Paul Price Associates, Inc. Job No. 027

SOCIOECONOMIC BASELINE REPORT

for the

LAKE BOSQUE PROJECT

BOSQUE COUNTY, TEXAS

Prepared for
The Brazos River Authority

Prepared by

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1.0 INTRODUCTION

1.1 GENERAL

This report presents the baseline social and economic characteristics of the area potentially affected by the proposed Lake Bosque project. The social and economic factors addressed in this report include demographic trends; population characteristics and projections; employment trends; income data; community services and facilities; housing supply and availability; water demand (including future demand projections); governmental finances; transportation; recreation and aesthetics; and land use. This information is being used as input to the delineation of the Purpose and Need for the Project (EA Section 1.2), the Socioeconomics and Land Use effects assessment (EA Sections 3.8 and 4.6), and certain aspects of the Fish and Wildlife effects assessments and mitigation plans (EA Sections 4.5.3 and 5.0).

1.2 DELINEATION OF THE ANALYSIS AREA

1.2.1 The Study Area

As shown in Figure 1 - 1 the study area was defined as the two county region (McLennan and Bosque County) which encompasses the proposed reservoir site, the area most likely impacted by the construction and operation of the Lake Bosque project and the communities participating in the Project. Except for the City of Waco, the communities in the area are small, with 1986 populations ranging from 1,330 to 9,900, and are characterized by small scale economies based on agriculture and manufacturing or are bedroom communities linked to the City of Waco. The demographic, economic, recreation and aesthetics, and land use sections of this report generally address the two county region as an integrated study area, rather than attempting to dissect the whole into individual communities. Demographic and economic impacts, primarily through increased economic opportunities and possible in-migration of people into the area resulting from development of the proposed Lake Bosque, will be felt to varying degrees in Bosque and

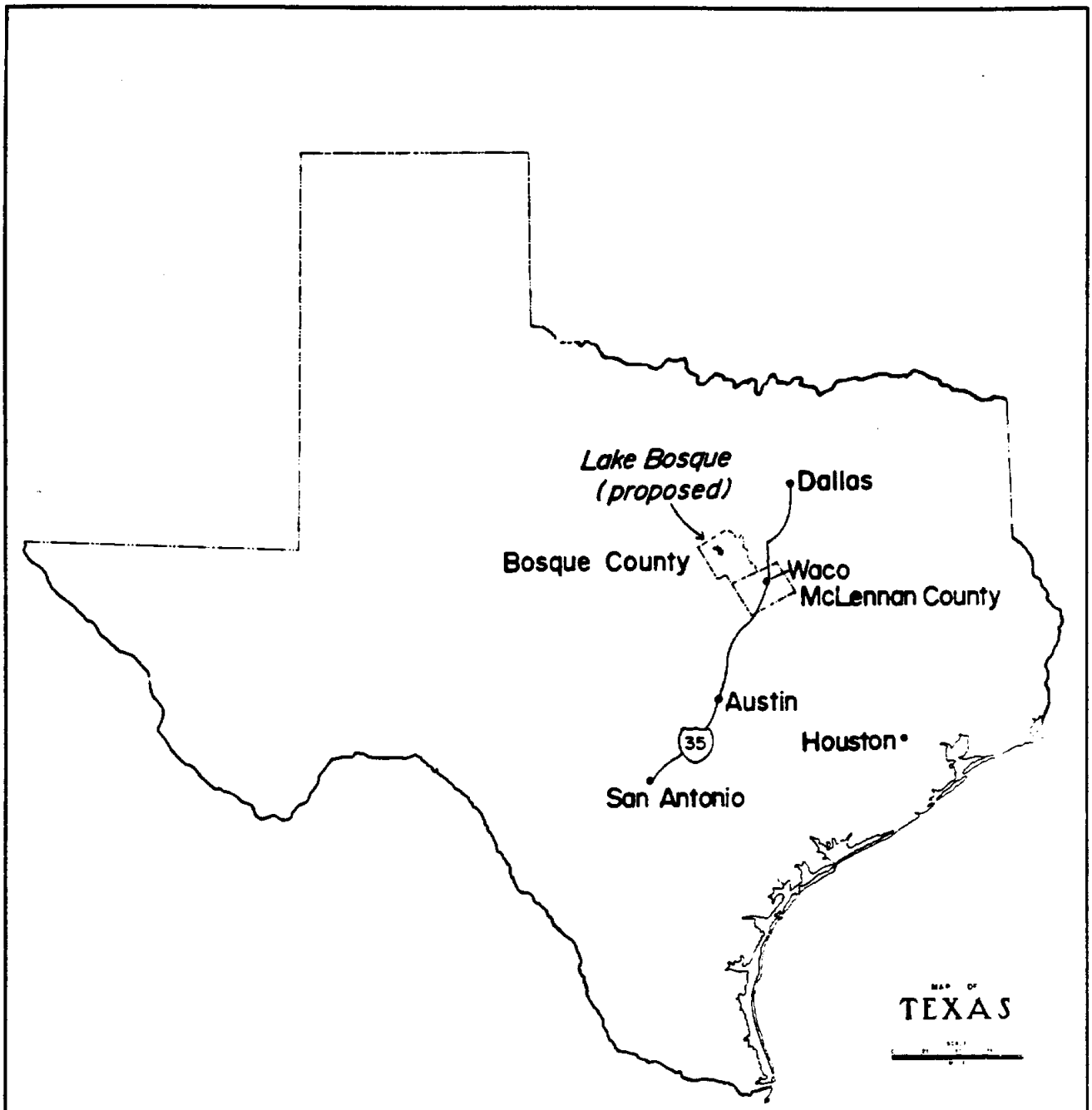

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Figure 1-1
Proposed Lake Bosque
Resevoir Site

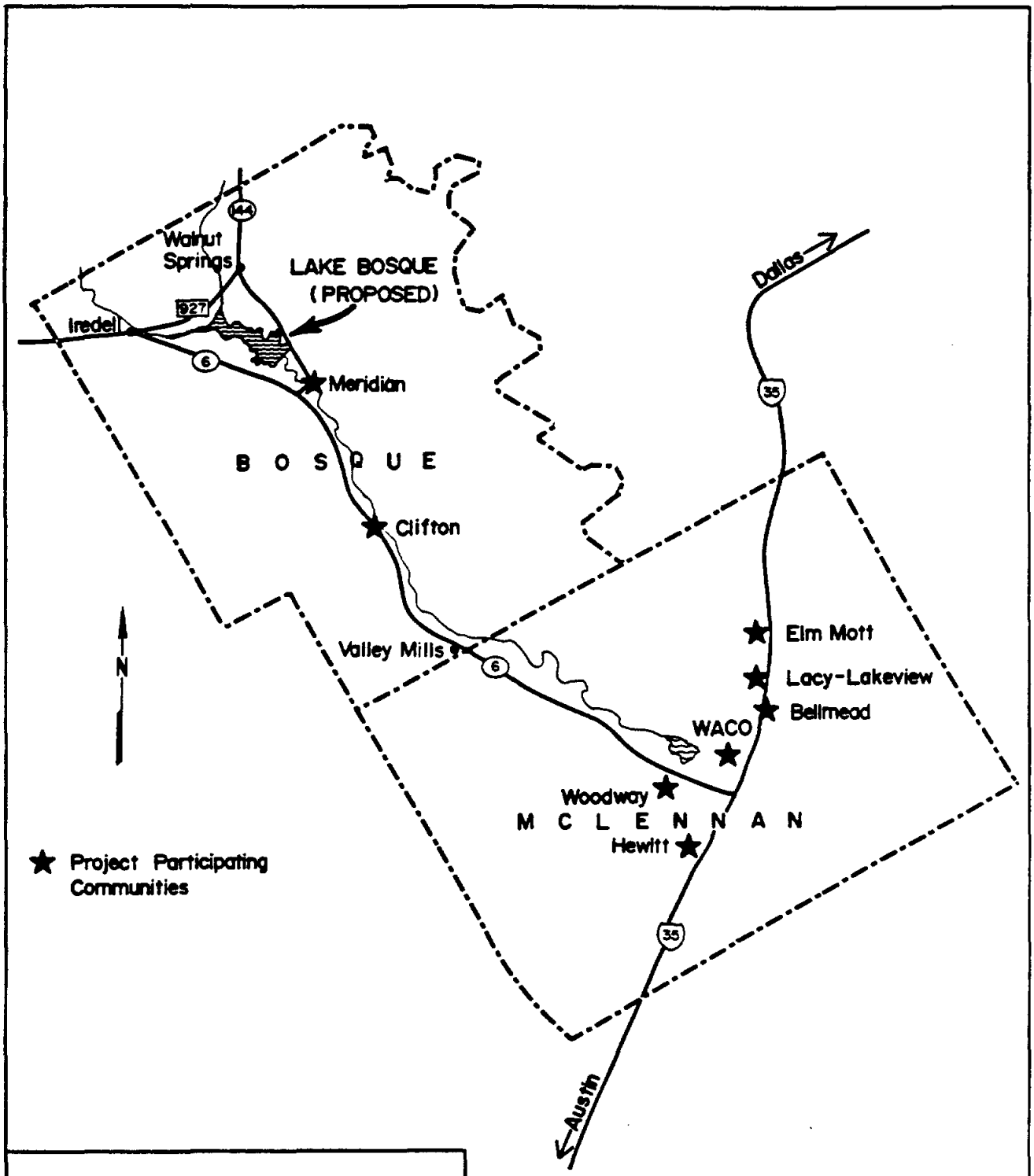

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Figure 1-2

Lake Bosque Project Study Area

(ETJ). McLennan County WCID #2 was created to provide water and sewer facilities for the unincorporated community of Elm Mott.

Waco is the county seat of McLennan County and a major commercial and industrial center of Central Texas. The city is located 90 miles south of Dallas on IH 35. Waco is the approximate geographic center of the Texas population, being within 100 miles of 24% of the States' population of almost 15 million people.

The cities of Hewitt, Bellmead, Lacy-Lakeview, Woodway and the unincorporated community of Elm Mott, located within 1 - 4 miles of Waco along major roadways, are residential suburbs with some light industrial land uses. City 1980 populations range from a high of 7,569 for the City of Bellmead to a low of 1,300 for the community of Elm Mott. Hewitt was the fastest growing city with a population increase from 1970 - 1980 of 822%.

2.0 POPULATION PROFILE

2.1 INTRODUCTION

This section describes present population size, age distribution, population growth trends and projections for the two county study area and project participating municipalities. Texas was used as a benchmark with which to compare county population growth trends and characteristics.

Population data from the U. S. Bureau of the Census, Texas Department of Health, Texas Water Development Board, the University of Texas Bureau of Business Research, the City of Waco and the Heart of Texas Council of Governments were used. Additional data update and supplementation was provided from local chambers of commerce and municipal government publications.

Presented in this document are five different population projections prepared by four separate public agencies. Because each projection contains different population totals and because population projections are the base from which future water needs are projected, a major portion of this section concerns the criteria for choosing the most reasonable and accurate population projection. Discussed are county and municipal population projections prepared by the Texas Department of Health (TDH), Texas Water Development Board (TWDB), the City of Waco Planning Department, and the Heart of Texas Council of Governments (HOTCOG).

2.2 HISTORICAL POPULATION TRENDS

Counties

As shown in Table 2 - 1, during the 1960s the rapid rate of population growth that occurred throughout the State of Texas did not happen in Bosque or McLennan Counties. While Texas' total population increased by almost 17%, Bosque County's population increased by only 1% (157 persons), and McLennan County's population decreased by 2%, a loss of 2,500 persons.

However, during the 1970s and 1980s, population growth in each county increased at rates more comparable to the skyrocketing growth occurring throughout the State. During the 1970s Bosque County's population grew by 22% to a total of 13,401 and McLennan County's population increased by 16% to a total of 170,755. Historically Bosque County's population has always been much smaller than that of McLennan County, however, since 1960 Bosque County's population increased at a faster rate than the population in McLennan County.

Communities

Although the 1960's brought relatively little growth to Bosque and McLennan Counties, the population of each subject community, except the City of Waco, increased at rates comparable to or much higher than Texas' average population growth (see Table 2 - 1).

During the 1960s the City of Waco's population declined by 2%, but the two of the fastest growing communities in McLennan County, Woodway and Bellmead, were located in Waco's extra-territorial jurisdiction (ETJ). In one decade Woodway and Bellmead's populations increased by 287% and 50% respectively. In Bosque County, Meridian and Clifton's populations increased at rates comparable to

Table 2 -1. Study Area Population Growth 1960 -1980

	1960 Population	1970 Population	% Δ	1980 Population	% Δ
Texas	9,579,677	11,198,655	16.9%	14,228,383	27.1%
Bosque County	10,809	10,966	1.5%	13,401	22.2%
Meridian	993	1,162	17.0%	1,330	14.5%
Clifton	2,335	2,578	10.4%	3,063	18.8%
Mclennan County	150,091	147,553	-1.7%	170,755	15.7%
Bellmead	5,127	7,698	50.1%	7,569	-1.7%
Hewitt	NA	569	----	5,247	822.1%
Lacy-Lakeview	2,272	2,558	12.6%	2,752	7.6%
Mclennan Co. WCID #2 (Elm Mott)	NA	NA	----	1,300	----
Waco	97,808	95,326	-2.5%	101,261	6.2%
Woodway	1,244	4,819	287.4%	7,091	47.1%

Source:
U. S. Bureau of the Census. General Population Characteristics, 1960-1980.
Texas Department of Health, Water Hygiene Inventory for 1986.
Note: NA = not available

Texas'17% growth rate.

The 1970s brought unprecedented population growth to Texas as well as significant growth to the municipalities of Bosque and McLennan Counties. Similar to the trend set in the 1960s, the City of Waco's population increased slowly while the population centers in its ETJ grew rapidly. One of the fastest growing municipalities was the community of Hewitt; in one decade its population grew by 882% to a total of 5,247. Despite rapid growth in the 1960s, Bellmead's population declined during the 1970s. Woodway's population grew much slower than in the 1960s but still increased by nearly 50%.

During the 1970s, the population in the communities of Meridian and Clifton increased at rates slower than, but still comparable, to Bosque County's population growth rate. The county population increased by 22% and the populations in Clifton and Meridian grew by 19% and 14% respectively. Clifton's population grew faster in the 1970s than it did during the 1960s, while Meridian's population growth declined.

2.3 1986 POPULATION ESTIMATES

Counties

Table 2 - 2 shows 1986 municipal and county population estimates prepared by the Texas Department of Health. The 1986 population figure for the State is an estimate by the U.S. Bureau of the Census. Also displayed are population growth rates from 1980 - 86.

From 1980 to 1986, the State population increased by 15% however, Bosque and McLennan County populations did not increase as rapidly. Bosque County's 1986 population, estimated at 15,132, increased at a rate comparable to the states average growth rate, while McLennan County's 1986 population, estimated at 182,354, grew only half as fast.

Communities

As shown in Table 2 - 2 population growth in Waco from 1980 to 1986 was slight while growth in the small communities within the city's extra-territorial jurisdiction (ETJ) was rapid. The populations in Clifton and Meridian remained stable experiencing little to no growth.

Table 2 - 2. Study Area Population Growth 1980 -1986

	1980 Population	1986 Population	% Δ
Texas	14,228,383	16,370,000	15.1%
Bosque County	13,401	15,132	12.9%
Meridian	1,330	1,330	0.0%
Clifton	3,063	3,067	0.1%
McLennan County	170,755	182,354	6.8%
Bellmead	7,569	8,500	12.3%
Hewitt	5,247	9,900	88.7%
Lacy-Lakeview	2,752	4,700	70.8%
McLennan Co. WCID #2 (Elm Mott)	1,300	1,600	23.1%
Waco	101,261	104,133	2.8%
Woodway	7,091	8,841	24.7%

Source:
U. S. Bureau of the Census. General Population Characteristics, 1960-1980.
Texas Department of Health, Water Hygiene Inventory for 1986.
Note: NA = not available

2.4 POPULATION DISTRIBUTION BY AGE

Table 2 - 3 displays the distribution of Texas, Bosque and McLennan Counties 1980 populations by five year age groups. Also shown are Texas Department of Health population projections for each age group for years 1990 and 2000. Figures 2 - 1, 2 - 2 and 2 - 3 graphically display the information from Table 2 - 3.

The median age in Texas is projected to increase through the year 2000. In 1980, 29% of the population was 15-29 years of age, by 1990 over a quarter of the population is projected to be 25-39 years old, and by year 2000 it is projected that one-fourth of the state population will be 35-49 years old (see Table 2 - 3 and Figure 2 - 1).

The age distribution of McLennan County's population is very similar to that of the State, however there are some differences (see Table 2 - 3 and Figure 2 - 2). The proportion of people aged 75 and older is slightly higher in McLennan County than the Texas average. That trend is projected to continue through year 2000. In 1980, the median age in the county was 15 - 24 years. This is partially explained by the large number of colleges and trade schools in the county. The high proportion of teenagers and young adults in the county is projected to decline through year 2000. In 1990 the two largest projected age groups are the 25-29 and 30-39 year cohorts. In 2000 the two largest adult age groups are the 35-39 and 40-44 cohorts. From 1980 to 2000 children ages 0-14 are expected to account for 24% of the population. The ageing trend projected for the State is also projected for McLennan County.

Bosque County (see Table 2 - 3 and Figure 2 - 3) is characterized by a much larger proportion of elderly residents than found in McLennan County or the State at large. In 1980 the proportion of people 75 years and older living in Bosque County was almost three times as high as the state average or McLennan County's average; the proportion of those aged 70 - 74 was twice as high as the state average or McLennan County's average. This trend is projected to continue to 2000. Compared to Texas, Bosque County's

Table 2 - 3. Texas, Population Distribution by Age, 1980 - 2000

Age Group	1980	1990	% Change	2000	% Change	% of Total Population 1980	1990	2000
0-4	1,169,061	1,489,062	27%	1,641,473	10%	8%	8%	8%
5-9	1,169,889	1,485,612	27%	1,631,985	10%	8%	8%	8%
10-14	1,179,988	1,339,531	14%	1,603,432	20%	8%	8%	8%
15-19	1,352,355	1,340,203	-1%	1,607,831	20%	10%	8%	8%
20-24	1,420,358	1,377,145	-3%	1,452,429	5%	10%	8%	7%
25-29	1,302,054	1,542,336	18%	1,398,587	-9%	9%	9%	7%
30-34	1,124,483	1,658,215	47%	1,454,691	-12%	8%	9%	7%
35-39	880,229	1,459,029	66%	1,624,675	11%	6%	8%	8%
40-44	723,002	1,218,042	68%	1,713,600	41%	5%	7%	8%
45-49	681,391	929,697	36%	1,477,417	59%	5%	5%	7%
50-54	680,275	736,487	8%	1,195,979	62%	5%	4%	6%
55-59	643,396	680,066	6%	890,958	31%	5%	4%	4%
60-64	531,549	638,097	20%	657,966	3%	4%	4%	3%
65-69	476,110	574,889	21%	573,125	0%	3%	3%	3%
70-74	371,155	427,717	15%	491,784	15%	3%	2%	2%
75+	523,896	745,222	42%	915,919	23%	4%	4%	5%
TOTAL	14,229,191	17,641,350	24%	20,331,851	15%	100%	100%	100%

Source:
Texas Deartment of Health.

Table 2 - 3. (Continued) Mclennan County, Population Distribution by Age, 1980 - 2000

Age Group	1980	1990	% Change	2000	% Change	% of Total Population 1980	1990	2000
0-4	12,654	14,865	17%	15,384	3%	7%	8%	7%
5-9	12,197	14,244	17%	14,652	3%	7%	7%	7%
10-14	12,224	14,102	15%	15,716	11%	7%	7%	8%
15-19	17,881	15,891	-11%	16,469	4%	10%	8%	8%
20-24	19,195	15,869	-17%	16,263	2%	11%	8%	8%
25-29	13,157	15,190	15%	12,313	-19%	8%	8%	6%
30-34	11,031	16,931	53%	13,763	-19%	6%	9%	7%
35-39	8,681	14,688	69%	16,053	9%	5%	8%	8%
40-44	7,879	11,881	51%	17,532	48%	5%	6%	8%
45-49	7,950	8,793	11%	14,584	66%	5%	5%	7%
50-54	8,681	7,732	-11%	11,381	47%	5%	4%	5%
55-59	8,810	7,742	-12%	8,367	8%	5%	4%	4%
60-64	7,881	8,203	4%	7,072	-14%	5%	4%	3%
65-69	7,432	8,095	9%	6,833	-16%	4%	4%	3%
70-74	5,985	6,578	10%	6,638	1%	4%	3%	3%
75+	9,117	12,105	33%	13,916	15%	5%	6%	7%
TOTAL	170,755	192,909	13%	206,936	7%	100%	100%	100%

Table 2 - 3. (Continued) Bosque County, Population Distribution by Age, 1980 - 2000

Age Group	1980	1990	% Change	2000	% Change	% of Total Population 1980	1990	2000
0-4	734	869	18%	913	5%	5%	6%	6%
5-9	777	925	19%	978	6%	6%	6%	6%
10-14	840	1,025	22%	1,037	1%	6%	7%	6%
15-19	925	920	-1%	1,010	10%	7%	6%	7%
20-24	745	689	-8%	739	7%	6%	5%	6%
25-29	714	789	11%	683	-13%	5%	5%	5%
30-34	730	966	32%	847	-12%	5%	6%	5%
35-39	651	853	31%	862	1%	5%	6%	5%
40-44	596	890	49%	1,062	19%	4%	6%	4%
45-49	557	782	40%	939	20%	4%	5%	4%
50-54	700	830	19%	1,046	26%	5%	6%	5%
55-59	857	737	-14%	879	19%	6%	5%	6%
60-64	1,029	892	-13%	886	-1%	8%	6%	8%
65-69	1,125	953	-15%	720	-24%	8%	6%	8%
70-74	989	922	-7%	761	-17%	7%	6%	7%
75+	1,432	1,876	31%	1,961	5%	11%	13%	11%
TOTAL	13,401	14,918	11%	15,323	3%	100%	100%	100%

Source:
Texas Department of Health.

Figure 2 - 1.
Texas, Population Projections by Age, 1980 - 2000

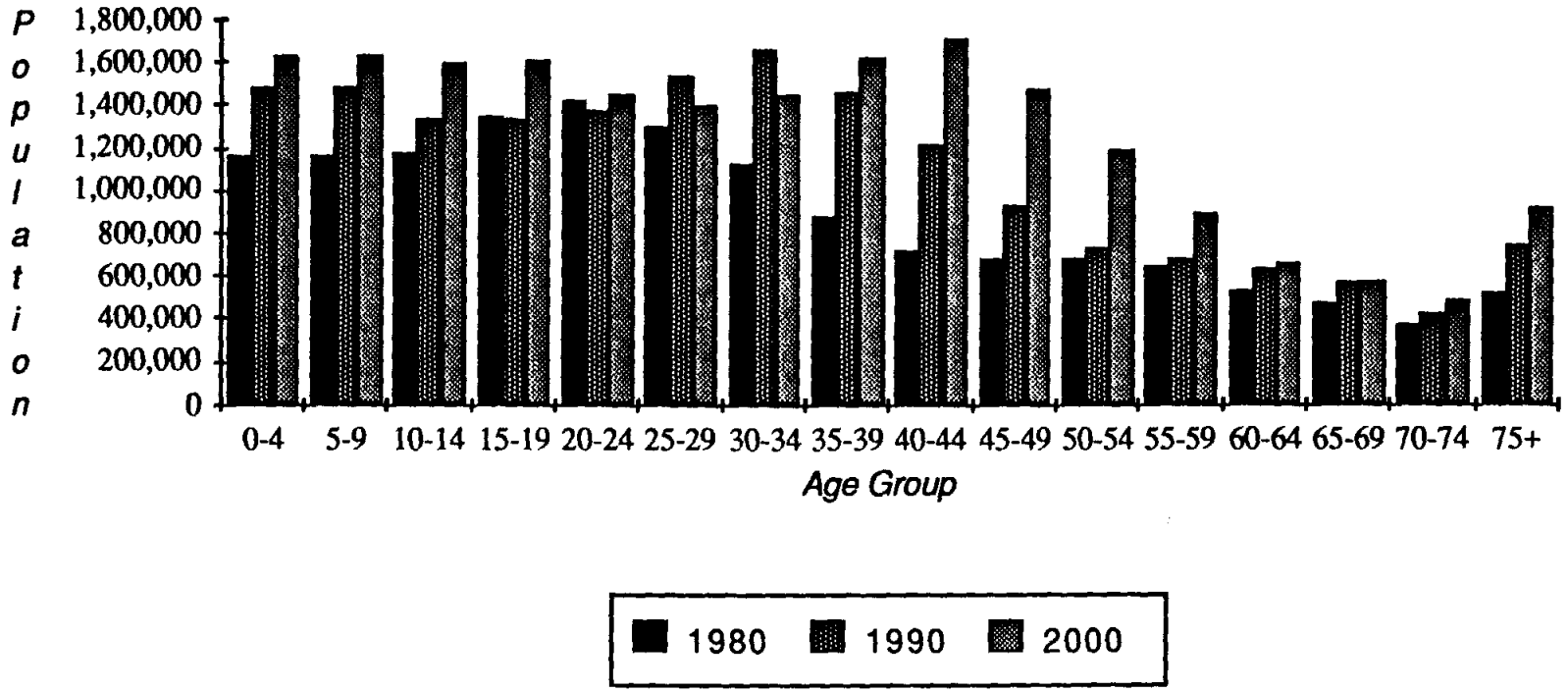


Figure 2 - 2.
McLennan County, Population Projections by Age, 1980 - 2000

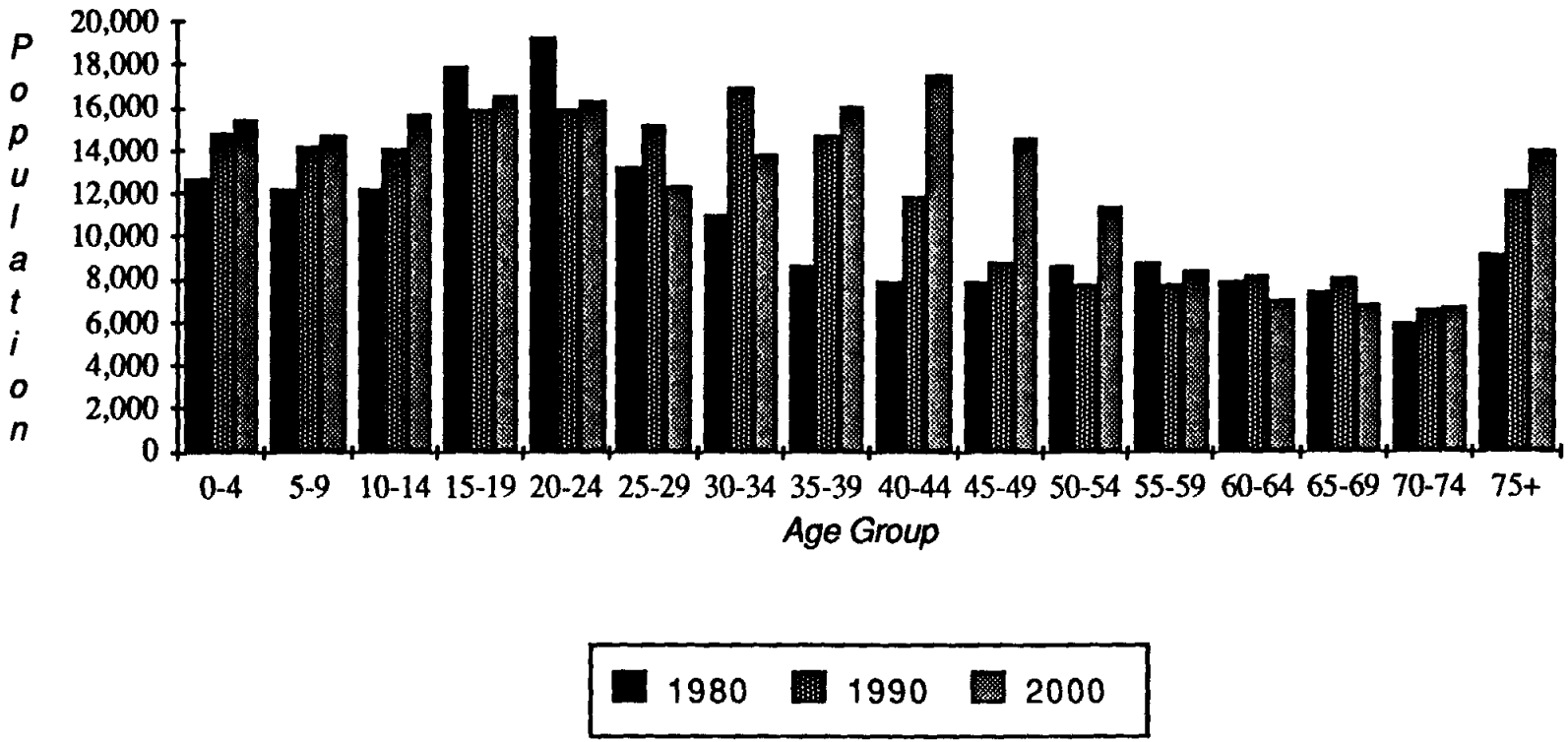
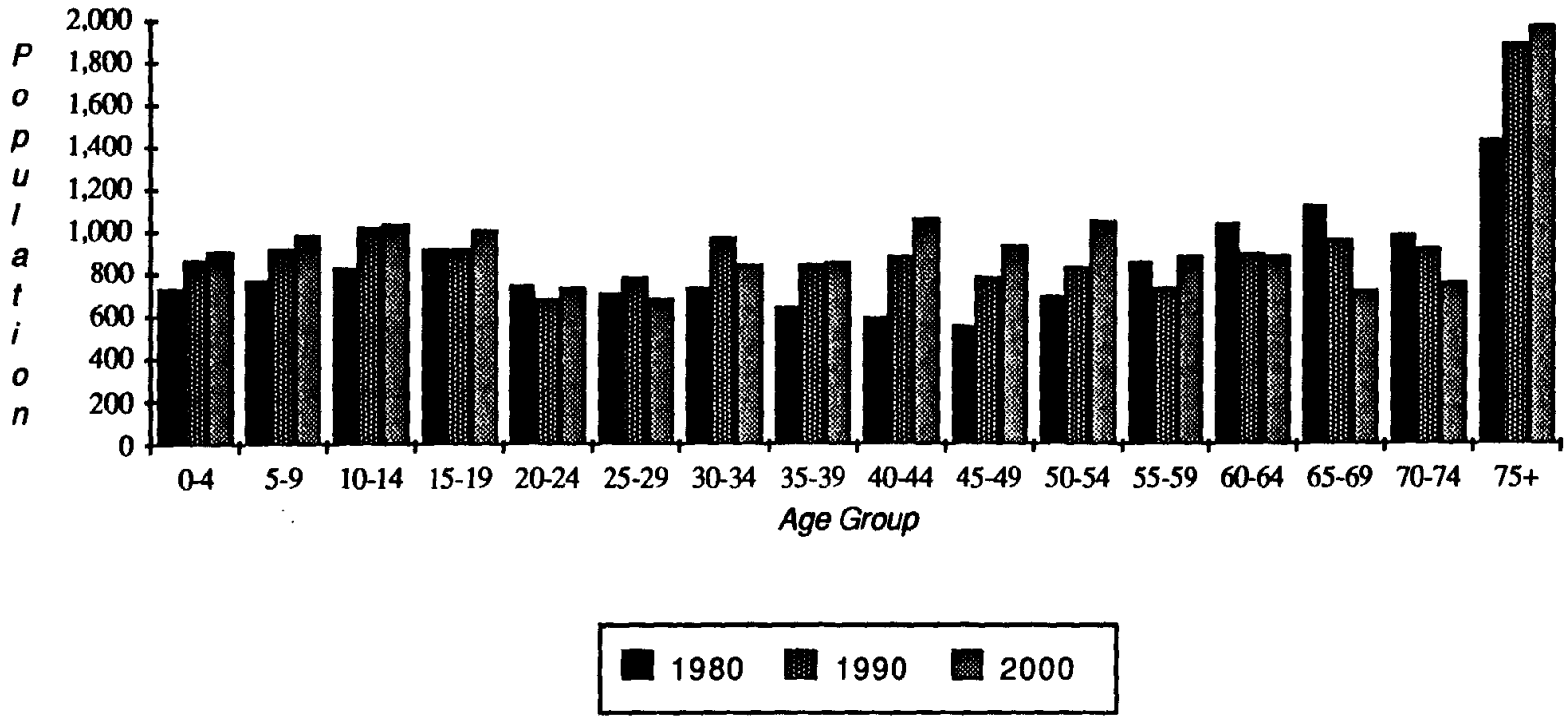


Figure 2 - 3.
Bosque County, Population Projections by Age, 1980 - 2000



population consists of relatively few children, few young adults and few middle-aged adults. The largest age groups are 60 years and older.

2.5 POPULATION PROJECTIONS

2.5.1 Introduction

When screening population projections one must keep in mind that they are the result of starting with a population estimate, a mathematical model of population change, and assumptions for variables such as fertility, mortality, and migration rates; because of this and because the assumptions can be any value, reasonable or unreasonable, likely or unlikely, there are an infinite number of possible population projections (Sierra, 1983). Often models are not always very useful, particularly when formulating projections for small geographical areas or for long time periods. In addition, given any geographical region and past history, a wide range of trends can be justified as reasonable projections, all reflecting satisfactory and professionally acceptable demographic techniques. This is the background against which available projections are judged.

In view of this situation Paul Price Associates has identified a "baseline" or "base-case" projection as the most reasonable or the most likely projection to occur, as well as, provided a range of low, medium and high forecasts. However, when considering a range of forecasts one should not presume that the medium forecast is the most likely to occur or is necessarily the one best used in all circumstances. In the following text analysis five sets of population projections are presented. Each model was scrutinized as to its assumptions, data sources, and methodology. Those population projections are listed below.

The Texas Water Development Board. Projections of Population and Municipal Water Requirements; High and Low Series. 1980 - 2030.

The Texas Department of Health. Population Data System, State Health Planning and Resource Development, Year 2000 projections.

Heart of Texas Council of Governments. 1980 - 2000 projections for counties and cities.

The City of Waco Department of Planning. 1980 - 2000 population projections for McLennan County, Waco, Waco ETJ, and incorporated cities within the Waco ETJ

The Texas Water Development Board's (TWDB) population projections for counties and municipalities extend to year 2030 while the other projections only cover the period from 1980 to 2000. Paul Price Associates has extended each of the "official" projections to the year 2040 (the approximate lifespan of the proposed Bosque Reservoir). Found in the Appendix of this document is the methodology used to extend each projection.

2.5.2 Population Projection Methodology

2.5.2.1 Texas Water Development Board Population Projection

Texas Water Development Board (TWDB) population projections were prepared in 1982 to project future water needs of the State through 2030. United States Bureau of the Census data for 1970 and 1980 was used for base year data. In February 1987 the TWDB revised their population projections at the county level . These figures were disaggregated by Paul Price Associates at the municipal level and incorporated into this report. The revised projections increased total 2040 population projections for McLennan County by 84 and for Bosque County by 4,000.

The population projections were calculated via a modified "cohort-component"[1] approach. In the TWDB model separate birth, death, and migration rates[2] were applied to each cohort (defined by 5 year age groups, sex, and race) for each county. This was done because rates vary according to sex, race, and age.

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[1] A cohort is defined as a group of people within an specified age group who share similar characteristics (sex, race, etc...).

[2] When preparing cohort- component population projections, decisions and assumptions about fertility, mortality, and migration rates are crucial. Rates can be applied in many ways, varying at certain points in time, changing linear over time, varing from cohort to cohort, adjusted at the national level, the state level, the county level, the city level, etc..... Therefore when scrutinizing a projection methodology special attention should be given to the application of these rates.

For example: the death rate for men 30 - 35 years is lower than that for men 60 - 75 years.

In the TWDB projection model, national cohort fertility rates[3] for 1975 - 80 by age and ethnicity were adjusted to account for historical differences between Texas and the United States. Those adjusted Texas fertility rates were then readjusted for each county based on the county's birth data for the decade of the 1970s and then applied to each cohort for the next decade's population projection. The age-specific fertility rates, beginning with year 2000, were reduced through time because it was assumed that future societal and technological changes would decrease fertility rates.

Mortality rates[4] were calculated for each age, ethnic and sex cohort. National death rates from the Bureau of the Census 1969-1971 were adjusted for Texas death rates using historical data. Projected rates of change were adjusted over time to account for the historical trend of decreasing death rates. Deaths from each cohort were summed to get the total county deaths for the projection period.

The overall accuracy of population projections depends heavily upon the accuracy of the projected migration component.[5] The importance of this factor becomes apparent when one considers that over one half of the population growth in Texas between 1970 and 1980 was due to in-migration. To estimate the effect of various county characteristics on the migration rate, least-squares estimators (multiple regression), were incorporated in the TWDB model. Each county migration rate was then converted into a specific cohort migration rate.

By using two different migration rates and keeping all other variables (birth, death, etc...) equal the TWDB population projection model provides two series (a High Series and a Low Series) of

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[3] Fertility rates were defined as the number of live births per 1000 women aged 15-44 in a given year.

[4] Mortality rates were defined as the number of deaths per 1000 people in a given year.

[5] Migration rates are defined as the number of people who move across a specified boundary for the purpose of establishing a new permanent residence.

population projections. The High Series migration rate was based on 1970 - 1980 Texas migration data, as reported in the 1980 Census. The Low Series projections were based on the same vital statistics regarding birth and death rates as used in the High Series projections. However, the migration rate is a weighted average of reported migration into Texas for the three decadel periods 1950-60, 1960-70 and 1970-80.

2.5.2.2 Texas Department of Health Population Projection

Revised in June 1986, the Texas Department of Health (TDH) population projections were prepared for 16 member agencies under the Community Health and Human Services Coordinating Council for the purpose of providing adequate health planning services and computing rates of disease and mortality in Texas.

The population projections were drawn from a modified 5-year cohort demographic model similar to the TWDB model. United States Bureau of the Census data for 1970 and 1980 was used for base year data. Incorporated into the model were adjusted mortality, migration, and fertility rates.

Fertility rates were based on 1980 child to woman ratios by race for the State and applied to year 1990 and 2000 aggregate population projections of women of childbearing years in each county. Mortality rates were prepared for the State by 5-year cohort, by sex and race and applied without adjustment at the county level. Neither rate was adjusted over time. The migration rate used in TDH's projection model was 75% of the 1970-80 State migration rate. The 1981-1990 rate was adjusted to accommodate gradual increase in migration until 1983, after which the rate was slowly decreased to 75% of the 1970-80 rate. Preliminary estimates of 1984 county and state population projections were compared with Census Bureau estimates and adjusted accordingly.

2.5.2.3 Heart of Texas Council of Governments Population Projection

Heart of Texas Council of Governments (HOTCOG) population projections were prepared in 1984 by Dr. Perryman of the Baylor Forecasting Service for HOTCOG and the Texas Commerce Department. The modified demographic cohort projection model used for these population forecasts is similar to that used by TWDB and TDH, except that this model was combined with an econometric model.

Econometric models of population change are predicted upon a presumed relationship between job availability and migration to or from an area. The difference between a combined model and a pure demographic model (such as the TWDB's and TDH's) is that a demographic model assumes migration is constant or varies by a mathematical function, whereas a combined econometric - demographic model computes migration as a varying function of economic needs.

The primary advantage of an econometric projection model over a demographic model is that it relates migration to and from an area to projected availability of employment. However, if the projections are for an area in which a few employers or sectors of the economy provide most of the employment, the population projections will be so sensitive to assumptions about those industries as to make them only slightly useful. Employment and unemployment variables play key roles in econometric projections of population, yet they are controversial and volatile.

The most significant difference between the HOTCOG model and others discussed in this document is the methodology of forecasting migration rates. While the other models used 1970 - 80 migration rates, 1950 - 80 rates, or other adjusted rates, in the HOTCOG model yearly migration rates were adjusted according to county specific economic growth indicators: post office box rentals, utility hookups, the number of building permits issued in a time period, etc... The resulting migration rates were adjusted to correspond with the State migration rate. National unadjusted mortality and fertility rates were applied by cohort, race, and sex.

2.5.2.4 City of Waco's Planning Department Population Projection

Population projections for year 2000 were made for Mclennen County, the area inside the Waco ETJ, the City of Waco, and other cities utilizing straight line projections plus historic trends. The migration rate for 1980 - 1984 as reported by the U.S. Bureau of the Census was used. Fertility and mortality rates were considered.

2.6 Population Projection Results

Counties

Table 2 - 4 shows 1980 - 2040 TWDB population projections for the State and Bosque and McLennan Counties. Table 2 - 5 displays the four agency population projections for Bosque County and McLennan County. Texas Department of Health (TDH), the City of Waco's Planning Department (WPD) and Heart of Texas Council of Governments (HOTCOG) projections were extended beyond year 2000 to 2040 by Paul Price Associates. TWDB projections were extended from year 2030 to 2040. Excluding HOTCOG population projections for McLennan County, extensions were calculated by applying the average decadel growth rate for the agency reported time period (1970 - 2000) to each successive decade. The average decadel growth rate for HOTCOG projections 1970-2000 was 22% for McLennan County, a growth rate considered too high to continue out to 2040. Therefore, the projected HOTCOG growth rate from 1990-2000 of 17% was chosen. Extensions to 2040 for TWDB projections were prepared by applying the 2020 - 2030 growth rate to the 2030 projected base population. A more detailed description of the extension methodology is provided in the Appendix.

Figure 2 - 4 and Figure 2 - 5 illustrate the discrepancies between the projected population figures found in Table 2 - 5. As shown, HOTCOG's population projections for 2040 of 458,540 and 39,003 for McLennan and Bosque County, respectively, are much higher than the other projections. Texas Water Development Board's Low Series population projections are the lowest for both counties, while TDH, TWDB High Series and the City of Waco's Planning Department projections are all lower than HOTCOG projections but higher than TWDB Low Series projections. TWDB Low Series projections show 2040 population in McLennan County at 239,559 and in Bosque County at 24,045.

Municipalities

Table 2 - 6 lists TWDB High and Low series population projections and the percent change from 1980 to 2040 for subject municipalities. Projections for McLennan County WCID # 2 were prepared by Paul Price Associates. Table 2 - 7 lists the City of Waco's population projections for McLennan County, the City of Waco and incorporated places in Waco's ETJ. Figures 2 - 6 through 2 - 10 graph the City of Waco and TWDB's population projections for Bellmead, Hewitt, Lacy-lakeview, Waco and Woodway.

As shown in Table 2 - 6, the range between projected TWDB High and Low series 1980 - 2040 population growth rates is large. The High series projections show four municipalities (Bellmead, Clifton, Meridian and Woodway) more than doubling their populations and three communities increasing their populations by over one-half. The TWDB Low series projections show only one community (Woodway) doubling its population, three community populations increasing by more than one-half and four communities increasing by less than one-half. In both projection series Woodway is the fastest growing community and Elm Mott the slowest. In both projection series growth rates for Bellmead, Woodway, Clifton and Meridian are among the highest. In accord with area historical trends, communities in the City of Waco's ETJ are projected to grow faster than the City of Waco.

Table 2 - 7 lists City of Waco population projections to year 2000 for Waco and communities in its ETJ. Projections to year 2040 are extrapolations of the planning department's official projections. The historical trend of communities in City of Waco's ETJ growing faster than the City is projected to continue. The fastest growing communities are Hewitt and Woodway.

Figures 2 - 6 through 2 - 10 compare 1980 through 2040 TWDB and City of Waco Planning Department (WPD) population projections for Bellmead, Hewitt, Lacy-Lakeview, Waco and Woodway. Generally, the TWDB High Series projections are the highest, the TWDB Low Series occupy the middle range, and the WPD projections are the lowest. The largest discrepancy between projections occurs with

Table 2-4 Texas Water Development Board State and County Populaton Projections, 1980 - 2040							
	1980 Population	1990 Projected Population	2000 Projected Population	2010 Projected Population	2020 Projected Population	2030 Projected Population	2040* Projected Population
State & Counties							
Texas							
High Series (in millions)	14.2	17.8	21.2	24.8	29.1	34.3	40.4
Low Series (in millions)	14.2	16.8	19.6	22.3	25.1	28.3	31.9
Mclennan County							
Revised High Case	170,755	200,412	208,117	219,587	240,264	262,889	287,645
Revised Low Case	170,755	190,790	194,846	198,243	206,793	222,574	239,559
Bosque County							
Revised High Case	13,401	15,633	19,790	22,015	24,489	27,332	30,505
Revised Low Case	13,401	15,175	16,653	18,275	20,032	21,947	24,045

Source: Texas Water Development Board population projections 2/1987. 2040 projections by Paul Price Associates, Inc.

Table 2-5 Population Projection Comparison

POPULATION ESTIMATES AND PROJECTIONS	1970	1980	% Chng. 1970-80	1990	2000	% Chng. 1990-2000	Avg. Decadel % Chng. 1970-2000
MCLENNAN COUNTY							
Texas Department of Health	147,553	170,755	16%	192,909	206,936	7%	13%
Texas Water Development Board							
high case	147,553	170,755	16%	200,412	208,117	4%	14%
low case	147,553	170,755	16%	190,790	194,846	2%	11%
Heart of Texas Council of Governments	147,553	170,755	16%	208,755	244,700	17%	22%
Waco Planning Department	147,553	170,755	16%	187,745	204,700	9%	13%
BOSQUE COUNTY							
Texas Department of Health	11,072	13,401	21%	14,918	15,323	3%	13%
Texas Water Development Board							
high case	11,072	13,401	21%	15,633	19,790	27%	26%
low case	11,072	13,401	21%	15,175	16,653	10%	17%
Heart of Texas Council of Governments	11,072	13,401	21%	15,900	18,100	14%	21%

Source:
Texas Department of Health, Texas Water Development Board revised 2/87, Heart of Texas Council of Governments and City of Waco Planning Dept.
Note: All 2040 figures and low case TWDB figures are extrapolations by Paul Price Associates of official population projections.

Table 2-5 Population Projection Comparison (concluded)

POPULATION ESTIMATES AND PROJECTIONS	2010	% Chng. 2000-10	2020	% Chng. 2010-2020	2030 Projected	% Chng. 2020-30	2040	% Chng. 2030-40
MCLENNAN COUNTY								
Texas Department of Health	234,697	13%	266,181	13%	301,890	13%	342,388	13%
Texas Water Development Board								
high case	219,587	6%	240,264	9%	262,889	9%	287,645	9%
low case	198,243	2%	206,793	4%	222,574	8%	239,559	8%
Heart of Texas Council of Governments	286,299	17%	334,970	17%	391,915	17%	458,540	17%
Waco Planning Department	225,068	10%	245,393	9%	269,810	10%	296,656	10%
BOSQUE COUNTY								
Texas Department of Health	17,284	13%	19,496	13%	21,991	13%	24,806	13%
Texas Water Development Board								
high case	22,015	11%	24,489	11%	27,332	12%	30,505	12%
low case	18,275	10%	20,032	10%	21,947	10%	24,045	10%
Heart of Texas Council of Governments	21,930	21%	26,570	21%	32,191	21%	39,003	21%

Source:
Texas Department of Health (TDH), Texas Water Development Board (TWDB) revised 2/87, Heart of Texas Council of Governments (HOTCOG) and City of Waco Planning Dept (CWP).
Note: All 2040 figures, TDH, HOTCOG, WPD projections past year 2000 and low case TWDB figures are extrapolations by Paul Price Associates, Inc. of official population projections.

Figure 2-4
McLennan County, Population Projection Comparison, 1970-2040

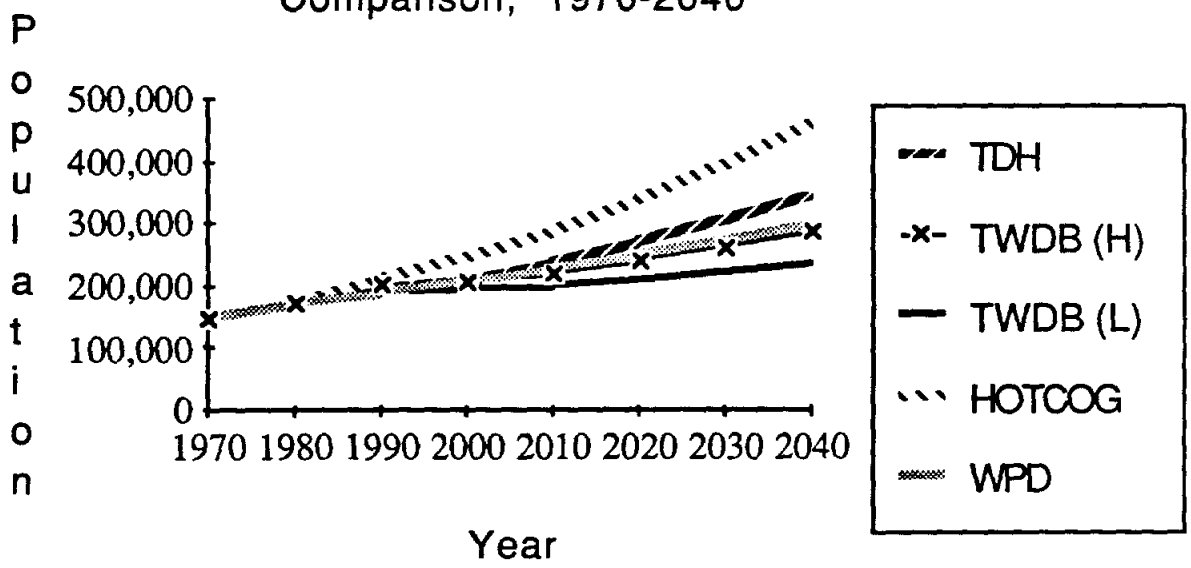
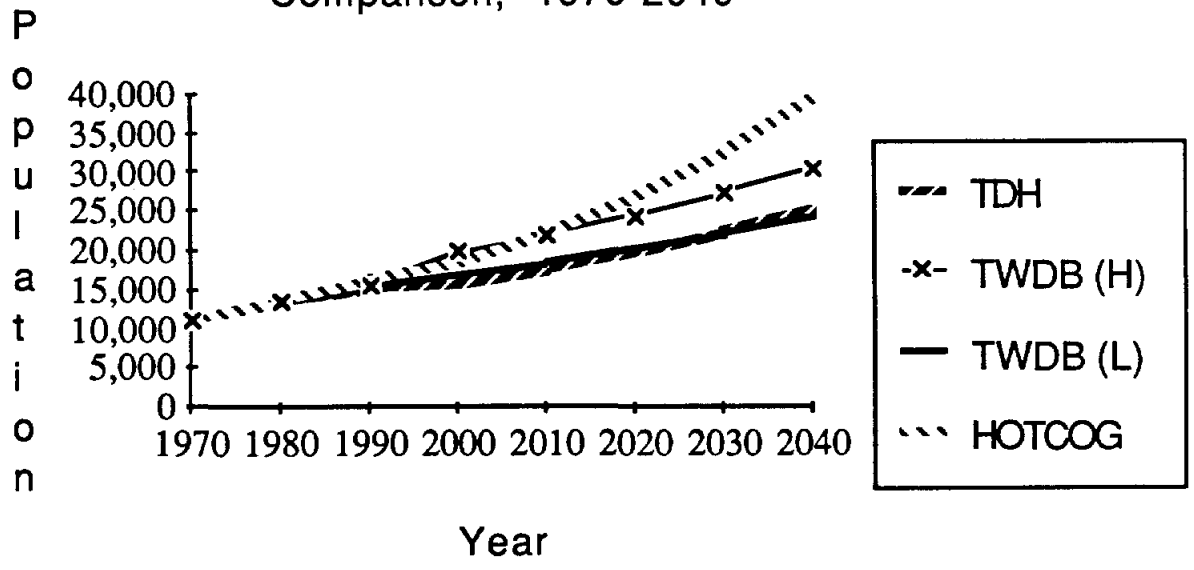


Figure 2-5
Bosque County, Population Projection
Comparison, 1970-2040



Waco and TWDB's population projections for Bellmead, Hewitt, Lacy-lakeview, Waco and Woodway.

As shown in Table 2 - 6, the range between projected TWDB High and Low series 1980 - 2040 population growth rates is large. The High series projections show four municipalities (Bellmead, Clifton, Meridian and Woodway) more than doubling their populations and three communities increasing their populations by over one-half. The TWDB Low series projections show only one community, Woodway, doubling its population, three community populations increasing by more than one-half and four communities increasing by less than one-half. In both projection series Woodway is the fastest growing community and Elm Mott the slowest. In both projection series growth rates for Bellmead, Woodway, Clifton and Meridian are among the highest. In accord with area historical trends, communities in the City of Waco's ETJ are projected to grow faster than the City of Waco.

Table 2 - 7 lists City of Waco population projections to year 2000 for Waco and communities in its ETJ. Projections to year 2040 are extrapolations of the planning department's official projections. The historical trend of communities in City of Waco's ETJ growing faster than the city is projected to continue. The fastest growing communities are Hewitt and Woodway.

Figures 2 - 6 through 2 - 10 compare 1980 through 2040 TWDB and City of Waco Planning Department (WPD) population projections for Bellmead, Hewitt, Lacy-Lakeview, Waco and Woodway. With one exception, TWDB High series projections are the highest, TWDB Low series projections are the lowest, and the Waco Planning Department's projections in the middle range. The largest discrepancies between the projections are for the communities of Hewitt and Bellmead. WPD projections for Hewitt show the community's population increasing at a much greater rate than in either TWDB projection series (see Figure 2 - 7). In contrast both TWDB population projections for Bellmead are considerably higher than WPD's.

Table 2-6 Texas Water Development Board Municipal Population Projections, 1980-2040								
Jurisdiction	1980 Population	1990 Projection	2000 Projection	2010 Projection	2020 Projection	2030 Projection	2040 Projection	% Change 1980-2040
Bellmead								
High Case	7,569	10,766	11,708	12,353	13,517	14,790	16,183	114%
Low Case	7,569	10,249	10,961	11,152	11,634	12,522	13,478	78%
Clifton								
High Case	3,063	3,737	4,793	5,332	5,932	6,620	7,388	141%
Low Case	3,063	3,738	4,244	4,750	5,316	5,971	6,707	119%
Hewitt								
High Case	5,247	6,158	6,395	6,747	7,383	8,078	8,838	68%
Low Case	5,247	5,862	5,987	6,091	6,355	6,839	7,359	40%
Lacy-Lakeview								
High Case	2,752	3,443	3,626	3,826	4,187	4,581	5,012	82%
Low Case	2,752	3,277	3,394	3,454	3,604	3,878	4,173	52%
McLennan County WCID #2 (Elm Mott)* **								
High Case	1,300	1,275	1,286	1,357	1,484	1,624	1,777	37%
Low Case	1,300	1,213	1,203	1,224	1,277	1,375	1,481	14%
Meridian								
High Case	1,330	1,662	2,142	2,383	2,650	2,958	3,303	148%
Low Case	1,330	1,613	1,802	1,978	2,168	2,376	2,604	96%
Waco								
High Case	101,261	114,555	115,909	122,297	133,813	146,413	160,199	58%
Low Case	101,261	109,056	108,518	110,408	115,171	123,961	133,422	32%
Woodway								
High Case	7,091	12,170	14,368	15,160	16,587	18,149	19,858	180%
Low Case	7,091	11,586	13,452	13,686	14,277	15,366	16,539	133%

Source: High Case Population projections by the Texas Water Development Board as of 2/1987.
2040 projections were extended by Paul Price Associates.
NOTE: *** Elm Mott (McLennan County WCID #2) projections are by Paul Price Associates, Inc.
Municipal population projections were derived by Paul Price Associates by disagregating the TWDB county population projections.

