The analysis of existing conditions provides an understanding of current transportation improvement needs along the SH 288 corridor by examining physical and engineering characteristics in comparison to area travel demands. This chapter summarizes existing roadway, transportation, land use, and environmental conditions in the corridor.

**Major Area Highways**

The SH 288 corridor is served by several principal highways. Major north-south highways include SH 288, FM 521 (Almeda Road), Business SH 288, and FM 523. Major east-west highways that intersect SH 288 include US 59, IH 610, Sam Houston Tollway (Beltway 8), FM 518, SH 6, future Grand Parkway (SH 99), FM 1462, SH 35, FM 2004, SH 332, and SH 36.

Characteristics of SH 288 and other major highways providing north-south mobility within the corridor (FM 521 (Almeda Road) and Business SH 288) are summarized in the following paragraphs.

**SH 288**

SH 288 is a major north-south highway in the Houston metropolitan area. The facility is 58 miles in length and extends from US 59 south of Downtown Houston to Freeport, Texas. SH 288 is a controlled access freeway (no at-grade intersections) from US 59 to FM 518. Between FM 518 and SH 332, the facility becomes a limited access four-lane highway with access provided at several cross streets, including median openings allowing access to both the northbound or southbound mainlanes. South of SH 332, the facility has the characteristics of an urban arterial, with several traffic signals and access allowed at driveways to adjacent businesses. SH 288 provides eight main travel
lanes from US 59 to Reed Road, which is located just south of IH 610. Six main lanes are provided from Reed Road to the Sam Houston Tollway (Beltway 8). SH 288 is a four-lane facility from SH 332 to Freeport, with some sections in Lake Jackson and Freeport having a six-lane section.

**FM 521 (Almeda Road)**

FM 521 (Almeda Road) is approximately 95 miles long extending from US 90A in Houston south to SH 35 near Palacios. The facility parallels SH 288 on the west side from US 59 to its intersection with Business SH 288 north of Angleton. FM 521 (Almeda Road) parallels the Union Pacific (UP) Railroad tracks from IH 610 to FM 1462. The typical section varies from an urban curb and gutter roadway to a rural roadway with narrow shoulders. Between Houston and the small community of Riley, FM 521 (Almeda Road) varies from a four lane to a five or six lane facility as it passes through more developed areas. South of IH 610, the facility is predominantly an asphalt roadway with open ditches.

**Business SH 288**

Business SH 288 is approximately 20 miles in length and extends through the Cities of Angleton and Clute. It is a four-lane undivided highway with limited control of access (i.e. at-grade intersections). Business SH 288 has direct access to SH 288 where they intersect north of Angleton and again at SH 332 north of Freeport.
**Planned Area Improvements**

A number of transportation improvements are already programmed for construction within the SH 288 corridor over the short and long term. H-GAC’s 2025 Regional Transportation Plan (RTP) and other agency highway programs include numerous transportation improvements in the area as shown in Figure 3-1. Examples of major transportation improvements currently under construction or planned for implementation along SH 288 include the following:

- Grade separations (overpasses/underpasses) at CR 58, CR 59, CR 101, and five major intersections in the Lake Jackson area; and,
- Frontage roads between BW 8 and CR 59.

Several major transportation improvements are also planned along other north-south highways in the corridor (such as FM 521 (Almeda Road), Business SH 288, and FM 523), and many intersecting east-west facilities that provide important connections to SH 288.

**Highway Characteristics**

The construction of SH 288 began in 1981 and was complete by 1987. The corridor was designed and constructed to meet the standards and needs at that time. In terms of today’s design standards, some geometric deficiencies exist along SH 288. However, the majority of SH 288 north of Lake Jackson meets current TxDOT design criteria for a freeway facility with few constraints to future mobility improvements along the facility. The most significant constraint
to future mobility improvements to the SH 288 corridor is the limited median space available in the vicinity of the interchange at IH 610.

**Right-of-Way**

Available data indicates that the majority of SH 288 north of FM 2004 has a right-of-way (ROW) width of 420 feet. The ROW width increases at intersections and interchanges. As indicated in Table 3-1, exceptions to the 420 foot width occur between US 59 and IH 610. South of FM 2004, ROW decreases from 300 feet to roughly 120 feet.

**Horizontal Alignment**

Some geometric deficiencies exist along the SH 288 corridor in comparison to design criteria found in the current TxDOT Roadway Design Manual for a desired 70 mph design speed. Between US 59 and IH 610, five horizontal curves do not meet a 60 mph design speed. The majority of the horizontal curves from IH 610 to Lake Jackson meet the criteria for a design speed of 65 mph. Exceptions exist at the horizontal curve south of Business SH 288, and the horizontal curves north and south of FM 2004. A desired 70 mph design speed for proposed improvements along SH 288 will require reconstruction of several horizontal curves.

