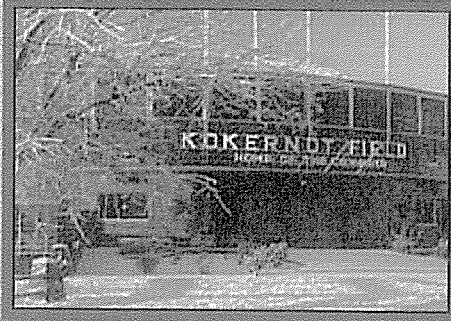
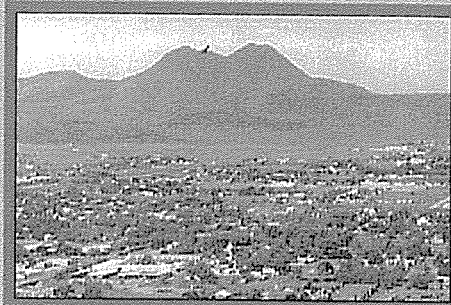



CITY OF ALPINE, TEXAS PLANNING STUDIES 2001-2005



**Presented to the
Alpine City Council
March 27, 2001**

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City of Alpine, Texas Planning Studies 2001-2005 Volume 1: Report

FINANCED THROUGH THE DEPARTMENT OF HOUSING AND
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Prepared by:
GrantWorks, Inc.
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Introduction and Acknowledgments

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1 Executive Summary and Study Overview

The City of Alpine initiated these Planning Studies in 1999. The City received funding for this project in October 1999 and has worked with engineering and planning consultants to complete this effort. This planning endeavor was financed in part through provisions of the Texas Department of Housing and Community Affairs, in conjunction with the U.S. Department of Housing and Urban Development.

The text, tables, charts, and figures contained in these Planning Studies provide an inventory, description, and analysis of Alpine's current physical, economic, and social conditions. Goals, objectives, and actions in the form of policy recommendations provide the direction Alpine might take during the coming years to become the place its citizens desire. This executive summary emphasizes the conclusions and final recommendations of the planning efforts described in detail in the body of this report.

1.1 Community Profile

Alpine is a small town of approximately 5,786 people located in the Trans Pecos region of far west Texas. It serves as the county seat of Brewster County. The City has a Mayor-Council form of government.

1.2 Population and Housing Studies

Alpine's population fluctuated significantly during the 1960s and 1970s. Current analysis indicates that the City has experienced an upward trend over the past two decades that will likely continue at a steady rate due in part to natural population increases and continued growth in the regional economy. Housing in the City consists primarily of single-family residences and manufactured/mobile homes, many of which would benefit from housing rehabilitation programs.

1.3 Land Use Studies

Alpine is primarily a residential community with a significant amount of land devoted institutional uses. The City also has a healthy amount of commercial development along its major thoroughfares. The extraterritorial jurisdiction consists mainly of undeveloped open land and some residential development. The growth expected in the City will likely spur residential infill development in areas that already have access to water and sewer services and other utilities. The potential also exists for large-lot subdivision for residential purposes in the ETJ.

1.4 Water System Study

Alpine's water supply and distribution system has been well maintained and is in good condition. The system is currently meeting all TNRCC and EPA regulations regarding drinking water standards. The primary concerns/goals of the planning period will be the development of new water supply resources and storage facilities, the expansion of the system to new service areas, and the replacement of undersized/deteriorating lines in several neighborhoods.

1.5 Wastewater System Study

The City's wastewater treatment facility is in excellent condition and is currently meeting all permit parameters. The average daily flows amount to only 30% of the facility's permitted capacity; therefore, no expansions of the plan will be needed during the planning period. The collection system has experienced problems with deteriorating/undersized vitrified clay pipe, lack of an adequate number of manholes on some lines, and one lift station that is in need of renovation. In addition, there are areas to which expansion of the City's sewer service should be considered. Finally, the southeast area of the City cannot currently be served by the City's public sewer system, dampening business and housing starts in

that area. If funding can be obtained, implementation of the Southeast Interceptor Sewer project will be a priority late in the planning period.

1.6 Street System Study

Alpine has 61.7 miles of streets and highways, 96% of which are paved. Only 52% of the streets are in good condition. As is typical of many smaller cities, Alpine has a limited street maintenance and improvement budget. However, the City leaders have made an investment in the maintenance of its streets, and a comprehensive program of paving, reconstruction, and seal coating has been completed over the past five years. The majority of the planned improvements for the next five years continue to focus on implementing a seal coating program to maintain the existing pavement in good condition.

1.7 Thoroughfares Study

Alpine has several major thoroughfares and is well served by its roads. Installing appropriate signage and/or lights at problem intersections will alleviate some traffic difficulties, and surface maintenance such as point repair and seal coating will increase motorist safety and improve traffic flow. In addition, extending the school speed zone near the Middle School campus will improve pedestrian access and safety in this area.

1.8 Open Space & Recreation Study

Alpine has adequate recreation space and facilities to serve its population. However, some of its most popular facilities are in dire need of renovation in order to maintain their serviceability. Organized sports are very popular with City residents, but there is a lack of existing facilities to support these activities. Rehabilitation of some existing park facilities and development of new sport fields and neighborhood parks will ensure provision of adequate open space and recreational facilities throughout the planning period.

1.9 Capital Improvements Program

Alpine has many infrastructure needs that must be carefully budgeted, especially given the limited financial capacity of the City. Major planned infrastructure includes water, sewer, street, park, and thoroughfare improvements. The City will continue to depend on outside assistance in the form of interlocal cooperation and grants from such sources as the Texas Community Development Program and the Texas Parks & Wildlife Program to augment its own revenues and accomplish its goals.

2 Community Goals and Objectives

2.1 Purpose and Definitions

These Planning Studies are based on goals and objectives. Whenever possible, the Planning Studies recommend actions that the elected officials and citizens of the City of Alpine may use to meet the stated goals and objectives. The Planning Studies do not carry the force of law but are instead a guide that all citizens of Alpine may use to help shape the physical, economic, and social character of their community. These Planning Studies are adopted by and amendable through resolution of the Council.

The primary purposes of these Planning Studies are to:

- guide routine engineering, financial, and planning decisions
- publicly acknowledge the future intentions of the City government with respect to the growth and nature of the community
- allow for increased coordination between the City, other governmental organizations, the citizens, private industry and developers, and other interested parties

This chapter outlines the major goals and objectives that will guide the overall development process in Alpine. Additional goals and objectives that deal with specific problems are found in most of the other chapters in these Planning Studies. Goals are general statements of the community's desired future achievements. They typically deal with environmental, economic, social, or aesthetic issues that ultimately enhance the quality of life in the community. Objectives provide specific approaches to meeting the community's goals and are often measurable in some way. A single objective may meet one or more goals.

Public hearings and presentations were held in 1999, 2000, and 2001 to help develop the goals and objectives for the City described in the following sections.

2.2 General Community Goals and Objectives

Goal: All development shall promote the health, safety, and welfare of all citizens of the community.

- Objective: Encourage housing rehabilitation to eliminate fire and other hazards and to provide handicapped accessibility for homeowners.
- Objective: Ensure that residents are served by a citywide potable water treatment, storage, and distribution system that meets minimum state standards regarding quality, quantity, pressure, and engineering specifications that promote the health and safety of residents.
- Objective: Ensure that residents are served by a citywide sanitary sewer collection and treatment system that meets minimum state standards regarding effluent quality, treatment capacity, collection system capacity, and other health and safety-related standards.
- Objective: Provide a citywide drainage system to minimize or prevent the health and safety problems associated with flooding the City can experience during periods of heavy rainfall.
- Objective: Resurface and reconstruct streets that pose a danger to motorists.

Goal: Balance preservation of the community's small town quality of life with economic development and housing growth.

- Objective: Encourage commercial and small-scale industrial development along highways on the outskirts of the community.
- Objective: Encourage construction on subdivided lots in developed areas (infill) rather than on agricultural land or undeveloped open land by providing and maintaining infrastructure serving developed areas.
- Objective: Develop additional single-family housing in the community.

Goal: Retain the affordability of living in the community.

- Objective: Pursue grant funding for financing improvements to the community's water and sewer systems to reduce the level of funds that the community must raise and to limit debt service.

- Objective: Pursue grant funding to rehabilitate existing housing and to assist homebuyers in order to maintain the community's affordable housing stock.

Goal: Pursue efficiency in delivery of community services by maximizing service and minimizing costs.

- Objective: Investigate interlocal agreements with Brewster County for maintenance of roads and drainageways, thus avoiding or limiting equipment purchases and continual labor expenses.
- Objective: Construct all improvements in a manner that encourages compact development to reduce the cost of infrastructure construction and maintenance for each resident.

3 Population Analysis

3.1 Methodology

Local Planning Studies include estimates and forecasts of the current and future populations because future planning for community facilities and services depends on the size and rate of the community's growth. The United States Bureau of the Census collects population information at ten-year intervals; this information is normally used to identify long-term population trends. The Census and the Texas State Data Center also issue periodic inter-census population estimates for many incorporated cities and towns. This analysis of the population of the City of Alpine uses data at ten-year intervals beginning in 1960 through 1990. (At the time of this writing, there is a limited amount of information available from the 2000 census. Therefore, some of the tables in this chapter rely on 1980 and 1990 census information.) More recent estimates and projections are based on a several factors including figures from the State Data Center's Population Estimates and Projections Program and calculations done using the cohort-component method of population projection.

3.2 Historical Population

As Table 3A shows, Alpine's population fluctuated significantly during the 1960s and 1970s but has risen slowly and steadily since 1980. During the 1960s the City's population increased by 26%. This trend reversed throughout the next decade with population decreasing by nearly 9% by 1980. Alpine's population began growing again during the 1980s, reaching 5,637 by 1990. During the years since the that census, Alpine has experienced continued population recovery, growing by 2.6% to reach a population of 5786 according to the 2000 census report, the highest figure since 1970. The growth in the City of Alpine accounts for nearly all the growth in Brewster County over the past decade.

The Texas State Data Center periodically issues population estimates and projections for all incorporated places in the state. The Center calculates its estimates based on several factors, including county-level birth and death data, public and private school enrollment, Medicare enrollment, net movement of people from the military to civilian populations and housing unit figures.

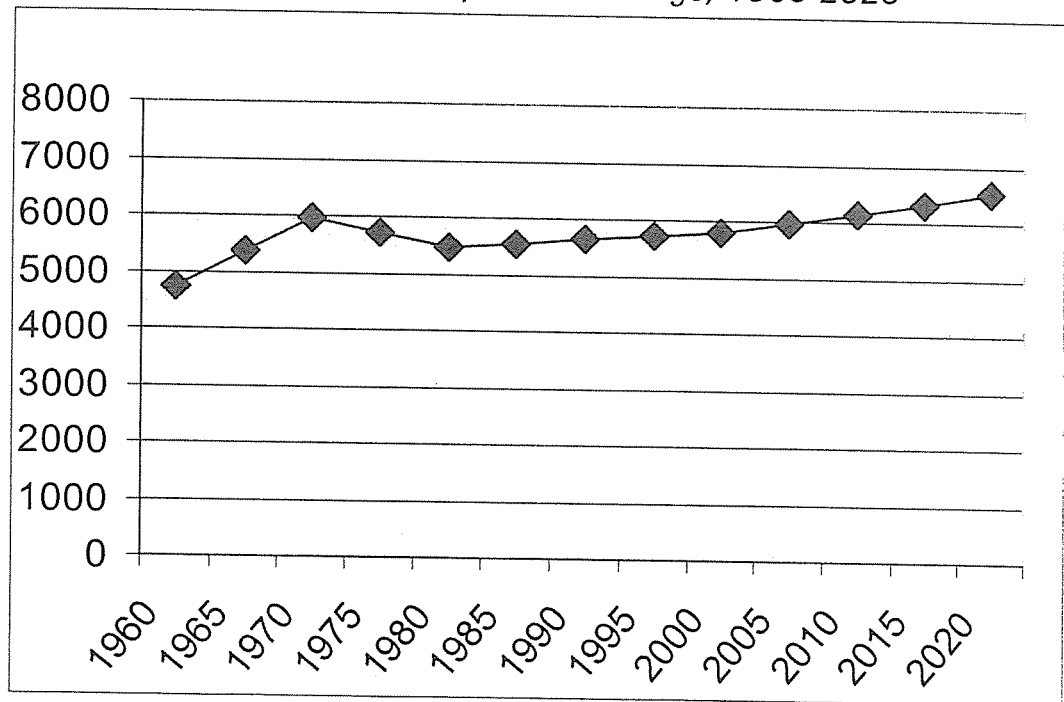
In order to get an accurate figure for population estimates and projections, the State Data Center numbers are considered and compared with numbers calculated using the cohort-component method of population estimation and projection. In this method, calculations are performed on each age group, or cohort, used in the census process. Projections rely on data that describe county-level birth and death rates and county-to-county migration patterns for each cohort, and are also shaped by historical trends in local school enrollment and vehicle registration.

According to these calculations and analyses, Alpine's population showed an increase over the past ten years, going from 5,637 in the 1990 Census to a current population of 5,786 according to the initial reports published by the 2000 census.

Table 3A: Population Change, 1960-2000

Year	Population	Absolute Change	Percent Change
1960	4,740	-	-
1970	5,971	+ 1,231	+ 26.0%
1980	5,465	-506	- 8.5%
1990	5,637	+ 172	+ 3.1%
2000	5,786	+ 149	+ 2.6%

Chart 3A: Population Change, 1960-2020



Source: (1) 1970-2000 Decennial Censuses of Population and Housing, Summary Population and Housing Characteristics. (2) Texas State Data Center's Texas State Population Estimates and Projections Program. (3) Cohort-component method population projection.

3.3 Population Characteristics

This analysis of the population characteristics of the City of Alpine uses data from the 1980 and 1990 U.S. Censuses.

Table 3B: Population by Race & Ethnicity, 1980-1990

Characteristic	1980		1990		2000	
	Number	%	Number	%	Number	%
Total Population	5,465	100%	5,637	100%	5,786	100%
White, not Hispanic	2,697	49%	2,950	52%	2695	47%
Black, not Hispanic	31	1%	72	1%	60	1%
Hispanic	2,642	48%	2,562	46%	2,911	50%
American Indian/ Alaskan Native	15	<1%	9	<1%	36	1%
Asian/Native Hawaiian Other Pacific Islander	55	1%	40	1%	21	<1%
Other Race/Two or More Races	25	<1%	4	<1%	63	1%

Source: 1980, 1990, and 2000 Censuses of Population and Housing, Summary Population and Housing Characteristics and Summary Social, Economic, and Housing Characteristics

Alpine is a community with a large Hispanic population and smaller Anglo and Black populations as compared to the racial composition of the state. The City's composition is considerably different from the state's 2000 break down of 52% Anglo, 32% Hispanic, 11% Black, 1% American Indian/Alaskan Native, 3% Asian/Native Hawaiian/Other Pacific Islander, and 1% Other Race/Two or More Races. As illustrated in Table 3B, in 1990 the racial breakdown of Alpine's population showed that Anglo residents represented just over one-half of the City's entire population. Throughout that decade, the Hispanic population grew and the Anglo population shrank such that by 2000, the Hispanic population represented over one half of the total population of the City. All other racial groups combined represented approximately 3% of the City's total population in 1990 and in 2000.

Female-headed family households made up 17.6% of the total family households in Alpine in 1990. This is considerably higher than the

Brewster County average of 14.2% and the Texas average of 11.6%. The percentage of family households headed by women nearly doubled during the decade, going from 9.0% in 1980 to 17.6% in 1990.

Disabled citizens¹ made up 15.7% of the City's adult population in 1990. Of the 724 people classified as disabled, 265 (or 37%) were over the age of 65. Of those disabled people between the ages of 16 and 64, 222 (or 48%) of them had a health condition that limited the amount and type of work they could do. Of these persons with a work disability, 114 (or 51%) were completely prevented from working by their disability.

Table 3C: Population by Age Group, 1990

Age Group	Alpine	Brewster County	Texas
0-4 years	7%	7%	8%
5-17 years	16%	17%	21%
18-44 years	46%	43%	44%
45-64 years	17%	19%	17%
65 or more years	14%	14%	10%

Source: 1990 Census of Population and Housing, Summary Population and Housing Characteristics

The median age for Alpine residents in 1990 was 29.3 years, compared to a county median age of 32.4 years and a state median age of 30.8 years. As Table 3C shows, Alpine's and Brewster County's percentages of children (under age 18) are considerably lower than that of the state. The City's percentage of young adults (ages 18-44) is slightly higher than that of the county or state. (This is likely due to the presence of Sul Ross University.) The City's and county's percentages of middle-aged (ages 45-64) residents are nearly identical to that of the state. Alpine's and

Brewster County's elderly (age 65 or older) population percentages are higher than the state's figure.

The City's age composition is similar to that found in many small rural towns in that the number of children is relatively low. As children enter early adulthood, many may move from the small town to larger cities that have more education and employment opportunities. In middle age, some of those people who left as they entered adulthood return when their children are grown. Also, small towns, Alpine included, often have a concentration of elderly residents who are unable (financially or physically) or unwilling to move elsewhere.

Most family formation and child bearing falls between the ages of 18 and 44. Considering the fact that this age group is well represented in Alpine (an unusual occurrence in a rural town), one might draw the conclusion that Alpine and Brewster County will likely experience a healthy rate of growth from natural population increases. However, Alpine's number of young adults is inflated by the presence of Sul Ross University. It is common for most college-age people to wait to begin families until they leave college, which often coincides with leaving Alpine as well. Therefore, despite the City's unexpectedly high young adult population (for a rural town), Alpine will likely still experience a rate of growth from natural population increases that is slower than state's rate.

3.4 Future Population Forecasts

Population forecasts are a key element in planning for the future. Federal, state, and local funding decisions for facilities such as highways, sewage treatment plants, and schools are based upon the projected number of people who will use them. A population forecast is a

¹ The Census defines disabled persons as non-institutionalized civilians age 16 years and older with

statement of what a place's population will be given a set of likely future conditions that consider the physical, social, economic, or political conditions that might encourage or inhibit growth.²

Several factors were used to forecast the size of Alpine's future population, including:

- Historic growth patterns,
- Age of population,
- Public facilities,
- Location along routes to employment centers,
- Ability to annex surrounding areas located in its extraterritorial jurisdiction.

Historic Growth. According to available information from the Census Bureau, the Texas State Data Center and other analyses, Alpine's population fluctuated significantly during the 1960s and 1970s, but has grown slowly and steadily since 1980. This upswing brings the City's present population to an estimated 5,786.

Age of Population. The age of the population also serves as an indicator of the future population growth. Alpine's population has a percentage of children (under 18 years) that is smaller than that of the state. The City has a considerably smaller percentage of young adults (18-44 years) than the state (see Table 3C). As discussed in the previous section, this may reflect the national trend of young people leaving smaller communities upon reaching adulthood. In some cases, these people return in their mid-to-late forties once their children are grown. Usually in rural towns this relative shortage of adults in their prime childbearing years results in

a of physical or mental disability that impairs their mobility or their ability to care for themselves.

² Richard E. Klosterman, *Community Analysis and Planning Techniques* (Savage, Maryland: Rowman & Littlefield, 1990).

slower than expected natural population increases unless a significant number of young people who are just now reaching childbearing years have reason to remain in their small hometowns to begin families.

In Alpine's case, there is no shortage of young adults (18-44 years). This is due to the presence of Sul Ross University. . Since the 1990 Census (the source of the age-group statistics), the City has experienced an upward trend in its population; therefore, perhaps more of the City's younger people are choosing to stay in Alpine to raise their families.

Public Facilities. The entire City has access to water and sewer services and water extends into the ETJ in some areas. It appears that the City has an adequate water and sewer infrastructure to allow for additional housing and other types of development. The City is located at the intersection of US Highway 90/67 and State Highway 16. Interstate Highway 10 lies just fifty miles to the north. These major thoroughfares are in good condition , but many of the City's streets are in fair to poor condition.

Alpine has several recreational and cultural facilities, a library, a nursing home, a medical clinic, and a regional hospital. The Alpine ISD that serves the City and surrounding area is considered sufficient to meet the community's needs. In addition, residents do have access to more extensive recreational, medical, educational, and cultural facilities as well as extensive employment opportunities in the cities of El Paso and Midland/Odessa, but these cities are all at least 150 miles from Alpine.

Industrial/Commercial Base. According to the Texas Workforce Commission, current (February 2001) figures indicate that the

unemployment in Brewster County is 2.0%, a figure nearly 50% lower than the state's rate of 3.8% for the same time period. The Workforce Commission does not report employment data for towns the size of Alpine. The retail trade, services, and governmental sectors anchor the local economy. Alpine has no major industrial employers within the City limits. Major employers in other sectors in Alpine and the surrounding area include:

- Sul Ross University.....390 employees
- Alpine ISD.....180 employees
- Big Bend Regional Medical Center.....140 employees
- Furr's Supermarket.....65 employees
- City of Alpine.....65 employees
- Brewster County.....65 employees
- Big Bend Telephone.....45 employees
- West Texas National Bank.....40 employees
- U.S. Border Patrol.....35 employees

Geographic Location. Alpine is well situated relative to some amenities (recreational opportunities – Big Bend Ranch State Recreational Area, the Davis Mountains), higher educational opportunities (Sul Ross University located in Alpine), medical facilities (Big Bend Regional Medical Center in located in Alpine), etc. In other ways, the City is geographically isolated. Many major regional employers and transportation facilities are located in El Paso and Midland/Odessa, but these cities are more than 200 miles away. Most Alpine residents are not commuters. They live in the City for the small-town ambiance, good schools, and scenic location, and they work there as well.

Additional Developable Lots. There are still many areas within the City limits that remain open for development. The City's extensive extraterritorial jurisdiction (ETJ) could also accommodate significant

growth. (For a city the size of Alpine, this ETJ is an area extending one mile from the City limits. Within its ETJ, an incorporated city has certain rights and responsibilities.)

Based on these factors, the City is expected to grow at a healthy rate of 0.5%-0.7% annually, continuing the upward trend of the past decade. This forecast is based on the assumptions that no major industrial employer opens a new facility within ten miles of Alpine and that no major area employers drastically reduce their workforces during the planning period.