Table 2 - 7. City of Waco Population Projections 1980 - 2040

JURISDICTON	1980	2000	Percent Change	Extended Population Projections 2020	2040
McLennan County	170,755	204,700	19.88%	245,393	294,176
Waco and ETJ	147,014	176,400	19.99%	211,660	253,968
City of Waco	101,261	116,400	14.95%	133,802	153,806

INCORPORATED PLACE	1980	2000	Percent Change	Extended Population Projections 2020	2040
Bellmead	7,569	8,010	5.83%	8,477	8,971
Hewitt	5,247	9,470	80.48%	17,092	30,848
Lacy-Lakeview	2,752	2,960	7.56%	3,184	3,424
Waco	101,261	116,380	14.93%	133,756	153,727
Woodway	7,091	9,410	32.70%	12,487	16,571
Other	10,101	13,550	34.15%	18,177	24,383
Subtotal	134,021	159,780	19.22%	190,490	227,102
Total of outside incorporated places and principally within Waco's ETJ	12,993	16,550	27.38%	21,081	26,852
Total ETJ Population	147,014	176,420	20.00%	211,708	254,054

Source:
United States Census 1970 and 1980, Waco Planning Dept., 1981.
Population projection extensions by Paul Price Associates.

Note:
Other incorporated places include the communites of Beverly Hills, Northcrest and Robinson.

Figure 2-6
Bellmead Population Projections 1980-2040

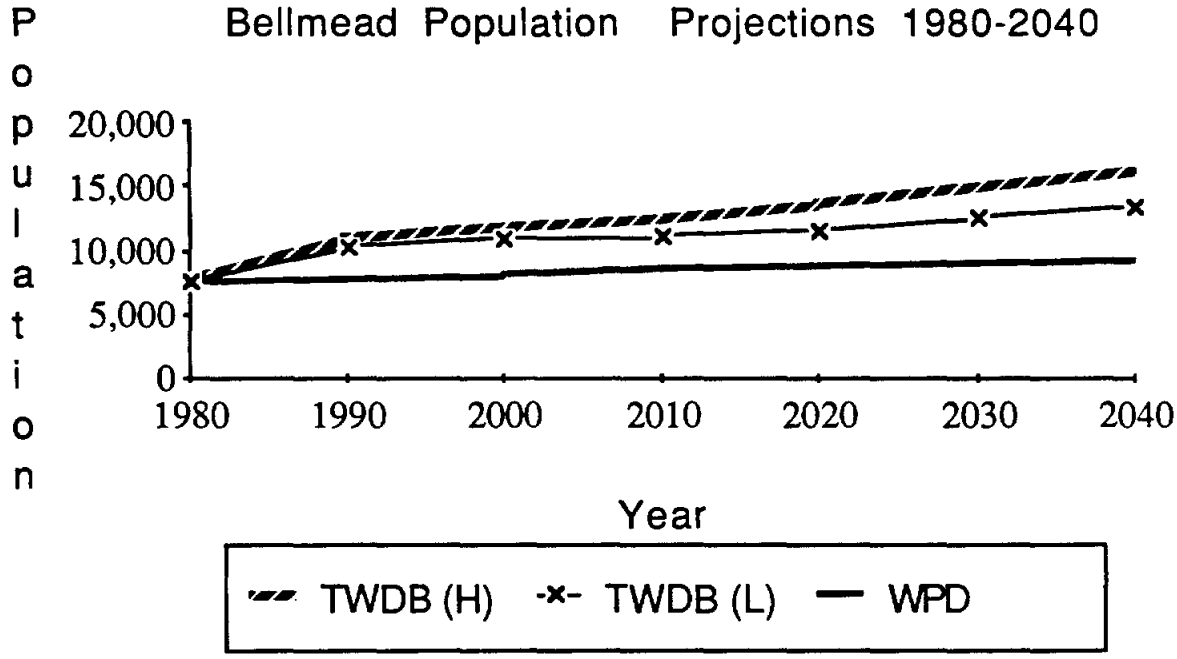


Figure 2-7
Hewitt Population Projections 1980-2040

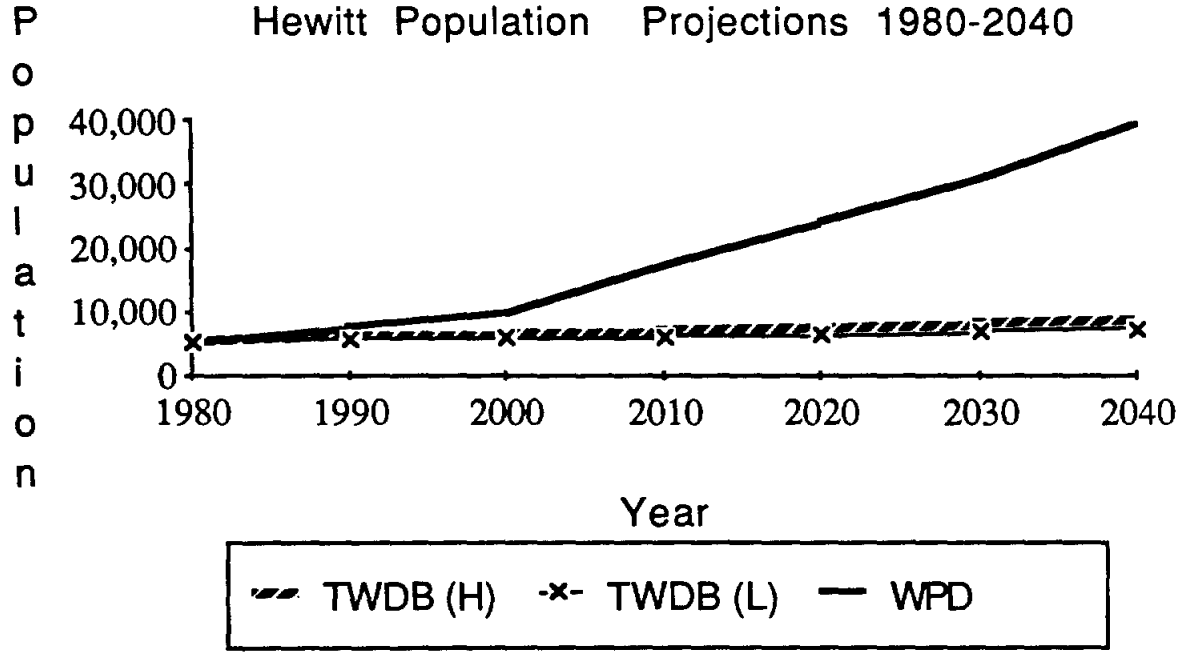


Figure 2-8
Lacy-Lakeview Population Projections 1980-2040

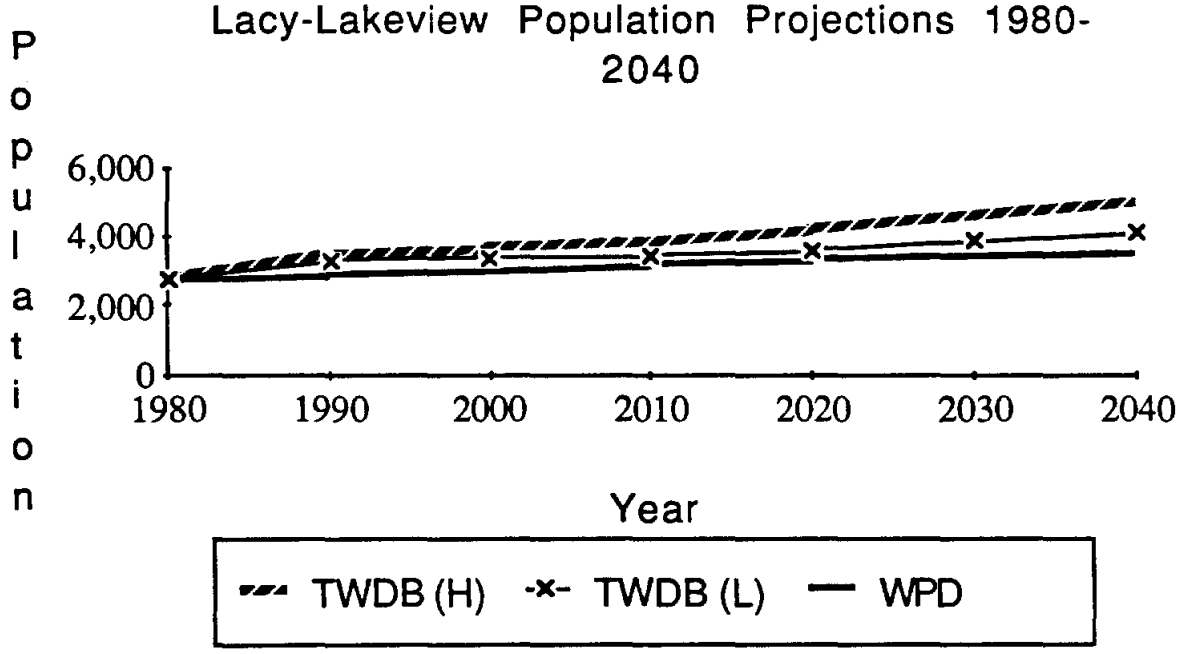


Figure 2-9
The City of Waco Population Projections 1980-2040

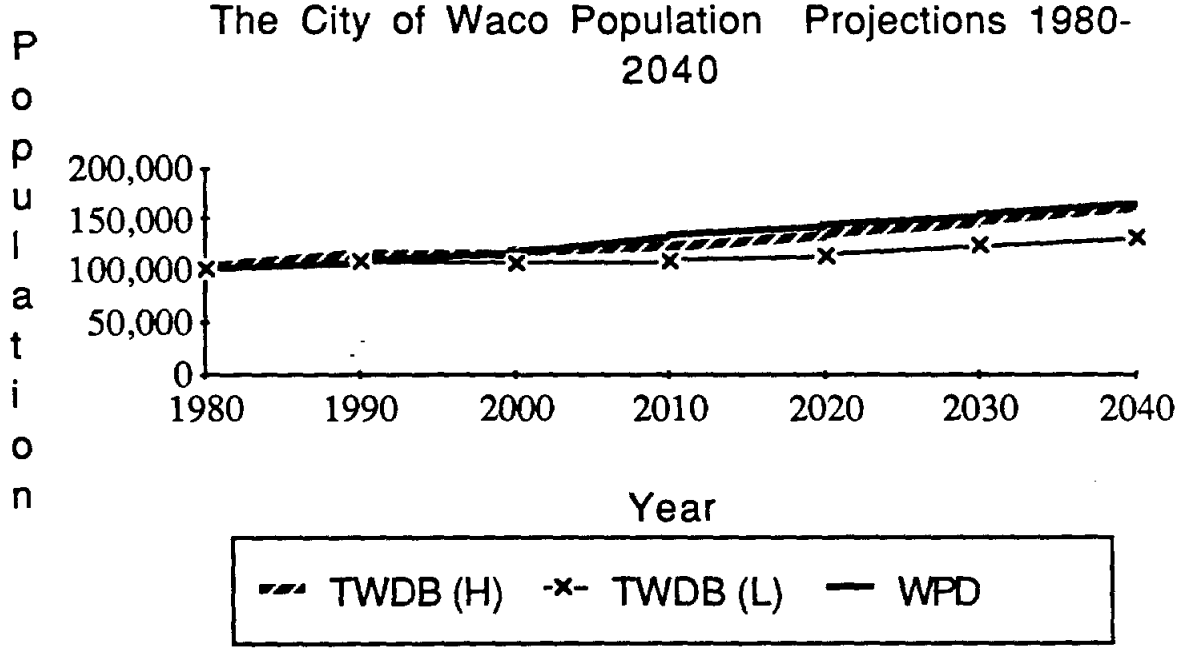
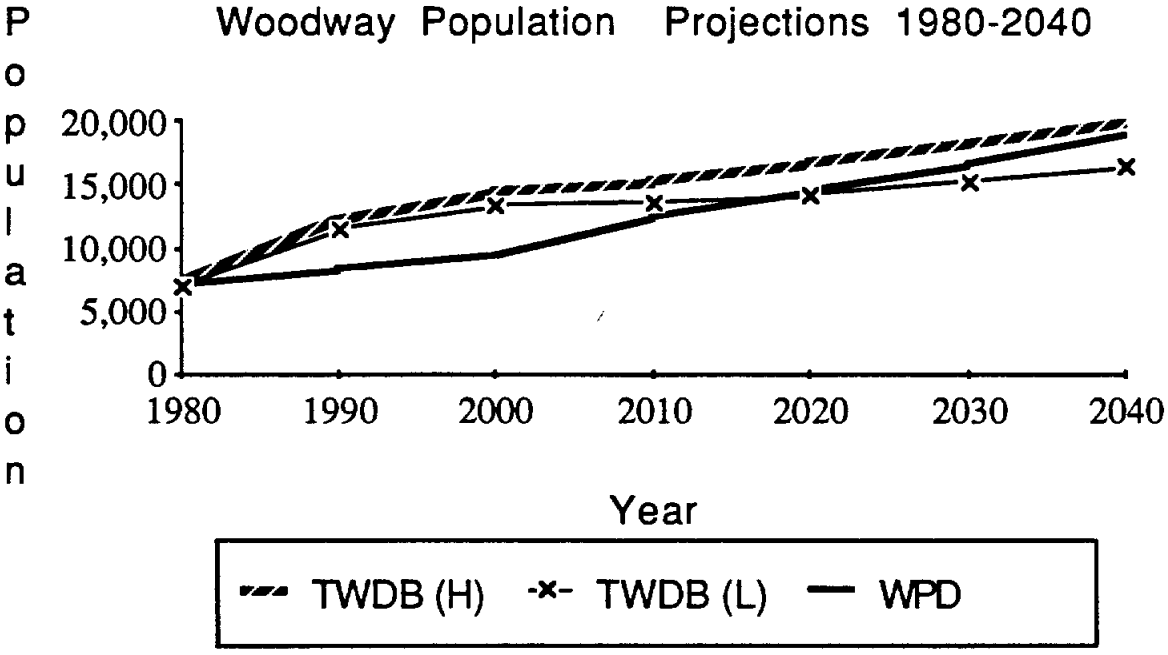


Figure 2-10
Woodway Population Projections 1980-2040



the City of Hewitt. Extended WPD projections place 2040 population at 30,848 (the 1980-2000 WPD projected growth rate of 80.48% was applied to obtain 2040 projections). The TWDB High and Low series project a 2040 Hewitt population of 16,183 and 13,478 respectively (see Figure 2 - 7).

2.7 RECOMMENDED POPULATION PROJECTION

Projections for the near future are generally more reliable than long-term projections. However, the life span of the proposed Lake Bosque Reservoir requires population projections for the far future, 2040. Comparison of different population projections reveals that TWDB projections occupy the bottom and middle range of future county population scenarios. But this does not necessarily mean that TWDB projections are the most accurate. The best method of deciding which projection is most accurate is to scrutinize, as has been done in the preceding text, the methodology and assumptions of each projection model.

The five population methodologies discussed in this document are very similar. Each series of projections is based on a modified demographic projection cohort model, with HOTCOG projections using a combined econometric - demographic model and the City of Waco using straightline projections combined with historic trends.

The most significant difference between the five population projections is the applied migration rate. In each of the methodologies, except for the TWDB Low Series population projection, the migration rate is based on a modified or pure 1970 - 80 migration rate. Texas Department of Health forecasts use a modified 1970 - 80 State migration rate, TWDB High Series projections incorporate the State 1970 - 80 migration rate, the City of Waco uses a 1980 - 84 adjusted migration rate and HOTCOG projections result from a yearly adjusted county based migration rate. The assumption that future migration rates will mirror the 1970's high migration rate results in population projections that are most likely too high.

The TWDB Low Series population projections reflect the result of different assumptions about migration rates. The Low Series projections are based on the same vital statistics regarding birth and death rates as used in the High Series projections; however, the migration rate is a weighted average of reported decadel migration in Texas from 1950 to 1980. The weighted average effectively reduces the impact of the very high rate of migration into Texas in the 1970s, and therefore results in a better long-term population projection.

3.0 ECONOMIC PROFILE

3.1 INTRODUCTION

Described in this section are employment trends in Texas, Bosque and McLennan Counties from 1960 to 1986. Employment was chosen as a growth indicator of the study area's economic activity. Major employment sectors were identified by Standard Industrial Classification codes (SIC) for 1960, 1970, 1980 and 1986. Discussed is the proportional change of employment over time for each industrial sector and the proportion of total employment provided by each sector. Service and export based industrial sectors for 1980 and 1986 were identified as well as the cause and rate of employment growth by sector. In addition, an income distribution analysis of the study area for 1970 and 1980 was conducted.

The Lake Bosque project is within commuting distance from anywhere within the two county study area and could potentially impact any of the area's communities, therefore, analysis of the study area's economy was conducted at the county level and was not targeted at any specific municipality. Other factors influencing the decision to conduct the analysis at the county level were: (1) the participant communities, except for the City of Waco, are small communities with populations ranging from 1,330 to 9,900 and are characterized by small scale economies; (2) the Waco Metropolitan Statistical area includes five of the participant communities in its boundaries and all of McLennan County.

Throughout the analysis Texas was used as a benchmark with which to compare the counties. Employment figures are from the U.S. Bureau of the Census 1960 - 1980 and the Texas Employment Commission Covered Employment and Wages by Industry and County summaries for 1980 - 1986. Income data is from the U.S. Bureau of the Census 1970 - 80. Census SIC codes were aggregated to comply with 1980 - 86 Texas Employment Commission (TEC) classifications. Table 3 - 1 lists those categories; an explanation of those categories follows.

Table 3 - 1

Texas Employment Commission
Standard Industrial Classification Codes

Agriculture, Forestry, Fisheries
Mining
Construction
Manufacturing
Transportation, Communications & Public Utilities (TCP)
Trade(wholesale & retail)
Finance, Insurance & Real Estate (FIRE)
Service Industries
Local and State Government

With the exception of a few categories such as Service Industries and Local and State Government, SIC classifications are fairly straightforward. For example: the category of Agriculture, Forestry and Fisheries includes employment related to crops, livestock, agriculture services, forestry, fishing, hunting and trapping. Service industries include employment in personal services such as dry cleaning, hair salons, restaurant, entertainment, as well as business and professional services (engineering, printing, law, etc..). Local and State Government includes health and education employment as well as traditional government employment.

Due to different collection criteria, Texas Employment Commission (TEC) data for 1980 - 86 does not directly correspond to U. S. Bureau of the Census data for 1980. Census data is drawn from individual survey responses whereas TEC data is collected from employers subject to the Texas Unemployment Compensation Act. TEC data does not account for the self-employed, unpaid family workers and those employed by churches and small nonprofit organizations. Despite those discrepancies it is useful to use both sets of data: Census data provides a historical background which is not readily available through TEC, while TEC data is the most current (as of January 1986, First Quarter).

3.2 HISTORICAL EMPLOYMENT TRENDS

Texas

The 1970s and 1980s was a period of rapid employment and population growth in Texas. From 1960 to 1980 employment in Texas expanded by nearly 60% while the population increased by one-half to 14.2 million. During the 1970s population growth greatly exceeded the national average, 27% for Texas and 11% for the Nation, and employment increased by 52% (see Table 3 - 2). Despite a decline in employment growth during the early 1980s, total state employment from 1980 to January 1986 increased by 17% to a total of 6,543,284 workers (see Table 3 - 3).

As shown in Table 3 - 2 from 1960 - 80 major Texas employment sectors were Manufacturing, Trade, Service and Government. In 1960, according to U.S. Bureau of the Census data, Trade was the single largest employment sector, followed closely by Service and Manufacturing industries. During the 1970s Manufacturing grew faster than Service industries and by 1980 tied with Government as the second largest employment sector. By 1980 nearly 60% of the labor force was employed in Trade, Government and Manufacturing.

As shown in Table 3 - 3 Texas Employment Commission (TEC) estimated 1980 Texas employment at 5,602,405, about 13% or 711,440 fewer jobs than reported by the U.S. Census. TEC data identified Trade as the primary employer (25% of total employment), but differs with Census estimates as to the second, third and fourth largest employment sectors. Manufacturing was listed as the second largest employer followed by Government and then Service.

From 1980 to 1986 total employment in Texas increased by 17%. The three fastest growing employment sectors which also grew faster than the state average for all employment sectors were: Service; Finance, Insurance, & Real Estate (FIRE) and Trade industries. Surprisingly, agricultural

Table 3 - 2. Texas Historic Employment Trends 1960 - 1980

INDUSTRY	TEXAS # Employed 1960	# Employed 1970	%Δ	# Employed 1980	%Δ	% Total Population 1960	1970	1980
Agri., Fisheries, Forestry	291,899	194,635	-33%	187,178	-4%	9%	5%	3%
Mining	100,162	103,075	3%	209,617	103%	3%	2%	3%
Construction	251,938	317,758	26%	545,450	72%	8%	8%	9%
Manufacturing	540,161	765,119	42%	1,129,267	48%	16%	18%	18%
Transp. Comm. & Public Utilities	245,949	286,195	16%	476,436	66%	7%	7%	8%
Trade	703,969	918,693	31%	1,378,408	50%	21%	22%	22%
FIRE	138,230	213,261	54%	377,862	77%	4%	5%	6%
Service & other	627,383	579,537	-8%	809,476	40%	19%	14%	13%
State and Local Gov.	418,812	763,256	82%	1,198,151	57%	13%	18%	19%
Health	73,438	208,892	184%	399,900	91%	2%	5%	6%
Education	182,456	328,564	80%	516,847	57%	5%	8%	8%
Government	162,918	225,800	39%	281,404	25%	5%	5%	4%
Total Employment	3,318,503	4,141,529	25%	6,311,845	52%	100%	100%	100%

Source: U.S. Bureau of the Census, General Social and Economic Caracteristics, 1970, 1980. Tables 123, 178.

Table 3 - 3. Texas Employment Trends 1980 - 86

INDUSTRY	Texas # Employed 1980	Texas # Employed 1986	% Δ	% Total Employment 1980	% Total Employment 1986
Agri., Fisheries, Forestry	56,500	65,201	15%	1%	1%
Mining	219,456	247,799	13%	4%	4%
Construction	416,760	426,312	2%	7%	7%
Manufacturing	1,022,974	974,691	-5%	18%	15%
Transp.Comm. & Pub. Ut.	324,420	354,280	9%	6%	5%
Trade	1,410,800	1,689,822	20%	25%	26%
FIRE	310,881	431,012	39%	6%	7%
Service & Other	881,703	1,238,695	40%	16%	19%
Government	958,911	1,113,109	16%	17%	17%
TOTAL EMPLOYMENT	5,602,405	6,540,921	17%	100%	100%

Source: Texas Employment Commission, Covered Employment and Wages by Industry and County. January, First Quarter 1980, 1986.

employment increased by 15% and Manufacturing was the only sector to lose employment.

TEC reported that for the first quarter of January, 1986, Trade was the largest employment sector in Texas, Service was the second largest, Government was the third largest employer and Manufacturing with 15% of the labor force was ranked fourth.

McLennan County

Similar to Texas, since 1960, major employment sectors in McLennan County have been Manufacturing, Trade and Government. But despite the similarities between McLennan County and the larger Texas economy, population and economic growth in McLennan County never approached the magnitude of Texas' growth.

During the 1960s employment and population growth in McLennan County, as shown in Table 3 - 4, did not reflect the growth that was occurring elsewhere in the State. From 1960 to 1970 total population in Texas increased by almost 17% and the labor force expanded by one-fourth. In McLennan County, population decreased by almost 2% and total employment increased by 8%. However from 1970 to 1980 as the population in Texas nearly tripled and the labor force increased by one-half, McLennan County's slow growth pattern changed; its population increased by 16% and total employment increased by 30%. The early to mid-1980s was a period of moderate growth, as employment in McLennan County increased by 11% while statewide employment increased by 17% (see Table 3 - 5).

As shown in Table 3 - 4, in 1960, 77% of the 52,496 employment force worked in Trade, Manufacturing, Government and Service industries. During the decade of the 1960s total employment grew by 8% as five of the nine industries expanded. The fastest growing sectors were Mining, Government, FIRE and Manufacturing. Four industries lost employment: Agriculture, Construction, Service and

Table 3 - 4 Mclennan County Historic Employment Trends 1960 - 1980

MCLENNAN COUNTY INDUSTRY	# Employed 1960	# Employed 1970	%Δ	# Employed 1980	%Δ	% Total Population 1960	1970	1980
Agri., Fisheries, Forestry	3,025	1,962	-35%	1,471	-25%	6%	3%	2%
Mining	61	156	156%	168	8%	0.1%	0.3%	0.2%
Construction	3,829	3,590	-6%	4,470	25%	7%	6%	6%
Manufacturing	9,759	11,345	16%	15,856	40%	19%	20%	22%
Transp. Comm. & Public Utilities	3,193	3,165	-1%	4,697	48%	6%	6%	6%
Trade	12,100	12,756	5%	16,688	31%	23%	23%	23%
FIRE	2,349	2,806	19%	4,725	68%	4%	5%	6%
Service & other	9,499	8,280	-13%	8,964	8%	18%	15%	12%
State and Local Gov.	8,681	12,499	44%	16,326	31%	17%	22%	22%
Health	2,168	3,673	69%	5,784	57%	4%	6%	8%
Education	3,763	6,120	63%	7,712	26%	7%	11%	11%
Government	2,750	2,706	-2%	2,830	5%	5%	5%	4%
Total Employment	52,496	56,559	8%	73,365	30%	100%	100%	100%

Source: U.S Bureau of the Census, General Social and Economic Characteristics, 1970,1980. Tables 123,178.

Table 3 - 5 Mclennan County Employment Trends 1980 - 86

INDUSTRY	Texas # Employed 1980	Texas # Employed 1986	% Δ	% Total Employment 1980	% Total Employment 1986	Mclennan County # Employed 1980	Mclennan County # Employed 1986	% Δ	% Total Employment 1980	% Total Employment 1986
Agriculture	56,500	65,201	15%	1%	1%	423	520	23%	1%	0.81%
Mining	219,456	247,799	13%	4%	4%	154	144	-6%	0.24%	0.22%
Construction	416,760	426,312	2%	7%	7%	3,769	3,989	6%	6%	6%
Manufacturing	1,022,974	974,691	-5%	18%	15%	16,005	15,799	-1%	25%	25%
Transp.Comm. & Pub. Ut.	324,420	354,280	9%	6%	5%	3,050	3,157	4%	5%	5%
Trade	1,410,800	1,689,822	20%	25%	26%	16,939	18,977	12%	26%	30%
FIRE	310,881	431,012	39%	6%	7%	3,812	4,592	20%	6%	7%
Service & other	881,703	1,238,695	40%	16%	19%	11,224	15,007	34%	17%	23%
Government	958,911	1,113,109	16%	17%	17%	8,772	9,261	6%	14%	14%
TOTAL EMPLOYMENT	5,602,405	6,540,921	17%	100%	100%	64,148	71,446	11%	100%	111%

Source: Texas Employment Commission, Covered Employment and Wages by Industry and County. January, First Quarter 1980, 1986.

Transportation, Communications & Public Utilities (TCP).

In 1970, 65% of the 56,559 labor force were employed in three industrial sectors: Trade, Government and Manufacturing. During the decade of the 1970s total employment grew by 30%. Eight of the nine sectors expanded, four at a faster rate than the county's employment growth rate. The fastest growing sectors were FIRE, Transportation, Communications and Public Utilities, Manufacturing, Government and Trade. Agricultural and Service employment continued to decline.

By 1980 the distribution of employment had changed little since 1970. The same three major industrial sectors, Trade, Manufacturing and Government employed 67% (slightly more than in 1970) of the 73,365 strong labor force. Although FIRE and Transportation, Communications and Public Utilities sectors had the strongest growth rates during the 1970s each had such a small employment base that the impact on total employment was slight.

TEC estimated 1980 total employment for McLennan County at 64,148, about 13% or 9,217 fewer jobs than the U.S. Bureau of the Census estimate. For 1986, total employment was estimated at 71,446, an increase of 11% from 1980. As seen in Table 3 - 5 during the early to mid-1980s Trade was the single largest employment sector, followed by Manufacturing, Service and Government sectors. The fastest growing industrial sectors were Service, Agriculture and FIRE. This was the first time since 1960 that Agriculture gained employment instead of losing it. For the first time in 26 years employment in Mining and Manufacturing declined.

Bosque County

The boomtime growth occurring throughout Texas during the 1960s and 1970s occurred later and at a slower pace in Bosque County. During the 1960s Bosque County saw only minute employment and population growth, but from 1970 - 80 the situation changed considerably as population

increased by 22% and total employment by 24% (see Table 3 - 6). But TEC employment estimates for 1980 - 86 show employment in Bosque County decreasing significantly from the 1970s (see Table 3 - 7).

In 1960, as shown in Table 3 - 6, over 60% of the 4,248 labor force in Bosque County was employed in Agriculture, Trade or Service industries. The largest single employment sector was Agriculture, accounting for over 27% of total employment. From 1960 - 70 total employment increased by 2% to a total of 4,333. The fastest growing employment sector was Mining, followed by FIRE, Government and Manufacturing. Although the growth rate for two Mining and FIRE employment was extremely high, the employment base of those sectors was so small that the impact of rapid growth was slight. Of the four sectors which lost employment: Agriculture; Service; Transportation, Communications and Public Utilities (TCP) and Trade, all but TCP employed a significant proportion of the labor force.

In 1970 major employment sectors in Bosque County were Manufacturing, Trade, Government and Agriculture. In direct response to the rapid population expansion during the 1970s all but two (Mining and Agriculture) of the nine employment sectors experienced growth. The fastest growing industrial sectors (although not the largest employers) were those dealing with the immediate needs of a quickly growing population: Construction; Transportation, Communications & Public Utilities (TCP); and Government. The other expanding sectors were FIRE, Trade and Manufacturing. From 1970 - 80 total county employment increased by 24% to a total of 5,378.

TEC estimates for 1980 place Bosque County's labor force at 3,040, about 2,338 or 43% less than the U.S. Bureau of the Census estimate. As shown in Table 3 - 7 major employers were Manufacturing , Government, Trade and Service. Agriculture accounted for only 4% of total employment. From 1980 - 86 total employment increased by 4% to a total of 3,168. Four of the sectors experienced growth and three lost employment. Construction was the fastest growing sector, with a growth rate of 135% , followed by FIRE and Trade. Both Service and Agriculture employment increased by 6%. Of the three sectors which lost employment, Government with a decrease of 25% was the hardest hit,

Table 3 - 6 Bosque County, Historic Employment Trends, 1960 - 1980

INDUSTRY	# Employed 1960	# Employed 1970	%Δ	# Employed 1980	%Δ	% Total Population 1960	1970	1980
Agrl., Fisheries, Forestry	1,166	686	-41%	578	-16%	27%	16%	11%
Mining	22	62	182%	31	-50%	1%	1%	1%
Construction	387	440	14%	700	59%	9%	10%	13%
Manufacturing	519	876	69%	1,071	22%	12%	20%	20%
Transp.Comm. & Pub. Ut.	267	222	-17%	356	60%	6%	5%	7%
Trade	757	748	-1%	927	24%	18%	17%	17%
FIRE	91	182	100%	252	38%	2%	4%	5%
Service & other	644	438	-32%	479	9%	15%	10%	9%
State and Local Gov.	395	679	72%	984	45%	9%	16%	18%
Health	66	320	385%	456	43%	2%	7%	8%
Education	183	181	-1%	369	104%	4%	4%	7%
Government	146	178	22%	159	-11%	3%	4%	3%
Total Employment	4,248	4,333	2%	5,378	24%	100%	100%	100%

Source: U.S Bureau of the Census, General Social and Economic Characteristics, 1970,1980. Tables 123,178.

Table 3 - 7 Bosque County Employment Trends 1980 - 86

INDUSTRY	Texas # Employed 1980	Texas # Employed 1986	% Δ	% Total Employment 1980	% Total Employment 1986	Bosque County # Employed 1980	Bosque County # Employed 1986	% Δ	% Total Employment 1980	% Total Employment 1986
Agri., Fisheries, Forestry	56,500	65,201	15%	1%	1%	126	133	6%	4%	4%
Mining	219,456	247,799	13%	4%	4%	NA	8	NA	NA	0%
Construction	416,760	426,312	2%	7%	7%	40	94	135%	1%	3%
Manufacturing	1,022,974	974,691	-5%	18%	15%	814	650	-20%	27%	21%
Transp.Comm. & Pub. Ut.	324,420	354,280	9%	6%	5%	130	121	-7%	4%	4%
Trade	1,410,800	1,689,822	20%	25%	26%	628	923	47%	21%	29%
FIRE	310,881	431,012	39%	6%	7%	103	166	61%	3%	5%
Service & Other	881,703	1,238,695	40%	16%	19%	562	595	6%	18%	19%
Government	958,911	1,113,109	16%	17%	17%	637	478	-25%	21%	15%
TOTAL EMPLOYMENT	5,602,405	6,540,921	17%	100%	100%	3040	3168	4%	100%	100%

Source: Texas Employment Commission, Covered Employment and Wages by Industry and County. January, First Quarter 1980, 1986.

Manufacturing following closely losing 20% of its employees, while Transportation, Communications and Public Utilities employment declined by 7% .

3.3 SHIFT SHARE ANALYSIS

3.3.1 Introduction

Shift-share analysis is an economic tool which analyzes the development of individual employment sectors over time. Employment growth is usually due to growth in an industry at large or because of forces that are particular to the region. The benefit of this analysis technique is that the cause and rate of employment growth (relative to some benchmark economy) can be determined. Tables 3 - 8, 3 - 9, 3 - 10 and 3 - 11 display 1970 - 80 and 1980 - 86 shift-share analyses for Bosque and McLennan Counties. Tables 3 - 8, 3 - 10 incorporate U. S. Bureau of the Census employment data by industrial sector for 1970 and 1980. Tables 3 - 9, 3 - 11 incorporate 1980 and 1986 TEC employment data. Texas was used as the benchmark economy.

3.3.2 Methodology

In the following shift-share tables the numbers in the column labeled "Share" represent the hypothetical employment that would have occurred in the industry if the industry had grown at the same rate as the Texas economy at large. The column labeled "Total Shift" is the difference between the hypothetical employment (if the industry had grown at the State average growth rate) and actual employment. Positive values indicate employment growth that is faster than the state's average; a negative value indicates growth which is slower.

The columns labeled "Industrial Shift" and "Regional Shift" are subcategories of the Total Shift column. Positive values in the Industrial Shift column indicate industrial sectors which grew faster than the state average for all industry and therefore gained employment at the expense of other industries. This column indicates the proportion of slow and fast growth industries located in the study area. Positive values in the Regional Shift column indicate a local industry that grew faster than the average for that same

industry at the regional level (in this case Texas) and therefore is drawing resources and labor from other regions into the study area. This signifies that the locality in which the industry is located is providing some sort of comparative advantage to that industry that is not found in other areas. That comparative advantage might consist of better access to markets, raw resources or skilled labor, etc...

3.3.3 Shift Share Analysis Results

McLennan County

As shown in Table 3 - 8, from 1970 to 1980 four of the fifteen industrial sectors in McLennan County grew at a faster rate than the average state industrial growth rate. Those industries were FIRE, Business & Repair, Entertainment & Recreation, and Health. The remaining industrial sectors grew slower than the average state industrial growth rate.

The reason those four industries grew faster than the average state industrial growth rate was that the whole industry at the state level was growing and not because McLennan County provided a unique comparative advantage to the industry. In short, growth in FIRE, Business & Repair, Entertainment & Recreation, and Health industries in McLennan County was matched by growth in the same industries throughout the state and not caused by anything unique to McLennan County. In fact, there were no industries for which McLennan County provided a comparative advantage.

As shown in Table 3 - 9, from 1980 - 86 only three of the nine industrial sectors, Agriculture, FIRE and Service grew faster than the state average. Growth in McLennan County's Agriculture industries was not caused by growth in the industry at the state level but because of comparative advantages found in the local region. Growth in FIRE and Service industries was caused by growth at the state industry level and not by any local comparative advantage.

Table 3 - 8 Shift-Share Analysis, Mclennan County 1970-1980

INDUSTRY	Texas # Employed 1970	Texas # Employed 1980	Mclennan County # Employed 1970	Mclennan County # Employed 1980	Absolute change	Share	Total Shift	Industrial Shift	Regional Shift
Agri., Fisheries, Forestry	194,635	187,178	1,962	1,471	-491	1,028	-1,519	-1,103	-416
Mining	103,075	209,617	156	168	12	82	-70	79	-149
Construction	317,758	545,450	3,590	4,470	880	1,881	-1,003	689	-1,692
Manufacturing	765,119	1,129,267	11,345	15,856	4,511	5,945	-1,440	-551	-888
Transp.Comm. & Pub. Ut.	286,195	476,436	3,165	4,697	1,532	1,659	-128	444	-572
Trade	918,693	1,378,408	12,756	16,688	3,932	6,685	-2,759	-308	-2,451
FIRE	213,261	377,862	2,806	4,725	1,919	1,470	447	694	-247
Service & other*	579,537	809,476	8,280	8,964	684	4,339	-3,659	-1,058	-2,601
Business & Repair	135,195	294,238	1,554	2,852	1,298	814	483	1,013	-530
Entertainment & Rec.	29,393	49,117	392	601	209	205	3	57	-54
Professional	658,804	1,172,129	1,265	955	-310	663	-974	322	-1,296
State and Local Gov.	763,256	1,198,151	12,499	16,326	3,827	6,550	-2,729	566	-3,295
health	208,892	399,900	3,673	5,784	2,111	1,925	184	1,432	-1,248
education	328,564	516,847	6,120	7,712	1,592	3,207	-1,618	297	-1,915
government	225,800	281,404	2,706	2,830	124	1,418	-1,295	-753	-542
Total Employment	4,141,529	6,311,845	56,559	73,365	16,806	29,639	-12,860	-27	-12,833

Source: U.S Bureau of the Census, General Social and Economic Characteristics, 1970,1980. Tables 123,178.

Table 3 - 9 Shift-Share Analysis, Mclennan County, 1980 - 1986

INDUSTRY	Texas # Employed 1980	Texas # Employed 1986	Mclennan County # Employed 1980	Mclennan County # Employed 1986	Absolute change	Share	Total Shift	Industrial Shift	Regional Shift
Agriculture	56,500	65,201	423	520	97	71	26	-6	32
Mining	219,456	247,799	154	144	-10	26	-36	-6	-30
Construction	416,760	426,312	3,769	3,989	220	631	-411	-545	134
Manufacturing	1,022,974	974,691	16,005	15,799	-206	2,681	-2,887	-3,437	549
Transp. Comm. & Public Utilities	324,420	354,280	3,050	3,157	107	511	-404	-230	-174
Trade	1,410,800	1,689,822	16,939	18,977	2,038	2,838	-800	512	-1,312
FIRE	310,881	431,012	3,812	4,592	780	639	141	834	-693
Service & Other	881,703	1,238,695	11,224	15,007	3,783	1,880	1,903	2,664	-761
Government	958,911	1,113,109	8,772	9,261	489	1,469	-980	-59	-922
TOTAL EMPLOYMENT	5,602,405	6,540,921	64,148	71,446	7,298	10,746	-3,448	0	-3,448

Source: Texas Employment Commission, Covered Employment and Wages by Industry and County. January, First Quarter 1980, 1986.

Table 3 - 11 Shift-Share Analysis, Bosque County, 1980 -86

INDUSTRY	Texas # Employed		Bosque County # Employed		Absolute change	Share	Total Shift	Industrial Shift	Regional Shift
	1980	1986	1980	1986					
Agri., Fisheries, Forestry	56,500	65,201	126	133	7	21	-14	-2	-12
Mining	219,456	247,799	NA	8	NA	NA	NA	NA	NA
Construction	416,760	426,312	40	94	54	7	47	-6	53
Manufacturing	1,022,974	974,691	814	650	-164	136	-300	-175	-126
Transp. Comm. & Public Utilitie	324,420	354,280	130	121	-9	22	-31	-10	-21
Trade	1,410,800	1,689,822	628	923	295	105	190	19	171
FIRE	310,881	431,012	103	166	63	17	46	23	23
Service & Other	881,703	1,238,695	562	595	33	94	-61	133	-195
Government	958,911	1,113,109	637	478	-159	107	-266	-4	-261
TOTAL EMPLOYMENT	5,602,405	6,540,921	3,040	3,168	128	509	-381	0	-381

Source: Texas Employment Commission, Covered Employment and Wages by Industry and County. January, First Quarter 1980, 1986.

Table 3 -10 Shift-Share Analysis, Bosque County 1970-1980

INDUSTRY	Texas # Employed 1970	Texas # Employed 1980	Bosque County # Employed 1970	Bosque County # Employed 1980	Absolute change	Share	Total Shift	Industrial Shift	Regional Shift
Agri., Fisheries, Forestry	194,635	187,178	686	578	-108	360	-468	-386	-82
Mining	103,075	209,617	62	31	-31	33	-64	32	-95
Construction	317,758	545,450	440	700	260	231	29	84	-55
Manufacturing	765,119	1,129,267	876	1,071	195	459	-264	-43	-222
Transp.Comm. & Pub. Ut.	286,195	476,436	222	356	134	116	18	31	-14
Trade	918,693	1,378,408	748	927	179	392	-213	-18	-195
FIRE	213,261	379,862	182	252	70	95	-25	47	-72
Service & other*	579,537	809,476	438	479	41	230	-189	-56	-133
Business & Repair	135,195	294,238	104	134	30	55	-25	68	-92
Entertainment & Rec.	29,393	49,117	33	16	-17	17	-34	5	-39
Professional	658,804	1,172,129	46	40	-6	24	-30	12	-42
State and Local Gov.	763,256	1,198,151	679	984	305	356	-51	31	-82
health	208,892	399,900	320	456	136	168	-32	125	-157
education	328,564	516,847	181	369	188	95	93	9	84
government	225,800	281,404	178	159	-19	93	-112	-50	-63
Total Employment	4,141,529	6,313,845	4,333	5,378	1,045	2,273	-1,228	0	-1,228

Source: U.S Bureau of the Census, General Social and Economic Characteristics, 1970,1980. Tables 123,178.

Table 3 - 11 Shift-Share Analysis, Bosque County, 1980 -86

INDUSTRY	Texas # Employed		Bosque County # Employed		Absolute change	Share	Total Shift	Industrial Shift	Regional Shift
	1980	1986	1980	1986					
Agri., Fisheries, Forestry	56,500	65,201	126	133	7	21	-14	-2	-12
Mining	219,456	247,799	NA	8	NA	NA	NA	NA	NA
Construction	416,760	426,312	40	94	54	7	47	-6	53
Manufacturing	1,022,974	974,691	814	650	-164	136	-300	-175	-126
Transp. Comm. & Public Utilitie	324,420	354,280	130	121	-9	22	-31	-10	-21
Trade	1,410,800	1,689,822	628	923	295	105	190	19	171
FIRE	310,881	431,012	103	166	63	17	46	23	23
Service & Other	881,703	1,238,695	562	595	33	94	-61	133	-195
Government	958,911	1,113,109	637	478	-159	107	-266	-4	-261
TOTAL EMPLOYMENT	5,602,405	6,540,921	3,040	3,168	128	509	-381	0	-381

Source: Texas Employment Commission, Covered Employment and Wages by Industry and County. January, First Quarter 1980, 1986.

Bosque County

In Bosque County, from 1970 - 80, employment in three of the fifteen industrial sectors increased faster than the state average, those industries were Construction, Transportation, Communications and Public Utilities (TCP), and Education (see Table 3 - 10). The remaining sectors grew slower than the state average. Growth in Construction and TCP industries was caused by industrial growth at the state level and was not the result of any regional advantage offered by Bosque County. Growth in the Education sector was caused primarily by local comparative advantages as well as by growth in the industry at the state level.

From 1980 - 86 three industries in Bosque County grew faster than the state average (see Table 3 - 11). They were Construction, Trade and FIRE. The remaining industries did not grow as quickly as the state average. Growth that occurred in Construction was not due to state wide industry expansion but rather to local comparative advantages found in the county. Growth in Trade and FIRE industries was caused by both statewide expansion in the industries and by comparative advantages found in the county.

3.4 ECONOMIC BASE ANALYSIS

3.4.1 Introduction

To analyze the economic base of the subject study area, the economy, in terms of employment, was classified into its basic (export) and nonbasic (service) components for two points in time, 1980 and 1986. U. S. Bureau of the Census 1980 employment data for nine major and six minor industrial sectors was used, as well as, Texas Employment Commission January 1986 employment data for nine industrial sectors. The results are shown in Tables 3 - 12, 3 - 13, 3 - 14 and 3 - 15.

Table 3 - 12 Location Quotients, Mclennan County, 1980

INDUSTRY	Texas Employment 1980	Mclennan Co. Employment 1980	Location Quotient	Employment Breakdown Service (#)	%	Basic (#)	%
Agri., Fisheries, Forestry	187,178	1,471	0.676	Service	100%	*	0%
Mining	209,617	168	0.069	Service	100%	*	0%
Construction	545,450	4,470	0.705	Service	100%	*	0%
Manufacturing	1,129,267	15,856	1.208	13,126	83%	2,730	17%
Transp. Comm. & Public Utilities	476,436	4,697	0.848	Service	100%	*	0%
Trade	1,378,408	16,688	1.042	16,022	96%	666	4%
FIRE	377,862	4,725	1.076	4,392	93%	333	7%
Service & Other	1,726,223	8,964	0.447	Service	100%	*	0%
Business & Repair	294,238	2,852	0.834	Service	100%	*	0%
Entertainment & Recreation	49,117	601	1.053	571	95%	30	5%
Professional	131,342	955	0.626	Service	100%	*	0%
State and Local Government	1,198,151	16,326	1.172	13,927	85%	2,399	15%
Health	399,900	5,784	1.244	4,648	80%	1,136	20%
Education	516,847	7,712	1.284	6,008	78%	1,704	22%
Government	281,404	2,830	0.865	Service	100%	*	0%
TOTAL EMPLOYMENT	6,311,845	73,365					

Source: U.S Bureau of the Census, General Social and Economic Characteristics, 1970,1980. Tables 123,178.

* Subcategory values are included in main category.

Table 3 - 13 Location Quotients, Mclennan County, 1986

INDUSTRY	Texas Employment 1986	Mclennan Co. Employment 1986	Location Quotient	Employment Breakdown			
				Service	%	Basic	%
Agriculture	65201	520	0.730	Service	100%	*	0%
Mining	247799	144	0.053	Service	100%	*	0%
Construction	426312	3989	0.857	Service	100%	*	0%
Manufacturing	974691	15799	1.484	10,646	67%	5,153	33%
Transp. Comm. & Public Utilites	354280	3157	0.816	Service	100%	*	0%
Trade	1689822	18977	1.028	18,458	97%	519	3%
FIRE	431012	4592	0.975	Service	100%	*	0%
Service & Other	1238695	15007	1.109	13,530	90%	1,477	10%
State and Local Government	1113109	9261	0.762	Service	100%	*	0%
TOTAL EMPLOYMENT	6,540,921	71,446					

Source: Texas Employment Commission, January, First Quarter 1986.

Table 3 - 14 Location Quotients, Bosque County, 1980

INDUSTRY	Texas Employment 1980	Bosque Co. Employment 1980	Location Quotient	Employment Breakdown			
				Service (#)	%	Basic (#)	%
Agri., Fisheries, Forestry	187,178	578	3.624	159	28%	419	72%
Mining	209,617	31	0.174	Service	100%	*	0%
Construction	545,450	700	1.506	465	66%	235	34%
Manufacturing	1,129,267	1,071	1.113	962	90%	109	10%
Transp. Comm. & Public Utilities	476,436	356	0.877	Service	100%	*	0%
Trade	1,378,408	927	0.789	Service	100%	*	0%
FIRE	377,862	252	0.783	Service	100%	*	0%
Service & Other	1,726,223	479	0.326	Service	100%	*	0%
Business & Repair	294,238	134	0.534	Service	100%	*	0%
Entertainment & Recreation	49,117	16	0.382	Service	100%	*	0%
Professional	131,342	40	0.357	Service	100%	*	0%
State and Local Government	1,198,151	984	0.964	Service	100%	*	0%
Health	399,900	456	1.338	341	75%	115	25%
Education	516,847	369	0.838	Service	100%	*	0%
Government	281,404	159	0.663	Service	100%	*	0%
TOTAL EMPLOYMENT	6,311,845	5,378					

Source: U.S Bureau of the Census, General Social and Economic Characteristics, 1970,1980. Tables 123,178.

* Subcategory values are included in main category.

Table 3 - 15 Location Quotients, Bosque County, 1986

INDUSTRY	Texas Employment 1986	Bosque Co. Employment 1986	Location Quotient	Employment Breakdown			
				Service (#)	%	Basic (#)	%
Agri., Fisheries, Forestry	65,201	133	4.212	32	24%	101	76%
Mining	247,799	8	0.067	Service	100%	*	0%
Construction	426,312	94	0.455	Service	100%	*	0%
Manufacturing	974,691	650	1.377	472	73%	178	27%
Transp. Comm. & Public Utilites	354,280	121	0.705	Service	100%	*	0%
Trade	1,689,822	923	1.128	818	89%	105	11%
FIRE	431,012	166	0.795	Service	100%	*	0%
Service & Other	1,238,695	595	0.992	Service	100%	*	0%
State and Local Government	1,113,109	478	0.887	Service	100%	*	0%
TOTAL EMPLOYMENT	6,540,921	3,168					

Source: Texas Employment Commission, January, First Quarter 1986.

Basic sectors are growth inducing industries which, through sales to non-local markets, bring new income into the area. Basic sector industries require support services such as business, advertisement and accounting services and thereby benefit the local economy in many ways. Such benefits include employment growth in service sectors and wages spent in the service sector.

For each basic unit of activity, whether measured in dollars or jobs, spin-off employment is created in the Service sector. A "multiplier effect" is created by the ratio of service employment to basic employment. The resulting ratio provides a rough estimate of induced growth or the number of service jobs created by each additional basic job. The service sector is dependent upon the growth of the export sector for expansion. It does not bring income into the region but redistributes income already in the region. The role of the service sector can be described as "city-maintaining", whereas the export or basic sector's role is that of "city-building".

The local economy must export enough goods and services to the rest of the economy to pay for its imports. While the precise ratio may prove difficult to determine, a certain proportion of an area's economic activity and employment must sell goods and services to outside markets. Non-basic activities by definition serve only the local market and are limited by the existing population size. There are only so many hamburgers and houses that can be sold in Bosque County at any given time. The export sector however, sells to outside markets and may expand independently of local growth conditions. Export industries are therefore critically important in determining the overall level of people and jobs that the local economy can support.

When one considers the factors which determine a locality's ability to attract new basic activity, the argument can be made that long term prosperity and maintenance of a viable export base is dependent on the nonbasic services that the locality can offer to prospective entrepreneurs (Watkins, 1980). If this argument is correct, then growth in Service and especially in FIRE industries is of particular

importance to the locality.

Of further importance is the question of "unearned wealth" found in areas impacted by federal spending programs and other interregional transfers of wealth (retirement cities or university towns for example). In such situations "unearned" income, not exports, constitutes the major source of growth. The significance of this point is that the " greater the amount of 'unearned' income flowing into or out of a community, the less applicable is the basic-nonbasic concept" (Blumenfield, 1955).

3.4.2 Methodology

The most direct way of measuring the local export base is to conduct business surveys to determine which sectors sell primarily to outside markets. Because of the expense such information is rarely available; therefore, less direct methods of classifying the basic sectors of the economy must be used. The methodology used in this document consists of a ratio (known as location quotients) between the percent of local industry employment and the percent of state employment in the industry. If the ratio is higher than one, the industry is considered basic, a ratio of one indicates self-sufficiency; if the ratio is less than one the region requires imports.

Location quotients are best used when the study region reflects the benchmark economy. The smaller, more relevant the benchmark is, the better the analysis; for this reason, Texas is used as the benchmark economy rather than the U.S. economy.

The methodology has some faults. One major flaw is the assumption that demand is constant and does not vary by region. For example in a region with an unusually high internal need for product X, location quotients would classify the supposed surplus as basic or export, when actually the difference is the manifestation of higher demand. Another drawback is that the inherent form of the industry is not taken into account. For example: although high-tech industry is inherently a basic industry, only that

employment proportion which is higher than the benchmark's proportion would be considered basic. Despite its faults, location quotients are a relatively simple way to understand economic patterns within a region.

3.4.3 Economic Base Analysis Results

McLennan County

Table 3 - 12 shows 1980 location quotients and the proportionate breakdown of service and export employment by industrial employment sector for McLennan County. Of the fifteen employment sectors, nine were service industries whose products were absorbed by the local market. The six export industries were: Manufacturing, Trade, FIRE, Entertainment & Recreation (a subsector of the Service industry), Government and two of its subsectors Health and Education. The export sectors with the highest proportion of export employment were: Manufacturing (17%) and the subcategories Health (20%) and Education (22%). Of interest is the fact that FIRE as well the Service subcategory of Entertainment & Recreation were classified as export industries (7% and 5% respectively). This means that the proportion of total employment in those sectors was higher than the average for Texas. The percentage of employment higher than the state average is the proportion of employment that is considered export. Because McLennan County has a relatively large number of universities and adult education institutions, is located between two major cities (Austin and Dallas) and bisected by major transportation routes, it is not surprising to find that Entertainment & Recreation is to some degree an export industry.

As shown in Table 3 - 13 in 1986 three industrial sectors in McLennan County were export industries. Those industries were Manufacturing (33% of its employment is export), Trade (3%) and Service (10%).

Bosque County

As shown in Table 3 - 14 in 1980 four of the fifteen employment sectors in Bosque County were export industries. Those sectors were Agriculture, Construction, Manufacturing and a subcategory of Government, Health. The export employment proportion for Agriculture is 72% , Construction 34%,

Manufacturing 10% and Health 25%.

As shown in Table 3 - 15 in 1986 three of Bosque County's nine industrial sectors were export. Those sectors are Agriculture (76%), Manufacturing (27%) and Trade(11%). The other sectors were oriented solely to the local market.

3.5 INCOME ANALYSIS

3.5.1 Introduction

An analysis of income distribution in Bosque County and McLennan County is presented in this section. Texas was used as the benchmark with which to compare county income distribution. Income data was drawn from the U.S. Bureau of the Census for 1970 and 1980. The method of analysis side-steps the problem of inflation as the results are a relative measure not an absolute measure of the proportional distribution of the population within five designated income brackets or quintiles.

The 1980 census collected income data for households, families and unrelated individuals as separate categories while the 1970 census collected data primarily for the family unit. The result is that for areas with a proportionally large number of unrelated individuals (universities, military bases, state hospitals, etc...) comparisons between 1970 and 1980 data must take those sampling differences into account. Therefore, in this report only income data collected for families was analyzed.

3.5.2 Methodology

To analyze the income distribution within the study area two steps were taken. First, the relationship of each county to the state was assessed with respect to household-income distribution at two specific points in time, 1970 and 1980. Second, the 1970 profile of each county was contrasted with its

respective 1980 profile to identify changes and possible trends in the composition of the counties.

To accomplish the first step, all households in Texas were separated into five equal groups, or quintiles, by annual income level for 1970 and 1980. Each quintile contains 20% of families in Texas. The income limits of each quintile were calculated to define income sectors. These sector limits were then applied to the families in each county, following which, the approximate number of families earning incomes within each sector was calculated. The number of families in each sector was then converted to a percentage. The resultant percentage figure indicates the share of each county's population within each income sector defined for the state. For example, a figure of 30% for a county would indicate that 10% more of the families in that county have income in that particular quintile than the average for the state (30%-20%=10%).

The second step of the analysis involved identifying changes and possible trends within each county. To accomplish this, the percentage of households within each sector during 1970 was compared with its counterpart for 1980. Both the size and direction of any changes were noted in order to detect significant growth or decline in any particular sector. Finally, the overall change of all the sectors within each county was assessed to identify any possible trends in the income composition of the county.

3.5.3 Income Analysis Results

Five income brackets (quintiles) each containing 20% of all Texas families for 1980 and 1970 are shown in Table 3 - 16.

Table 3 - 16

Texas Income Quintile Distribution

Quintiles	1980	1970
Q1	0 - $9,391	0 - $4,120
Q2	$9,392 - $16,204	$4,121 - $7,094
Q3	$16,205 - $23,244	$7,095 - $9,996
Q4	$23,245 - $33,114	$9,997 - $14,120
Q5	$33,114 +	$14,121+
	median income $19,618	median income $8,490

Source: Paul Price Associates. U.S. Bureau of the Census, 1970 and 1980.