**Vertical Alignment and Clearance**

Changes in the vertical alignment of SH 288 are primarily attributed to grade separated intersections with corridor freeways and arterials. In most instances, SH 288 is elevated over the intersecting roadway and vertical curves have acceptable grades (slopes) of three percent or less. Between US 59 to IH 610, five vertical curves do not

---

**Table 3-1**

**Typical Right-of-Way Widths**

<table>
<thead>
<tr>
<th>Location</th>
<th>Typical Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 59 to IH 610</td>
<td>346’ to 600’</td>
</tr>
<tr>
<td>IH 610 to FM 2004</td>
<td>420’</td>
</tr>
<tr>
<td>FM 2004 to SH 332/B288B</td>
<td>300’</td>
</tr>
<tr>
<td>SH 332/B288B to north of Victoria Street</td>
<td>150’</td>
</tr>
<tr>
<td>North of Victoria Street to SH 36</td>
<td>120’</td>
</tr>
</tbody>
</table>
Figure 3-1
Planned Area Transportation Improvements
meet minimum criterion for a 70-mph design speed. From IH 610 to the Brazoria County line, four locations do not meet the 70-mph design criteria. Since SH 288 was designed and currently operates as a limited access facility (and not a freeway) in most of Brazoria County, only four curves meet the 70-mph design criteria in the central and southern portions of the study corridor.

TxDOT design guidelines currently recommend vertical clearances (distance between SH 288 pavement and overpass or underpass) of 16.5 feet for freeways. Along the mainlanes of SH 288, a total of 11 locations do not meet clearance criterion – all are located at overpasses or underpasses north of IH 610.

**Typical Cross Sections**

Various segments of SH 288 have distinct typical sections, transitioning from a rural freeway/highway to an urban arterial. Most of SH 288 between US 59 to SH 332 has a grassy median with a width of approximately 108 feet. Typical highway cross sections along SH 288 are shown in **Figure 3-2**.

- From US 59 south to IH 610, SH 288 is a controlled access rural freeway with eight 12-foot travel lanes with 10-foot inside and 10-foot outside shoulders. There are only two through travel lanes in the southbound direction and three in the northbound direction on SH 288 through the IH 610 interchange.
- From IH 610 south to FM 518, SH 288 is a controlled access rural freeway with six 12-foot travel lanes and four-foot inside and 10-foot outside shoulders.
- From FM 518 to SH 332 at Lake Jackson, SH 288 consists of four 12-foot lanes, an inside shoulder width of four feet, and an outside shoulder width of 10 feet. Access to the roadway is limited and includes several at grade intersection crossings controlled by stop signs.
- From SH 332 to the SH 332/Business SH 288 interchange, SH 288 is designed as an urban arterial with signalized cross-street intersections. The roadway generally consists of six 12-foot lanes with an inside shoulder width of two feet and a typical outside shoulder of two feet.
- SH 288 transitions to an arterial street south of the SH 332/Business SH 288 to the northern limits of Freeport near Victoria Street. In this segment, SH 288 consists of six 12-foot lanes, a raised median, an outside shoulder, and designated right-turn lanes.
Through Freeport to SH 36, SH 288 is curbed and consists of six 12-foot travel lanes with a continuous center turn lane. South of Avenue A, the roadway becomes a four lane divided facility with a raised median.

**Intersections**

Currently, there are no at-grade intersections along SH 288 from US 59 to FM 518, making it a freeway or full control of access facility. This segment includes 12 grade separated interchanges (overpasses and underpasses), including major interchanges at US 59, IH 610, and Beltway 8. The remainder of the corridor is comprised of a mix of grade separated and at-grade interchanges, which functions as a limited access facility. There are more than 30 at-grade intersections on SH 288 between FM 518 and SH 36 in Freeport, some of which are non-signalized and controlled by stop signs on the intersecting streets. Most at-grade intersections in Lake Jackson and Freeport are controlled with traffic signals while those in the rural area between FM 518 and Lake Jackson are controlled by stop signs on the side streets.

Under ideal circumstances, roadways should intersect at 90 degree angles to avoid design and safety challenges such as limited site distance and elongated turning movements. Along SH 288, a total of 28 roadways intersect at skew angles of less than 75 degrees. Fourteen of these roadways intersect the main travel lanes of SH 288, with the majority located in the Freeport area.
Figure 3-2
Typical Cross Sections
In its recently completed Mobility 2025 Plan, the Houston Metropolitan Transit Authority (METRO) designated SH 288 as one of nine candidate corridors identified for advanced high capacity transit. Advanced high capacity transit can include a variety of transportation options, including HOV lanes, bus rapid transit, or some form of rail transit (light or commuter rail). Existing transit facilities in the area are summarized as follows:

- TxDOT operates six Park & Pool lots in the SH 288 corridor that provide the commuting public with parking spaces for their vehicles so that they may share a ride with others who are traveling in the same direction. The number of marked spaces at these Park and Pool lots ranges from 25 to 35 with the exception of the lot at FM 518, which has recently been expanded to 50 marked spaces. Currently, these lots are at or exceed the capacity of their allocated spaces. The location of these Park and Pool lots are shown in Figure 3-3 and include the following:
  - SH 288 and FM 518;
  - SH 288 and SH 6;
  - SH 288 and CR 49;
  - SH 288 and CR 45;
  - SH 288 and SH 35; and,
  - FM 2004 west of Lake Road in Lack Jackson.

- METRO transit routes and facilities in the SH 288 corridor are limited to four bus routes that operate on SH 288 between IH 610 and US 59. There are no METRO bus routes that operate between IH 610 and Beltway 8, which is the southern limit of METRO’s service area. The SH 288 corridor does not have HOV facilities or Park & Ride lots at this time.
METRO provides local transit services in the northern section of the SH 288 corridor with fifteen bus routes, most operating seven days a week. Almost 14,000 weekday boardings occur within portions of the study area that are currently part of the METRO service area.

