Corpus Christi Metropolitan Planning Organization

# Major Freight Facilities Impact Study Final Report

Submitted By:
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February 2010

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# CORPUS CHRISTI MAJOR FREIGHT FACILITIES IMPACT STUDY

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This report was funded in part through grant[s] from the Federal Highway Administration [and Federal Transit Administration], U.S. Department of Transportation. The views and opinions of the authors [or agency] expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

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# 1.0 INTRODUCTION

The Corpus Christi region has always played an important role in North American freight transportation. The Port of Corpus Christi has been an important gateway for domestic and international waterborne commerce. Serving the region are three railroads that link the Port to markets in the U.S. and Mexico. Currently plans are in place to expand the region's logistics capabilities. The Port of Corpus Christi Authority is planning to ultimately develop a new multi-use terminal on its La Quinta property. New rail-dependent industries are planning to locate both within and just outside the Port area. In the western part of the region, the City of Robstown is proposing to develop a trade processing center that will take advantage of its proximity to three major railroads.

In addition to its freight transportation infrastructure assets, the region also has in place the institutional and organizational structures necessary to address both freight needs and opportunities. In addition to the Corpus Christi Metropolitan Planning Organization, the governmental agency responsible for coordinating transportation planning in the region**,** both Nueces and San Patricio Counties have established County Rural Transportation Districts which are legally eligible to accept and utilize private, state, and federal funds to develop the rail infrastructure necessary to assure efficient and economical rail service to meet the region's agricultural and industrial needs. These organizations also provide a local setting to work jointly with railroads and other freight providers with regard to improving freight operations and infrastructure within the region.

This report describes and evaluates the Corpus Christi region's existing and planned logistics assets. Besides providing a reference document of the region's assets, it answers the following questions:

- What is the consensus on La Quinta's key markets and potential volumes?
- What are the factors that will result in La Quinta's success?
- What rail and highway improvements are necessary both to support the projected La Quinta cargo volumes and to ensure freight mobility in the region?
- What is required to provide additional rail access for La Quinta?
- What initiatives have been taken by KCS to improve its service to the region?
- What are applications of new freight technology?
- What is the role of other logistics facilities in the region?

Existing information, studies, stakeholder interviews and site visits, where applicable, were relied upon to address the questions. In addition to addressing the questions, freight mobility improvements are prioritized.

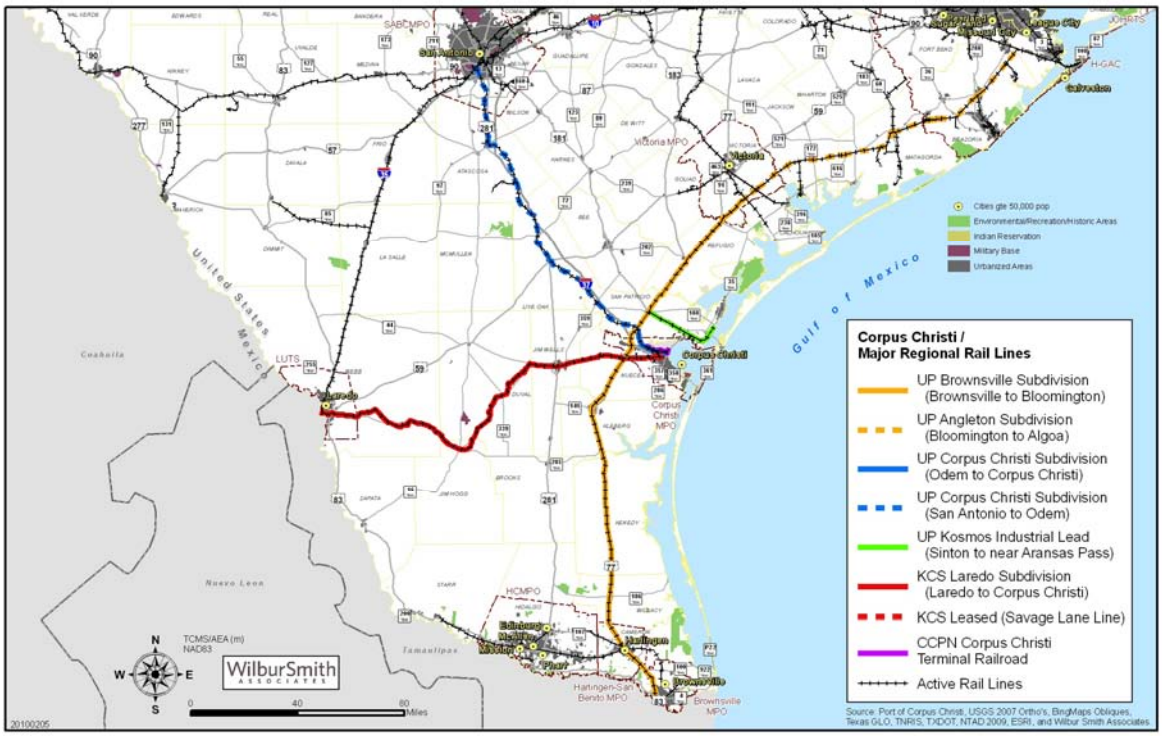
# 2.0 CORPUS CHRISTI REGIONAL RAIL TRANSPORTATION NETWORK

The following is a profile of the major rail lines comprising Corpus Christi's rail system. It outlines the physical, operational and safety aspects of each rail line serving the Corpus Christi region.

**Exhibit 1** shows the regional scope of the five principal rail lines serving the Corpus Christi area:

1. Union Pacific Railroad – Brownsville Subdivision
2. Union Pacific Railroad – Corpus Christi Subdivision
3. Union Pacific Railroad – Kosmos Industrial Lead
4. Kansas City Southern Railroad – Laredo Subdivision (Tex-Mex Railroad)
5. Corpus Christi Terminal Railroad

**Exhibit 1: Major Regional Rail Lines**

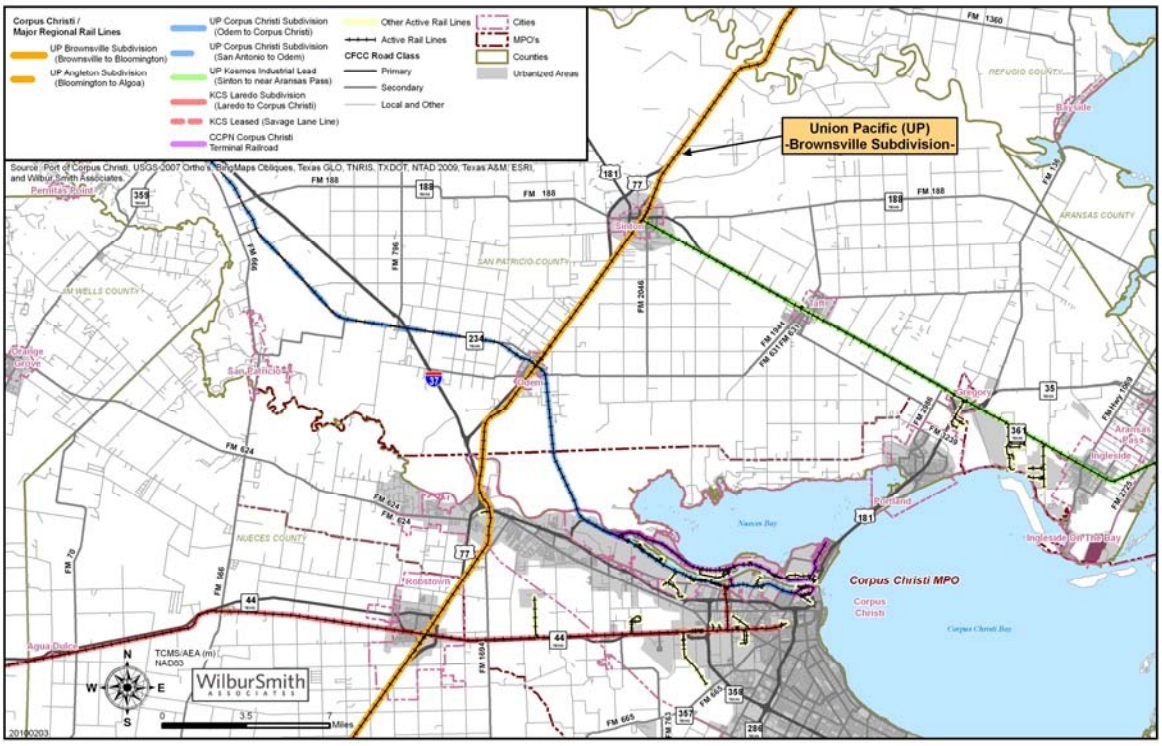



Following is a description of the principal rail lines.

## 2.1 Union Pacific RR’s Brownsville Subdivision

The Brownsville Subdivision is part of Union Pacific Railroad’s (UP) main line connecting its U.S. network with Mexico. The Brownsville Subdivision extends 221 miles from Bloomington to Brownsville. Beyond Bloomington the line extends to the Houston area via UP’s Angleton Subdivision.

**Exhibit 2: Brownsville Subdivision**



Source: Port of Corpus Christi, USGS 2007 Ortho's, BingMaps Obliques, Texas GLO, TNRIS, TXDOT, NTAD 2009, Texas A&M, ESRI, and Wilbur Smith Associates.

### Line Description

Train speeds are limited to 49 mph over this line. Between Odem and Sinton, however, the maximum allowable train speed is limited to 20 mph. Allowable speeds are also reduced within yard limits along the line and in the vicinity of specific lead tracks. The line is principally single track. To provide for trains that need to meet or pass each other, there are ten passing sidings, approximately one every 22 miles. The longest distance between sidings is approximately 31 miles between Sinton and Woodsboro. The sidings range in length from 2,700 feet at Bishop to 14,000 feet at Sinton.

Maximum car weight capacities vary on the subdivision. The maximum gross weight for freight cars on the line is 286,000 pounds between Brownsville and Sinton.[1] The

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[1] Freight car weight of 286,000 pounds, which includes the combined weight of the car and its lading, is generally accepted as the industry standard.

maximum gross weight between Sinton and Bloomington, however, is only 268,000 pounds, primarily due to bridges which were not constructed to carry the heavier loads.

**Train Operations**

The typical number of trains operating on the line varies along its length. The number of freight trains between Brownsville and Kingsville is generally 10 trains per day (five trains in each direction). An additional two trains per day operate between Kingsville and Bishop, likely to provide local service. The number of trains on the line increases significantly, to approximately 15 per day, north of the Tex-Mex interchange at Robstown to Bloomington.

As a condition to approving the 1996 Union Pacific/Southern Pacific merger, both Burlington Northern Santa Fe (BNSF) and KCS/Tex-Mex were granted operating rights over UP. BNSF was granted rights over the entire line between the Houston area and Brownsville; KCS/Tex-Mex was granted rights between Placedo and the UP connection at Robstown and access to its local facilities in Corpus Christi. Beyond Placedo trackage rights originally were via UP's Port Lavaca Subdivision to Flatonia and thence to Beaumont via Houston. Upon acquisition and rebuilding of the former SP line between Victoria and Rosenberg, KCS/Tex-Mex now operates on UP beyond Placedo to its Victoria/Rosenberg line then beyond on UP between Rosenberg and Beaumont.

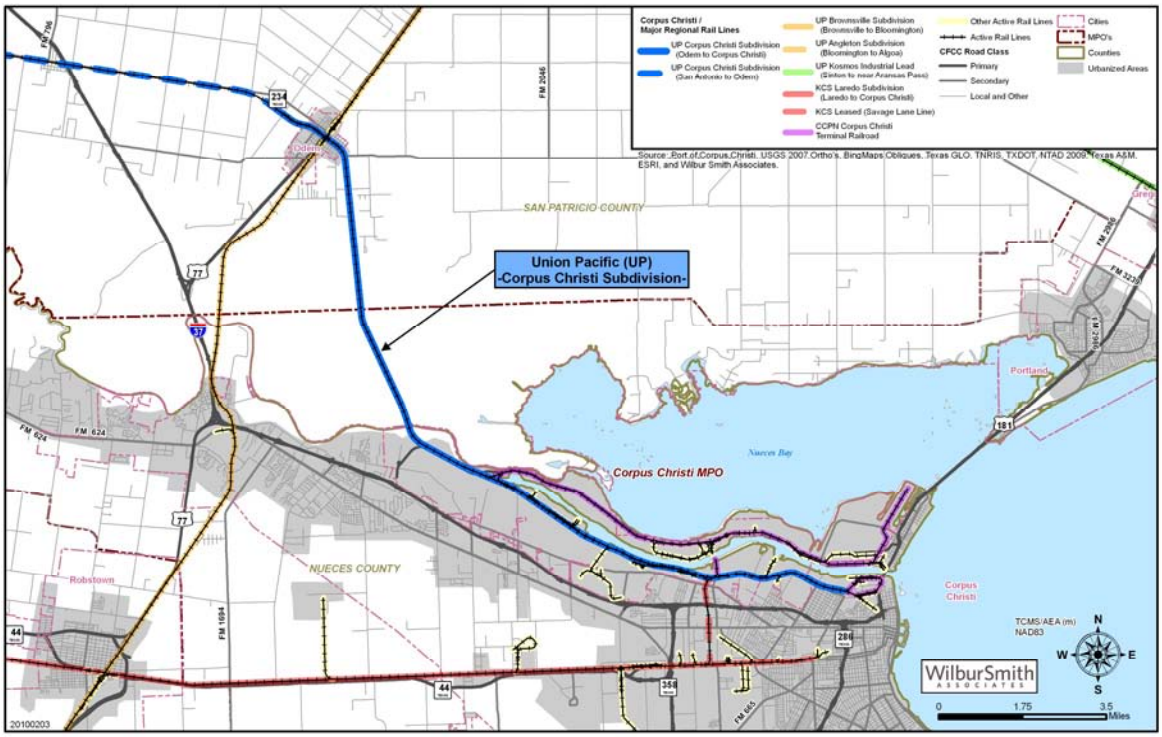
**Safety**

A total of 12 train incidents or accidents (not including grade crossing incidents) were recorded on the line over the five year period of 2004 to 2008. Seven accidents occurred within yard limits and five on mainline or siding tracks. Most of the incidents were derailments caused by track or equipment failures, but no deaths or injuries were reported.

## 2.2 Union Pacific's Corpus Christi Subdivision

The Corpus Christi Subdivision connects the Sosan Yard near San Antonio with the Corpus Christi Yard near downtown Corpus Christi, a distance of 150 miles.

**Exhibit 3: Corpus Christi Subdivision**




## Line Description

The maximum allowable speed limit on the line is generally 25 mph, with 20 mph limits near Three Rivers and within the Odem yard limits. Between Odem and the Port of Corpus Christi, the speed limit is 49 mph but is reduced to 10 mph within the port itself.

The line is single track. Six passing sidings are located on the line, approximately one for every 25 miles of track. The longest distance between sidings is approximately 36 miles between George West and Hubert. The sidings range in length from 2,750 feet at Leyr to 9,000 feet at George West. The maximum gross car weight on the line is 286,000 lbs., the industry standard.

## Train Operations

The number of trains which operate over the line is generally six trains per day, three in each direction. However, the daily train volume between Odem and Viola Yard ranges between 10 and 15 trains per day due to movements between the Port and the Brownsville Subdivision and local switching movements.

Both BNSF and Kansas City Southern Railway (KCS) have trackage rights over the segment of line between Odem and the Viola Yard within the Port of Corpus Christi for the purpose of serving port tenants and interchanging traffic with the Corpus Christi Terminal Railroad.

