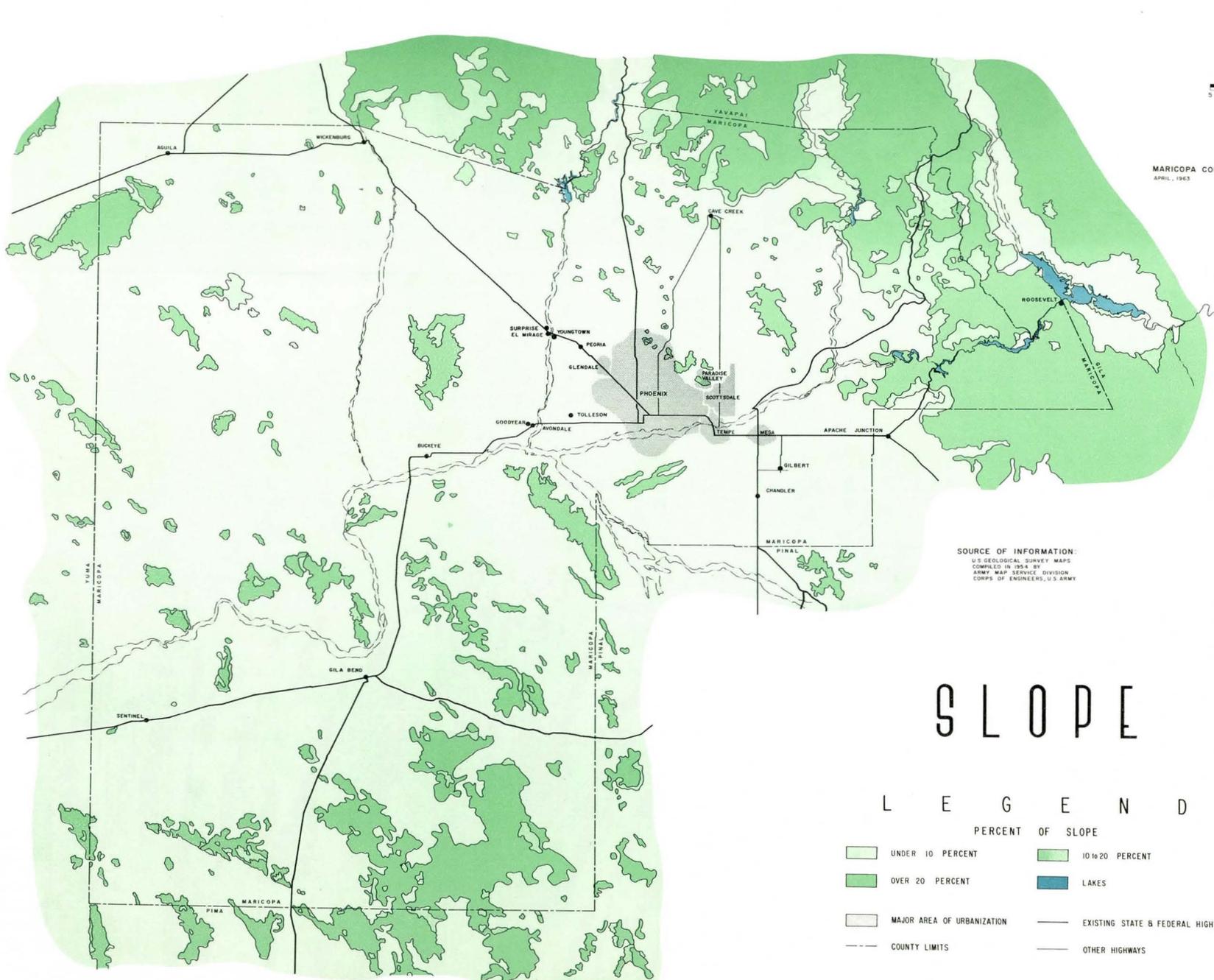
Within Maricopa County there is over 7,000 feet difference between the point of highest and lowest elevation. Four Peaks Mountain on the northeastern border reaches an elevation of 7,645 feet above sea level, while the lowest point of 436 feet above sea level is located 126 miles to the southwest in the Gila River Bed on the west county boundary line.

The location of most urban places within the County are on relatively level land. The Phoenix metropolitan area which contains over 80 per cent of the County population is located at an average elevation of 1080 feet above sea level.

Topographical features play an important part in the general agricultural and urban development of an area. Topography influences to some degree the location of highways and major streets, railroads, airports and public water and sewerage systems and the general location of industry, commerce and residential development of an urban area. Topography has played an important part in the agricultural development of the County by permitting dams and reservoirs to be established in the mountain areas which in turn supply irrigation water to the valley floor.

The physical appearance of the County is constantly changing as land is more intensively used for agriculture and urban uses. Dams and lakes, canals and highways also change the physical appearance of the County.

In the development of a comprehensive plan, topographical features that hinder or restrict development must be given consideration. Future urban development within the County should take place in areas free of physical hazards and difficulties. Development of land on steep slopes, in flood plains, on poorly drained land and in arid areas without water should be discouraged. Development within these areas eventually creates problems of public responsibility and creates costly burdens to the property owner and general taxpayer.



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 MARICOPA COUNTY PLANNING AND ZONING DEPT.
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SOURCE OF INFORMATION:
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SLOPE

LEGEND

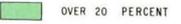
- | PERCENT OF SLOPE | |
|--|---|
|  UNDER 10 PERCENT |  10 to 20 PERCENT |
|  OVER 20 PERCENT |  LAKES |
|  MAJOR AREA OF URBANIZATION |  EXISTING STATE & FEDERAL HIGHWAYS |
|  COUNTY LIMITS |  OTHER HIGHWAYS |

PLATE 37

Slope

Slope is another physical characteristic that relates to the probability and economic development of land for agriculture or urban use.

Slope is measured in per cent; a slope of 1 per cent indicates a one foot rise in elevation for each 100 feet of horizontal distance; 10 per cent slope would be a 10 foot rise in elevation for each 100 feet of horizontal distance. Slope should not be confused with the term grade which is measured in degrees.