Table 3D: Forecasted Population, 2000-2020

Year	Population
2000	5,786
2005	5,962
2010	6,143
2015	6,329
2020	6,521

Source: (2000) U.S. Census, (other years) Texas State Data Center's State Population Estimates and Projections Program combined with cohort-component method calculations

The City's population will not increase at the same rate for every age group. The age of the population is reflected in the types of housing, services, and amenities that are in demand in a community. As compared to other rural communities, Alpine has a relatively healthy number of young adults (ages 18 to 44). However, this figure is inflated by the presence of students at Sul Ross University, most of whom will not stay to raise their families in Alpine. Historically, many young adults tend to leave community upon reaching adulthood. If more young people remain

in Alpine as they move into the prime childbearing years (ages 18 to 35), the natural population increase will be greater.

Table 3E: Population by Age Group, 1990 and 2020

Age Group	1990		2020	
	Population	Percentage	Population	Percentage
0-4 years	372	7%	522	8%
5-17 years	938	16%	978	15%
18-44 years	2,592	46%	2,804	43%
45-64 years	948	17%	1,174	18%
65 or more years	787	14%	1,043	16%
TOTAL	5,637	100%	6,521	100%

Source: 1990 figures - 1990 Census of Population and Housing. Future population estimates based on 1990 Census of Population and Housing, Texas State Data Center's Texas State Population Estimates and Projections Program, and the 1999 Housing Survey.

3.5 Population Distribution

Information regarding the distribution of population in Alpine in 2000 is based upon 1990 Census data, 2000 population data from the Texas Data Center and other analyses, and the 2000 housing survey. Alpine's population is concentrated in the central part of the City. The population density in Alpine averages 1,525 people per square mile, or approximately 2.4 people per acre. This density is on par with that of many other small rural towns in Texas.

Population density was mapped (Figure 3A) using the 2000 figure of 5,786 people (see Section 3.2). Estimates of the distribution of population in 2020 (also shown on Figure 3A) were based on the population forecasts described in Section 3.4, as well as the current housing study and the current and future land use studies described in chapters 4, 5 and 6 respectively. Future growth will likely occur in the areas that have street access, water service, and adequate undeveloped lots.

3.6 Population Build-out

Physically, Alpine is a compact community of 3.8 square miles. It has average population density for a City of its size and location, and there are still a number of undeveloped building sites located within the City limits. The community could accommodate several additional residents within its City limits. The total number of people who could reside within the current City limits assuming all available residential land is developed and occupied is the City's "holding capacity."

The City currently contains approximately 2,428 acres of land of which 1,680 acres (or 70%) are developed, 373 acres (or 15%) are semi-developed, and 375 acres (or 15%) consist of agricultural/ranch land or otherwise undeveloped open space. (See Chapter 5.) If all the developable area of the City is built-out with a land use mix and housing density similar to that existing in the developed part of the community today, Alpine's build-out population will be approximately 9,725 under the present City limits.

The City's extraterritorial jurisdiction (ETJ) has the capacity to absorb additional growth that the community may experience. Infill will account for much of the development likely to take place within the next twenty years, but some development will occur in the City's ETJ as well.

The City's ETJ covers nearly twenty square miles. This is approximately five times as much area as the existing City. This land is 93% undeveloped, consisting almost exclusively of open land used mainly for oil and gas extraction or agriculture. Currently, the ETJ supports a population of approximately 900 people but could conceivably support a population of much more if fully built out at densities similar to those

found currently in the incorporated City of Alpine. The combined build-out population of Alpine and its ETJ would be approximately 39,000.

4 Housing Study

4.1 Background

The Housing Study identifies the location and condition of the City of Alpine's housing stock. It identifies the various types of housing as well, including multifamily (condominiums, apartments, duplexes, etc.), single-family detached (the typical house), and mobile/manufactured homes. Finally, it identifies the housing developments funded using governmental assistance. The information gathered in this study sheds light on the housing needs of the community, helps to direct the formation of housing goals, and establishes a blueprint for future actions the City might take to provide adequate housing for its residents.

4.2 Methodology

The 1990 Census of Population and Housing provides some insight into the general housing conditions in Alpine as a whole, including the age and number of owner-occupied housing units, the rents and number of rental units, and the costs associated with owning or renting a housing unit.

Data gathered during a windshield survey performed in the fall of 2000 augments the Census data, providing a geographic perspective on the condition of housing in different parts of the City. The survey of housing uses a classification system that rates the condition of each housing unit in Alpine ranging from "standard" to "dilapidated" as defined below. A housing unit includes single-family detached houses, mobile/manufactured homes, and multifamily units such as apartments, condominiums, and town homes.

Table 4A: Housing Condition Survey Classifications and Criteria

Classification	Criteria
Standard	<p>Few or no minor visible exterior defects such as:</p> <ul style="list-style-type: none"> › cracked, peeling, or missing paint › cracked, sagging, rotting, or missing siding, steps, porch planks, or other wooden surfaces › cracked or broken window panes › cracked masonry, brick, or mortar surfaces › missing or damaged roof shingles › small rust spots on mobile homes <p>Generally meets local building codes No detriment to health and safety present</p>
Deteriorating	<p>Few visible exterior defects requiring repair beyond routine maintenance such as:</p> <ul style="list-style-type: none"> › missing or damaged wooden surfaces that could cause injury if walked upon or leaned against › missing window panes › badly deteriorated window frames › major holes in exterior walls, up to one (1) foot across and/or penetrate through the interior walls › roof missing many shingles or has holes up to six (6) inches across › chimney bricks missing › extensive rusting, joint separation on mobile home exterior <p>Rehabilitation is economically feasible</p>
Dilapidated	<p>Fails to provide safe shelter Several of the major defects listed under Deteriorating Any major structural damage such as:</p> <ul style="list-style-type: none"> › sagging foundation › sagging roof › slanted or tilted exterior walls › missing doors › collapsed chimney or porch › fire or severe water damage <p>Rehabilitation is not economically feasible</p>

A house in standard condition may have one or more characteristics of decay but is not considered deteriorated unless repairs would require significant expense to the homeowner.

4.3 Current Housing Conditions

This analysis draws from the 1990 U.S. Census and the windshield survey, described in Section 4.2. These two sets of data are presented in the tables below. They are used in conjunction to render a more complete picture of the City's current housing stock than either could provide alone. Following presentation of the data is a discussion of the current housing conditions in Alpine.

The following Census data is provided for 2,141 housing units in Alpine and 3,350 housing units in Brewster County:

Table 4B: Housing Data from the 1990 U.S. Census

Data		Alpine	Brewster County
Age of All Units	% units built before 1939	29%	22%
	% units built 1940-1979	56%	55%
	% units built 1980-1990	15%	23%
Owner- Occupied Units	Number of units	1,259	1,995
	% of total units	59%	60%
	Monthly cost, with mortgage ³	\$548	\$544
	% of household income	17%	17%
	Monthly cost without mortgage	\$158	\$155
	% of household income	13%	13%
Rental Units	Number of units	882	1,355
	% of total units	41%	40%
	Average monthly rent	\$294	\$277
	% of household income	27%	24%

³ According to the Census Bureau, monthly costs include payments for mortgages, deeds of trust, homeowner association or condominium fees, real estate taxes, fire, flood, or other hazard insurance, utilities, and heating fuels.

The windshield survey tabulated 2,479 housing units within the City limits. The results of the survey were mapped as Figure 4A and are tabulated below:

Table 4C: Housing Data from Windshield Survey

	Unit Type			Total Units	% of Total Units
	Single-family Residence	Multifamily Residence	Manufactured Home		
Standard	1,261 occupied 16 vacant	399 occupied 41 vacant	529 occupied 0 vacant	2,189 occ 57 vac	90 %
Deteriorating	115 occupied 28 vacant	18 occupied 0 vacant	3 occupied 0 vacant	136 occ 28 vac	7 %
Dilapidated	6 occupied 42 vacant	7 occupied 4 vacant	0 occupied 10 vacant	13 occ 56 vac	3 %
TOTAL	1,382 occupied 86 vacant	424 occupied 45 vacant	532 occupied 10 vacant	2,338 occ 141 vac	100 %

As illustrated, the majority (90%) of Alpine's 2,479 housing units are in standard condition, while only 10% of the units are deteriorated or dilapidated. Most of the housing stock consists two- and three-bedroom ranch style and bungalow homes and manufactured homes (mobile homes). Approximately 6% of the homes in Alpine appeared vacant at the time of the windshield survey. However, of those, 60% were deteriorating or dilapidated.

Alpine housing stock is older than that of the surrounding county. Overall, the majority of the City's housing stock (56%) was built during the 1940-1979 period. This is very similar to the county figure; however, Alpine has more homes built prior to 1939 and fewer homes built sing 1980 than the County at large. Housing in the community is generally affordable, with most homes priced under \$85,000 and many under \$50,000.

In Alpine, monthly homeowner costs, both for those who carry a mortgage and those who do not, are nearly identical to those in the surrounding county. However, renters in the City pay a higher percentage of their income for housing than is typically paid by renters in the county as a whole. Regardless, both County and City figures are below the 30% threshold considered to be an excessive housing cost burden. In this community and county, the greatest cost burden is borne by renters, as is typical throughout Texas and the United States.

The City has a large number of multifamily housing units, 94% of which are in standard condition. All together, these multifamily units represent 19% of the total housing in the City. At the time of the windshield survey, it appeared there was a 10% vacancy rate for multifamily units.

Mobile or manufactured homes represent 22% of the City's housing stock. There tend to be clusters of manufactured housing, but the clusters themselves are widely distributed throughout the City. 98% of the mobile homes in Alpine appeared to be maintained in standard or better condition. Fifteen mobile homes (or 2% of the total) appeared vacant at the time of the housing survey, but all of these were in dilapidated condition.

The 6% overall vacancy rate in the City is low. When a more detailed breakdown is examined, the vacancy rate drops even further. 86 single-family homes, 10 manufactured homes, and 45 multifamily units were identified as vacant in the survey. However, of these 141 vacant units, 20% of them are deteriorated but could be rehabilitated and 40% of them are dilapidated to the point that they are unsalvageable. This leaves 57 vacant units that could be occupied immediately, bringing the adjusted overall vacancy rate to only 2%.

4.4 Future Housing Needs

As a community's population increases, demand for housing also increases. Considering Alpine's very low vacancy rate, any additional population will almost surely result in the construction of new single-family and multifamily homes. Taking into account the City's projected population, the average number of people living in each housing unit (2.6 people per unit), and the lack of unoccupied units in standard condition (only 16 at present), the community will need an estimated 68 additional housing units by 2005 and a total of 283 additional units by 2020.

Table 4D: New Housing Demand between 2000 and 2020

	Single-family	Mobile Home	Multifamily	Total
Rental	50	15	50	115
Owner-occupied	117	47	4	168
Total	167	62	54	283

Rental housing for retirees and other elderly people will be an important component of the growth in the single-family housing and manufactured home markets in the coming years. If Alpine does manage to maintain more of its young adult population, additional affordable housing for younger families (additional duplexes, for instance) will also be important. The growth expected in Alpine will place additional pressure on the Town's existing housing stock and should encourage rehabilitation and improved maintenance to ensure that the older homes remain habitable over the next fifteen to twenty years.

Generally, apartments for elderly and retired people are found in larger cities such as El Paso, Midland, or Odessa. However, as the population

of smaller communities continues to age, many senior citizens who are either unable or do not wish to maintain a single-family house are considering local retirement apartment communities as a good alternative to living alone or in a nursing home. Many smaller communities are encouraging construction of apartments designed for the elderly so that these people are not forced to move to a larger city. It is conceivable that Alpine could support additional, multifamily housing for senior citizens, either privately owned or publicly funded.

Another need that results from the aging of the population is for enhanced handicapped accessibility in housing. Most manufactured homes and many conventional homes are built with narrow doors and hallways, cramped bathrooms, and steep entryway steps. As the elderly population rises, the number of disabled people also rises. Careful attention to building design in new homes and an on-going program to assist disabled people in making their homes accessible can solve this growing problem.

Another factor influencing future housing development is the potential for large-lot land subdivision in the undeveloped areas in and around Alpine. This type of development appeals to many Texans, and in many areas it works to keep the market for moderately priced new single-family homes steady. Some large-lot subdivision along with infill throughout the City's established subdivisions will likely constitute the largest part of the housing development in the City over the next five to twenty years.

Assuming the existing housing stock is maintained and additional manufactured housing and multifamily housing development is not discouraged by the City, the character of the housing demand beyond the next five years will reflect the needs of Alpine's growing population and

will likely include some additional large-lot subdivision on the fringes of the City's developed core. As the City grows, it is imperative that City leaders continue to address the needs of existing homeowners, particularly the needs of those who are too elderly and/or poor to care for their homes. Housing rehabilitation is crucial to preserve the community's housing stock for future generations and to keep it on the tax rolls.

The City's public housing authority (PHA) has limited financial capacity to finance housing for low-income residents as needs arise. The Hacienda Square Apartments, the Alpine Manor Duplexes, and the recently completed Alpine Retirement duplexes were all constructed with federal funding and provide rental subsidies or relief to low-to-moderate income families and the elderly. The Hacienda Square and Alpine Manor were constructed with Farmers Home Administration loan guarantee funding. Hacienda Square is for families and single people, and it participates in the HUD Section 8 housing assistance program along with the PHA. Residency in Alpine Manor is limited to elderly persons. Alpine Retirement Duplexes are also restricted to senior citizens. They were constructed with TDHCA tax credit financing.

The City does maintain several codes and ordinances including: mobile home and flood plain ordinances; uniform building, electrical, plumbing, and natural gas codes; as well as codes dealing with minimum housing standards and dangerous structures. The City government does its best to enforce these codes through a simple method of random checks and by addressing complaints when they arise; however, the City does not maintain a formal codes enforcement program nor does it employ a codes enforcement officer.

4.5 Housing Plan

Several goals have been established in regard to the City's present and future housing stock.

Goal: Ensure every resident has housing that offers full plumbing and kitchen facilities, potable water, adequate sewage disposal, and adequate shelter.

Goal: Encourage the provision of housing at rents or homeowner costs that are affordable to every member of the community.

Goal: Encourage fair housing practices and fight discrimination in housing throughout the community.

Goal: Encourage development of home ownership opportunities for residents of all income levels.

Goal: Encourage clearance of debris and unsafe structures from the City.

As discussed in the previous section, the City's most pressing housing needs will be related to providing additional moderate-cost housing for its growing population, maintaining the existing housing stock, providing accessible housing and housing rehabilitation for the disabled and elderly populations, and ensuring that the various safety codes are met, particularly in manufactured homes.

Alpine has held numerous public hearings to solicit comments from local housing and other community development organizations regarding the use of federal funds and general City policy in the provision of additional housing opportunities for residents. Most of these hearings have been held in conjunction with applications to and implementation of the various programs of the Texas Department of Housing and Community Affairs.

With these specific needs in mind, the following plan will provide guidance to the City's official housing-related activities in the 2001-2005 period:

Table 4E: Housing Objectives & Activities, 2001-2005

<i>Annually</i>	Publicly proclaim Fair Housing Month, provide information regarding federal Fair Housing policy and local Fair Housing Ordinances to the public.
<i>2001-2002</i>	<p>Work with local churches and community groups to begin a self-help housing rehabilitation program aimed at preserving the City's existing housing stock.</p> <p>Apply for approximately \$200,000 in HOME grant funds to provide owner-occupied housing rehabilitation assistance to approximately six elderly and/or disabled homeowners.</p> <p>Consider participation in establishing a countywide non-profit community housing development organization (CHDO) to take advantage of housing development funds from the Texas Housing Trust Fund and the owner-occupied rehabilitation CHDO set-asides.</p>
<i>2003-2004</i>	<p>Continue to apply for HOME Funds to provide owner-occupied rehabilitation assistance in the community using the City and the CHDO to write two or more applications for assistance each year.</p> <p>In conjunction with local banks, pursue HOME first-time homebuyer and down payment assistance to encourage home purchases in community.</p>
<i>2005</i>	Investigate funding sources for handicapped-accessibility improvements to single-family and manufactured homes to help elderly and other disabled individuals remain in their homes.

There are state and federal programs designed to assist communities that wish to increase the number of affordable housing opportunities and enhance the quality of existing housing. The City should continue to work with the Texas Department of Housing and Community Affairs (TDHCA), particularly the HOME Program, to provide housing rehabilitation and other affordable housing assistance in the community. The City normally declares April Fair Housing Month and maintains information on fair housing.

Alpine was awarded approximately \$208,000 in Texas HOME Program funds in order to rehabilitate the homes of several elderly, low-income residents in 1999. In addition, the City has completed several housing rehabilitation programs through the HUD/CDBG programs and one TCDP Disaster Relief housing rehabilitation grant.

Additional assistance may be obtained indirectly through the formation of a local housing finance corporation authorized by the City to undertake the development of new housing. Such corporations are established independently of the City, and the City has no financial or legal responsibility for the corporation's activities. Bonds issued by a housing finance corporation are repaid with income (rents) from the units built, but may be accounted for in the City's financial audit. For example, in 1997 Eagle Lake's housing finance corporation was granted bonding authority for \$3 million to build 50 affordable duplex units with rents in the range of \$350 to \$600 per month. These units are not subject to the income guidelines that govern most assisted housing programs, so all residents can take advantage of the new housing opportunities.

Future affordable housing initiatives might consider the First Time Homebuyer Program, the Down Payment Assistance Program, the

Statewide Housing Assistance Payment Program, the Permanent Housing for the Handicapped and Homeless Persons Program, TDHCA's Housing Trust Fund, the Section 202 Elderly Housing Assistance Program (HUD/FHA), the programs of the Rural Housing Service of the USDA.

The City will continue its efforts to provide fair housing opportunities for all its residents through official proclamation of Fair Housing Month, enforcement of its Fair Housing Ordinance, and posting of this policy in a prominent location at City Hall. In addition, the City's Fair Housing Ordinance should be re-examined each year for compliance with current federal and state law.

5 Existing Land Use Study

5.1 Study Area

Alpine is a rural community located in the northwestern part of Brewster County in Trans Pecos region of far west Texas. The City sits at the intersection of US Hwy 90/67 and SH 118 and is surrounded by open land. The City includes an area of 3.8 square miles and controls an additional 19.4 square miles in its extraterritorial jurisdiction (ETJ). The majority of Alpine is compact with development that is concentrated along the major thoroughfares the City limits.

5.2 Land Use Inventory and Analysis

An inventory of existing land uses provides the community with a tool that reveals how land is used and how much is used for each purpose in the community today. When mapped, this inventory shows how the community is formed, how its components fit together. The location and extent of land uses in a community affects property values, neighborhood stability, traffic flow, aesthetics, and economic development potential.

The inventory of land uses in Alpine took place in the fall of 2000. A cursory drive through Alpine reveals a community with a healthy mix of residential and commercial property. The current land use inventory was conducted using the following classifications (with examples) to designate land uses in the City of Alpine:

Table 5A: Land Use Classifications

Classification	Examples
Single-family Residential	single-family houses, mobile homes, granny flats
Multifamily Residential	duplexes, triplexes, apartments, condominiums
Commercial	stores, offices
Warehouse/Industrial	factories, salvage yards, mines, warehouses
Institutional	educational, medical, and religious institutions
Park and Recreation	developed public open space
Public	government offices and facilities, public utilities
Major Transportation/ROWs	highways, railways, airports, ports, rights-of-way
Semi-developed vacant	vacant subdivided lots of less than 5 acres in areas with water, sewer, and street infrastructure
Agricultural, Forest, or Other Undeveloped Open Space	fields, farms, woodlands, open flood plain

The field survey verified the compact character of the City of Alpine. Approximately 85% of the City's land area is developed or semi-developed. Table 5B provides a detailed summary of the geographical extent of the various land uses.

Table 5B: Extent of Current Land Uses, 2000

Land Use Classification	Acreage	% of Developed Area ⁴	% of City	Acres per 100 people ⁵
Single-family Residential	458	22.3%	18.9%	7.9
Multifamily Residential	41	2.0%	1.7%	0.7
Commercial	95	4.6%	3.9%	1.6
Industrial/Warehouse	0	0.0%	0.0%	0.0
Institutional	156	7.6%	6.4%	2.7
Parks and Recreation	134	6.5%	5.5%	2.3
Public	12	0.6%	0.5%	0.2
Major Transportation/ROWs	784	38.2%	32.3%	13.5
Semi-developed	373	18.2%	15.4%	6.4
Total for Developed Areas	2,053	100.0%	84.6%	35.3
Agricultural, Forest, other Open Space	375	N/A	15.4%	6.5
Citywide Total	2,428	N/A	100.0%	42.0

Single-family Residential Land Use: This category comprises approximately 19% of the City's total area (and 22% of the City's developed land area). It is the most important use of developed land in Alpine, occupying 458 acres. Single-family residential uses include detached and semi-detached housing units designed to accommodate one household as well as mobile homes and manufactured housing. Most homes in Alpine were built in the 1940-1980 period. Areas with single-family homes tend to be large neighborhoods with few other uses present. In most single-family neighborhoods, vacant lots, churches, and schools are the only other land uses.

⁴ Developed areas include all land uses except agricultural, woodland, and vacant cleared land.

⁵ Based upon the estimated 2000 population of approximately 5,786 people.

Multifamily Residential Land Use: Alpine has several areas of multifamily development. 94% of the multifamily units are in standard condition. This acreage includes the Alpine Public Housing Authority and the Sul Ross University duplexes and triplexes. 90% of the multifamily units appeared to be occupied at the time of the windshield survey. Land used for this type of housing comprises 2% of the developed area of the City. Multifamily housing allows for higher densities than single-family housing, as the total 469 units occupy just 41 acres of land.

Commercial Land Use: Because of the City's relative isolation from other trade centers, Alpine's population tends not to travel to access shopping and other services as much as do residents in many other rural towns. In part due to this isolation, Alpine has a surprisingly varied amount of commercial development. 95 acres (or 5%) of the City's developed area is dedicated to commercial land uses. Commercial land uses are found within the Central Business District in the center of town and also along the US Hwy 90/67 corridor.

Industrial/Warehouse Use: The City has no acreage devoted exclusively to industrial/warehouse uses.

Institutional Land Uses: Traditionally, areas occupied by schools, churches, hospitals, nursing homes, and the like make up the institutional land use category, one of the larger categories in Alpine with 156 acres or 8% of the City's developed area. Alpine ISD facilities, Sul Ross University, and Big Bend Regional Medical Center comprise the vast majority of this acreage, with several churches adding additional area.