Rural and small urban transportation services in the SH 288 corridor are provided by the Gulf Coast Center – Connect Transit located in Galveston, Texas. Transportation services are provided to clients and the general public in Brazoria and Galveston Counties. Scheduled service is also provided to the Texas Medical Center. Participants can access a ride by scheduling their trip at least one day in advance.

A SH 288 Corridor Planning Study recently completed by METRO indicates several transit needs in the SH 288 corridor; however, it does not represent the greatest travel demand or need in the Houston area as compared to some of the other highly traveled corridors in the region. Significant residential and commercial developments are taking place or in planning stages and opportunities for right-of-way acquisition and implementation of transit facilities are currently available. In addition, other significant planned transit investments in adjacent corridors present opportunities for linkages.

METRO envisions a number of transit improvements in the SH 288 corridor over the course of the next 20 years including improvements to existing bus routes, and new service routes that would provide important connections between SH 288 and Hobby Airport and between a Park and Ride lot at FM 518 and the Texas Medical Center and Downtown Houston. METRO also suggests that new Park & Ride lots (at FM 518 and Airport Road) and a Transit Center (at Airport Road) should be considered for the SH 288 corridor. METRO also recognizes the potential to construct HOV facilities in the corridor sometime in the future that could extend, at a minimum, to Beltway 8.
Figure 3-3
Park and Pool Lots
**INTERMODAL FACILITIES**

The SH 288 corridor provides access to several intermodal facilities in the study area such as airports and seaports. William P. Hobby Airport, located just east of the SH 288 corridor, is a major part of the Houston Airport System and experiences more than four million enplaned passengers per year. The Brazoria County Airport, located between Lake Jackson and Angleton near SH 288, is designated as a “reliever airport” for commercial airports in the area and services companies such as Dow Chemical, Sulzer Medica, and Petroleum Helicopters. The Port of Freeport, located on the southern end of the SH 288 corridor, is one of the fastest growing ports on the entire Gulf Coast (second largest container port on the Texas Gulf Coast). It is currently ranked as the 12th largest port in the United States in terms of international cargo tonnage and offers more than 7,500 acres for future development.

**UTILITIES AND RAILROADS**

Several petrochemical and utility lines, as well as railroads, cross the SH 288 corridor. Objects such as overhead utility towers and pipeline valves can create constraints to corridor improvements and should be avoided. Six rail lines cross the SH 288 corridor, as listed in Table 3-2.

<table>
<thead>
<tr>
<th>Owner</th>
<th>Location South of:</th>
<th>Crossing (all grade separated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP</td>
<td>Brays Bayou</td>
<td>RR over SH 288</td>
</tr>
<tr>
<td>UP</td>
<td>IH 610 (Holmes Road)</td>
<td>SH 288 over RR</td>
</tr>
<tr>
<td>BNSF</td>
<td>SH 6</td>
<td>SH 288 over RR</td>
</tr>
<tr>
<td>UP</td>
<td>SH 35</td>
<td>SH 288 over RR</td>
</tr>
<tr>
<td>UP</td>
<td>SH 288/B288B at Dow</td>
<td>SH 288 over RR</td>
</tr>
<tr>
<td>UP</td>
<td>SH 288/B288B at Dow</td>
<td>SH 288 over RR</td>
</tr>
</tbody>
</table>
Although future transportation improvements to SH 288 could require expansion of an existing highway-railroad grade separation, or even the construction of a new structure, the presence of this and other rail line crossings should not create a significant engineering constraint.

**Major Traffic Generators**

The location and character of major traffic generators and employers along SH 288 influence traffic volumes and patterns in the area. Examples of existing and growing major traffic generators in the study area include the Texas Medical Center, Houston Community College, Shadow Creek and Silver Lake Subdivisions, Brazos Mall, and Dow Chemical in Freeport. Additionally, Downtown Houston is located just north of the study corridor. Additional future and ongoing generators include a Biotechnology Park (The Spectrum) in Pearland, South Fork and Rodeo Palms subdivisions (south of Pearland), and numerous other residential and commercial developments.

**Traffic Volumes**

Existing daily traffic volumes along SH 288 are shown in Table 3-3. Daily traffic volumes on SH 288 range from a high of 184,000 vehicles per day (vpd) just south of Downtown Houston near US 59, to a low of 13,600 vpd at the southern end of the study corridor near SH 36 in Freeport. The decrease in traffic volumes south of FM 518 in Pearland reflects the lower level of residential and commercial development as SH 288 extends further away from Houston.
Truck traffic on SH 288 varies considerably. In the northern portion of the corridor between US 59 and IH 610, the percent of truck traffic of the total traffic is approximately three percent. Between IH 610 and SH 6 truck traffic ranges between seven to thirteen percent of the total traffic. Throughout the rest of the corridor truck percentages range from approximately 15 to 20 percent.

