



# COMMUNITY DEVELOPMENT PLAN 2000 - 2020

## VOLUME II DRAINAGE WATER WASTEWATER CENTRAL BUSINESS DISTRICT ECONOMIC DEVELOPMENT CAPITAL IMPROVEMENTS

SOUTHWEST CONSULTANTS  
P.O. BOX 830634  
RICHARDSON, TEXAS  
(972) 442-4156  
AND  
MAURICE SCHWANKE & COMPANY  
1209 SOUTHWOOD BLVD.  
ARLINGTON, TEXAS  
(817) 274-3943

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**DRAINAGE**



# INTRODUCTION

The intent of this Storm Drainage System Study is to review all available information on storm drainage in the city, make an analysis of the existing system, establish a data base, and then use the information to prepare a plan and make recommendations with cost estimates to improve the existing storm drainage systems within the city.

To help minimize property damage from flooding during periods of intense rainfall, the drainage system for a community must be addressed sized and properly maintained. The public has come to expect that no damage will result to property from storm drainage or high water, and gives no thought to the location of neighborhoods in relation to ground elevation drainage flows, etc., all of which directly affect the surface storm drainage immediately adjacent to homes or business structures. Storm drainage facilities required for a city may include inlets, storm sewers, culverts, bridges, concrete lined channels, natural drainage channels, overflow swales, creeks, rivers, and lakes.

It is the purpose of this report to present short range and long range plans for the development and construction of facilities to meet the needs of the population and to make recommendations concerning the implementation of those plans. It should be

noted than any plan is subject to change with changing economic and growth conditions, and frequent evaluations should be made in order to prevent the plan from being outdated. Revisions, additions, and deletions should be made as conditions warrant.

## **STORM DRAINAGE INVENTORY**

The storm drainage system of Whitesboro currently consists of a system of open gutters, inlets, pipes, ditches, and culverts. These facilities carry storm water run-off within Whitesboro to the eventual terminus outside the city limits. Several creek generally flow away from Whitesboro which exists on a ridgeline. The South Branch Big Mineral Creek exist to the north, Salt Creek to the southwest, Jordan Creek to the south, and tributaries of Mustang Creek to the east. The tributaries of both South Branch Big Mineral Creek and Mustang Creek have the greatest impact the city's growth. Portions of both creeks tributaries contain flood hazard areas while traversing across Whitesboro. Whitesboro Flood Hazard areas are mapped on a Flood Insurance Map (FIRM Map Number: 48181C125 D with an effective date of May 18, 1992) and shown on all maps associated with the Community Development Plan.

A flood hazard area consists of two sections. The center of the flood hazard area is known as the floodway. This area, which includes the actual water channel, is the area, which cannot be filled without causing increased flooding elsewhere during a 100-year storm. The area extending from the floodway to the outer edge of the flood hazard area is known as the flooding fringe. This higher area can be developed after appropriate study, but habitable structures must be built one-foot above the 100-year flood elevation. These creek areas (with associated flood hazard area) provide obvious challenges to development - crossings are difficult, and flood hazard areas are either unbuildable or require limited filling.

In August, 2000 the City's existing storm water facilities were catalogued. They are detailed in Table 1 and graphically shown in Figure 1. The approximate length, size and type of every public drainage structure has been identified. Most of the drainage in Whitesboro is currently surface oriented in an extensive system of curb and gutters.

TABLE 1

## CITY OF WHITESBORO

## EXISTING STRUCTURE INVENTORY

NUMBER	SIZE	LENGTH	TYPE	REMARKS
1	18"	37'	RCP	STANDING WATER, WEEDS, 30% PLUGGED
2	18"	36'	RCP	90% PLUGGED, ASPHALT & MUD
3	4'X2'	57'	BOX	HEADWALL, STANDING WATER
4	26"	46'	RCP	HEADWALL, STANDING WATER
5	32"	53'	RCP	HEADWALL, STANDING WATER
6	46"	54'	RCP	STANDING WATER, HEADWALL, MUD, 20% PLUGGED
7	32"	23'	RCP	STANDING WATER, HEADWALL, MUD, 20% PLUGGED
8	2-24"	30'	CMP	HEADWALL
9	30"	42'	CMP	CRUMPLED BOTH ENDS, STANDING WATER, WEEDS & MUD, 20% PLUGGED
10	2-2'X8'	40'	BOX	STANDING WATER, HEADWALL, STORM DRAIN INLET 4'X6"
11	7'X2'	54'	BOX	STORM DRAIN INLET, FLUME, WEEDS
12	3'X1'	32'	BOX	HEADWALL, STORM DRAIN 11'X6", MUD, 50% PLUGGED ON WEST SIDE

13	18"	44'	RCP	HEADWALL
14	2-50"	48'	CMP	BRUSH, CONCRETE, 30% PLUGGED
15	3'X2'	58'	BOX	HEADWALL, STANDING WATER, 20% PLUGGED, MUD
16	2'X3'	48'	BOX	HEADWALL
17	2'X3'	57'	BOX	HEADWALL, STANDING WATER, 20% PLUGGED, MUD
18	3'X2'	48'	BOX	HEADWALL, STANDING WATER
19	3'X4'	48'	BOX	HEADWALL, STANDING WATER, BRUSH ON ONE END
20	30'	31'	BRIDGE	STANDING WATER, BRUSH
21	3'X5'	215'	BOX	2 STORM GRATES-3'X4', ONE AT EACH MEDIAN, HEADWALL, STANDING WATER
22	24"	88'	RCP	HEADWALL, WEEDS, STANDING WATER, 20% PLUGGED,
23	2-24"	54'	RCP	HEADWALLS
24	3'X2'	47'	BOX	50% PLUGGED, WEEDS, HEADWALL
25	2'X5'	64'	BOX	HEADWALL, STANDING WATER
26	2-28"	44'	RCP	HEADWALL, ROCK, MUD, DEBRIS
27	28"	41'	RCP	HEADWALL
28	24"	87'	CMP	HEADWALL ON WEST END, WEEDS, STANDING WATER
29	24"	72'	CMP	HEADWALL, 33% PLUGGED, MUD, TRASH

30	18" ONE END, 24"	110'	CMP	WEEDS
31	2'X5'	33'	BOX	STANDING WATER, MUD, DEBRIS, HEADWALL
32	4'X8'	288'	BOX	HEADWALL, STANDING WATER
33	28"	108'	RCP	HEADWALL, 50% PLUGGED, WEEDS, MUD, STANDING WATER
34	4-4'X28'	340' TOTAL	BOX	HEADWALL, 30% PLUGGED, MUD, STANDING WATER
35	4'X22'	244'	BOX	HEADWALL, STANDING WATER, 33 % PLUGGED, MUD, WEEDS
36	24"	34'	RCP	HEADWALL
37	2'X6'	51'	BOX	HEADWALL, STANDING WATER, 10% PLUGGED, MUD
38	2-24"	63'	RCP	HEADWALL
39	24"	82'	RCP	HEADWALL
40	2-24"	45'	RCP	HEADWALL
41	2-24"	70'	RCP	STORM DRAIN GRATE ON NORTH SIDE 6'X7' MOSTLY BLOCKED BY DEBRIS
42	3'X6'	73'	BOX	STORM DRAIN, NO VISIBLE INLET BUT CONNECTED TO 4 STORM DRAINS
43	2'X2'	24'	BOX	HEADWALL, 40% PLUGGED, WEEDS
44	35"	95'	CMP	HEADWALL

45	3-24"	30'	CMP	50% PLUGGED ON ONE END, WEEDS
46	2'X5'	115'	BOX	HEADWALL
47	4'X24'	168'	BOX	HEADWALL, WEEDS, STANDING WATER, CREEK
48	2'X4'	188'	BOX	N. END INLET IS 3'X3' STORM DRAIN, STANDING WATER
49	4'X12'	34'	BOX	BOX CULVERT ON ONE END, OTHER STORM DRAIN, DOUBLE INLET, STANDING WATER
50	24"	148'	RCP	HEADWALL
51	24"	300'	RCP	HEADWALL
52	16"	24'	CMP	

RCP = REINFORCED CONCRETE PIPE    BOX = BOX CULVERT    CI = CAST IRON  
 CMP = CORRUGATED METAL PIPE    CT = CLAY TILE

## STORM DRAINAGE ANALYSIS

At present, the City of Whitesboro does not have an extensive underground storm drainage system. Instead, stormwater drainage is carried on the surface within bar ditches, gutters and well-defined unimproved drainage channels. The topography is such that most rain water flows away from property generally along street right-of-ways. The curb and gutters has proved to be an adequate system where they exist. However, other right-of-ways contain bar ditches and channels have in many instances have not received much attention in the past for maintenance and reshaping (See Figure 2-4).

FIGURE 2  
DRAINAGE PROBLEMS

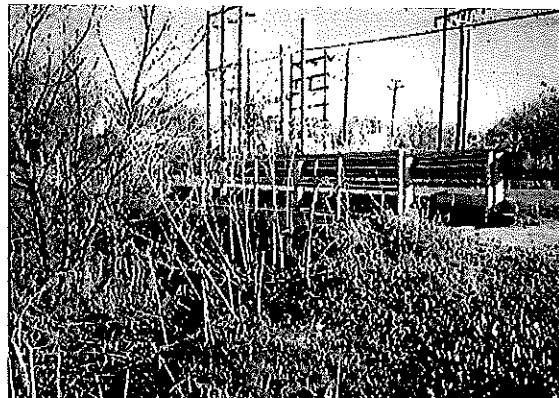
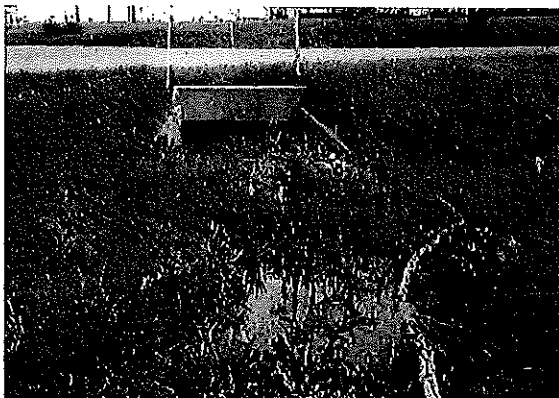




FIGURE 3  
DRAINAGE PROBLEMS

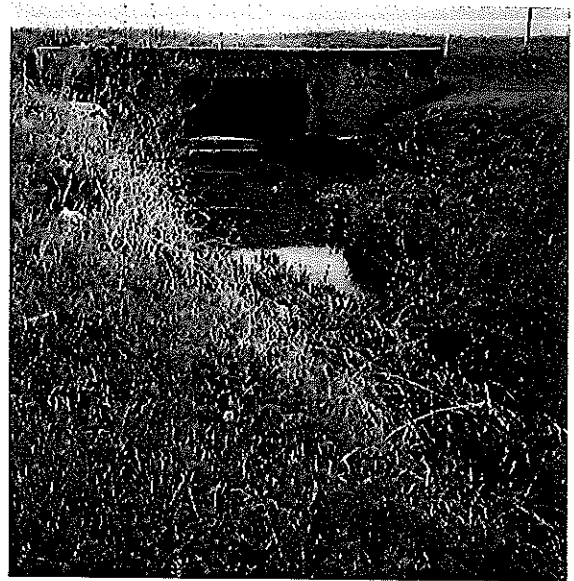
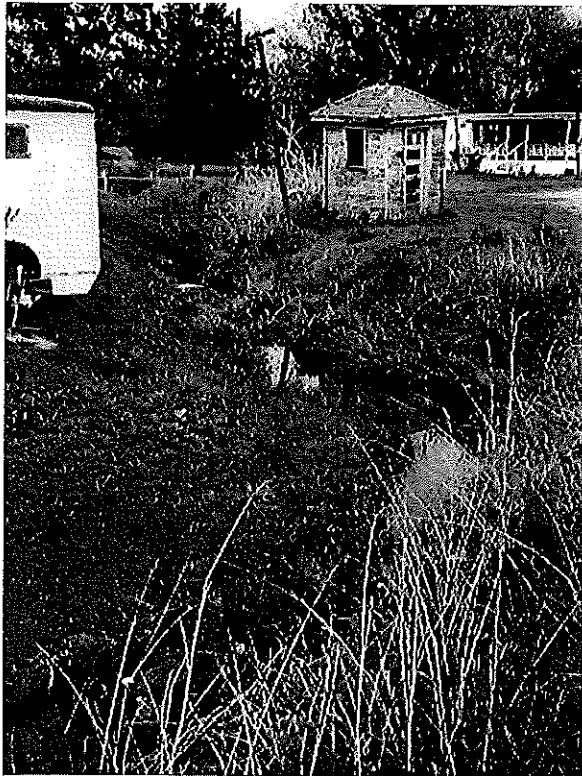
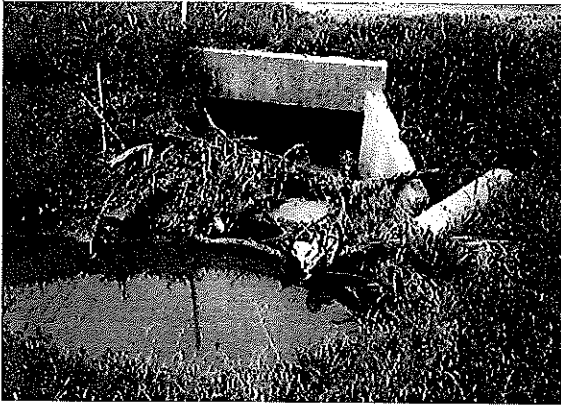


FIGURE 4  
DRAINAGE PROBLEMS



Therefore problems that occur in Whitesboro are not associated with flooding creeks but with man-made bar ditches and culverts when rain water flows off adjacent properties and follow the natural topographical lay of the City. A major drainage area funnels storm water run-off through the central part of Whitesboro following a street grid system.

Due to the aforementioned lack of attention over the years, the bar ditches, channels, and culverts have become choked with silt, vegetation and have lost their capacity to carry water (See Figure 2 - 4). Additionally, manmade structures such as the street

pattern do not lend themselves to adequate drainage since these facilities exist perpendicular to the natural flow lines.

The city ranked priorities to solve drainage problems in Whitesboro are as follows:

- 1) existing bar ditches and culverts should be cleared of silt and reshaped,
- 2) new bar ditches should be constructed where needed,
- 3) existing channels should be cleared of silt and vegetation,

In an attempt to identify problems and make needed recommendations, a complete inventory of drainage facilities within the City of Whitesboro was made. As a result, a total of 52 facilities have been identified. Of this number, 37 have problems with standing water, weeds or blocked with siltation, other facilities have additional problems that need to be see Table 1 under "Remarks".

To implement needed improvements, the following actions should be taken:

- 1) existing culverts which are blocked with silt should be cleaned out when possible,
- 2) when siltation is beyond removal and pipes are collapsed beyond repair, new culverts should be installed,

- 3) new culverts should be constructed where needed, and
- 4) drainage ways should be reshaped and cleaned.

In regard to the drainage facilities of Whitesboro problems with culverts were identified outside of the heavily urbanized area of the City. The core of the City has curb and gutters to direct the flow of runoff. Over 70 percent of the drainage facilities other than curb and gutters need maintenance. For this reason, it is recommended that improvements be made to increase the capacity of these existing facilities to expedite run-off past these areas to the natural drainage ways. This lack of maintenance causes localized flooding along streets, however no homes are being inundated with water due to culvert siltation. Additionally, the drainage channel that contains runoff flows between North Union Street and Center Park and through Center Park should be improved to facilitate the movement of water during storm events.

# **STORM DRAINAGE PLAN**

**GOAL: THE STORM DRAINAGE PLAN GOAL IS TO EFFECTIVELY TRANSPORT STORM WATER RUN-OFF DOWNSTREAM IN A MANNER WHICH MINIMIZES DAMAGE TO PROPERTY AND INCONVENIENCE TO RESIDENTS.**

As part of this Study, a Priority Action Plan listing priorities, estimated costs, and possible funding sources has been developed and presented. The physical aspects of the plan are also graphically presented in Figure 5. The goal of this plan is to effectively transport storm water run-off downstream in a manner, which minimizes damage to property and inconvenience to residents.

## **First Priority**

The first priority of the Action Plan should include improvements to the following specific facility numbers 1, 2, 12, 14, 24, 29, 33, 34, 35, 43, and 45. It is recommended that improvements be made to these culverts to increase the water carrying capacity. The cost of the these projects should be mitigated due to the fact that several are associated with Texas Department of Transportation rights-of-ways.

The City portion of the repairs should cost approximately \$3,500. This cost could be reduced further if people required to perform community service are used to clean out existing plugged facilities that are not damaged or deteriorated.

### **Second Priority**

The second priority of the Action Plan should include improvements to the following specific facility numbers 3, 4, 5, 6, 7, 9, 10, 11, 15, 17, 18, 19, 20, 21, 22, 25, 26, 28, 31, 32, 37, 41, 42, 47, 48, and 49. It is recommended that improvements be made to these culverts to increase the water carrying capacity. The cost of these projects should be mitigated due to the fact that several are associated with Texas Department of Transportation rights-of-ways. The City portion of the repairs should cost approximately \$6,200. This cost could be reduced further if people required to perform community service are used to clean out existing plugged facilities that are not damaged or deteriorated.

### **Third Priority**

The third priority is to address the drainage from facility number 42 to a point east of center park. The improvements to this unimproved drainage channel would assist in

the moving of storm water runoff events. The final design of this channel could range from the reshaping of drainage channel to the lining of the channel with an erosion control surface. The worst-case scenario would place the cost of the facility improvements at over \$175,000.

#### Fourth Priority

To enable existing and proposed drainage facilities to carry the maximum possible flow without entering into a major capital improvement program, a ditch maintenance program should be initiated. This program should include reworking and deepening existing bar ditches and cleaning out or replacing deteriorated and silted culverts where curb and gutters do not exist. After the initial improvements, undertaking a periodic maintenance program, which would include removal of debris, mowing of bar ditches and minor culvert repair, should continue the process. The approximate cost for this program is \$2.25/linear foot, excluding driveway drain pipe. A significant portion of this cost can be offset by participating with local governmental units and the Grayson County judicial system by using labor from individuals who are required to perform community service. If this labor is **not available** a more reliable source of funds could be secured through the general fund to carry out recommended improvements.

Following implementation of improvements of the Drainage Priority Action Plan, the City of Whitesboro should continue it's established program of bar ditch and channel maintenance. Not only will this assist with water control, mosquito infestation will be brought under control, the area will be visually enhanced. A drainage ordinance will also ensure that future development will not adversely impact existing development. If all of the proposed improvements outlined in the Storm Drainage Plan are implemented, major drainage problems facing the City should be resolved.



**WATER**

# INTRODUCTION

The purpose of this segment of the Community Development Plan is to provide an inventory of the existing City of Whitesboro water supply system, and an analysis of the systems operations. No recent system wide water system analysis has been conducted that considers all of the current development activity occurring in Whitesboro. A previous study was prepared in September of 1983 for both the water and wastewater systems by the firm of Hogan & Rasor, Inc.

The furnishing of adequate public utilities such as water facilities is vital to Whitesboro's life and growth. It was the introduction of water piped under pressure and water-carried waste disposal, which made possible the urban concentrations of population, as we know them today. The average citizen has come to expect water to be available, in the quantity desired, and gives no thought to the source of that water or the destination of the resulting wastes. The instant response to these demands requires considerable planning, effort, and investment in plants and equipment.

The City Council should be concerned with the proper relationship of the utility systems to each other and to the land use plan. The complexity of the utility systems increases greatly as they cover larger areas and serve increasing numbers of customers. This water plan will help direct the City towards the efficient updating and expansion of Whitesboro's water system.

# **WATER SYSTEM PLANNING**

To properly plan a future water system capable of providing the requirements of the projected community, it is necessary to evaluate the present system, including the water supply and distribution system network and its capability of providing service for the present and projected demands. The City must have a dependable water supply that will provide for all water demands; including domestic, industrial, and commercial, as well as an allowance of about 25 percent for distribution system leakage, fire fighting, and other unmetered uses. The present average usage throughout the United States is around 100 gallons per capita per day. In industrial cities with heavy industrial water consumption the average usage may be 300 gallons per capita per day or more.

Effective February 1, 1998 the Texas Department of Insurance implemented Insurance Services Office's Fire Suppression Rating Schedule and the Public Protection Classification System; the Key rate System, which had been in use for nearly 80 years, was repealed. Key rating uses population as the primary basis for determining a city's fire protection requirements. Key rates were based on a time when Texas towns had a single-core business district. The new rating system should not be used for purposes other than insurance rating. Since Whitesboro fits the Old Key Rate identity it is still a good measure and useful for planning purposes. Planning for the water utility system must take into account the basis on which this key rate is computed as affected by the water works, which includes pumping

facilities and fire flow pressures, water supply, ground level storage reservoirs, elevated storage, water distribution system and fire hydrants, and pumping station or stations.

Most cities maintain pressure in the water distribution system by providing elevated water storage, preferably at some high topographical location or locations in the city. Water is pumped from ground storage reservoirs located at wells, a treatment plant, or delivery point, into the system to maintain a high level of water in the elevated tank and thus a high pressure in the system. A balanced system should provide pumps with capacity to supply the average daily consumption, with additional pumps, which can put sufficient water into the system to meet the maximum daily demands and maintain the system pressure. To satisfy the peak hourly demands, water can be used from the elevated storage along with that provided by additional pumps.

Water storage reservoirs in a water system provide water for three principal purposes: (1) to meet hourly demands which are in excess of water supply facilities; (2) to meet the increase in demand created during fire event; and (3) to meet the system demands during short interruptions of water supply. The key rate requires 55 gallons of elevated water storage per capita, in addition to required ground level water storage of 130 gallons per person served by the water system. Also, the City should be in compliance with current per service connection requirement of the

Texas Natural Resources Conservation Commission for elevated storage (Rules and Regulations for Public Water Systems - TNRCC).

Ground storage consists of a reservoir placed on or just below the ground surface. Water in a ground storage reservoir is treated and ready for use, but must be pumped from the reservoir into the distribution system with high service pumps. Ground storage is generally located at a water treatment plant, near a well site, or at a delivery point.

Elevated storage consists of a reservoir elevated above the area, which it is to serve. This elevation can be accomplished via a tower type structure or a tank location on high ground. Water in this type reservoir is also treated and is ready for use. Due to its elevation above the ground there is sufficient pressure to flow the water into the distribution mains by gravity without pumping. However, the elevated storage tank must be filled from the source of supply via the pumping facilities.

Maximum hourly demands for water can be supplied in several ways. One method is to maintain pumping capacity at the source or supply sufficient to pump water at a rate high enough to supply the maximum hour demand. Another method is to supply water with pumps at the source of supply with capacity to meet the maximum daily consumption rate and to supply the higher maximum hourly demand by permitting

water in the elevated tank to drain into the system during peak consumption hours. Either of these methods is acceptable practice; some combination of the two might be determined to be a more economical experience has shown that the peak pumping capacity should be approximately 125 percent of the maximum daily demand.

Materials used in water system construction usually have a fairly long life, but will ultimately have to be replaced. In water system planning, attention should be given to the deterioration of any facilities which have served their purpose and which may be either too expensive to maintain or overly expensive to operate, and an efficient schedule or replacement developed.

In general, no water lines less than six (6) inches in diameter should be installed. Lines should be sized to maintain proper pressure and flow rates at all locations. Consideration must be given to the location of water lines in relation to sanitary sewers and other public utilities.

The proper provision and distribution of fire hydrants and valves is critical to the operation and maintenance of a water distribution system. Fire hydrants should be located so that all structures are within 300 of the fixture. Water valves should be placed such that no unnecessary interruptions occur over large areas when line

repairs are made at any particular location.

The Texas Natural Resources Conservation Commission has set forth guidelines for the location, installation, and operation of water lines and all other water works utilities (Rules and Regulations for Public Water Systems - TNRCC).

In planning for a growing city, consideration must be given to the extension of the utility system into new areas as building construction progresses. Unless utility expansion is orderly and adequate, growth of the City into new areas cannot and will not occur. Building may not be completely stopped by failure to extend service into the new areas, but the character of the development that does occur is likely to be inferior and has an adverse effect on the City as a whole.

## **WATER SYSTEM INVENTORY**

The City of Whitesboro owns its water supply distribution system. Potable water is currently obtained from four wells. The Whitesboro water is treated at each well. The City currently serves 1600 connections. The inventory and updating of the existing City system was compiled in October 2000. The results of the inventory are

graphically depicted in Figure 6. Water system capacities are also indicated in Table 2. Pipe diameter ranges in size from 1 inch to 8 inches. The Whitesboro water system configuration has three ground storage tanks, four wells, one elevated storage tank, and distribution lines. The only cost of producing well water is the pumping and treatment of water at the wells.

The Water system operation has several operators with various certificates. The highest certificate has a Class "C" Operator's Certificate, which complies with Texas Natural Resources Conservation Commission. Daily operation and maintenance of the water facilities consists of the following:

1. Check chlorine residual;
2. Check water Ph;
3. Check water alkalinity; and,
4. General maintenance as needed and required.

With respect to system standards and design criteria, the Texas Natural Resources Conservation Commission has developed specific minimum guidelines. These standards are less than those required for an approved public water supply. They provide a basis for evaluation, however. Current available data from the Whitesboro water system, as compared with Texas Natural Resources Conservation Commission standards, are indicated in Table 3. As shown, the City's standards are



not all above those of the Texas Natural Resources Conservation Commission. All calculations are based on 1600 water connections.

TABLE 2

## CITY OF WHITESBORO

### WATER SYSTEM INVENTORY

FACILITY	CAPACITY
<u>North Well @ Quillen Street</u>	Avg. 243 gpm
Ground Storage Tank	308,000 gallons
<u>South Well @ 1 Block West of Main on Water Street</u>	Avg. 340 gpm
<u>Wilson Well @ N. end of Wilson St.</u>	Avg. 360 gpm
Ground Storage Tank	250,000 gallons
<u>West Well @ Walnut &amp; Chestnut</u>	Average 459 gpm
Ground Storage	250,000 gallons
Elevated Storage	250,000 gallons

Additional standard of the Key rate require that minimum line sizes in residential areas be not less than 6 inches in diameter. In addition, all lines must be looped to

ensure uninterrupted service should a line breakage occur. In commercial areas, 8-inch lines must be installed. No 6-inch dead-end water mains should be more than 1800 feet in length. Additionally, standard three-way fire hydrants require a 6-inch or larger diameter water main with a minimum of 5 inch valve openings. Fire hydrants are to be properly located every 300 feet in commercial areas and every 600 feet in residential areas so that every building in the City limits will be within 500 feet of a standard City fire hydrant. Fire hydrants on mains less than 6 inches are not recognized by the Key rate as providing effective fire protection.

TABLE 3

## **CITY OF WHITESBORO**

### **WATER SYSTEM STANDARDS**

<b>FACILITY CAPACITY</b>	<b>TNRCC</b>	<b>WHITESBORO</b>
Total Storage	200 gal./connection	661
Elevated Storage	100 gal./connection	156
Wells	0.6 gpm/connection	.87
Minimal Residual Pressure	20 psi	54
Normal Operating Pressure	35 psi	54
"C" Certified Operators	2	2

TNRCC = Texas Natural Resources Conservation Commission

Based Upon 1600 connections served by system.

TABLE 4

**CITY OF WHITESBORO**

WATER SYSTEM STANDARDS

FACILITY CAPACITY	KEY RATE	WHITESBORO
Minimum Main Size	6 - inch	1 - 10
Elevated Storage	55 gal. per capita	66.8
Ground Storage	130 gal. per capita	216

KEY RATE – OLD KEY RATE STANDARDS

Based Upon 3,740 Residents served by system.

**WATER SYSTEM ANALYSIS**

As illustrated in Table 3 and 4, most of the major elements of the water system are adequate according to the standards set forth.

TABLE 5  
**CITY OF WHITESBORO**

POTENTIAL SERVICE CAPACITY

<b>FACILITY</b>	<b>MAXIMUM CONNECTIONS</b>	<b>2000 CONNECTIONS</b>	<b>AVAILABLE CONNECTIONS</b>
Total Storage	5,290	1,600	3,690
Elevated Storage	2,500	1,600	900
Well Capacity	2,337	1,600	737

Based on TNRCC Minimum Acceptable Standards and Current Whitesboro data.

On the surface the facilities appear to be well above the minimum standards. This is true until a problem occurs with some of the facilities. During the past several years one or more of the wells have quit functioning at inopportune times. This has caused the City to mandate water rationing. Because of this the Plan for water system improvements will call for increased water production and storage capabilities beyond those outlined by the aforementioned standards.

Many portions of the City lack adequate sized looping of distribution lines with several lines in undersized condition. Key Rates recommend a minimum line size of 6 inches for residential areas and 8 inches for commercial and industrial areas to provide adequate fire protection. Large areas of Whitesboro are unprotected from lack of fire hydrant coverage as illustrated in Figure 8.

The current water rate adopted for 2000 is as follows:

**Residential & Commercial - Inside City Limits**

Base Charge – 1,000 gallon minimum	\$7.00
Each 100 gallons water thereafter	\$0.215

**Residential & Commercial - Outside City Limits**

Base Charge – 1,000 gallon minimum	\$14.00
Each 100 gallons water thereafter	\$0.325

For apartments, apartment complexes or other multi-family dwellings, each living unit is considered to be a separate customer for billing.

Presently, operation of the City's water system facilities is adequate with maintenance conducted on a regular basis. With the assistance of this study, locating necessary elements of the water system will be easier. As updates are made, a more effective approach can be achieved in evaluating future projects.

In the past, the water system has met the City's needs. The critical elements of the water system are the distribution system's line size, and the lack of looping. As the City grows, additional burdens will be placed on these inadequate facilities of the water system infrastructure.

Based on input from the public, staff, and City Council, the following problems were developed and ranked according to the perceived need of the water system of Whitesboro:

1. Provide new water and storage capacities to prevent shortfalls in the water supply.
2. Replace old undersized water mains in the central sector of City
3. Loop distribution lines throughout the City to provide improved distribution and pressure.
4. Plan for the future.
5. The City should strive to keep water cost as low as possible.
6. The City should encourage the conservation of water resources by customers of the water system.

No other problems are perceived as being in need of resolution.

## **DROUGHT CONTINGENCIES AND CONSERVATION**

The TNRCC has published a system for notification for drought-related water problems. This system also includes priorities and states of water rationing during times of drought. This system is recommended as follows:

### **Priority**

- E - Emergency. Could be out of water in 45 days or less.
- P - Priority. Could be out of water in 90 days or less.
- W - Watch. Water shortage possible.
- R - Resolved. No longer experiencing water capacity problems.

## **Stage**

### **Stages of water rationing**

1. Mild rationing. Usage of water for outdoor purposes, such as lawns, gardens, and car washing, can be restricted by utility.
2. Moderate rationing. All outdoor water usage is prohibited except by hand-held hoses with manual on/off nozzles. Water usage for livestock is exempt from this restriction.
3. Severe rationing. All outdoor water usage is prohibited; livestock watering may be exempted by the utility. All consumption may also be limited to each customer in specific ways.

A renewed public interest in water resources was embodied in the passage of Senate Bill 1 (SB 1) by the 75th Texas Legislature. SB 1 is a comprehensive omnibus water bill that addressed improving many different areas of water management, ranging from water planning and regulation to data collection and dissemination. Included in this bill is the establishment of regional water planning groups.

The Texas Water Development Board is responsible for administering the state and regional water planning groups. Grayson County of which Whitesboro is part of is within Region C Water Planning Group. Within Appendix A of this document is a

complete listing of the Region C members and map of the Region C.

The Texas Water Development Board has also published "Forty-Nine water Saving Tips". This document has been provided in Appendix B. These tips are for all households and are useful in the conservation of our water resources.

## **SYSTEM PLAN**

A priority action plan listing priorities, estimated costs, and possible funding sources has been developed. The physical aspects of the plan are graphically presented in Figure 8. In order to bring the City's water system into compliance with Texas Natural Resources Conservation Commission and Key Rate standards, recommended improvements should be an integral part of an overall five-year Capital Improvements Program.

**GOAL - THE GOAL OF THIS PLAN IS TO EFFECTIVELY PROVIDE FOR THE ADEQUATE PROVISION OF WATER SUPPLY, PRESSURE, AND DISTRIBUTION TO ALL AREAS OF THE CITY.**

### **First Priority**

The first priority of the plan is the construction of an elevated storage tank and well to provide for adequate pressure and supply for the water system.

This project will cost approximately \$480,000.



### **Second Priority**

The second priority is to replace several water lines as follows:

Center Street	Wainwright to Mineral
Mineral Street	Center to North Union
Wade Street	Collinsville to South Union
Union Street	Hall to South St.

Estimated cost of this project will be \$121,000.

### **Third Priority**

The third priority is to replace several water lines as follows:

Water Street	Chestnut to South Union
Charter Street	Collinsville to South Union
Hall Street	Elm to Jordan
White Street	First to Fourth
Tipton Street	Carver to Abney
Carver Street	Abney to Tipton

This project will cost approximately \$145,000.

