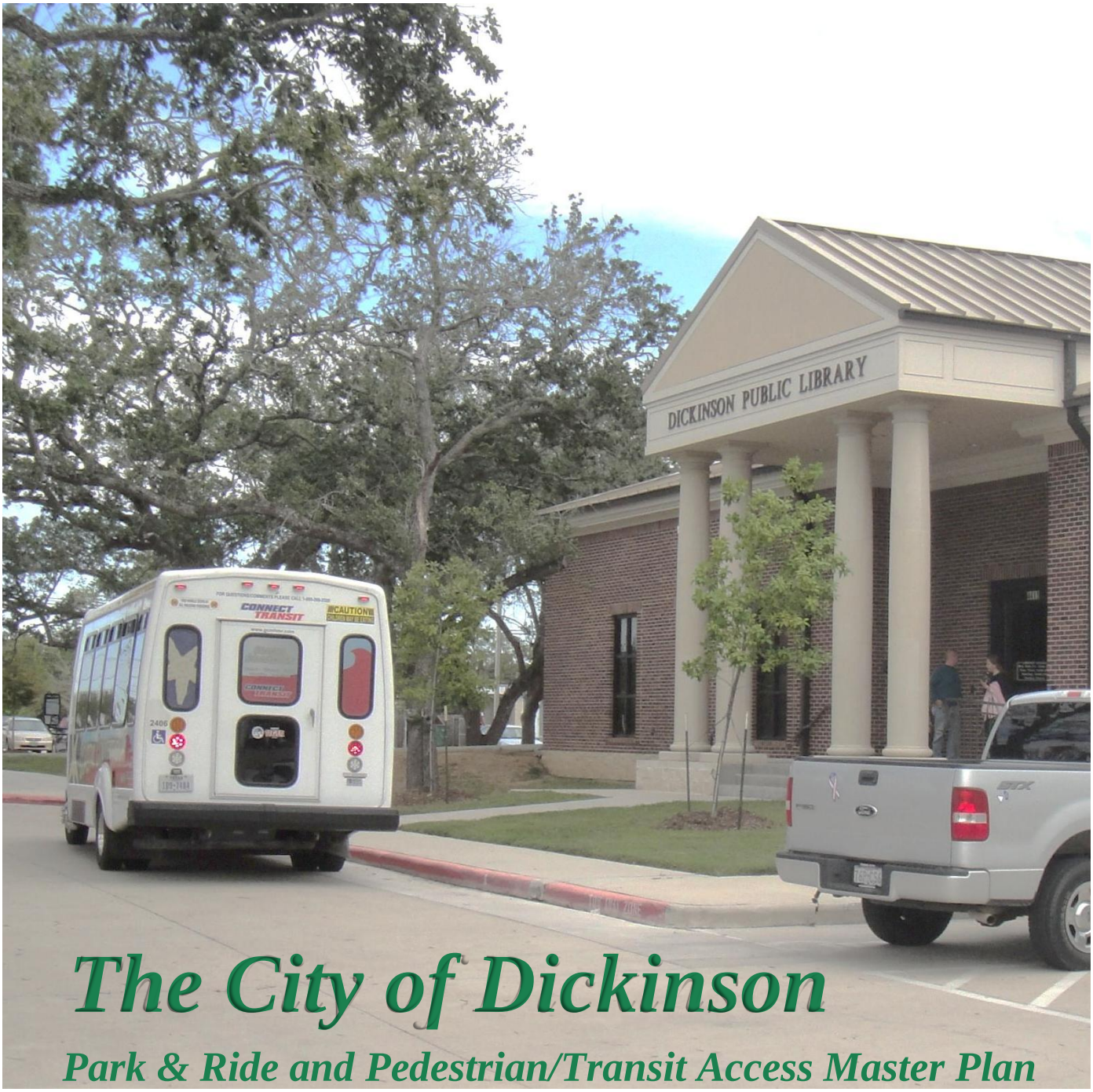


The City of Dickinson

Park & Ride and Pedestrian/Transit Access Master Plan

July 2013

Prepared for:

The City of Dickinson

Gulf Coast Center

Prepared by:

The Goodman Corporation

C O N T E N T S

This project was funded in part through the Federal Transit Administration. The contents of this report reflect the analysis of The Goodman Corporation which is responsible for the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Transit Administration.

Glossary

EXECUTIVE SUMMARY

Development of this *Dickinson Park & Ride and Pedestrian/Transit Access Master Plan* was a collaborative effort with the full support and cooperation of the City of Dickinson and the Gulf Coast Center (GCC), Dickinson's primary transit service provider. The purpose of the master plan is to provide a comprehensive strategy to improve connectivity to local and regional transit while upgrading the general "walkability" of the pedestrian environment. The master plan has been developed in accordance with the Federal Transit Administration's (FTA) Livable Communities Initiative (LCI) guidelines that provide a consistent framework for the planning and development of transit access infrastructure designed to enhance access to transit services.

Figure ES.1 – Dickinson Gateway Treatment

BACKGROUND

The City of Dickinson was officially incorporated in 1977 and is located along the IH 45 corridor, 28 miles southwest of the City of Houston and 19 miles northeast of the City of Galveston. The City has a total area of 12 square miles and had a population of 18,680 as of the 2010 Census. This was an over 8% increase from 2000 Census numbers. Although the City of Dickinson is primarily a bedroom community, it is in close proximity to major attractions and businesses such as NASA's Johnson Space Center, Moody Gardens, Gulf Greyhound Park, and Kemah Boardwalk.

PURPOSE OF THE MASTER PLAN

Development of the master plan is in response to a growing need for improved pedestrian infrastructure as well as increased transit access throughout Dickinson and the surrounding region. There are four components to the master plan including development of the Dickinson Park & Ride, LCI streetscape improvements, bus stop improvements, and gateway treatments. The first three components in the master plan have been targeted to help increase access to

GCC's current transit nexus. The master plan details the need for a park & ride as an additional outlet to GCC buses accessing multiple destinations along the IH 45/SH 3 corridor. Key transit corridors and bus stop locations were examined for current conditions in order to recommend pedestrian and transit access improvements that would further facilitate transit ridership and walkability in Dickinson. The City of Dickinson will be able to maximize local and state expenditures for implementing gateway treatments at one of the main access points into the City at FM 517.

MASTER PLAN COMPONENTS AND ASSOCIATED COSTS

The following transit related components are detailed in the Master Plan with associated costs:

Dickinson Park & Ride

The proposed Dickinson Park & Ride will be located on SH 3 and Mowat Drive, just east of Oleander Drive. The park and ride is a 201 space parking facility that can accommodate three full-size bus berths with a 1728 sq. ft. passenger waiting area. A parking demand analysis was completed during the detailed travel forecast modeling stage of the Galveston-Houston Mobility Corridor Interim Plan. The Interim Plan travel demand analysis, using a computer-based supply and demand travel demand forecast model, examined several potential park & ride locations along the IH 45/SH 3 corridor between Houston and Galveston. Dickinson was one of several locations in which parking demand was assessed based on the results of the model. The travel demand model estimates that the park & ride parking will eventually need at least 480 spaces to accommodate the full commuter service demand; however, the City has elected for a smaller initial footprint for the facility. Although the initial park & ride (Phase I) will accommodate 201 spaces, it will be surrounded by abundant available land for future expansion.

Costs for the Dickinson Park & Ride (Table ES.1) include the following:

Table ES.2 – Total Costs for the Dickinson Park & Ride		
Corridor/Category	***Line Item Costs***	***Total Cost***
Land Value*		$258,000
Park & Ride Construction		
Surface Lot Construction (201 Spaces at $2,500)	$502,500	
Facility Construction (1,728 Sq. Ft. at $200)	$345,600	
Subtotal	*$848,100*	
PE (2%)	$16,962	
Design (6%)	$50,886	
Construction Administration (3%)	$25,443	
Construction Management (2%)	$16,962	
Subtotal	*$958,353*	
Contingency (10%)	$95,835	
Total		$1,054,188
Total Park & Ride Capital Costs		**$1,312,188**
*Value based on comparable appraisal of park & ride site within Galveston County		

Streetscape Improvements

The following corridors within the Master Plan are recommended for pedestrian-transit access improvements:

- State Highway 3 - North of Deats Road from 21st Street (20 block faces -- 0.70 miles)
- State Highway 3 - Deats Road to FM 517 (15 block faces -- 0.70 miles)
- State Highway 3 - South of FM 517 to Oleander Drive (10 block faces -- 0.55 miles)
- FM 517 – Timber Drive to Liggio Street (9 block faces -- 0.35 miles)

The inventory corridors that were chosen were based on feedback from the City regarding priority corridors as well as the ½ mile radius capture area as recommended by the FTA LCI guidelines. The City has already targeted these particular corridors for pedestrian-transit access improvements, which are eligible for future federal reimbursement. The following streetscape infrastructure improvement costs (Table ES.2) are included in the Master Plan:

Table ES.2 – Streetscape Improvements Cost Per Corridor	
Corridor/Category	***Cost***
FM 517	$274,681
SH 3 – North of Deats Road	$462,457
SH 3 – Deats Road to FM 517	$447,788
SH 3 – South of FM 517	$392,057
Total Corridor Costs	$1,576,983
ADA Ramps	$12,600
Crosswalks	$5,600
Subtotal	$1,595,182
Design/Admin/Construction Mgt. (20%)	$319,036
Contingency (10%)	$191,422
Total	**$2,105,640**

Bus Stop Improvements

Bus stop locations were inventoried throughout the City of Dickinson and were found to have no infrastructure, including bus stop signs. The following bus stop improvement costs consist of 150 linear feet of sidewalks and curbs, ADA ramps, pedestrian lighting, landscaping, bus stop signage and other related amenities:

Table ES.3 – Bus Stop Improvements Cost	
Category	***Cost***
Improvement Costs for 40 Bus Stops	$866,845
Design/Admin/Construction Mgt. (20%)	$173,369
Contingency (10%)	$104,022
Total	**$1,144,236**

Gateway Improvement Costs

The City of Dickinson has elected to utilize funds from a 2007 state awarded "Keep Dickinson Beautiful" grant plus local resources toward a gateway sign and associated landscaping treatments at an official entrance into the City on FM 517 at Gum Bayou. The project value is estimated at **$230,080**.

MASTER PLAN COMPONENT COST SUMMARY

In summary, the Dickinson Park & Ride and Pedestrian-Transit Access Master Plan has a project value of just under $4.8 million (Table ES.3).

Table ES.3 Master Plan Component Cost Summary	
Component	***Cost***
Dickinson Park & Ride	$1,312,188
LCI Streetscape Improvements	$2,105,640
Bus Stop Improvements	$1,144,236
Gateway Treatments	$230,080
Total Eligible Infrastructure Costs	$4,792,144

Benefits of Master Plan Implementation

The proposed improvements detailed within the Master Plan will benefit the community in numerous ways including encouraging public transit usage by making the experience safe, enjoyable, and attractive. If implemented, the proposed improvements would conservatively support an annual increase of 130,650 new boardings, which would reduce annual net VMT in the region by approximately 3.3 million miles per year and result in an estimated annual reduction of harmful air pollutants of 21 tons. This reduction is critical to the Houston-Galveston region, which currently is in nonattainment for air quality standards.

FUNDING STRATEGY

The City of Dickinson can seek out a number of federal funding sources to implement the infrastructure improvements detailed within the Master Plan. In order to utilize most federal funding streams, the City will need to provide a local match. Table ES.4 lists the corridor costs with the federal portion (80%) and local share (20%) delineated.

Table ES.4 – Federal/Local Share by Corridor and Shared Infrastructure

Corridor/Infrastructure	*Estimated Cost**	*Federal Share (80%)*	*Local Share (20%)*
Total Bus Stop Costs	$1,144,236	$915,389	$228,847
FM 517	$362,579	$290,063	$72,516
SH3 - North of Deats Road	$610,443	$488,354	$122,089
SH3 - Deats Road to FM 517	$591,080	$472,864	$118,216
SH3- South of FM 517	$517,515	$414,012	$103,503
Shared Infrastructure Costs	$24,024	$19,219	$4,805
Keep Dickinson Beautiful Program	$230,080	$184,064	$46,016
Park & Ride	$1,312,188	$1,049,750	$262,438
Total	**$4,792,144**	**$3,833,715**	**$958,429**

*Includes 20% Design/Admin. Costs and 10% Contingency.

Table ES.5 distributes corridor improvement implementation over a five-year span, with federal and local costs delineated. Shared infrastructure costs, consisting of ADA ramps and Crosswalk improvements, are spread evenly over the five years.

Table ES.5 – Project Phasing by Corridor/Infrastructure

Corridor/Infrastructure	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Total Bus Stop Costs	**X**	**X**	**X**		
FM 517		**X**			
SH3 - North of Deats Road			**X**		
SH3 - Deats Road to FM 517				**X**	
SH3 - South of FM 517					**X**
Shared Infrastructure Costs	**X**	**X**	**X**	**X**	**X**
Keep Dickinson Beautiful Program	**X**				
Park & Ride				**X**	**X**
***Total Infrastructure**	$616,297	$748,796	$1,001,465	$713,800	$1,711,787
Federal Share (80%)	$493,037	$599,037	$801,172	$571,040	$1,369,430
Local Share (20%)	$123,259	$149,759	$200,293	$142,760	$342,357

*Includes Soft Costs and Contingency

The Master Plan seeks to maximize the value of local investments against available federal funds by capturing eligible local expenditures as local match, under a separate pre-award authority process known as an FTA Letter of No Prejudice (LONP). The LONP effectively protects the local value of capital investments within the plan for up to five years and is one of the most essential tools that the City can use to maximize its local expenditures.

Chapter 1 – INTRODUCTION

PURPOSE OF THE MASTER PLAN

Development of this *Dickinson Park & Ride and Pedestrian/Transit Access Master Plan* is in response to a growing need for improved pedestrian infrastructure and increased transit access throughout Dickinson and the surrounding region. The Gulf Coast Center (GCC) provides general public transportation services for the citizens of Galveston and Brazoria counties, through Connect Transit. The City of Dickinson and GCC initiated this master plan for development of a proposed park & ride facility, streetscape and bus stop improvements, and gateway treatments. The improvements recommended in this master plan are targeted at reducing congestion and enhancing access to GCC's current transit nexus. An existing conditions inventory was performed on key transit corridors and bus stop locations in order to recommend pedestrian and transit access improvements that would facilitate transit ridership and walkability in Dickinson. This master plan details the need for a park & ride facility to provide additional transit service using GCC buses from multiple destinations along the IH 45 and SH 3 corridors. The City will be able to maximize local and state expenditures for implementing gateway treatments at one of the main access points into the city at FM 517. It is also anticipated that this master plan will be submitted to the Federal Transit Administration (FTA) to support a request for a Letter of No Prejudice (LONP) to preserve the City's ability to expend local funds on eligible improvements prior to receipt of grant funds. Expended local funds will be used as local match or reimbursement from the eventual grant.

PARTNERSHIP FOR SUSTAINABLE COMMUNITIES

FTA initiated its Livable Communities Initiative (LCI) to promote better linkages between transit services and the surrounding communities and to provide improved pedestrian accessibility to transit to increase transit ridership. In June 2009, the Department of Transportation (DOT), Department of Housing and Urban Development (HUD), and Environmental Protection Agency (EPA) created the Partnership for Sustainable Communities (PSC), or Livability Partnership, which is dedicated to supporting more livable and sustainable communities and establishing livability principles while promoting equitable development and environmental stability. Key elements of the partnership include enhancing integrated planning and investment, providing a vision for sustainable growth, and developing livability measures and tools. The PSC provides federal funding to support livability and sustainability initiatives, which are promoted through the utilization of public transportation.

The PSC encourages smart growth initiatives and helps guide the development of communities efficiently throughout the nation. To help guide communities, the PSC developed six livability principles, as follows:

- Provide more transportation choices.
- Promote equitable, affordable housing.
- Enhance economic competitiveness.
- Support existing communities.
- Coordinate and leverage federal policies and investment.
- Value communities and neighborhoods.

These principles help communities to develop in a more sustainable and equitable manner. To further help communities promote livability and sustainability objectives, such as greater transportation efforts, transit-oriented and mixed-use developments, walkable neighborhoods, and enhanced access to employment; funding is available to communities through the new transportation authorization, Moving Ahead for Progress in the 21st Century (MAP-21).

In coordination with the PSC, LCI guidelines provide funding justification for streetscape improvements designed to facilitate and increase transit usage and pedestrian activity. Eligible improvements would include the repair and installation of sidewalks, curbs, driveways, crosswalks, landscaping, and Americans with Disabilities Act (ADA) compliant ramps.

BACKGROUND

Dickinson was incorporated as a city in 1977. Originally established by John Dickinson in 1824 in a land grant from Mexico, this settlement along Dickinson Bayou grew, especially after several rail stops were built nearby for the Galveston, Houston and Henderson (GH&H) Railroad. Farming was the first main local industry, which changed to the oil industry after World War II to keep pace with the industrialization of the oil industries in Houston and Galveston. Dickinson's population began to increase in 1962 with the installation of the Lyndon B. Johnson Space Center a short distance away. Dickinson's current size is a total area of 10.3 square miles, with a land area of 9.9 square miles and a water area of 0.42 square miles.

Dickinson is situated along IH 45, 28 miles southwest of Houston and 19 miles northeast of Galveston. According to the U.S. Census, Dickinson's total population in 2000 was 17,093, which grew to 18,680 in 2010, an increase of 8%. Dickinson's senior population in 2000 was 1,634, which grew to 2,025 in 2010, an increase of 23.9%. The number of persons living below the poverty level in Dickinson in 2000 was 2,213, which grew to 2,456 in 2010, an increase of 0.4%. *Table 1.1* presents the results of commute to work questions included on the census form.

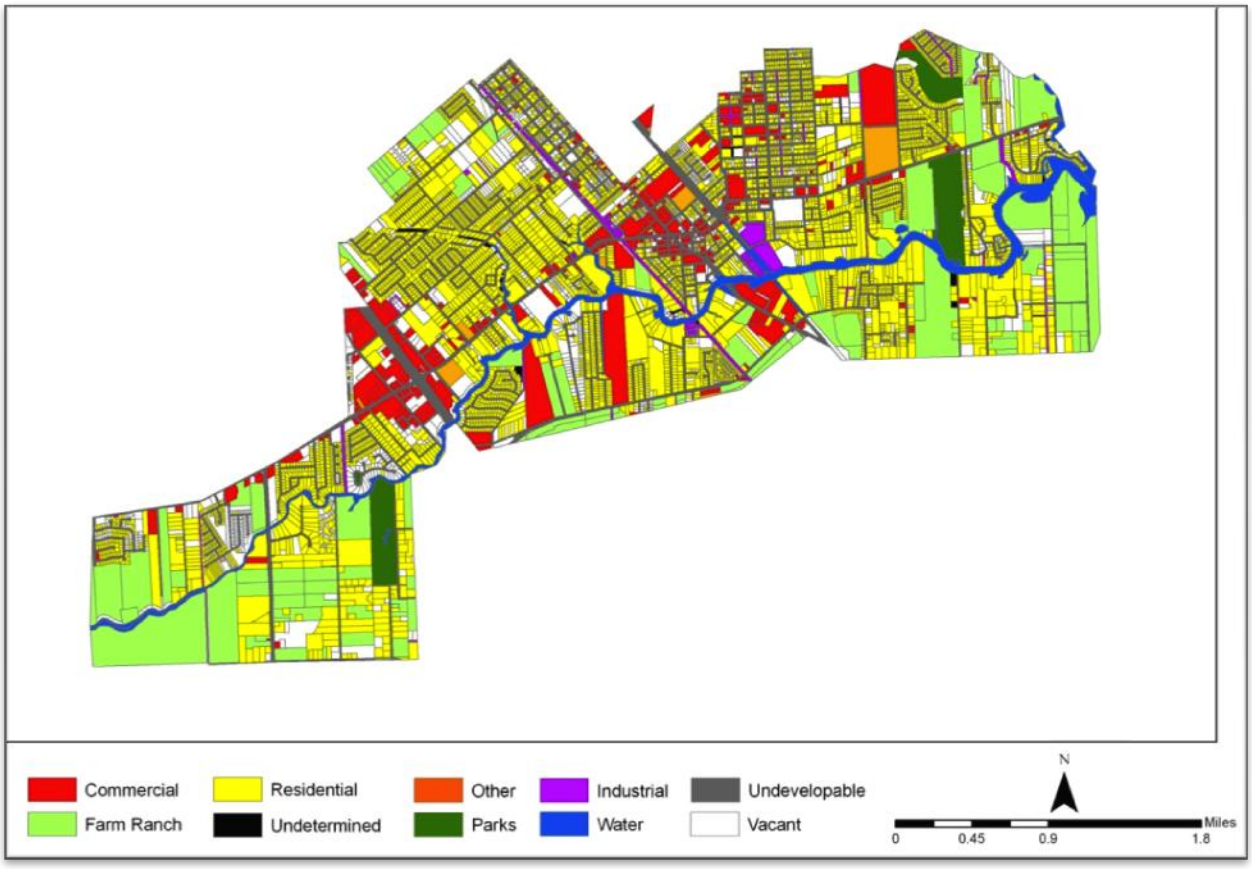
Table 1.1 – Determination of Commuters to Work	
Class	***Total Estimate***
Workers 16 years and over	8,851
Car, Truck, Van - Drove Alone	7,111
Car, Truck, Van – Carpooled	1,079
Public Transportation (excluding taxi)	26
Walked	144
Other Means	340
Worked at Home	151
Source: U.S. Census 2010	

This master plan will help the City facilitate its plans to move Dickinson toward increased livability and sustainability along major arteries in Dickinson. The pedestrian and transit improvements in this master plan will enhance the ability of residents and City employees to move around the city without a car (whether by foot or by transit), and improve air quality by reducing vehicle pollution.

LAND USE

Figure 1.1 presents the land use for parcels within the city limits of Dickinson, which include significant sections of residential, commercial, and industrial uses.

Figure 1.1 – Land Use



EMPLOYMENT CHARACTERISTICS

According to the U.S. Census Bureau's American Community Survey (ACS), in 2005 to 2009, industries that were most common for male residents are as follows:

- Manufacturing (16% of the male labor force)
- Retail (14%)
- Construction (12%)

Industries that were most common for female residents include the following:

- Healthcare and social assistance (21% of the female labor force)
- Education (15%)
- Retail (12%)

The new Tanger Outlet-Simon Properties outlet mall, at IH 45 and Holland Road less than two miles south of Dickinson, brought to the community more than 400 construction jobs and provided approximately 900 full- and part-time jobs. According to the ACS, the workforce population is mainly individuals who work for private for-profit companies *(Table 1.2)*. Of the 18,680 residents in Dickinson, 9,929 are in the labor force; 82.52% have completed high school; and 17.82% have a bachelor's degree. Of the 9,929 residents in the labor force, 6.71%, or 666 residents, are unemployed. There are approximately 6,599 households in Dickinson and over 7,190 housing units.