The predominant peak hour of traffic during the morning rush hour is 7:00 AM to 8:00 AM, with the evening rush hour varying within the 4:00 PM to 6:00 PM time period. Peak hour traffic is generally seven to nine percent of the total daily traffic between US 59 and SH 6, and ranges from six to ten percent south of SH 6. The AM peak hour directional distribution of traffic is approximately 50 percent northbound/50 percent southbound between US 59 and north of the Texas Medical Center, 70 percent northbound/30 percent southbound between the Texas Medical Center and SH 6, and 60 percent northbound/40 percent southbound south of SH 6.
Chapter 3

SH 288 has experienced considerable traffic growth over the past decade. From Years 1992 to 2002, the highest traffic growth along SH 288 occurred between Beltway 8 to FM 518 at approximately eight percent per year - from 42,000 vpd to 94,000 vpd. The central portion of the corridor experienced an annual traffic growth of approximately six percent between SH 6 and Angleton (from 13,000 vpd to 25,000 vpd), and the southern section of the corridor experienced an annual traffic growth rate of approximately one percent between Lake Jackson and SH 36 (from 23,000 vpd to 25,000 vpd). Figures 3-4 and 3-5 show the average annual traffic growth from Years 1992 to 2002 along the study corridor.
**Level-of-Service (LOS)**

Level-of-Service (LOS) is a qualitative measure of traffic operations, ranging from LOS A to LOS F. LOS A/B represents good traffic operations with high traffic speeds and virtually no congestion. LOS C/D, which is considered the limit of acceptable traffic operations, represents some but reasonable traffic delays. LOS E/F represents conditions where traffic volumes are approaching or exceeding the highway capacities, which result in congestion and unacceptable traffic delays and speeds. Table 3-4 describes the various LOS categories.

As shown in Figure 3-6, the northern section of SH 288 between US 59 and FM 518 operates well over capacity conditions at unacceptable LOS E/F during peak periods. The sections between FM 518 and SH 6 (adjacent to Pearland and Manvel) and between FM 2004 and SH 36 (Lake Jackson and Freeport) operate at LOS C/D. The central portion of the corridor between SH 6 and FM 2004 operates at LOS A/B.

<table>
<thead>
<tr>
<th>LOS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Highest quality of traffic service; free-flow conditions; motorists drive at desired speed; minor traffic flow disruptions.</td>
</tr>
<tr>
<td>B</td>
<td>Good quality of traffic service; reasonable flow conditions; noticeable presence of other vehicles; ability to maneuver is slightly restricted.</td>
</tr>
<tr>
<td>C</td>
<td>Stable traffic flow; noticeable increase in platoon formation; ability to maneuver noticeably restricted; minor disruptions could cause traffic service deterioration.</td>
</tr>
<tr>
<td>D</td>
<td>Approaching unstable traffic flow; speed and ability to maneuver severely restricted; limit of acceptable operations.</td>
</tr>
<tr>
<td>E</td>
<td>Unstable traffic flow; travel demand approaching or at roadway capacity.</td>
</tr>
</tbody>
</table>
ACCIDENT HISTORY

Accident records from the Texas Department of Public Safety indicate that over the three year period between Years 1998 and 2000, accidents along the SH 288 corridor ranged from 554 collisions in Year 1999 to 603 collisions in Year 2001. Analysis of accident rates calculated by the number of accidents per 100 million vehicle miles traveled (100MVMT), as shown in Table 3-5, show that the section between US 59 and IH 610 has the highest accident rate (109.1) while the southermost section from FM 2004 to SH 36 has the lowest rate (12.9). The statewide average accident rate for interstates in urban areas was 123.8 in Year 1998; 120.0 in Year 1999, and 121.2 in Year 2000.

Typically, roadway facilities are considered to have significant safety issues when the accident rate is at least double the statewide average. Sections of SH 288 between FM 518 and FM 2004 (from SH 6 to Business SH 288 and from SH 35 to FM 2004) have accident rates higher than the statewide average of 94 for state highways in rural areas, but none are close to double the statewide average (188).

Crash hot spots indicate concentration of collisions where cars interact along a corridor, such as intersections and junctions. The four most serious hot spots along SH 288 are located between US 59 and the Texas Medical Center. In comparison, serious crash risk estimates the risk of collision along segments of a corridor based upon the number of serious crashes per 100 million vehicle miles traveled (VMT). Between Years 1998 and 2000, the serious crash risk on SH 288 was equal to the
Figure 3-6
Existing Level-of-Service (LOS)
regional average. The southern end of the corridor in the areas of Lake Jackson and Freeport was shown to have the highest crash risk, followed by the section of SH 288 north of IH 610. The middle portion of SH 288 had the lowest crash risk.

**EXISTING LAND USE**

The land adjacent to the SH 288 right-of-way is characterized by a variety of uses. Generally, the adjacent land uses become less intensely developed moving north to south, with the obvious exceptions of the Cities of Lake Jackson, Clute, and Freeport.

Between US 59 and Brays Bayou, the dominant land use is residential, with some public and commercial land uses. From Brays Bayou to IH 610, the SH 288 corridor includes commercial, industrial, public, and high-density residential land uses.

South of IH 610, land use shifts from intensive industrial to extensive rural land uses. Recent and on-going single-family residential development between Beltway 8 and Almeda-Genoa Road is gradually displacing the numerous small land-holding farms in this area.