Parks and Recreation Land Uses: Alpine currently has 134 acres of parkland or other developed open space within its City limits, constituting

approximately 6% of the City's developed area. There several smaller pocket parks scattered throughout the City in addition a golf course and several recreational areas owned and operated by the Alpine IDS and Sul Ross University. For a detailed discussion of all park and recreation facilities, see Chapter 11.)

Public Land Use: Facilities belonging to local, county, and state governments occupy most of the 12 acres dedicated to public land uses. These uses include the City Hall and the fire department, EMS, and law enforcement buildings, the Brewster County courthouse, the post office, etc.

Major Transportation and Rights-of-way: 38% of Alpine's total land area is used for streets, easements, and other similar uses. Street and highway easements occupy the bulk of the land in this category. The largest single use in the category goes to the Alpine Casparis Municipal Airport. Land used for these purposes is classified as developed.

Semi-Developed, Agricultural, and other Open Space Land Uses: Approximately 30% of Alpine's total land area consists of undeveloped acreage or semi-developed in-town lots. Of the 748 undeveloped or semi-developed acres within the City limits, about half are classified as semi-developed vacant, comprised of lots in the built-up area of the City with access to potable water facilities, sewer facilities and paved streets. The semi-developed vacant areas are those areas where surrounding development densities make agricultural or mining uses less practical and where residential and other development is most likely.

5.3 Development Considerations

The future layout of the City depends on a variety of known or assumable development considerations, including local population growth, adequacy of public utilities, thoroughfares, and other facilities, flooding and drainage constraints, and the land use goals and objectives established by the community.

Population Growth: As a town's population grows, the demand for additional residential development also increases. An estimated 253 single-family housing units (including manufactured/mobile homes) and 30 multifamily units will be required by 2020, each occupying approximately 0.2 acres and 0.1 acres respectively (the citywide average for single-family residential units and multifamily units). This will significantly increase the amount of land devoted to residential uses over the next twenty years.

Public Utilities: It appears that the City has adequate water and sewer infrastructure to allow for additional housing and other types of development. The entire area within the City limits has access to utilities including water, sewer, natural gas, and maintained streets. The City is located along US 90/67 and SH 118, both of which are in good condition.

Public Services and Facilities: Alpine residents have access to a variety of public services and amenities within the City limits. The Alpine ISD operates primary and secondary schools within the City limits. The district has a reputation for providing a solid educational curriculum and a variety of extracurricular activities. The City of Alpine provides the law enforcement in the community and the Alpine Volunteer Fire Department (primarily funded through the City) provides fire protection services. EMS

service in Alpine is operated by a private company, but the services are subsidized annually by the City and Brewster County. There is also a regional medical center and an accredited university in Alpine.

Major Thoroughfares: As mentioned previously, most of the City's streets are paved, but many are not in good condition. Alpine is intersected by US 90/67 and SH 118. These highways carry non-local traffic through the City. IH 10 runs east and west and lies to the north of the City just sixty miles.

Flood Hazard: The U.S. National Flood Insurance Program provides flood insurance rate maps that depict the 100-year and 500-year flood plains. These flood plains cover those areas that would most likely be inundated by the largest storm events that typically occur in the area over the specified time period of 100 or 500 years. The regulatory 100-year floodway defines the area where buildings are not eligible for flood insurance, while those located in the 100-year floodway fringe are eligible once flood proofing is implemented.

Generally, the Flood Insurance Program's goal is to limit development in flood plains, thereby reducing damage to structures and danger to people during flooding. However, due to the long history of settlement in river and creek valleys and the social and financial costs associated with moving people from their homes, most communities attempt to reduce flooding by using structures such as reservoirs, channels, embankments, and other engineered methods of flow containment and diversion. The City of Alpine is a participant in the National Flood Insurance Program.

Soils: : Alpine is built upon two soil associations: the Boracho-Mitre and the Musquiz-SantoTomas-Boracho. The first is composed of shallow to

very shallow, rolling and undulating soils located on foot slopes of igneous hills and mountains. The second is composed of deep to shallow, nearly level soils in valleys. Both associations contain calcareous and noncalcareous soils. The soils of this area are best suited for rangeland and wildlife. Most of the land in Brewster County consists of these soils or ones of similar quality.

Other Natural and Man-made Constraints: Alpine Creek is the only significant natural constraint to development in the City. US 90/67, SH 118, and the railroads represent the only manmade barriers to development in Alpine.

ETJ: The Town's Extraterritorial Jurisdiction (ETJ) is where much of the future development in the Alpine area could occur. The ETJ extends one mile from the City limits and includes approximately 12,390 acres or 19.4 square miles of land, making it nearly five times the size of the incorporated City. Currently, the ETJ consists primarily of undeveloped acreage. 809 acres (7% of the ETJ) are developed, the majority of which consist of highway rights-of-way and commercial and residential development.

Subdivision Regulations and Zoning Alpine has adopted subdivision regulations that govern the size and shape of lots; development standards for streets, drainage, and utilities; or minimum construction standards. Subdivision regulations give the City control over these factors both within the City limits and in the City's ETJ. Depending on the type of development that Alpine experiences over the next several years, the City's subdivision regulations should be reviewed and updated.

Alpine also has a zoning ordinance and corresponding zoning map. Zoning is a tool used by communities to regulate the types of uses that can occur on a given piece of land, generally for the protection of the public's health and safety. Zoning ordinances cannot be passed or enforced without the adoption of a comprehensive plan by the community. This is to ensure that decisions regarding land uses are made in a logical, orderly, and justifiable manner. Uses that exist on a particular piece of land prior to the adoption of a zoning ordinance are "grand-fathered".

Alpine can use its zoning to prevent undesired land uses in various areas of town. For example, areas near schools can be zoned "residential" or "office" to reduce traffic volumes. Special zoning requirements can also be used to keep particularly offensive or noxious businesses such as massage parlors or hazardous waste incinerators out of certain areas of town. However, the legal history of zoning has dictated that completely "zoning out" some uses, particularly multifamily residential uses, so that they cannot occur anywhere in a community is unconstitutional. As with its subdivision regulation, the City should consider reviewing and updating its zoning ordinance regularly so that it can be used as a effective tool to facilitate orderly development in conjunction with planned infrastructure enhancements.

6 Future Land Use Plan

6.1 Background

The future land use study describes the desired future for the development of the City of Alpine in light of the information presented earlier regarding the current population, housing, and land uses in the community. It is an informed attempt to take Alpine from where it is now to where it wants to be in 2020, twenty years from now.

Planning for a community's future is based on knowledge about the past and present and what actions can be taken to influence the course of development in the community. Both internal and external forces create physical, social, and economic change in communities, often changing the community's goals and priorities in the process. Because of this dynamic nature, this plan should be re-evaluated periodically and should be adapted, if necessary, to meet the needs of the community.

6.2 Physical Form and Design

The form of a community describes its physical development pattern and is influenced by the natural and man-made environment, including physical barriers such as streams or railways, physical development regulators such as the levelness of land or accessibility to highways, and socio-economic influences such as land ownership or government regulations. Most decisions that affect the shape and pattern of development are based on a combination of these types of factors.

Noted planner Kevin Lynch identified five design elements that are the building blocks of towns:

- Districts, which are specific areas such as the downtown or eastside;

- Paths, which enable movement between districts, within districts, or as entrances or exits from communities, such as streets or paths;
- Nodes, which serve as gathering places and are often located where paths intersect or at the heart of a district, such as a town square or park;
- Landmarks, which are prominent buildings or public sites that provide reference points, such as the city hall, a water tower, or a hill;
- Edges, which help organize a community into districts, such as rivers, railways, or the transition between built-up area and undeveloped countryside.

Alpine's physical form is fairly common for a small rural town. Development extends out from the major thoroughfares in a grid pattern. Its compact nature has kept the majority of the City from adopting the looser street patterns that characterize the newer neighborhoods in many larger cities. The positive aspects of the small-town character of Alpine, including good schools, quiet neighborhoods and streets, and scenic surroundings, provide a quality of life that many Americans enjoy.

The only discernable district in Alpine is the downtown or central business district. The major paths are US 90/67 and SH 118. Alpine does have several nodes: the Sul Ross University campus, the golf course, and Kokernot Municipal Park. There do not appear to be any significant manmade barriers to development in the City.

6.3 Future Land Use Goals and Objectives

This statement of future land use goals and objectives for Alpine is not official City law; rather, it is a policy meant to guide the City toward a future vision of the community.

Goal: Develop the community in such a manner as to be consistent with the City's ability to serve existing and new development.

- Objective: Plan for reasonable demand with regard to water and sewer service and street access. For example, the community shall encourage development in areas located within 1,000 feet of existing streets and water and sewer lines.
- Objective: Consider revising outdated subdivision regulations to ensure proper land division and rights-of-way widths for streets and utilities.

Goal: Maintain community infrastructure and promote efficiency in delivery of community services.

- Objective: Encourage compact development that makes use of the existing infrastructure. Compact development is easier and cheaper to service with water and sewer, more energy efficient, preserves open space, and encourages a greater sense of community spirit.

Goal: Preserve the residential and small-town nature of the community while encouraging additional economic development.

- Objective: Encourage development on lots in developed subdivisions and established neighborhoods. This will preserve outlying areas as agricultural and open space buffers and frees large tracts of land for eventual industrial or commercial development sites.
- Objective: Organize a City beautification committee or utilize existing garden clubs and service organizations to coordinate and implement a clean-up day, greenbelt project, tree planting, flowerbed construction, or other beautification projects. .
- Objective: Consider reviewing and updating the zoning ordinance to better regulate land uses as the City continues to grow and develop.

Goal: *Promote the general health and safety of the residents of the community.*

- Objective: Review, revise, or draft (if necessary) new ordinances regulating abandoned properties, trash dumping, abandoned vehicles, screening, and other public health nuisances.

6.4 Future Land Use Plan

Alpine will likely continue to grow at a steady rate due to natural population increases, the ability to annex surrounding development, and through continued growth in the regional economy. Due to expected growth over the next twenty years, residential and commercial land uses will increase their extent the most rapidly, while public and institutional land uses will grow more slowly. New residential subdivision development is probably as both infill housing development on the scattered vacant lots in Alpine's existing neighborhoods and as large-lot subdivision in the surrounding ETJ.

The addition of more single-family residential acreage will be the City's largest change in land use during the coming years. Some increase in multifamily acreage may also occur. Additional commercial development will likely occur in the central business district and along major thoroughfares and south of the Alpine/Casparis Municipal Airport. Other land uses will remain near their current geographical extent. The future land use plan (Figure 6A) and Table 6A illustrate the City's likely development by 2020, twenty years from now.

Table 6A: Extent of Future Land Uses, 2020

Land Use Classification	Acreage	% of Developed Area⁶	% of City	Acres per 100 people⁷
Single-family Residential	558	26.1%	23.0%	9.6
Multifamily Residential	42	2.0%	1.7%	0.7
Commercial	168	7.9%	6.9%	2.9
Industrial/Warehouse	0	0.0%	0.0%	0.0
Institutional	156	7.3%	6.4%	2.7
Parks and Recreation	136	6.4%	5.6%	2.4
Public	12	0.6%	0.5%	0.2
Major Transportation/ROWs	784	36.8%	32.3%	13.5
Semi-Developed	274	12.9%	11.3%	4.7
Total for Developed Areas	2,130	100.0%	87.7%	36.7
Agricultural, Forest, other Open Space	298	N/A	12.3%	5.3
TOTAL	2,428	N/A	100.0%	42.0

⁶ Developed areas include all land uses except agricultural, woodland, and vacant cleared land.

⁷ Based upon the estimated 2020 population of approximately 6,521 people.

7 Water Supply and Distribution Study

7.1 Review of Prior Studies and Existing Data

Thirty-five years ago, in 1966, Kenneth E. Esmond-Consulting Engineers completed a comprehensive plan for the City that included an analysis of the water supply and distribution system. Ten years later, in 1975, the West Texas Council of Governments prepared a regional water and sewer plan. Numerous improvements were recommended in each of these plans, and the City has acted upon most of those recommendations in the intervening years. In the 1960s and 1970s, ensuring a future water supply was already becoming important issue facing City leaders. The 1966 plan encouraged the City to investigate several water supply alternatives, and it is assumed that investigation took place. Additional wells and well fields have been utilized since the time of that study.

In 1976, the City itself conducted another set of planning studies, but a detailed inventory and analysis of the water system was not undertaken at that time. Then, in 1991, the City received a report from the Texas Cities Analysis & Planning Program provided by the Texas Agricultural Extension Service under the direction of the Texas A&M University system. This program provides cities with an overview of existing infrastructure systems, living conditions, economic environment, etc. However, its scope is limited, and the brief mention of the City's water system cannot be considered an in-depth study.

In 1998, the City commissioned LBG-Guyton Associates, a professional ground water and environmental engineering firm, to prepare a preliminary evaluation of potential ground-water supply development. The evaluation concluded that the water-supply alternatives that appeared to provide the most potential with regard to quantity and expense were the development

of the Meriwether Ranch well field (privately owned) and the drilling of additional wells at the existing Sunny Glen and Smith properties. It was also concluded that the expansion of the Musquiz well field and adjacent areas was a less attractive alternative due to the possibility of an exportation tax on any water transported out of Jeff Davis County. The City considered the evaluation's findings and has let those conclusions guide its water supply decision-making in the past two years, but the full-scale water exploration strategy recommended in the study has not yet commenced.

The following study gives an inventory of the major components of the City's water system, identifies potential problems that should be addressed, and provides a prioritized summary of the needed improvements and their estimated costs.

7.2 Water System Inventory

Figure 7A and Table 7A show the current inventory and locations of the City's water system.

Table 7A: Major Water System Components

Component	Location	Capacity or Size
Sunny Glen Ground Storage No. 1	Sunny Glen Pump Station	100,000 gallons
Sunny Glen Ground Storage No. 2	Sunny Glen Pump Station	100,000 gallons
Sunny Glen Elevated Tank	South Hill	500,000 gallons
Musquiz Elevated Tank	South Hill	1,000,000 gallons
Musquiz Ground Storage No. 1	Musquiz Pump Station at SH 118 North	500,000 gallons
Musquiz Ground Storage No. 2	Musquiz Pump Station at Hwy 118 North	500,000 gallons
East Well Ground Storage	Old Marathon Hwy	33,000 gallons
Lower Hill Well	City Yard, south Alpine	100 gpm
Upper Hill Well	City Yard, south Alpine	200 gpm
Roberts Well No. 1	Sunny Glen Well Field	65 gpm
Roberts Well No. 2	Sunny Glen Well Field	50 gpm
Roberts Well No. 3	Sunny Glen Well Field	350 gpm
Roberts Well No. 4	Sunny Glen Well Field	50 gpm
Roberts Well No. 5	Sunny Glen Well Field	40 gpm
Gardner Well	Sunny Glen Well Field	200 gpm
Cartwright Well	Sunny Glen Well Field	190 gpm
Musquiz Well No. 6	Musquiz Well Field	325 gpm
Musquiz Well No. 7	Musquiz Well Field	325 gpm
Musquiz Well No. 8	Musquiz Well Field	120 gpm
Musquiz Well No. 9	Musquiz Well Field	80 gpm
Musquiz Well No. 10	Musquiz Well Field	550 gpm
Musquiz Well No. 11	Musquiz Well Field	550 gpm
Golf Course Well	golf course	135 gpm
East Well	near railroad ROW, southeast Alpine	75 gpm
Railroad Well	near railroad ROW, southeast Alpine	100 gpm
Daugherty Well	Sunny Glen Well Field	80 gpm
Terry Well No. 2	Sunny Glen Pump Station	90 gpm

Table 7B: Water Distribution System Components

Component	No. of Units	Component	No. of Units
2" water line	37,685 LF	12" water line	13,000 LF
3" water line	6,005 LF	Fire hydrants	189
4" water line	67,205 LF	Valves	237
6" water line	73,180 LF	Service connections	2,318
8" water line	76,600 LF		

7.3 Water System Analysis

Standards and Criteria. Alpine's water supply, storage, & distribution systems generally operate well within the parameters for water systems established by the Texas Natural Resource Conservation Commission (TNRCC) and the Texas Department of Insurance (TDI) as identified in Table 7C.

Table 7C: Minimum Water System Standards

Facility or Measure	TNRCC or TDI Standard ⁸	City of Alpine
<i>TNRCC:</i>		
Well Capacity (gpm/connection)	0.6	1.58
Total Storage - TNRCC (gal/connection)	200	1,180
Normal Operating Pressure (psi)	35	55
"C" Certified Operators	2	1
Minimum Main Size	2"	2"
<i>TDI:</i>		
Total Storage - TDI (gal per capita)	130	472

⁸ Minimum Water System Capacity Requirements, Section 290.45 of Rules and Regulations for Public Water Systems, TNRCC. Publication makes internal reference to TDI standard.

The City's water distribution system is composed of approximately 273,675 linear feet of line ranging in size from 2" to 12" in diameter. The majority of the lines were installed between 1924 and 1959. The older lines made of cast iron, galvanized steel, or asbestos cement. Newer lines are made of polyvinyl chloride (PVC). There appear to be an adequate number of gate valves on the system to allow necessary maintenance and repair. In general, lines are adequately sized to meet the City's needs, but a few problems do exist. There are some old 2" and 4" lines of galvanized steel and cast iron that experience leaks and cause low pressure. These problem lines are located throughout the City, but most are found in south Alpine. Line size is a particular problem in the southeast part of town known as Pueblo Nuevo. This area experienced periodic pressure problems due to the existence of old (pre-1952) 2" galvanized steel water lines.

All residents within the City limits have access to public water, and the distribution system extends out into the ETJ in some areas. In 1999, the City passed a moratorium on any new water and sewer extensions/connections outside of the city limits until the completion of these planning studies. The City from 1995 to 1998 had received several requests from developers for water service for planned developments as well as requests from households directly adjacent to the City limits. The City was unsure whether its existing water infrastructure could handle new development. Prior to the 1999 moratorium the City had a policy of not extending water and sewer outside of the City limits unless Council approval was obtained. Approvals were made on a case-by-case basis and few expansions were approved. Some of the considerations for denial were based on the type of development planned for the area such as manufactured home, single family or commercial.

Their main concern was the sufficiency of water quantity and supporting infrastructure such as tanks, booster stations, etc. to handle the increased demand for services outside the City limits. The water infrastructure improvements programs completed by the City from 1995 through 2001 have now enabled the City to be able to provide water service to areas outside the City limits. The determining factor will be whether the planned land use will be compatible with the surrounding land use and not be detrimental to the land values of the existing adjacent neighborhoods. Specific service expansion areas to be considered are listed below:

- Quail Ridge Subdivision: Service to this area can be provided through the existing 6" line located on Quail Ridge Road. (outside City limits)
- Mosley Loop and Mosley Lane: Provide service to the subdivisions and homes located next to and off of Mosley Loop and Mosley Lane that are not presently served by City Water. City service terminates at the City limits on Mosley Loop. A 6" line runs the entire length of Mosley Loop and Mosley Lane then turns west on Highway 90 to the Ramada Inn Hotel. (outside City limits)
- West Highway 90: Provide service to the area on both sides of Highway 90 from the intersection of Mosley Lane to the Oriental Express Restaurant. A 6" line runs along the west side of the highway to the Ramada Inn. This would encourage business and other residential development along Highway 90 West. The TCDP West Alpine Pressure Plane Improvements completed in 1996 enabled sufficient pressure to serve this area for the first time. (outside City limit)
- Northwest Alpine: Provide service to the undeveloped area outside of the City limits bounded by West Fort Davis Street on the north, Alpine West Estates on the west and Del Rio Street on the south. (outside City limits)
- South East Alpine: Provide service to the ten-acre tract located south of the railroads tracks in the eastern part of town next to the Campus View Addition. This area is in the preliminary stages of development with zoning for manufactured homes. (inside City limits)
- North Highway 118: Provide service to the areas on both sides of State Highway 118 north from the Big Bend Regional Hospital to the Texas Department of Public Safety Complex. Water service to this area is limited to the hospital, some businesses and homes along the

highway, the airport, the future site of the Big Bend Events Center and the Texas Department of Public Safety Complex. Two different water lines run along the east side of the highway and serve these facilities with a gap in water service between the hospital and the Big Bend Events Center. These two lines need to be connected and another line extended from the existing water line on the west side of the highway to run west along the highway. The majority of the property along both sides of the highway is private ranchland, but in recent years, the property owners have sold highway frontage property. This would encourage development along Highway 118 north. (outside City limits)

- East Highway 90: Provide service to the areas and businesses fronting both sides of the East Highway 90. This is where the majority of Alpine's businesses are located. Water lines run on both sides of the highway. Some businesses outside of the city limits along the highway have water service while others do not. A 4" line located on the east side of the highway serving several businesses will have to be extended with a larger 6" line installed. The existing 6" line located on the west side of the highway is sufficient to serve future development through connections or extensions. (outside City limits)

As discussed previously, the City Council will have to make the decisions regarding any future service and extensions outside of the City limits. Developers or the property owners requesting water service will pay for these extensions. The extra revenue generated by a water rate 1.5 times the rate inside the City limits would help the City overcome the current financial constraints to expansion. Due to the recent repairs and improvements to the system, Alpine should now have adequate capacity, volume, and supporting infrastructure to provide water to areas outside of the City limits. The City's water infrastructure is now in a condition that it can handle additional growth.

The City has excellent water quality that meets all TNRCC and EPA drinking water quality standards. Water is treated through chlorination at the pump stations. The City is wholly reliant on ground water produced by the twenty wells it currently has in operation. The majority of these

wells are located in the Sunny Glenn well field northeast of town and the Musquiz well field eight miles north of the airport. Most of the wells were drilled in the mid-to-late 1950s or the early 1970s, and approximately half have current yields in excess of 100 gpm. Recent improvements to the water supply components include the 1999 installation of new telemetry monitoring system to control the Musquiz well field. In 2000 the City completed Musquiz Well No. 11 by installing pumps and related equipment and connected the well to the well field transmission system. To increase production, the City reworked, deepened, and installed larger pumps in the wells located in the Sunny Glen well field during 1999 and 2000. Currently, telemetry controls are being installed to control the Sunny Glen well field. While Alpine's water system is adequate to meet the City's current needs, it will be necessary to drill additional wells to ensure adequacy of supply for expected growth.

