

AN INTERNSHIP IN PUBLIC ADMINISTRATION PERFORMED AT  
THE HOUSING AUTHORITY OF THE CITY OF TUCSON AND  
THE CITY OF TUCSON WATER AND SEWERS DEPARTMENT  
TUCSON, ARIZONA: SEPTEMBER 4, 1969 - DECEMBER 19, 1969

by

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STATEMENT BY AUTHOR

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## PREFACE AND ACKNOWLEDGMENTS

The first half of this author's internship was with the Housing Authority of the City of Tucson and the second half was with the Water and Sewers Department of the City of Tucson. The purpose of the internship and the diary is to broaden the author's knowledge of the management of public organizations.

This project diary is the result of over four months of observation and study, on a part-time basis; and since the internship requirement was fulfilled at two organizations, the diary is divided into five parts. The first part, Chapters I and II, provides the historical setting and the organization and operations of the Tucson Housing Authority. The second part, Chapters III and IV, covers the author's projects and experiences while with the Authority. The third part, Chapters V and VI, explains the organization of the City of Tucson and the operation and organization of the Water and Sewers Department. The fourth part, Chapters VII and VIII, relates the author's projects and experiences while with the Water and Sewers Department. The fifth part, Chapter IX, is an integration of the theory of public administration with the actual practices, as observed by the author, of the Tucson Housing Authority and the Water and Sewers Department, a summary, and conclusion.

It would be impossible to name all the people whose assistance has made this diary possible. However, special thanks must be

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## CHAPTER I

### HISTORY AND DEVELOPMENT OF PUBLIC HOUSING

The first portion of my internship was spent with The Housing Authority of the City of Tucson. My assignment was to conduct two studies. The first research project was that of determining the special needs of the elderly in public housing. The second assignment was to study and determine satisfactory areas in Tucson in which to construct public housing for the elderly.

#### The Beginning of Public Housing

The purpose of public housing is to provide decent, safe, and sanitary housing for those in the lowest income group who cannot afford to pay enough to cause private interests to construct an adequate supply of satisfactory housing.

It was not until the great depression of the 1930s that the Federal government became involved in peacetime public housing in our country.

One of President Roosevelt's first acts when he took office in 1933 was to ask for and obtain an appropriation of \$3 billion for a program of public works. The program was primarily intended to give added employment to those in the construction industry and to increase the demand for materials. Actually, the government wanted to increase the public's purchasing power. But

in addition to this, the projects were also intended to be useful and, if possible, ultimately revenue-producing. The idea of public housing for low income families arose quickly because it had been successfully used in Great Britain after World War I and in pre-Hitler Germany.<sup>1</sup>

Some 22,000 houses in 50 projects were completed or under construction by 1937.<sup>2</sup>

#### Housing Act of 1937

The first specific public housing act, which set up the United States Housing Authority, was established in 1937. It was authorized to make loans to local public housing agencies for up to 90 per cent of the development cost of the project. The United States Housing Authority was given permission to sell its tax-exempt bonds to raise the funds for these loans.<sup>3</sup>

Two of the significant provisions of this act were changes from previous practice.<sup>4</sup>

1. Local communities would decide whether or not they wanted public housing, either through their local government or through specially organized local housing authorities. In other words, the Federal government removed itself from the direct management and construction of public housing. The properties were no longer owned by the Federal government, but rather by the local governmental unit.

2. The principal of "equivalent elimination" was introduced at this time. It meant that public housing could only replace as many units as were being taken out of the housing supply by condemnation, demolition, or compulsory repair or improvement.

Shortly after the fall of France in 1940, Congress passed the Lanham Act which provided the necessary funds and a new administrative organization for housing low-income families whose wage earners were in defense or war production. The act established the Federal Public Housing Authority which then became responsible for all Federal public housing.<sup>5</sup>

During the war, approximately 160,000 units were constructed, but during the next three years only 2,000 units were built because of the acute shortage of materials and the vigorous opposition to public housing.<sup>6</sup>

#### Housing Act of 1949

The election of 1948 indicated a surprising reversal in public opinion as Congress passed the Housing Act of 1949. While the controversy was intense, it became apparent that the two main factions of the disagreement both wanted a decent home and suitable living environment for everyone.<sup>7</sup>

With this act, Congress authorized the construction of over 800,000 units which they hoped would break the back of the housing shortage for the poor.<sup>8</sup>

There are three major amendments to the basic law of 1937.<sup>9</sup>

1. The Housing Act of 1949 eliminated the requirement that projects which receive annual Federal contributions must also be given a local cash or tax subsidy of at least 20 per cent of the Federal contributions. This new provision stated that local projects were to be tax exempt; but in lieu of the taxes, a payment of not more than 10 per cent of the annual shelter rents could be made for each project to the local governmental unit.

2. It required that a gap of at least 20 per centum be left between the upper limits for admission to the proposed low-rent housing and the lowest rent at which private enterprise could provide a substantial supply of good housing.

3. It established a priority list for those eligible for public housing. Those displaced by low-rent housing projects or public slum clearance were given first priority.

The Housing Act of 1949 set a new and higher standard in the area of public policy. Its principal merit was that, until the 1968 act, it was the only public housing measure that actually authorized action on a scale that had a reasonable relationship to need.<sup>10</sup>

But, as frequently happens, high hopes are carried out only to a fractional degree. In the 18 years which ended in 1967, only 460,000 units were constructed.<sup>11</sup>

By 1968 almost one million units of public housing were either completed, under construction, or under contract.<sup>12</sup>

#### Housing Act of 1968

This act, which the President called the "Magna Carta to liberate our cities," reaffirmed the goals of the act of 1949, and brought about several important shifts in emphasis. These included the shift away from high-income urban renewal projects to low- and moderate-income housing. Emphasis was also placed on housing for large families, upgrading management personnel, improving tenant services, etc.<sup>13</sup>

With this act the government also provided for mortgage insurance in high-risk areas, government guarantees for financing new town developments which have a proper balance of low- and moderate-income housing, and the establishment of a national housing partnership which attempts to attract more private financial resources into the low- and moderate-income field.<sup>14</sup>

One of the most important new programs is that which provides help through the device of subsidized interest rates to the low-income families who want to rent or own housing.

### Housing for the Elderly

In recent years, the elderly, especially Anglos, have come to constitute a larger share of the occupants of public housing. They formed 30 per cent in 1966, but now almost half of the public housing projects are being constructed specifically for the elderly.<sup>15</sup>

Public housing has always been more acceptable to the elderly than to younger people; and this is particularly true among Anglos. Apparently, much of the race antagonism of their earlier life subsides as people grow older and, therefore, they object much less to living with or near Negroes and other minority people.<sup>16</sup>

### The Turnkey Method

In 1968 the Turnkey Method was introduced to reduce the excessive amount of time consumed in the planning, execution, and construction of public housing.

Under this method a developer contracts with the local housing authority to obtain the land and produce a completed building or complex. Only when the developer turns the keys of the completed project over to the local housing authority will payment be made by the authority. This method has helped immensely in reducing the time needed to produce a housing project.<sup>17</sup>

## CHAPTER II

### THE HOUSING AUTHORITY OF THE CITY OF TUCSON AND ITS ADMINISTRATION

Like most of the larger cities of the United States, Tucson has its own local housing authority to provide low-rent housing.

#### History

The Housing Authority of the City of Tucson was created by the Mayor and Council on February 20, 1941.<sup>18</sup>

It was not until February 1942, when Resolution 33 established the location of the first public housing in Tucson, called La Reforma, that the public began to see some results of their local housing authority.

According to Mrs. Margaret Hopkins, Accountant, the first bid accepted for construction of the 162-unit La Reforma Housing Project was for over \$500,000. By August 1943 the project was fully occupied. With the advent of World War II, war production workers were given priority in the housing units. In addition, over 1,100 housing units and trailers were provided for the housing of defense production workers.

According to Housing Authority personnel, many of the units constructed during the war for defense workers were either

sold, torn down, or turned over to the Defense Department or Veterans Administration who converted the housing units and trailers for their own use after the war.

In 1967 the Connie Chambers Housing Project was constructed adjacent to the La Reforma Project. All of the 200 units were filled almost as soon as they were available for occupancy.

The Housing Authority has now moved into another important area of public housing. By July 1970 the Martin Luther King Apartments should be available for occupancy. This is the first project built specifically for Tucson's elderly who qualify for low-rent public housing. This project, located in the downtown area, consists of 96 units.

#### Organization

The need for public housing is determined locally; then the local housing authority may apply to the Public Housing Authority for Federal assistance. The prerequisite for such action is an official approval by a local governing body, such as a city council or similar agency.<sup>19</sup>

Private contractors are utilized to construct any projects undertaken by the local housing authority. Title to the public housing projects in Arizona are in the name of the City or County in which they are constructed. The local authority acts as a non-profit agency for the City.

According to the Bylaws of the Housing Authority of the City of Tucson, the Board of Commissioners of the Housing Authority



is selected by the Mayor and Council. The Board appoints the Executive Director. Jerome Hosenfeld is the present Director and is responsible to the Board for the efficient and effective operation of the local housing projects.

#### Personnel Policies and Practices

The Executive Director is responsible for classification of jobs; determination of compensation for each classification level; and employment, placement, promotion, and release of personnel.

The staff is not allowed any involvement in political campaigns and is forbidden to hold offices in political parties.

#### Financial Administration

All of the money used to construct the public low-rent housing projects is from the Federal government.

The operating expenses are to be paid for by the revenue derived from the monthly rent. If, however, sufficient revenue cannot be derived from the rent, the Public Housing Administration will pay up to a limited percentage of the project's development cost toward operating expenses. The contribution varies from year to year depending on the amount of funds the local housing authority has available from income after meeting the operating expenses exclusive of the Debt Service.<sup>20</sup>

Although low-rent housing is exempt from local taxes, local housing authorities make payments in lieu of taxes of up to

10 per cent of the annual rental income. These payments go to the local governmental units--city, county, school district, etc.--for the purpose of the low-rent housing bearing a share of the cost of the usual necessary municipal services.<sup>21</sup>

## CHAPTER III

### STUDY OF THE SPECIAL NEEDS OF THE ELDERLY

The first few days I was with the Tucson Housing Authority I was given a good introduction to the program and facilities of the organization.

I was shown how applications are handled and how priorities are established for those who most need low-cost housing.

Much time was also spent during the first week in reading various files and manuals regarding the operation of public housing projects. This helped to provide me with a broader understanding of the problems the administration of the agency has in expanding low-cost and elderly housing in Tucson.

After several days of attempting to familiarize myself with low-cost public housing, I was assigned a research study. The study centered largely around the problems of the elderly and what needs to be provided for them in public housing.

#### Background Statistics

According to the national average, using age 65 and above, there are five single women and two single men for every married couple.<sup>22</sup> Table 1 demonstrates the continuing growth of Tucson's elderly population.

Table 1. Population Statistics of Tucson's Elderly

<u>Year</u>	<u>Ages 55-59</u>	<u>Ages 60-64</u>	<u>Ages 65+</u>	<u>Ages 55+</u>	<u>Ages 62+*</u>
1960	8,665	7,664	16,733	33,062	21,331
1965	10,383	9,253	20,712	40,348	26,264
1970#	12,449	11,172	25,637	49,258	32,340
Rate of Increase	19.9%	20.74%	23.78%		

Source: U.S. Census Data

# Estimate based on the assumption that percentage change between 1965 and 1970 will be the same as between 1960 and 1965

\* Estimate based on U.S. Census Data

When looking at the situation in Tucson, the Tucson Housing Foundation found that over 50 per cent of those who live in homes of their own feel that their houses are too large, too expensive, too run-down, too much work, and too poorly located for the older folks. Also indicated in this study was the fact that Tucson's elderly are quite isolated, in that over 50 per cent have no friends or relatives they can turn to in times of need. Approximately 47 per cent came to Tucson for health reasons, which tends to indicate that there are a higher proportion of elderly who are not completely able to care for themselves than in many other areas.<sup>23</sup>

The local Social Security office indicates that in Pima County, as of January 1, 1969, over 39,000 elderly are on Social Security, with the average monthly check being \$86.00.<sup>24</sup>

When questioned about housing, Tucson's elderly were found to consider the following most important:<sup>25</sup>

1. They want to be as independent as they are physically able to be.
2. They desire as much security as possible from the hazards of old age.
3. They want their residence to be permanent; they do not want to be worried about the necessity of relocating.
4. They require a moderately-priced housing unit because of their limited and constantly decreasing buying power.

However, before we permit these facts to become too important, we must also consider the results of several studies conducted in various parts of the country which demonstrated the following about the ambulatory aged:<sup>26</sup>

1. 15 per cent cannot clean their own living quarters
2. 12 per cent cannot prepare meals
3. 27 per cent cannot launder their own clothes
4. 16 per cent cannot shop
5. 83 per cent have difficulties with ironing

The rates for Tucson would most likely be somewhat higher because many elderly come to this area to reduce the effects of illnesses, such as arthritis, which diminish their ability to care for themselves.

Only five to six hours a day are committed to activities which must be performed daily which means that ten hours a day are available for other activities. Many spend much of their time watching television, visiting, reading, and relaxing. But the average elderly person has two hours a day which are still unoccupied.<sup>27</sup>

#### Various Design Features

Since the elderly spend much time at home and tend to be more socially isolated, living accommodations are an important concern to them.

Some recommended design features are listed.

1. Adequate temperature and climate control are necessary because the elderly require more warmth than do younger people. Humidity control is necessary because of the many elderly citizens of Tucson who suffer from respiratory diseases.

2. There must be adequate sources of sunlight and artificial light.

3. An adequate control of sound and noise is required although it should not be too quiet because this gives the feeling of isolation.