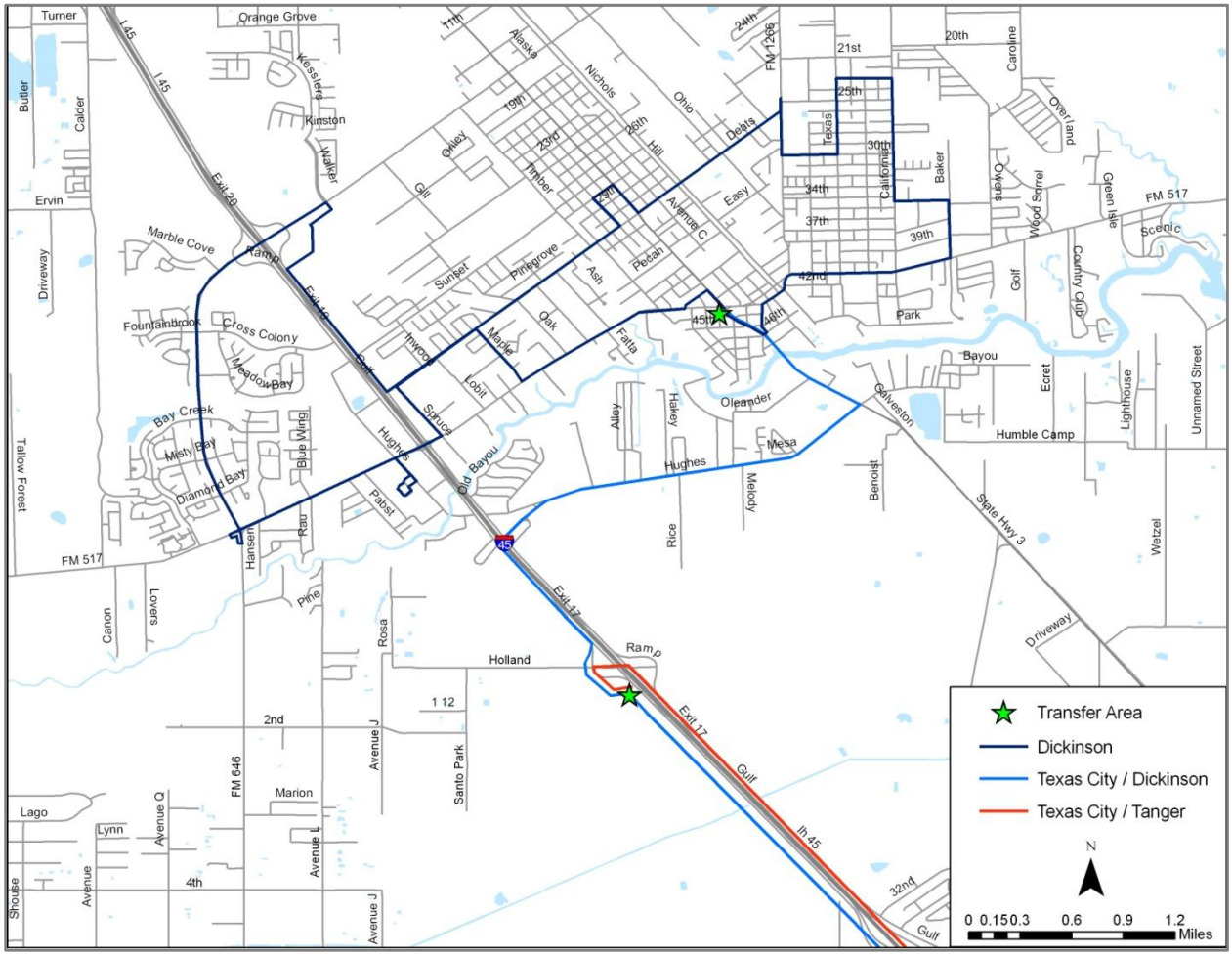
Table 1.2 – Class of Worker of Civilian Employed Population 16 Years and Over

Class	***Total Estimate***
Civilian employed population 16 years and over	8,927
Private for-profit wage and salary workers (for private company or self-employed)	6,498
Private not-for-profit wage and salary workers	422
Local government workers	731
State government workers	519
Federal government workers	109
Self-employed in own not incorporated business workers and unpaid family workers	648

TRANSIT USE

The need for the streetscape improvements proposed in this master plan is derived from the current level of transit use in the Dickinson area and the potential of connection of major areas through pedestrian and transit infrastructure improvements. GCC's service currently provides two fixed routes in Dickinson. One route traverses throughout Dickinson and has 40 bus stops with no infrastructure present, and a second route connects Dickinson to Texas City. The first service, the Dickinson Gator Run, travels from City Hall to the public library, senior center, medical center, and major retail areas on IH 45. Ridership for both services totals 65 trips per day. Chapter 2 presents a detailed analysis of transit service and ridership activity in Dickinson.

Figure 1.2 – Dickinson Bus Routes



REPORT ORGANIZATION

This report includes the following chapters which present supporting information and documentation necessary to obtain an FTA LONP to protect the pedestrian/transit infrastructure expenditures.

Chapter 1 Introduction presents a description of the project and provides background information.

Chapter 2 Existing Transit Services presents an analysis of current transportation services available in Dickinson.

Chapter 3 Demand Analysis presents the methodology and results of the demand analysis which determined the demand for each commuter service.

Chapter 4 Site Layout provides the conceptual building program and layout for proposed the proposed park & ride facility.

Chapter 5 Site Selection describes the process for developing the site evaluation methodology, presents an analysis of each site, and summarizes the rankings of the site selection analysis resulting in a preferred site.

Chapter 6 Existing Conditions Inventory describes the existing pedestrian infrastructure conditions within the LCI capture areas generated by transit terminals and bus stops relating to the current bus routes serving Dickinson.

Chapter 7 Capital Cost of Improvements presents the costs and methodology of the park & ride and pedestrian-related infrastructure improvements recommended in this master plan.

Chapter 8 Benefit/Cost Analysis presents the benefits and costs that can be derived from implementation of the proposed project.

Chapter 9 Funding and Implementation Strategy presents a multi-phased strategy for funding the capital costs detailed in Chapter 7.

ADDITIONAL DOCUMENTS

The overall supporting information also includes a companion environmental analysis (EA) reports with a request for a Categorical Exclusion (CE).

Chapter 2 – EXISTING TRANSIT SERVICES

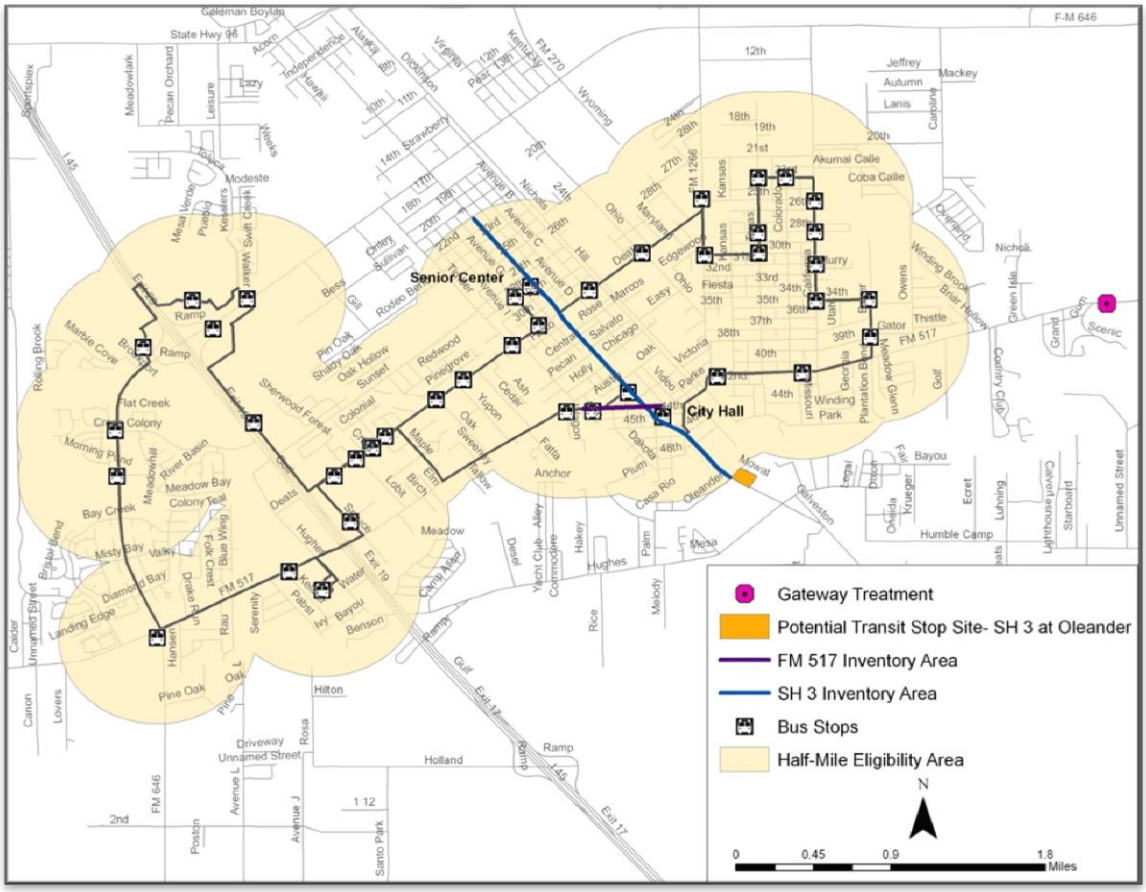
In recent years, transit in Dickinson has changed from a demand-response service to a fixed-route bus system that provides service throughout Dickinson. Dickinson's two routes are operated by GCC, a Community Mental Health and Mental Retardation (MHMR) Center. GCC is one of the State of Texas's 39 MHMR community centers, serving both Galveston and Brazoria counties. After the establishment of the Texas MHMR Act, community centers began to form from local agencies so those with disabilities could be served near their residences instead of traveling to state institutions. GCC's transportation department, Connect Transit, provides general public transportation services for the citizens of Galveston and Brazoria counties. Originally a demand-response transportation system, Connect Transit began fixed-route services in Texas City in 2008 and in Dickinson in 2010. Connect Transit operates fixed-route services, Mainland Transit, which operates seven fixed-route bus services in Texas City, Dickinson, San Leon, Bacliff, and La Marque, and several other outlying towns, covering 108 route miles.

The Dickinson route operates Monday through Friday, with service hours from 6 a.m. to 6 p.m., with 60-minute headways. The Texas City/Dickinson route operates from 7 a.m. to 5:45 p.m., with 60-minute headways. There are 40 bus stops in Dickinson, as presented in *Figure 2.1*.

Connect Transit also operates Southern Brazoria County Transit serving the cities of Lake Jackson, Angleton, Freeport, and Clute. In addition, Connect Transit provides demand-response, curb-to-curb service to those living within Galveston and Brazoria counties.

The UTMB Victory Lakes Park & Ride is located north of League City on IH 45. This commuter park & ride provides service to UTMB main campus in League City to Galveston Island and connects to Island Transit. Four buses operate from 5:30 a.m. to 8:30 a.m., and 3:15 p.m. to 6:15 p.m.

Figure 2.1 – Dickinson Bus Stops and Impact Areas



CONNECT TRANSIT RIDERSHIP

Connect Transit provided data for the number of riders and trips per day for each of its routes. Monthly and daily averages are provided in *Table 2.1* for the Connect Transit routes in Galveston County.

Table 2.1 – Galveston County Average Annual Ridership Per Route				
	FY2009	***FY2010***	***FY2011***	***FY2012***
Texas City EB/WB	12,411	22,784	34,373	37,942
Texas City Loop	2,036	11,464	15,502	14,753
La Marque	1,293	5,080	6,814	9,709
Dickinson Gator Run*			8,681	9,506
Texas City Region/Dickinson*			6,337	7,500
San Leon/Bacliff*			6,232	7,023
These routes were not in service during FY2009-2010.				

FUTURE TRANSIT SERVICES

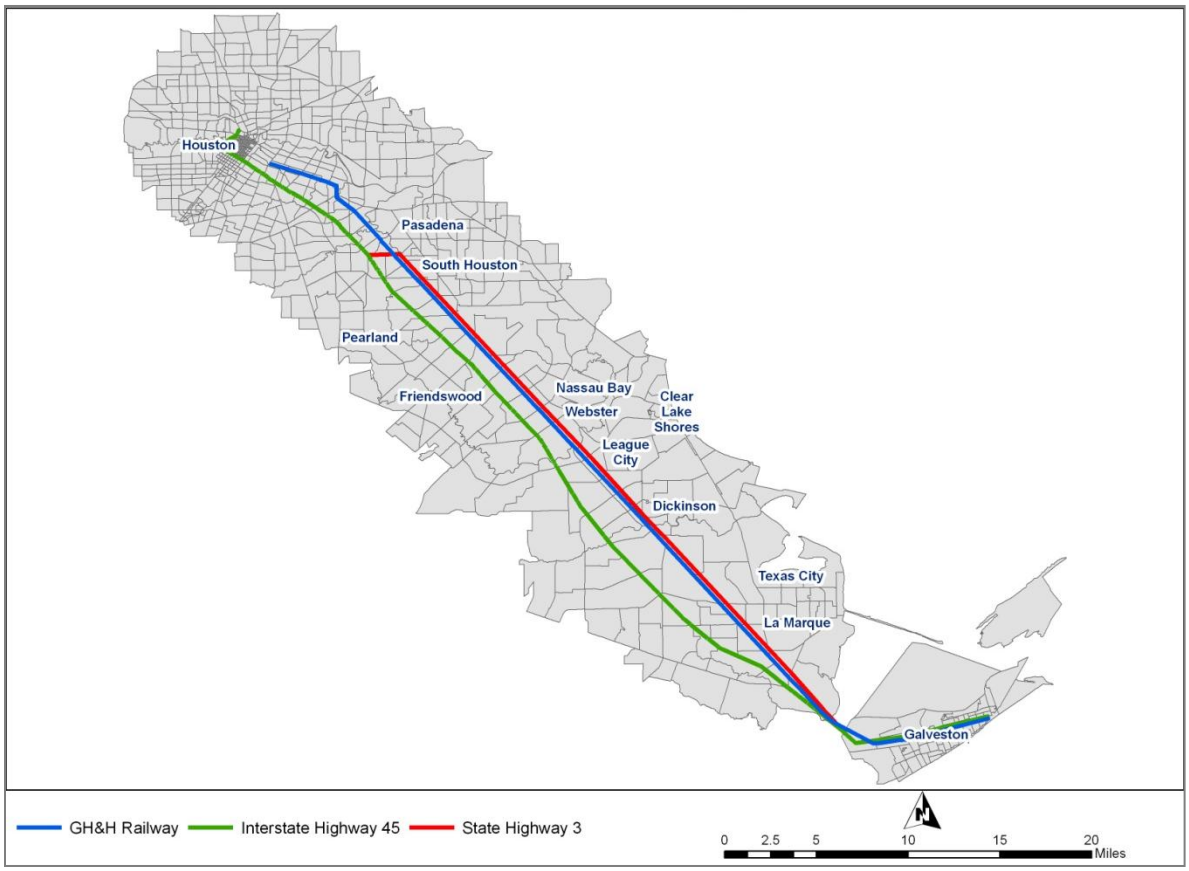
Although Connect Transit will continue to provide local transit service in Dickinson and surrounding municipalities in the Galveston Bay area, GCC has begun additional planning to improve the bus stops within Dickinson. The City currently is working with GCC to implement bus stop amenities and associated LCI streetscape improvements to support the increased demand for transit services. In addition, more mobility options are being planned to provide regional connectivity with the bay area.

In an effort to improve mobility and reduce emissions in the Houston-Galveston region, multiple stakeholders and governmental entities led by the City of Galveston, the Metropolitan Transit Authority of Harris County (METRO), the Houston-Galveston Area Council (H-GAC), FTA, Galveston County Transit District (GCTD), and others have supported studies to determine the need for implementation of a Houston-Galveston Commuter Rail Transit (CRT) system.

The Houston-Galveston Mobility Corridor is located in the southeastern quadrant of the H-GAC region and includes much of Galveston County, as well as a portion of Harris County. *Figure 2.2* shows the three potential road and rail alignments (IH 45, SH 3, and GH&H) that could serve the corridor.

The *Houston-Galveston Mobility Corridor Interim Plan* is being finalized and has examined the different technologies for a Locally Preferred Alternative (LPA) for the mobility corridor. Since implementation of the LPA has been deferred to after 2020 for financial reasons, an eight-phase interim plan of bus-oriented transit services is being implemented to provide transit mobility and build transit ridership within the corridor. The LPA will interface with Connect Transit's and Island Transit's local transit routes.

Figure 2.2 – Galveston-Houston Mobility Corridor



Chapter 3 – DEMAND ANALYSIS

This chapter presents the methodology used to forecast potential parking demand for the proposed park & ride. Population and employment are key inputs to the demand forecasting process and are developed by H-GAC, the local Metropolitan Planning Organization (MPO). A demand analysis was completed using H-GAC's computer-based supply-and-demand Travel Demand Forecast (TDF) model during the detailed travel forecast modeling stage of the *Galveston-Houston Mobility Corridor Interim Plan*. The interim plan travel demand was forecast for 2025. The model accounted for future study area population, estimated employment in study area downtowns and other major activity centers, socioeconomic characteristics of study area residents, and travel time and cost characteristics of the competing highway and transit modes of travel. The model simulates travel on the entire highway and transit system in the Houston Metropolitan area containing all transit services provided by Houston METRO, Connect Transit, and Island Transit, including local bus, express bus, commuter bus, and METRORail.

The model provides information on service frequency (i.e., how often trains and buses arrive at any given transit stop), routing, intermodal connections, travel times, and transit fares for all transit lines. The highway system includes all express highways and principal arterial roadways, as well as minor arterial and local roadways. Outputs of the model set contain detailed information relating to the transportation system. Regarding highway planning, the model provides output data on traffic volumes, congested travel speeds, Vehicle-Miles Traveled (VMT), and average travel times on the roadway links. Regarding transit planning, the model provides output relating to the average weekday ridership on different transit sub modes (for example: rail, local bus, express bus, and commuter bus), station boardings, park & ride demand, and peak load volumes.

TRANSIT PATRONAGE MODELING

Daily ridership for all the transit alternatives was estimated using METRO's long-range travel demand model set. This set of models was developed for METRO by outside consultants and has been used by METRO extensively in the past. These models are the same type as those used in most large urban areas in North America. These are based on the traditional four-step, sequential process, as follows:

- Trip Generation
- Trip Distribution
- Mode Choice
- Trip Assignment

This process is used to estimate average daily transit ridership, based on the best available population and employment forecasts, estimated highway travel conditions (including downtown parking costs), and future transit services. The geographic area represented in METRO's model, the Houston metropolitan area, is divided into smaller areas, Traffic Analysis Zones (TAZ). All calculations in the travel model are performed at the TAZ level. There are approximately 3,000 TAZ in the modeling system. A description of the four-step process is presented next.

FOUR-STEP MODELING PROCESS

A schematic representation of the four-step modeling process is shown in *Figure 3.1*.

Step 1 - Trip Generation

In the first step, the model estimates the number of trips produced in and attracted to each traffic zone. To accomplish this, the model uses estimated population, employment, and other socioeconomic and household characteristics of each zone. Trips are divided into three major categories, home-based work trips; home-based other trips; and non-home based trips. A trip generation model run is executed for each trip purpose. The output of the trip generation model feeds into the rest of the model chain. Therefore, great care is taken to ensure that the demographic and socioeconomic data are as error-free as possible to prevent the propagation of errors in the remaining model steps. This step is performed by H-GAC.

Step 2 - Trip Distribution

In Step 2, the distribution model links the trip ends[1] estimated from trip generation to form zonal trip interchanges.[2] The output of the second step is a trip table, a matrix containing the number of trips occurring between every origin-destination zone combination. Trip distribution is performed for each trip purpose. In a system of 3,000 zones, 9 million trip origin-to-destination combinations are possible. This step of the model is also performed by H-GAC.

Step 3 - Mode Choice

In Step 3, the mode choice model allocates the person trips estimated from the trip distribution step to the two primary competing modes; automobile and transit. This allocation estimates the desirability or utility of each choice a traveler faces, based on the attributes of that choice and the characteristics of the individual. The resulting output of the mode choice model is the percentage of trips that use the automobile and transit for each trip interchange. The transit trips are divided further into two modes of access: walk-access transit trips and drive-access transit trips (park & ride trips). The auto trips are divided further into single-occupancy and multiple occupancy trips.

The mode choice model set consists of three models, one for each trip purpose. Inputs to the mode choice model, transit travel times and costs and highway travel times, socioeconomic data

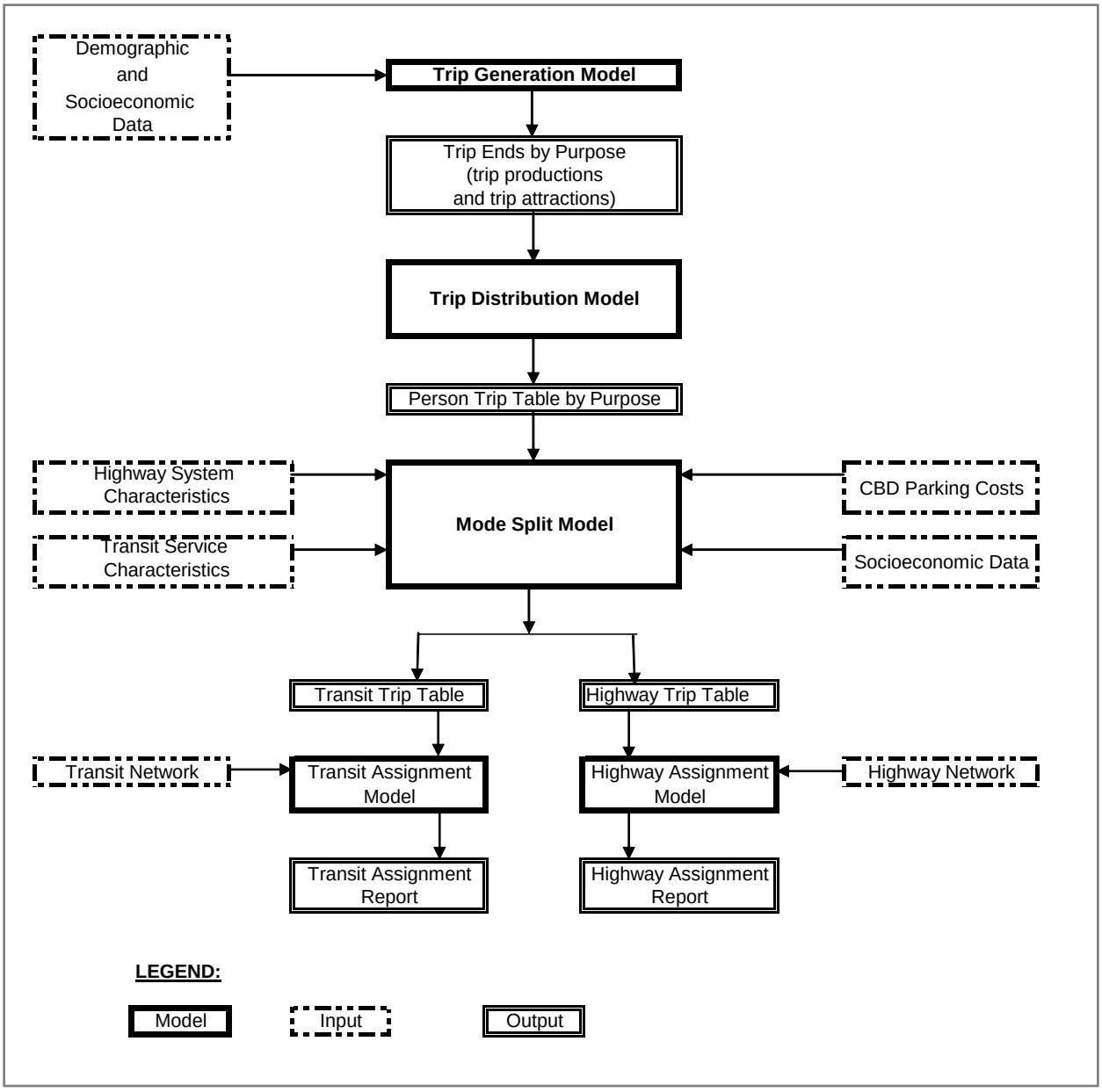
[1] Trip ends represent the point from which the trip is produced or to which it is attracted.
[2] Movements between two zones.

are supplied by the computerized transit and highway networks. METRO is formally responsible for running this model within the METRO service area. As support to H-GAC, METRO also runs this model for transit improvements outside of the service area, as needed.

Step 4 - Trip Assignment

In this final step, the model assigns the transit trips to different transit modes such as local bus, express bus, commuter bus, and METRORail. The model uses all available transit paths from one zone to another. This path may involve just one transit mode, such as local bus or commuter bus, or multiple modes, such as local bus with a transfer to METRORail line. Highway trips are assigned to the highway network. Therefore, future year traffic volumes on highways and forecast transit ridership on transit lines can be obtained from the model outputs.

Figure 3.1 – Travel Demand Forecasting Process



Preparing the Model for Application

Before the model is applied to a specific study, a first run is produced and adjusted several times until it has replicated the existing highway volumes and transit ridership data at an acceptable level of accuracy. This adjustment is called "model calibration." It is done by adjusting the constant coefficients in the model using an automated procedure. Sometimes additional fine tuning is necessary and that is usually done by modifying how the access to the highway and transit system is represented in the model. Once the highway and transit component of the

model are well calibrated to simulate the current conditions, it is ready for forecasting. The forecast year inputs are then created and the entire model set is run to simulate future year travel.