### **Fourth Priority**

The Fourth priority is to replace several water lines as follows:

Otis Street	North Union to College
College Street	Otis to Third

College Street

North Avenue

Pecan Street

West Main to Hall

Pecan to Bois D' Arc

Buchanan to North Ave.

This project will cost approximately \$142,500.

### **Fifth Priority**

The fifth priority is to replace several water lines as follows:

Across Center Park

Bagin Street

Center Street

North Union to Wilson St

Fire Hydrant to Center

Bagin to Grayson

This project will cost approximately \$75,000.

Funding for the above prioritized improvements might be secured from several different sources or combinations thereof. The sources of funding include Revenue Bonds, Farmers Home Administration Loans, the Texas Water Development Board Loan Fund, and the Texas Community Development Program administered by the Texas Department of Housing and Community Affairs.

By the end of the fifth year, a significant portion of the water system needs will have been addressed, bringing the system closer to compliance with State Board of Insurance requirements. Following implementation of the proposed improvements, the City's water system should be able to accommodate existing development with capacity to serve additional residential units.

Future Development outside of the existing urbanized area will need to be addressed in an orderly fashion. Because of this the plan map identifies water system distribution mains to address anticipated growth in undeveloped portions of the City as well as portion of the Extra Territorial Jurisdiction. These lines should be funded and built using the Subdivision Ordinance and by the establishment of Impact Fees by the City. The Two Way Water Supply corporation supplies the outer reaches of the ETJ. However, portions of the area **have not been** Claimed as part of either Whitesboro's or Two Way's Certificate of Convenience and Necessity (CCN).

The Initially Prepared Region C Water Plan is contained in Appendix C. Within this report three recommendations/observations affect the City of Whitesboro and are as follow:

1. Current groundwater use in Grayson County exceeds TWDB's estimated long-term reliable supply of water.
2. Development of the Grayson County Water Supply System is proposed to deliver water to users throughout the county. The system includes a raw water pipeline from Lake Texoma, a treatment and desalination plant, and treated water pipelines.
3. Water users will temporarily overdraft groundwater while developing surface supplies.

These recommendations/observations were formed to address the next 50 years.

**WASTEWATER**

## INTRODUCTION

This wastewater system study and analysis consists of an inventory of current conditions and problems facing the City of Whitesboro in the treatment and collection of its wastewater. The second portion of this report focuses on the development of a wastewater system plan with a long-term strategy for improvements to the existing system.

To properly plan a wastewater collection and treatment system for a community, the planner must have knowledge of the existing system, area topography and growth trends. Peak wastewater flows which are expected to be generated at selected points in the service area are then determined and compared with the existing system capacities. Adjustments to the system can then be proposed.

Wastewater collection and treatment is heavily influenced by the topography of a community. Since gravity sewers are much preferable to lift stations and force mains (in terms of both economics and operational complexity) the ideal arrangement is a sewage treatment plant located at the downstream end of a drainage basin with gravity sewers extending along drainage ways

within the basin. A Whitesboro is not fortunate in this regard since the City sits on a ridgeline and drains generally to all directions. The current location of mains in Whitesboro has the need for 4 public lift stations.

## **WASTEWATER SYSTEM INVENTORY**

The first step in the inventory process was to insure that all know lines and capacities of lift stations were determined and mapped. This was accomplished with the help of the Whitesboro Public Works director and Assistant City Administrator. A previous study was prepared in September of 1983 for both the water and wastewater systems by the firm of Hogan & Rasor, Inc. Additionally, an engineering feasibility report for the sewage treatment plant was prepared for the City by Morris Engineering in April of 2000.

The City of Whitesboro owns its wastewater system. The collection system is comprised of gravity flow wastewater mains, 4 lift stations, 4 force mains and a wastewater treatment plant located at the northern edge of the City.

The wastewater collection system is comprised of clay tile and polyvinyl-chloride pipe ranging from 4-inch to 18-inch pipe terminating at the wastewater treatment plant. The location of trunk and collector lines, manholes, lift station, and force main are illustrated in Figure 9. The wastewater collection system serves 1,345 residential connections and 176 commercial connections within the City Limits. Inside the City not all residential customers are served with wastewater services. The wastewater rates are based on water usage with the following rates adopted in 1997:

Residential and commercial users

Base Charge (first 1,000 gallons)	\$5.00
Each 100 gallons of water usage	\$0.085

For apartments, apartment complexes or other multi-family dwellings, each living unit is considered to be a separate customer for billing.

The annual operating expenses of wastewater treatment, and maintenance of all wastewater and water system is approximately \$365,357 annually.

As this rate increases over time Whitesboro will need to adjust customer

cost proportionately. Additionally, if Whitesboro continues to grow the need for additional funds to retire new debt will be reduced because of new connections added to the existing system.

## **WASTEWATER SYSTEM ANALYSIS**

Criteria of to analyze the wastewater system is based on TNRCC standards which are derived from the Texas Administrative Code Title 30, Part I, Chapter 317 - Design Criteria for Sewerage Systems. Some of the wastewater collection system's major components are in good condition. However, many lines are still clay tile allowing for excessive infiltration. This problem should be addressed by finding the leaks and correcting the problem.

With regard to soil, the two general soil groups within Whitesboro are the Normangee-Crockett-Wilson Soil and the Callisburg-Crosstell-Gasil. The Normangee-Crockett-Wilson Soil is a deep loamy soil that has a very slow permeable rate. The Callisburg-Crosstell-Gasil Soil group is a deep loamy and sandy soil that has a moderate to very slow permeable rate. The City of



Whitesboro is dominated by the Normangee-Crockett-Wilson soils, this soil series presents severe limitations for septic systems (percs slowly). The City of Whitesboro should adopt and enforce standards for the design and construction of development, and restrict the use of septic systems in order to mitigate the severe limitations posed by its soils.

Industrial wastewater is currently not a problem in the City. If an industrial user requiring special treatment move into Whitesboro the city should adopt ordinances that will address unusual treatment needs.

Operational procedures designed to maintain compliance with the Texas Health Department and U.S. Environmental Protection Agency standards are adequate for plant operation. Daily operational procedures carried out by City licensed "C" operator to ensure adequate maintenance of the systems and facilities. Daily maintenance procedures for the plant should include:

1. Inspect treatment facilities;
2. Check chlorine residual;
3. Check pumps and pumping rates; and,
4. General maintenance as required.

Currently, All of the wastewater lines are 4 inches in size or larger. Any new line construction should be 6-inches or larger.

The City of Whitesboro has an extended aeration sewage treatment plant permitted by TNRCC for 0.450 mgd and discharging to a tributary of Big Mineral Creek. It was put in operation in 1973. The plant suffers from wet weather hydraulic overloading and deteriorating equipment.

The current design capacity is not meeting the needs of the current population and definitely will not accommodate the anticipated future growth during the planning period if inflow and infiltration is uncontrolled. No special sewer treatment is needed in Whitesboro.

In regards to sanitary sewer system improvements the highest priority and greatest community needs are ranked as follows:

1. Take out of service the Walsh Lift Station and gravity flow outfall to waste treatment plant.
2. Replacing existing clay tile lines and controlling the existing infiltration/inflow problems in older south and western Whitesboro.

3. Double the capacity of existing wastewater treatment plant to overcome the hydraulic overloading of the plant.
4. The replacement of older wastewater lines and lift stations in key locations throughout the City.
5. Making provisions for future development

In analysis of the wastewater system, standards for review are as follows:

1. No wastewater lines other than house laterals and force mains shall be less than 6 inches in diameter.
2. All wastewater lines shall be designed and constructed with hydraulic slopes sufficient to give a velocity when flowing full of not less than 2.0 feet per second.
3. Wastewater lines should be laid in straight alignment where possible with uniform grade between manholes.

4. Manholes should be placed at points of changes in alignment, grade or size of wastewater line, and at the intersection of wastewater lines and the end of all wastewater lines that will be extended at a later date.
5. Brick manholes should be eliminated to control infiltration.
6. The inside diameter of the manholes shall be not less than 4 feet.
7. Provide an average of 100 gallons of wastewater treatment facilities per capita.
8. Wastewater lines shall be designed for the estimated future population to be served, plus adequate allowance for institutional and commercial flows.
9. Wastewater and water lines shall be installed no closer to each other than nine feet between outside diameters.

# **WASTEWATER SYSTEM PLAN**

The Action Plan listing priorities, estimated costs, and possible funding sources has been developed and presented. Improvements to the Whitesboro wastewater system, which comply with Texas Natural Resources Conservation Commission and Environmental Protection Agency standards, will be an integral part of an overall Five-Year Capital Improvement Program for the City. The recommended wastewater system improvements have been indicated on Figure 10.

**GOAL - THE GOAL OF THIS PLAN IS TO EFFECTIVELY PROVIDE FOR THE ADEQUATE TREATMENT AND COLLECTION OF WASTEWATER FOR ALL AREAS OF THE CITY DURING THE NEXT FIVE YEARS AND TO PROVIDE FOR FUTURE GROWTH.**

### **First Priority**

The First year construction activities include the replacement of the Walsh Lift Station with a gravity flow line north and east to the wastewater treatment plant.

The cost of this project is approximately \$280,000

### **Second Priority**

The Second priority is the construction activities to replace clay tile lines and address inflow and infiltration problems in the southern sector of the City. The wastewater lines will be installed in the following easements and Streets:

Common Street

South Union to Collinsville

Charter Street	South Union to Collinsville
Wade Street	South Union to Collinsville
West South Street	West of Church to Market Ct.
Market Ct. and South	South St. to Walnut
Walnut Street and easterly	Market to Depot
Broadway Street	Charter South to Walnut ext.
Carver Street	Abney South
Abney Street	Sunset West
R.O.W.	Abney to north side of Whitecotton pk.

The cost of this project is approximately \$290,000

### **Third Priority**

The third priority is to double the size of the wastewater treatment plant.

The estimated cost of this project is \$2,200,000.

#### **Fourth Priority**

The fourth priority project is the replacement of a wastewater main in right-of-way from S.H. 377 to U.S. Highway 82.

The anticipated cost of this project is \$195,000

#### **Fifth Priority**

The fifth priority is the construction of a new and larger lift station and the deactivation of 2 lift stations and the construction of new force main and new gravity flow lines in the southeastern sector of the City. The activities are in the following locations:

Lift Station	Sherman Drive at Creek
Force Main	Lift Station to existing force main
Gravity Main	Depot Lift Station to New Lift Station
Gravity Main (Bois D' Arc)	East Main to North Avenue

The anticipated cost of this project is \$535,000.



### **Sixth Priority**

The sixth priority is the construction of a gravity wastewater line from the proposed priority 5 lift station to the northwest.

The anticipated cost of this project is \$122,500.

Several sources are available for funding of the Five-Year Action Plan. Sources could include applying for Texas Community Development Grant funds, Texas Capital Funds, F.H.A. loans, Revenue Bonds, **Private Sector funds, and impact fees**, and using local inkind labor and equipment on a pay-as-you-go method.

Future Development outside of the existing urbanized area will need to be addressed in an orderly fashion. Because of this the plan map identifies wastewater system collection mains, lift stations and force mains that will be necessary to address growth in undeveloped portions of the City as well as the Extra Territorial Jurisdiction. The proposed facilities generally follow existing drainage basins with lift stations placed strategically at the lowest elevations to maximize the potential size of the service areas. Force mains are then projected back towards existing development. Care needs to be taken to

ensure that the downstream lines are sized adequately to handle the drainage basins that are proposed to be added to system. These lines should be funded and built using the Subdivision Ordinance and by the establishment of Impact Fees by the City.

# **CENTRAL BUSINESS DISTRICT**

# INTRODUCTION

## IMPORTANCE OF THE CBD

Historically, the Central Business Districts of American communities have enabled the development and expression of localized culture, and have been the primary catalysts for growth in commerce and trade. Central Business Districts are typically the outgrowth of concentrated commercial activity, supplying the financial power needed to attract and organize increased population density and associated growth in demand for support services.

Form is given to the CBD by the land uses it attracts. Common uses include: banks; offices; centers of government; post offices; centers of communication; retail stores; restaurants; personal services; places for cultural expression; meeting places of civic and social groups; streetscapes; and systems of supporting infrastructure. So long as the financial pull persists, the CBD maintains its vibrant, dynamic form.

So, from many standpoints, the CBD is the most powerful section of a city. A healthy, safe, attractive, and successful downtown area is a key factor in a community's image, growth and prosperity. Further, the CBD of every city is unique, serving as a collective face for a community that expresses identity, character, vitality, and local

values. When a community asks where it is in its process of growth and development, or what the community aspires to be in the future, very often it is the image of the local CBD that first comes to mind.

## **GENERAL ISSUES**

The following statements outline overriding observations which each community typically must consider relative to their own CBD. Sincere, organized discussion of such issues by local downtown merchants, City officials, and the general public usually will lead to productive public and private actions that are beneficial to the community.

1. There is a strong need to develop a Central Business District which is a safe, attractive and functional place for shopping, civic functions, cultural experience, and a wide range of other activities.
2. It is important to seek redevelopment opportunities as well as new development in the Central Business District which preserve the local identity and enhance the existing character of the community.

Generally speaking, the trend in most small town CBD's over the past two or three decades has been one of general decline, as demonstrated by large numbers of vacant and under-utilized buildings, deteriorating infrastructure, vacant lots, and a general lack of use and vitality. These conditions are frequently symptomatic of the CBD's inability to compete with newer shopping centers, regional malls, and/or the commercialization of bypass highways. Additionally, because there is little economic incentive, vacant buildings and lots and associated infrastructure are usually poorly maintained, thus contributing to a CBD's unfortunate, common tendency to have a shabby, unattractive appearance. The primary difference between most struggling CBD's is the scale or degree of these symptomatic problems.

Stated another way, a scenario followed by many CBD's can be described as follows:

(a) At a strategic connection to transportation, the Central Business District springs into being for practical, economic reasons, becoming the heart of a local post agricultural human settlement pattern.

(b) The typical CBD thrives as a center of specialized activity, where people share news on the street corners, wares are marketed, services provided, essential supplies purchased, and social/cultural interaction is sought.

(c) As the overall town grows, and transportation technology evolves, the

commercial land uses often migrate toward the more modern transportation network, creating new activity nodes and enabling larger expanses of urbanized areas. As such land use migration occurs, the bypassed CBD is no longer the center of activity.

(d) Communities normally realize too late that their CBD (and often their unique identity) has been replaced by shopping malls, discount centers, dispersed shopping areas, and strip commercial development serving passerby traffic.

The best solution to the all too frequent scenario described above is prevention. However, even if the scenario of deterioration has already run its course, most CBD's can once again become a vital part of the community, especially if the remnants of the CBD are desirably located, and are maintained and rehabilitated in a manner that is attractive to the trade area. The rejuvenation depends on a concerted effort of business owners, city officials, and customers. A dying CBD made active again can have a youthful, exciting effect on the entire community. Working toward realization of such a common community vision requires participation of community leaders in implementing a viable plan.

## **PURPOSE OF A CBD PLAN**

The purpose of the Central Business District Plan is multi-fold. The CBD Plan should first provide the vision and incentives to inspire coordinated, positive action by local leadership. The Plan should serve as a long-range guide for scheduling improvements in the CBD, and for evaluating proposals for physical changes affecting the CBD. The Plan should also be used as a framework for developing policies for zoning, building codes, and other regulatory instruments. A plan can be used as a guide for making recommendations and establishing priorities regarding capital improvement programs for the CBD. So, the CBD Plan should serve as an information source and a policy guide that will be useful to citizens and business owners in making private investment decisions. Hopefully, the Plan will also create confidence in a positive socio-economic future for the entire community.

## **OPPORTUNITIES FOR THE SMALL CBD**

A small group of businesses which are part of a town center have a set of potential advantages all their own. The more of these factors present, the more easily a CBD can become commercially potent and vitalized. The potential advantages of these small groups in a CBD are summarized as follows:



1. Quick access to frequently needed items such as everyday retail purchases, personal services, etc. without requiring a significant travel;
2. Availability of selected goods and services not supplied by the typical outlet, such as a specialty line of clothing, a quality gift shop, a fresh fish market, etc.;
3. Opportunity for personal relationships with customers, clients, and patients, (and an intimate knowledge of their preferences, needs, and credit standing), and conversely, the customer's knowledge of where to find a trustworthy product or professional;
4. Accessibility for bicyclists/walkers, especially the elderly and the young;
5. An unhurried, low-pressure atmosphere, which turns errands into excuses for social outings instead of rushed pursuits;
6. Relative safety in a familiar and uncrowded area where parents can keep track of children and the elderly are not intimidated;
7. Entertainment value found in any special features the place may have, such as bandstand concerts, an outdoor cafe, or a sidewalk fair;

8. Prevalence of unique character, flavor and surprises offered by a city center which has evolved over the years, as contrasted to the cookie-cutter package design of even the best malls;

9. Presence of locally-oriented services such as the community post office, banks, utility companies, library, etc.;

10. A safe place for community activities, whether political, ceremonial, artistic or institutional, and an interesting place for informal daily contacts;

11. Development which can serve as the civic symbol, a sense of place, of character, of history, of culture; and,

12. A source of human resources for volunteer services, such as volunteer fire fighters or service clubs.

# **INVENTORY & ANALYSIS**

## **BACKGROUND**

Whitesboro's existing Central Business District is generally defined as a compact 33.5-acre area containing primarily governmental, church, retail and service uses facing onto Main Street of which part is a boulevard street section. The perimeter of the Whitesboro CBD is formed by the outside lot lines of the lots fronting onto Main Street between Church Street and Broadway Street, and Along Union Street between Hall Street and Water/Charter Street. Furthermore, the CBD is located close to the geographic center of the developed portion of Whitesboro, with most of the Whitesboro population being located within a mile radius of the CBD.

Overall, the CBD is a well-defined, readily identifiable, almost rectangular area convenient to the Whitesboro citizenry. For Whitesboro, the CBD is very compact and manageable. Though there are some exceptions, the buildings are mostly in fair to good condition. The streets of the CBD are in mostly good condition except for several small areas where surface deterioration has occurred.

The buildings within the CBD are low rise (1 to 2 stories), with some of the buildings having historic preservation potential. The walkways are generally wide enough to

accommodate comfortable pedestrian access to buildings and provide some room for improvements to the CBD pedestrian atmosphere.

The general land use pattern in the vicinity around the CBD consists primarily of park, churches and residential land uses.

The majority of competing commercial uses within Whitesboro are primarily located north of the Central Business district along U.S. 82 (see Figure 11). Housing near the CBD is found to be in mostly good condition with some minor to major stages of deterioration. For a more in-depth analysis of housing, see the Housing section in this Plan.

Like many Texas CBD's, the Whitesboro CBD is experiencing some vacancy which may be attributable to larger scale retail opportunities within a reasonable driving distance of Whitesboro. The primary competing CBD's and major shopping areas for Whitesboro are located in Sherman (18 miles to the east), and Gainesville (15 miles to the west). Whitesboro will have to assure a pleasant, unique retail, service, and entertainment opportunities to attract and maintain businesses and customers from their greater service area in order to address their minor CBD building vacancy rate (see OPPORTUNITIES FOR THE SMALL CBD above). Also, coordination of CBD plans and policies with future economic development efforts will be imperative.

## EXISTING LAND USE

As shown in Figure 12, existing land use in Whitesboro's CBD is typical of many small town CBD's. Small-scale heavy commercial, retail, service, and municipal/public uses are concentrated in the CBD. Vacancies in the CBD allows for adequate land use planning options for future CBD enhancement. The land use pattern in the CBD is organized around a boulevard street in a logical and orderly fashion. Also noteworthy is that Whitesboro has a mix of appropriate businesses that enhance the advantages of a small downtown, has some historic structures, is close to a park, and is traversed by proposed open space linkage trail system.

The building conditions, as illustrated by Figure 13, offer opportunities for feasible improvement. Since some of the buildings have a pleasing character, there is opportunity for historic preservation upon improvement of building conditions. The buildings designated as structures with major deterioration need to be removed or, if economically viable, completely renovated as soon as possible, as such structures are unsightly, sometimes unsafe, and often an economic liability to the CBD.

The CBD area, as defined contains approximately 144,930 square feet of total non-residential/church floor space. This figure includes 27,059 square feet of public/semi-public occupied floor space. The vacant floor space is approximately 7,447 square

feet, which is about 5 percent of the available non-public/non-semi-public floor space.

Increased occupancy in the near future will hopefully be achieved so that the costs and blight effect associated with future deterioration can continue to be avoided.

Figure 12 indicates the existing vacancies in the CBD area.

It should also be noted that the total commercial floor area in the CBD is 62,240 square feet while the total floor area for service use is 48,148. Additionally, it should be emphasized that the ratio of total used space to vacant space in the CBD is 19:1, which should be maintained or improved to assure the future vitality of a CBD.

Existing city-wide commercial acreage stands at 76.3 acres, according to the existing land use plan. Of this total commercial acreage, 6.8 acres of gross land area are currently used for commercial/service uses in the CBD Study Area. Therefore, the CBD accounts for nearly 9 percent of the total commercial land use in the City. As indicated in the city-wide land use plan, it is recommended that the City not encourage significant areas of new commercial development serving *local* retail needs, as Whitesboro's compact downtown must serve as the primary destination for local retail demand if Whitesboro's CBD is to grow in strength. **Highway oriented commercial is the only commercial recommended outside the CBD.**

## EXISTING ACCESS FACILITIES

As indicated in Figure 14, most of the traffic comes in and out of Whitesboro's CBD by way of S.H. 377 from the north and S.H. 56 from the east and west. According to the 1998 Texas Department of Transportation estimates, the average daily traffic count just east of the CBD on S.H. 56 4,900, and falls off west of town to 4,300 ADT. S.H. 377 north of the CBD carries an ADT of 5,100 and quickly falls off to 2,700 ADT south of the CBD.

Upon further analysis of the foregoing Texas Department of Transportation ADT volumes, several observations are in order. The street widths and configurations in Whitesboro CBD are adequate for the existing traffic volumes and have enough excess capacity to service a rejuvenated CBD. The traffic volumes seem to indicate that the Whitesboro CBD serves a fairly significant portion of the **local** market area. In terms of any future changes to the existing thoroughfare configuration, there appears to be no need for modification within the CBD. In terms of future land use, there are numerous configurations that may be considered as there is enough excess thoroughfare capacity to consider many options.

In summary, thoroughfares are not a constraint for planning the Whitesboro CBD. Fortunately, most streets in the CBD are in fair to good condition, have adequate width, and are two-way. Common Street and Williams Street are not expected to

carry heavy traffic loads.

As illustrated by Figure 14, traffic controls serving the CBD consist of 12 stop signs and 1 signalized intersection. All normal turning movements are allowed in the CBD except for Buck Rodgers Street which is a south bound only facility. The traffic controls appear to be adequate for existing and future traffic volumes and traffic patterns.

The current parking pattern is shown in Figure 15. Most of the CBD is served with angle on-street parking along most of both sides of the majority of the streets of the CBD. The CBD has existing off street parking along Mineral and Common Street as well as off street parking associated with the post office and other free standing buildings. Also, locations of handicapped parking and ramping are shown on Figure 14 and are inadequate in number and location (see ADA discussion below).

Also indicated in Figure 14 are the locations of curb and gutter in the CBD, which we found to mostly be in fairly good condition. Sidewalks vary from property to property in the CBD (see Figure 14, 16 and 17). The CBD sidewalk system needs considerable improvement. Sidewalks of appropriate widths and in good condition need to be provided to serve every property in the CBD. Sidewalk furnishings, lamps, and fixtures as well as special treatments and pavement patterns are especially needed to further enhance pedestrian environment and historic redevelopment of the CBD.



FIGURE 16

## CITY OF WHITESBORO

### SIDEWALK CONDITIONS



Existing sidewalks change condition from property to property. The sidewalk shown is in poor condition.

This sidewalk has an abrupt change in elevation provided by two steps. This scenario is not acceptable to provide for handicapped access to the CBD.



FIGURE 17

## CITY OF WHITESBORO

### SIDEWALK CONDITIONS



This handicapped ramp is too steep to provide appropriate wheel chair access. Additionally, the totally Blue space is not an asset to the CBD.

This sidewalk section is in poor condition. The area for pedestrian traffic is too narrow.



With regard to American Disabilities Act (ADA) requirements, the Whitesboro CBD does not appear to be totally accommodating of the needs of handicapped persons. The inventory of handicapped parking spaces and ramps shown on Figure 15 illustrates that ramps have been provided in various locations. However, several of the ramps are too steep and in some instances lead to sidewalks that have steps as changes in grades as illustrated in Figures 16 and 17. It is recommended that a comprehensive handicapped ramp program be implemented along with curb and sidewalk adjustments. Appendix D, which contains an excerpt from **THE ELIMINATION OF ARCHITECTURAL BARRIERS PROGRAM**, as established by Article 7, Article 601b of Texas Revised Civil Statutes identifies various curb ramp solutions. These standards along with ADA standards should be used when constructing the handicap related improvements.

## **OTHER EXISTING CONDITIONS**

The core of the CBD has many attributes that contribute to the overall appearance. These attributes include the landscaped median with trees and historical well and marker, trees at various mid and end block locations and seating areas with planters. Several examples of these elements are shown in Figure 18 and 19.

FIGURE 18

## CITY OF WHITESBORO

### EXISTING DESIGN FEATURES



Existing landscaped median with well and historical marker. One-way traffic is provided on each side of median, which minimizes traffic conflicts. Additionally, this feature adds a valuable greenbelt appearance to the CBD.

Streetscape showing mid-block planters with trees and benches. Four areas of similar nature are provided along Main Street between Union and Center Street.



Other areas lacking urban design elements impacting the economics and functional ambiance or identity of the Whitesboro CBD which need to be addressed include: historic preservation of buildings; street and sidewalk furniture; public and private signage, awnings and cornices; sidewalk and intersection paving patterns, and improvements for tying into the proposed city-wide multi-purpose trail system. Additionally, the addition of the proposed city hall to be constructed at the northwest corner of North Union Street with Main Street will add to the success of the CBD and the overall appearance. This appearance will come in the way of landscaping and the addition of a "Town Clock" as a focal point.

## **CENTRAL BUSINESS DISTRICT PLAN**

### **GOALS**

Based on the perspective contained in the introduction and the foregoing analysis of the existing conditions, the following more specific goals have been formulated:

**GOAL 1: TO ENABLE THE ECONOMY OF WHITESBORO TO PROVIDE SUFFICIENT AND VARIED GOODS, SERVICES, AND CULTURAL**

**OPPORTUNITIES THAT MEET THE NEEDS OF THE COMMUNITY AND PROVIDE EMPLOYMENT OPPORTUNITIES FOR ITS CITIZENS.**

**GOAL 2: TO PRESERVE AND ENHANCE THE INTEGRITY OF THE PROPERTY VALUES THAT CURRENTLY EXIST WITHIN THE CENTRAL BUSINESS DISTRICT.**

**GOAL 3: TO CREATE NEW DEVELOPMENT AND REDEVELOPMENT OPPORTUNITIES THAT WILL ENERGIZE THE CBD AND HELP IT BECOME AN ATTRACTIVE FOCUS AREA AND A DESTINATION FOR A WIDER REGIONAL CLIENTELE.**

**GOAL 4: TO CREATE A VIABLE, ACTIVE, AND SECURE PEDESTRIAN ENVIRONMENT THAT: ENLIVENS THE CBD EXPERIENCE; PROVIDES OPPORTUNITIES FOR GREATER CULTURAL EXPERIENCE AND SOCIAL INTERACTION; AND PROMOTES VISUALLY EXCITING URBAN ACTIVITY.**

**GOAL 5: TO ATTRACT PRIVATE INVESTMENT WITH PUBLIC FACILITIES AND PUBLIC ENCOURAGEMENT OF LAND USES THAT CREATE MARKET DEMAND.**

Contained within the following section of the Central Business District Plan are short and long-range objectives and associated recommendations to carry out the above identified specific goals for the CBD.

## **OBJECTIVES/RECOMMENDATIONS**

### **1) Organization**

A. By late -2001, form a representative CBD implementation Committee of dedicated individuals to: (a) oversee the implementation of the CBD goals, objectives, and recommendations; and (b) coordinate with the Economic Development Board.

#### **\* Recommendations**

- Appoint special task forces (each chaired by a member of the Implementation Committee) to lead special interests and skilled professional assistance in addressing the following areas of plan implementation: Land Use; Access; Public Facilities; Urban Design; and Marketing.

- Top priority must be given to obtaining community "buy-in" and commitment to all phases of plan implementation. Key opinion leaders and City officials must be in

support of the implementation effort in order to maximize success. Education of the citizenry and the merchants, as well as incentive offerings are critically important.

- The implementation Committee should direct the effort to obtain public and private grants, as well as other funds and incentives needed to implement the various elements of the CBD plan.

- Coordination of the efforts of the various special task forces must be given high priority in order to assure a consistent, comprehensive perspective, and to encourage synergistic relationships among the individual task forces.

## **2) Land Use**

A. By mid-2000, adopt land use policies that are consistent with the goals section of this plan and apply the adopted policies as a guide for investment and zoning decisions affecting the CBD.

### **\*Recommendations**

- Encourage sit-down restaurants, professional and municipal offices, retail stores, cultural uses and activities, personal services, and pedestrian oriented land uses to locate and/or remain within the CBD, even if it requires a change in the zoning



ordinance. Locating large retail facilities (serving mostly local needs) outside the CBD is a certain way to thwart the revitalization of the CBD. The U.S. 82 frontage outside the CBD is best used for highway oriented uses (e.g. motels, gas stations, car lots and small drive-thru, fast food restaurants).

B. By the end of 2001 adopt and begin monitoring and influencing the implementation of the CBD future land use plan as illustrated in Figure 20.

\*Recommendations

- It is important for members of the land use committee to maintain a broad planning perspective and maintain an overall view of the relationship of the CBD to the rest of the community. Coordination with the Marketing Task Force and the City's zoning administration is critical.
- Make sure short range decisions affecting land use in the CBD complement longer range implementation measures, including the provision of amenities in public open space, expansion of parking, creation of a lively pedestrian environment, and encouragement of new near-town residential opportunities.
- Encourage the appropriate evolution of uses in the CBD. Uses locating in the CBD should be those which enhance the pedestrian/tourist experience such as retail shops and boutiques; restaurants with outdoor seating; galleries and museums; performing

arts; tourist services; hotels/inns, craft shops; and professional offices with a historic appearance.

### **3) Access**

A. In accordance with the schedule in the phased improvements portion of this plan, encourage appropriate parties to bring and maintain all streets, curbs, gutters and sidewalks in the CBD into good condition and in conformance with all ADA requirements.

#### **\*Recommendation**

- Make sure that the design of improvements in the CBD reflect the historic and planned urban design character of the area.

- Coordinate the final design with the Urban Design Committee.

- Handicapped parking should be well disbursed throughout the CBD, meet all ADA requirements and be convenient to ramping for required grade changes.

B. As the City implements the proposed city-wide, multi-use trail system, design and build an appropriate trail section linking the CBD to the city-wide trail system.

\* Recommendations

- Coordinate all design efforts with the Urban Design Committee, city hall, and the Recreation and Open Space Section of this Plan.

- Design a CBD trail node and section that gives the pedestrian a sense of arrival into an historic downtown, using such features as: brick paving patterns; an ornate bicycle rack and drinking fountain; a kiosk with a map and information for discovering the history and merchants of downtown; and old-fashioned street lamps(see Appendix E).

#### **4) Public Facilities**

A. By the end of 2001, in order to embrace the 21st century, honor the past, build community spirit, and create a sense of CBD identity, complete the construction of a **"Town Clock"** focal point at the northeast corner of Avenue A and First Street (see Figure19).

\* Recommendations

- In a joint effort lead by City Officials, make sure the design of the Town Clock: acts as an attractive, festive focal point; memorializes past leadership and/or events; and reflects the historic character of the CBD.

- Be creative and symbolic in designing the Town Clock. For example, one side of the clock could represent the past and the other side the future, thus symbolizing the community's journey through time; and/or provide special chimes that can be scheduled to go off at any chosen moment in time to signalize special events.

## **5) Urban Design**

A. By late-2001, appoint an Architectural/Historic Preservation Review Committee (AHPRC) to lead the implementation effort for CBD, and by the early-2002 adopt Urban Design Guidelines for AHPRC review of all CBD proposals for: redevelopment; new development; public facility improvements; and improvement of the pedestrian experience within the CBD.

### **\* Recommendations**

- Seek opportunities to integrate marketing themes, logo, and area identity developed by the Marketing Task Force into the urban design features addressed in the design guideline recommendations. Colorful banners or flags bearing the logo can be used to create a festive atmosphere.

- Add old-fashioned street lamps at key locations around the town square (see Appendix E).