4. Housing should be designed to maximize conservation of energy by minimizing the necessity for reaching, lifting, bending, pulling, climbing, etc. Some examples follow.<sup>28</sup>

- a. Higher plug ins
- b. Lower switches so they can be reached from the wheel chairs
- c. Railings and support bars
- d. Doorways wide enough for wheel chairs
- e. Access ramps for wheel chairs

Some authorities question the desirability of high electrical outlets because they are seldom used and it must be remembered that the average elderly person bends lower twice a day to put on and remove his shoes. Also, a person is much more apt to trip on a cord extending from an outlet which is 30 inches above the floor.<sup>29</sup>

According to a national survey, only 5 per cent of the residents of elderly housing projects use wheel chairs, therefore, the entire project need not be planned to accommodate wheel chairs.<sup>30</sup>

5. Safety factors should be built in because the elderly are much more accident prone, the chief accidents being falls and fires. These accidents can be reduced by the use of:

- a. Non-slip floors
- b. Grab bars
- c. Low or no thresholds
- d. Electric ranges

6. Planning should endeavor to maximize employment of corner apartments for the following reasons:

- a. Double the area and interest of view
- b. On sunny days the sun will shine in apartment regardless of orientation

7. Some flexibility should be designed into the original structure because when a housing unit for the elderly is opened, the average age of its occupants nationally is 74.5 years, but after 15 years of operation the average age is 82.6 years. Upon entering, 83 per cent are single, but after 15 years of operation the proportion increases to 95 per cent. These changes generally represent a lowering of income for the surviving person and a desire for a smaller, less expensive apartment.<sup>31</sup>



8. Fire-sensing devices should be in each room, especially in high-rise type buildings because elderly are usually apprehensive about fires when living in this type of building.

One factor which makes planning difficult is that no single type of housing meets the needs of all the elderly because the elderly are individuals and each has his own likes, dislikes, and capabilities.

#### Location Factor

##### Site

Some of the advantages of a central city location are that the elderly would be conveniently located for shopping, entertainment, cultural activities, transportation facilities, etc.

The disadvantages of such a location would include traffic, noise, and gas fumes. Also, many of the elderly enjoy gardening and other facets of nature, of which there is little in the central city. Often the views from such apartments overlook drab, unpleasant rooftops before encompassing the more rewarding distant views. However, these distant views frequently cannot be seen by the elderly because of their failing eyesight.

It must, however, not be forgotten that the areas outside of the central city area are not without their disadvantages. In these areas it is difficult to find a site where shopping, good eating establishments, and cultural activities are nearby.

### Required Supportive Services

Older people need more than just low-cost housing; they must have additional services available near the housing project, such as:

1. Daily check on those living alone
2. Emergency medical help
3. Food service
4. Friendly counseling
5. Homemaker help
6. Home nursing
7. Laundry facilities
8. Transportation

### Recommended Supportive Services

In order for the elderly to enjoy life so they will not become isolated and bored which often leads to a continuous complaining about minor aches and pains, other services must be in the project or easily accessible, including:

1. Barber shop
2. Beauty shop
3. Churches
4. Drug store
5. Dry cleaning facilities
6. Library
7. Recreation facilities
8. Restaurant

### Size Factor

Most administrative and maintenance costs per unit decrease as the size of the project increases. However, 300 units appears to be about the maximum in which people can live with comfort and dignity in a relationship which is non-institutional in nature.<sup>32</sup>

### San Antonio Study

A problem which the Housing Authority of San Antonio encountered when trying to get Mexican-Americans to apply for housing for the elderly should be given serious thought and consideration because of Tucson's sizeable Mexican-American population.

In San Antonio a housing unit was specifically designed for Mexican-Americans and was built in an area where the Mexican-American population is quite high. Special efforts were made to attract the Mexican-Americans, but these efforts were largely unsuccessful. Only 20 per cent of the 500 applicants have Spanish surnames.<sup>33</sup>

Since the Housing Authority of San Antonio was largely unsuccessful in attracting Mexican-Americans, 100 who would qualify were interviewed and compared with Anglo applicants. The Mexican-Americans had lower incomes and less education; less than 10 per cent could read, write, and/or speak English; and they were more likely to be living with their spouse. The survey found that

two-thirds thought their housing was "all right" even though their housing was among the poorest in San Antonio.<sup>34</sup>

Dr. Carp, who conducted the survey, found that most Mexican-Americans were satisfied with their present homes because of their pride in home ownership and their interpersonal bonds with their relatives, friends, and neighbors. Although their homes were small and of poor quality, they were assured of privacy and independence.<sup>35</sup>

Another reason for the lack of Mexican-American applicants was that they were largely uninformed regarding the low-rent housing because most were without newspapers, radio, and any other means of mass communication. Their difficulty with the English language renders many of the channels of mass media ineffective.<sup>36</sup>

Dr. Carp concluded that housing for elderly Mexican-Americans may work if it were distributed throughout their areas of the city, permitting many to remain in their home neighborhoods.<sup>37</sup>

## CHAPTER IV

### STUDY OF AREAS FOR CONSTRUCTION OF HOUSING FOR THE ELDERLY

The second study conducted for the Tucson Housing Authority is somewhat related to the first in that its purpose was to determine which areas are satisfactory for the construction of housing for the elderly in order that their special needs may be met.

#### Suggested Areas Based on Population Trends

While other factors must be taken into consideration when determining areas suitable for the construction of housing for the elderly, it was suggested by Mr. Jerome Hosenfeld, Executive Director, that I begin by using population statistics.

#### Population Statistics

Using U.S. Census data, population trends reveal three areas, two large and one small, which are most favorable for construction of housing for the elderly. These areas are identified as A, B, and C on Figure 1.

The designated areas, based on census tract boundaries, were determined by the population trends and the percentage and density of residents who are age 55 and above. These areas are



Figure 1. Map of Suggested Areas for the Construction of Housing for the Elderly Based on Population Trends

characterized by increases in the age categories of 55 to 59, 60 to 64, and 65 and above. The percentages of those age 55 and above and their densities are relatively high.

According to the 1965 Census, over 14,000 elderly citizens live in the designated areas. This is equal to about 46 per cent of all elderly who live in the census tracts which are wholly contained within the City Limits of Tucson. By 1970 these areas are expected to contain more than 19,000 residents 55 years of age and above.

#### Availability of Necessary Services and Facilities

Before the decision is made as to where housing for the elderly should be constructed, some factors other than population trends and forecasts must be given consideration. These population statistics only indicate how the population has changed, not why these changes have taken place. For example, when a long-time resident moves out of an area because he is no longer satisfied with the area, he must certainly be given different consideration than one who moves out of an area because he was forced out by urban renewal or the continuing expansion in the University area.

Population studies have made it possible to determine the areas in which the number of elderly residents is increasing or decreasing, but now we must determine if the necessary facilities are available in sufficient quantities before recommending construction of housing for the elderly. Within the large designated areas, decisions must be made as to the actual site of the project.

Frequently the success or failure of a project, such as housing for the elderly, is determined by the degree to which supportive services are available. The "comparative remoteness from medical care, shopping, and community life; lack of supportive services; and rental costs" were judged by the Tucson Housing Foundation as the major causes for the failure of housing projects for the aged. Examples cited included Green Valley, Christopher City, Sun Haven, and Tarlton Park Apartments, plus additional smaller unsuccessful projects.<sup>38</sup>

Medical Facilities. Emergency medical help is available from a number of hospitals and clinics in most parts of the designated areas. Home nursing is also available throughout the areas.

Shopping. Ideally, it would be best if a housing project could be situated near a shopping center which would provide many of the services needed by our elderly, such as a barber shop, beauty shop, drug store, restaurant with carry-out food service, and a dry cleaning establishment. Since many shopping centers of various sizes are situated throughout most of the designated areas, a significant number of sites should be available which can meet most of the necessary requirements. However, if it is not feasible to locate near a shopping center, it should be located within three blocks, preferably less, of a food store and a drug store. Hopefully, they could be found together which would help reduce the necessary walking.



Leisure Time Activities. Facilities or services which should be located within easy walking distance of the housing project include recreational facilities, general entertainment area, library, and churches. Several of Tucson's libraries are in or very near the designated areas. Churches and parks are scattered throughout.

Homemaker Aids. Food service and homemaker help are available throughout the designated areas.<sup>39</sup>

Transportation. Public transportation is presently in operation throughout most of the areas and buses run on an hourly basis on a majority of routes. However, the housing project should be located within several blocks of one of the bus routes so the central section of the community can be reached by most elderly with a minimum of inconvenience.

#### Areas to be Avoided

Several additional factors must be carefully considered in site selection. The site should not be in or near an industrial area, in a flood area, or in an immediate air traffic pattern, for obvious reasons. Since most of the designated area is residential and not in a flood area, these factors should not greatly reduce the number of available sites. The air traffic pattern may, however, present a more difficult and limiting factor, especially in the area nearest the Davis Monthan Air Force Base. Also, new types of aircraft and increasing use of air space may necessitate altering the air traffic patterns. However, the area near the end

of the runway is likely to remain an undesirable area in which to construct housing for the elderly.

#### Suggested Area Based on Other Factors

The 1960 and 1965 U.S. Census data indicate that it is the area largely enclosed by Speedway Boulevard, Campbell Avenue, 22nd Street, and Interstate 10, which includes the central city area, in which Tucson has realized the largest decrease in the number of residents in the age groups of 55 to 59, 60 to 64, and 65 and above, both in terms of percentages and in actual numbers.

Since the 1965 Census data was collected, the urban renewal area has been evacuated which means the decrease of elderly residents in the central city area is even greater than the figures indicate, and, of course, the continued expansion of the University of Arizona and supportive facilities, such as apartments and eating establishments, has pushed additional long-time residents out of the area. The University's anticipated expansion also tends to stifle the migration of people above 55 years of age into the area due to the fear that in the near future they will be forced to relocate, either by the University's expansion, or by the rapidly rising price of land on which apartments, restaurants, and other enterprises catering to students' needs and desires can be constructed and profitably operated.

While population trends suggest that the central city area is an unfavorable location for housing for the elderly, this area should not be eliminated. If detailed studies are available which

demonstrate why people are leaving the central city area, this author has not been able to locate them. Some of the probable major reasons for this emigration are that the older citizens have been forced out by the urban renewal program and the deterioration of housing units. Rising housing costs and taxes have also contributed to the migration out of the central city.

There are many plus factors for locating housing projects for the elderly in the central city area. This places the residents near the library, cultural activities, entertainment, public transportation, restaurants, and most, if not all, of the other required services. It must also be remembered that the number of elderly living in this area is very high, which, in itself, is a good reason for locating a project there.

Probably the strongest argument for building additional units for the elderly in the central city area can simply be made by pointing out that the Housing Authority has received more than three times as many applicants as can be placed since the Martin Luther King Apartments, located in the central city area, were announced. This indicates that the elderly do not consider the central city area location to be unsatisfactory.

Despite a number of disadvantages such as noise, heavy traffic, pollution, and lack of vegetation, the advantages of a central city location expand the satisfactory area for location of housing for the elderly to include most of the area between

Speedway Boulevard and 22nd Street, east of the freeway and west of First Avenue.

The areas identified as A, B, and C on Figure 2 are the suggested areas based on population trends. The area designated as D on Figure 2 is the suggested area based on other factors in addition to population statistics.



Figure 2. Map of Suggested Areas for the Construction of Housing for the Elderly

Areas A, B, and C are based on population trends. Area D is based on many other factors.

## CHAPTER V

### THE CITY OF TUCSON AND ITS ADMINISTRATION

The second part of my internship was spent with the City of Tucson, Water and Sewers Department, Administration Division, with most of my time being devoted to the Sewerage Division. My major assignments were to conduct studies in two areas. Summarized first in this section is my study on the possible alternatives to the present sewer connection fee and suggested modifications, if advisable. The second study deals with the conversion of the Sewerage Division to operate on a self-sustaining, utility basis.

The City of Tucson is chartered and administered under a Council-Manager form of government. By law, governing powers are vested in the Mayor and Council, the only elected officials of the City of Tucson. While the Mayor and Council establish the policies of Tucson, the City Manager is responsible for administering these policies.

#### History

The City of Tucson has, over the last two decades, experienced very rapid growth, both in terms of area and of population. Prior to the 1940s, Tucson and the surrounding area had

experienced a slow but rather steady growth.<sup>40</sup> Some of the principal reasons for this increase were the immigration of those who came to Tucson because of their health problems, and the winter visitors who liked the area and decided to become permanent residents.

Tucson, with its many cloudless days, was a choice location for training large numbers of pilots during World War II. This large expansion of the training program brought thousands to this area. Defense industries were also responsible for bringing large numbers of workers and their families to Tucson. This rapid expansion created the need for many supportive activities which brought additional thousands.

Since then the rapid expansion of Tucson has been rather continuous because many of the servicemen who were stationed in Tucson for training during the war returned later to settle down. Of course, the number of people immigrating to Tucson for health reasons is continuing.

The Tucson Urban Area has grown in terms of population from 58,000 in 1940 to 269,000 in 1965,<sup>41</sup> with the projected growth to 1,100,000 by 1980.<sup>42</sup>

The area of the City of Tucson has grown substantially, as well. According to the City Planning Division, the area has increased from slightly under eight square miles with approximately 38,000 inhabitants in 1940 to about 80 square miles and 260,000 inhabitants in 1969. Because of this unusually high rate of

growth, the strain has been tremendous upon the administrative organization and finances of the City.

### Organization

The electorate of Tucson, in 1929, adopted a charter establishing the Council-Manager system which governs Tucson as a constitutional home rule city.<sup>43</sup> The organization of the city government is shown in Figure 3.