The "Slope Map," Plate 37 shows the general degree of slope for all land within the County. The slope categories shown were selected to represent the general limits imposed by slope on general land development. Seventy-eight per cent of the County land area has a general slope of less than 10 per cent as indicated on Plate 37. The rest of the County is basically made up of areas with slopes higher than 20 per cent. The majority of the mountains rise sharply upward from the valley floor and provide very little land area within the 10 to 20 per cent slope category.

Most of the County's agricultural development takes place on lands of less than 5 per cent slope so as to accommodate economic irrigation practices. Industrial and warehousing establishments are also attracted to sites of less than 5 per cent slope in order to keep construction, maintenance and operation costs at a minimum and to increase ease and efficiency in the handling of equipment and trucking. General commercial developments also normally seek locations of less than 5 per cent slope.

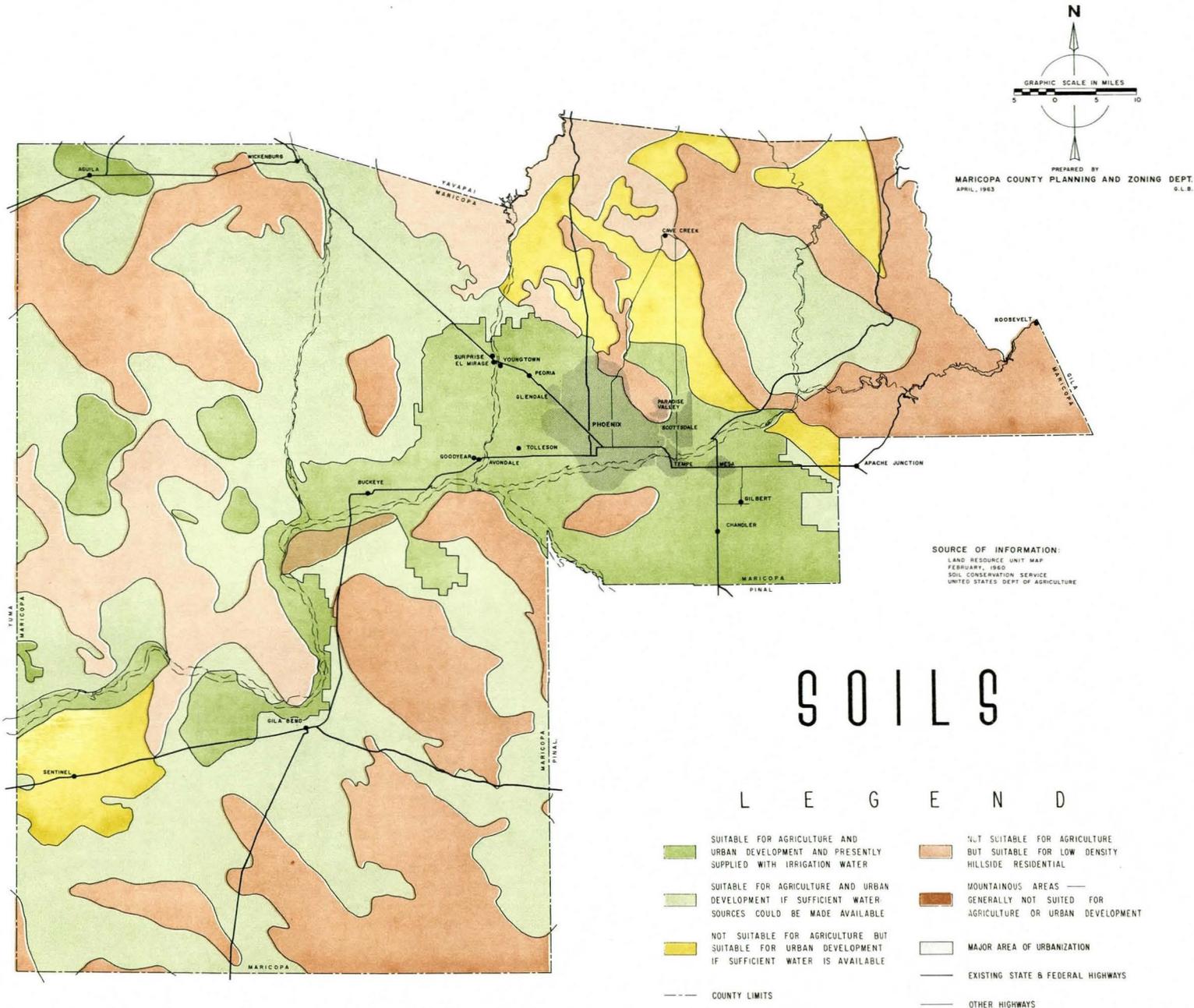
Residential and general urban development can be satisfactorily developed in areas with general slopes of less than 10 per cent. However, as slopes become steeper than 10 per cent, construction methods for the extension of streets, utilities and buildings become more difficult and expensive. Many higher income residential properties are established on hillside developments which are normally constructed on lands with 10 to 20 per cent slopes.

Lands having slopes of more than 20 per cent slope are not suitable for urban or agricultural development and should be preserved for natural wild life reserve areas, recreational purposes and natural openness.

As the County continues to grow in population and urban expansion, the conflict between farms, homes, factories and commercial developments for desirable level land will become more acute. The development of a county comprehensive plan will aid in the development and reservation of certain lands for these uses and serve as a guide for their location.

Soils

Soils play an important function in the development of the County. It is not feasible to develop lands for agriculture or urban use which are detrimental to the growing of crops or which will create problems in the expansion of urban facilities and utilities. Consequently it is not desirable to develop a county comprehensive plan without some knowledge of the characteristics of the soils and their limitation upon agriculture and urban growth.



The Soils Map, Plate 38, indicates the general nature of the surface soils of the County and indicates soils which are suitable for agriculture and urban development. It is recognized that there are many isolated areas within these general areas that may or may not be suitable for development. A more detailed explanation of soils and their agricultural capabilities can be received from the Soil Conservation Service, Department of Agriculture, Federal Building, Phoenix, Arizona.