- Historic buildings should be inventoried and scheduled for restoration.
- Special attention should be paid to restoring interesting architectural features such as building cornices.
- Make all awnings of a continuous, consistent design that do not detract from the cornices and historic character of the buildings. (e.g. a canvas awning system with a planned color and building identification/address system). Remove all existing canopies, awnings, and store front surfacing that are not consistent with the chosen awning system and the historic character of the buildings.
- Make all sidewalks as wide as possible (6 foot minimum) to provide room for pedestrians, and where possible, provide street furnishings, trees (existing street trees should be pruned and landscaped around their base), other landscape, and entertainment. Walks should: have a maximum grade of 5%; be of a continuous surface, not be interrupted by steps or abrupt level changes; be ramped to road level at crosswalks and changed in texture for the blind; be of a non-slip surface; and be attractive in appearance.
- Provide distinctive sidewalk, crosswalk, and street surfaces (e.g. intermittent or solid special paving patterns), placing the greatest emphasis on the entrances to the CBD.

- Provide street furnishings with historic character such as benches, sculptures, trash receptacles, light bollards, and designer sign posts.
- Encourage all signage to be small, artistic, and inviting.
- Use decorative plaques commemorating or expressing culture and history to add interest to the pedestrian experience in front of the CBD pocket park, and to maintain community spirit. Inset sidewalk plaques to honor past business leaders and take the pedestrian on a walk through time.
- Encourage sidewalk entertainment, sidewalk art, and vendors during special events. Thematic chalk work of school-aged children can add indigenous character and entertainment to many events.
- Encourage the use of murals (such as the one on east side of bank building at Center Street) to dress up the sides and rears of buildings, to reflect the history of Whitesboro and enhance the pedestrian experience.
- Encourage shop owners to "spill" their goods and services out of their buildings toward the street for browsing pedestrians during operating hours. Also encourage late weekend night hours and sidewalk seating.

- Create and maintain a safe, festive atmosphere using ample lighting, volunteer bicycle patrols, banners, scheduled entertainment, etc.

B. By the early-2002, review all City Codes and suggest any necessary changes for implementing the CBD Plan.

\* Recommendations

- Create an overlay district for the CBD that offers incentives and necessary flexibility for meeting design guidelines.

## **6) Marketing**

A. By mid-2001, assess the strengths and weaknesses, opportunities and constraints in the CBD market, identifying any "holes" or "niches" in the overall regional market the CBD fills or may fill (as the CBD Plan is implemented), as well as determining short and long term local market needs. This effort must be coordinated with all economic development efforts.

B. By the late-2002, identify strategies consistent with the CBD Plan to increase the market share of the CBD in the overall regional economy.

\* Recommendations

- Establish an enticing theme, identity, slogan, and logo that communicates well with both local citizens and those players key to implementing marketing strategies.
- Target markets that are most likely to be receptive to marketing efforts, and design the marketing information to appeal to those targeted markets.
- "Get the word out" using well-crafted messages for: networks of contacts associated with community leadership; advertising media; quality brochures; and trade show and association information.

C. In mid-2002, begin work on strategies for developing and maintaining local interest in participating in and promoting CBD revitalization, and begin implementing those strategies by mid-2003.

\* Recommendations

- Develop a Shop Whitesboro Program to help bring back customers from competitors in towns such as Sherman and Gainesville.
- Where feasible, enhance and add to the existing calendar of events, emphasizing coordinated efforts such as: sales promotions (e.g. dollar days, sidewalk sales,



midnight madness, clearance sales, etc.) grand openings, seasonal promotions (coordinated decoration program) and special events (e.g. holiday events, concerts, street fairs, fund raisers, arts and craft shows, antique days, festivals, farmer's markets, parades, etc.)

- Involve the community in efforts "showcasing" the community in unique efforts that reflect local culture and draw tourism.

- Hold gala celebrations that mark each key success in implementing the CBD plan.

## **CBD PHASED IMPROVEMENTS**

The improvements set forth in the Central Business District Plan are very good projects for the City; however, they would be classified in the "Wanted" category of the recommended Capital Improvements Program. Funding alternatives other than the use of Capital Improvement Programming include: (1) formation of a district where dues are collected for improvements, (2) private donations, (3) utilization of economic development sales tax revenue, and (4) the establishment of a Tax increment Fund area. Tax Increment Financing is utilized to establish a reinvestment zone for making improvements. The City makes improvements, which are financed by General

Obligation or Revenue Bonds. The total property value at the time the zone is created becomes the base value. The taxing entities continue to receive taxes generated from the base property value, but all future tax revenues above the base value are assigned to the Tax Increment Fund, which is used to retire the bonds.

Improvements identified as priorities to be implemented by the City of Whitesboro during the first five years of the planning period are ranked according to priority for implementation as follows:

1. Construct Town Clock, and Fountain Focal Point.

Cost: \$50,000 to \$60,000

Source of Funds: Time Warrant.

Construct new and improved handicapped ramps at presently unserved or under served street intersections.

Cost: \$20,000 to \$30,000

Source of Funds: City of Whitesboro general obligation bonds.

2. Construct sidewalk, curb, and gutter, improvements.

Cost: \$55,000 to \$65,000

Source of Funds: City of Whitesboro general obligation bonds.

3. Install uniform architectural lighting elements and street trees throughout CBD.

Cost: \$150,000 to \$200,000

Source of Funds: City of Whitesboro general obligation bonds.

4. Paint Mural on Building Wall adjacent to South Union Street and south of Main Street.

Cost: \$0 to \$5,000

Source of Funds: Donation.

5. Construct enhancements for pedestrian crossings.

Cost: \$50,000 to \$60,000

Source of Funds: City of Whitesboro general obligation bonds.

Other cost for CBD improvements during the planning period will be private but coordinated expense.

It needs to be mentioned that the CBD is not adequately provided fire protection at this time (See Figure 7). This problem is being addressed by the Water Plan element of this study. Fire hydrant protection in the CBD needs to be provided from at least an 8-inch or larger line.

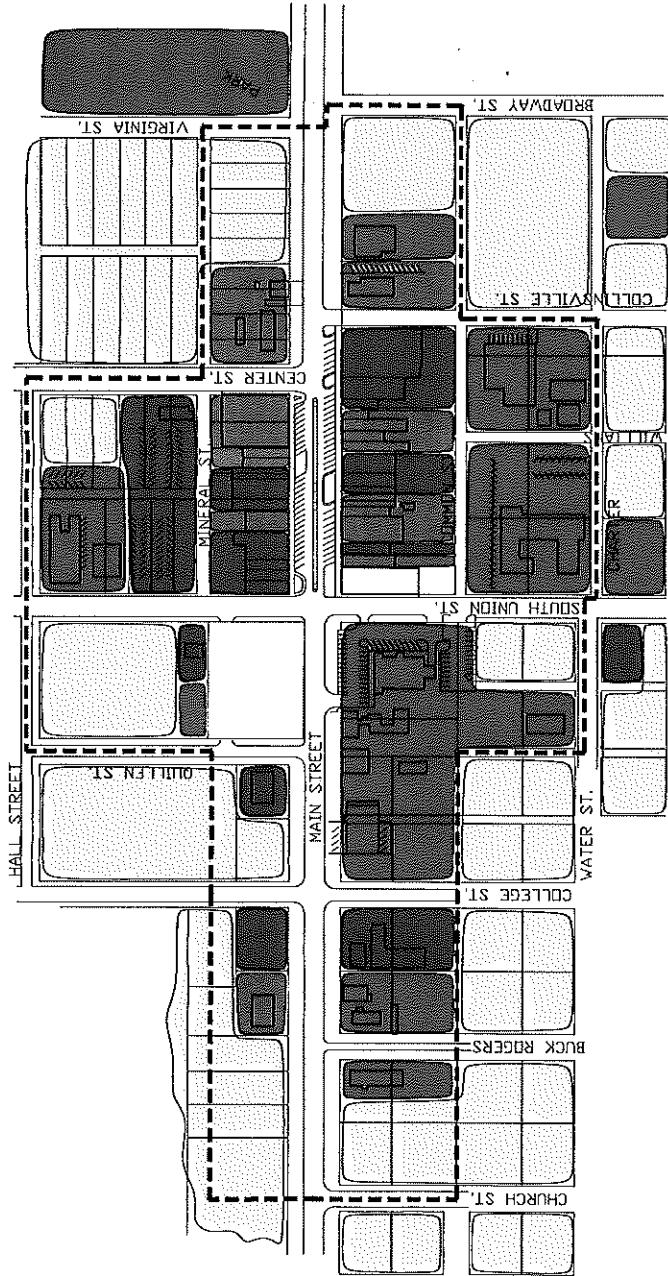


FIGURE 12  
CENTRAL BUSINESS DISTRICT  
EXISTING LAND USE

- SERVICE
- COMMERCIAL
- RESIDENTIAL
- VACANT BUILDING OR LAND
- PUBLIC/SEMI-PUBLIC

## CITY OF WHITESBORO



0 50' 100' 150'  
DECEMBER, 2000

FINANCED  
THROUGH THE  
TEXAS DEPARTMENT OF HOUSING AND COMMUNITY AFFAIRS  
STATE OF TEXAS

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CONSULTING ENGINEERS  
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AND  
MAURICE SCHWABKE & COMPANY  
1200 SOUTHMOOD BLVD.  
ARLINGTON, TEXAS

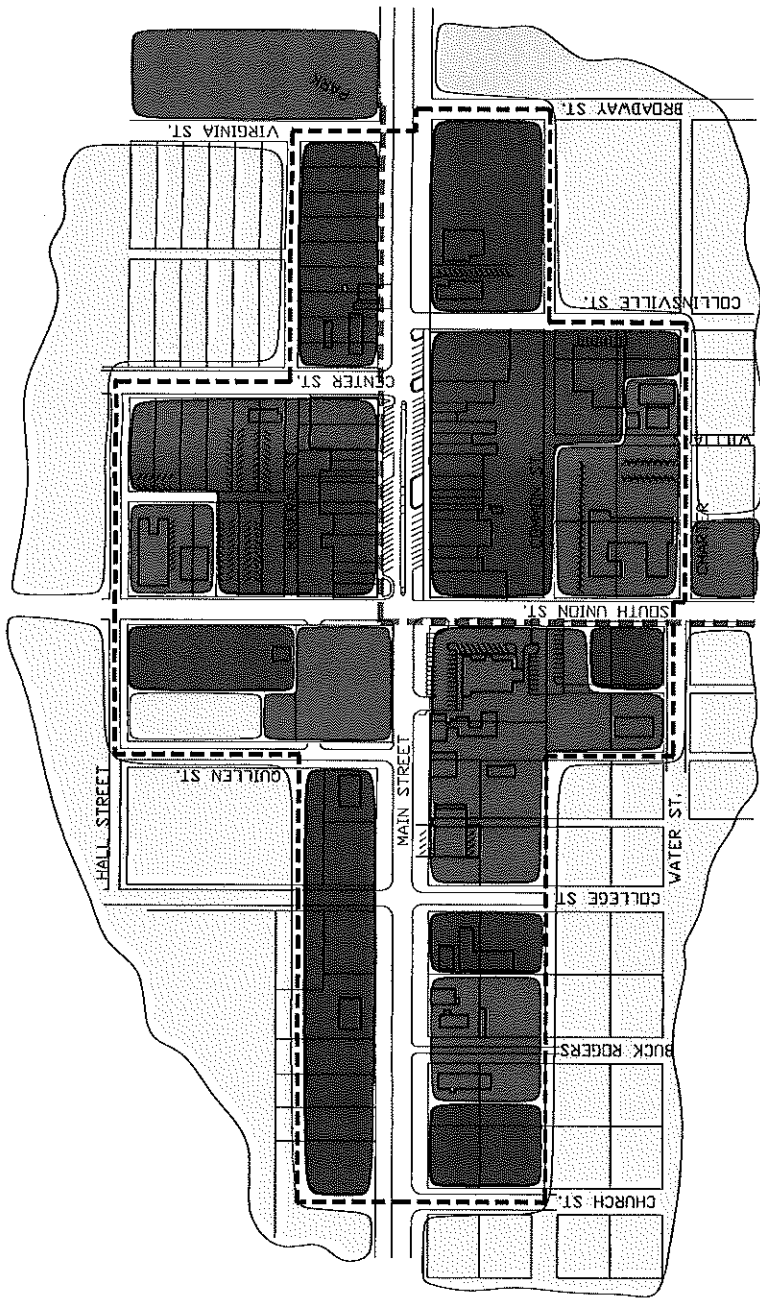
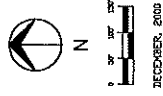


FIGURE 20  
CENTRAL BUSINESS DISTRICT  
FUTURE LAND USE

- RETAIL/COMMERCIAL
- RESIDENTIAL
- ▨ INSTITUTIONAL
- ▧ OPEN SPACE
- - - - - PART OF CITY WIDE TRAIL SYSTEM

## CITY OF WHITESBORO



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MAURICE SCHWABKE & COMPANY  
1808 SOUTHWIND BLVD.  
ARLINGTON, TEXAS

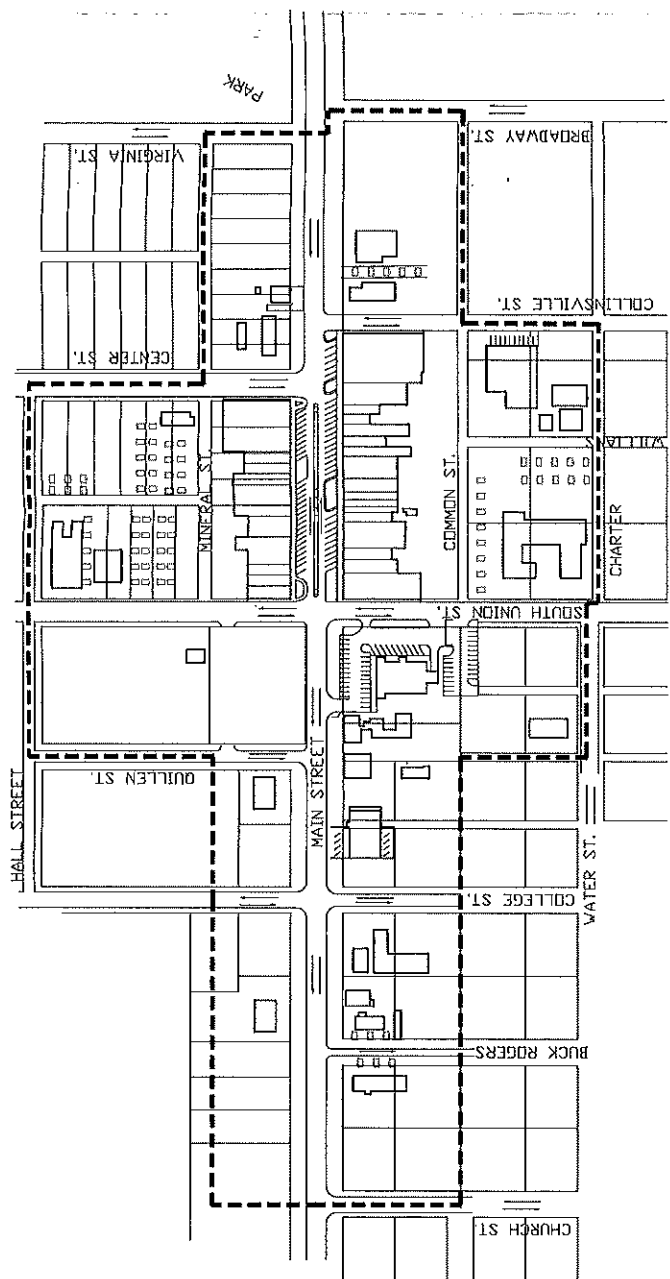


FIGURE 15  
CENTRAL BUSINESS DISTRICT  
PARKING PATTERN

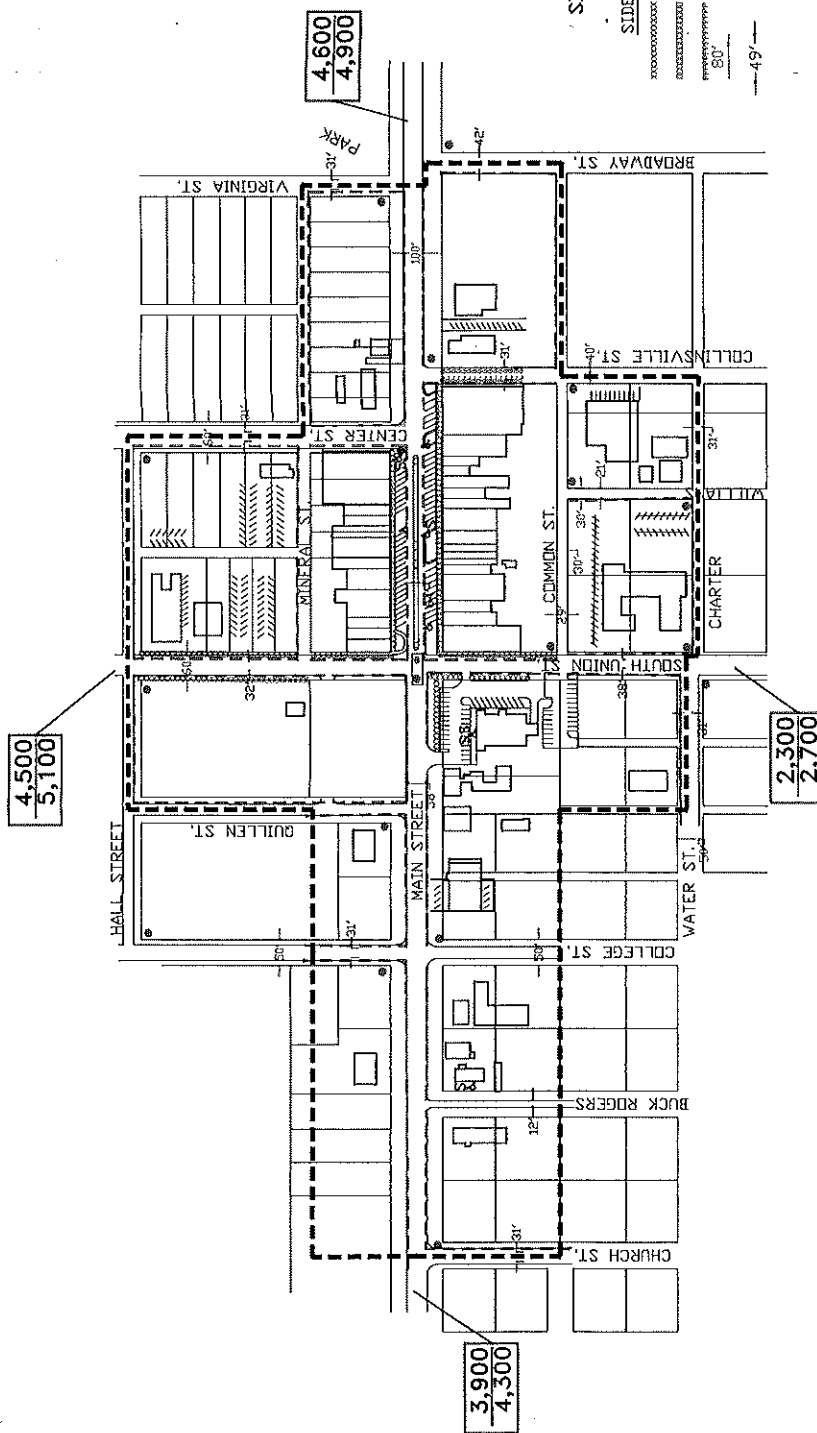
○○○○○ OFF STREET PAVED PARKING SPACES  
 OR AS SHOWN  
 \\\ \\\ \ ON STREET ANGLE PARKING SPACES  
 ——— ALLOWED TRAFFIC MOVEMENTS  
 NOTE: ALL TURNING MOVEMENTS ARE ALLOWED

# CITY OF WHITESBORO

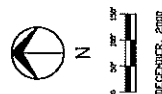


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PREPARED THROUGH A JOINT VENTURE OF  
 SOUTHWEST CONSULTANTS  
 P.O. BOX 1000  
 RICHARDSON, TEXAS  
 AND  
 MAURICE SCHWABE & COMPANY  
 1209 SOUTHWOOD BLVD.  
 ARLINGTON, TEXAS



# CITY OF WHITESBORO



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**9,400**  
**19,400**

**1997 TRAFFIC COUNTS**  
**1998 TRAFFIC COUNTS**

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SOUTHWEST CONSULTANTS  
P.O. BOX 84834  
DALLAS, TEXAS 75284-0834  
AND  
MAURICE SCHWABKE & COMPANY  
1209 SOUTHWOOD BLVD.  
ARLINGTON, TEXAS

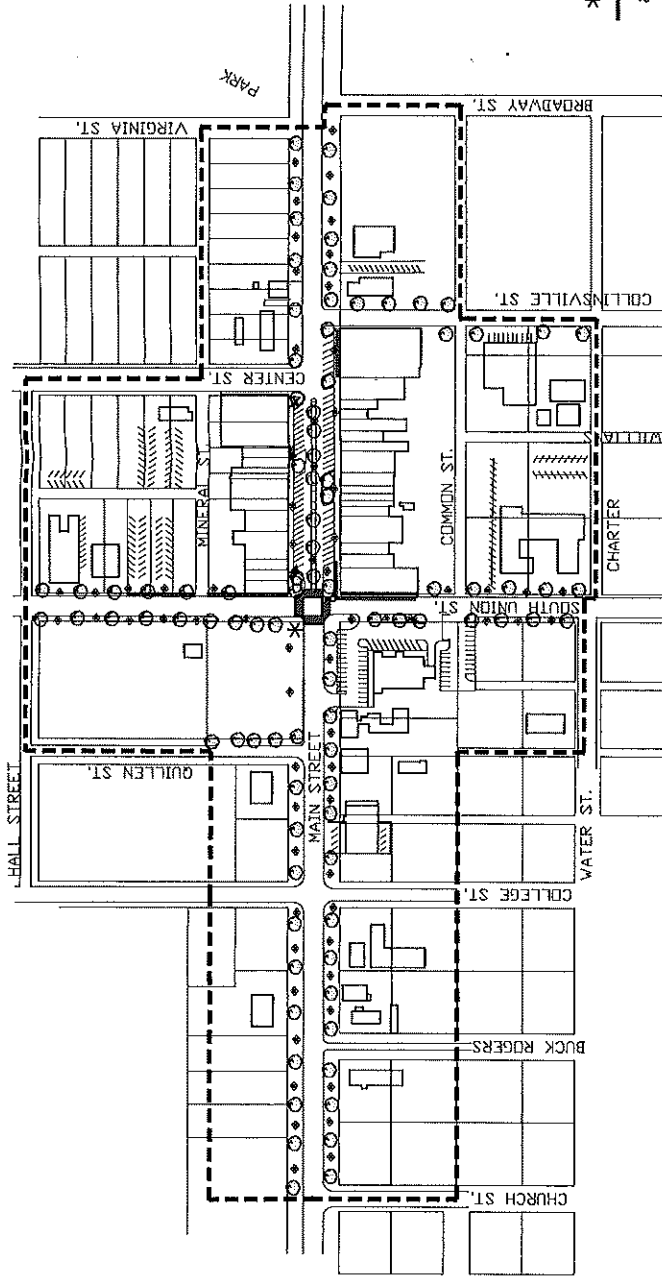


FIGURE 19  
CENTRAL BUSINESS DISTRICT  
OBJECTIVES/RECOMMENDATIONS

- \* TOWN CLOCK (PRIORITY 1)
- & PROPOSED SIDEWALK IMPROVEMENTS (PRIORITY 2)
- + HANDICAP RAMPS (PRIORITY 1 & 2)
- PROPOSED LIGHTING (PRIORITY 4)
- ⊙ STREET TREE (PRIORITY 4)
- ⊛ PROPOSED MURAL (PRIORITY 3)
- PEDESTRIAN CROSSING (PRIORITY 5)

## CITY OF WHITESBORO



0 50' 100' 150'  
DECEMBER, 2003

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AND  
MAURICE SCHWABKE & COMPANY  
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ARLINGTON, TEXAS



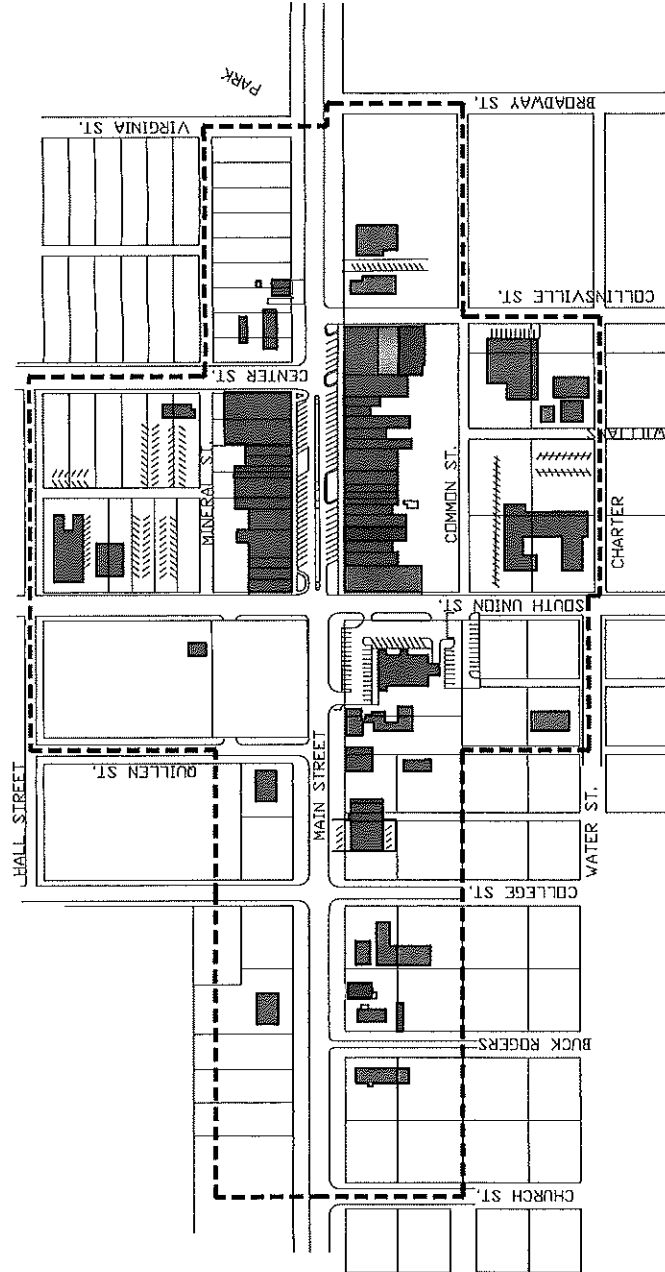


FIGURE 13  
CENTRAL BUSINESS DISTRICT  
BUILDING CONDITION\*

- SOUND
- MINOR DETERIORATION
- MAJOR DETERIORATION

\*BUILDING CONDITION DOES NOT INCLUDE RESIDENTIAL

## CITY OF WHITESBORO



DECEMBER, 2000

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PREPARED THROUGH A JOINT VENTURE OF  
SOUTHWEST CONSULTANTS  
P.O. BOX 8088  
RICHARDSON, TEXAS  
AND  
MAURICE SCHWABE & COMPANY  
1000 UNIVERSITY BLVD.  
ARLINGTON, TEXAS

# **CAPITAL IMPROVEMENTS**

# INTRODUCTION

The Capital Improvement Program is a five-year expenditure plan providing the City with a comprehensive view of major facility needs and financing strategies. It is both a funding strategy, in part dictated by the various restrictions on funding sources, and a program plan reflecting the City's priorities. The majority of funds within the Capital Improvement Program are restricted for use and are not available to offset the operating expenses.

The CIP examines the infrastructure and capital needs of the City for the next five years. The CIP should be reviewed and updated on an annual basis to reflect the changing needs of the community and changes in available funding for financing capital projects. The CIP should be considered as a financial planning tool that lists the City's capital improvement projects, and schedules the projects for funding and implementation. The CIP should also be considered one of the primary policy-making instruments utilized by the Mayor and City Council.

The City finances capital improvements primarily on a pay as you go basis utilizing revenue from the general fund and operating revenues from and Water & Sewer Fund. Long-term debt is considered and utilized only for projects that are of such dimension as to warrant a bond issue.

Projects are identified and funded taking into consideration government imposed mandates, usefulness to the community, and affect on operational expenses. Projects which have a total cost of \$ 25,000 or more should be included in the CIP. Projects in the CIP may include the following:

obligations for labor, materials, and contractors involved in completing a project, acquisition of land or structures, engineering or architectural services, and other professional services, expenses for City vehicles and equipment used on construction projects, renovating or expanding City facilities and grounds, significant maintenance or repair cost extending useful lives or facilities.

The Capital Improvements Program is the City's recurring commitment for the planning and design to upgrade, expand and/or construct new buildings, parks, grounds, open space, streets, and sewers. The intent of CIP is to serve as a guide in the provision of new facilities; to meet the increasing demands for Capital Improvements created by outdated facilities, growth and ever-changing building codes and methods in the industry. CIP should continue with its primary goal in assisting to define City Government and Community goals and policies that will eventually lead to their implementation.

## **WHAT IS A CAPITAL IMPROVEMENT?**

Capital Improvements are major projects undertaken by the City that are generally not recurring and are either: 1) any project, facility, or equipment that will cost \$25,000 or more and last longer than five (5) years; or 2) Long-range plans or studies of capital projects, facilities or equipment that will cost \$4,000 or more. The capital improvement program is reviewed in conjunction with the annual operating

) budget, but is not dependent upon it since the funds for capital improvements come from the Capital Replacement monies that are appropriated each year in the annual budget. However, the capital improvement should be reviewed each year and revised as necessary which will also change the Five Year Capital Improvement Program.

## PRIORITY SCHEMES

) There are various rating schemes available for establishing capital improvements priorities. The following set of standards is briefly mentioned for evaluation of the capital improvements program. The standards discussed here are based on rating systems used in most cities with minor variations:

1.     **Mandatory** or essential projects are activities needed to protect life and health of the community. Projects classified under this category are projects of the highest priority.
  
2.     **Necessary** capital improvements are projects which are necessary for the convenience and conservation of endangered resources or for the completion of partially completed projects. Projects of this type include improvements which are considered necessary for a progressive growing community and for problems that do not endanger life or public health.

3. **Desirable** capital improvements are projects which protect property, replace obsolete facilities, reduce operating costs and add to the attractiveness of the community. Projects of this type are not considered absolutely necessary and may be deleted from the capital improvements program.
4. **Deferrable** projects are capital improvements of the lowest priority which can be postponed or eliminated from the capital improvements program because of questions over cost, timing, or need.

## FINANCIAL ANALYSIS

The City of Whitesboro has many sources of income. Typical for Texas municipalities, user/utility fees, ad valorem taxes, franchise taxes, and sales taxes are the more predominant forms of income. In Whitesboro, the revenues of the general fund and the enterprise fund (electricity, sanitation, water and sewer) have a significant split in amounts as shown in Figure 21. The revenue of Whitesboro is generated from electricity, sanitation, water and sewer portion of the enterprise fund at 76 percent and the general fund at 24 percent. The General Fund Revenue components are shown in Figure 22. Major components of the General Fund include ad valorem taxes at 27 percent, sales tax at 25 percent, franchise fees at 17%, ambulance subsidies at 9 percent, parks at 7 percent, Fines and Forfeitures at 6 percent, and all others combined at 9 percent. The following Table 9 indicates the past three complete financial statement's revenues for the General Fund and Enterprise Fund (Electricity, Sanitation, Water and

Wastewater).

TABLE 9  
**CITY OF WHITESBORO**  
**REVENUES BY FUND**

	1997	1998	1999
<b>General Fund</b>	\$ 910,692	\$1,007,032	\$ 1,161,738
<b>Enterprise Fund</b>	\$ 3,152,335	\$3,701,874	\$ 3,745,911
<b>Totals</b>	\$ 4,063,027	\$4,708,906	\$ 4,907,649

The City of Whitesboro prepares annual budgets as required by law and sound management. Budgets are important as they provide an effective tool for management and policy decisions. With careful consideration and thorough planning, budgets assist the City in tracking its finances, costs, and most importantly, whether or not a particular operation is losing money or is in the black.

The City of Whitesboro has a total indebtedness of \$682,657 including principal and interest. This indebtedness is made up of time warrants that were issued in 1997 to combine five existing time warrants and to provide for an additional \$153,227 for enterprise fund improvements. However, the City will be issuing \$2,200,000 of new debt by June to pay for a new city hall/police station and for electrical system improvements. For a review of all City indebtedness and future annual repayment schedules, Table 10 has been prepared.