Model Application

In the Galveston-Houston mobility corridor, the 2025 (forecast year) transportation network was developed by including all the future highway and transit projects that were programmed in H-GAC's Regional Transportation Plan (RTP). On the transit side, each transit alternative was coded in the computerized network by providing all the necessary information regarding the operational characteristics of the proposed service. This would include access characteristics at each station, peak and off-peak headways, station dwell times, travel times, proposed fares and intermodal connections. For each alternative, appropriate market areas (groups of zones on either side of the proposed alignment) were delineated for each station and proper transit access connections were coded.

Using the updated transit network information and other future year model inputs, the entire model set was run for each transit phase. The daily transit ridership on the proposed transit service was obtained directly from the model outputs. The model provides daily boardings and alightings at each proposed park & ride by trip purpose and mode of access (park & ride versus walking to station). Other important demand statistics can also be extracted from the model outputs, such as linked transit trips in the system; VMT and vehicle hours by all modes of transportation; transit shares to downtown and non-downtown locations; and boardings by transit sub-modes.

After the model runs were completed, the results were used to summarize the number of forecast year daily boardings and parking demand at the station level.

Major Factors Affecting Ridership

Ridership forecasts, estimated by travel demand models, depend heavily on input assumptions. Of these assumptions, the most important are as follows:

- Future population growth (based on H-GAC's 2035 forecasts);
- Future employment growth (based on H-GAC's 2035 forecasts);
- Forecast socioeconomic characteristics (based on H-GAC's 2035 forecasts);
- Forecast highway congestion (estimated by model); and
- Proposed transit Level of Service (LOS).

TRANSIT PHASES ANALYZED

The interim plan outlines services until the recommended LPA can be implemented. The interim plan consists of phases with one or more service types within each phase. Phase 1 was depicted as starting in 2008 with a progressively increased Level of Service (LOS) until the LPA is

implemented in 2020. Phases and service types, including the Dickinson Park & Ride, are projected to be implemented within a 2014 to 2017 timeline.

TRAVEL MODEL RESULTS

According to the *Galveston-Houston Mobility Corridor Interim Plan* forecast model *(Table 3.1)*, service types B and E would serve the proposed park & ride facility. Service type B *(Figure 3.2)* is a northbound service that would serve three potential park & ride facilities in La Marque, Dickinson, and Texas City before reaching Eastwood Transit Center (ETC) and downtown Houston. Service type E *(Figure 3.3)* is a southbound service that would stop at the same three prospective park & ride facilities starting in Dickinson and traveling to downtown Galveston and the campus of The University of Texas Medical Branch (UTMB) at Galveston.

Figure 3.2 – Service Type B

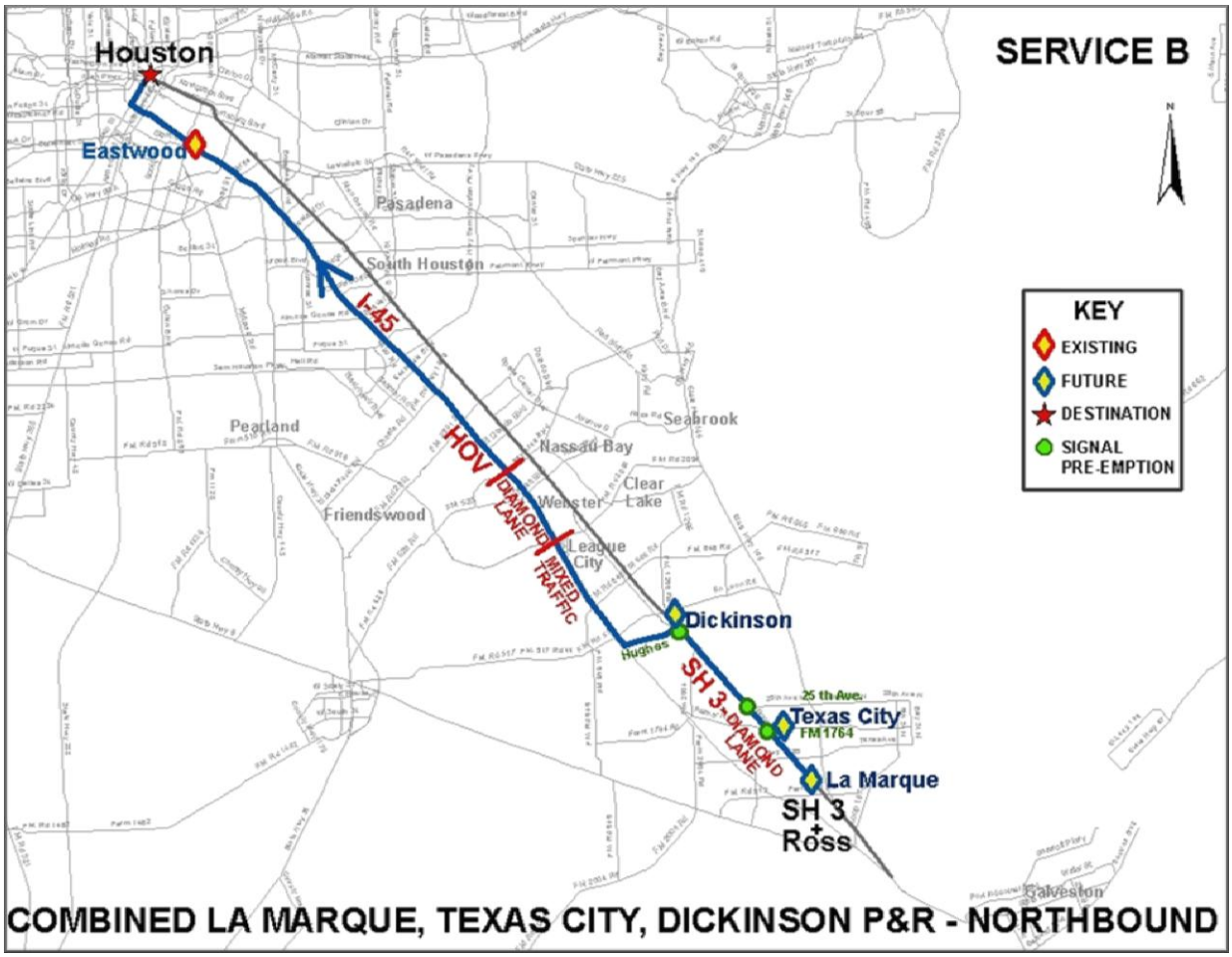
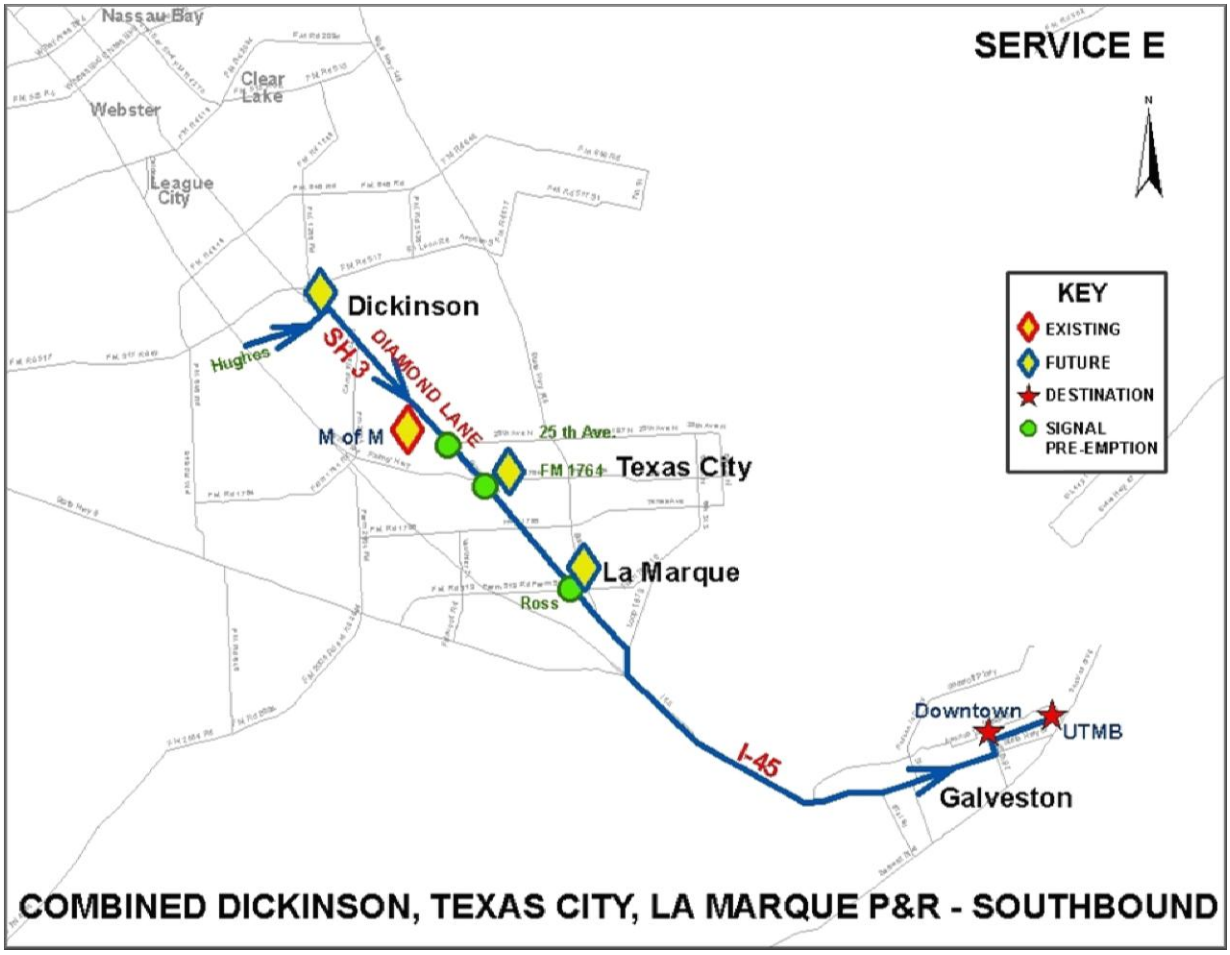


Figure 3.3 – Service Type E



The proposed park & ride facility would accommodate the northbound commuter service described in service type B in 2015. The southbound commuter service described in service type E is anticipated to start in 2017 and would operate with pre-emptive signalization and new vehicles. The TDF model estimated parking demand at the park & ride facility would be 480 spaces at build-out in 2025. Due to financial and capacity constraints, a first phase total of 188 spaces would be developed at this time using limited funding.

Chapter 4 – PARK & RIDE SITE LAYOUT

This chapter presents a conceptual building and site layout for the proposed project. The proposed park & ride facility would accommodate specific short- and long-term transit needs within the community. The design would be developed according to specifications determined by the City to blend with the surrounding environment.

TRANSIT NEEDS

Express commuter routes, local service, and demand-response services would interface at the proposed facility. In evaluating the number of bus spaces required for the facility, an analysis was made of the arrival and departure times for all of the routes during the morning and evening peak hours. It was assumed in each case that a bus would remain in the bus bay for five minutes. It was assumed that in no case would buses overlap in the morning and evening periods. Demand-response schedules will vary throughout the day, but will not interfere with express commuter bus operations. Two to three bus spaces would provide sufficient capacity and flexibility.

FACILITY NEEDS

The proposed park & ride facility construction program would include a transit facility with parking for shared-use activities, bus parking/loading spaces, and a transit terminal with passenger waiting areas, information station, vending/phone area, rest rooms, bike lockers/racks, and waste receptacles. Additional building program details would include the following:

Bus Operations

- Site will accommodate three full-size bus berths with a passenger waiting area.
- Bus circulation drives will be reinforced concrete.
- Spaces will be reserved for bus operators within the parking area.
- Signage will be installed for bus berth assignments to facilitate operations and serve passengers.
- Passenger safety will always be a priority in all design considerations.

Traffic

- Close coordination will be required with the City regarding surrounding traffic conditions, including proximity of driveways to intersections.

- Traffic-control devices will be installed to clearly define vehicle circulation and pedestrian activity.

Parking

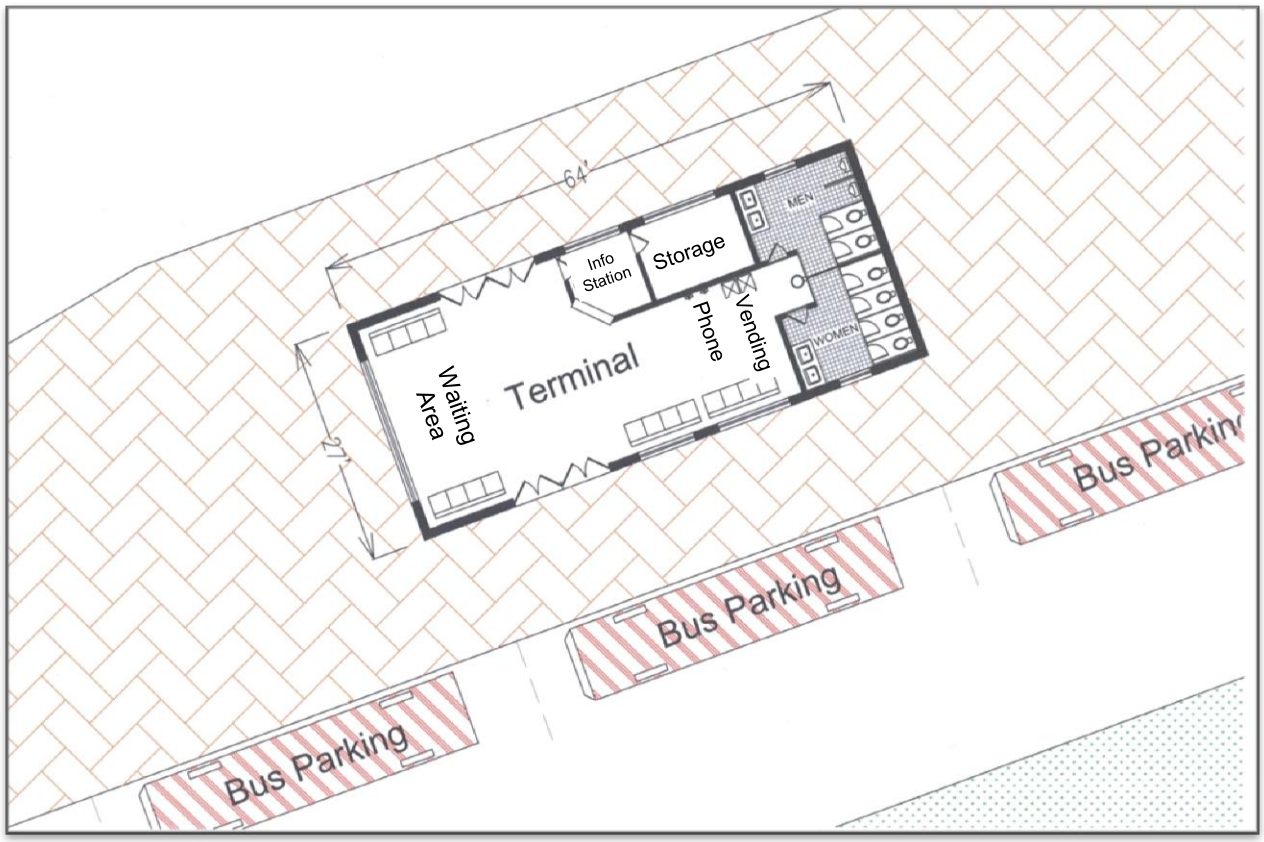
The initial layout of the park & ride lot (Phase I) would consist of 201 spaces, with room for 151 more spaces to accommodate future expansion (Phase II). This includes six (6) Handicapped spaces to accommodate disabled transit riders.

CONCEPTUAL BUILDING PROGRAM AND LAYOUT

The building program allocates space for each of the potential users: joint development, visitors, vanpool, and short- and long-range commuter services. *Figure 4.1* presents the proposed transit park & ride site and a layout for the proposed terminal and parking. *Figure 4.2* presents a layout for the proposed terminal depicting the passenger waiting areas, information station, storage room, vending/phone area, and rest rooms. Bike lockers/racks and waste receptacles also would be included in the terminal area.

Figure 4.1 – Park & Ride Site

Figure 4.2 – Park & Ride Layout



Chapter 5 – SITE SELECTION

Chapter 2 presented the results of the demand analysis which estimated parking demand at completion of a proposed park & ride at 480 spaces to accommodate commuter service. A first phase total of 201 spaces would be developed at this time using limited funding. Three sites were evaluated against a set of criteria to determine a location that would best function as a successful park & ride terminal facility and meet the needs of local commuters.

METHODOLOGY

The methodology used in this site selection analysis includes the following components:

- Development of primary site evaluation criteria;
- Development of criteria;
- Collection of ownership, user, and other data;
- Evaluation of each site against criteria; and
- Recommendations

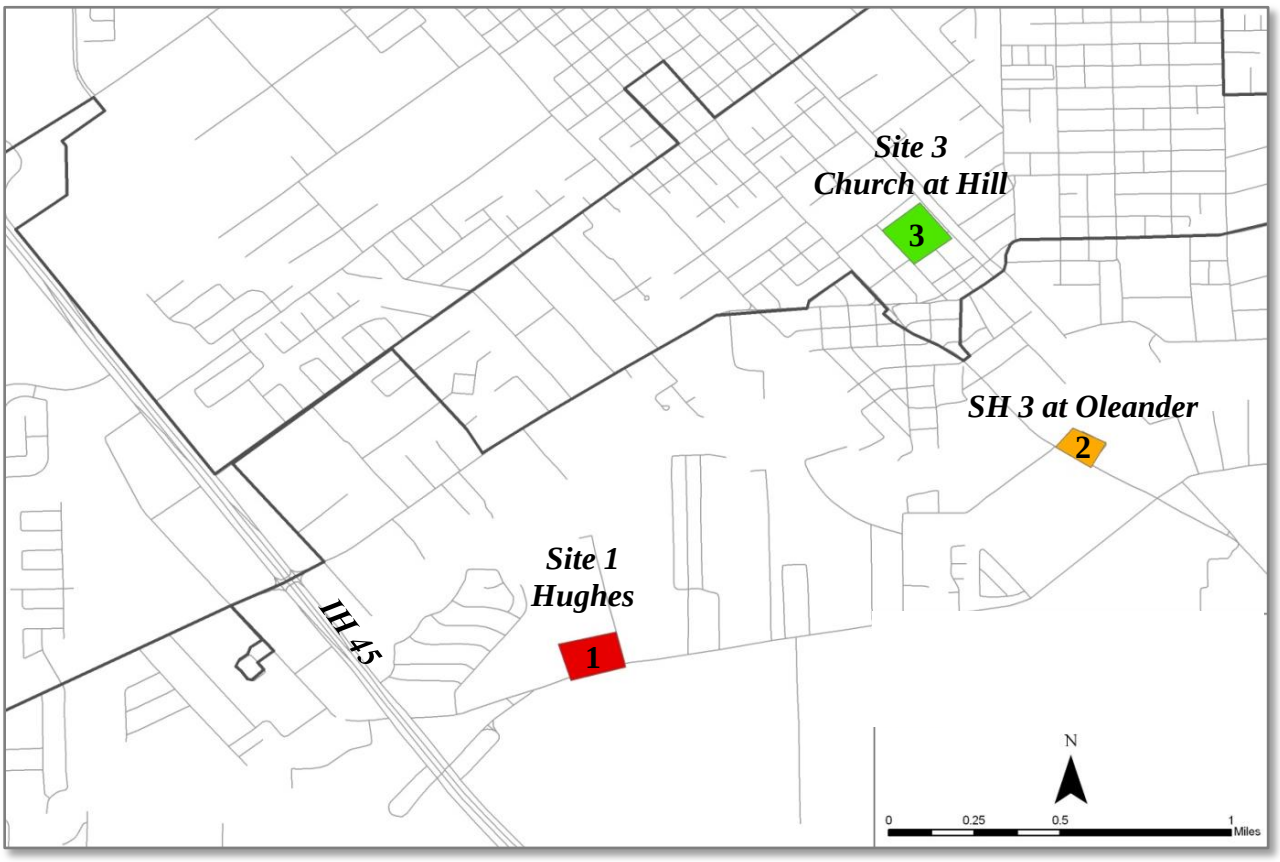
A list of essential site requirements that would meet minimum day-to-day operating functions of the facility was developed based on both near-term and long-term needs. A set of evaluation criteria then was developed based on the site requirements. An evaluation form was designed to score the evaluation factors on a scale of one to five, and then appropriately weighted depending on the relative importance of the factor. Sites were given a numerical score evaluated against each factor. The scores were tabulated to yield a composite ranking for each potential site. The preferred site with the highest ranking will be selected.

CANDIDATE SITES

The following sites were considered for the proposed terminal facility *(Figure 5.1)*:

- **Site 1 Hughes Road** – Approximately one-half mile east of IH 45
- **Site 2 Little League Fields** – SH 3 north side near Oleander Drive
- **Site 3 Church Street at Hill Avenue**

Figure 5.1 – Candidate Sites



SITE SELECTION CRITERIA

The purpose of the site selection analysis is to locate a site that best serves the objectives of providing an accessible, attractive, functional, and cost-effective park & ride facility for the commuters of Dickinson. The candidate sites were selected for consideration in consultation with the City. The following primary criteria were examined for each proposed location to determine the site's suitability for use as the selected park & ride site. Each of the sites were ranked against the criteria using a scale from 1 to 5 (1 being the lowest ranking and 5 being the highest ranking) and weighted in importance using a scale from 1.0 to 2.0, with 2.0 reflecting the most important criteria and/or criteria for which mitigation is difficult. The numerical rankings then were tabulated to yield a composite score for each candidate site.

- ***Location.*** Proximity to SH 3 and the GH&H railroad preferred to link park & ride service with future express bus service on SH 3, and for future transition of the facility to a commuter rail transit (CRT) station. (Weighting: 2.0)
- ***Size.*** The proposed park & ride lot must accommodate 201 parking spaces. (Weighting: 2.0)
- ***Availability.*** Sites that are readily available for purchase, long-term lease, or condemnation preferred. Vacant parcels with no existing businesses currently in operation generally preferred over sites with active businesses requiring relocation. (Weighting: 1.5)
- ***Ownership.*** Single ownership preferred over multiple owners. The time and expense can be significant to piece together a suitably sized parcel from smaller parcels. (Weighting: 1.5)
- ***Surrounding Land Use.*** Sites not adjacent to sensitive receptors, such as residences, schools, churches, daycare facilities, and hospitals, preferred. Negative consequences can include noise and a perceived threat to privacy. Sites situated near goods and services demanded by transit customers, such as shopping and events, preferred over isolated sites. (Weighting: 1.5)
- ***Environmental Considerations.*** Environmental considerations can include potential risks from past or current uses. A site with no or limited probability of generating an environmental clean-up cost preferred over a site with potential environmental liabilities. FTA does not recognize environmental remediation as an eligible cost and will not support the purchase of land with known environmental liabilities. FTA also does not recognize parcels located in a flood plain as an eligible cost and consider this a fatal flaw and the site will not be considered. (Weighting: 2.0)
- ***Historical Significance.*** Site design and use may be limited by being located within an historic zone or adjacent to an historic structure. An evaluation by the State Historical Preservation Officer (SHPO) may be required to determine the significance of an

adjacent structure that is potentially historic, and mitigating measures may be required to preserve and protect the structure. (Weighting: 2.0)

- ***Traffic Impacts.*** Additional auto and bus traffic generated by the proposed facility may impact existing traffic patterns. Sites with adequate roadway capacity preferred over more congested sites. Additionally, sites located on streets constructed to withstand heavier bus traffic preferred over streets that are not reinforced. (Weighting: 1.0)
- ***Visibility.*** Sites that allow commuters to easily identify the facility from major roads and other locations preferred over sites with limited visibility. (Weighting: 1.0)
- ***Vehicular Accessibility.*** Sites that provide easy ingress and egress for vehicles preferred over sites with limited accessibility. (Weighting: 1.5)
- ***Pedestrian and Bicycle Access.*** Sites with good, safe access by foot or bicycle preferred since some transit patrons may rely on walking or bicycling to reach the park & ride facility. (Weighting: 1.0)
- ***Transit Connectivity.*** Sites that allow for the park & ride service to be readily connected to the existing fixed-route bus service (Connect Transit) preferred over those that require extensive re-routing of the fixed routes to establish a link to the park & ride. (Weighting: 2.0)
- ***Commuter Rail Transit (CRT) Transition.*** Sites that allow for a seamless transition in the future from bus service to CRT preferred over those that can only be used for bus service. (Weighting: 2.0)
- ***Expansion Ability.*** Sites with available space for expansion of the park & ride facility preferred over those with limited space as parking demand will likely increase over time. (Weighting: 1.0)
- ***Adaptability for Shared Parking.*** Sites with potential for shared parking scenarios preferred, whereby the same parking is used by park & ride users during peak hours and by other users such as retail patrons at other times, resulting in a decrease in the number of parking spaces required. (Weighting: 1.0)
- ***Special Conditions.*** Sites with no special conditions or deed restrictions in place preferred since special conditions can obstruct proposed development or add to development costs. (Weighting: 1.0)

The highest value that can be earned pursuant to the ranking criteria is **120 points**.