Plate 38 indicates in green the general location of lands which are suitable for agriculture and urban development and which are presently supplied with irrigation water. These areas are normally under cultivation except where urban development has taken place. These lands comprise approximately 1,059,000 acres or 18 per cent of the county area. Approximately 550,000 acres are presently used for agriculture and produce a crop yield of over 270 million dollars annually. Agriculture has played an important role in the development of the County and was the greatest income producer for the County until 1954 when it was surpassed by manufacturing.

Older agricultural areas have been gradually declining as the County population grows at a rapid rate and the transition of agricultural lands for urban uses continues each year.

Future agricultural expansion within the County is quite limited due to the scarcity and cost of a sufficient water supply, and once land is taken out of agricultural production for urban development it is next to impossible to replace if it should be needed or desired. Therefore, consideration should be given for the preservation of existing agricultural areas that produce exceptionally high yields.

The light-green areas shown on Plate 38 are lands which are suitable for agricultural and urban development if sufficient water sources can be made available. These lands account for 2,256,600 acres or 38 per cent of the county area.

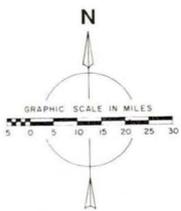
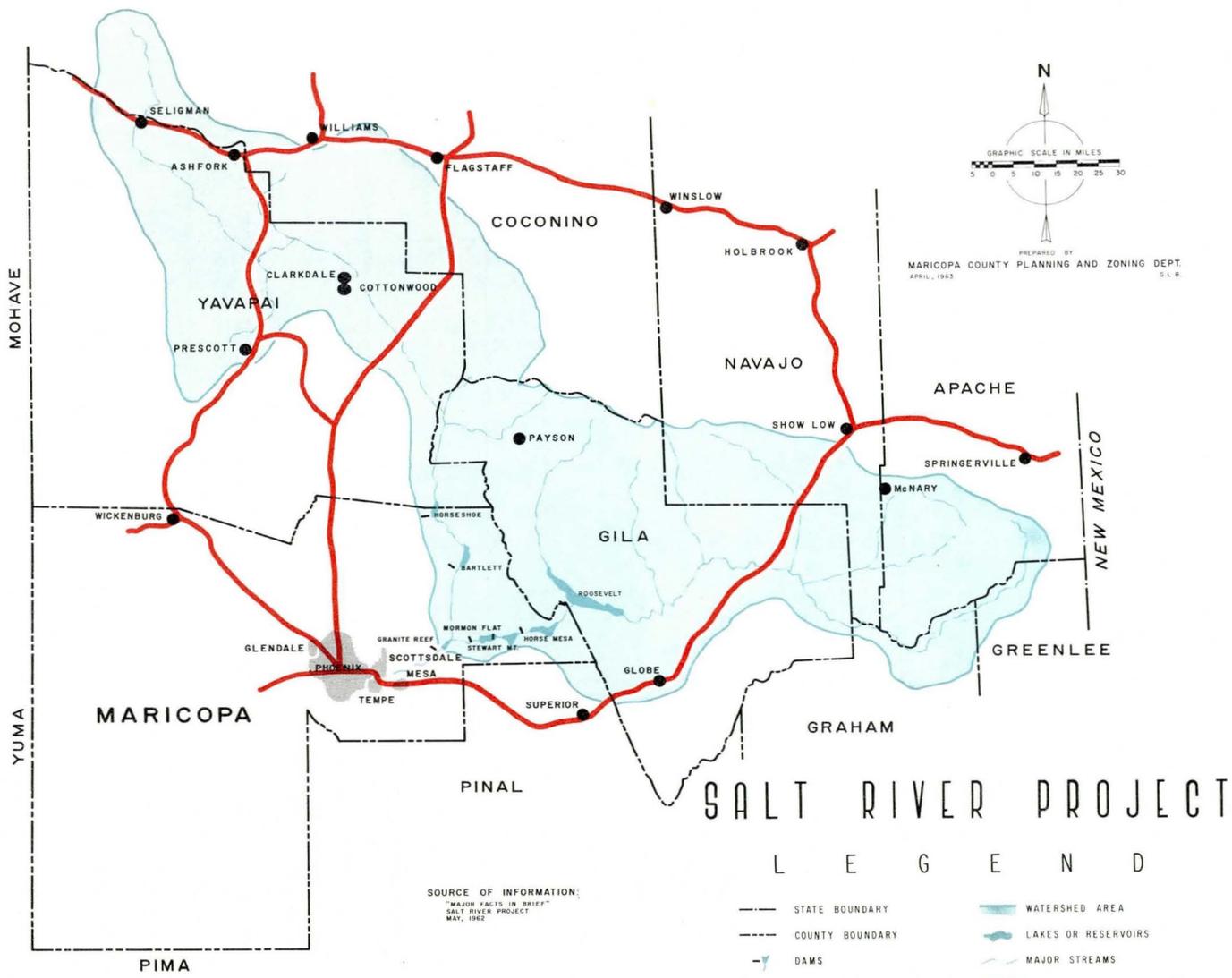
The yellow areas shown on Plate 38 are lands which soils are not suitable for agricultural development due to their coarseness and terrain. These lands could be used for general urban development if sufficient water supplies can be made available.

The light-brown areas shown on Plate 38 are lands which are not suitable for agricultural development. The soils are coarse and shallow and developed over a wide variety of bedrock. The terrain is rough to mountainous. The land is not suitable for general urban development. However, certain areas may permit the development of low density hillside subdivisions or mountain home sites. Special engineering and construction methods would be necessary in these areas for building foundations, streets and roads and for the development of water and sanitation facilities.

The dark-brown areas shown on Plate 38 are mountainous. Soils are very shallow and coarse with major rock outcroppings throughout. These lands are not suitable for agriculture or urban development.

In the future it will become more and more important that agricultural lands and urban development do not conflict and that certain agricultural lands be reserved for continued production which will tend to preserve the economic base.

It is also important that a general feeling of openness be provided within the urban area. The development of a county comprehensive plan will aid in the general location of urban development and in the reservation of appropriate open spaces.



PREPARED BY
 MARICOPA COUNTY PLANNING AND ZONING DEPT.
 APRIL, 1963
 S.L.B.