TABLE 10  
**CITY OF WHITESBORO**

INDEBTEDNESS(PRINCIPLE AND INTEREST)

YEAR ENDING SEPTEMBER 30,	1997 TIME WARRANTS	NEW CITY HALL DEBT	NEW ELECTRICAL SYSTEM DEBT	TOTAL
2000	48,775			48,775
2001	48,775	110,000	90,000	248,775
2002	48,775	110,000	90,000	248,775
2003	48,775	110,000	90,000	248,775
2004	48,775	110,000	90,000	248,775
2005-2013	438,780			438,780
2005-2021		1,760,000	1,440,000	3,200,000
TOTAL	682,657	2,200,000	1,800,000	4,682,657

An important factor regarding debt is the ability to repay. This ability is affected by the overlapping debt and overlapping effective tax rate of all taxing authorities. The residents of the City of Whitesboro are faced with an overlapping tax rate of \$2.89115/\$100. The Values are broken down in Table 11. These rates are slightly higher than other overlapping tax rates in the Texoma Region of the State.



TABLE 11

## **CITY OF WHITESBORO**

### **OVERLAPPING TAX RATE**

<b>Taxing Authority</b>	<b>Tax Rate</b>
City	\$0.5/\$100
Grayson County	\$0.43884/\$100
Whitesboro ISD	\$1.85/\$100
Grayson CO. JC.	\$0.10311/\$100
Total	\$2.89195/\$100

## **RECOMMENDED STANDARDS OF DEBT LIMITATIONS**

A money manager of today has many factors to consider before issuing new debt for its municipality. The first of these considered factors must be the entity's current level of debt and its ability to finance additional indebtedness. While reviewing the City's debt, certain statistical information is worth reviewing. This includes: (1) the total debt as a

percent of the total market value of all taxable property; (2) the per capita indebtedness; (3) the debt to household ratio; and (4) a comparison of the annual debt service requirement against the annual revenues. Generally, the total debt as a percent of the total market value of all taxable property, Number 1 above, should not exceed ten percent. Cities with debts nearing or exceeding ten percent of the taxable property should be very careful of increasing their debt as their financial ability to repay will be extremely lessened. A rate of six percent may be considered a more conservative rate in order to promote a more conservative/traditional debt policy. With regards to Number 2, per capita bonded indebtedness, the upper limits should not exceed \$2,000 of debt per capita. A lower, more conservative fiscal policy might call for a maximum per capita rate of \$1200-\$1400. With regards to Number 3 above, debt to household ratio, an acceptable range would be between \$1,500-\$2,000. With regards to Number 4 above, the annual debt service should not exceed 20 percent of annual revenues.

The 2000 total assessed valuation of all taxable property was \$83,529,663.

The total indebtedness (principle and interest) is \$4,682,657. Therefore, the indebtedness represents 5.6 percent of the total value of taxable property in the City. This rate is Well below the 10 percent maximum.

Based on the 2000 population estimate of 3,740 the per capita

indebtedness of principle and interest in Whitesboro is \$1,252 per capita. In other words, every man, woman, and child in the City is responsible for approximately \$1,252 of City debt. This statistic is below the recommended standard of \$2,000 per capita.

The debt to household ratio using the housing survey count of 1,598 (excludes group quarters and vacant units) occupied housing units would put the ratio at \$3,023 per household. This means that each household in Whitesboro is responsible for approximately \$3,023 of City debt.

The annual debt service makes up approximately 5.1 percent of the total annual revenues. This number is below the maximum 20 percent recommended.

The City of Whitesboro has had a practice of financing improvements through the use of Time Warrants, using a pay-as-you-go method, and by leveraging local funds by securing grant funds. It is recommended that the City continue to apply for grant funds through the Department of Housing and Community Affairs to leverage local funds and to continue using a pay-as-you-go method of financing. The City has used this option in the past effectively. Whitesboro has considerable capacity under the above stated debt level indicators to assume addition debt load. It should be noted that Whitesboro is growing rapidly and the ability to take on more debt is improving.

The 70th Texas Legislature passed Senate Bill 336 regulating various types of utility fees, defined in the legislation as "**impact fees**". Such fees

included traditional impact (or capital recovery) fees, but also lot, acreage, frontage and other typical utility fees. Impact fees also include "contributions in aid of construction" such as off-site approach main dedications. The legislation laid out very specific requirements for the technical development of such fees as well as the procedures necessary for enactment of such fee programs. SB 336 is incorporated with the Texas Local Government Code as Chapter 395 as it was amended by the 71st Legislature effective August 28, 1989. Chapter 395 authorizes municipalities and certain special districts to impose impact fees against new development. An impact fee is a form of development exaction, which may be defined as a contribution of land, improvements or money imposed as a condition of development approval in order to mitigate the impacts of the development project.

**These impact fees should be established to pay for many of the capital improvements needed in the future for Whitesboro.**

## **CAPITAL NEEDS LIST**

Several Meetings were held with the City staff in regard to needed improvements. Based upon the Meetings and knowledge of the City's infrastructure capital needs lists were prepared to outline needed capital improvements. These lists were finalized at a meeting with city officials in December of 2000. The lists were prepared to identify general priorities to be accomplished by the City of Whitesboro during the planning period's

five year working plan. The capital needs list is divided into improvements to the wastewater and water systems, and miscellaneous improvements. Tables 11 through 13 outline the needed improvements.

TABLE 11

## **CITY OF WHITESBORO**

### **WATER SYSTEM CAPITAL NEEDS LIST**

<b>PRIORITY*</b>	<b>PROJECT</b>	<b>LOCATION</b>
N	The first priority of the plan is the construction of an elevated storage tank and well to provide for adequate pressure and supply for the water system.	

This project will cost approximately \$480,000.

N	This project is to replace several water lines as follows:	
	Center Street	Wainwright to Mineral
	Mineral Street	Center to North Union
	Wade Street	Collinsville to South Union
	Union Street	Hall to South St.

Estimated cost of this project will be \$121,000.

D	This project is to replace several water lines as follows:	
	Water Street	Chestnut to South Union

Charter Street	Collinsville to South Union
Hall Street	Elm to Jordan
White Street	First to Fourth
Tipton Street	Carver to Abney
Carver Street	Abney to Tipton

This project will cost approximately \$145,000.

D This project is to replace several water lines as follows:

Otis Street	North Union to College
College Street	Otis to Third
College Street	West Main to Hall
North Avenue	Pecan to Bois D' Arc
Pecan Street	Buchanan to North Ave.

This project will cost approximately \$142,500.

D This project is to replace several water lines as follows:

Across Center Park	North Union to Wilson St
Bagin Street	Fire Hydrant to Center
Center Street	Bagin to Grayson

This project will cost approximately \$75,000.

M - Mandatory      N - Necessary

D - Desirable      Z - Deferrable

TABLE 12

# **CITY OF WHITESBORO** **WASTEWATER SYSTEM CAPITAL NEEDS LIST**

<b>PRIORITY*</b>	<b>PROJECT</b>	<b>LOCATION</b>
M	The First year construction activities include the replacement of the Walsh Lift Station with a gravity flow line north and east to the wastewater treatment plant.	

The cost of this project is approximately \$280,000

M	This project is the construction activities to replace clay tile lines and address inflow and infiltration problems in the southern sector of the City. The wastewater lines will be installed in the following easements and Streets:	
---	--	--

Common Street	South Union to Collinsville
Charter Street	South Union to Collinsville
Wade Street	South Union to Collinsville
West South Street	West of Church to Market Ct.
Market Ct. and South	South St. to Walnut

Walnut Street and easterly	Market to Depot
Broadway Street	Charter South to Walnut ext.
Carver Street	Abney South
Abney Street	Sunset West
R.O.W.	Abney to north side of Whitecotton pk.

The cost of this project is approximately \$290,000

N This project is to double the size of the wastewater treatment plant.

The estimated cost of this project is \$2,200,000.

N This project is the replacement of a wastewater main in right-of-way from  
S.H. 377 to U.S. Highway 82.

The anticipated cost of this project is \$195,000



- )
- D This project is the construction of a new and larger lift station and the deactivation of 2 lift stations and the construction of new force main and new gravity flow lines in the southeastern sector of the City. The activities are in the following locations:

Lift Station	Sherman Drive at Creek
Force Main	Lift Station to existing force main
Gravity Main	Depot Lift Station to New Lift Station
Gravity Main (Bois D' Arc)	East Main to North Avenue

The anticipated cost of this project is \$535,000.

- )
- D This project is the construction of a gravity wastewater line from the proposed priority 5 lift station to the northwest.

The anticipated cost of this project is \$122,500.

M - Mandatory	N - Necessary
D - Desirable	Z - Acceptable

TABLE 13  
**CITY OF WHITESBORO**  
**MISCELLANEOUS CAPITAL NEEDS LIST**

<b>PRIORITY*</b>	<b>PROJECT</b>	<b>LOCATION</b>
Z	Park Improvements city wide with a Total budget for design and construction (including grant application work) is anticipated to be \$955,000 of which the local match would be approximately \$477,500 worth of donated land, labor, equipment, materials, and cash.	
D	Golf Course serving the entire community with a total budget of \$2,545,000.	
Z	Construction of a detention pond system to reduce peak flows of storm water run-off. This project should be coordinated with the park element of this plan and make double use of the required land for detention ponds. The cost of the first year project will be approximately \$195,000.	
Z	This project is to address the drainage from facility number 42 to a point east of center park. The improvements to this unimproved drainage channel would assist in the moving of storm water runoff events. The final design of this channel could range from the reshaping of drainage channel to the lining of the channel with an	

erosion control surface. The worst-case scenario would place the cost of the facility improvements at over \$175,000.

N            The City will be building a new City Hall at an estimated cost of \$1,200,000.

M            The City has programmed in the improvement to the electrical system throughout the City at an estimated cost of \$1,000,000.

M - Mandatory      N - Necessary      D - Desirable      Z - Deferrable

## **CAPITAL IMPROVEMENTS PROGRAM (2001-2005)**

Each proposed capital improvement project identified in this document, as well as other critical needs outlined by the City of Whitesboro, were rated based on the preceding section's guidelines. A schedule of improvements for a five-year period was prepared. The schedule includes the estimated costs for improvements, anticipated sources of income, and recommended priority for implementation. The improvements are graphically displayed in Figure 14. The footnotes referencing the possible sources of funds which might be applicable to each of the specific projects are keyed to the following:

- (1) Local Whitesboro City Tax Funds.
- (2) Local Whitesboro Water & Sewer Revenue
- (3) City of Whitesboro Water & Sewer Bonds
- (4) Grant through the Texas Community Development Program

- (5) Texas Water Development Board (Loan)
- (6) Farmer's Home Administration Loan and/or Grant
- (7) Texas Parks & Wildlife Department (50% Grant)
- (8) Texas Capital Fund (Infrastructure Loan)
- (9) Developer Participation
- (10) Private Donations
- (11) Impact Fees
- (12) Electrical Revenues

### **First Year Projects**

The First year construction activities include the replacement of the Walsh Lift Station with a gravity flow line north and east to the wastewater treatment plant.

The cost of this project is approximately \$280,000  
Funds can be secured through 2 and 4.

Another First year project is the construction activities to replace clay tile lines and address inflow and infiltration problems in the southern sector of the City. The wastewater lines will be installed in the following easements and Streets:

Common Street	South Union to Collinsville
Charter Street	South Union to Collinsville
Wade Street	South Union to Collinsville

and Streets:

Common Street	South Union to Collinsville
Charter Street	South Union to Collinsville
Wade Street	South Union to Collinsville
West South Street	West of Church to Market Ct.
Market Ct. and South	South St. to Walnut
Walnut Street and easterly	Market to Depot
Broadway Street	Charter South to Walnut ext.
Carver Street	Abney South
Abney Street	Sunset West
R.O.W.	Abney to north side of Whitecotton park

The cost of this project is approximately \$290,000

Funds can be secured through 2 and 4.

During the first year Whitesboro should begin an attempt to secure funding for park improvements. The first year anticipated cost is \$4,000 with subsequent expenditures in the following years to bring park improvements to fruition.

Funds can be secured through 1 and 10.

The City will be building a new City Hall at an estimated cost of \$1,200,000.

Funds can be secured through 1.

The City has programmed in the improvement to the electrical system throughout the City at an estimated cost of \$1,000,000.

Funds can be secured through 12.

### **Second Year Project**

The Second year projects will be the construction of an elevated storage tank and well to provide for adequate pressure and supply for the water system.

This project will cost approximately \$480,000.

Funds can be secured through 2, 3, 4, 5, and 11.

### **Third Year Projects**

The Third year projects will replace several water lines as follows:

Center Street	Wainwright to Mineral
Mineral Street	Center to North Union
Wade Street	Collinsville to South Union
Union Street	Hall to South St.

Estimated cost of this project will be \$121,000.

Funds can be secured through 2, 3, 4, 5, 6, 9, and 11.

### **Fourth Year Projects**

The Fourth Year projects will be to replace several water lines as follows:

Water Street	Chestnut to South Union
Charter Street	Collinsville to South Union

Hall Street	Elm to Jordan
White Street	First to Fourth
Tipton Street	Carver to Abney
Carver Street	Abney to Tipton

This project will cost approximately \$145,000.

Funds can be secured through 2, 3, 4, 5, 6, 9, and 11.

### **Fifth Year Projects**

The Fifth Year project will be to start the process to double the size of the wastewater treatment plant. The estimated cost to do a total all at once enlargement of the plant will cost \$2,200,000. However, intermediate steps in the overall improvement will bring this cost initially down to approximately \$500,000.

Funds can be secured through 2, 3, 4, 5, 6, 8, and 11.

## **TOTAL COST AND ALLOCATION SCHEDULED PER YEAR**

The total project cost for all projects in the 2001-2005 CIP Program is \$4,721,000. Table 14 summarizes the total cost for each year for the 2001-2005 recommended capital improvements projects. Actual cash expenditures may vary depending on funding methods selected and the availability of grants, etc. This Capital Improvement Program includes all identified City Needs.



**TABLE 14**  
**CITY OF WHITESBORO**  
**SUMMARY OF 2001-2005 CIP PROGRAM**

WATER CATEGORY	2001	2002	2003	2004	2005
Cip Year 2 Improvements		\$ 25,000.00	\$ 150,000.00	\$ 305,000.00	
*Funds can be secured through 2,3, 4, and 5.					
Cip Year 4 Improvements			\$ 121,000.00		
*Funds can be secured through 2,3, 4, and 5.					
Cip Year 4 water line improvements				\$ 145,000.00	
*Funds can be secured through 1, 2, 3, 4, 9, and 11.					
WASTEWATER CATEGORY					
Cip Year 1 wastewater improvement projects	\$ 80,000.00	\$ 124,000.00	\$ 200,000.00	\$ 166,000.00	
*Funds can be secured through 2 and 4.					
Cip Year 5 wastewater improvement project					\$ 250,000.00
*Funds can be secured through 2, 3, and 4.					
MISCELLANEOUS CATEGORY					
Year 1 City Hall - 1*	\$ 1,200,000.00				
City Park Improvements. 1& 10.*	\$ 4,000.00	\$ 100,000.00	\$ 250,000.00	\$ 300,000.00	\$ 301,000.00
Electrical Improvements - 12*	\$ 500,000.00	\$ 500,000.00			
TOTALS					
*NOTE: NUMBERS INDICATE FUNDING SOURCES.	\$ 1,784,000.00	\$ 749,000.00	\$ 721,000.00	\$ 916,000.00	\$ 551,000.00
					\$ 4,721,000.00

- (1) Local Whitesboro City Tax Funds.  
(2) Local Whitesboro Water & Sewer Revenue  
(3) City of Whitesboro Water & Sewer Bonds  
(4) Grant through the Texas Community Development Program  
(5) Texas Water Development Board (Loan)  
(6) Farmer's Home Administration Loan and/or Grant  
(7) Texas Parks & Wildlife Department (50% Grant)  
(8) Texas Capital Fund (Infrastructure Loan)  
(9) Developer Participation  
(10) Private Donations  
(11) Impact Fees  
(12) Electrical fees

## **APPENDIX A**

# REGION C REGIONAL WATER PLANNING GROUP

Counties: Collin, Cooke, Dallas, Denton, Ellis, Fannin, Freestone, Grayson, Henderson, Jack,  
Kaufman, Navarro, Parker, Rockwall, Tarrant and Wise

## WHY IS REGIONAL WATER PLANNING NEEDED?

In June 1997, Governor George W. Bush signed into law Senate Bill 1 (SB 1), comprehensive water legislation enacted by the 75th Texas Legislature. This comprehensive water legislation was an outgrowth of increased awareness of the vulnerability of Texas to drought and to the limits of existing water supplies to meet increasing demands as population grows. The state's population is expected to increase from its current level of about 19 million to more than 36 million people by the year 2050.

With passage of SB 1, the Legislature put in place a "bottom up" water planning process designed to ensure that the water needs of all Texans are met as Texas enters the 21st century. SB1 allows individuals representing 11 interest groups to serve as members of Regional Water Planning Groups (RWPG) to prepare regional water plans for their respective areas. These plans will map out how to conserve water supplies, meet future water supply needs and respond to future droughts in the planning areas.

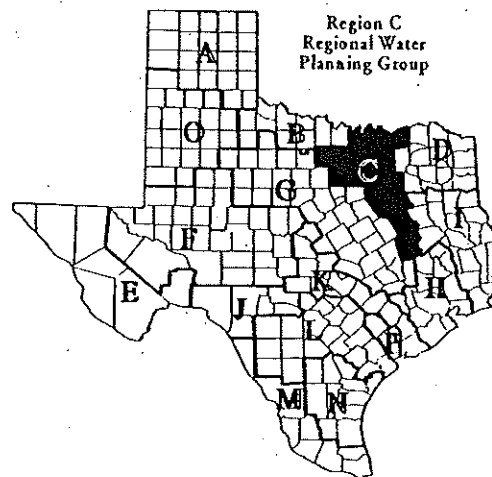
In accordance with SB 1, regional water plans must be completed and adopted by September 1, 2000, and the Texas Water Development Board (TWDB) must approve and incorporate the regional water plans into a comprehensive state water plan by September 1, 2001. The water plans will be updated every five years.

After September 2001, TWDB financial assistance may be provided only to water supply projects that meet needs in a manner that is consistent with the approved regional water plans. In addition, the Texas Natural Resource Conservation Commission may not issue a water right for municipal purposes unless it is consistent with an approved regional water plan after 2001.

## WHO IS PREPARING REGIONAL WATER PLANS?

SB 1 designated the TWDB as the lead state agency for coordinating the regional water planning process and developing a comprehensive state water plan. To accomplish these tasks, the TWDB developed planning guidance documents to govern how regional water plans will be developed, delineated planning areas and designated planning group representatives.

In February 1998 after extensive review and public comment, the TWDB adopted state and regional water planning rules, delineated 16 regional planning areas and selected 270 individuals from 11 SB 1-required interest groups to serve as initial members of the RWPG. The counties included in this region are highlighted on the map to the right, and the interest groups and their current representatives for this region are listed in the left side bar.



Each RWPG is responsible for preparing and adopting a regional water plan for their area. Most RWPG have hired consultants to assist with developing the engineering, socioeconomic, hydrological, environmental, legal and institutional components of the regional water plans. RWPG must provide for public input in the planning process, hold public meetings and furnish a draft report of the plan for public review and comment. SB 1 requires that each regional water plan address the needs of all water users and suppliers, except certain political subdivisions that decide not to participate. >



## **HOW MUCH WILL IT COST TO PREPARE A REGIONAL WATER PLAN?**

SB 1 provides state financial assistance administered by the TWDB to assist in paying for the preparation of regional water plans. TWDB rules provide that state funds will be used to pay 100 percent of the direct planning costs, while RWPG will be required to cover 100 percent of their administrative costs.

All 16 RWPG complied with the August 1, 1998 deadline to submit to the TWDB completed grant applications for state financial assistance and scopes of work for preparing regional water plans. The costs for the 16 water plan preparation scopes of work total approximately \$20.5 million. By December 1998, the TWDB awarded \$7.56 million in planning grants appropriated by the Legislature for the Fiscal Year 1998-1999 biennium as partial payment toward the costs of developing regional water plans. Additional state financial assistance will be considered by the Legislature during its session convening in January 1999.

## **WHAT ARE THE STEPS IN PREPARING A REGIONAL WATER PLAN?**

The planning process begins with the collection and analyses of many types of information related to water demands and supplies. RWPG members are responsible for deciding how future water needs in their respective region may be met. Each regional water plan will include information about water supplies and demand, water quality problems affecting water supply, and social and economic characteristics of the region. The plan also will identify water supply threats to agriculture and natural resources. Information concerning current preparations for drought and the status of other water plans in the region will be reviewed.

The following tasks are common to each regional water plan:

- ♦ Determine water demands
- ♦ Determine water supplies available for use during drought of record
- ♦ Determine where and when there is a surplus of supply or a need for additional supplies
- ♦ Determine social and economic impact of not meeting needs
- ♦ Develop plans that contain:
  - Specific strategies to meet future near-term needs (less than 30 years)
  - Options to meet long-term future needs (30-50 years)
  - Identified needs with no feasible solutions
- ♦ Identify ecologically unique streams and rivers
- ♦ Identify unique sites for reservoir construction
- ♦ Coordinate with neighboring regions concerning mutual interests and shared resources
- ♦ Propose regulatory, administrative or legislative recommendations to improve water resource management in the state

## **WHAT IF AN ENTITY DOES NOT PARTICIPATE IN THE PLAN?**

Participation in the regional planning process is not required. If a political subdivision or a RWPG decides not to participate, the TWDB will use existing local and regional water planning strategies identified in the TWDB-prepared 1997 state water plan and other study results to update the next state water plan. TWDB recommended water management strategies and/or recommendations for a specific entity and/or region are typically based on the least expensive solution.

## **WHAT ARE THE BENEFITS OF PARTICIPATING IN DEVELOPING REGIONAL WATER PLANS?**

- ♦ The opportunity to identify regional solutions to water supply problems with resulting lower water supply costs.
- ♦ The opportunity to obtain detailed current population data for small communities and rural areas in the region. For communities of less than 1,000 population, this information is not available in the 1997 state water plan, nor is it readily available from official sources.
- ♦ The opportunity to analyze water supplies, water demand and water resource management strategies for local communities at the level of detail agreed upon by the RWPG and identified in SB 1.
- ♦ The opportunity to determine regional water infrastructure needs and how best to meet those needs.
- ♦ The opportunity to identify and address local issues and concerns within the framework of SB 1 and regional water plans.
- ♦ The ability to receive low-interest TWDB loans for financing water supply projects.

## **WHAT DON'T REGIONAL WATER PLANS DO?**

- ♦ Regional water plans do not change existing water law. Legislative action is needed for such changes.
- ♦ Regional water plans do not affect existing water rights or contracts.
- ♦ Regional water plans do not force water management strategies on an entity. If a proposed water management strategy is objectionable to the political subdivision supplying or receiving water supplies, then the strategy will not be included in the plan as a strategy for meeting the need of the objecting political subdivision. The entity must specify its reasons for objecting to a proposed water management strategy, and the strategy may still be applied to meet other needs.

## **HOW CAN I PARTICIPATE IN REGIONAL WATER PLANNING EFFORTS?**

To participate in regional water planning efforts, you may attend any of the RWPG meetings or contact regional group members or the TWDB to voice your concerns or to obtain additional information. At the TWDB, you may contact Mr. Ralph Boeker by calling (512) 936-0851 or by E-mail to [rboeker@twdb.state.tx.us](mailto:rboeker@twdb.state.tx.us). Also, you may visit the TWDB web site at [www.twdb.state.tx.us](http://www.twdb.state.tx.us).

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## Members of the Region C Water Planning Group

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### Officers\*

Office	Incumbent
Chair	Terrace Stewart
Vice-Chair	Jim Parks
Secretary	Roy Eaton

\*The Region C group does not have an Executive Committee.

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### Offices

Office	Entity
Administrative	North Texas Municipal Water District P.O. Box 2408 Wylie, TX 75098-2408
Political Subdivision	North Texas Municipal Water District

**Note:**

Administrative Office manages records.

Political Subdivision is the entity eligible to apply for State grant funds.

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### Voting Membership

Interest	Name	Entity	County (Location of Interest)
Public	Mary E. Vogelson	League of Women Voters	Dallas
	Irvin M. Rice	Retired	Dallas
Counties	Judge Tom Vandergriff	Tarrant County	Tarrant
Municipalities	Terrace W. Stewart	City of Dallas	Dallas and Collin
	Howard Martin	City of Denton	Denton
	Paul Phillips	City of Weatherford	Parker
	William W. Meadows	City of Fort Worth	Tarrant
Industrial	A. Leroy Burch	Gifford-Hill-American, Inc.	Dallas
Agricultural	Brad Barnes	Rancher	Jack
Environmental	Robert O. Scott	Tarrant Coalition for Environmental Awareness	Tarrant
	Elaine J. Petrus	Streams and Valleys	Tarrant
Small Businesses	Roy J. Eaton	Wise County Messenger	Wise
Elec. Generating Utilities	Paul Zweacker	Texas Utilities	Dallas (service in entire region)
River Authorities	Danny F. Vance	Trinity River Authority	Tarrant and 6 other counties in region
Water Districts	Jerry W. Chapman	Greater Texoma Utility Authority	Grayson and 2 other counties in region
	Jim Parks	North Texas Municipal Water District	
	George W. Shannon	Tarrant Regional Water District	Tarrant
Water Utilities	Connie Standridge	Winkler WSC	Freestone
	Jim McCarter	Navarro Mills WSC	Navarro
Other(s)	None in region		

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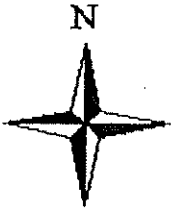
## Non-Voting Membership

Name	Entity
Curtis Campbell	Region B RWPG
Ralph Boeker	Texas Water Development Board
Dan Jones	Texas Parks and Wildlife Department
Monty Shank	East Texas RWPG (I)
Ken Smith	Brazos G RWPG
Danny F. Vance	Region H RWPG
Ed C. Withers	North East Texas RWPG (D)

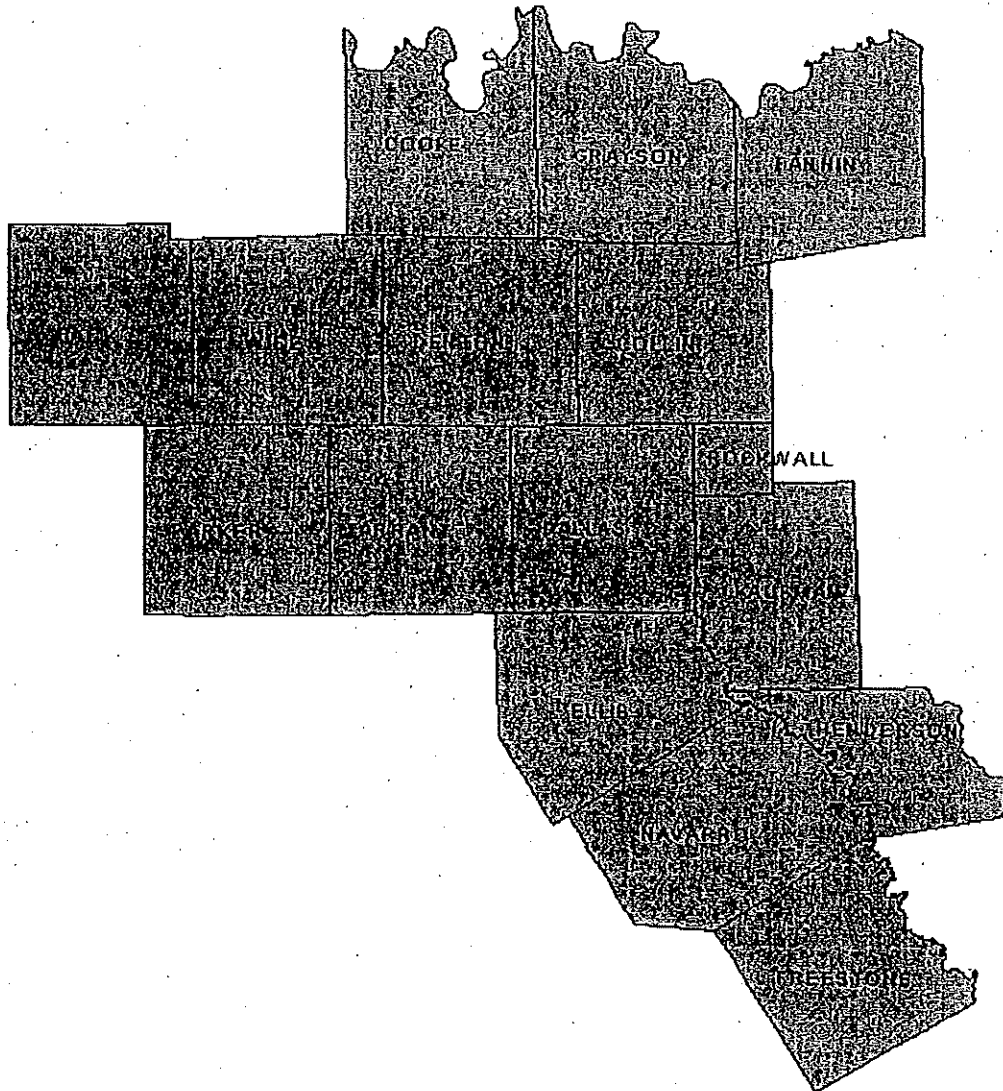
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For more information about this region contact:

Ralph Boeker  
(512) 936-0851  
[rboeker@twddb.state.tx.us](mailto:rboeker@twddb.state.tx.us)



## Region C (counties)





## **APPENDIX B**



# Save Water Now !!!



Fix leaks  
Install water-efficient shower heads  
Wash only full loads of dishes and clothes  
Water yard once every five days  
Water early in the morning or late at night  
Avoid watering sidewalks and streets

Every Drop Makes a Difference!

## Forty-Nine Water Saving Tips

### WHY CONSERVE WATER?

Texas' conventional fresh-water supplies are already 75 to 80 percent developed. The more efficient use of our precious water resources through water conservation and reuse holds a real potential to both preserve and extend limited water supplies and to save Texans real money. The largest saver is you, the customer. Consider that even a 10 to 15 percent reduction in personal water use can save Texas' water and sewer rate payers billions of dollars over the next 50 years. However, the effort to conserve water must begin now with each individual. This brochure provides the homeowner with water and money-saving tips on how to use water more efficiently in and around the home.

### POSSIBLE SAVINGS WITH WATER CONSERVATION

For approximately \$10 to \$20, the average homeowner can install two low-flow showerheads, place dams or bottles in the toilet tanks, install low-flow aerators on the faucets, and repair dripping faucets and leaking toilets. This could save 10,000 to more than 25,000 gallons per year for a family of four, and would pay for itself in less than a year! Even more could be saved if good outdoor water conservation is practiced for the lawn and garden.

## CONSERVATION TIPS

### In The Bathroom



### In The Kitchen



### In The Laundry



### Appliances &

### Plumbing



### Outdoors

#### **In the Bathroom...**

- Install a low-flow showerhead that limits the flow from the shower to less than three gallons per minute.
- Take short showers and install a cutoff valve, or turn the water off while washing and back on again only to rinse.
- Take a shower instead of taking a bath. Showers with low-flow showerheads often use less water than taking a bath.
- Reduce the level of the water being used in a bathtub by one or two inches if a shower is not available.
- Shampoo hair in the shower. Shampooing in the shower takes only a little more water than is used to shampoo hair during a bath and much less than shampooing and bathing separately.
- When remodeling a bathroom, install a new low-volume flush toilet that uses only 1.6 gallons per flush.
- Test toilets for leaks. Add a few drops of food coloring or a dye tablet to the water in the tank, but do not flush the toilet. Watch to see if the coloring appears in the bowl within a few minutes. If it does, the toilet has a silent leak that needs to be repaired.
- Use a toilet tank displacement device such as a toilet dam or bag. Also, a plastic bottle can be filled with stones or water, recapped, and placed in the toilet tank. These devices will reduce the volume of water in the tank but will still provide enough for flushing. (Bricks are not recommended since they eventually crumble and could damage the working mechanism.) Displacement devices are not recommended with new low-volume flush toilets.
- Never use the toilet to dispose of cleansing tissues, cigarette butts, or other trash. This wastes a great deal of water and also places an unnecessary load on the sewage treatment plant or septic tank.
- Do not use hot water when cold will do. Water and energy can be saved by washing hands with soap and cold water. Hot water should be added only when hands are especially dirty.
- When brushing teeth, turn the water off until it is time to rinse.
- Do not let the water run when washing hands. Water should be turned off while washing and scrubbing and be turned on again to rinse. A cutoff valve may be installed on the faucet.
- When shaving, fill the lavatory basin with hot water instead of letting the water run continuously.
- Install faucet aerators to reduce water consumption.

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### In the Kitchen...

- Scrape the dishes clean instead of rinsing them before washing. There is no need to rinse unless they are heavily soiled.
- Use a pan of water (or place a stopper in the sink) for washing and rinsing pots, pans, dishes, and cooking implements, rather than turning on the water faucet each time a rinse is needed.
- Never run the dishwasher without a full load. This practice will save water, energy, detergent, and money.
- Use the garbage disposal sparingly or start a compost pile.
- Keep a container of drinking water in the refrigerator. Running water from the tap until it is cool is wasteful. Better still, both water and energy can be saved by keeping cold water in a picnic jug on a kitchen counter to avoid opening the refrigerator door frequently.
- Use a small pan of cold water when cleaning vegetables, rather than letting the water run over them.
- Use only a little water in the pot and put a lid on it for cooking most food. Not only does this method save water, but food is more nutritious since vitamins and minerals are not poured down the drain with the extra cooking water.
- Always keep water conservation in mind, and think of other ways to save in the kitchen. Small kitchen savings from not making too much coffee or letting ice cubes melt in a sink can add up in a year's time.