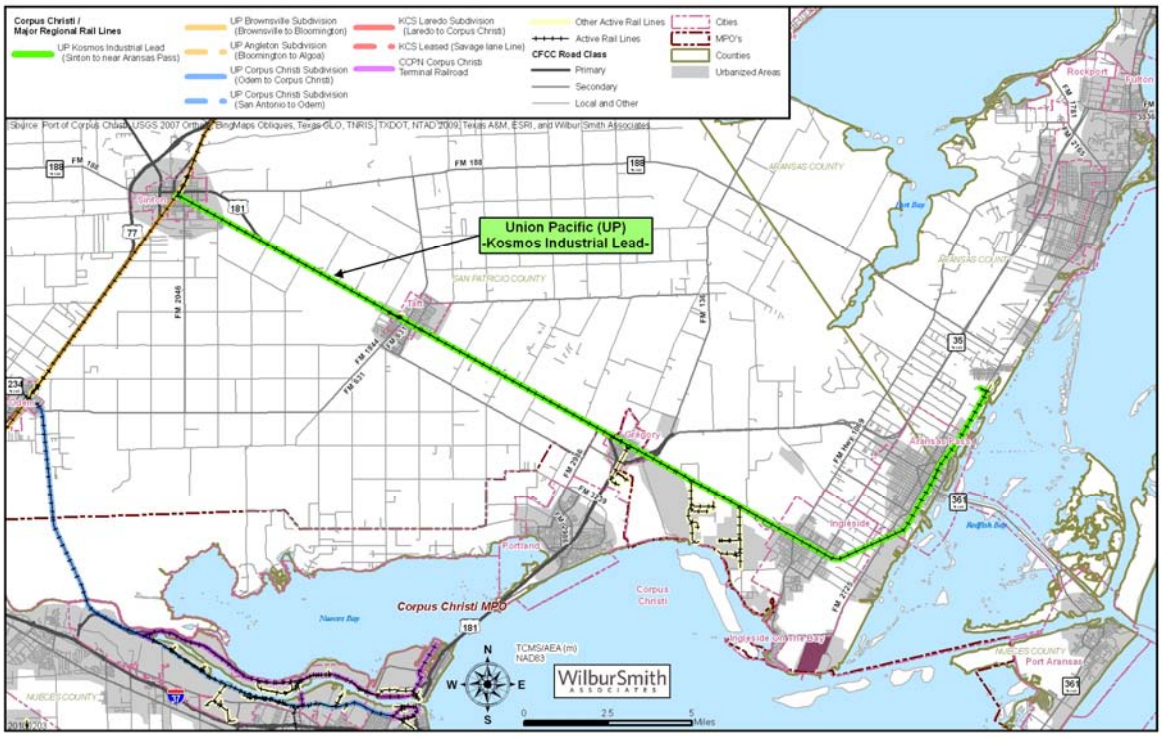
**Safety**

A total of eight train incidents or accidents (not including grade crossing incidents) were reported on the line over the five year period. Three accidents occurred within yard limits, primarily within the Corpus Christi area, and five on mainline or siding tracks. Most of the incidents were derailments caused by track or equipment failures and no deaths or injuries were reported.

## 2.3 Union Pacific's Kosmos Industrial Lead

The Kosmos Industrial Lead begins at Sinton Junction and extends to Kosmos. The length of the line is approximately 30 miles.

**Exhibit 4: Kosmos Industrial Lead**




**Line Description**

The line is single track with two sidings. A 2,300 foot siding is located near the Sherwin Alumina plant and a 1,200 foot siding at Aransas Pass. Both of these sidings are currently used for car storage. In addition, additional tracks have been added at the Gregory Yard, adding both passing siding and storage capacity at the location. The maximum speed limit over the line is 20 mph between Sinton Junction and Taft. Between Taft and the end of the line the speed limit is reduced to 10 mph. The maximum gross weight for cars on the line is 268,000 pounds.

**Train Operations**

Current train operations are limited with only four trains per day, including local service, from the Sinton and Gregory Yards, as well as a rock train which originates in San Antonio, moving over the Corpus Christi Subdivision to Odem and the Brownsville Subdivision to Sinton. The Kosmos Industrial Lead is owned and operated by UP with no other railroad providing service.

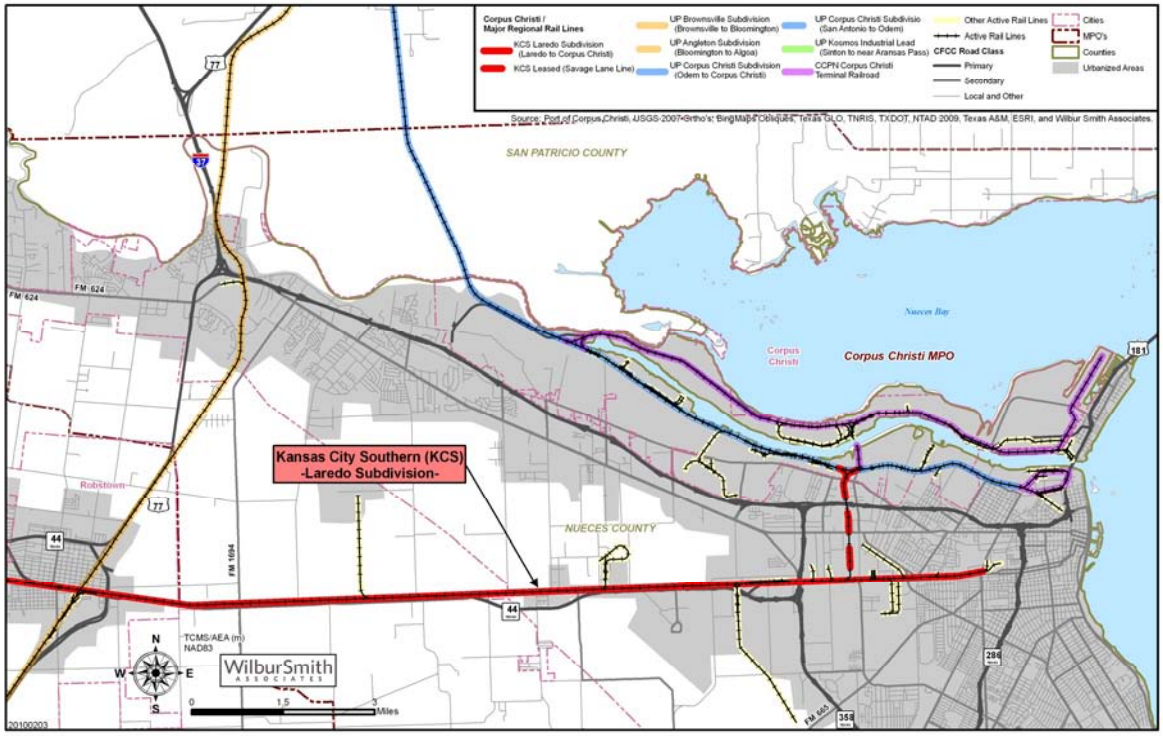
**Safety**

Only two rail incidents were reported over the five year period, a derailment over the connection with the Brownsville Subdivision and a derailment within the Gregory Yard.

## 2.4 KCS Laredo Subdivision

The Laredo Subdivision connects KCS Laredo Yard and the former Tex-Mex Railroad's Corpus Christi Terminal. Access to the Port is via the Savage Lane Line. The length of the subdivision is approximately 157 miles. Industry tracks extend an additional five miles along Agnes St. beyond the Corpus Christi Yard.

**Exhibit 5: Laredo Subdivision**



**Line Description**

The maximum allowable speed limit over the first 90 miles east of Laredo is 40 mph. Between Benavides and just east of Robstown, the speed limit ranges from 25 to 30 mph. Over the final eight miles approaching the Port, the speed limit is reduced to 10 mph. The maximum gross weight for cars on the line is 286,000 pounds.

Ten sidings are listed in the Tex-Mex timetable. The sidings range in length from 4,100 feet at Bruni to 8,000 feet at Spear. The greatest distance between sidings is approximately 26 miles between Killam and Bruni at the western end of the line.

**Train Operations**

Train density on the subdivision increases the nearer the line is to Corpus Christi. Between Laredo and Robstown, train volume ranges from two to four trains per day. Between Robstown and the Port of Corpus Christi, train density increases nearer the Corpus Christi area due to local and interchange movements.

No other railroads have trackage rights over the line. KCS, however, does move BNSF trains from its Corpus Christi Yard to the interchange point with the Corpus Christi Terminal Railroad. The BNSF trains access the KCS yard over UP's Corpus Christi Subdivision.

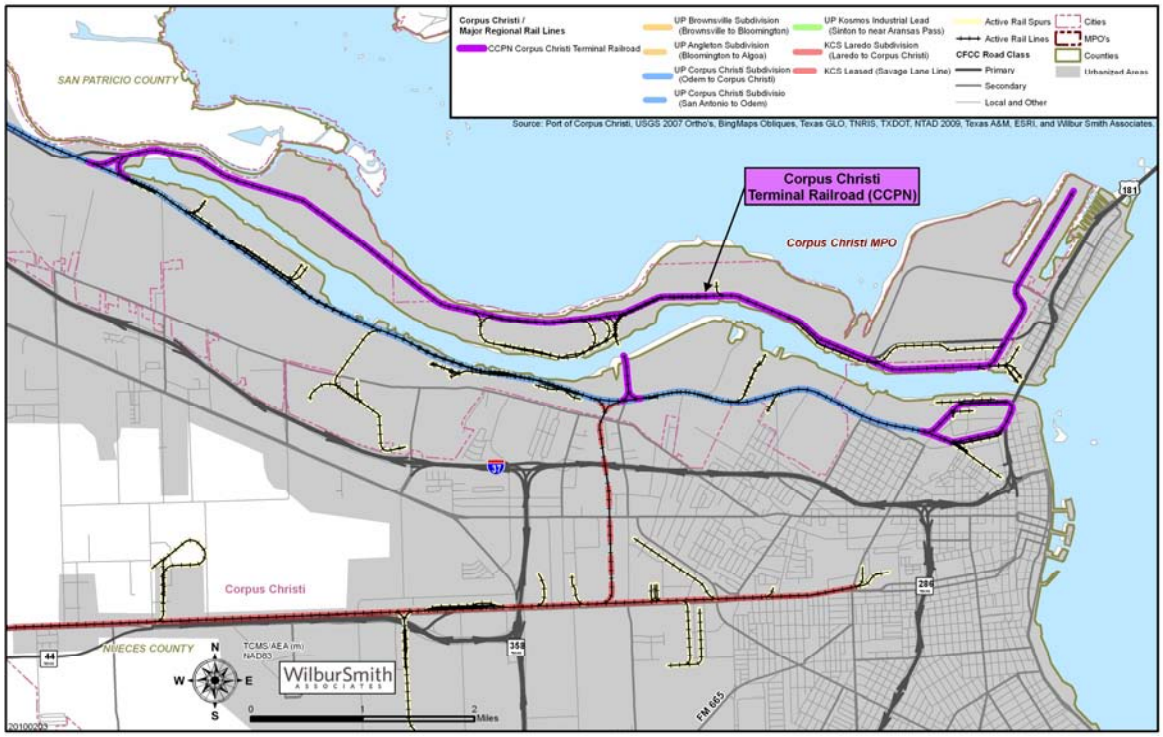
**Safety**

Thirty-nine train incidents or accidents were reported over the line during the 2004 to 2008 period of time. Yard derailments and equipment damage accidents accounted for 21 of the total, ten of these accidents occurred within the Corpus Christi Terminal area. The remaining 18 incidents occurred on mainline or siding tracks over the length of the line. Multiple incidents were clustered between Berry and Matthews, and between Alice and Agua Dulce.

## 2.5 Corpus Christi Terminal Railroad

The Port is directly served by the Corpus Christi Terminal Railroad (CCPN), which provides switching services within the Port for BNSF, KCS and UP for industries they do not serve directly. The CCPN operates 30+ miles of railway in the Corpus Christi port complex providing switching services to shippers on the north side of the ship channel and the Port's south side General Cargo Terminal.

## Exhibit 6: Corpus Christi Terminal Railroad



# 3.0 CORPUS CHRISTI HIGHWAY NETWORK

## 3.1 National Highway System Segments

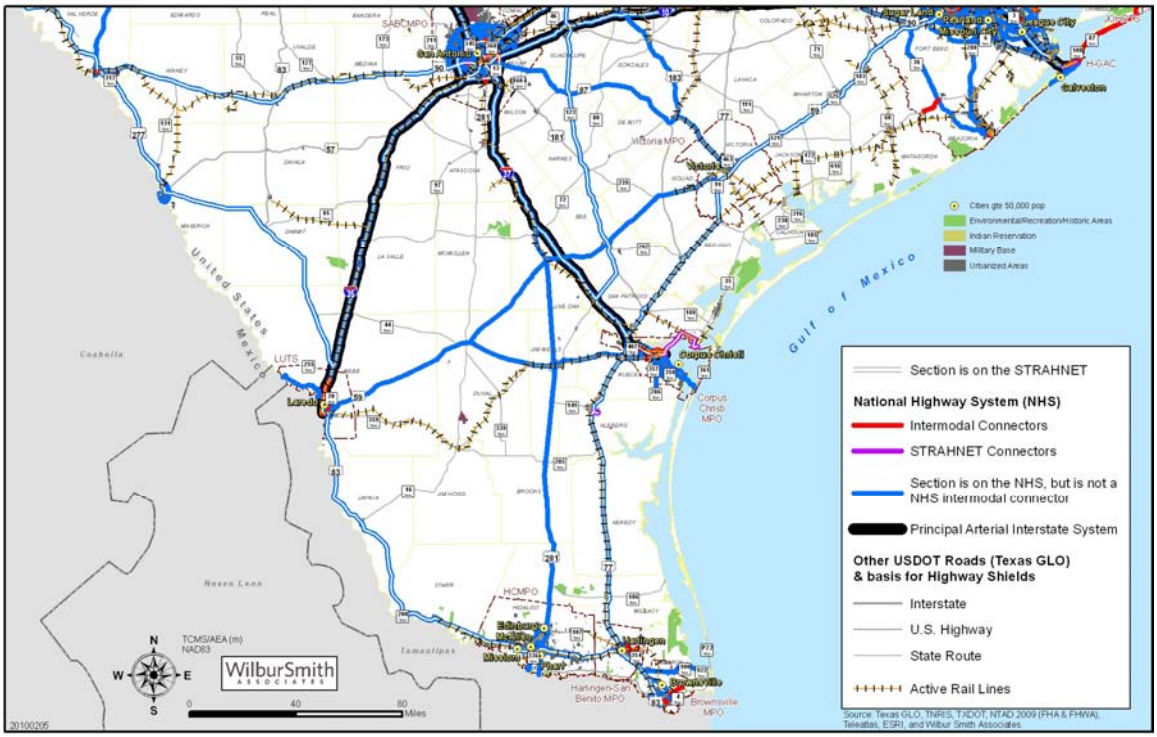
The National Highway System (NHS) comprises 160,000 miles of roadway designated as essential to the U.S. economy or security. It includes several networks:

- Interstate Highway System
- Other NHS Routes
- Strategic Highway Network (STRAHNET)
- Major STRAHNET Connectors
- Intermodal Connectors

## 3.2 Interstate Highways

One interstate highway serves the Corpus Christi area, I-37. It connects the region at US 181/SH 35 with San Antonio, a distance of 143 miles. The highway provides access to downtown Corpus Christi and the airport.

**Exhibit 7: Corpus Christi Major Highways**



## 3.3 Other NHS Routes

Other NHS Routes are highways that provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility. The following roadways are designated as Other NHS Routes:

1. SH 44
2. SH 286 (locally known as the Crosstown)
3. SH 358 (locally known as South Padre Island Drive –SP10)
4. Joe Fulton Trade Corridor
5. Rand Morgan Road (FM 2292)
6. Ocean Drive
7. Weber Road
8. Spur 22
9. Park Road 22

## 3.4 STRAHNET Routes

STRAHNET routes are roadways that are important to the United States' strategic defense policy and provide defense access, continuity and emergency capabilities for defense purposes. In addition to I-37, the region contains several other STRAHNET routes. US 77 is a Non-Interstate STRAHNET Route. US 181, SH 35 and SH 361 are Major STRAHNET Connectors.