In Brazoria County, residential land use exists throughout the length of the corridor at varying densities. There are several subdivisions and large tract master-planned communities along the corridor. These are large developments of single-family homes that are typically walled or gated. Throughout the rest of the corridor, single-family homes are mostly scattered individual structures, many of which were likely in existence before SH 288 was built.
Commercial land uses in the corridor are concentrated around major intersections including FM 2234 (McHard Road), FM 518, SH 6, SH 35, and Business SH 288.

Industrial development is concentrated in the northern and southern ends of the SH 288 corridor. The extensive petrochemical plant complexes in Freeport and Clute are at the southern end of the corridor. Warehouses and oil field industries are found at the north end of the corridor, between Brays Bayou and Beltway 8.

Once the corridor reaches Lake Jackson, adjacent development becomes very prevalent and continues to the southern terminus at SH 36 in Freeport.

**DEMOGRAPHICS AND SOCIAL CONDITIONS**

A summary of the socioeconomic and demographic characteristics in the SH 288 corridor is provided in the following paragraphs. The study corridor is defined as the census tracts that cross SH 288 and are described in detail in Technical Memorandum No. 1 “Evaluation of Existing Conditions”.

The SH 288 corridor experienced significant population growth between Years 1990 and 2000. In Year 1990, over 188,400 persons lived in the SH 288 study corridor, consisting of 98,665 residents in Brazoria County, 16,811 residents in Fort Bend County and 72,988 residents in Harris County. By Year 2000, the population within the SH 288 corridor had grown to over 262,500 persons, consisting of 168,909 residents in Brazoria County, 22,442 residents in Fort Bend County, and 71,159 residents in Harris County.

Comparison between state, county and corridor population trends provides a glimpse at the strong growth occurring along the corridor. Between Years 1990
and 2000, the Texas population grew by 3,865,310 people or 19 percent. Each of the three counties in this study corridor increased in population, with Fort Bend experiencing the most growth with 129,031 people (36 percent). Brazoria increased by 50,060 (21 percent), and Harris County increased by 761,470 (19 percent). Likewise, growth within the SH 288 corridor is uneven. The population within the Brazoria County portion of the corridor increased by 41 percent, with the population within the Harris County segment of the SH 288 corridor experiencing a one-quarter percent decline.

**Age**

The population within the SH 288 corridor is aging. The dominant age cohort in Year 1990 was 30-39 years and the dominant age cohort in Year 2000 was 50-59 years. The median age is 32 years.

**Race and Ethnicity**

As with the Houston metropolitan region, the racial and ethnic composition within the SH 288 corridor is diversifying. Fewer census respondents considered themselves White only and the proportion of Hispanics increased dramatically, particularly in the Harris County segment of the SH 288 corridor.

**Family Characteristics**

According to Census figures between Years 1990 and 2000, Brazoria and Fort Bend County segments of the SH 288 corridor are attracting younger, smaller families and households, while the Harris County segment of the corridor is attracting older and larger families and households. At the same time, the single-parent family is more evident in the corridor segment of Brazoria County than in the corridor segment of Harris County. Average median incomes are generally higher in areas outside the SH 288 corridor segment of Harris County and the difference is increasing. Housing tends to be newer in the corridor segments of Brazoria and Fort Bend Counties than in Harris County.

**Households, Incomes, and Poverty**

Population growth along the SH 288 corridor is mirrored by growth in the number of households. In Year 1990, there were 1,162,574 households in Brazoria,
Fort Bend, and Harris Counties. By Year 2000, households in the three counties had increased to 1,398,636. Within the SH 288 corridor, the segment within Brazoria County witnessed the largest percentage increase in households (43 percent). The rate of household growth within the SH 288 corridor was nearly three times that of the nation (13 percent) and nearly twice that of Texas (18 percent).

As noted in Table 3-6, growth models project that by Year 2025 the number of households within the SH 288 corridor could exceed 100,000 - a 36 percent increase in the number of households compared to Year 2000. For individual segments of the SH 288 corridor, growth in the number of households between Years 2000 and 2025 in Brazoria, Fort Bend, and Harris Counties is projected to be 33 percent, 58 percent, and 29 percent, respectively.

### Incomes

In the decade between Years 1990 and 2000 average median per capita incomes within the SH 288 corridor experienced strong positive growth in comparison to the United States and Texas. In Year 1990, income levels were between $4,600 and $5,000 below national levels and between $3,000 and $9000 below state levels. Only the SH 288 corridor census tracts in Brazoria County had incomes that slightly exceeded state levels. By Year 2000, Brazoria and Fort Bend Counties exceeded national income levels by between $3,000 and $4,000, and state income levels by between $4,500 and $5,800. Harris County, still with strong growth, remained trailing national and state income levels by $6,000 and $4,500, respectively.

<table>
<thead>
<tr>
<th>Table 3-6 Projected Household Growth Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Households</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>CMSA</td>
</tr>
<tr>
<td>Tri-County</td>
</tr>
<tr>
<td>Corridor</td>
</tr>
<tr>
<td>Brazoria</td>
</tr>
<tr>
<td>Fort Bend</td>
</tr>
<tr>
<td>Harris</td>
</tr>
</tbody>
</table>
Existing Conditions

In Year 1990, 17 percent of the population living in the SH 288 corridor was living below the poverty line. This was less than the poverty population for Texas (18 percent) but more than the national poverty population (13 percent). In Year 2000, the percentage of those living in the corridor below the poverty line decreased by two points, but it remained greater than the national percentage and at par with the percentage for the State of Texas (12 percent and 15 percent, respectively).