SOURCE OF INFORMATION:
 "MAJOR FACTS IN BRIEF"
 SALT RIVER PROJECT
 MAY, 1962

SALT RIVER PROJECT

LEGEND

- STATE BOUNDARY
- COUNTY BOUNDARY
- | DAMS
- MAJOR AREA OF URBANIZATION
- CITIES AND TOWNS
- WATERSHED AREA
- LAKES OR RESERVOIRS
- MAJOR STREAMS
- STATE AND FEDERAL HIGHWAYS

Water Resources

Water resource is the physical feature that provides a primary affect upon the future development of the County. General agricultural and urban development would not have, or cannot economically take place except in areas which can provide adequate quantities of quality water.

In Maricopa County water is obtained from surface water and ground water supplies. Surface supplies are derived from streams and rivers which drain the watershed areas and are collected in man made reservoirs. Ground water is obtained from natural underground reservoirs by the use of wells and pumps. Both surface and ground water supplies are somewhat limited in quantity and quality within the County.

Surface waters are provided to the County primarily by the Salt River Project. This project has a series of dams and reservoirs which collect waters from the Salt and Verde River watershed area as shown on Plate 39. This watershed area contains some 13,000 square miles, most of which lies outside the County. The runoff or collecting capacity of the watershed area is approximately 12,000,000 acre feet of which approximately 8 per cent or 1,000,000 acre feet reaches the reservoirs for use.⁽²⁾ Total storage capacity of the reservoirs is 2,076,713 acre feet. Average annual discharge for agriculture and urban use between 1913 and 1955 was 960,050 acre feet. Often annual discharge has exceeded collection quantities and total storage has been reduced considerably. In 1956 total storage within the reservoir dropped to an all time low of 340,654 acre feet; 1961 resulted in the second lowest year with 855,260 acre feet in storage at the end of the year.

(2) Page 13, Arizona Grows Where Water Flows

The cities of Phoenix and Glendale receive the greatest portion of their water for domestic consumption from the surface waters of the Salt River Project and will continue to require more with future growth.

For further information pertaining to surface waters contact the Community Relations Office, Salt River Project, Phoenix, Arizona.

Information concerning ground water conditions for all portions of the County is not available. A water report showed that ground water accounted for 68 per cent of the total water supply used for agriculture and urban consumption within the area surveyed.⁽³⁾

Ground water conditions vary considerably in depth, quantity and quality from one area to another throughout the County. These conditions create certain problems to agriculture and urban development and play an important part in the preparation of a comprehensive plan.

The depth and annual decline of the water table determines the physical economic feasibility of locating new wells and the life span of existing wells.

Quantity, or well capacity, is another limiting factor as to the general use of the land. Well capacity varies greatly from one area to another within the County. Agricultural uses require a great deal more water than general urban development, while industry normally requires more than commercial or residential. In outlying subdivisions or small communities which have independent wells or water systems, the quantity of water often indicates the size and density of population that can be accommodated within the area.

(3) Page 2, Available Water for Urban Development in the Phoenix Area, 1959. Samuel F. Turner

Quality of water has become an increasing problem within the County in the last few years. Water quality varies greatly and has developed into a serious and expensive problem in some areas. The greatest water quality problem is the increasing retention of soluble salts in the underground reservoirs. In certain areas the salt content of the water has increased to a point where it is not suitable for domestic consumption without proper treatment of some nature. The city of Buckeye is located in one of these areas and in 1962 established an ionics treatment plant to reduce the salt content for domestic consumption. The general salt problem areas are increasing in size and magnitude throughout the county.

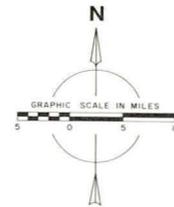
Other quality problems that have occurred and which are increasing in their occurrence include mineral content, temperature and silt. High content of minerals such as iron and fluoride is detrimental to personal health. Water treatment in these areas involves blending purer water with local water or by chemical or mechanical means to reduce the mineral content. High water temperatures have been occurring frequently. This is not a serious problem to health or agriculture but does provide an inconvenience to the domestic user. Another problem is the increase of silts and solid particles within the water supply which have to be settled or filtered out before being suitable for domestic consumption. Bacteria contamination has not created any serious problems within the County but this is another problem that has to be watched, especially in residential subdivisions that have individual water wells and sanitary septic tanks.

All of the above mentioned quality problems can be solved but for the most part do require special and costly treatment facilities.