## 3.5 Intermodal Connectors

Intermodal Connectors are highways that provide access between major intermodal facilities and the other four subsystems making up the National Highway System. Intermodal Connectors in the region are:

1. Up River Road
2. North Port Avenue
3. Cantwell Lane
4. Navigation Boulevard

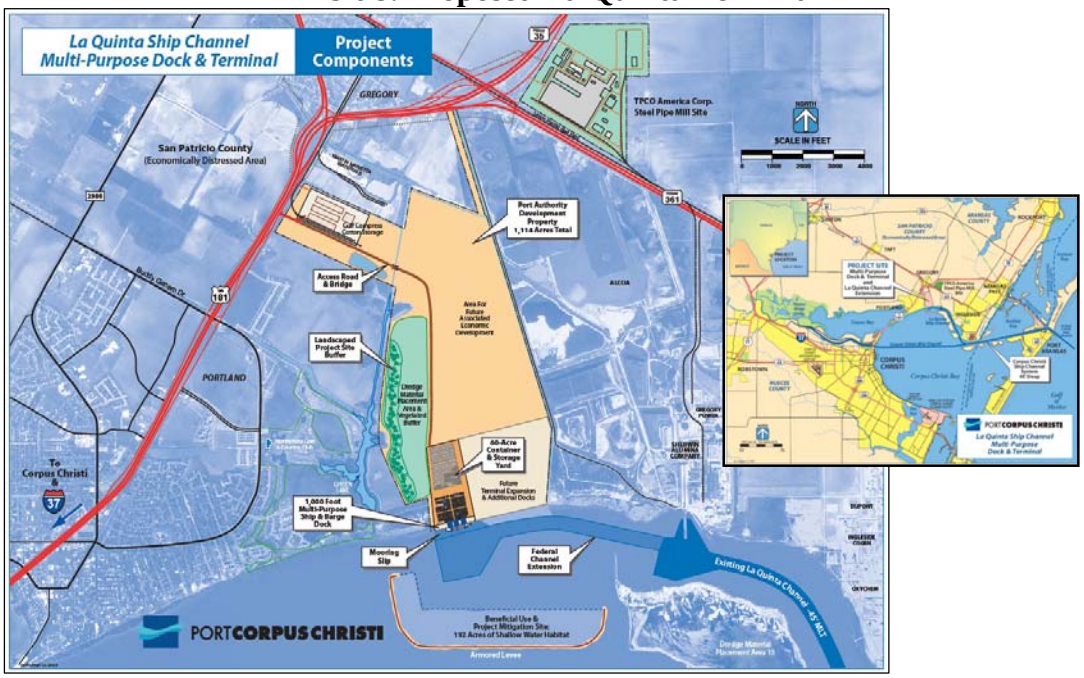
# 4.0 LA QUINTA TERMINAL

## 4.1 Description

Plans to construct a multi-use terminal on the La Quinta property have progressed for a number of years. The slowdown in global trade since late 2008 has resulted in reduced intermodal movements worldwide. As freight logistics planners work their way through these global economic impacts, as well as issues resulting from fluctuating energy costs, contingency plans for La Quinta have included the possibility of initially using the property as a general purpose cargo dock with a gradual transition to a multi-use terminal as conditions become more favorable. For this reason, discussion of the La Quinta property throughout the report will refer to activities at the facility as the "La Quinta Project" unless the discussion specifically refers to plans and studies already conducted to determine the proposed multi-use terminal's impact on the region's transportation system or its market potential.

The La Quinta Terminal will be located in Ingleside on Corpus Christi Bay. The proposed container port is to consist of a 188-acre marine terminal, 3,500 feet of wharf, and a 114-acre terminal at full build-out. The facility is designed to include on-dock intermodal capability with multiple working tracks to accommodate an estimated 400,000 containers annually from ships to rail. The proposed layout of the facility will have a capacity to handle 1.3 million twenty-foot equivalent units (TEUs). Plans for the terminal also include areas designed for container storage, warehousing and distribution.

**Exhibit 8: Proposed La Quinta Terminal**




Source: Port of Corpus Christi, Accessed January 27, 2010.

The Port of Corpus Christi initiated the La Quinta Terminal project in January, 1998 when it purchased a 1,000-acre tract of land near the Ingleside Naval Base. The site was deemed to be especially suitable for a container port facility as ships accessing the terminal would not need to pass under the Harbor Bridge, and with its location in the North Bay area, traffic to and from the facility would not contribute to congestion in downtown Corpus Christi. Water access to the facility through the La Quinta Ship Canal will initially be limited to ships with a 39-foot draft. A 45-foot water depth in the La Quinta Channel is already available to Sherwin Alumina, and the port has a Corps of Engineers permit to dredge to 39 feet beyond Sherwin. Additionally, the Port is working to dredge this last segment to 45 feet.

The La Quinta Terminal is located adjacent to Union Pacific's Kosmos Industrial Lead, which connects to the railroad's Brownsville Subdivision. The Brownsville Subdivision is UP's major north-south route in southeast Texas and connects the Corpus Christi area to markets in the U.S. and Mexico. The La Quinta site is connected to US 181 and to the SH 35 Frontage Road. US 181 and SH 35 provide links to the major regional highways of US 77 (the proposed I-69 NAFTA highway), I-37 and SH 44/US 59.

The La Quinta Trade Gateway Container Terminal was proposed to be developed in four phases with construction beginning in 2010. In Phase 1, the La Quinta Channel will be extended, a 1,500-foot turning basin constructed and a 31-acre terminal with two cranes developed. Target container volume during this phase is 250,000 TEUs (estimated to be 151,500 containers). During Phase 1 operation, landside access would be truck only.

In Phase 2, an additional 32 acres would be developed as well as a 50-acre rail intermodal yard. Expected capacity following completion of this phase would be 500,000 TEUs, approximately 303,000 containers.

Phase 3 calls for 62 additional acres to be developed and an additional 26 acres added to the rail intermodal facility. An additional four cranes would also be acquired. The expected capacity of the facility upon completion of this phase is one million TEUs, or 606,000 containers.

The final phase, or maximum build-out, calls for a 188-acre facility with nine cranes, a 114-acre rail intermodal yard and a 3,500 linear foot berth. Maximum capacity is estimated to be 1.3 million TEUs, approximately 700,000 containers.

The Gulf Compress cotton warehouse became La Quinta's first tenant in 2004 when it was relocated from its location at the Port to provide land for Corpus Christi's minor league baseball stadium. The new facility has 575,000 square feet of storage and exports approximately 6,000 TEUs of cotton from the warehouse to Asian and Mexican markets.

The Port of Corpus Christi has also signed a memorandum of understanding with Mexico-based Meridian 100 Free Trade Zone Mexico, which plans to build an industrial park in Columbia, Nuevo Leon, Mexico. This company will import assembly

components through La Quinta, ship them to their facility on trucks, assemble the parts and export them throughout the rest of Mexico and the U.S. by truck.

In December 2008, the Port of Corpus Christi Authority (POCCA) signed a memorandum of understanding (MOU) with Zachary American Infrastructure. The MOU provides for a one-year period in which the POCCA and Zachary officials will attempt to finalize an agreement on financing, design and construction of the La Quinta Terminal.

The Port of Corpus Christi Authority has also approved a lease option agreement with the Freight Shuttle Development Co. to conduct a freight shuttle demonstration project on 100 acres within the La Quinta property. The Freight Shuttle concept, and its potential applications within the Corpus Christi area, is described elsewhere in this report.

## 4.2 La Quinta Potential Market and Volume

A number of studies and market analyses have been undertaken to determine the feasibility of a major container terminal at the La Quinta site. The competitive advantages of La Quinta's location and transportation-related connections to its markets, and the estimated volumes of container movements over these routes serve as a primary determinant in identifying the freight transportation priorities of the region. Any weaknesses in the system will serve to undercut the efficiency and capacity of the facility which in turn could threaten its chance for success.

*Market Feasibility Appraisal for a Container Terminal at Corpus Christi*

The first market feasibility study for the La Quinta Container Terminal was conducted by the Kingsley Group in February, 2001. La Quinta's key competitive advantages identified in this study included:

- The facility's proximity to Northern Mexico manufacturing centers
- The relative proximity to Central and Southwest Texas
- The facility's ability to efficiently handle landbridge trains to and from the Ports of Los Angeles and Long Beach
- The ability to leverage Midwest-Mexico intermodal train services

This study based its feasibility of the La Quinta Container Terminal primarily on its geographic location together with its highway access, which would allow it to eventually capture a major share of cargoes to and from Northeastern Mexico and Central and Southwest Texas, and rail access which would allow it to handle significant volumes of landbridge trade lanes.

La Quinta's rail effectiveness was based on the minimal train switching required between the dock and rail yard, access (1.5 miles) to the Brownsville Subdivision rail mainline, and shorter dock to dock running time to and from Southern California. The facility's

access to competitive north-south rail service would allow it to capitalize on improved, high-frequency NAFTA train services, while more efficient intermodal train service to and from Southern California would provide the facility access to cargoes moving between Asia and Latin America now moving primarily through the Panama Canal.

An additional justification identified for the La Quinta facility in this study was its potential to relieve pressure on the highway and rail networks in the Houston and New Orleans metropolitan areas. Estimated container volumes for the facility were 100,000 TEUs in the first year of operation growing to 400,000 TEUs by year seven.

*The Potential Economic Impact of the La Quinta Trade Gateway Container Terminal*

In February, 2004, the Port of Corpus Christi released "The Potential Economic Impact of the La Quinta Trade Gateway Container Terminal" prepared by Martin Associates. This report stated that based on existing growth rates of international trade, La Quinta had the market potential to attract upwards of one million TEUs by 2024. This study assumed that in the initial stages of the facility's development, all containers would be moved by truck. In the later years, a 25 percent rail intermodal share was assumed. The focus of this study was to determine the business revenue, employment, personal earnings and tax impacts of the La Quinta facility.

Volumes in this report for the early years of the facility's development were reduced somewhat from those estimated in the earlier Kingsley report. Estimated TEUs ranged from approximately 50,000 in the first year of operation to 450,000 TEUs by year ten. By the tenth year of operation, the facility's activity was estimated to support 5,750 total jobs, about $350 million of business revenue, $302 million of personal earnings, and $27.2 million of state and local taxes.

*Planning for Container Growth along the Houston Ship Channel and Other Texas Seaports. An Analysis of Corridor Improvement Initiatives for Intermodal Cargo*

In November, 2005, the Federal Highway Administration sponsored a study of port and rail infrastructure in Texas, and its suitability for handling increased volumes of containers in the near future. The four ports and their corresponding rail corridors addressed in the report were the Ports of Beaumont, Houston, Corpus Christi and Brownsville.

The focus of this report differed from earlier feasibility and market analyses of the La Quinta Container Terminal by concentrating more on the importance of adequate port container capacity in Texas rather than the market potential of the individual ports. The study's support for developing a major container handling facility at La Quinta was based on the need for redundancy in Texas' container handling network, and the need to provide overflow capacity for the Port of Houston.

This report repeated a number of the advantages cited earlier for a container facility at La Quinta over Houston, including its deeper channel, the lack of congestion in the area's transportation system, and its more convenient access to South Texas and Mexico. It also cited La Quinta's ability to serve two critical economic areas – the greater Houston area, and the I-35 corridor. Conversely, the study also stated that Corpus Christi is not currently a major source of container demand, and cited the need for proof that La Quinta is needed not only in case of emergency, but can compete with the Barbour's Cut, Brownsville and Bayport facilities.

*La Quinta Market Potential*

The Port of Corpus Christi, recognizing that various events and changes to supply chains had impacted the routing of cargoes, engaged TranSystems, Inc. to update the estimates of La Quinta Container Terminal's market potential. The study was completed in early 2008. Since the original market assessment, completed in 2001, all-water service to Gulf and East Coast ports had increased as congestion became prevalent at West Coast ports and the cost and transit times of mini-landbridge services grew. In addition, it was noted that plans to expand the Panama Canal by 2015 would increase the likelihood that all-water routings would continue their growth trend.

This study established a current (2006) market potential of 227,000 TEUs. The source of the container movements included volumes diverted from other Texas ports, those moving by intermodal rail through Pacific Southwest and Mexico ports, and transloaded containers.

Although this report did not estimate the number of TEUs by build-out phase, the projected traffic does roughly match the volumes estimated in the earlier reports. An estimated annual growth rate of between 6.3 percent and 6.8 percent was applied to each source of traffic (Texas Gulf, Pacific Southwest Intermodal Rail, Mexico Intermodal Rail and Truck, and Pacific Southwest Transload), thus increasing the overall volume of containers handled at La Quinta from 277,000 TEUs in 2006 to 814,000 in 2026.

The report does note that the market analysis is based on the assumption that congestion in the Houston area will continue to increase, and that the Port of Corpus Christi will continue efforts to increase draft depths to 45 feet and eventually to 52 feet. It also noted that the opportunity for La Quinta to capture Pacific Southwest intermodal movements is heavily dependent on attracting shippers to the Corpus Christi/San Antonio areas.

*Market Summary*

In general, the past studies agree on both the potential markets to be served by the La Quinta facility and the estimated volumes which could be handled over time. The markets identified are:

- All-water imports from Asia to Corpus Christi through the Panama Canal

- Imports from Asia via water to West Coast ports and rail landbridge to Corpus Christi
- Imports from Mexico to Corpus Christi by rail or truck
- Imports from Latin America to Corpus Christi via water
- Distribution to Mexico from Corpus Christi by rail or truck
- Distribution to Latin America from Corpus Christi by water
- Distribution to the Midwest and Gulf states by rail or water

The number of TEUs is expected to be from 250,000 to 300,000 initially, grow to the 400,000 to 600,000 range by year ten, and approach 800,000 to one million TEUs in a 20 year time span.

## 4.3 Factors Related to the La Quinta Terminal's Success

The future success of the La Quinta terminal and Corpus Christi's potential as a container port can be linked to three factors:

1. Current impacts on international trade volumes and changes in logistics patterns caused by the recent economic crisis are not long-term and lead to permanent trade and logistics patterns that could adversely affect the potential of La Quinta
2. Adequate water and landside infrastructure connections to La Quinta are provided to ensure that container movements to and from the terminal are efficient enough to compete with other container ports
3. Cost-competitive rail access to the terminal is provided to ensure La Quinta is competitive with other ports

## 4.4 Recent Changes in International Container Logistics Changes

Over the past two years, two separate developments have had at least a short-term impact on international container logistics. The increase in fuel prices experienced in 2008, and the global economic recession which began in late 2008 and has continued into 2009, have created some noticeable freight intermodal trends. As noted above, should these trends continue, they could affect the future success of the La Quinta terminal. These trends include:

*Decreased volume of international container movements*

The global economic decline has affected international freight forwarding between foreign ports and the U.S. as the import market contracts. Container volumes from China have fallen at double digit rates as of mid-2009. At least a portion of the La Quinta terminal's market is based on congestion at competing ports which will not occur without a resumption of growth in containerized freight movements.

*Slowdown in supply chain network changes*

In the past, as freight volumes increased, the freight logistics network increased in size through new construction of port, warehouse and distribution capacity. The recession has resulted in supply chain managers shifting their attention to short-term results such as inventory reduction and the renewal of contracts with current logistics service providers. Longer-term projects and proposed changes to existing supply chain strategies are at least temporarily a lower priority.