The City, as a municipal corporation, exists to provide an atmosphere in which individuals and groups can live harmoniously. This is best afforded by maximizing the benefits of urban living, regulating man's activities, and attempting to reduce, as much as possible, the disruptive effects of high population densities. Tucson, as most cities, provides the urban services which men living together require but cannot economically provide for themselves.<sup>44</sup>

### General Government

The 1969-1970 Annual Budget published by the City of Tucson is the basis for the information contained in the remainder of the section "Organization." General government, as defined in the Budget, includes all those activities of top management and their staff agencies whose activities are other than the "line" departments. In contrast to the "line" activities, the staff agencies are service oriented rather than operational in scope. The



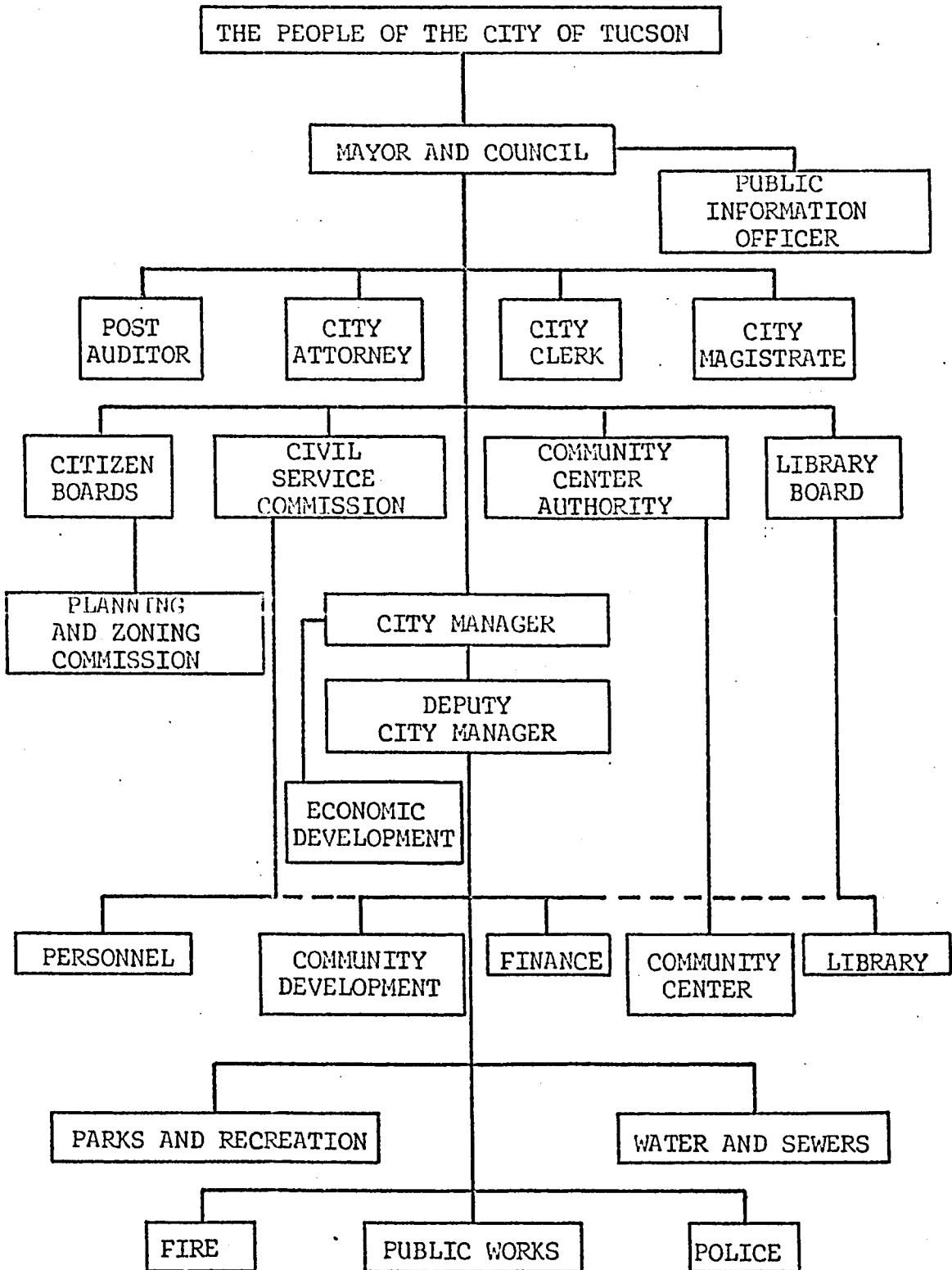


Figure 3. City of Tucson Organizational Chart

organizational chart of the general government function is shown in Figure 4.

Mayor and Council. The City of Tucson is governed by a body consisting of a Mayor and six councilmen. This governing body incorporates the democratic concept of "government of the people, by the people, and for the people." The members of this body are elected for overlapping four-year terms on a partisan basis. Each of the councilmen is nominated by his city ward and elected at large, while the Mayor is both nominated and elected by the City at large. After the Council has been elected, they elect one of their own members to the position of Vice-Mayor, usually the leading member of the party which has filled a majority of the council seats.

The councilmen and the Mayor are the only elected office-holders, and, as such, are most directly responsible to the citizens for all of the operations of the City. It is the responsibility of the Mayor and Council to determine general policy.

In addition to the Mayor and Council, the general government category includes the major staff departments, various citizen boards, and the City Manager, who are all directly responsible to the Mayor and Council. The Mayor and Council have the power to appoint and remove at their pleasure, with a two-thirds majority, these department heads and boards, including the City Attorney, City Clerk, City Magistrate, Community Center Authority, Library

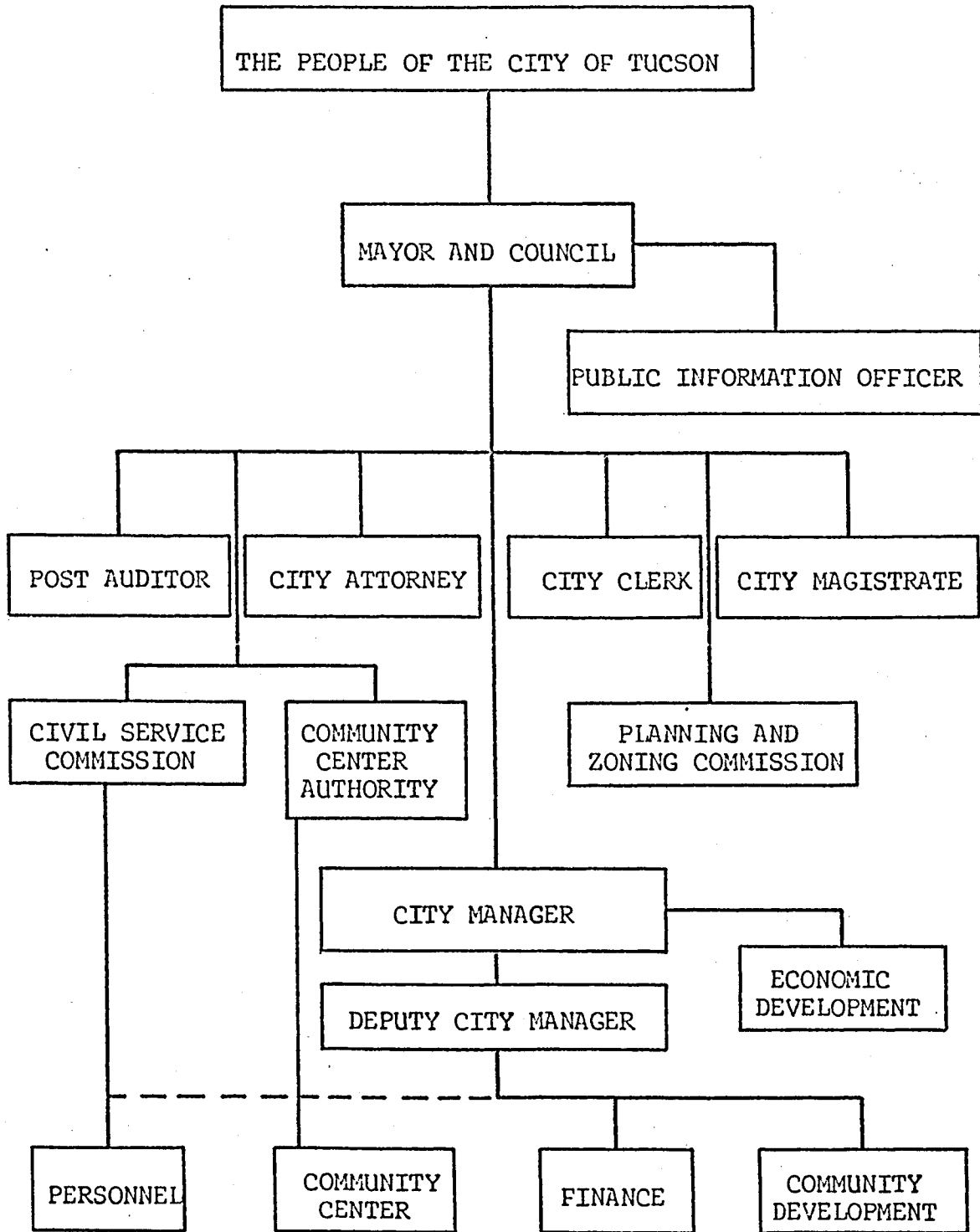


Figure 4. General Government Organizational Chart

Board, Planning and Zoning Commission, citizen boards, and, of course, the City Manager.

The Personnel Department is one of the remaining functions placed in the general government category. It is in the organization and operations of this department where the City of Tucson differs greatly from the model Council-Manager form of government. Under the model, the personnel director is directly responsible to the city manager; but in Tucson, he is hired by and responsible to the Civil Service Commission, which is appointed by the Mayor and Council. Consequently, the City Manager must depend upon personal connections and the cooperation of others to establish desired changes in personnel.

City Manager. The City Manager is the chief administrative officer of the City and occupies an important policy-making position. He is selected by the Mayor and Council on the basis of his professional ability, experience, and training.

His main responsibility is to efficiently administer all of the city operations in accordance with the general policies established by the Mayor and Council, to whom he is responsible.

He is charged with seeing that all of the laws and ordinances of the City are enforced, advising the Mayor and Council of recommended actions he considers necessary for effective operation, keeping the Mayor and Council advised of the City's financial condition, and preparing the annual budget and submitting it to the Mayor and Council.

Since the City Manager is responsible for the administration of the operational and some of the general governmental departments, he is given the authority, in accordance with personnel and civil service regulations, to appoint, supervise, and remove most of the department heads. In order to demonstrate to the public that the City is being administered effectively, it is the City Manager's duty to keep the public informed of the City's operations.

The general government staff departments which are directly responsible to the City Manager or Deputy City Manager include the Community Development Department, Economic Development Division, and Finance Department.

The Community Development Department, although under the City Manager, performs a general government function. This department was organized in fiscal year 1964-65 in order to deal with the problems of city growth and development, economic development, Federal Aid programs such as Urban Renewal, inspections, planning, and zoning. The Model Cities Division was added during fiscal year 1968-69.

The Economic Development Division is responsible for bringing additional industries and businesses into the City of Tucson.

It is the Finance Department's responsibility to provide the necessary financial services for the City, including accounting, budget control, data processing, and purchasing. Additional

department activities include the auditing of tax returns, the collection of all revenues owed to the City, the issuance of business and occupational licenses, and the operation of cash management and investment programs. Although these activities are under the City Manager on the organizational chart, the Finance Department is under the general government function.

#### "Operational" Departments

The "operational" departments which are directly responsible to the City Manager for providing the services necessary for harmonious living in Tucson include the Fire Department, Parks and Recreation Department, Police Department, Public Works Department, and Water and Sewers Department.

The Library Department, another "operational" department, is responsible, however, to the Library Board, which is appointed by the Mayor and Council.

The organizational chart of the "operational" departments is shown in Figure 5.

Fire Department. The prevention of fires within the City is one of the primary duties of the Fire Department. Needless to say, prevention is not always possible; therefore, their responsibility for the protection of life and property forces them to fight all fires, investigate the causes of and losses incurred in the fires, and furnish first aid and other life-saving measures, when necessary.

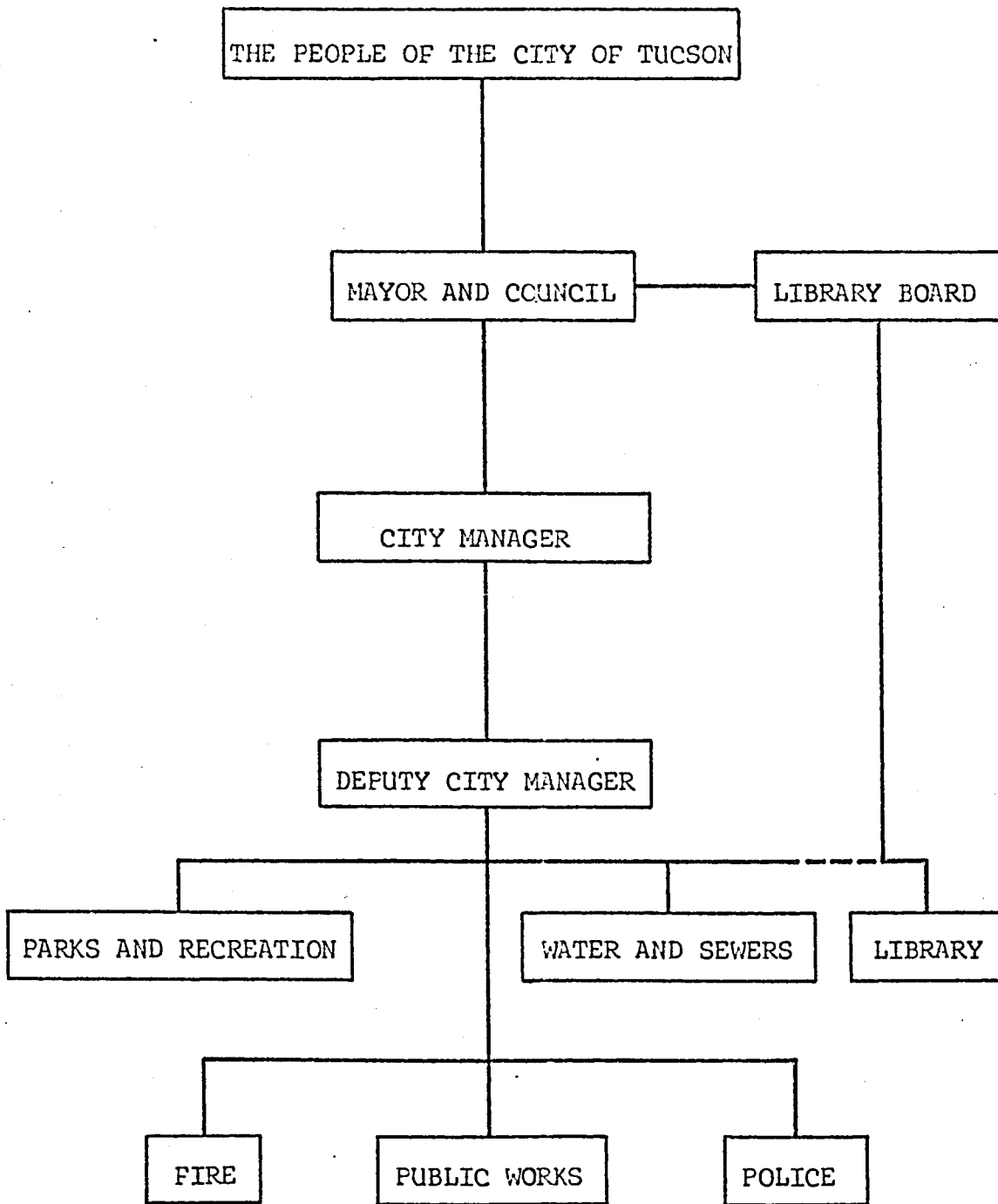


Figure 5. "Operational" Departments Organizational Chart

Parks and Recreation Department. The function of the Parks and Recreation Department is to provide a program in line with the physical and recreational needs of the residents of Tucson. Some of the activities include arts and crafts, city-wide sports, parks and zoo development and maintenance, Community Center and playground programs, and swimming.