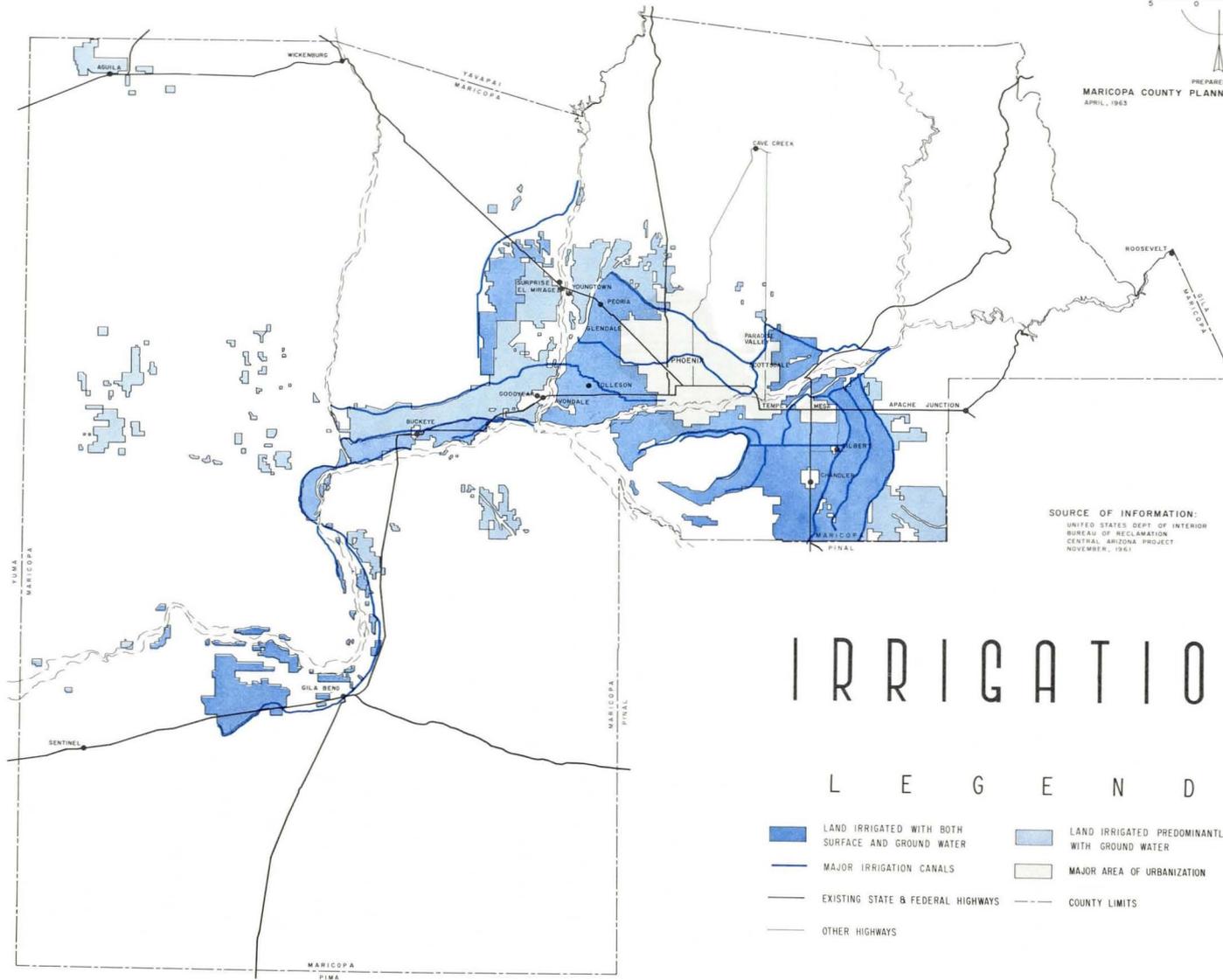
Due to lack of sufficient technical knowledge on these matters, it is beyond the scope of this report to discuss in detail or to portray graphically the areas that are now subject to specific water problems or which will become problem areas as ground water pumping continues.

The Maricopa County Planning Commission has requested that a detailed study of ground water problems be obtained. This step is necessary for the preparation of a comprehensive plan and will be useful as a guide in the review of new development and subdivision growth within the County.

This study will provide valuable information as to future water requirements for urban and agricultural use and will indicate possible sources of supply.



PREPARED BY
 MARICOPA COUNTY PLANNING AND ZONING DEPT.
 APRIL, 1963 JWS - G.L.B.



SOURCE OF INFORMATION:
 UNITED STATES DEPT. OF INTERIOR
 BUREAU OF RECLAMATION
 CENTRAL ARIZONA PROJECT
 NOVEMBER, 1961

IRRIGATION

L E G E N D

- | | | | |
|---|---|---|--|
|  | LAND IRRIGATED WITH BOTH SURFACE AND GROUND WATER |  | LAND IRRIGATED PREDOMINANTLY WITH GROUND WATER |
|  | MAJOR IRRIGATION CANALS |  | MAJOR AREA OF URBANIZATION |
|  | EXISTING STATE & FEDERAL HIGHWAYS |  | COUNTY LIMITS |
|  | OTHER HIGHWAYS | | |

Irrigation

Agriculture by irrigation has been the predominant factor in growth and development of the County. Perhaps as early as 200 BC the Hohokam Indians were diverting irrigation waters from the Salt River to the valley floor. The early white settlers constructed their first irrigation canal in 1869. In 1962 Maricopa County had 522,650⁽⁴⁾ acres under irrigation for agricultural use, which produced an annual yield of over 270 million dollars.

Plate 40 shows the general location of lands presently under irrigation except for those areas being utilized for urban development. Plate 40 also indicates the general location of major canals serving water to those areas.

There are over 15 irrigation districts established within the County which include some 388,000 acres. The Salt River Valley Users Association, commonly called the Salt River Project, is the largest and originally contained 242,000 acres of which approximately 50,000 acres have been lost to urban development. Lands in irrigation under individual development account for the remaining 185,000 acres.

The history of irrigation began with the Hohokam Indians who miraculously constructed over 125 miles of canals and ditches with stone axes and hoes. However, because of some mysterious reasons these canals and fields were abandoned. The first ditch constructed by white settlers was in 1869, through an association of farmers who had very few problems in sharing water as a sufficient supply was available for all. Later, as more