The City's water storage system is in reasonably good condition at present. The City maintains seven water storage tanks. Four of the seven were constructed in the late 1990s and 2000/01. All of these are in good condition. The two tanks constructed in 1972 are in fair condition, and the oldest tank (constructed 1956) is in poor condition. Recent improvements to the City's water storage system include the 1997/1999 construction of two new 500,000 gallon water storage tanks at the Musquiz well field and the 2001 construction of a 100,000 gallon ground storage tank at the Sunny Glen Pump Station.

The overall system has a normal operating pressure of 55 psi. This is high enough to operate its system effectively and to properly ensure adequate fire protection. Prior to 1996, pressure problems were experienced on the west side of Alpine, and the City had been cited by

TNRCC for low pressures there. The completion in 1996 of the TCDP funded 500,000 gallon. Musquiz elevated storage tank, and the 100,000-gallon. Sunny Glen ground storage tank with booster pumps solved the problems.

Periodic low-pressure problems are experienced in southeast Alpine in the Pueblo Nuevo section of town. As mentioned previously, old galvanized 2" lines cause these problems. Additional periodic low-pressure problems along Highway 90 East and Old Marathon Road (east) are caused by inadequate water storage tank, piping, pumps and valves at East Side Pump Station located on Old Marathon Road. Finally, some homes constructed on the hills surrounding Alpine and on the higher elevations have experienced low-pressure problems due to the absence of individual pressure facilities. The elevations of these particular homes prevent the City from guaranteeing adequate pressure, and the affected homeowners have been encouraged to install individual pressure tanks.

The City has an adequate number of fire hydrants to serve its current system. As the fire protection buffers on Figure 7A indicate, there are few fire protection gaps. TDI recommends that every building within a city's incorporated limits be no more than 500 feet from a fire hydrant and that fire hydrants be located on mains at least 6" in diameter. The City meets both these standards.

TNRCC requires two Certified Class C operators. Alpine's Director of Utilities that holds a Class A water certificate. The remaining certificate necessary to comply is held by the operator of the Fort Davis Water Supply Corporation who utilizes his Class C certificate to assist Alpine through a mutual agreement. The City is currently training two operators who will obtain their Class C certificates and thus resolve this problem.

A review of the water system's files indicates that standard operational and reporting procedures are being handled in a timely, effective, and efficient manner.

The City's water rate structure is dependent on the meter size, with residential minimum charges ranging from \$6.00 to \$18.00 in the City limits for meters from ¾" to 2". Commercial rates are higher and have a wider meter range. After the minimum charge, Alpine residents pay on a graduated scale beginning with \$2.20 for the first 5,000 gallons, continuing on up to \$2.50 for all consumption above 101,000 gallons. Alpine charges an average of \$0.XXXX to provide one gallon of water within the City limits and expends approximately \$0.XXXX to produce one gallon of water. This yields a net income of \$0.XXXX per gallon for the City. This net income can be used to repair and upgrade the City's infrastructure systems.

In 1999, the 75th Texas Legislature passed Senate Bill 1 requiring all public water suppliers to develop drought contingency plans to be implemented during periods of water shortages and drought. A draft drought contingency plan combines strategies to achieve lasting, long-term improvements in water use efficiency with response measures aimed at avoiding, minimizing, or mitigating the risks and impacts of drought-related water shortages and other emergencies. The plan adopted by a water provider should ensure its capability of providing water under drought conditions. To comply with this legislation and to ensure a safe, adequate, and uninterrupted supply of water for its citizens, the City of Alpine adopted a drought contingency plan prior to the September 1, 2000 deadline.

In addition to the local water conservation/drought contingency plan discussed above, the City has also participated in the regional water planning effort undertaken by the Far West Texas Regional Water Planning Group. The final plan, completed in January 2001, includes projections of regional water availability and demand as well as analysis of specified water management options for the far west Texas region.

Prioritized Problems & Solutions There are a number of areas of concern that need to be addressed. Some regard expansion of the system to new areas and others are concerned with improvement of existing system components. City leaders, staff, and consulting engineers have worked together to identify these areas of concern based on the analysis above. The following problems and solutions were identified and ranked:

1. Address storage and supply problems by constructing 100,000-gallon ground storage tank at the Sunny Glen Pump Station with corresponding telemetry system to control Sunny Glen Well Field and related storage tanks. (Work in progress, to be completed April 2001.)
2. Address storage facility maintenance concerns by painting the 1,000,000-gallon Musquiz storage tank located next to airport at Musquiz Pump Station.
3. Address storage and supply concerns through the construction of a 100,000-gallon ground storage tank at the East Side Pump Station to replace the 50,000-gallon pink tank located on Sul Ross State University property that has been placed out of service. This new tank will provide increased pressure and volume to the east part of town along East Highway 90, Old Marathon Road and the southeast part of Alpine known as Pueblo Nuevo.
4. Address future water supply needs by beginning the investigation of additional well field resources by drilling a test well at Alpine Casparis Municipal Airport
5. Address expansion concerns through the installation of approximately 1,160 L.F. of 6" water line with two fire hydrants and related fittings

from line located in West Eagle Pass Street through alleys located in blocks between North 14th Street and Middle School Drive bounded by Eagle Pass and Uvalde Street

6. Address expansion concerns through the extension of approximately 1,800 L.F. of 6" water line to Phase 1 of the Quail Ridge Subdivision. Install four fire hydrants and related fittings. New line will run from the line located along Quail Ridge Road. (Subject to City Council approval since subdivision is outside City limits.)
7. Address expansion concerns through the extension of approximately 1,200 L.F. of 6" water line with three fire hydrants and related fittings to planned subdivision located on ten-acre tract adjacent to Campus View Addition in the east part of Alpine, south of the Union Pacific Railroad tracks.
8. Address distribution and pressure problems through the replacement of undersized 1" and 2" water lines with 6" water lines inclusive of fire hydrants, valves, fittings, existing taps and street repair in the following areas:
 - 1,725 L.F. of water line on East Avenue H between Lackey and Ragin Streets.
 - 300 L.F. of line on South Harmon between East Avenue I and East Avenue J.
 - 300 L.F. of 2 line on East Avenue J between Lackey and Harmon Streets.
 - 300 L.F. of line on Lackey Street between East Avenue J and East Avenue K.
 - 1,015 L.F. of line on South 3rd between East Murphy and Jo Ann Drive.
9. Address transmission problems through the replacement of the existing Sunny Glen well field collection and transmission pipeline consisting of undersized, deteriorating 4" and 6" lines with a standard 8" line to run from the well field to the Sunny Glen Pump Station. This will increase the volume of water produced by the well field.
10. Address future water supply needs by drilling one additional water well at the Sunny Glen well field, the Musquiz well field, or another suitable location such as airport determined through exploration and testing. Project will include related telemetry, pumps, electrical controls, valves, fittings, and collection line to connect to existing water transmission system.

11. Address distribution and pressure problems through the replacement of undersized 2" water lines with 6" water lines inclusive of fire hydrants, valves, fittings, existing taps and street repair in the following areas:

- 1,315 L.F. of line on South 5th street between Murphy and south dead end of 5th Street.
- 1,370 L.F. of line on South 6th Street between Murphy and south dead end of 6th Street.
- 656 L.F. of line on South 4th Street between Murphy & East Avenue G.
- 656 L.F. of line on Durrell Street between Murphy & East Avenue G.

12. Address distribution and pressure problems through the replacement of undersized and deteriorated 2" water lines with 6" water lines, inclusive of valves, fittings, hydrants, existing taps, and street/alley repair. (These areas in north Alpine will not qualify for TCDP assistance, but are in need of improvement. Due to its financial condition, the City may not be able to afford the line replacement, but they are noted for the record.)

- 656 L.F. of line on North 8th Street between Sanderson and Eagle Pass Street.
- 656 L.F. of line on Sanderson Street between 8th and 10th Streets.
- 1,015 L.F. of line on North 4th between Marfa Street and Del Rio Street.
- 1,015 L.F. of line in the alleys located on the blocks between Marfa and Del Rio streets bounded by 4th and 5th streets.

(Note to Nos. 13 & 14: Engineering studies have determined the following to be necessary in the future. These projects are very expensive and the ability of the City to finance these projects within the five-year planning period is questionable due to financial constraints and its large bonded indebtedness. It will likely be necessary to finance these projects through staggered TCDP grants, combination TCDP/RECD, Border Environmental Coalition Funds (BEC) or a combination of other federal and state funding sources. These are longer term, five to ten year projects.)

13. Address future supply and capacity concerns: The City needs to drill two additional wells in the Musquiz well field, extend the collection system to the new wells, install 500 gpm pumps with electrical controls, and construct parallel lines to portions of the existing collection system to accommodate the additional volume of water,

and provide line work and fittings to make connections to the proposed booster pump station.

14. Address future transmission concerns: It will be necessary in the future to construct a larger transmission line with a corresponding booster station from the Musquiz well field to the City. The existing ten-mile long, 12" water transmission line is operating near capacity and cannot handle that amount of water produced by the Musquiz well field. A new 18" line would be constructed parallel to the existing 12" line.

7.4 Water Supply and Distribution System Plan

The City of Alpine strives to provide a safe, uninterrupted water supply and to meet state and other water system standards. In light of this overriding mission, the City establishes the following goals and objectives:

Goal: Operate the local water system using the most efficient and cost-effective methods.

- Objective: Provide preventative maintenance of all facilities on an annual basis. All facilities shall be inspected at least one time per year.

Goal: Provide residents with clean, safe, potable water through a citywide water system.

- Objective: Continue maintaining and inspecting the existing system facilities according to a regular schedule and providing repairs as the need arises.
- Objective: Address storage, supply, and capacity concerns through accomplishment completion of the following projects: (Numbers correspond to the numbered items in the previous section, *Prioritized Problems & Solutions*. Details for quantification of objectives can be found in that section.)
 - construct Sunny Glen 100,000-gallon storage tank and telemetry system (no. 1)
 - paint Musquiz 1,000,000-gallon storage tank (no. 2)
 - construct 100,000-gallon storage tank at East Side Pump Station (no. 3)
 - drill test well at airport (no. 4)
 - drill one additional well in Sunny Glen, Musquiz, or other suitable well field (no. 10)
 - drill two additional wells in Musquiz well field (no. 13)

- Objective: Address transmission and distribution concerns through accomplishment completion of the following projects: (Numbers correspond to the numbered items in the previous section, *Prioritized Problems & Solutions*. Details for quantification of objectives can be found in that section.)
 - replacement of undersized line with all related hydrants, valves, etc. (nos. 8, 11, and 12)
 - replace undersized Sunny Glen collection/transmission line (no. 9)
 - construct larger transmission line from Musquiz well field (no. 14)
- Objective: Address system expansion concerns through accomplishment completion of the following projects: (Numbers correspond to the numbered items in the previous section, *Prioritized Problems & Solutions*. Details for quantification of objectives can be found in that section.)
 - expand to West Eagle Pass Street (no. 5)
 - expand to Phase 1 of the Quail Ridge Subdivision (no. 6)
 - expand to ten-acre tract adjacent to Campus View Addition (no. 7)

Goal: *Ensure adequate water pressure and fire protection*

- Objective: Continue maintaining and inspecting the existing system facilities according to a regular schedule and providing repairs as the need arises.
- Objective: Address pressure and fire protection concerns through accomplishment completion of the following projects: (Numbers correspond to the numbered items in the previous section, *Prioritized Problems & Solutions*. Details for quantification of objectives can be found in that section.)
 - replacement of undersized line with all related hydrants, valves, etc. (nos. 8, 11, and 12)

For the five-year planning period, the following improvements are recommended. (Numbers correspond to the numbered items in the previous section, *Prioritized Problems & Solutions*. Details for quantification can be found in that section.)

Table 7D: Water System Improvement Plan Projects, 2001-2005

Project	Year	Estimated Cost* and Source**
Construct Sunny Glen 100,000-gallon storage tank and telemetry system (no. 1)	2001	\$297,000 TCDP/ENT
Paint Musquiz 1,000,000-gallon storage tank (no. 2)	2001	\$50,000 CO
Construct 100,000-gallon storage tank at East Side Pump Station (no. 3)	2001	\$145,000 CO
Drill test well at airport (no. 4)	2002	\$10,000 ENT
Expand distribution system to West Eagle Pass Street (no. 5)	2002	\$22,000 DEV
Expand distribution system to Phase 1 of the Quail Ridge Subdivision (no. 6)	2002	\$34,000 DEV
Expand distribution system to ten-acre tract adjacent to Campus View Addition (no. 7)	2002	\$23,000 DEV
Replacement of undersized line with all related hydrants, valves, etc. (no. 8)	2003	\$300,000 TCDP/ENT
Replace undersized Sunny Glen collection/transmission line (no. 9)	2004	\$342,000 TCDP/ENT
OR		
Drill one additional well in Sunny Glen, Musquiz, or other suitable well field (no. 10)		\$300,000 TCDP/ENT
Replacement of undersized line with all related hydrants, valves, etc. (no. 11)	2005	\$300,000 TCDP/ENT

*Includes any associated engineering, administration, and/or acquisition costs.

**Sources: Texas Community Development Program (TCDP), City of Alpine Enterprise Fund (ENT), 1999 Certificates of Obligation (CO), private developers (DEV),

8 Wastewater Collection and Treatment System Study

8.1 Review of Prior Studies and Existing Data

Thirty-five years ago, in 1966, Kenneth E. Esmond-Consulting Engineers completed a comprehensive plan for the City that included an analysis of the sewage collection and treatment system. Ten years later, in 1975, the West Texas Council of Governments prepared a regional water and sewer plan. Numerous improvements were recommended in each of these plans, and the City has acted upon most of those recommendations in the intervening years. In the 1966 plan, the primary recommendation was to convert the City's Imhoff tank treatment system to a cleaner, more efficient oxidation ditch system. As reported in the 1975 plan, the City undertook the conversion and was operating an oxidation ditch system by 1970.

Also, in 1975, the engineering firm of Freese, Nichols, & Esmond prepared a study entitled Wastewater Collection Study/Infiltration-Inflow Analysis. The study determined that the main source of infiltration was deteriorated lines and manholes that were not watertight. The problem presented itself only during periods of heavy rainfall.

In 1976, the City itself conducted another set of planning studies but a detailed analysis of the sewer system was not undertaken at that time. Then, in 1991, the City received a report from the Texas Cities Analysis & Planning Program provided by the Texas Agricultural Extension Service under the direction of the Texas A&M University system. This program provides cities with an overview of existing infrastructure systems, living conditions, economic environment, etc. However, its scope is limited, and the brief mention of the City's sewer system cannot be considered an in-depth study.

In 1998, the City commissioned the firm of Gutierrez, Smouse, Wilmut, & Associates, Inc. to prepare a preliminary engineering report for the southeast interceptor sewer. The details of this report and the associated project (which has never been undertaken) will be discussed later in this chapter.

The following study gives an inventory of the major components of the City's sewer system, identifies potential problems that should be addressed, and provides a prioritized summary of the needed improvements and their estimated costs.

8.2 Wastewater System Inventory

Alpine's wastewater treatment plant was designed and permitted to treat up to 1.48 million gallons of wastewater each day with an activated sludge extended aeration system. . The City's sewer mains range in diameter from 4" to 12" and are generally located in the street rights of way. The major components of the wastewater system include:

Table 8A: Major Sewer System Components

Component	Location	Capacity
Treatment Facility	northeast of City limits	1.48 MGD
Service Connections	Citywide	2,318
Manholes	Citywide	514
4" Force Main	Citywide	3,015 LF
6" Force Main	Citywide	2,645 LF
4" Gravity Line	Citywide	15,050 LF
6" Gravity Line	Citywide	126,805 LF
8" Gravity Line	Citywide	73,885 LF
10" Gravity Line	Citywide	1,045 LF
12" Gravity Line	Citywide	32,325 LF
Old Marathon Rd Lift Station	Old Marathon Road	450 GPM
Murphy Street Lift Station	W. Murphy at S.10th	150 GPM
Stucke Lift Station	Stucke Trailer Park/E. US 90	2X150 GPM

8.3 Wastewater System Analysis

Standards and Criteria. The U.S. Environmental Protection Agency (EPA) and the Texas Natural Resource Conservation Commission outline the standards or criteria applicable to the design and operation of municipal wastewater systems. Generally, the standards address influent quality, collection, treatment, and effluent quality. The TNRCC guidelines are set forth in "Design Criteria for Sewerage Systems" which outlines system design and operations in all respects. EPA requirements mainly relate to discharge limitations and industrial wastewater treatment.

The TNRCC standards provide general information concerning effluent quality for the average municipal demand. Typically, effluent strength should not exceed 200 mg/L and should realistically range from 125-150 mg/L for the average. BOD₅ and TSS values higher than 200 mg/L would

likely be the result of wastewater demand from industrial sources that should be pretreated or eliminated. The average quantity of demand set forth by the standards is 100 gallons per capita per day. It is possible that tertiary treatment using sand filtration will become necessary as TNRCC tightens requirements over the next few years.

The criteria for sewage treatment facilities are based on process type and address the individual system components. The design standards take into account design flow, peak flow, influent characteristics, and required discharge quality. The criteria are comprehensive in content and address all stages of treatment through the plant facility. When a public sewer system experiences average daily flows in excess of 75% of its permitted capacity for three or more consecutive months, TNRCC regulations require that the system owner begin planning for plant expansion or replacement. When average daily flows exceed 85% for three or more consecutive months, TNRCC requires that the owner of the facility begin construction on a new or expanded treatment facility.

Of particular importance are the current emphasis on and anticipated changes in the manner by which the solids fraction (waste sludge) of the process is handled and managed. EPA standards outlined by 40 CFR part 503 require treatment facilities to achieve specified levels of pathogenic reduction for alternative methods of sludge disposal. At the risk of oversimplifying a complex topic, this means that the higher the level of pathogenic reduction achieved by a wastewater treatment facility, the more options there are for sludge disposal.

Design criteria for collections systems include standards for pipe size, location, gradient, construction, manhole spacing, lift station design, and allowable infiltration/inflow. The criteria set a minimum main diameter of

six inches and specify minimum gradients for various pipe sizes to achieve a gravity flow velocity of two feet per second (2 fps). The minimum grade requirements applicable for pipe sizes in the City's system are listed in Table 8B.

Table 8B: Sewer Gradient Standards

Main Size	Fall in feet per 100' of line
6"	0.50
8"	0.33
10"	0.25
12"	0.20

The typical manhole spacing for 6" to 15" main sizes with straight alignment and uniform grades is 500 feet (maximum). Reduced spacing may be necessary based on a system's ability to clean and maintain its sewer with available equipment.

Lift station design criteria generally allows for a 100 GPM minimum size (except for variances on a case-by-case basis) with duplex pumping facilities. The standards provide for specifics regarding construction and require emergency provisions in the case of power outages. Additionally, a minimum force main sewer diameter of four inches is specified along with a minimum velocity of two feet per second.

Acceptable inflow/infiltration may be determined by applying the standard of 200 gallons per inch of diameter per mile of pipe per day. Using information collected in the system inventory, the allowable inflow/infiltration for the City of Alpine would be about 39,700 GPD. Inflow/Infiltration is a serious, on-going, and cumulative problem in many systems. It can significantly affect the ability and cost to treat wastewater.

Alpine's average daily flows hover around 0.405 MGD, but in periods of extremely wet weather the flow can be as high as 0.523 MGD. The system does have inflow and infiltration problems due to the number of old lines in the system and the number of manholes that are not watertight and are located in flood prone areas. Extensive smoke testing or other methods would be necessary to determine the specific problem areas. However, the average daily flows, even during periods of heavy rainfall, are well within the permitted capacity; therefore, inflow/infiltration does not appear to be a significant problem at present. However, as the system expands, monitoring of this inflow/infiltration will be particularly important.

Analysis. The wastewater system analysis evaluates the facilities inventory with respect to the outlined standards or criteria. In particular, the analysis considers the wastewater treatment facilities, industrial waste and special treatment facilities, collection system in general, unserved/underserved areas, manhole conditions, the characteristics of the soil and terrain affecting the collection facilities, lift station conditions, inflow/infiltration problems, and operational procedures.

The wastewater treatment plant is located 2.5 miles northeast of the City of Alpine. The treatment system is an activated sludge extended aeration system. The original wastewater treatment plant was constructed in 1925 and consisted of a Imhoff tank treatment system. In 1968 the Imhoff tank wastewater treatment plant was modified by the addition of an oxidation ditch, a chlorine contact chamber and a raw sewage lift station. In 1982 the plant was further modified by adding a final clarifier, constructing additional chlorine contact chamber volume and replacing the rotors in the oxidation ditch. In August 1999 major renovations were completed consisting of one carousel, one clarifier, expanded contact

chamber volume, and four sludge-drying beds. The cost was \$1.5 million. It was these improvements that expanded the treatment capacity to 1.48 MGD. The renovation costs were financed through a combination of Certificates of Obligation, and TCDP funding. The renovations were necessary to bring the plant into compliance with its previous TNRCC Wastewater Discharge Permit. The plant had been exceeding its discharge limits and parameters prior to that time.

Treated effluent from the plant is pumped back to the City to irrigate the golf course, the soccer fields located at Kokernot Park, and the tree farm located at the wastewater treatment plant. The remainder of the effluent is discharged to an unnamed tributary adjacent to the treatment plant.

The City's TNRCC treatment permit provides for maximum BOD₅ levels of 45 mg/L and total suspended solids (TSS) discharge levels of 45 mg/L. The plant effluent must also maintain a minimum dissolved oxygen level of 4.0 mg/L. The plant's permitted pH (degree of acidity or alkalinity) range is from 6.0 to 9.0 standard units. The wastewater treatment plant is currently meeting all discharge and effluent quality parameters.

The City's sewer plant currently reports an average daily flow rate of approximately 0.405 MGD (0.523 MGD in heavy rainfall). Based on the present population and given the current lack of major industrial customers, the average flow is within the expected range, about 30% of the facility's permitted capacity. In general, the treatment plant is in excellent condition with no problems encountered. It now has the capacity to handle existing and future development.

Industrial waste and special treatment facilities do not exist within the City at the present time because there are currently no producers of such

waste hooked onto the system. Under current law, the EPA is responsible for regulating and providing guidance in the area of pretreatment programs. Should the need arise, their offices can provide specific information, model ordinances, program guidelines, and expertise regarding industrial waste and pretreatment considerations.