*Changes in manufacturing sources (domestic vs. international) and resulting transportation logistics changes*

The extreme volatility of fuel prices over the past two years has infused a high level of uncertainty into the global freight supply chain. The high fuel prices of 2008 led to discussion of changes in product sourcing as the advantages of lower cost of producing products in distant countries were being diminished by high transportation costs.

Although globalization will not disappear or be reversed due to high energy costs or the financial crisis, it is likely that these factors, over the intermediate or long-term, would lead to shorter supply chains with product sourcing moving closer to consumer markets.

A reduction in Asian container trade would reduce the amount of container traffic projected to be delivered to the La Quinta terminal from Southwest Pacific ports for local distribution or transloading to Latin America. Due to its proximity to Mexico and Central/South America, however, Corpus Christi could benefit from increased Mexican intermodal cargo movements destined for Central or Southwest Texas.

The uncertainties of the current recession and future fuel costs will require continued analysis of changes to the supply chains as development of La Quinta progresses.

## 4.5 Impact of Infrastructure Connections

The traffic that will move through La Quinta will principally be discretionary in that users will have multiple ports to choose from. Without a heavy population of warehouse and distribution facilities within the Corpus Christi area, the Port will have to compete on the basis of the reliability, efficiency and cost in serving longer distance markets such as Mexico, the Midwest and even the West Coast. The physical condition and operational efficiency of the terminal's water access and its highway and rail connections to major transportation corridors are all important factors in its ability to build success and compete.

*La Quinta's Waterside Access*

As noted earlier, La Quinta Ship Channel depths will be between 39 feet and 45 feet. Efforts are also ongoing to increase the Corpus Christi and La Quinta Ship Channels' depth to 45 feet and to widen the ship channel between the Harbor Bridge and the La Quinta Ship Channel to 530 feet. These improvements will allow larger vessels to serve the port, increase the efficiency of ship movements, reduce accidents and reduce the need for tugboat services. The improvements are essential to attract container shipments to the port as the existing 39 foot draft would not accommodate most modern container vessels. The newer, larger containerships typically require channel depths of at least 50 feet, particularly for fully loaded vessels.

*La Quinta's Rail Access*

Rail access connecting La Quinta to its inland markets can be viewed from three perspectives:

1. Rail access between La Quinta over the UP Kosmos Industrial Lead to the Brownsville Subdivision
2. Rail operations over the Brownsville Subdivision including connections to other carriers in the Corpus Christi area
3. Rail operating reliability and efficiency between the Corpus Christi area and the ultimate origins or destinations of the containers moving through the La Quinta terminal. This would include routings between the Corpus Christi area and both the West Coast and Midwest.

*Rail Access between La Quinta and the Brownsville Subdivision*

The La Quinta Terminal will be connected to UP's Brownsville Subdivision, and ultimately the nation's rail mainline system, via the UP Kosmos Industrial Lead. The current conceptual site plan calls for the rail connection exiting from the west side of the La Quinta facility, turning north along the eastern edge of US 181 and intersecting with the Kosmos Industrial Lead approximately one mile north of the Town of Gregory. The distance over the Kosmos Industrial Lead between the intersection of the proposed La Quinta rail spur and the connection to the Brownsville Subdivision at Sinton will be approximately 20 miles.

The Kosmos Industrial Lead between Sinton and Gregory currently permits train speeds of 20 mph, except for a one mile segment in the Town of Taft where a 10 mph speed restriction is in place.

The Kosmos Industrial Lead currently carries an average of four trains per day (two in each direction). The initial freight modal split for the facility is estimated to be 80 percent truck and 20 percent rail. Based on a full build-out throughput of 800,000 TEUs, it is estimated that the initial rail service required will be one train per day in each direction.

As the modal split eventually reaches the desired level of 50 percent truck and 50 percent rail, it is estimated that rail service will grow to three trains per day in each direction as La Quinta reaches its market potential. Although it is possible that other rail traffic on this line may increase, through rail connections to such facilities as the proposed Tianjin Pipe Corp. manufacturing plant and the Kiewit Construction site, it is unlikely that the traffic levels will interfere with intermodal train service to La Quinta.

*Rail Connection with the Brownsville Subdivision*

Access to UP's Brownsville Subdivision provides connections to the BNSF and KCS rail networks within the study area as well as the UP itself. Therefore, rail operations over UP's Brownsville Subdivision in the vicinity of Corpus Christi is key to efficient rail service between the La Quinta facility and any part of the U.S. or Mexico. The physical and operating characteristics of the Brownsville Subdivision are essential to the reliability of the proposed container movements by rail.

The major restrictions to efficient rail operations between La Quinta and the rail mainline network are limitations in the connectivity between the Brownsville Subdivision and the Kosmos Industrial Lead and between the Brownsville Subdivision and the Corpus Christi Subdivision.

The first restriction to these movements is a missing physical connection from the Brownsville line southbound to the Kosmos Industrial Lead eastbound at Sinton. A connection between the Brownsville Subdivision northbound and the Kosmos Industrial Lead does exist, but the missing leg of this wye connection presents a serious operating deficiency for scheduled intermodal service.

The missing connector between the Kosmos Industrial Lead and the Brownsville Subdivision at Sinton requires all trains heading toward Houston and other connections to the north from La Quinta to first travel southwest on the Brownsville Subdivision to Odem, a distance of approximately 5.4 miles. The train must then turn southeast at Odem onto the Corpus Christi Subdivision until the entire train clears the wye at Odem. The train must then back up onto the Brownsville Subdivision in the southwest direction until the locomotive clears the intersection and retrace the route toward Odem. Only then is the train from La Quinta correctly aligned to travel northbound from the Kosmos Industrial Lead.

This situation, in addition to adding a minimum of 10 miles of slow train operations and backup moves, also creates a safety situation in Odem due to the train blocking four crossings during the turnaround move. These crossing blockages can affect both the general public and emergency services.

The construction of a rail connection between the Kosmos Industrial Lead and the Brownsville Subdivision northbound is complicated by the fact that the San Patricio

Electric Cooperative headquarters building and storage yard lie in the right-of-way required to connect the lines.

Trains destined from La Quinta to San Antonio and points west face a different restriction. From the Kosmos Industrial Lead, La Quinta trains head southwest onto the Brownsville Subdivision. At Odem, trains would normally turn northwest onto the Corpus Christi Subdivision toward San Antonio. However, there is no direct connection between the Brownsville Subdivision southbound and the Corpus Christi line westbound. Trains must therefore turn southeast onto the Corpus Christi line until clearing the Brownsville Line, back southbound onto the Brownsville Line, and then head northwest onto to the Corpus Christi Line toward San Antonio.

Again, these multiple movements over busy lines cause delays that could seriously affect the reliability of container movements, and create similar grade crossing blockages as those described above.

Construction of a connection between the Brownsville Line southbound and the Corpus Christi line westbound would require the removal of a one-story block building, currently housing a loan company, which sits in the required right-of-way. The San Patricio Rural Rail District has been working to address this issue.

Given the schedule and reliability requirements of intermodal container movements, the additional time required to make these directional movements, and the added congestion the movements will cause on a high volume rail mainline for all traffic, require that construction of the connections at Sinton and Odem be given a high priority.

*Rail Operations between the Corpus Christi Area and La Quinta Markets*

The several market analyses undertaken to determine the feasibility of the La Quinta Multi-use Terminal were consistent in identifying the Mexican and Midwest NAFTA markets for imported containers, and the Southwest Coast for incoming containers destined for the Corpus Christi region.

Based on La Quinta's potential markets, the following rail lines within Texas and rail corridors to the north and west will have an impact on the success of the La Quinta facility.

Market – Northern Mexico
Affected Rail Lines – UP Brownsville Subdivision (Corpus Christi - Brownsville)
KCS Texas-Mexican Railway (Robstown - Laredo)

Market – South Central States (New Mexico, Texas, Oklahoma, Arkansas, Louisiana)
Affected Rail Lines – UP Brownsville Subdivision (Corpus Christi – Bloomington)
UP Angleton Subdivision (Bloomington – Houston)
UP Corpus Christi Subdivision (Corpus Christi – San Antonio)
KCS Victoria – Rosenberg Line

Projected utilization levels of rail freight corridors serving La Quinta container traffic are available in the recently published "National Freight Infrastructure Capacity and Investment Study" report, published by the Association of American Railroads.

This report shows that the Brownsville Subdivision is already experiencing capacity problems and the number of trains per day is expected to increase by 15 to 25 trains by 2035. This would result in the line operating above capacity.

*La Quinta's Highway Access*

The La Quinta Terminal will be located within easy access of the Interstate Highway Network. La Quinta is located directly on US 181, approximately 15 miles from its intersection with I-37 in Corpus Christi. From I-37 trucks have access to Mexico markets via US 77 to Brownsville or via US 59 to Laredo.

Access to South Central States is most easily attained from I-10 which traverses New Mexico, Arizona and California west of Texas, and along the Gulf Coast states of Louisiana and Mississippi to the east. A number of routes connect to I-10 to the north to provide access to the Mississippi Valley and Midwest states. From La Quinta, access to I-10 can be achieved via I-37 northwest to I-10 at San Antonio. Access to I-10 in the easterly direction is most easily attained from US 181, which connects to US 77 approximately 20 miles from the La Quinta facility. At Victoria, US 77 connects with US 59 and to I-10 north of Houston.

As a multi-use terminal, the La Quinta facility was estimated to generate 2,600 truck trips per day, with approximately 170 truck trips generated in the morning and evening peaks. These estimates are based on the average annual throughput of 800,000 TEUs and a freight modal split of 80 percent truck and 20 percent rail. The estimated future modal split of 50/50 would reduce these levels and decrease the impact on the adjacent road network.

Local and regional highways provide uncongested access and good connections to the major production/consumption centers in Texas. Existing traffic conditions (2002) for all highways deemed critical to La Quinta operate at average Level of Service (LOS) C or better. LOS C provides for stable traffic flow and fair traffic progression at signals. [2]

[2]The Highway Capacity Manual and AASHTO Geometric Design of Highways and Streets define the following service levels:
A= Free flow
B=Reasonably free flow
C=Stable flow
D=Approaching unstable flow

Studies of future traffic conditions in the year 2025 also found conditions to be generally acceptable and not significantly impacted by La Quinta multi-use terminal traffic. Most study area locations were estimated to operate at acceptable LOS D conditions or better with or without the La Quinta terminal and did not account for proposed TxDOT highway improvements.

Planned highway improvements should also benefit the La Quinta facility in the future. The proposed I-69 would roughly follow the route of US 59 from Laredo via Houston, continuing northeast into Louisiana and north through the Midwest states to Michigan. Together with the development of US 77 and US 281 to interstate standard, these routes would provide more efficient access to the I-10 highway corridor.

TxDOT is also considering the feasibility of constructing an exclusive truck-only tollway facility extending from the Port of Corpus Christi to the Port of Laredo. Currently, these ports are most directly connected through a combination of U.S. and state highways through mostly rural and business districts with speed limits from 30 to 70 mph. Travel time and costs for trucks could be improved by a more direct, truck-only route, and potentially relieve heavily congested highway segments of I-35 and I-10.

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E=Unstable flow
F=Forced or breakdown flow

# 5.0 BROWNSVILLE SUBDIVISION OPERATIONS

Union Pacific's Brownsville Subdivision acts as the spine of rail access to the Corpus Christi area. The rail line provides the only direct rail connection between the Gulf Coast region and the Mississippi Valley and Midwest. Most importantly, the Brownsville Subdivision serves as the only vehicle for competitive rail access to the east coast of Texas south of Houston, through the BNSF and KCS Railroads' trackage rights arrangements which allow them to serve the Port of Corpus Christi and other industries between Houston and Corpus Christi.

The Brownsville Subdivision's southern boundary is Brownsville, TX at the Texas-Mexico border. From this point, the line extends approximately 221 miles north along the Texas Gulf Coast to Bloomington, TX where the line becomes the Angleton Subdivision and continues toward Houston.

The current operating nature of the Brownsville Subdivision, its related importance to the Corpus Christi area, and its perceived future role and ability to meet the area's rail service needs will be addressed below.

## 5.1 Historical Background

The Brownsville Subdivision was constructed between 1904 and 1906 by the St. Louis, Brownsville and Mexico Railway. The charter of the St. Louis, Brownsville and Mexico Railway was signed on January 12, 1903 and called for construction of a railroad from Houston to the Rio Grande River at or near Brownsville. Plans called for work to commence at a point on the existing Tex-Mex Railroad in Robert Driscoll's pasture, later to be known as Robstown. Materials were to be delivered by ship to Corpus Christi and transported by rail from Corpus Christi over the Tex-Mex to the job site. Upon completion of the line to Brownsville, the construction of the line from Robstown to Houston would commence. Construction of the line between Robstown and Brownsville was completed on June 7, 1904 and service was inaugurated on July 4, 1904.

From Robstown, track construction reached Sinton on April 10, 1905, and following the railroad securing trackage rights between Algoa and Houston, the line was opened from Brownsville to Houston on December 31, 1907.

The St. Louis, Brownsville and Mexico Railway became part of the Missouri Pacific Lines on January 1, 1925, but continued to operate as a separate company until it was merged into the Missouri Pacific Railroad Company on March 1, 1956. On December 22, 1982, the Missouri Pacific merged with the Union Pacific and Western Pacific Railroad companies to create the Union Pacific System under the Union Pacific Corp. holding

company, but maintained its own corporate and commercial identity until January 1, 1997.

## 5.2 Physical and Operational Characteristics

The Brownsville Subdivision is generally a single-track mainline between Brownsville and Bloomington, TX where the rail line becomes the Angleton Subdivision, continuing toward Houston.

At its southern terminus of Brownsville, the UP line conducts local operations from the Brownsville Yard. The UP also connects to the Port of Brownsville via the Brownsville & Rio Grande International RR. North of Brownsville, the UP also operates a yard facility at Harlingen, where the line connects to the Rio Valley Switching Co.

Approximately 140 miles north of Brownsville, at Robstown, UP intersects with the KCS Railway which extends from Corpus Christi to Laredo. Between Harlingen and Robstown, a switching yard is located at Kingsville, approximately 24 miles south of Robstown, and various industrial spurs serve industries such as Hoeschst Celanese at Bishop, Terra International and the Petronila Grain Cooperative. Passing sidings are also located at Bishop, Driscoll, and at Robstown Junction.

Train control along this segment of the Brownsville Subdivision is through Track Warrant Control, where trains are authorized for movement only between specified locations. The allowable train speed on this segment is 49 mph, and is reduced to 25 mph at Robstown Junction. This segment of the mainline is not heavily used, with 5 to 6 trains providing through service in each direction.

North of Robstown, the Brownsville Subdivision is more heavily utilized, especially between Odem and Sinton. At Odem, the line intersects with UP's Corpus Christi Subdivision. This line extends from San Antonio and terminates at Corpus Christi. A small yard is also located at Odem. Approximately eight miles north of Odem, the line also intersects with UP's Kosmos Industrial Lead, which serves industries along the northern edge of Corpus Christi Bay. A switching yard is located at Sinton. North of Sinton, the rail line continues to the Bloomington Yard, which is a major UP classification yard.

This segment of the Brownsville Subdivision also contains a number of industrial spurs and passing sidings at Woodsboro (9,300 ft.), Greta (7,250 ft.) and Inari (7,667 ft.).

Between Robstown and Odem, train speeds are set at 49 mph. At Odem, a two mile section (MP 153-155) is limited to 20 mph. North of Odem, a speed limit of 40 mph is allowed. Train control over this section of the rail line is via Track Warrant Control, except for segments between Odem and Sinton Junction, and between Inari and Bloomington. These segments operate under Centralized Traffic Control where train

movements are directed through the remote control of switches and signals from a central control point. This system enables trains to pass each other at sidings without the need for train crews to stop and manually throw switches.