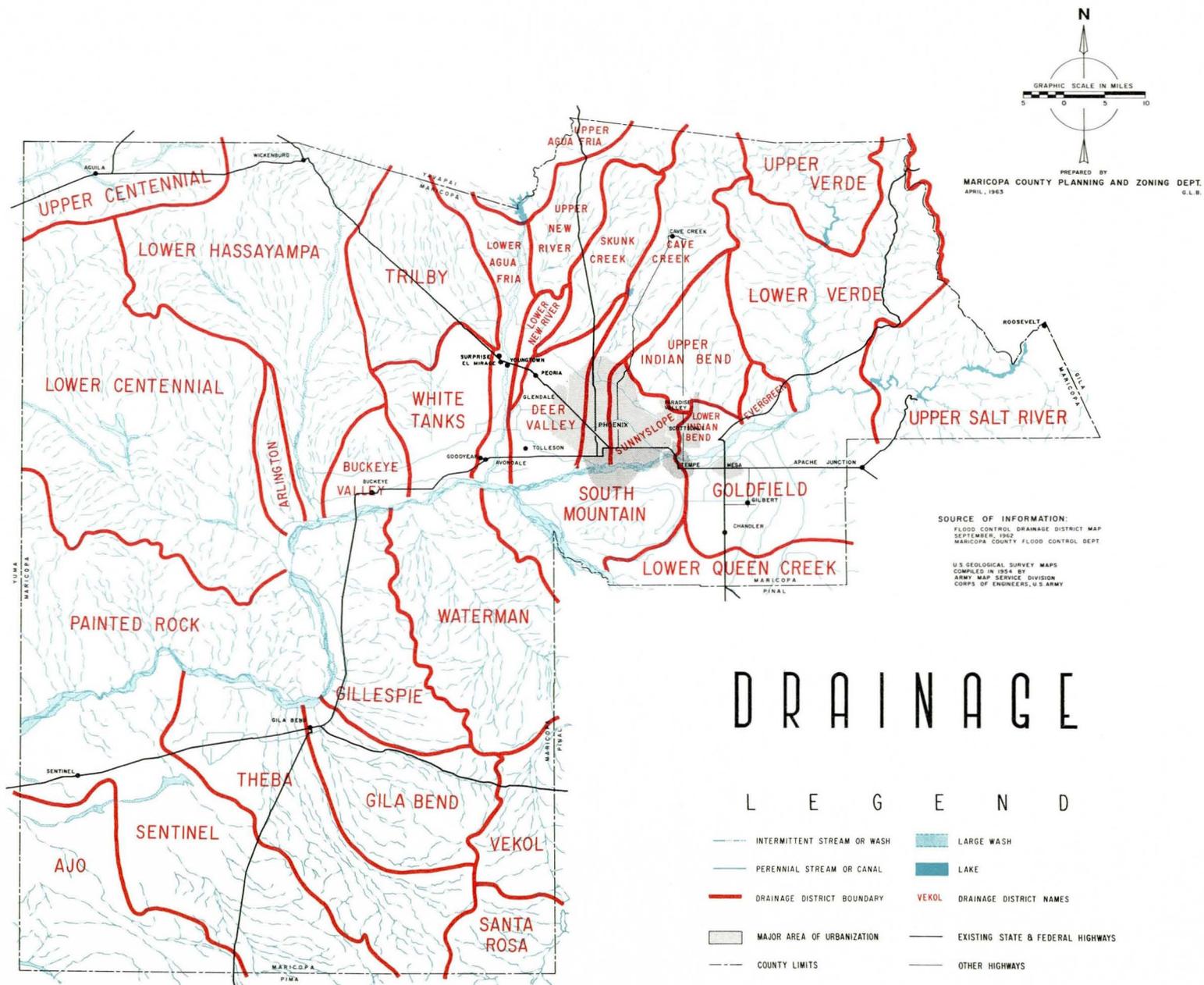
(4) Arizona Statistical Review, 1962.

settlers moved into the valley and more canals and ditches were established, confusion and conflict arose over the water rights. A better association was needed to solve water rights problems and to help expand and finance irrigation improvements.

On February 9, 1903, under Arizona Territorial Laws an association was incorporated of approximately 4,000 members. This association by working with the Federal government under the Reclamation Act of June 17, 1902, signed an agreement on June 25, 1904, for the construction of Theodore Roosevelt Dam. This dam was the beginning of a vast modern irrigation system that exists within the county today.

For more detailed information on the Salt River Project and the county irrigation system contact the Community Relations Department, Salt River Project, Phoenix, Arizona.

As irrigation has played such an important part in the general development of the County, it is necessary that consideration be given for its potential in the preparation of a comprehensive plan.



Drainage and Flooding

Drainage is the summation of the movement of water within an area plus the means by which it travels - either on the surface in the form of streams or in man made channels, canals or underground systems. The land area contributing water to any of these carriers is known as the drainage area or basin. Flood plains are the areas that become inundated when excess waters spill over the natural channels of streams and canals.

The Drainage Map, Plate 41, shows the general location of major natural drainage channels. Major drainage channels within the County are the Salt, Verde, Gila, Hassayampa, Agua Fria, and New Rivers; Cave Creek, Skunk Creek, Queen Creek, Indian Bend Wash, Waterman's Wash, Bender-Sand Tank Wash, and Centennial Wash. These rivers except the Verde and Salt above Grante Reef Dam are dry for the most part but do carry waters of flooding proportions during periods of peak thunderstorm activity. These major drainage areas and their adjoining low lands are subject to periodic flooding; and serious problems are posed to the urban development that has taken place in these areas.

The first settlers to Maricopa County found a natural system of washes, streams and rivers that adequately carried off the natural drainage water. As population growth continued, the increased growth of agriculture and urban development disrupted this system. Streets, roads, farms and subdivisions in many cases were developed with little regard to the natural drainage system. As urban development takes place buildings, homes and pavements do not absorb water as did the natural ground and vegetation they replaced. Therefore, this also compounds the problem of natural drainage and runoff.

The disruption of natural channels and the increase in runoff enhances flood hazards, creates the need for expensive storm sewers and encourages a waste of natural water that normally would be used for replenishing underground water supplies. Inadequate storm drainage presently constitutes a serious problem in many parts of the County. The protection of natural drainage courses from urban development as well as the protection of urban development from flooding will become increasingly important in the future as population and urban growth continues.

In the preparation of a comprehensive plan, the provisions for adequate storm drainage systems, the preservation of natural drainage channels and the reservation of sufficient open space to aid in the retention of surface

water must be considered. Probably the most economical method of insuring against flood damage is by regulating development in problem areas through zoning and subdivision regulations. However, this does not solve the flooding problem of existing areas which have been permitted to develop in flood plain areas.

The Maricopa County Flood Control Office was established in 1959. Under the guidance of a County Flood Control Advisory Committee this office has had flood control studies conducted for certain drainage districts within the County and is presently undertaking additional studies. These studies point out the problems within various drainage districts and recommend proposals to reduce or eliminate flooding problems.

These projects will be studied in regard to their priority of benefits to the County and will be recommended for construction in the future. For further detailed information on drainage and flood control matters contact the Maricopa County Flood Control District Office.

Areas subject to flooding and proposed flood control projects have an important effect upon the development of a comprehensive plan for the County.

SUMMARY

In summary, physical features have and will continue to influence the development of land within the County, and these conditions will be reflected in the ensuing county wide planning studies to be prepared by the Maricopa County Planning Department.

Climate conditions create very few limitations to the general development of the County. The desert-type climate has been a major asset in the economic and population growth of the County and contributes to irrigated agriculture by providing a long growing season for warm weather crops.

Geologic and soil conditions create limitations for general development on about 45 per cent of the county area. Alluvial soils in parts of the valley floor are very fertile for agriculture, but it is these soils that are rapidly being absorbed by urban development. A balanced program of agriculture and urban development on these lands would be to the best interests of the County and its people.