SITE EVALUATION

Three sites were analyzed for the proposed park & ride terminal facility, as follows:

Site 1 Hughes Road is located on the north side of Hughes Road, approximately one-half mile east of IH 45. The site is currently unused and owned by the Dickinson Economic Development Corporation (DEDC). The DEDC will pursue a developer in the future to develop the property into a mixed-use development. The entire parcel is approximately 45 acres.


Site 1 – Hughes Road

Other site considerations include the following:

- Good visibility and access from Hughes Road, good access to IH 45;
- No potential for future transition to CRT station (not adjacent to GH&H railroad);
- Potential for shared parking scenarios with mixed uses on site; and
- Not easily connected to existing fixed-route transit.

Site 2 Little League Fields is located on the north side of SH 3, near Oleander Drive. It is owned by Dickinson Little League and occupied by ball fields. The parcel is approximately 4 acres.

Other site considerations include the following:


Site 2 – Little League Fields

- Good visibility and access from SH 3;
- Excellent location for use by express bus service on SH 3 and transition to future CRT station (parcel sits between SH 3 and GH&H railroad);
- Parcel is not currently listed for sale, and use as a park & ride facility would require displacement of the Little League fields; and
- Can be connected to existing fixed-route transit with a route modification.

Site 3 Church at Hill is located at the intersection of Church Street and Hill Avenue. It is owned by the Dickinson Independent School District (DISD) and houses a large school bus barn and maintenance facility. The parcel is approximately 7 acres.

Site 3 – Church Street at Hill Avenue

Other site considerations include the following:

- No visibility from major roadways (3 blocks from SH 3);
- Excellent location for use by express bus service on SH 3 and transition to future CRT station (parcel sits between SH 3 and GH&H railroad);
- Parcel not currently listed for sale, and use as a park & ride facility would require displacement of DISD bus facility;
- Infrastructure on site appears relatively new – less likely that DISD would part with the site;
- Site includes gas pumps, gas tanks, bus maintenance facility – could require environmental remediation to remove;
- Adjacent roadways are narrow, low-capacity streets; and
- Can be connected to existing fixed-route transit with a slight route modification.

Table 5.1 presents a summary of the candidate site characteristics.

Table 5.1 - Candidate Site Characteristics			
Characteristic	***Site 1 Hughes***	***Site 2 Little League Fields***	***Site 3 Church at Hill***
Total Acreage	45	4	7
Cost/Sq. Ft. (approx.)	$0.40	$0.42	$0.65
Location	401 Hughes Rd. (north side ~½ mile east of IH 45)	5101 SH 3 (at Oleander Dr.)	2805 Oak Park (NW corner of Church St. and Hill Ave.)
Existing Zoning	Conventional Residential	General Commercial	Conventional Residential
Existing Land Use	Vacant – DEDC soliciting developers for potential mixed use	Sports and Recreation (Little League fields)	Transportation Facility (school bus barn)
Surrounding Land Use – North	Dickinson Bayou	Dickinson Bayou, campgrounds	Football field, DISD property
Surrounding Land Use – South	Hughes Rd., vacant	County Government Offices (Roads and Drainage Services Center)	SF Residential
Surrounding Land Use – East	Vacant	GH&H Railroad, SF Residential, Vacant	GH&H Railroad, SF Residential
Surrounding Land Use – West	SF Residential	SH 3, Vacant, Commercial	SF Residential
Property Ownership	Single	Single	Single
Property Owner (or Owner's Representative)	DEDC 218 FM 517 West Dickinson, TX 77539	Dickinson Little League P.O. Box 626 Dickinson, TX 77539	DISD 2218 FM 517 East Dickinson, TX 77539

SELECTION OF PREFERRED SITE

Table 5.2 presents an evaluation of the proposed sites.

Table 5.2 – Site Evaluation

Criterion	***Site 1*** ***Hughes***	***Site 2*** ***Little League Fields***	***Site 3*** ***Church at Hill***
Location	Fair – not adjacent to SH 3 (express bus) or GH&H railroad, but near IH 45	Excellent – proximate to both SH 3 (express bus) and GH&H railroad	Excellent – proximate to both SH 3 (express bus) and GH&H railroad
Size	Excellent	Good	Good
Availability	Good (assuming selected developer incorporates transit component into scheme)	Poor – not currently listed for sale; not vacant, would require displacement	Poor – not currently listed for sale; not vacant, would require displacement. Infrastructure on site appears new
Ownership	Excellent – single	Excellent – single	Excellent – single
Surrounding Land Use	Good (assuming developed as mixed use). SF residences to west sensitive receptors	Fair – campgrounds to the north sensitive receptor	Fair – SF residences to east, west, and south sensitive receptors
Environmental Considerations	Per City, 9.5 acres in NW corner of property in 100-yr flood plain (park & ride facility not likely to be located here). Area directly adjacent to Hughes Rd. partially in 500-yr flood plain, most not in flood plain. Phase 1 environmental identified no other issues	Majority of site not in flood plain; small portion in northeast corner in 500-yr flood plain. No other apparent environmental issues	Site not in flood plain. No other apparent environmental issues
Historical Significance	None	None	None
Traffic Impacts	No adverse impacts – adjacent roadways have adequate capacity for added auto and bus traffic; roadways constructed to withstand heavy buses	No adverse impacts – adjacent roadways have adequate capacity for added auto and bus traffic; roadways constructed to withstand heavy buses	Surrounding streets narrow and could be strained by added auto and bus traffic. Closest major streets (SH 3, FM 517) at near capacity in AM peak
Visibility	Good – not directly visible from IH 45, easily visible from Hughes Rd.	Excellent from SH 3	Poor – not visible from SH 3
Vehicular Accessibility	Excellent	Excellent	Fair – 3 blocks from SH 3 along narrow, low-capacity streets
Ped/Bike Access	Fair – no sidewalks; shoulder of Hughes Rd. available for bicyclists	Poor – lacks sidewalks, lacks designated bike paths	Poor – lacks sidewalks, narrow streets, lacks designated bike paths
Transit Connectivity	Poor – not easily connected to Connect Transit Purple route	Fair – connection to Connect Transit Purple route would require modification of route	Good – connection to Connect Transit Purple route would require slight modification of route
CRT Transition	Poor – not adjacent to GH&H railroad	Excellent – directly adjacent to GH&H railroad	Excellent – directly adjacent to GH&H railroad
Expansion Ability	Excellent	Fair – parcel locked in by Dickinson Bayou and other land uses. Expansion would	Fair – parcel locked in by railroad, SF residences, and DISD property. Expansion

		have to be vertical (garage)	would have to be vertical (garage)
Adaptability for Shared Parking	Excellent (assuming developed as mixed use)	Poor – surrounding land uses not compatible with shared parking scenarios	Poor – surrounding land uses not compatible with shared parking scenarios
Special Conditions	None	None	Site includes gas pumps, gas tanks, and bus maintenance facility

RANKING RESULTS

Table 5.3 presents a summary of the ranking results. The evaluation and scoring process has deemed **Site 2 Little League Fields** to be the most suitable location for the proposed park & ride facility.

Table 5.3 - Candidate Site Evaluation Results

CRITERIA RATING Unsatisfactory 1 – 2 – 3 – 4 – 5 Satisfactory

	Site 1 ***Hughes***		***Site 2*** ***Little League Fields***		***Site 3*** ***Church at Hill***	
Criterion (weighting)	***Raw***	***Weighted***	***Raw***	***Weighted***	***Raw***	***Weighted***
Location (2.0)	3	**6**	5	**10**	5	**10**
Size (2.0)	5	**10**	4	**8**	4	**8**
Availability (1.5)	4	**6**	1	**1.5**	1	**1.5**
Ownership (1.5)	5	**7.5**	5	**7.5**	5	**7.5**
Surrounding Land Use (1.5)	4	**6**	3	**4.5**	3	**4.5**
Environmental Considerations (2.0)	4	**8**	4	**8**	5	**10**
Historical Significance (2.0)	5	**10**	5	**10**	5	**10**
Traffic Impacts (1.0)	5	**5**	5	**5**	3	**3**
Visibility (1.0)	4	**4**	5	**5**	1	**1**
Vehicular Accessibility (1.5)	5	**7.5**	5	**7.5**	3	**4.5**
Ped/Bike Access (1.0)	3	**3**	2	**2**	2	**2**
Transit Connectivity (2.0)	2	**4**	3	**6**	4	**8**
Commuter Rail Transition (2.0)	1	**2**	5	**10**	5	**10**
Expansion Ability (1.0)	5	**5**	3	**3**	3	**3**
Adaptability for Shared Parking (1.0)	5	**5**	2	**2**	2	**2**
Special Conditions (1.0)	5	**5**	5	**5**	2	**2**
Total	**65**	**94**	**62**	**95**	**53**	**87**

CONCLUSION

The site selection process identified the Little League Fields site as the top candidate for the Dickinson Park & Ride facility. While the Hughes Road site came in as a very close second, the distance of the site from the primary Galveston-Houston transit corridor on SH 3 puts the site at a slight disadvantage. However, a park & ride on the Hughes Road site could have the opportunity to link a potential mixed-use development with transit sooner than when BRT and rail activity is slated to occur on SH 3. The Hughes Road site, in close proximity to the IH 45 corridor, could act as a stepping stone to linking Dickinson regionally with transit services being planned for the corridor. The Little League site, while located directly on SH 3, is not currently for sale and will be challenging to acquire for park and ride development. Similarly, the site at Church Street and Hill Avenue has not been listed for sale by DISD. The DISD site also has other characteristics that make it the least desirable park and ride candidate, such as narrow streets, possible environmental remediation issues, and low visibility from a major thoroughfare.

The **Little League Fields (Site 2)** is best positioned to being a potential park & ride and future commuter rail stop given its close proximity to the Galveston-Houston transit corridor on SH 3.

Chapter 6 – EXISTING CONDITIONS INVENTORY

This chapter details the existing conditions of pedestrian-related infrastructure, such as sidewalks to improve pedestrian access to existing and future bus stops, as well as associated recommended improvements. The information compiled for this chapter provides the basis for estimating the capital cost of improvements in Chapter 7, and the mobility benefits in Chapter 8, as a result of implementing the recommend improvements.

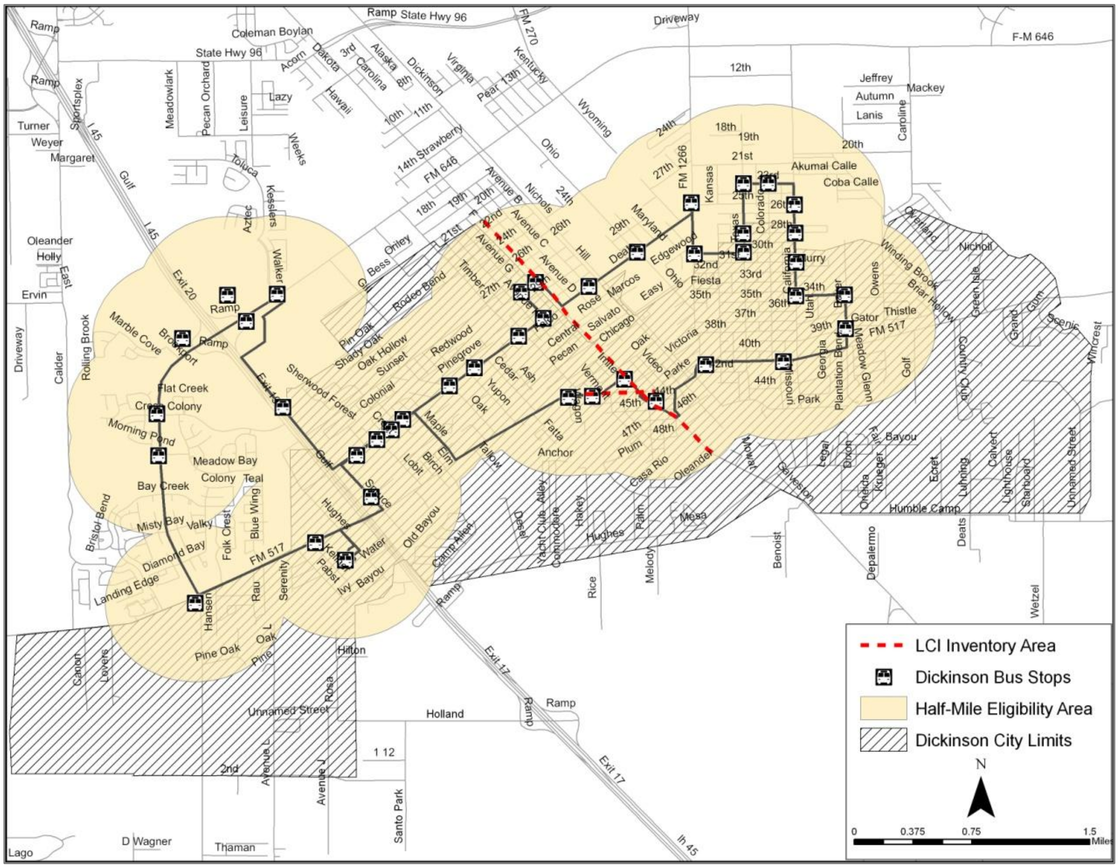
FEDERAL TRANSIT ADMINISTRATION'S LIVABLE COMMUNITIES INITIATIVE

FTA LCI[1] guidelines provide a framework for the design of streetscape improvements that enhance pedestrian/ transit access to transit facilities and services. Improvements such as sidewalks, hike & bike trails, ADA-compliant ramps, landscape barriers between pedestrians and auto traffic, pedestrian-oriented lighting, benches, waste receptacles, and transit shelters are considered eligible by FTA for inclusion within a capital grant if improved pedestrian/transit access or Pedestrian Level of Service (PLOS) can be demonstrated. Quantifying streetscape improvements and pedestrian user access to transit provides a comparative PLOS for each corridor.

Under LCI guidelines, prior to August 2011, pedestrian/transit access improvements were eligible within a 500-ft. radius around a transit stop and a 1,500-foot radius around a transit terminal. Updates to the LCI revised the eligibility area to be a one-half mile radius around transit terminals and stops. This FTA guidance was provided in August 2011 in a circular entitled *Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law*[2]. *Figure 6.1* presents the eligible one-half mile area around transit terminals and stops where the pedestrian/transit access infrastructure can be federally protected.

[1] "Livable Communities Initiative." National Transportation Library. Gordan J. Linton. Accessed 10.6.12 http://ntl.bts.gov/DOCS/livbro.html.
[2] "Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law." Federal Register / Vol. 76, No. 161 / Docket No. FTA-2009-0052 /Friday 8.19.11. Accessed 10.6.12 http://www.gpo.gov/fdsys/pkg/FR-2011-08-19/pdf/2011-21273.pdf.

Figure 6.1 – Half-mile Eligible LCI Area



EXPANDED STREETSCAPE INVENTORY

The inventory corridor segments chosen for the master plan, all within the LCI capture area *(Figure 6.1)*, coincide with capital improvement projects planned by the City. These improvements include areas where Dickinson Gator Run operates. The methodology for determining the inventory corridors is described next.

This eligible LCI improvement area is based on one-half mile radius around bus stops. *Figure 6.1* illustrates how the coverage area applies to Dickinson and other Connect Transit bus stops. Almost the entire city is included; therefore, the selected corridors shown in red are all eligible for inclusion in the LCI.

METHODOLOGY

The basis of the existing conditions, or current state of pedestrian infrastructure in the selected areas, methodology is as follows:

- ***Identify Eligible Corridors*** – After establishing the LCI impact area, eligible corridor segments were selected and delineated into smaller sections called block faces. A block

face consists of one side of a given street between two intersections. For example, SH 3, a major north-south arterial, has block faces on both the east and west sides of the street, delineated by two intersecting west-east streets.

- ***Measure Pedestrian and Transit Infrastructure Attributes*** – Each block face was physically inventoried, taking measurements of several infrastructure elements described in the next section. Some measurements will help formulated the costs associated with the construction of new infrastructure, if recommended.
- ***Describe and Rank Existing Streetscape Conditions*** – Both general block face conditions and individual infrastructure elements were described and, in some instances, ranked. Block face rankings are described next.

PEDESTRIAN/TRANSIT ACCESS INFRASTRUCTURE

The following items encompass the pedestrian/transit access infrastructure that was inventoried for each applicable block face:

- ***Sidewalks*** measured for width and length along block face, as well as examined for current conditions (one element ranked);
- ***Driveways*** measured for total combined width along block face (one element ranked);
- ***Curbs*** measured for length along block face and examined for current conditions (one element ranked);
- ***ADA-compliant Ramps*** at street crossings, driveways, and alleys counted where relevant and examined for current conditions (up to four elements ranked);
- ***Crosswalks and stop bars***, counted where relevant and examined for current conditions (up to four elements ranked);
- ***Planting strips and landscaping***, between sidewalks and the roadway, measured for width and length along block face, as well as examined for current conditions (one element ranked);

Each block face should have a minimum of four crosswalks and ramps to serve pedestrians at each intersection crossing where applicable and accessible. This means a block face could have up to 12 infrastructure items ranked depending upon the applicable number of ramps and crosswalks. Chapter 8 presents the impact of the number of individually ranked infrastructure items has on an overall grade of the block face.

QUALITATIVE RANKINGS OF PEDESTRIAN AND TRANSIT ELEMENTS

The purpose of the qualitative rankings is to determine whether or not a particular pedestrian/transit infrastructure element needs to be replaced. This determination is made from

the perspective of a pedestrian or disabled individual who uses a network of sidewalks, isolated from automobile traffic, to safely access transit stops, origins, and destinations. One of the important factors in conducting the existing conditions inventory is to determine the quality of the pedestrian and transit elements. For those infrastructure items that were eligible for ranking, an initial ranking score was assigned during the existing conditions inventory.

Table 6.1 presents the qualitative scoring for individual pedestrian/transit infrastructure items and the corresponding numerical factor. The ranking scores criteria used for each infrastructure item are presented.

Table 6.1 – Individual Pedestrian/Transit Element Scoring		
0	=	No Treatment Necessary (Excellent)
1	=	Minimum Treatment Needed (Good)
2	=	Moderate Treatment Needed (Fair)
3	=	Maximum Treatment Needed (Poor)

"0" No Treatment Necessary (Excellent): Sidewalks are of sufficient width to support both pedestrian and disabled individuals; sidewalks and curbs are unbroken and are in very good condition, fully supporting pedestrian and disabled traffic; all sidewalks meet ADA standards at driveway intersections; ramps have the proper slope and design; crosswalks are properly striped with stop bars; planting strips are of the appropriate width, acting as a sufficient buffer between pedestrians and motorized vehicles; landscaping in the planting strips is appropriate to the block face and zoning in the area and has supportive irrigation. **No treatment recommended.**

Score 0
Excellent Condition

"1" Minimum Treatment Needed (Good): Sidewalks are of sufficient width to support both pedestrians and disabled individuals; sidewalks and curbs have minor surface damage or cracks but are unbroken and are otherwise in very good condition, needing little to no repair work; all sidewalks meet ADA standards at driveways and intersections; ADA ramps may show some wear, but have the proper slope and design; crosswalks are properly striped with stop bars; planting strips are of the appropriate width, acting as a sufficient buffer between pedestrians and motorized vehicles; landscaping in the planting strip is appropriated to the block face and zoning of the area and has supportive irrigation. **Minimum treatment recommended.**


Score 1
Good Condition

"2" Significant Treatment Needed (Fair): Sidewalks are either too narrow or have moderate damage such as holes, gaps, or large cracks, making travel difficult for both pedestrians and disabled individuals; sidewalks may be raised or lowered at driveways and intersections; utilities may be obstructing the pedestrian right-of-way; curbs are crumbling or have gaps; ADA ramps are of an outdated design or show moderate wear; crosswalk striping is faded or may not include stop bars for motorized vehicles; planting strips are too narrow and do not serve as a sufficient perceived barrier between pedestrians and motorized vehicles; landscaping in planting strip is inappropriate to the block face and zoning of the area or may lack supportive irrigation. **Moderate replacement recommended.**


Score 2
Fair Condition

"3" Maximum Treatment Needed (Poor): Sidewalks are either too narrow or have major damage such as severe surface breaks or missing sections, making travel impossible for both pedestrians and disabled individuals; sidewalks may be raised or lowered at driveways and intersections; utilities may be obstructing the pedestrian right-of-way; curbs are crumbling or have missing sections; ADA ramps are badly damaged, pooling water, or missing altogether; crosswalk striping is completely faded or nonexistent without stop bars for motorized vehicles; planting strips are too narrow and do not serve as a sufficient perceived barrier between pedestrians and motorized vehicles; landscaping in planting strip is inappropriate to the block face and zoning of the area or nonexistent or lacking supportive irrigation. **Complete replacement recommended.**

For the purpose of the existing conditions inventory, the pedestrian and transit elements ranked as Excellent or Good would not be recommended for repair or replacement and are not included in the costing matrix. Elements that are ranked as Fair or Poor would be recommended for moderate or complete replacement and are costed using construction figures from recent Galveston projects and the latest TxDOT unit cost averages. Note that the shared infrastructure elements, such as crosswalks and ramps, were examined by block face and ranked without considering other adjoining block faces. In estimating the recommended streetscape costs, any shared infrastructure in need of replacement was listed separately, so as not to be "double counted."

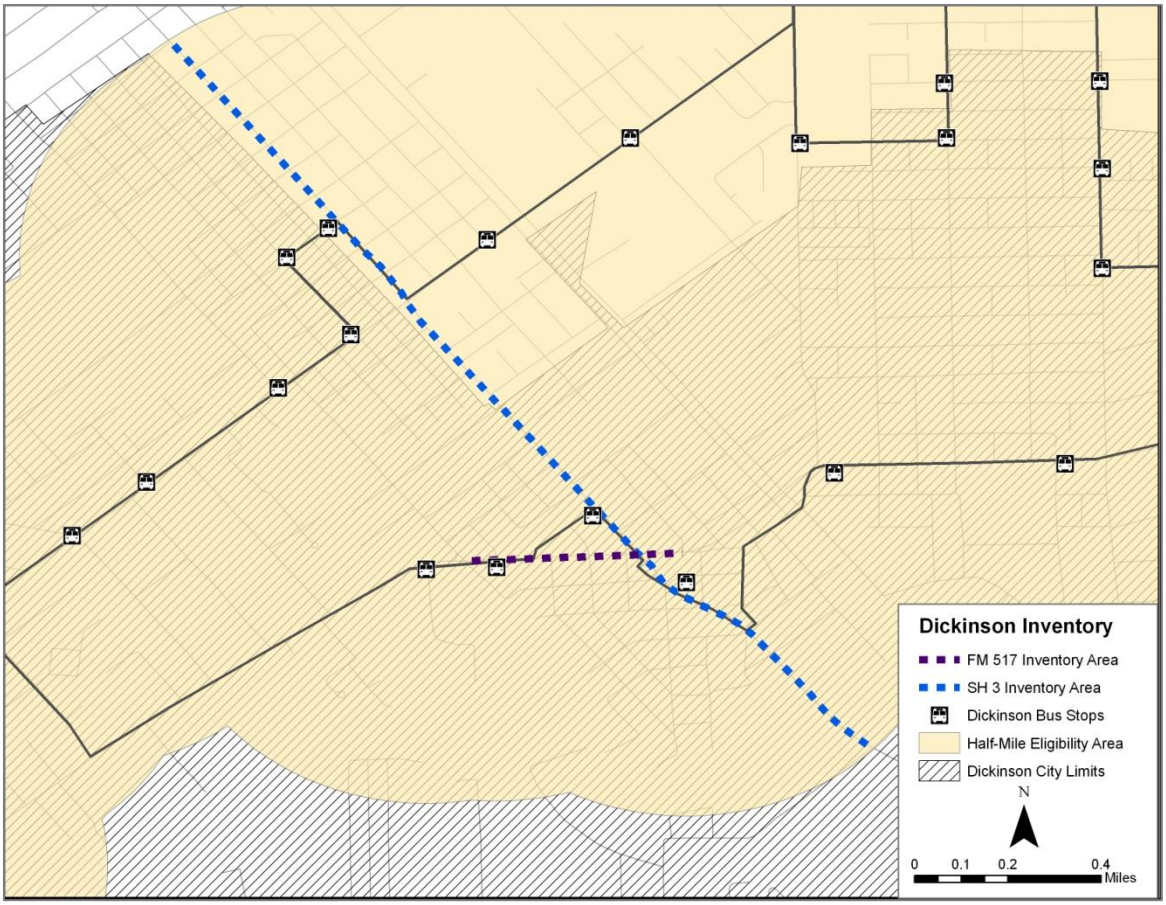
The individual infrastructure scores were totaled and a rating was created for each block face. These scores demonstrate which block faces were in the worst condition and, therefore, would require the most improvements. Chapter 8 presents the cumulative ranking of unimproved block faces, compared to the block face rankings after improvements are implemented, which can result in positive impacts on pedestrian/transit access with a variety of benefits to the surrounding community.