The golfing operations, although fully administered by the Parks and Recreation Department, are to operate on an enterprise accounting procedure for the first time this year. Hopefully, this will make the golfing operations a self-contained financial operation.

Police Department. The protection of life and property is the primary function of the Police Department in Tucson. This necessitates the investigation of crimes, prevention of juvenile delinquency, and the reduction of traffic accidents.

Public Works Department. The principal housekeeping functions of the City government are performed by the Public Works Department. This department is responsible for the Automotive Maintenance Division, Building Maintenance Division, Communications Division, Refuse Division, Engineering Division, Streets Maintenance Division, Traffic Engineering Division, and the Capital Program of Traffic and Street Improvement, whose activities vary tremendously.

Water and Sewers Department. The function of the Water Utility Activity of the Water and Sewers Department is to furnish



the citizens and commercial establishments with sufficient pure water and to take the necessary steps to provide adequate supplies in the future.

The Sewerage Division of the Water and Sewers Department has as its responsibility the collection and treatment of the sewage of Tucson's residents and commercial establishments.

Library Department. The Library Department, a "line" department, is responsible to the Library Board, appointed by the Mayor and Council. The Library Director is appointed by the Library Board.

The primary function of the Library Department is to provide information for all age groups from pre-school to senior citizens. This information is provided in many forms including books, magazines, microfilm, newspapers, and phonograph records.

#### Personnel Policies and Practices

Much of the information in the following section was obtained from You and Your Job with the City of Tucson, a publication of Tucson City Hall.

The Tucson City Charter provides that most of the positions with the City come under the Civil Service Commission which is administered by the Personnel Department. Since the Director of Personnel is responsible to the Civil Service Commission, and not to the City Manager as is generally the case with the Council-Manager form of government, personnel policies and changes must be effected on the basis of coordination of the City Manager and the

Director of Personnel. A major exception to the regulations of the Civil Service system is the Library Department, although the general personnel practices in this department are very much the same as those under Civil Service.

It is the responsibility of the Personnel Department to obtain the best qualified people for the openings in the City of Tucson. In order to do this, notices of job openings are publicly posted indicating when and where impartial, competitive examinations will be held. If the position in question is one which requires a highly skilled person, the job opening and test date may be advertised in other areas in hopes of recruiting highly qualified personnel.

The tests are usually related to the duties and the requirements of the position for which the applicant has applied. The Civil Service Board uses the results of the examination, which may be oral, written, and/or performance, to establish a ranking of applicants who qualified for the position.

From the top three qualifiers on the list, the director of the department in which the opening has occurred selects the applicant he feels will best fill the job opening. After the person is hired, he must satisfactorily complete a probationary period during which time his performance is carefully observed and evaluated. If he does not satisfactorily perform his duties, he will be dismissed.

It is also the responsibility of the Personnel Department, with the cooperation of the employee's supervisor, to periodically evaluate the performance of the employee. This procedure helps make possible the promotion of those who most deserve it. And if the supervisor is honest in his evaluation, it makes possible the demotion of those who are not performing in a satisfactory manner.

Since the City employees are under a merit system, competitive examination results and job performance evaluations are usually the determining factors when an employee is being considered for a promotion. Ability to perform the job, length of service, and past experience are also considered, but are given less importance.

The pay rates of employees are determined by a salary ordinance established by the Mayor and Council.

Of primary concern to each employee, and an important part of the Civil Service system, is the position classification system, which is established by examining each job in terms of its duties and responsibilities so as to place similar jobs within the same class, each with its descriptive title.

The primary reason for classifying the positions is to provide equality to the employees in the areas of pay, transfers, promotions, etc. Each of the classifications has determined beginning, intermediate, and maximum steps in salary.

## Financial Administration

Providing the principal financial services for the City is the main responsibility of the Finance Department. To aid in providing the necessary services to all of the other departments in the City, this department is divided into the Accounting Division, Budget and Research Division, Data Processing Division, Licenses Division, Purchasing Division, and Treasury Division.

Organizationally, the Director of Finance is directly responsible to the City Manager for the operation of the Finance Department.

### Fiscal Policy Determination

According to Pfiffner and Presthus, the most important element of financial administration is fiscal policy determination. This portion of financial administration is generally considered to be in the realm of the Mayor and Council. Included in this area are the determination of broad outlines of the programs and the authorization of the necessary appropriations to carry out these programs.<sup>45</sup>

### Accountability Problem

The broad problem of accountability is the second element of financial administration.<sup>46</sup> The primary concern here is that of proving to the citizens that their money is being wisely and honestly spent by those elected to office and by the administrative personnel for whom the elected officials are responsible.

A system of internal checks based on record keeping is a widely accepted method of accomplishing accountability. Since the City is using public funds, it has a record keeping system which can demonstrate to the public how the funds are being used.

#### Management Aspect

The third element is the management aspect which includes the fiscal organization and the budgetary process.<sup>47</sup> Also commonly included under this element are the various financial officers and their duties.

Fiscal Organization. The Accounting Division is responsible for maintaining the necessary accounts in order to retain control and report on the current status of funds. The most important operation, from a general administrative standpoint, is the maintenance of the appropriation and revenue control ledgers which illustrate how money available compares with that which is being spent. The accounting system of each of the other departments is also under the Accounting Division's supervision--a functional supervision rather than one of line-of-command control.

The Budget and Research Division is responsible for preparing the annual budget and for assisting the departments in preparing their budgets for the upcoming year.

The primary function of the Data Processing Division is the operation of the City's electronic data processing facilities.

The Licenses Division is responsible for the issuance of various occupational licenses and for controlling the collection of the City sales tax.

The Purchasing Division is responsible for purchasing equipment and supplies for the City's municipal operations.

The primary function of the Treasury Division is the receipt and identification of all revenue due to the City. This includes fines, penalties, City sales tax, interest on investments, etc.

Budgetary Process. Each of the individual departments, with assistance from the Budget and Research Division, prepares its own budget request for the coming fiscal year. The Budget and Research Division consolidates all of the requests and prepares the annual budget for the City Manager, who is responsible to the Mayor and Council for preparing the budget.

The City Manager presents the budget to the Mayor and Council for their approval. At this point, these elected officials will approve the budget and appropriate the amounts, if they feel it will permit the respective departments to function at the proper level. They also take into account the expected revenue for the budget year.

Financial Officers. The various financial officers include the Chief Accountant, Budget Officer, Data Processing Supervisor, License Supervisor, Purchasing Agent, Treasury Supervisor, and, of course, the Director of Finance to whom the others are

responsible. Each is responsible for the activities of his particular division or department.

#### Budget Statistics

The 1969-1970 Annual Budget calls for nearly \$34 million in expenditures, \$9 million of which is for the Water Utility, operating entirely on a self-sustaining basis. After the 26.8 per cent appropriated for the Water Utility, the next largest activities are 21.7 per cent for Public Works, 15 per cent for General Government, and 12 per cent for the Police Department.

The budgeted revenue for 1969-1970 includes 32 per cent from sales tax, which should be higher this year with the increased City sales tax; 26.8 per cent from water revenue; 12 per cent from property tax; and 7.5 per cent from auto and gas tax.

## CHAPTER VI

### THE WATER AND SEWERS DEPARTMENT

The Water and Sewers Department, the City's largest in terms of expenditures, is under the leadership of Frank Brooks. The department is organized on a line basis, as shown in Figure 6.

#### The Water Utility

All of the water activity is operated on a utility basis. The operation is similar to that of a public utility, the major difference being that it is wholly owned by Tucson's citizens.

#### History

Shortly after the turn of the century, on July 24, 1900, the Tucson Water Company became the City of Tucson Water Works. At that time the utility had 625 customers and about 78,000 feet of distribution lines to maintain. During the next 20 years, nine wells were drilled or dug and of these original nine, five are still in use. By 1920 the number of customers had increased to 4,000, serving an estimated 20,000 people with 44 miles of mains.<sup>48</sup>

Between 1920 and 1940 the utility built the customary reservoirs and additional lines. Large elevated storage tanks were constructed to equalize pressure during periods of heavy usage.<sup>49</sup>



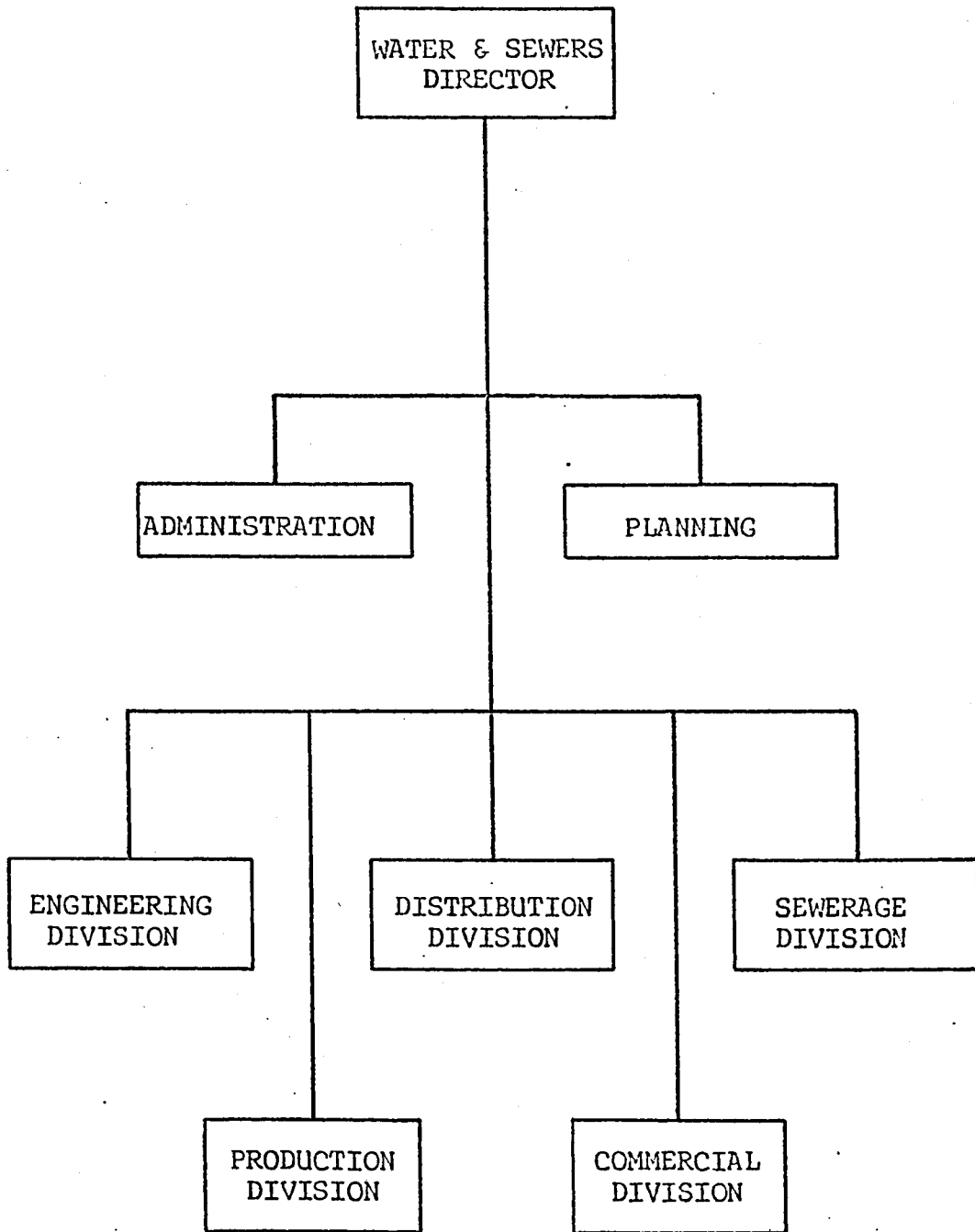


Figure 6. Water and Sewers Department Organizational Chart

After 1938 the residential growth far exceeded the city limits with the consequence that a large number of privately-owned water companies were developed to meet the demand. As the city extended its boundaries through a program of annexation, it purchased several water companies during the 1940s.<sup>50</sup>

The period between 1951 and 1960 has been termed the period of the "great expansion." Many private water companies were purchased as they were annexed, many new trunk supply lines were laid, many wells were drilled, and storage reservoirs were constructed. This aided in providing services to the 32,500 new customers added during that time.<sup>51</sup>

The period from 1961 until the present has been marked by more changes and innovations of the department. Many of the private water companies which had been constructed on the perimeter of the City were annexed, purchased, and integrated into the Water Utility. In order to improve and enlarge the system, the utility let contracts to place over 20 miles of 36-inch and larger transmission mains.<sup>52</sup>

On the commercial side of the utility, a modern technique was introduced in 1961 when the billing and posting of water accounts were taken over by the newly-created Office Services Section (Data Processing).