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### In the Laundry...

- Wash only a full load when using an automatic washing machine (32 to 59 gallons are required per load).
- Whenever possible, use the lowest water-level setting on the washing machine for light or partial loads.
- Use cold water as often as possible to save energy and to conserve the hot water for uses that cold water cannot serve. (This is also better for clothing made of today's synthetic fabrics.)

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### For Appliances and Plumbing...

- Check water requirements of various models and brands when considering purchasing any new appliances. Some use less water than others.
- Check all water-line connections and faucets for leaks. A slow drip can waste as much as 170 gallons of water EACH DAY, or 5,000 gallons per month, and will add to the water bill.
- Learn to repair faucets so that drips can be corrected promptly. It is easy to do, costs very little, and can mean a substantial savings in plumbing and water bills.
- Check for hidden water leakage such as a leak between the water meter and the house. To check, turn off all indoor and outdoor faucets and water-using appliances. The water meter should be read at 10 to 20 minute intervals. If it continues to run or turn, a leak probably exists and needs to be located.
- Insulate all hot water pipes to reduce the delays (and wasted water) experienced while waiting for the water to "run hot."
- Be sure the water heater thermostat is not set too high. Extremely hot settings waste water and

energy because the water often has to be cooled with cold water before it can be used.

- Use a moisture meter to determine when house plants need water. More plants die from over-watering than from being on the dry side.

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### For Outdoor Use...

- Water only when needed. Look at the grass, feel the soil, or use a soil moisture meter to determine when to water.
- Do not over-water. Soil can hold only so much moisture, and the rest simply runs off. A timer will help, and either a kitchen timer or an alarm clock will do. Apply only enough water to fill the plant's root zone. Excess water beyond that is wasted. One and a half inches of water applied once a week in the summer will keep most Texas grasses alive and healthy.
- Water lawns early in the morning during the hotter summer months. Otherwise, much of the water used on the lawn can simply evaporate between the sprinkler and the grass.
- To avoid excessive evaporation, use a sprinkler that produces large drops of water, rather than a fine mist. Sprinklers that send droplets out on a low angle also help control evaporation. Adjust sprinkler heads as necessary, to avoid waste, runoff and ensure proper coverage.
- Set automatic sprinkler systems to provide thorough, but infrequent watering. Pressure-regulating devices should be set to design specifications. Rain shutoff devices can prevent watering in the rain.
- Use drip irrigation systems for bedded plants, trees, or shrubs, or turn soaker hoses upside-down so the holes are on the bottom. This will help avoid evaporation.
- Water slowly for better absorption, and never water on windy days.
- Forget about watering the streets or walks or driveways. They will never grow a thing.
- Condition the soil with mulch or compost before planting grass or flowerbeds so that water will soak in rather than run off.
- Fertilize lawns at least twice a year for root stimulation, but do not over-fertilize. Grass with a good root system makes better use of less water and is more drought-tolerant.
- Do not scalp lawns when mowing during hot weather. Taller grass holds moisture better. Grass should be cut fairly often, so that only 1/2 to 3/4 inch is trimmed off. A better looking lawn will result.
- Use a watering can or hand water with the hose in small areas of the lawn that need more frequent watering (those near walks or driveways or in especially hot, sunny spots).
- Use water-wise plants. Learn what types of grass, shrubbery, and plants do best in the area and in which parts of the lawn, and then plant accordingly. Choose plants that have low water requirements, are drought-tolerant, and are adapted to the area of the state where they are to be planted.
- Consider decorating some areas of the lawn with wood chips, rocks, gravel, or other materials now available that require no water at all.
- Do not "sweep" walks and driveways with the hose. Use a broom or rake instead.
- When washing the car, use a bucket of soapy water and turn on the hose only for rinsing.
- Learn and use waterwise concepts in your landscape.

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Please send comments, suggestions, or questions to;

**TEXAS WATER DEVELOPMENT BOARD**  
 P.O. BOX 13231 • 1700 M. CONGRESS AVENUE • AUSTIN, TX 78711-3231  
 (512) 453-7847 • FAX (512) 475-2053

## APPENDIX C

## **EXECUTIVE SUMMARY**

## **INITIALLY PREPARED REGION C WATER PLAN**

**September 2000**

### **Executive Summary**

This report presents the Senate Bill One regional water plan developed in the year 2000 for Region C. Region C covers all or part of 16 counties in North Central Texas, as shown in Figure ES-1.

The Region C water plan was developed under the direction of the 19-member Region C Water Planning Group. The planning process included the following steps, which are presented in this executive summary and described in greater detail in the main report and the appendices:

- Description of Region C
- Population and Water Demand Projections
- Analysis of Water Supply Currently Available to Region C
- Comparison of Water Supply and Projected Water Demand
- Evaluation and Selection of Water Management Strategies
- Regulatory, Administrative, Legislative, and Other Recommendations
- Plan Approval Process and Public Participation

#### ***ES-1 Description of Region C***

As of 1998, the estimated population of Region C was 4,779,210 - 24.4 percent of Texas' total population. The two most populous counties in Region C, Dallas and Tarrant, have 70.6 percent of the region's population. There are 38 cities in Region C with an estimated 1998 population of more than 20,000. These cities include 80.5 percent of the 1998 population of the region.

#### **Economic Activity in Region C**

Region C includes most of the Dallas and Fort Worth-Arlington metropolitan statistical areas, which have experienced strong economic growth in the 1990s. Payroll and employment in



Region C are concentrated in the central urban counties of Dallas and Tarrant. The largest business sectors in Region C in terms of payroll are services and manufacturing.

### Water-Related Physical Features in Region C

Most of Region C is in the upper portion of the Trinity Basin, with smaller parts in the Red, Brazos, Sulphur, and Sabine Basins. Figure ES-1 shows the major streams in Region C. Precipitation increases west to east in Region C from slightly more than 30 inches per year in western Jack County to more than 44 inches per year in the northeast corner of Fannin County. The average annual runoff in the region also increases from the west to the east. Evaporation is higher in the western part of Region C. The patterns of rainfall, runoff, and evaporation result in more abundant water supplies in the eastern part of Region C than in the west.

There are 34 reservoirs in Region C with conservation storage over 5,000 acre-feet, all of which are shown in Figure ES-1. These reservoirs and others outside of Region C provide most of the region's water supply. Reservoirs are necessary to provide a reliable surface water supply in this part of the state because of the wide variations in natural streamflow. Reservoir storage serves to capture high flows when they are available and save them for use during times of normal or low flow.

The Trinity aquifer supplies most of the groundwater used in Region C. Other aquifers in the region include the Carrizo-Wilcox, the Woodbine, the Nacatoch, and the Queen City.

### Current Water Uses and Demand Centers in Region C

Water use in Region C has increased significantly since 1980, primarily in response to increasing population and municipal demand. The historical record shows years of high use, including 1988, 1996, and 1998. High use years are associated with dry weather, which causes higher municipal demands due to increased outdoor water use. It is interesting to note that Region C, with 24.4 percent of Texas' population, had only 7.2 percent of the state's water use in 1997. This is primarily because Region C has very limited water use for irrigation. About 85 percent of the current water use in Region C is for municipal supply, followed by manufacturing use as the second largest category, then by steam electric power generation. Irrigation, mining, and livestock are relatively minor uses of water in Region C.

## Current Sources of Water Supply

Total water use in Region C has increased significantly since 1980, but groundwater use has actually decreased in that period. Since 1990, over 90 percent of the water use in Region C has been supplied by surface water, but groundwater is still an important source of supply, especially in some rural areas. Most of the surface water supply in Region C comes from major reservoirs. Another significant water source for Region C is surface water imported from other regions. The Trinity aquifer is by far the largest source of groundwater in Region C, with the Woodbine, Carrizo-Wilcox and other minor aquifers also used. Current use of groundwater exceeds the reliable long-term supply available in many parts of Region C.

Over half of the water used for municipal supply in Region C is discharged as treated effluent from wastewater treatment plants, making wastewater reclamation and reuse a potentially significant source of additional water supply for the region. At present, only a fraction of the region's treated wastewater is actually reclaimed and reused in the region. Many of the region's water suppliers are considering reuse projects, and it is clear that reuse of treated wastewater will be a significant part of future water planning for Region C.

## Water Providers in Region C

Water providers in Region C include regional wholesale suppliers (river authorities and water districts) and retail suppliers (cities and towns, water supply corporations, special utility districts, and private water companies). Cities and towns provide most of the retail water service in Region C. Table ES-1 shows some basic data on sales to others by the five major water providers in Region C, which are the only water suppliers in the region with over 20,000 acre-feet per year in wholesale sales.

## Agricultural and Natural Resources in Region C

Agricultural and natural resources in Region C are dependent on the region's water resources. Wetlands often rely on water from streams and reservoirs. Wetlands provide food and habitat for fish and wildlife, water quality improvement, flood protection, shoreline erosion control, and groundwater exchange, in addition to opportunities for human recreation, education, and research. Threatened or endangered species can depend on habitat associated with rivers and streams. The Texas Parks and Wildlife Department has identified several Region C stream segments as having significant natural resources based on their high water quality, exceptional

**Table ES-1**  
**Major Water Providers in Region C**

Major Water Provider	1997 Wholesale Sales (Acre-Feet)			Number of Wholesale Customers		
	Raw	Treated	Total	Cities	Water Suppliers	Others
Tarrant Regional WD	258,448	0	258,448	12	11	16
North Texas MWD	0	168,247	168,247	23	14	1
Dallas	13,324	148,281	161,605	17	4	2
Fort Worth	427	39,521	39,948	28	2	4
Trinity River Authority	15,220	22,217	37,437	8	2	1

aquatic life, high aesthetic value, fisheries, spawning areas, unique state holdings, endangered or threatened species, priority bottomland hardwood habitat, wetlands, springs, and pristine areas.

Region C includes almost 6,000,000 acres in farms and over 2,500,000 acres of cropland. Less than 1 percent of the cropland in Region C is irrigated, but there are localized areas of irrigation. The market value of agriculture products is significant in all Region C counties, with a total value for 1997 of almost \$500,000,000. For the region as a whole, the market value of livestock is almost twice that of crops. There are large areas classified as prime farmland by the Natural Resources Conservation Service in Cooke, Denton, Collin, Tarrant, Dallas, and Ellis Counties.

Oil and natural gas fields are significant natural resources in portions of Region C. There is a high density of oil wells in Jack, Wise, Cooke, and Grayson Counties, with a lesser density in Denton, Parker, Navarro, Henderson, and Kaufman Counties. There is a high density of producing natural gas wells in Freestone, Parker, Jack, and Wise Counties, with a lesser density in Navarro, Henderson, Denton, Cooke, and Grayson Counties.

There are some lignite coal resources in Region C. The most significant current lignite production in Region C is in Freestone County to supply TXU Electric's Big Brown Steam Electric Station on Lake Fairfield.

## Summary of Threats and Constraints to Water Supply in Region C

The most significant potential threats to existing water supplies in Region C are surface water quality concerns, groundwater drawdown, and groundwater quality. Constraints on the development of new supplies include the availability of sites and unappropriated water for new water supply reservoirs and the challenges imposed by environmental concerns and permitting.

Most of the water suppliers in Region C will have to develop additional supplies before 2050. The major water suppliers have supplies well in excess of current needs, but they will require additional water to meet projected growth. Some smaller water suppliers face a more urgent need for water.

Surface water quality concerns that might affect Region C water supplies include the following:

- Detection of atrazine at low levels in some water supply reservoirs
- Nutrient levels in water supply reservoirs
- Total organic carbon (TOC) levels in source waters
- Elevated levels of dissolved solids in some reservoirs and stream reaches
- Trace levels of arsenic in some waters.

In general, these concerns can be addressed by standard water treatment methods and do not pose a significant threat to water supplies in the region.

Drawdown of aquifers poses a threat to small water suppliers and to household water use in rural areas. As water levels decline, the cost of pumping water grows and water quality generally suffers. Water level declines have been reported in localized areas in each of the aquifers in Region C. In particular, the region-wide pumping from the Trinity and Nacatoch aquifers is estimated to be greater than the recharge. Concern about groundwater drawdown is likely to prevent any substantial increase in groundwater use in Region C and may require conversion to surface water in some areas.

Groundwater quality in Region C aquifers is generally acceptable for most municipal and industrial purposes. However, natural concentrations of arsenic, fluoride, nitrate, chloride, iron, manganese, sulfate, and total dissolved solids in excess of either primary or secondary drinking water standards occur in some areas.

## Water-Related Threats to Agricultural and Natural Resources in Region C

Water-related threats to agricultural and natural resources in Region C include changes to natural flow conditions, water quality concerns, and inundation of land due to reservoir development. In general, there are few significant water-related threats to agricultural resources in Region C due to the limited use of water for agricultural purposes. Water-related threats to natural resources are more significant.

## ***ES-2 Population and Water Demand Projections***

### Methodology for Projections of Population and Water Demand

The Texas Water Development Board's Senate Bill One planning guidelines require the use of TWDB's population and water demand projections from the 1997 *Texas Water Plan* unless revisions are approved by TWDB based on changed conditions or new information. The TWDB projects water demand separately for municipal, manufacturing, steam electric power generation, mining, irrigation, and livestock uses. Municipal demand is developed for each community with a population of over 500 and includes commercial, institutional, and residential water uses but does not include manufacturing use. A "county other" group for each county covers municipal use in rural areas and communities with less than 500 people. All demand categories except municipal are developed on a countywide basis.

To develop the population and water demand projections for Region C, the Region C water planning group went through the following steps:

- Assembled historical data and previous TWDB projections and developed tables and figures that could be reviewed by counties, cities, water suppliers, industries, and other interested entities.
- Sent the TWDB data and a questionnaire to all Region C counties, cities with a population over 1,000, regional water suppliers, retail water suppliers (supplying over 0.2 mgd), and large industries.
- Gathered population data from the State Data Center and the North Central Texas Council of Governments.
- Reviewed the previous TWDB population projections for each county and recommended changes to projections where current populations deviate significantly from the previous projections.
- Adjusted city population projections based on historical trends and knowledge of expected future development using the county population projections as controls.

- Compared TWDB's projections of per capita municipal water demand from the 1997 Texas Water Plan with actual per capita water demand in the 1990s from TWDB data.
- Developed data on 1998 per capita water use for Region C water providers.
- Adjusted previous TWDB projections in per capita water demand to reflect actual use in the 1990s, trends in water use, water conservation, reasonable minimum demands for water, knowledge of future development that might affect per capita needs, and other factors.
- Developed tables and graphs for each city in the region to assist in the review of the recommended projections.
- Revised projections of water demand for steam electric power generation based on input from TXU Electric.
- Checked previous TWDB projections for manufacturing, mining, irrigation, and livestock use and left them unchanged after comparison with recent historical data.
- Formed a Technical Review Committee consisting of experienced water resource planners to review the recommendations of the consultants on population and water use and report to the planning group.
- Held a public meeting to receive input on the water demand projections.
- Made a number of additional changes as a result of TWDB review and input.
- Submitted the revised projections to the TWDB board, which approved the revised projections in December of 1999.

### Population Projections

Table ES-2 presents the adopted population projections by county for Region C. Figure ES-2 shows the historical and projected population for the region. All counties are projected to increase in population between now and 2050, and the projected 2050 population for Region C is 9,481,157. Once the county population projections were completed, city population projections were adjusted based on historical trends and knowledge of expected future development. The county populations served as controls in this process, and all population not assigned to a particular city was included as county other.

### Water Demand Projections

Table ES-3 shows the adopted water demand projections for Region C by county. Table ES-4 and Figure ES-3 show the projected water demand for the region by type of use. The projected 2050 water demand for Region C is 2,536,902 acre-feet per year, which is more than double the 1996 use in the region. Most of the change from previous TWDB projections is in municipal

**Table ES-2**  
**Adopted County Population Projections for Region C**

<b>County</b>	<b>Historical 1996</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>
Collin	373,095	443,000	635,456	923,309	1,150,000	1,351,000	1,501,395
Cooke	33,196	34,209	36,967	38,816	40,000	41,250	42,500
Dallas	1,999,926	2,104,858	2,326,828	2,556,793	2,784,704	3,045,931	3,259,995
Denton	349,566	423,327	591,350	802,461	1,033,731	1,200,000	1,349,999
Ellis	94,097	103,070	123,854	144,054	162,273	175,403	185,364
Fannin	27,435	30,000	33,601	37,000	39,501	40,499	41,001
Freestone	17,757	18,167	18,800	19,300	19,600	20,000	20,300
Grayson	100,611	106,119	110,226	114,702	117,865	120,981	122,000
Henderson (Partial)	46,652	46,562	51,261	55,515	57,704	58,690	60,476
Jack	7,435	7,819	8,139	8,591	8,934	9,175	9,353
Kaufman	61,646	68,368	87,106	108,291	129,359	147,108	162,417
Navarro	42,875	45,191	49,207	53,031	57,015	59,200	61,000
Parker	73,897	80,436	99,095	118,287	139,094	156,023	171,216
Rockwall	34,287	41,175	61,392	88,136	122,000	160,588	203,529
Tarrant	1,306,457	1,415,759	1,594,218	1,798,894	1,915,375	2,111,193	2,205,610
Wise	41,019	44,800	54,674	64,363	73,641	81,000	85,002
Region C Total	4,609,951	5,012,860	5,882,174	6,931,543	7,850,796	8,778,041	9,481,157

demands, with a smaller change in steam electric power demands. No changes were made to TWDB's previous projections for manufacturing, mining, irrigation, or livestock demands.

One of the most important reasons for the increase in projected per capita demand for Region C is the high water use recorded for many Region C water suppliers in 1996 and 1998. This high water use occurred despite significant water conservation efforts in the region and despite the impact of low flow plumbing fixtures. There are several factors that tend to increase per capita municipal water use in the region:

- In many communities, new development is large houses with large lots, sprinkler systems, swimming pools, and other water-using amenities.
- The number of people per household is decreasing in most of Region C. This tends to cause an increase in per capita use because household uses are spread over fewer people.
- Many Region C communities are experiencing rapid commercial development, which increases per capita water use.

**Table ES-3**  
**Adopted County Water Demand Projections for Region C**  
- Values in Acre-Feet per Year -

County	Historical 1996	Projected Water Demand					
		2000	2010	2020	2030	2040	2050
Collin	89,230	129,015	199,964	262,520	312,307	363,821	401,007
Cooke	8,429	9,054	9,133	9,238	9,304	9,581	9,879
Dallas	505,423	594,937	683,097	751,767	810,356	883,850	940,289
Denton	65,075	90,209	135,740	185,725	230,286	257,410	281,989
Ellis	19,721	24,372	43,204	46,030	49,309	53,991	55,575
Fannin	17,515	12,100	13,330	14,500	15,597	16,572	17,515
Freestone	20,608	20,074	31,058	33,000	33,036	37,260	37,290
Grayson	29,152	29,060	29,760	30,242	31,347	32,508	33,688
Henderson (Partial)	10,888	12,697	13,169	13,478	13,697	13,737	13,908
Jack	3,337	2,644	2,589	2,574	2,591	2,615	2,652
Kaufman	10,653	21,219	24,401	27,392	32,361	34,832	42,017
Navarro	10,558	10,301	10,845	11,210	11,850	12,303	12,735
Parker	12,372	14,120	24,528	28,455	37,697	42,853	45,725
Rockwall	6,566	9,160	19,805	26,027	33,061	41,320	50,249
Tarrant	291,406	379,205	423,578	468,728	490,960	527,716	553,302
Wise	25,688	18,206	31,460	34,007	36,067	37,819	39,082
Region C Total	1,126,621	1,376,373	1,695,661	1,944,893	2,149,826	2,368,188	2,536,902

**Table ES-4**  
**Adopted Water Demand Projections for Region C by Type of Use**  
- Values in Acre-Feet per Year -

Use	Historical 1996	Projected Water Demand					
		2000	2010	2020	2030	2040	2050
Municipal	946,557	1,162,093	1,401,197	1,625,412	1,808,337	1,988,513	2,125,330
Manufacturing	71,366	117,577	135,114	148,798	162,714	183,188	207,637
Steam Electric Power	52,103	59,800	122,300	132,700	139,700	156,192	162,192
Mining	22,576	13,046	13,231	14,190	15,294	16,515	17,950
Irrigation	9,689	5,382	5,344	5,318	5,306	5,305	5,318
Livestock	24,330	18,475	18,475	18,475	18,475	18,475	18,475
Total	1,126,621	1,376,373	1,695,661	1,944,893	2,149,826	2,368,188	2,536,902



### ***ES-3 Analysis of Water Supply Currently Available to Region C***

Total water use in Region C in 1996 was over 1,100,000 acre-feet. About 74 percent of the region's 1996 water use came from in-region reservoirs. The projected total reliable water supply available to Region C in 2050 from current sources will be about 2,022,000 acre-feet per year. (This figure does not consider supply limitations due to the capacities of current raw water transmission facilities and wells.) Figure ES-4 shows the projected total water availability for Region C. The sources of supply for Region C in 2050 include:

- 1,138,000 acre-feet per year (56%) from in-region reservoirs
- 180,000 acre-feet per year (9%) from groundwater
- 70,000 acre-feet per year (3%) from local supplies
- 82,000 acre-feet per year (4%) from reuse
- 552,000 acre-feet per year (28%) from imports from other regions

The projected supply available to Region C from existing sources in 2050 is significantly less than the projected 2050 water use.

If the supply limitations due to the capacities of current raw water transmission facilities and wells are considered, the available supply for Region C is reduced significantly. Most water user groups will have to make improvements to water transmission facilities or wells to provide for their projected needs. Several major Region C water supplies will require additional raw water transmission facilities before they can be utilized fully.

Current groundwater use in parts of Region C exceeds the projected long-term water supply availability. Supplies from other sources will be needed in these areas so that groundwater use can be reduced. Counties and aquifers where current use exceeds long-term supplies include the following:

- Trinity aquifer in Cooke County
- Trinity and Woodbine aquifers in Denton County
- Woodbine aquifer in Ellis County
- Trinity and Woodbine aquifers in Grayson County
- Nacatoch aquifer in Kaufman County
- Trinity aquifer in Parker County
- Trinity aquifer in Tarrant County.

Some of the total supply shown as available to Region C will probably not be utilized fully during the period covered by this plan. This includes over 90,000 acre-feet per year of groundwater shown to be available in the Carrizo-Wilcox aquifer in Freestone County.

The five major water providers in Region C (City of Dallas, Tarrant Regional Water District, North Texas Municipal Water District, City of Fort Worth, and Trinity River Authority) provided over 903,000 acre-feet of water in 1996 (80% of the total provided in the region). They have 74% of the 2050 water supply currently available to the region.

The recent dry summers of 1996, 1998, 1999, and 2000 have caused very high water use for many Region C water suppliers. These droughts have put stress on some of the region's major reservoirs, which are designed for a 5 to 7 year drought like that of the 1950's. The high demands also exposed supply limitations for many smaller suppliers (especially those dependent on groundwater) and exposed treatment and distribution limitations for other suppliers.

#### ***ES-4 Comparison of Current Water Supply and Projected Water Demand***

##### **Comparison of Supply and Demand**

Figure ES-5 shows the comparison of total supply with demand for Region C, including supplies that require additional water transmission facilities before they are available to the region. By 2030, the projected demand for Region C exceeds the total supply, even if all of the supplies available to the region are used in full.

Considering only currently connected supplies (those with transmission systems already in place), the following facts emerge for Region C:

- In 2000, three Region C counties (Cooke, Dallas, and Parker) show a net need for immediate additional supplies when all demands and all connected supplies are totaled.
- Significant additional supplies need to be connected before 2010 in Region C. (Several major projects to connect existing supplies are already underway.)
- By 2050, 11 out of the 16 Region C counties show a need for the connection or development of additional supplies to meet projected demands.
- By 2050, 193 out of 282 Region C water user groups show a need for the connection or development of additional supplies to meet projected demands.
- Current plans call for the connection of significant additional supplies for Region C over the next few years, including the following:
  - Irving and Upper Trinity Regional Water District's Lake Chapman pipeline is scheduled for completion by 2003 and will connect 65,700 acre-feet per year.

- Dallas Water Utilities Lake Fork pipeline is scheduled for completion in 2004 and will connect 120,000 acre-feet per year.
- Tarrant Regional Water District is planning additional capacity for its pipeline to Richland-Chambers Lake that will connect an additional 110,000 acre-feet per year by 2005.
- Many Region C water suppliers depend on the region's major water providers (Dallas Water Utilities, Tarrant Regional Water District, North Texas Municipal Water District, Fort Worth, and Trinity River Authority) for all or part of their supplies. Each of those major water providers will need additional supplies by 2050.

### **Socio-Economic Impacts of Not Meeting Projected Water Needs**

If no additional water supplies are developed, Region C will face substantial shortages in water supply over the next 50 years. The Texas Water Development Board provided technical assistance to regional water planning groups in the development of information on the socio-economic impacts of failing to meet projected water needs. TWDB's findings for Region C can be summarized as follows:

- The currently connected supplies in Region C would meet only 51.1 percent of the projected 2050 demand.
- Without any additional supplies, the region's projected 2050 population would be limited to 6,511,032, instead of 9,481,157, a reduction of 31.3 percent.
- Without any additional supplies, the region's projected 2050 employment would be limited to 2,835,255, instead of 4,425,184, a reduction of 35.9 percent.
- Without any additional supplies, the region's projected 2050 income would be limited to \$115,963,000,000, instead of \$171,199,000,000, a reduction of 32.5% percent.

### ***ES-5 Evaluation and Selection of Water Management Strategies***

The regional water planning group went through several steps in the evaluation and selection of water management strategies for Region C:

- Review of previous plans for water supply in Region C, including locally developed plans and the most recent State water plan
- Development of goals, issues, and concerns for the planning process
- General consideration of the types of water management strategies required by Senate Bill One regional planning guidelines
- Development of evaluation criteria for management strategies
- Evaluation of individual strategies

- Development of cost information for individual strategies
- Selection of strategies.

The development of a water plan covering fifty years for a region as large and populous as Region C is full of uncertainties. The implementation of the resulting plan must be flexible to allow for slower or faster than expected growth, unexpected obstacles in development of water management strategies, and unexpected opportunities. Specific points to remember include the following:

- The order in which steps are taken and the exact amount of supply available from each source are subject to variation.
- Water suppliers may need to turn to other alternatives if the recommended alternatives prove to be impractical.
- Changes in one element of the plan can affect other elements.
- Given the uncertainty in developing future supplies, flexibility in plan implementation is essential to success.
- The details of the plan will probably change as implementation proceeds.

### Goals of the Planning Process

The goals for the Region C water planning effort are as follows:

- Provide sufficient water to meet realistic estimates of demand in a timely manner.
- Develop an effective continuing planning process to maintain reliable estimates of supply, maintain realistic estimates of demand, and identify appropriate programs and facilities to meet the water supply needs of Region C.
- Provide for the water supply needs of Region C in a manner that supports the continued economic strength of both Region C and the state as a whole.
- Develop a water supply plan that recognizes the economic, environmental, and cultural importance of natural resources and provides for the maintenance of those resources.
- Address the water supply needs of small cities and rural areas as well as large metropolitan areas.
- Provide for sustainable groundwater use in areas where groundwater is an essential component of the water supply plan.

### Types of Water Management Strategies Considered

As required by Senate Bill One guidelines, the Region C Water Planning Group considered specific types of water management strategies as means of developing additional water supplies:

- Water conservation and drought response planning
- Reuse of wastewater
- Expanded use or acquisition of existing supplies
- Reallocation of reservoir storage to new uses
- Voluntary redistribution of water resources
- Voluntary subordination of water rights
- Enhancement of yields of existing sources
- Control of naturally occurring chlorides
- Interbasin transfers
- New supply development
- Water management strategies in the current State water plan
- Brush control, precipitation enhancement, and desalination
- Water right cancellation
- Aquifer storage and recovery
- Other measures.

#### Methodology for Evaluating Water Management Strategies

The Region C Water Planning Group considered the following factors in the evaluation of potential water management strategies:

- Quantity of water made available
- Reliability of supply
- Unit cost of delivered and treated water
- Difficulty of addressing environmental issues
  - Instream flows
  - Bay and estuary flows
  - Wildlife habitat
  - Cultural resources
  - Wetlands
  - Water quality
  - Other
- Impacts on water resources and other management strategies

- Impacts on agricultural and natural resources
- Consistency with plans of Region C water suppliers
- Consistency with other regions.

Development of cost estimates for water management strategies followed guidelines provided by the Texas Water Development Board. The costs include a 30 percent allowance for engineering and contingencies for pipelines and a 35 percent engineering and contingency allowance for other projects. Costs are for development of new supplies and do not include costs for:

- Facilities already in place
- Replacement or upgrading of aging facilities
- Improvements to meet changing regulatory requirements
- Improvements for water distribution to retail customers.

#### Recommended Water Management Strategies for Major Water Providers

A large part of the water supplied in Region C is provided by the five major water providers in the region: Dallas Water Utilities, Tarrant Regional Water District, North Texas Municipal Water District, Fort Worth, and Trinity River Authority. These five entities will continue to provide the majority of the water supply for Region C through 2050, and they will also develop most of the new supply developed in that time period. Recommended water management strategies to meet the needs of these major water providers include the following:

- **Marvin Nichols I Lake**
  - Major new reservoir in the Sulphur River Basin in Region D
  - Cooperative effort of Region C and Region D water suppliers
  - Total yield of 619,100 acre-feet per year
    - 123,800 acre-feet per year to Region D
    - 112,000 acre-feet per year to Dallas Water Utilities
    - 164,000 acre-feet per year to Tarrant Regional Water District
    - 155,300 acre-feet per year to North Texas Municipal Water District
    - 64,000 acre-feet per year to meet other Region C needs.
  - Estimated capital cost (including transmission to Region C but not including treatment) of \$1,575,448,000.

- **Dallas Water Utilities**

- Figure ES-6 shows the overall comparison of supply and demand for Dallas Water Utilities with recommended water management strategies.
- Continue to use return flows above its lakes (50,000 acre-feet per year in 2000, decreasing to 0 by 2050).
- Temporarily overdraft its reservoirs in 2000 (22,000 acre-feet per year in 2000).
- Extend the Elm Fork permit for wet weather diversions (10,000 acre-feet per year).
- Connect Lake Fork Reservoir to its system (120,000 acre-feet per year).
- Connect Lake Palestine to its system (109,600 acre-feet per year).
- Participate in the Marvin Nichols I project (112,000 acre-feet per year).
- Develop the Southside Reuse project (68,300 acre-feet per year).
- Renew contracts with existing customers as they expire.
- Develop additional water treatment capacity as needed.
- Other alternatives for Dallas Water Utilities include additional reuse and development of yield from return flows in the watersheds of water supply reservoirs.

- **Tarrant Regional Water District**

- Figure ES-7 shows the overall comparison of supply and demand for Tarrant Regional Water District with recommended water management strategies.
- Add pumps and a booster pump station to develop additional capacity in the pipeline from Richland-Chambers Lake to Tarrant County (113,900 acre-feet per year).
- Develop the West Fork Connection to allow water to be transferred among the parts of the water supply system.
- Develop the proposed reuse project to pump water from the Trinity River into Cedar Creek Lake and Richland-Chambers Lake to supplement yields (115,500 acre-feet per year).
- Develop a third pipeline from Cedar Creek Lake and Richland-Chambers Lake to Tarrant County.
- Participate in the Marvin Nichols I project (164,000 acre-feet per year).
- Other alternatives for Tarrant Regional Water District include water from Oklahoma, development of Lake Tehuacana, and obtaining water from Lake Texoma.

- **North Texas Municipal Water District**

- Figure ES-8 shows the overall comparison of supply and demand for North Texas Municipal Water District with recommended water management strategies.

- Develop additional water supplies in Lake Lavon from reuse (35,900 acre-feet per year).
- Develop additional water supplies from Lake Texoma (10,000 acre-feet per year).
- Develop a water supply from existing water sources in Oklahoma (50,000 acre-feet per year).
- Develop Lower Bois d'Arc Creek Reservoir on Bois d'Arc Creek (98,000 acre-feet per year).
- Participate in the Marvin Nichols I project (155,300 acre-feet per year).
- Develop additional water treatment capacity and treated water transmission system improvements as needed.
- Other alternatives for North Texas Municipal Water District include obtaining a substantial additional supply from Lake Texoma and extending the existing Lake Texoma pipeline to minimize channel losses.
- **City of Fort Worth**
  - Continue to obtain essentially all of its raw water from Tarrant Regional Water District.
  - Renew contracts with its existing customers as they expire.
  - Develop additional water treatment capacity as needed.
- **Trinity River Authority**
  - Continue to obtain raw water from Tarrant Regional Water District for its Tarrant County Water Supply Project.
  - Expand Tarrant County Water Supply Project raw water transmission, water treatment, and treated water transmission facilities as needed to meet growing demands.
  - Obtain raw water from Tarrant Regional Water District to implement the Ellis County Water Supply Project.
  - Develop raw and treated water transmission lines to implement the Ellis County Water Supply Project.
  - Develop reuse projects:
    - Additional golf course and landscape irrigation in the Las Colinas area.
    - Golf course and landscape irrigation in Denton and Tarrant Counties.
    - Steam electric power supply in Dallas and Ellis Counties
    - Reuse for municipal supply in Dallas County through Joe Pool Lake and Lake Grapevine.