A detailed existing conditions inventory of amenities on each block face is included in *Appendix A* and describes the individual measurements and observations and the general pedestrian experience. Staff conducting the inventory walked each block face and noted their experiences from the perspective of a pedestrian or a person using a wheelchair, walker, or stroller.

STREETSCAPE INVENTORY

The streetscape inventory block faces within the study area showing existing bus stops are presented in *Figure 6.2*. A total of 54 block faces were inventoried. Improvements to pedestrian-related infrastructure, such as sidewalks, ADA-compliant ramps, landscape barriers between pedestrians and streets, and pedestrian-oriented lighting are considered eligible under FTA LCI guidelines as long as the relationship to transit is demonstrated and federal guidelines are met throughout the procurement and construction process.

Figure 6.2 – FM 517 and SH 3 Streetscape Inventory Area



Chapter 8 presents the rankings of each corridor segment based upon the average rankings of the individual infrastructure elements assessed during the existing conditions inventory *(Appendix A)*. Three of the corridor segments are on the same street, but contain distinct inventory attributes.

SH 3 (North of Deats Road from 21st Street) (20 block faces -- 0.70 miles)

SH 3 is a major aterial, traversing north/south through Dickinson. Land use on this section of SH 3 is primarily residential and light commercial, with Dickinson Senior Center located near 28th Street. Most block faces on this corridor segment have the same general conditions, including older sidewalks that are in Good condition; the curb is broken near driveways and other openings; and the planting strip has only grass and is sunken into the ground. Crosswalks are generally in Excellent condition. ADA ramps are evenly split between Good and Fair conditions. Some driveways and ramps are classified in Fair condition due to debris collecting and impeding the pedestrian right-of-way.

Recommendation: Replace failing infrastructure, including ramps and driveways in Fair or Poor condition.

SH 3 (Deats Road to FM 517) (15 block faces -- 0.70 miles)

Deats Road and FM 517 are two of Dickinson's major east-west arterial streets to IH 45. The section of SH 3 between these two major streets had varying conditions from block to block. Planting strips varied between three to five feet in width and were considered Fair on the north end of this corridor segment and Good on the south end. Sidewalks, curbs, and driveways varied in condition, however, were generally in Good condition throughout the block faces. Ramps showed the most variety, ranging from Poor to Good. Crosswalks were generally in Excellent or Good condition.

Recommendation: Replace failing infrastructure, including ramps and driveways in Fair or Poor condition, where needed.

SH 3 (South of FM 517 to Oleander Drive) (10 block faces -- 0.55 miles)

There are fewer pedestrian infrastructure elements on SH 3 south of FM 517. The block face driveways fronting city hall and the public library have Excellent sidewalks and planting strips. The remainder of the corridor segment lacks sidewalks. Some ADA ramps at FM 517 are in Fair condition; however, crosswalks are Poor and the corridor lacks ADA ramps on the segment away from FM 517.

Recommendation: Replace all failing infrastructure or install new infrastructure, including sidewalks and ADA ramps, where needed.

FM 517 (Timber Drive to Liggio Street) (9 block faces - 0.35 miles)

FM 517 is an arterial road traversing west to east through Dickinson. The segment at FM 517 at IH 45 is residential; however, commercial and government uses are in the remaining segment. Sidewalks, driveways, and curbs are in Good condition. Planting strips on these block faces lack landscaping as a barrier between pedestrians and auto traffic. Three block faces on FM 517 near SH 3 lack pedestrian infrastructure, such as sidewalks and planting strips.

Recommendation: Replace all failing infrastructure or install new infrastructure, including sidewalks and ADA ramps, where needed.

EXISTING CONDITIONS AT BUS STOPS

In addition to the streetscape inventory, the conditions surrounding the 40 Dickinson bus stops served by Connect Transit were examined. The bus stops all lack transit infrastructure such as concrete pads, benches, waste receptacles, and bus stop wayfinding signage. Conditions at each bus stop were ranked as Poor. Recommended improvements could include sidewalks, curbs, ADA ramps, concrete pads, benches, and other transit-related infrastructure to better facilitate access to transit.

Figure 6.3 – Example of a Poor Bus Stop with no infrastructure

GENERAL RECOMMENDATIONS

In addition to the corridor and bus stop recommendations, overall recommendations for pedestrian/transit access infrastructure improvements throughout Dickinson would include the following:

- ***Sidewalks*** – The south corridor of SH 3 and the east corridor of FM 517 lacks sidewalks. New sidewalks are needed in areas along the inventory corridors to provide safe pedestrian access to transit.
- ***Landscaping*** – The majority of block faces within the inventory area had just grass in the planting strip area between the roadway and the sidewalk. Enhanced landscaping should be included in the planting strip to provide safer pedestrian access and for beautification purposes.

- ***Pedestrian-oriented Lighting*** – There are few pedestrian lights in the inventory corridors. Pedestrian-oriented lighting should be installed for safe nighttime sidewalk access.
- ***Culverts*** – Culverts are a necessary treatment in areas with large drainage canals that are typically placed where pedestrian and transit infrastructure would be placed, including concrete pads for bus stops and shelters. Culverts are needed at bus stops in residential areas of the inventory area, as well as specific block faces along the main inventory corridors *(Appendix B - Capital Costs*)

Chapter 7 – CAPITAL COSTS

This chapter summarizes the costs of the proposed Dickinson Park & Ride facility as well as the streetscape and bus stop improvements recommended in Chapter 6, along with associated gateway treatments detailed later in this chapter. *Table 7.1* presents the estimated capital costs for the proposed project.

Table 7.1 – Estimated Project Costs	
Component	***Cost***
Dickinson Park & Ride	$1,312,188
LCI Streetscape Improvements	$2,105,640
Bus Stop Improvements	$1,144,236
Gateway Treatments	$230,080
Total	$4,792,144

CAPITAL COSTS FOR DICKINSON PARK & RIDE FACILITY

The proposed Dickinson Park & Ride facility project includes a 201 space surface lot with the potential for shared-use parking, bus and passenger loading area, and a passenger waiting structure with rest rooms, vending/phone area, bus schedules and information, and waste receptacles. *Table 7.2* presents the estimated capital costs components involved in constructing the Dickinson Park & Ride.

Table 7.2 – Estimated Project Costs for Park & Ride		
Corridor/Category	***Line Item Costs***	***Total Cost***
Land Value*		$258,000
Park & Ride Construction		
Surface Lot Construction (201 Spaces at $2,500)	$502,500	
Facility Construction (1,728 Sq. Ft. at $200)	$345,600	
Subtotal	*$848,100*	
PE (2%)	$16,962	
Design (6%)	$50,886	
Construction Administration (3%)	$25,443	
Construction Management (2%)	$16,962	
Subtotal	*$958,353*	
Contingency (10%)	$95,835	
Total		$1,054,188
Total Park & Ride Capital Costs		**$1,312,188**
*Value based on comparable appraisal of park and ride site within Galveston County		

CAPITAL COSTS FOR NEW STREETSCAPE INFRASTRUCTURE

The purpose of conducting an existing conditions inventory is to determine the extent of improvements required for enhanced pedestrian and transit access. The existing infrastructure was inventoried within a series of capture areas, generated around nodes of transit as per FTA LCI parameters. The following sections provide an explanation of the ranking system and detail which pedestrian infrastructure was appropriate for ranking. Recommendations for the replacement of infrastructure ranked Fair or Poor are detailed, with the capital costs necessary to bring the infrastructure to acceptable levels for pedestrian/transit access.

STREETSCAPE DESIGN GUIDELINES

Block faces within a half-mile radius of a bus stop are eligible for pedestrian and transit-related streetscape improvements. ADA guidelines provide for improvements to the pedestrian/transit corridors that include the following:

- Construct or replace, at minimum, 5-foot wide standard concrete sidewalks;
- Construct or replace concrete curbs;
- Replace driveways within the public right-of-way across the sidewalk when there are deficiencies in pavement condition, cross slope, or needs ramps;
- Construct or replace sidewalk ramps at applicable intersections using the minimum standard specifications to comply with ADA requirements;
- Stripe or restripe crosswalks at applicable intersections;
- Install pedestrian-oriented solar-powered street lighting as deemed appropriate by the City;
- Replace or install grass sod and/or overstory trees; and
- Install benches, waste receptacles, and concrete pads at transit stops.

Detailed cost estimates for the LCI streetscape improvements are included in *Appendix B.*

BUS STOP INFRASTRUCTURE GUIDELINES

In addition to block faces being eligible for pedestrian and transit-related improvements, 40 bus stops were identified for improvements within the capture area. Because all 40 bus stops lacked basic transit-related infrastructure, a set formula was used for costing per stop. The following improvement elements are recommended for each bus stop:

- 150 LF of 6’ wide sidewalks
- 150 LF of curbs
- 2 ADA ramps
- 1 pedestrian-oriented light with pole
- 150 LF of 4’ wide planting strip with 5 trees

- 1 bus stop sign
- 1 8'x12' concrete pad
- 2 metal bollards
- 1 bench
- 1 waste receptacle
- 1 bus stop sign
- Culvert construction, if necessary

Detailed cost estimates for bus stop improvements are included in *Appendix B.*

2013 INFRASTRUCTURE CAPITAL COSTS

Table 7.3 presents the unit costs used to calculate the capital costs of the identified LCI streetscape improvements. These costs were derived from recent infrastructure costs provided by the Texas Department of Transportation (TxDOT).

Table 7.3 – Unit Cost Basis for Streetscape Infrastructure Capital Costs

Item	*Unit Cost*	*Unit*
Sidewalks	$4.50	SF
Curb and Gutter	$13.32	LF
Driveway Bibs	$4.50	SF
ADA Ramps	$1,400	EA
Pedestrian-oriented Lighting		
(12' Solar)	$1,465	EA
Stand-Alone Solar Pole (light-kit + pole)	$2,500	EA
Conventional	$2,000	EA
Electrical Conduit	$1.50	LF
Landscaping and Irrigation		
100-Gallon Trees	$640	EA
Tree Grate	$400	EA
65-Gallon Trees	$235	EA
Sod/Ground Cover	$0.18	SF
Planting Soil	$1.50	SF
Irrigation		
Sprinklers A	$35	EA
Sprinklers B	$2.40	EA
Pipe and Wire	$4	LF
Controller/Clock	$5,500	EA
Street Amenities		
Bench	$525	EA
Waste Receptacles	$500	EA
Bus Stop Sign	$350	EA
Concrete Pad (8'x12')	$1,225	EA
Brick Pavers	$10	SF
Bike Rack	$1,000	EA
Bollards	$1,500	EA
*Culverts	Varies	LF
Crosswalks	$200	EA

Demolition		
Demo – Sidewalk	$0.55	SF
Demo – Curb	$1.30	LF
Demo – Driveway	$0.57	SF

RECOMMENDED LCI STREETSCAPE IMPROVEMENT COSTS BY CORRIDOR

Table 7.4 presents the costs for LCI streetscape improvements per corridor using the infrastructure costs in *Table 7.3*. Note that the total includes 20% for design, administration, preliminary engineering, advanced planning, and construction management and oversight. Also included is 10% contingency on overall costs. Detailed costs per block face are included in *Appendix B.*

Table 7.4 – Streetscape Improvements Cost Per Corridor	
Corridor/Category	***Cost***
FM 517	$274,681
SH 3 – North of Deats Road	$462,457
SH 3 – Deats Road to FM 517	$447,788
SH 3 – South of FM 517	$392,057
Total Corridor Costs	$1,576,983
ADA Ramps	$12,600
Crosswalks	$5,600
Subtotal	$1,595,182
Design/Admin/Construction Mgt. (20%)	$319,036
Contingency (10%)	$191,422
Total	**$2,105,640**

BUS STOP IMPROVEMENT COSTS

Based on the bus stop capital improvements, *Table 7.5* presents the total cost of bus stop improvements for facilitating transit access to Connect Transit buses in Dickinson.

Table 7.5 – Bus Stop Improvements Cost	
Category	***Cost***
Improvement Costs for 40 Bus Stops	$866,845
Design/Admin/Construction Mgt. (20%)	$173,369
Contingency (10%)	$104,022
Total	**$1,144,236**

"KEEP DICKINSON BEAUTIFUL" GRANT COSTS

In 2007, Keep Dickinson Beautiful, an organization made up of various community members received a Governor's Community Achievement Award landscaping grant in the amount of $85,000. The funds can be used within the TxDOT right-of-way in Dickinson. The City has opted to use these funds, plus local resources, toward a gateway sign and associated landscaping

on FM 517 at Gum Bayou. The project value, including design/construction costs and contingencies, is estimated at **$230,080** *(Appendix B)*.

TOTAL COST PER ELIGIBLE PEDESTRIAN/TRANSIT INFRASTRUCTURE COMPONENT

Table 7.6 presents the estimated capital cost for the eligible pedestrian/transit access components of the proposed project.

Table 7.6 – Cost per Eligible Pedestrian/Transit Infrastructure Component

Component	***Cost***
Dickinson Park & Ride	$1,312,188
LCI Streetscape Improvements	$2,105,640
Bus Stop Improvements	$1,144,236
Gateway Treatments	$230,080
Total	$4,792,144

Chapter 8 – MOBILITY BENEFITS

The proposed LCI streetscape improvements and park & ride in this master plan can lead to a number of direct mobility benefits for Dickinson. The improved access to transit, bus stops, park & ride, and LCI streetscape improvements can help facilitate enhanced walkability, leading to an increase in both transit ridership and pedestrian activity. This, in turn, would lead to reductions in the following:

- Vehicle-Miles Traveled (VMT)
- Traffic congestion
- Air pollutant emissions
- Fuel consumption

The U.S. DOT's National Infrastructure Investments recent notices of funding availability provide a recommended methodology for evaluating transportation infrastructure projects. The evaluations process examines the fundamental question of whether the expected benefits of the project justify the cost with the understanding that some benefits and costs are difficult to quantify. This chapter presents the DOT-recommended Benefit/Cost Analysis (BCA).

OVERVIEW

In June 2009, DOT, HUD, and EPA formed the PSC or Livability Partnership to establish livability principles while promoting equitable development and environmental stability.[1] These three agencies are poised to help guide and encourage smart growth throughout the nation.

The BCA examines how the project would improve the State of Good Repair (SGR), economic competitiveness, livability, sustainability, and safety. The criteria can be considered a qualified description, quantified analysis, and/or monetized benefit. Each monetized benefit is supplemented with a description of the methodology used to quantify the benefit. *Table 8.1* provides an overview of the BCA.

The various benefits have been studied by a variety of nationally recognized authorities, including the Transit Coordination Research Program (TCRP), Transportation Research Board (TRB), National Research Council, and Governmental Accountability Office, where methods have been developed for predicting and monetizing the ridership benefits associated with these types of improvements. The BCA calculates the monetized benefits that would incur as a result

[1] "HUD-DOT-EPA Interagency Partnership for Sustainable Communities" - http://www.epa.gov/dced/partnership/index.html

of proposed project. Assuming a 40-year useful lifecycle for the improvements, the project can expect a benefit/cost ratio of 1.25-to-1 at a 7% discount and 1.35-to-1 at a 3% discount.

Table 8.1 – BCA Overview

Criteria	*Benefit(s)*	*Description*	*Qualitative Description*	*Quantified Benefit*	*Monetized Benefit*
State of Good Repair	Replacing Infrastructure Savings	Extends lifecycle of existing infrastructure	**X**		
Economic Competitiveness	Job Creation Opportunity	Estimates number of short-term and long-term Employment	**X**	**X**	
	Improved Business Climates	Describes how project will enhance the business climate for affected businesses	**X**		
	Property Value Increase	Outlines how project would enhance surrounding property values	**X**		
Livability	Transit Livability Elements	Targets the six key elements of the Livability Partnership	**X**		
	Context Sensitivity	Creates a sense of place and ensures the comfort and safety of all users of a particular corridor, regardless of transportation	**X**		
	Transportation Linkage	Describes how projects will interface with other modes of transportation	**X**		
	Transit Needs Index	Identifies areas with high transit need	**X**		
	Pedestrian/Transit Access	Estimates increase in transit usage	**X**		
	New Annual Boardings	Increase in transit boardings		**X**	
	Increased Fare Recovery	Increase in farebox revenues from new ridership		**X**	**X**
	Increase in Parking Revenue	Increase in parking revenue from new park & ride		**X**	**X**
Sustainability	NOx Reduction	Reduction in harmful air pollutants and greenhouse gasses due to reduced auto use		**X**	**X**
	VOC Reduction			**X**	**X**
	CO			**X**	
	Fuel Cost Savings	Reduction in fuel consumption due to reduced auto use		**X**	**X**
	Auto Cost	Reduction in average auto cost due to reduced auto uses		**X**	**X**
Safety	Accident Reduction	Reduction in property losses, injuries, and fatalities due to reduced auto use		**X**	**X**
	Crime Prevention Through Environmental Design	Designs infrastructure to reduce fear and incidences of crime	**X**		

STATE OF GOOD REPAIR (SGR)

The proposed project would enhance existing pedestrian infrastructure. Enhancing this infrastructure is difficult to quantify, and, as a result, were omitted from the BCA funding estimates. However, enhancing existing infrastructure is an important benefit of the proposed project. The following provides a qualitative examination of the SGR benefits resulting in the proposed project.

The proposed project would further advance H-GAC's Livable Centers strategy by reflecting the strategies, goals and objectives in the analyses, recommendations, and benefits derived. A primary goal of H-GAC's Livable Centers strategy is to improve access while reducing the need for mobility by Single-Occupancy Vehicles (SOV). The project focused on improving transit service in the area and narrowing the right-of-way (ROW) for vehicles. This would help to encourage pedestrian activity and increase human comfort – shade and safety.

H-GAC defines Livable Centers as safe, convenient, and attractive areas where people can live, work, and play with less reliance on their cars. H-GAC's Livable Centers program is a regional strategy designed to address limited, already congested mobility infrastructure by improving transit access. The EPA classifies Galveston County and other surrounding counties as in severe nonattainment, which means the region has failed to meet emission requirements as far back as 1997. The transportation infrastructure has not kept pace with current demand and will be unable to accommodate future growth due to limited ROW and funding. Consequently, a new direction is needed to improve transit access, enhance quality of life, reduce emissions, and provide more efficient mobility alternatives. The H-GAC Livable Centers address these issues by promoting the creation of walkable areas and mixed use developments that can be easily accessed and are regionally connected.

H-GAC's Livable Centers projects offer a number of benefits in terms of the community, mobility, environment, and economic development. These benefits are directly related to the following regional goals outlined in H-GAC's 2035 RTP:

- Improve mobility, pedestrian circulation and reduce congestion;
- Improve access to jobs, homes, and services;
- Increase transit options;
- Coordinate transportation and land use plans; and
- Create a healthier environment.

The proposed LCI streetscape improvements and park & ride would meet the goals of H-GAC's Livable Centers program.

ECONOMIC COMPETITIVENESS

Dickinson desires to further develop a competitive business climate that includes large businesses, as well as locally owned businesses. Dickinson must resolve several important mobility-related issues, including better visibility of the existing local fixed-route bus service, in order to continue to expand its existing business base. The proposed park & ride site has the potential to spur Transit-Oriented Development (TOD) and could become a catalyst for more business development in the area.

Job Creation Opportunity

The proposed project would generate economic impacts and create jobs. These economic impacts are quantified according to DOT guidelines for short- and long-term impacts, as follows:

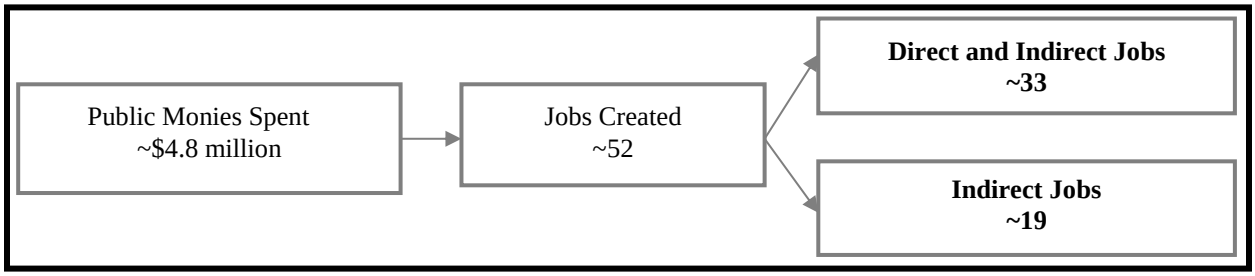
- ***Short-term jobs*** created during construction of the project.
- ***Long-term jobs*** created and expenditures made as a result of the operations and maintenance of the project. There typically are three distinct effects, direct, indirect, and induced, during the analysis of economic impact. The total economic impact is the sum of the direct, indirect, and induced effects. These effects are defined as follows:
    - **Direct effect** represents the initial expenditures (e.g., construction expenditures) received by businesses located in the study area.
    - **Indirect effect** represents the impact of the additional "business spending" generated as these businesses sell more output and, in turn, purchase additional inputs from their suppliers (e.g., machinery manufacturers).
- **Induced effect** represents the increase in economic activity, over and above the direct and indirect effects, associated with the increased labor income that accrue to workers and is spent on household goods and services purchased from area businesses.

Short-Term Jobs

This methodology used was developed by White House Council of Economic Advisers (CEA) for estimating jobs for the American Recovery and Reinvestment Act (ARRA) of 2009.[2] The method applies a value of one job-year per $92,000 expenditures. For every $92,000 spent, 64% of the job-years represent direct and indirect effects and 36% of the job-years are induced effects. *Chart 8.1* presents the total short-term jobs created from the proposed project.

[2] Executive Office of the President, Council of Economic Advisers, "Estimates of Job Creation from the American Recovery and Reinvestment Act of 2009," Washington, D.C., 5.11.09. Pg. 7

Chart 8.1 – Total Short-Term Job Creation



Long-Term Jobs

Long-term employment benefits were calculated to measure the job-creation impact of ongoing maintenance and operation needs for the proposed park & ride and associated LCI pedestrian improvements. *Table 8.2* presents the calculation of the number of long-term jobs created by the proposed project. Benefits were estimated using an annual cost factor for operations and maintenance and an average hourly wage.

- Operations and Maintenance (O&M) costs were estimated using the number of spaces at the park & ride (201 spaces) times an annual cost factor of $200 per space.[3]
- The Bureau of Labor Statistics set the 2009 average hourly wage for maintenance, cleaning, and grounds keeping for the Houston-Baytown-Huntsville region at $9.72.[4]

Table 8.2 – Long-Term Job Creation	
Annual O&M Cost	$40,200
Average Hourly Wage for Maintenance-Level Work	$9.72
Benefit Percentage	35%
Wage and Benefit Rate	$13.12
Calculation of Hours Worked ($316,000 / $13.12)	3,064 hours
Annual Full-Time Equivalent	2,080 hours
Number of FTEs Created	**1.47 FTEs**

[3] Victoria Policy Transport Institute. *Parking Management Comprehensive Implementation Guide. Pg. 18*. www.vpti.org
[4] Bureau of Labor Statistics, http://www.bls.gov/ncs/ocs/sp/ncbl1561.txt. Accessed 10.14.11.