As determined in the inventory portion of this study, the wastewater collection system is composed of approximately 249,110 LF of gravity flow line ranging in size from 4" to 12". Based on the wastewater treatment plant construction date of 1925 it is estimated that the lines have been installed commencing in 1925 through the present. The lines are a combination of vitrified clay, cast iron and PVC. The older parts of the system consist of primarily vitrified clay lines. The primary problem affecting the collection system is the age and condition of various clay lines throughout town that are deteriorating and causing stoppages. These lines are in need of replacement

The system also has 5,660 LF of force main ranging in size from 4" to 6" in diameter. The City operates three lift stations, one of which is in fair condition and one of which is in good condition. However, the Old Marathon lift station is in need of equipment replacement. Several lines have excessive grease. City should enforce its grease trap ordinance and require restaurants to install grease traps to address this problem.

Based on the total number of manholes (514), the average spacing in the developed part of the City computes to be approximately 485 feet. This is within the recommended maximum of 500 feet spacing. However, there are some areas of the system that could use additional manholes: the outfall line from the City limits to the treatment facility, West Murphy Street, and Cactus Street.

Soil characteristics and natural terrain can also affect a collection facility's design, operations, and serviceability. As noted earlier, native soils are shallow to deep and may be either calcareous or noncalcareous. These types of soils do not tend to compound inflow/infiltration problems or increase maintenance costs. The Alpine system experiences little in the way of problems associated with the soil characteristics of the area.

All areas within the City limits have public sewer service, as do all City water customers located outside the City limits. In 1999, the City passed a moratorium on any new sewer extensions outside of the City limits until the completion of this planning study. From 1995 to 1998, the City had received several requests from developers for sewer service for planned developments. Prior to the 1999 moratorium, sewer service was extended outside of the City limits only upon City Council approval, but few extensions were approved due to the inability of the wastewater treatment plant to meet its TNRCC permit requirements. The plant was operating above 75% of capacity and was in violation at the time. The improvements completed in 1999 have now enabled the City to extend sewer service to all areas adjacent to the City limits. The City's subdivision regulations require developers to pay the cost of sewer service extensions. Expansions being considered are as follows:

- Quail Ridge Subdivision: Extend collector line from Alpine West Estates to Quail Ridge Road, and then construct service lines into Quail Ridge Subdivision, outside the City limits. This request has been reviewed periodically since 1995 by the City Council, but no definite action has been taken. Developer would pay extension fees. Projects would be subject to City Council approval.

- Northwest Alpine: This is an undeveloped area outside the City limits bounded by West Fort Davis Street on the north, Alpine West Estates on the west and Del Rio Street on the south. Developers have shown interest in this area. Developer would pay extension fees. Projects would be subject to City Council approval.
- Alpine West: This is a subdivision adjacent to City limits and to Alpine West Estates. This subdivision has paved streets and is served by City water. Sewer service is needed to alleviate septic tanks. Would qualify for TCDP assistance.

The largest expansion related project is the Southeast Interceptor Sewer: The project involves the construction of a main interceptor sewer line along both sides of East US 90 to Moss Creek, then along the eastern side of Hancock Hill until it reaches the existing outfall sewer line that runs along the northern side of Hancock Hill to the treatment plant. The proposed sewer collection system estimated at \$650,100.00 includes 12" ductile iron pipe, 12"/10"/8" PVC pipe, lift station modifications, a highway bore, and 49 manholes.

One of the most difficult areas to provide service has been this eastern portion of the community. The lack of sewer service along East US 90 has limited the City's and Sul Ross State University's ability to grow towards the east. New businesses have had to install septic systems. The Best Western Motel had to construct its own onsite treatment unit and a new motel under construction has to install a small sewer lift grinder station.

In 1998, GSW and Associates, Inc. prepared a preliminary engineering study, and the City of Alpine submitted a full application to USDA-RECD. An environmental assessment has already been prepared and approved by

RECD. The City of Alpine was notified in June 1999 through a letter of condition that the project had been approved for a 100% loan. The City was hoping for at least a 25% loan; and therefore did not pursue the project further at that time. The project is still needed and has been proposed through several engineering studies dating back to 1972. This is a long-term project that will have to be financed through improved RECD loan/grant ratio, BEC (Border Environmental Coalition) funding or other federal/state sources.

The City has the treatment and infrastructure capacity to extend sewer service to certain areas outside of the city limits where development is planned. The City Council will have to decide the merits of the extensions based on land use, generated revenues and compatibility with the surrounding neighborhoods adjacent to the planned developments. The extra revenue generated by sewer rate for customers outside the City limits that is 1.5 times the regular in-town rate would help ease the current financial burdens faced by the City's infrastructure systems.

In the areas of operational procedures, there are non-capital intensive needs that the City should address concerning both its treatment and collection systems for Alpine. Basically, these needs are ongoing and should be addressed by routine, scheduled procedures. The City currently has two licensed operators that have been certified as Class C by the TNRCC after training and on-the-job experience.

Specifically, the following operational procedure needs are:

- Establish a program for on-going maintenance of plant mechanical equipment, possibly using software packages designed for this task.
- Obtain proper monitoring equipment and monitor influent quality on a periodic basis.

- Establish a routine schedule for line cleaning.
- Track electricity usage and eliminate simultaneous tasks that require large amounts of power at the treatment plant to take advantage of the peak demand meter.

Often, in many systems, these operational/maintenance practices take the path of repair as opposed to preventive maintenance. In order to head off serious problems, there should be emphasis on addressing these needs regularly to maintain the system at maximum efficiency and serviceability.

Prioritized Problems. In summary, the wastewater system analysis and input from local sources has identified the primary areas of concern with the current sewer system:

1. Lack of manholes on the 12" outfall line extending from the City limits to the treatment plant.
2. Deterioration of the Old Marathon lift station.
3. Need for a sewer grinder lift station at the new Railroad Motel.
4. Need for extension of sewer service to the Quail Road Subdivision.
5. Need for extension of sewer service to the ten-acre tract of land adjacent to the Campus View Subdivision.
6. Lack of adequate number of manholes on West Murphy and Cactus Streets.
7. Presence of undersized, deteriorating clay lines in various parts of the City.

8.4 Wastewater Collection and Treatment System Plan

The City establishes the following goal for its wastewater system:

Goal: *Provide residents with safe and sanitary wastewater disposal.*

- Objective: Ensure that 100% of the system components operate effectively by replacing worn out equipment and deteriorating facilities as required.
- Objective: Improve the ability of utility personnel to access lines for maintenance purposes by installing 11 manholes on the 12" outfall line from the treatment plant to the City, 9 manholes on West Murphy Street, and 5 manholes on Cactus Street.
- Objective: Improve the functioning of the collection system by replacing all necessary equipment at the Old Marathon lift station and by constructing a sewer grinder lift station at the new Railroad Motel location.
- Objective: Expand sewer system into new areas through the installation of 3,000 LF of 8" collection line in the Quail Ridge Subdivision and 1,200 LF of 8" collection line with manholes to the planned subdivision located on the ten-acre tract of land adjacent to the Campus View Subdivision.
- Objective: Address problems of deteriorating, undersized lines by replacing 4,320 LF of sewer line (inclusive of all fittings, manholes, and street/alley repair) in various neighborhoods throughout the City (see Figure 8B, Proposed Sewer System Improvements map for exact locations.)
- Objective: Address lack of adequate sewer facilities on the east side of the City by constructing the Southeast Interceptor Sewer discussed previously in this chapter.

Goal: *Effectively and efficiently treat wastewater at the municipal treatment facilities.*

- Objective: Maintain in good working order all parts of the wastewater treatment plant and undertake preventative maintenance routinely.

Goal: *Provide utility personnel with safe and healthy work environment.*

- Objective: Ensure all proper safety precautions are taken and that the infrastructure needed for safe operation of treatment and collection facilities is in place. There should be zero on-the-job injuries.

Table 8C: Sewer System Improvement Plan Projects, 2001-2005

Project	Priority Level	Estimated Cost* And Source**
Install manholes on parallel main 12" outfall line from City limits to treatment facility	2001	\$7,000 + City labor ENT
Refurbish the Old Marathon lift station	2001	\$10,000 + City labor ENT
Construct sewer grinder lift station at new Railroad Motel	2001	\$25,000 DEV
Extend/construct 3,000 LF of 8" line to Quail Ridge Subdivision	2002	\$60,000 DEV
Extend/construct 1,200 LF of 8" line to ten-acre tract adjacent to Campus View Subdivision	2002	\$10,000 DEV
Install 9 manholes on West Murphy Street	2002	\$17,000 + City labor ENT
Install 5 manholes on Cactus Street	2003	\$8,500 + City labor ENT
Replace 4,320 LF of sewer line (inclusive of all fittings, manholes, and street/alley repair) in various neighborhoods throughout the City (see Figure 8B)	2004	\$250,000 TCDP/ENT
Construct Southeast Interceptor Sewer	2005	\$650,100 BEC/RECD/EDA/other

*Includes any associated engineering, administration, and/or acquisition costs.

**Source: Texas Community Development Program (TCDP), City of Alpine Enterprise Fund (ENT), private developers (DEV), Economic Development Administration (EDA)

9 Street System Study

9.1 Overview of Prior Studies and Existing Data

The movement of people and goods from place to place is the primary function of a community's street system. Both the arrangement and the condition of streets influence the ease with which movement can be made, the safety of those who travel, and the types of development that occur on adjacent land.

Various planning studies and reports have been prepared for the City in the past 35 years. A few of them contained a thoroughfare/circulation plan, but none included a street conditions study. The following study gives an inventory of the major components of the City's sewer system, identifies potential problems that should be addressed, and provides a prioritized summary of the needed improvements and their estimated costs.

9.2 Street System Inventory

Within its City limits, Alpine has 61.7 miles of streets all of which are paved. The City's ETJ contains an additional 11.9 miles of roadways. Each street segment was grouped into one of the three following categories:

Good Condition	Few surface cracks or potholes, little edge deterioration
Fair Condition	Surface cracks less than 1/2 inch wide, potholes less than 2 inches in diameter, crumbling edges extend less than 1 inch from street edge
Poor Condition	Surface cracks more than 1/2 inch wide, potholes greater than 2 inches in diameter, crumbling edges extend more than 1 inch from street edge

Each of the City's streets fit into one of these categories. Table 10A provides a breakdown of the lengths of each street condition category and Figure 10A illustrates the locations of the various streets and their relative conditions. It also shows which streets are paved and which are unpaved. As the data below shows, 96% of Alpine's streets are paved, but only 52% of them are in good condition.

Table 10A: Length of Streets by Condition

Condition Category	Total Length (linear feet)	Length (miles)	% of Total (for all streets)
Paved, Good Condition	166,835	31.6	52%
Paved, Fair Condition	108,160	20.5	33%
Paved, Poor Condition	38,265	7.2	11%
<i>Total for Paved Streets</i>	<i>313,260</i>	<i>59.3</i>	<i>96%</i>
Unpaved, Good Condition	0	0.0	0%
Unpaved, Fair Condition	3,455	0.6	1%
Unpaved, Poor Condition	9,345	1.8	3%
<i>Total for Unpaved Streets</i>	<i>12,800</i>	<i>2.4</i>	<i>4%</i>
Total for All Streets	326,060	61.7	100%

9.3 Street System Analysis

Alpine's existing street system is laid out in a rectilinear pattern occasionally broken by some angled intersections. Overall, the streets are in fair-to-good condition and provide safe access to all areas of the City. The age of streets varies throughout town. The older parts of town have streets exceeding ninety years old. The City paves streets with its own manpower and equipment.

Often, the street systems in rural communities are maintained by a variety of different entities. This is not the case in Alpine. Brewster County does not maintain any streets within the City. No interlocal agreements exist for road maintenance and repairs. Both the City and county will mutually assist each other when need arises. Brewster County has provided base work, and the City has used its equipment to pave streets. Streets that are paved in conjunction with the county are usually adjacent to City limits and in ETJ and serve the interests of both entities.

Texas Department of Transportation (TxDOT) maintains the following highways within the City: US Hwy 90/67, SH 118, and SH 223. TxDOT has completed several beautification and highway enhancement projects within Alpine the last five years with the majority completed within the last three years. These projects included landscaping of highway medians and islands, installation of sidewalks with handicapped curb ramps, and the installation of handicapped curb ramps on existing sidewalks on the highway rights-of-way through Alpine. The current project will be completed in January and consists of the construction of new sidewalks and curbing along north SH 118 from the new Big Bend Regional Medical Center through town to Stockton Street and along south SH 118 from Jackson Field to East Avenue K.

In October 2000 the City completed a five-year street paving and seal coating improvements program. The majority of the streets were seal coated during this time period. Other work consisted of paving unpaved streets, and the reconstruction of deteriorated streets. Over 150 blocks of streets were improved throughout the City. Alpine tries to balance its street improvements program throughout all areas of the City. The

number of streets improved over the past five years is too numerous to mention.

One project of particular importance was completed in 1997 through a joint effort with TxDOT. TxDOT provided approximately 85% of the total funding of \$961,950 and the City provided \$116,825.00 for the creation of an east loop connecting west US 90 and north SH 118. The purpose of this project was to keep some of the local traffic from utilizing the highways and to make it easier for citizens to get across town. The existing streets of West Fort Davis, North 10th, West Del Rio, and Cherry streets were totally reconstructed and sidewalks, curbs, and handicapped curb ramps were added.

A city has several types of improvements from which to choose when repairs are required on existing streets. The appropriate choice will depend on several factors including the amount of wear/damage to be addressed with the repair, the amount of traffic the street is expected to receive, and the amount of funds available to make street improvements. The different types of improvements include:

- *Point Repairs:* Excavation of failed pavement sections to a depth of eight inches, back-filled with eight inches of crushed limestone stabilized with 2% cement, primed and sealed with a coarse surface treatment. (Used to treat potholes and other imperfections and roadway hazards.)
- *Level-up:* Leveling of depressions in pavement with hot mix asphaltic concrete (HMAC) or hot mix/cold laid asphaltic concrete. (Used to even out roadway surface.)
- *Seal Coat:* Application of asphalt cement and covered with pre-coated aggregate at one cubic yard of aggregate per 90 square

yards. Aggregate is rolled after application. (Ideally, used once every three to five years to maintain streets and forestall more costly repairs.)

- *Overlay:* Depending on the severity of wear, approximately one inch of surface is milled off the existing street. Then the remaining surface material is overlaid with a minimum of 1.5" - 2" of hot mix asphaltic concrete (HMAC) or hot mix/cold laid asphaltic concrete, followed by a surface treatment. (Used to completely replace the surface material of a street to address pavement deterioration and extend street life.)
- *Reclaim:* Mill existing base and asphalt materials to a depth of six inches, add water-based emulsified asphalt to create a recycled asphalt-enhanced roadway base. Apply two-course surface treatment of asphalt cement and covered with pre-coated aggregate. Aggregate is rolled after each application. (Streets receiving the reclamation treatment will last 12 to 20 years, depending on the traffic load and environmental conditions.)

Prioritized Problems. Like most small cities, Alpine has limited resources to expend on street improvements. Both new paving and re-paving are costly endeavors, and financial constraints often prohibit either. However, a strong program of routine maintenance and seal coating will extend the life of paved streets and forestall more costly paving projects.

The City has historically improved streets south of the railroad tracks with CDBG funding and north of the tracks with City funds. The City of Alpine has paved the south side streets utilizing various HUD-CDBG and TCDP grants from 1975 through 1993 totaling over 200 blocks, as well as utilizing its own funds and paving equipment on other south side

streets when grant funding was not available. The City's TCDP funding priority shifted in 1994 from streets to water and sewer projects

All over town, seal coat maintenance and paving of dirt streets not eligible for grants had been neglected due to financial constraints and lack of equipment. It was not until 1982 that the city purchased its own paving equipment. (Prior to 1982, streets were either improved utilizing construction contractors financed through City funds or through HUD-CDBG and TCDP grants.) As a result, there are many streets that have deteriorated beyond repair and many streets that are in immediate need of seal coating preserve existing pavement. The City has been trying to catch up by trying to target an equal amount of streets on the north and south sides to improve each year. The most serious types of repairs needed are seal coating, reconstruction of paved deteriorated streets and paving of the small amount of dirt streets that remain.

A yearly street improvements program has been included in every budget for the past ten years. The amount of \$50,000.00 has been budgeted in FY 2000/01 for paving materials that should reconstruct/pave/seal coat approximately thirty blocks. Also budgeted is \$45,000 to replace the existing aggregate spreader and \$60,000.00 to replace the existing asphalt distributor. The City will continue to budget yearly for street improvements.

The City will be awarded a 2001 TCDP Street Improvements Grant in the amount of \$300,000 for the total reconstruction and paving of parts of Murphy and South 13th streets totaling approximately eleven blocks. This will be a two-course aggregate and asphalt treatment with 2,695 L.F. of concrete curb and gutter and 3,930 L.F. of header curb.

It is recommended that the street segments in Table 10B be improved through seal coating, new paving, or reconstruction. These segments were chosen and prioritized based on the following considerations: (1) condition of pavement surface, (2) thoroughfare classification (see Chapter 10), and (3) proximity to traffic generators. (Seal Coat = SC, Paving = P, and Reconstruct = R)

Table 10B: Prioritized Street Segments to Repair & Seal Coat

ID No.	Street	From	To	Repair Type	Length (Blocks)
1	Middle School Dr	West Brown	Del Rio	SC	5
2	W Brown	Middle School Dr	Cherry	SC	3
3	W Sul Ross Ave	Plum	Olive	SC	5
4	W Eagle Pass	Peach	Plum	SC	1
5	N Apple	W Avenue E	W Sul Ross Ave	SC	1
6	W Stockton	N 12 th	N 16 th	SC	4
7	N 14 th	W Sanderson	W Fort Davis	SC	3
8	N 17 th	Sul Ross Ave	Brown	P/R	3
9	W Avenue B	17 th	16 th	P/R	1
10	N Phelps	Nations	Brown	P/R	2
11	N Garnett	Holland	RR ROW	P/R	1
12	E Avenue I	S Walker	Ragin	P/R	8
13	S Lackey	E Avenue I	E Avenue G	P/R	2
14	Apricot	W Brown	W Eagle Pass	P/R	2
15	W Eagle Pass	Apricot	Cherry	P/R	1
16	E Murphy	S 1 st	S 5 th	P/R	4
17	W Murphy	S 7 th	S 13 th	P/R	6
18	S 13 th	W Murphy	E Avenue G	P/R	2
19	W Marfa	N 14 th	N 11 th	SC	3
20	N 12 th	W Stockton	Fort Davis	SC	2
21	W Sanderson	N 5 th	N 10 th	SC	5
22	N 12 th	Holland	RR tracks	SC	1
23	N 4 th	Uvalde	Del Rio	SC	2
24	E Eagle Pass	N 4 th	N 5 th	SC	1
25	N 5 th	Hendrix	June	SC	1
26	W Anson	N 5 th	N 7 th	SC	2
27	S Means	W Avenue G	W Avenue I	SC	2
28	W Avenue I	Means	Cotter	SC	1
29	W Avenue H	Means	Halbert	SC	3
30	S Halbert	W Avenue G	W Avenue H	SC	1
31	W Avenue I	Halbert	Nations	SC	1

32	S Cactus	Avenue I	S City limits	SC	4
33	S Dawson	Avenue G	Avenue H	SC	1
34	S 14 th	Murphy	Avenue G	SC	2
35	E Avenue I	Berkeley	Avenue I	SC	1
36	W Brown Ave	N 11 th	N 13 th	SC	2
37	E Del Rio	N 2 nd	N 5 th	SC	3
38	S Harrison	E Avenue K	dead end	P	3
39	Joann Dr	S 3 rd	S 4 th	P	1
40	W Eagle Pass	N 13 th	N 14 th	P	1
41	N 13 th	W Del Rio	W Eagle Pass	P	1
42	Eagle Pass	N 5 th	N 10 th	SC	5
43	Uvalde	N 5 th	RR tracks west	SC	8
44	W Avenue B	6 th	8 th	SC	2
45	N 12 th	Uvalde	Brown	SC	1
46	Lockhart Ave	N 11 th	N 13 th	SC	2
47	Avenue A	N 5 th	N 13 th	SC	11
48	W Nations	7 th	9 th	SC	2
49	W Avenue B	W 13 th	W 14 th	R	1
50	Avenue G	S Cockrell	S 11 th	SC	14
51	E Lockhart Ave	N 5 th	Harrison	SC	9
52	East Avenue B	N 5 th	Harrison	SC	9
53	N 7 th Street	Avenue A	Del Rio	SC	5

9.4 Street System Plan

This plan addresses the concerns noted in the preceding analysis section. It serves as a guide to the prioritization, costs, funding, and timing of future street improvements. Where appropriate, new street construction should comply with the specifications established in the City's subdivision regulations.

Goal: Maintain community street system to the benefit of all citizens.

- Objective: Promote adequate traffic flow and safety by seal coating/paving/reconstructing approximately 167 blocks of streets/thoroughfares during the planning period.
- Objective: Prevent deterioration of surfaces by promoting drainage and weed control at street edges on an annual basis.
- Objective: Provide for an improved street system through the establishment of standards for planning, design, and construction of street improvements in the City and through the review and revision of existing subdivision regulations.

Goal: Ensure that the community street system is a safe way for residents to travel throughout the community.

- Objective: Maintain and repair deteriorated street surfaces in a timely fashion through a program of routine seal coating and repair. Remove debris from roadside ditches, culverts, and curb and gutter to reduce flooding and pooling of water on street surfaces.
- Objective: Provide legible traffic signage where appropriate, and enforce traffic laws.

Goal: Provide all residents with adequate access to the community's street system.

- Objective: Repair and seal coat street segments identified in the plan that provide access to community facilities or provide the only main route of access for residential neighborhoods.

The successful implementation of the proposed street system plan should meet all of the stated goals and objectives. For example, little benefit would come from constructing and then maintaining a street that met no particular planning and design standards. To the contrary, it is imperative that the plan provide for quality in planning, design, construction and maintenance. The first goal lists as an objective the establishment of standards for planning, design, and construction of street improvements in the City. These standards should address not only the materials aspect of street improvements, but requirements for right-of-way width, cross-section, block length, building setbacks, drainage, and other pertinent considerations.

If implemented, the recommended projects for the period 2001-2005, shown in Table 10E, should adhere to accepted municipal standards. The improvement schedule outlined in the following table references several sections of streets to be seal coated in years 2001-2005. It is recommended that seal coating take place every five to seven years. The

street segments described below are illustrated on the Proposed Street Improvements Map, Figure 9B of Volume 2 of this report.