Topography and slope pose certain limitations to general development within the County. However, much of the County ranges from 0 to 10 per cent slope which provides abundant quantities of land for future growth. Elevations in the County range from 400 to 7000 feet above sea level and these variations will play an important part in the general location of streets and highways, general urban development, wild-life refuges, recreation and areas of general openness within the County.

Water is the key to future development in the County. Ground and surface water resources are somewhat limited in quantity and accessibility. Water demands within the County will continue to grow, and consideration must be given to the proper development and use of the County's water resources.

Irrigation is a primary factor in the economic development of the County. Only through irrigation has it been possible to cultivate the desert which provides a variety of agricultural crops with exceptionally high yields. Consideration must be given to the preservation and reservation of certain irrigable lands for future agricultural products.

Drainage and flooding problems will increase with urban expansion. The necessity of preserving streams for storm drainage and of restricting development in flood problem areas will become more imperative in the future.

A P P E N D I X

TABLE A
LABOR FORCE TRENDS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370
Persons 14 years Old and Over	101,457,844	135,857	0.134	112,801,417	236,320	0.210	126,276,548	448,980	0.356
Labor Force	53,010,582	68,076	0.128	60,329,231	121,252	0.201	69,877,481	249,994	0.358
Employed	45,070,315	54,496	0.121	56,449,409	108,423	0.192	64,639,252	233,636	0.361
Unemployed	7,634,767	13,210	0.173	2,854,311	9,574	0.335	3,504,829	11,072	0.316
Military	305,500	370	0.121	1,025,511	3,255	0.317	1,733,402	5,286	0.305

Source: U.S. Census of Population

TABLE B

EMPLOYMENT TRENDS BY OCCUPATION GROUPS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Professional and Technical Workers	3,579,585	4,963	0.139	4,921,272	10,999	0.223	7,232,410	27,960	0.387
Managers and Proprietors	3,633,656	6,081	0.167	5,036,808	13,055	0.259	5,409,543	23,358	0.432
Clerical and Sales Workers	7,463,014	10,295	0.138	10,861,234	22,930	0.211	13,380,277	52,302	0.386
Craftsmen	5,171,394	5,130	0.099	7,820,634	14,516	0.186	8,741,292	32,099	0.367
Operatives	8,079,922	6,718	0.083	11,180,315	13,831	0.124	11,897,636	29,043	0.244
Laborers	3,142,888	3,101	0.099	3,436,110	6,184	0.180	3,107,535	11,095	0.357
Personal Service Workers	5,291,594	7,125	0.135	5,708,178	12,649	0.222	7,170,784	24,121	0.336
Farmers and Farm Managers	5,147,789	3,106	0.060	4,310,979	3,312	0.077	2,505,684	2,655	0.106
Farm Laborers	3,142,122	7,619	0.242	2,416,810	9,079	0.376	1,444,807	14,032	0.971
Not Reported	418,351	358	0.086	742,933	1,868	0.251	3,183,675	15,445	0.485
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE C
EMPLOYMENT TRENDS BY INDUSTRIAL GROUPS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Agriculture	8,559,134	12,163	0.142	7,033,591	13,795	0.196	4,349,884	18,929	0.435
Mining	918,853	514	0.056	930,968	470	0.050	654,006	553	0.085
Construction	2,087,564	3,205	0.154	3,457,980	9,421	0.272	3,815,937	21,444	0.562
Manufacturing	10,670,087	3,939	0.037	14,685,482	9,983	0.068	17,513,086	36,476	0.208
Transportation	3,143,227	3,314	0.105	4,449,861	8,473	0.190	4,458,147	14,323	0.321
Trade	7,497,793	13,200	0.176	10,507,331	27,517	0.262	11,792,635	48,434	0.411
Finance	1,474,681	1,792	0.122	1,919,610	4,541	0.237	2,694,630	13,897	0.516
Services	8,574,153	13,075	0.152	10,092,646	25,875	0.256	13,549,947	5,671	0.396
Public Administration	1,415,283	2,636	0.186	2,514,469	6,217	0.247	3,202,890	12,149	0.379
Not Reported	729,540	658	0.092	843,335	2,131	0.253	2,608,085	13,760	0.528
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE D

MANUFACTURING EMPLOYMENT TRENDS - DURABLE GOODS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Durable Goods	5,152,832	1,151	0.022	7,764,478	4,769	0.061	9,828,689	24,483	0.249
Wood Products	903,496	335	0.037	1,196,116	715	0.060	1,067,252	1,298	0.121
Metal Products	1,507,107	379	0.025	2,032,184	2,381	0.117	2,516,631	4,766	0.189
Machinery	1,112,105	266	0.024	2,114,840	924	0.044	3,055,447	9,376	0.307
Motor Vehicles	569,767	53	0.009	856,786	105	0.012	841,861	309	0.037
Other Transportation Equipment	307,869	6	0.002	486,371	98	0.020	976,837	5,306	0.543
Other Durables	752,488	112	0.015	1,078,181	546	0.051	1,370,661	3,428	0.250
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE E
 MANUFACTURING EMPLOYMENT TRENDS - NON-DURABLE GOODS
 1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Non-Durable Goods	5,517,255	2,788	0.051	6,921,004	5,214	0.075	7,684,397	11,993	0.156
Food Products	1,202,782	1,584	0.132	1,481,280	2,678	0.181	1,822,477	5,050	0.277
Textiles	1,166,470	50	0.004	1,227,525	60	0.005	954,036	101	0.011
Apparel	783,735	23	0.003	1,066,511	166	0.016	1,159,163	1,879	0.162
Printing and Publishing	637,957	715	0.112	862,936	1,447	0.168	1,141,192	3,438	0.301
Chemicals	400,852	203	0.051	637,349	512	0.083	864,542	828	0.096
Other Non-Durables	1,325,459	213	0.016	1,645,403	351	0.021	1,742,987	697	0.040
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE F