The two functions of water and sewers were placed under the control of the same director in 1963.

## Operation

After acquiring a broader and more detailed understanding of the operations of the water activity by scanning through many of the utility's files, manuals, and periodicals, Bill Barron, Administrative Assistant, conducted a tour of one of the principal water production facilities. Here I was amazed to find that almost all of the Water Utility's water pumps, both productive and booster, can be controlled from one location. This control center receives a continuous stream of information regarding the production of each well, the water pressure in each water zone, and the volume of water contained in each of the storage reservoirs.

This master control center is also connected by teletype to the City of Tucson Fire Department Stations. This provides information as to the location of the fire and permits the close watch of the water pressure in the area from which the Fire Department is drawing water. If the fire is a large one, or if the water pressure, which is vital in effective fire fighting, begins to drop, the controller at the master control center can take immediate action to raise the pressure by engaging additional idle pumps in the area, or by bringing additional water into the effected area from storage reservoirs in adjacent areas.

This central control location also provides the utility with an accurate record of the volume of water pumped.

It was on this same tour that I was made aware that the Water Utility has found it necessary to divide the City into five

principal zones in order to provide adequate water pressure for the connections within the city limits. The difference in elevation of the various parts of the City has made this necessary.

#### Organization

Four of the divisions of the Water and Sewers Department have as their primary function the responsibility of supplying the citizens of Tucson with an adequate supply, with reserve capacity, of pure potable water, and to perform the required research to insure this supply in the future.

Engineering Division. The Engineering Division, under the direction of John Rauscher, prepares and develops plans for long-range water development. It is called upon to design new water main grids so water can be provided to the largest number of customers at the least possible costs. Another responsibility of this division is the supervision of major installations of water and sewer mains. This division is also responsible for preparing plans for the renovation of existing wells and other water activity facilities.

Production Division. The Production Division is directed by M. E. Devine and is basically responsible for providing the necessary water needed by Tucson's residents, commercial establishments, and industries. Along with this is the maintenance of wells and reservoirs, rehabilitation of old wells after their production begins to decrease significantly, and maintenance of the necessary water pressure so all customers receive as even a flow

of water as possible. The Production Division also operates the repair shop and the main water utility plants.

Distribution Division. The Distribution Division is under the direction of Clarence Bach and is responsible for distributing water from wells and reservoirs to the utility's customers. This responsibility includes installing some of the necessary water mains to provide all those in the City with water when requested, and maintaining the existing distribution system. This includes the installation of water meters and replacement of deteriorating water mains. Also, in order to permit the Commercial Division to determine how much water has been used by each connection, the Distribution Division must keep the water meters in a satisfactory working condition so they accurately measure the water flow. An added function of this division is the installation and maintenance of water lines and the fire hydrants connected to them.

Commercial Division. The Commercial Division is headed by A. B. Hobbs. Its functions include determining how much a new connector to the municipal water system or the sanitary sewer system will be required to pay for his connection.

Another responsibility is to establish how much water each connection has used during a given period of time and how much will be charged for this usage. In order to determine how much water has passed through each connection, the division is responsible for employing a sufficient number of meter readers so that all meters are read every month. This division generally handles

all of the complaints received from water customers regarding faulty water meters, inaccurate readings, incorrect billing, etc. These monthly readings are used to calculate the monthly charge for each connection.

Along with the responsibility of collecting the monthly bill is the responsibility of cutting off the water supply if the Commercial Division is not paid.

### The Sewerage Division

The Sewerage Division is the fifth division of the Water and Sewers Department and is the only division which is not operated on a utility basis.

### History

In 1900 the first sewer, which extended approximately one mile, was installed in Tucson. At that time, no city sewage treatment facilities were available. The raw sewage, however, was used for irrigation and fertilization by nearby farmers.<sup>53</sup>

The first sewer line was lengthened about five miles in 1917 to a more isolated discharge point. Here additional distribution facilities were constructed by farmers so they could use the raw sewage.<sup>54</sup>

As the population of Tucson passed 25,000 in 1928, construction of the first sewage treatment plant was started at the outfall terminal. It was one of the primary treatment types which removed almost all of the suspended solids from the effluent. The

farmers near the sewage treatment plant continued to purchase the effluent for irrigation purposes.<sup>55</sup>

As the 1950s approached and the population was continuing to expand rapidly, the Sewerage Division administration realized that additional sewage treatment facilities would soon be needed. A new 12 million gallon per day sewage treatment plant was designed and constructed about one mile from the old plant which was then abandoned. In 1952 this new plant, which was more efficient and performed a more complete job of treatment, was put into operation. At this time it was estimated that the City of Tucson had 120 miles of sanitary sewer lines.<sup>56</sup>

The population of the City more than doubled during the 1950s<sup>57</sup> and more than 500 miles of new sewer lines were installed to meet the growing demands of the population expansion.<sup>58</sup>

A high-rate trickling filter plant was added in 1960. In 1968 another plant, an activated sludge-type with step aeration, began operation which increased the treatment capacity of the entire sewage treatment facility to 36 million gallons per day.<sup>59</sup>

Now the City has over 1,000 miles<sup>60</sup> of sewer lines crisscrossing the metropolitan area to collect the wastewater for treatment.

It must be remembered that sewers do not constitute a sewer system. Treatment facilities are needed at the outfall of this vast network of underground piping to complete the job. The rapid expansion of Tucson's demand for sewage treatment facilities

required near emergency measures of the participating agencies in 1949 in order to insure not only adequate collection sewers, but efficient treatment and disposal, as well. To cope with their problem, Greater Tucson's early efforts were to merely "dispose" of the sewage, but later efforts were to properly "treat and dispose" of the sewage.<sup>61</sup>

#### Operation and Organization

The Sewerage Division, headed by E. O. Dye, is dissimilar to the other divisions of the Water and Sewers Department in many ways, the primary one being that at the present time it is not operated on a utility basis, but rather receives its operating revenue from the general fund. This also means there is little, if any, correlation between the need or demand for each customer's service and the amount he pays for it.

The Sewerage Division is responsible for the maintenance and operation of the sewer lines and the treatment plant in a manner which is in compliance with the wishes of the citizens for protecting their life and property.

The sewage treatment plant, located northwest of the downtown area on the Santa Cruz River, receives and treats approximately 28 million gallons of raw sewage per day, 1.5 million gallons of which is treated for the County until their sewage treatment plant is completed.

The Sewage Treatment Process. On a tour of the sewage treatment plant the complete treatment process was explained and



demonstrated beginning where the large foreign objects such as stones, pieces of lumber, articles of clothing, and the like are removed from the incoming sewage so they will not plug or damage any of the sewage treatment facilities.

The next stage involves the removal of most of the suspended solids (sludge) from the liquid sewage. From this stage the sludge is transferred to the digesters which are large air-tight containers in which the formation of large quantities of sewer gas takes place as the active sludge continues to decompose. After the sludge has become inactive, it is removed from the digester, dried, ground, and spread on the City parks as fertilizer.

After the solids have been removed, some of the remaining active effluent flows to the trickling filters where the bacteria and algae growing on the rocks placed in the trickling filters consume the organic wastes in the primary effluent.

The other effluent is treated by the "standard activated sludge process." This effluent flows to aerators where colonies of bacteria and other micro-organisms consume the organic wastes in the primary effluent while passing through the aerator tanks. The activity of the bacteria and other micro-organisms is greatly increased by introducing large volumes of compressed air into the tanks; hence, the name aerator tanks. The sewer gas produced in the digesters, which formerly was wasted, is now being utilized to fuel the large engines which power the air compressors supplying the pressurized air to the aerator tanks.

After the effluent has passed through either of the previously mentioned processes, it flows through a chlorination tank where it is treated to render it suitable for discharge.

At the present time, most of the effluent is sold to nearby farmers who use this nutrient-rich water for irrigation of non-edible crops. Some of the effluent is wasted into the nearby Santa Cruz River.

The Wastewater Reclamation-Recreation Project. Near the sewage treatment plant, the Tucson Wastewater Reclamation-Recreation Project is under construction with financial support from the Federal Water Pollution Control Administration.

The purpose of this project initially was to conduct research in reclamation methodology of wastewater and to analyze the quality of the reclaimed water.

Now the emphasis has been shifted to the construction of several lakes which will be used for recreational purposes. Related water supply and treatment facilities are included in the construction. If the necessary funds are forthcoming from the Federal government, several irrigation and sprinkling facilities will be constructed, as well as park amenities to make the recreational lakes area acceptable for boating, camping, fishing, and picnicing.

Another one of the purposes is to gain public acceptance for the necessary eventual reuse of the treated effluent by cycling it back into the Water Utility's supply system. This is

especially important in the arid regions of the world of which Tucson is a part.

## CHAPTER VII

### THE SEWER CONNECTION FEE STUDY

After this rather thorough education of the Water and Sewers Department, I was introduced to Frank Brooks, Director of the Water and Sewers Department, and to the division heads and others I would need to consult for my studies for the Sewerage Division.

The second week I began work on one of the two projects for the Sewerage Division--an investigation as to whether the present sewer connection fee used by the division is satisfactory, and, if not, what would be the suggested modification or change in the basis for the fee.

#### Present Basis for Sewer Connection Fee

The first step was to determine on what the present sewer connection fee is based. City Ordinance No. 2746 states that the connecting fee for lots or areas not already connected to the sanitary sewer shall be \$150.00 per acre of land area served by the individual connection. Areas used for streets, alleys, and other public uses are deducted from this area. When the area served is less than an acre, the fee is a prorated charge. This is the basis for the sewer connection fee in areas already assessed for sewer improvement.

In areas not already assessed for sewer improvement, the applicant, in lieu of such assessment, must make payment equal to \$ .0175 for each square foot of land to be served by the connection. Land more than 200 feet from the street right-of-way line would not be assessed if so exempted by the Director of the Water and Sewers Department. This charge is in addition to the \$150.00 per acre fee.

Many people are of the belief that the present fee is used to pay the costs of treating the connector's sewage load, but this is incorrect. This revenue is only to be used for installing additional sewage collection mains.

The basis for the sewer connection fee is an area of complaints from citizens because they say it is inequitable. Their arguments are valid because under the present ordinance, the sewer connection fee is the same for a given piece of property whether a small single family dwelling were to be constructed or a hotel, factory, or any other large contributor of sewage. It is readily understood that a larger contributor of sewage requires larger collection facilities, and home owners feel these large contributors should be required to pay a substantially higher fee for connecting to the sanitary sewer than the average home owner pays.

#### Alternative Bases for Sewer Connection Fee

Since the present method is grossly inequitable to the average home owner and very advantageous to the larger contributor, other bases for the sewer connection fee were researched.

According to the Water and Sewer Rate Survey conducted by the League of Arizona Cities and Towns, at least five bases are presently being utilized to determine the sewer connection charge.

#### Size of Connection

Advantages. One of the advantages of this basis for the charge is that it is relatively easy to administer because the division between the different sizes of connections is easily determined and leaves little room for disagreement. Another advantage is that the basis is readily understood by applicants. It is generally said that the simpler the basis or clearer the division line, the less time the administering agency will need to spend explaining the basis and the less grounds for argument there will be.

Disadvantages. The disadvantages of this basis, however, are many. The most apparent one is that the charge is not related to costs or to the customer's need for the service; neither is it an accurate indicator of the additional facilities needed to carry the sewage load of the specific connection in question. Another factor to be considered with this basis is that sewer connections must be larger than a certain minimum size in order to permit a relatively trouble-free flow of sewage through the line. This minimum size is considerably larger than a single family residence or small business would need, if size were determined only by the anticipated sewage flow.

## Actual Cost of Connection

Advantages. The main advantage is that it is an equitable charge as far as the connection cost is concerned.

Disadvantages. Readily apparent is the difficulty of properly calculating what a connection fee should be when the applicant must pay for the service facilities needed to carry his specific quantity of sewage to the treatment plant or discharge point. Due to the complexity of the computations needed to determine the costs of the additional sewage collection facilities needed for a specific connection, administrative costs would be very high. Not only is it difficult to calculate the costs, but this would be an area of continuous disagreement because the calculations would be complex and most citizens would not understand; therefore, many would soon be thinking they were required to make payment for something from which they were not really benefiting.

## Flat Fee

Advantages. The flat fee is easily understood and practically eliminates the grounds for disagreement over the charge, thereby making this relatively easy to administer. Calculations determining cost are almost non-existent with this method.

Disadvantages. The name of this fee, in itself, indicates its greatest disadvantage--the flat fee is grossly inequitable. This is true whether it is based on a flat fee per given area serviced or per connection, because there is little correlation between the flat fee and the required additional sewage collection

facilities, considering that the application could be for a single family dwelling, a hotel, or an industrial connection.

#### Actual Cost or Flat Fee, Whichever is Greater

This basis for the sewer connection fee incorporates the advantages and the disadvantages of both bases, as previously stated.

#### Distance of Extension

Advantages. The only real good point for this type of fee is that the connection fee is directly related to the length of the extension.

Disadvantages. There are many disadvantages, but the principal one is that there is no correlation between the sewer connection fee and the cost of the sewer facilities needed to carry the additional sewage load to the sewage treatment plant. This basis for the fee incorporates most of the bad points of the Actual Cost basis.

#### Fixture Unit

Mr. Hobbs, Commercial Division Director, suggested that I investigate and compare the advantages and disadvantages of a sixth alternative--the Fixture Unit fee basis.