Housing Estimates and Projections

In Year 1990, less than 73,000 housing units were located in the SH 288 corridor. By Year 2000, the number of homes within the SH 288 corridor had escalated by 25 percent to 97,649. During the ten year period, housing vacancies throughout the corridor decreased while the percentage of owner-occupied homes increased. In Year 2000, 66 percent of the housing stock along the SH 288 corridor was comprised of single family, detached homes – a higher percentage than both the State of Texas (63 percent) and the United States (59 percent).

Home Values

According to U.S. Census Bureau data, the Year 1990 median property value of owner-occupied homes in the SH 288 corridor was $58,340. By Year 2000, median property value of owner-occupied homes in the SH 288 corridor had escalated to $81,699. The median property values of owner-occupied homes in the Brazoria, Fort Bend, and Harris County all increased throughout the decade with Fort Bend County supporting a median property value of $100,850 in Year 2000.
Employment Estimates and Projections

Job availability increases in the SH 288 corridor are expected to total slightly more than 100,000 jobs by Year 2025, an increase of 28 percent from Year 2000. As shown in Table 3-7, Brazoria, Fort Bend, and Harris Counties are expected to have increases of 22 percent, 68 percent, and 24 percent, respectively.

Occupations and Workforce

U.S. Census Bureau data indicate that, in Year 2000, the largest proportion of SH 288 corridor jobs (21 percent) was in the education, health, and social services sector - one to two percent higher than the national and state averages, respectively.

Table 3-7
Job Growth Forecast

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSA</td>
<td>2,178,265</td>
<td>3,194,270</td>
<td>1,016,005</td>
<td>32 percent</td>
</tr>
<tr>
<td>Tri-County</td>
<td>1,977,366</td>
<td>2,866,878</td>
<td>889,512</td>
<td>31 percent</td>
</tr>
<tr>
<td>Corridor</td>
<td>260,228</td>
<td>360,488</td>
<td>100,260</td>
<td>28 percent</td>
</tr>
<tr>
<td>Brazoria</td>
<td>45,240</td>
<td>57,676</td>
<td>12,436</td>
<td>22 percent</td>
</tr>
<tr>
<td>Fort Bend</td>
<td>11,028</td>
<td>34,105</td>
<td>23,077</td>
<td>68 percent</td>
</tr>
<tr>
<td>Harris</td>
<td>203,960</td>
<td>268,707</td>
<td>64,747</td>
<td>24 percent</td>
</tr>
</tbody>
</table>

Source: H-GAC Forecast Group

Population Mobility

In Year 1990, the U.S. Census Bureau reported that 53 percent of people living in the SH 288 corridor had lived in their current homes for at least five years. By Year 2000, population mobility had increased only slightly to 54 percent.

Existing Environmental Conditions

Various regulations play a role in protecting the existing environmental conditions and resources located along the SH 288 corridor as follows:

Wildlife Habitat

♦ The Fish and Wildlife Coordination Act of 1966
Vegetation Management and Landscape Practices Executive Memorandum

Threatened and Endangered Species
♦ Endangered Species Act in 1973

Wetlands
♦ Section 404 of the Clean Water Act of 1972
♦ Executive Order 11990, “Protection of Wetlands”

Navigable Waters of the United States
♦ Section 10 of the Rivers and Harbors Act

Surface Water
♦ Texas Commission on Environmental Quality (TCEQ) issues permits for withdrawals of water from surface water bodies

Floodplains
♦ Executive Order 11988, “Floodplain Management”

Groundwater
♦ Safe Drinking Water Act, Section 1424(e)

Water Quality
♦ Clean Water Act of 1972

Farmlands
♦ The Farmland Protection Policy Act, Title XV, Subtitle I of the 1981 Agricultural and Food Act (Public Law 97-98)

Air Quality
♦ Clean Air Act of 1970
♦ Clean Air Act Amendments of 1977 and 1990
Chapter 3

Noise Quality

Hazardous Waste Sites
♦ Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly called the Superfund Act

Cultural Resources
♦ Section 106 of the National Historic Preservation Act of 1966
♦ Texas Antiquities Code

Visual Quality
♦ FHWA guidelines for assessing visual quality along roadways

Biological Resources
Biological resources that may live in the SH 288 corridor include ecological communities of plants and animals, including threatened and endangered species. The SH 288 corridor is in the Gulf Prairies and Marshes vegetation zone, which extends from Louisiana to Mexico along the coast of the Gulf of Mexico. In its native condition, the inland areas of the region consist of level plains covered by tall grassland or post oak savannah. Salt marshes are next to the coast. Trees, especially exotic species such as Chinese tallow tree have invaded some areas. Due to the high fertility of the soil in the region, a large part of the native prairie has been converted to farmland or improved pasture. Much of the SH 288 corridor has been cleared of its native vegetation and converted to agricultural production or urban development.