**Table ES-5**  
**New Supply from Water Management Strategies and**  
**Estimated Capital Costs for Region C Major Water Providers**

<b>Major Water Provider</b>	<b>New Supply, 2000-2050 (Acre-Feet per Year)</b>	<b>Estimated Capital Cost</b>
Dallas Water Utilities	419,900	\$1,491,213,000
Tarrant Regional Water District	393,391	\$998,848,000
North Texas Municipal Water District	349,172	\$1,454,792,400
Fort Worth	– (a)	\$224,383,000
Trinity River Authority	72,500	\$213,865,000
<b>Total</b>	<b>1,234,963</b>	<b>\$4,383,101,000</b>

Note: (a) New supplies for Fort Worth and Trinity River Authority are included in the Tarrant Regional Water District total.

Table ES-5 shows the total new supply from 2000 through 2050 and the estimated capital cost to develop the supply for the five Region C major water providers.

#### Recommended Water Management Strategies by County

The recommended strategies for each county in Region C are summarized below:

- **Collin County**
  - Most Collin County water user groups will continue to obtain treated water from North Texas Municipal Water District.
  - Blue Ridge will develop new wells and continue to rely on the Woodbine aquifer.
  - Celina will obtain treated water from the Upper Trinity Regional Water District.
  - Dallas Water Utilities will supply the part of Dallas in Collin County.
  - Prosper will purchase treated water from North Texas Municipal Water District and Upper Trinity Regional Water District.
  - Water suppliers will temporarily overdraft groundwater while developing surface supplies.
  - Water for steam electric power will be provided by a direct reuse project.
- **Cooke County**
  - Current groundwater use in Cooke County exceeds TWDB's estimated long-term reliable supply.
  - Gainesville is currently developing transmission and treatment facilities to connect to its existing Moss Lake surface water supply.
  - Muenster is planning to develop a 500 acre-foot per year supply from the proposed Muenster Lake in the next few years.

- The Cooke County Water Supply System will be developed using raw water from Gainesville's Moss Lake to provide surface water supplies for water users in the county.
- Water users will temporarily overdraft groundwater while developing surface supplies.
- Water users in Cooke County might consider formation of a groundwater management district.
- The Upper Trinity Regional Water District will supply treated water to Valley View and a portion of Cooke County Other.
- **Dallas County**
  - Most water user groups in Dallas County will continue to obtain treated water from Dallas Water Utilities and North Texas Municipal Water District, renewing contracts as they expire.
  - Irving will complete facilities to bring its water supply from Lake Chapman to Lake Lewisville for treatment by Dallas and use by Irving.
  - Grapevine will implement its authorized direct reuse project.
  - Dallas County Other demands will be met from Dallas Water Utilities, Trinity River Authority reuse projects, and the proposed Marvin Nichols I project.
  - Water for steam electric power generation and mining will come from Dallas Water Utilities and a Trinity River Authority reuse project.
- **Denton County**
  - Current groundwater use in Denton County exceeds TWDB's estimated long-term reliable supply.
  - Upper Trinity Regional Water District will continue to develop its surface water supply system. Most Denton County water suppliers will purchase raw or treated water from UTRWD.
  - Upper Trinity Regional Water District will deliver raw water from Lake Chapman to Lewisville Lake through lines constructed by Irving.
  - Upper Trinity Regional Water District will develop reuse of the water imported from Lake Chapman.
  - Upper Trinity Regional Water District, Denton, and Lewisville will continue to purchase raw water from Dallas Water Utilities.
  - Lewisville will purchase raw water from Lake Chapman from UTRWD.
  - Dallas Water Utilities, North Texas Municipal Water District, and Fort Worth will continue to supply treated water to current customers in Denton County, renewing contracts as they expire.
  - Water users will temporarily overdraft groundwater while developing surface supplies.

- Trinity River Authority will develop a reuse project for golf course and landscape irrigation.
- Additional mining supplies will be obtained from other local supplies.
- Water for steam electric power will be provided by a direct reuse project.
- **Ellis County**
  - Current groundwater use in Ellis County exceeds TWDB's estimated long-term reliable supply.
  - The Trinity River Authority and water suppliers in Ellis County will develop the Ellis County Water Supply System using raw water from Tarrant Regional Water District, treatment capacity from Waxahachie, and transmission facilities developed for the project.
  - Dallas Water Utilities will continue to provide treated water to Ellis County water suppliers, renewing contracts as they expire.
  - Ennis, Mansfield, and Midlothian will obtain raw water from Tarrant Regional Water District.
  - Milford will continue to obtain treated water from Files Valley Water Supply Corporation.
  - Water users will temporarily overdraft groundwater while developing surface supplies.
  - Water for steam electric power will be provided from Trinity River Authority and Ennis reuse projects and TRA's Joe Pool Lake and Lake Bardwell.
- **Fannin County**
  - Most Fannin County water user groups have an adequate supply to meet projected water demands through 2050.
  - Additional supplies for county other use will be obtained from the Woodbine aquifer.
- **Freestone County**
  - Fairfield will develop an additional well in the Carrizo-Wilcox aquifer.
  - Wortham will obtain treated water from Mexia.
  - Water for steam electric power will be provided from TRWD's Richland-Chambers Lake.
- **Grayson County**
  - Current groundwater use in Grayson County exceeds TWDB's estimated long-term reliable supply.
  - Development of the Grayson County Water Supply System is proposed to deliver water to users throughout the county. The system includes a raw water pipeline from Lake Texoma, a treatment and desalination plant, and treated water pipelines.

- Water users will temporarily overdraft groundwater while developing surface supplies.
- Denison will sell treated water to Pottsboro (using raw water rights obtained by Pottsboro).
- **Henderson County**
  - Most Henderson County water user groups have an adequate supply to meet projected water demands through 2050.
  - Malakoff will develop a surface water supply system using raw water from TRWD's Cedar Creek Lake.
- **Jack County**
  - All Jack County water user groups have an adequate supply to meet projected water demands through 2050.
- **Kaufman County**
  - Current groundwater use in Kaufman County exceeds TWDB's estimate of long-term reliable supply.
  - North Texas Municipal Water District, Terrell, and Dallas Water Utilities will continue to supply their current customers in Kaufman County.
  - Treated wastewater from Garland will be reused for steam electric power demand.
  - Water users will temporarily overdraft groundwater while developing surface supplies.
  - TRWD will supply surface water for mining.
  - Additional irrigation local supplies will be developed for irrigation demands.
- **Navarro County**
  - Corsicana will continue to provide treated water for most of the water suppliers in Navarro County, and Corsicana has an adequate water supply.
  - A new well will be developed in the Carrizo-Wilcox aquifer for mining use.
- **Parker County**
  - Current groundwater use in Parker County exceeds TWDB's estimated long-term reliable supply.
  - Weatherford is constructing a pump station and 36-inch pipeline to bring water from Lake Benbrook to Lake Weatherford. That project is planned for completion in 2002.
  - Weatherford will treat raw water made available by Tarrant Regional Water District through its pipeline and sell treated water to Aledo, Annetta, Hudson Oaks, and Willow Park, all of which currently use the Trinity aquifer for their water supply.

- TRWD will provide additional water for Azle, Briar, Reno (through Springtown), and Springtown.
- Additional county other and manufacturing supplies will be developed from TRWD through Weatherford.
- Water for steam electric power will be provided by reuse of treated wastewater from Weatherford and by water from Lake Benbrook.
- Water for mining will be provided by increased local water supply diversions.
- Water users will temporarily overdraft groundwater while developing surface supplies.
- **Rockwall County**
  - Dallas Water Utilities will continue to supply the part of Dallas in Rockwall County.
  - Most water suppliers in Rockwall County will continue to obtain treated water from North Texas Municipal Water District.
  - Water for steam electric power will be provided by reuse.
- **Tarrant County**
  - Current groundwater use in Tarrant County exceeds TWDB estimate of reliable long-term supply.
  - Tarrant Regional Water District will continue to provide raw water for most of the water suppliers in Tarrant County.
  - Fort Worth and the Trinity River Authority's Tarrant County Water Supply project will continue to supply treated water to many Tarrant County water suppliers, renewing contracts as they expire.
  - Arlington, Benbrook, Fort Worth, Mansfield and the Trinity River Authority Tarrant County Water Supply System will expand water treatment plants to keep pace with increasing demands.
  - Kennedale and Pantego will obtain treated water from Arlington and Fort Worth.
  - Dallas Water Utilities will provide supplies for Grand Prairie and Grapevine, renewing contracts as they expire.
  - Grapevine will develop its direct reuse project.
  - Water for steam electric power and golf course and landscape irrigation will be provided from reuse.
  - Water users will temporarily overdraft groundwater while developing surface supplies.
- **Wise County**
  - Walnut Creek Special Utility District will serve Aurora, Boyd, Newark, and Rhome with treated water, using water purchased from Tarrant Regional Water District.

- Alvord will add an additional well and continue to use the Trinity aquifer.
- Briar, Bridgeport, and Decatur will obtain additional supplies from the Tarrant Regional Water District.
- Upper Trinity Regional Water District will supply a portion of county other needs through Bolivar WSC.
- Steam electric power needs will be provided by sales from Tarrant Regional Water District.

### Livestock Demands

In 13 of the 16 Region C counties, the estimated county-wide water supply for livestock purposes can meet projected demands for the county as a whole. However, these overall county-wide supply and demand figures do not show areas of shortages that exist within the counties under drought conditions. The Region C Water Planning Group recommends several special measures to address localized livestock water shortages

- Overdrafting of aquifers during droughts
- Brush control
- Maintaining existing stock ponds and adding new stock ponds
- Improving and maintaining existing NRCS dams
- Agriculture Department survey questions on agricultural water use

### ***ES-6 Regulatory, Administrative, Legislative, and Other Recommendations***

The Region C Water Planning Group makes the following recommendations for regulatory, administrative, legislative, and other changes:

- Recommendations related to the Senate Bill One planning process
  - Encourage alternative strategies to be designated for near and long term planning needs.
  - Allow TWDB to exercise discretion in the consideration and approval of funding for alternatives not presented as part of the regional water plan.
  - Allow TNRCC to exercise discretion in the consideration and approval of water right permit applications not part of the regional water plan.
  - Allow regional water planning groups to assume that contracts for water supply will be renewed when they expire.

- Provide clarification of the impact of designating a unique stream segment.
- Recommendations related to TNRCC policy and water rights
  - Make some water rights exempt from cancellation for ten years of non-use.
  - Reduce the regulatory and legislative obstacles to indirect reuse of treated wastewater.
  - Remove barriers to interbasin transfers of water.
- Recommendations for state and federal programs to address water supply issues
  - Increase funding for Texas Water Development Board loans and the state participation program to assist with the development of water supply projects.
  - Accelerate studies of groundwater availability for the Trinity aquifer.
  - Increase state participation in water conservation efforts.
  - Provide a program for education of board members of Water Supply Corporations, Special Utility Districts, and Municipal Utility Districts.
  - Increase state participation in watershed protection planning.
  - Encourage federal funding for development, maintenance, and upgrading of NRCS structures.
  - Provide state assistance with maintenance and construction of stock ponds.
  - Encourage Texas Department of Agriculture to include water supply questions on its survey of farmers and ranchers.
- Recommendations for ecologically unique river and stream segments
  - Provide clarification of the impacts of designating a unique stream segment.
- Recommendations for unique sites for reservoir construction
  - Marvin Nichols I
  - Lower Bois d'Arc Creek
  - Muenster
  - Tehuacana

### ***ES-7 Plan Approval Process and Public Participation***

The Region C Water Planning Group made special efforts to inform and seek input from the general public, water suppliers, and others with special interest in the planning process.

#### **Regional Water Planning Group**

The original legislation for Senate Bill One and the Texas Water Development Board planning guidelines establish regional water planning groups to control the planning process.

The Region C Water Planning Group held regular meetings open to the public during development of the plan, including nine meetings in 1998, 11 meetings in 1999, and 12 meetings in January through August 2000.

#### Outreach to Water Suppliers and Regional Planning Groups

The Region C Water Planning Group made special efforts to contact water suppliers in the region and obtain their input in the planning process.

- The planning group sent out questionnaires early in the Region C planning seeking information on population and water use projections and other water supply issues.
- The planning group appointed a technical review committee composed of experienced water resource planners to review population and water demand projections.
- The planning group instructed its consultants to keep in contact with water suppliers as planning progressed.

The Region C and Region D water planning groups formed the Sulphur River Task Group, including members of both water planning groups, to coordinate water supply planning involving the Sulphur River Basin. As a result of cooperative efforts, both planning groups support the development of Marvin Nichols I Reservoir on the Sulphur River in Region D

#### Outreach to the Public

The Region C Water Planning Group outreach efforts for the public included the following:

- Publication of newsletters to inform the public.
- Public awareness presentations to interested groups throughout the region.
- Media outreach program to involve the news media.
- Publication of the draft of the *Initially Prepared Region C Water Plan* on the Freese and Nichols web page, at <http://www.freese.com/senbill1/regionc/index.htm>.

#### Public Meetings and Public Hearings

The Region C Water Planning Group has held the following public meetings and hearings to bring the Region C Water Plan to the public:

- Required initial meeting on the planning process.
- Public Hearing on population and water use



- Five public meetings throughout the region on water needs and potential strategies
- Five public meetings and a public hearing on draft initially prepared plan in September of 2000.

## APPENDIX D

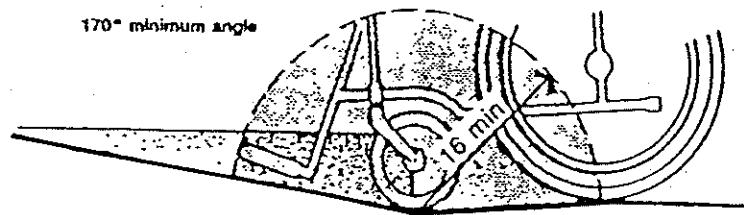
## (j) Curb Ramps.

- (1) **Location.** Curb ramps complying with this subsection shall be provided wherever an accessible route crosses a curb. Curb ramps shall be placed so that they are not obstructed by parked vehicles.
- (2) **Slope.** Where ramps are required for curbs eight inches or less, they shall comply with either this subsection or subsection (k) of this section. See Tables (j)1 and (k)1. Where ramps are required for curbs in excess of eight inches, the curb ramps shall comply with Table (k)1. Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of such adjoining surfaces shall not exceed 1:20 (5.0%) and shall have a surface-to-surface angle of no less than 170 degrees. See Figure (j)1.1. Slopes shall be measured as shown in Figure (k)2.
- (3) **Width.** The minimum width of curb ramps shall be 36 inches exclusive of flared sides.
- (4) **Surface.** Surfaces of curb ramps shall comply with subsection (h) of this section. Textures may consist of exposed crushed stone aggregate, roughened concrete, rubber, raised abrasive strips, or grooves. Surfaces that are raised, etched, or grooved in such a manner that would permit water to accumulate are prohibited. Curb ramps having slopes less than 1:10 (10%) shall, for the purpose of warning, have a surface texture that significantly contrasts with that of the surrounding surfaces.
- (5) **Built-up Curb Ramps.** Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes or into spaces that would interfere with persons entering and exiting parked vehicles. See Figures (j)2.1 and (i)1.3.
- (6) **Sides of Curb Ramps.** Curb ramps intersecting with pedestrian walkways and built-up curb ramps that are less than 48 inches wide and without side protection shall have flared sides. The maximum slope of the flares shall be 1:10 (10%). See Figures (j)2.1 - (j)2.3. Curb ramps with returned curbs may be used where pedestrians would not normally walk across them. See Figure (j)2.4.
- (7) **Maneuvering Clearance.** There shall be a clear maneuvering space of at least 48 inches at the top and bottom of curb ramps. See Figure (j)2.2.
- (8) **Diagonal Curb Ramps.** If diagonal (corner-type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. If diagonal curb ramps are provided at marked crossings, the 48 inches minimum maneuvering clearance at the bottom of diagonal curb ramps should be within the markings. See Figures (j)3.3 and (j)3.4. If diagonal curb ramps have flared sides, they should also have a segment of straight curb at least 24 inches long located on each side of the curb ramp and within the marked crossing. See Figure (j)3.3.
- (9) **Islands.** Raised islands in crossings shall be cut through level with the street or have curb ramps at both sides and a level area at least 48 inches long in the part of the island intersected by the crossings. See Figures (j)3.1 and (j)3.2.

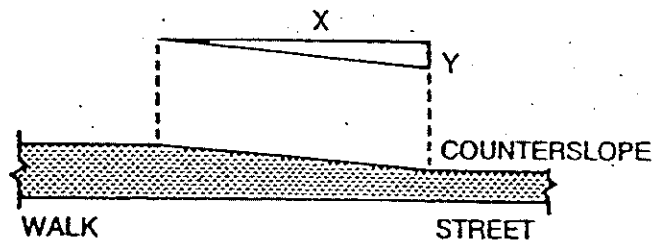
# 115.62 STANDARDS AND SPECIFICATIONS

TABLE (J) 1

RISE	MAXIMUM HORIZONTAL PROJECTION (RUN)	MAXIMUM ALLOWABLE SLOPE
3 inches	18 inches	16.7% (1:6)
7 inches	56 inches	12.5% (1:8)
8 inches	72 inches	11.0% (1:9)



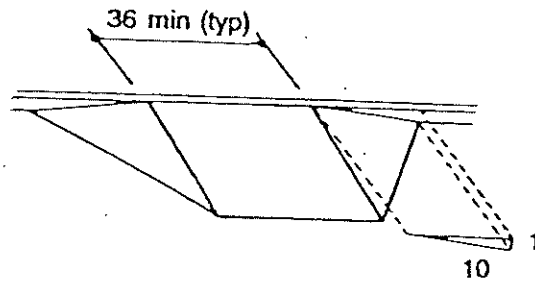
(J) 1.1



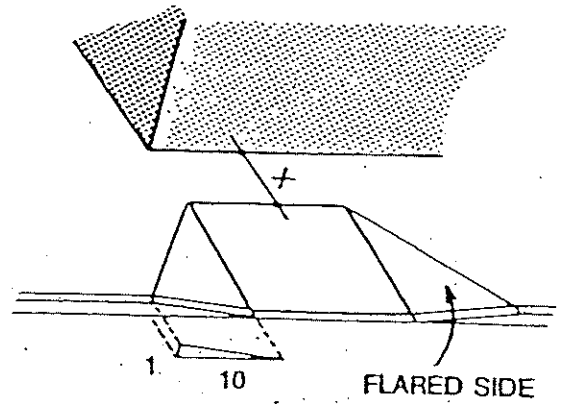
NOTES:

- (1) Slope =  $y/x$ , where  $x$  is a level plane.
- (2) Counterslope shall not exceed 1:20.

(J) 1.2

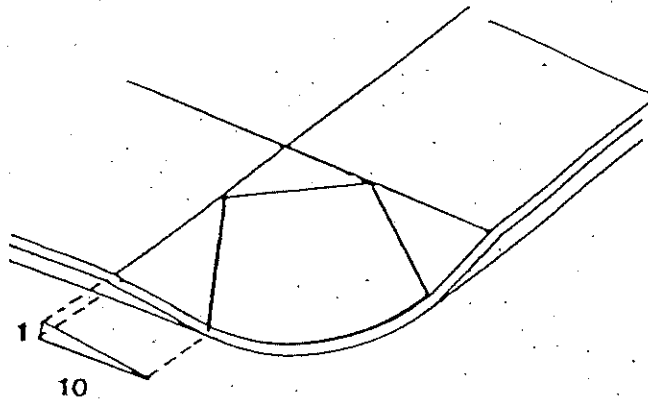


(j) 2.1

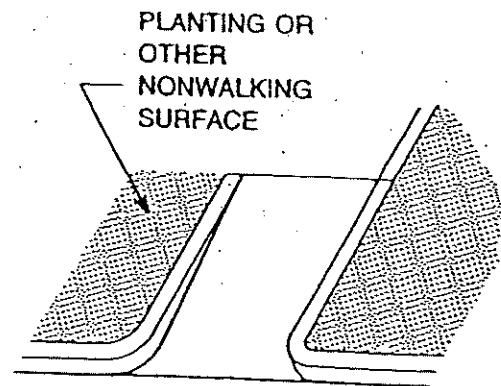


NOTE: If x is less than 48 in, then the slope of the flared sides shall not exceed 1:12.

(j) 2.2

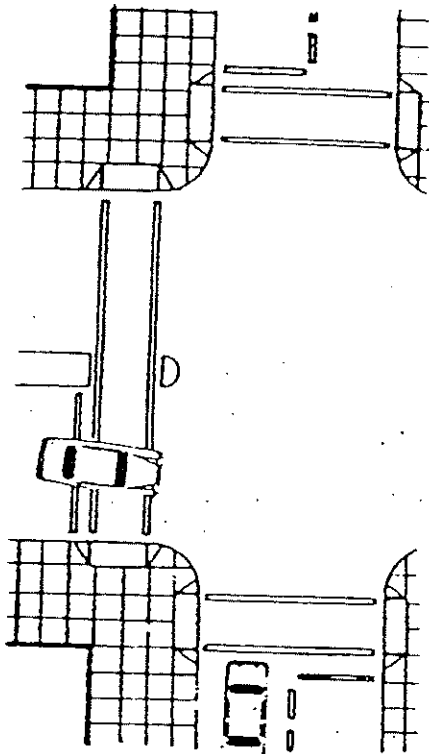


(j) 2.3

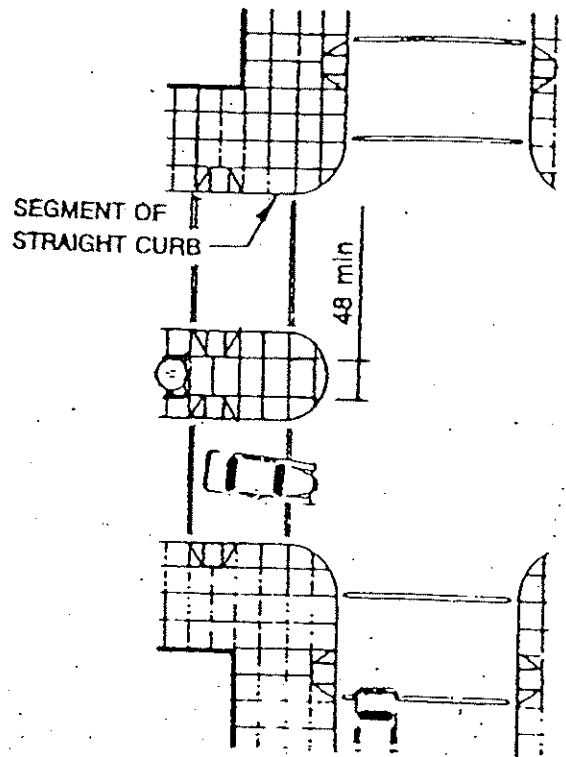


(j) 2.4

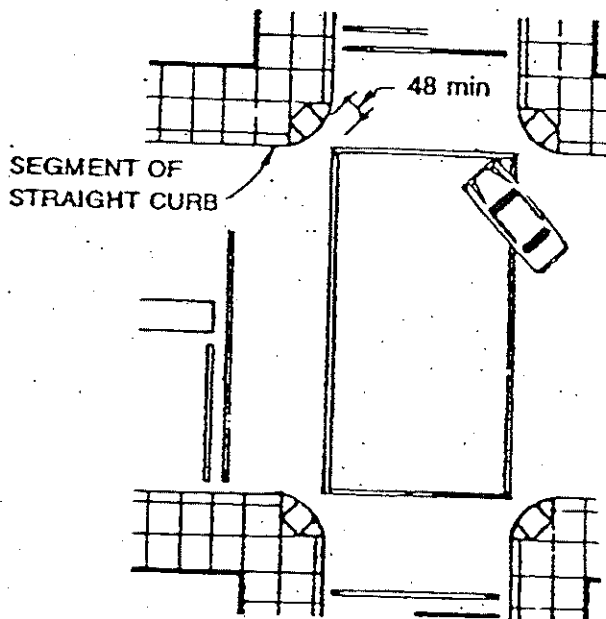
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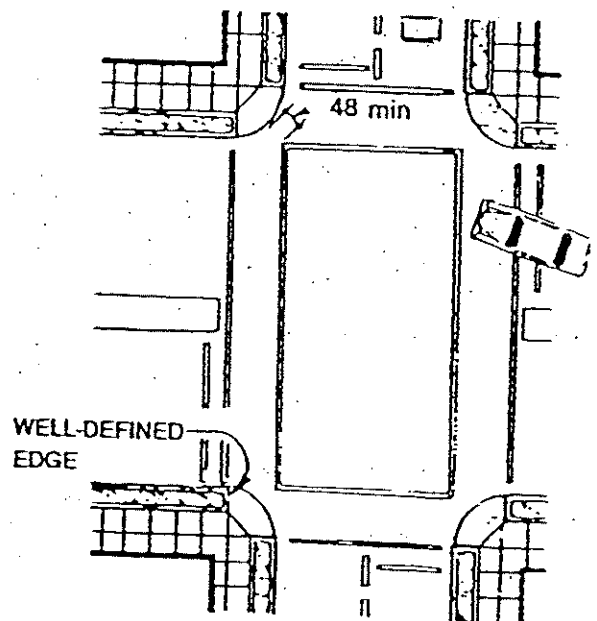
(j) 3.2



(j) 3.1



(j) 3.3



(j) 3.4

**(k) Ramps.**

- (1) **General.** Any part of an accessible route with a slope greater than 1:20 (5.0%) shall be considered a ramp and shall comply with this subsection. Any two or more ramp segments (runs) that are within 30 feet of each other shall be considered a single ramp. See Figure(k)1.

**EXCEPTION:** Sloped surfaces greater than 5.0% but less than 6.0% and not exceeding 30 feet in length are exempt.

**EXCEPTION:** Aisles and floor surfaces within the seating areas of theaters and auditoriums are exempt.

- (2) **Slope and Rise.** Ramps shall not exceed the slope and rise ratios set out in Table (k)1. Slopes shall be measured and calculated as illustrated in Figure (k)2. Transitions from walks to ramps shall be flush and free of abrupt changes. Maximum slopes of adjoining surfaces shall not exceed 1:20 (5.0%), and shall have a surface-to-surface angle of no less than 170 degrees. See Figure (j)1.1.

- (3) **Width.** Ramps in excess of 30 feet long shall have a minimum width of 44 inches in the clear. Ramps that are 30 feet or less in length may have widths of no less than 36 inches in the clear.

- (4) **Landings.** Ramps shall have level landings at the bottom and top of each run and shall comply with the following:

- (A) The landing shall be at least as wide as the widest ramp run leading to it.
- (B) The landing length shall be a minimum of 60 inches in the clear.
- (C) Wherever ramps change direction, there shall be a level landing of at least 60 inches by 60 inches.

**EXCEPTION:** When change of direction does not exceed 45 degrees and the intersecting surfaces are blended so that an abrupt level differential is not created, landings may be exempted.

- (D) If a doorway is located at a landing, the area in front of the doorway shall comply with subsection (n) of this section.

- (5) **Handrails.** Any ramp having a horizontal projection greater than 72 inches shall have handrails on both sides complying with this subsection. Handrails are not required on curb ramps complying with subsection (j) of this section. Handrails shall have the following features.

- (A) Handrails shall be continuous except at landings where doorways or pedestrian crossings occur. The inside handrail on switch-back or dog-leg ramps shall always be continuous.
- (B) Handrails shall extend at least 12 inches beyond the top and bottom of ramps and at level landings where the handrails are not continuous. Extensions shall be parallel with the floor or ground surface. Where full extensions would create protruding hazards, rail termination cues shall be provided. Such cues may include, but are not limited to, those illustrated in Figure (u)1.
- (C) Handrails that are wall-mounted or that are located adjacent to another surface or object shall have a clear space between the rail and adjacent surface of at least 1-1/2 inches. See Figures (u)2.1 - (u)2.5. Handrails may be located in a recess

## 115.62 STANDARDS AND SPECIFICATIONS

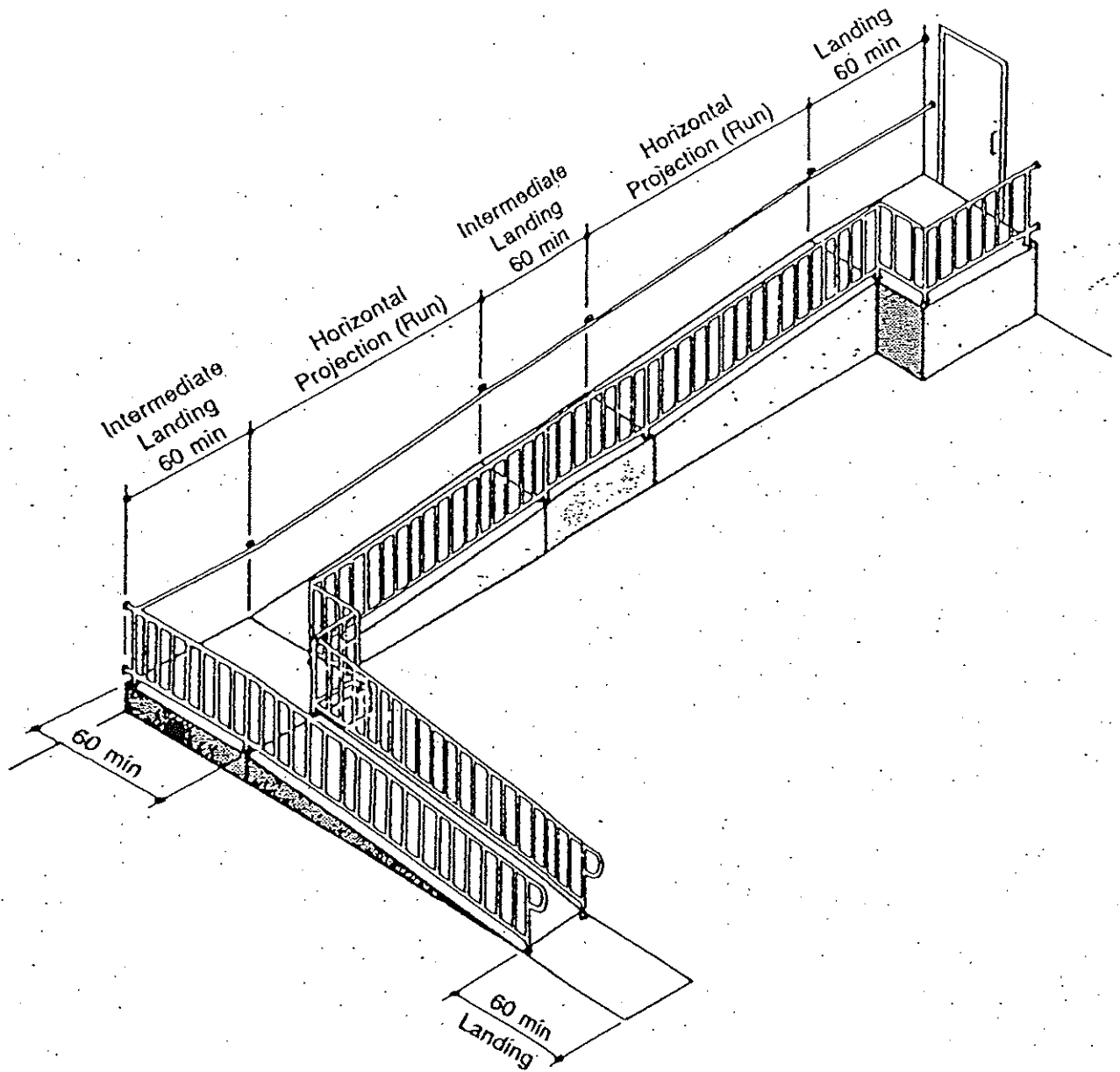
If the recess is a maximum of three inches deep and extends at least 18 inches above the top of the rail. See Figure (u)2.4.

- (D) Handrail gripping surfaces shall be continuous without interruption by mounting brackets, mullions, newel posts, or other construction elements or obstructions.
- (E) The diameter or width of the gripping surface of handrails shall comply with subsection (u)(3)(A) of this section. See Figures (u)2.1 - (u)2.5. Standard pipe sizes designated by the industry as 1-1/4 inches to 1-1/2 inches are acceptable industry tolerances as noted in subsection (c) of this section.
- (F) The structural integrity of handrails and their mountings shall comply with subsection (u)(2)(B) of this section.
- (G) The top of handrail gripping surfaces shall be mounted between 30 inches and 36 inches above the ramp surface (including landings) except at locations where higher rails are required by local codes for safety considerations.