Approximately seven to eight trains in each direction are operated between the three railroads which operate over various segments of the Brownsville Subdivision between Robstown and Bloomington.

## 5.3 Shared Access

Although the Union Pacific owns the Brownsville Subdivision, the BNSF and KCS/Tex-Mex Railroads have trackage rights over various segments of the line. Under terms of the trackage rights agreement with UP, KCS/Tex-Mex cannot serve any customers along the line. BNSF has rights to new industries locating at those points formerly served by Southern Pacific, subject to terms and conditions negotiated with UP.

Under the terms of the merger agreement, Tex-Mex was also granted rights over the circuitous route from Placedo to Flatonia, and from Flatonia to Rosenberg, and on to Houston. Upon KCS's acquisition of the Tex-Mex, these rights were also assigned to KCS by the STB in April, 2006. These rights provide KCS/Tex-Mex the ability to access their Corpus Christi facilities and to connect between Laredo and Beaumont, via Houston, for all points on the KCS system.

The BNSF has trackage rights over the entire length of the Brownsville Subdivision between Brownsville and Bloomington. These rights continue on the Angleton Subdivision to Algoa. These trackage rights allow BNSF to connect between Mexico and BNSF-owned trackage in the Houston area. BNSF acquired its trackage rights as a result of Union Pacific's merger with Southern Pacific in 1996 as a condition to merger approval.

## 5.4 Current Operating Restrictions

The National Rail Freight Infrastructure Capacity and Investment Study, prepared by the Association of American Railroads through the cooperative effort of its Class I railroad members, identifies the Brownsville Subdivision as operating near its capacity levels, or at current Level of Service D on a scale of A to F.

The Draft Corpus Christi-Yoakum Regional Freight Mobility Study, which was undertaken by Jacobs in 2008, conducted an operational analysis of the rail system in and around the Corpus Christi area that reaffirms the Brownsville Subdivision's capacity constraints, albeit without the cooperation of the railroads involved.

The study developed a number of performance measures to determine the levels of delay for each rail subdivision in the region. These delay measurements included:

- Delay ratio – total train delay divided by the unimpeded elapsed running time of trains
- Delay hours per day – average number of delay hours per day over the course of the simulation
- Delay minutes per 100 train-miles operated – the sum of all delays within a subdivision divided by the total number of train miles operated over the segment multiplied by 100
- Delays greater than 30 minutes – major delays which provide a good indication of a major chokepoint.

The study showed that the operations over the Brownsville Subdivision resulted in higher delay levels than any other Subdivision in the region, often by wide margins.

The Delay Ratio can be used to indicate an approximate level of congestion on a subdivision and the approximate percentage of the line segment that is approaching its sustainable capacity. The operating simulation for the Brownsville Subdivision registered a 51 percent Delay Ratio.

Delay hours per day averaged 36.9 for all trains over the course of the simulation, and delay per 100 miles was 112.5 minutes. These measures indicate how congested segments are under base operations. The high levels for these measurements, as well as others, also indicate the potential for crews exceeding their allowed on-duty time of 12 hours before completing their service assignments. Replacing “outlawed” crews results in additional delay and high operating costs.

During the 14-day simulation period, a total of 236 delays exceeding 30 minutes in length were observed. The total amount of delay experienced during this period was 292.2 hours. The greatest number of delays (101) exceeding 30 minutes occurred in the northern portion of the Subdivision, in and around the Bloomington Yard. This was followed by the Odem – Sinton segment with 74 occurrences and the Woodsboro – Greta segment between the two above with 51 occurrences. South of Robstown only 10 occurrences were detected during the simulation. Averages of over one hour of delay were noted for the delay events simulated in this measurement.

Although the simulations and related delay measurements described above were not based on railroad data, the assumptions made and results produced were reviewed by TxDOT and others familiar with rail operations on the Brownsville Subdivision and deemed acceptable for the purposes of the freight mobility analysis.

A number of factors have been identified as contributing to the existing levels of congestion on this important rail line. These physical and operational constraints exist

primarily north of Robstown. A description of these perceived problem areas are provided below.

*Bloomington Yard Operations*

The Bloomington Classification Yard is located at the northern end of the Brownsville Subdivision. Bloomington also serves as a junction point between the Brownsville Subdivision and the Seadrift and Victoria Industrial Leads. The high volume of trains passing through or originating/terminating the Bloomington yard contribute a significant amount of delay to the line's operations. The various rail functions carried out within the yard area all contribute to delays and congestion which ultimately affect the Corpus Christi area.

The need for trains to travel slowly within the Bloomington yard limits decrease average velocity over the line and consume a significant amount of capacity on a single track line. This especially affects trains entering or leaving the yard which must clear the main line slowly due to yard track speeds and switches. Bloomington also serves as a crew change location and where cars are added or cut from train consists. These operations can block tracks required by through trains serving Corpus Christi.

*Siding Lengths*

Although there are a number of passing sidings located on the Brownsville Subdivision, the length of most of these sidings are no longer adequate to accommodate the longer trains most railroads now operate to improve productivity. Sidings and their lengths along the line include: Raymondville (7,730 ft.); Norias (4,496 ft.); Armstrong (7,456 ft.); Robstown (7,116 ft.); Sarita (5,168 ft.); Driscoll (3,200 ft.); Woodsboro (9,300 ft.); Greta (7,250 ft.); and Inari (7,667 ft.). Railroad companies generally prefer to operate trains between 9,000 and 10,000 feet in length when possible to minimize the number of crews and locomotives needed. This situation requires that for longer trains traveling in opposite directions, one train must be delayed significantly longer due to the greater distance between usable sidings, or that train lengths must be shortened, resulting in more train moves and lower productivity.

*Lack of Remotely Controlled Signals*

As noted earlier, the only segments of the Brownsville Subdivision with Centralized Traffic Control (CTC) are between Bloomington and Inari, and between Sinton and Odem. The Woodsboro Siding is locally controlled by passing trains from the locomotive or a crew member's radio and is not under CTC. The remainder of the Subdivision is operated via Track Warrant Control where train crews are generally authorized for movement via radio. The absence of signalized controls over a rail line is generally referred to as "dark territory."

With regard to delays on the Brownsville Subdivision, the lack of centralized control for train movement itself is not the most critical problem due to the number of current train movements. A more significant contributor to delay is the inability to remotely control switches. Crews on a train taking a siding must stop and line the switch allowing it to enter the siding. The switch must then be realigned for the opposing train to proceed on the main line. The train in the siding must then align the switch allowing it to re-enter the mainline. After the entire train has cleared the siding, the crew must then realign the switch and walk the length of the train before the train can continue.

*Switching Services to Industry*

Although a number of larger industries along the line are served via their own industry spurs or sidings, delays along the Brownsville Subdivision are experienced as a result of trains setting out or picking up cars from industries. Trains often stop on or block the main line during these switching operations which cause delays for other trains moving over the line. Grade crossing inventory reports show that at some locations switching operations can result in as many as 50 movements daily over some crossings.

*Connections to Other Rail Lines*

The number of connections between the Brownsville Subdivision and other rail lines is not unusual over the entire length of the line. Within the Corpus Christi area, however, there are number of rail connections within a relatively short distance.

Within an approximately twenty mile distance, the Brownsville Subdivision intersects with the KCS line at Robstown, connects with the Corpus Christi Subdivision in two directions at Odem, and connects with the Kosmos Industrial Lead in one direction at Sinton Junction.

Delays experienced at these intersections would likely not be excessive, except for the fact that at both Odem and Sinton, track connections are not available for direct train movements in all directions. This requires reverse direction and backup movements along the line that result in lost time not only for the trains performing the movements, but which block the single track line for any trains moving through the area.

At Odem, the Brownsville Subdivision connects to the Corpus Christi Subdivision. The Corpus Christi line leads to San Antonio to the northwest and to Corpus Christi to the northeast. For trains operating on the Brownsville line from the south, wye connections to the Corpus Christi line are available in both directions. For trains operating on the Brownsville line from the north however, there is no track connection to the Corpus Christi line toward San Antonio. Thus, trains operating south on the Brownsville Subdivision heading toward San Antonio, or trains from San Antonio heading north on the Brownsville line are required to make backup moves that block not only both mainlines, but also highway grade crossings in the area.

For trains heading south on the Brownsville line heading toward San Antonio, trains must move past the wye, back onto the Corpus Christi Subdivision in the direction of Corpus Christi until the train clears the wye, and then proceed on the Corpus Christi line toward San Antonio. For trains on the Corpus Christi line from San Antonio heading north onto the Brownsville Subdivision, trains must continue on the Corpus Christi line past the intersection, back up onto the Brownsville Line to the south until clearing the intersection, then proceed north.

In addition to the delays caused by these movements over the two rail mainlines, the backup moves also result in additional delays over roadway grade crossings in the Odem area. Long delays can be expected at the Willis St. and Baylor St. crossings on the Brownsville Subdivision and the 1st St. and 3rd St. crossings on the Corpus Christi Subdivision during these additional train movements which are at a minimum an inconvenience to roadway traffic and a potentially more serious situation when emergency vehicles are delayed.

The complexities and delays involved in the additional movements involved at the intersection with the Kosmos Industrial Lead are even more serious.

The wye provides a direct connection for trains operating on the Brownsville Subdivision northbound entering the Kosmos Industrial Lead. For southbound trains however, there is no direct track connection with the Kosmos Line. Trains must therefore continue south an additional 7.5 miles to Odem and switch onto the Corpus Christi Subdivision toward Corpus Christi. Once trains clear the Brownsville line, they must back up onto the Brownsville Subdivision southbound until clearing the wye. Only then is the train positioned to travel back to Sinton and enter the Kosmos Industrial Lead.

Trains departing the Kosmos Industrial Lead onto the Brownsville Subdivision northbound must also make the same movement onto the Corpus Christi Subdivision at Odem, and then back onto the Brownsville line southbound until clearing the wye before heading north.

The delays involved in these additional movements are manifold. For the trains involved, they include the time necessary to operate the additional 15 to 16 miles between Odem and Sinton as well as the backup moves. During this time, other trains are delayed over this portion of the Brownsville line. In addition, the same roadway crossings noted above are blocked during the required movements.

*Weight and Size Restrictions*

Although weight restrictions over a rail line do not directly contribute to delay, a rail line's inability to accommodate or allow the full loading of modern and state-of-the-art rail cars lead to inefficiencies and competitive disadvantages for the shippers served by the line. This especially applies to shippers located in the Port of Corpus Christi which deal predominately in bulk commodities.

Most rail mainlines are now maintained to accommodate 286,000 pound axle loadings, the current norm for rail cars carrying bulk commodities such as coal, grain, aggregate, lumber, etc. Maximum rail car axle loadings on the Brownsville Subdivision however, are limited to 263,000 pounds. The impact of this limitation is that shippers served via the Brownsville Subdivision must be served with older, lower capacity rail cars or with newer cars that cannot be fully loaded. Shippers must therefore order more carloads to receive the same amount of material.

The weight restrictions on the Brownsville Subdivision are generally attributed to bridges on the line that cannot accommodate the higher car weights. In addition to weight issues, some bridges also restrict dimensional (wide) loadings. Within the study area alone there are at least 40 rail bridges on the Brownsville line, most of which are over waterways.

## 5.5 Projected Future Traffic Levels

The National Rail Freight Infrastructure Capacity and Investment Study predicted that by 2035 the Brownsville Subdivision will operate at Level of Service F, or above its operating capacity, unless improvements are made.

The predicted future capacity constraints on the line can be based on a nominal growth rate for existing traffic commodities which originate and terminate in the Corpus Christi area and NAFTA-related through traffic. This additional traffic has the potential of adding 6 to 8 additional trains per day over the line. An additional 2 to 6 trains daily is expected in conjunction with the La Quinta Project. These additional trains would essentially double the number of current train movements over the length of the rail line and especially between Robstown and Bloomington.

## 5.6 Existing Infrastructure Needs

The National Rail Freight Infrastructure Capacity and Investment Study primarily cites the need for upgraded signal systems and added tracks or sidings as the types of improvements required to meet the capacity needs of the future. The Brownsville Subdivision is also a candidate for these type improvements as well as other specific needs within the study area which are required to improve current and near term operations. The following are general improvements to the Brownsville Subdivision within the study area that should be considered to meet existing and future needs.

*Completion of the Wye at Sinton Junction*

Completion of the track connection at the northeast quadrant of the Brownsville Subdivision and Kosmos Industrial Lead would eliminate the need for the 10 to 11 miles of reverse direction and backup movements currently necessary for some trains. This would reduce track delays between Sinton and Odem, and eliminate a portion of

congestion at the intersections of the Brownsville and Corpus Christi Subdivisions, as well as related grade crossing delays. This improvement would be especially critical to the future efficiency of rail service to the proposed La Quinta facility as train turn times can be as much as four hours depending on traffic levels.

**Exhibit 9: Sinton Junction**


This connection would require the construction of approximately 250 yards of track at the northeast quadrant of the wye. The right-of-way necessary to construct this connection is currently the site of offices and a storage yard for the San Patricio Electric Cooperative. A planning-level cost estimate to construct this wye track is $2,774,000 (See **Appendix A** for detail).

*Completion of the Wye at Odem Junction*

This wye sees the largest number of train movements over the length of the Brownsville Subdivision. Train counts included in FRA grade crossing inventory information list between 42 and 50 train crossings daily in the vicinity of the Brownsville and Corpus Christi wye at Odem. Many of these train movements are the result of the backup movements made necessary by the missing wye track at the northwest quadrant of the wye. This wye is also considered critical for existing movements from the Kosmos Industrial Lead and potential La Quinta container movements destined for San Antonio and points west.

**Exhibit 10: Odem Junction**


This connection would require construction of approximately 250 yards of track located primarily on UP property as the wye is within the Odem yard limits. The only obstruction to construction of this connection is a one-story block structure located on Rt. 77 which is currently occupied by a loan company.

A planning-level cost estimate for the track connection is $2,481,508 (see **Appendix A** for detail). The San Patricio Rural Rail District is also working with UP with regard to this project.

*Additional Track Capacity Between Robstown Junction And Sinton Junction*

This approximately 20 mile segment of the Brownsville Subdivision serves as the common link for three Class I railroads serving the Port of Corpus Christi, access to northeast Mexico, and potentially a new international container transfer facility. The segment also provides access to industries along the line, passes through two rail yards (Odem and Sinton), and intersects with three major rail lines (KCS at Robstown, Corpus Christ Subdivision at Odem, and Kosmos Industrial Lead at Sinton).

This crossroad for local, port, NAFTA, and potentially container traffic however, remains a single track facility for through movements. Even within the yard facilities only one or two additional tracks are available for car storage or switching operations. Capacity improvements, including double tracking, additional sidings or expanded yard facilities could be designed to improve existing rail flows and to accommodate future increases.

*Upgraded Signal System*

Combined with the lack of track capacity described above, another key element to the capacity constraints on the Brownsville Subdivision is the lack of a remote centralized control system over much of the corridor. Currently, only the segments between Odem and Sinton, the Woodsboro Siding, and north of Inari are served by Centralized Traffic Control. The remainder of the line is considered dark territory, requiring Traffic Warrants for any train movements.

Upgrading the entire mainline to Centralized Traffic Control, or at a minimum the segment between Robstown and Inari, would allow not only increased fluidity and higher train speeds over the line, it would also eliminate the need for crews to physically align switches which result in significant train delay along the line.