Income quintiles for McLennan County and Bosque County families for 1980 and 1970 are shown in Table 3 - 17. Listed is the distribution of county families per quintile for 1970 and 1980. For example: Twenty-four percent of McLennan County families were in the lowest quintile income category for Texas, 4% more than the state average (24%-20%= 4%). Figures 3 - 1 and 3 - 2 graphically display the data from Table 3 - 17. Figures 3 - 3 and 3 - 4 display the percentile difference between the proportion of county families and Texas families in each income quintile for 1970 and 1980. As can be seen, in comparison to the state average, both counties have a very high proportion of low income families.

Table 3 - 17

Family Income Distribution by County for 1970 and 1980

	McLennan County			Bosque County	
Quintiles	1980	1970	Quintiles	1980	1970
Q1	24%	23%	Q1	28%	36%
Q2	23%	21%	Q2	26%	24%
Q3	21%	22%	Q3	21%	17%
Q4	18%	19%	Q4	15%	13%
Q5	14%	15%	Q5	9%	10%

Source: Paul Price Associates.

Figure 3 - 1. Study Area Income Distribution 1980

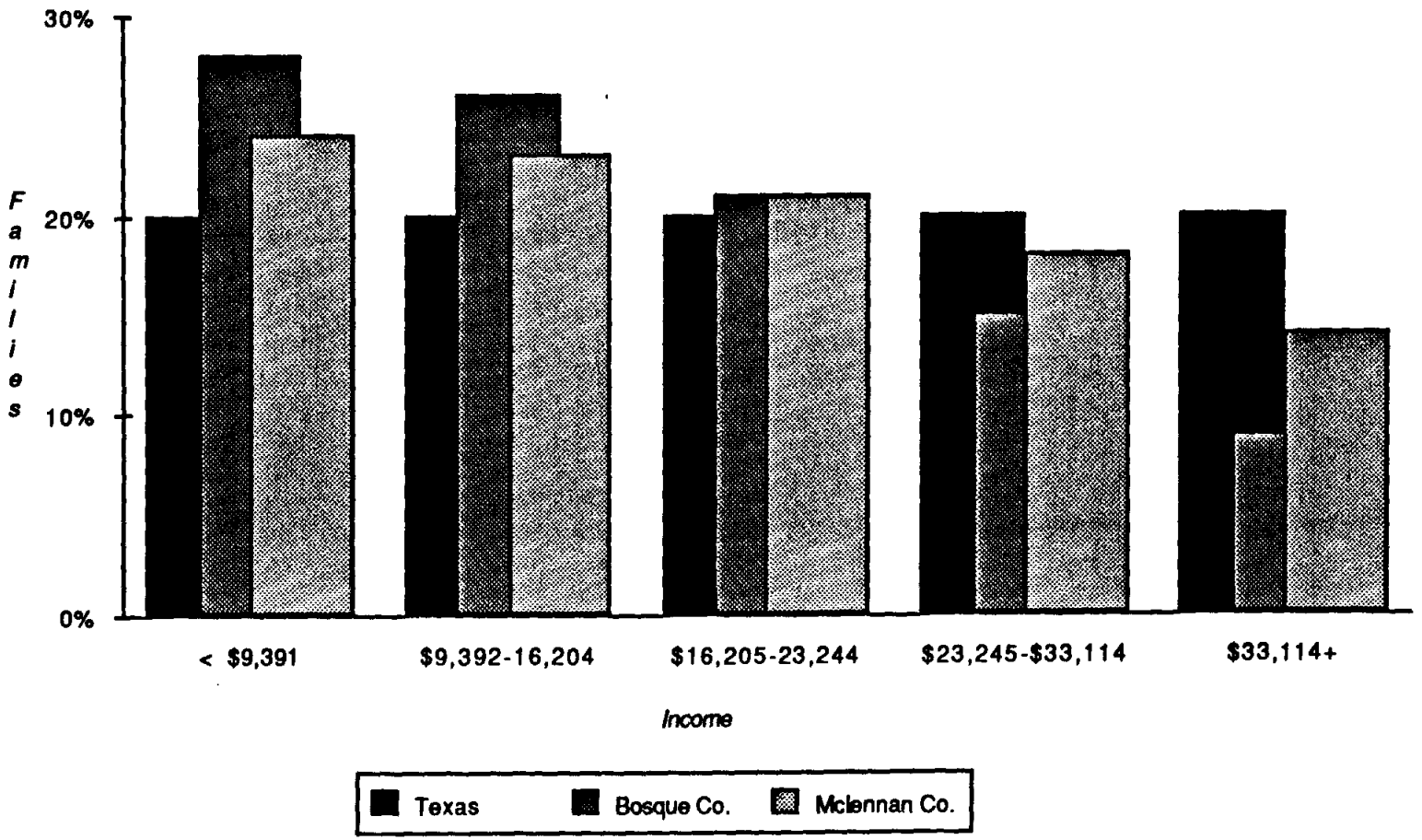
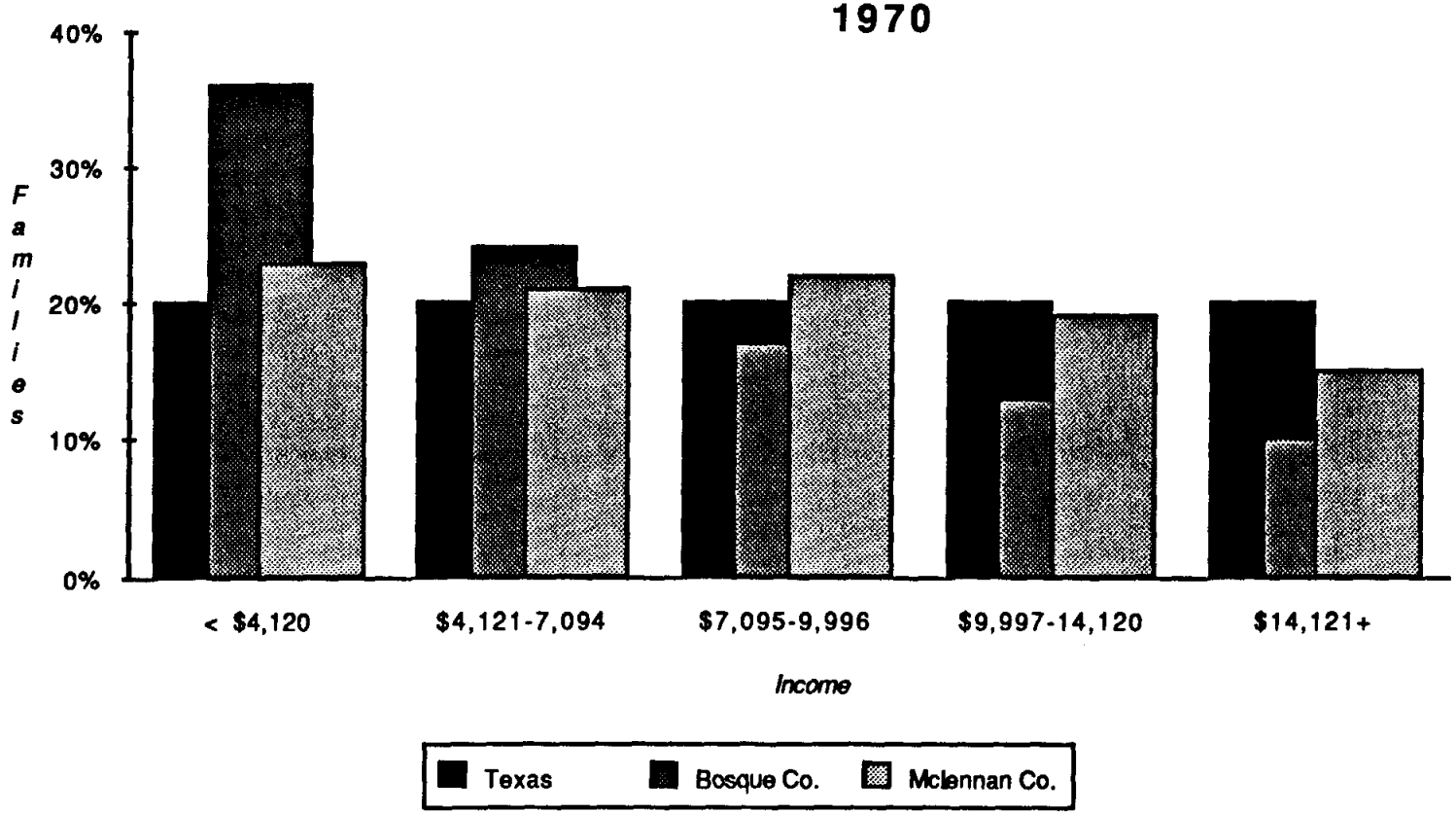


Figure 3 - 2.
Study Area Income Distribution
1970



McLennan County

In 1970 and 1980 the proportion of McLennan County families in the three lower income quintiles (Q1, Q2, Q3) was consistently higher than the Texas average (see Figure 3 - 3). Inversely the proportion of families in the two highest quintiles was for both time periods lower than the Texas average. Of significance is the fact that the income distribution pattern has not improved over time but has deteriorated. From 1970 to 1980 the proportion of families in the two lowest income brackets increased while the proportion in the three highest brackets decreased. In short, from 1970 - 1980, the county gained additional low income families and lost wealthy and middle income families.

Bosque County

As shown in Figure 3 - 4 income distribution in Bosque County in 1970 and 1980 was skewed in the direction of poverty. In 1970, 36% of all families were in the lowest income bracket (Q1), approximately 16% more than the state average (see Figure 3 - 4). Sixty percent of all Bosque County families occupied the two lowest income brackets. The proportion of families in the three highest income brackets (Q5, Q4, Q3) was much lower than the state average.

By 1980 the situation improved. The proportion of families in the lowest income quintile (Q1) decreased by one-half but was still 8% higher than the state average. The proportion of families in the lower-middle (Q2) and middle (Q3) quintiles increased, while families in the upper-middle (Q4) and upper income (Q5) quintiles increased slightly or remained fairly stable. In short, family income in Bosque County improved during the 1970s, but by 1980 the county was still characterized by a higher proportion of lower income families than the state average.

Figure 3 - 3: Income Comparison for Texas and Mclennan County - 1970, 1980

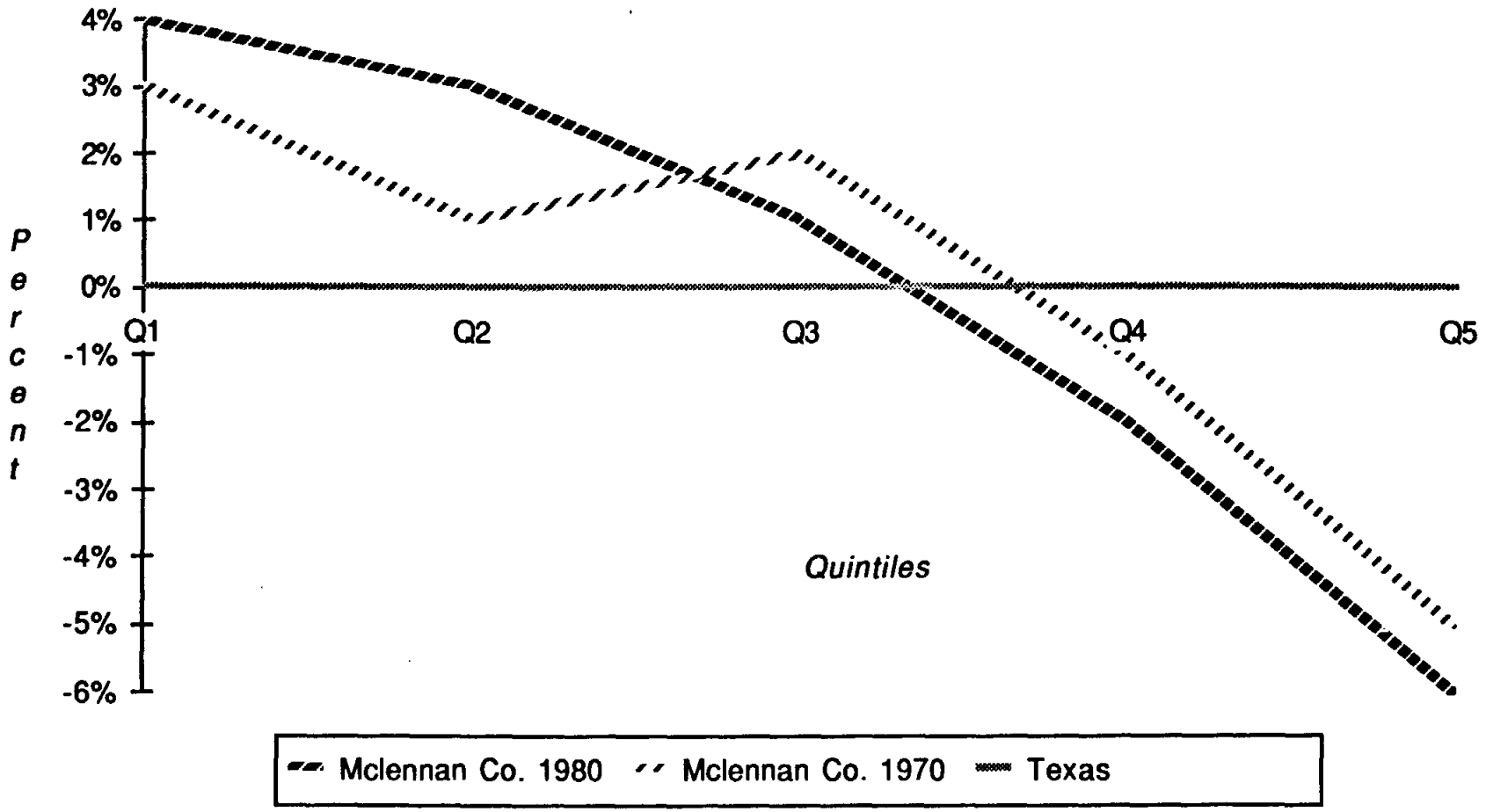
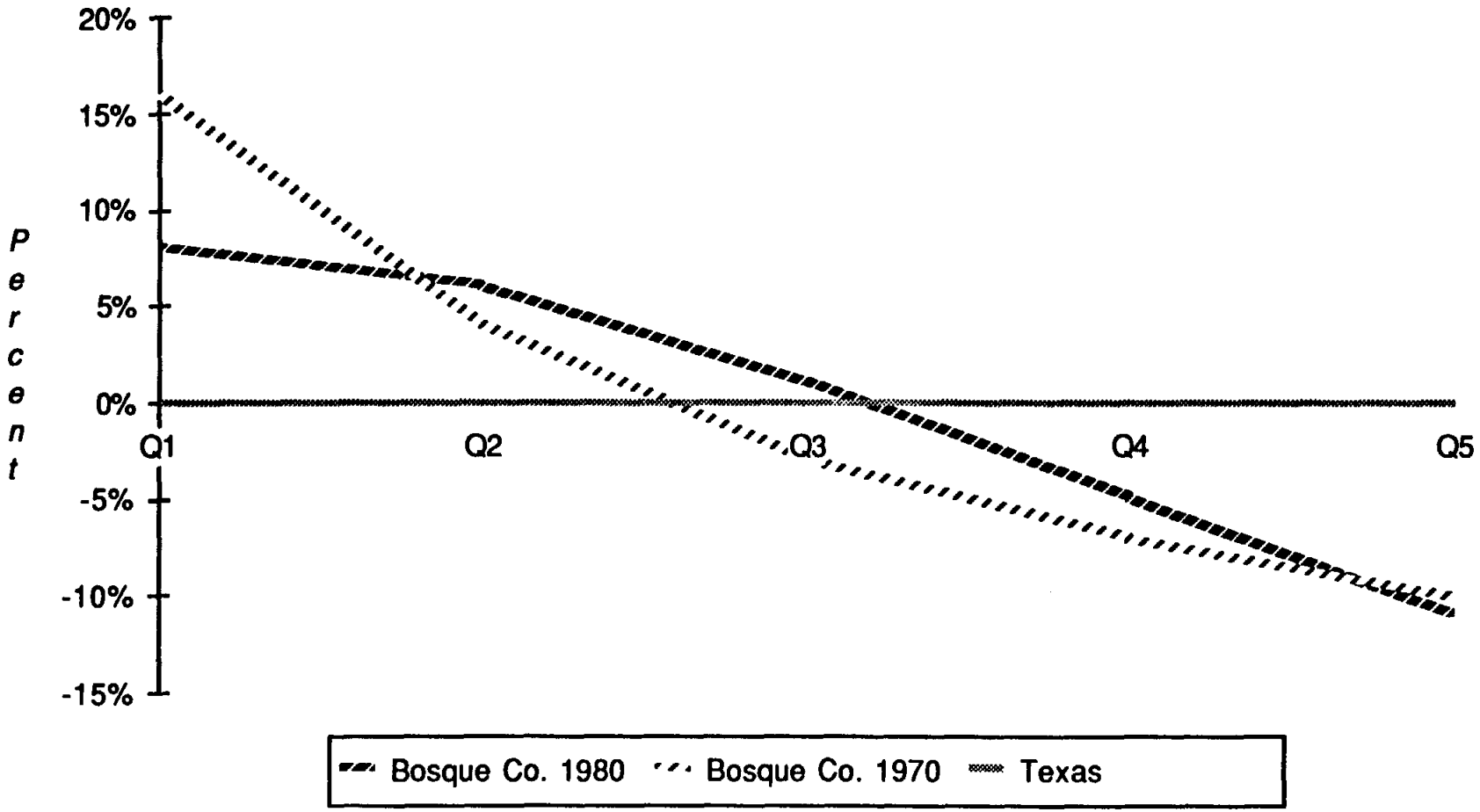


Figure 3 -4: Income Comparison for Texas and Bosque County - 1970, 1980



4.0 COMMUNITY SERVICES AND FACILITIES

4.1 INTRODUCTION

This section provides a baseline from which to judge the current level and future capability of community services and facilities in Bosque and McLennan Counties to absorb growth. Reported are statistics concerning educational services, public safety services and health services and facilities. Estimated is the amount of school taxes lost from the removal of land from school tax roles for the construction of the proposed Lake Bosque. Provided in this section is a summary of water and wastewater treatment statistics for project participating cities, and projections of future water demands for the proposed Lake Bosque. Also included in this section is a summary of transportation elements in the study area, include are: traffic counts for Bosque County roads and air and railroad services to the proposed Lake Bosque. Housing information detailing study area vacancy rates and market composition is provided.

4.2 EDUCATION

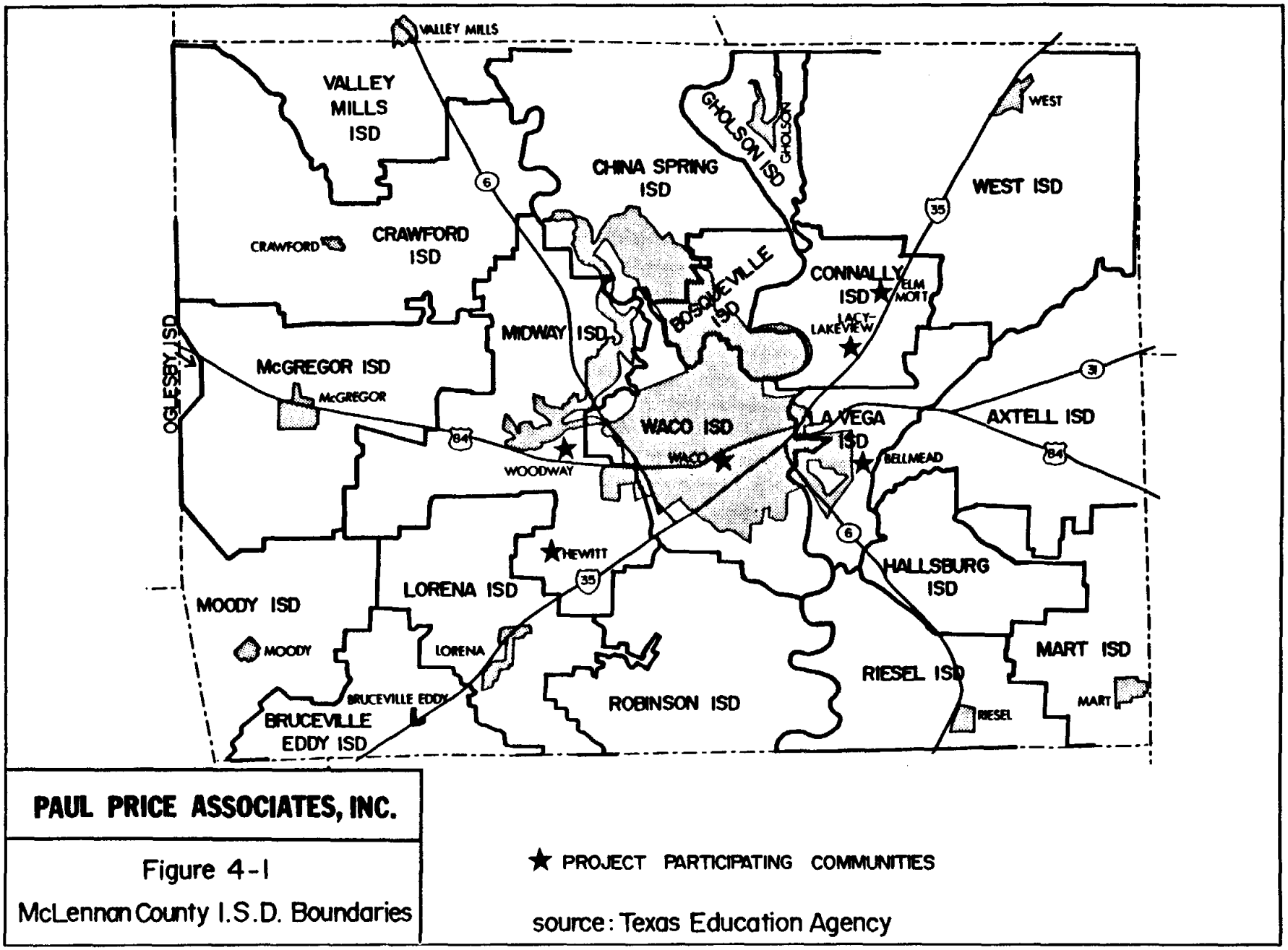
Independent school districts (ISDs) within the study area are listed in Table 4 - 1. Also shown are 1985 - 86 student to teacher ratios, total enrollment, number of teachers and expenditures per student. The location and geographic boundaries of each ISD are shown in Figures 4 - 1 and 4 - 2. Enrollment for 1985 - 1986 ranged from 15,182 in the Waco ISD to 113 in the Hallsburg District. Student-teacher ratios varied from 21.8 students per teacher in the Lorena ISD to 9.8 students per teacher in the Axtel ISD. Expenditures ranged from $5,022 per pupil in the Axtel ISD to $1,929 in the Lorena ISD.

Table 4 - 2 lists the operating tax rates for the three ISDs whose tax rolls will be reduced (due to lost property valuations) if the proposed Lake Bosque is built. The tax rate cannot exceed $1.50 per $100 valuation per Section 20.04 of the Texas Education Code unless specifically authorized by special legislative act. The three ISDs which will lose part of their tax base if Lake Bosque is built are: Walnut

Table 4 - 1. Bosque, McLennan County ISD Education Statistics, 1985 - 1986

County/ISD (1985 - 1986)	Enrollment	Teachers	Student/Teacher Ratio	Expenditures per Student
McLennan County				
Axtell	781	80	9.8	$5,022
Bosqueville	307	16	19.2	$2,309
Bruceville-Eddy	520	27	19.3	$2,476
China Spring	868	48	18.1	$2,205
Connally	2,389	117	20.4	$2,451
Crawford	343	20	17.2	$2,689
Gholson	160	6	26.7	$2,515
Hallsburg	113	8	14.1	$3,805
La Vega	2,398	118	20.3	$2,752
Lorena	936	43	21.8	$1,929
Mart	755	47	16.1	$2,670
McGregor	1,188	68	17.5	$2,809
Midway	5,026	237	21.2	$2,357
Moody	599	35	17.1	$2,847
Riesel	458	27	17.0	$2,407
Robinson	1,800	91	19.8	$2,160
Waco	15,182	879	17.3	$3,144
West	1,176	57	20.6	$2,053
County Totals	34,999	1,924	18.2	$2,790
Bosque County				
Clifton	948	52	18.2	$2,613
Cranfills Gap	156	14	11.1	$3,948
Iredell	155	12	12.9	$4,472
Kopperl	227	13	17.5	$3,357
Meridian	466	27	17.3	$3,071
Morgan	145	14	10.4	$4,089
Valley Mills	505	31	16.3	$3,066
Walnut Springs	190	15	12.7	$3,154
County Totals	2,792	178	15.7	$3,125

Source: Texas Education Agency, 1986.



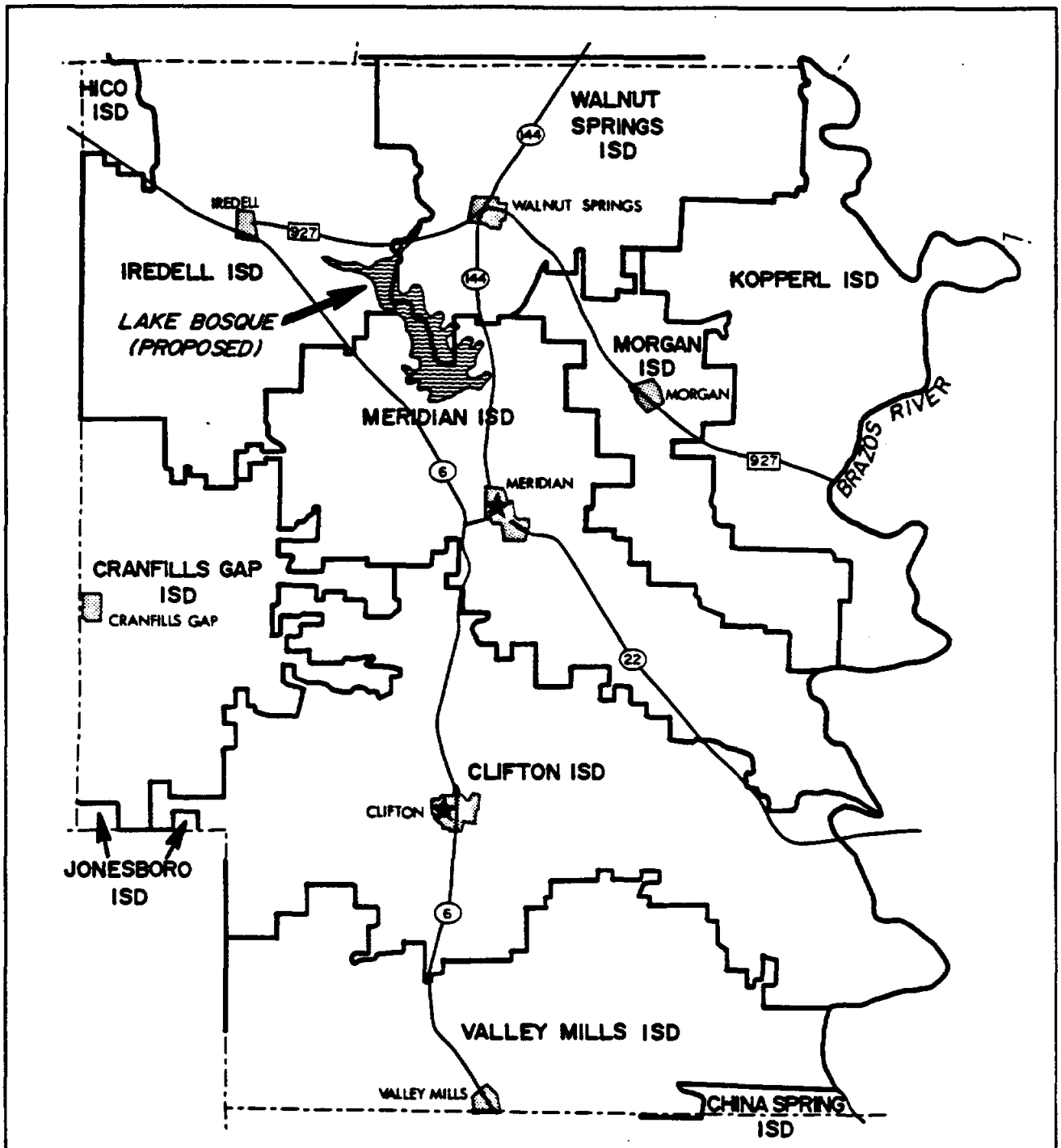
PAUL PRICE ASSOCIATES, INC.

Figure 4-1

McLennan County I.S.D. Boundaries

★ PROJECT PARTICIPATING COMMUNITIES

source: Texas Education Agency



PAUL PRICE ASSOCIATES, INC.

★ PROJECT PARTICIPATING COMMUNITIES

Figure 4-2

Bosque County I.S.D. Boundaries

source: Texas Education Agency

Springs, Iredell and Meridian. As shown in Table 4 - 2 the existing tax rate for each school district ranges from 40% to 55% of the allowable $1.50 tax rate. The percent of net ISD taxes accrued from the proposed Lake Bosque site ranges from 2.40% to 3.86% of each ISD's tax revenue.

Table 4 - 2

Independent School District Tax Rates, Budget Year 1986

ISD	Tax Rate	Remaining Margin	% of Net Taxes Attributed to Lake Bosque Site
Iredell	.834	$.67	3.71%
Meridian	.6484	$.85	2.40%
Walnut Springs	.607	$.89	3.86%

Source: Texas Education Agency, ISD Budgets 1986. Bosque County Appraisal District, 1986.

4.3 PUBLIC SAFETY

Table 4 - 3 lists the number of police officers, firemen and vehicles for the the study area's County Sheriff Departments and project participating municipalities. Standards for expanding populations estimate 2.1 police officers per 1,000 population as adequate protection (Golden et al., 1980). None of the municipalities satisfy that standard, although the police officer to population ratio for Woodway and Clifton at 1.97 is very close.

Fire protection in the study area is provided by volunteer and full-time paid firemen. Two full-time firemen per 1,000 population are recommended for expanding populations (Golden et al., 1980). As shown in Table 4 - 3, the ratio of firemen per 1,000 population for each project area municipality, except Waco, is higher than two, this is because volunteer firemen were included in the ratio calculation. Only Waco has a full-time paid fire department, Bellmead and Woodway have a combined volunteer and paid fire fighting department, while the remaining communities rely on volunteers for fire protection.

Table 4 - 3. Study Area Public Safety Statistics, Bosque and Mclennan Counties, 1986

County/City	Police Officers				Firemen		
	Police Personnel	1986* Population	per 1000 Population	Police Vehicles	Fire Personnel	per 1000 Population	Fire Vehicles
Mclennan County							
County Sheriff Δ	130	182,354	0.71	25	0	0.00	0
Bellmead	10	8,500	1.18	11	3 (p), 16 (v)	2.12	5
Hewitt	15	9,900	1.52	10	29 (v)	2.93	7
Lacy-lakevew	6	4,700	1.28	3	12 (v)	2.55	5
Mclennan Co. WCID # 2 (Elm Mott)	0	1,600	0.00	0	16 (v)	10.00	4
Waco	161	104,133	1.55	40	168	1.61	34
Woodway	14	7,091	1.97	10	22 (o), 30 (v)	7.76	4
Bosque County							
County Sheriff Δ	18	15,132	1.19	4	0	0.00	0
Clifton	6	3,067	1.96	3	28 (v)	9.13	9
Meridian	1	1,330	0.75	1	24 (v)	18.05	6

Source: Municipality Fire and Police Departments, County Sheriff Department, 1986.
Note: (p) Paid, (v) Volunteer, (o) Police Officers doubling as Firemen, (Δ) Includes jailors, dispatchers and reserve officers. * 1986 TDH population estimate.

4.4 HEALTH SERVICES AND FACILITIES

As shown in Table 4 - 4, the two county study area contains eight hospitals and 1,995 beds. McLennan County's ratio of 10.37 beds per 1,000 population is twice as high as the recommended 5 per 1,000 population (Golden et al., 1980). This is due to the presence of a federal Veterans Administrative hospital which accounts for more than one-half of the county's inventory of hospital beds. Bosque County's ratio of beds to population is also higher than the recommended ratio. The recommended standard for counties of 0.7 physicians per 1,000 population is exceeded in both counties (Golden et al., 1980).

4.5 EXISTING WATER AND WASTEWATER TREATMENT FACILITIES

Water and wastewater system data, for 1986, collected by the Texas Department of Health is shown in Table 4 - 5. Included in the table is the estimated population serviced by the system, number of connections, total water production, average daily consumption, total storage capacity, auxiliary production capacity, the water source, number of wells (when applicable), and the date of inspection.

Each of the project participants maintains a water system and provides wastewater treatment services. Except the City of Waco, all the participants rely on Trinity ground water for water supplies. These communities do not have developed facilities for treating surface water.

Table 4 - 4. Medical Facilities and Personnel Statistics

	McLennan County	Bosque County
Hospitals		
Number	6	2
Beds	1891	104
Hospital Beds per 1,000 population*	10.37	6.87
Physicians		
Number	303	15
per 1,000 population*	1.66	0.99
Nurses		
Number licensed	714	105
per 1,000 population*	3.92	6.94

Source: Texas Department of Health, 1984 and 1986*.

Table 4 - 5. Municipal Water and Wastewater Treatment Statistics

City/Authority	System Classification	No. of Connections	Total Production (MGD)	Avg. Daily Consumption (MGD)	Total Storage Capacity (MGD)	No. of Wells and Water Source	Percent Committed
Clifton	Water & Sewer	1,533	1.634	0.459	0.619	5 Trinity	28%
Meridian	Water & Sewer	650	0.828	0.227	0.100	3 Trinity	27%
Bellmead	Water & Sewer	3,200	2.592	0.897	1.600	3 Trinity	35%
Hewitt	Water & Sewer	3,540	2.716	1.188	2.619	5 Trinity	44%
Lacy-Lakeview	Water & Sewer	1,605	2.009	0.592	0.550	2 Trinity	29%
Elm Mott (McLennan County WCID # 2)	Water & Sewer	530	1.337	0.176	0.300	2 Trinity	13%
Waco	Water & Sewer	37,164	66.000	24.324	21.645	0 Lake Waco	37%
Woodway	Water & Sewer	2,947	4.449	1.700	7.125	6 Trinty	38%

Source: Texas Department of Health. Water Hygiene Inventory,1986.

4.6 FUTURE WATER REQUIREMENTS

4.6.1 Introduction

To prevent a situation of unmet demand requiring additional capital investment, and possibly more serious consequences, water demand projections should allow for the highest reasonable population growth and per capita water demand. Reservoir firm-yield supplies should accommodate an upper limit as well as satisfy the minimum projected demand. For the Lake Bosque Project, this range begins with Paul Price Associates' water demand projection and is capped by a projection using the Texas Water Development Board's (TWDB) High Series population projection, high per capita demand and high manufacturing demand (see Figure 4-3). These population projections incorporate the Texas Water Development Board's (TWDB) February 1987 revised county population projections.

Paul Price Associates, Inc. (PPA) prepared their own projections to 2040 of the future water needs of the communities currently participating in the Lake Bosque Project, as well as projected future water needs of probable customer entities, rural county areas and manufacturing in the two county study area. This section provides a description of the methodology and results of the water demand projections prepared by Paul Price Associates for the Lake Bosque Project. A more detailed description, equations and tables showing decadel water demand projections, projected supply and sources for each consumer entity and user category is found in the Appendix. Tables 4 - 6 and 4 - 7 lists Paul Price Associates' total projected water demand and per capita water demand for each consumer category, i.e.: Municipal, Other, and Manufacturing. Table 4 - 8 lists Paul Price Associates' projected demand for each user category for the Lake Bosque Project.

Lake Waco has a dependable yield of 59,100 acre feet per year. A proposed enlargement (occurring in year 2000) would increase the Lake's yield by 20,100 acre feet. As shown in Figure 4 - 3, Lake Waco and the proposed enlargement would not sufficiently satisfy projected minimum total demand in

Table 4-6 Paul Price Associates Demand Projections							
Demand Categories	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**
Municipal Demand (MGD)							
Project Participants (excludes City of Waco)	4.60	6.90	7.79	7.95	8.68	9.09	9.85
Potential Customers	1.07	1.61	1.73	1.76	1.83	1.97	2.13
Total Municipal Demand	5.67	8.51	9.52	9.71	10.51	11.06	11.98
City of Waco	26.44	30.53	30.93	31.46	32.82	35.33	38.02
Total Municipal Demand including the City of Waco	32.11	39.04	40.45	41.17	43.33	46.39	50.00
Other Demand (MGD)							
Mclennan Co.	3.13	4.19	4.29	4.34	4.48	4.77	5.11
Bosque Co.	0.84	1.37	1.55	1.72	1.89	2.09	2.30
Total	3.97	5.56	5.84	6.06	6.37	6.86	7.41
Total Municipal and Other Demand							
(Includes the City of Waco)							
MGD	36.08	44.60	46.29	47.23	49.70	53.25	57.41
Acre-feet Per Year	40,415	49,959	51,852	52,905	55,671	59,648	64,308
Manufacturing Demand (MGD) (Low Demand)							
Mclennan Co.	3.55	5.26	7.35	9.63	12.48	15.70	19.76
Bosque Co.	0.08	0.10	0.12	0.12	0.18	0.22	0.28
Total	3.63	5.36	7.47	9.75	12.66	15.92	20.04
Total Muncipal, Other and Manufacturing Demand							
Including the City of Waco							
MGD	39.71	49.96	53.76	56.98	62.36	69.17	77.45
Acre-feet per Year	44,481	55,963	60,219	63,826	69,853	77,481	86,756
Excluding the City of Waco							
MGD	13.27	19.43	22.83	25.52	29.54	33.84	39.43
Acre-feet per Year	14,864	21,765	25,573	28,586	33,089	37,906	44,168

Source: Paul Price Associates Inc., The Texas Water Development Board
NOTE: Demand is based on TWDB Low Series population projections, TWDB High series per capita water demand ratios, and TWDB Low series Manufacturing demand projections.
Demand projections are based on TWDB February1978 population projection revisions.

Table 4 - 7. Per Capita Water Demand Summary

Demand Categories	1980	1990	2000	2010	2020	2030	2040
Municipal Per Capita Demand (GPD)							
Project Participants *(excludes City of Waco)*	162	184	187	187	187	187	187
Potential Customers	159	189	190	190	190	190	190
City of Waco	261	280	285	285	285	285	285
All Municipalites	235	252	254	254	254	254	254
Other Per Capita Demand (GPD)							
McLennan Co.	125	180	186	185	183	181	180
Bosque Co.	108	161	166	166	166	166	166

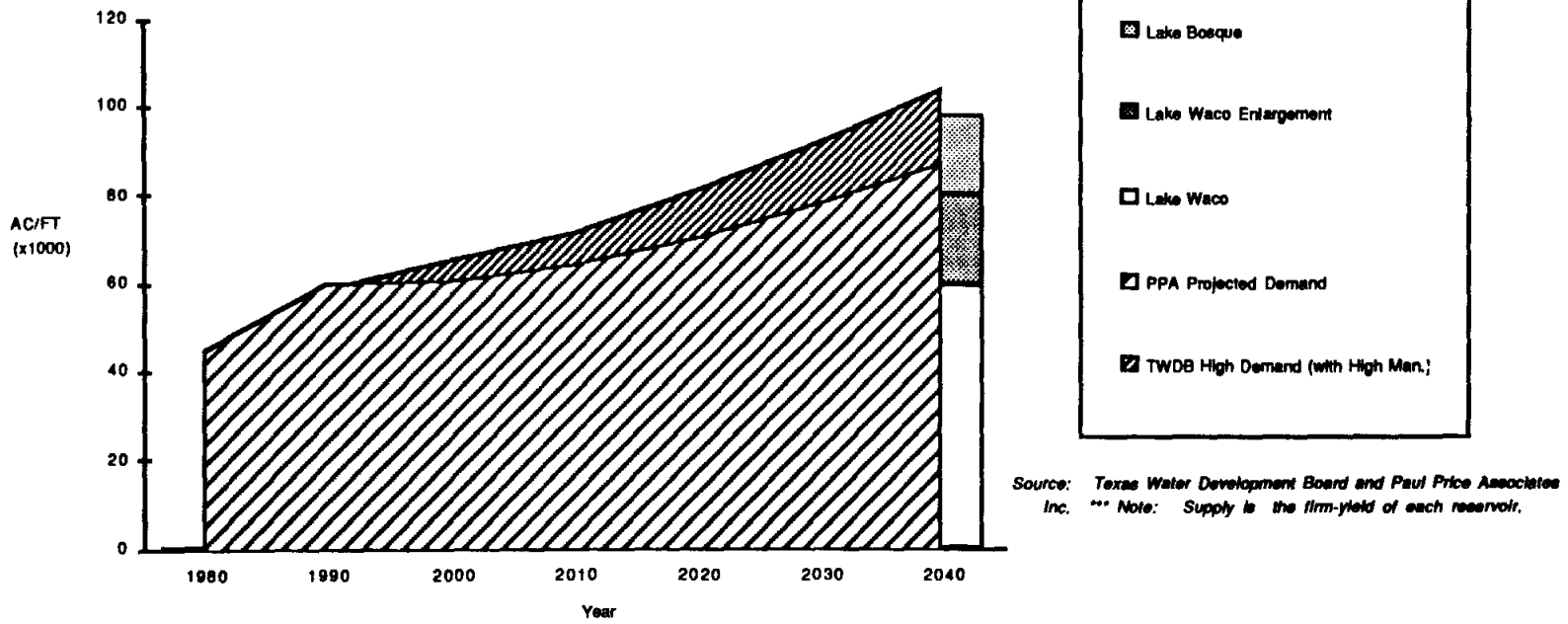
Source:
Texas Water Development Board, High Series Projections.
Note: Per Capita consumption rates are from the TWDB high series water demand projections.

Table 4-8 Projected Demand for Lake Bosque

Projected Demand for Lake Bosque 1990-2040	1990		2000		2010		2020		2030		2040	
	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD
Municipal Demand (Excludes City of Waco)												
Project Participants	6,831	6.10	7,777	6.94	7,907	7.06	8,680	7.75	9,138	8.16	10,203	9.11
Potential Customers	1,809	1.61	1,937	1.73	1,971	1.76	2,055	1.83	2,208	1.97	2,381	2.13
Total Municipal Demand	8,640	7.71	9,190	8.20	9,878	8.82	10,735	9.58	11,346	10.13	12,584	11.23
Other Demand												
McLennan County	4,146	3.70	4,263	3.81	4,320	3.86	4,475	4.00	4,799	4.28	5,175	4.62
Bosque County	24	0.02	108	0.10	356	0.32	634	0.57	1,424	1.27	1,663	1.48
Total Other Demand	4,170	3.72	4,371	3.90	4,676	4.17	5,109	4.56	6,223	5.56	6,838	6.10
Manufacturing Demand												
McLennan County												
High Series	5,825	5.20	8,744	7.81	11,921	10.64	6,259	5.59	0	0.00	5,613	5.01
Low Series	5,400	4.82	7,801	6.96	10,412	9.30	4,037	3.60	-3,025	-2.70	1,515	1.35
Bosque County												
High Series	0	0.00	148	0.13	186	0.17	233	0.21	288	0.26	356	0.32
Low Series	-4	-0.0036	137	0.12	168	0.15	206	0.18	252	0.22	308	0.28
Total Bi-County Manufacturing Demand												
High Series	5,825	5.20	8,892	7.94	12,107	10.81	6,492	5.80	288	0.26	5,969	5.33
Low Series	5,396	4.82	7,938	7.09	10,580	9.45	4,243	3.79	-2,773	-2.48	1,824	1.63
Total Demand for Lake Bosque												
Municipal, Other, High Manufacturing	18,635	16.64	22,453	20.04	26,661	23.80	22,336	19.94	17,857	15.94	25,391	22.67
Municipal, Other, Low Manufacturing	18,206	16.25	21,499	19.19	25,134	22.44	20,087	17.93	14,796	13.21	21,246	18.97

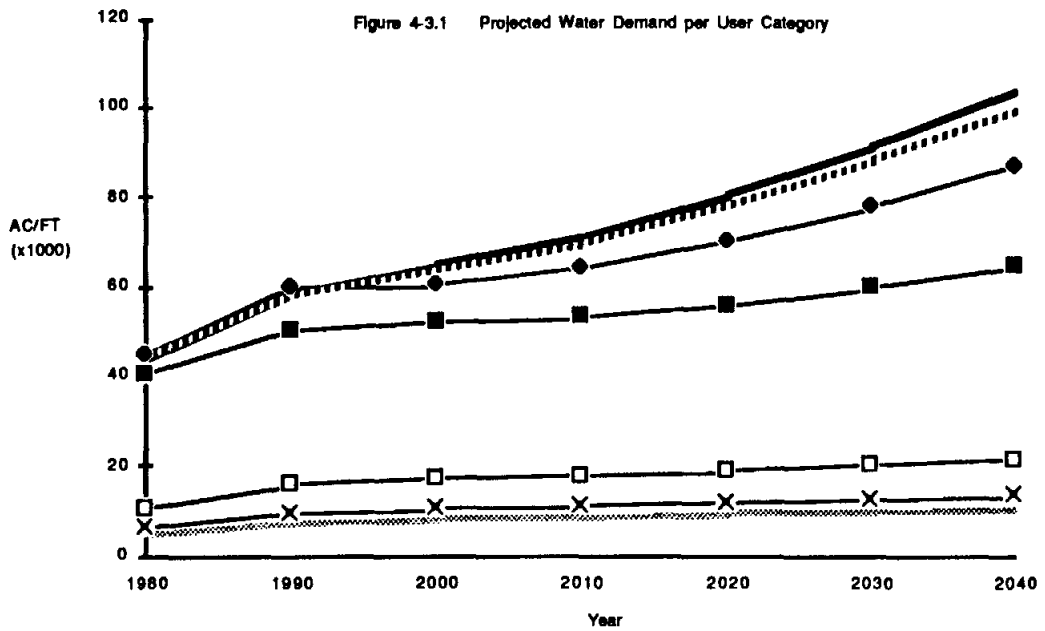
Sources:
Paul Price Associates, Inc.
Texas Water Development Board
Revised Population Projections 2/1987

Figure 4-3 Projected Water Demand and Supply



*Source: Texas Water Development Board and Paul Price Associates Inc. *** Note: Supply is the firm-yield of each reservoir.*

Figure 4-3.1 Projected Water Demand per User Category



*Source: Texas Water Development Board and Paul Price Associates Inc. *** Note: Demand projections are accumulative. Participant Mun. demand does not include the City of Waco. Supply is the firm-yield of each reservoir.*

year 2040. The discrepancy between projected demand and future supply is compounded because the City of Waco owns all the water rights to Lake Waco and does not intend to sell those rights to other municipalities. Therefore, as existing groundwater supplies become inadequate or unsuitable and as Lake Waco water is inaccessible, except to the City of Waco and Beverly Hills, other entities would have to participate in additional surface water development projects or else obtain water from other entities.

4.6.2 Water Demand Categories

There are currently eight cities participating in the Lake Bosque Project, they are: Bellmead, Clifton, Hewitt, Lacy-lakeview, McLennan Co. WCID #2 (Elm Mott), Meridian, Waco and Woodway. Classified as potential customers for the Lake Bosque Project are four municipalities located in either Bosque or McLennan County, who as reported in the TWDB Municipal Water Supply-Demand 1990 - 2030 summaries, currently rely or would in the future rely on Lake Waco surface water to supply all or a proportion of their water needs. These municipalities are: Mart, Moody, Northcrest and Bruceville-Eddy. Municipal water demand projections include commercial, residential, city service (swimming pools, parks, etc...) and some miscellaneous light industrial use within the municipal jurisdiction, but do not include industrial water requirements or sales to others outside the municipal jurisdiction.

The category of "Other" demand includes non-urban areas of Bosque and McLennan Counties. That proportion of Other demand identified by the TWDB Municipal Water Supply-Demand 1990-2030 as currently relying, or in the future relying, on Lake Waco for water supply was the basis for the projected Lake Bosque demand.

A high and low series manufacturing water demand projections were prepared by the TWDB in 1981 for each county. That proportion of Manufacturing Demand identified by the TWDB Municipal Water Supply-Demand 1990-2030 summary as currently relying, or in the future relying, on Lake Waco for water supply was the basis for Paul Price Associates' projected demand for Lake Bosque. The recommended water

demand projection for the Manufacturing Demand category is the TWDB Low Series manufacturing projection. Incorporated into the Low Series projection is a slower growth rate than used in the High Series projection. Today, in view of the present downturn in the Texas economy, TWDB staff believe that the Low Series manufacturing projection is more appropriate. The manufacturing demand figures shown in Table 4 - 6 are the TWDB's low series projections.

4.6.3 Methodology

Driving PPA's water demand projections are the Texas Water Development Board (TWDB) Low Series population projections coupled with drought condition per capita consumption rates used in the TWDB High Series water demand projections.[1] The results are water demand projections based on the most conservative population projections and drought condition per capita water demand rates. Because TWDB projections were available only to 2030, PPA extended demand projections to 2040 by applying the percent change from 2020 - 2030 to 2030 base numbers.

The TWDB per capita use estimates were based upon water use data reported by suppliers of municipal and commercial water within each county and upon statistical analysis of trends in per capita water consumption rates through time. Per capita water demand estimates were made for each city and projected through the year 2000. Because of a historic trend of increased standards of living and the rapid rate of availability of public water service to a rapidly expanding affluent Texas population, 4 gallons of additional per capita water consumption per decade until year 2000 was assumed. After year 2000, due to conservation and improvement in technology, per capita water consumption was assumed to remain constant.

Two steps were required to calculate future demand for the Lake Bosque Project. The first step was to project total water demand for each project participating city, potential customer cities, other demand and manufacturing demand (see Table 4-6). The second step was to compare total demand for each category with available supplies as reported by the Brazos River Authority, HDR Engineering and water use projections for Lake Whitney and ground-water supplies as indicated in the TWDB City and County Water Supplies and Demand summary. Water available from ground-water and other supply sources, such as Lake

[1] The Texas Water Development Board's water demand projections were based upon TWDB population projections for 1980 - 2030, one is a best case scenario, the other a worst case. The High Series water demand projection is driven by the High Series population projection and drought influenced per capita water consumption rates. The Low Series water demand projection is driven by the Low Series population projection and average climate per capita water consumption rates.

Whitney or Lake Aquilla (but not Lake Waco), was subtracted from each categories' total demand. The remaining demand was either excess demand (more demand than projected supply) or else demand satisfied by Lake Waco water. However, because the City of Waco does not intend to sell Lake Waco water, any demand projected against Lake Waco would be unmet. Therefore, any excess demand or demand for Lake Waco water was considered potential demand for the proposed Lake Bosque.

To project water demand for 2040, water demand projections per decade from 1980 to 2040 for each category: project participating municipalities, potential customer entities, other and manufacturing were prepared. The results are found in the Appendix (Tables A.1 - 1, A.1 - 2, and A.1 - 3). For each category and each city three characteristics were projected: population, per capita consumption (reported in gallons per day (gpd)), and total water consumption (reported in acre feet per year (Ac/ft) and million gallons per day (mgd)). Displayed in the tables are TWDB high and low case population and water demand projections and Paul Price Associates' projections for total demand. Because Paul Price Associates' water demand projections incorporate TWDB low series population projections and high series per capita water demand ratios, the results lie between the TWDB high and low series demand projections. Also shown for each category is projected demand for Lake Bosque. Projected demand for Lake Bosque was calculated by subtracting all water supplies, except Lake Waco, from the total projected demand (derived by multiplying high TWDB per capita consumption rates with TWDB low population projections). Any projected excess demand and demand for Lake Waco water was assumed to be demand for the proposed Lake Bosque.

In the Appendix are tables listing the source and amount of available water supply for each user (Tables A.1 - 4, A.1 - 5, A.1 - 6). Projected water supply data is from the TWDB projection high series. Supply projections for 2040 were not available from the TWDB. Therefore, it was assumed that 2040 water supplies would remain constant with supplies available in 2030.

4.6.4 Water Supplies and Demand Projection Results

4.6.4.1 Total Water Supplies and Demand Projections

Total water use in 1980 (includes project participants, potential customers, the City of Waco, other and manufacturing demand) was 39.71 million gallons per day (44,481 acre feet per year). Paul Price Associates' projection of 2040 total demand is 77.45 million gallons per day or 86,756 acre feet per year. As shown in Figure 4 - 3, the firm-yield of Lake Waco (59,100 acre feet per year) and the proposed enlargement (20,100 acre feet per year) would not sufficiently meet projected total demand in year 2040. Total 2040 projected demand of 86,756 acre feet per year is 7,756 acre feet per year higher than Lake Waco's firm-yield of 79,200 acre feet per year. The proposed Lake Bosque would increase firm-yield supplies by 18,189 acre feet per year sometime around year 1990. Due to proposed desalination of Lake Whitney the TWDB expects additional supplies to become available by year 2020. However, it is generally believed that desalination of Lake Whitney is not likely to occur, and if it does, that water rates would be prohibitive to most users. The United States Army Corp of Engineers estimates that the desalination project would cost $250 million and because of its high cost is not likely to be constructed anytime in the near future, if ever.

Municipal water demand (includes project participants, potential customers and the City of Waco) is projected to increase from 32.11 million gallons per day (35,968 acre feet per year) in 1980 to 50.00 million gallons per day (56,008 acre feet per year) in 2040 (see Table 4-6). As shown in Table 4 - 7 per capita consumption rates are different for each municipal category. In 1980 per capita demand was 162 gallons per day for project participants, 159 gallons per day for potential customers, and 261 gallons per day for the City of Waco. The aggregate municipal per capita demand (including project participants, potential customers and the City of Waco) was 235 gallons per day in 1980. Due to conservation, by year 2000 per capita demand is expected to peak and stabilize at 187 gallons per day, 190 gallons per day and 285 gallons per day respectively. Total municipal per capita demand peaks and remains level at 254 million gallons per

day by year 2000.

In 1980, all of the municipalities (except the City of Waco) relied exclusively on ground-water as a supply source. The TWDB supply summary assigns Lake Waco as the future supply source for each of the communities. As shown in Figure 4 - 3, supply from Lake Waco and the proposed enlargement is not sufficient for projected demand. Compounding the problem of insufficient supply in 2040 is the fact that the City of Waco will not sell Lake Waco water to other entities. Therefore, if supply from Lake Waco (as assigned by the TWDB) is subtracted from total supply, projected demand beginning in year 1990 for project participants and potential customers would not be met. This unmet demand plus any projected shortages would be demand for Lake Bosque.

Total other demand in McLennan and Bosque Counties is projected to increase from 3.97 million gallons per day (4,447 acre feet per year) use in 1980 to 7.41 million gallons per day (8,300 acre feet per year) in 2040. Per capita consumption in rural McLennan County is projected to increase from 125 gallons per day in 1980 to 180 gallons per day in 2040; rural Bosque County per capita consumption is projected to increase from 108 gallons per day to 166 gallons per day in 2040. Identified water supply sources are Lake Waco, the Trinity Aquifer and other ground-water sources.

Manufacturing demand in the two county area is projected by the TWDB low projection series to increase from 3.63 million gallons per day (4,066 acre feet per year) use in 1980 to 20.04 million gallons per day (22,448 acre feet per year) in 2040. TWDB high projection series projects 2040 demand at 23.74 million gallons per day (26,592 acre feet per year). The low TWDB projection series was incorporated into Paul Price Associates' demand projections. Manufacturing water supplies were identified as Lake Waco, the Trinity Aquifer , and beginning in 2020, Lake Whitney.