Advantages. The basis for this charge is a fixture unit as defined by the Uniform Plumbing Code. This fee is based on the number of fixture units which will be contributing sewage through a specific connection.



This means the charge would be related to the sewer facilities needed to carry the additional load because a house or a hotel with many fixture units would be required to pay more than the owner of a small house or other facility containing fewer fixture units.

The fixture unit charge is also somewhat related to the applicant's ability to pay because a large, more expensive home will, as a general rule, contain more fixture units than a smaller, less expensive home of a family of lesser means.

It is relatively easy to administer because the connection fee is based on readily identifiable fixtures; therefore, it will be easier for people to understand and there will be fewer complaints and arguments. The average citizen will also realize that this has eliminated much of the inequity so prevalent under the present system.

Disadvantages. One of the minor disadvantages might be some resentment from those who have built expensive homes, containing many fixture units, for their retirement years, and despite the many fixture units, only two people will be using them.

Another disadvantage is that even though the fixture unit is the most accurate, economically feasible indicator available to determine how much sewage will be contributed and what additional sewage collection facilities will be needed, it does not determine exactly how much sewage will be contributed by a specific fixture unit.

### Recommended Basis for Sewer Connection Fee

The basis for the sewer connection fee should be changed so that it is based on the fixture unit. This would greatly help to reduce, if not eliminate, the inequality which now exists and the controversy associated with it. Now, many of the owners of smaller homes complain about the high cost of connecting to the municipal sanitary sewer; and the fixture unit basis would, in most cases, significantly reduce the fee for them.

The fixture unit fee should be established at a level so that it will pay for the additional sewage collection facilities made necessary by every additional fixture unit. If the fixture unit fee were set at \$2.50 per fixture unit, for example, the average home owner would be required to pay about the same amount as he is presently required to pay. However, many of the inequities would be removed. An applicant with a smaller house, assuming it has fewer fixture units, would find he would be required to pay less than he does under the present connection fee; but a hotel, or any other connection with a large number of fixture units, would pay considerably more than is required under the present connection fee. This is justifiable because a connection requiring larger collecting sewer lines would be paying for the larger mains it has made necessary.

The Commercial Division would be receiving more money under the fixture unit fee system than under the present system because almost every house requires a minimum of at least five

fixture units, which means almost every connection would be required to pay a fee of \$12.50 or more, based on the \$2.50 per fixture unit rate. But the larger connectors, those with many fixture units such as a hotel or a large home, would need to pay considerably more than they pay under the present connection fee. This increased revenue would assist in paying for the expansion of the sewage collection lines needed to service the rapidly expanding population.

The costs of installing sewer lines are high; therefore, under the fixture unit fee the connector contributing large amounts of sewage would be required to pay its share for the construction of collection lines, and not only a flat fee as under the existing system.

## CHAPTER VIII

### THE SEWER UTILITY STUDY

The second study I conducted during the portion of my internship with the Water and Sewers Department dealt with various aspects of converting the Sewerage Division to operate on a utility basis, similar to the present operation of the Water Utility.

With this study, the division would be able to demonstrate to the Mayor and Council and to the public the advantages of converting the Sewerage Division to operate on a utility basis.

#### Problems of the Present Method

Some of the main reasons the Water and Sewers Department wanted a study conducted in this area are because of the rapidly rising costs of municipal government administration and operation, and the inability to procure sufficient revenue from the present bases of taxation to meet these costs and to provide the services demanded by Tucson's citizens. The most recent strong impetus was due to the large increase in salaries for the City's employees. If the additional City sales tax had not been approved by a popular vote on December 16, 1969, the City would have been hard pressed to generate sufficient revenue to continue the present level of services and to pay the increased salaries. Even with

this additional City sales tax, however, more revenue is needed for the City to more adequately perform the services demanded.

According to the 1969-1970 Annual Budget, converting the Sewerage Division to a utility would release approximately \$1 million of the general fund revenue presently required to finance the Sewerage Division to be utilized in other areas.

#### Inadequacy of Funding Method

The Sewerage Division at present receives its operating revenue from the general fund which is mainly obtained from the auto and gas taxes, property tax, and sales tax. It is obvious that there is little, if any, correlation between the taxes mentioned above and the cost of maintaining the sewer collection lines, replacing the sewer lines which have deteriorated to an unsafe condition, maintaining and operating the sewage treatment plant, or treating the specific connection's contribution of sewage. This demonstrates the inequity of the present method of funding the Sewerage Division.

At present, the owner of a large, expensive home on a large piece of property pays much more than is necessary to collect and treat his sewage. Conversely, a laundry, for example, which contributes large quantities of difficult-to-treat sewage, pays relatively little when considering the quantity and the quality of the sewage discharged into the sanitary sewer system.

Since religious facilities, governmental installations, and schools are exempt from paying property tax, they do not

contribute their fair share of revenue to pay for the costs of collecting and treating their sewage. Therefore, the citizens must pay the difference in increased auto and gas taxes, property tax, and sales tax, which, as a whole, tax those most who can least afford to pay.<sup>62</sup>

### Tax Limitations

The rising costs of providing the services needed by the local citizens have placed Tucson, as well as most other governmental organizations, in an extremely difficult position.

Tucson is limited by its charter as to the amount of revenue that can be obtained from the property tax. Recently the voters approved, by a slim margin, an increase in the City's sales tax, but the residents of Tucson are reaching the point where they may not favor another increase in taxes nor an additional tax. Also, the Sewerage Division is not the only division receiving less revenue than it needs for its operations, not to mention the funds needed for expansion and improvement.

### Inconsistent Appropriations

Under the present system, the amount of revenue to be appropriated for the Sewerage Division during a given year is not determined by the leadership of the division but rather by those who must heed the political wishes of the council members and consider the amount of revenue which will be coming in during the next year. This means the Sewerage Division must compete with the

other divisions of the City for funds to operate and generally receives less than is needed to operate in the most efficient manner.

Lack of sufficient funds to operate efficiently is more costly in the long run for several reasons.

Maintenance. Maintenance costs are often some of the first of the operating costs to be reduced when funds are limited. In the long run, though, when sewer mains, equipment, and sewage treatment facilities are not maintained properly, they are subject to an unusually high rate of breakdown.

In the sewer mains this leads to stoppages or washouts; both are expensive to clean up and/or repair. They also cause animosity on the part of the general public towards the employees and the Sewerage Division as a whole.

A reduction of proper maintenance leads to additional equipment failures, which in turn lead to fewer pieces of equipment being available to perform the necessary functions. This causes service to drop or necessitates the rental of equipment to complete the job.

If the sewage treatment facilities are not maintained in the required manner, they are also subject to failure, which means the sewage cannot be treated properly. Since the flow of sewage cannot be halted, it must be dumped into the river untreated, thus polluting the river.

Equipment Replacement. Another method of reducing costs, necessitated by the lack of sufficient funds, is extending the replacement schedule of equipment and facilities. This also proves costly in the long run. Equipment, if used longer than it should be, becomes more costly to operate in several ways. It is subject to frequent breakdown, thus increasing the repair costs and reducing the time during which it can be utilized to perform the functions for which it is needed.

If sewer lines which have deteriorated to an unsafe condition are not replaced when they should be, operating costs go up as well as public resentment. This is due to the larger number of stoppages and washouts of the deteriorated sewer mains. The Sewerage Division is responsible for cleaning up after sewer stoppages when they occur in the main lines. The division is also subject to pay for the damages caused by stoppages and sewer main failures if the City has been negligent.

Long-Range Planning. The fact that the division does not know how much revenue it can expect to receive for any given year severely hampers the long-range plans of the division. Therefore, the division is constantly working on updating its long-range plans to comply with the money actually appropriated so that the expanding residential area and the growing commercial-industrial areas can be served in the best manner in terms of both service and efficiency.



The lack of consistency of funds, and, therefore, the inability of the division to make long-range plans make difficult the purchasing of equipment, for example, because a certain percentage should be replaced every year in order to equalize the costs as much as possible. This, however, is certainly not possible when the funds to operate the division vary significantly from year to year.

#### Benefits of Sewer Service Charge

The sewer service charge, which is being used by about 61 per cent of the cities in the United States of over 10,000 population, is an acceptable means of raising additional revenue to provide the services required by the citizens.<sup>63</sup> Tucson and Phoenix are two of the larger cities in the United States which presently do not directly bill those connected to the sanitary sewer for the collection and treatment of their sewage.

It is not merely a play on words when a switch is made to a sewer service charge. It really means that the Sewerage Division moves out of the realm of what can be loosely termed a "police" function and becomes a utility.<sup>64</sup> To state it in yet another way, it no longer performs an activity to protect the general health and welfare of the community, to be paid on the basis of the value of the property owned by each individual or on the basis of the amount of City sales tax paid during the year. Instead, it becomes a sort of marketable service that each customer purchases to the degree that he needs or desires it.

In a study conducted by The American City, plant superintendents and other responsible officials in 176 selected cities indicated that it is generally not very difficult to introduce a sewer service charge because the public is familiar with other utility charges. Monthly electric, gas, and water bills are not strangers to most people and most residents are quite willing to pay them according to the amount they use.<sup>65</sup>

Those properties not connected to the sewer and owners of vacant lots would not pay for sewer operating costs as they do under a general taxation plan. They would enjoy some benefits from having the facilities available; but if they pay an assessment for construction of a public sewer in the future and not for its use, no grossly unfair advantage results.

Various authorities list other disadvantages, which include the addition of another bill, and increased administrative and clerical help. However, these disadvantages are offset by many advantages such as the continuity and adequacy of funds, the elimination of competition with other items in the budget, the freedom from diversion of these funds, and many others.<sup>66</sup>

#### Payment Based on Benefit

Probably the main reason for converting the Sewerage Division to operate on a utility basis is to conform with the recommended policy that services should be paid for by those benefiting and in proportion to the benefit.

When the financial burden of the sewerage works is shifted from the property tax to a sewer service charge, one of the results is that religious institutions, schools, and governmental units, which do not pay property tax, pay directly for the amount of sewage they contribute because the criterion for paying for the service is based on use.

#### Additional Taxes Avoided

Another important reason for introducing the sewer service charge is to avoid additional taxes, either in the form of new taxes or by increasing the existing ones.

The revenue to operate a sewer utility is obtained by introducing a sewer service charge, sometimes still called "sewer rent." The terminology is important here because this is another source of revenue which is not called, or generally thought of by the public, as an additional tax.<sup>67</sup> It is, however, still a payment by the public for a service they expect and need. Generally, however, the public will readily accept a charge which pays directly for a service it comprehends while it may not favor an additional tax.

#### Federal Assistance Available

An increasingly important reason for changing the operation of the Sewerage Division to a utility is that it is strongly recommended by the Department of Housing and Urban Development if a city wants to receive financial assistance from the Federal

government for construction of sewage treatment facilities. According to Frank Brooks, Water and Sewers Department Director, HUD will presently provide up to 50 per cent of the needed funds for approved sewage treatment projects.

#### Experiences of Other Cities

In a survey conducted in 1960 by The American City, an overwhelming majority of plant superintendents and other officials reported that the public accepted sewer service charges relatively well. In the population group of over 100,000, 74 per cent of the superintendents indicated favorable acceptance and 9 per cent unfavorable. It is important to note that 17 per cent of the respondents in this group did not indicate an opinion one way or the other. These superintendents may feel that they are not close enough to the general public to comment, which may be interpreted to mean that even more than 74 per cent are in favor of a sewer service charge.<sup>68</sup>

According to The American City survey, the anticipated opposition from prospective customers generally overshadows the other disadvantages of the sewer service charge. However, people are becoming more accustomed to these monthly charges and usually object less strenuously now than they did in the past. In fact, some cities report that adequate public relation campaigns, well in advance, have generated considerable enthusiasm for obtaining the necessary sanitary sewer facilities by means of this type of financing.<sup>69</sup>

The property tax squeeze has resulted in a large number of communities imposing the sewer service charge as the only feasible method of financing the sewerage system's operations and expansion. In Arizona at least 23 municipalities were utilizing a sewer service charge by 1962.<sup>70</sup>

#### Master File of Sewer Customers

One of the problems of converting the Sewerage Division to operate on a utility basis is that of determining which houses, commercial establishments, and industries are connected to the sanitary sewer. At the present time, the Commercial Division has records indicating that there are over 57,000 connections to the sanitary sewer system.

The present file of sewer customers is believed to be relatively accurate for the areas which have been built up since 1947, according to the Commercial Division. The City also has incomplete records of some of the older sections of the City from as far back as 1928.

The Commercial Division has few, if any, records for the areas between Speedway Boulevard and 18th Street between Tucson Boulevard and the western edge of the City. It is in this area where additional work will need to be done to determine if the residence or commercial establishment is connected to the sewer.

Since the Commercial Division of the Water Utility has an extensive file of water customers, it would be advantageous if information regarding sewer connections would be cross-referenced

with the water customers' files. This would be helpful in determining the number and location of connections for which the Sewerage Division has no records.

A map should be drawn indicating the locations for which there are sewer connection records. This would help delineate the areas in which additional research is needed to determine whether the residences and commercial establishments are connected.

#### Various Methods of Determining Existing Connections

One method would be to check each property in the area, but the cost would be prohibitive, and most likely the inspectors would encounter strong resistance when asking home owners whether they may enter the home to determine if the home is connected to the sewer line. These two factors alone eliminate this method.

Another method is to send a questionnaire to the owner of each piece of developed property to determine whether it is connected.

The questionnaire could be a straightforward one asking the owner whether the piece of property in question is connected to the sewer main, and, if so, when it was connected. However, many of the people who are connected would be apprehensive about answering the questions correctly because they may feel they would be charged, especially if the mass media were to publicize the fact that the Sewerage Division was to be converted to a utility operation and a sewer service fee introduced. Some properties may be connected to the sewer with their owners unaware of that fact.

Also, many property owners would simply not return the questionnaire. Therefore, this method is not likely to produce the desired results.