Table 10C: Street Improvement Plan Projects, 2001-2005

Project (numbers refer to street segments/ improvements in Table 10B)	Priority Level	Estimated Cost & Source of Funds*
Seal Coat segments 1-7	2001	\$50,000 / GEN
Pave/Reconstruct segments 8-15		
Purchase Asphalt Distributor	2001	\$60,000 / GEN
Purchase Aggregate Spreader	2001	\$50,000 / GEN
Pave/Reconstruct segments 16-18	2002	\$300,000 / TCDP
Seal Coat segments 19-31		
Seal Coat segments 32-37	2003	\$30,000 / GEN
Pave segments 38-41		
Seal Coat segments 42-48	2004	\$25,000 / GEN
Reconstruct segment 49		
Seal Coat segments 50-53	2005	\$30,000 / GEN

**Source of funds will be City of Alpine General Fund (GEN) or Texas Community Development Program (TCDP)*

Additional Considerations: The City should invest in road boring equipment or contract out the service to bore streets for the installation of water and sewer service. The current practice is to excavate water and sewer line extensions with the backhoe, install the lines, then patch the streets with cold mix. This practice has led to many streets in town being damaged, including newly paved and seal coated streets. The street cuts lead to future deterioration of the streets with city crews having to constantly repair the cuts. The cost of boring could be added to the sewer and water extension permit costs. The City should also consider extending water and sewer service to adjacent lots before paving dirt streets to avoid cutting the streets at a later date to install utilities.

10 Thoroughfares Study

10.1 Inventory of Major and Collector Streets

The movement of people and goods throughout a community is one of the primary activities undertaken by humans. Such movement is directly related to the arrangement of land uses and the condition of transportation routes. In the United States, goods and people are transported primarily by automobile, making street and highway systems the most important transportation routes in communities. Every community has specific streets that carry heavy traffic volumes, even though the regular volume on most streets is fairly light. These major streets connect different areas within the community such as residential neighborhoods, shopping districts, employment centers, and schools, and also connect different communities to one another. They are known as *thoroughfares*.

The purpose of this thoroughfare system plan is to identify methods of concentrating traffic on major streets while at the same time reducing travel time for motorists. Re-routing intra-community traffic from neighborhood streets to thoroughfares enhances motorist and pedestrian safety as well. The thoroughfare plan also strives to balance the conflicting goals of movement and access. Movement denotes the speed and capacity of traffic, while access is the ease or difficulty of traveling from the street to adjacent properties and back. Often, as movement on a particular street increases, access to adjacent properties is hampered. Conversely, as more properties gain direct access to a street, movement on the street is impeded.

A city's thoroughfares act as its skeleton, holding its various neighborhoods and districts together and dictating where new

development will occur. In Alpine, the thoroughfare system connects a compact community with rectilinear streets.

Street Functional Hierarchy. Streets are most easily categorized based upon their function, with streets that serve primarily to move traffic at high speeds or in large volumes at one end of the spectrum and streets designed to provide access to multiple small properties at the other end. For example, interstate highways are designed to carry rapid, high volume traffic from one distant area to another while neighborhood streets are designed to accommodate the few automobiles owned by those people who live in the neighborhood.

This system, described in Table 11A, may be viewed as a hierarchy, with streets designed for movement at the top and those designed for access at the bottom.

Table 11A: Street Functional Hierarchy

Street Type	Description
Major Arterial	Provides efficient movement at higher speeds (55 mph or more), often with controlled access to prevent slowing of movement. <i>Examples: interstate highways or four-lane divided state highways.</i>
Minor Arterial	Connects and augments major arterials, providing some access and a lower level of movement at moderate to high speeds (35-60 mph) Example: <i>multilane streets with center and left turn lanes.</i>
Collector	Provides both access and movement, generally carries local traffic from neighborhoods to employment, shopping, or other points of interest at moderate speeds (20-45 mph). <i>Example: two- or four-lane FM roads or city streets with stoplights but few stop signs.</i>
Local	Primarily provides access to individual properties lining the street at generally low speeds (15-25 mph).

Typical Design Standards. Each street type in the functional hierarchy is accompanied by general design criteria that improve either movement or access, depending on which function is desired. Although these criteria reflect the optimal design for each type of street, it should be noted that streets are classified using their actual function rather than their design in this study.

Street Type: Major Arterials
Function: To provide traffic movement between major traffic generators such as large neighborhoods, commercial districts, industrial areas, and to connect to nearby communities.
Access: Divided roadways reduce marginal friction and provide space for left turn lanes separate from traffic lanes. Any signalized intersections should be at uniform intervals of a ½-mile to obtain a progressive traffic flow at reasonable speeds. Any intermediate non-signalized access via public streets or private driveways may be provided in a manner that does not interfere with the primary function of movement. Deceleration lanes should be provided for all right-turns (streets and driveways). Median openings at non-signalized locations should be designed for specific left-turn movements. Access management is essential to minimize traffic accidents and to promote movement; signalized intersections and non-signalized access points should be designed so that turning vehicles travel not more than 10 miles per hour (mph) slower than the main traffic stream.
Traffic Control: An interconnected traffic signal system should be identified in a thoroughfare plan with conduit and controller box bases installed at the time of new arterial construction. On existing streets, future signal locations should also be identified in a thoroughfare plan with installation planned in advance of meeting minimum requirements.
Planning Considerations: Desired locations are community boundaries between large residential neighborhoods and between residential and commercial or industrial areas. Landscape buffering is essential, especially adjacent to residential areas. Bicycle and pedestrian facilities should be separated from traffic lanes and adequate space should be provided behind the curb for utility lines so maintenance and repair does not require blocking a traffic lane.
Trip Length: 3-10 miles
Traffic Volume: 20,000 to 30,000 or more vehicles per day.
Right-of-Way: At least 20 feet per lane plus a left-turn median of 20 feet.
Pavement: Two separate roadways of two or more lanes each with 12-foot traffic lanes, medians, and curb and gutter.
Examples: US Hwy 90 functions as a major arterial.

Street Type: Minor Arterials
Function: To provide traffic movement between secondary traffic generators such as small shopping districts and shopping centers, office parks, high schools, and large parks or recreation areas. Also, to collect and distribute traffic from lower-order streets to major arterials.
Access: Any signalized intersections should be at uniform intervals of ¼-mile to obtain a progressive traffic flow of reasonable speeds. A continuous two-way left turn lane is often provided in areas with frequent non-signalized driveways or streets. Signalized intersections and non-signalized access points should be designed so that turning vehicles travel not more than 15 miles per hour (mph) slower than the main traffic stream.
Planning Considerations: Desired locations similar to those for major arterials. Sidewalks should be located adjacent to the right-of-way line and sufficient space behind the sidewalk should be left for utility lines.
Trip Length: 2-5 miles
Traffic Volume: Up to 20,000 vehicles per day.
Right-of-Way: At least 20 feet for each traffic lane, turn lane and median.
Pavement: Either two roadways separated by a 20-foot median, each with two 12-foot traffic lanes, or a 12- to 14-foot uninterrupted pavement surface with a continuous two-way left turn lane.
Examples: Functionally, Avenue G is a minor arterial.

Street Type: Collector Streets
Function: Collect and distribute traffic between local streets and arterials. They also serve neighborhood traffic generators such as elementary schools, small apartment complexes, and neighborhood commercial centers. Collectors may be further classified as major collector and minor collector streets. A major collector street serves several districts or subdivisions or serves as principal access to commercial or industrial developments. Major collectors provide limited access to abutting properties and parking is usually restricted. A minor collector street serves individual districts. In residential areas, they collect traffic from local streets but do not continue on through several districts. In commercial and industrial areas, minor collectors provide access from one development or district to other collectors or arterials.
Access: Collectors of greater than a ½-mile long serving a single family or duplex residential area should not provide direct access to private driveways; rather, local streets that intersect with the collector should provide driveway access. Collectors may provide direct access if they are shorter than a ½-mile in length.
Planning Considerations: Collectors that are to be eventually extended into undeveloped land should not provide direct access for private driveways if the planned length will exceed a ½-mile. Collectors should never follow routes that provide a direct, convenient route through a subdivision for traffic that has neither an origin nor destination within the subdivision.

Trip Length: 1/2-3 miles
Traffic Volume: Major: up to 6,000 vehicles per day. Minor: up to 3,000 vehicles per day.
Right-of-Way: At least 80 feet for major and at least 60 feet for minor collectors.
Pavement: At least 44 feet from curb to curb for major and at least 40 feet for minor collectors.
Examples: Fort Davis Ave. and Peach Street are collectors.

Street Type: Local Streets
Function: To provide access to individual adjacent properties.
Access: Entering and exiting private driveways and parking lots is convenient and safe.
Planning Considerations: The maximum number of individual access points (driveways) or residences on a cul-de-sac street is 24, while the maximum for looped or square-blocked streets that intersect other streets is 48.
Trip Length: Less than ½-mile.
Traffic Volume: Up to 500 vehicles per day.
Right-of-Way: At least 50 feet.
Pavement: At least 30 feet curb to curb.
Examples: Marfa Ave. and 13 th Street are local streets.

Survey of Arterial and Collector Streets. Alpine's street system is a modified grid with numerous narrow through streets and a fairly regimented traffic flow. Several streets clearly function as arterials because they connect key traffic generators and provide access to other communities. Collector streets are more difficult to identify because the grid pattern relies on traffic signage and street width rather than intersection limits to regulate the flow of traffic. Because most locations in a grid street system can be accessed by a variety of routes, collectors are less important in grid systems than in typical suburban neighborhoods, which rely on cul-de-sacs and curvilinear streets. Tables 11B and 11C identify the key thoroughfares in Alpine.

Table 11B: Arterial Streets

Arterial	Function	Traffic Flow*	
		Avg. Daily	Peak Hour
US 90/Holland	Connects City with Marfa, Marathon, I-10, and the Rio Grande Valley	8500	1700
Avenue E (Business 90)	Provides highway access to the Central Business District from US 90.	3000	600
SH 118/ 5 th Street	Connects the City with Fort Davis, I-10, and areas south including Big Bend National Park.	3600	700

** Traffic flows based upon the Texas Department of Transportation's District Highway Traffic Map (1995).*

According to data reported in the 1990 Census, seventy-seven percent of Alpine's 2,490 employed residents drove alone to work. This translates into more than 3,800 trips each day. An additional ten percent carpooled to work, while the remaining thirteen percent walked, bicycled, or worked at home. The average commute to work took about eleven minutes.

Currently, the city's arterial system is able to meet the traffic demand placed upon it. Delays are somewhat common in the central business district. The arterial roads are the busiest in the city, carrying residents to school, to work, and to shopping locations around town.

Alpine's collector streets are well defined, and support the circulation patterns established by yield signs and stop signs throughout the City. Table 11C lists Alpine's collector streets and illustrates their respective functions throughout the City.

Table 1.1C: Collector Streets

Collector	Major/ Minor	Function	Traffic Flow*	
			Avg. Daily	Peak Hour
Fort Davis Ave.	Major		580	120
Del Rio Ave.	Major		650	260
Cherry St.	Major		800	340
East Ave. I	Major		450	80
Matewan	Major		420	75
RM Hwy	Major		300	60
North 14 th St.	Major		300	120
West Murphy St.	Major		300	70
South Lackey St.	Major		175	40
June St.	Major		100	30
Fighting Buck Lane	Major		100	30
West Fort Davis	Minor			
Peach St.	Minor			
Orange St.	Minor			
West Brown	Minor			
North 17 th St.	Minor			
Eagle Pass	Minor			
7 th St.	Minor			
Vulcan St.	Minor			
John St.	Minor			
Cherry Lane	Minor			
Ave. A	Minor			
Durrell	Minor			
West Ave. I	Minor			
Ferguson Ave.	Minor			
North 2 nd St.	Minor			

Traffic flows based upon estimates by the planner taken in September 2000.

Curb and Gutter. There is very little curb and gutter extends in the City.

Parking Restrictions. There are no parking restrictions or metered parking spaces in Alpine other than ADA accessible spaces and private parking lots. Even parking in private lots is not discouraged except during regular business hours (private business lots) or during church services (church lots).

Truck Routes. Alpine's major truck route is US Highway 90. This road routes traffic northwest to Marfa, Fort Davis, and Interstate 10, or southwest to the Rio Grande Valley, Del Rio, and Mexico. Texas Highway 118 provides access from the highway to nearby towns and to undeveloped land surrounding the City.

Public Transportation. There is no public transportation available to residents of the City of Alpine.

Traffic Regulation. 427 stop signs, 289 yield signs, and four flashing traffic lights regulate traffic in the City of Alpine.

10.2 Thoroughfare Analysis

The need for thoroughfares is most influenced by land use because of the role land use plays in generating traffic. Various land uses produce varying trip demands and trip demands define the need for transportation, whether automobile, pedestrian or mass transit. Transportation improvements are based on the type of transportation needed. More efficient transportation facilities make the adjacent land more accessible, thus enhancing land values, and increased land values affect the type and level of land uses, completing the cycle.

Trip Generators. The ability to predict trip generation and assign trips to a roadway network requires the ability to determine trip rates and characteristics for various types of land use. The Institute of Transportation Engineers (ITE) compiles comprehensive listings of trip rates by land use in an informational report call *Trip Generation*. This document is updated periodically and is widely used in thoroughfare

analysis. Table 11D illustrates a typical trip generation rate table for some of the different types of land use found in Alpine.

Table 11D: Daily Trip Generation Rates

Land Use	Trip Rate Basis (Unit)	Daily Trips/ Unit
Single Family	Dwelling unit (DU)	10.0
Multi-family	DU	6.1
Office, under 100,000 square feet (SF)	1,000 SF	17.1
Retail Shopping Center, under 50,000 SF	1,000 SF	117.9
Retail Shopping District, under 20,000 SF	1,000 SF	35.3
Light Industrial	1,000 SF	5.5
Elem. and Jr. High Schools with busing	Student	0.3
High Schools with busing	Student	0.7

Alpine has several major traffic generators, some of which cause traffic at predictable times and others for which generated trips are less regulated. Major traffic generators are defined as sites that are the starting point or destination of more than 100 vehicle trips per day on average. A visit to the grocery store in one automobile generates two "trips:" the trip from the point of origin and the return trip. Trip generation rates are calculated in such a way as to account for what are known as "multi-event" trips, or those in which the driver leaves home and visits multiple destinations before returning home. Some traffic generators only function on specific days, such as schools or churches; others function year round, such as hospitals or grocery stores.

Table 11E: Major Traffic Generators

Site	Streets affected	Traffic Generated (est.)*	
		Avg. Daily	Peak Hour
Sul Ross State University	Holland Ave./US 90, North Harrison	1500	300
Central Elementary School	Brown Ave, 7 th St., 5 th St., Avenue A	280	220
Alpine Middle School	Brown Ave., Cherry St., Del Rio St.	250	200
Alpine High School	5 th St./TX 118, TX 223, Fort Davis Ave.	370	290
Furr's Supermarket	Agnes and SW 1 st	360	150
Brewster County Courthouse	North 6 th and 7 th , Sul Ross, and Avenue E	220	70
City of Alpine	North 7 th and 8 th , Sul Ross, and Avenue C	220	70
West Texas National Bank	North 4 th and 5 th , Avenue C	200	50
Morrison's True Value	North 5 th , Avenue C, Sul Ross	280	50
US Post Office	North 13 th and 14 th , Avenue E and Holland	150	50
Big Bend Regional Medical Center	TX 118	510	70

**Estimates based upon ITE standards, determined using facility size or employment size (Alpine residents/employees only).*

Route Continuity and Problem Intersections. The first group of thoroughfare issues considers the continuity of traffic patterns throughout the City, and also explores areas where specific traffic problems exist. Some streets in Alpine lack the needed overall continuity because of physical barriers such as railroads. In general, the street network is well developed, with few problem areas pertaining to missing streets. It is assumed that undeveloped right-of-way will be paved as needed in keeping with residential development. Paving projects have ensured that adequately surfaced roads serve most significantly populated areas. Most roads in the City are in fair to poor condition.

There are several intersections that lack appropriate traffic signage in Alpine. Obviously, intersections where traffic flow is not properly regulated represent a serious hazard to pedestrians and motorists. Installing traffic signs should be a priority during the planning period. Signage problems in the City of Alpine stem from the location of yield signs along major collectors. Yield signs need to be replaced with stop signs along Sul Ross Avenue, 10th Street, 11th Street, Fort Davis Street, Murphy Street, Avenue G, and East Avenue I. The City should establish an annual program to install and/or repair signs as needed.

Problem intersections were identified during field visits made in November 2000. The most significant problems can be found at the intersection of 5th Street and Sul Ross Avenue. 5th Street (TX 118) and Holland Ave. (US 90) are major arterials. Locally heavy traffic on these roads is exacerbated by through traffic, including increased truck traffic due to NAFTA. Sul Ross Ave., which is the primary access road for the SRSU campus, intersects 5th Street one block north of Avenue E (Business 90). In addition to the campus, business district, and through traffic on 5th Street, there is increased local traffic in this intersection due to the close proximity of several major traffic generators.

Other problem intersections have been the site of numerous accidents and should be converted to four-way stops. These intersections are Ave. E at Harrison, Harrison at Holland, and Holland at 2nd St. The intersection of Ave. E and 5th St. is particularly worrisome. Though regulated by a blinking red light, it is a common location for accidents, partially due to the presence of a major traffic generator. Lights, signage, and parking in and around this intersection need to be reconfigured to ensure that motorists have adequate visibility to see oncoming traffic and adequate warning of their responsibility to stop and yield.

It is important to note that many of the problems that were identified in this study include roads that are not maintained by the City. Both 5th Street (TX 118) and Holland Ave. (US 90) are maintained by the Texas Department of Transportation. The City will have to negotiate with TxDOT to accomplish any changes to traffic patterns or signage on these roads. Currently, the City is awaiting results of a TxDOT study including traffic counts at the intersections of 5th St. and Sul Ross, and Ave. E and Harrison. The City will need to continue to explore the possibilities of cooperation with TxDOT in improving other intersections discussed above.

Another concern for many Alpine residents is the proposed highway known as La Entrada al Pacifico. This highway will route heavy truck traffic from Presidio through Alpine to Midland/Odessa. Many citizens have strongly expressed their disapproval of this route as planned. A variety of possibilities to the planned route exist, ranging from cancellation of the project to construction of a highway bypass. This is a complicated issue with many stakeholders, and arriving at an acceptable solution will require negotiations and compromise from all parties. The City must critically analyze its position with regard to the pros and cons of La Entrada al Pacifico, and must also consider the opinions of its residents before moving forward.

Traffic Speeds and Pedestrian Safety. The second group of thoroughfare issues deals with the speed and safety of traffic, particularly in school zones and other areas with heavy pedestrian traffic. With the exception of the Middle School, existing school speed zones and crosswalks around Alpine School District Campuses are adequate. West Brown Ave., North 16th St. and North 17th St. are roads that are heavily used by Middle School students traveling on foot or on bicycles. Currently, the school

speed zone ends at the intersection of West Brown and Middle School Road. At this point, the speed limit doubles, from 15 mph to 30 mph. Increased speeds in this heavily pedestrian area pose a serious threat to students traveling toward, across, and along West Brown. Extending the school speed zone along West Brown to 14th St., and down 16th and 17th Streets to Sul Ross would serve to reduce traffic speed and volume. In the planning period, extending the school speed zone will help to assure that children are able to travel safely between home and school.

In Alpine, as in many cities its size, railroad crossings present a unique concern for both pedestrian and vehicular traffic. Problems in Alpine stem from the frequency and length of closed crossings, rather than from the problem of inadequately signed and lighted crossings. Alpine is home to a Union Pacific crew change station. Crew changes take between ten and twenty minutes and, if both east- and westbound crews are changing, three of the five crossings can be closed for the duration. The City's only option in managing problems caused by railroad crossings is to deal directly with the track owner, Union Pacific in this case. The City is currently negotiating with Union Pacific to construct a new crew change station outside the City Limits.

In addition to traffic control through signage, there are other methods that can be used to improve safety and accessibility where those are the desired goals. New traffic calming techniques such as speed humps are gaining in popularity in places where the goal is not to stop traffic but to maintain lower speeds. Speed humps are trapezoidal asphalt structures that rise less than eight inches above the street surface. They are designed to allow cars driving at the designated speeds to pass over with a slight bump; cars driving in excess of the designated speed are will experience a jarring that increases as the speed increases. When properly

spaced, the humps have the effect of keeping traffic speeds within five miles per hour of the designated speed. The humps are marked with bright white cross hatching to warn motorists. Speed humps are popular in school zones and on neighborhood streets that serve as shortcuts for motorists seeking to avoid traffic on busier streets.

10.3 Thoroughfare Improvements Plan

The implementation of a thoroughfare plan in Alpine is complicated, because the City must partner with other entities for the maintenance of some of its most troublesome streets and traffic facilities. While this plan provides some guidance for long-term solutions to problems that exist in the thoroughfares network, the short-term projects are more likely to be affordable and practical for the City to implement during the five-year planning horizon.

Goals and Objectives. The City has established the following goals and objectives for its thoroughfare system:

Goal: Ensure that the thoroughfare system has adequate capacity for the development densities and land uses served.

- Objective: Establish rights-of-way of at least 60 feet and paving widths of at least 30 feet for major thoroughfares and rights-of-way of at least 40 feet and paving widths of at least 24 feet for collectors.
- Objective: Require 100% of all dedicated streets in future developments within the city or its extraterritorial jurisdiction to conform to appropriate right-of-way and paving widths, as established in the City's subdivision ordinance.
- Objective: Deny 100% of all plats or site plans that do not provide direct dedicated street access to all platted residential lots.

Goal: Develop a balanced transportation system capable of moving people and goods in a safe, efficient, and environmentally responsible manner.