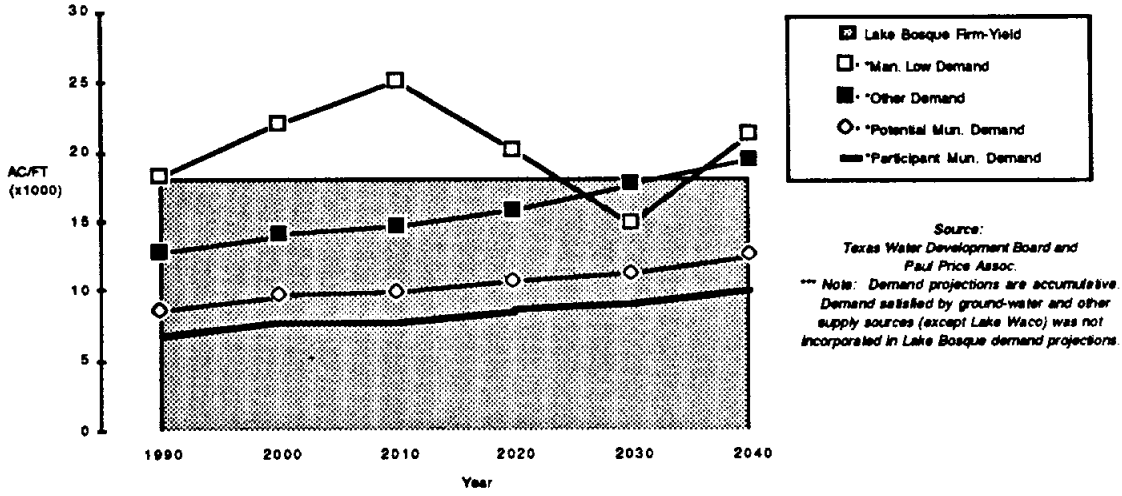
4.6.4.2 Water Demand Projections for Lake Bosque

Projected demand for Lake Bosque was derived by comparing total projected demand with firm-yield supplies and projected water supplies from Lake Waco, Lake Whitney, ground-water and other sources (Tables A.1 - 4, A.1 - 5, A.1 - 6). Because the City of Waco will not sell water from Lake Waco to other entities, demand that was assigned by the TWDB to Lake Waco was assumed to be potential demand for Lake Bosque. Demand satisfied by ground-water supplies, as indicated by the TWDB, was not included in demand projections for Lake Bosque. However, due to deteriorating ground-water quality, it is likely that users would switch to a surface-water supply source if available. As shown in Table 4 - 8 total municipal, other and manufacturing demand for Lake Bosque is projected for year 2040 at 18.97 million gallons per day (21,246 acre feet per year). That projection includes water needs for project participating communities, potential consumer communities, other demands and TWDB Low Series manufacturing demands. Municipal and other water demand accounts for 91.4% of total project demand.

Figure 4 - 4 illustrates projected accumulative demand for the Lake Bosque Project. The sharp decrease in manufacturing demand after 2010 is due to an assumption by the TWDB that a large increase in Lake Whitney supply, due to desalination, will become available. However, it is generally thought that the cost of desalination would be prohibitive and that resulting water would be too expensive for most users.

Project participating municipal demand for Lake Bosque is projected to increase from 6.10 million gallons per day (6,831 acre feet per year) in 1990 to 9.11 million gallons per day (10,203 acre feet per year) in 2040. Potential customer demand is projected to increase from 1.61 million gallons per day (1,809 acre feet per year) in 1990 to 2.13 million gallons per day (2,381 acre feet per year) in 2040. TWDB Low Series manufacturing demand is projected to decrease from 4.82 million gallons per day (5,396 acre feet per year) in 1990 to 1.63 million gallons per day (1,824 acre feet per year) in 2040. This decrease is due to the projected availability of Lake Whitney water. TWDB water demand and supply summaries indicate that by year 2020, 60% of Mclennan County's manufacturing water demand will be satisfied by

Figure 4-4 Lake Bosque Projected Demand and Supplies



Source:
Texas Water Development Board and Paul Price Assoc.
*** *Note: Demand projections are accumulative. Demand satisfied by ground-water and other supply sources (except Lake Waco) was not incorporated in Lake Bosque demand projections.*

Lake Whitney. Bosque County's manufacturing demand is projected to continue relying on Lake Waco as a supply source.

4.7 TRANSPORTATION

4.7.1 Roadway System

As shown in Figure 4 - 5 the proposed Bosque Reservoir site is located in the middle of a triangle whose points are formed by the communities of Meridian to the southeast, Iredell to the northwest and Walnut Springs to the north. The sides of the triangle are formed by State Highway 6 running between Meridian and Iredell, State Highway 144 connecting Meridian and Walnut Springs, and Ranch Road 927 between Walnut Springs and Iredell. Gravel surfaced county roads access the site to the major roadways.

As shown in Figure 4 - 5 traffic volume in 1985 for State Highway 6 between Meridian and Iredell, near the project site, averages 1,350 vehicles per day (average annual 24-hour traffic) (Texas Department of Highways and Public Transportation). Traffice volume for Ranch Road 927 averages 420 vehicles per day. Traffice volume for State Highway 144 averages 890 vehicles per day. Traffic volume on county roads within the county range from 35 to 100 vehicles per day (1984 traffice counts, Bosque County Highway Department, District 9).

Figure 4 - 6 summarizes the roadway and powerline changes associated with the proposed Lake Bosque project. As proposed, reservoir construction will require the relocation of small sections of county and state roadways (to skirt portions of the reservoir), as well as abandonment of county roads which cross the proposed site. Two powerlines located west and northeast of the site would also be relocated and a county road directly linking Highway 6 to the reservoir may be constructed.

There are no major road improvements planned for Bosque County area roads (Texas Department of Highways and Public Transportation, 1986).

4.7.2 Air Service

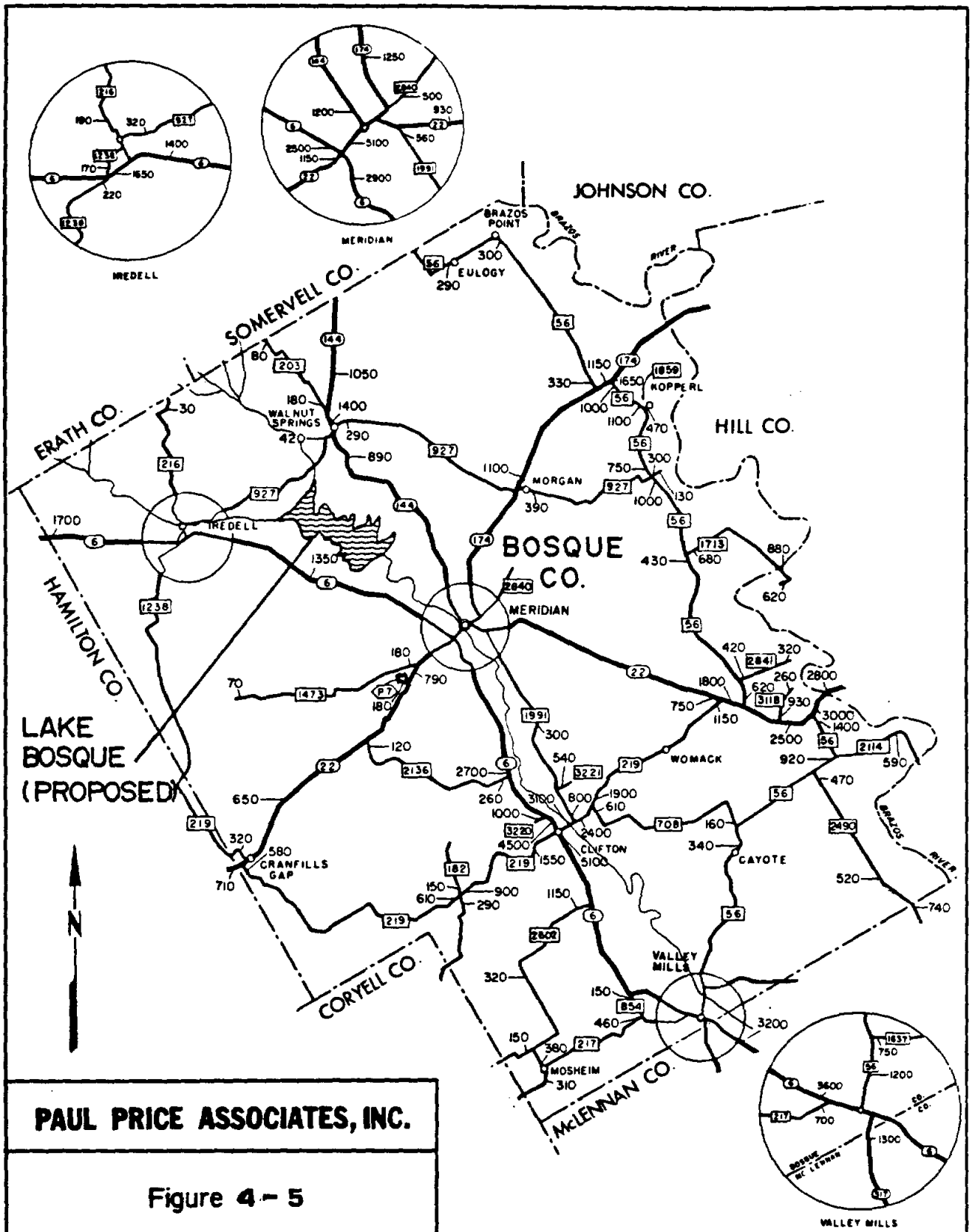
Air service is available in Clifton and Waco. The Clifton Municipal Airport, northeast of the City, approximately 16 miles from the proposed site, offers 3,000 feet of lighted and paved runway and comprehensive services including storage, major and minor repairs, jet fuel and aviation gasoline. Commercial flight service is not available. However, complete services and 13 commercial flights per day, with connections to major cities throughout the country, are available in Waco, approximately 40 miles east of the proposed site.

4.7.3 Rail Service

The Santa Fe Railway System, extending from Chicago to the Gulf Coast services the City of Clifton. Amtrack passenger rail service is available three times weekly from Temple, Dallas or Fort Worth, each city is approximately 70-100 miles from the proposed reservoir site.

4.8 HOUSING

Housing information for the two-county study area was derived from the U.S. Department of Commerce, 1980 Census of Housing, local municipal publications and local area realtors. Table 4 - 9 details 1980 housing conditions in McLennan and Bosque Counties. In both counties vacancy rates for owner-occupied housing units indicate a shortage of available housing, rental vacancy rates point to slightly larger supply of available rental units.



PAUL PRICE ASSOCIATES, INC.

Figure 4 - 5

Bosque Co. Traffic Volume Counts

source: Texas Department of Highways and Public Transportation, 1985

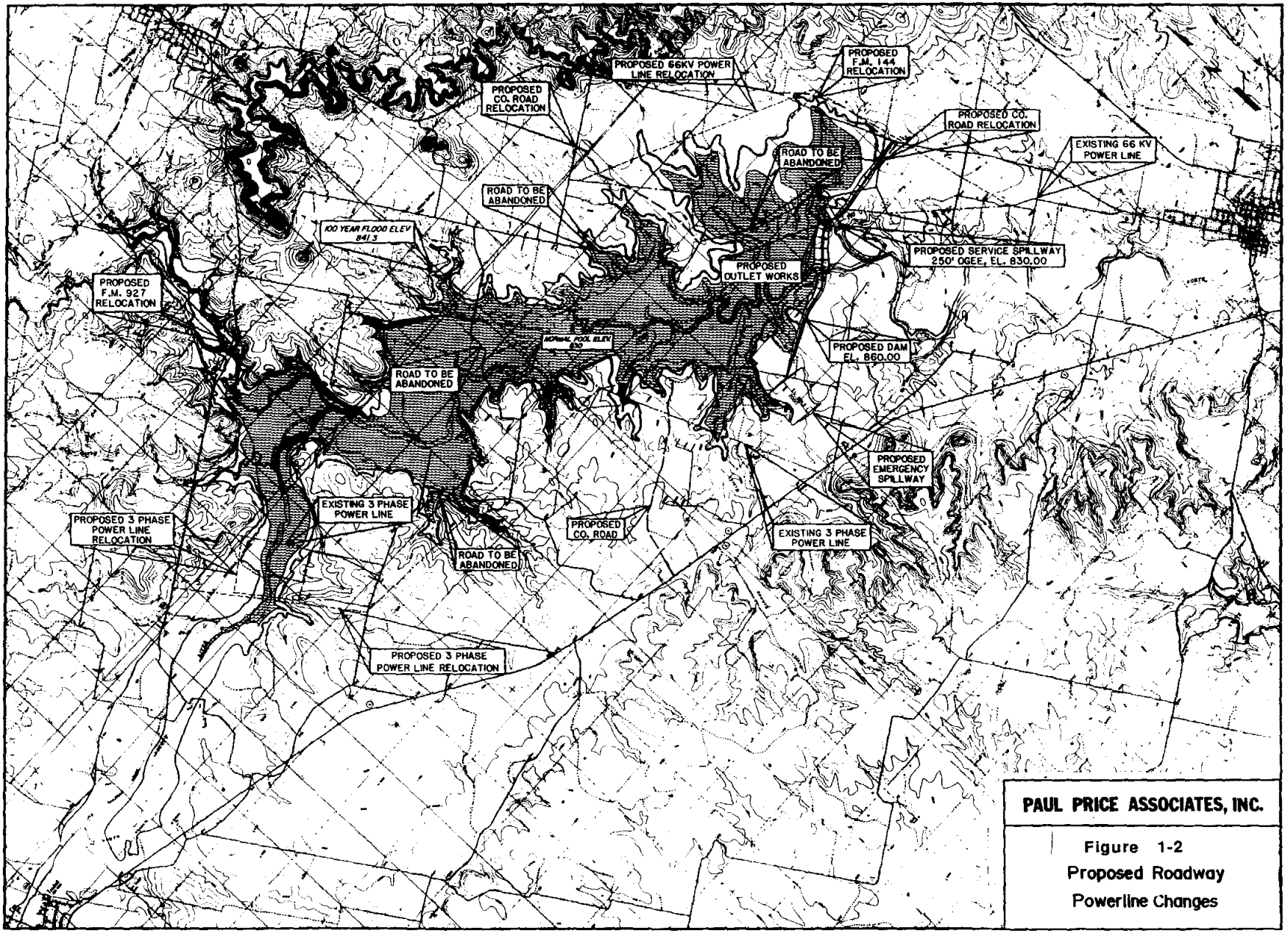

PROPOSED 66KV POWER LINE RELOCATION
PROPOSED F.M. 144 RELOCATION
PROPOSED CO. ROAD RELOCATION
PROPOSED CO. ROAD RELOCATION
EXISTING 66 KV POWER LINE
ROAD TO BE ABANDONED
ROAD TO BE ABANDONED
100 YEAR FLOOD ELEV 841.3
PROPOSED SERVICE SPILLWAY 250' OGEE, EL. 830.00
PROPOSED OUTLET WORKS
PROPOSED F.M. 927 RELOCATION
NORMAL POOL ELEV. 820
PROPOSED DAM EL. 860.00
ROAD TO BE ABANDONED
PROPOSED EMERGENCY SPILLWAY
EXISTING 3 PHASE POWER LINE
PROPOSED 3 PHASE POWER LINE RELOCATION
PROPOSED CO. ROAD
EXISTING 3 PHASE POWER LINE
ROAD TO BE ABANDONED
PROPOSED 3 PHASE POWER LINE RELOCATION
PAUL PRICE ASSOCIATES, INC.
Figure 1-2
Proposed Roadway
Powerline Changes

Table 4 - 9

Housing Data for the Study Area, 1980

	McLennanCounty	Bosque County
Total Housing Units	65,934	7,439
Seasonal	113	86
Year-round	65,821 (99.8% of total)	7,353 (98.8% of total)
Vacant Housing Units	4,267	1,840
Occupied Housing Units		
Total	61,554	5,513
Persons per Occupied Unit	2.65	2.36
# One-person Households	14,488	1,527
Median value ($) / owner	$29,100	$23,400
Contract valued ($) / renter	$158.00	$88.00
Vacancy Rate		
Homeowner	1.7 %	2.0 %
Renter	7.0 %	7.4 %

Source: U. S. Department of Commerce, Census of Housing, 1980

Comparison of building permits issued annually is a method of assessing housing availability between census years. Tables 4 - 10 and 4 - 11 show the number and value of housing units permitted for construction in 1983, 1984 and 1985 in the study area. The value of permits issued in Bosque County was at its peak in 1984 but has since declined. The value of permits issued in McLennanCounty has decreased yearly since 1983. In both counties the number of residential permits decreased .

Local realtors in McLennanCounty report for December 1986 listings of approximately 1,290 new and relisted single family units. Average sales price for a three bedroom single-family home was $61,592. McLennanCounty, as of December 1986, had approximately 18,000 multi-family units, of which, 80% were estimated as occupied. Average monthly rent for a 3 bedroom apartment in the Waco area was $450. In areas skirting the City of Waco apartment rents were 10% to 25% less.

Local realtors in Bosque County reported approximately 50 new and relisted single-family homes since December 1986. The average sales price for a three bedroom single-family home was

approximately $35,000. Other homes were available from $20,000 to $110,000. It was estimated that the county contains 250 apartment units, the majority located in the three most active communities, Clifton, Valley Mills, and Meridian. Of those apartments it was estimated that 95 - 100% were occupied. Average monthly rent for a 1 - 2 bedroom apartment in Bosque County was $162 - $236. The rental market was so tight that waiting lists for occupancy were common.

Table 4 - 10. Building Permits Issued in Bosque County: 1983, 1984, 1985

Building Permits Bosque County	1983	1984	1985
Total Value ($) of Building Permits	$880,000	$1,380,000	$1,121,000
Non-residential			
Value	$116,000	$176,000	$573,000
Residential			
Value	$709,000	$1,207,000	$545,000
Number of Units	19	32	11
Repair, Alterations, & Additions			
Value	$55,000	$5,000	$3,000
Non-residential			
Office	$0	$70,000	$60,000
Industrial	$7,000	$0	$0
Retail	$0	$0	$28,000
Public*	$0	$0	$300,000
Other Non-residential	$787,000	$106,000	$185,000
Residential			
Single-family			
Value	$559,000	$1,790	$545,000
Number of Units	11	20	11
2-4 plex			
Value	$0	$0	$0
Number of Units	0	0	0
Apartments			
Value	$150,000	$128,000	$0
Number of Units	8	12	0

Source: Texas Real Estate Research Center, 1986.
* Does not include highway or bridge construction.

Table 4 - 11. Building Permits Issued in McLennan County: 1983, 1984, 1985

McLennan County	1983	1984	1985
Total Value of Building Permits (in 1000s)	$157,900	$150,641	$114,851
Non-residential			
Value	$45,600	$36,234	$37,884
Residential			
Value	$90,300	$85,777	$50,664
Number of Units	2989	2183	1048
Repair, Alterations, & Additions			
Value	$22,000	$28,630	$26,303
Non-residential			
Office	$10,900	$16,515	$15,784
Industrial	$6,155	$5,003	$1,681
Retail	$5,255	$5,445	$7,530
Public*	$18,980	$2,367	$3,372
Other Non-residential	$4,000	$4,054	$5,967
Hotel	$0	$2,850	$3,550
Residential			
Single-family			
Value	$35,040	$44,766	$39,554
Number of Units	602	692	543
2-4 plex			
Value	$5,790	$8,082	$2,278
Number of Units	203	234	65
Apartments			
Value	$49,478	$32,929	$8,832
Number of Units	2184	1257	440

Source: Texas Real Estate Research Center, 1986.

* Does not include highway or bridge construction.

5.0 PUBLIC FINANCES

5.1 INTRODUCTION

The ability to finance capital improvements such as sewer, streets, parks and recreation facilities is an important measure of a city and county's ability to serve additional populations. Capital improvements may be financed through a variety of techniques including current revenue, reserve funds, general obligation (G.O.) bonds, revenue bonds (R.B.), authorities and special districts. This section examines current revenues, expenditures and indebtedness for fiscal year ended September 30, 1985 for Bosque and McLennan Counties and the seven project participating communities, Waco, Bellmead, Clifton, Meridian, McLennan County WCID # 2 (Elm Mott), Hewitt and Lacy- Lakeview. Data is from the Comprehensive Annual Financial Report for McLennan County, the Audited Combined Current Financial Statements for Bosque County, and Texas Municipal Reports for 1986. Also detailed in this report is the market value, assessed agricultural production value , assessed value, and taxable value of land proposed to be inundated by Lake Bosque.

5.2 COUNTY RESOURCES

Services and primary functions of McLennan and Bosque Counties include general government, public safety, county roads, health, welfare, culture and recreation, conservation, and public improvements. Total bi-county revenue for the year amounted to $24,081,188. Revenue and expenditures for Bosque and McLennan Counties, for the fiscal year ended September 30, 1985, as reported in each county's financial report are shown in Tables 5 - 1 and 5 - 2. The following text refers to those tables.

Current sources of county revenue in the study area for fiscal year ended September 10, 1985 include property taxes which accounted for 42% and 30% respectively of total revenue for McLennan and Bosque County. Intergovernmental transfers, a significant source of current revenue in McLennan County,

Table 5-1. McLennan County Revenues and Expenditures

MCLENNAN COUNTY	GOVERNMENTAL FUND TYPES				FIDUCIARY FUND TYPES		TOTAL GENERAL GOVERNMENT FUNDS
	GENERAL REVENUES	SPECIAL REVENUE	DEBT SERVICE	CAPITAL PROJECTS	EXPENDABLE TRUST	Totals Memorandum Only	
REVENUES:							
Taxes (property)	$6,018,039	$2,351,015	$762,700	$156,722	$0	$9,288,476	$9,131,754
Licenses and Permits	$64,342	$0	$0	$0	$0	$64,342	$64,342
Intergovernmental	$1,016,072	$2,412,388	$10,904	$2,324	$0	$3,441,688	$3,439,364
Charges for Services	$2,702,620	$763,421	$0	$0	$0	$3,466,041	$3,466,041
Fines and Forfeits	$518,275	$556,948	$0	$0	$0	$1,075,223	$1,075,223
Miscellaneous	$973,858	$492,304	$88,260	$11,944	$3,149,715	$4,716,081	$1,554,422
TOTAL REVENUE	**$11,293,206**	**$6,576,076**	**$861,864**	**$170,990**	**$3,149,715**	**$22,051,851**	**$18,731,146**
EXPENDITURES:							
CURRENT							
General Government	$5,204,410	$1,072,704	$0	$0	$0	$6,277,114	$6,277,114
Public Safety	$3,105,639	$1,582,113	$0	$0	$0	$4,687,752	$4,687,752
Public Transportation	$0	$3,719,093	$0	$0	$0	$3,719,093	$3,719,093
Health	$360,580	$0	$0	$0	$0	$360,580	$360,580
Welfare	$1,239,404	$109,622	$0	$0	$0	$1,349,026	$1,349,026
Culture-Recreation	$284,804	$0	$0	$0	$0	$284,804	$284,804
Education	$0	$0	$0	$0	$3,038	$3,038	$0
Conservation	$111,521	$0	$0	$105,813	$0	$217,334	$111,521
CAPITAL PROJECTS	$0	$0	$0	$951,126	$0	$951,126	$0
DEBT SERVICE:							
Principle Retirement	$115,922	$46,536	$520,000	$0		$682,458	$682,458
Interest and Fiscal Charges	$27,172	$11,513	$327,600	$0		$366,285	$366,285
MISCELLANEOUS	$0	$0	$0	$0	$3,180,725	$3,180,725	
TOTAL EXPENDITURES	**$10,449,452**	**$6,541,581**	**$847,600**	**$1,056,939**	**$3,183,763**	**$22,079,335**	**$17,838,633**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	$843,754	$34,495	$14,264	($885,949)	($34,048)	($27,484)	$892,513
OTHER FINANCING SOURCES	$19,317	$111,697	$0	$752,563	$3,086	$886,663	$131,014
EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	$863,071	$146,192	$14,264	($133,386)	($30,962)	$859,179	$1,023,527
Fund Balance at Beginning of Year	$5,676,044	$2,599,777	$734,603	$127,404	$794,382	$9,932,210	$9,010,424
Fund Balance at End of Year	**$6,539,115**	**$2,745,969**	**$748,867**	**($5,982)**	**$763,420**	**$10,791,389**	**$10,033,951**

Source: Comprehensive Annual Financial Report for Mclennan County, fiscal year ended 9/86.

Table 5-2. Bosque County Revenues and Expenditures

BOSQUE COUNTY	GOVERNMENTAL FUND TYPES				CAPITAL PROJECTS	TRUST and AGENCY	TOTAL	TOTAL GENERAL GOVERNMENTAL FUNDS
	GENERAL REVENUES	ROAD & BRIDGE	SPECIAL REVENUE	DEBT SERVICE				
REVENUES:								
Taxes	$371,182	$241,718	$0	$0	$0	$0	$612,900	$612,900
Fees of Office	$203,481	$0	$0	$0	$0	$17,886	$221,367	$203,481
Fines and Forfeits	$196,367	$0	$0	$0	$0	$0	$196,367	$196,367
Intergovernmental	$0	$0	$80,044	$0	$0	$0	$80,044	$80,044
License and Permits	$0	$474,725	$0	$0	$0	$0	$474,725	$474,725
Interest and Other	$199,149	$44,543	$0	$1,732	$15,507	$5,436	$266,367	$245,424
Trust Deposits Received	$0	$0	$0	$0	$0	$177,567	$177,567	$0
TOTAL REVENUE	**$970,179**	**$760,986**	**$80,044**	**$1,732**	**$15,507**	**$200,889**	**$2,029,337**	**$1,812,941**
EXPENDITURES:								
General Administration	$292,245	$0	$0	$0	$0	$0	$292,245	$292,245
Administration of Justice	$415,922	$0	$0	$0	$0	$1,415	$417,337	$415,922
Public Welfare	$77,627	$0	$0	$0	$0	$0	$77,627	$77,627
Health and Sanitation	$963	$0	$0	$0	$0	$0	$963	$963
Appraisal Board	$71,572	$0	$0	$0	$0	$0	$71,572	$71,572
State Extension Service	$18,945	$0	$0	$0	$0	$0	$18,945	$18,945
Emergency Management Fund	$18,312	$0	$0	$0	$0	$0	$18,312	$18,312
County Wide Road and Bridge	$0	$470,095	$36,869	$0	$0	$0	$506,964	$506,964
Debt Service								
Principal Retirement	$6,000	$15,000	$0	$2,000	$0	$0	$23,000	$23,000
Interest Expense	$6,000	$2,517	$0	$495	$0	$0	$9,012	$9,012
Capital Outlay	$25,218	$29,200	$0	$0	$653	$0	$55,071	$54,418
Payment of Trust Deposits	$0	$0	$0	$0	$0	$177,133	$177,133	$0
Total Expenditures	**$932,804**	**$516,812**	**$36,869**	**$2,495**	**$653**	**$178,548**	**$1,668,181**	**$1,488,980**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	$37,375	$244,174	$43,175	($763)	$14,854	$22,341	$361,156	$323,961
Fund Balance, 10/1	$92,432	$357,951	$0	$15,332	$384	$104,808	$570,907	$465,715
Fund Balance, 9/11	**$129,807**	**$602,125**	**$43,175**	**$14,569**	**$15,238**	**$127,149**	**$932,063**	**$789,676**

Source: Bosque County
Financial Statement, Year Ended September 30, 1985

contributed 16% of the general budget but only 4% in Bosque County. The second largest revenue contributor in Bosque County, Licenses and Permits, accounted for 24% of total revenue .

Nationally, since the 1970s municipal financing has relied less on property taxes and more on other revenue sources such as user charges and bond issuance for municipal expenditures. A popular method of financing infrastructure is through the issuance of general obligation (G.O.) and/or revenue bonds. General obligation bonds are backed by the taxing power of the jurisdiction and often require voter approval. General obligation bonds are primarily used to pay interest and principal on capital improvements, such as schools, recreation facilities and parks. In contrast, revenue bonds are supported by revenue producing capital improvements such as water and sewer treatment plants. The interest and principle on revenue bonds are financed through service charges and user fees. Interest rates on revenue bonds are higher than those of G.O. bonds but do not require voter approval.

Authorities and special districts are another way of financing development. Municipal Utility Districts (MUD), Water Conservation and Improvement Districts (WCID), and Hospital Districts are examples of special districts that provide necessary services. These districts are often financed through revenue bonds which are retired through user fees. Some special districts such as MUDs have the power to float tax-free revenue bonds and G.O. bonds. As legal subdivisions of the state, MUDS have the power to levy taxes to pay off bond debt. Special districts in the two-county study area include McLennan County WCID #3, McLennan County WCID #2, and 32 Independent School Districts .

The revenue generating methods described above are used to support local municipal and county expenditures, including educational services, transportation, and capital improvements. Principal county expenditures for Bosque County was for Public Safety, in McLennan County major expenditures were for General Government services. Approximate per capita expenditure in McLennan County for year ended September 1985 was $121, in Bosque County per capita expenditure was $110.

Annual county financial reports are organized on the basis of fund and account groups, each of which is considered a separate accounting entity. Annual county financial reports record all fund and account groups (revenues and expenditures) of the county. Usually the various accounts are organized into generic fund types within broad category and account groups. For the purpose of this report the account of primary interest is the broad category of Governmental Funds and the sub-category funds: General Fund, Special Revenue Fund, Debt Service Fund, Capital Projects Fund. Of further interest is the General Long-Term Debt Account Group which reports bonded indebtedness and other long-term liabilities. This account group is not a "fund" per se, but is concerned only with the measurement of financial position.

5.2.1 The General Fund

5.2.1.1 Revenues

The General Fund is the general operating fund of the county. It is used to account for all financial resources except those by requirement accounted for in another fund. In McLennan County total revenue for general governmental purposes (General Fund) amounted to $18,731,146, a decrease of 2.20% from the preceding year. Nearly 49% of general revenues was accounted for by property taxes and penalties, while Intergovernmental and Service Charges each raised approximately 18% of general revenues. In Bosque County the General Fund for fiscal year ended September 30, 1985 was $1,812,941. Property taxes accounted for 34% of General Governmental Funds, Licenses and Permits accounted for 26% of revenues, and Intergovernmental transfers accounted for only 4% of total revenues.

As of 1982 all taxable property in both counties was assessed at 100% of its appraised value. Counties are permitted by the State Constitution and Statutes to levy property taxes up to $.80 per $100 of assessed valuation for general governmental services and for the payment of principal and interest on long-term debt other than road bonds. In addition, $.30 per $100 of assessed valuation may be levied for farm-to-market road construction and maintenance. This would allow a total rate of $1.10 per $100 of assessed valuation to finance general governmental services, farm-to-market roads and payment of principal and interest on long-term debt other than road bonds.

In McLennan County assessed 1985 property valuations of $3.4299 billion represent an increase of 6.84% from the preceding year. Excluding exemptions, the net taxable value in McLennan County was $2,734,250,075. Currently, the tax rate assessed on the 1984 tax roll to finance general governmental services for the year ended September 30, 1985, was $.3013 per $100 of assessed valuation. Thus, the County has a tax rate margin of $.4987 per $100 of assessed valuation and could raise $13,635,704 in additional tax revenue before reaching the legal limit

The McLennan County tax rate assessed on the 1984 tax roll to finance the construction and maintenance of farm-to-market roads for the year ended September 30,1985, was $.0554 per $100 of assessed valuation. This means the County has a tax rate margin for $.2446 per $100 of assessed valuation and could raise $6,687,976 in additional tax revenue before reaching the legal limit.

As detailed in the preceding paragraphs a combined total of $20,323,680 in additional tax revenue could be raised in McLennan County by levying the maximum tax rate allowed to finance general governmental services and the construction and maintenance of farm-to-market roads. No road bonds were outstanding at publication time of the Comprehensive Annual Financial Report for fiscal year ended September 30,1985.

Property taxes for Bosque County accounted for 30% of the total revenues for fiscal year 1985. Assessed 1985 property valuations stood at $385.6 million. Currently, the tax rate assessed on the 1984 tax roll was $.1531 per $100 of assessed valuation. This means the County has a tax rate margin of $.6469 per $100 of assessed valuation and could raise $2,494,642 in additional tax revenue before reaching the legal limit.

5.2.1.2 Expenditures

As shown in Table 5 -1 expenditures by McLennan County for general governmental purposes amounted to $17,944,446 (excluding capital expenditures from Capital Projects Funds and Trust and Agency Funds expenditures) for the year ended September 30. 1985, an increase of 3.63% over expenditures for the preceding year. General Government, Public Safety and Public Transportation functions accounted for over 81% of total expenditures. Debt service expenditures amounted to only 5.84% of total expenditures.

Table 5 - 2 details Bosque County's 1985 fiscal expenditures; as shown, general governmental expenditures amounted to $1,488,980 with an excess of revenues over expenditures. Administration of Justice and General Governmental Administration functions accounted for over 48% of general governmental expenditures. Debt service expenditures accounted for 2.1% of all expenditures.

5.2.2 The Special Revenue Fund (The Road and Bridge Fund)

Special Revenue Funds are used to account for resources which are legally restricted to expenditures for specified current operation purposes or for the acquisition of relatively minor or comparatively short-lived fixed assets. The Road and Bridge fund (a Special Revenue Fund), established to account for current funds used for the purpose of constructing and maintaining roads and bridges, is of particular significance to the question of accommodating future growth. The principal source of revenues

Table 5 - 3. Study Area Road and Bridge Funds

ROAD AND BRIDGE FUND	Mclennan County	Bosque County
REVENUES		
Taxes	$2,212,575	$241,718
Intergovernmental	$433,324	$0
Charges for Services	$50	$474,725
Fines and Forfeits	$556,948	$0
Miscellaneous	$395,426	$44,543
TOTAL REVENUES	**$3,598,323**	**$760,986**
EXPENDITURES		
CURRENT		
County Wide Road and Bridge Fund	--	$470,095
General Government	$0	$0
Public Safety	$0	$0
Public Transportation	$3,719,093	$0
Welfare	$0	$0
CAPITAL PROJECTS	$0	$29,200
DEBT SERVICE		
Principal Retirements	$39,280	$15,000
Interest and Fiscal Charges	$8,132	$2,517
TOTAL EXPENDITURES	**$3,766,505**	**$516,812**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	**($168,182)**	**$244,174**

Source: 1985 Annual Financial Statement Bosque and Mclennan Counties.

for this fund are ad valorem taxes, fines, forfeits and intergovernmental revenues. The financial statement for the County Road Bridge Fund for Bosque and McLennan Counties is shown in Table 5 - 3.

5.2.3 The Debt Service Fund

Debt service funds are used to account for the accumulation of resources for and the payment of general long-term debt principal, interest and related costs. A separate Debt Service Fund is established for each long-term debt issue except for such items serviced directly from the General Fund or from Special Revenue Funds. Three Debt Service Funds currently exist for McLennan County: Refunding Bonds - Series 1983, Certificate of Obligation - Series 1985, Certificate of Obligation - Series 1985-A. Bosque County has only one Debt Service Fund. Tables 5 - 1 and 5 - 2 show the combined statement of revenues, expenditures and changes in Debt Service Funds for each county.

5.2.4 The Capital Projects Fund

Capital Projects Funds are used to account for the purchase or construction of major capital facilities. Capital Projects Funds are not usually used to acquire short-lived general fixed assets such as furniture, machinery, etc. There are two Capital Projects Funds in use by McLennan County. One is the Permanent Improvement Fund which accounts for the acquisition and improvement of land and buildings on a continuing basis. The principal source of revenues for this fund are ad valorem taxes. The second fund is the Road Bond Fund - Series 1961, it consists of the remaining proceeds from the sale of road bonds and is available for the purchase of right-of-way and the construction of roads. Tables 5 - 1 and 5 - 2 detail expenditures and revenues of the Capital Projects Funds for McLennan and Bosque Counties.

5.2.5 The General Long-term Debt Account Group

Bonded indebtedness and certain other types of liabilities due more than one year after the balance sheet date are accounted for in the General Long-Term Debt Account Group.

The ratio of net long-term general obligation debt to assessed valuation and the amount of net long-term general obligation debt per capita are useful indicators of a county's debt position to county management, citizens and investors. This information for Bosque and McLennan counties as of September 30, 1985 is shown in Table 5 - 4.

Table 5 - 4

Debt Administration

	Net Debt Amount	Ratio of Debt to Assessed Value	Ratio of Debt to Estimated Market	Debt per Capita
MCLENNAN COUNTY				
Direct Debt:				
Net Bonded Debt	$4,071,133	0.1187%	0.1187%	$22.35
Other Direct Debt	619,200	0.0181%	0.0181%	3.40
Subtotal Debt	4,690,33	0.1368%	0.1368%	25.75
Overlapping Debt	48,628,516	1.4178%	1.4178%	267.02
TOTAL	$53,318,849	1.5546%	1.5546%	$292.77
BOSQUE COUNTY				
Direct Debt:				
Net Bonded Debt	–	–	–	–
Other Direct Debt	–	–	–	–
Subtotal Debt	$46,931	–	–	–
Overlapping Debt	–	–	–	–
TOTAL	$46,931	.01217%	–	$3.10

Source: Comprehensive Annual Financial Report, McLennan County and Bosque County, September 30, 1985.

Outstanding general obligation bonds as of September 30, 1985, for McLennan County totaled $4,820,000. The Debt Service Funds balance of $748,867 reduces the net bonded debt to

$4,071,133. The general laws of The State of Texas limit the issuance of bonds for the construction of courthouses, jails, and for certain other purposes to 5% of the assessed total taxable value of all property within the county. The legal debt margin for McLennan County is $167,421,639 for limited tax bonds. The legal limit on the annual tax rate for purposes of the General Fund, Road and Bridge Fund, Jury Fund, and Permanent Improvement Fund including debt service is $.80 per $100 of assessed valuation. However, the Attorney General of Texas will not approve the issuance of bonds which require a levy of more than $.40 of this limit for debt service on limited tax bonds. For fiscal year ended September 30, 1985, McLennan County levied a tax rate of $.0292 per $100 of assessed valuation for debt service on these bonds. The County has no outstanding debt for unlimited tax road bonds, therefore the legal debt margin as of September 30, 1985 is the full amount allowable by law, 25% of the assessed valuation of the real property in the County or $645,742,067. As of September 30, 1985 there were no general obligation bonds authorized but unissued by McLennan County, and there were no revenue bonds either authorized or outstanding.

Outstanding general obligation debt for Bosque County, as of September 1985, amounted to $46,931. Bosque County's Road Bonds for $11,000 are payable at variable amounts through 1993, with interest at 5.25% to %5.5- depending upon the maturity date. The bonds are fully funded by Debt Service fund assets.

5.2.6 County Debt Rating

McLennan County's bond and credit rating is very solid. Certificates of Obligation - Series 1985 - A were assigned a rating of A-1 by Moody's Investors. An A-1 rating is an upper medium quality bond rating, indicating a strong capacity to pay principal and interest. According to credit standards published by the International City Management Association (ICMA) a ratio of net bonded debt to assessed property valuation of less than 5% is very good. The ratio for McLennan County is 1.5546%. Other indications of a sound credit rating for McLennan County is a per capita debt of $292.77,much less than the

recommended $550 (ICMA).

To further support the statement that McLennan County is a strong financial entity is a comparison of net debt growth rates against tax base and per capita income growth rates for two periods 1980 - 81 and 1983 - 84. The comparison reveals that the growth rate of net debt does not rise excessively over tax base or personal income growth rates. In fact, the growth rate of McLennan County's net debt is about half of that for the tax base.

Bosque County's credit rating is also solid. Its ratio of bonded debt to assessed value (.01%) is much lower than the 5% "very good" credit standard ratio published by the International City Management Association (ICMA). Other indications of a sound credit rating for Bosque County is a per capita debt of $3.10, much less than the recommended $550 (ICMA).

5.3 MUNICIPAL FINANCES

5.3.1 Property Taxes

Table 5 - 5 lists assessed property valuations, applied property tax rates and remaining tax margins for each subject municipality. Also shown is the degree of bond indebtedness (total and per capita) of each municipality and the results of different methods of analyzing municipal creditability.

Additional tax revenue available to municipalities (statutory tax limit - actual tax rate) ranges from a low of $180,000 for Meridian to $29,917,642 for the City of Waco. None of the property tax rates reach the legal property tax limit. Property tax rates range from a high of $.56 per $100 for the City of Waco to a low of $.22 for Clifton. A majority of the subject municipalities property tax rates are approximately $.30 per $100 valuation.

Table 5 - 5. Municipal Finances and Credit Ratings

MUNICIPALITIES	Bellmead	Hewitt
Assessed Valuation* (A.V.)	$77,761,361	$151,090,148
(date of valuation)	1985	1985
Property Tax Rate (per $100 A.V.)	$0.3000	$0.3150
Property Tax Limit (per $100 A.V.)	$2.50	$2.50
Property Tax Margin (per $100 A.V.)	$2.20	$2.19
Additional Tax Revenue Available	$1,710,750	$3,301,320
% of A.V. Paid by 10 Principal Taxpayers	16%	14%
General Obligation Bond Debt	$1,779,000	$2,325,000
% of G.O. Debt Self-supporting	100%	65%
Debt Service Requirement	$21,738	$289,256
Value of Authorized but Unissued G.O .Bonds	none	none
Net Debt	$0	$710,194
Net Debt per Capita	$0.00	$135.35
Payment Record	never defaulted	never defaulted
Revenue Bond Debt	$232,000	$4,873,000
Avg. Ann. Req. Debt Service	$59,100	$305,041
Net System Revenue Available Fiscal Year '85	$297,417	$630,231
Authorized but Unissued Revenue Bonds	none	none
Debt Service/Total Revenue from Sources	19.87%	48.40%
Total Debt		
Total Direct & Overlapping Debt	$266,684,773	$2,981,745
Per Capita Debt	$354.71	$568.28
Credit Rating		
Total Debt/Market Value of Property Tax Base	3.43%	0.02%
less than 5% = very good		
more than 10% = trouble		
Revenue Debt Service/Total Revenue from Sources	19.87%	48.40%
less than 20-25% = very good		
Date of Financial Statement	5/30/86	9/30/86

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Meridian	Lacy-Lakeview
Assessed Valuation* (A.V.)	*$19,000,000*	$73,252,395
(date of valuation)	1985	1986
Property Tax Rate (per $100 A.V.)	*$0.5500*	$0.3000
Property Tax Limit (per $100 A.V.)	$1.50	$1.50
Property Tax Margin (per $100 A.V.)	$0.95	$1.20
Additional Tax Revenue Available	$180,500	$879,029
% of A.V. Paid by 10 Principal Taxpayers	23%	38%
General Obligation Bond Debt	$599,000	$70,000
% of G.O. Debt Self-supporting	100%	100%
Debt Service Requirement	$55,912	$16,850
Value of Authorized but Unissued G.O .Bonds	none	none
Net Debt	$129,438	$0
Net Debt per Capita	$97.32	$0.00
Payment Record	never defaulted	never defaulted
Revenue Bond Debt	$23,000	$1,035,000
Avg. Ann. Req. Debt Service	$8,278	$92,713
Net System Revenue Available Fiscal Year '85	$52,773	$356,649
Authorized but Unissued Revenue Bonds	none	$155,000
Debt Service/Total Revenue from Sources	15.69%	26.00%
Total Debt		
Total Direct & Overlapping Debt	$138,465	$1,660,070
Per Capita Debt	$104.11	$603.22
Credit Rating		
Total Debt/Market Value of Property Tax Base	0.01%	0.02%
less than 5% = very good		
more than 10% = trouble		
Revenue Debt Service/Total Revenue from Sources	15.69%	26.00%
less than 20-25% = very good		
Date of Financial Statement	9/30/85	7/1/86

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Clifton	Woodway
Assessed Valuation* (A.V.)	$50,592,713	$239,263,970
(date of valuation)	1983	1985
Property Tax Rate (per $100 A.V.)	$0.2200	$0.3400
Property Tax Limit (per $100 A.V.)	$1.50	$2.50
Property Tax Margin (per $100 A.V.)	$1.28	$2.16
Additional Tax Revenue Available	$647,587	$5,168,102
% of A.V. Paid by 10 Principal Taxpayers	21%(1984 A.V.)	5%
General Obligation Bond Debt	$180,000	$965,000
% of G.O. Debt Self-supporting	100%	100%
Debt Service Requirement	$33,995	$119,201
Value of Authorized but Unissued G.O .Bonds	none	none
Net Debt	$157,410	$4,626
Net Debt per Capita	$51.39	$0.65
Payment Record	never defaulted	never defaulted
Revenue Bond Debt	none	$1,745,000
Avg. Ann. Req. Debt Service	$0	$110,374
Net System Revenue Available Fiscal Year '85	$36,887	$455,605
Authorized but Unissued Revenue Bonds	none	none
Debt Service/Total Revenue from Sources	0.00%	24.23%
Total Debt		
Total Direct & Overlapping Debt	$421,903	$3,012,884
Per Capita Debt	--	$424.89
Credit Rating		
Total Debt/Market Value of Property Tax Base	0.01%	0.01%
less than 5% = very good		
more than 10% = trouble		
Revenue Debt Service/Total Revenue from Sources	0.00%	24.23%
less than 20-25% = very good		
Date of Financial Statement	9/30/83	9/30/85

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Mclennan County WCID # 2 (Elm Mott)
Assessed Valuation* (A.V.)	$18,658,293
(date of valuation)	1985
Property Tax Rate (per $100 A.V.)	$0.3100
Property Tax Limit (per $100 A.V.)	NA
Property Tax Margin (per $100 A.V.)	NA
Additional Tax Revenue Available	NA
% of A.V. Paid by 10 Principal Taxpayers	27%
General Obligation Bond Debt	$405,000
% of G.O. Debt Self-supporting	100%
Debt Service Requirement	$56,560
Value of Authorized but Unissued G.O .Bonds	none
Net Debt	$0
Net Debt per Capita	--
Payment Record	never defaulted
Revenue Bond Debt	none
Avg. Ann. Req. Debt Service	none
Net System Revenue Available Fiscal Year '85	none
Authorized but Unissued Revenue Bonds	none
Debt Service/Total Revenue from Sources	none
Total Debt	
Total Direct & Overlapping Debt	$386,224
Per Capita Debt	--
	$514.97 per acre
Credit Rating	
Total Debt/Market Value of Property Tax Base	0.02%
less than 5% = very good	
more than 10% = trouble	
Revenue Debt Service/Total Revenue from Sources	none
less than 20-25% = very good	
Date of Financial Statement	9/30/85

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Waco
Assessed Valuation* (A.V.)	$2,322,798,323
(date of valuation)	1985
Property Tax Rate (per $100 A.V.)	$0.5620
Property Tax Limit (per $100 A.V.)	$1.85
Property Tax Margin (per $100 A.V.)	$1.29
Additional Tax Revenue Available	$29,917,642
% of A.V. Paid by 10 Principal Taxpayers	12%
General Obligation Bond Debt	$22,704,000
% of G.O. Debt Self-supporting	100%
Debt Service Requirement	$2,987,386
Value of Authorized but Unissued G.O .Bonds	none
Net Debt	$7,658,902
Net Debt per Capita	$75.64
Payment Record	never defaulted
Revenue Bond Debt	$24,753,763
Avg. Ann. Req. Debt Service	$2,897,230
Net System Revenue Available Fiscal Year '85	$7,496,247
Authorized but Unissued Revenue Bonds	none
Debt Service/Total Revenue from Sources	38.65%
Total Debt	
Total Direct & Overlapping Debt	$17,449,196
Per Capita Debt	$173.32
Credit Rating	
Total Debt/Market Value of Property Tax Base less than 5% = very good more than 10% = trouble	0.01%
Revenue Debt Service/Total Revenue from Sources less than 20-25% = very good	38.65%
Date of Financial Statement	9/30/86

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

5.3.2 Municipal Credit Rating

One measure of a strong credit rating (International City Management Association) is if total debt per capita is less than less than $550, if per capita debt is higher than $1,300 financial instability is likely. All the subject municipalities fit this criteria for a good credit rating except the communities of Hewitt and Lacy-lakeview whose net per capita debt is slightly higher than the recommended $550 but much lower than the danger zone above $1,300.

A second method of measuring credit soundness recommended by the International City Management Association is to compare total debt to the market value of the entity's property tax base: a ratio of less than 5% is very good, more than 10% signals possible trouble. As shown in Table 5 - 5 all the municipalities fit this criteria for a sound credit rating.

A third method provided by the International City Management Association of determining credit stability is to compare the revenue debt service with total revenue from sources, if the ratio is less than 20-25% the credit rating is considered good. When this method of of credit analysis was applied three municipalities were shown to have a higher than desirable debt service to revenue ratio; those cities were, Hewitt, Lacy-Lakeview and Waco.

5.4 TAXABLE VALUE OF LANDS POTENTIALLY INUNDATED

Approximately fifty-four landowners owning 13,351 acres will be impacted to some extent by the proposed construction of Lake Bosque. In some cases all of a particular land parcel will be inundated, in other cases only a portion of the parcel. Approximately nine homes and 6,143.26 acres of the 13,251 acres will be affected by the proposed lake Bosque's conservation pool and 100 year floodplain.

The Bosque County Financial Statement for year ended 1985 reports total property assessments at $385,630,342. The proposed project would remove about 6,143 acres from the county tax roles. The assessed value of property removed from the tax roles by the construction of the proposed reservoir is about 45% of the assessed value of the 13,629 acres partially affected by the project. As shown in Table 5 - 6 the assessed property value for the 13,629 acres partially affected by the proposed reservoir was $2,827,655. Forty-five percent of the assessed valuation of the 13,629 acres is $1,272,455 or .33% of the county's tax base. Thus, the construction of the proposed reservoir would remove about .33% of the county's tax base.

5.5 SUMMARY

Property taxes accounted for the majority of McLennan and Bosque Counties' tax revenues. Other major revenue sources in McLennan County were Intergovernmental Transfers and Service Charges; in Bosque County an important revenue source was Licenses and Permits.

Property valuations in McLennan County for 1985 increased slightly from the preceding year. Legally McLennan County could more than double the tax rate for financing general government services and quadruple the current tax rate for financing the construction and maintenance of farm-to-market roads and still fall below the ceiling limit. Bosque County could increase property tax revenues by increasing the current tax rate by five and still fall below the legal limit.

Measures for calculating bond and credit rating strength reveal that both counties are secure, as per capita debt and the ratio of debt to assessed value are both low. In addition, McLennan County was assigned a rating of A-1 by Moody's investors. An A-1 rating is an upper medium quality bond rating indicating a strong capacity to pay principal and interest.

None of the seven project participating communities' property tax rates are close to the legal ceiling of $2.50 per $100 valuation. Four of the communities have property tax rates which fluctuate around $.30 per $100 valuation. Those communities could increase property tax rates by seven to eight times and still fall below the legal limit. Two of the communities could triple their property tax rates and one community could increase its tax rate by five and each would still remain under the ceiling limit.

Three methods of analyzing credit soundness were applied. The first criteria was a per capita debt of less than $550. All the subject communities complied with this criteria except the communities of Hewitt and Lacy-Lakeview. However, the net per capita debt of those communities was only slightly higher than the recommended value and much lower than the danger zone above $1,300. The second method of measuring credit soundness compared total debt to the communities' property market valuations. The results showed all the subject communities in good standing. The third method of determining credit stability compared revenue debt service with total revenue from sources. The results of this application revealed three communities with a higher than desirable debt service to revenue ratio; those communities were Hewitt, Lacy-Lakeview and Waco.

In short, the financial position of Bosque and McLennan Counties is good. Both have strong credit ratings and if needed, have ample tax margins allowing major increases in property tax revenues. The subject municipalities are also in good financial condition, with relatively low property tax rates, ample tax margins and low per capita debt ratios.