#### Recommended Method of Determining Existing Connections

The recommended method, which also is not without its bad points, is to send a bill for the sewer service to all of the Water Utility customers, all of the private water company customers, and all owners of improved property, and wait for those who are not connected to complain that they are being unduly charged. Then it would be necessary to dispatch inspectors to determine whether a connection does, in fact, exist. If it does not exist, the charge would be deleted from their file and a notation made that the property in question is not connected. If they are, in fact, connected, it can readily be demonstrated to both the homeowner and the City by way of a dye test showing that they are connected and will, therefore, continue to be charged.

Granted, this may arouse some unfavorable public opinion, but costs and inaccuracies eliminate the other methods.

Hopefully, those who are connected are aware of it and will not complain. The Commercial Division should receive few, if any, complaints from the downtown area because it is a relatively safe assumption that all properties in this area are connected.

In order to keep unfavorable public opinion to a minimum, the City should plan to make the required inspection promptly after the protest is voiced.

According to Mr. Hobbs, Commercial Division Director, anticipated costs for determining, by the dye test, which properties are connected to the sanitary sewer is less than \$15,000. This amount would permit the inspections to be made in less than a one-month period.

See Table 2 for a breakdown of the number of dye tests necessary and Table 3 for a breakdown of the cost.

#### What the Sewer Service Charge Should Pay For

If the City wants to operate the Sewerage Division as a true utility, the sewer service charge should collect sufficient money to pay for all operating and maintenance costs, some construction costs, and bond principle and interest payments.

The sewer service charge should not, however, be used to finance new domestic collection sewer construction unless all of the sewer construction has been provided without assessment to property owners.

Since land values increase when basic improvements of sewer, water, and paving are available, it is reasonable and equitable to continue a policy of special assessment for lateral sewer rather than to attempt to raise sewer service charges enough to finance this type of construction.



Table 2. Number of Tests Needed to Identify Connections

Estimated number of connections for which the City has no records	10,000
Estimated number of connections which are known to the customers and will not require the dye test	<u>8,000</u>
Resulting number of connections which would need to be tested	2,000

Table 3. Cost of Tests Needed to Identify Connections

Estimated manpower requirements for inspecting 2,000 connections (10 crews of 2 men each)	\$11,200
Estimated transportation and material costs	<u>800</u>
Resulting cost of inspections	\$12,000

### Alternative Bases for Sewer Service Charge

Just as a startled game bird jumping up in a field of hunters draws fire from several directions, so does the common goal of paying for a sewerage facility attract diverse types of ordinances from those cities which levy sewer service charges.

If it is determined that the Sewerage Division should function on a self-supporting utility basis similar to the Water Utility, the route to this end still remains wide open. Although practically all water utilities charge for their product on the basis of the amount of water used, sewer service charges show a more nearly equal division between metered and flat rate bases.<sup>71</sup>

Good rates are as simple as they can be while still being equitable in distributing the charges to the respective customers.

Some authorities list as many as 18 different types of charges; however, all fall into the general categories of flat and metered rates. Many cities employ a combination of these, but almost all differ in such features as rates, minimums, maximums, fixture charges, and front footage and area fees.<sup>72</sup>

One possible solution would appear to be to install a meter in every connector's sewer to determine the amount of sewage being contributed. The problem is that no inexpensive, convenient, and relatively trouble-free sewage meter is available for residential-size connections. Even if such a meter were available, installation costs would be extremely high because each connector's sewer would need to be opened to install the meter. Administrative

costs would also be high, because every meter would need to be read regularly.

#### Water Meter Rates

Since over 85 per cent of the water distributed today in urban areas is metered, it is not surprising that the majority of cities with sewer service charges have chosen to base their charges on the amount of water metered.<sup>73</sup>

The sewer service charge based on the water meter reading does not, however, enjoy the same degree of popularity as does the metered water rate. Several reasons are listed below.

1. All of the water which flows through the customer's water meter does not find its way to the sanitary sewer. This is a very influential factor in Tucson because of the low rainfall which necessitates that substantial amounts of water be used for irrigation of lawns and trees. Also, much water is used for swimming pools, evaporative cooling, etc.

2. Private water companies in the confines of the City may not readily make their monthly water meter readings available. Tucson, with a number of privately-owned water companies already within its boundaries, and anticipated additional companies because of continued annexation, could expect to encounter problems in this area for many years to come if a sewer service charge were to be based on a proportion of the water meter reading.

3. The difficulty of treating sewage varies with strength as well as volume. The strength factor applies primarily to commercial-industrial connections because residential connections vary somewhat in volume but the strength of the sewage remains approximately the same.

4. Administrative costs are high because calculations must be made each month to determine each customer's charge.

Many of the cities which base charges on the water meter readings have attempted to overcome these problems by adjusting their charges to allow for sprinkling and other water which does not reach the sanitary sewer.

One method used by some cities to avoid penalizing those who use substantial amounts of water for sprinkling, irrigation, swimming pools, evaporative coolers, etc., is the low month system. In this system the month in which the water meter reading is the lowest supercedes the other months.<sup>74</sup>

Some gain access to the private water company's board or to the water company's meter readings. Some reimburse the water utility for computing and mailing the sewer service bills.<sup>75</sup>

## Flat Rates

Although there are numerous possibilities when using the flat rate, generally flat rates assume some combination of the following forms:<sup>76</sup>

1. Uniform charges for all customers
2. Uniform charges for similar groups of customers
3. Charges based on the number of sewer connections
4. Charges based on the number of fixture units

The main advantage of most flat rates is the simplicity of the rate structure and related to this, the ease of administration. The greatest disadvantage of flat rates is that they are inequitable. This becomes increasingly important when cities become larger and, consequently, more complex, because the sewage contains a greater variety of strengths and volumes from individual contributors.

### Recommended Basis for Sewer Service Charge

The metered rate, based on the amount of water metered, should not be used in Tucson because the large quantities of water used for sprinkling lawns and watering greenery make this method grossly inequitable. Because of this influential factor and others it is recommended that the City adopt a flat rate service charge based on the dwelling unit.

## Residential Dwelling Units

A single-family dwelling would be classified as one dwelling unit, a duplex as two dwelling units, and a 60-apartment building as 60 dwelling units. The same would be true in the case of mobile home villages--each mobile home would be classified as one dwelling unit.

Advantages. The advantages in using the flat rate per dwelling unit follow.

1. The flat rate is easy to administer.
2. The flat rate eliminates the controversy which would arise over the amount of water used for irrigation, swimming pools, evaporative cooling, etc., if charges were based on a metered rate.
3. Less cost is involved in determining monthly charges because no measurement devices are used and no computations are necessary.
4. The flat rate eliminates the problem the Sewer Utility might have with the private water companies in attempting to obtain the water consumption figures of each residence if charges were to be based on the amount of water metered.
5. The flat rate is the simplest rate structure, and generally, the simpler the rate structure, the less controversy the City will have with those connected to the sanitary sewer.

Disadvantages. The dwelling unit charge basis is not entirely equitable because it is not based completely on the amount of sewage contributed by each connection. It is, however, much less inequitable than the present method. This disadvantage is more than outweighed by the advantages, the principal one being the reduced costs of administration due to its simplicity.

#### Commercial-Industrial Rate

If the unit or complex is used for transient type lodging, such as a motel, hotel, or travel trailer court, the connection would be classified as commercial-industrial and, therefore, would be billed according to the commercial-industrial rates which would be a flat minimum fee plus a certain amount per 100 cubic feet of water metered over the amount provided by the minimum fee. All connections other than those to dwelling units would be charged according to the commercial-industrial rate.

#### Special Situations

Unusual situations, such as golf courses, schools, etc., will require rates based upon the results of an investigation of their particular situation. These rates should be determined by the Sewer Utility and should be in line with the costs of collecting and treating the amount of sewage received from each connection.

Firms producing strong wastes containing chemicals which are incompatible with the sewage treatment process should be required to pre-treat their sewage to make it acceptable to the

treatment process. Also, firms producing strong wastes which are acceptable to the treatment process but require additional expense for treatment should be charged an additional surcharge or supplementary amount equal to the additional costs incurred for treatment. These firms should be required to construct manholes on their lines to permit the measurement of both the strength and the quantity of their wastes before they are discharged into the municipal sewer system.

Another factor to be considered when dealing with large contributors is the variation in discharge rate. If the flow is irregular, the firm may be required to construct holding tanks to reduce, if not eliminate, the variation in the discharge rate so surges are not sent through the lines and all the way through the treatment process.

#### Estimated Revenue

Before the amount of revenue to be derived from various sewer service charges can be determined, it is necessary to know the number of dwelling units and the number of commercial-industrial connections.

Since records indicating the number of commercial-industrial connections to the sanitary sewer are not available, Mr. Wilcox of the Tucson Gas and Electric Company was contacted. He indicated that 10 per cent of their gas and electric connections are classified as commercial-industrial. Therefore, 10 per cent was the figure used when determining the number of sewer



connections which are commercial-industrial. However, Tucson Gas and Electric's commercial-industrial classification includes apartment complexes and mobile home courts as one commercial-industrial connection, but the suggested sewer service charge considers each apartment and mobile home one dwelling unit; therefore, these need to be subtracted from the commercial-industrial figure.

The number of estimated commercial-industrial sewer connections is determined in Table 4. The number of estimated dwelling units is determined in Table 5.

In order to ascertain the amount of sewage contributed by the average commercial-industrial connection, it is first necessary to determine the total amount contributed per day by all dwelling units, because the only statistics available are based on per capita use in dwelling units.

A study conducted by Gordon Fair and John Geyer, Professors of Sanitary Engineering at Harvard and Johns Hopkins Universities, respectively, indicated the average contribution to the sanitary sewer system is about 70 gallons per capita per day (gpcd). The Planning Division indicated that Tucson has an average of 3.4 persons per dwelling unit.

Average daily sewage flow (1969)	26,500,000 gpd
Total dwelling units' contribution (70 gpcd x 3.4 persons x 74,000 d.u.)	<u>-17,600,000 gpd</u>
Total commercial-industrial contribution	8,900,000 gpd

Table 4. Number of Commercial-Industrial Connections

Known sewer connections		57,000	A
Estimated unknown sewer connections		<u>+10,000</u>	A
Estimated total sewer connections		67,000	
Estimated percentage which is comm.-ind.		x <u>.10</u>	B
Estimated comm.-ind. connections		6,700	
Apartment complexes	1,350		C
Estimated mobile home courts	+ <u>150</u>		D
Total deductions	1,500	- <u>1,500</u>	
Estimated commercial-industrial connections		5,200	

## Sources of Statistics

A--A. B. Hobbs, Commercial Division Director

B--Mr. Wilcox, Tucson Gas and Electric Company

C--Licenses Division, Finance Department (figures as of Nov. 1, 1969)

D--Kirke Guild, Engineering Division

Table 5. Number of Dwelling Unit Connections

Estimated sewer connections		67,000
Estimated commercial-industrial connections		- <u>5,200</u>
Estimated dwelling unit connections		61,800
Apartment complexes	1,350 A	
Dwelling units per complex	<u>x7.407</u> A	
Apartment dwelling units		10,000
Estimated mobile home dwelling units		<u>2,200</u> B
Total estimated dwelling unit connections		74,000

## Sources of Statistics

A--Licenses Division, Finance Department (figures as of Nov. 1, 1969)  
 B--Kirke Guild, Engineering Division

By dividing the total commercial-industrial contribution by the number of commercial-industrial connections, we can determine that the average commercial-industrial connection contributes 1,712 gallons per day or 51,360 gallons per month which is equal to 6,848 cubic feet (c.f.). The 6,848 figure has been rounded to 6,800 cubic feet for computational purposes.

Table 6 was calculated to estimate the total annual revenue from dwelling units which would be derived from various rates.

The total annual commercial-industrial minimum fee revenue is estimated for various rates in Table 7.

The total annual revenue derived from commercial-industrial connections beyond the maximum allowed by the minimum fee can be determined by using the following formula:

$$\text{No. of C.-I. Connections} \times \text{Charge/100c.f.} \times \frac{\text{Average Mo. use} - \text{Max. allowed by min. fee}}{100} \times 12 \text{ months}$$

When calculating Table 8, the formula was used in the following way:

$$5,200 \times \text{charge per 100c.f.} \times \frac{(6,800 - \text{max.})}{100} \times 12 \text{ months}$$

Table 8 estimates the total annual revenue from the commercial-industrial excess fee based on various rates.

To obtain the total revenue for a year, an amount must be selected from each of Tables 6, 7, and 8.

Table 6. Dwelling Unit Revenue

<u>Monthly Charge Per Dwelling Unit</u>	<u>Annual Charge Per Dwelling Unit</u>		<u>Total D.U. Annual Revenue</u>
1.00	12.00	x74,000 d.u.	\$ 888,000
1.05	12.60		932,400
1.10	13.20		976,800
1.15	13.80		1,021,200
1.20	14.40		1,065,600
1.25	15.00		1,110,000
1.30	15.60		1,154,400
1.35	16.20		1,198,800
1.40	16.80		1,243,400
1.50	18.00		1,332,000
1.75	21.00		1,554,000

Table 7. Commercial-Industrial Minimum Fee Revenue

<u>Monthly Charge Per Connection</u>	<u>Annual Charge Per Connection</u>		<u>Total Revenue of Minimum Fee</u>
1.00	12.00	x5,200 conn.	\$ 62,400
1.05	12.60		65,520
1.10	13.20		68,640
1.15	13.80		71,760
1.20	14.40		74,880
1.25	15.00		78,000
1.30	15.60		81,920
1.35	16.20		85,040
1.40	16.80		87,360
1.50	18.00		93,600
1.75	21.00		109,200

Table 8. Commercial-Industrial Excess Revenue

<u>Mo. Charge per 100 c.f. Above Maximum</u>	<u>Maximum of 800 c.f./mo.</u>	<u>Maximum of 900 c.f./mo.</u>	<u>Maximum of 1,000 c.f./mo.</u>
\$ .07	\$262,000	\$258,000	\$253,000
.08	299,000	295,000	290,000
.09	337,000	331,000	326,000
.10	374,000	368,000	362,000
.11	411,000	405,000	398,000
.12	449,000	442,000	434,000
.13	487,000	478,000	470,000
.14	524,000	515,000	507,000
.15	562,000	552,000	543,000

## Billing Procedures

### Frequency

The advantages of frequent billing are many. The majority of the customers would probably prefer to pay relatively small bills frequently rather than receive larger bills at somewhat longer intervals. This precept holds even though the smaller bills may total more than the others at the end of the year.<sup>77</sup>

The monthly billing procedure has become an American custom. It serves as a reminder that the sewerage system stands ready to serve 24 hours a day. Because the fee for this service is low in comparison to others, the monthly reminder will generally not become a burden.<sup>78</sup>

If customers are to be persuaded that the sewer service charge is a fee for a convenient utility, the sewer utility should submit monthly bills as do most gas and electric utilities.