# 6.0 RAIL ACCESS TO THE LA QUINTA TERMINAL

## 6.1 Benefits of Rail Access Alternatives

Regional stakeholders in the La Quinta Project have raised the desirability to have more than one rail operator provide service to the facility. Port facilities, like most industries in the U.S., operate in a highly competitive global marketplace. The fact that La Quinta is located on the UP's Kosmos Industrial Lead, and that no other railroads which operate in the Corpus Christi area have trackage rights over the line, have led to questions concerning the terminal's competitive position with other container facilities.

Although no specific concerns with regard to UP service have been raised, it is likely that stakeholders base their desire for rail access by multiple railroads on the premise that multiple players would lead to competition in both price and the quality of service provided.

Freight rates, of course, are of concern and will be a major determinant of ocean container shipping companies' willingness to utilize the facility as a load center.

From a service perspective, the sensitive time requirements for intermodal container service and the ability for shippers to meet delivery schedules is critical to their choice of mode and routing. Rail lines have limited capacity and the routing options available with multiple carriers provide routing alternatives not available from a single service provider.

## 6.2 Rail Access Alternatives

Although rail service over the Kosmos Industrial Lead is currently limited to UP operation, stakeholders involved in the development of the La Quinta Multi-use Terminal, such as the San Patricio Rural Rail Transportation District, the Port of Corpus Christi and others could work with UP to develop options for potential access by additional rail carriers or to develop procedures that will ensure the maximum operating efficiencies possible for La Quinta rail movements. Alternatives for discussion could include:

1. Potential UP Track Sharing Arrangements
2. Construction of Additional Capacity within the UP right-of-way
3. Construction of a new route to a competitive staging area

*Potential UP Track Sharing Arrangements*

As noted earlier, the existing capacity of the Kosmos Industrial Lead can accommodate the two to six daily intermodal container trains that are deemed necessary to serve the La Quinta facility. Other than increasing the siding length at Gregory to accommodate long trains, the line provides for fluid train movements between La Quinta and the Brownsville Subdivision. Thus, either UP alone, or multiple carriers, could serve the La Quinta facility without adding significant rail infrastructure over the Kosmos Industrial Lead. Therefore, the potential for shared track operations will exist from the inception of rail service to the facility.

Due to UP's ownership and exclusive operating rights over the Kosmos Industrial Lead, the carrier is not required to provide trackage rights, reciprocal switching or any other form of direct or indirect access to the terminal. As it would be preferable to have multiple railroads serve to La Quinta for purposes of marketing the facility, a number of alternatives involving potential shared use of the Kosmos Industrial Lead will be analyzed as a basis for possible negotiations with UP. These alternatives are outlined below.

*BNSF/KCS Trackage Rights over the Kosmos Industrial Lead*

Trackage rights are an agreement between railroads where one railroad is authorized to operate its trains, between specific locations, over tracks owned by another railroad (landlord). There are two categories of trackage rights. In one case, overhead rights, one railroad arranges to move its freight over the line of a second, but is not permitted to access customers on the line. In the second case, the operating railroad can serve shippers on the landlord's tracks. The latter typically have been mandated by the STB to retain competition in markets that have lost a rail carrier because of a merger. Typically there is a trackage rights fee for this privilege, and the associated rights must be filed with the STB.

*UP Providing Interchange Transfer Services for Other Carriers*

Interchange transfer, commonly called switching, is the railroad industry term for moving freight cars between a shipper's facility and the nearest interchange with a connecting railway. In the case of the La Quinta terminal, rather than UP permitting direct access for BNSF or KCS interchange points, UP would charge the railroads a fee for providing the service.

*CCPN Switching within the Terminal Area*

Similar to functions it carries out within the existing Port area, the CCPN could provide service and switching to all rail users on the Kosmos Industrial Lead. This would relieve UP from its operating and other costs related to service on the line, and likely reduce the cost structure for the line and improve service to users due to the dedicated service

provided by CCPN. CCPN could deliver cars to the other railroads' interchange points for a switching fee.
Each of the above alternatives requires cooperation by UP. Incentives exist, however, that may encourage UP to at least share the La Quinta traffic.

The projected increase in rail traffic will eventually require improvements to the Kosmos Line to increase train speeds and expand capacity. Public stakeholders can offer financial assistance for upgrades, siding extensions, improved connections to the Brownsville Subdivision, additional or extended spurs to new or existing industries on the line, improved grade crossings, or grade crossing eliminations in return for UP providing trackage or other rights. Assistance could also be extended to other lines such as the Brownsville Subdivision.

*Construction of a Second Track within the Existing Kosmos Corridor*

Albeit a far less attractive alternative to shared use of the existing rail line, construction of a second track between La Quinta and BNSF/KCS which operate on the Brownsville Subdivision could be an alternative. The Kosmos Line generally runs through rural areas between Sinton and Gregory. The rail line is adjacent to US 181 for most of the distance and abuts farmland for long stretches of the route except where the track operates through the Towns of Sinton, Taft and a portion of Gregory.

Along most of the Kosmos Line/US 181 corridor, there appears to be adequate space to construct a rail line on the opposite side of US 181 from the UP line. The exception to this is generally within the Towns of Sinton and Taft and in the area of the recently completed grade separated highway bridge over the UP line in Gregory.

*Construction of a New Intermodal Staging Area*

This option entails the construction of a container terminal at a location where the BNSF and KCS could load containers for movement over their lines. The containers could be moved between La Quinta and the staging point by truck or a high-technology mode of transportation such as the Universal Freight Shuttle (see discussion in Chapter 8).

The drawback to this option is the cost and time of the multiple transfers of the containers which could offset any advantages of the additional railroads' access.

# 7.0 KCS OPERATIONS IN THE CORPUS CHRISTI REGION

The Kansas City Southern Railway's (KCS) investment strategy over the past 15 years leaves little doubt that its operations through the Corpus Christi region are critical to its long-range plans. The railroad's future level of commitment to improving service, expanding operations and making investments within the Corpus Christi region, however, are more difficult to determine. This section will discuss KCS' long-term strategy to establish an international intermodal corridor, and the impacts of this strategy on the Corpus Christi region.

## 7.1 Long-Term KCS Strategy

KCS is the smallest of the U.S. Class I railroads. Its original network in 1887 extended from Kansas City south through Shreveport. From Shreveport, it extended to Dallas, Port Arthur and New Orleans. The primary commodities moved by the railroad included grain, lumber, and oil field supplies to meet the needs of the Texas oil boom. This KCS network remained essentially the same until 1993. In 1993, KCS acquired the MidSouth Rail Corporation which extended its network to Meridian, MS, Tuscaloosa, MS, Birmingham, AL, and Counce, TN. KCS also acquired trackage rights into Gulfport, MS which allowed it to interchange with CSX.

The ratification of the North American Free Trade Agreement in 1993 resulted in major changes in the movement of freight and shipping logistics in North America. These changes, combined with the decision by the Mexican government to privatize its railroad system, and the merger between the Union Pacific and the Southern Pacific Railroads, allowed the KCS to build its existing international corridor.

In 1995, KCS acquired a 49 percent stake in the 157-mile Texas-Mexican Railway (Tex-Mex) which extended from Corpus Christi to the Mexico border at Laredo. In 1996, KCS and Tex-Mex made a successful bid to operate the Ferrocarril del Noreste RR, which extended from Laredo, Mexico south through Monterrey, and other Mexican cities such as Guadalajara, Mexico City, and Veracruz, as well as the port city of Lazaro Cardenas. Operations over this railroad began in June, 1997 under the new name Transportacion Ferroviara Mexicana S.A. de C.V. (TFM).

The merger of the Union Pacific and Southern Pacific Railroads in 1996 allowed KCS to link the original KCS system to the Tex-Mex and TFM properties. KCS requested and was granted trackage rights from Beaumont to Corpus Christi via Houston by the federal Surface Transportation Board as a condition to its approval of the merger. Between 1996 and 2005, KCS worked to solidify its control over this newly established system by acquiring a controlling interest in the Tex-Mex in 2003 and in the TFM in 2005.

KCS also extended its reach north of Kansas City by acquiring the Gateway Western line between Kansas City and St. Louis, and extended its reach as far as Minneapolis and Chicago through haulage rights and other alliances with Class I railroads. Upon completion of this series of purchases and the granting of operating rights, the KCS and its Tex-Mex and TFM subsidiaries had established a coordinated end-to-end intermodal corridor linking commercial and industrial centers of the U.S. and Mexico. This system, however, was comprised of lines which required significant upgrades and trackage rights over circuitous routes which negatively affected its operational efficiency and cost structure. Since 2005, KCS has focused on addressing these needs.

*Improvements to the Tex-Mex Line*

Since its first involvement with the Tex-Mex, the KCS has supported significant capital investments in the line to address its poor safety record and improve operations. In 1997, $23 million was invested in a major rail and tie replacement program. Full grade crossing warning systems were also installed at 21 locations, together with hotbox/dragging equipment detectors.

In 2005, Tex-Mex won approval of a $50 million FRA Railroad Rehabilitation & Improvement Financing (RRIF) loan for further major safety and infrastructure projects to accommodate increasing cross border trade. These funds were used to upgrade 146 miles of track and rehabilitation of 26 bridges between Laredo and Corpus Christi. These upgrades allowed the line to accommodate 286,000 pound loadings. Capacity needs were also addressed with the construction of two new sidings and the expansion of an existing siding. The rail yard at Laredo was also upgraded.

These improvements, in addition to enabling heavier loads and additional capacity on the line, also allowed trains to operate at higher speeds (49mph), thus increasing operating efficiencies.

*Reconstruction of the Victoria-Rosenberg Segment*

Although KCS/Tex-Mex received trackage rights over UP lines to provide a connection between Corpus Christi and Beaumont, the rights provided were over heavily used, circuitous routes. The trackage rights received from UP through the Surface Transportation Board begin at the Tex-Mex intersection with UP at Robstown and extend northward over the UP Brownsville Subdivision to Bloomington. Between Bloomington and Houston, however, the trackage rights provided follow former Southern Pacific routes beginning at Placedo, through Victoria, and northward to Flatonia. The trackage rights then extend eastward to Rosenberg, just south of Houston, where KCS/Tex-Mex can interchange with BNSF or continue north through Houston toward Beaumont over UP trackage rights. The Victoria-Flatonia-Rosenberg route entailed a total of 157 trackage rights miles.

Until 1985, the Southern Pacific RR operated regularly scheduled freight service over track between Rosenberg and Victoria. This 90 mile line was placed out of service by SP and much of the trackage was salvaged. In 2000, KCS acquired the Rosenberg-Victoria segment and in 2007 applied for a $100 million federal RRIF loan to construct and re-open the line.

On June 17, 2009, the rail service between Rosenberg and Victoria was officially re-established. Six to eight trains daily are expected to utilize the line with speeds of up to 49 mph in addition to re-opening the rail line. KCS also purchased and constructed a 100-acre intermodal terminal near Rosenberg and additional acreage for an industrial park to support distribution and warehouse facilities and potential light manufacturing and other uses. The total cost of the new line and intermodal facility was $173.5 million.

The re-opening of the Rosenberg-Victoria segment serves a number of purposes for KCS. The new 90 mile segment allows KCS to bypass 157 miles of expensive UP trackage rights, and the other operational limitations inherent in operating over another railroad's property. The reduction in mileage also translates into reduced transit times, fuel, and the number of train crews required.

The combined improvements over the Laredo Subdivision and the Rosenberg-Victoria segment will allow KCS to offer premium intermodal service between Midwest or Gulf States and various Mexican destinations, including Mexico City and the Port of Lazaro Cardenas. KCS makes note that its new intermodal route between Lazaro Cardenas and Houston is only 1,322 track miles in distance as opposed to 1,722 miles from the Port of Los Angeles/Long Beach, and 2,616 miles from the Port of Tacoma. It also points to a similar advantage over the same ports for intermodal movements to Atlanta.

## 7.2 KCS Service to the Corpus Christi Area

As noted above, KCS service through the Corpus Christi area is essential to its goal of providing fast, efficient intermodal and other rail service between the Midwest and Gulf States and a number of major Mexican markets. The fact remains, however, that the trackage it utilizes through the Corpus Christi area, specifically between Placedo and Robstown, remains the most congested and unreliable segment of its operations.

This lack of control of its operations in the Corpus Christi area, as well as the fact that most KCS intermodal and long-distance non-intermodal trains do not move via Corpus Christi, likely also contributes to a lack of marketing effort by KCS in the region. KCS, in its presentations regarding its international intermodal corridor, cites numerous new business opportunities throughout its network. These include biofuel facilities, automotive parts facilities and intermodal ramps, steel plants, grain facilities, etc. None of these new business opportunities, however, are located in the Corpus Christi area.

Likewise, KCS plans no new intermodal terminal expansions in the area in the near future, the nearest being the Rosenberg facility.

## 7.3 KCS Service to the Port of Corpus Christi

Although the volume of business available to KCS at the Port of Corpus Christi likely precludes its abandonment of service to the port, its means of access to the port area does provide an impediment to its efficiency and competitiveness.

From the north, KCS accesses the Port via its trackage rights over the UP's Brownsville and Corpus Christi Subdivisions at Odem. The delays associated with the Brownsville line and movements onto the Corpus Christi line at Odem are well documented elsewhere in this report. From the south, KCS accesses the port area over its own Laredo Subdivision. BNSF also has trackage rights over this route and relies on KCS to deliver its cars to the Corpus Christi Terminal Railroad. Interchange with the Corpus Christi Terminal Railroad since the removal of the Tule Lake Drawbridge, however, now requires a longer, more circuitous route around the ship channel to enter the interchange yard. This new routing entails additional operating and crew costs, reducing its competitive stance within the Port.

## 7.4 Summary

With the completion of KCS' significant investments in the Laredo Subdivision and Rosenberg-Victoria line, the railroad's priority of operating an efficient NAFTA intermodal service is clear. This emphasis on intermodal movements, however, may negatively impact KCS' commitment to local service in the general Corpus Christi area and the Port. With its limited access and control of routes in the region, KCS will use the capacity it has available to its most profitable use, most likely through intermodal movements. The high cost structure involved in operating to and within the Port may eventually lead the railroad to limit its participation to interchanging its Port-related traffic with the UP at existing yard facilities, or perhaps at a new facility at Robstown in the future.

Given this possibility, any elimination of bottlenecks, capacity enhancements or operational arrangements on any lines over which KCS operates will increase the likelihood that KCS will remain a competitive force within the Port and the Corpus Christi region.

# 8.0 POTENTIAL UNIVERSAL FREIGHT SHUTTLE

The Universal Freight Shuttle (UFS) is an innovative transportation technology designed to transport containerized, intercity or port-to-terminal freight. Its potential applicability to the movement of freight in the Corpus Christi area has been enhanced with the December, 2008 announcement that the Freight Shuttle Development Corp. plans to build a full-scale prototype of the system on the site of the future La Quinta multi-use terminal.

## 8.1 Background

The Universal Freight Shuttle (UFS) was conceived in 1999 when the Texas Transportation Institute's Multimodal Freight Transportation Division investigated the practicability of an underground freight transportation system. Although this system was not found to be feasible, ideas developed during the research were used to develop the shuttle concept. The concept has also been endorsed by Zachary American Infrastructure. Zachary American Infrastructure intends to use the UFS for the projects freight transportation component.

**Exhibit 11: Universal Freight Shuttle**

Source: Gulf Coast Strategic Highway System website, Accessed January 28, 2010
http://www.gulfcoaststrategichighway.org/project%20overview.html

The UFS consists of electrically powered, unmanned vehicles which are propelled by linear induction motors that travel on a guideway similar to the "people movers" operating at some major airports and cities. Unlike the people movers, however, the shuttle vehicles are large enough to move standard ocean shipping containers or highway truck trailers.