Table 5-6. Land Values for Proposed Lake Bosque Site

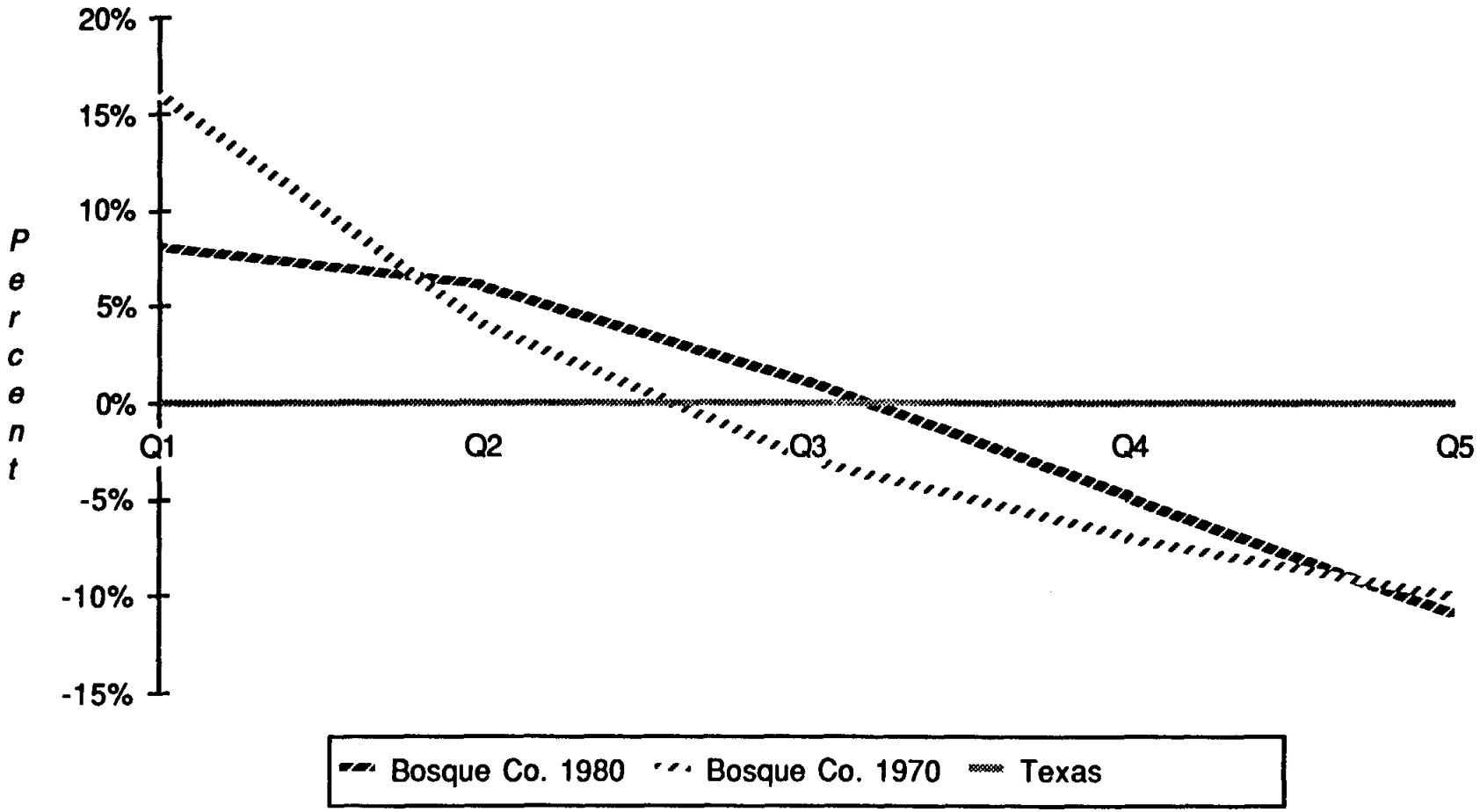
ID #	Landowner	Abstract	Total Acres	Land Use	Market Value	Production Value	Assessed Value	Taxable Value
A-183	MCKNIGHT, LELA	NICHOLS, E.B.	1	HS	$236,550	- -	$236,550	$236,550
A-183	MCKNIGHT, LELA	NICHOLS, E. B.	1	HS	$36,890	- -	$36,890	$36,890
A-183	MCKNIGHT, LELA	NICHOLS, E.B/GREEN	875	AG	$668,790	$87,590	$139,520	$139,520
A-183	MCKNIGHT, LELA	HOLLINGSWORTH JAS.	253	AG	$194,180	$15,470	$15,470	$15,470
A-183	MCKNIGHT, LELA	HOLLINGSWORTH JAS.	1	HS	$23,350	- -	$23,350	$23,350
A-183	MCKNIGHT, LELA	JAMES ROURKE	1	HS	$23,150	- -	$23,150	$23,150
A-183	MCKNIGHT, LELA	JAMES ROURKE	390	AG	$296,610	$22,360	$24,160	$24,160
A-183	MCKNIGHT, LELA	J. GRIFFEN	417	AG	$315,750	$22,370	$33,950	$33,950
A-183	MCKNIGHT, LELA	L. DAVIS	741	AG	$591,470	$76,530	$144,810	$144,810
A-183	MCKNIGHT, LELA	L. DAVIS	1	HS	$26,300	- -	$26,300	$26,300
A-183	MCKNIGHT, LELA	L. DAVIS	1	HS	$28,390	- -	$28,390	$28,390
A-183	*TOTAL- MCKNIGHT, LELA*	- -	*2,681*		*$2,461,430*	*$224,320*	*$732,540*	*$732,540*
A-209	COCHRAN, JIM	NA	NA	NA	NA	NA	NA	NA
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	440	AG	$338,700	$41,160	$49,260	$49,260
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	1	HS	$11,310	- -	$11,310	$11,310
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	1	HS	$44,240	- -	$44,240	$29,240
A-252	MARTIN , CHARLOTTE	JAS. HOLLINGSWORTH	720	AG	NA	- -	- -	- -
A-26	GAUNTT, H.W.	NA	100	AG	$69,000	$4,700	$4,700	$4,700
A-266	RICH, EARL E.	J. GRIFFEN	100	AG	$73,960	$5,870	$9,170	$9,170
A-266	RICH, EARL E.	J. GRIFFEN	1	HS	$33,470	- -	$33,470	$33,470
A-277	HILLARD C.T.	NA	NA	NA	NA	NA	NA	NA
A-286	MOORE, PAUL	DAVID RYAN	152	AG	$117,950	$13,440	$13,440	$13,440
A-286	MOORE, PAUL	DAVID RYAN	1	HS	$23,550	- -	$23,550	$23,550
A-290	GILLELAND, A. J.	JOHN GRIFFEN	49	AG	$38,200	$3,950	$7,580	$7,580
A-290	GILLELAND, A. J.	JOHN GRIFFEN	1	HS	$35,070	- -	$35,070	$35,070
A-291	SPEER, BIRDIE	NA	103	AG	NA	- -	- -	- -
A-295	VICKERY, JACK	DAVID GREEN	68	AG	$51,000	$3,740	$3,740	$3,740
A-295	VICKERY, JACK	DAVID GREEN	1	HS	NA	- -	- -	- -
A-296	REEVES, CHARLES H.	J. GRIFFEN	99	AG	$44,380	$4,370	$4,780	$4,780
A-296	REEVES, CHARLES H.	J. GRIFFEN	1	HS	$50,350	- -	$50,350	$5,000
A-30	MONNICH, DAVID H.	JONATHON HOAK	69	AG	$5,280	$4,160	$14,160	$14,160
A-300	LEATHERWOOD, W. J.	WM. B. LOFTON	186	AG	$142,130	$14,650	$28,110	$28,110
A-305	NA	NA	NA	NA	NA	NA	NA	NA
A-309	CAREY, DAN B.	NA	NA	NA	NA	NA	NA	NA
A-316	NICKELS, ROY L.	JUANA DIAZ	533	AG	$169,890	$15,040	$22,170	$22,170
A-318	NICKELS, ROY L.	JUANA DIAZ	1	HS	$15,190	- -	$15,190	$15,190
A-319	HENDRIX, DAVID M. JR.	LITTLE JONAS	106	AG	$80,980	$6,680	$6,680	$6,680
A-319	HENDRIX, DAVID M. JR.	C.E. ANDERSON	205	AG	$162,750	$20,030	$20,030	$20,030
A-319	HENDRIX, DAVID M. JR.	JOHN GRIFFIN SR.	366	AG	$266,580	$27,810	$80,160	$80,160
A-319	HENDRIX, DAVID M. JR.	JOHN GRIFFIN SR.	1	HS	$27,190	- -	$27,190	$27,190
A-323	KLUTS, FRED	NA	42	NA	NA	NA	NA	NA
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	1	HS	$21,980	- -	$21,980	$21,980
A-325	THOMPSON, JOHN R.	JAMES ROURKE	146	AG	$109,770	$11,390	$11,390	$11,390
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	5	AG	$9,450	$690	$690	$690
A-325	THOMPSON, JOHN R.	EDWARDS, T. E.	15	AG	$11,560	$850	$850	$850
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	781	AG	$590,830	$58,820	$82,160	$82,610
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	1	AG	$60,490	$0	$60,490	$60,490
A-339	BARTON, DAVID B.	NA	11	NA	NA	NA	NA	NA
A-379	PIERCE, J.V.	HOLLINGSWORTH JAS.	57	AG	$44,380	$4,370	$4,780	$4,780
A-379	PIERCE, J.V.	HOLLINGSWORTH JAS.	1	HS	$50,300	- -	$50,300	$5,000
A-414	MCKNIGHT, DAVID	HOLLINGSWORTH, JAS	38	AG	$28,630	$2,110	$2,110	$2,110
A-56	WEBB, MAE	JOHNATHON HOAK	140					
A-58	HOWARD, T.D.	BAKER, HANCE	156	AG	$116,930	$7,020	$7,570	$7,570
A-65	MOORE, ERVIN W.	JOHNATHON HOAK	121	AG	$93,310	$8,090	$16,150	$16,150
A-700	NA	NA	NA	NA	NA	NA	NA	NA
A-701	NA	NA	NA	NA	NA	NA	NA	NA
A-702	NA	NA	NA	NA	NA	NA	NA	NA
A-703	NA	NA	NA	NA	NA	NA	NA	NA
A-704	JAGGERS, W. FRED	WILLIAM RIDDLES	50	AG	$37,500	$2,750	$2,750	$2,750
A-704	NA	NA	NA	NA	NA	NA	NA	NA
A-73	WOODY, H. E.	NA	NA	NA	NA	NA	NA	NA
A-76	FOSTER, RANDELL R.	NA	NA	NA	NA	NA	NA	NA
A-84	O'BRIAN, FOSTER D.	NA	44	NA	NA	NA	NA	NA
A-88	HOLLAN, CHARLES N.	GEO. LAWERENCE	150	AG	$112,880	$6,770	$6,770	$6,770
A-91	PIKE ALBERT	BAKER, HANCE	42	AG	$31,780	$2,600	$2,600	$3,620
B-277	BEECHERL,LOUIS A. JR.	DAVID RYAN	262	AG	$196,820	$14,430	$14,430	$14,320
C-1	NA	NA	NA	NA	NA	NA	NA	NA
C-128	HANNA, JEFFEIE F.	WILLIAM PARVIN	3	HS	$78,280	- -	$78,280	$78,280
C-128	HANNA, JEFFEIE F.	WILLIAM PARVIN	160	AG	NA	NA	NA	NA

Table 5-6. (continued)

ID #	Landowner	Abstract	Total Acres	Land Use	Market Value	Production Value	Assessed Value	Taxable Value
C-14	JENKINS, TOM Z.	JOHN K. MCLENNAN	67	AG	$51,650	$6,350	$9,140	$9,140
C-14	JENKINS, TOM Z.	JOHN K. MCLENNAN	1	HS	$16,270	- -	$16,270	$16,270
C-154	NAGEL, RICHARD C.	JESSE P. HITCHCOCK	166	AG	$129,360	$13,310	$19,540	$19,540
C-154	NAGEL, RICHARD C.	JESSE P. HITCHCOCK	1	HS	$14,960	- -	$14,960	$14,960
C-19	VICK, THOMAS	SAMUEL K. LEWIS	253	AG	$196,100	$23,140	$53,270	$53,270
C-19	VICK, THOMAS	SAMUEL K. LEWIS	1	HS	$84,460	- -	$84,460	$5,000
C-196	ALLEN, EUGENE	WILLIAM MEDLIN	237	AG	$179,000	$14,860	$14,860	$14,860
C-197	LACY-FEED CO.	J. HOWE	1	HS	$14,360	- -	$14,360	$14,360
C-197	LACY-FEED CO.	J. HOWE	179	AG	$119,330	$8,750	$368,260	$368,260
C-204	MANISON, THOMAS	ANDREW H. LONG	90	AG	$80,720	$16,140	$16,140	$16,140
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$75,040	- -	$75,040	$75,040
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$23,230	- -	$23,230	$23,230
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$23,650	- -	$23,650	$23,650
C-204	MANISON, THOMAS	ANDREW H. LONG	1,213	AG	$917,470	$82,020	$82,020	$82,020
C-205	HARDCASTLE, J.W.	LONG, ANDREW H.	137	AG	$102,900	$6,170	$6,170	$6,170
C-210	GRIMM, FURMAN A.	RUNDEL BENJ. F.	95	AG	$73,070	$6,800	$6,800	$6,800
C-23	HAMILTON, J.J.	DANIEL C. THOMAS	88	AG	NA	NA	NA	NA
C-27	HALL, GLADYS	DANIEL C. THOMAS	17	AG	$13,390	$1,300	$1,300	$1,300
C-27	HALL, GLADYS	WM. ECHELBERGER	102	AG	$79,250	$7,800	$9,780	$9,780
C-27	HALL, GLADYS	WM. ECHELBERGER	1	HS	$21,290	- -	$21,290	$21,290
C-27	HALL, GLADYS	HITCHCOCK, JESSE B.	40	AG	$31,020	$3,050	$3,050	$3,050
C-33	RANDOLPH, ROBERT M.	NA	NA	NA	NA	NA	NA	NA
C-41	FARRELL, B.E.	DAVID D. GREEN	157	AG	$117,750	$8,640	$8,640	$8,640
C-41	FARRELL, B.E.	JACOB, EYLER	692	AG	$525,150	$43,300	$43,300	$43,300
C-418	GIPSON, WILLIAM E.	WM. ECHELBERGER	263	AG	$200,690	$20,770	$24,230	$24,230
C-418	GIPSON, WILLIAM E.	JESSE P. HITCHCOCK	120	AG	$89,760	$6,580	$6,580	$6,580
C-44	WILLIAMS, HARVEY	WM. PARVIN	466	AG	$349,500	$20,970	$31,920	$31,920
C-44	WILLIAMS, HARVEY	WM. PARVIN	1	HS	$50,735	- -	$50,735	$51,735
C-450	MORRIS, ROBERT	BENJ. L. RUNDEL	100	AG	NA	NA	NA	NA
C-493	REINKE, ERNEST W. JR.	PATCHING, L.Y. DEC'D	1	HS	$69,040	- -	$69,040	$69,040
C-493	REINKE, ERNEST W. JR.	PATCHING, L.Y. DEC'D	159	AG	$122,780	$14,910	$20,260	$20,260
C-59	HARDCASTLE B.R.	JESSE HITCHCOCK	40	NA	NA	NA	NA	NA
C-59	HARDCASTLE B. R.	SAMUEL K. LEWIS	178	AG	$138,390	$11,720	$11,720	$11,720
C-59	HARDCASTLE B. R.	RUNDEL, BENJ. F.	16	AG	$12,530	$1,340	$1,340	$1,340
C-66	BICE, DON	HOWE, JAMES	70	AG	$52,550	$69,040	$69,040	$3,850
C-68	ROYAL, EARL	DANIEL C. THOMAS	200	AG	NA	NA	NA	NA
C-700	NA	NA	NA	NA	NA	NA	NA	NA
C-701	NA	NA	NA	NA	NA	NA	NA	NA
D-196	HAMPE, LOUISE L., & A.W.	DANIEL C. THOMAS	1	HS	$11,090	- -	$11,090	$11,090
D-196	HAMPE, LOUISE L., & A.W.	DANIEL C. THOMAS	117	AG	$88,470	$6,130	$6,130	$6,130
D-196	HAMPE, LOUISE L., & A.W.	SAMUEL K. LEWIS	143	AG	$108,180	$9,630	$9,630	$9,630
	TOTAL		13,629		$10,060,825	$912,770	$2,827,655	$2,579,515
	Lake Bosque acreage (proposed) (Δ)		6,143					
	Percent of Landowners' Total Acreage		45%					
	Percent of Dollar Values Removed By Proposed Proj		45%		$4,527,371	$410,747	$1,272,445	$1,160,782

Notes: Na = not available, Ag = agriculture, HS = homesite, NHS = not a homesite.
Source: Bosque County Appraisal District, (Δ) Technical Consulting Associates, 1985.

Figure 3 -4: Income Comparison for Texas and Bosque County - 1970, 1980



4.0 COMMUNITY SERVICES AND FACILITIES

4.1 INTRODUCTION

This section provides a baseline from which to judge the current level and future capability of community services and facilities in Bosque and McLennan Counties to absorb growth. Reported are statistics concerning educational services, public safety services and health services and facilities. Estimated is the amount of school taxes lost from the removal of land from school tax roles for the construction of the proposed Lake Bosque. Provided in this section is a summary of water and wastewater treatment statistics for project participating cities, and projections of future water demands for the proposed Lake Bosque. Also included in this section is a summary of transportation elements in the study area, include are: traffic counts for Bosque County roads and air and railroad services to the proposed Lake Bosque. Housing information detailing study area vacancy rates and market composition is provided.

4.2 EDUCATION

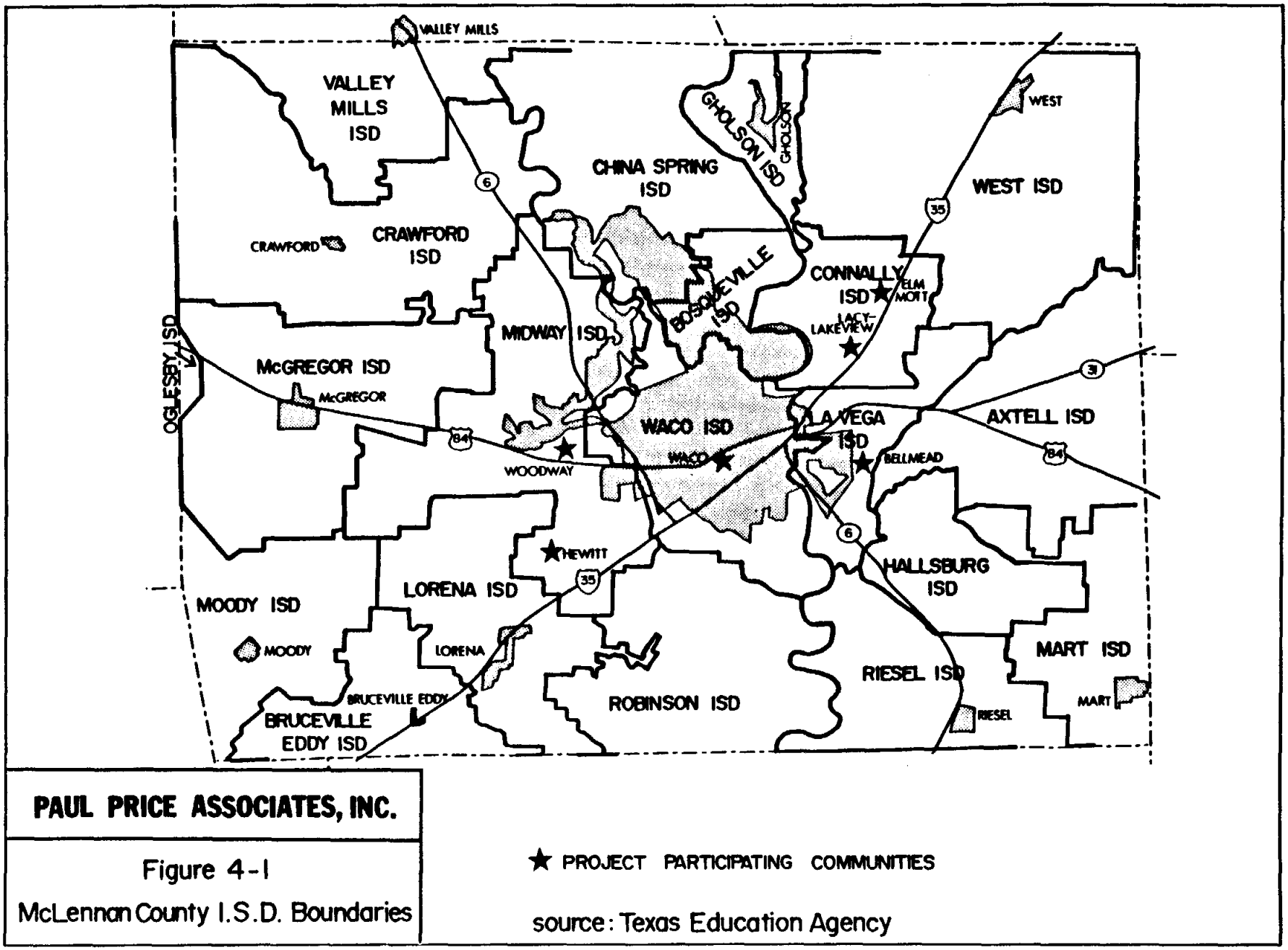
Independent school districts (ISDs) within the study area are listed in Table 4 - 1. Also shown are 1985 - 86 student to teacher ratios, total enrollment, number of teachers and expenditures per student. The location and geographic boundaries of each ISD are shown in Figures 4 - 1 and 4 - 2. Enrollment for 1985 - 1986 ranged from 15,182 in the Waco ISD to 113 in the Hallsburg District. Student-teacher ratios varied from 21.8 students per teacher in the Lorena ISD to 9.8 students per teacher in the Axtel ISD. Expenditures ranged from $5,022 per pupil in the Axtel ISD to $1,929 in the Lorena ISD.

Table 4 - 2 lists the operating tax rates for the three ISDs whose tax rolls will be reduced (due to lost property valuations) if the proposed Lake Bosque is built. The tax rate cannot exceed $1.50 per $100 valuation per Section 20.04 of the Texas Education Code unless specifically authorized by special legislative act. The three ISDs which will lose part of their tax base if Lake Bosque is built are: Walnut

Table 4 - 1. Bosque, McLennan County ISD Education Statistics, 1985 - 1986

County/ISD (1985 - 1986)	Enrollment	Teachers	Student/Teacher Ratio	Expenditures per Student
McLennan County				
Axtell	781	80	9.8	$5,022
Bosqueville	307	16	19.2	$2,309
Bruceville-Eddy	520	27	19.3	$2,476
China Spring	868	48	18.1	$2,205
Connally	2,389	117	20.4	$2,451
Crawford	343	20	17.2	$2,689
Gholson	160	6	26.7	$2,515
Hallsburg	113	8	14.1	$3,805
La Vega	2,398	118	20.3	$2,752
Lorena	936	43	21.8	$1,929
Mart	755	47	16.1	$2,670
McGregor	1,188	68	17.5	$2,809
Midway	5,026	237	21.2	$2,357
Moody	599	35	17.1	$2,847
Riesel	458	27	17.0	$2,407
Robinson	1,800	91	19.8	$2,160
Waco	15,182	879	17.3	$3,144
West	1,176	57	20.6	$2,053
County Totals	34,999	1,924	18.2	$2,790
Bosque County				
Clifton	948	52	18.2	$2,613
Cranfills Gap	156	14	11.1	$3,948
Iredell	155	12	12.9	$4,472
Kopperl	227	13	17.5	$3,357
Meridian	466	27	17.3	$3,071
Morgan	145	14	10.4	$4,089
Valley Mills	505	31	16.3	$3,066
Walnut Springs	190	15	12.7	$3,154
County Totals	2,792	178	15.7	$3,125

Source: Texas Education Agency, 1986.



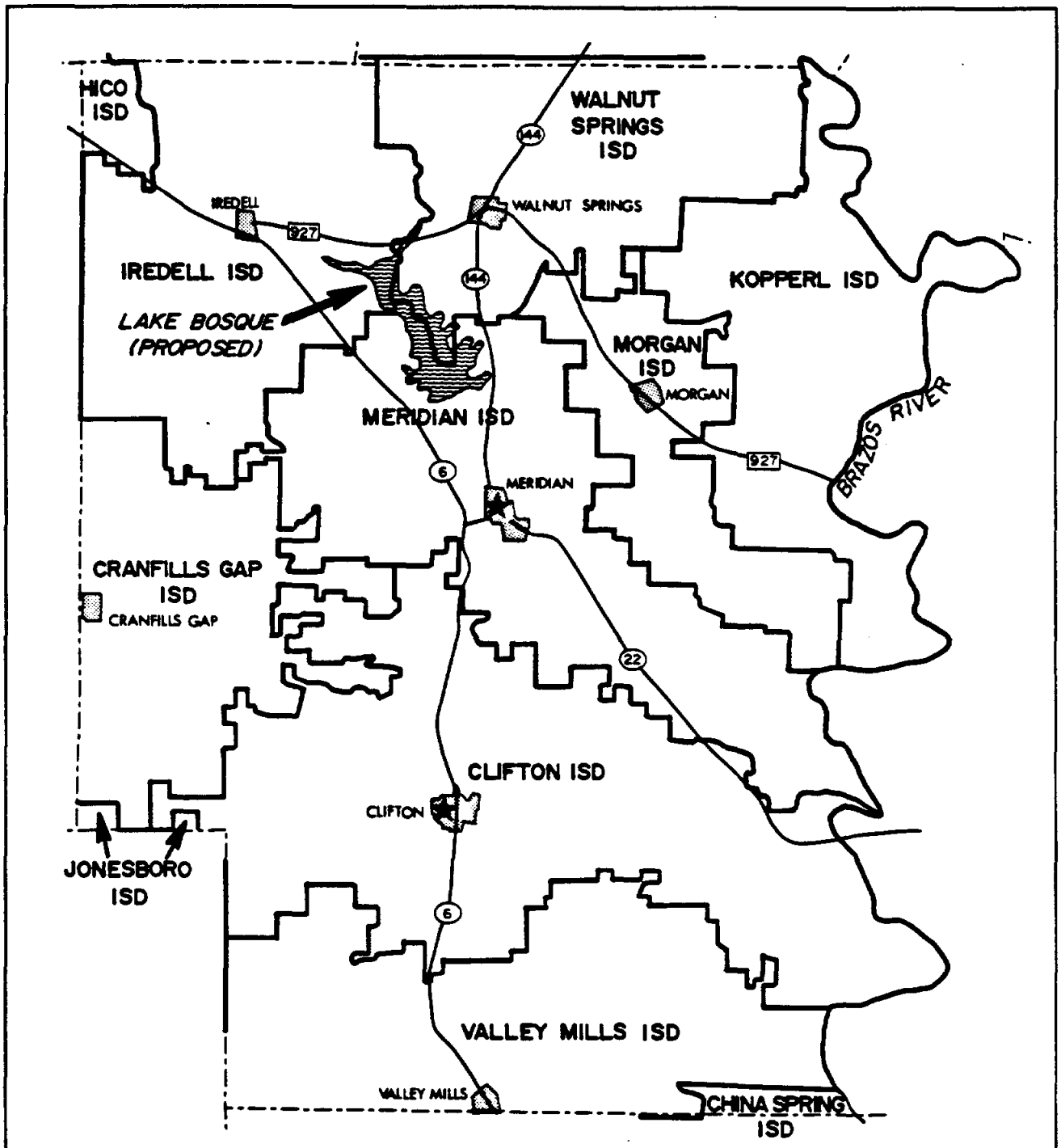
PAUL PRICE ASSOCIATES, INC.

Figure 4-1

McLennan County I.S.D. Boundaries

★ PROJECT PARTICIPATING COMMUNITIES

source: Texas Education Agency



PAUL PRICE ASSOCIATES, INC.

★ PROJECT PARTICIPATING COMMUNITIES

Figure 4-2

Bosque County I.S.D. Boundaries

source: Texas Education Agency

Springs, Iredell and Meridian. As shown in Table 4 - 2 the existing tax rate for each school district ranges from 40% to 55% of the allowable $1.50 tax rate. The percent of net ISD taxes accrued from the proposed Lake Bosque site ranges from 2.40% to 3.86% of each ISD's tax revenue.

Table 4 - 2

Independent School District Tax Rates, Budget Year 1986

ISD	Tax Rate	Remaining Margin	% of Net Taxes Attributed to Lake Bosque Site
Iredell	.834	$.67	3.71%
Meridian	.6484	$.85	2.40%
Walnut Springs	.607	$.89	3.86%

Source: Texas Education Agency, ISD Budgets 1986. Bosque County Appraisal District, 1986.

4.3 PUBLIC SAFETY

Table 4 - 3 lists the number of police officers, firemen and vehicles for the the study area's County Sheriff Departments and project participating municipalities. Standards for expanding populations estimate 2.1 police officers per 1,000 population as adequate protection (Golden et al., 1980). None of the municipalities satisfy that standard, although the police officer to population ratio for Woodway and Clifton at 1.97 is very close.

Fire protection in the study area is provided by volunteer and full-time paid firemen. Two full-time firemen per 1,000 population are recommended for expanding populations (Golden et al., 1980). As shown in Table 4 - 3, the ratio of firemen per 1,000 population for each project area municipality, except Waco, is higher than two, this is because volunteer firemen were included in the ratio calculation. Only Waco has a full-time paid fire department, Bellmead and Woodway have a combined volunteer and paid fire fighting department, while the remaining communities rely on volunteers for fire protection.

Table 4 - 3. Study Area Public Safety Statistics, Bosque and Mclennan Counties, 1986

County/City	Police Officers				Firemen		
	Police Personnel	1986* Population	per 1000 Population	Police Vehicles	Fire Personnel	per 1000 Population	Fire Vehicles
Mclennan County							
County Sheriff Δ	130	182,354	0.71	25	0	0.00	0
Bellmead	10	8,500	1.18	11	3 (p), 16 (v)	2.12	5
Hewitt	15	9,900	1.52	10	29 (v)	2.93	7
Lacy-lakevew	6	4,700	1.28	3	12 (v)	2.55	5
Mclennan Co. WCID # 2 (Elm Mott)	0	1,600	0.00	0	16 (v)	10.00	4
Waco	161	104,133	1.55	40	168	1.61	34
Woodway	14	7,091	1.97	10	22 (o), 30 (v)	7.76	4
Bosque County							
County Sheriff Δ	18	15,132	1.19	4	0	0.00	0
Clifton	6	3,067	1.96	3	28 (v)	9.13	9
Meridian	1	1,330	0.75	1	24 (v)	18.05	6

Source: Municipality Fire and Police Departments, County Sheriff Department, 1986.
Note: (p) Paid, (v) Volunteer, (o) Police Officers doubling as Firemen, (Δ) Includes jailors, dispatchers and reserve officers. * 1986 TDH population estimate.

4.4 HEALTH SERVICES AND FACILITIES

As shown in Table 4 - 4, the two county study area contains eight hospitals and 1,995 beds. McLennan County's ratio of 10.37 beds per 1,000 population is twice as high as the recommended 5 per 1,000 population (Golden et al., 1980). This is due to the presence of a federal Veterans Administrative hospital which accounts for more than one-half of the county's inventory of hospital beds. Bosque County's ratio of beds to population is also higher than the recommended ratio. The recommended standard for counties of 0.7 physicians per 1,000 population is exceeded in both counties (Golden et al., 1980).

4.5 EXISTING WATER AND WASTEWATER TREATMENT FACILITIES

Water and wastewater system data, for 1986, collected by the Texas Department of Health is shown in Table 4 - 5. Included in the table is the estimated population serviced by the system, number of connections, total water production, average daily consumption, total storage capacity, auxiliary production capacity, the water source, number of wells (when applicable), and the date of inspection.

Each of the project participants maintains a water system and provides wastewater treatment services. Except the City of Waco, all the participants rely on Trinity ground water for water supplies. These communities do not have developed facilities for treating surface water.

Table 4 - 4. Medical Facilities and Personnel Statistics

	McLennan County	Bosque County
Hospitals		
Number	6	2
Beds	1891	104
Hospital Beds per 1,000 population*	10.37	6.87
Physicians		
Number	303	15
per 1,000 population*	1.66	0.99
Nurses		
Number licensed	714	105
per 1,000 population*	3.92	6.94

Source: Texas Department of Health, 1984 and 1986*.

Table 4 - 5. Municipal Water and Wastewater Treatment Statistics

City/Authority	System Classification	No. of Connections	Total Production (MGD)	Avg. Daily Consumption (MGD)	Total Storage Capacity (MGD)	No. of Wells and Water Source	Percent Committed
Clifton	Water & Sewer	1,533	1.634	0.459	0.619	5 Trinity	28%
Meridian	Water & Sewer	650	0.828	0.227	0.100	3 Trinity	27%
Bellmead	Water & Sewer	3,200	2.592	0.897	1.600	3 Trinity	35%
Hewitt	Water & Sewer	3,540	2.716	1.188	2.619	5 Trinity	44%
Lacy-Lakeview	Water & Sewer	1,605	2.009	0.592	0.550	2 Trinity	29%
Elm Mott (McLennan County WCID # 2)	Water & Sewer	530	1.337	0.176	0.300	2 Trinity	13%
Waco	Water & Sewer	37,164	66.000	24.324	21.645	0 Lake Waco	37%
Woodway	Water & Sewer	2,947	4.449	1.700	7.125	6 Trinty	38%

Source: Texas Department of Health. Water Hygiene Inventory,1986.

4.6 FUTURE WATER REQUIREMENTS

4.6.1 Introduction

To prevent a situation of unmet demand requiring additional capital investment, and possibly more serious consequences, water demand projections should allow for the highest reasonable population growth and per capita water demand. Reservoir firm-yield supplies should accommodate an upper limit as well as satisfy the minimum projected demand. For the Lake Bosque Project, this range begins with Paul Price Associates' water demand projection and is capped by a projection using the Texas Water Development Board's (TWDB) High Series population projection, high per capita demand and high manufacturing demand (see Figure 4-3). These population projections incorporate the Texas Water Development Board's (TWDB) February 1987 revised county population projections.

Paul Price Associates, Inc. (PPA) prepared their own projections to 2040 of the future water needs of the communities currently participating in the Lake Bosque Project, as well as projected future water needs of probable customer entities, rural county areas and manufacturing in the two county study area. This section provides a description of the methodology and results of the water demand projections prepared by Paul Price Associates for the Lake Bosque Project. A more detailed description, equations and tables showing decadel water demand projections, projected supply and sources for each consumer entity and user category is found in the Appendix. Tables 4 - 6 and 4 - 7 lists Paul Price Associates' total projected water demand and per capita water demand for each consumer category, i.e.: Municipal, Other, and Manufacturing. Table 4 - 8 lists Paul Price Associates' projected demand for each user category for the Lake Bosque Project.

Lake Waco has a dependable yield of 59,100 acre feet per year. A proposed enlargement (occurring in year 2000) would increase the Lake's yield by 20,100 acre feet. As shown in Figure 4 - 3, Lake Waco and the proposed enlargement would not sufficiently satisfy projected minimum total demand in

Table 4-6 Paul Price Associates Demand Projections							
Demand Categories	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**
Municipal Demand (MGD)							
Project Participants (excludes City of Waco)	4.60	6.90	7.79	7.95	8.68	9.09	9.85
Potential Customers	1.07	1.61	1.73	1.76	1.83	1.97	2.13
Total Municipal Demand	5.67	8.51	9.52	9.71	10.51	11.06	11.98
City of Waco	26.44	30.53	30.93	31.46	32.82	35.33	38.02
Total Municipal Demand including the City of Waco	32.11	39.04	40.45	41.17	43.33	46.39	50.00
Other Demand (MGD)							
Mclennan Co.	3.13	4.19	4.29	4.34	4.48	4.77	5.11
Bosque Co.	0.84	1.37	1.55	1.72	1.89	2.09	2.30
Total	3.97	5.56	5.84	6.06	6.37	6.86	7.41
Total Municipal and Other Demand							
(Includes the City of Waco)							
MGD	36.08	44.60	46.29	47.23	49.70	53.25	57.41
Acre-feet Per Year	40,415	49,959	51,852	52,905	55,671	59,648	64,308
Manufacturing Demand (MGD) (Low Demand)							
Mclennan Co.	3.55	5.26	7.35	9.63	12.48	15.70	19.76
Bosque Co.	0.08	0.10	0.12	0.12	0.18	0.22	0.28
Total	3.63	5.36	7.47	9.75	12.66	15.92	20.04
Total Muncipal, Other and Manufacturing Demand							
Including the City of Waco							
MGD	39.71	49.96	53.76	56.98	62.36	69.17	77.45
Acre-feet per Year	44,481	55,963	60,219	63,826	69,853	77,481	86,756
Excluding the City of Waco							
MGD	13.27	19.43	22.83	25.52	29.54	33.84	39.43
Acre-feet per Year	14,864	21,765	25,573	28,586	33,089	37,906	44,168

Source: Paul Price Associates Inc., The Texas Water Development Board
NOTE: Demand is based on TWDB Low Series population projections, TWDB High series per capita water demand ratios, and TWDB Low series Manufacturing demand projections.
Demand projections are based on TWDB February1978 population projection revisions.

Table 4 - 7. Per Capita Water Demand Summary

Demand Categories	1980	1990	2000	2010	2020	2030	2040
Municipal Per Capita Demand (GPD)							
Project Participants *(excludes City of Waco)*	162	184	187	187	187	187	187
Potential Customers	159	189	190	190	190	190	190
City of Waco	261	280	285	285	285	285	285
All Municipalites	235	252	254	254	254	254	254
Other Per Capita Demand (GPD)							
McLennan Co.	125	180	186	185	183	181	180
Bosque Co.	108	161	166	166	166	166	166

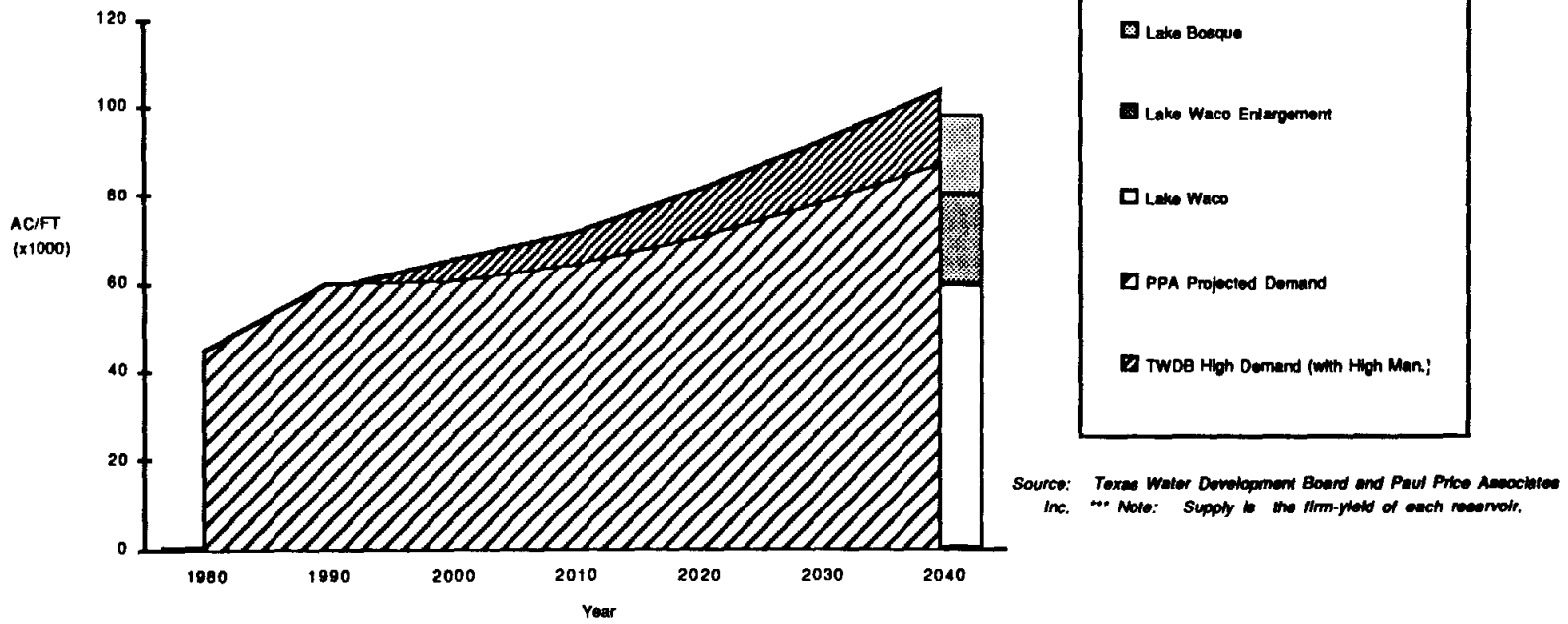
Source:
Texas Water Development Board, High Series Projections.
Note: Per Capita consumption rates are from the TWDB high series water demand projections.

Table 4-8 Projected Demand for Lake Bosque

Projected Demand for Lake Bosque 1990-2040	1990		2000		2010		2020		2030		2040	
	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD
Municipal Demand (Excludes City of Waco)												
Project Participants	6,831	6.10	7,777	6.94	7,907	7.06	8,680	7.75	9,138	8.16	10,203	9.11
Potential Customers	1,809	1.61	1,937	1.73	1,971	1.76	2,055	1.83	2,208	1.97	2,381	2.13
Total Municipal Demand	8,640	7.71	9,190	8.20	9,878	8.82	10,735	9.58	11,346	10.13	12,584	11.23
Other Demand												
McLennan County	4,146	3.70	4,263	3.81	4,320	3.86	4,475	4.00	4,799	4.28	5,175	4.62
Bosque County	24	0.02	108	0.10	356	0.32	634	0.57	1,424	1.27	1,663	1.48
Total Other Demand	4,170	3.72	4,371	3.90	4,676	4.17	5,109	4.56	6,223	5.56	6,838	6.10
Manufacturing Demand												
McLennan County												
High Series	5,825	5.20	8,744	7.81	11,921	10.64	6,259	5.59	0	0.00	5,613	5.01
Low Series	5,400	4.82	7,801	6.96	10,412	9.30	4,037	3.60	-3,025	-2.70	1,515	1.35
Bosque County												
High Series	0	0.00	148	0.13	186	0.17	233	0.21	288	0.26	356	0.32
Low Series	-4	-0.0036	137	0.12	168	0.15	206	0.18	252	0.22	308	0.28
Total Bi-County Manufacturing Demand												
High Series	5,825	5.20	8,892	7.94	12,107	10.81	6,492	5.80	288	0.26	5,969	5.33
Low Series	5,396	4.82	7,938	7.09	10,580	9.45	4,243	3.79	-2,773	-2.48	1,824	1.63
Total Demand for Lake Bosque												
Municipal, Other, High Manufacturing	18,635	16.64	22,453	20.04	26,661	23.80	22,336	19.94	17,857	15.94	25,391	22.67
Municipal, Other, Low Manufacturing	18,206	16.25	21,499	19.19	25,134	22.44	20,087	17.93	14,796	13.21	21,246	18.97

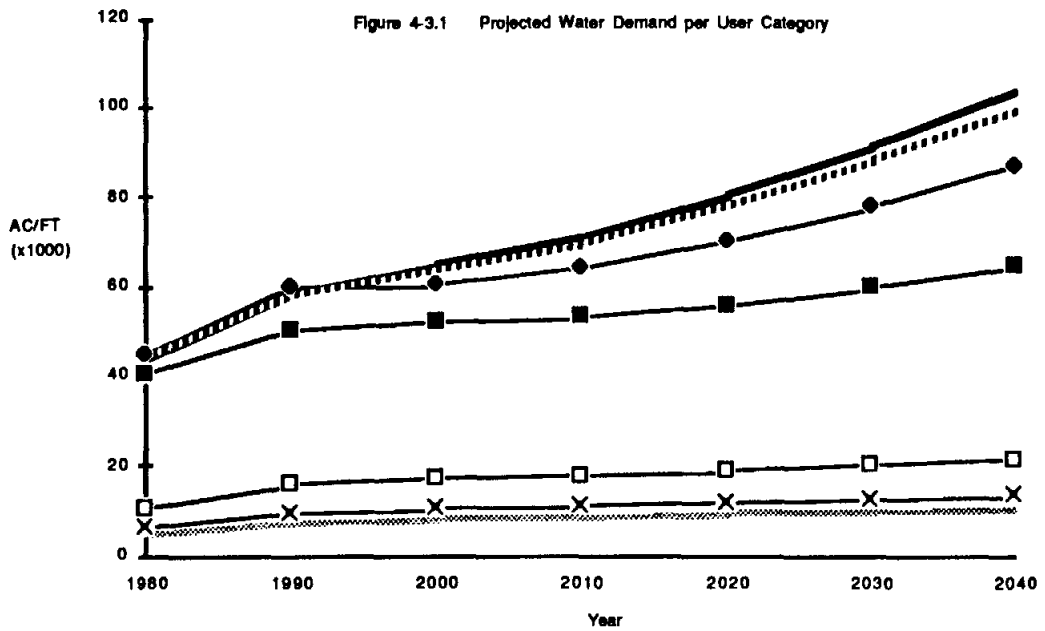
Sources:
Paul Price Associates, Inc.
Texas Water Development Board
Revised Population Projections 2/1987

Figure 4-3 Projected Water Demand and Supply



*Source: Texas Water Development Board and Paul Price Associates Inc. *** Note: Supply is the firm-yield of each reservoir.*

Figure 4-3.1 Projected Water Demand per User Category



*Source: Texas Water Development Board and Paul Price Associates Inc. *** Note: Demand projections are accumulative. Participant Mun. demand does not include the City of Waco. Supply is the firm-yield of each reservoir.*

year 2040. The discrepancy between projected demand and future supply is compounded because the City of Waco owns all the water rights to Lake Waco and does not intend to sell those rights to other municipalities. Therefore, as existing groundwater supplies become inadequate or unsuitable and as Lake Waco water is inaccessible, except to the City of Waco and Beverly Hills, other entities would have to participate in additional surface water development projects or else obtain water from other entities.

4.6.2 Water Demand Categories

There are currently eight cities participating in the Lake Bosque Project, they are: Bellmead, Clifton, Hewitt, Lacy-lakeview, McLennan Co. WCID #2 (Elm Mott), Meridian, Waco and Woodway. Classified as potential customers for the Lake Bosque Project are four municipalities located in either Bosque or McLennan County, who as reported in the TWDB Municipal Water Supply-Demand 1990 - 2030 summaries, currently rely or would in the future rely on Lake Waco surface water to supply all or a proportion of their water needs. These municipalities are: Mart, Moody, Northcrest and Bruceville-Eddy. Municipal water demand projections include commercial, residential, city service (swimming pools, parks, etc...) and some miscellaneous light industrial use within the municipal jurisdiction, but do not include industrial water requirements or sales to others outside the municipal jurisdiction.

The category of "Other" demand includes non-urban areas of Bosque and McLennan Counties. That proportion of Other demand identified by the TWDB Municipal Water Supply-Demand 1990-2030 as currently relying, or in the future relying, on Lake Waco for water supply was the basis for the projected Lake Bosque demand.

A high and low series manufacturing water demand projections were prepared by the TWDB in 1981 for each county. That proportion of Manufacturing Demand identified by the TWDB Municipal Water Supply-Demand 1990-2030 summary as currently relying, or in the future relying, on Lake Waco for water supply was the basis for Paul Price Associates' projected demand for Lake Bosque. The recommended water

demand projection for the Manufacturing Demand category is the TWDB Low Series manufacturing projection. Incorporated into the Low Series projection is a slower growth rate than used in the High Series projection. Today, in view of the present downturn in the Texas economy, TWDB staff believe that the Low Series manufacturing projection is more appropriate. The manufacturing demand figures shown in Table 4 - 6 are the TWDB's low series projections.

4.6.3 Methodology

Driving PPA's water demand projections are the Texas Water Development Board (TWDB) Low Series population projections coupled with drought condition per capita consumption rates used in the TWDB High Series water demand projections.[1] The results are water demand projections based on the most conservative population projections and drought condition per capita water demand rates. Because TWDB projections were available only to 2030, PPA extended demand projections to 2040 by applying the percent change from 2020 - 2030 to 2030 base numbers.

The TWDB per capita use estimates were based upon water use data reported by suppliers of municipal and commercial water within each county and upon statistical analysis of trends in per capita water consumption rates through time. Per capita water demand estimates were made for each city and projected through the year 2000. Because of a historic trend of increased standards of living and the rapid rate of availability of public water service to a rapidly expanding affluent Texas population, 4 gallons of additional per capita water consumption per decade until year 2000 was assumed. After year 2000, due to conservation and improvement in technology, per capita water consumption was assumed to remain constant.

Two steps were required to calculate future demand for the Lake Bosque Project. The first step was to project total water demand for each project participating city, potential customer cities, other demand and manufacturing demand (see Table 4-6). The second step was to compare total demand for each category with available supplies as reported by the Brazos River Authority, HDR Engineering and water use projections for Lake Whitney and ground-water supplies as indicated in the TWDB City and County Water Supplies and Demand summary. Water available from ground-water and other supply sources, such as Lake

[1] The Texas Water Development Board's water demand projections were based upon TWDB population projections for 1980 - 2030, one is a best case scenario, the other a worst case. The High Series water demand projection is driven by the High Series population projection and drought influenced per capita water consumption rates. The Low Series water demand projection is driven by the Low Series population projection and average climate per capita water consumption rates.

Whitney or Lake Aquilla (but not Lake Waco), was subtracted from each categories' total demand. The remaining demand was either excess demand (more demand than projected supply) or else demand satisfied by Lake Waco water. However, because the City of Waco does not intend to sell Lake Waco water, any demand projected against Lake Waco would be unmet. Therefore, any excess demand or demand for Lake Waco water was considered potential demand for the proposed Lake Bosque.

To project water demand for 2040, water demand projections per decade from 1980 to 2040 for each category: project participating municipalities, potential customer entities, other and manufacturing were prepared. The results are found in the Appendix (Tables A.1 - 1, A.1 - 2, and A.1 - 3). For each category and each city three characteristics were projected: population, per capita consumption (reported in gallons per day (gpd)), and total water consumption (reported in acre feet per year (Ac/ft) and million gallons per day (mgd)). Displayed in the tables are TWDB high and low case population and water demand projections and Paul Price Associates' projections for total demand. Because Paul Price Associates' water demand projections incorporate TWDB low series population projections and high series per capita water demand ratios, the results lie between the TWDB high and low series demand projections. Also shown for each category is projected demand for Lake Bosque. Projected demand for Lake Bosque was calculated by subtracting all water supplies, except Lake Waco, from the total projected demand (derived by multiplying high TWDB per capita consumption rates with TWDB low population projections). Any projected excess demand and demand for Lake Waco water was assumed to be demand for the proposed Lake Bosque.

In the Appendix are tables listing the source and amount of available water supply for each user (Tables A.1 - 4, A.1 - 5, A.1 - 6). Projected water supply data is from the TWDB projection high series. Supply projections for 2040 were not available from the TWDB. Therefore, it was assumed that 2040 water supplies would remain constant with supplies available in 2030.

4.6.4 Water Supplies and Demand Projection Results

4.6.4.1 Total Water Supplies and Demand Projections

Total water use in 1980 (includes project participants, potential customers, the City of Waco, other and manufacturing demand) was 39.71 million gallons per day (44,481 acre feet per year). Paul Price Associates' projection of 2040 total demand is 77.45 million gallons per day or 86,756 acre feet per year. As shown in Figure 4 - 3, the firm-yield of Lake Waco (59,100 acre feet per year) and the proposed enlargement (20,100 acre feet per year) would not sufficiently meet projected total demand in year 2040. Total 2040 projected demand of 86,756 acre feet per year is 7,756 acre feet per year higher than Lake Waco's firm-yield of 79,200 acre feet per year. The proposed Lake Bosque would increase firm-yield supplies by 18,189 acre feet per year sometime around year 1990. Due to proposed desalination of Lake Whitney the TWDB expects additional supplies to become available by year 2020. However, it is generally believed that desalination of Lake Whitney is not likely to occur, and if it does, that water rates would be prohibitive to most users. The United States Army Corp of Engineers estimates that the desalination project would cost $250 million and because of its high cost is not likely to be constructed anytime in the near future, if ever.

Municipal water demand (includes project participants, potential customers and the City of Waco) is projected to increase from 32.11 million gallons per day (35,968 acre feet per year) in 1980 to 50.00 million gallons per day (56,008 acre feet per year) in 2040 (see Table 4-6). As shown in Table 4 - 7 per capita consumption rates are different for each municipal category. In 1980 per capita demand was 162 gallons per day for project participants, 159 gallons per day for potential customers, and 261 gallons per day for the City of Waco. The aggregate municipal per capita demand (including project participants, potential customers and the City of Waco) was 235 gallons per day in 1980. Due to conservation, by year 2000 per capita demand is expected to peak and stabilize at 187 gallons per day, 190 gallons per day and 285 gallons per day respectively. Total municipal per capita demand peaks and remains level at 254 million gallons per

day by year 2000.

In 1980, all of the municipalities (except the City of Waco) relied exclusively on ground-water as a supply source. The TWDB supply summary assigns Lake Waco as the future supply source for each of the communities. As shown in Figure 4 - 3, supply from Lake Waco and the proposed enlargement is not sufficient for projected demand. Compounding the problem of insufficient supply in 2040 is the fact that the City of Waco will not sell Lake Waco water to other entities. Therefore, if supply from Lake Waco (as assigned by the TWDB) is subtracted from total supply, projected demand beginning in year 1990 for project participants and potential customers would not be met. This unmet demand plus any projected shortages would be demand for Lake Bosque.

Total other demand in McLennan and Bosque Counties is projected to increase from 3.97 million gallons per day (4,447 acre feet per year) use in 1980 to 7.41 million gallons per day (8,300 acre feet per year) in 2040. Per capita consumption in rural McLennan County is projected to increase from 125 gallons per day in 1980 to 180 gallons per day in 2040; rural Bosque County per capita consumption is projected to increase from 108 gallons per day to 166 gallons per day in 2040. Identified water supply sources are Lake Waco, the Trinity Aquifer and other ground-water sources.

Manufacturing demand in the two county area is projected by the TWDB low projection series to increase from 3.63 million gallons per day (4,066 acre feet per year) use in 1980 to 20.04 million gallons per day (22,448 acre feet per year) in 2040. TWDB high projection series projects 2040 demand at 23.74 million gallons per day (26,592 acre feet per year). The low TWDB projection series was incorporated into Paul Price Associates' demand projections. Manufacturing water supplies were identified as Lake Waco, the Trinity Aquifer , and beginning in 2020, Lake Whitney.

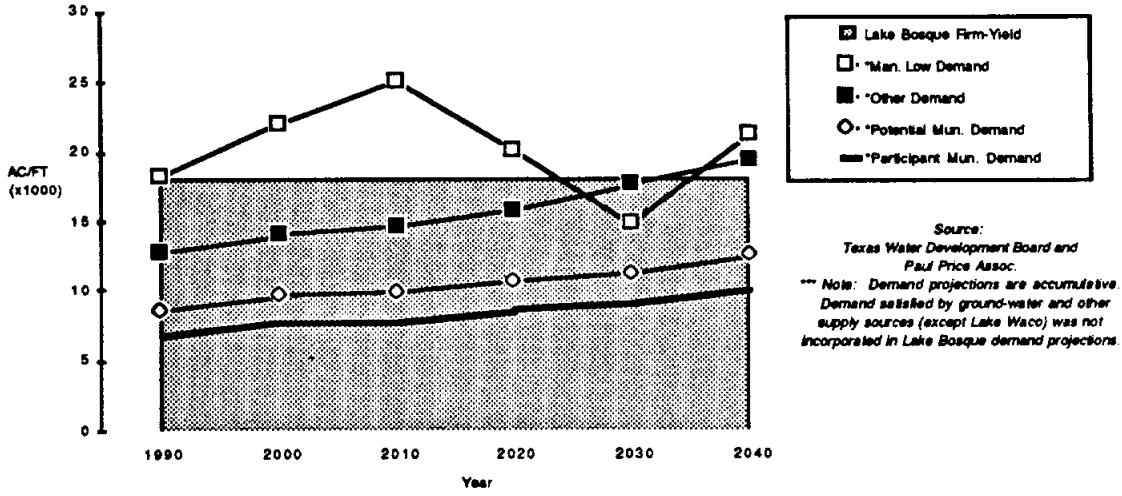
4.6.4.2 Water Demand Projections for Lake Bosque

Projected demand for Lake Bosque was derived by comparing total projected demand with firm-yield supplies and projected water supplies from Lake Waco, Lake Whitney, ground-water and other sources (Tables A.1 - 4, A.1 - 5, A.1 - 6). Because the City of Waco will not sell water from Lake Waco to other entities, demand that was assigned by the TWDB to Lake Waco was assumed to be potential demand for Lake Bosque. Demand satisfied by ground-water supplies, as indicated by the TWDB, was not included in demand projections for Lake Bosque. However, due to deteriorating ground-water quality, it is likely that users would switch to a surface-water supply source if available. As shown in Table 4 - 8 total municipal, other and manufacturing demand for Lake Bosque is projected for year 2040 at 18.97 million gallons per day (21,246 acre feet per year). That projection includes water needs for project participating communities, potential consumer communities, other demands and TWDB Low Series manufacturing demands. Municipal and other water demand accounts for 91.4% of total project demand.

Figure 4 - 4 illustrates projected accumulative demand for the Lake Bosque Project. The sharp decrease in manufacturing demand after 2010 is due to an assumption by the TWDB that a large increase in Lake Whitney supply, due to desalination, will become available. However, it is generally thought that the cost of desalination would be prohibitive and that resulting water would be too expensive for most users.

Project participating municipal demand for Lake Bosque is projected to increase from 6.10 million gallons per day (6,831 acre feet per year) in 1990 to 9.11 million gallons per day (10,203 acre feet per year) in 2040. Potential customer demand is projected to increase from 1.61 million gallons per day (1,809 acre feet per year) in 1990 to 2.13 million gallons per day (2,381 acre feet per year) in 2040. TWDB Low Series manufacturing demand is projected to decrease from 4.82 million gallons per day (5,396 acre feet per year) in 1990 to 1.63 million gallons per day (1,824 acre feet per year) in 2040. This decrease is due to the projected availability of Lake Whitney water. TWDB water demand and supply summaries indicate that by year 2020, 60% of Mclennan County's manufacturing water demand will be satisfied by

Figure 4-4 Lake Bosque Projected Demand and Supplies



Source:
Texas Water Development Board and Paul Price Assoc.
*** *Note: Demand projections are accumulative. Demand satisfied by ground-water and other supply sources (except Lake Waco) was not incorporated in Lake Bosque demand projections.*

Lake Whitney. Bosque County's manufacturing demand is projected to continue relying on Lake Waco as a supply source.

4.7 TRANSPORTATION

4.7.1 Roadway System

As shown in Figure 4 - 5 the proposed Bosque Reservoir site is located in the middle of a triangle whose points are formed by the communities of Meridian to the southeast, Iredell to the northwest and Walnut Springs to the north. The sides of the triangle are formed by State Highway 6 running between Meridian and Iredell, State Highway 144 connecting Meridian and Walnut Springs, and Ranch Road 927 between Walnut Springs and Iredell. Gravel surfaced county roads access the site to the major roadways.

As shown in Figure 4 - 5 traffic volume in 1985 for State Highway 6 between Meridian and Iredell, near the project site, averages 1,350 vehicles per day (average annual 24-hour traffic) (Texas Department of Highways and Public Transportation). Traffice volume for Ranch Road 927 averages 420 vehicles per day. Traffice volume for State Highway 144 averages 890 vehicles per day. Traffic volume on county roads within the county range from 35 to 100 vehicles per day (1984 traffice counts, Bosque County Highway Department, District 9).

Figure 4 - 6 summarizes the roadway and powerline changes associated with the proposed Lake Bosque project. As proposed, reservoir construction will require the relocation of small sections of county and state roadways (to skirt portions of the reservoir), as well as abandonment of county roads which cross the proposed site. Two powerlines located west and northeast of the site would also be relocated and a county road directly linking Highway 6 to the reservoir may be constructed.

There are no major road improvements planned for Bosque County area roads (Texas Department of Highways and Public Transportation, 1986).