Improved Business Climate

A report by the American Public Transportation Association (APTA) supports the principle that investment in transit infrastructure yields benefits from increased property and sales tax. The report, *The Benefits of Public Transportation: Building Investment Value in Our Economy and Marketplace,* studied not only the large urban markets like Portland, Oregon, and Dallas, Texas, but smaller markets, like Corpus Christi, Texas, and Tampa, Florida, such as the following:

- ***Corpus Christi, Texas:*** Investment in the Regional Transportation Authority's Six Point Station has spurred occupancy in empty store fronts and development of new high-quality retail and business services in an economically diverse neighborhood. Commercial property valuations have risen from $5 million to $8 million.
- ***Tampa, Florida:*** The HARTline bus system coordinated development of its new University Area Transit Center in a chronically depressed neighborhood with development of a nearby community center and renovation of a major mall. The result was over $75 million of development near the transit center, higher land values and increased tax revenue to the area.[5]

Results from these cities and others are promising. On average, property values that are within a five-minute to ten-minute walk from high-quality transit infrastructure developments are being valued for 20% to 25% more than comparable properties farther away. However, the mix of elements that fueled these successes encompasses more than just transit and it is this subtle formula that must be tailored to each specific context.

The proposed project would create a safe, convenient, walkable, and state-of-the-art transportation infrastructure that will help connect transit to major residential areas, essential services, and jobs. Enhancing transportation infrastructure in the Dickinson area would result in building a strong business climate.

LIVABILITY

In 2009, the EPA, HUD, and DOT joined to create the PSC to develop more affordable housing, to increase available and affordable transportation options and to help reduce emissions and environmental impacts. The City has an opportunity to leverage this focus on smart development to improve its overall livability, provide better transit connectivity, develop more inviting streets, and create a sense of place along a main corridor in Dickinson.

The Livability Partnership has adopted six principles[6] to guide its mission, as follows:

[5] APTA, The Benefit of Public Transportation: Building Investment Value in Our Economy and Marketplace. www.apta.org. Accessed 9.8.05.
[6] http://www.sustainablecommunities.gov/

- Provide more transportation choices
- Promote equitable, affordable housing
- Enhance economic competitiveness
- Support existing communities
- Coordinate and leverage federal policies and investment
- Value communities and neighborhoods

Transit Livability Elements

PSC emphasizes the importance of multiple transportation choices – whether that is bus, biking, walking, or rail. The FTA has created the following key transit elements which are encouraged under the FTA's participation in the Livability Partnership.

- ***Transit-Oriented Development:*** TOD aims to develop mixed-use high density communities that are oriented near transit facilities. By design, TOD encourages pedestrian and bicycle activity and supports a high level of transit use. The proposed park & ride has the potential to spur TOD and could become a catalyst for more business development in the area.
- ***Joint Development:*** Where transit facilities are to be constructed, project stakeholders may have an opportunity to construct space for other transit-compatible uses. The capital cost to construct space for compatible uses can be funded, in part, with federal funding administered by the FTA.
- ***Intercity Bus:*** The intercity bus connects rural areas with larger regional transit systems and/or national transit system. Intercity bus services are essential for non-urbanized residents to connect with essential services, such as specialized healthcare facilities. The proposed park & ride could accommodate intercity bus carriers.
- ***Transit Enhancements:*** Areas within a half-mile a transit terminal or bus stop are eligible for FTA funding for Transit Enhancements (TE). Eligible improvements include repair and/or construction of sidewalks, curbs, ramps, driveways, and crosswalks. Landscaping and installation of street amenities, such as bus shelters, pedestrian-oriented lighting, benches, bike racks, and waste receptacles, also are eligible for funding. The project would include pedestrian enhancements that would create a safe, inviting environment for pedestrian access along major corridors in Dickinson.
- ***Bicycle and Pedestrian Enhancements:*** Much like the TE policies, FTA provides funding for bicycle enhancements (e.g., bike racks and lockers); however, the eligible area has increased to three miles from a transit stop or terminal. The proposed project would enhance transit access by providing bicycle infrastructure at the proposed park & ride.

- ***Art in Transit:*** This element supports the design and placement of art in and/or near transit facilities. The FTA encourages the participation of local community ideas for the art. The proposed park & ride would most likely include art in the design to enhance the visual aesthetics of the park & ride.

The proposed project would help meet most of the principles outlined in the Livability Partnership with the addition of the proposed park & ride, pedestrian streetscape and other related improvements, and leveraging local dollars. The proposed project will focus on key transit elements outlined by the FTA, which include transit improvements, and pedestrian and bicyclist enhancements. A major goal of the proposed project is to increase livability and walkability for residents and visitors.

Context Sensitivity

Street design should be appropriate to its context (rural, rustic, urban, and suburban), the relationship with buildings, adjoining uses, and open spaces, as well as other considerations. As development becomes denser, context will become more important since the potential conflicts between different uses and building forms may become more intense and require better design solutions. A deeper understanding of the context helps identify when it is appropriate to blend in with the surroundings or when to stand out.

The proposed project, if successfully implemented, would reflect design excellence. It would add to the identity, durability, connectivity, and walkability of Dickinson. For example, pedestrian-oriented lighting and appropriate landscaping would increase overall safety of pedestrians and define the local character through the use of context-appropriate materials.

Dickinson has its own identity, and as a result, context sensitivity is important in relation to the improvements. The Institute of Transportation Engineers (ITE) report, *Recommended Practice, Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, set guidelines for pedestrian design. The principle of context sensitivity supports urban design that ensures the comfort and safety of all users of a particular corridor, regardless of transportation mode (i.e., automobile, bicycle, or walking).

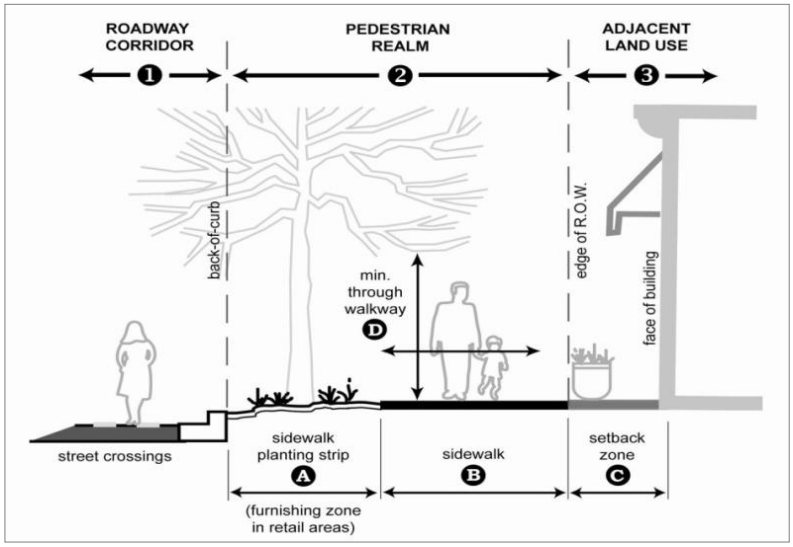


Figure 8.1 – Context Sensitivity

As shown in *Figure 8.1*, the area between the curb and the buildings has several zones. These zones include areas for landscaping and/or street furniture, sidewalks, and setbacks between the edge of the public right-of-way and the face of the building, which property owners may use as they want. Ideally, the sidewalk would be wide enough to ensure maximum comfort for pedestrians. Adjustments to the zones can be made as needed, such as foregoing curbside landscaping in order to accommodate on-street parking.

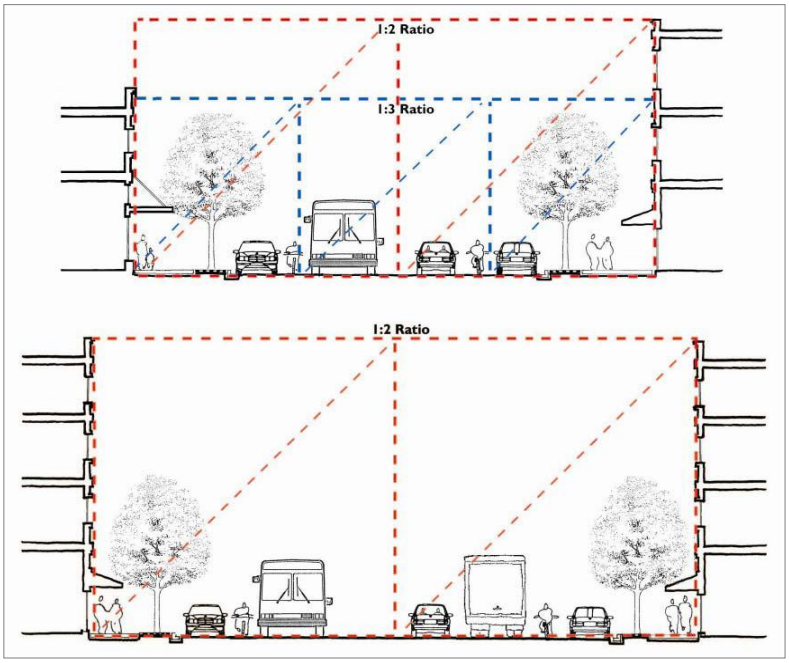


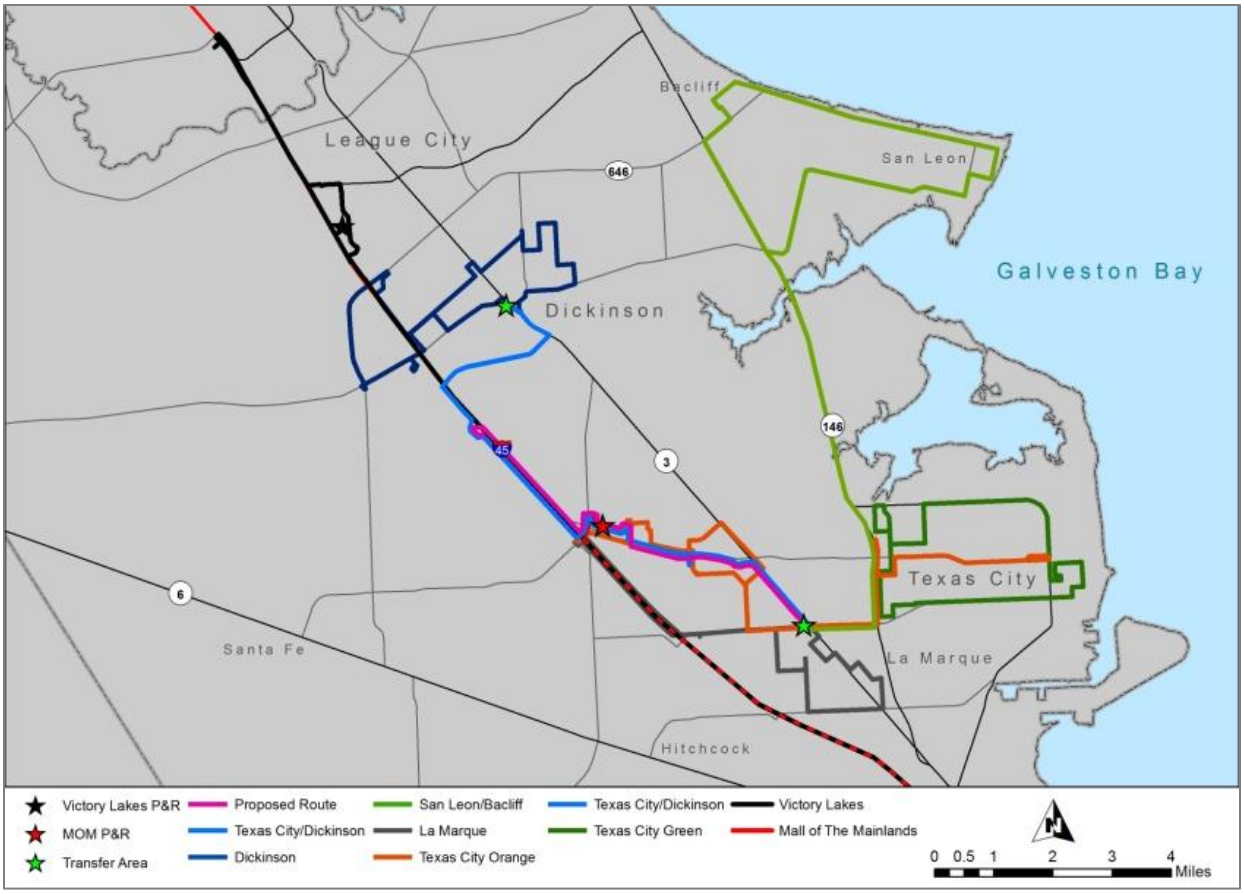
Figure 8.2 – Height-to-Width Ratios

Another important factor in context sensitivity is building scale in relation to the street. *Figure 8.2* illustrates building height-to-street width ratios of 1:2 and 1:3. These ratios create a "human" scale on the street that fosters a comfortable environment and encourages walking. Where feasible, the proposed project will adhere to the recommended height-to-width ratios.

Transportation Linkage

The park & ride site was selected to create a program that would link the commuter routes to regional transit systems. Linking transportation facilities would allow thousands of resident's access to public transportation throughout the entire region. *Figure 8.3* presents the different systems the commuter route will connect.

Figure 8.3 – Regional Transportation Linkages



Transit Needs Index

The Transit Needs Index (TNI) is a tool to assess an area's transit need created with 2010 US Census data.[7] It relies on a weighting of demographic data to formulate a score for the relative need of transit. To calculate the TNI scores for Dickinson, data for population density, median household income, minority population, zero car households, senior population, and instances of disability were collected. Each of these factors then was weighted relative to the transit need in the state of Texas *(Table 8.3)*.

Table 8.3 – TNI Weights	
Factor	***Weights***
Population Density	1.00
Median Household Income	2.50
Minority Population	1.00
Zero Car Households	1.50
Senior Population	2.00
Workforce Disability	2.00

Higher population density is favorable for higher development of transit service. Density is not the sole determinant, but it is a critical factor in considering transit feasibility. Individuals and families with lower incomes (particularly those living below the poverty level) tend to have a higher demand for transit services. Households with higher median incomes typically will have transportation options, including the use of a personal vehicle. Median income of households shows the number of individuals in a household that live below the poverty line as determined by the U.S. Census Bureau *(Table 8.4)*.

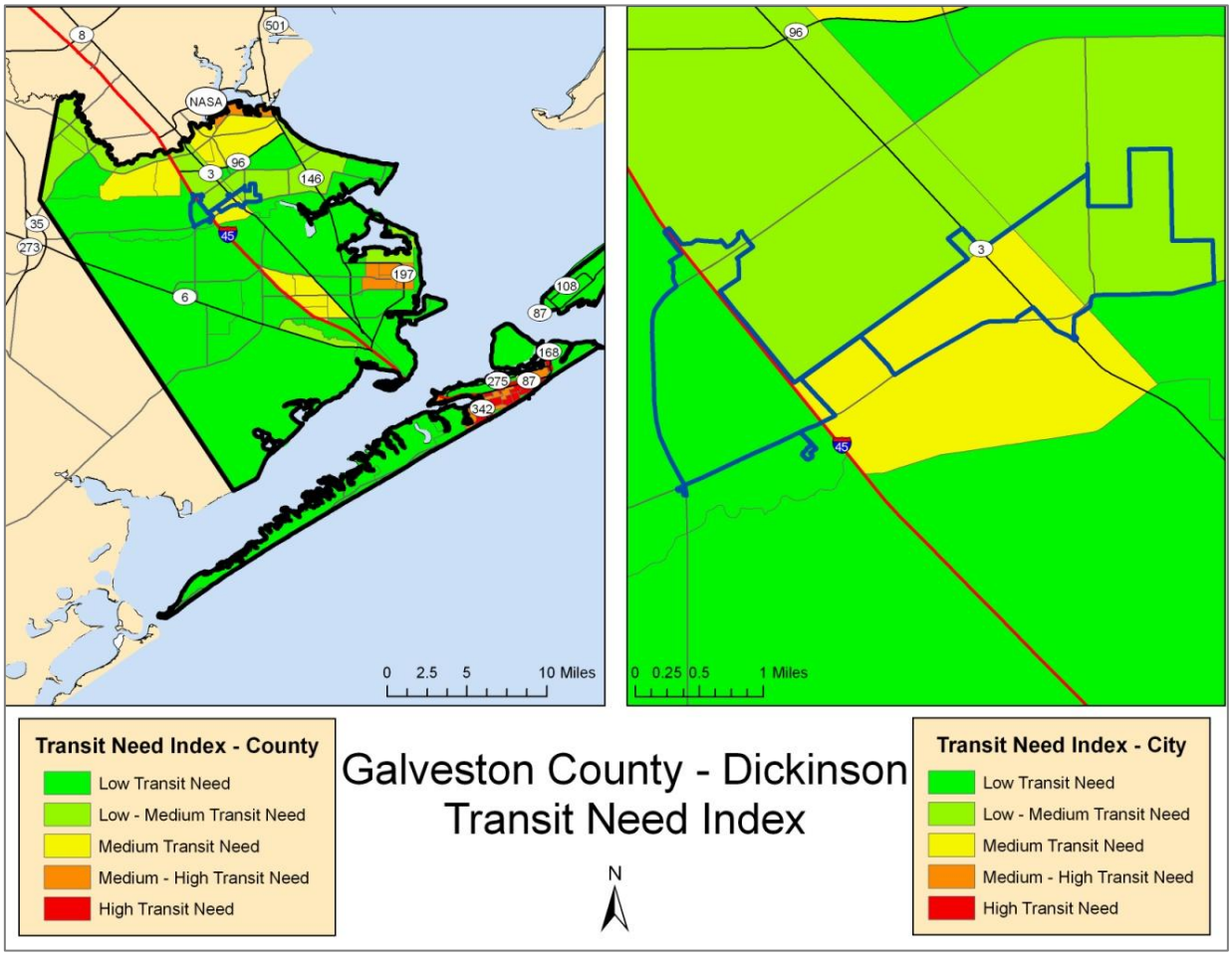
Table 8.4 – 2012 Poverty Guidelines for the 48 Contiguous States and the District of Columbia[8]	
Persons in household	***Poverty guideline***
1	$11,170
2	15,130
3	19,090
4	23,050
5	27,010
6	30,970
7	34,930
8	38,890
For families/households with more than 8 persons, add $3,960 for each additional person.	

Like population density, the percentage of minority and elderly populations can be used to gauge transit demand in an area. The presence of high minority and senior populations nationally has been positively correlated with demand for transit to access to workplaces, health and human service facilities, and other facilities. Automobile availability is a direct measure of transportation resources, and those without a car must find transportation alternatives.

[7] "2010 ACS and 2010 American Decennial Survey." *American FactFinder*. US Census Bureau, n.d. Web. 7.31.12. <http://factfinder2.census.gov/>.
[8] "2012 HHS Poverty Guidelines." *2012 HHS Poverty Guidelines*. U.S. Department of Health & Human Services, 2.9.12. Web. 7.31.12. <http://aspe.hhs.gov/poverty/12poverty.shtml>.

Individuals that are disabled are sometime dependent of alternative modes of transportation, including demand response services through regional transit agencies.

Figure 8.4 – Galveston County and Dickinson TNI



The Dickinson Market Area TNI results indicate that the area has as medium transit need relative to the State of Texas. Transit need in these census tracts is generated primarily by higher percentage of minorities, a higher number of households with no automobile access and living below the poverty level. These individuals typically rely on costly demand-response services. Reducing the dependency on demand-response service would result in greater cost efficiencies and effectiveness.

Pedestrian/Transit Access

Knowing the existing conditions of the pedestrian infrastructure and the Bus Level of Service (BLOS) is important in selecting priority projects, both pedestrian and transit, however the relationship between the pedestrian infrastructure and the BLOS, directly affect ridership and

environmental benefits. A report prepared for the TCRP, TRB, and National Research Council, in association with the Texas Transportation Institute (TTI), states the following: [9]

> *The passenger point of view, or quality of service, directly measures passengers' perception of the availability, comfort, and convenience of transit service. There are a number of factors that measure pedestrian and transit quality of service:*
>
> - *Service coverage (near one's origin and destination)*
> - *Pedestrian environment*
> - *Scheduling: Frequency of service*
> - *Amenities*
> - *Transit information*
> - *Transfers*
> - *Total trip time*
> - *Cost*
> - *Safety and security*
> - *Passenger loads*
> - *Appearance and comfort*
> - *Reliability*

Of the factors listed above, the following items address pedestrian quality of service.

- ***Pedestrian Environment*** – Even if a transit stop is located within a reasonable walking distance of one's origin and destination, the areas around the transit stops must provide a comfortable walking environment for transit users. The proposed project would enhance the pedestrian environment surrounding the project area.
- ***Amenities*** – The amenities that are provided within the walking distance of transit stops and stations help make transit more comfortable and convenient for transit users. Typical amenities include benches, shelters, informational signing, and waste receptacles. Amenities that will be beneficial to pedestrians will be included.
- ***Safety and Security*** – Passenger perception of safety must be considered in addition to actual conditions. Transit corridors and stops must be well lit. Planting strips and/or on-street parking can provide barriers between pedestrians and vehicles. Development of the proposed park & ride would apply a multidisciplinary approach to deterring criminal behavior through environmental design, which is also known as Crime Prevention Through Environmental Design (CPTED), as well as other best practices.

[9] *Transit Capacity and Quality of Service Manual,* Kittelson and Associates, Inc.

- ***Appearance and Comfort*** – Having aesthetically pleasing and comfortable transit stops with amenities, pedestrian lighting, and landscaping improves transit's image, especially important when trying to attract choice riders, who are riders that choose not to drive. The proposed park & ride and the pedestrian improvements will include amenities such as pedestrian-oriented lighting, landscaping, ADA-compliant ramps, benches, and bike racks.

The relationship between an improved pedestrian environment and its contribution to a better transit service and increased ridership has been documented in several studies nationwide. The most recent research is included in the 2009 *Quality and Level of Service Handbook*, prepared by the Florida Department of Transportation (FDOT). The handbook addresses the relationship between the pedestrian environment, which is measured in PLOS, and the bus service performance, which is measured in BLOS. The handbook presents evidence of a positive relationship between the quality of the pedestrian environment and the quality of the bus service.

Six general infrastructure elements were ranked during the inventory. Up to four ADA-compliant ramps and crosswalks could be ranked per block face, meaning a total of 14 individual elements could be ranked. Each element of the existing pedestrian infrastructure was given a ranking and summed per block face PLOS outline in Chapter 6. Each individual infrastructure element was totaled to represent the overall block face PLOS versus an estimated PLOS after the recommended improvements are implemented *(Appendix A)*. In a few instances, the block faces are already at an acceptable LOS for pedestrians and cannot achieve a post-improvement grade of A.

Table 8.5 lists the conversion table from cumulative individual infrastructure rankings to PLOS per block face, depending on the number of total applicable infrastructure items used in the rankings. The appropriate column was used depending on the number of inventory elements used in the ranking.

Table 8.5 – PLOS Ranking Scale Modifications

PLOS	***Full Infrastructure Treatment***	***Removed Inventory Element (-1 to -2)***	***Removed Inventory Element (-3 to -4)***	***Removed Inventory Element (-5 to -6)***	***Removed Inventory Element (-7 to -8)***	***Removed Inventory Element (-9 to -10)***
	Total Rank	***Total Rank***	***Total Rank***	***Total Rank***	***Total Rank***	***Total Rank***
A	0 to 6	0 to 6	0 to 5	0 to 4	0 to 3	0 to 2
B	8 to 14	7 to 12	6 to 10	5 to 8	4 to 6	3 to 4
C	15 to 21	13 to 18	11 to 15	9 to 12	7 to 9	5 to 6
D	22 to 28	19 to 23	16 to 20	13 to 16	10 to 12	7 to 8
E	29 to 35	24 to 30	21 to 25	17 to 20	13 to 15	9 to 10
F	36 to 42	31 to 36	26 to 30	21 to 24	16 to 18	11 to 12

Utilizing the applicable ranking scales in *Table 8.5*, PLOS rankings were created for "before" and "after" the recommended improvements. The full listing of PLOS rankings for all block faces in the inventory is included in *Appendix A*. *Table 8.6* presents the "before" PLOS rankings.