Linear induction motors operate on the same basic principle as conventional, rotary induction motors, except that instead of the coils being wound around a shaft, the assembly is unwound into a linear configuration. Running current through the coil induces motion in the shaft. By controlling an array of linear motors under a platform, the platform can be moved over a guideway. The motors themselves consist of no moving parts and as such are reliable and perform for long periods with low maintenance costs. Platforms, which are conveyed via the linear motor systems, are unmanned and have few moving parts. The wheel assembly on the platform is the only moving part.

The UFS is designed to move the containers or trailers along 20-foot wide, two-way guideways which would be located within the median or right-of-way of the existing highway system. The guideways would be constructed 16 feet above the ground to allow traffic movement. Property owners or any other required operations such as the movement of farm equipment, have unimpeded access under the shuttle system right-of-way.

The freight shuttle will be fully automated and designed to operate at a top speed of 62 mph. The shuttle vehicles are specially designed with a rotating cargo bay to allow for drive on/drive off capability. The major shuttle terminals are estimated to have a capacity to load/unload 3,000 containers per day. Smaller mini-terminals would have a capacity of 600 loads per day. Terminals at Mexico border crossings would also include in-motion Homeland Security scanning stations that would allow every container to be inspected.

## 8.2 Proposed Universal Freight Shuttle Applications

The UFS is intended to be a new hybrid system that would complement the railroad and trucking industries with a system that achieves a high level of performance and capacity that operates with a lower cost structure and with fewer environmental impacts. The sponsors claim that the system, at full build-out, would reduce annual transportation freight miles from 60 million to 40 million, resulting in a savings of 3 million gallons of diesel fuel, as well as other expenses associated with fewer truck miles on the state's highways. They also claim the system is intended to fill the 400 to 600 mile range required for overnight truck runs and the minimum haulage for cost-efficient train.

By filling this void, the system's proponents claim the freight shuttle benefits include reducing freight costs, relieving the long-haul truck driver shortage, separating freight from passenger traffic, and reducing highway capacity constraints.

The Freight Shuttle Development Corporation's proposed system would include 2,000 miles of guideway connecting Dallas to San Antonio, Laredo, Corpus Christi, and Houston, and an additional connection between San Antonio and Houston. The target date for implementation of the system is 2015.

Prior to construction of the system, a full-scale prototype of the cargo movement system would be built at the future La Quinta terminal site. The estimated $15 to $20 million prototype will allow fabrication and testing of the full range of system components including guiderails, shuttle mechanics, power systems and automated controllers.

## 8.3 Potential Universal Freight System Applications in the Corpus Christi Area

Based on the Freight Shuttle Development Corporation's short term plans, there are a number of progressively larger applications of the technology that could be developed in the Corpus Christi area over time. These applications could include:

- Automated transport of containers within the proposed La Quinta terminal
- Movement of containers between Corpus Christi freight hubs
- Connection of Corpus Christi to the proposed state-wide UFS Trans-Texas Corridor system

Each of these potential applications will be addressed in more detail below.

*Applications within the La Quinta Terminal*

Interest in utilizing automated container movement systems within port facilities has increased in recent years as research and development in transport automation have led to new technologies and applications.

The high cost and inefficiency of the current system of moving individual containers from the dock to storage facilities, and often moving them again for loading on trucks or trains, has led to research into automated Multi-Trailer Systems (MTS). Although not automated, MTS has been in use for many years within the Port of Rotterdam. The potential perceived from automated trucks, combined with multiple trailers, is reduced costs per TEU, primarily due to lower labor costs and higher capacity levels.

In 1994, the German Federal Ministry for Research and Technology commissioned a study of container transport systems of the future. As a result of this work, Preussag Noell GMBH developed a linear motor-driven system which transports containers from the gantry crane to the storage yard. A prototype of this system has been constructed at the Eurokai Container Terminal in Hamburg, Germany. The Port of Tacoma, Eurokai and Noell are investigating innovative automated systems employing linear motors to propel containers through storage yards. Sea-Land's proposed GRAIL system uses linear induction motors located on overhead shuttles that move along a monorail above the terminal. The containers are stacked beneath the monorail and can be accessed and brought to the ship as needed. Sea-Land has a portion of this system operating at its Hong Kong terminal.

This research and on-going testing of linear propulsion systems to transport containers within port facilities shows that the construction of a prototype and testing of the UFS is based on a realistic technology that has attracted interest in all corners of the world. It also provides an opportunity for the proposed La Quinta facility to be equipped with a modern and efficient transportation system that provides it with the cost and other advantages necessary to compete with other ports.

The agreement between the Freight Shuttle Development Corporation and the Port of Corpus Christi to build a prototype of the cargo system on the proposed La Quinta multi-use terminal site provides the opportunity to not only test the shuttle system components, but if the testing is successful to integrate it into the operations of the facility. Implementation of the system prior to the full build-out of the La Quinta facility would provide the Freight Shuttle Development Corp. the opportunity to locate the guideway and related facilities without a large portion of the port facility already in place and avoid having to work around existing facilities. This is an advantage no other automated container movement system has had in its testing phase.

An additional advantage of testing the prototype in the early stages of La Quinta's operations is the fact that rail operations within the facility are not expected to begin until the second phase of operation. This will provide time to test the system and extend it from the container wharf to the proposed rail intermodal yard if the technology and container loading/unloading system works as expected.

Following unloading from ships, containers are moved to a storage area where they are stacked until moved to their ultimate destination by either truck or rail. As existing plans do not include direct loading from ships to rail, trucks will be required to dray containers from the container storage area to the rail intermodal yard, which is located at least one mile from the container wharf, according to existing plans. An early application of the UFS could be to transfer containers between the wharf area or container storage area and the rail intermodal yard, thus eliminating the need for draying individual containers by truck. This would reduce truck congestion within the yard, resulting in reduced costs and environmental emissions. From the perspective of proving the practicality of the UFS, it provides the opportunity to operate a two to four mile guideway loop, display the efficiency of the container transfer technology and facilities, and the benefits of the in-motion inspection system.

The establishment of a successful UFS operation within the La Quinta Terminal could be a key to the success of La Quinta itself. The successful testing and development of the system, and possible expansion of the system within the port and outside of it could lead to economic development opportunities related to the growth of the UFS network, such as the facility serving as a manufacturing and distribution hub for the UFS and its suppliers.

*Applications within Corpus Christi Freight Hubs*

Assuming the development and testing of the UFS prototype at the La Quinta facility proves successful, and the potential benefits related to the technology's cost, efficiency and environmental elements are documented, the next step to advancing the UFS to a larger scale is the creation of a small network through a measured expansion of the system. The greater Corpus Christi area has many of the characteristics necessary to serve this purpose.

In order to prove that the UFS is the viable intercity freight transportation system envisioned by its developers and proponents, it must successfully pass another set of tests beyond the basic testing of the technology at the scale available at La Quinta. The expanded testing needs would include:

- Construction and operation within a highway right-of-way
- Construction and operation over bridges and other facilities
- The ability to interchange between network routes
- The ability to accommodate containers loaded with bulk commodities and truck trailers
- The concept of the UFS Mini-Terminal design

A Corpus Christi-based UFS network could provide the test bed required to prove the technology's capabilities to operate on a state-wide basis. The following are some alternatives that could be further evaluated as potential further testing components as well as logical and commercially-viable build-out of the system.

There are a number of logical expansions of the UFS network beyond the La Quinta multi-use terminal that could serve a commercial purpose. The following provides a description of the alternatives and the potential system testing and commercial services they could provide.

*La Quinta to the Port of Corpus Christi via US 181*

This alternative is the most logical extension of the UFS system from the La Quinta facility. There are commercial synergies as it connects two port facilities separated by significant natural barriers.

Expansion of the UFS system from La Quinta to the Port would entail construction of the guideway from the intermodal facility to US 181 and across the Nueces Bay Causeway to the southern edge of Nueces Bay and along Navigation Blvd/Joe Fulton International Trade Corridor. This routing would require construction of approximately nine miles of guideway to the port entrance at Navigation Blvd. From this point, an additional one mile of guideway would be required to connect to the ports facilities on the southern edge of the channel and to I-37, one of the primary components of the Trans-Texas Corridor System.

The routing involved in connecting La Quinta to the port facilities would require the UFS guideway technology to address one of its major physical challenges – construction over a major body of water.

From the commercial perspective, this alternative connects the multi-use terminal to the Rincon Industrial Park and the various petrochemical and grain tenants. Although the commercial synergies associated with connecting an international container port to a largely bulk port do not appear to be substantial, if advances in the development and marketing of containerized bulk commodities continues, backhaul movements to overseas markets of containerized grains, cotton, and petrochemicals could justify a UFS connection between the Port and intermodal facilities.

There is one additional benefit related to the connection. If no means are found to provide rail access by multiple carriers to the La Quinta Terminal via the Kosmos Industrial Lead, a UFS connection to the Port of Corpus Christi and the Port's Terminal Railroad enables any containers delivered to be carried by any railroad serving the port.

*La Quinta to Sinton via US 181*

Although this alternative extension does not present strong commercial benefits itself, it does provide a less challenging extension of the UFS network and also provides a means for additional access to the La Quinta multi-use terminal.

This extension would involve approximately 17 miles of guideway construction, albeit over US 181, a highway that largely runs through rural areas with no major natural barriers to cross as with the first alternative. In some ways this routing could also serve as an alternative to reach the Port of Corpus Christi, if crossing Nueces Bay is deemed to not be practical.

The construction and operation of the UFS between La Quinta and Sinton allows testing of the guideway system within highway right-of-way and claims that full access is available beneath the guideway system. A large portion of the land along US 181 is farmland that requires access from either side of the highway. The route also provides the opportunity to test the UFS's ability to traverse various highway-related features along the route such as bridges, cross streets, etc. At Sinton, the system interchanges with US 77 which is proposed to be upgraded to I-69. This route also connects Corpus Christi to both Brownsville and the Mexico border to the south, and Houston to the north.

The commercial potential of this alternative by itself is probably dependent on the success of the region attracting a significant number of warehouse and distribution facilities in the Sinton area which could be serviced directly by the UFS system. The UFS would shuttle containers between La Quinta and a mini-terminal located at a strategic location which can serve clustered industries. In addition, should the Port be unsuccessful in achieving competitive rail access to La Quinta, UFS shuttle service to a

transfer facility located on the Brownsville Subdivision in Sinton and accessible to both BNSF and KCS would serve to provide competition. The transfer facility could also serve as a freight village to spur economic development activity.

*La Quinta – Port of Corpus Christi – Robstown*

Robstown is a major railroad junction point that has been the subject of recent study for its potential as a major transportation transfer facility. Robstown's inclusion as a UFS transfer center is logical given its location on US 77 (future I-69) between Corpus Christi and Brownsville, its intersection with Texas Highway 44, which leads to Laredo, and the availability of land at the junction of the UP and KCS lines. Robstown would serve as a logical node in a statewide UFS network.

The shorter-term viability of Robstown's inclusion in a smaller Corpus Christi-based UFS network is dependent on a number of variables. Robstown lies approximately 17 miles from the Port of Corpus Christi and an additional 12 miles from the La Quinta multi-use terminal along the US 77 and I-37 routing. This approximately 30 mile network would certainly serve as an adequate test for most aspects of a statewide UFS network.

The commercial feasibility of the Corpus Christi UFS network, however, is largely dependent on Robstown's eventual role as a transportation hub. The potential transportation functions which could be carried out at Robstown range from its serving as a container classification center for distribution to various Mexico markets, a bulk commodity transfer location, and/or a rail maintenance center.

Assuming container movements between La Quinta and Mexican markets are time critical, a UFS direct link between La Quinta and Robstown, where Robstown serves to classify and transfer containers onto trains heading to either the Laredo or Brownsville borders with Mexico, could provide significant competitive and time advantages. The direct UFS movement to Robstown would provide the competitive rail access deemed essential for the container port. In addition, the more direct 30 mile routing between the two points along the highway configuration, and automated (24/7) nature of the UFS technology, would provide significant time, and possibly cost savings, if unit container trains originated from Robstown as opposed to La Quinta. This is due to the levels of service provided over the Kosmos Industrial Lead, the bottlenecks posed at Sinton and Odem on the Brownsville Subdivision, and the possibility that multiple crews would be necessary to move trains between La Quinta and Robstown. As the routing also passes through the Port of Corpus Christi, tenants and other customers in the vicinity of downtown Corpus Christi could also add containers to be classified and loaded at Robstown.

If Robstown's value is determined to be as a bulk transfer facility location, the commercial feasibility of connecting Robstown to a Corpus Christi-based UFS network is largely dependent on advances in containerization of bulk commodities. If the transport

of bulk commodities in containers were to achieve a significant market share, Robstown could serve as a consolidation point for containers exported from La Quinta or utilized by tenants within the Port of Corpus Christi.

## 8.4 Summary

The potential for the Universal Freight Shuttle to contribute to the Corpus Christi freight transportation system ranges from the short-term benefits that could be realized from the successful testing of the technology within the La Quinta multi-use terminal to the longer-term, but more speculative, potential as the testing ground for statewide application and commercial viability as a local network.

The existing Corpus Christi transportation system presents both opportunities and barriers to the success of a local UFS network. On one hand, the rail transportation system between existing and potential freight container hubs in the area is subject to competitive obstacles, as well as both physical and operational constraints which would benefit a fast and efficient UFS network. On the other hand, the highway system is relatively free-flowing and does not require the high capital costs that would be required of a UFS network.

As the estimated 15 year projection for full implementation of the statewide UFS system appears optimistic, especially in light of the national economy, a number of changes in general freight and container logistics, as well as market shifts, could take place before the UFS technology is tested and proven. The configuration of the region's highway network and the potential to expand the UFS network to follow the market growth of the La Quinta Multi-use Terminal makes the Corpus Christi region a logical beneficiary and contributor to any success the UFS system realizes.

# 9.0 MULTIMODAL LOGISTICS FACILITIES

With the Port of Corpus Christi, the region is a major logistics processing center for international and domestic freight. Excellent highway and rail connections make the region a principal trade gateway. In addition to the facilities at the Port, consideration is being given to the development of an inland logistics center in Robstown.

## 9.1 Port of Corpus Christi

The Port of Corpus Christi is the sixth largest port in the U.S. In 2007, 81 million tons of cargo passed through the Port. The major commodity moving through the Port is petroleum products, principally crude oil and gasoline. It accounts for 82 percent of the Port's tonnage. Other important commodities include bulk petroleum coke, ores and minerals, military equipment, and general cargo including wind turbine components.

The Port of Corpus Christi includes facilities owned and operated by the Corpus Christi Port Authority and by private companies. The Port Authority's facilities consist of:

- North Side Cargo Terminal
- Southside Cargo Terminal
- Cold Storage Facility
- Dry Bulk Terminal
- Liquid Bulk Terminal

Private facilities typically are owned by and serve the industries on the ship channel. These include chemical and petrochemical companies.

The Port continues to attract new development as a result of its rail and roadway upgrades, such as the Joe Fulton International Trade Corridor. The Las Brisas Energy Center, LLC has recently proposed building a 1,320 gross megawatt state-of-the-art electric generating facility on the north side of the Port's Inner Harbor. Petroleum coke is expected to be moved to this facility via rail and water, while by-products will be transported out via rail, water and truck. This facility, with expected completion by 2013, will be designed to minimize environmental impacts.

*Port of Corpus Christi Land Connections*

The Port of Corpus Christi is served by extensive highway and rail networks. The Port has direct access to I-37 as a connection to markets throughout Texas and Mexico. Although UP is the primary railroad serving the port, both BNSF and KCS additionally provide rail service

## 9.2 City of Robstown Trade Processing and Inland Center

The City of Robstown is also actively working to attract industry and warehouse/distribution activity based on its transportation accessibility. The US Army recently built a controlled-humidity warehouse in Robstown to store large equipment such as trucks and climate-sensitive equipment for training and deployment. Such development provides impetus for new housing and retail development.