**EXCEPTION:** See section (d)(1)(B) of this section for handrail mounting heights appropriate for schools and other facilities used primarily by children.

- (H) Handrails and any wall or other adjacent surface shall be free of sharp or abrasive elements.
- (6) **Edge Protection.** Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that will prevent people from slipping off the edges. Curbs shall be a minimum of two inches high. See Figure (k)4.1. When surface projections extend less than 12 inches past the handrails, then vertical or intermediate horizontal rails shall be provided. See Figures (k)3 and (k)4.1 - (k)4.4.
- (7) **Cross Slopes and Surfaces.** The cross slope of ramp and landing surfaces shall be no greater than 1:50 (2.0%). The surface texture of ramps and their landings shall comply with subsection (h) of this section.
- (8) **Outdoor Conditions.** Outdoor ramps, landings, and their approaches shall be designed so that water will not accumulate on the walking surfaces.



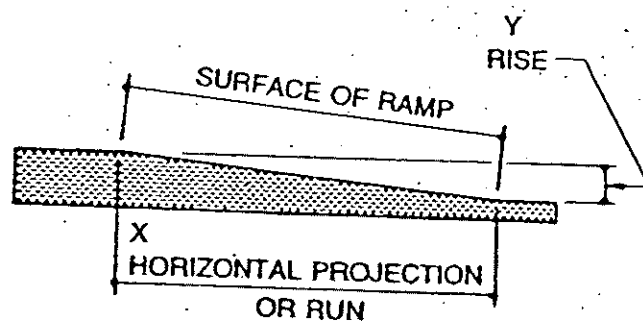


(k) 1

# 115.62 STANDARDS AND SPECIFICATIONS

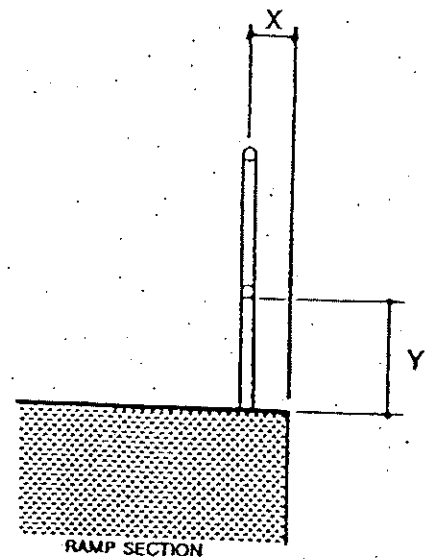
TABLE (k) 1

RISE	MAXIMUM HORIZONTAL PROJECTION (RUN)	MAXIMUM ALLOWABLE SLOPE
3 inches	18 inches	16.7% (1:6)
5 inches	35 inches	14.2% (1:7)
7 inches	56 inches	12.5% (1:8)
9 inches	96 inches	10.0% (1:10)
30 inches	30 feet	8.3% (1:12)
34 inches	40 feet	7.1% (1:14)
44 inches	60 feet	6.0% (1:16)



NOTES:  
(1) Slope =  $y/x$ , where  $x$  is level plane.  
(2) Counterslope shall not exceed 1:20.

(k) 2



NOTE:  
If  $X$  is:  
0'-2"       $Y$  shall be:  
2'-6"      9" max  
6'-12"    12" max  
             18" max

(k) 3

## APPENDIX E

# Special Offer

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## ■ Model #LP464-10A

Add a touch of historic flavor.  
This four globe light features durable 10" round acrylic globes that will brighten your home for years.

## ■ Measurements

Overall Height: 8'6"  
Pole Height: 7'4"  
Base Height: 19.5"  
Base Diameter: 8.5"

## ■ Electrical

Includes 4 medium base sockets.  
60 watt max. ea. incandescent.

## ■ U.P.S. Shippable

For Quick & Easy  
Delivery-To-Your-Door

Find your state abbreviation to determine shipping charges:

- OK, TX = \$29 s/h
- AR, KS, LA, NE, NM, MO, MS = \$37 s/h
- AL, AZ, CO, GA, IA, IL, IN, KY, MN, SC, SD, TN, UT, WI, WY = \$44 s/h
- DC, DE, FL, ID, MD, MI, MT, NC, ND, NJ, NV, NY, OH, PA, VA, WV = \$49 s/h
- CA, CT, MA, ME, NH, OR, RI, VT, WA = \$54 s/h



## ■ To Order

Phone, Fax, or Mail Your Prepaid Order  
To The Address Below.  
Visa and Mastercard Orders Accepted.

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**For a FREE BROCHURE to  
anywhere in the U.S.A.**

**Send your name and mailing address to us by:**

- **E-mail:**  
[brandon@brandonmail.com](mailto:brandon@brandonmail.com)
- **Fax:** 972-542-1015
- **Mail to:**

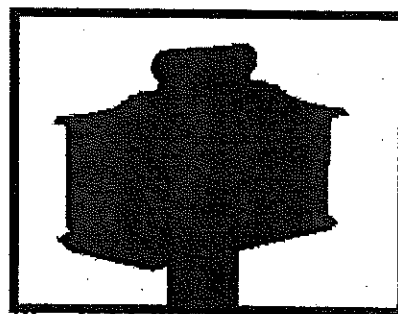


- **Phone:** 972-542-  
**3000** (hours: 8:30am-  
5:00pm CDT)

Dept: NET  
Brandon Industries, Inc.  
1601 W. Wilmeth Rd.  
McKinney, Texas  
75069-8250

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**Go to our Home Page for more information about the company and its products.**

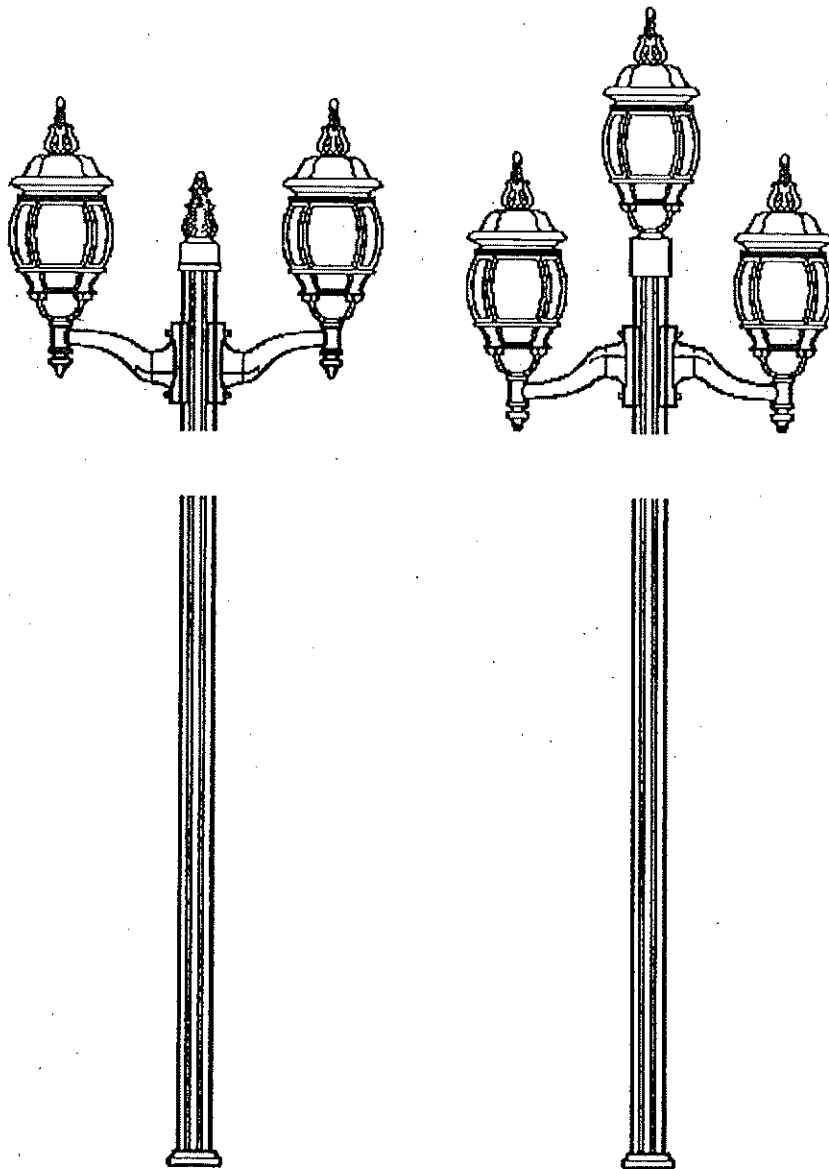


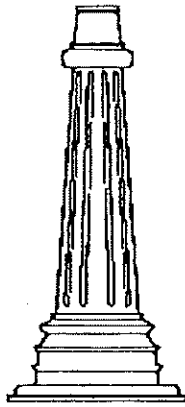
Classic Mailboxes

# BRANDON INDUSTRIES, INC.

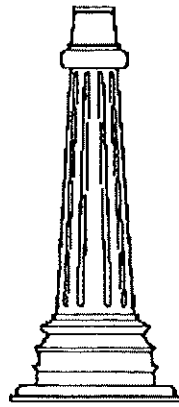
## LP#2 Residential Lamp Post Base With Multiple Light Fixtures

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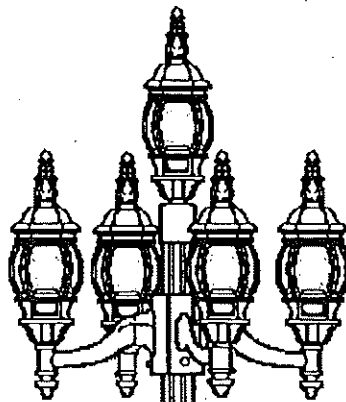
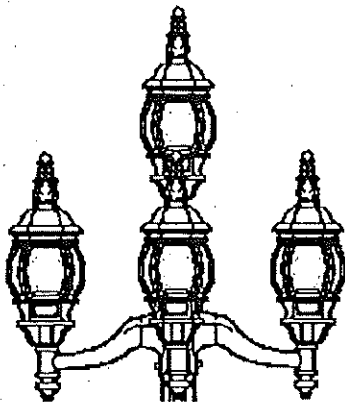


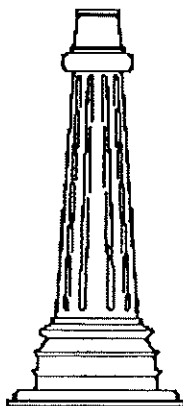


**LP262-83M**  
OAH: 9'7"  
Bevel Glass Lens



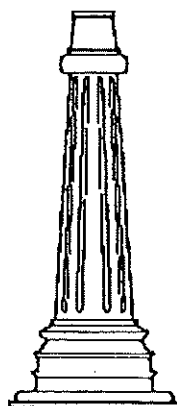
**LP263-83M**  
OAH: 10'1"  
Bevel Glass Lens





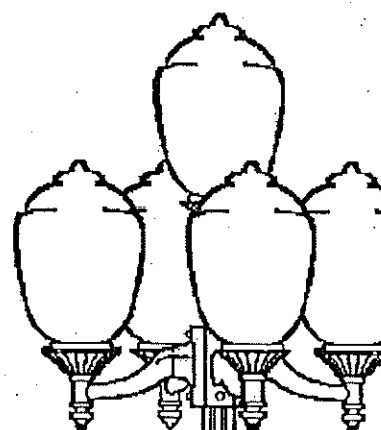
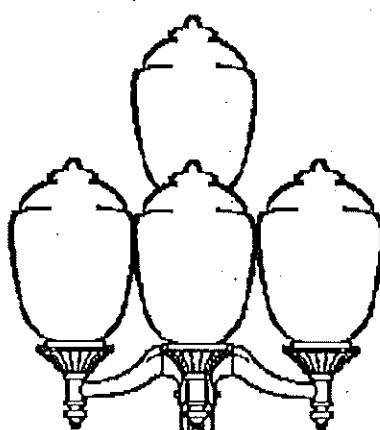
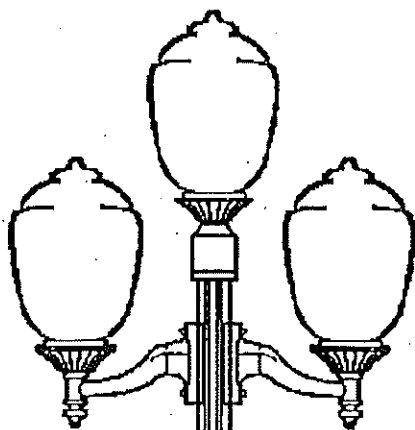
**LP264-83S**

OAH: 9'9"  
Bevel Glass Lens

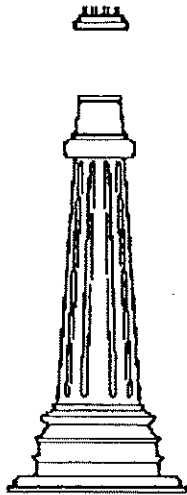


**LP265-83S**

OAH: 9'9"  
Bevel Glass Lens





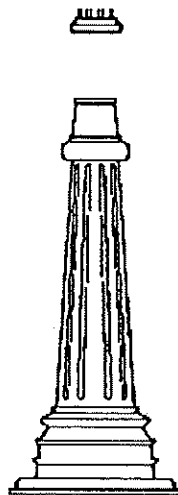


**LP263-14**

OAH: 10'0"  
3 White Poly Globes

**LP263-24**

OAH: 10'0"  
3 Clear Poly Globes

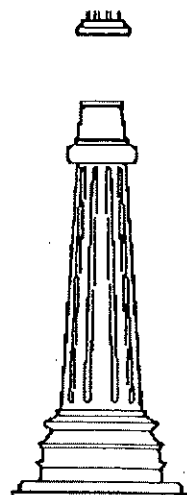


**LP264-14**

OAH: 10'0"  
4 White Poly Globes

**LP264-24**

OAH: 10'0"  
4 Clear Poly Globes

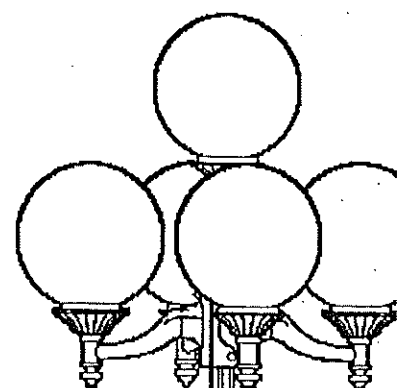
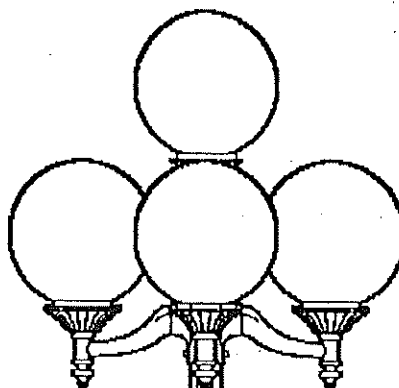
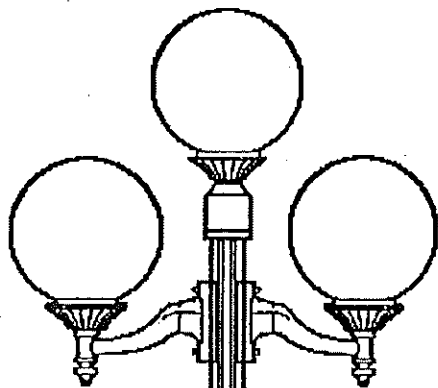


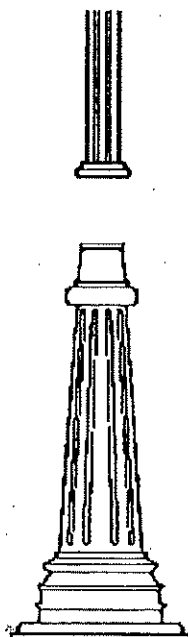
**LP265-14**

OAH: 10'0"  
5 White Poly Globes

**LP265-24**

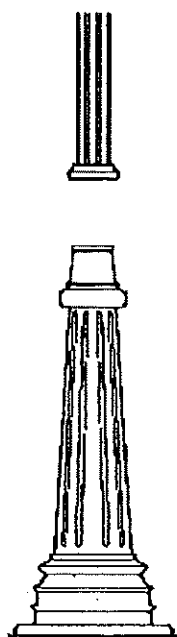
OAH: 10'0"  
5 Clear Poly Globes





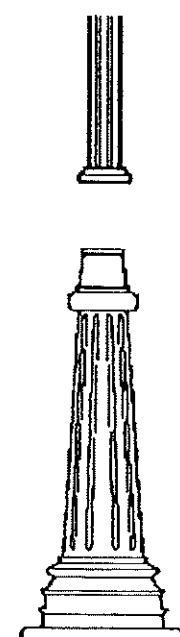
**LP263-12**

OAH: 9'7"  
3 White 12" Dia. Globes



**LP264-12**

OAH: 9'7"  
4 White 12" Dia. Globes



**LP265-12**

OAH: 9'7"  
5 White 12" Dia. Globes

**E-mail:** [brandon@brandonmail.com](mailto:brandon@brandonmail.com)

**Fax:** 972-542-1015



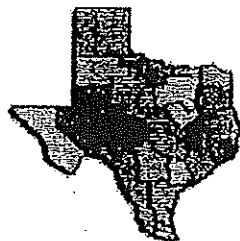
**Phone:** 972-542-3000

(hours: 8:30am-5:00pm CDT)

**Mail to:**

DEPT: NET  
Brandon Industries, Inc.  
1601 Wilmeth Rd.  
McKinney TX 75069-8250

## APPENDIX F

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[Site Map](#)
[What's New](#)


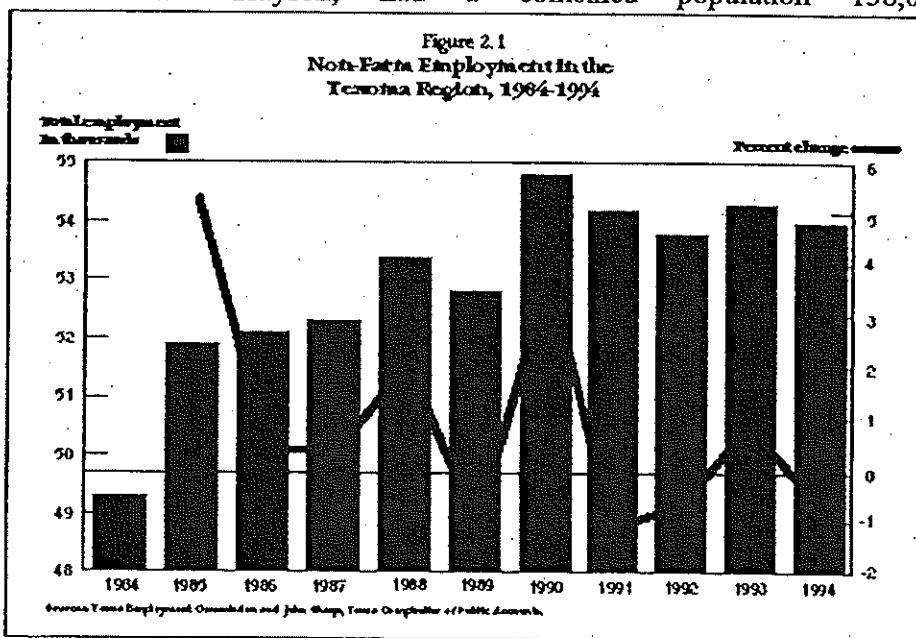
John Sharp, Texas Comptroller of Public Accounts

The Texas EconomyRegional OutlookTexoma

## Texoma Regional Forecast

### Economic Trends of the Past Decade

The Texoma region of Texas experienced periods of strong economic growth during the past decade. (See Figure 2.1.) A reliance on manufacturing has meant that the area has seen some economic hard times, particularly when national recessions have depressed demand for manufactured goods. The counties included in the Texoma region, Cooke, Fannin and Grayson, had a combined population 158,000 in 1995.



During the past ten years the region's employment has increased by 9.6 percent, raising the number of jobs from 49,300 in 1984 to 54,100 in 1994. This represents an annual increase in the total employment of 0.9 percent per year. Unemployment in the region, currently standing at 6.2 percent, reached a peak in 1987 at 7.9 percent. The Texoma region had its greatest employment growth recently in 1990 when over 2,000 jobs were added to the economy and again in 1994 when 1,750 jobs were added. The recent growth periods of 1990 and 1994 were characterized by unusually strong growth in the services and manufacturing sectors of the economy.

The region has a diverse economic base. Manufacturing is the largest employer in the region, contributing 25.2 percent of the jobs. The trade industry comprises 23.7 percent

of employment in the region, while the services and government sectors contributed 19.8 percent and 16.6 percent, respectively. Manufacturing has, historically, been very strong in the region. The region's largest manufacturers produce a wide variety of products ranging from electronic components to prepared meat to surgical supplies. Major manufacturers in the region include Texas Instruments, Oscar Mayer and Johnson and Johnson Medical.

During the tumultuous 1980s, the Texoma region, like most in Texas, suffered from the effects of problems in the oil and real estate industries. From 1984 to 1994, the mining sector lost 65.2 percent of its workforce, falling from 1190 jobs to 410. Manufacturing, too, has experienced a downturn from 15,900 jobs in 1984 to 13,650 in 1994, a loss of 14.1 percent. Offsetting these declines, however, the services industry has increased its employment by 56.8 percent to 10,700 jobs, while the finance, insurance and real estate industries, together, have expanded the job base by 31.5 percent to 2,700 jobs.

Agricultural cash receipts in the region stood at more than \$156 million in 1994, 1.1 percent of the Texas total. Beef cattle and feed crops— such as hay and sorghum— are the dominant agricultural enterprises in the region. Livestock receipts, which comprise 1.1 percent of the state's total reached \$80 million in 1994, while crop production stood at \$63 million, a 1.2 percent take of the state's total. Nurseries, horses and other agriculture related products contribute \$12.4 million to the cash receipts for the region.

### **Economic Outlook for the Texoma Region through 2000**

The diversified economy of the Texoma region should continue a modest expansion through the end of the century. After posting a 1.2 percent increase in employment from 1994 to 1995, the rate of job gain should accelerate in 1996 as employment growth in the manufacturing sector drives some increases in the service sector and some small gains in trade. (See Table 2.1.) Through the end of the decade, employment growth should accelerate a little further, rising to an average of 1.9 percent annual growth rate through 2000.

Job gains in manufacturing in the Texoma region should fuel much of the expansion the region will enjoy over the next few years. In particular, the expansion planned as a result of the joint venture between Texas Instruments and MEMC Electronic Materials, Inc. should drive the employment growth in the electronics industry up from an already respectable growth rate of 2 percent from 1994 to 1995, to over 3 percent annually through the end of the decade. But, despite this promising development, the region's manufacturing employment base is not immune to other broader trends impacting the nation and the state.

First, there will continue to be pressure on defense contractors throughout the 1990s as the military readjusts to new post-Cold War realities in both budgets and missions. Secondly, aided by a devalued peso, Mexico's exports will become ever more competitive with production in Texas and most strongly affect industries such as textiles and apparel where Mexican producers already have inroads into the U.S. market. Third, productivity gains in some highly automated production processes, typical of industries such as petroleum refining and chemicals, can lead to employment declines through attrition even though no productive capacity is lost.

As it has in the recent past, the service sector will continue to generate many new jobs in the Texoma region through the end of the decade. Although the service sector will account for only 21.4 percent of all jobs in the region by the year 2000, the addition of 1,925 jobs to the region's service sector from 1995 to 2000 accounts for 36.4 percent of the expected job growth for the region as a whole during this period. Strongly

contributing to this growth will be changes in business services and the nature of health care.

The very strong 6.5 percent growth in business service sector employment seen from 1994 to 1995, is expected to slow slightly in 1996 but remain sizable, rising 4.4 percent over the next year, and continuing one of the major job generating sectors through the end of the decade. In part, leading the recent growth surge has been a shift toward "just-in-time" personnel management, in which firms have added employees, but have done so by hiring temporary personnel, driving up employment in the temporary services sector. Also adding to this growth is the continuing trend of contracting out of many business functions, such as building maintenance, accounting and computer functions, to service firms.

Employment growth in the health care industry has long been a staple of employment growth in the service sector generally. But, through the end of the 1990s, two opposite trends should be evident in employment in health care. On the one hand, the growth of managed care will continue to put pressure on the unbridled expansion of health care services, leading to an overall slowing in the rate of growth in health care employment. But this same cost-consciousness is fostering the growth of some health care services which tend to be on the lower side of the health care cost spectrum, replacing higher-cost services. In particular, employment opportunities are expected to remain strong in the home health care market and in skilled nursing facilities.

In line with increasing employment growth in services and manufacturing, employment growth in retail trade should accelerate slightly in the last half of the 1990s, averaging 1.9 percent annual growth through 2000. Wholesale trade employment will also expand during this time but at a slower rate, with this slower rate reflecting labor productivity savings which are becoming of increased importance to this sector. But, the sheer size of the trade sector makes this an important source of job generation in the region, with this sector generating more than 1 in every 5 net new jobs in the region in the last half of the 1990s.

Reflecting the added impetus of relative low interest rates in 1995, construction employment posted a strong gain of 5.2 percent. While it is unlikely that interest rates will rise substantially in the near future and choke off growth in this sector, neither will they fuel sustained growth in construction employment. Instead, construction employment in 1996 is expected to post more modest gains, rising only 2 percent in 1996 and remaining at about that level through the end of the decade.

One sector displaying divergent patterns of growth is government. In line with continued federal budgetary constraints, federal civilian employment is expected to decline slightly during the next few years. State and local government employment, driven more by population increases and school district employment needs, should gain employment slowly, at about 1.5 percent in 1996, and slightly faster through the end of the decade.

The growth of the region's economy will feed continued population growth. Total population in the region is expected to rise from 158,000 in 1995 to 161,500 by 2000. As the baby boom generation continues to move out of prime child-bearing ages, however, the rate of growth in the region's population will slow through the end of the decade mirroring declining birth rates expected across the state in the last half of the 1990s.

Total personal income in the region displayed good growth from 1994 to 1995, increasing 5.7 percent. After slowing somewhat in 1996, total income growth in the region should accelerate slightly through the end of the century. Because the rate of population growth is declining during this period, the rate of growth in per capita income

in the region should increase from an expected 4.9 percent in 1996 to average 5.8 percent during the last five years of the decade.

After increasing at a 5.5 percent annual growth rate from 1994 to 1995, the growth in retail sales in the Texoma region should remain at about this same rate in 1996, before rising to an average annual rate of 6.3 percent throughout the last half of the 1990s as employment and income growth accelerates.

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John Sharp - Texas Comptroller of Public Accounts

Window on State Government

# Texoma Region Forecast

## Economic Trends of the Past Decade

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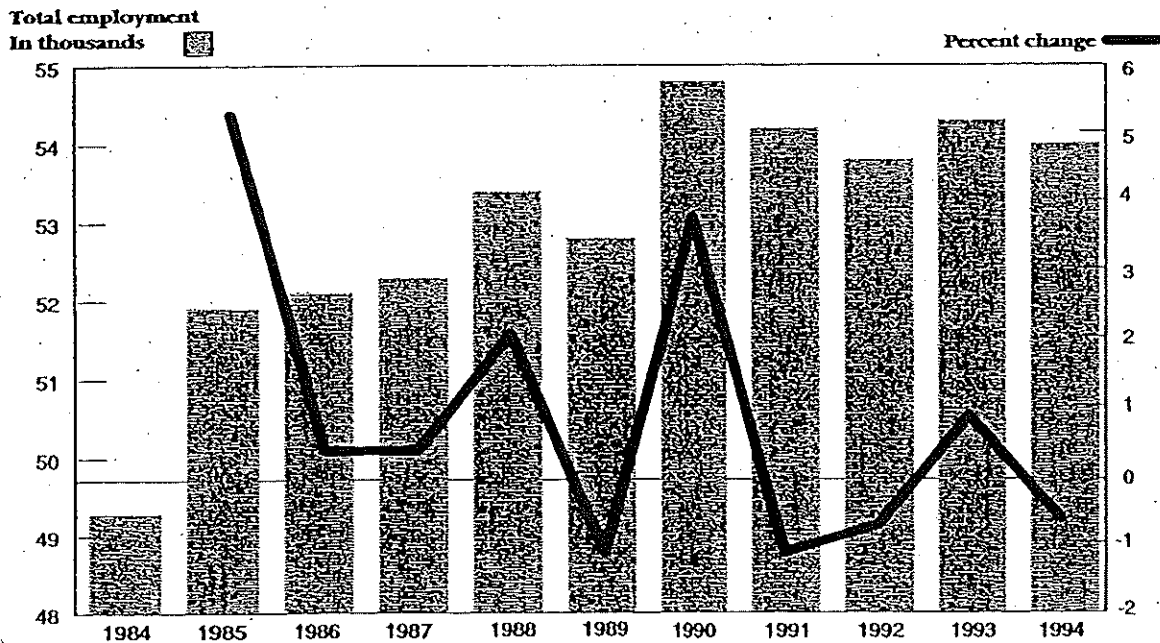
During the past ten years the region's employment has increased by 9.6 percent, raising the number of jobs from 49,300 in 1984 to 54,100 in 1994. This represents an annual increase in the total employment of 0.9 percent per year. Unemployment in the region, currently standing at 6.2 percent, reached a peak in 1987 at 7.9 percent. The Texoma region had its greatest employment growth recently in 1990 when over 2,000 jobs were added to the economy

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During the tumultuous 1980s, the Texoma region, like most in Texas, suffered from the effects of problems in the oil and real estate industries. From 1984

Figure 2.1  
Non-Farm Employment in the  
Texoma Region, 1984-1994



Sources: Texas Employment Commission and John Sharp, Texas Comptroller of Public Accounts.



to 1994, the mining sector lost 65.2 percent of its workforce, falling from 1190 jobs to 410. Manufacturing, too, has experienced a downturn from 15,900 jobs in 1984 to 13,650 in 1994, a loss of 14.1 percent. Offsetting these declines, however, the services industry has increased its employment by 56.8 percent to 10,700 jobs, while the finance, insurance and real estate industries, together, have expanded the job base by 31.5 percent to 2,700 jobs.

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where Mexican producers already have inroads into the U.S. market. Third, productivity gains in some highly automated production processes, typical of industries such as petroleum refining and chemicals, can lead to employment declines through attrition even though no productive capacity is lost.

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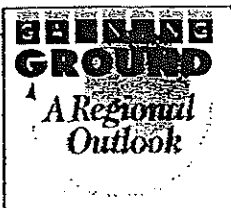
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Table 2.1  
Texoma State Planning Region Forecast

Sector	1994	1995	1996	2000	Annual Percent Change		
					1994-95	1995-96	1996-2000
Total Nonagricultural Employment	54,055	54,700	55,622	59,986	1.2%	1.7%	1.9%
Agricultural Services	501	510	522	571	1.8	2.3	2.3
Mining	414	402	393	363	-2.9	-2.3	-2.0
Construction	1,953	2,055	2,095	2,112	5.2	2.0	0.2
Manufacturing	13,648	13,832	14,021	14,597	1.4	1.4	1.0
Nondurables	4,861	4,921	4,966	5,046	1.2	0.9	0.4
Food Processing	2,312	2,310	2,318	2,309	-0.1	0.4	-0.1
Textiles & Apparel	544	552	551	513	1.6	-0.2	-1.7
Other Nondurables	2,006	2,059	2,096	2,224	2.7	1.8	1.5
Durables	8,787	8,912	9,055	9,551	1.4	1.6	1.3
Furniture & Fixtures	1,171	1,195	1,223	1,317	2.0	2.3	1.9
Stone, Clay & Glass Prod.	528	531	533	529	0.4	0.5	-0.2
Primary Metals	898	906	909	903	0.9	0.3	-0.2
Fabricated Metals	1,057	1,072	1,085	1,113	1.3	1.2	0.6
Industrial Machinery & Computers	1,177	1,189	1,192	1,203	1.0	0.3	0.2
Electronics	2,811	2,867	2,955	3,326	2.0	3.1	3.0
Instruments	631	630	629	606	-0.2	-0.1	-0.9
Miscellaneous Manufacturing	512	523	529	554	2.1	1.2	1.2
Transportation, Communications & Public Utilities	2,335	2,339	2,365	2,515	0.2	1.1	1.6
Wholesale & Retail Trade	12,814	13,006	13,235	14,196	1.5	1.8	1.8
Wholesale Trade	1,857	1,947	1,962	2,031	4.9	0.8	0.9
Retail Trade	10,957	11,059	11,273	12,165	0.9	1.9	1.9
Finance, Insurance & Real Estate	2,703	2,705	2,719	3,043	0.1	0.5	2.9
Services	10,695	10,883	11,212	12,808	1.8	3.0	3.4
Health Services	5,571	5,652	5,873	6,821	1.5	3.9	3.8
Business Services	1,493	1,590	1,661	2,008	6.5	4.4	4.9
Other Services	3,631	3,640	3,678	3,979	0.3	1.0	2.0
Government	8,992	8,968	9,060	9,781	-0.3	1.0	1.9
Federal Civilian	989	946	921	930	-4.3	-2.6	0.2
State Government	763	767	779	883	0.5	1.5	3.2
Local Government	7,240	7,254	7,360	7,969	0.2	1.5	2.0
Population	156,500	158,000	158,900	161,500	1.0	0.6	0.4
Per Capita Personal Income	\$18,316	\$19,177	\$20,107	\$25,179	4.7	4.9	5.8
Total Personal Income (bil. \$)	\$2.87	\$3.03	\$3.20	\$4.07	5.7	5.5	6.2
Retail Sales (billions \$)	\$1.40	\$1.47	\$1.55	\$1.98	5.5	5.4	6.3

Source: John Sharp, Texas Comptroller of Public Accounts.



tance to this sector. But, the sheer size of the trade sector makes this an important source of job generation in the region, with this sector generating more than 1 in every 5 net new jobs in the region in the last half of the 1990s.