- Objective: Enhance the ability of arterial thoroughfares to move large volumes of traffic safely and at appropriate speeds by limiting intersections with stoplights and stop signs, by providing left and center turn lanes, providing appropriate drainage (curb and gutter), and resurfacing streets as required. Pave/repave and seal coat roads as indicated in Chapter 9, Street System Study.
- Objective: Allow for alternative means of transportation such as bicycling and walking when establishing design standards—at least one mile of hike and bike trail for every 50 miles of paved road or one mile per every 5 square miles of incorporated area.
- Objective: Allow for the needs of people with disabilities and the elderly in designing and building transportation facilities. All (100%) new transportation facilities shall conform to the requirements of the Americans with Disabilities Act.
- Objective: Replace yield signs with stop signs as necessary along Sul Ross Avenue, 10th Street, 11th Street, Fort Davis Street, Murphy Street, Avenue G, and Avenue I. Establish a cooperative program with TxDOT to improve traffic regulation where City streets intersect with state and US highways. Continue to negotiate with Union Pacific and TxDOT to increase safety at railroad crossings.

Goal: Limit through traffic in residential neighborhoods.

- Objective: Encourage neighborhood street designs that limit the number of intersections with arterial streets to less than once every one-half mile.
- Objective: Discourage through traffic by using four-way stops rather than yields, speed humps, and on-street parking.

Goal: Minimize pedestrian-vehicular conflict points.

- Objective: Reroute or slow traffic around pedestrian areas such as schools, churches, and parks by installing stop signs at key intersections and by installing a school speed zone.
- Objective: Provide safe means for pedestrians to travel across busy intersections when they come in contact with vehicular traffic by installing pedestrian crosswalks.

- Objective: Improve pedestrian access to the Middle School by extending the school speed zone along West Brown to 14th Street and along 16th and 17th Streets to Sul Ross Avenue.

Thoroughfare Priorities and Costs. The most important thoroughfare improvements are those that protect the safety of pedestrians, followed by those that protect motorists. The ease and convenience of traffic flow is secondary to these issues and is reflected in the City's prioritized thoroughfares improvements list.

Table 11F: Thoroughfare Improvement Plan Projects, 2001-2005

Project	Priority Level	Estimated Cost
Install school speed zones along West Brown to 14 th Street, and along 16 th and 17 th Streets from West Brown to Sul Ross Avenue.	2001	\$2,000 (Gen)
Replace yield signs with stop signs along Sul Ross Avenue from Harrison to 5 th Street.	2002	\$3,000 (Gen)
Install flashing red light at Sul Ross and 5 th Street. Designate right turn only lanes on Sul Ross approaching 5 th Street.	2003	\$30,000 (Gen, TxDOT)
Annually, install four sets of stop signs as preferred by Council along 10 th Street, 11 th Street, Fort Davis Street, Murphy Street, Avenue G, and Avenue I.	2003 - 2005	\$2,000 (Gen, annually)
Install stop signs and flashing red light at intersection of Harrison and Avenue E.	2004	\$12,000 (Gen, TxDOT)
Install flashing yellow light at intersection of Harrison and Holland.	2004	\$10,000 (Gen, TxDOT)
Install flashing yellow light at intersection of Holland and 2 nd Street.	2005	\$10,000 (Gen, TxDOT)
Reconfigure traffic controls and signs to increase motorist awareness and improve traffic flow.	2005	\$20,000 (Gen, TxDOT)

Gen = City of Alpine municipal funds and in-kind contributions, TxDOT = Texas Department of Transportation.

The City will complete these improvements primarily as part of its ongoing street maintenance plans. It is possible that the Texas Community Development Program will fund street improvements in the Rio Grande region in which Alpine competes for funds. If this funding becomes unavailable, an alternative is to attempt to pass a bond issuance for street improvements, of which thoroughfare improvements could be a part.

11 Recreation and Open Space Study

One of the most enduring trends of the past quarter century is the American health kick, typified by the proliferation of new diets, health clubs, nontraditional medical treatment, and fitness magazines. In smaller cities like Alpine, recreational areas play a key role in maintaining not only the physical health of individuals, but also the emotional health of the community. Parks and recreational areas provide pleasant places for family reunions, friendly competition, exercise, and socializing.

Every city has the responsibility of providing adequate parks and open space for the health, entertainment, and beauty of the community. However, the limited availability of funds for these public uses generally requires foresight in planning for future expansion of parks and public open spaces.

Several factors contribute to the increasing demand for parks and recreational facilities in many Texas towns: the increase in life expectancy coupled with earlier retirement ages for many people; the spread of competitive sporting programs to the youngest and oldest age groups; and the understanding that a healthy diet and regular exercise are beneficial for mental and physical well-being.

The demand for park and recreational facilities in a community is a function of the community's population. Simply increasing the total acreage of parkland cannot satisfy this demand; rather, it is met by offering improved and accessible parks characterized by a variety of facilities.

11.1 Recreation and Open Space Inventory

Recreational Areas Classification. The National Recreation and Park Association's (NRPA) "Recreation, Park, and Open Space Standards and Guidelines" identifies the types and sizes of parks found in most communities. These classifications are based on the acreage of the recreational area and the types of facilities offered. They are (1) Special Parks, (2) Neighborhood Parks, (3) Playing Fields, (4) Passive Recreational Areas and (5) Community Parks.

Special parks are used for single-purpose or specialized recreational activities such as golf courses, nature centers, display gardens, athletic complexes, and buildings, sites, or objects of historical or archaeological significance. Sometimes special parks are linear in nature and are developed for one or more modes of recreational travel such as hiking, biking, and pleasure walking. This subset of special parks is referred to as linear parks. Typically, these areas serve a region of at least ten miles in radius and may be of varying size. Special and linear parks are typically wide enough to protect the resource while allowing for maximum use.

Neighborhood parks provide both active and passive recreational opportunities for all age groups. Ideally, a neighborhood park occupies two to four acres. Facilities located in a neighborhood park might include paved or graveled walking trails, ball diamonds, basketball or tennis courts, playground equipment, and volleyball courts. These parks often provide some scenic or natural areas separated from the active recreational areas by trees, shrubbery, or flowerbeds. Benches and lighting should also be provided. Neighborhood parks serve an area of one-quarter to one-half mile in radius and range in size from one to ten

acres. Generally, one to two acres of this type of parkland should be provided per one thousand residents.

Playing fields are developed recreational land where active games such as football, soccer, volleyball, baseball and softball can be played. Most schools have playing fields and many communities have modern baseball and softball fields located in a playing field complex. Typically, these areas serve a region of at least five miles in radius and are usually at least three acres in size. At least three acres of playing fields per one thousand residents should be provided.

Passive recreational areas include land used for sun bathing, picnicking, flying kites, enjoying scenic views, or simply relaxing. Facilities might include benches, tables, and limited parking. Examples of passive recreational areas are roadside rest areas, scenic view sites, small landscaped areas, open fields, or irregular areas of ground maintained by the city to provide open space. There are no minimum standards for passive recreational areas.

Community parks provide separated facilities for both leisurely and active play areas for all age groups. The parkland should be accessible by vehicles and have sufficient parking areas. Community parks typically accommodate all-day usage, planned recreational programs for competitive sports, passive entertainment, and large group gathering facilities. A community park will often include all or most of the following: ball diamonds, tennis courts, restrooms, walking paths, a swimming pool, areas for lawn games, multipurpose areas, shelters and grills or pits for picnicking, and playground equipment for children of all ages. Community parks typically serve an area ranging from two to five miles in radius and include at least fifteen acres. Between five and eight

acres of community parkland should be provided per one thousand residents.

Alpine's Recreational Areas. The City of Alpine is served by thirteen existing recreational facilities, including Medina Park, Centennial Park, Baines Park, Pueblo Nuevo Baseball Field, Arbolitos Park, Railroad Park, the Kokernot Park Complex, Nopalitos Park, Memorial Park, American Legion Baseball Field, Alpine Country Club, Alpine Recreation Center, Old Town Square, and facilities located on Alpine ISD and Sul Ross State University campuses. Detailed lists of existing facilities can be found in Figure 12A.

Medina Park is a neighborhood park designed for use by small children and adults. Facilities include a variety of play equipment, three picnic tables, and three barbecue grills. This park is located on South 11th Street between West Avenues G and F.

Centennial Park is located at the corner of South 11th Street and West Avenue I. It features an adult baseball field, bleachers, and two dugouts in poor condition.

Baines Park is a neighborhood park with facilities designed for adult and youth activities. Facilities include a concrete basketball court, playground equipment, covered picnic areas, picnic tables, and barbecue grills. Baines Park is located on East Avenue G between South 4th and South 5th Streets.

Pueblo Nuevo Baseball Field is primarily used as a Little League practice field. This area, located on East Avenue G between Hancock and Chastain Streets, is unimproved.

Arbolitos Park is a pocket park in the central business district. It is located on Holland Street between North 5th and 6th Streets, and features nine planters, five wood benches, and five decorative street lamps.

Railroad Park is located at the corner of North 5th and North Holland Streets. This pocket park features three covered rest areas, a concrete table with benches, an additional bench, and a caboose.

Kokernot Park Complex is located on North 2nd Street. It is a 24 acre complex including a park area, swimming pool, and sports fields. Facilities include picnic tables, barbecue grills, playground equipment, benches, adult pool and wading pool, shower facilities and concession for the pool area, a half-mile track with exercise stations, a soccer field, a 300 foot radius Little League baseball field with bleachers and an announcer's booth, an adult softball field with bleachers and an announcer's booth, and a 200 foot radius Little League Field with an announcer's booth, restrooms, a concession stand, and bleachers.

Nopalitos Park is a small park donated for the purpose of mediation beside Alpine Creek. It is located at the corner of North 7th Street and West Lockhart Avenue.

Memorial Park is located downtown on Sul Ross Avenue. It is a World War II veterans' memorial and also contains a picnic table.

The American Legion Baseball Field features an unimproved field area and is used as a practice field for Little League teams. It is located at the corner of North 16th and West Stockton Streets.

Alpine Country Club is a nine-hole golf course that is operated by the Alpine Country Club. It is located on Highway 223 in the northeast part of the City.

Alpine Recreation Center is a new facility located on West Sul Ross Avenue. It is a two-story, 12,000 square-foot building which was donated by the Alpine ISD. This facility includes offices of the Alpine Substance Abuse Program that offers after school programs. Rooms include a computer lab, a recreation room, and a gymnasium. The building is more than 50 years old, and is in need of extensive renovation.

The Old Town Square is located at the corner of North 5th Street and Sul Ross Avenue. This park functions as a parking area for pedestrian access to the central business district, and it is landscaped.

Numerous recreational facilities can be found on the Alpine ISD campuses. Facilities at the elementary school include a concrete basketball court and a variety of playground equipment. The Middle School provides its students with picnic tables, benches, an asphalt basketball court, and a concrete basketball court. Several facilities are located at Alpine High School and at Buck Stadium. They include three tennis courts, a basketball court, a football field with stadium seating, a concession stand, a field house with restrooms, and a practice area. While the Alpine ISD strives to provide public access to its facilities, it must also provide for the security of its students. Necessarily, access to school facilities must be somewhat regulated.

Additional facilities are located on the campus of Sul Ross State University. Facilities that are available for use by the public include the rubberized asphalt track and bleachers at Jackson Track Field, and open

space located adjacent to the softball field. In addition, there is a lighted baseball field, Kokernot Field, which is used by SRSU, AISD, and Little League teams.

It is worth noting that there are two major public recreation areas within driving distance of Alpine. Big Bend National Park and Big Bend Ranch State Natural Area are located about 100 miles southeast of Alpine, and offer camping, picnicking, fishing, swimming, hiking, museums, and scenic drives. In addition, Fort Davis, the Davis Mountains State Park, and UT's McDonald Observatory are located about 50 miles north of the City. Fort Davis is popular for its museum exhibits, while the Davis Mountains State Park offers picnicking, camping and hiking areas as well as scenic drives throughout its 2,700 acres. McDonald Observatory, located on the 6,700-foot peak of Mount Locke, houses the world's third-largest telescope and offers a varied schedule of public events.

A detailed breakdown of the park and recreational facilities that are locally available to the residents of Alpine is found in Table 12A. Because the Alpine ISD maintains several playing fields and playgrounds that are generally available to the public, these are included in the table below.

Table 12A: Recreation & Open Space Facilities

Improvement Type	Number	Condition
Playscapes/Playgrounds	4 (3 AISD)	Fair/Good
Picnic Tables	18 (2 AISD)	Good
Covered Picnic Tables	5	Good
Barbecue Grills	15	Good
Basketball Courts	2 (3 AISD)	Good
Rubberized Asphalt Track	1 (1 SRSU)	Good
Tennis Courts	3 PISD	Good
Baseball/Softball/Little League Fields	3 (1 SRSU)	Good
Gymnasium	1	Fair
Playing Fields	2 (1 AISD)	Good
Swimming Pool	1	Poor
Soccer Field	1	Good
Football Field	1 AISD	Good
Golf Course	1	Good
Recreation Center	1	Fair

11.2 Recreational and Open Space Analysis

Recreational and Open Space Standards. There are basic principles that guide the successful development of parks and recreational facilities in communities of all sizes and types. These guidelines provide specific information to community leaders who understand their community's goals but who need additional guidance throughout the planning process. While they are useful, such arbitrary standards must be considered as they relate to the specific needs and characteristics of the community in which they are to be applied. Accordingly, the City will want to modify some of the standards to reflect the unique character of the Alpine community. General open space development guidelines include:

- In most cases, active recreation areas should be separated according to the users' ages, primarily to protect younger children from injury. Some areas should be designated for use by all ages so entire families can enjoy being together.

- Recreational areas should be accessible to the age group they are designed to serve. For example, neighborhood playgrounds usually serve an area with a radius of one-half mile, which is a reasonable distance for a child to walk. Care should be taken to ensure that safe pedestrian routes provide access to these facilities. Larger facilities that are designed to serve all members of a family can be accessible by automobiles, thus serving users up to five miles away.
- Combined municipal and school recreational facilities are recommended to serve the needs of the community. Lack of coordination between these types of facilities often leads to the construction of redundant facilities. If possible, school recreational areas, including parking areas, drinking fountains, and restrooms, should remain open on weekends and during the summer months.
- Greenbelts, hike and bike trails, parkways, or paths should be provided to connect large recreational areas, providing access, scenic views, and recreational opportunities. Vehicular routes should be encouraged only when recreational areas are separated by more than one mile; otherwise, walking trails, greenbelts, or other pedestrian routes are desirable.

Facility Standards. The City has determined that the NRPA standards regarding park and recreational facilities, which are the result of years of research and implementation, are being used successfully at numerous parks across the nation. Therefore, the City relies on these standards, with minor modifications, for use in all park and recreational facilities in Alpine.

Most facilities listed in the NRPA standards specify service area populations far greater than that of Alpine. In application, the City has modified these standards to reflect local recreational priorities, especially the popularity of walking, swimming and organized sports.

The NRPA standards do not set guidelines for playground equipment and picnic uses. The City feels that these are important facilities and that they should meet the following standards: one playground per neighborhood park and three picnic tables per neighborhood park. Some of the picnic tables should be covered in order to shelter them from rain and from the hot summer sun. Furthermore, the NRPA standards do not address indoor recreation standards. Alpine typically experiences extremely hot summers, characterized by temperatures in excess of one hundred degrees. Residents of the City are fortunate to have access to the Alpine Recreation Center for use throughout the year. However, the Center is in need of substantial renovation and improvement.

Table 12B: Recreation & Open Space Level of Service Standards

Activity/ Facility	Space Requirements	Size and Dimensions	Orientation	Units per Capita	Service Radius	Notes
Basketball Court	2,400-3,036 SF	46' – 50' x 84'	Long axis N-S	1 per 500	¼ - ½ mile	Usually in school, recreation, or church facility. Safe walking or bike access. Outdoor courts in neighborhoods and community parks and active recreation areas in other parks.
Racquetball or Handball Court	800 SF for 4-wall 1,000 SF for 3- wall	20' x 40'. Minimum 10' to rear of 3-wall court. Minimum 20' overhead clearance.	Long axis N-S Front wall at N	1 per 20,000	15-30 minute travel time	4-wall usually indoor as part of multi-purpose facility. 3- wall usually outdoor in park or school setting
Tennis Court	Minimum of 7,200 SF per court (2 acres for complex)	36' x 78' with 12' clearance on both sides.	Long axis N-S	1 per 2,000	¼ - ½ mile	Best in batteries of 2-4. Located in community or neighborhood park or near schools.
Volleyball Court	Minimum of 4,000 SF	30' x 60' with 6' clearance on all sides.	Long axis N-S	1 per 1,000	¼ - ½ mile	Same as other court activities.
Multiple Recreation Court	9,984 SF	120' x 80'	Long axis of courts with primary use N-S	1 per 10,000	1-2 miles	Use for basketball, volleyball, and tennis.

Table 12B: Alpine Recreation and Open Space Level of Service Standards (continued)

Activity/ Facility	Space Requirements	Size and Dimensions	Orientation	Units per Capita	Service Radius	Notes
Adult Baseball	3.0 to 3.85 acres	Baselines – 90' Pitching distance – 60 ½' Foul lines – 320' Center field – 400'	Locate home plate so pitcher throws across sun and batter not facing sun. Line from home plate to pitcher's mound runs east northeast.	1 per 1,000	¼ - ½ mile	Part of neighborhood park. Lighted field part of community park.
Little League	1.2 acres	Baselines – 60' Pitching distance – 46' Foul lines – 200' Center field – 200-250'				
Football	1.5 acres	160' x 360' with 6' clearance on all sides	Fall season, long axis NW-SE. For longer periods, N-S.	1 per 20,000	15-30 minutes travel time	Usually part of a baseball, football, soccer complex in a community park or near high school.
Soccer	1.7 to 2.1 acres	195-225' x 330-360'	Same as football	1 per 10,000	1-2 miles	Number of units depends on popularity. Youth soccer on smaller fields near schools.
Softball	1.5 to 2.0 acres	Baselines – 60' Pitching distance – 46' or 40' for women Fast pitch field radius from plate – 225' between foul lines. Slow pitch – 275' or 250' for women.	Same as baseball.	1 per 1,000 if also used for youth baseball.	¼ - ½ mile	Slight difference in dimensions for 16" slow pitch. May also be used for youth baseball.
Trails	N/A	Well-defined head max. 10' wide, maximum average grade of 5% not to exceed 15%.	N/A	1 system per region.	N/A	Capacity: rural trail – 40 hikers per day per mile; urban trail – 90 hikers per day per mile.

Table 12B: Alpine Recreation and Open Space Level of Service Standards (continued)

Activity/ Facility	Space Requirements	Size and Dimensions	Orientation	Units per Capita	Service Radius	Notes
¼-mile running track	4.3 acres	Overall width – 276' Length – 600' Track width for 8 lanes is 32'	Long axis in sector from N-S to NW-SE with finish line at northerly end.	1 per 20,000	15-30 minutes travel time	Usually part of a high school or in community park complex.
Golf						
9-hole	50 acres min.	Avg. length – 2,250 yds.	Majority of holes on N-S axis.	1 per 25,000	½-1 hour travel time	Accommodates 350 people per day.
18-hole	110 acres min.	Avg. length – 6,500 yds.		1 per 50,000		Accommodates 500-550 people per day.
Swimming Pool	Varies with size of pool and amenities. Usually ½ to 2 acres.	Teaching – min. of 25 yards x 45' even depth of 3-4 feet. Competitive – minimum of 25 x 16 m, minimum of 27 SF of water surface per swimmer. Deck to water ratio 2:1.	None, although care should be taken in siting lifeguard stations relative to afternoon sun.	1 per 20,000 (pools should accommo- date 3- 5% of the total populatio- n at a time).	15-30 minutes travel time.	Pools for general community use should be planned for teaching, competitive, and recreational purposes with enough depth (3.4m) to accommodate 1m and 3m diving boards. Located in community parks or school sites.
Picnic Tables	n/a	n/a	n/a	1 per 150	½ mile	Should include trash receptacles and be covered when possible by a pavilion.

Needs Assessment & Identification. The City used the three needs assessment techniques (demand, standards, and resources) suggested by the Texas Parks and Wildlife Department in developing this section. The demand-based approach relies on information gathered at public hearings to indicate the desires of local residents for park and recreational facilities and services. The standards-based approach uses established NRPA and City standards to determine the number and types of facilities and the amount of park area required to meet the City's needs. The resource-based approach identifies assets and resources that could be used for open space, parks, and recreation facilities.

The demand-based assessment was based upon surveys made during the autumn of 2000. 6.5% of Alpine's population, or 367 people, responded to the surveys. Additional information regarding park preferences was collected at public hearings held in the fall of 2000, and informally through conversations with members of the City Council and the community. In addition, the five-member Parks Board represents citizen preferences. Survey respondents identified the following list of recreational activities as those most commonly pursued by Alpine residents: golfing, swimming, baseball (including Little League), tennis, walking, and biking. Other activities mentioned included jogging, gardening, and playing volleyball, and playing at playgrounds.

The most popular existing facilities among adults are the recreation center, the walking trails, the swimming pool, and the tennis courts; among children the playgrounds, the swimming pool, and the baseball fields are most popular. Organized sports at all levels are popular year-round with Alpine residents. Fortunately, facilities sufficient to support league play do exist in the City's current inventory.

When asked in the surveys what facilities they would most like to have in Alpine, residents indicated that a nature viewing area and soccer fields are "very important" facilities to their families. The top five ranked facilities are listed below.

Table 12C: 2000 Recreation and Open Space Survey Priorities

Rank	Facility
1	Swimming Pool
2	Hike/Bike/Walk Trails
2	Public Restrooms
2	Picnic Pavilion
3	Tennis/Football/Volleyball

The standards-based assessment used the criteria presented in the Standards and Guidelines section of this plan. While lacking in some areas, the current park system adequately meets the needs of Alpine's population. The major recreational facilities are fairly accessible to all members of the community, and are within two and one-half miles of the entire population. In addition, nearly all residents live within the standard one-half mile of a recreational area that contains children's facilities. However, facilities located in several parks are in poor condition. Rehabilitating existing facilities and enhancing existing parks should be a priority in the planning period.

According to standards established by the National Recreation Association, approximately one acre of public parkland should be made available for every one hundred residents. School-owned property is not included in this measurement. Using this rule-of-thumb, Alpine's residents would need about 60 acres of parkland. Primarily because of the large Kokernot Park Complex and the facilities located at Sul Ross State University, the City has adequate recreational space (approximately 134 acres). However, the City's facilities are lacking in some areas, and

therefore the City does not quite meet the recommended standard. A comparison of the City's recreational resources and the specific facilities standards illustrates the current situation.