4.7.2 Air Service

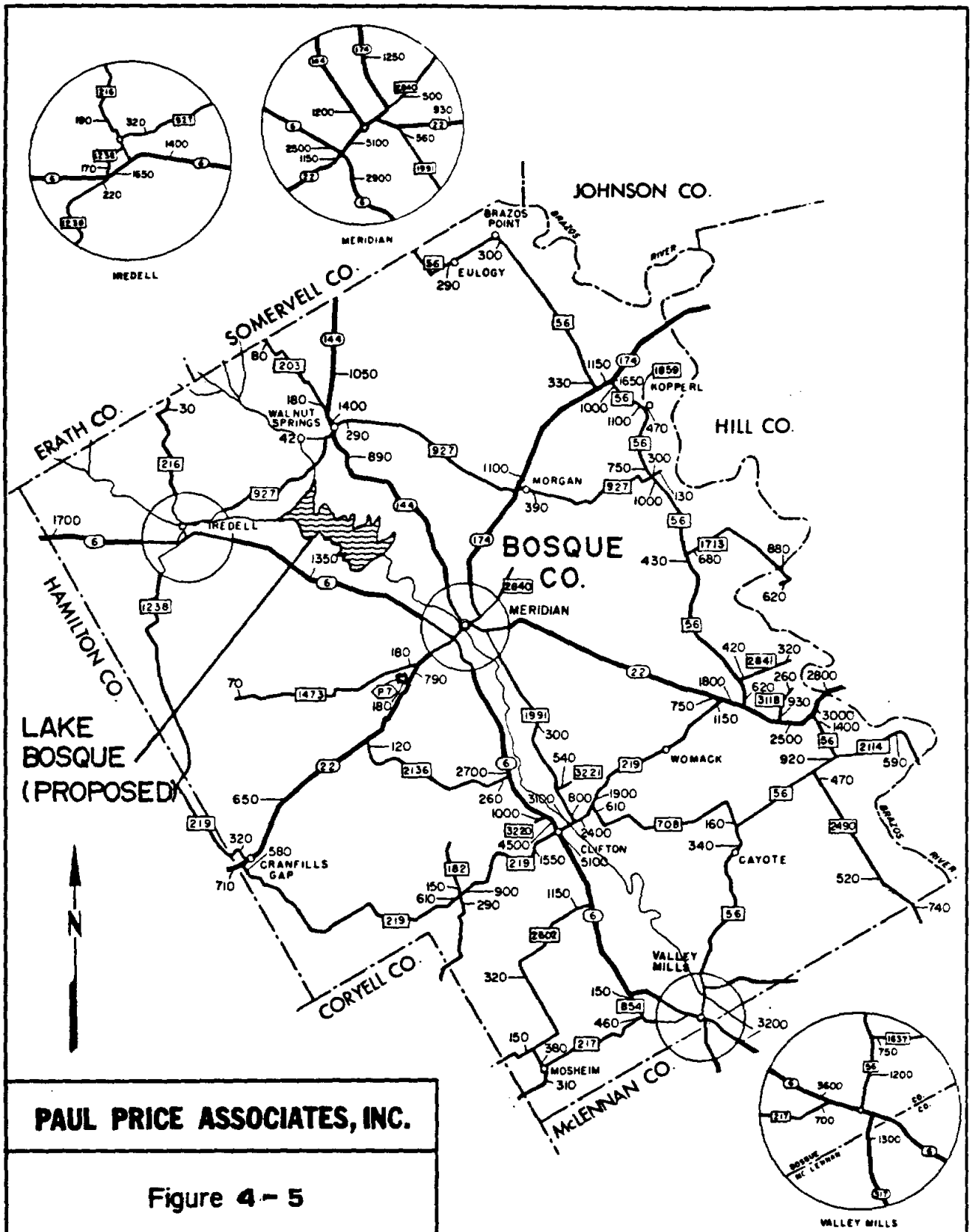
Air service is available in Clifton and Waco. The Clifton Municipal Airport, northeast of the City, approximately 16 miles from the proposed site, offers 3,000 feet of lighted and paved runway and comprehensive services including storage, major and minor repairs, jet fuel and aviation gasoline. Commercial flight service is not available. However, complete services and 13 commercial flights per day, with connections to major cities throughout the country, are available in Waco, approximately 40 miles east of the proposed site.

4.7.3 Rail Service

The Santa Fe Railway System, extending from Chicago to the Gulf Coast services the City of Clifton. Amtrack passenger rail service is available three times weekly from Temple, Dallas or Fort Worth, each city is approximately 70-100 miles from the proposed reservoir site.

4.8 HOUSING

Housing information for the two-county study area was derived from the U.S. Department of Commerce, 1980 Census of Housing, local municipal publications and local area realtors. Table 4 - 9 details 1980 housing conditions in McLennan and Bosque Counties. In both counties vacancy rates for owner-occupied housing units indicate a shortage of available housing, rental vacancy rates point to slightly larger supply of available rental units.



PAUL PRICE ASSOCIATES, INC.

Figure 4 - 5

Bosque Co. Traffic Volume Counts

source: Texas Department of Highways and Public Transportation, 1985

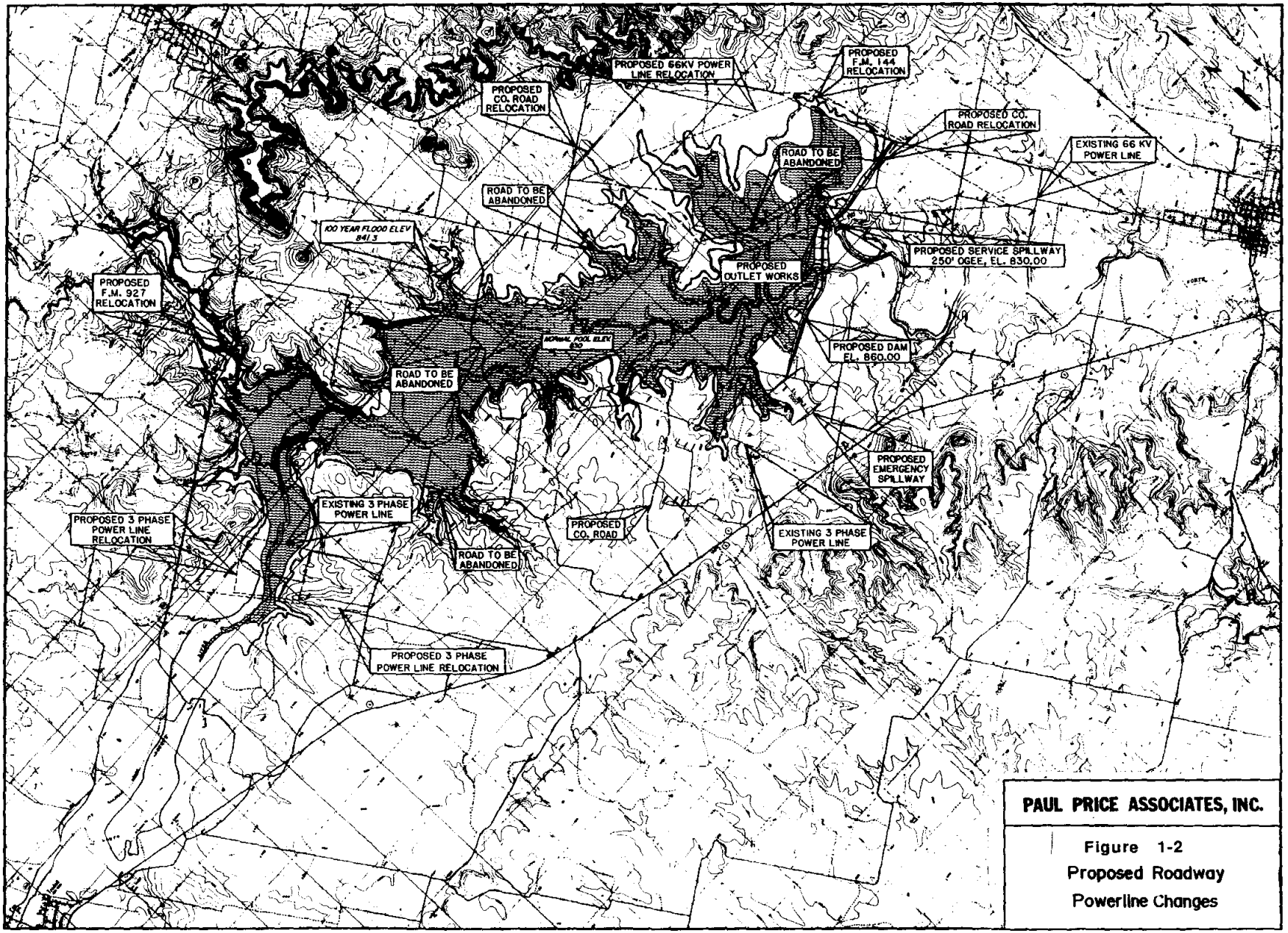

PROPOSED 66KV POWER LINE RELOCATION
PROPOSED F.M. 144 RELOCATION
PROPOSED CO. ROAD RELOCATION
PROPOSED CO. ROAD RELOCATION
EXISTING 66 KV POWER LINE
ROAD TO BE ABANDONED
ROAD TO BE ABANDONED
100 YEAR FLOOD ELEV 841.3
PROPOSED SERVICE SPILLWAY 250' OGEE, EL. 830.00
PROPOSED OUTLET WORKS
PROPOSED F.M. 927 RELOCATION
NORMAL POOL ELEV. 820
PROPOSED DAM EL. 860.00
ROAD TO BE ABANDONED
PROPOSED EMERGENCY SPILLWAY
EXISTING 3 PHASE POWER LINE
PROPOSED 3 PHASE POWER LINE RELOCATION
PROPOSED CO. ROAD
EXISTING 3 PHASE POWER LINE
ROAD TO BE ABANDONED
PROPOSED 3 PHASE POWER LINE RELOCATION
PAUL PRICE ASSOCIATES, INC.
Figure 1-2
Proposed Roadway
Powerline Changes

Table 4 - 9

Housing Data for the Study Area, 1980

	McLennanCounty	Bosque County
Total Housing Units	65,934	7,439
Seasonal	113	86
Year-round	65,821 (99.8% of total)	7,353 (98.8% of total)
Vacant Housing Units	4,267	1,840
Occupied Housing Units		
Total	61,554	5,513
Persons per Occupied Unit	2.65	2.36
# One-person Households	14,488	1,527
Median value ($) / owner	$29,100	$23,400
Contract valued ($) / renter	$158.00	$88.00
Vacancy Rate		
Homeowner	1.7 %	2.0 %
Renter	7.0 %	7.4 %

Source: U. S. Department of Commerce, Census of Housing, 1980

Comparison of building permits issued annually is a method of assessing housing availability between census years. Tables 4 - 10 and 4 - 11 show the number and value of housing units permitted for construction in 1983, 1984 and 1985 in the study area. The value of permits issued in Bosque County was at its peak in 1984 but has since declined. The value of permits issued in McLennanCounty has decreased yearly since 1983. In both counties the number of residential permits decreased .

Local realtors in McLennanCounty report for December 1986 listings of approximately 1,290 new and relisted single family units. Average sales price for a three bedroom single-family home was $61,592. McLennanCounty, as of December 1986, had approximately 18,000 multi-family units, of which, 80% were estimated as occupied. Average monthly rent for a 3 bedroom apartment in the Waco area was $450. In areas skirting the City of Waco apartment rents were 10% to 25% less.

Local realtors in Bosque County reported approximately 50 new and relisted single-family homes since December 1986. The average sales price for a three bedroom single-family home was

approximately $35,000. Other homes were available from $20,000 to $110,000. It was estimated that the county contains 250 apartment units, the majority located in the three most active communities, Clifton, Valley Mills, and Meridian. Of those apartments it was estimated that 95 - 100% were occupied. Average monthly rent for a 1 - 2 bedroom apartment in Bosque County was $162 - $236. The rental market was so tight that waiting lists for occupancy were common.

Table 4 - 10. Building Permits Issued in Bosque County: 1983, 1984, 1985

Building Permits Bosque County	1983	1984	1985
Total Value ($) of Building Permits	$880,000	$1,380,000	$1,121,000
Non-residential			
Value	$116,000	$176,000	$573,000
Residential			
Value	$709,000	$1,207,000	$545,000
Number of Units	19	32	11
Repair, Alterations, & Additions			
Value	$55,000	$5,000	$3,000
Non-residential			
Office	$0	$70,000	$60,000
Industrial	$7,000	$0	$0
Retail	$0	$0	$28,000
Public*	$0	$0	$300,000
Other Non-residential	$787,000	$106,000	$185,000
Residential			
Single-family			
Value	$559,000	$1,790	$545,000
Number of Units	11	20	11
2-4 plex			
Value	$0	$0	$0
Number of Units	0	0	0
Apartments			
Value	$150,000	$128,000	$0
Number of Units	8	12	0

Source: Texas Real Estate Research Center, 1986.
* Does not include highway or bridge construction.

Table 4 - 11. Building Permits Issued in McLennan County: 1983, 1984, 1985

McLennan County	1983	1984	1985
Total Value of Building Permits (in 1000s)	$157,900	$150,641	$114,851
Non-residential			
Value	$45,600	$36,234	$37,884
Residential			
Value	$90,300	$85,777	$50,664
Number of Units	2989	2183	1048
Repair, Alterations, & Additions			
Value	$22,000	$28,630	$26,303
Non-residential			
Office	$10,900	$16,515	$15,784
Industrial	$6,155	$5,003	$1,681
Retail	$5,255	$5,445	$7,530
Public*	$18,980	$2,367	$3,372
Other Non-residential	$4,000	$4,054	$5,967
Hotel	$0	$2,850	$3,550
Residential			
Single-family			
Value	$35,040	$44,766	$39,554
Number of Units	602	692	543
2-4 plex			
Value	$5,790	$8,082	$2,278
Number of Units	203	234	65
Apartments			
Value	$49,478	$32,929	$8,832
Number of Units	2184	1257	440

Source: Texas Real Estate Research Center, 1986.

* Does not include highway or bridge construction.

5.0 PUBLIC FINANCES

5.1 INTRODUCTION

The ability to finance capital improvements such as sewer, streets, parks and recreation facilities is an important measure of a city and county's ability to serve additional populations. Capital improvements may be financed through a variety of techniques including current revenue, reserve funds, general obligation (G.O.) bonds, revenue bonds (R.B.), authorities and special districts. This section examines current revenues, expenditures and indebtedness for fiscal year ended September 30, 1985 for Bosque and McLennan Counties and the seven project participating communities, Waco, Bellmead, Clifton, Meridian, McLennan County WCID # 2 (Elm Mott), Hewitt and Lacy- Lakeview. Data is from the Comprehensive Annual Financial Report for McLennan County, the Audited Combined Current Financial Statements for Bosque County, and Texas Municipal Reports for 1986. Also detailed in this report is the market value, assessed agricultural production value , assessed value, and taxable value of land proposed to be inundated by Lake Bosque.

5.2 COUNTY RESOURCES

Services and primary functions of McLennan and Bosque Counties include general government, public safety, county roads, health, welfare, culture and recreation, conservation, and public improvements. Total bi-county revenue for the year amounted to $24,081,188. Revenue and expenditures for Bosque and McLennan Counties, for the fiscal year ended September 30, 1985, as reported in each county's financial report are shown in Tables 5 - 1 and 5 - 2. The following text refers to those tables.

Current sources of county revenue in the study area for fiscal year ended September 10, 1985 include property taxes which accounted for 42% and 30% respectively of total revenue for McLennan and Bosque County. Intergovernmental transfers, a significant source of current revenue in McLennan County,

Table 5-1. McLennan County Revenues and Expenditures

MCLENNAN COUNTY	GOVERNMENTAL FUND TYPES				FIDUCIARY FUND TYPES		TOTAL GENERAL GOVERNMENT FUNDS
	GENERAL REVENUES	SPECIAL REVENUE	DEBT SERVICE	CAPITAL PROJECTS	EXPENDABLE TRUST	Totals Memorandum Only	
REVENUES:							
Taxes (property)	$6,018,039	$2,351,015	$762,700	$156,722	$0	$9,288,476	$9,131,754
Licenses and Permits	$64,342	$0	$0	$0	$0	$64,342	$64,342
Intergovernmental	$1,016,072	$2,412,388	$10,904	$2,324	$0	$3,441,688	$3,439,364
Charges for Services	$2,702,620	$763,421	$0	$0	$0	$3,466,041	$3,466,041
Fines and Forfeits	$518,275	$556,948	$0	$0	$0	$1,075,223	$1,075,223
Miscellaneous	$973,858	$492,304	$88,260	$11,944	$3,149,715	$4,716,081	$1,554,422
TOTAL REVENUE	**$11,293,206**	**$6,576,076**	**$861,864**	**$170,990**	**$3,149,715**	**$22,051,851**	**$18,731,146**
EXPENDITURES:							
CURRENT							
General Government	$5,204,410	$1,072,704	$0	$0	$0	$6,277,114	$6,277,114
Public Safety	$3,105,639	$1,582,113	$0	$0	$0	$4,687,752	$4,687,752
Public Transportation	$0	$3,719,093	$0	$0	$0	$3,719,093	$3,719,093
Health	$360,580	$0	$0	$0	$0	$360,580	$360,580
Welfare	$1,239,404	$109,622	$0	$0	$0	$1,349,026	$1,349,026
Culture-Recreation	$284,804	$0	$0	$0	$0	$284,804	$284,804
Education	$0	$0	$0	$0	$3,038	$3,038	$0
Conservation	$111,521	$0	$0	$105,813	$0	$217,334	$111,521
CAPITAL PROJECTS	$0	$0	$0	$951,126	$0	$951,126	$0
DEBT SERVICE:							
Principle Retirement	$115,922	$46,536	$520,000	$0		$682,458	$682,458
Interest and Fiscal Charges	$27,172	$11,513	$327,600	$0		$366,285	$366,285
MISCELLANEOUS	$0	$0	$0	$0	$3,180,725	$3,180,725	
TOTAL EXPENDITURES	**$10,449,452**	**$6,541,581**	**$847,600**	**$1,056,939**	**$3,183,763**	**$22,079,335**	**$17,838,633**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	$843,754	$34,495	$14,264	($885,949)	($34,048)	($27,484)	$892,513
OTHER FINANCING SOURCES	$19,317	$111,697	$0	$752,563	$3,086	$886,663	$131,014
EXCESS (DEFICIENCY) OF REVENUES AND OTHER SOURCES OVER EXPENDITURES AND OTHER USES	$863,071	$146,192	$14,264	($133,386)	($30,962)	$859,179	$1,023,527
Fund Balance at Beginning of Year	$5,676,044	$2,599,777	$734,603	$127,404	$794,382	$9,932,210	$9,010,424
Fund Balance at End of Year	**$6,539,115**	**$2,745,969**	**$748,867**	**($5,982)**	**$763,420**	**$10,791,389**	**$10,033,951**

Source: Comprehensive Annual Financial Report for Mclennan County, fiscal year ended 9/86.

Table 5-2. Bosque County Revenues and Expenditures

BOSQUE COUNTY	GOVERNMENTAL FUND TYPES				CAPITAL PROJECTS	TRUST and AGENCY	TOTAL	TOTAL GENERAL GOVERNMENTAL FUNDS
	GENERAL REVENUES	ROAD & BRIDGE	SPECIAL REVENUE	DEBT SERVICE				
REVENUES:								
Taxes	$371,182	$241,718	$0	$0	$0	$0	$612,900	$612,900
Fees of Office	$203,481	$0	$0	$0	$0	$17,886	$221,367	$203,481
Fines and Forfeits	$196,367	$0	$0	$0	$0	$0	$196,367	$196,367
Intergovernmental	$0	$0	$80,044	$0	$0	$0	$80,044	$80,044
License and Permits	$0	$474,725	$0	$0	$0	$0	$474,725	$474,725
Interest and Other	$199,149	$44,543	$0	$1,732	$15,507	$5,436	$266,367	$245,424
Trust Deposits Received	$0	$0	$0	$0	$0	$177,567	$177,567	$0
TOTAL REVENUE	**$970,179**	**$760,986**	**$80,044**	**$1,732**	**$15,507**	**$200,889**	**$2,029,337**	**$1,812,941**
EXPENDITURES:								
General Administration	$292,245	$0	$0	$0	$0	$0	$292,245	$292,245
Administration of Justice	$415,922	$0	$0	$0	$0	$1,415	$417,337	$415,922
Public Welfare	$77,627	$0	$0	$0	$0	$0	$77,627	$77,627
Health and Sanitation	$963	$0	$0	$0	$0	$0	$963	$963
Appraisal Board	$71,572	$0	$0	$0	$0	$0	$71,572	$71,572
State Extension Service	$18,945	$0	$0	$0	$0	$0	$18,945	$18,945
Emergency Management Fund	$18,312	$0	$0	$0	$0	$0	$18,312	$18,312
County Wide Road and Bridge	$0	$470,095	$36,869	$0	$0	$0	$506,964	$506,964
Debt Service								
Principal Retirement	$6,000	$15,000	$0	$2,000	$0	$0	$23,000	$23,000
Interest Expense	$6,000	$2,517	$0	$495	$0	$0	$9,012	$9,012
Capital Outlay	$25,218	$29,200	$0	$0	$653	$0	$55,071	$54,418
Payment of Trust Deposits	$0	$0	$0	$0	$0	$177,133	$177,133	$0
Total Expenditures	**$932,804**	**$516,812**	**$36,869**	**$2,495**	**$653**	**$178,548**	**$1,668,181**	**$1,488,980**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	$37,375	$244,174	$43,175	($763)	$14,854	$22,341	$361,156	$323,961
Fund Balance, 10/1	$92,432	$357,951	$0	$15,332	$384	$104,808	$570,907	$465,715
Fund Balance, 9/11	**$129,807**	**$602,125**	**$43,175**	**$14,569**	**$15,238**	**$127,149**	**$932,063**	**$789,676**

Source: Bosque County
Financial Statement, Year Ended September 30, 1985

contributed 16% of the general budget but only 4% in Bosque County. The second largest revenue contributor in Bosque County, Licenses and Permits, accounted for 24% of total revenue .

Nationally, since the 1970s municipal financing has relied less on property taxes and more on other revenue sources such as user charges and bond issuance for municipal expenditures. A popular method of financing infrastructure is through the issuance of general obligation (G.O.) and/or revenue bonds. General obligation bonds are backed by the taxing power of the jurisdiction and often require voter approval. General obligation bonds are primarily used to pay interest and principal on capital improvements, such as schools, recreation facilities and parks. In contrast, revenue bonds are supported by revenue producing capital improvements such as water and sewer treatment plants. The interest and principle on revenue bonds are financed through service charges and user fees. Interest rates on revenue bonds are higher than those of G.O. bonds but do not require voter approval.

Authorities and special districts are another way of financing development. Municipal Utility Districts (MUD), Water Conservation and Improvement Districts (WCID), and Hospital Districts are examples of special districts that provide necessary services. These districts are often financed through revenue bonds which are retired through user fees. Some special districts such as MUDs have the power to float tax-free revenue bonds and G.O. bonds. As legal subdivisions of the state, MUDS have the power to levy taxes to pay off bond debt. Special districts in the two-county study area include McLennan County WCID #3, McLennan County WCID #2, and 32 Independent School Districts .

The revenue generating methods described above are used to support local municipal and county expenditures, including educational services, transportation, and capital improvements. Principal county expenditures for Bosque County was for Public Safety, in McLennan County major expenditures were for General Government services. Approximate per capita expenditure in McLennan County for year ended September 1985 was $121, in Bosque County per capita expenditure was $110.

Annual county financial reports are organized on the basis of fund and account groups, each of which is considered a separate accounting entity. Annual county financial reports record all fund and account groups (revenues and expenditures) of the county. Usually the various accounts are organized into generic fund types within broad category and account groups. For the purpose of this report the account of primary interest is the broad category of Governmental Funds and the sub-category funds: General Fund, Special Revenue Fund, Debt Service Fund, Capital Projects Fund. Of further interest is the General Long-Term Debt Account Group which reports bonded indebtedness and other long-term liabilities. This account group is not a "fund" per se, but is concerned only with the measurement of financial position.

5.2.1 The General Fund

5.2.1.1 Revenues

The General Fund is the general operating fund of the county. It is used to account for all financial resources except those by requirement accounted for in another fund. In McLennan County total revenue for general governmental purposes (General Fund) amounted to $18,731,146, a decrease of 2.20% from the preceding year. Nearly 49% of general revenues was accounted for by property taxes and penalties, while Intergovernmental and Service Charges each raised approximately 18% of general revenues. In Bosque County the General Fund for fiscal year ended September 30, 1985 was $1,812,941. Property taxes accounted for 34% of General Governmental Funds, Licenses and Permits accounted for 26% of revenues, and Intergovernmental transfers accounted for only 4% of total revenues.

As of 1982 all taxable property in both counties was assessed at 100% of its appraised value. Counties are permitted by the State Constitution and Statutes to levy property taxes up to $.80 per $100 of assessed valuation for general governmental services and for the payment of principal and interest on long-term debt other than road bonds. In addition, $.30 per $100 of assessed valuation may be levied for farm-to-market road construction and maintenance. This would allow a total rate of $1.10 per $100 of assessed valuation to finance general governmental services, farm-to-market roads and payment of principal and interest on long-term debt other than road bonds.

In McLennan County assessed 1985 property valuations of $3.4299 billion represent an increase of 6.84% from the preceding year. Excluding exemptions, the net taxable value in McLennan County was $2,734,250,075. Currently, the tax rate assessed on the 1984 tax roll to finance general governmental services for the year ended September 30, 1985, was $.3013 per $100 of assessed valuation. Thus, the County has a tax rate margin of $.4987 per $100 of assessed valuation and could raise $13,635,704 in additional tax revenue before reaching the legal limit

The McLennan County tax rate assessed on the 1984 tax roll to finance the construction and maintenance of farm-to-market roads for the year ended September 30,1985, was $.0554 per $100 of assessed valuation. This means the County has a tax rate margin for $.2446 per $100 of assessed valuation and could raise $6,687,976 in additional tax revenue before reaching the legal limit.

As detailed in the preceding paragraphs a combined total of $20,323,680 in additional tax revenue could be raised in McLennan County by levying the maximum tax rate allowed to finance general governmental services and the construction and maintenance of farm-to-market roads. No road bonds were outstanding at publication time of the Comprehensive Annual Financial Report for fiscal year ended September 30,1985.

Property taxes for Bosque County accounted for 30% of the total revenues for fiscal year 1985. Assessed 1985 property valuations stood at $385.6 million. Currently, the tax rate assessed on the 1984 tax roll was $.1531 per $100 of assessed valuation. This means the County has a tax rate margin of $.6469 per $100 of assessed valuation and could raise $2,494,642 in additional tax revenue before reaching the legal limit.

5.2.1.2 Expenditures

As shown in Table 5 -1 expenditures by McLennan County for general governmental purposes amounted to $17,944,446 (excluding capital expenditures from Capital Projects Funds and Trust and Agency Funds expenditures) for the year ended September 30. 1985, an increase of 3.63% over expenditures for the preceding year. General Government, Public Safety and Public Transportation functions accounted for over 81% of total expenditures. Debt service expenditures amounted to only 5.84% of total expenditures.

Table 5 - 2 details Bosque County's 1985 fiscal expenditures; as shown, general governmental expenditures amounted to $1,488,980 with an excess of revenues over expenditures. Administration of Justice and General Governmental Administration functions accounted for over 48% of general governmental expenditures. Debt service expenditures accounted for 2.1% of all expenditures.

5.2.2 The Special Revenue Fund (The Road and Bridge Fund)

Special Revenue Funds are used to account for resources which are legally restricted to expenditures for specified current operation purposes or for the acquisition of relatively minor or comparatively short-lived fixed assets. The Road and Bridge fund (a Special Revenue Fund), established to account for current funds used for the purpose of constructing and maintaining roads and bridges, is of particular significance to the question of accommodating future growth. The principal source of revenues

Table 5 - 3. Study Area Road and Bridge Funds

ROAD AND BRIDGE FUND	Mclennan County	Bosque County
REVENUES		
Taxes	$2,212,575	$241,718
Intergovernmental	$433,324	$0
Charges for Services	$50	$474,725
Fines and Forfeits	$556,948	$0
Miscellaneous	$395,426	$44,543
TOTAL REVENUES	**$3,598,323**	**$760,986**
EXPENDITURES		
CURRENT		
County Wide Road and Bridge Fund	--	$470,095
General Government	$0	$0
Public Safety	$0	$0
Public Transportation	$3,719,093	$0
Welfare	$0	$0
CAPITAL PROJECTS	$0	$29,200
DEBT SERVICE		
Principal Retirements	$39,280	$15,000
Interest and Fiscal Charges	$8,132	$2,517
TOTAL EXPENDITURES	**$3,766,505**	**$516,812**
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	**($168,182)**	**$244,174**

Source: 1985 Annual Financial Statement Bosque and Mclennan Counties.

for this fund are ad valorem taxes, fines, forfeits and intergovernmental revenues. The financial statement for the County Road Bridge Fund for Bosque and McLennan Counties is shown in Table 5 - 3.

5.2.3 The Debt Service Fund

Debt service funds are used to account for the accumulation of resources for and the payment of general long-term debt principal, interest and related costs. A separate Debt Service Fund is established for each long-term debt issue except for such items serviced directly from the General Fund or from Special Revenue Funds. Three Debt Service Funds currently exist for McLennan County: Refunding Bonds - Series 1983, Certificate of Obligation - Series 1985, Certificate of Obligation - Series 1985-A. Bosque County has only one Debt Service Fund. Tables 5 - 1 and 5 - 2 show the combined statement of revenues, expenditures and changes in Debt Service Funds for each county.

5.2.4 The Capital Projects Fund

Capital Projects Funds are used to account for the purchase or construction of major capital facilities. Capital Projects Funds are not usually used to acquire short-lived general fixed assets such as furniture, machinery, etc. There are two Capital Projects Funds in use by McLennan County. One is the Permanent Improvement Fund which accounts for the acquisition and improvement of land and buildings on a continuing basis. The principal source of revenues for this fund are ad valorem taxes. The second fund is the Road Bond Fund - Series 1961, it consists of the remaining proceeds from the sale of road bonds and is available for the purchase of right-of-way and the construction of roads. Tables 5 - 1 and 5 - 2 detail expenditures and revenues of the Capital Projects Funds for McLennan and Bosque Counties.

5.2.5 The General Long-term Debt Account Group

Bonded indebtedness and certain other types of liabilities due more than one year after the balance sheet date are accounted for in the General Long-Term Debt Account Group.

The ratio of net long-term general obligation debt to assessed valuation and the amount of net long-term general obligation debt per capita are useful indicators of a county's debt position to county management, citizens and investors. This information for Bosque and McLennan counties as of September 30, 1985 is shown in Table 5 - 4.

Table 5 - 4

Debt Administration

	Net Debt Amount	Ratio of Debt to Assessed Value	Ratio of Debt to Estimated Market	Debt per Capita
MCLENNAN COUNTY				
Direct Debt:				
Net Bonded Debt	$4,071,133	0.1187%	0.1187%	$22.35
Other Direct Debt	619,200	0.0181%	0.0181%	3.40
Subtotal Debt	4,690,33	0.1368%	0.1368%	25.75
Overlapping Debt	48,628,516	1.4178%	1.4178%	267.02
TOTAL	$53,318,849	1.5546%	1.5546%	$292.77
BOSQUE COUNTY				
Direct Debt:				
Net Bonded Debt	–	–	–	–
Other Direct Debt	–	–	–	–
Subtotal Debt	$46,931	–	–	–
Overlapping Debt	–	–	–	–
TOTAL	$46,931	.01217%	–	$3.10

Source: Comprehensive Annual Financial Report, McLennan County and Bosque County, September 30, 1985.

Outstanding general obligation bonds as of September 30, 1985, for McLennan County totaled $4,820,000. The Debt Service Funds balance of $748,867 reduces the net bonded debt to

$4,071,133. The general laws of The State of Texas limit the issuance of bonds for the construction of courthouses, jails, and for certain other purposes to 5% of the assessed total taxable value of all property within the county. The legal debt margin for McLennan County is $167,421,639 for limited tax bonds. The legal limit on the annual tax rate for purposes of the General Fund, Road and Bridge Fund, Jury Fund, and Permanent Improvement Fund including debt service is $.80 per $100 of assessed valuation. However, the Attorney General of Texas will not approve the issuance of bonds which require a levy of more than $.40 of this limit for debt service on limited tax bonds. For fiscal year ended September 30, 1985, McLennan County levied a tax rate of $.0292 per $100 of assessed valuation for debt service on these bonds. The County has no outstanding debt for unlimited tax road bonds, therefore the legal debt margin as of September 30, 1985 is the full amount allowable by law, 25% of the assessed valuation of the real property in the County or $645,742,067. As of September 30, 1985 there were no general obligation bonds authorized but unissued by McLennan County, and there were no revenue bonds either authorized or outstanding.

Outstanding general obligation debt for Bosque County, as of September 1985, amounted to $46,931. Bosque County's Road Bonds for $11,000 are payable at variable amounts through 1993, with interest at 5.25% to %5.5- depending upon the maturity date. The bonds are fully funded by Debt Service fund assets.

5.2.6 County Debt Rating

McLennan County's bond and credit rating is very solid. Certificates of Obligation - Series 1985 - A were assigned a rating of A-1 by Moody's Investors. An A-1 rating is an upper medium quality bond rating, indicating a strong capacity to pay principal and interest. According to credit standards published by the International City Management Association (ICMA) a ratio of net bonded debt to assessed property valuation of less than 5% is very good. The ratio for McLennan County is 1.5546%. Other indications of a sound credit rating for McLennan County is a per capita debt of $292.77,much less than the

recommended $550 (ICMA).

To further support the statement that McLennan County is a strong financial entity is a comparison of net debt growth rates against tax base and per capita income growth rates for two periods 1980 - 81 and 1983 - 84. The comparison reveals that the growth rate of net debt does not rise excessively over tax base or personal income growth rates. In fact, the growth rate of McLennan County's net debt is about half of that for the tax base.

Bosque County's credit rating is also solid. Its ratio of bonded debt to assessed value (.01%) is much lower than the 5% "very good" credit standard ratio published by the International City Management Association (ICMA). Other indications of a sound credit rating for Bosque County is a per capita debt of $3.10, much less than the recommended $550 (ICMA).

5.3 MUNICIPAL FINANCES

5.3.1 Property Taxes

Table 5 - 5 lists assessed property valuations, applied property tax rates and remaining tax margins for each subject municipality. Also shown is the degree of bond indebtedness (total and per capita) of each municipality and the results of different methods of analyzing municipal creditability.

Additional tax revenue available to municipalities (statutory tax limit - actual tax rate) ranges from a low of $180,000 for Meridian to $29,917,642 for the City of Waco. None of the property tax rates reach the legal property tax limit. Property tax rates range from a high of $.56 per $100 for the City of Waco to a low of $.22 for Clifton. A majority of the subject municipalities property tax rates are approximately $.30 per $100 valuation.

Table 5 - 5. Municipal Finances and Credit Ratings

MUNICIPALITIES	Bellmead	Hewitt
Assessed Valuation* (A.V.)	$77,761,361	$151,090,148
(date of valuation)	1985	1985
Property Tax Rate (per $100 A.V.)	$0.3000	$0.3150
Property Tax Limit (per $100 A.V.)	$2.50	$2.50
Property Tax Margin (per $100 A.V.)	$2.20	$2.19
Additional Tax Revenue Available	$1,710,750	$3,301,320
% of A.V. Paid by 10 Principal Taxpayers	16%	14%
General Obligation Bond Debt	$1,779,000	$2,325,000
% of G.O. Debt Self-supporting	100%	65%
Debt Service Requirement	$21,738	$289,256
Value of Authorized but Unissued G.O .Bonds	none	none
Net Debt	$0	$710,194
Net Debt per Capita	$0.00	$135.35
Payment Record	never defaulted	never defaulted
Revenue Bond Debt	$232,000	$4,873,000
Avg. Ann. Req. Debt Service	$59,100	$305,041
Net System Revenue Available Fiscal Year '85	$297,417	$630,231
Authorized but Unissued Revenue Bonds	none	none
Debt Service/Total Revenue from Sources	19.87%	48.40%
Total Debt		
Total Direct & Overlapping Debt	$266,684,773	$2,981,745
Per Capita Debt	$354.71	$568.28
Credit Rating		
Total Debt/Market Value of Property Tax Base	3.43%	0.02%
less than 5% = very good		
more than 10% = trouble		
Revenue Debt Service/Total Revenue from Sources	19.87%	48.40%
less than 20-25% = very good		
Date of Financial Statement	5/30/86	9/30/86

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Meridian	Lacy-Lakeview
Assessed Valuation* (A.V.)	*$19,000,000*	$73,252,395
(date of valuation)	1985	1986
Property Tax Rate (per $100 A.V.)	*$0.5500*	$0.3000
Property Tax Limit (per $100 A.V.)	$1.50	$1.50
Property Tax Margin (per $100 A.V.)	$0.95	$1.20
Additional Tax Revenue Available	$180,500	$879,029
% of A.V. Paid by 10 Principal Taxpayers	23%	38%
General Obligation Bond Debt	$599,000	$70,000
% of G.O. Debt Self-supporting	100%	100%
Debt Service Requirement	$55,912	$16,850
Value of Authorized but Unissued G.O .Bonds	none	none
Net Debt	$129,438	$0
Net Debt per Capita	$97.32	$0.00
Payment Record	never defaulted	never defaulted
Revenue Bond Debt	$23,000	$1,035,000
Avg. Ann. Req. Debt Service	$8,278	$92,713
Net System Revenue Available Fiscal Year '85	$52,773	$356,649
Authorized but Unissued Revenue Bonds	none	$155,000
Debt Service/Total Revenue from Sources	15.69%	26.00%
Total Debt		
Total Direct & Overlapping Debt	$138,465	$1,660,070
Per Capita Debt	$104.11	$603.22
Credit Rating		
Total Debt/Market Value of Property Tax Base	0.01%	0.02%
less than 5% = very good		
more than 10% = trouble		
Revenue Debt Service/Total Revenue from Sources	15.69%	26.00%
less than 20-25% = very good		
Date of Financial Statement	9/30/85	7/1/86

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Clifton	Woodway
Assessed Valuation* (A.V.)	$50,592,713	$239,263,970
(date of valuation)	1983	1985
Property Tax Rate (per $100 A.V.)	$0.2200	$0.3400
Property Tax Limit (per $100 A.V.)	$1.50	$2.50
Property Tax Margin (per $100 A.V.)	$1.28	$2.16
Additional Tax Revenue Available	$647,587	$5,168,102
% of A.V. Paid by 10 Principal Taxpayers	21%(1984 A.V.)	5%
General Obligation Bond Debt	$180,000	$965,000
% of G.O. Debt Self-supporting	100%	100%
Debt Service Requirement	$33,995	$119,201
Value of Authorized but Unissued G.O .Bonds	none	none
Net Debt	$157,410	$4,626
Net Debt per Capita	$51.39	$0.65
Payment Record	never defaulted	never defaulted
Revenue Bond Debt	none	$1,745,000
Avg. Ann. Req. Debt Service	$0	$110,374
Net System Revenue Available Fiscal Year '85	$36,887	$455,605
Authorized but Unissued Revenue Bonds	none	none
Debt Service/Total Revenue from Sources	0.00%	24.23%
Total Debt		
Total Direct & Overlapping Debt	$421,903	$3,012,884
Per Capita Debt	--	$424.89
Credit Rating		
Total Debt/Market Value of Property Tax Base	0.01%	0.01%
less than 5% = very good		
more than 10% = trouble		
Revenue Debt Service/Total Revenue from Sources	0.00%	24.23%
less than 20-25% = very good		
Date of Financial Statement	9/30/83	9/30/85

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Mclennan County WCID # 2 (Elm Mott)
Assessed Valuation* (A.V.)	$18,658,293
(date of valuation)	1985
Property Tax Rate (per $100 A.V.)	$0.3100
Property Tax Limit (per $100 A.V.)	NA
Property Tax Margin (per $100 A.V.)	NA
Additional Tax Revenue Available	NA
% of A.V. Paid by 10 Principal Taxpayers	27%
General Obligation Bond Debt	$405,000
% of G.O. Debt Self-supporting	100%
Debt Service Requirement	$56,560
Value of Authorized but Unissued G.O .Bonds	none
Net Debt	$0
Net Debt per Capita	--
Payment Record	never defaulted
Revenue Bond Debt	none
Avg. Ann. Req. Debt Service	none
Net System Revenue Available Fiscal Year '85	none
Authorized but Unissued Revenue Bonds	none
Debt Service/Total Revenue from Sources	none
Total Debt	
Total Direct & Overlapping Debt	$386,224
Per Capita Debt	--
	$514.97 per acre
Credit Rating	
Total Debt/Market Value of Property Tax Base	0.02%
less than 5% = very good	
more than 10% = trouble	
Revenue Debt Service/Total Revenue from Sources	none
less than 20-25% = very good	
Date of Financial Statement	9/30/85

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

Table 5 - 5. (Continued) Municipal Finances and Credit Ratings

MUNICIPALITIES	Waco
Assessed Valuation* (A.V.)	$2,322,798,323
(date of valuation)	1985
Property Tax Rate (per $100 A.V.)	$0.5620
Property Tax Limit (per $100 A.V.)	$1.85
Property Tax Margin (per $100 A.V.)	$1.29
Additional Tax Revenue Available	$29,917,642
% of A.V. Paid by 10 Principal Taxpayers	12%
General Obligation Bond Debt	$22,704,000
% of G.O. Debt Self-supporting	100%
Debt Service Requirement	$2,987,386
Value of Authorized but Unissued G.O .Bonds	none
Net Debt	$7,658,902
Net Debt per Capita	$75.64
Payment Record	never defaulted
Revenue Bond Debt	$24,753,763
Avg. Ann. Req. Debt Service	$2,897,230
Net System Revenue Available Fiscal Year '85	$7,496,247
Authorized but Unissued Revenue Bonds	none
Debt Service/Total Revenue from Sources	38.65%
Total Debt	
Total Direct & Overlapping Debt	$17,449,196
Per Capita Debt	$173.32
Credit Rating	
Total Debt/Market Value of Property Tax Base less than 5% = very good more than 10% = trouble	0.01%
Revenue Debt Service/Total Revenue from Sources less than 20-25% = very good	38.65%
Date of Financial Statement	9/30/86

Source: Texas Municipal Reports,
Municipal Advisory Council of Texas
Notes: Italics indicate estimated data.
NA = Not applicable.

5.3.2 Municipal Credit Rating

One measure of a strong credit rating (International City Management Association) is if total debt per capita is less than less than $550, if per capita debt is higher than $1,300 financial instability is likely. All the subject municipalities fit this criteria for a good credit rating except the communities of Hewitt and Lacy-lakeview whose net per capita debt is slightly higher than the recommended $550 but much lower than the danger zone above $1,300.

A second method of measuring credit soundness recommended by the International City Management Association is to compare total debt to the market value of the entity's property tax base: a ratio of less than 5% is very good, more than 10% signals possible trouble. As shown in Table 5 - 5 all the municipalities fit this criteria for a sound credit rating.

A third method provided by the International City Management Association of determining credit stability is to compare the revenue debt service with total revenue from sources, if the ratio is less than 20-25% the credit rating is considered good. When this method of of credit analysis was applied three municipalities were shown to have a higher than desirable debt service to revenue ratio; those cities were, Hewitt, Lacy-Lakeview and Waco.

5.4 TAXABLE VALUE OF LANDS POTENTIALLY INUNDATED

Approximately fifty-four landowners owning 13,351 acres will be impacted to some extent by the proposed construction of Lake Bosque. In some cases all of a particular land parcel will be inundated, in other cases only a portion of the parcel. Approximately nine homes and 6,143.26 acres of the 13,251 acres will be affected by the proposed lake Bosque's conservation pool and 100 year floodplain.

The Bosque County Financial Statement for year ended 1985 reports total property assessments at $385,630,342. The proposed project would remove about 6,143 acres from the county tax roles. The assessed value of property removed from the tax roles by the construction of the proposed reservoir is about 45% of the assessed value of the 13,629 acres partially affected by the project. As shown in Table 5 - 6 the assessed property value for the 13,629 acres partially affected by the proposed reservoir was $2,827,655. Forty-five percent of the assessed valuation of the 13,629 acres is $1,272,455 or .33% of the county's tax base. Thus, the construction of the proposed reservoir would remove about .33% of the county's tax base.

5.5 SUMMARY

Property taxes accounted for the majority of McLennan and Bosque Counties' tax revenues. Other major revenue sources in McLennan County were Intergovernmental Transfers and Service Charges; in Bosque County an important revenue source was Licenses and Permits.

Property valuations in McLennan County for 1985 increased slightly from the preceding year. Legally McLennan County could more than double the tax rate for financing general government services and quadruple the current tax rate for financing the construction and maintenance of farm-to-market roads and still fall below the ceiling limit. Bosque County could increase property tax revenues by increasing the current tax rate by five and still fall below the legal limit.

Measures for calculating bond and credit rating strength reveal that both counties are secure, as per capita debt and the ratio of debt to assessed value are both low. In addition, McLennan County was assigned a rating of A-1 by Moody's investors. An A-1 rating is an upper medium quality bond rating indicating a strong capacity to pay principal and interest.

None of the seven project participating communities' property tax rates are close to the legal ceiling of $2.50 per $100 valuation. Four of the communities have property tax rates which fluctuate around $.30 per $100 valuation. Those communities could increase property tax rates by seven to eight times and still fall below the legal limit. Two of the communities could triple their property tax rates and one community could increase its tax rate by five and each would still remain under the ceiling limit.

Three methods of analyzing credit soundness were applied. The first criteria was a per capita debt of less than $550. All the subject communities complied with this criteria except the communities of Hewitt and Lacy-Lakeview. However, the net per capita debt of those communities was only slightly higher than the recommended value and much lower than the danger zone above $1,300. The second method of measuring credit soundness compared total debt to the communities' property market valuations. The results showed all the subject communities in good standing. The third method of determining credit stability compared revenue debt service with total revenue from sources. The results of this application revealed three communities with a higher than desirable debt service to revenue ratio; those communities were Hewitt, Lacy-Lakeview and Waco.

In short, the financial position of Bosque and McLennan Counties is good. Both have strong credit ratings and if needed, have ample tax margins allowing major increases in property tax revenues. The subject municipalities are also in good financial condition, with relatively low property tax rates, ample tax margins and low per capita debt ratios.

Table 5-6. Land Values for Proposed Lake Bosque Site

ID #	Landowner	Abstract	Total Acres	Land Use	Market Value	Production Value	Assessed Value	Taxable Value
A-183	MCKNIGHT, LELA	NICHOLS, E.B.	1	HS	$236,550	- -	$236,550	$236,550
A-183	MCKNIGHT, LELA	NICHOLS, E. B.	1	HS	$36,890	- -	$36,890	$36,890
A-183	MCKNIGHT, LELA	NICHOLS, E.B/GREEN	875	AG	$668,790	$87,590	$139,520	$139,520
A-183	MCKNIGHT, LELA	HOLLINGSWORTH JAS.	253	AG	$194,180	$15,470	$15,470	$15,470
A-183	MCKNIGHT, LELA	HOLLINGSWORTH JAS.	1	HS	$23,350	- -	$23,350	$23,350
A-183	MCKNIGHT, LELA	JAMES ROURKE	1	HS	$23,150	- -	$23,150	$23,150
A-183	MCKNIGHT, LELA	JAMES ROURKE	390	AG	$296,610	$22,360	$24,160	$24,160
A-183	MCKNIGHT, LELA	J. GRIFFEN	417	AG	$315,750	$22,370	$33,950	$33,950
A-183	MCKNIGHT, LELA	L. DAVIS	741	AG	$591,470	$76,530	$144,810	$144,810
A-183	MCKNIGHT, LELA	L. DAVIS	1	HS	$26,300	- -	$26,300	$26,300
A-183	MCKNIGHT, LELA	L. DAVIS	1	HS	$28,390	- -	$28,390	$28,390
A-183	*TOTAL- MCKNIGHT, LELA*	- -	*2,681*		*$2,461,430*	*$224,320*	*$732,540*	*$732,540*
A-209	COCHRAN, JIM	NA	NA	NA	NA	NA	NA	NA
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	440	AG	$338,700	$41,160	$49,260	$49,260
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	1	HS	$11,310	- -	$11,310	$11,310
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	1	HS	$44,240	- -	$44,240	$29,240
A-252	MARTIN , CHARLOTTE	JAS. HOLLINGSWORTH	720	AG	NA	- -	- -	- -
A-26	GAUNTT, H.W.	NA	100	AG	$69,000	$4,700	$4,700	$4,700
A-266	RICH, EARL E.	J. GRIFFEN	100	AG	$73,960	$5,870	$9,170	$9,170
A-266	RICH, EARL E.	J. GRIFFEN	1	HS	$33,470	- -	$33,470	$33,470
A-277	HILLARD C.T.	NA	NA	NA	NA	NA	NA	NA
A-286	MOORE, PAUL	DAVID RYAN	152	AG	$117,950	$13,440	$13,440	$13,440
A-286	MOORE, PAUL	DAVID RYAN	1	HS	$23,550	- -	$23,550	$23,550
A-290	GILLELAND, A. J.	JOHN GRIFFEN	49	AG	$38,200	$3,950	$7,580	$7,580
A-290	GILLELAND, A. J.	JOHN GRIFFEN	1	HS	$35,070	- -	$35,070	$35,070
A-291	SPEER, BIRDIE	NA	103	AG	NA	- -	- -	- -
A-295	VICKERY, JACK	DAVID GREEN	68	AG	$51,000	$3,740	$3,740	$3,740
A-295	VICKERY, JACK	DAVID GREEN	1	HS	NA	- -	- -	- -
A-296	REEVES, CHARLES H.	J. GRIFFEN	99	AG	$44,380	$4,370	$4,780	$4,780
A-296	REEVES, CHARLES H.	J. GRIFFEN	1	HS	$50,350	- -	$50,350	$5,000
A-30	MONNICH, DAVID H.	JONATHON HOAK	69	AG	$5,280	$4,160	$14,160	$14,160
A-300	LEATHERWOOD, W. J.	WM. B. LOFTON	186	AG	$142,130	$14,650	$28,110	$28,110
A-305	NA	NA	NA	NA	NA	NA	NA	NA
A-309	CAREY, DAN B.	NA	NA	NA	NA	NA	NA	NA
A-316	NICKELS, ROY L.	JUANA DIAZ	533	AG	$169,890	$15,040	$22,170	$22,170
A-318	NICKELS, ROY L.	JUANA DIAZ	1	HS	$15,190	- -	$15,190	$15,190
A-319	HENDRIX, DAVID M. JR.	LITTLE JONAS	106	AG	$80,980	$6,680	$6,680	$6,680
A-319	HENDRIX, DAVID M. JR.	C.E. ANDERSON	205	AG	$162,750	$20,030	$20,030	$20,030
A-319	HENDRIX, DAVID M. JR.	JOHN GRIFFIN SR.	366	AG	$266,580	$27,810	$80,160	$80,160
A-319	HENDRIX, DAVID M. JR.	JOHN GRIFFIN SR.	1	HS	$27,190	- -	$27,190	$27,190
A-323	KLUTS, FRED	NA	42	NA	NA	NA	NA	NA
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	1	HS	$21,980	- -	$21,980	$21,980
A-325	THOMPSON, JOHN R.	JAMES ROURKE	146	AG	$109,770	$11,390	$11,390	$11,390
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	5	AG	$9,450	$690	$690	$690
A-325	THOMPSON, JOHN R.	EDWARDS, T. E.	15	AG	$11,560	$850	$850	$850
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	781	AG	$590,830	$58,820	$82,160	$82,610
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	1	AG	$60,490	$0	$60,490	$60,490
A-339	BARTON, DAVID B.	NA	11	NA	NA	NA	NA	NA
A-379	PIERCE, J.V.	HOLLINGSWORTH JAS.	57	AG	$44,380	$4,370	$4,780	$4,780
A-379	PIERCE, J.V.	HOLLINGSWORTH JAS.	1	HS	$50,300	- -	$50,300	$5,000
A-414	MCKNIGHT, DAVID	HOLLINGSWORTH, JAS	38	AG	$28,630	$2,110	$2,110	$2,110
A-56	WEBB, MAE	JOHNATHON HOAK	140					
A-58	HOWARD, T.D.	BAKER, HANCE	156	AG	$116,930	$7,020	$7,570	$7,570
A-65	MOORE, ERVIN W.	JOHNATHON HOAK	121	AG	$93,310	$8,090	$16,150	$16,150
A-700	NA	NA	NA	NA	NA	NA	NA	NA
A-701	NA	NA	NA	NA	NA	NA	NA	NA
A-702	NA	NA	NA	NA	NA	NA	NA	NA
A-703	NA	NA	NA	NA	NA	NA	NA	NA
A-704	JAGGERS, W. FRED	WILLIAM RIDDLES	50	AG	$37,500	$2,750	$2,750	$2,750
A-704	NA	NA	NA	NA	NA	NA	NA	NA
A-73	WOODY, H. E.	NA	NA	NA	NA	NA	NA	NA
A-76	FOSTER, RANDELL R.	NA	NA	NA	NA	NA	NA	NA
A-84	O'BRIAN, FOSTER D.	NA	44	NA	NA	NA	NA	NA
A-88	HOLLAN, CHARLES N.	GEO. LAWERENCE	150	AG	$112,880	$6,770	$6,770	$6,770
A-91	PIKE ALBERT	BAKER, HANCE	42	AG	$31,780	$2,600	$2,600	$3,620
B-277	BEECHERL,LOUIS A. JR.	DAVID RYAN	262	AG	$196,820	$14,430	$14,430	$14,320
C-1	NA	NA	NA	NA	NA	NA	NA	NA
C-128	HANNA, JEFFEIE F.	WILLIAM PARVIN	3	HS	$78,280	- -	$78,280	$78,280
C-128	HANNA, JEFFEIE F.	WILLIAM PARVIN	160	AG	NA	NA	NA	NA

Table 5-6. (continued)

ID #	Landowner	Abstract	Total Acres	Land Use	Market Value	Production Value	Assessed Value	Taxable Value
C-14	JENKINS, TOM Z.	JOHN K. MCLENNAN	67	AG	$51,650	$6,350	$9,140	$9,140
C-14	JENKINS, TOM Z.	JOHN K. MCLENNAN	1	HS	$16,270	- -	$16,270	$16,270
C-154	NAGEL, RICHARD C.	JESSE P. HITCHCOCK	166	AG	$129,360	$13,310	$19,540	$19,540
C-154	NAGEL, RICHARD C.	JESSE P. HITCHCOCK	1	HS	$14,960	- -	$14,960	$14,960
C-19	VICK, THOMAS	SAMUEL K. LEWIS	253	AG	$196,100	$23,140	$53,270	$53,270
C-19	VICK, THOMAS	SAMUEL K. LEWIS	1	HS	$84,460	- -	$84,460	$5,000
C-196	ALLEN, EUGENE	WILLIAM MEDLIN	237	AG	$179,000	$14,860	$14,860	$14,860
C-197	LACY-FEED CO.	J. HOWE	1	HS	$14,360	- -	$14,360	$14,360
C-197	LACY-FEED CO.	J. HOWE	179	AG	$119,330	$8,750	$368,260	$368,260
C-204	MANISON, THOMAS	ANDREW H. LONG	90	AG	$80,720	$16,140	$16,140	$16,140
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$75,040	- -	$75,040	$75,040
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$23,230	- -	$23,230	$23,230
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$23,650	- -	$23,650	$23,650
C-204	MANISON, THOMAS	ANDREW H. LONG	1,213	AG	$917,470	$82,020	$82,020	$82,020
C-205	HARDCASTLE, J.W.	LONG, ANDREW H.	137	AG	$102,900	$6,170	$6,170	$6,170
C-210	GRIMM, FURMAN A.	RUNDEL BENJ. F.	95	AG	$73,070	$6,800	$6,800	$6,800
C-23	HAMILTON, J.J.	DANIEL C. THOMAS	88	AG	NA	NA	NA	NA
C-27	HALL, GLADYS	DANIEL C. THOMAS	17	AG	$13,390	$1,300	$1,300	$1,300
C-27	HALL, GLADYS	WM. ECHELBERGER	102	AG	$79,250	$7,800	$9,780	$9,780
C-27	HALL, GLADYS	WM. ECHELBERGER	1	HS	$21,290	- -	$21,290	$21,290
C-27	HALL, GLADYS	HITCHCOCK, JESSE B.	40	AG	$31,020	$3,050	$3,050	$3,050
C-33	RANDOLPH, ROBERT M.	NA	NA	NA	NA	NA	NA	NA
C-41	FARRELL, B.E.	DAVID D. GREEN	157	AG	$117,750	$8,640	$8,640	$8,640
C-41	FARRELL, B.E.	JACOB, EYLER	692	AG	$525,150	$43,300	$43,300	$43,300
C-418	GIPSON, WILLIAM E.	WM. ECHELBERGER	263	AG	$200,690	$20,770	$24,230	$24,230
C-418	GIPSON, WILLIAM E.	JESSE P. HITCHCOCK	120	AG	$89,760	$6,580	$6,580	$6,580
C-44	WILLIAMS, HARVEY	WM. PARVIN	466	AG	$349,500	$20,970	$31,920	$31,920
C-44	WILLIAMS, HARVEY	WM. PARVIN	1	HS	$50,735	- -	$50,735	$51,735
C-450	MORRIS, ROBERT	BENJ. L. RUNDEL	100	AG	NA	NA	NA	NA
C-493	REINKE, ERNEST W. JR.	PATCHING, L.Y. DEC'D	1	HS	$69,040	- -	$69,040	$69,040
C-493	REINKE, ERNEST W. JR.	PATCHING, L.Y. DEC'D	159	AG	$122,780	$14,910	$20,260	$20,260
C-59	HARDCASTLE B.R.	JESSE HITCHCOCK	40	NA	NA	NA	NA	NA
C-59	HARDCASTLE B. R.	SAMUEL K. LEWIS	178	AG	$138,390	$11,720	$11,720	$11,720
C-59	HARDCASTLE B. R.	RUNDEL, BENJ. F.	16	AG	$12,530	$1,340	$1,340	$1,340
C-66	BICE, DON	HOWE, JAMES	70	AG	$52,550	$69,040	$69,040	$3,850
C-68	ROYAL, EARL	DANIEL C. THOMAS	200	AG	NA	NA	NA	NA
C-700	NA	NA	NA	NA	NA	NA	NA	NA
C-701	NA	NA	NA	NA	NA	NA	NA	NA
D-196	HAMPE, LOUISE L., & A.W.	DANIEL C. THOMAS	1	HS	$11,090	- -	$11,090	$11,090
D-196	HAMPE, LOUISE L., & A.W.	DANIEL C. THOMAS	117	AG	$88,470	$6,130	$6,130	$6,130
D-196	HAMPE, LOUISE L., & A.W.	SAMUEL K. LEWIS	143	AG	$108,180	$9,630	$9,630	$9,630
	TOTAL		13,629		$10,060,825	$912,770	$2,827,655	$2,579,515
	Lake Bosque acreage (proposed) (Δ)		6,143					
	Percent of Landowners' Total Acreage		45%					
	Percent of Dollar Values Removed By Proposed Proj		45%		$4,527,371	$410,747	$1,272,445	$1,160,782

Notes: Na = not available, Ag = agriculture, HS = homesite, NHS = not a homesite.
Source: Bosque County Appraisal District, (Δ) Technical Consulting Associates, 1985.