Table 8.6 – "Before" PLOS By Corridor	
Corridor	***Average PLOS***
SH 3 (North of Deats Road)	B
SH 3 (Deats Road to FM 517)	C
SH 3 (South of FM 517)	D
FM 517	C

Pedestrian infrastructure improvements leads to fewer automobile trips in two ways: increased transit ridership and increased pedestrian activity. All corridors will be improved to an "A" average PLOS.

Increased Transit Ridership – Every transit user starts and/or ends his/her trip as a pedestrian. Therefore, streetscape improvements, including improvements to bus stops, make access to transit easier, resulting in higher transit ridership as some drivers will choose to use transit instead of driving. *Table 8.7* presents the relationship between PLOS and BLOS.

Table 8.7 – Bus Ridership Adjustment Factors Based on PLOS	
PLOS	***BLOS Adjustment Factor***
A	1.15
B	1.10
C	1.05
D	1.00
E	0.80
F	0.55

The difference between a PLOS A (1.15) and a PLOS B (1.10), as presented in *Table 8.8*, is a BLOS adjustment of 5%. This 5% increase in BLOS translates directly to a 5% increase in transit ridership. The expected ridership increases for each possible PLOS change are similarly calculated.

The expected increase in ridership in Dickinson was calculated using the delta of the before and after PLOS rankings, along with the ridership data provided by Connect Transit. The annual unlinked passenger trips (UPT) in Dickinson is approximately 9,035. Using this methodology, the improvements to bus stops and streetscaping would add 4,940 UPT annually (or 19 UPT a weekday) by improving the PLOS and making transit easier to access in the inventory areas. This represents a 55% increase in transit ridership in Dickinson, due to the improved pedestrian realm.

The daily new ridership can be converted into reduced automobile trips by assuming a vehicle occupancy factor of 1.25 persons per vehicle (PPV). The new daily added trips are converted to

an average of 7.6 daily vehicle trips removed ((19 UPT/2 trips per passenger))/1.25 PPV). According to FTA's National Transit Database (NTD), the average vehicle trip length in the region is 5.2 miles. For the average of 7.6 daily vehicle trips removed, this equates to a daily reduction of 39.5 VMT.

Table 8.8 – VMT and Cold Start Reductions from New Transit Trips (Daily)	
Average Reduced Vehicles	7.6
Average Cold Starts	15.2
Average VMT	39.5

Increased Pedestrian Activity – The second way in which streetscape improvements lead to fewer automobile trips is by facilitating increased pedestrian activity. A high-quality pedestrian realm makes walking more feasible and appealing than it would be without the improvements. Proactive measures to facilitate pedestrian activity can result in a one-for-one replacement of auto trips of one-quarter mile or less with a pedestrian trip. Some longer auto trips also may be replaced, if good pedestrian infrastructure brings desirable destination within reach, eliminating the need to drive to a location much farther away.

An acceptable equation for emission benefits from improved bike and pedestrian facilities outlined in the *Texas Guide to Accepted Mobile Source Emission Reduction Strategies* takes into account the following factors:

- Annual Average Daily Traffic (AADT)
  - Source – TxDOT[10]
- Percent Mode Shift (PMS) from Driving to Bike/Pedestrian
  - Source – Texas Guide to Accepted Mobile Source Emission Reduction Strategies (0.004) [11]
- Length of Facility
  - Length of segments (0.25 miles)

The recommended formula is as follows:

AADT * PMS = Daily Reduced Automobile Trips

[10] TxDOT, "2010 Houston District Transit Map". http://ftp.dot.state.tx.us/pub/txdot-info/tpp/traffic_counts/2010/hou_base.pdf
[11] TxDOT, "The Texas Guide to Accepted Mobile Source Emission Reduction Strategies". 8.1.07. http://moser.tamu.edu/docs/Texas.Guide.to.Accepted.Mobile.Source.Emission.Reduction.Strategies_8.1.07.pdf

Along the major corridors in Dickinson for which improvements will occur, the existing average daily traffic count is 13,850 vehicles. Using the methodology described above, as a result of the proposed streetscape improvements, traffic has been forecast to decrease by 55 vehicles over each 24-hour period. Since PLOS improvements can spur the replacement auto trips of one-quarter or less with a pedestrian trip, a reduction of 55 vehicles each making a quarter-mile trip represents a daily VMT reduction of 13.85 miles. Each vehicle trip removed also corresponds to the removal of two cold starts. The VMT and cold starts reductions that result from increased pedestrian activity are summarized in *Table 8.9*.

Table 8.9 – VMT and Cold Start Reductions from Increased Pedestrian Activity (Daily)	
Average Reduced Vehicles	55
Average Cold Starts	110
Average VMT	13.85

Annual Boardings and Farebox Revenue

Farebox recovery is one of the most important incomes for a transit provider. The farebox can be used to enhance operations, purchase capital equipment, or leverage federal funding. Projects that increase the annual farebox revenue also will enhance the financial capacity of transit systems. The proposed project is expected to increase annual unlinked passenger trips by 130,650. Assuming the park & ride trips are $4 per trip and the circulator is free, the annual net increase in fares totals $522,600.

Annual Increase in Farebox Revenue = $522,600

Parking Revenues

Parking constitutes a portion of income and is a financial benefit of the proposed terminal. Due to financial and capacity constraints, a first phase total of 201 spaces would be developed at this time using limited funding. The cost of transit parking would be $1 per day. The estimated annual increase in parking revenues would total $52,260.

Annual Increase in Parking Revenues = $52,260

SUSTAINABILITY

The EPA has classified the Houston-Galveston-Brazoria area in severe nonattainment of the 8-hour ozone standard. In other words, the Houston-Galveston-Brazoria air quality does not meet federal air quality standards. This investment in transit infrastructure would produce

environmental benefits due to decreased automobile use, which will reduce air pollutants, VMT, and traffic congestion, which is important to the region's future growth.

H-GAC models the following harmful air pollutants: nitrogen oxides (NOx), volatile organic compounds (VOC), carbon monoxide (CO). In addition to a reduction in harmful air pollutants, the proposed facility would result in reduced fuel usage and lower automobile costs.

Reduced VMT and Emission Reductions

The enhanced streetscape and development of the proposed park & ride would result in reduction of harmful air pollutants and VMT.

Table 8.10 – Total VMT and Cold Start Reductions from Increased Transit Ridership and Pedestrian Activity

Benefit	Daily	Annual	Annual Cold Starts
Increased Local Transit Ridership	39.5	10,275	1,976
Annual VMT (Transit)	13.8	5,019	20,075
Total	**53.5**	**15,294**	**22,051**

The combined reduced VMT and cold starts from increased transit ridership and increased pedestrian activity are presented in *Table 8.10*. Connect Transit's annual VMT reduction is based on the Monday-through-Friday schedule it currently operates. Estimates of the emission benefits due to increased transit ridership and increased pedestrian activity are the calculated reductions in VMT and cold starts. Using 2011 emission factors provided by H-GAC for the service, *Tables 8.11 to 8.13* present the calculations for emission reductions.

Table 8.11 – Emission Reductions – New Transit Riders

Emission	*Vehicle Emission Factors[(1)] (Grams/Mile)*	*Distance (Miles/Trip)*	*Vehicles Removed Daily*	*Service Days Per Year*	*Annual Grams*	*Annual Tons*
NOx	0.476	5.2	7.6	260	4,891	0.01
VOC	0.569				5,851	0.01
CO	4.571				46,969	0.05

[(1)] Source of emission factors: 2011 H-GAC/EPA. Weighted vehicle average (70% LDGV, 20% LDGT 1-4, 5% LDDV, and 5% LDDT 12) 100% arterial travel at 25 mph. (6 a.m. – 8 p.m. Average)

Table 8.12 – Emission Reductions – Increased Pedestrian Activity

Emission	*Vehicle Emission Factors[(1)] (Grams/Mile)*	*Distance (Miles/Trip)*	*Reduced Vehicle Trips[(2)]*	*Service Days Per Year*	*Annual Grams*	*Annual Tons*
NOx	0.476	0.25	55	365	2,389	0.003
VOC	0.569				2,858	0.003
CO	4.571				22,941	0.025

[(1)] Source of emission factors: 2011 H-GAC/EPA. Weighted vehicle average (70% LDGV, 20% LDGT 1-4, 5% LDDV, and 5% LDDT 12) 100% arterial travel at 25 mph. (6 a.m. – 8 p.m. Average)
[(2)] Vehicle trips x 2.

Table 8.13 – Annual Cold Start Emissions						
Emission	***Vehicle Emission Factors[(1)] Per Cold Start***	***Increased Transit Cold Starts Reduced[(2)]***	***Reduced Pedestrian Activity Cold Starts[(2)]***	***Cold Starts Reduced***	***Annual Grams***	***Annual Tons***
NOx	0.078	1,976	20,075	22,051	3,266	0.004
VOC	0.239				10,053	0.011
CO	1.431				60,288	0.066
[(1)] Source of emission factors: 2011 H-GAC/EPA. Weighted vehicle average (70% LDGV, 20% LDGT 1-4, 5% LDDV, and 5% LDDT 12) 100% arterial travel at 25 mph. (6 a.m. – 8 p.m. Average) [(2)] Vehicles removed * 260 annual service days [(3)] Vehicles removed * 365 annual days						

Table 8.14 combines the emission reductions from both increased transit and pedestrian.

Table 8.14 – Emission Benefits from Reduced Emissions				
Emission	***Transit (tons)***	***Pedestrian (tons)***	***Cold Start (tons)***	***Annual Benefit***
NOx	0.005	0.003	0.004	0.012
VOC	0.006	0.003	0.011	0.021
CO	0.052	0.025	0.066	0.144
Total	**0.064**	**0.031**	**0.081**	**0.176**

Commuter service VMT Reduction

A new daily commuter service from the proposed park & ride to downtown Houston and Galveston would attract 251 new riders, approximately 188 downtown Houston and 63 to Galveston. The new ridership for the commuter service can be converted into reduced automobile trips by assuming a vehicle occupancy factor of 1.25 PPV. The proposed park & ride would accommodate 201 vehicles that would otherwise drive from the park & ride to either downtown Houston (150) or Galveston (51). The daily VMT for the commuter service was calculated by multiplying the parking demand by the miles that would otherwise have been traveled in an auto.

The result is an estimated reduction of 12,732 daily VMT or an annual reduction of 3.3 million VMT (daily VMT * 260 annual operating days). *Table 8.15* presents the estimated new daily Unlinked Passenger Trips (UPT) for each component and the gross daily and annual reduction in VMT.

Table 8.15 – Reduced VMT in Year 1					
Destination	***UPT****	***Reduced Vehicle Trips***	***Miles to Destination***	***Daily VMT Reduced***	***VMT Reduced***
Downtown Houston	375	300	37	11,100	2,886,000
Galveston	128	102	16	1,632	424,320
Total	**458**	**366**		**12,732**	**3,310,320**
UPT = Unlinked Passenger Trip.					

The increased transit demand would require additional bus service. The increase in bus service results in an increase in VMT. The daily VMT for the increased bus service is calculated by multiplying the number of new bus trips originating from the proposed park & ride by the miles that each bus will travel *(Table 8.16). Table 8.17* presents the annual reduced VMT, the increased VMT caused by an increase in transit service, and the estimated net reduction in VMT.

Table 8.16 – Increased Bus VMT in Year 1

Destination	*Number of Buses*	*Route Miles*	*Daily VMT Increase*	*VMT Increased*
Downtown Houston	6	74	444	115,440
Galveston	2	32	64	16,640
Total	**10**		**656**	**170,560**

Table 8.17 – VMT Changes in Year 1

Category	*VMT*
Auto VMT Reduced	3,310,320
Bus VMT Added by New Service to Downtown Houston	115,440
Bus VMT Added by New Service to Galveston	16,640
Total	**3,178,240**

Using 2011 emission factors provided by H-GAC, *Tables 8.18 through 8.22* present the calculations for emission reductions.

Table 8.18 – Vehicle Emission Reductions in Corridor between Dickinson and Downtown Houston

Emission	*Vehicle Emission Factors[(1)] (Grams/Mile)*	*Distance (Miles/Trip)*	*Vehicles Removed Daily*	*Service Days Per Year*	*Annual Grams*	*Annual Tons*
NOx	0.45	37	300	260	1,300,921	1.434
VOC	0.42				1,215,220	1.340
CO	4.82				13,912,072	15.335

[(1)] Source of emission factors: 2011 H-GAC/EPA. Weighted vehicle average (70% LDGV, 20% LDGT 1-4, 5% LDDV, and 5% LDDT 12) 10% arterial travel at 25 mph and 90% freeway travel at 45 mph. (peak-period average).

Table 8.19 – Vehicle Emission Reductions in Corridor between Dickinson and Galveston

Emission	*Vehicle Emission Factors[(1)] (Grams/Mile)*	*Distance (Miles/Trip)*	*Vehicles Removed Daily*	*Service Days Per Year*	*Annual Grams*	*Annual Tons*
NOx	0.452	16	102	260	191,929	0.212
VOC	0.580				246,247	0.271
CO	4.787				2,031,369	2.239

[(1)] Source of emission factors: 2011 H-GAC/EPA. Weighted vehicle average (70% LDGV, 20% LDGT 1-4, 5% LDDV, and 5% LDDT 12) 10% arterial travel at 25 mph and 90% freeway travel at 45 mph. (peak-period average).

Table 8.20– Annual Cold Start Emissions – Park and Ride						
Emission	***Vehicle Emission Factors[(1)] Per Cold Start***	***Service to CBD Cold Starts Reduced[(2)]***	***Service to Galveston Cold Starts Reduced [(2)]***	***Cold Starts Reduced***	***Annual Grams***	***Annual Tons***
NOx	0.078	78,000	26,520	104,520	8,103	0.009
VOC	0.239				24,943	0.027
CO	1.431				149,582	0.165
[(1)] Source of emission factors: 2011 H-GAC/EPA. Weighted vehicle average (70% LDGV, 20% LDGT 1-4, 5% LDDV, and 5% LDDT 12) 100% arterial travel at 25 mph. (6 a.m. – 8 p.m. Average) [(2)] Vehicles removed * 260 annual service days [(3)] Vehicles removed * 260 annual service days						

Table 8.21 – Bus Addition to Downtown Houston						
Emission	***Bus Emission Factors[(1)] (bhp/Mile)***	***Bus Emission Factors[(2)] (Grams/Mile)***	***Daily VMT***	***Service Days Per Year***	***Annual Grams***	***Annual Tons***
NOx	0.130	0.523	444	260	7,853	0.009
VOC	0.010	0.040			46	0.000
CO	0.100	0.403			4,646	0.005
[(1)] Emissions for Cummins DCEXH0540LAT Model 2013- California Air Resources Board. [(2)] (bhp/mi to g/mi = 4.0245)						

Table 8.22 – Bus Addition to Galveston						
Emission	***Bus Emission Factors[(1)] (bhp/Mile)***	***Bus Emission Factors[(2)] (Grams/Mile)***	***Daily VMT***	***Service Days Per Year***	***Annual Grams***	***Annual Tons***
NOx	0.130	0.523	64	260	1,132	0.001
VOC	0.010	0.040			7	0.000
CO	0.100	0.403			670	0.001
[(1)] Emissions for Cummins DCEXH0540LAT Model 2013, California Air Resources Board [(2)] (bhp/mi to g/mi = 4.0245)						

The proposed park & ride and associated infrastructure improvements would result in an annual reduction of **21 tons** of harmful air pollutants.

Table 8.23 – Summary of Park & Ride Emission Benefits				
Emission	***Daily Transit Benefits Reduced Emissions (Tons)***	***Daily Cold Start Reduced Emissions (Tons)***	***Daily Transit Service Reduced Increase (Tons)***	***Annual Net Emission Reduction (Tons)***
NOx	1.646	0.009	0.010	1.645
VOC	1.611	0.027	0.000	1.638
CO	17.575	0.165	0.006	17.734
Total	**20.831**	**0.201**	**0.016**	**21.017**

Reduction in Fuel Consumption

By enhancing transit stops, the proposed project is estimated to reduce annual VMT by 3.3 million. The 2010 EPA Corporate Average Fuel Economy (CAFE) standard is 27.5 miles per gallon (mpg) for passenger cars and 24.1 mpg for light-duty trucks. This analysis assumes not all vehicles will be operating at the 2010 CAFE standards. As result, a conservative figure of 23.5 mpg was used in calculating the decrease in fuel consumption. The proposed facility is estimated to reduce fuel consumption by approximately 141,515 gallons per year.

Annual Decrease in Fuel Consumption = 141,515 gallons

Auto Cost Savings

Operating a vehicle is one of the most expensive budgets items in American households. The proposed project would provide an opportunity for thousands of residents to choose an alternative mode of transportation, such as transit. According to the American Automobile Association (AAA), the average operating cost for a vehicle in 2010 was between $0.14 and $0.17 per mile. This analysis uses $0.15 per mile for annual vehicle operating cost. The proposed project is estimated to reduce VMT by 3.3 million annually, which would save the region approximately $511,812 annually in automobile cost.

Annual Savings from Reduced Automobile Use = $511,812

SAFETY

The proposed park & ride and associated LCI pedestrian and bus stop improvements would further meet the goals of the H-GAC Livable Centers program, which is designed, in part, to improve integration of transit facilities into their surrounding communities. The LCI streetscape improvements around the facility would provide a safer pedestrian environment. In addition, the reduction of VMT would lower the incidence of traffic accidents.

Crime Prevention through Environmental Design

CPTED guidelines will be part of the final design of the proposed park & ride.[12] According to the National Crime Prevention Institute, CPTED is "the proper design and effective use of the built environment which may lead to a reduction in the fear and incidence of crime, and an improvement of the quality of life." CPTED is a concept that relates certain elements of good urban design to reducing the incidence of crime. In some communities, where CPTED has been

[12] *Source:* www.cpted-watch.com

successfully implemented, criminal activity has decreased by as much as 40%. CPTED involves four broad strategies:

- ***Natural Surveillance*** – A design concept directed primarily at keeping potential offenders easily observable. Promoted by: features that maximize visibility of people, parking areas, and building entrances; doors and windows that look out on to streets and parking areas; pedestrian-friendly sidewalks and streets; front porches; and adequate nighttime lighting.
- ***Territorial Reinforcement*** – Physical design can create or extend a sphere of influence. Users then develop a sense of territorial control, which discourages potential offenders who perceive this control. This is promoted by features that define property lines and distinguish private spaces from public spaces through the use of landscape plantings, pavement designs, gateway treatments, and fences.
- ***Natural Access Control*** – This design concept attempts to decrease criminal opportunity by denying access to targets and creating a perception of risk in potential offenders. This is achieved by designing streets, sidewalks, building entrances and neighborhood gateways to clearly indicate public routes and discouraging access to private areas through the use of structural elements.
- ***Target Hardening*** – This design principle recommends the installation of features that prohibit entry or access to high-risk entryways, such as window locks, dead bolts for doors and interior door hinges.

These strategies can be implemented in slightly different ways depending on the land use (i.e., single-family residential, multi-family residential, office, retail, industrial, parking). Specific guidelines for implementation are widely available from the International CPTED Association and other organizations.

Accident Reduction

Reductions in VMT can lower the incidence of traffic accidents, which results in auto related fatalities and injuries. The cost savings from reducing the number of auto related fatalities and injuries include direct savings (e.g., reduced personal medical expenses, lost wages, and lower individual insurance premiums), as well as significant avoided costs to society (e.g., second-party medical and litigation fees, emergency response costs, incident congestion costs, and litigation costs). The values of such benefits are outlined in the U.S. DOT's *Treatment of Value of Preventing Fatalities and Injuries in Preparing Economic Analyses – 2011 Revision. Table 8.24* presents the values of a fatality and/or injury.

Table 8.24 – Value of Statistical Life			
AIS Code	***Severity***	***Fraction of Value of Statistical Life***	***Unit Value 2011 $***
6	Fatal	1.000	$5,800,000
5	Critical	0.760	$4,408,000
4	Severe	0.188	$1,087,500
3	Serious	0.058	$333,500
2	Moderate	0.016	$89,900
1	Minor	0.002	$11,600

The next step examines the number of auto-related fatalities and injuries per VMT that occur in Texas. TxDOT reports the total number of auto-related fatalities and injuries each year. *Table 8.25* shows the number of auto-related fatalities and injuries that occurred in Texas in 2011 and the VMT (235 million annual VMT) per auto-related fatality and/or injury.

Table 8.25 – Total Cost Savings By Estimated Reduced Fatalities/Injuries			
AIS Code	***Statewide***	***2011 Fatalities - Injuries***	***Texas VMT (2011) Per Fatality - Injury***
6	Fatalities	3,015	78,143,284
3	Serious Injury	79,573	2,960,828
2	Other Injury Crashes	131,433	1,792,564
Total		**214,012**	

The proposed project would reduce annual VMT by approximately 3.3 million or approximately 0.00141% of total Texas VMT. The estimated reduction in auto-related fatalities and injuries is calculated by dividing Texas VMT per auto-related fatalities and injuries by the total number of project VMT reduction. For example, for every 78 million VMT, an auto-related fatality occurred in Texas. The proposed project would reduce annual VMT by 3.3 million and, as a result, there would be 0.043 fewer auto-related fatalities per year, which results in an estimated annual cost savings of approximately $238,000. *Table 8.26* presents the estimated annual monetary benefit derived from the reduction in auto-related fatalities and injuries.

Table 8.26 – Total Cost Savings By Estimated Reduced Fatalities/Injuries						
AIS Code	***Statewide***	***2011 Texas VMT Per Fatality/Injury***	***Annual Reduction in VMT (Project Total)***	***Fatalities/Injuries Reduced by Project[(1)]***	***Value of Statically Life***	***Cost Savings by Reduced Fatalities/ Injuries***
6	Fatalities	78,143,284	3,325,614	0.043	$5,800,000	$237,968
3	Serious Injury	2,960,828	3,325,614	1.123	$333,500	$361,131
2	Other Injury Crashes	1,792,564	3,325,614	1.885	$89,900	$160,793
	Total			**3.021**		**$759,892**
[(1)] Texas VMT Per Fatality – Injury/Annual Reduction in VMT						

MONETIZING BENEFIT

As previously stated, not all benefits can be quantified. However, whenever they can be quantified, they can also be monetized to calculate a benefit/cost ratio. The input values used in the following analysis are taken from the U.S. DOT guidance on the preparation of benefit/cost analyses, including the recently published guidelines for the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program. In areas where DOT has not provided valuation guidance or a reference to guidance, standard industry practices and recent research have been applied. *Table 8.27* presents the estimated monetization values and methodology sources.

Table 8.27 – Monetization Factors and Sources

Factor	***Annual Reduction Total***	***Monetization Factors***		***Source***
Sustainability				
NOx Reduction	1.66	$4,000	$ Per Metric Ton	*Corporate Average Fuel Economy for MY2011 Passengers Cars and Light Trucks* (Mar2009), page VIII-60, Table VIII-5 " Economic Values for Benefits Computations (2007$)
VOC Reduction	1.66	$1,700	$ Per Metric Ton	Same as above
CO	17.88	N/A	N/A	No widely accepted monetization
Fuel Cost Savings (VMT/23.5MPG)	141,515	$4.00	$ Per Gallon	U.S. Energy Information Administration - http://www.eia.gov/oog/info/gdu/gasdiesel.asp and 2010 CAFE Standards
Auto Cost (Annual VMT)	3,325,614	$0.15	Per Mile	AAA Vehicle Cost Estimates 2006
Livability				
Total New Transit System Linked Trips	130,650	N/A	N/A	No monetization
Increased Fare Recovery	$522,600	$4.00	$ Per Rider	See Increased Transit Ridership
Increase in Parking/Facility Revenues	$788,209	$1.00	$ Per Day	Highway Research Program (NCHRP) Report 552 '*Guidelines for Analysis of Investments in Bicycle Facilities*" which incorporates a web site Cost-Benefit Analysis of Bicycle Facilities
Safety				
Fatalities-Injuries Reduction	$788,209	*See Text*		Treatment of Value of Preventing Fatalities and Injuries in Preparing Economic Analyses – 2011 Revision

CAPITAL AND OPERATING COST REVIEW

The total estimated capital and operating costs are delineated in *Table 8.28*. The proposed park & ride capital and land costs are approximately $1,312,188. The estimated costs for streetscape, bus stop, and Keep Dickinson Beautiful improvements total $3,479,956. The estimated average annual operating cost totals $1,711,200.