Decades of rangeland grazing and increasing human encroachment have kept the original flora out, and few large tracts have preserved the original vegetation and wildlife. Since the corridor has been maintained as a transportation facility for 30 years, vegetation and wildlife is limited due to mowing and vehicle movement. The corridor is not an essential habitat for native species of flora or fauna. The floodplains associated with local streams may provide suitable
habitat for wildlife, and the oak motts and riparian woods may provide nesting areas for birds and browsing habitat for deer.

**Wetlands and Water Resources**

Wetlands are defined in the U.S. Environmental Protection Agency (EPA) regulations as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Some wetlands have functional value as wildlife habitat, floodwater detention, or ground water recharge. Water resources include surface water quantity and quality, ground water quantity and quality, floodplains, and navigable waters.

The SH 288 corridor includes a number of water features ranging from wetlands and minor ditches to bayous before reaching Freeport and the Gulf of Mexico. Along with wetlands, additional water resources include surface water, groundwater, floodplains, and navigable waters.

Wetlands in the SH 288 study area appear to have been disturbed by previous activities, such as channelization or agriculture. Many of the original wetlands in the SH 288 corridor no longer exist or are restricted to areas adjacent to water bodies. The area north of Angleton and south of Iowa Colony has the highest concentration of wetlands, while areas south of Angleton have the lowest concentration of wetlands.

The SH 288 corridor crosses Sims Bayou, Brays Bayou, Clear Creek, Mustang Bayou, Oyster Creek, Austin Bayou, West Fork Chocolate Bayou, Hayes Creek, and Bastrop Bayou. Each of these streams, except Brays Bayou, has fringing wetlands that are likely to be jurisdictional. The corridor also crosses several
unnamed intermittent streams, all of which have been altered or created through excavation.

The Brazos River is the only navigable waterway of the United States located in the SH 288 corridor. Located at Freeport in the southern portion of the corridor, the river runs parallels but does not cross SH 288 within the limits of this study.

The SH 288 corridor includes three major watersheds: San Jacinto River Basin, the San Jacinto-Brazos Coastal Basin, and Brazos River Basin. Most of the runoff from the corridor is carried by Buffalo Bayou, Oyster Creek, and the Brazos River. Further, the corridor crosses or is close to several major streams and bayous including Brays Bayou, Sims Bayou, Clear Creek, Mustang Bayou, Oyster Creek, West Fork Chocolate Bayou, Hayes Creek, Austin Bayou, Bastrop Bayou, and the Brazos River. In addition to these surface waters, the corridor crosses or is close to several small bayous, ditches, and gullies.

The amount of floodplain associated with each of the bayous and streams that cross the SH 288 corridor varies widely. For example, Brays Bayou crosses the highway with a 100-year floodplain that is 1,000 feet wide. On the other hand, the corridor crosses 5,900 feet of the 100-year floodplain of West Fork Chocolate Bayou. A total of 11,000 feet of the corridor is in the 100-year floodplain, from the Brazos River levee to SH 36; however, the highway does not cross the Brazos River or the Old Brazos River Channel.

The SH 288 corridor has nine major aquifers and 31 minor aquifers; however, the Gulf Coast major aquifer is the main water supply for the groundwater users in the corridor. Twelve groundwater wellheads are located in the study area, eight of which use the Gulf Coast major aquifer. There are no recharge zones for the Gulf Coast Aquifer located in the SH 288 corridor.
The quality of some surface waters within the basins impacting the SH 288 corridor is impaired by water pollution. For example, in Year 2002, Segment 1007 of the San Jacinto River Basin did not meet standards supporting consumption of fish caught in the stream. In the San Jacinto-Brazos Coastal Basin, Segment 11 of Mary’s Creek and North Fork Mary’s Creek did not meet standards for contact recreation in Year 2002 due to high levels of fecal coliform bacteria. On the other hand, several appear in satisfactory condition. Downstream segments of the Brazos River in the SH 288 corridor generally have good water quality and meet criteria for their designated uses.

Geology, Soils, and Farmlands

The SH 288 corridor is in the West Gulf Coast subdivision of the Atlantic and Gulf Coastal Plains geomorphic province of the United States and has been described as “flat, featureless, almost treeless plain.” Within the SH 288 corridor, oil fields mix with the scattered trees, especially along the margins of salt domes in the north end of the corridor. Since the Gulf Coast area is made of unconsolidated sediments, the area is susceptible to subsidence. Both natural processes and human activities can be responsible for subsidence in this area, including removal of fluids, such as water, oil, and gas, from the underlying sandy strata.

Soil surveys indicate that the area making up the SH 288 corridor consists of nine “soil associations” – soils with similar and distinct characteristics. Two of these are associated with bottomlands, three are found on coastal terraces, and one is found in marshes. All are nearly level, prairie soils and all but one is composed of poorly drained, very slowly permeable soils.

While most of the SH 288 corridor is farmland, only a small amount is prime farmland. Rice used to be a major crop in the corridor, but due to relatively poor soils and the increasing cost of water compared to the decreasing value of rice, little rice is now grown in the corridor. Most of the soils are not well suited for row crop agriculture, therefore pastureland and rangeland are more common.
Air Quality and Noise

Air quality is both a regional issue and a corridor issue. Pollutants like carbon monoxide are generated directly by engine combustion and disperse rapidly. Other forms of air pollution, such as photochemical “smog” and ozone, are formed over time in the air by the chemical reaction of several chemicals. Wind carries pollutants quickly around the flat landscape of the region, blunting the impact on the area immediately surrounding a single polluter such as a car or a chemical plant but causing a larger overall area of pollution. As a result, smog and ozone often form at some distance from their source.