6.0 RECREATION AND AESTHETICS

6.1 INTRODUCTION

This section provides a baseline from which to assess the impact of the proposed reservoir on recreation and aesthetics in the study area. Recreational demand was described in terms of baseline conditions and projected needs for future populations. Regional recreational facilities were identified and characterized in terms of use statistics. The primary source of information was the 1985 Texas Outdoor Recreation Plan. The existing visual environment was evaluated with respect to standard aesthetic parameters including uniqueness, diversity, landforms and historic value by sampling a representative selection of viewsheds.

6.2 RECREATION

6.2.1 The Texas Outdoor Recreation Plan

The 1985 Texas Outdoor Recreation Plan (TORP) is the fifth statewide comprehensive outdoor recreation plan since 1965. The goal of the plan is to improve the outdoor recreation opportunities preferred by Texas residents and visitors. Objectives of the plan are numerous, however, the most important in relation to the proposed Bosque Reservoir are the issues of optimal utilization of resources for outdoor recreation and the coordination of outdoor recreation planning in Texas. TORP highlights four recreation issues and problems specific to the Heart of Texas, Region 11, in which the proposed Lake Bosque lies.

The first issue concerns the recreational needs of the elderly. In 1980, 17% of the region's population were 65 years or older, compared to 10% statewide. Population projections indicate that this trend will continue. Therefore, TORP recommends active support of facilities and programs that cater to senior citizens, i.e.: trails with benches, community centers, shaded picnic areas, gardening and birdwatching programs.

The second issue concerns municipal budgets that do not include parks and recreation directors or provisions for future expansion of park systems. To reduce budget constraints TORP recommends alternative funding sources, such as fundraising events, civic support and fee systems.

The third issue is that of vandalism and crime in parks. Vandalism is costly, repairs drain funds away from new facilities and park acquisitions. Real or perceived threats of crime keep park users away and reduce the attractiveness of parks. TORP notes that some park managers with hopes of discouraging crime and vandalism have started special programs and events with the intent of attracting more families to parks.

The fourth and perhaps most pertinent issue in relation to the Lake Bosque project, is that public access to water for swimming, boating and fishing is limited. TORP states that increased public access to water is crucial in meeting Region 11's recreational needs. Despite the numerous lakes in Region 11 public access is so limited that of the 24 TORP regions only 2 others show a greater needs per thousand population for freshwater swimming areas. An additional problem is the lack of storage facilities, slips and stalls capable of handling large boats.

6.2.2 Recreational Resources

6.2.2.1 Land and Water

Figure 6 - 1 shows the Texas Outdoor Recreation Plan Heart of Texas, Region 11 in which the study area is located. Also shown are the region's State recreational and historical areas and facilities as compiled by the U.S. Army Corps of Engineers (USCE). Table 6 - 1 lists the recreational and historic areas and facilities found in Region 11. In Table 6 - 1, the numbers next to the recreational areas correspond to the sites marked in Figure 6 - 1.

Table 6 - 1

Heart of Texas, Region 11, Recreational Resources

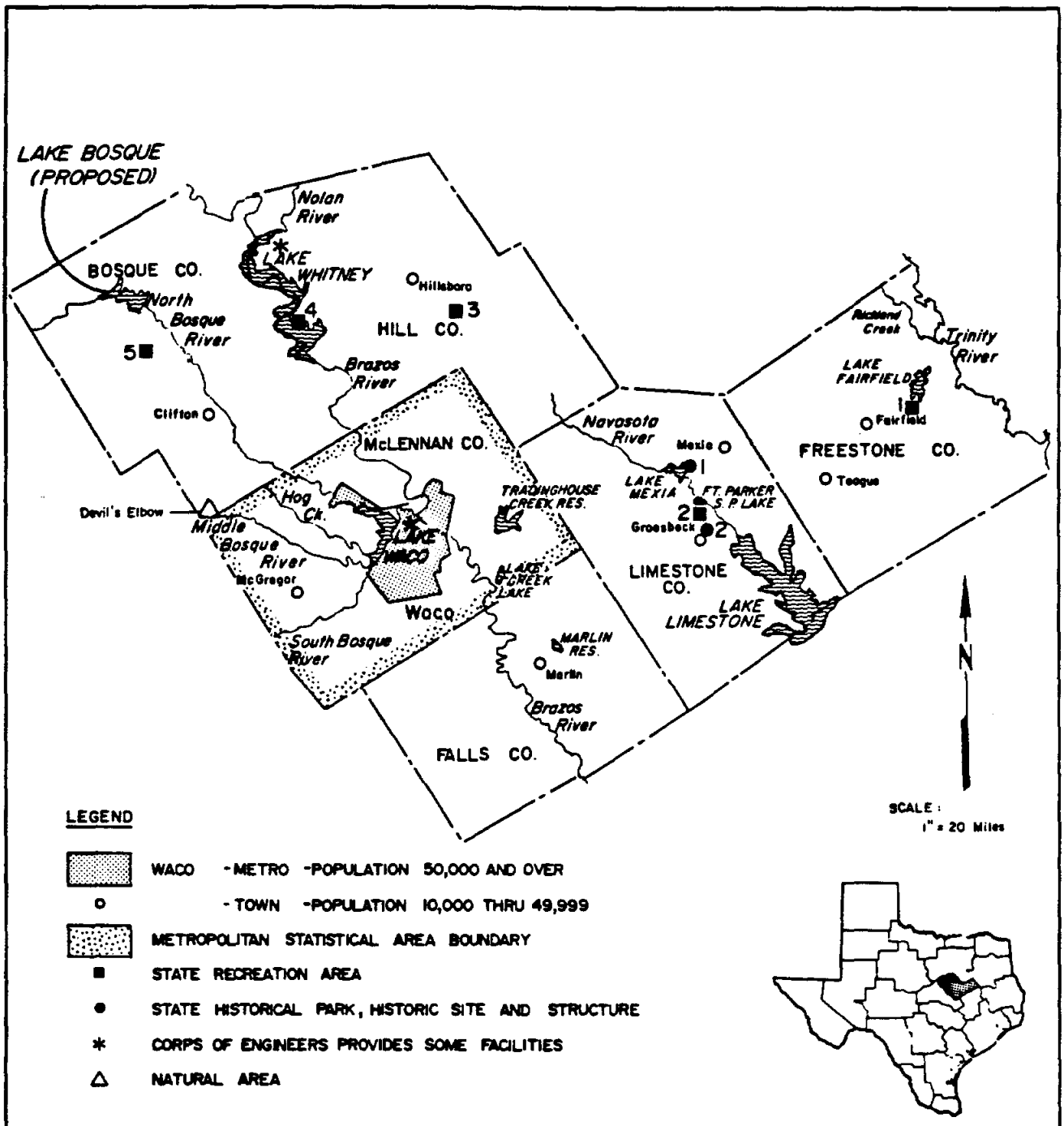
Parks & Recreation Areas	Streams	Lakes
Fairfield Lake State Rec. Area (1)	Bosque River	Fairfield Lake
Fort Parker State Rec. Area (2)	Brazos River	Fort Parker State Park Lake
Jeff Davis State Rec. Area (3)	Hog Creek	Lake Limestone
Lake Whitney State Rec. Area (4)	Navasota River	Lake Mexia
Meridian State Rec. Area (5)	Nolan River	Lake Waco
Confederate Reunion Grounds State Historical Park (1)	Richland Creek	Lake Whitney
Old Fort Parker State Historic Site (2)	Trinity River	Tradinghouse Creek Reservoir

Land

6 counties
5,560 square miles
Recreation Land 40,132 acres
Developed Recreation Land 7,834 acres
Elevation: 300' - 1,200'

Source: Texas Outdoor Recreation Plan, 1985

As detailed in Table 6 - 1, Region 11 includes 6 counties, Bosque, McLennan , Hill, Falls, Limestone and Freestone. The region covers 5,560 square miles, of which 40,132 acres or 1% were designated by TORP as recreational acres. Of the recreation land, 7,834 acres or 19% were classified as developed recreation land. The term developed recreation land describes land developed for recreational



PAUL PRICE ASSOCIATES, INC.

Figure 6-1

Heart of Texas, Region II

source: Texas Outdoor Recreation Plan, 1985

purposes, included are nature trails but not land adjacent to them, excluded are open areas unless specifically designed to provide recreation. The region contains seven lakes or reservoirs which cover 50,885 surface acres.

The USCE owns 63% of the region's recreation land acres, most of which are located adjacent to Lakes Whitney and Waco. The bulk of the regional population is within an hours drive of the most popular lake resources. Compared to the State, Region 11 has an above average number of parks for its population . The federal government supplies the greatest share of developed parkland, about 35%, but the local sector manages 55% of the parks in the region and maintains the greatest number of facilities. Texas Parks and Wildlife Department attracts visitors to the region with seven park sites, but the state sector, including river authorities, only supplies 9% of the developed recreation land (TORP).

6.2.2.2 Regional Recreation Attractions

Within Region 11 there are many regional recreation attractions. In contrast to the neighborhood park which generally attracts users from the immediate local area, regional recreation attraction areas serve the recreational needs of a large area and attract visitors from far away. TORP identifies nine regional recreation attractions in Region 11: five recreation areas, two historic parks and two park systems around Lake Waco and Lake Whitney. In Bosque County, Meridian State Park is considered a recreational attraction. Water regional attractions include five rivers: the Bosque (Main, Middle, and North Forks), Brazos, Navasota, Nolan, and the Trinity; two creeks: the Hog and Richland; and seven lakes or reservoirs covering 50,885 surface acres. None of the waterways are recommended for inclusion in a natural river system, presumably due to the degree of adjacent development and lack of significant features. Three of the rivers (the Brazos, Richland Creek and the Trinity) are considered permanently floatable while the remainder (the Bosque River and its Middle and North Forks, Hogg Creek, Navasota Creek, Navasota River, and the Nolan River) are considered seasonably floatable, primarily after rains. As is typical in Texas, public access to the rivers is severely restricted.

6.2.2.3 Natural Areas

Region 11 contains five "natural areas" or sites which represent a partial inventory of the state's natural areas and are significant for their relatively undisturbed ecosystems. Those five natural areas include the Balcones Escarpment, Bird Hollow, Bluff Creek, Devil's Elbow, and Caney Creek Triangle. The first three of those regions are in McLennan County, Devil's Elbow straddles the Bosque and McLennan County border, and Caney Creek Triangle is in Freestone County. Devil's Elbow is located on private property in the northwest corner of McLennan County adjacent to Bosque County on the Middle Bosque River (see Figure 6 - 1). The three mile long area includes floodplain lands and canyon walls and is described by the 1973 Texas Natural Areas Survey as the most scenic of McLennan County's limestone canyons.

TORP designates four areas as potential trail development sites because of their scenic or historic qualities and/or linear characteristics. Two of the trail sites are in McLennan County, one is in Bosque County and one in both counties. Those sites are:

The Brazos River Corridor, (McLennan County). Along both banks of the river and Lake Brazos from the dam upstream to the Bosque River confluence. 18 miles of bike, hike, nature study and walking trials.

Lake Waco, (McLennan County). Following the shoreline of Lake Waco. 60 miles of backpacking, hiking and horseback riding.

Lake Whitney, (Hill and Bosque Counties). 28 miles of backpacking, hiking, horseback riding, and nature study trails.

Morgan to Waco, (Bosque, Hill and McLennan Counties). 47 miles of bike, hiking and horseback riding trail following an abandoned railroad ROW from Morgan to Whitney to Waco.

6.2.3 Recreational Demand

TORP projections[1] indicate that in 1990 the top ranking activities in Region 11, in terms of percent of the population participating, are walking, fishing, picnicking, swimming in freshwater and camping. The popularity of these activities which are less strenuous and more relaxing than most may be influenced by the high numbers of senior citizens in the region.

Region 11 is characterized by an above average participation in water related activities. The region ranks in the top five for boating, fishing, skiing, and swimming in freshwater.

6.2.4 Recreational Supply Deficits

TORP estimates that by 1990, Region 11 will have regional deficits for all types of facilities except boat ramps and lake acres. Compounding the problem of supply deficits is the problem of distribution and changing user needs, for example: because boaters are purchasing larger boats and despite that boat ramp access on area lakes is good, what is needed are additional storage facilities, marina slips and stalls, or dry docks that can handle boats that are too large to be pulled by an automobile.

Compared to state averages, Region 11 shows above average 1990 needs for ten facilities: baseball fields, campsites, football fields, golf holes, horseback riding trails, picnic tables, soccer fields, softball fields, swimming, walking, hiking trails. Only two other regions in the state show greater needs per thousand population for freshwater swimming areas. TORP suggests that since Region 11 has an abundance of lakes, this need can be met by improving shoreline access and designating areas for swimmers. The Bosque River used to have one public access point known as Jackson Crossing which according to

[1]TORP participation projections are based on the Texas Water Development Board High Series population projections.

local informants and other sources was a popular fishing hole and picnic spot (Technical Consulting Associates, 1985). The landowner has since closed the area to the public.

6.2.5 Torp Recommendations

TORP recommends that the federal government, because it owns the largest share of undeveloped recreation land in Region 11, should shoulder the largest role in supplying hiking and horseback riding trails. Commercial providers report the second largest inventory of undeveloped recreation land in the region. TORP recommends that this sector, especially when located on freshwater bodies, should increase its role in providing campsites, boat storage facilities, fishing and swimming access. TORP also recommends that the local sector, municipalities, civic clubs, leagues, and school districts continue their primary role in supplying sports fields and courts.

6.3 AESTHETICS

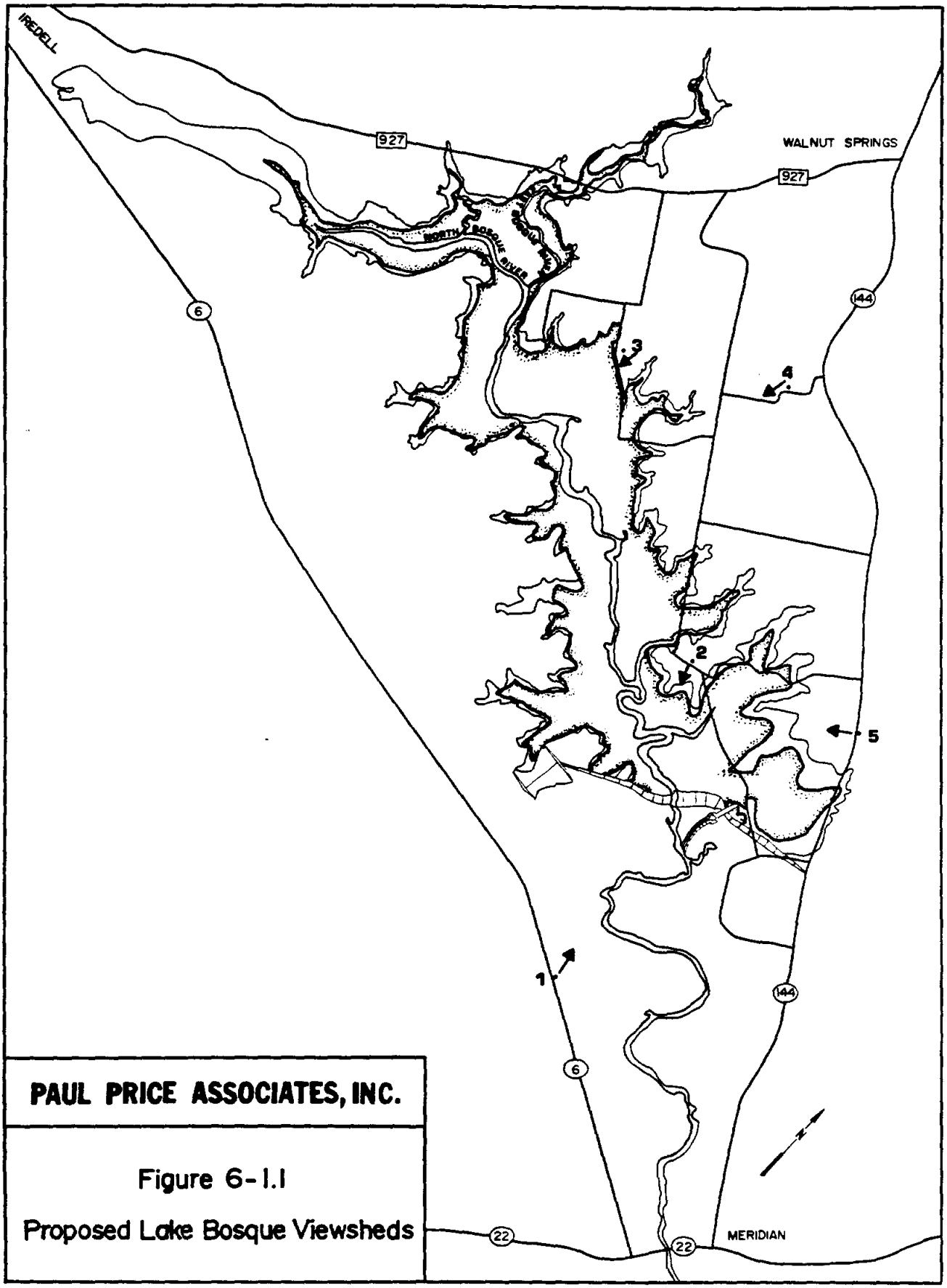
6.3.1 Introduction

An aesthetic survey of the land area included within the proposed Lake Bosque was conducted in February of 1985. Aesthetic values considered include topographical variation, prominence of water features, coloration, vegetational diversity and vividness, unique geological formations (blufflines, hilltops, exposed rock), man-made structures and uniqueness of view with respect to the region. Five viewsheds, the locations shown in Figure 6 - 1.1, were photographed and evaluated. The survey emphasized views presently available to the public along roadsides.

6.3.2 Study Area Characteristics

The surveyed area is located in a transitional zone and includes rolling pasture and farmland with interspersed forests and grasslands. The Bosque River valley characterized by river-bottom lands leveling out at about 800 feet mean elevation, is dotted with 900 - 1,050 foot high hills and encompassed by an 800 - 1,000 foot high ridge line. The areas immediately adjacent to the Bosque River are characterized by riparian woodlands, however these areas are private property and not accessible to the public. Excluding the western side of the proposed reservoir site along Highway 6 and areas where the view is obstructed by vegetation or some other object, panoramic views of the proposed reservoir site are accessible anywhere at elevations above 850 feet. Viewsheds are obstructed along Highway 6 due to intervening elevations and dense vegetation.

At the time of the survey the weather was rainy and overcast. Because of unusually heavy rainfall earlier in the month vegetation was greener than usual. Natural vegetation includes indian grass, little bluestem grass, buffalo grass, cedar, oak woodland, prickly pear cactus, pale-leaf yucca and mountain laurel. According to area promotional brochures, wildflowers grow profusely along the roadsides; in April



PAUL PRICE ASSOCIATES, INC.

Figure 6-1.1

Proposed Lake Bosque Viewsheds

and May, abundant species include mountain pink, indian paintbrush, bluebonnets, gaillardia and white rock daisy. Mammals common to the area are livestock, raccoons, fox, and white-tail deer. Meridian State Recreation Park, located four miles southwest of Meridian on Texas Highway 22, contains mature juniper stands, critical habitat for the rare golden-cheeked warbler, an endangered species which nests nowhere but the Edwards Plateau region of Texas. Many other birds are present including the ladder-backed woodpecker, black-capped vireo, rufous-crowned sparrow and canyon wren. In winter many waterfowl are present in areas with appropriate aquatic habitat.

6.3.3 Viewsheds

Viewshed #1 (see Figure 6 - 2) is from a Roadside Park at mean elevation 817 feet, located along Highway 6, approximately three and one-half miles northwest of Meridian, south of the proposed dam. Several covered picnic tables are available. The view, although partially obstructed by power lines and trees, provides limited visual access of the Bosque River valley croplands and pasturelands, the surrounding ridge line and the proposed reservoir site. From this vantage point 7 to 9 farm houses and accompanying structures are visible.

Viewshed #2 (Figure 6 - 3) is located one and one-half miles west of a roadway intersection approximately five miles north of Meridian on Highway 144. Elevation is about 850 feet and the viewshed is towards the southeast and encompasses the distant ridgeline and valley basin pasturelands. The area is relatively flat with some gentle increases in elevation. Barbed wire fences, farm machinery and cattle are visible.

Viewshed #3 (Figure 6 - 4) is located at the northern end of the proposed reservoir, approximately one and one-half miles south of an unmarked roadway intersection on Highway 144 two and one-quarter miles west of the intersection of Highways 144 and 927. The viewshed is directed towards the south, elevation is approximately 870 feet. Visible is river blackland soil prepared for crop planting, the

FIGURE 6-2
VIEWSHED #1

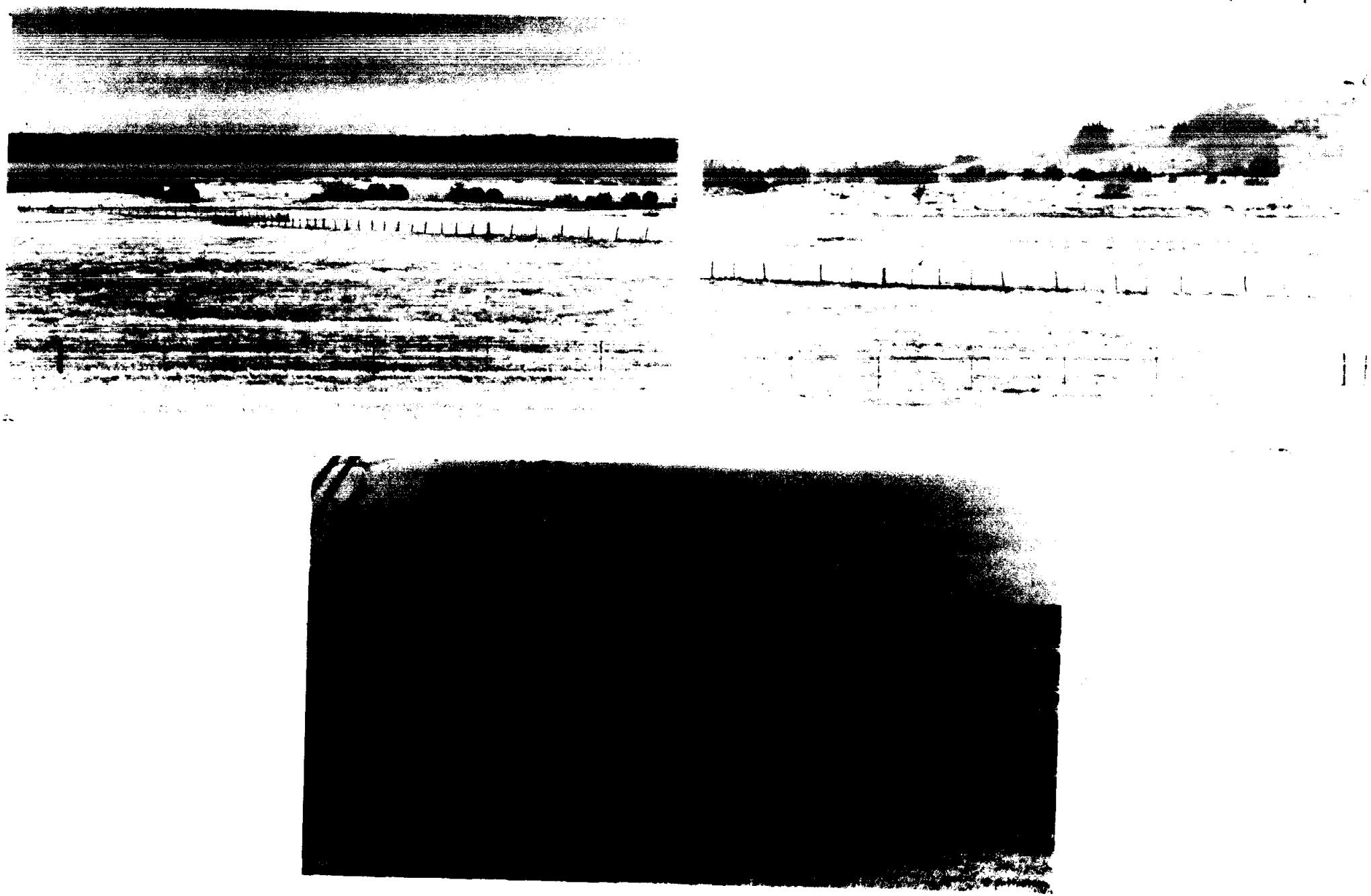


FIGURE 6-3
VIEWSHED #2

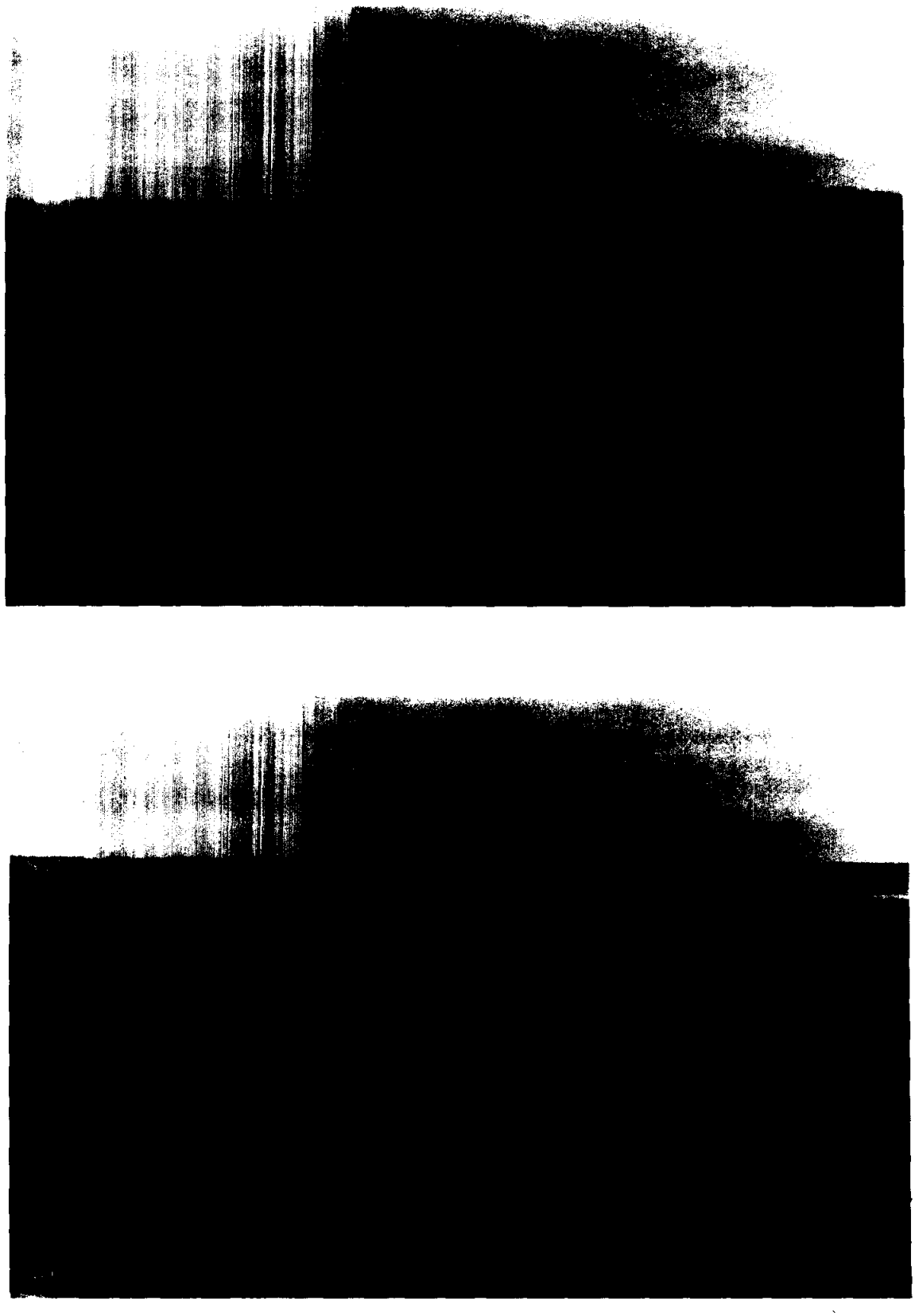


FIGURE 6-4
VIEWSHED #3

surrounding ridgeline and some trees. Access to the river is prohibited by barbed wire fences.

Viewshed #4 (Figure 6 - 5) is from a large hill (Page Hill) located approximately one-eighth of a mile west of a roadway intersection two and one-quarter miles south of the intersection of Highways 144 and 927. Public hill top access to the top of the hill is not available, roadside elevation is approximately 1,000 feet, the viewshed is westward. Visible is the valley plain and the surrounding ridgeline. The land is dotted with trees and used as pastureland and cropland.

Viewshed #5 (Figure 6 - 6) is located five miles north of Meridian along Highway 144. Elevation is approximately 900 feet, the viewshed is towards the west, and the encompassing ridge line is visible. Landscape characteristics, typical of the roadside scenery throughout the proposed Lake Bosque area, barbed wire fences, an occasional farm house, farm equipment, scrub oak, brush, cactus, pastureland and some cropland, are visible .

The scenario along Highway 6 between Meridian and Iredell, south of the proposed reservoir site, is very similar to Viewshed #5 except that pastureland is not as prominent and there are densely wooded areas that would obstruct views of the proposed reservoir.

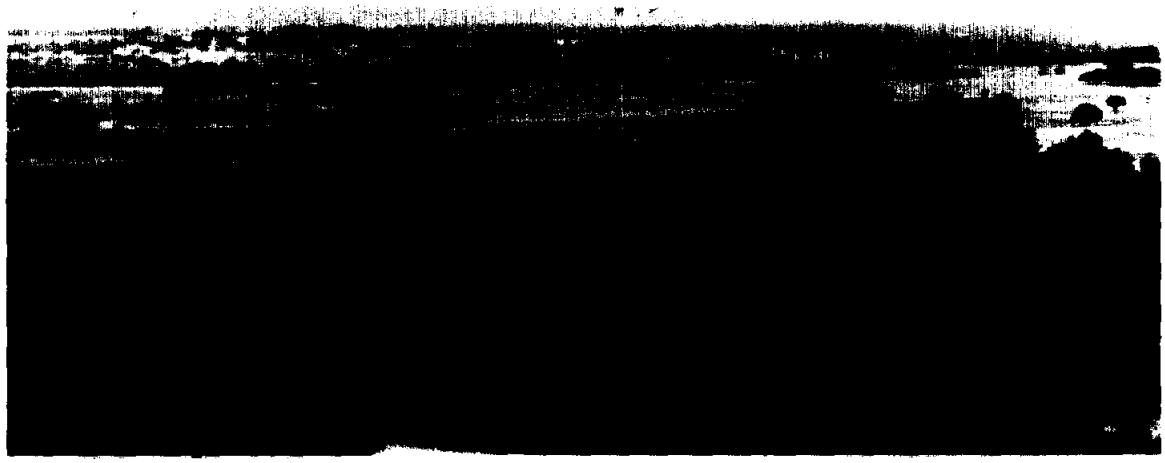


FIGURE 6-5
VIEWSHED #4

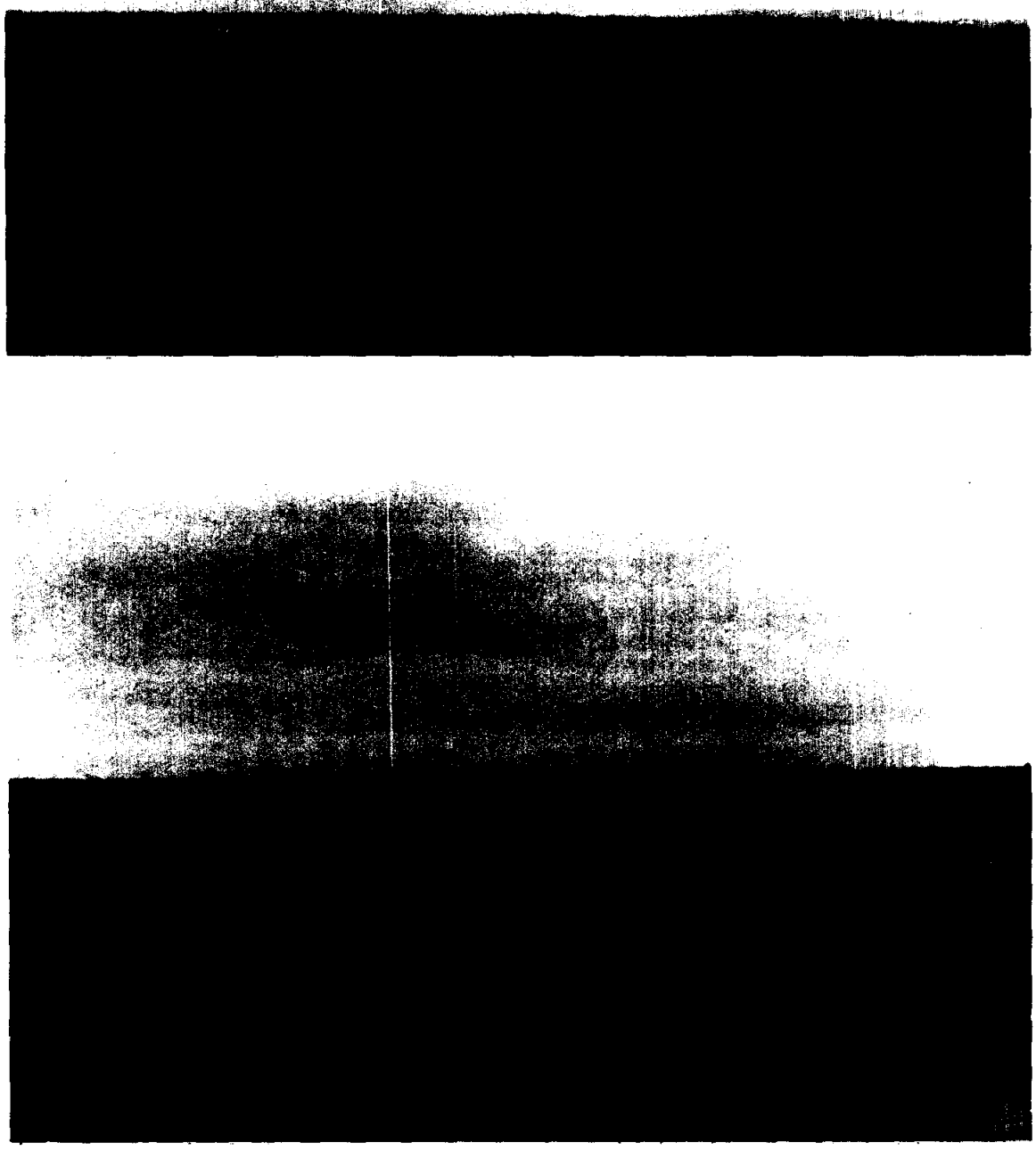


FIGURE 6-6
VIEWSHED #5

7.0 LAND USE

7.1 INTRODUCTION

This section provides a description of land uses occurring at the site of the proposed Lake Bosque. Included are Bosque County land use trends from 1958 to 1987 and land use productivity as measured by cash receipts from farm marketings from 1970 to 1985. Also shown in this section is the estimated financial impact of the proposed Lake Bosque on area land values, agricultural productivity and tax base.

7.2 CURRENT LAND USE OF PROPOSED LAKE BOSQUE SITE

Land uses identified in the evaluation of the proposed Lake Bosque site include cropland, pastureland, woodland, residential, wetlands and stockponds. The resulting land use maps (Figures 7 - 1, 7 - 2, 7 - 3) are found in the map pocket.

The identification of major land uses was determined through photo-interpretation of an October 1984 aerial photograph (1" = 1000') and a May 1985 vegetation map prepared by Technical Consulting Associates, Inc., (1" = 1000") confirmed with an on-ground survey in February 1987.

7.3 BOSQUE COUNTY LAND USE TRENDS

As shown in Table 7 - 1 Bosque County contains 595,172 acres of cropland, pastureland, hayland and rangeland. The proposed reservoir would remove about 6,143 acres or 1.03% of the county's agricultural land.

The Soil Conservation Service in Bosque County reports that as of January 9, 1987 the following land use occurred in Bosque County:

Table 7 - 1

Bosque County Land Use, 1987

Land Use	Acres	% of Total Land Use
Cropland	141,863	22%
Pasture and Hayland	50,855	8%
Otherland (includes water, urban, roads & railroads)	23,681	4%
Rangeland	402,454	63%
Recreationland	12,484	2%
Wildlife	10,000	1%
TOTAL land and water area	641,337	100%

Source: U.S. Department of Agriculture, Soil Conservation Service

Table 7 - 2 lists land use in Bosque County as reported by the Bosque County Conservation Needs Inventory for 1958 and 1967. As shown, rangeland, the major land use in the county for both time periods, accounted for 62 - 63% of all land uses. That trend has continued to 1987. The only significant change in land use in Bosque County since 1958 has been an increase in pasture and hayland and a decrease in cropland.

Table 7 - 2

Bosque County Land Use, 1958 and 1967

Land Use	Acres		% of Total Land	
	1958	1967	1958	1967
Cropland	211,587	185,499	33%	29%
Pasture and Hayland	396	8,618	0.06%	1%
Rangeland	398,904	403,423	62%	63%
Otherland (includes Federal land,water, urban, roads & railroads)	30,450	43,743	5%	7%
TOTAL land and water area	641,337	641,337	100%	100%

Source: U.S. Department of Agriculture, Soil Conservation Service
Bosque County Conservation Needs Inventory, 1958 and 1967.

7.4 LAND USE PRODUCTIVITY

7.4.1 Bosque County

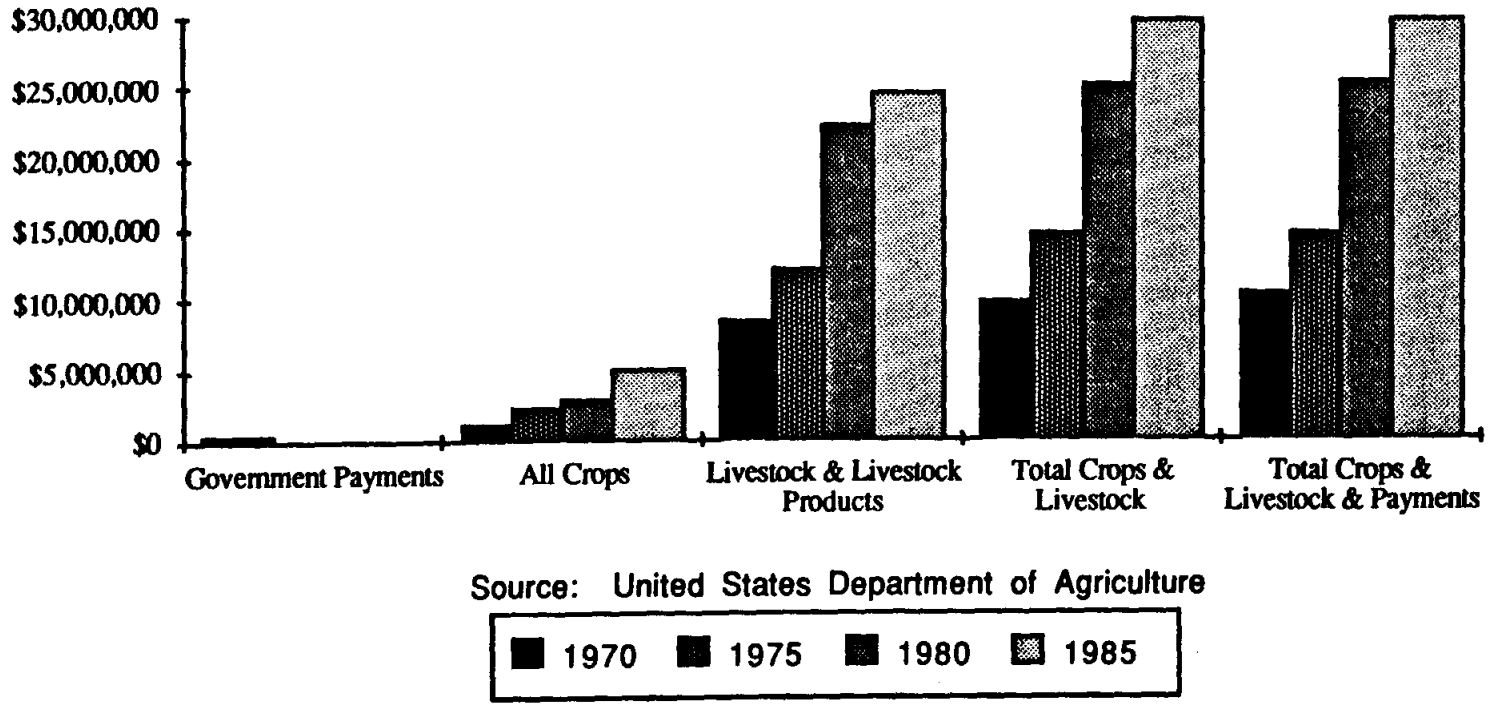
Figure 7 - 4 shows Bosque County's total cash receipts from farm marketings for 1970, 1975, 1980 and 1985. During each five year period market receipts from livestock and livestock products accounted for the majority of Bosque County total market receipts. Shown in Table 7 - 3 is Bosque County's proportion of District 4 Blacklands' total market receipts and county figures for farm marketing cash receipts from 1970 to 1985. There are 25 counties in the Blackland District, therefore, the average county should account for 4% of total cash receipts. When compared to other counties in the Blacklands Region, Bosque County's performance was slightly above average for livestock & livestock products' cash receipts and below average for crop cash receipts and total crops and livestock cash receipts.

7.4.2 Current Land Values of Proposed Lake Bosque Site

Figure 7 - 5 shows the proposed reservoir site and existing land parcels affected by the proposed conservation pool (830 ft. MSL), dam, spillways and the occasionally inundated zone between the conservation pool elevation and the 100 year flood level (841.3 ft MSL). The proposed Lake Bosque will affect approximately 6,143.8 acres of cropland, pastureland, woodlands, wetlands and at least 9 homesites. As proposed, about 4,564 acres at the 830 ft (MSL) conservation pool level will be inundated; an additional 191.46 acres will be occupied by the dam and two spillways; an,d about 1,387 acres will be included in the occasionally inundated zone between the conservation pool elevation and the 100 year flood level (841.3 ft) (Technical Consulting Associates, 1985).

Approximately 54 landowners own about 13,629 acres which will be impacted to some extent by either the proposed conservation pool, the dam and spillways or the occasionally inundated flood zone. In some cases all of a particular land parcel will be affected in other cases only a portion of the parcel.

Figure 7 - 4. Bosque County: Historic Farm Marketing Cash Receipts, 1970 - 1985



Source: United States Department of Agriculture

Table 7 - 3. Bosque County Market Cash Receipts

BOSQUE COUNTY CASH RECIEPTS FROM FARM MARKETINGS	1970	1975	1980	1985
Government Payments	$573,000	$98,000	$177,000	NA
All Crops	$1,206,000	$2,366,000	$2,958,000	$5,143,000
Livestock & Livestock Products	$8,574,000	$12,154,000	$22,058,000	$24,436,000
Total Crops & Livestock	$9,780,000	$14,520,000	$25,043,000	$29,579,000
Total Crops & Livestock & Payments	$10,353,000	$14,618,000	$25,193,000	$29,579,000

PERCENT OF DISTRICT 4 BLACKLANDS' CASH RECEIPTS FROM FARM MARKETINGS	1970	1975	1980	1985
Government Payments	1.0%	1.1%	1.4%	NA
All Crops	1.0%	1.2%	1.0%	1.4%
Livestock & Livestock Products	3.7%	3.8%	3.9%	4.3%
Total Crops & Livestock	2.8%	2.8%	2.9%	3.2%
Total Crops & Livestock & Payments	2.6%	2.8%	2.9%	NA

Note: NA = not available
Source: United States Department of Agriculture, Texas Crop & Livestock Reporting Service, 1987.

Seven of the 54 land parcels will be completely encompassed by the proposed project while the remaining parcels will be partially affected (Figure 7 - 5).

Information concerning some land parcels and ownership titles was not available (Audited Combined Financial Statements, Bosque County, 1985). The sum of planimetered estimates for the proportion of each land parcel affected by the proposed reservoir was not consistent with the known total acreage of the proposed reservoir and in several cases with the County Appraisal's recorded total parcel acreage. Because of these problems we were able to record information for only 80% of the land affected by the proposed reservoir.

The financial impact of the proposed reservoir on area land values and tax base was estimated by listing land parcels and their respective dollar values (market value, production value, assessed value, tax value) which lie totally or partially below the 100 year flood level (841.3 ft MSL). The acreage and dollar values of those parcels was summed and then multiplied by the ratio of the proposed reservoir acreage to the total land acreage partially or totally affected by the proposed project (the ratio is 6,143.8/13,629 or .45). As just described, about 45% of the 13,629 acres will be impacted by the proposed reservoir, dam and spillways, and occasionally inundated flood zone. Thus, approximately 45% of the summed values for the original 13,629 acres will be removed from Bosque County's tax base. Table 7 - 4 lists the reported land use of the parcel, homestead value (if applicable), the market value for the total land parcel as well as the production value, the assessed value and the taxable value. Property acreage, land value, production value, assessed and tax values were compiled from Bosque County Appraisal District's 1986 tax roles.