Table 8.28 – Total Estimated Capital and Operating Costs

Improvement	***Capital Cost***	***Annual Operating Costs***
Park & Ride Service*	N/A	$1,664,000
Park & Ride	$1,312,188	$40,200
LCI Streetscape Improvement	$2,105,640	$5,000
Bus Stop Improvements	$1,144,236	$1,500
Gateway Treatment	$230,080	$500
Total	**$4,792,144**	**$1,711,200**

*****$100 per hour * 8 buses * 8 hrs. daily * 260 operating days per year for estimated full turnkey contract.

BENEFIT/COST RATIO – YEAR 5 OF SERVICE

Assuming a 7% discount rate, 2% inflation rate, $32 million in discounted project construction and O&M lifecycle costs over 40 years would generate over $39 million in net benefits, or a benefit/cost ratio of 1.25-to-1. Given these assumptions, the project's net present value is $8 million and the internal rate of return is 10%.

Assuming a 3% discount rate, 2% inflation rate, $57 million in discounted project construction and O&M lifecycle costs over 40 years would generate approximately $77 million in net benefits and a benefit/cost ratio of 1.35-to-1. Given these assumptions, the proposed facility net present value is $20 million and the internal rate of return is 14%. *Table 8.29* presents the results of the BCA calculations.

Table 8.29 – Benefit/Cost Summary

Benefit(s)	***Discounted Values (7% Real Discount Rate)***	***Discounted Values (3% Real Discount Rate)***
Sustainability		
NOx Reduction	$116,304	$232,289
VOC Reduction	$49,515	$98,894
Fuel Cost Savings (VMT/23.5MPG)	$9,937,432	$19,847,711
Auto Cost (Annual VMT)	$8,757,362	$17,490,795
Livability		
Increased Parking Revenues	$647,874	$1,157,240
Increased Fare Recovery	$6,478,740	$11,572,401
Safety		
Fatalities – Injuries Reduction (VMT)	$13,486,660	$26,936,468
Totals		
Total Benefits ($)	**$39,473,886**	**$77,335,799**
Capital Costs	$4,478,639	$4,652,567
Total O&M Costs	$27,037,540	$52,577,727
Total Costs ($)	**$31,516,180**	**$57,230,294**
B/C Ratio	**1.25**	**1.35**
NPV	$7,957,707	$20,105,505
Economic Rate of Return (Nominal)	10%	14%

CONCLUSION

The proposed park & ride facility and LCI streetscape improvements would achieve national, state, and local transportation policy objectives as articulated by the Livability Partnership. These enhancements would increase the quality of life for the residents and thousands of commuters traveling from the Dickinson area by improving transit LOS, walkability, safety, and sense of place.

Because the Houston-Galveston-Brazoria region does not meet federal air quality standards, comprehensive transit infrastructure is needed. The proposed improvements would conservatively support an annual increase of 130,650 new boardings, which would reduce annual net VMT in the region by approximately 3.3 million miles per year and result in an estimated annual reduction of harmful air pollutants of 21 tons.

The proposed project would increase short-term employment by 52 jobs and long-term employment by ~1.5 FTEs. In addition, the proposed project is estimated to decrease accidents annually by ~3.021 and would avoid approximately $760,000 in related costs each year. At a 7% discount rate, the overall benefit/cost ratio would be 1.25-to-1, and at a 3% discount rate, the benefit/cost ratio would be 1.35-to-1.

The proposed LCI streetscape improvements and park & ride would greatly benefit the community and encourage public transit use by making the experience safe, enjoyable, and attractive, and linking an underserved area, Dickinson, to Galveston and eventually one of the largest economic centers in the U.S., downtown Houston.

Chapter 9 – FUNDING AND IMPLEMENTATION STRATEGY

This chapter describes the potential sources of federal, state, and local funding available to support implementing this $4.8 million master plan, which identifies pedestrian and transit access infrastructure improvements for Dickinson. The City should submit this master plan and the companion environmental analyses to FTA for approval of an LONP to protect local expenditures for master plan improvements as local share on future federal funding. If advance expenditures exceed local match requirements, future grants can be used to reimburse the difference. This chapter provides a list of funding strategies that the City can use to successfully implement the infrastructure improvements.

MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY

Significant changes were authorized in the new transportation bill, MAP-21, signed by the President Obama in July 2012. MAP-21 authorizes transit and highway funding for FY2013 and FY2014. On the highway side of MAP-21, there were significant changes to the programs and funding administered by the Federal Highway Administration (FHWA), however the "flex" programs, which are programs where funding can be transferred from FHWA to FTA, were relatively unchanged except for the Transportation, Community, and System Preservation Program (TCSP). The TCSP was repealed. The City may request funding for LCI projects, facilities for non-motorized transportation, transit capital projects, and public bus terminals and facilities under the Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) Improvement Program, and facilities for pedestrians, bicyclists, and persons with disabilities under the Transportation Alternatives Program (TAP), formerly Transportation Enhancements. LCI projects are eligible for funding under TAP.

MAP-21 authorized far reaching changes to transit programs available to small urbanized areas, which have populations between 50,000 and 200,000, such as the Texas City Urbanized Area (UZA), which includes Dickinson. The most significant change was the designation of TxDOT as the Designated Recipient of all Urbanized Area Formula Program (FTA Section 5307) funding for small urbanized areas. As a result, TxDOT has authorized GCC, the City's main transit service provider, as the "direct recipient" for the program. In this role, GCC will have the same responsibilities as in previous years, as well as working directly with FTA. TxDOT will be responsible for authorizing GCC as the direct recipient annually and entering into supplemental agreements with GCC for every FTA project grant.

The other big change under MAP-21 was the near elimination of discretionary transit programs for capital projects at the national level. Funding for the Enhanced Mobility of Seniors and Individuals with Disabilities Program (FTA Section 5310) and the Bus and Bus Facilities

Program (FTA Section 5339) will be apportioned by formula using census data such as population, population density, senior population, and individuals with disabilities. For small urbanized areas this means that the federal funding would be apportioned to the state (TxDOT), by formula. The state then distributes the funds competitively among the local government authorities, public agencies, and other organizations engaged in public transportation in small urbanized areas. The Job Access/Reverse Commute (JARC) and New Freedom (NF) programs were consolidated under FTA Sections 5307 and 5310, respectively; therefore, projects formerly eligible under JARC and NF now must compete with projects traditionally funded under Sections 5307 and 5310.

QUALIFYING COSTS

FTA may fund up to 80% of the qualifying costs for master plan improvements. Qualifying costs can include preliminary engineering, design, value engineering, mobilization, and construction (including administration and management) specifically attributed to the applicable pedestrian and transit access infrastructure as described in this master plan. Conversely, the local share commitment for qualifying costs is traditionally 20% and 100% for non-qualifying costs. *Table 9.1* presents the capital costs for the improvements by corridor/infrastructure and the 80/20% split between federal and local funds.

Table 9.1 – Federal/Local Share by Corridor and Shared Infrastructure

Corridor/Infrastructure	*Estimated Cost**	*Federal Share (80%)*	*Local Share (20%)*
Total Bus Stop Costs	$1,144,236	$915,389	$228,847
FM 517	$362,579	$290,063	$72,516
SH3 - North of Deats Road	$610,443	$488,354	$122,089
SH3 - Deats Road to FM 517	$591,080	$472,864	$118,216
SH3- South of FM 517	$517,515	$414,012	$103,503
Shared Infrastructure Costs	$24,024	$19,219	$4,805
Keep Dickinson Beautiful Program	$230,080	$184,064	$46,016
Park & Ride	$1,312,188	$1,049,750	$262,438
Total	**$4,792,144**	**$3,833,715**	**$958,429**

*Includes 20% Design/Admin. Costs and 10% Contingency.

FIVE-YEAR PROJECT IMPLEMENTATION

Table 9.2 distributes corridor improvement implementation over a five-year span, delineating federal and local costs. Shared infrastructure costs, consisting of crosswalk and ramp improvements, are distributed evenly over five years.

Table 9.2 – Project Phasing by Corridor/Infrastructure					
Corridor/Infrastructure	***Year 1***	***Year 2***	***Year 3***	***Year 4***	***Year 5***
Total Bus Stop Costs	**X**	**X**	**X**		
FM 517		**X**			
SH3 - North of Deats Road			**X**		
SH3 - Deats Road to FM 517				**X**	
SH3 - South of FM 517					**X**
Shared Infrastructure Costs	**X**	**X**	**X**	**X**	**X**
Keep Dickinson Beautiful Program	**X**				
Park & Ride				**X**	**X**
****Total Infrastructure***	$616,297	$748,796	$1,001,465	$713,800	$1,711,787
Federal Share (80%)	$493,037	$599,037	$801,172	$571,040	$1,369,430
Local Share (20%)	$123,259	$149,759	$200,293	$142,760	$342,357
*Includes Soft Costs and Contingency					

The following sections outline the funding sources and present a strategy to secure a combination of federal, state, and local resources to implement this master plan.

FEDERAL/STATE FUNDING RESOURCES

Although recent passage of MAP-21 has eliminated several federal discretionary programs, there are a number of federal and state funding resources available to reimburse eligible expenditures. The following resources are applicable to fund the 80% portion of the project costs detailed in *Table 6.1*.

Congressional Authorization and Appropriations

The MAP-21 authorizing legislation, combined with the existing congressional ban on earmarks, has narrowed the avenues available to pursue federal funding to support pedestrian and transit access infrastructure. Changes in congressional attitudes should be monitored through the FY2013 Congressional Transportation Appropriations activity and the evolution of MAP-21, which began in the fall of 2012. Accordingly, the City should request funding through the FY2013 and FY2014 Transportation Appropriation process to support several transit-related improvements detailed in this master plan, and within the next Transportation Authorizing legislation which will replace MAP-21 in FY2015.

Federal Highway Administration Funding

FHWA is one of several operating administrations under the U.S. DOT umbrella. The FHWA oversees the construction, maintenance, and preservation of the network of highways throughout the United States. FHWA funding resources that would be applicable to this master plan and administered by local and state entities are presented next.

METROPOLITAN PLANNING ORGANIZATION-ADMINISTERED FUNDS

H-GAC is the MPO that programs and administers specific FHWA funding via the local Transportation Improvement Program (TIP). MPO-administered FHWA funds include STP and CMAQ funds. Detailed descriptions of these two programs are provided below. From time to time, however, supplemental CMAQ funding may become available to support pedestrian and transit infrastructure improvements, which would increase transit ridership and result in air quality benefits.

Surface Transportation Program (STP)

STP provides flexible funding that can be used by states and localities for all projects eligible for funding under current FHWA and FTA programs including projects on any federal-aid highway, NHS, bridge projects on public roads, transit capital projects, and intra-city and intercity bus terminals and facilities. STP is the largest FHWA flexible funding program, which means highway dollars can be transferred to the FTA for use in local transit-related projects. The program is funded on an 80% federal and 20% local basis. It is recommended that STP funding be pursued during MPO-sponsored project calls.

Congestion Mitigation and Air Quality Improvement Program

The purpose of CMAQ is to provide funding for transportation projects or programs that contribute to the attainment or maintenance of the EPA's National Ambient Air Quality Standards (NAAQS) for ozone and CO. Transit facilities, such as park & ride terminals, pedestrian and bicycle improvements, are eligible for CMAQ funding along with up to three years of federal operating assistance in air quality nonattainment areas, such as the Houston-Galveston region. CMAQ-funded projects are selected on a competitive basis by the area MPO, in this case, H-GAC, on a semi-annual basis, in conjunction with the development of the three-year TIP. The MPO reviews and ranks CMAQ project requests and recommends selection based on a variety of factors, including air quality benefits (cost per pound of pollutants reduced), system connectivity, environmental justice, and regional significance. Project readiness, which includes prior inclusion in H-GAC's RTP, local share commitment, completion of PEs and EAs, and acquisition of right-of-way, is a prerequisite for full consideration. CMAQ is traditionally funded on an 80% federal and 20% local basis. The air quality benefits detailed in Chapter 5 demonstrate the eligibility of this master plan to obtain CMAQ funds.

FHWA TXDOT-ADMINISTERED FUNDS

Similar to H-GAC, the State of Texas also administers specific FHWA funding through TxDOT. The following programs are awarded through the state's DOT.

- ***Transportation Alternatives Program (TAP)***

  The goal of TAP is to encourage diverse modes of travel, increase community benefits from transportation investment, strengthen partnerships between state and local

governments, and promote citizen involvement in transportation decisions. To be eligible for consideration, all projects must demonstrate a relationship to the surface transportation system through either function or impact and go above and beyond standard transportation activities. This master plan would be eligible in the following categories:

- Provision of facilities for pedestrians and bicycles
- Landscaping and other scenic beautification

TAP is a statewide competitive program administered in accordance with applicable federal and state rules and regulations. Projects are submitted to TxDOT and the MPO for review and selected for funding by the Texas Transportation Commission. The funds provided by this program are on a cost-reimbursement basis and reimbursement is limited to 80% of allowable costs. The government entity nominating a project is responsible for the remaining cost including all cost overruns.

- ***Transportation Investment Generating Economic Recovery (TIGER)***

  Although the TIGER program call for projects does not occur on a regular basis, TIGER program funding can be used to reimburse investments in projects that involve road, rail, and transit-related improvements that are designed to achieve national objectives of sustainability. Therefore, the TIGER program is a highly competitive discretionary grant program that has generally been used for larger projects. The grantee needs significant local and congressional support for success, with most previously successful applicants providing more than the minimum 20% local match.

FEDERAL TRANSIT ADMINISTRATION FUNDING

The FTA, another operating administration of DOT, oversees and funds mass transit operations throughout the nation. The following sections present applicable FTA funds that are available to a municipality via the state.

FTA TxDOT-Administered Funds

In addition to administration of FHWA funds, TxDOT is also charged with the administration of FTA funding, which is apportioned to the state by formula. The formula funds that can be used to fund LCI projects consist of the following:

- ***Section 5307 – Urbanized Area Formula Program*** – This program provides grants to UZAs for public transportation capital, planning, job access and reverse commute projects, as well as operating expenses in certain circumstances.
- ***Section 5310 – Enhanced Mobility of Seniors and Individuals with Disabilities Program*** – This program is intended to enhance mobility for seniors and persons with

disabilities by providing funds for programs to serve the special needs of transit-dependent populations beyond traditional public transportation services and ADA complementary paratransit services. NF projects, which are capital projects that improve access to fixed-route service and decrease reliance by individuals with disabilities on complementary paratransit, are also eligible for funding under this program.

- ***Section 5339 – Bus and Bus Facilities Program –*** Provides capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. Funds are eligible to be transferred by the state to supplement the UZA Formula Grant Program.

OTHER FEDERAL FUNDING PROGRAMS

Community Development Block Grant (CDBG)

The CDBG program was developed to promote viable urban communities by providing decent housing, a suitable living environment and expanding economic opportunities primarily for persons of low and moderate income. One of the advantages of the CDBG program funding is the use of these funds as the local match for other federal grant programs referenced in this chapter. The Section 108 Loan Guarantee Program and Brownfield Economic Development Initiative (BEDI) are CDBG programs that are discussed as potential local match sources later in this chapter.

Section 108 Loan Program

Section 108 is the loan guarantee provision of the CDBG program. Eligible activities for Section 108 financing include acquisition of real property and construction of public facilities including street, sidewalk, and other site improvements. The Section 108 Loan program allows a community to transform a small portion of its CDBG funds into federally guaranteed loans large enough to pursue physical and economic revitalization projects that can renew entire neighborhoods. However, Section 108 loans are not risk free. Local governments borrowing funds guaranteed by Section 108 must pledge their current and future CDBG allocations to cover the loan amount as security for the loan.

Brownfields Economic Development Initiative (BEDI)

BEDI is a competitive grant program administered by HUD, utilized to stimulate and promote economic and community development. BEDI grant funds are targeted for the redevelopment of abandoned or underused industrial and commercial facilities which may have environmental issues preventing expansion or redevelopment. BEDI funds minimize the potential loss of future CDBG allocations and must be used in conjunction with a new Section 108-guaranteed loan commitment.

HUD emphasizes the use of CDBG related funds such as Section 108 and BEDI to finance projects and activities that will provide near-term results and demonstrable economic benefits.

LOCAL MATCH FUNDING SOURCES

In order for the City to be able to utilize the federal funding tools detailed in this chapter, local funds, which traditionally constitute 20% of the project cost, must be identified. The following are local match resources that the City can utilize, including its own funding resources.

CDBG Funding

An additional benefit of CDBG-funded projects is the ability to further leverage the funds as local match for additional federal funding. CDBG funds represent one of the few federal funding sources that can further leverage federal dollars. Both Section 108 and BEDI funds can be leveraged for additional federal funding.

Capital Improvement Projects

The City, through its Public Works department, annually engages in capital improvement projects throughout Dickinson. Capital improvement projects, including construction of LCI streetscape improvements along the inventory corridors and at the bus stop locations detailed in Chapter 6 can be considered eligible sources of local match. The Public Works Department must follow all federal guidelines from procurement to project close-out in order for such expenditures to be eligible.

Transportation Development Credits (TDC)

A state may use toll revenues, which are generated and used by public, quasi-public, and private agencies to build, improve, or maintain highways, bridges, or tunnels serving the public purpose of interstate commerce, as credit toward the non-federal share requirement for any federal funds made available to implement eligible DOT-related capital projects. A transit authority or municipality may apply to TxDOT's Public Transportation Division or H-GAC for TDCs in lieu of the local share for eligible transit capital projects. The Transportation Policy Committee (TPC) is responsible for awarding H-GAC TDCs and the Texas Transportation Commission (TTC) is responsible for awarding state TDCs.

TDCs can leverage federal funds but do not function as cash. Therefore, their applicability is based on the project's success in securing federal funds. Furthermore, TDCs may not be needed if sufficient local value were to be generated through the donation of ROW and/or property.

City of Dickinson

As a taxing entity, the City has a number of tools available that it can use to help fund the suggested improvements within this master plan, as follows:

General Fund

The City's general fund receives most of its revenues from tax sources and is a portion of the City's overall budget. The City can direct excess funds to specific projects, without referendum, that are not already budgeted. If the City so chooses, it can direct excess general funds for the development of infrastructure contained within this master plan.

Certificates of Obligation

The City can choose to issue Certificates of Obligation that do not require voter approval as an emergency form of debt relief. Hurricane Ike occurred in 2008 and the storm-damaged streetscape infrastructure is detailed in this master plan. Certificates of Obligation could help fund the proposed project with the potential for future 80% reimbursement.

General Obligation Bonds

The City has issued general obligation bonds to support transit improvements and/or to support the local share cost (20%) of matching federal funding for transit. General obligation bonds require a referendum with a majority vote. Recent discussions at City Council indicate that a future bond issue might include support for capital infrastructure projects including public transit. Since current rates of financing municipal bonds are at their lowest levels in history, it would make sense for the City to consider this type of debt financing instrument to support future transit capital requirements. There are certain restrictions utilizing tax-exempt bonds, so the City should consider their use carefully.

Other Local Match Sources

There are additional sources of match that can come from non-municipal governmental entities or private businesses through public-private partnerships that utilize non-grant related funds. The following list contains suggestions of entities that may be able to engage in an agreement with the City to fund project elements within this master plan.

Dickinson Economic Development Corporation

DEDC is a 501(c), or nonprofit, entity dedicated to promoting economic development within Dickinson. DEDC has the ability to provide incentives to attract local and regional businesses, corporations, and developers to build within Dickinson. DEDC does not only encourage various entities to infuse local money into Dickinson's economy, but also has the ability to provide grants and financial incentives toward specific projects, elements of which can be used as local match for federal grant funds.

SH 3 Overlay District

The SH 3 Overlay District is an example of DEDC's ability to utilize incentives to attract various entities to help develop a particular corridor, which, in this case, is SH 3, one of the inventory corridors included in the master plan. The DEDC, via the overlay district, can provide improvement programs that incentivize development while providing specific design standards and guidelines to which developers must adhere. For example, the SH 3 Overlay District Façade Improvement Program can provide grants to match up to 50%, or $25,000, of expended funds on eligible façade improvements. Funds used to improve eligible pedestrian/transit access improvements on SH 3 detailed within the master plan can be used as local match.

Keep Dickinson Beautiful

Similar to the DEDC, Keep Dickinson Beautiful is a non-profit corporation, focused on environment awareness, beautification, and preservation of Dickinson and its existing green spaces. Keep Dickinson Beautiful is donation- and member-supported corporation with the ability to grant funding for specific beautification projects. One component of the master plan is a gateway beautification treatment at one of the City's main access points, FM 517 at Gum Bayou. Grant funds issued by Keep Dickinson Beautiful for improvements to the pedestrian environment are able to be used as local match for additional federal funding.

Galveston County Water Control and Improvement District #1 (WCID#1)

The WCID#1 covers the majority of Dickinson and serves as the primary water and sewer provider for Dickinson. The district focuses on water quality, conservation, and back flow prevention. Occasionally, the district will receive grant funding for the purposes of extending water and wastewater services to various present and future developments. If the grant funds are comprised of state or local money, these may be used as local match in reference to a project related to pedestrian/transit access improvements.

Dickinson Independent School District (DISD)

DISD at times will issue public supporter bonds to build infrastructure related to schools within the district. Voters approved an $85 million bond issue in 2005 to construct new schools and related facilities and school buses. If new school infrastructure includes streetscape elements such as sidewalks, ADA ramps, pedestrian lighting, crosswalks and bus staging areas, the funds used to construct federally eligible infrastructure could be further leveraged as local match.

Private Developers

Private developers that wish to develop land adjacent to any of the project corridors within this master plan may elect to improve the pedestrian streetscape surrounding their developments. In advance of procurement and construction of federally eligible streetscape infrastructure, such as sidewalks, ramps, and pedestrian-oriented lighting, the City could require developers to follow federal procurement guidelines to ensure that the expenditures would be eligible for reimbursement or local match of a related project. A public-private partnership could be developed so that both the developer and the City would benefit.

Capture and Protect Local Value: FTA Letter of No Prejudice

Using pre-award authority under an FTA-approved LONP is a valuable strategy to an FTA grantee and partners. Under an LONP, advance local expenditures for an eligible capital project can be protected as local match or for federal reimbursement for up to five years. This tool allows local governments and transit authorities to advance project activities with local funds, build "local share" toward the overall project, and allow for subsequent federal reimbursement should discretionary, STP, CMAQ, TAP, or other federal funds become available. To receive an LONP, and protect its local investments, a project sponsor must meet FTA advanced planning

and environmental requirements to obtain LONP approval by the FTA Regional Office. In addition, the sponsor must meet all FTA requirements for procurement of design, engineering, and construction contractors. The City should submit this report and the supporting environmental documents to FTA with a request for an LONP prior to expending any local funds on improvements recommended in this master plan.

SUMMARY

Table 9.3 presents a summary of applicable funding sources available to the City for funding the recommended improvements in this master plan. A successful strategy for funding capital improvements under the federal paradigm must include the following actions:

- Identify potential federal funding resources and timing the availability of funding based on numerous calls for projects at the regional, state, and federal levels and federal authorizations and appropriations. In some cases, a given project or phase may be eligible for more than one program.
- Identify and allocate local share resources to meet federal match requirements.
- Gain a multi-year commitment by City Council to move the project forward through funding plan development, environmental assessment, and other federal and state agency requirements.

Table 9.3 – Funding Strategy Summary

Funding Source	***Revenue Source***	***Jurisdiction/ Organization***	***Frequency***
Congressional Authorization and Appropriations	Federal	Congress	Annually, as per authorizing legislation.
CMAQ	FHWA	H-GAC	Semi-Annual funding cycle, competitive process
STP	FHWA	H-GAC	Multi-year call for projects, competitive process
TAP	FHWA	TxDOT	Annual call for projects, competitive process
TIGER	FHWA	TxDOT	Infrequent call for projects, competitive process
FTA Section 5307	FTA	TxDOT	Annual authorization as Direct Recipient
FTA Section 5310	FTA	TxDOT	Annual call for projects, competitive process
FTA Section 5339	FTA	TxDOT	Annual call for projects, competitive process
Section 108 Loan	HUD	CDBG	As applied for
BEDI	HUD	CDBG	Annual call for projects, competitive process
TDC	State	TxDOT	Pursue credits for local match, as needed
TDC	State	H-GAC	Pursue credits for local match, as needed
City General Fund	City	City Council	As approved by City Council
Certificates of Obligation	City	City Council	As approved by City Council