Air quality in the SH 288 corridor is affected by regionally high ozone concentrations and relatively high levels of nitrogen oxides and particulate matter. The Houston-Galveston area exceeds national standards for days of elevated ozone levels and, while in compliance for other air pollutants, levels of nitrogen oxides and particulate matter is high. Sources of air pollution include automobiles, industries, and agriculture. Carbon monoxide is the most likely of these pollutants to significantly affect local air quality. Carbon monoxide can reach noxious, but rarely dangerous, levels along heavily traveled roadways and extremely congested intersections with limited dispersion.

Once a Most Feasible Alternative is selected, H-GAC will determine if it conforms to the State Implementation Plan and Regional Transportation Plan for air quality. If it meets air conformity, it will be included in the RTP and eventually the TIP. It may then proceed to the project development and design processes dependent on available funding.

Noise from roadway traffic is generated primarily from vehicle tires, engines and exhaust. Factors influencing noise levels from roadway traffic include vehicle speeds, traffic numbers, the proportion of medium and heavy trucks to automobiles, and whether traffic lanes are elevated, at grade, or depressed.
Sensitive land uses along the corridor such as residences, schools, churches, and recreation areas can be impacted by noise. The northern part of the corridor has relatively high, continuous traffic volumes and corresponding noise levels. Farther south, the roadway becomes a rural divided highway and traffic noise levels are lower and more variable.

**Hazardous Materials**

Hazardous materials include corrosive substances (such as acids), flammable substances (such as gasoline), explosive substances (such as gunpowder) and toxic substances (such as hydrogen sulfide). Hazardous materials become an environmental problem when released into the environment where they can damage ecosystems or human health.

Just over 900 known or potential hazardous contamination sites are located within the SH 288 corridor. Most of the sites are petroleum storage tanks, generally buried gasoline tanks at service stations. Leaking petroleum storage tanks can generate a plume of petroleum products that can contaminate soil and groundwater. Most leaking petroleum storage tanks were removed in the early 1990s and the contamination has been cleaned.

Of the remaining sites, 174 are Emergency Response Notification System sites, where a spill of a hazardous material has been reported. Hazardous waste generators and handlers include 167 large and small quantity generators, four facilities for the treatment, storage and disposal of hazardous waste, and four sites where corrective action was taken to clean up contamination. Fourteen landfills are in or near the corridor. Fourteen sites are state Superfund Sites, 11 are federal Superfund sites with no further remedial action planned, and two are federal Superfund sites in need of further remediation.

**Cultural Resources**

Cultural resources include historic structures and objects, and archaeological (prehistoric) objects and sites. An inventory of cultural resources was conducted in the SH 288 corridor to identify known and potential historic structures and archaeological sites.
The SH 288 corridor (an area within one-half mile on either side of SH 288), includes elevated areas near streams, which have the potential for prehistoric cultural resources, since prehistoric campsites found elsewhere in the region are frequently on such landforms. Akokisa and Bedai Indians have been recorded in the area in early historic times.

Anglo-American settlers first entered the area in the 1820s and were part of the Austin Colony. The early economy was based largely on plantation agriculture. The construction of railroads in the late 19th Century facilitated growth in the lumber industry, and oil and gas discoveries helped fuel the 20th Century economy. Cities such as Angleton, Clute, Manvel, Freeport and Pearland were established and some incorporated before 1900 while Lake Jackson was established by Dow Chemical Company in Year 1942 as a model community.

At this time, one site within a half mile of the SH 288 corridor and several others ranging as far as one and one-half miles from the corridor are on the National Register of Historic Places. Additionally, ten sites within one-half mile and nearly 60 sites within one and one-half of the corridor have been identified for eligibility to the National Register of Historic Places through a Neighborhood Survey form. There are also 18 historical markers and two historic cemeteries within one and one-half mile of the corridor.

Of all areas within one and one-half miles of the SH 288 corridor, the portion north of Oyster Creek to the southern end of the corridor, the area around Mustang Bayou, and the towns of Chenango and Angleton, are more likely to have archaeological resources and may require backhoe trenching as well as a pedestrian survey. According to the Potential Archaeological Liability Map (PALM) some areas within the corridor may require a surface survey or deep reconnaissance.

**Visual Quality and Aesthetics**

In large part, the impression of the highway is a pleasing, scenic rural area evolving and expanding in urban and suburban character in several locations, particularly the area nearest the Houston Metropolitan Area. Visually, the SH 288 corridor can be grouped into: developed areas in the vicinity of south Houston; incorporated settlements of Pearland, Manvel, Alvin, Iowa Colony, Angleton,
Lake Jackson, Clute, Oyster Creek and Freeport; and unincorporated settlements of Bailey’s Prairie, Bonney, and Brookside – all separated by slowly decreasing rural areas. While many areas along the corridor are experiencing residential development, the area between the Harris/Brazoria County line and the southern city limits of Pearland is experiencing the most rapid growth, with anticipated rapid growth as far south as State Highway 6.