The Bosque County Financial Statement for year ended 1985 reports total property assessments at $385,630,342. The proposed project would remove about 6,143 acres from the county tax roles. The assessed value of property removed from the tax roles by the construction of the proposed reservoir is about 45% of the assessed value of the 13,629 acres partially affected by the project. As shown in Table 7 - 4 the assessed property value for the 13,629 acres partially affected by the proposed reservoir

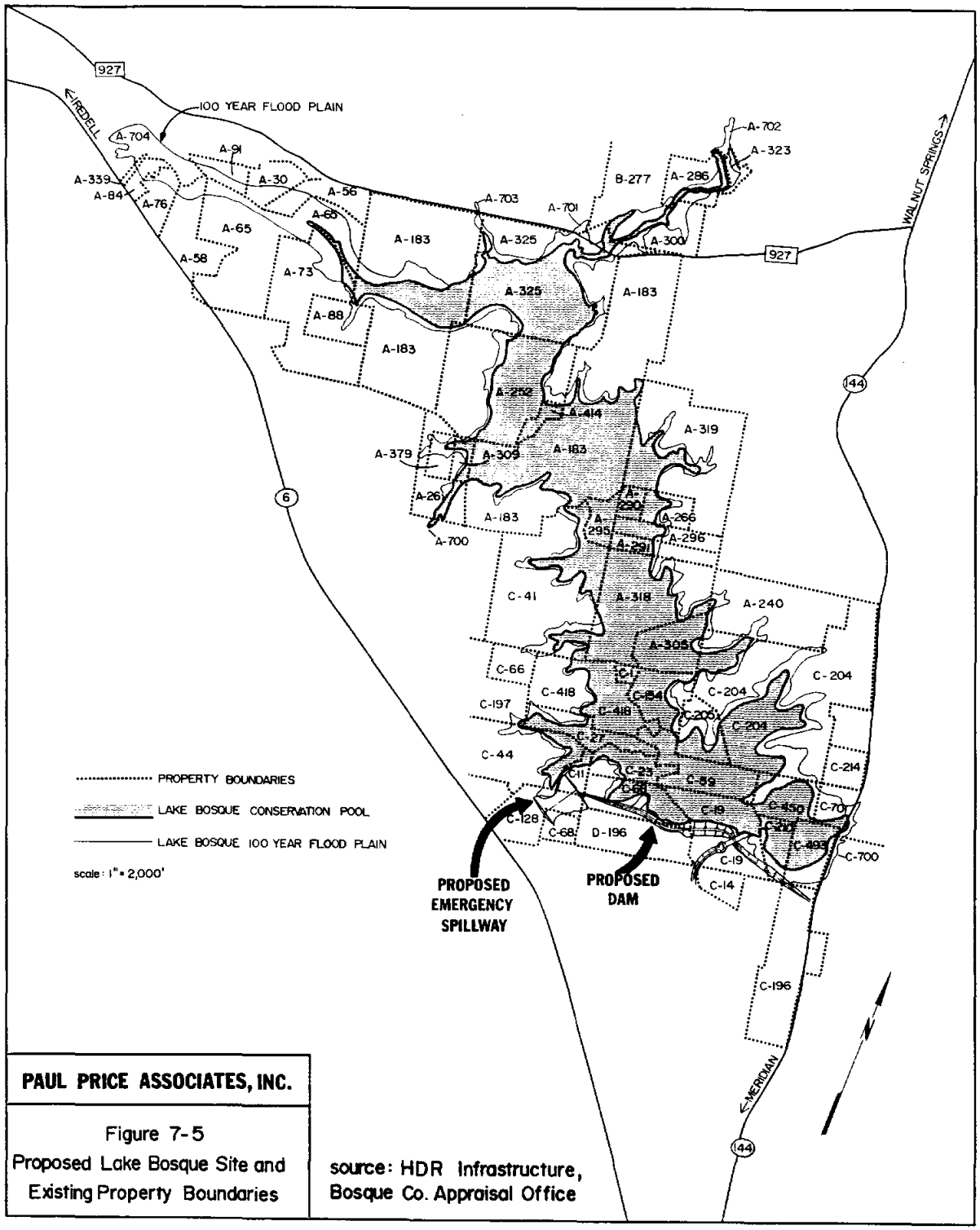


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Figure 7-5
Proposed Lake Bosque Site and Existing Property Boundaries

source: HDR Infrastructure, Bosque Co. Appraisal Office

Table 7 - 4. Land Values for Proposed Lake Bosque Site

ID #	Landowner	Abstract	Total Acres	Land Use	Market Value	Production Value	Assessed Value	Taxable Value
A-183	MCKNIGHT, LELA	NICHOLS, E.B.	1	HS	$236,550	- -	$236,550	$236,550
A-183	MCKNIGHT, LELA	NICHOLS, E. B.	1	HS	$36,890	- -	$36,890	$36,890
A-183	MCKNIGHT, LELA	NICHOLS, E.B/GREEN	875	AG	$688,790	$87,590	$139,520	$139,520
A-183	MCKNIGHT, LELA	HOLLINGSWORTH JAS.	253	AG	$194,180	$15,470	$15,470	$15,470
A-183	MCKNIGHT, LELA	HOLLINGSWORTH JAS.	1	HS	$23,350	- -	$23,350	$23,350
A-183	MCKNIGHT, LELA	JAMES ROURKE	1	HS	$23,150	- -	$23,150	$23,150
A-183	MCKNIGHT, LELA	JAMES ROURKE	390	AG	$296,610	$22,360	$24,160	$24,160
A-183	MCKNIGHT, LELA	J. GRIFFEN	417	AG	$315,750	$22,370	$33,950	$33,950
A-183	MCKNIGHT, LELA	L. DAVIS	741	AG	$591,470	$76,530	$144,810	$144,810
A-183	MCKNIGHT, LELA	L. DAVIS	1	HS	$26,300	- -	$26,300	$26,300
A-183	MCKNIGHT, LELA	L. DAVIS	1	HS	$26,390	- -	$26,390	$26,390
A-183	*TOTAL- MCKNIGHT, LELA*	- -	*2,681*		*$2,461,430*	*$224,320*	*$732,540*	*$732,540*
A-209	COCHRAN, JIM	NA	NA	NA	NA	NA	NA	NA
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	440	AG	$338,700	$41,180	$49,260	$49,260
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	1	HS	$11,310	- -	$11,310	$11,310
A-240	SCHLEGEL, N. L.	LONG, ANDREW H.	1	HS	$44,240	- -	$44,240	$29,240
A-252	MARTIN , CHARLOTTE	JAS. HOLLINGSWORTH	720	AG	NA	- -	- -	- -
A-26	GAUNTT, H.W.	NA	100	AG	$69,000	$4,700	$4,700	$4,700
A-266	RICH, EARL E.	J. GRIFFEN	100	AG	$73,960	$5,870	$9,170	$9,170
A-266	RICH, EARL E.	J. GRIFFEN	1	HS	$33,470	- -	$33,470	$33,470
A-277	HILLARD C.T.	NA	NA	NA	NA	NA	NA	NA
A-286	MOORE, PAUL	DAVID RYAN	152	AG	$117,950	$13,440	$13,440	$13,440
A-286	MOORE, PAUL	DAVID RYAN	1	HS	$23,550	- -	$23,550	$23,550
A-290	GILLELAND, A. J.	JOHN GRIFFEN	49	AG	$38,200	$3,950	$7,580	$7,580
A-290	GILLELAND, A. J.	JOHN GRIFFEN	1	HS	$35,070	- -	$35,070	$35,070
A-291	SPEER, BIRDIE	NA	103	AG	NA	- -	- -	- -
A-295	VICKERY, JACK	DAVID GREEN	68	AG	$51,000	$3,740	$3,740	$3,740
A-295	VICKERY, JACK	DAVID GREEN	1	HS	NA	- -	- -	- -
A-296	REEVES, CHARLES H.	J. GRIFFEN	99	AG	$44,380	$4,370	$4,780	$4,780
A-296	REEVES, CHARLES H.	J. GRIFFEN	1	HS	$50,350	- -	$50,350	$5,000
A-30	MONNICH, DAVID H.	JONATHON HOAK	69	AG	$5,280	$4,180	$14,180	$14,180
A-300	LEATHERWOOD, W. J.	WM. B. LOFTON	186	AG	$142,130	$14,650	$28,110	$28,110
A-305	NA	NA	NA	NA	NA	NA	NA	NA
A-309	CAREY, DAN B.	NA	NA	NA	NA	NA	NA	NA
A-318	NICKELS, ROY L.	JUANA DIAZ	533	AG	$169,890	$15,040	$22,170	$22,170
A-318	NICKELS, ROY L.	JUANA DIAZ	1	HS	$15,190	- -	$15,190	$15,190
A-319	HENDRIX, DAVID M. JR.	LITTLE JONAS	106	AG	$80,980	$6,680	$6,680	$6,680
A-319	HENDRIX, DAVID M. JR.	C.E. ANDERSON	205	AG	$162,750	$20,030	$20,030	$20,030
A-319	HENDRIX, DAVID M. JR.	JOHN GRIFFIN SR.	366	AG	$286,580	$27,810	$80,160	$80,160
A-319	HENDRIX, DAVID M. JR.	JOHN GRIFFIN SR.	1	HS	$27,190	- -	$27,190	$27,190
A-323	KLUTS, FRED	NA	42	NA	NA	NA	NA	NA
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	1	HS	$21,980	- -	$21,980	$21,980
A-325	THOMPSON, JOHN R.	JAMES ROURKE	146	AG	$109,770	$11,390	$11,390	$11,390
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	5	AG	$9,450	$690	$690	$690
A-325	THOMPSON, JOHN R.	EDWARDS, T. E.	15	AG	$11,560	$850	$850	$850
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	781	AG	$590,830	$58,820	$82,160	$82,610
A-325	THOMPSON, JOHN R.	CALVERT, HUGH H.	1	AG	$60,490	$0	$60,490	$60,490
A-339	BARTON, DAVID B.	NA	11	NA	NA	NA	NA	NA
A-379	PIERCE, J.V.	HOLLINGSWORTH JAS.	57	AG	$44,380	$4,370	$4,780	$4,780
A-379	PIERCE, J.V.	HOLLINGSWORTH JAS.	1	HS	$50,300	- -	$50,300	$5,000
A-414	MCKNIGHT, DAVID	HOLLINGSWORTH, JAS	38	AG	$28,830	$2,110	$2,110	$2,110
A-56	WEBB, MAE	JOHNATHON HOAK	140					
A-58	HOWARD, T.D.	BAKER, HANCE	156	AG	$116,930	$7,020	$7,570	$7,570
A-65	MOORE, ERVIN W.	JOHNATHON HOAK	121	AG	$93,310	$8,090	$16,150	$16,150
A-700	NA	NA	NA	NA	NA	NA	NA	NA
A-701	NA	NA	NA	NA	NA	NA	NA	NA
A-702	NA	NA	NA	NA	NA	NA	NA	NA
A-703	NA	NA	NA	NA	NA	NA	NA	NA
A-704	JAGGERS, W. FRED	WILLIAM RIDDLES	50	AG	$37,500	$2,750	$2,750	$2,750
A-704	NA	NA	NA	NA	NA	NA	NA	NA
A-73	WOODY, H. E.	NA	NA	NA	NA	NA	NA	NA
A-76	FOSTER, RANDELL R.	NA	NA	NA	NA	NA	NA	NA
A-84	O'BRIAN, FOSTER D.	NA	44	NA	NA	NA	NA	NA
A-86	HOLLAN, CHARLES N.	GEO. LAWERENCE	150	AG	$112,880	$6,770	$6,770	$6,770
A-91	PIKE ALBERT	BAKER, HANCE	42	AG	$31,780	$2,800	$2,800	$3,620
B-277	BEECHER,LOUIS A. JR.	DAVID RYAN	262	AG	$196,620	$14,430	$14,430	$14,320
C-1	NA	NA	NA	NA	NA	NA	NA	NA
C-128	HANNA, JEFFEIE F.	WILLIAM PARVIN	3	HS	$78,280	- -	$78,280	$78,280
C-128	HANNA, JEFFEIE F.	WILLIAM PARVIN	160	AG	NA	NA	NA	NA

Table 7 - 4. (Continued) Land Values for Proposed Lake Bosque Site

ID #	Landowner	Abstract	Total Acres	Land Use	Market Value	Production Value	Assessed Value	Taxable Value
C-14	JENKINS, TOM Z.	JOHN K. MCLENNAN	67	AG	$51,650	$6,350	$9,140	$9,140
C-14	JENKINS, TOM Z.	JOHN K. MCLENNAN	1	HS	$16,270	- -	$16,270	$16,270
C-154	NAGEL, RICHARD C.	JESSE P. HITCHCOCK	166	AG	$129,360	$13,310	$19,540	$19,540
C-154	NAGEL, RICHARD C.	JESSE P. HITCHCOCK	1	HS	$14,960	- -	$14,960	$14,960
C-19	VICK, THOMAS	SAMUEL K. LEWIS	253	AG	$196,100	$23,140	$53,270	$53,270
C-19	VICK, THOMAS	SAMUEL K. LEWIS	1	HS	$84,460	- -	$84,460	$5,000
C-196	ALLEN, EUGENE	WILLIAM MEDLIN	237	AG	$179,000	$14,860	$14,860	$14,860
C-197	LACY-FEED CO.	J. HOWE	1	HS	$14,360	- -	$14,360	$14,360
C-197	LACY-FEED CO.	J. HOWE	179	AG	$119,330	$8,750	$368,260	$368,260
C-204	MANISON, THOMAS	ANDREW H. LONG	90	AG	$80,720	$16,140	$16,140	$16,140
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$75,040	- -	$75,040	$75,040
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$23,230	- -	$23,230	$23,230
C-204	MANISON, THOMAS	ANDREW H. LONG	1	HS	$23,650	- -	$23,650	$23,650
C-204	MANISON, THOMAS	ANDREW H. LONG	1,213	AG	$917,470	$82,020	$82,020	$82,020
C-205	HARDCASTLE, J.W.	LONG, ANDREW H.	137	AG	$102,900	$6,170	$6,170	$6,170
C-210	GRIMM, FURMAN A.	RUNDEL BENJ. F.	95	AG	$73,070	$6,800	$6,800	$6,800
C-23	HAMILTON, J.J.	DANIEL C. THOMAS	88	AG	NA	NA	NA	NA
C-27	HALL, GLADYS	DANIEL C. THOMAS	17	AG	$13,390	$1,300	$1,300	$1,300
C-27	HALL, GLADYS	WM. ECHELBERGER	102	AG	$79,250	$7,800	$9,780	$9,780
C-27	HALL, GLADYS	WM. ECHELBERGER	1	HS	$21,290	- -	$21,290	$21,290
C-27	HALL, GLADYS	HITCHCOCK, JESSE B.	40	AG	$31,020	$3,050	$3,050	$3,050
C-33	RANDOLPH, ROBERT M.	NA	NA	NA	NA	NA	NA	NA
C-41	FARRELL, B.E.	DAVID D. GREEN	157	AG	$117,750	$8,640	$8,640	$8,640
C-41	FARRELL, B.E.	JACOB, EYLER	692	AG	$525,150	$43,300	$43,300	$43,300
C-418	GIPSON, WILLIAM E.	WM. ECHELBERGER	263	AG	$200,690	$20,770	$24,230	$24,230
C-418	GIPSON, WILLIAM E.	JESSE P. HITCHCOCK	120	AG	$89,760	$6,580	$6,580	$6,580
C-44	WILLIAMS, HARVEY	WM. PARVIN	466	AG	$349,500	$20,970	$31,920	$31,920
C-44	WILLIAMS, HARVEY	WM. PARVIN	1	HS	$50,735	- -	$50,735	$51,735
C-450	MORRIS, ROBERT	BENJ. L. RUNDEL	100	AG	NA	NA	NA	NA
C-493	REINKE, ERNEST W. JR.	PATCHING, L.Y. DEC'D	1	HS	$69,040	- -	$69,040	$69,040
C-493	REINKE, ERNEST W. JR.	PATCHING, L.Y. DEC'D	159	AG	$122,760	$14,910	$20,260	$20,260
C-59	HARDCASTLE B.R.	JESSE HITCHCOCK	40	NA	NA	NA	NA	NA
C-59	HARDCASTLE B. R.	SAMUEL K. LEWIS	178	AG	$138,390	$11,720	$11,720	$11,720
C-59	HARDCASTLE B. R.	RUNDEL, BENJ. F.	16	AG	$12,530	$1,340	$1,340	$1,340
C-66	BICE, DON	HOWE, JAMES	70	AG	$52,550	$69,040	$69,040	$3,850
C-68	ROYAL, EARL	DANIEL C. THOMAS	200	AG	NA	NA	NA	NA
C-700	NA	NA	NA	NA	NA	NA	NA	NA
C-701	NA	NA	NA	NA	NA	NA	NA	NA
D-196	HAMPE, LOUISE L., & A.W.	DANIEL C. THOMAS	1	HS	$11,090	- -	$11,090	$11,090
D-196	HAMPE, LOUISE L., & A.W.	DANIEL C. THOMAS	117	AG	$88,470	$6,130	$6,130	$6,130
D-196	HAMPE, LOUISE L., & A.W.	SAMUEL K. LEWIS	143	AG	$108,180	$9,630	$9,630	$9,630
	TOTAL		13,629		$10,060,825	$912,770	$2,827,655	$2,579,515
	Lake Bosque acreage (proposed) (Δ)		6,143					
	Percent of Landowners' Total Acreage		45%					
	Percent of Dollar Values Removed By Proposed Proj		45%		$4,527,371	$410,747	$1,272,445	$1,160,782

Notes: Na = not available, Ag = agriculture, HS = homesite, NHS = not a homesite.
Source: Bosque County Appraisal District, (Δ) Technical Consulting Associates, 1985.

was $2,827,655. Forty-five percent of the assessed valuation of the 13,629 acres is $1,272,455 or .33% of the county's tax base. Thus, the construction of the proposed reservoir would remove about .33% of the county's tax base.

Another method of estimating the value of land impacted by the proposed Lake Bosque is to multiply the average selling price of bottomland and cropland in the project area by the number of bottomland and cropland acres impacted by the proposed lake. Approximately 898.76 acres of bottomland woodland and 1,279.52 acres of cropland lie within the proposed conservation pool, the 100 year flood pool, dam and spillway area. Local realtors reported recent sales of bottomland and cropland in the project area from $1,200 to $1,500 per acre. If the maximum price of $1,500 per acre is assumed, the value of 2,178.28 acres of combined bottomland and cropland is $3,267,420.

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A.1.0 LAKE BOSQUE RESERVOIR PROJECT WATER DEMAND PROJECTION METHODOLOGY AND DATA SOURCES SUMMARY

A.1.1 DATA SOURCES

The following sources were used to prepare water demand projections, found in Tables A.1 - 1, A.1 - 2, A.1 - 3, A.1 - 4, A.1 - 5, and A.1 - 6. Population

1. Texas Water Development Board, Projections of Population and Municipal Water Requirements, High Case and Low Case.

2. Texas Water Development Board, Municipal Demand and Supply Summary, High Set Demand and Supply, 04-29-84.

3. Texas Water Development Board, County Supply and Demand Summary, High Demand Set as of 02-2-83 using 1990 supply Try-9.

4. Texas Water Development Board, revised County population projections, February 1987.

A.1.2 METHODOLOGY

Paul Price Associates' water demand projections were based on revised Texas Water Development Board Low Series Population projections and TWDB High Series water demand per capita consumption rates. This was done because the Texas Water Development Board's (TWDB) water demand projections present a worst case and a best case scenario. The high series TWDB water demand projections were based on the revised high series population projection and drought influenced per capita water consumption rates; the revised low case water demand projections were based on the low series population projection and average climate per capita water consumption rates. Paul Price Associates' water demand projections provide a more conservative scenario of future water demands by taking into account a slower population growth rate as well as drought condition per capita water demand rates.

Table A.1-1 Municipal 1990 Water Use and 1990-2040 Demand Projections

Municipal Water Use for 1990 and Revised 1990 - 2040 Demand Projections	1990 Population	Water Use			1990 Projected Population	Water Demand Projections		
		Per Capita GPD	Acre-feet per year	MGD		Per Capita GPD	Acre-feet per year	MGD
Project Participants								
Municipal Demand								
Bellmead								
Revised TWDB High Case	7,569	117	996	0.89	10,766	162	1,954	1.74
Revised TWDB Low Case	7,569	117	996	0.89	10,249	104	1,194	1.07
Paul Price Associates Projection	7,569	117	996	0.89	10,249	162	1,860	1.66
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	1,860	1.66
Clifton								
Revised TWDB High Case	3,063	197	677	0.60	3,737	219	917	0.82
Revised TWDB Low Case	3,063	197	677	0.60	3,738	161	674	0.60
Paul Price Associates Projection	3,063	197	677	0.60	3,738	219	917	0.82
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	504	0.45
Hewitt								
Revised TWDB High Case	5,247	144	844	0.75	6,158	166	1,145	1.02
Revised TWDB Low Case	5,247	144	844	0.75	5,862	108	709	0.63
Paul Price Associates Projection	5,247	144	844	0.75	5,862	166	1,090	0.97
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	1,090	0.97
Lacy-Lakeview								
Revised TWDB High Case	2,752	207	639	0.57	3,443	181	698	0.62
Revised TWDB Low Case	2,752	207	639	0.57	3,277	123	451	0.40
Paul Price Associates Projection	2,752	207	639	0.57	3,277	181	664	0.59
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	664	0.59
Mclennan Co. WCID #2								
Revised TWDB High Case	1,300	126	183	0.16	1,275	180	257	0.23
Revised TWDB Low Case	1,300	126	183	0.16	1,213	132	179	0.16
Paul Price Associates Projection	1,300	126	183	0.16	1,213	180	245	0.22
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	62	0.05
Meridian								
Revised TWDB High Case	1,330	77	115	0.10	1,662	171	318	0.28
Revised TWDB Low Case	1,330	77	115	0.10	1,613	113	204	0.18
Paul Price Associates Projection	1,330	77	115	0.10	1,613	171	309	0.28
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	4	0.00
Waco								
Revised TWDB High Case	101,261	261	29,618	26.44	114,555	280	35,929	32.07
Revised TWDB Low Case	101,261	261	29,618	26.44	109,056	222	27,119	24.21
Paul Price Associates Projection	101,261	261	29,618	26.44	109,056	280	34,204	30.53
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	-1,709	-1.53
Woodway								
Revised TWDB High Case	7,091	213	1,695	1.51	12,170	204	2,781	2.48
Revised TWDB Low Case	7,091	213	1,695	1.51	11,586	146	1,895	1.69
Paul Price Associates Projection	7,091	213	1,695	1.51	11,586	204	2,648	2.36
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	2,648	2.36
Potential Customer Entities								
Municipal Demand								
Mart								
Revised TWDB High Case	2,324	257	669	0.60	2,669	249	744	0.66
Revised TWDB Low Case	2,324	257	669	0.60	2,541	191	544	0.49
Paul Price Associates Projection	2,324	257	669	0.60	2,541	249	709	0.63
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	709	0.63
Moody								
Revised TWDB High Case	1,385	102	159	0.14	1,730	163	316	0.28
Revised TWDB Low Case	1,385	102	159	0.14	1,707	105	201	0.18
Paul Price Associates Projection	1,385	102	159	0.14	1,707	163	312	0.28
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	312	0.28
Northcrest								
Revised TWDB High Case	1,944	79	173	0.15	3,240	162	588	0.52
Revised TWDB Low Case	1,944	79	173	0.15	3,085	104	359	0.32
Paul Price Associates Projection	1,944	79	173	0.15	3,085	162	560	0.50
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	560	0.50
Bruceville-Eddy								
Revised TWDB High Case	1,101	165	203	0.18	1,290	166	240	0.21
Revised TWDB Low Case	1,101	165	203	0.18	1,228	108	149	0.13
Paul Price Associates Projection	1,101	165	203	0.18	1,228	166	228	0.20
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	228	0.20

Table A.1-1

Municipal Water Use for 1980 and Revised 1990 - 2040 Demand Projections	2000 Projected Population	Water Demand Projections Per Capita GPD	Acre-feet per year	MGD	2010 Projected Population	Water Demand Projections Per Capita GPD	Acre-feet per year	MGD
Project Participants								
Municipal Demand								
Bellmead								
Revised TWDB High Case	11,708	164	2,151	1.92	12,353	164	2,269	2.03
Revised TWDB Low Case	10,961	106	1,301	1.16	11,152	106	1,324	1.18
Paul Price Associates Projection	10,961	164	2,014	1.80	11,152	164	2,049	1.83
Projected Demand for Lake Bosque	--	--	2,014	1.80	--	--	2,049	1.83
Clifton								
Revised TWDB High Case	4,793	224	1,203	1.07	5,332	224	1,338	1.19
Revised TWDB Low Case	4,244	166	789	0.70	4,750	166	883	0.79
Paul Price Associates Projection	4,244	224	1,065	0.95	4,750	224	1,192	1.06
Projected Demand for Lake Bosque	--	--	652	0.58	--	--	779	0.70
Hewitt								
Revised TWDB High Case	6,395	168	1,203	1.07	6,747	168	1,270	1.13
Revised TWDB Low Case	5,987	110	738	0.66	6,091	110	751	0.67
Paul Price Associates Projection	5,987	168	1,127	1.01	6,091	168	1,146	1.02
Projected Demand for Lake Bosque	--	--	1,127	1.01	--	--	1,146	1.02
Lacy-Lakeview								
Revised TWDB High Case	3,826	185	751	0.67	3,826	185	793	0.71
Revised TWDB Low Case	3,394	127	483	0.43	3,454	127	491	0.44
Paul Price Associates Projection	3,394	185	703	0.63	3,454	185	716	0.64
Projected Demand for Lake Bosque	--	--	703	0.63	--	--	716	0.64
Mclennan Co. WCID #2								
Revised TWDB High Case	1,286	185	266	0.24	1,357	184	280	0.25
Revised TWDB Low Case	1,203	138	186	0.17	1,224	137	188	0.17
Paul Price Associates Projection	1,203	185	249	0.22	1,224	184	252	0.23
Projected Demand for Lake Bosque	--	--	66	0.06	--	--	69	0.06
Meridian								
Revised TWDB High Case	2,142	175	420	0.37	2,383	175	467	0.42
Revised TWDB Low Case	2,383	117	312	0.28	1,978	117	259	0.23
Paul Price Associates Projection	2,383	175	467	0.42	1,978	175	388	0.35
Projected Demand for Lake Bosque	--	--	111	0.10	--	--	-10	-0.01
Waco								
Revised TWDB High Case	115,909	285	37,003	33.03	122,297	285	39,042	34.85
Revised TWDB Low Case	108,518	227	27,593	24.63	110,408	227	28,074	25.06
Paul Price Associates Projection	108,518	285	34,644	30.93	110,408	285	35,247	31.46
Projected Demand for Lake Bosque	--	--	-2,343	-2.09	--	--	-3,779	-3.37
Woodway								
Revised TWDB High Case	14,368	206	3,315	2.96	15,160	206	3,498	3.12
Revised TWDB Low Case	13,452	148	2,230	1.99	13,686	148	2,269	2.03
Paul Price Associates Projection	13,452	206	3,104	2.77	13,686	206	3,158	2.82
Projected Demand for Lake Bosque	--	--	3,104	2.77	--	--	3,158	2.82
Potential Customer Entities								
Municipal Demand								
Mart								
Revised TWDB High Case	2,718	252	767	0.68	2,868	252	810	0.72
Revised TWDB Low Case	2,545	194	553	0.49	2,590	194	563	0.50
Paul Price Associates Projection	2,545	252	718	0.64	2,590	252	731	0.65
Projected Demand for Lake Bosque	--	--	718	0.64	--	--	731	0.65
Moody								
Revised TWDB High Case	1,912	167	358	0.32	2,018	167	377	0.34
Revised TWDB Low Case	1,790	109	219	0.20	1,822	109	222	0.20
Paul Price Associates Projection	1,790	167	335	0.30	1,822	167	341	0.30
Projected Demand for Lake Bosque	--	--	335	0.30	--	--	341	0.30
Northcrest								
Revised TWDB High Case	3,741	165	691	0.62	3,947	165	730	0.65
Revised TWDB Low Case	3,503	107	420	0.37	3,563	107	427	0.38
Paul Price Associates Projection	3,503	165	647	0.58	3,563	165	659	0.59
Projected Demand for Lake Bosque	--	--	647	0.58	--	--	659	0.59
Bruceville-Eddy								
Revised TWDB High Case	1,340	168	252	0.23	1,414	168	266	0.24
Revised TWDB Low Case	1,255	110	155	0.14	1,278	110	157	0.14
Paul Price Associates Projection	1,255	168	236	0.21	1,278	168	241	0.21
Projected Demand for Lake Bosque	--	--	236	0.21	--	--	241	0.21

Table A.1-1

Municipal Water Use for 1980 and Revised 1990 - 2040 Demand Projections	2020 Projected Population	Water Demand Projections 2020 Per Capita GPD	2020 Acre-feet per year	2020 MGD	2030 Projected Population	Water Demand Projections 2030 Per Capita GPD	2030 Acre-feet per year	2030 MGD
Project Participants								
Municipal Demand								
Bellmead								
Revised TWDB High Case	13,517	164	2,483	2.22	14,790	164	2,717	2.43
Revised TWDB Low Case	11,634	106	1,381	1.23	12,522	106	1,487	1.33
Paul Price Associates Projection	11,634	164	2,137	1.91	12,522	164	2,300	2.05
Projected Demand for Lake Bosque	--	--	2,137	1.91	--	--	2,300	2.05
Clifton								
Revised TWDB High Case	5,932	224	1,488	1.33	6,620	224	1,661	1.48
Revised TWDB Low Case	6,620	166	1,231	1.10	5,971	166	1,110	0.99
Paul Price Associates Projection	6,620	224	1,661	1.48	5,971	224	1,498	1.34
Projected Demand for Lake Bosque	--	--	1,248	1.11	--	--	1,139	1.02
Hewitt								
Revised TWDB High Case	7,383	168	1,389	1.24	8,078	168	1,520	1.36
Revised TWDB Low Case	6,355	110	783	0.70	6,839	110	843	0.75
Paul Price Associates Projection	6,355	168	1,196	1.07	6,839	168	1,287	1.15
Projected Demand for Lake Bosque	--	--	1,196	1.07	--	--	1,287	1.15
Lacy-Lakeview								
Revised TWDB High Case	4,187	185	868	0.77	4,581	185	949	0.85
Revised TWDB Low Case	3,604	127	513	0.46	3,878	127	552	0.49
Paul Price Associates Projection	3,604	185	747	0.67	3,878	185	804	0.72
Projected Demand for Lake Bosque	--	--	747	0.67	--	--	804	0.72
Mclennan Co. WCID #2								
Revised TWDB High Case	1,484	183	304	0.27	1,624	182	331	0.30
Revised TWDB Low Case	1,277	137	196	0.17	1,375	135	208	0.19
Paul Price Associates Projection	1,277	183	262	0.23	1,375	182	280	0.25
Projected Demand for Lake Bosque	--	--	79	0.07	--	--	97	0.09
Meridian								
Revised TWDB High Case	2,650	175	519	0.46	2,958	175	580	0.52
Revised TWDB Low Case	2,168	117	284	0.25	2,376	117	311	0.28
Paul Price Associates Projection	2,168	175	425	0.38	2,376	175	466	0.42
Projected Demand for Lake Bosque	--	--	-21	-0.02	--	--	-35	-0.03
Waco								
Revised TWDB High Case	133,813	285	42,719	38.13	146,413	285	46,741	41.72
Revised TWDB Low Case	115,171	227	29,285	26.14	123,961	227	31,520	28.14
Paul Price Associates Projection	115,171	285	36,767	32.82	123,961	285	39,574	35.33
Projected Demand for Lake Bosque	--	--	-5,936	-5.30	--	--	-7,151	-6.38
Woodway								
Revised TWDB High Case	16,581	206	3,826	3.42	18,143	206	4,187	3.74
Revised TWDB Low Case	16,587	148	2,750	2.45	18,149	148	3,009	2.69
Paul Price Associates Projection	14,277	206	3,294	2.94	15,368	206	3,546	3.17
Projected Demand for Lake Bosque	--	--	3,294	2.94	--	--	3,546	3.17
Potential Customer Entities								
Municipal Demand								
Mart								
Revised TWDB High Case	3,138	252	886	0.79	3,434	252	969	0.87
Revised TWDB Low Case	2,701	194	587	0.52	2,907	194	632	0.56
Paul Price Associates Projection	2,701	252	762	0.68	2,907	252	821	0.73
Projected Demand for Lake Bosque	--	--	762	0.68	--	--	821	0.73
Moody								
Revised TWDB High Case	2,208	167	413	0.37	2,416	167	452	0.40
Revised TWDB Low Case	1,900	109	232	0.21	2,045	109	250	0.22
Paul Price Associates Projection	1,900	167	355	0.32	2,045	167	383	0.34
Projected Demand for Lake Bosque	--	--	355	0.32	--	--	383	0.34
					--	--	383	0.34
Northcrest								
Revised TWDB High Case	4,319	165	798	0.71	4,725	164	868	0.77
Revised TWDB Low Case	3,716	107	445	0.40	4,000	107	479	0.43
Paul Price Associates Projection	3,716	165	687	0.61	4,000	164	735	0.66
Projected Demand for Lake Bosque	--	--	687	0.61	--	--	735	0.66
Bruceville-Eddy								
Revised TWDB High Case	1,547	168	291	0.26	1,692	168	318	0.28
Revised TWDB Low Case	1,332	110	164	0.15	1,434	110	177	0.16
Paul Price Associates Projection	1,332	168	251	0.22	1,434	168	270	0.24
Projected Demand for Lake Bosque	--	--	251	0.22	--	--	270	0.24

Table A.1-1

Municipal Water Use for 1990 and Revised 1990 - 2040 Demand Projections	2040** Projected Population	Water Demand Projections		
		Per Capita GPD	Acre-feet per year	MGD
Project Participants				
Municipal Demand				
Bellmead				
Revised TWDB High Case	16,183	164	2,973	2.65
Revised TWDB Low Case	13,476	106	1,600	1.43
Paul Price Associates Projection	13,478	164	2,476	2.21
Projected Demand for Lake Bosque	--	--	2,476	2.21
Clifton				
Revised TWDB High Case	7,388	224	1,854	1.65
Revised TWDB Low Case	6,707	166	1,247	1.11
Paul Price Associates Projection	6,707	224	1,683	1.50
Projected Demand for Lake Bosque	--	--	1,533	1.37
Hewitt				
Revised TWDB High Case	8,838	168	1,663	1.48
Revised TWDB Low Case	7,359	110	907	0.81
Paul Price Associates Projection	7,359	168	1,385	1.24
Projected Demand for Lake Bosque	--	--	1,385	1.24
Lacy-Lakeview				
Revised TWDB High Case	5,012	185	1,039	0.93
Revised TWDB Low Case	4,173	127	594	0.53
Paul Price Associates Projection	4,173	185	865	0.77
Projected Demand for Lake Bosque	--	--	865	0.77
Mclennan Co. WCID #2				
Revised TWDB High Case	1,777	182	362	0.32
Revised TWDB Low Case	1,481	135	224	0.20
Paul Price Associates Projection	1,481	182	302	0.27
Projected Demand for Lake Bosque	--	--	119	0.11
Meridian				
Revised TWDB High Case	3,303	175	647	0.58
Revised TWDB Low Case	2,604	117	341	0.30
Paul Price Associates Projection	2,604	175	510	0.46
Projected Demand for Lake Bosque	--	--	9	0.01
Waco				
Revised TWDB High Case	160,199	285	51,142	45.65
Revised TWDB Low Case	133,422	227	33,926	30.28
Paul Price Associates Projection	133,422	285	42,594	38.02
Projected Demand for Lake Bosque	--	--	-4,131	-3.69
Woodway				
Revised TWDB High Case	19,858	206	4,582	4.09
Revised TWDB Low Case	16,539	148	2,742	2.45
Paul Price Associates Projection	16,539	206	3,816	3.41
Projected Demand for Lake Bosque	--	--	3,816	3.41
Potential Customer Entities				
Municipal Demand				
Mart				
Revised TWDB High Case	3,758	252	1,061	0.95
Revised TWDB Low Case	3,128	194	680	0.61
Paul Price Associates Projection	3,128	252	883	0.79
Projected Demand for Lake Bosque	--	--	883	0.79
Moody				
Revised TWDB High Case	2,643	167	494	0.44
Revised TWDB Low Case	2,201	109	269	0.24
Paul Price Associates Projection	2,201	167	412	0.37
Projected Demand for Lake Bosque	--	--	412	0.37
Northcrest				
Revised TWDB High Case	5,169	165	955	0.85
Revised TWDB Low Case	4,305	107	516	0.46
Paul Price Associates Projection	4,305	165	796	0.71
Projected Demand for Lake Bosque	--	--	796	0.71
Bruceville-Eddy				
Revised TWDB High Case	1,851	168	348	0.31
Revised TWDB Low Case	1,545	110	190	0.17
Paul Price Associates Projection	1,545	168	291	0.26
Projected Demand for Lake Bosque	--	--	291	0.26

Table A.1-1e Summary of Municipal 1980 Water Use and 1990-2040 Demand Projections

Municipal Water Use for 1980 and Revised 1990 - 2040 Demand Projections	1980 Population	Water Use			1990 Projected Population	Water Demand Projections			2000 Projected Population	Water Demand Projections		
		Per Capita GPD	Acre-feet per year	MGD		Per Capita GPD	Acre-feet per year	MGD		Per Capita GPD	Acre-feet per year	MGD
SUMMARY OF TOTAL DEMAND												
Project Participants (Excluding City of Waco)												
Revised TWDB High Case	28,352	162	5,149	4.60	39,211	184	8,070	7.20	44,318	188	9,310	8.31
Revised TWDB Low Case	28,352	162	5,149	4.60	37,538	126	5,307	4.74	41,624	130	6,039	5.39
Paul Price Associates Projection	28,352	162	5,149	4.60	37,538	184	7,732	6.90	41,624	187	8,729	7.79
Projected Demand for Lake Bosque	-	--	0	0	-	--	6,831	6	-	--	7,777	7
Potential Customers												
Revised TWDB High Case	6,754	159	1,204	1.07	8,929	189	1,888	1.69	9,711	190	2,068	1.85
Revised TWDB Low Case	6,754	159	1,204	1.07	8,561	131	1,252	1.12	9,093	132	1,346	1.20
Paul Price Associates Projection	6,754	159	1,204	1.07	8,561	189	1,809	1.61	9,093	190	1,937	1.73
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	1,809	1.61	--	--	1,937	1.73
Total Municipal Demand												
Revised TWDB High Case	35,106	162	6,353	5.67	48,140	185	9,958	8.89	54,029	188	11,379	10.16
Revised TWDB Low Case	35,106	162	6,353	5.67	46,099	127	6,559	5.86	50,717	130	7,386	6.59
Paul Price Associates Projection	35,106	162	6,353	5.67	46,099	185	9,541	8.52	50,717	188	10,666	9.52
Projected Demand for Lake Bosque	--	--	0	0.00	--	--	8,640	7.71	--	--	9,714	8.67
Total Municipal Demand (Includes the City of Waco)												
Revised TWDB High Case	136,367	235	35,971	32.11	162,695	252	45,887	40.97	169,938	254	48,382	43.19
Paul Price Associates Projection	136,367	235	35,971	32.11	155,155	252	43,745	39.05	159,235	254	45,309	40.45

Source:
Texas Water Development Board
Revisions 2/1987
Paul Price Associates

Table A.1-1a

Municipal Water Use for 1980 and Revised 1990 - 2040 Demand Projections	2010 Projected Population	Water Demand Projections Per Capita GPD	Acre-feet per year	MGD	2020 Projected Population	Water Demand Projections Per Capita GPD	Acre-feet per year	MGD	2030 Projected Population	Water Demand Projections Per Capita GPD	Acre-feet per year	MGD
SUMMARY OF TOTAL DEMAND												
Project Participants (Excluding City of Waco)												
Revised TWDB High Case	47,158	188	9,915	8.85	51,734	188	10,878	9.71	56,794	188	11,945	10.66
Revised TWDB Low Case	42,335	130	6,165	5.50	46,245	132	7,138	6.37	51,110	131	7,520	6.71
Paul Price Associates Projection	42,335	188	8,901	7.95	45,935	189	9,722	8.68	48,327	188	10,161	9.09
Projected Demand for Lake Bosque	-	--	7,907	7	-	--	8,680	8	-	--	9,138	8
Potential Customers												
Revised TWDB High Case	10,247	190	2,183	1.95	11,212	190	2,388	2.13	12,267	190	2,608	2.33
Revised TWDB Low Case	9,253	132	1,370	1.22	9,649	132	1,428	1.28	10,386	132	1,538	1.37
Paul Price Associates Projection	9,253	190	1,971	1.76	9,649	190	2,055	1.83	10,386	190	2,208	1.97
Projected Demand for Lake Bosque	--	--	1,971	1.76	--	--	2,055	1.83	--	--	2,208	1.97
Total Municipal Demand												
Revised TWDB High Case	57,405	188	12,097	10.80	62,946	188	13,267	11.84	69,061	188	14,553	12.99
Revised TWDB Low Case	51,588	130	7,535	6.73	57,894	132	8,566	7.65	61,496	131	9,057	8.09
Paul Price Associates Projection	51,588	188	10,872	9.70	57,894	188	11,778	10.51	61,496	188	12,389	11.06
Projected Demand for Lake Bosque	--	--	9,878	8.82	--	--	10,736	9.58	--	--	11,346	10.13
Total Municipal Demand (Includes the City of Waco)												
Revised TWDB High Case	179,702	254	51,140	45.65	196,759	254	55,985	49.98	215,474	254	61,294	54.72
Paul Price Associates Projection	161,998	254	46,118	41.17	173,065	250	48,545	43.34	185,457	250	51,962	46.39
Source: Texas Water Development Board Revisions 2/1987 Paul Price Associates												

Table A.1-1a

Municipal Water Use for 1980 and Revised 1990 - 2040 Demand Projections	2040** Projected Population	Water Demand Projections		
		Per Capita GPD	Acre-feet per year	MGD
SUMMARY OF TOTAL DEMAND				
Project Participants (Excluding City of Waco)				
Revised TWDB High Case	62,359	188	13,120	11.71
Revised TWDB Low Case	52,341	131	7,655	6.83
Paul Price Associates Projection	52,341	188	11,037	9.85
Projected Demand for Lake Bosque	-	--	10,203	9.11
Potential Customers				
Revised TWDB High Case	13,421	190	2,859	2.55
Revised TWDB Low Case	11,179	132	1,655	1.48
Paul Price Associates Projection	11,179	190	2,381	2.13
Projected Demand for Lake Bosque	--	--	2,381	2.13
Total Municipal Demand				
Revised TWDB High Case	75,780	188	15,979	14.26
Revised TWDB Low Case	63,520	131	9,310	8.31
Paul Price Associates Projection	63,520	188	13,418	11.98
Projected Demand for Lake Bosque	--	--	12,584	11.23
Total Municipal Demand (Includes the City of Waco)				
Revised TWDB High Case	235,979	254	67,122	59.92
Paul Price Associates Projection	196,942	254	56,012	50.00
Source: Texas Water Development Board Revisions 2/1987 Paul Price Associates				

Table A.1-2 1980 Water Use and 1990-2040 Demand Projections for the User Category of Other

Bosque and McLennan County Other 1980 Water Use and Revised 1990-2040 Demand Projections	1980	Water Use			1990	Water Projections		
	Population	Per Capita GPD	Acre-feet per year	MGD	Projected Population	Per Capita GPD	Acre-feet per year	MGD
County Other Demand (Rural)								
McLennan County Other								
Revised TWDB High Series	24,925	125	3,501	3.13	24,432	180	4,929	4.40
Revised TWDB Low Series	24,925	125	3,501	3.13	23,259	133	3,467	3.10
Bosque County Other								
Revised TWDB High Series	7,782	108	941	0.84	8,739	161	1,577	1.41
Revised TWDB Low Series	7,782	108	941	0.84	8,483	113	1,075	0.96
Paul Price Associates Projected County Other Demand								
McLennan Co. High Demand	24,925	125	3,501	3.13	24,432	180	4,926	4.40
Low Demand	24,925	125	3,501	3.13	23,259	180	4,690	4.19
Bosque County High Demand	7,782	108	941	0.84	8,739	161	1,576	1.41
Low Demand	7,782	108	941	0.84	8,483	161	1,530	1.37
Total high Demand	32,707	--	4,442	3.97	33,171	--	6,502	5.80
Total Low Demand	32,707	--	4,442	3.97	31,742	--	6,220	5.55
Paul Price Associates Projected Other Demand for Lake Bosque Water								
McLennan County								
High	--	--	--	--	--	--	4,382	3.91
Low	--	--	--	--	--	--	4,146	3.70
Bosque County								
High	--	--	--	--	--	--	70	0.06
Low	--	--	--	--	--	--	24	0.02

Source:
Texas Water Development Board
Paul Price Associates, Inc.
TWDB Population Revisions 2/1987

Table A.1-2

Bosque and McLennan County Other 1980 Water Use and Revised 1990-2040 Demand Projections	2000	Water Projections			2010	Water Projections		
	Projected Population	Per Capita *GPD*	*Acre-feet per year*	*MGD*	Projected Population	Per Capita *GPD*	*Acre-feet per year*	*MGD*
County Other Demand (Rural)								
McLennan County Other								
Revised TWDB High Series	24,643	186	5,138	4.59	26,001	185	5,392	4.81
Revised TWDB Low Series	23,071	138	3,569	3.19	23,473	137	3,605	3.22
Bosque County Other								
Revised TWDB High Series	11,103	166	2,066	1.84	12,474	166	2,321	2.07
Revised TWDB Low Series	9,343	118	1,236	1.10	10,355	117	1,358	1.21
Paul Price Associates Projected County Other Demand								
McLennan Co. High Demand	24,643	186	5,134	4.58	26,001	185	5,388	4.81
Low Demand	23,071	186	4,807	4.29	23,473	185	4,864	4.34
Bosque County High Demand	11,103	166	2,065	1.84	12,474	166	2,319	2.07
Low Demand	9,343	166	1,737	1.55	10,355	166	1,925	1.72
Total high Demand	35,746	--	7,199	6.43	38,475	--	7,708	6.88
Total Low Demand	32,414	--	6,544	5.84	33,828	--	6,790	6.06
Paul Price Associates Projected Other Demand for Lake Bosque Water								
McLennan County								
High	--	--	4,590	4.10	--	--	4,844	4.32
Low	--	--	4,263	3.81	--	--	4,320	3.86
Bosque County								
High	--	--	436	0.39	--	--	750	0.67
Low	--	--	108	0.10	--	--	356	0.32

Source:
Texas Water Development Board
Paul Price Associates, Inc.
TWDB Population Revisions 2/1987

Table A.1-2

Bosque and McLennan County Other 1980 Water Use and Revised 1990-2040 Demand Projections	2020 Projected Population	Water Projections Per Capita GPD	Water Projections *Acre-feet per year*	Water Projections MGD	2030 Projected Population	Water Projections Per Capita GPD	Water Projections *Acre-feet per year*	Water Projections MGD
County Other Demand (Rural)								
McLennan County Other								
Revised TWDB High Series	28,447	183	5,835	5.21	31,126	181	6,315	5.64
Revised TWDB Low Series	24,483	136	3,732	3.33	26,353	135	3,988	3.56
Bosque County Other								
Revised TWDB High Series	13,944	166	2,595	2.32	15,655	166	2,913	2.60
Revised TWDB Low Series	11,407	117	1,496	1.34	12,570	117	1,649	1.47
Paul Price Associates Projected County Other Demand								
McLennan Co. High Demand	28,447	183	5,831	5.21	31,126	181	6,311	5.63
Low Demand	24,483	183	5,019	4.48	26,353	181	5,343	4.77
Bosque County High Demand	13,944	166	2,593	2.31	15,655	166	2,911	2.60
Low Demand	11,407	166	2,121	1.89	12,570	166	2,337	2.09
Total high Demand	42,391	--	8,424	7.52	46,780	--	9,222	8.23
Total Low Demand	35,890	--	7,140	6.37	38,923	--	7,680	6.86
Paul Price Associates Projected Other Demand for Lake Bosque Water								
McLennan County								
High	--	--	5,287	4.72	--	--	5,767	5.15
Low	--	--	4,475	3.99	--	--	4,799	4.28
Bosque County								
High	--	--	1,106	0.99	--	--	1,998	1.78
Low	--	--	634	0.57	--	--	1,424	1.27

Source:
Texas Water Development Board
Paul Price Associates, Inc.
TWDB Population Revisions 2/1987

Table A.1-2

Bosque and McLennan County Other 1980 Water Use and Revised 1990-2040 Demand Projections	2040 Projected Population	Water Projections by Paul Price Associates Per Capita GPD	Acre-feet per year	MGD
County Other Demand (Rural)				
McLennan County Other				
Revised TWDB High Series	34,057	180	6,871	6.13
Revised TWDB Low Series	28,365	133	4,229	3.77
Bosque County Other				
Revised TWDB High Series	17,575	166	3,270	2.92
Revised TWDB Low Series	13,853	117	1,817	1.62
Paul Price Associates Projected County Other Demand				
McLennan Co. High Demand	34,057	180	6,867	6.13
Low Demand	28,365	180	5,719	5.11
Bosque County High Demand	17,575	166	3,268	2.92
Low Demand	13,853	166	2,576	2.30
Total high Demand	51,632	--	10,135	9.05
Total Low Demand	42,218	--	8,295	7.40
Paul Price Associates Projected Other Demand for Lake Bosque Water				
McLennan County				
High	--	--	6,323	5.64
Low	--	--	5,175	4.62
Bosque County				
High	--	--	2,355	2.10
Low	--	--	1,663	1.48

Source:
Texas Water Development Board
Paul Price Associates, Inc.
TWDB Population Revisions 2/1987

Table A.1-3. Manufacturing 1980 Water Use and 1990-2040 Demand Projections

Bosque and McLennan County Manufacturing Water Use for 1980 and Projections for 1990-2040	1980 USE		1990 Projection		2000 Projection		2010 Projection		2020 Projection		2030 Projection		2040 Paul Price Asso. Projection	
	Acre-feet per year	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*
County Manufacturing Demand														
McLennan County														
TWDB High Series	3,982	3.55	6,320	5.64	9,181	8.20	12,296	10.98	16,206	14.47	20,618	18.41	26,231	23.42
TWDB Low Series	3,982	3.55	5,895	5.26	8,238	7.35	10,787	9.63	13,984	12.48	17,593	15.70	22,133	19.76
Bosque County														
TWDB High Series	87	0.08	112	0.10	148	0.13	186	0.17	233	0.21	288	0.26	356	0.32
TWDB Low Series	87	0.08	108	0.10	137	0.12	168	0.15	206	0.18	252	0.22	308	0.28
Paul Price Associates Projected Manufacturing Demand for Lake Bosque														
McLennan County														
High Series	–	–	5,825	5.20	8,744	7.81	11,921	10.64	6,259	5.59	0	0.00	5,613	5.01
Low Series	–	–	5,400	4.82	7,801	6.96	10,412	9.29	4,037	3.60	-3,025	-2.70	1,515	1.35
Bosque County														
High Series	–	–	0.00	0.00	148	0.13	186	0.17	233	0.21	288	0.26	356	0.32
Low Series	–	–	-4	0.004	137	0.12	168	0.15	206	0.18	252	0.22	308	0.28
Source: Paul Price Associates Texas Water Development Board														

Table A.1 - 4 Municipal Water Supplies

Municipal Water Supply for 1980 and Projections for 1990-2040 (for High Series Demand Projections)	Supply 1980		Projection 1990		Projection 2000		Projection 2010		Projection 2020		Projection 2030		Projection 2040	
	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD	Acre-feet per year	MGD
Bellmead														
Trinity Ground-Water	996	0.89	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	1,953	1.74	2,150	1.92	2,268	2.02	2,482	2.22	2,716	2.42	2,716	2.42
Total	996	0.89	1,953	1.74	2,150	1.92	2,268	2.02	2,482	2.22	2,716	2.42	2,716	2.42
Clifton														
Trinity Ground-Water	583	0.52	263	0.23	263	0.23	263	0.23	263	0.23	209	0.19	209	0.19
Local Supply	94	0.08	150	0.13	150	0.13	150	0.13	150	0.13	150	0.13	150	0.13
Waco Surface-Water	0	0.00	464	0.41	606	0.54	728	0.65	864	0.77	1,075	0.96	1,075	0.96
Total	677	0.60	877	0.78	1,019	0.91	1,141	1.02	1,277	1.14	1,434	1.28	1,434	1.28
Hewitt														
Trinity Ground-Water	844	0.75	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	1,144	1.02	1,203	1.07	1,269	1.13	1,389	1.24	1,520	1.36	1,520	1.36
Total	844	0.75	1,144	1.02	1,203	1.07	1,269	1.13	1,389	1.24	1,520	1.36	1,520	1.36
Lacy-Lakeview														
Trinity Ground-Water	639	0.57	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	698	0.62	751	0.67	792	0.71	867	0.77	949	0.85	949	0.85
Total	639	0.57	698	0.62	751	0.67	792	0.71	867	0.77	949	0.85	949	0.85
McLennan County WCID #2														
Trinity Ground-Water	183	0.16	183	0.16	183	0.16	183	0.16	183	0.16	183	0.16	183	0.16
Waco Surface-Water	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	183	0.16	183	0.16	183	0.16	183	0.16	183	0.16	183	0.16	183	0.16
Meridian														
Trinity Ground-Water	115	0.10	305	0.27	356	0.32	398	0.36	446	0.40	501	0.45	501	0.45
Waco Surface-Water	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	115	0.10	305	0.27	356	0.32	398	0.36	446	0.40	501	0.45	501	0.45
Waco														
Trinity Ground-Water	0	26.44	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	29,618	26.44	35,913	32.06	36,987	33.02	39,026	34.84	42,703	38.12	46,725	41.71	46,725	41.71
Total	29,618	26.44	35,913	32.06	36,987	33.02	39,026	34.84	42,703	38.12	46,725	41.71	46,725	41.71
Woodway														
Trinity Ground-Water	1,695	1.51	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	2,780	2.48	3,314	2.96	3,497	3.12	3,826	3.42	4,186	3.74	4,186	3.74
Total	1,695	1.51	2,780	2.48	3,314	2.96	3,497	3.12	3,826	3.42	4,186	3.74	4,186	3.74
Potential Customers														
Mart														
Trinity Ground-Water	669	0.60	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	744	0.66	767	0.68	809	0.72	886	0.79	969	0.87	969	0.87
Total	669	0.60	744	0.66	767	0.68	809	0.72	886	0.79	969	0.87	969	0.87
Moody														
Trinity Ground-Water	159	0.14	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	327	0.29	357	0.32	377	0.34	413	0.37	452	0.40	452	0.40
Total	159	0.14	327	0.29	357	0.32	377	0.34	413	0.37	452	0.40	452	0.40
Northcrest														
Trinity Ground-Water	173	0.15	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	588	0.52	691	0.62	729	0.65	798	0.71	873	0.78	873	0.78
Total	173	0.15	588	0.52	691	0.62	729	0.65	798	0.71	873	0.78	873	0.78
Bruceville-Eddy														
Trinity Ground-Water	203	0.18	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Waco Surface-Water	0	0.00	240	0.21	252	0.22	266	0.24	289	0.26	316	0.28	316	0.28
Total	203	0.18	240	0.21	252	0.22	266	0.24	289	0.26	316	0.28	316	0.28
Total Municipal Supply														
Trinity Ground-Water	6,259	32.03	751	0.67	802	0.72	844	0.75	892	0.80	893	0.80	893	0.80
Local Supply	94	0.08	150	0.13	150	0.13	150	0.13	150	0.13	150	0.13	150	0.13
Waco Surface-Water	29,618	26.44	44,851	40.04	47,078	42.03	49,761	44.42	54,517	48.67	59,781	53.37	59,781	53.37
Total	35,971	58.55	45,752	40.84	48,030	42.88	50,755	45.31	55,559	49.60	60,824	54.30	60,824	54.30
Source: Texas Water Development Board Paul Price Associates											2040 supply figures were held constant with 2030 figures.			

Table A.1 - 5 Other 1980 Water Use and 1990-2040 Supplies

Bosque and McLennan County Other 1980 Water Use Supply and 1990 - 2040 Supply Projections	1980 Water Supply		1990 Water Supply		2000 Water Supply		2010 Water Supply		2020 Water Supply		2030 Water Supply		2040 Water Supply	
	Acre-feet per year	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*
Supply Source for Other Demand (For High Series TWDB Projections)														
McLennan County														
Ground-Water Supply														
Trinity Group	0	0.00	544	0.49	544	0.49	544	0.49	544	0.49	544	0.49	544	0.49
Other	2,892	2.58	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Ground-Water Supply	2,892	2.58	544	0.49	544	0.49	544	0.49	544	0.49	544	0.49	544	0.49
Surface-Water Supply														
Lake Waco	609	0.54	4,374	3.90	4,578	4.09	4,829	4.31	5,281	4.71	3,506	3.13	3,506	3.13
Aquilla Creek	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Whitney WO Power	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Surface-Water Supply	609	0.54	4,374	3.90	4,578	4.09	4,829	4.31	5,281	4.71	3,506	3.13	3,506	3.13
Total Supply	3,501	3.13	4,918	4.39	5,122	4.57	5373	4.80	5,825	5.20	4,050	3.62	4,050	3.62
Bosque County														
Ground-Water Supply														
Trinity Group	0	0.00	1,506	1.34	1,629	1.45	1,569	1.40	1,487	1.33	913	0.82	913	0.82
Other	937	0.84	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Ground Water Supply	937	0.84	1,506	1.34	1,629	1.45	1,569	1.40	1,487	1.33	913	0.82	913	0.82
Surface-Water Supply														
Lake Waco	0	0.00	0	0.00	126	0.11	411	0.37	736	0.66	1,596	1.42	1,596	1.42
Local Supply	4	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Surface-Water Supply	4	0.00	0	0.00	126	0.11	411	0.37	736	0.66	1,596	1.42	1,596	1.42
Total Supply	941	0.84	1,506	1.34	1,755	1.57	1,980	1.77	2,223	1.98	2,509	2.24	2,509	2.24

Source:
Texas Water Development Board
Paul Price Associates

Note: 2040 supply figures were kept constant with 2030 TWDB figures. Percent change from 2020 - 2030 was applied to 2030 base number to calculate total growth from 2030-2040.

Table A.1-6 Manufacturing 1980 Water Use and 1990-2040 Supplies

Bosque and McLennan County Manufacturing Water Use for 1980 and Projections for 1990-2040	1980 USE		1990 Projection		2000 Projection		2010 Projection		2020 Projection		2030 Projection		2040 Paul Price Asso. Projection	
	Acre-feet per year	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*	*Acre-feet per year*	*MGD*
Manufacturing Supply Source (For High Series Projections)														
McLennan County														
Ground-Water Supply														
Trinity Group	–	–	495	0.44	437	0.39	375	0.33	264	0.24	143	0.13	143	0.13
Brazos River Alluvium	–	–	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Ground-Water Supply	–	–	495	0.44	437	0.39	375	0.33	264	0.24	143	0.13	143	0.13
Surface-Water Supply														
Lake Waco	–	–	5,825	5.20	8,744	7.81	11,921	10.64	6,259	5.59	0	0.00	0	0.00
Aquilla Creek	–	–	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Whitney WO Power	–	–	0	0.00	0	0.00	0	0.00	9,683	8.64	20,475	18.28	20,475	18.28
Total Surface-Water Supply			5,825	5.20	8,744	7.81	11,921	10.64	15,942	14.23	20,475	18.28	20,475	18.28
Total Supply	–	–	6,320	5.64	9,181	8.20	12,296	10.98	16,206	14.47	20,618	18.41	20,618	18.41
Bosque County														
Ground-Water Supply														
Trinity Group	–	–	112	0.10	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Brazos River Alluvium	–	–	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Ground Water Supply	–	–	112	0.10	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Surface-Water Supply														
Lake Waco	–	–	0	0.00	0	0.00	186	0.17	233	0.21	288	0.26	288	0.26
Aquilla Creek	–	–	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Whitney WO Power	–	–	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total Surface-Water Supply			0	0.00	0	0.00	186	0.17	233	0.21	288	0.26	288	0.26
Total Supply	–	–	112	0.10	0	0.00	186	0.17	233	0.21	288	0.26	356	0.26
Source: Paul Price Associates Texas Water Development Board											2040 supply figures were kept constant with 2030 figures. Total demand was increased by the percent change from 2020-30.			

Manufacturing water demand projection figures used in the water demand projections were from the TWDB low series projections.

Demand for Lake Bosque was projected by subtracting the amount of total demand satisfied by supplies from Lake Waco as indicated in the TWDB supply summaries. The sum of demand satisfied by Lake Waco supplies and any excess demand was assumed to be demand for Lake Bosque water.

A.1.3 NOTES

** Mclennan County manufacturing water demand for Lake Waco, year 2030, is projected at 0 by the TWDB County Water Supply-Demand summary. This is because the TWDB projects Lake Whitney to supply over 99.3% of total water demand. Manufacturing water demand for Lake Waco, year 2040, is projected at 0. This is because to calculate 2040 demand the percent change from 2020-2030 was applied to 2030 base numbers.

** Table A.1 - 7 shows the proportion of manufacturing demand drawn from Lake Waco for 1990 - 2030 as indicated by the TWDB County Water Supply-Demand 1990-2030 summary.

Table A.1 - 7

Manufacturing Water Demand for Lake Waco

	1990	2000	2010	2020	2030
Mclennan County	92.17%	95.2%	96.9%	38.6%	0
Bosque County	0	100%	100%	100%	100%

** Projected 2040 supply data was not available. Therefore, in the supply projections, supply is assumed constant to 2030 supply levels and sources.

** The City of Robinson was not included in municipal water demand projections because the city withdrew from the project. The TWDB County Water Demand and Supply Summary indicates that Robinson will be drawing water from Lake Waco by 1990. However, it is the understanding of Paul Price Associates' that The City of Waco will not be selling water from Lake Waco.

** The definition of Other demand includes the rural county population and excludes the population of the communities listed in Table A.1 - 8.

Table A.1 - 8

Communities not Included in the Definition of Other (Rural) Demand

Robinson	Valley Mills	Waco	West	Woodway
Bruceville-Eddy	Hewitt	Bellmead	Beverly Hills	Clifton
Lacy-Lakeview	McGregor	Mart	Meridian	Moody
Northcrest				

Of the sixteen communities listed in Table A.1 - 8, seven are participating in the project and four were identified as potential participants. The four remaining communities, Beverly Hills, Valley Mills, Robinson, West and McGregor were not accounted for in the projections. Although the community of Robinson withdrew from the project, TWDB County Water Demand and Supply Summary reports that 100% of Robinson's water supply will come from Lake Waco surface water. Valley Mills and McGregor currently and in the future were projected (by TWDB County Water Demand and Supply Summary) to continue relying entirely on Trinity ground water, and the community of West is projected to continue relying on Aquilla Creek surface water for their water needs. Beverly Hill is currently contracting with the City of Waco for water is expects to continue doing so in the future.

** The population of Mclennan County WCID #2 (Elm Mott) was included in the "Other Demand" water projections.

Socioeconomic Baseline Report
For The
Lake Bosque Project
Bosque County, Texas Water Development Board
Contract No. 8-483-522

The following maps are not attached to this report. They are located in the official file and may be copied upon request.

Maps -Lake Bosque Project Area Land Use
Figure 7-1
Figure 7-2
Figure 7-3

Please contact Research and Planning Fund Grants Management Division at (512) 463-7926 for copies.