Table 12D: Facilities Standards & Existing Facilities Comparison

Facility	Existing Units	Units Required	Units Needed
<i>Basketball</i>	2 (3 AISD)	11 courts	4 courts
Racquet/Handball	None	None	None
Tennis	3 AISD	3 courts	None
<i>Volleyball</i>	None	5 courts	5 courts
<i>Baseball/Softball</i>	2 (1 SRSU)	5 fields	2 fields
<i>Little League Field</i>	1 (1 SRSU)	5 fields	3 fields
Football	1 AISD	None	None
Soccer	1 field	None	None
Golf	1 9-hole course	None	None
Running track	1 (1 SRSU)	1 ¼ mile track	None
Multi-Rec Court	None	None	None
Hike/Bike Trails	None	None	None
Swimming Pool	1 pool	None	None
<i>Playgrounds</i>	4 (3 AISD)	3 playgrounds	1 playground
<i>Picnic Tables</i>	18 (2 AISD)	35 tables	15 tables
Indoor Rec Center	1 recreation center	None	None

Note: Facilities needed in the planning period are italicized in Table 11D.

The units listed in the required and needed columns of Table 11D will satisfy the recreation needs of Alpine's current population and its future population through the planning period. Facilities listed as unneeded have threshold service populations far in excess of Alpine's expected 2010 population.

The resource-based assessment revealed that the City of Alpine is home to numerous natural features that warrant special consideration in planning for parkland, open space, and recreation. Analysis of existing and future land use patterns is useful in identifying available open space, while similar analysis of population concentration helps in determining which areas of the City are underserved. The area around Alpine Creek

presents a unique opportunity for recreational development that links existing parks across several neighborhoods and a variety of land uses. The City is in the process of studying this area to determine necessary improvements to the creek and the flood plain that surrounds it. It is highly unlikely that this project will commence during the planning period. In addition to the construction of this new facility, there is a pressing need for renovation to some of the City's existing facilities.

Recreational and Open Space Problems and Priorities. Through discussions at public hearings, discussions with local and County officials, and the application of the previously mentioned standards, the following priorities were identified:

1. Facilities at the swimming pool are in need of repair or replacement.
2. The Recreation Center is in need of extensive renovations.
3. Many parks are in need of facilities (picnic tables, sidewalks) that meet ADA standards.
4. The City lacks sufficient basketball and volleyball courts.
5. The City needs additional Little League and baseball/softball fields.

11.3 Recreation and Open Space Plan

Goals and Objectives. Alpine's park plan provides a foundation for the development of future park and recreation facilities in the community. To realize this vision for the future, actions prescribed by this plan must relate to the specific goals that the citizens of Alpine hope to achieve. In this plan, goals and the objectives that lead to goal implementation were determined through informal discussions with local residents, public hearings related to community development projects, and a public hearing held to address these issues. The goals and objectives adopted are:

Goal 1: The City of Alpine will work to increase the percentage of park land, including recreational open space and greenbelt areas, and the availability of facilities to meet adopted standards.

- Short-range Objective A: Develop a land use management standard for acquisition of parkland for new residential developments to ensure availability of adequate parkland with the development of new residential areas. At least one acre of park and recreational land per one hundred residents will be available for use in the City or its extraterritorial jurisdiction.
- Short-range Objective B: Develop additional facilities to accommodate community's stated recreational needs. Develop additional facilities as indicated by the City's stated list of priorities and in compliance with adopted standards.
- Short-range Objective C: Incorporate this recreational and open space study into an updated Master Park Plan suitable to submit for review by the Texas Parks and Wildlife Department in July of 2001.
- Long-range Objective D: Increase the amount of parkland within the city by acquiring additional space designated in the future land use plan. Preserve open space and greenbelt areas through the dedication of these areas. The proposed Alpine Creek project will satisfy this objective.
- Long-range Objective E: Provide additional walking and bicycling opportunities by building at least one mile of hike and bike trail for every fifty miles of road or for every five square miles of incorporated territory. The proposed Alpine Creek project will satisfy this objective.
- Long-range Objective F: Plan and construct all parks and recreational facilities to meet adopted standards (see Table 11B for quantifiable standards).

Goal 2: The City of Alpine will increase the availability of recreational facilities for all citizens.

- Short-range Objective A: Provide and maintain acceptable facilities for young children (playgrounds) within safe walking distance (1/2 mile) of any concentration of housing (more than ten units, each of which is located within 50 feet of the closest adjacent unit). Develop additional land in Centennial Park and level and develop playing fields at Pueblo Nuevo Baseball Field and American Legion Baseball Field. These projects are fairly inexpensive and can be funded by the City.
- Short-range Objective B: Perform repairs on existing facilities to ensure that their safety and usefulness continues. Renovate and replace facilities as funds become available, beginning with the

swimming pool and Alpine Recreation Center. These projects should be financed primarily by grant funds from Texas Parks and Wildlife's Recreation Grants Program.

- Long-range Objective C: Ensure that all facilities are constructed to provide adequate access to handicapped individuals including restrooms and parking areas as well as recreational spaces and facilities.
- Long-range Objective D: Ensure convenient and safe access to recreational opportunities for residents of all neighborhoods in the City. No contiguous group of twenty or more housing units located less than fifty feet from one another should be more than one mile from a park or recreational area.

Goal 3: Maximize the return on the City's investment in park and recreational facilities.

- Short-range Objective A: Use grant programs, City general revenues, volunteer efforts, private and corporate donations, and interlocal agreements to construct recreational facilities according to the prioritized schedule developed in this plan and in compliance with adopted standards.
- Long-range Objective B: Develop interlocal agreements with the school district and the County for joint use of facilities and shared maintenance expenses for new parks developed by the City.
- Long-range Objective C: Cooperate with the ISD, SRSU, and the County in planning for future park improvements.
- Long-range Objective D: Seek expertise in park design, construction techniques, and project implementation from the Texas Parks and Wildlife Department, Brewster County, the City's engineering firm, and other sources of information.

Recommendations:

The City of Alpine, in accordance with the Parks Board and the citizenry, has developed an ambitious plan for the renovation and development of its park system. Such vision and commitment is rare in cities of this size. The City has been awarded several grants that will provide funds for some of the planned improvements. However, long-term maintenance of the park system will be costly. The City would benefit from establishing partnerships with local entities to ensure its continued provision of recreational facilities. The City should seek to develop partnerships with

local utility providers, Brewster County, Alpine ISD, and SRSU in order to ensure the extended usefulness and safety of new park facilities. Relationships with other local businesses such as major employers should be cultivated as well.

Parks and recreation projects recommended to meet established priorities and needs through the planning period with cost estimates are listed in Table 12E. It is likely that some projects will be delayed due to lack of funding. In this case, the City should continue with projects that are practical and affordable, and should address delayed projects as funding becomes available. Funding sources for projects beyond the first year of the planning period have not been identified. The City should apply for additional TxP&W grants to cover planned projects as needed.

*Table 12E: Recreation and Open Space Improvement
Plan Projects, 2001-2005*

Location and Project	Priority Level	Estimated Cost
<i>Kokernot Park:</i> Install new dirt on baseball fields, upgrade sprinkler system, enlarge concrete slab, construct sand volleyball court, seal cracks in pool and repair plumbing, upgrade to ADA equipment.	High (2001)	\$53,700 (Gen, Local)
<i>Alpine Recreation Center:</i> Repair roof.	High (2001)	\$20,000 (Gen, Local)
<i>Centennial Park:</i> Upgrade and extend sprinkler system.	High (2001)	\$5,000 (Gen, Local)
<i>Medina Park:</i> Install sprinkler system.	High (2001)	\$1,500 (Gen, Local)
<i>Baines Park:</i> Upgrade and extend sprinkler system.	High (2001)	\$1,000 (Gen, Local)
<i>Memorial Park:</i> Install 4 benches, improve borders, create ADA and pedestrian access, and install wrought iron fencing.	High (2001)	\$5,000 (Gen, Local)
Parks Board Discretionary Funding	Annual	\$10,000 (Gen) Annually
<i>Kokernot Park:</i> Renovate pool facilities including liner, piping, slide, filtration and chlorination system, and	High (2002)	\$375,000 (Gen, Local, TxP&W)

bathhouse; construct concession/ bathroom structure at baseball field.		
<i>Kokernot Park:</i> Install new play structure, ADA accessible tables, and repave walking track.	High (2002)	\$25,000 (Gen, Local)
<i>Alpine Recreational Center:</i> Construct skate park, 2 sand volleyball courts, combo baseball/soccer field, miniature golf course and rehabilitate interior.	High (2002)	\$371,000 (Gen, Local, TxP&W)
<i>Centennial Park:</i> Clear tract of debris and structure remnants.	High (2002)	\$1,500 (Gen, Local)
<i>Baines Park:</i> Install play structure.	High (2002)	\$5,000 (Gen, Local)
<i>Arbolitos Park:</i> Landscape, pave parking lot, and install irrigation.	High (2002)	\$36,550 (Gen, Local, TEA 21 Grant Match)
<i>Pueblo Nuevo Baseball Field:</i> Clear and level field, install topsoil, install sprinkler system and seed grass.	High (2002)	\$10,000 (Gen, Local)
<i>Kokernot Park:</i> Pave LLF parking lot, level, install additional topsoil and seed grass on soccer field.	Medium (2003)	\$15,000 (Gen, Local)
<i>Centennial Park:</i> Construct concession/ bathroom building.	Medium (2003)	\$50,000 (Gen, Local)
<i>Baines Park:</i> Install play structure.	Medium (2003)	\$7,000 (Gen, Local)
<i>Medina Park:</i> Install play structure and two ADA accessible tables.	Medium (2003)	\$8,000 (Gen, Local)
<i>American Legion Baseball Field:</i> Clear and level field, install topsoil, install sprinkler system and seed grass.	Medium (2003)	\$12,000 (Gen, Local)
<i>Kokernot Park:</i> Construct multi-use pavilion.	Medium (2004)	\$70,000 (Gen, Local)
<i>Centennial Park:</i> Construct outdoor basketball court.	Medium (2004)	\$25,000 (Gen, Local)
<i>Baines Park:</i> Install play structure and two ADA accessible tables.	Low (2005)	\$8,000 (Gen, Local)
<i>Centennial Park:</i> Construct playground area.	Low (2005)	\$15,000 (Gen, Local)
<i>Pueblo Nuevo Baseball Field:</i> Construct two practice fields with backstops and fencing.	Low (2005)	\$10,000 (Gen, Local)
<i>American Legion Baseball Field:</i> Construct two practice fields with backstops and fencing.	Low (2005)	\$10,000 (Gen, Local)

TxP&W = Texas Parks and Wildlife Department Grants, Gen = City of Alpine municipal funds and in-kind contributions, Local = donations from private citizens, charitable organizations, and local businesses.

There is a very strong volunteer community in the City of Alpine. Organizing church, civic, and social groups into a non-profit recreation group would enable the City to take advantage of a little-used program offered by the Texas Parks and Wildlife's Recreation Grants fund. This program, known as the Community Outdoor Outreach Program, provides funding to qualified non-profit or religious groups. Funds obtained through this program are earmarked for use in specific activities such as fishing, hunting, bird watching, camping, hiking, and wildscaping. This program functions as a reimbursement program, and TDP&W encourages local entities to form partnerships in order to qualify for these funds.

12 Capital Improvement Program

The condition of infrastructure is a major concern of all communities. It deteriorates with time and use. As cities expand, stress is placed upon the capacity of local governments to accommodate additional people. A capital improvements program (CIP) provides the local government with the opportunity to identify long-term capital needs, and to anticipate spending needs with multi-year planning. CIPs are the foundation of financing for capital expenditures because they blend program and needs analysis with financial capabilities. Properly developed and used, CIPs are critical tools for anticipating large expenditure items and determining when and how much money will be needed to keep up with infrastructure needs.

12.1 Financial Analysis

Alpine is typical of most Texas cities in the types of revenues and expenditures it has. Taxes, fees, fines, interest, and occasional grant funds make up most revenues while operating expenses, maintenance, repairs, salaries, debt service, and capital outlays make up the expenditures. Summaries of the City's actual revenues and expenditures for fiscal years ending September 30, 1998, 1999, and 2000 are included in Table 13C later in this chapter.

Sources and Amounts of Income and Expenditures. The City divides its budget into four funds: The General Fund and the Enterprise fund are the two largest. The General Fund is the general operating fund of the City. It is used to account for resources traditionally associated with government that are not required legally or by sound financial management to be accounted for in another fund. Income for the General Fund is generated primarily through the property tax, sales tax, franchise

fees, permits, licenses, fines, etc. General Fund expenditures include administrative personnel costs, supplies and materials, professional services, capital outlays, etc.

The Enterprise Fund is a proprietary fund used to account for operations that are financed and operated in a manner similar to private business enterprises. In such a fund, it is the intent of the City Council that the costs of providing services to the general public on a continuing basis be financed or recovered primarily through user charges. Alpine uses its Enterprise Fund to account for its water, sewer, and sanitation services. Income for the Enterprise Fund comes in the form of charges for water, sewer, and sanitation services. Expenditures include personnel costs, repairs and maintenance, utilities, professional/contract services, and capital outlays.

The City also has a Special Revenue Fund that is used to account for proceeds of specific revenue sources that are legally restricted to expenditures for particular purposes. Federal and state financial assistance is generally accounted for in this fund. Normally, unused balances are returned to the grantor at the close of specified project periods.

Finally, the City maintains a Trust and Agency Fund that is used to account for assets when a government is functioning either as a trustee or as an agent for another party Motel Tax and Civic Center monies are accounted for in this fund.

Public Improvements Financing Practices. The type of financing used to pay for infrastructure expenditures depends on several factors, the most critical of which include the annual tax revenues generated, the unmet

demand for different infrastructure projects, and the jurisdiction's indebtedness. Because costs often run into the millions of dollars, several alternatives are often used to finance infrastructure expansion or replacement: general obligation bonds and certificates of general obligation, revenue bonds, operating revenues/general fund, impact fees, and state or federal funds.

- General obligation bonds are paid out of the City's annual revenues. These types of bonds usually raise large sums of money with the debt retired over several decades. G.O. bonds are backed by the "full faith, credit and taxing powers" of the issuing jurisdiction. When G.O. bonds are sold, the jurisdiction guarantees that it will raise sufficient revenues to retire the debt on schedule, usually using property taxes. Because G.O. bonds are repaid by all taxpayers in a community, they are usually used to finance projects that benefit the community as a whole, such as public buildings, parks, recreation centers, and major street improvements. Certificates of obligation are similar to G.O. bonds.
- Revenue bonds are sold to develop projects that produce revenues to the City, such as municipal sewer and water systems. In this case, the guarantee of repayment comes from the revenues generated by the financed project, which usually includes taxes or fees collected from the project's beneficiaries. Most projects financed using revenue bonds benefit a wide class of users, such as water customers, airport users, or toll road users. Unlike G.O. bonds, revenue bonds do not require the backing by the jurisdiction's "full faith, credit and taxing powers." Consequently, the local government is not obligated to raise taxes to avoid default on the revenue bonds. Because of this, revenue bonds usually carry higher interest rates than general obligation bonds.

These bonds parallel those used for private enterprises; voter approval is usually not necessary to float revenue bonds.

- Operating revenues or the General Fund are funds that are derived from the income-generating functions of a local government such as sales and property tax collections and fees and fines levied by its courts. Financing infrastructure using operating revenues or the general fund saves the interest and fees associated with issuing bonds, but because the operating revenue cannot usually provide the large cash flows of a bond issuance, it is usually used to finance smaller, lower-cost capital improvement projects that can be paid for in one year.
- Impact fees include user fees and special assessments and can only be levied by cities. Impact fees are levied as charges to property developers to help defray the costs of providing infrastructure or new facilities for the new development. The approach applies the costs of infrastructure development to those who are primary beneficiaries (usually the developers). The decision as to who will pay impact fees for development is difficult, but many communities that are experiencing rapid growth must raise infrastructure development funds in this manner. In some communities, developers are allowed to make non-cash contributions in lieu of fees. Such contributions might include land for a community park or construction of a new branch library.
- Other fees that can be used to repay development costs include those that are usually collected directly from the beneficiaries of a project. Examples include public swimming pool or golf course user fees, trash collection fees, or water meter tap fees.

- The final method of financing is use of state and federal funds. Grants and low-interest loans provided by state and federal agencies have long been a key ingredient in the development of local infrastructure. Most assistance requires some form of local matching contribution and some require that other socioeconomic conditions be present in the local jurisdiction, such as low-income neighborhoods or high unemployment. Although state and federal assistance for infrastructure has decreased significantly in the past twenty-five years, grant programs continue to provide a significant source of funding for infrastructure development in rural Texas. These sources include the Texas Community Development Program (TCDP), the Texas Parks & Wildlife grant program (TP&W), the Statewide Transportation Enhancement Program (TxDOT), and loan programs such as the State Water Revolving Loan Fund (Texas Water Development Board) and the programs of the USDA's Rural Development Service (RD).

Other suggestions for financing capital improvements include:

- use of county prisoners as day laborers for drainage, park, and street projects as a way to save money and accomplish additional work;
- encouragement of volunteer groups to make simple park improvements and to clear brush and debris out of vacant lots and drainageways;
- use of the Small Cities Environment Program (STEP), a self-help grant program supported by the Texas Natural Resources Conservation Commission, the Texas Water Development Board, and the TCDP, that uses volunteer labor to install or replace water or sewer lines bought using grants from the TCDP. This program requires that project cost be significantly lower than the costs of similar

improvements using conventional construction contractors (30 to forty percent lower).

Cost of Financing. Each option available to pay for infrastructure carries a certain financial obligation. One objective of local governments is to incur minimal interest and finance charges, which may depend on the bond rating of the jurisdiction. If enterprise funds, revenues from general taxes, or outside assistance from state or federal sources are sufficient to pay for infrastructure development, no financing costs will be incurred.

Equity. Local governments must determine the relationship between those who receive the benefits and those who pay the costs. In some cases, it is possible to identify groups of individuals who benefit more directly from a particular project; in others, the benefit may be more widely distributed. Some forms of financing may be more burdensome to one group of citizens than another, leaving local governments to decide how the costs and benefits of infrastructure projects will be distributed.

Political Acceptability. While most communities have a range of infrastructure financing options, local political realities often play a major role determining which option is chosen. In some communities it may not be politically feasible to increase property taxes, while it may be acceptable to issue bonded indebtedness for a specifically earmarked purpose. In other cases, it may be more acceptable to charge fees directly to those who benefit from a project or incur debt that will be repaid by fees charged for use of the project.

Long Term Debt. Alpine currently carries long-term debt as follows:

Table 13A: Long Term Debt, FY 2001

Year	Type of Debt	Outstanding	Annual Payment
1990	Certificates of Obligation, closed existing land fill and opened new 80-acre site	\$485,000	\$50,800
1992	Certificates of Obligation, closed existing land fill and opened new 80-acre site	\$250,000	\$33,000
1993	Certificates of Obligation, closed existing land fill and opened new 80-acre site	\$450,000	\$40,100
1996	Certificates of Obligation, Sewer Plant Improvements & match for TxDOT Street Improvements	\$665,000	\$58,400
1997	Certificates of Obligation, Sewer Plant Improvements	\$600,000	\$48,000
1999	Certificates of Obligation, Water System Improvements & Sewer Plant Improvements	\$330,000	\$19,800
1999A	Certificates of Obligation, Airport, Police Dept., and Parks & Recreation Improvements	\$250,000	\$15,500
n/a	Bank Loans	XXXXXXXX	\$53,500
n/a	Caterpillar Finance	XXXXXXXX	\$31,300
na/	WTU/Bank Ventures	XXXXXXXX	\$7,800
TOTAL		\$3,030,00	\$358,200

When considering the use of debt to finance capital improvements, three common measures of a City's ability to issue new debt should be considered:

- (1) Generally, total debt as a percentage of the total market value of property in the City should not exceed 10%. Communities with higher percentages should carefully consider whether the local tax base could support new debt. More fiscally conservative communities may establish six percent as the upper limit for this item.

The total market value of the property in Alpine is \$146,790,745 (2000 figures). With an outstanding bonded indebtedness of \$3,030,300 the City's debt as a percentage of its total market value of property is only 2.1%.

- (2) Per capita bonded indebtedness should generally be kept below \$1,200. If fiscal policy is especially conservative, \$600 in bonded debt per resident would be a more reasonable number.

Per capita bonded indebtedness is \$524 in Alpine at present. If overlapping indebtedness is considered, the per capita bonded indebtedness jumps to \$683 (see Table 13B). This figure is still well below the general limit on per capita bonded indebtedness, but it is slightly about the conservative threshold discussed above.

Table 13B: Overlapping Debt, FY 2000

Taxing Entity	Outstanding Debt	Percent Applicable	Alpine's Share of Debt
Brewster County	\$3,174,100	29%	\$920,490

- (3) The City's annual debt service should not exceed 20% of the City's annual receipts.

The City's current annual debt service is approximately \$358,200, which amounts to 8% of the City's annual receipts (minus grant income). This is well below the recommended cap.

(insert discussion of current debt situation here)

12.2 Income and Expenditures, 1998-2000

Table 13C: General Fund Revenues & Expenditures

[illegible]

Expenditures	1998	1999	2000
TOTAL EXPENDITURES			

Table 13D: Enterprise Fund Revenues & Expenditures

Revenue	1998	1999	2000
TOTAL			

Expenditures	1998	1999	2000
TOTAL			

12.3 Capital Needs Inventory and Prioritization

The capital needs listed here should be built while keeping in mind their relative importance. However, due to competition for limited funds, improvements that may be considered "mandatory" because they promote health and safety may be built after other improvements considered "desirable" or "acceptable" such as certain street construction or new utility department vehicles. A community must consider both the urgency and the feasibility of a particular capital project. If funds are likely to become available for a lower priority project before a higher priority project, the City should indicate this on its capital improvements schedule. Alpine has classified its capital needs using the following system:

1. Mandatory (M): those which address an eminent threat to life or health;
2. Necessary (N): those which provide important public services by improving existing systems and/or replacing obsolete facilities;
3. Desirable (D): those which improve the aesthetic aspects of a community or address quality of life issues;
4. Acceptable (A): those which may fall under the "necessary" or "desirable" categories above, but are undertaken primarily to reduce operating costs to the City.

Table 13E: Capital Needs Prioritization

[illegible]

12.4 Capital Improvements Program Schedule.

The following table delineates the proposed capital improvements for the 2001-2005 planning period, the estimated costs, sources of funds, and timing of the projects. The projects are listed in order of priority.