Reflecting the added impetus of relative low interest rates in 1995, construction employment posted a strong gain of 5.2 percent. While it is unlikely that interest rates will rise substantially in the near future and choke off growth in this sector, neither will they fuel sustained growth in construction employment. Instead, construction employment in 1996 is expected to post more modest gains, rising only 2 percent in 1996 and remaining at about that level through the end of the decade.

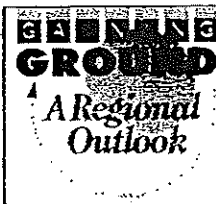
One sector displaying divergent patterns of growth is government. In line with continued federal budgetary constraints, federal civilian employment is expected to decline slightly during the next few years. State and local government employment, driven more by population increases and school district employment needs, should gain employment slowly, at about 1.5 percent in 1996, and slightly faster through the end of the decade.

The growth of the region's economy will feed

continued population growth. Total population in the region is expected to rise from 158,000 in 1995 to 161,500 by 2000. As the baby boom generation continues to move out of prime child-bearing ages, however, the rate of growth in the region's population will slow through the end of the decade mirroring declining birth rates expected across the state in the last half of the 1990s.

Total personal income in the region displayed good growth from 1994 to 1995, increasing 5.7 percent. After slowing somewhat in 1996, total income growth in the region should accelerate slightly through the end of the century. Because the rate of population growth is declining during this period, the rate of growth in per capita income in the region should increase from an expected 4.9 percent in 1996 to average 5.8 percent during the last five years of the decade.

After increasing at a 5.5 percent annual growth rate from 1994 to 1995, the growth in retail sales in the Texoma region should remain at about this same rate in 1996, before rising to an average annual rate of 6.3 percent throughout the last half of the 1990s as employment and income growth accelerates. ♦



# Workforce Profile and Occupational Outlook for the Texoma Region

**H**istorically, natural resources have driven the Texas economy. But, human resources will make the difference in the future. If Texas is to continue to prosper, economic development must come from a large, well trained, highly skilled, high wage workforce. A work force with low skill levels or who cannot adapt to a changing marketplace will hinder businesses from expanding or raising productivity.

To assess work force needs it is essential to know what assets each region contains and which occupations are likely to be in high demand in the future. For example, looking at the size, demographic properties, education and occupations held by an area's population, particularly in reference to state and national norms, helps identify niches where additional education and training could enhance economic activity.

## Demographics

The characteristics of an area's population—its current composition and its future trends—are significant indicators of an area's work force training needs. The population's growth rate provides a clue to the growth rate of the area's work force. In addition, a large current population of children—that could itself indicate a need for training programs—or an expected increase in the working age population indicates the future availability of workers.

By the turn of the century, the Texoma region will add about 11,000 people to the 1990 population of 150,602. This 7.3 percent increase will bring the region's total population to slightly more than 161,500 people. (See Table 4.1.) The region's percentage growth falls far behind that of Texas—17.6 percent from 1990 to the year 2000—and also dips below the nation's expected 10.8 percent increase.

Table 4.1  
Population Trends for the Texoma Region, Texas  
and the United States, 1990 to 2000

Population Category	1990 Population				2000 Population				Percent Change 1990-2000		
	Texoma Region	Percent of Region's Population	Percent of Texas Population	Percent of U.S. Population	Texoma Region	Percent of Region's Population	Percent of Texas Population	Percent of U.S. Population	Texoma Region	Texas	U.S.
0-4 years	10,521	7.0	8.4	7.6	10,460	6.5	7.9	7.0	-0.6	11.4	3.0
5 to 17 years	28,409	18.9	20.2	18.2	28,510	17.6	19.9	19.0	0.4	15.9	15.5
18-64 years	86,167	57.2	61.3	61.7	95,490	59.1	62.0	61.2	10.8	18.9	9.8
65 and over	25,505	16.9	10.1	12.5	27,080	16.8	10.2	12.8	6.2	18.7	13.1
Anglo	134,709	89.4	60.7	75.6	141,330	87.5	55.7	71.6	4.9	8.2	4.9
Black	9,296	6.2	11.7	11.8	11,380	7.0	11.6	12.2	22.4	16.8	14.8
Hispanic	4,684	3.1	25.5	9.0	6,500	4.0	30.0	11.3	38.8	37.6	38.2
Other	1,913	1.3	2.1	3.6	2,340	1.4	2.7	4.9	22.3	50.7	51.2
Male	72,387	48.1	49.3	48.9	78,720	48.7	49.4	48.9	8.7	18.0	10.7
Female	78,215	51.9	50.6	51.3	82,820	51.3	50.6	51.1	5.9	17.3	10.4
Total	150,602	100.0	100.0	100.0	161,540	100.0	100.0	100.0	7.3	17.6	10.8

\*Totals may not add due to rounding.

Sources: 1990 Census, Middle series of the U.S. Population Forecast from the Census Bureau and John Sharp, Texas Comptroller of Public Accounts.

The number of children in an area's population is another measure of future worker availability. The number of preschoolers in the Texoma region will decline by 0.6 percent during the decade, compared to about a 3.0 percent increase in preschoolers nationally. The preschool population in Texas will increase by 11.4 percent.

The drop in the number of preschoolers mirrors a similar decline in the proportion of preschool age children in the region's population, which will fall from 7.0 percent to 6.5 percent by the year 2000. This aspect of the region's population matches state and national trends. In the region, Texas and the nation, the proportion of preschoolers in the population will decline through the end of the decade, reflecting lower birth rates as the baby boom ages out of prime child-bearing years.

The number of school age children (those 5 to 17 years old) in the Texoma region will increase slightly. By the end of the decade, school-age children in the region will add about 100, bringing the total school age population to 28,510 by the turn of the century. The region's expected 0.4 percent growth falls far short of the growth expected in both the state and nation. The state anticipates 15.9 percent growth while the nation expects a 15.5 percent rise in the number of school age children.

This slow growth in the number of school age children may well be the cloud with a silver lining for the region's educational system. Rapid growth in the number of children elsewhere in the state will increase pressures on public education systems.

Over the short term, the current working-age population is of paramount importance to an area's economic development. The number of workers available, along with their education, skills and training, influence the type of businesses that will locate in an area.

In the Texoma region the pool of potential workers—those aged 18 to 64—comprise the largest segment of the population, 57.2 percent in 1990. The region expects to add just over 9,300 working age people to its population by the turn of the century. At that time, the working age population should total 95,490. The Texoma region's 10.8 percent growth in the number of working age people just tops the nation's expected 9.8 percent growth but falls behind the state's 18.9 percent growth from 1990 to the year 2000.

In race and ethnicity, the Texoma region along with the state and the nation is increasing in diversity. While the number of Anglos in the region will grow from 134,709 to 141,330, the percentage of Anglos in the total population will decline from 89.4 percent of the population in 1990 to 87.5 percent in the year 2000. By the end of the decade, the per-

centage of the population composed of blacks will rise from 6.2 percent in 1990 to 7.0 percent. Hispanics will also have a larger share of the region's population by the year 2000, 4.0 percent—up from 3.1 percent in 1990.

The labor force participation rates—the percentage of the population in the work force—varies among the race/ethnic population categories and, when combined with the growth rate for a particular race/ethnic group, can provide an indication of the availability of future workers. In the November 1993 *Monthly Labor Review*, the Bureau of Labor Statistics reported that Hispanic men had the highest participation rate, at 80.5 percent in 1992. Among women, white non-Hispanic women had the highest participation rate, at 58.3 percent.

Gender is also an important component of the labor force because it influences participation in the work force. Child bearing and rearing typically lower the labor force participation rate for women. In the Texoma region, the male labor force participation rate at 71.9 percent in 1990 falls slightly behind the national and Texas rates for men, 75.5 and 77.2 percent respectively. The female labor force participation rate for the Texoma region at 52.7 also falls below the state's 57.1 percent and the nation's 57.6 female labor participation rate.

#### *Educational Attainment*

Educational attainment is an important barometer of an area's work force potential. A high level of educational attainment provides flexibility in job searches, makes it easier to get and keep jobs, increases the opportunity for advancement and usually means higher wages. Such occupational flexibility and ability to successfully retrain for new jobs mean educational attainment is also an important factor for businesses considering a move to an area and for employers hiring workers.

In the Texoma region in 1990, 29.1 percent of the adult population—people aged 18 or older—did not graduate from high school. (See Table 4.2.) Of these 32,556 adults, 10.8 percent—or 12,058 people—had less than a ninth grade education. In Texas, 12.3 percent of adults had less than a ninth grade education while a total of 28.1 percent of adults did not graduate from high school. Nationally only 9.4 percent of adults lacked a ninth grade education, while a total of 24.6 percent did not receive a high school diploma.

The percentage of adults in the Texoma region lacking a high school education is higher than the national and state percentages. The region's higher percentage is a matter of concern because a high school diploma is required for entry level positions by an increasing number of employers. In addition,

Table 4.2  
**Educational Attainment Levels for the Texoma Region,  
 Texas and the United States, 1990\***

<u>Level of Educational Attainment</u>	<u>Texoma Region</u>	<u>Percent of Region</u>	<u>Texas</u>	<u>Percent of Texas</u>	<u>United States</u>	<u>Percent of U.S.</u>
<b>Not a High School Graduate</b>	32,556	29.1	3,416,943	28.1	45,518,277	24.6
Less than 9th grade	12,058	10.8	1,492,112	12.3	17,383,238	9.4
9th to 12th grade, no diploma	20,498	18.3	1,924,831	15.8	28,135,039	15.2
<b>High School Education or Better**</b>	79,225	70.9	8,734,215	71.9	139,585,052	75.4
High School Graduate or GED	34,462	30.8	3,153,187	25.9	55,769,325	30.1
Some College, no Degree	24,586	22.0	2,777,973	22.9	38,417,704	20.8
Associate Degree	6,824	6.1	598,956	4.9	11,095,930	6.0
Bachelor's Degree	8,483	7.6	1,530,849	12.6	22,709,074	12.3
Graduate or Professional Degree	4,870	4.4	673,250	5.5	11,593,019	6.3
<b>Total</b>	<b>111,781</b>	<b>100.0</b>	<b>12,151,158</b>	<b>100.0</b>	<b>185,103,329</b>	<b>100.0</b>

\*For persons 18 years of age and older.

Sources: 1990 Census and John Sharp, Texas Comptroller of Public Accounts.

the earnings gap between more educated or higher skilled workers and the less educated has increased the nation.

Considering that many of the region's workers must come from this pool of adults, the lack of a high school education is troubling. Steps must be implemented to insure that the region's adults lacking a high school education have access to classes for general educational development (GED).

The 70.9 percent share of adults in the Texoma region with at least a high school education is below the state's 71.9. Nationally, more than three quarters of all adults have at least a high school education. Among other measures of educational attainment—ranging from some college to graduate degrees—the region topped both the state and the nation in the percentage of adults with an associate degree. However, both the state and national percentages of adults with a bachelor's or graduate or professional degree are higher than the region's percentages.

The percentage of adults with these highest levels of education—Bachelor's degrees or graduate or professional degrees—are particularly important measures of an area's work force. The *Monthly Labor Review* reported in November 1995 reported that three of the major occupational groups generally requiring education or training beyond high school will increase faster than average. These groups are managerial occupations, professional specialty occupations and technicians, and related support occupations. Moreover, the Texas Employment Commission projections indicate that professional and technical occupations will account

for 20 percent of all jobs in the state by the year 2000.

In Texas, 12.6 percent of adults had bachelor's degrees as did 12.3 percent of the nation's adults. In the Texoma region only 7.6 percent of adults had bachelor's degrees. The nation outranked Texas in the percentage of adults with graduate or professional degrees—6.3 percent compared to 5.5 percent. The Texoma region falls behind both the state and the nation, with 4.4 percent of adults having graduate or professional degrees. Because high wage jobs generally require a higher level of education, the Texoma region may be a less inviting location for businesses offering these high wage jobs.

#### Occupational Outlook

As previously discussed, total employment in the Texoma region should increase significantly by the year 2000. While this is good news, in order to allocate resources for work force training to meet future needs, area planners need more detail. An occupational profile provides some of the needed information. By looking at the occupations employing the most people, growing the fastest or providing the most new jobs, economic development planners and employment specialists can begin to determine the training needs of an area.

*Largest 25 Occupations in 1993:  
The Employment Profile*

Too often in discussing future trends, the focus can quickly slip into what is "hot," timely, technologically fascinating or rapidly growing while overlooking more fundamental, but less glamorous trends. While resisting such temptations is difficult, the facts of work force development are that the bulk of the jobs are in what many would consider somewhat mundane occupations.

Table 4.3 lists the 25 occupations employing the most people in the Texoma region. Together, these occupations represent more than 45 percent of the region's total employment. There are three reasons why these occupations appear on this list while some others—especially those typically associated with occupations we think of as being in high demand—do not.

Table 4.3  
**Texoma Region  
Largest 25 Occupations, 1993**

<u>Occupational Title</u>	<u>Employment</u>
Farmers	3,150
Salespersons, Retail	1,950
General Managers & Top Executives	1,500
Cashiers	1,500
General Office Clerks	1,500
Secretaries	1,450
Food Preparation Workers	1,350
Nursing Aides & Orderlies	1,200
Farm Workers	1,200
Truck Drivers	1,200
Blue Collar Working Supervisors	1,150
Janitors, Cleaners & Maids	1,100
First Line Sales Supervisors	1,000
Bookkeeping, Accounting, & Auditing Clerks	950
Helper, Laborer, Movers, NEC	900
Registered Nurses	850
Sales Representatives	800
Cooks	800
Assemblers, Fabricators, NEC	800
Teachers, Elementary	750
Teachers, Secondary School	750
Child Care Workers	750
First Line Supervisors, Clerical	650
Licensed Practical Nurses	600
Waiters & Waitresses	600

\*NEC, not elsewhere classified

Sources: Preliminary data from Texas Employment Commission and John Sharp, Texas Comptroller of Public Accounts.

First, this listing, as are all others, is a prisoner of the classification system used. The categorization of what people do into occupational titles was not designed to result in an equal number of people in each category, but to reflect the output of each worker and, to some degree, the level of training required for the occupation. As such, some categories are broader than others. For example, the occupational classification system does not distinguish those who sell cars from those who sell clothing. Both are classified as salespersons. Nor does it distinguish between cattle ranchers and cotton barons. They are both farmers. Moreover, in the specific case of farming, the difficulty of this broad categorization is compounded by the fact there is no distinction between those individuals whose sole source of income comes from farming and those only supplementing other income sources (including retirement income) through farming. In the Texoma region farmers topped the list of the 25 largest occupations and employed 3,150 in 1993. Salespersons placed second, employing 1,950 (See Table 4.3).

The second factor evident in the ranking of the largest occupations is that some occupations tend to be used in a wide variety of industries. For example, to a greater or lesser degree, nearly every business employs the services of general managers, secretaries, office clerks, supervisors, janitors and accountants. Cumulatively, these occupations represent a large part of the job base. General managers, general office clerks and secretaries ranked third, fifth and sixth in terms of number of regional workers employed.

Finally, the third strand running through this listing of large occupations is that, with very few exceptions, they are predominantly service sector occupations. This underscores the fact that service producing industries are one of the largest sectors of any region's economy. Both the health and education services industries employ occupations on the list of the top 25 including nursing aides and orderlies, registered nurses and licensed practical nurses and elementary and secondary teachers.

*Top 25 Occupations with the  
Highest Annual Openings, 1993-2000*

Why should this ranking matter for future training needs? Shouldn't we be concerned with what occupations are growing rather than just which ones are big? The answer is we should look at both. While an occupation's current size may bear little relationship to its future growth, a high growth rate may mean few actual jobs. For example, there are a large number of farm workers in the Texoma region but this occupation will decline in employment by

the year 2000. In contrast, an occupation may be growing by 50 percent, yet if it employs 10 workers, only five new jobs will be added. For the purposes of planning for training needs, an important consideration is the volume of new openings, both from replacement and growth.

Openings due to replacement occur because an individual leaves or is separated from an occupation through quitting for another occupation, temporarily leaving to attend school or retiring. While the current size of an occupation need bear no relationship to future growth, it can greatly influence the need for training individuals if there is a need to replace persons leaving the occupation. Replacement rates vary for occupations based on wage rates, average age of workers, worker status and required level of education and training. Filling a job vacancy due to a replacement does not increase total employment within an occupation but may present a training need.

Other occupational openings are due to growth. Growth occurs for a variety of reasons, including economic growth, demographic change and technological change. An example of occupational growth due to demographic change includes child care workers: employment among child care workers increases as more women enter full-time paid employment.

Annual openings—those due to both growth and replacement—which provide the broadest indication of future training needs in the Texoma region are in Table 4.4. There are 22 occupations that appear on both Tables 4.3 and 4.4. This occurs because coupling even a modest growth rate in numerically large occupations with a relatively large number of replacements results in a high ranking in terms of total annual openings. This tendency results in 14 occupations listed in Table 4.4 having at least 50 percent of their expected openings attributable to replacement needs. Growth in the services and retail trade industries drives much of the growth in these occupations.

In some cases, the changing demographics of the work force are driving occupational growth, both directly and indirectly. The expansion of the elderly population, with the attendant need for increased health care, increases the need for nursing aides and orderlies, registered nurses and licensed practical nurses. The increasing number of children contributes to the high growth in demand for child care workers. Moreover, the impact of two-worker families on the prepared food industry is twofold as increased income enables the family to purchase more meals prepared outside the home, while tight schedules demand such purchases. Growth in the prepared food industry will cause an increase in

Table 4.4  
**Texoma Region**  
**25 Occupations with the Highest Annual Openings,**  
**1993 - 2000**

<u>Occupational Title</u>	<u>Annual Openings (New Jobs + Replacements)</u>	<u>Percent of Total Due to Replacement</u>
Salespersons, Retail	110	63.6%
Cashiers	85	76.5
Food Preparation Workers	85	52.9
Nursing Aides & Orderlies	75	20.0
General Office Clerks	60	41.7
Cooks	55	45.5
Secretaries	50	60.0
Waiters & Waitresses	50	60.0
Truck Drivers	45	44.4
Janitors, Cleaners & Maids	45	44.4
Registered Nurses	45	22.2
Farmers	40	62.5
Helper, Laborer, Movers, NEC	40	50.0
Child Care Workers	40	12.5
General Managers & Top Executives	35	57.1
Blue Collar Working Supervisors	35	71.4
First Line Supervisors, Clerical	35	42.9
Licensed Practical Nurses	35	28.6
Farm Workers	30	116.7
First Line Sales Supervisors	30	50.0
Teachers, Secondary School	30	50.0
Computer Specialists	30	16.7
Hand Material Movers, NEC	30	83.3
Sales Representatives	25	80.0
Maintenance Repairers, General Utility	25	40.0

NEC, not elsewhere classified

Sources: Preliminary data from Texas Employment Commission and John Sharp, Texas Comptroller of Public Accounts.

the number of food preparation workers, cooks and waiters and waitresses.

*Top 25 Occupations with the  
Highest Annual New Job Growth, 1993-2000*

Table 4.5 lists the 25 occupations ranked by the largest number of new jobs annually. Because new jobs indicate growth industries, careful analysis of this list could indicate changing training needs.

Service occupations, which will add the largest number of jobs nationally and in Texas, account for eight of the occupations in Table 4.5. As previously discussed, trends in health care and demographics will drive the future demand for many of these occupations, which include nursing aides and orderlies, food preparation workers, child care workers,



Table 4.5  
**Texoma Region**  
**Occupations with the Highest Annual New Job Growth,**  
**1993 - 2000**

Occupational Title	New Job Growth Annually	Replacement Job Growth Annually	Total Job Growth Annually
Nursing Aides & Orderlies	60	15	75
Food Preparation Workers	40	45	85
Salespersons, Retail	40	70	110
Child Care Workers	35	5	40
Registered Nurses	35	10	45
General Office Clerks	35	25	60
Cooks	30	25	55
Computer Specialists	25	5	30
Licensed Practical Nurses	25	10	35
Janitors, Cleaners & Maids	25	20	45
Truck Drivers	25	20	45
Waiters & Waitresses	20	30	50
Cashiers	20	65	85
First Line Supervisors, Clerical	20	15	35
Helper, Laborer, Movers, NEC	20	20	40
Secretaries	20	30	50
Home Health Aides	15	5	20
Managers & Administrators, NEC	15	10	25
Maintenance Repairers, General Utility	15	10	25
Teachers, Secondary School	15	15	30
First Line Sales Supervisors	15	15	30
General Managers & Top Executives	15	20	35
Farmers	15	25	40
Cleaners & Servants, Private Household	10	0	10
Pharmacists	10	0	10

\*NEC, not elsewhere classified

Sources: Preliminary data from Texas Employment Commission and John Sharp, Texas Comptroller of Public Accounts.

cooks, janitors cleaners and maids, waiters and waitresses, home health aides and private household cleaners and servants.

Home health aides, the occupation which ranked number one nationally in new job growth, is adding jobs in response to changes in family structure, increased health care costs, service delivery, advances in technology and changes in Medicare funding.

Employment for home health aides has grown because the rising costs of hospital stays—particularly for long term medical problems—has prompted the increased need for lower cost home care when possible. In addition, two wage earner families rarely have someone available to care for the elderly or sick. Now, thanks to advances in technology—including portable ventilators and heart

monitors—home health aides can perform procedures that once required a hospital stay. In addition, changes in Medicare rules have expanded the use of home health aides by increasing reimbursements to patients for such care.

Growth in the business services industry—particularly temporary employment companies (SEE SIDE BAR)—will promote job growth for general office clerks, secretaries and computer specialists.

#### *Top 25 Occupations with the Highest Annual Rate of Openings, 1993-2000*

Because all of the previous rankings of projected occupational growth are heavily influenced by the size of the occupation in the region, other trends on occupational growth are revealed by correcting for this factor through ranking the occupations according to their annual rate of total openings (growth plus replacement divided by the total number of persons in the occupation in 1993).

Such a ranking of occupations in the Texoma region is listed in Table 4.6. The table includes 14 service occupations. Growth in the eating and drinking places industry drives growth in several occupations including food servers, food service workers, counter attendants, dining room and bartender helpers, hosts and hostesses, waiters and waitresses and cooks.

Of the 25 occupations in Table 4.6, 13 employed only 50 or fewer people in 1993. Growth in these occupations is therefore small in terms of numerical employment. The job titles included among the occupations with the highest rate of annual openings on Table 4.6 represent several

other major occupational categories also—professional and specialty, administrative support, technicians and related support and precision production, craft and repair occupations.

#### *Top 25 Occupations with the Highest Annual Rate of New Job Growth, 1993-2000*

Probably the closest listing to "hot" or emerging occupations can be derived by ranking the occupations according to percentage increase due to growth rather than both growth and replacement. (See Table 4.7.) Using percentages rather than total openings due to growth eliminates occupations that are growing slowly but because of their large size are generating a large number of new openings.

There are four professional specialty occupations

## Temporary Workers

What company nationally employs the largest number of people? Many might answer with one of the alphabet companies, IBM, GM or AT&T but they would be wrong. The nation's largest company is Manpower Inc., a supplier of temporary employees or temps.

Temporary employment companies are the fastest growing segment of the business service industries, which includes everything from janitorial services to engineering and advertising companies.

As companies strive to become leaner, meaner and more productive and cost effective, hiring "just in time" temporary employees has become more popular. A company can add workers during peak periods, reduce workers during slack times and save money. The company also saves money because temporaries rarely receive fringe benefits, which have been estimated at 30 to 40 percent of payroll. Companies also use temporary positions to look over prospective employees, while avoiding wrongful termination liability and the expense of recruiting and interviewing prospective employees. If temporary employees work out the company can hire them for a permanent position.

Who are temporaries? The image of a temporary may still be that of a youth working part time or a shrewish Kelly girl taking dictation, but temporary employees and the nature of their work have changed. First, temporary employment bears

no relation to the number of hours worked in a week but rather refers to the length of time worked. Technically a temporary job lasts less than one year—although occasionally temporary workers can be on the job longer without being hired permanently.

Temporaries can also hold almost any position. As companies attempt to remain competitive, temporary workers are just as likely to be working in laboratories or factories as in offices. The typical employee has a bachelor of science degree at some niche temporary employment companies, while other companies provide temporary senior executives or temporary lawyers. For these workers the flexibility of temporary employment outweighs the negative aspects of no sick days and no retirement. For those forced into temporary employment by downsizing, about 33 percent of such jobs lead to permanent employment.

While it may seem that every company should consider hiring temporary workers some pitfalls exist. A company relying too heavily on temps may have trouble finding the necessary skilled employees when job markets tighten. A company may not save money if temps do not stay long enough to cover any training costs incurred and temporary employees may have more accidents because they usually get less training. Finally, temporary employees can create tension when permanent workers feel threatened that they will lose their job to a temporary. ♦

on Table 4.7. These occupations include pharmacists, respiratory therapists, physical therapists and special education teachers. Growth in the health service and education industries accounts for much of the growth in these occupations.

Of the 25 occupations in Table 4.7, 12 employed only 50 people each in 1993. This was the smallest number an occupation could employ and still be used in this analysis. Growth in these occupations is therefore small in terms of numerical employment but can represent important niche areas of growth.

### Priority and Emerging Occupations

Each year the Quality Work Force Planning unit at the Texas Education Agency develops a statewide list of Priority Occupations, which is reviewed and approved by the Texas State Board of Education.

(See Table 4.8.) This list aims to provide planners with information on statewide labor market conditions. Priority Occupations must meet all four of the following criteria:

- (1) have at least 1,000 annual job openings;
- (2) have occupational growth, not decline;
- (3) require at least 6 months of training; and
- (4) pay at least \$9.00 per hour.

The Board noted another eleven "Additional Priority Occupations" that do not meet at least one of the four requirements for Priority Occupations. (See Table 4.9.) In addition, the State Board of Education selected nine "Emerging Occupations." (See Table 4.10.) These were identified by industry and labor experts but do not exist in large enough numbers to be visible in labor market surveys. ♦

Table 4.6  
**Texoma Region**  
**25 Occupations with the Highest**  
**Annual Rate of Openings,**  
**1993 - 2000**

<u>Occupational Title</u>	<u>Percent Growth in Annual Openings (Annual Openings/1993 emp.)</u>	<u>Proportion of Annual Openings due to Replacement</u>
Cleaners & Servants, Private Household	20.0%	0.0%
Food Servers	20.0	50.0
Food Service Workers, NEC	20.0	50.0
Counter Attendants	12.5	80.0
Dining Room & Bartender Helpers	10.0	66.7
Pharmacists	10.0	0.0
File Clerks	10.0	50.0
Fire Fighters	10.0	50.0
Respiratory Therapists	10.0	0.0
Physical Therapists	10.0	0.0
Emergency Medical Technicians	10.0	0.0
Medical Records Technicians	10.0	0.0
Protective Service Workers, NEC	10.0	100.0
Hosts & Hostesses	10.0	0.0
Physical, Corrective Therapy Assistants	10.0	0.0
Service Workers, NEC	10.0	0.0
Cabinetmakers & Bench Carpenters	10.0	0.0
Water & Wastewater Treatment Plant Operators	10.0	0.0
Waiters & Waitresses	8.3	60.0
Bank Tellers	7.5	66.7
Guards	7.5	33.3
Cooks	6.9	45.5
Teachers, Special Education	6.7	0.0
Correction Officers & Jailers	6.7	0.0
Sheet Metal Workers	6.7	50.0

\*NEC, not elsewhere classified

Sources: Preliminary data from Texas Employment Commission and  
John Sharp, Texas Comptroller of Public Accounts.

Table 4.7  
**Texoma Region**  
**Occupations with the Highest Annual Rate**  
**of New Job Growth, 1993 - 2000**

<u>Occupational Title</u>	<u>Annual Percent Increase due to New Job Growth</u>
Cleaners & Servants, Private Household	20.0%
Pharmacists	10.0
Food Servers	10.0
Food Service Workers, NEC	10.0
Respiratory Therapists	10.0
Physical Therapists	10.0
Emergency Medical Technicians	10.0
Medical Records Technicians	10.0
Hosts & Hostesses	10.0
Physical, Corrective Therapy Assistants	10.0
Service Workers, NEC	10.0
Cabinetmakers & Bench Carpenters	10.0
Water & Wastewater Treatment Plant Operators	10.0
Teachers, Special Education	6.7
Correction Officers & Jailers	6.7
Nursing Aides & Orderlies	5.0
Computer Specialists	5.0
Guards	5.0
Health Professions, NEC	5.0
Data Entry Keyers	5.0
File Clerks	5.0
Fire Fighters	5.0
Medicine & Health Service Managers	5.0
Property & Real Estate Managers	5.0
Loan Officers & Counselors	5.0

\*NEC, not elsewhere classified

Sources: Preliminary data from Texas Employment Commission and  
John Sharp, Texas Comptroller of Public Accounts.

Table 4.8  
Priority Occupations for Texas, 1995

<u>Occupational Category</u>	<u>Prevailing Hourly Wage Estimate</u>	<u>Projected Yearly Openings in Texas</u>
Accountant and Auditor	\$14.42	2,355
Auto Mechanic	12.79	2,115
Carpenter	11.88	1,280
Computer Programmer	16.51	1,860
Computer Systems Analyst	19.10	1,485
Drafter	13.15	1,105
Education Administrator	15.39	1,285
Electric Engineering Technician	13.93	1,310
Electrical Engineer	20.64	1,345
Electrician	13.51	1,355
Financial Manager	15.95	1,335
Food Service Manager	10.45	1,560
Insurance Sales Agent	11.36	1,005
Lawyer	30.45	1,745
Machinist	12.39	1,130
Maintenance Repairer, General	10.33	3,120
Manager, General Function	15.23	6,570
Manager, NEC*	10.33	3,480
Marketing Manager	17.43	1,195
Painter/Paperhanger	10.43	1,010
Physician/Surgeon	25.18	1,035
Plumber/Pipefitter	14.13	1,115
Police Patrol Officer	13.93	1,170
Registered Nurse	13.42	4,870
Sales Representative, Scientific	15.40	1,365
Sales Representative, Wholesale	13.93	3,810
Sales Supervisor	10.33	3,045
Secretary, NEC	9.81	8,045
Service Supervisor, NEC	9.32	1,555
Supervisor, Construction Trades	12.39	1,415
Supervisor, Mechanics	15.98	1,475
Supervisor, Production Workers	14.96	1,165
Supervisor/Manager, Clerical	11.36	3,230
Teacher, College/University	21.50	2,680
Teacher, Elementary	11.61	3,820
Teacher, NEC	10.07	1,145
Teacher, Secondary	12.39	4,750

\*NEC, not elsewhere classified  
Source: Texas Education Agency.

Table 4.9  
Additional Priority Occupations  
for Texas, 1995

<u>Occupational Category</u>	<u>Prevailing Hourly Wage Estimate</u>	<u>Projected Yearly Openings in Texas</u>
Child Care Worker	\$6.55	6,310
Dentist	25.48	610
Farmer	9.55	1,015
Health Professions, NEC*	7.27	885
Home Health Aide	7.73	2,640
Licensed Practical Nurse	8.25	2,840
Medical Laboratory Technician	10.84	355
Medical Laboratory Technologist	12.02	400
Medical Secretary	9.33	700
Pharmacist	20.56	705
Radiologic Technician	11.36	370
Radiologic Technologist	13.03	270

\*NEC, not elsewhere classified  
Source: Texas Education Agency.

Table 4.10  
Emerging Occupations for Texas, 1995

<u>Occupational Category</u>
Agriculture in the international marketplace
Aquaculturist
Network systems technician
Crop protection/production specialist
Information technology support specialist
Laboratory analyst/environmental
Laser/electro-optics technician
Manufacturing/automated systems technician
Telecommunications technician

Source: Texas Education Agency.