Of the cities surveyed in 1960 by the editors of The American City, 51 per cent indicated that they billed sewer service charges monthly. The trend in the Southwest toward the monthly billing procedure is very strong in that almost every respondent in this area indicated a monthly frequency.<sup>79</sup>

Most cities bill their commercial and industrial accounts monthly, regardless of the frequency of payment.<sup>80</sup> This prevents the bills for the larger accounts from becoming unwieldy, and it follows the business custom of monthly billing. Since these bills



are normally many times larger than residential fees, any objection to the cost of preparing and mailing them frequently is unfounded.

When Tucson initiates the sewer service charge, it should be on a monthly billing basis. This would enable the monthly sewer service charge and the water bill to be put on the same statement each month. It would be simplest this way, especially for the commercial-industrial bills where both the monthly water bill and the sewer service fee are computed by electronic data processing from the monthly water meter readings.

#### Delinquency

Many cities require that both water and sewer bills be paid at the same time or the customer's water supply is cut off. The objection to this is the possible creation of health hazards. A family could get drinking water from the neighbors, but would find it difficult to dispose of their wastes in a sanitary manner without water.<sup>81</sup>

Other methods for collecting delinquent bills include the small claims court and the device of making unpaid accounts a lien on property to be collected with real estate taxes. To avoid these measures, some cities require a deposit from each customer, while other exact payment for an entire period or some portion of it in advance.<sup>82</sup>

The recommended method is to require a deposit from each customer in advance. This eliminates the possibility of creating

a health hazard as in the case when the water supply is discontinued.

#### Areas Requiring Additional Research

I have found this study to be very educational and interesting, and I regret that I was unable to complete the study because of insufficient time. It certainly would have been much more meaningful to the Sewerage Division, to the diary, and to myself if I could have completed the sewer utility study. A good number of the advantages and problems of establishing the Sewerage Division as a utility have been touched upon in this study, but there are many additional areas which will need to be thoroughly researched before the first sewer service bill can be prepared and sent.

A number of facets which have not yet been sufficiently researched follow.

1. Since enterprise accounting and budgeting methods are needed to operate a utility properly, research in these areas is essential.

2. An inventory should be taken and an appraisal made of all of the Sewerage Division's facilities to determine the present value. The Reproduction Cost New Less Depreciation basis, which is the cost of constructing the entire physical plant in one project at current prices less depreciation through use, should be used for the inventory.

Together with this appraisal should be a determination of depreciation rates for each group of equipment and for all physical facilities.

3. The technicalities of drawing up the ordinances required to establish the Sewer Utility should be investigated.

4. Research is needed to determine the rules, policies, and operating procedures necessary to operate in an effective and efficient manner.

5. Research is needed to determine how the sewer service billing should be initiated in order to reduce as much as possible the misunderstandings and complaints.

6. The legality problems, which may be encountered when establishing the utility, should be investigated.

7. The job cost type accounting system needs to be explored to determine how it can be employed to maximize financial control.

8. Research is needed regarding the establishing of standards as to what is acceptable in the sanitary sewer system. This is becoming increasingly important as Tucson attracts additional large and diverse industries.

## CHAPTER IX

### CONCLUSION

During the internship with the Housing Authority of Tucson and the Water and Sewers Department I realized that the practice of public administration is generally not far removed from the theory.

#### Integration of Theory and Practice

Many of the research methods which were covered in Public Administration Research 229 were frequently used while compiling facts and statistics for the research studies performed for the Housing Authority and the Sewerage Division. The integration of theory and practice was especially evident in compiling the statistics on population trends for one of the studies conducted for the Housing Authority. The statistical operations covered in this course enabled me to obtain various averages, percentiles, etc., required for the studies. Documentary-type research was used to study the history and development of both of the organizations.

In all four of the studies conducted during the internship I was made aware of two of the primary characteristics of public administration brought out in Public Administration 262 and in Social Relations and Administration 301. The first of these

characteristics is that public administration works for and under the direction of politicians. This was especially evident in the studies concerning the sewer connection fee and the sewer utility. If the recommendations of either of these studies are to be put into effect, they must be politically acceptable because the decision as to whether or not these recommendations are initiated is made by the Mayor and Council who are accountable to the citizens of Tucson.

The appropriations for Federal public housing in the U.S. are made by politicians who are generally attempting to carry out the wishes of their constituents. However, the needs in the area of public housing as expressed by the Housing Authority of Tucson and all other local housing authorities may not be the most important priority to the politicians for a particular budget cycle. In other words, the construction of public housing projects throughout the U.S. is completely dependent upon the Congress. If the Congressmen feel the other needs should receive priority and, therefore, appropriate less than usual for public housing, only the most urgent projects will be funded. If the politicians feel public housing is one of the priority areas, a large appropriation will be made and many of the public housing projects will be funded.

The second characteristic is that public administration is carried on in public and is, therefore, subject to continuous review and criticism. Since the administrators of public agencies are responsible for carrying out the desires of the electorate, the citizens are entitled to be informed of the governmental

units' decisions. The mass media frequently relate to the public the major decisions of the public administrators; and the administrators of public agencies often receive criticism from some of the citizens because of their differences in opinion. This is demonstrated by the criticism received by the Housing Authority administration when the decision had been reached as to where low-cost public housing would be constructed.

Dr. Livermore repeatedly emphasized in Public Management 241 that nonprofit organizations frequently receive voluntary assistance on all levels. This was exemplified to me when conducting interviews for my study of the special needs of the elderly. The Tucson Housing Foundation relies on the members of other organizations to aid them in their studies and projects.

The Sewer Utility study made the integration of theory and practice of local taxation very evident. The theories and problems of local finance were discussed in detail in State and Local Government Finance 246. It is because of the problems of local finance that the City of Tucson will find it necessary to eventually convert the Sewerage Division to operate as a utility.

One of the reasons for converting to a Sewer Utility is that the citizens who use the services of the utility are paying according to the cost of collecting and treating their sewage. This concept of payment by those who benefit from the service was an important part of Municipal and Metropolitan Government 213.

The theory that extending the budget cycle generally greatly improves the administration of public agencies was

presented in Public Administration 261 and in Fiscal and Budgetary Administration of Public Agencies 337. The problem of continuity of funds for operation was quite evident at the Sewerage Division. Because of this lack of continuity of appropriations, the division is not able to operate as economically as it could if it were certain that it would receive a certain amount of appropriations every year.

Related to this concept is long-range planning. Since the appropriations are made on a year-to-year basis, long-range planning loses much of its value because the plans must be modified so frequently. This problem was repeatedly discussed in Public Management 241. In Fiscal and Budgetary Administration of Public Agencies 337 a majority of the class periods dealt with long-range planning and how it, when tied in with the Planning-Programming-Budgeting System (PPBS), makes the administration of public organizations more economical in obtaining the desired results. In order to realize the advantages of PPBS, the budget cycle should be lengthened to five or ten years which permits a better utilization of long-range planning and a better allocation of resources.

During my internship and while preparing this diary, I also noted some of the conflicts between the theories of administration and the actual practices of the City of Tucson government.

Under the present organizational arrangement, it is difficult for the City Manager to exercise control of certain departments. An outstanding example of this is the Library Department,

where the Library Director is directly responsible to the Library Board, which is selected by the Mayor and Council. This is in contrast to the council-manager model form of government as studied in Municipal and Metropolitan Government 213 where the library director would be directly responsible to the city manager, thus facilitating much better control. Another area in which the library differs from the model is that its employees are not under the Civil Service regulations.

The organizational lines of responsibility of the Personnel Department are another area in which the practice in the City of Tucson differs significantly from the model council-manager form of government. The Director of Personnel is directly responsible to the Civil Service Commission, which is appointed by the Mayor and Council. This could make it difficult for the City Manager to initiate the changes in personnel, within the limitations established by the Civil Service Commission, he deems necessary to obtain the efficient management of the departments for which he is held responsible. Under the present organization, he must rely on the cooperation of others in order to make the needed changes.

While a number of conflicts were noted; as a whole the daily operations of the Housing Authority and the Sewerage Division were relatively close to the theories studied in the classroom. The theories and procedures with which I became acquainted in the classroom made it much easier to understand the various procedures encountered during the internship.



## Summary

## The Housing Authority of Tucson

The administration of public housing in the U.S. has improved greatly since it was initiated in the 1930s. It has evolved to the point where the need for public housing is determined locally and must have the official approval of a local governing body before the Federal government will grant any funds. The Turnkey Method has greatly reduced the amount of time needed to complete a project.

I found the entire subject of the special needs of the elderly and low-cost housing for them to be very interesting and educational. It is a subject which I feel should receive additional publicity because our senior citizens are much in need of low-cost housing. This need is rapidly increasing because of the inflation we are presently experiencing which makes it extremely difficult for those on fixed incomes, as many of the elderly are, to purchase the goods and services they need. Low-cost housing will continue to increase in importance because the population of our elderly is increasing and the cost of living is moving up rapidly.

My studies for the Housing Authority made me realize that our senior citizens need to be planned for in a more meaningful way. Transportation is just one of the many areas in which our elderly need special consideration. It may be possible for the average Tucsonian to carry on his day-to-day activities without

public transportation, but this certainly is not the case with the elderly. Many are unable to get around by any other means, either because they cannot drive, have no close friends who can chauffeur them, or cannot afford a taxi. If public housing for the elderly is located in the central city area, the need for public transportation is reduced somewhat, but they still need it to visit other areas. Also, there are many elderly people in Tucson who do not live in public housing who need the public transportation system.

The portion of my study where I needed to rely on census data for information regarding population changes made it very apparent that the data would be much more useful if census tracts were uniform in size and shape in metropolitan areas. This would permit more meaningful comparisons between various areas of the city.

#### The Water and Sewers Department

The portion of my internship with the Water and Sewers Department consisted of two research studies; some information was found in source material, but the majority was obtained in discussion with many of the various Water and Sewers Department personnel.

It was interesting to learn how the entire sewerage system functions in disposing of one of the more unpleasant by-products of an urbanized area. Since the developed properties of Tucson are spread over such a large area considering the number of inhabitants, an immense system is required to collect and transport the

sewage to the sewage treatment plant where it can be treated properly.

During the research on the Sewer Connection Fee Study, I became more and more convinced that the present flat fee basis of \$150.00 per acre for a connection would need to be changed.

One of the principal reasons is that the present system is inequitable in that the owner of a piece of property would be charged the same amount for connecting to the sanitary sewer whether he built a small one-bedroom house or a hotel on that piece of property.

After much research, the fixture unit fee basis has been recommended to eliminate the problem. Under this basis the connector would be charged according to the number of fixture units he will be adding which will contribute sewage to the sanitary sewer system. This means that each connector will pay according to the cost of the additional sewage collection facilities needed to carry the sewage discharged from his connection to the sewage treatment plant.

Although I was unable to complete the Sewer Utility Study, I am convinced that conversion of the Sewerage Division to operate on a utility basis is inevitable because the City of Tucson, like most other cities, is caught in a financial squeeze and needs another source of revenue. A sewer service charge is a realistic solution because it is generally more acceptable to the public than an additional tax or an increase in the existing taxes. It is a charge for a service the citizens need and readily

understand. When billed for on a monthly basis, as are the other utilities, the charge would be nominal.

Since Tucson and Phoenix are two of the larger cities in the United States which do not presently use this method to obtain additional revenue, no disadvantage results in attempting to attract additional industry to this area.

There are a number of advantages of operating on a utility basis which generally do not exist under the present method of operation. The utility-type of operation provides a continuity of income and because of this the utility can make, and more closely follow, long-range plans, thereby operating more efficiently and effectively. In addition, HUD strongly recommends utility-type operation in order for them to grant funds for construction of sewage plant facilities.

### Conclusions

My internship with The Housing Authority of Tucson and The Water and Sewers Department was a very educational and interesting experience although it lasted only four months (475 hours) on a part-time basis. The first 225 hours were spent on research studies for the Housing Authority; and for the remaining 250 hours I was involved with research studies for the Water and Sewers Department. This internship climaxed one and one-half years of graduate study in public management and was a very educational supplement to the classroom instruction.

My previous experience, one year in distribution management and two years in an administrative capacity, made the internship more meaningful to me. I think the internship is of much greater value to the individual who has had some previous experience working in administrative-type work. This experience assisted me in visualizing more realistically some of the problems encountered in my studies. It also assisted me in knowing that in spite of the ease with which one may think a certain plan can be implemented, in reality it is generally much more difficult and frequently requires a thorough understanding of the problem or situation if the desired results are to be achieved.

The manner in which I was treated by the personnel was greatly appreciated. Without exception, I was accepted as a fellow employee and never as an "outsider."

It was also my pleasure to note that the Housing Authority staff and every member of the various divisions of the Water and Sewers Department with whom I came in contact has a strong positive attitude toward education. Without this attitude, I feel it would be difficult, at best, for an intern to have a successful and educational learning experience during his internship.

The value of the internship, I feel, does not lie specifically in what is learned in regards to operational procedures, but rather in the exposure to the general problems at different levels so the problems of each specific level are understood to some degree.

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