TRANSPORTATION EMPLOYMENT TRENDS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Total Transportation	3,143,227	3,314	0.105	4,449,861	8,473	0.190	4,458,147	14,323	0.321
Railroads	1,136,885	819	0.072	1,391,245	1,402	0.101	941,214	1,184	0.126
Trucking	495,191	651	0.131	698,160	1,479	0.212	911,454	2,967	0.326
Other									
Transportation	561,699	466	0.083	864,574	1,056	0.122	887,245	1,742	0.196
Communications	394,451	463	0.117	710,525	1,371	0.193	819,649	3,741	0.456
Utilities and Sanitary Service	555,001	915	0.165	785,357	3,165	0.403	898,585	4,689	0.522
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE G
TRADE EMPLOYMENT TRENDS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Total Trade	7,497,793	13,200	0.176	10,507,331	27,517	0.262	11,792,635	48,434	0.411
Wholesale Trade	1,203,751	3,217	0.267	1,965,036	6,319	0.322	2,212,984	10,105	0.457
Food Stores	1,372,283	2,087	0.152	1,665,830	3,702	0.222	1,689,688	6,388	0.378
Eating and Drinking Places	1,118,365	2,017	0.180	1,691,383	4,502	0.266	1,801,667	7,330	0.407
Other Retail Trade	3,803,394	5,879	0.155	5,185,082	12,994	0.251	6,088,296	24,611	0.404
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE H

SERVICE EMPLOYMENT TRENDS
1940-1960

	1940			1950			1960		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Total Service	8,574,153	13,075	0.152	10,092,646	25,875	0.256	13,549,947	53,671	0.396
Business and Repair Service	883,313	1,521	0.172	1,307,669	4,030	0.308	1,610,728	7,681	0.477
Personal Service	3,903,884	5,836	0.149	3,464,991	9,279	0.268	3,858,494	15,173	0.393
Private Household	2,248,970	2,677	0.119	1,601,270	3,667	0.229	1,916,964	6,088	0.318
Other Personal	1,654,914	3,159	0.191	1,863,721	5,612	0.301	1,941,530	9,085	0.468
Professional Service	3,786,956	5,718	0.151	5,319,986	12,566	0.236	8,080,725	30,817	0.381
Entertainment and Recreation	396,529	737	0.186	493,433	1,385	0.281	502,879	2,252	0.448
Total Employment	45,070,315	54,496	0.121	56,435,273	108,423	0.192	64,639,247	233,636	0.361
Total Population	132,165,129	186,193	0.141	151,325,798	331,770	0.219	179,325,671	663,510	0.370

Source: U.S. Census of Population

TABLE I
EMPLOYMENT PER 1000 PERSONS

	1940		1950		1960		1970 (Projection)		1980 (Projection)	
	United States	Maricopa County	United States	Maricopa County	United States	Maricopa County	United States	Maricopa County	United States	Maricopa County
Agriculture	64.76	65.32	46.48	41.58	24.26	28.53	14.87	20.88	10.50	15.05
Mining	6.95	2.76	6.16	1.41	3.65	0.83	2.12	0.36	1.40	0.35
Construction	15.80	17.21	22.85	28.39	21.28	32.32	20.18	32.40	19.95	30.10
Manufacturing	80.73	21.16	97.05	30.09	97.66	54.97	97.35	66.19	96.25	70.72
Durable Goods	38.98	6.18	51.31	14.37	54.81	36.90	56.03	45.42	56.01	50.25
Non-Durable	41.75	14.97	45.74	15.71	42.85	18.07	41.32	20.77	40.24	20.47
Transportation	23.78	17.80	29.41	25.53	24.86	21.58	22.66	20.16	21.35	18.20
Trade	56.74	70.89	69.44	82.93	65.76	72.99	63.37	68.66	61.60	64.52
Finance	11.15	9.62	12.69	13.68	15.03	20.94	16.28	22.68	17.15	22.75
Services	64.88	70.22	66.70	77.99	75.56	80.89	81.78	84.39	84.70	84.56
Business and Repair	6.68	8.17	8.64	12.14	8.98	11.57	9.56	12.24	9.80	11.90
Personal	29.53	31.34	22.89	27.96	21.52	22.87	21.24	18.87	20.65	17.01
Professional	28.65	30.71	35.16	37.87	45.06	46.45	50.98	53.28	54.25	55.65
Public Admins.	10.70	14.16	16.62	18.73	17.86	18.31	19.12	20.16	19.60	19.60
Not Reported	5.51	3.53	5.57	6.42	14.54	20.74	16.28	24.12	17.50	24.15
Total Employment	341.02	292.69	372.94	326.81	360.46	352.13	354.01	360.00	350.00	350.00

Source: Computations for 1940, 1950 and 1960 were based on U.S. Census of Population data.
Projections were made by the Advanced Planning Division.

TABLE J

EMPLOYMENT PROJECTIONS
1970-1980

	1970			1980		
	United States	Maricopa County	County as a Per Cent of the Nation	United States	Maricopa County	County as a Per Cent of the Nation
Agriculture	3,107,850	20,880	0.672	2,572,500	21,070	0.819
Mining	443,100	360	0.081	343,000	490	0.143
Construction	4,217,600	32,400	0.768	4,887,750	42,140	0.862
Manufacturing	20,346,150	66,190	0.325	23,581,250	99,010	0.420
Durable Goods	11,710,250	45,420	0.388	13,722,450	70,350	0.513
Non-Durables	8,635,900	20,770	0.241	9,858,800	28,660	0.291
Transportation	4,735,950	20,160	0.426	5,230,750	25,480	0.481
Trade	13,244,350	68,660	0.518	15,092,000	90,330	0.599
Finance	3,402,500	22,680	0.667	4,201,750	31,850	0.758
Services	17,092,000	84,390	0.494	20,751,500	118,380	0.570
Business and Repair	1,998,050	12,240	0.613	2,401,000	16,660	0.694
Personal	4,439,150	18,870	0.425	5,059,250	23,810	0.471
Professional	10,654,800	53,280	0.500	13,291,250	77,910	0.586
Public Administration	3,996,100	20,160	0.504	4,802,000	27,440	0.571
Not Reported	3,402,500	24,120	0.709	4,287,500	33,810	0.789
Total Employment	73,988,100	360,000	0.487	85,750,000	490,000	0.571
Total Population	209,000,000	1,000,000	0.478	245,000,000	1,400,000	0.571

Source: Based on ratios from Table I

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