The City is currently evaluating the use of a 240-acre site as a trade and logistics center. The objective of the center is to serve as a logistics processing center for receiving, storing, processing and shipping products to or from Mexico and overseas markets. The proposed site has competitive rail service as it has access to three Class I railroads, BNSF, KCS and UP. It also is located near US 77. Consequently, the facility is attractive from a competitive perspective.

Although many specifics of the Robstown Trade Center have yet to be developed, one proposal is that it serves as a container processing facility with operations integrated with that of La Quinta. In that role, containers discharged from a ship at La Quinta would be placed on a shuttle train to the Robstown Trade Center for sorting and placement on an intercity intermodal train.

An alternative function for the center would be as a bulk transfer facility dedicated at least initially to serving the regional agriculture industry. Grain would be delivered to on-site elevators for initial storage and loading into unit trains of grain cars for delivery to Mexico as well as other markets in the U.S.

The following is a brief review of recent intermodal trends which provides background in analyzing new intermodal proposals.

*Intermodal Trends*

In the ten years prior to the current economic downturn, international trade grew explosively. The growth was principally in products that lent themselves to be shipped in containers. To accommodate the large volume of containerized shipments, significant investment was made in transportation infrastructure and facilities.

*Port Terminal Investment Trends*

Expansion programs have been implemented at nearly every port on the three coasts. These programs were designed not only to provide capacity for the larger volume of containers, but also to accommodate larger vessels and the greater number of containers delivered at each vessel call.

Much of the new marine terminal capacity was constructed in Southern California at the San Pedro Bay ports of Los Angeles and Long Beach, existing major gateways into North

America. At the same time, investments were made at ports that had been of lesser prominence as North American trade entry points, such as Lazaro Cardenas in Mexico. Additionally, entirely new container ports were developed. Prince Rupert in Canada is an example. Prior to the construction of a large container terminal, Prince Rupert served the Canadian coal and lumber industries.

*Railroad Line Infrastructure Trends*

With the development of double stack train technology, railroads became the most cost-effective mode of transportation for the landside movement of containers. However, the rationalization of the railroad industry after its deregulation significantly reduced its capacity. As the container business grew, the railroads found themselves facing a number of bottlenecks in their networks.

To more efficiently move the container traffic, the railroads have invested heavily. The western railroads increased the number of tracks on their western routes, which had been predominately a single track with passing sidings. They also invested in improving operations in congested urban locations. One of the most prominent is the Alameda Corridor project in Southern California, which created a railroad speedway eliminating grade crossings for 20 miles leading from the San Pedro bay ports through the City of Los Angeles.

In the eastern half of the U.S., both CSX and Norfolk Southern have entered into public-private partnerships to improve routes from the eastern seaboard ports to Midwest markets. CSX has initiated its National Gateway Project and NS is developing the Heartland Corridor between the Port of Norfolk and Chicago.

Closer and more relevant to the Corpus Christi region is the rehabilitation by KCS of the former Southern Pacific Railroad line between Victoria and Rosenberg. The new line offers two benefits to KCS. First, it eliminates use by KCS of a more circuitous line owned by UP, reducing the KCS route between southeast Texas and the Houston area by 151 miles. Second, the new line allows KCS to reduce its reliance on trackage owned by UP between Robstown and Houston. When using the UP line, KCS trains operate under the control of UP with higher priority typically assigned to UP trains. The combination of both factors will significantly reduce KCS transit times in southeast Texas.

*Inland Intermodal Terminal Trends*

In addition to improvements in the rail lines, investments have also been made in new inland intermodal terminals, a practice that continues today in the face of recession. BNSF will be constructing a new 1,000 acre intermodal container transfer facility in eastern Kansas. The proposed terminal will be the Midwest endpoint for BNSF's service from Pacific Coast ports. Likewise, UP is constructing a large intermodal container transfer facility in Joliet, Illinois. The Joliet facility will be 750 acres. Both intermodal terminals will be co-located with planned logistics parks. The eastern railroads are also

investing in new intermodal terminals as part of National Gateway and Heartland Corridor projects.

KCS is also involved in expanding its intermodal container terminal capacity. It recently opened a new 800-acre intermodal terminal and logistics park in Rosenberg on the new Victoria-Rosenberg line. The principal market that this terminal addresses is the Houston metropolitan area, avoiding the rail congestion in the Houston rail network. It will, however, also serve the Corpus Christi region, providing improved intermodal container service to the Mexico market.

*Robstown Container Transfer Facility Assessment*

Although the railroads have been investing heavily in container transportation infrastructure, the investment is directed towards clearly defined container transportation networks. These networks have been established because they demonstrate efficient, low cost operations. Consequently, new intermodal facilities must meet certain criteria for a railroad to provide service.

The following describes the criteria and evaluates a proposed container facility at Robstown.

*Prospective Terminal Must Be on Railroad's Intermodal Network*

Intermodal networks are structured as they are for several reasons. First, they are designed to achieve balanced traffic flows. Balanced traffic flows reduce costs by minimizing the expense of moving empty cars or containers. Second, intermodal networks are designed to accommodate high capacity double stack trains. Double stack train technology contributed significantly to the success of intermodal container transportation as two containers could be transported at cost nearly equal to that of transporting one container with conventional, single stack technology. Finally, routes are selected for intermodal container transportation because of their ability to support reliable high speed train service.

A container transfer facility at Robstown would not be located on either BNSF's or UP's existing intermodal network. Should La Quinta, however, develop as an international container load center with traffic destined for Mexico, then Robstown would be central to UP's network. Robstown is located on the KCS NAFTA intermodal route connecting Mexico with markets in the U.S.

*Terminal Volume Must Support Frequent, Long Trains*

Because the manner in which railroads operate, with only one train permitted to occupy a segment of line (for safety reasons) called blocks, trains consume the same line capacity irrespective of length. In fact the longer the train the better in terms of capacity utilization. Volume is also a determinant of terminal costs. Terminals have high fixed

costs – large volumes are required to cover the cost. With regard to frequency, high frequency service is required to meet shipper product delivery schedule requirements.

The challenge facing a container terminal in Southeast Texas will be its ability to collect sufficient container volumes to support the frequent, long train requirement. The surrounding market area does not have a sufficiently large economy to support a terminal. A Robstown terminal could provide train assembly capability for La Quinta, however, that capability is planned for the ocean terminal itself at its on-site intermodal yard. Robstown would be redundant.

*Terminals Must Be Spaced For Optimal Service*

Intermodal train service is an "express" type of operation with long distances between terminals so that train stops are minimal. In addition, intermodal terminals should be spaced so that geographic markets do not overlap unless the volume is large enough to support overlapping markets.

With the development of an intermodal container facility at Rosenberg, a second facility at Robstown, especially if served by KCS, would result in excess container terminal capacity in the region. An intermodal terminal at La Quinta would also be a competitor with a Robstown facility.

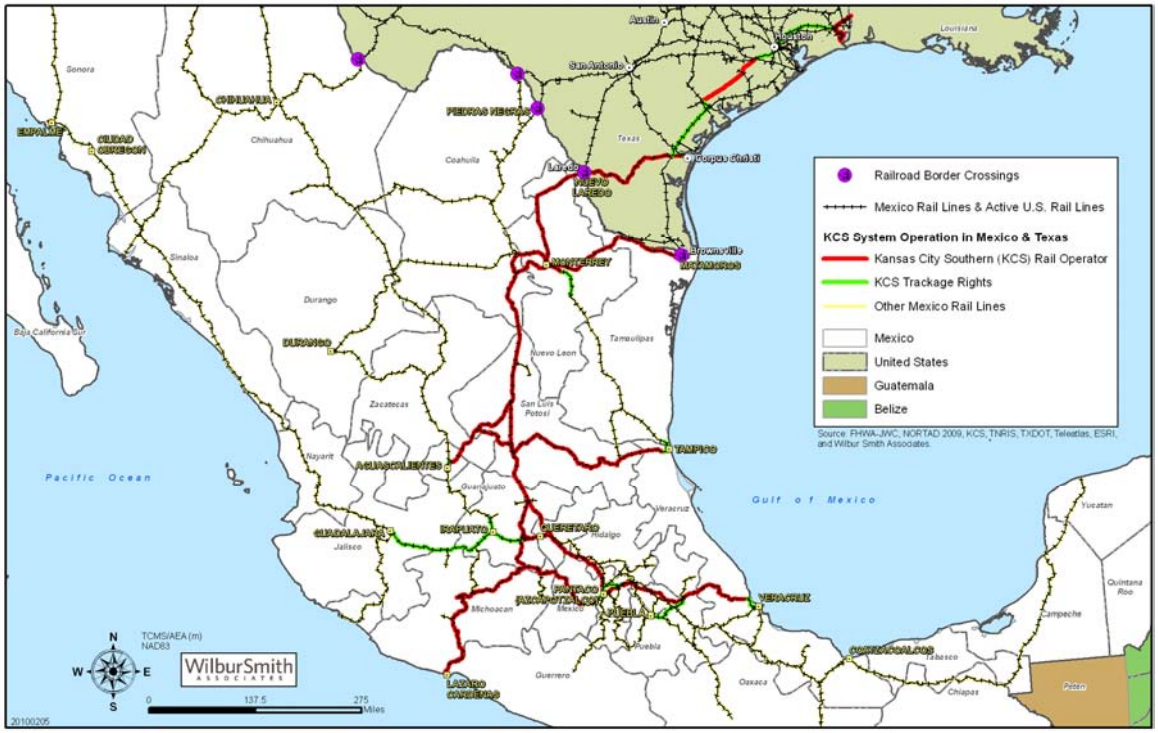
*Other Uses for a Logistics Facility in Robstown*

Although the opportunities for a successful intermodal container terminal in Robstown are limited, the Robstown Trade Processing Center does have other logistics applications. A recent analysis identified the need for improved grain storage and shipment capability in the Corpus Christi area.

The study found that existing storage facilities in the region are in poor condition and rail infrastructure is inadequate to support the demand for grain, particularly by Mexican markets. Most of the grain infrastructure was built along rail lines now owned by UP. Also, UP does not operate in Mexico and requires that freight cars be delivered to a connecting Mexican railroad at the border. Not unlike other railroads, UP is reluctant to participate in movements of short distances as they are less profitable on a relative, as well as absolute, scale.

KCS, on the other hand, operates in Mexico and reaches Mexico's principal grain market, Monterrey. The development of a grain logistics center in Robstown would provide KCS with the opportunity to participate in the business.

**Exhibit 12: KCS System**




While initial development of the facility as an agriculture logistics center may not be the optimal use of the property from an economic development perspective, it does offer the greatest likelihood for success. KCS, of course, will be required to support the concept. KCS will need to provide the train service and grain cars. It must also offer a freight rate that permits Corpus Christi grain to be competitive with other sources.

## 9.3 Other Logistics Facility Initiatives

*Naval Station Ingleside*

The pending closure of Naval Station Ingleside and its conversion to commercial use provides a significant economic development opportunity in the region. Development of the property, however, will introduce additional commercial traffic in the area as well as increase the requirement for competitive, high quality rail service. The highway system to the facility will need improvement, requiring avoidance of Ingleside. Rail oriented development will increase the demands on the Kosmos Industrial Lead.

*Joe Fulton International Trade Corridor Development*

The creation of the Joe Fulton Corridor opens up significant acreage to development, as evidenced by plans for the Las Brisas Energy Center. The highway access and improved rail access offered by the Corridor provides excellent multimodal connectivity for the

area. However, rail traffic from the Corridor will face the same constraints on the Brownsville Subdivision as well as other rail shipments in the region.

*TPCO America Texas Mill*

TPCO America Corporation has filed an air permit application for the construction and 24-hour a day operation of the TPCO America Texas Mill, a "minimill" facility that will manufacture steel products from recycled scrap steel. The Texas Mill will be located between SH 35 and SH 361 near the La Quinta property. Truck and rail movements on the Kosmos Industrial Lead will increase with movements bringing resource material in and finished product out. Improvements to the SH 35 / FM 136 are in the preliminary design stage to provide a safer transition of employee and truck traffic into and out of the facility.

# 10.0 CONCLUSIONS AND RECOMMENDATIONS

The Corpus Christi region benefits from its significant freight transportation assets that span ocean, rail and motor carrier shipping. Economic development in the future, however, will make increasing demands on infrastructure and operations. To maintain freight mobility in the region, improvements will be required. Evaluation of the current and future regional freight environment suggests the following:

1. The proposed infrastructure and capacity improvements to the Brownsville Subdivision should be the highest priority as the Subdivision is a bottleneck irrespective of future economic development. Specifically, the proposed improvements to the connections at Odem and Sinton should provide not only significant improvements in rail efficiency, but also highway safety and efficiency improvements due to the congestion at crossings which result from the multiple rail movements required.
2. As development begins to occur at La Quinta or Ingleside, improvements will need to be made to the Kosmos Industrial Lead and the highway network in the area, as nearly all successful port development initiatives have been supported by expedited mainline rail service and highway access. In addition, the Kosmos "corridor", with its combination of port-related development, such as La Quinta, and available land with good transportation access will likely attract the interest of additional industrial development, as has already been evidenced by the decision of TPCO to locate there.
3. Providing for multiple rail carriers to serve La Quinta is desirable, and probably a critical component in ensuring the future success of La Quinta as a viable intermodal facility. It is recommended that local and possibly state stakeholders, including the San Patricio Rural Rail District and others, approach this issue on a public-private partnership basis where both the public and private parties involved agree that efficient service to La Quinta and the Corpus Christi region is the ultimate goal. Establishment of this common goal would then be followed with determining which infrastructure and operational changes, as well as cost sharing arrangements, are necessary to achieve the goal.

   If UFS is deemed viable following its testing period, its extended application to reach staging facilities for BNSF and KCS could also offer a viable alternative if accompanied by significant financial assistance for it construction.
4. Short of any commitments by the major railroads to offer intermodal container service to Robstown, the proposed logistics facility should focus on improving the transportation of non-containerized freight.

The combination of these conclusions and recommendations would provide the Corpus Christi region not only an improved freight transportation system for current freight

operations, but also provide the additional capacity required to address the freight transportation needs and linkages to economic development required for the future.

In addition, the infrastructure and capacity improvements recommended, such as additional connections, longer sidings and upgrade signal controls will contribute to the safety of rail employees and reduce the exposure for other types of rail accidents. Similarly, the elimination of redundant rail movements over at-grade highway crossings will increase highway efficiency and reduce exposure to highway-rail incidents.

Implementation of the conclusions and recommendations will likely require a public-private partnership approach between public stakeholders, probably led by the County Rural Rail Transportation Districts, and the railroad operators, primarily UP. This partnership should be based on the common goal of improving freight service to, from, and through the Corpus Christi region. Once this has been established, the next steps will include the infrastructure and operational improvements required, their prioritization, and finally, cost sharing arrangements.

As public financing will be required to initiate key projects that are not currently railroad capital project priorities or do not meet their return on investment criteria, the region must develop a financing plan which includes local, state and federal participation. Recent calls for significant changes in the way national transportation needs, and specifically freight needs, are addressed in the future have resulted in recommendations to better meet the nation's economic reliance on transportation. Suggested new program areas included in the National Policy and Revenue Commission's *Transportation for Tomorrow* report that could be beneficial to the region's transportation goals include: Asset Management; Freight Transportation; Congestion Relief-Metropolitan Mobility; Safe Mobility; and, Access to Small Cities and Rural Areas. Federal funding of these recommended programs would be based on individual plans developed by each state and metropolitan area.

# 11.0 APPENDIX A: PLANNING LEVEL COST ESTIMATES FOR WYES

## 11.1 Planning Level Cost Estimate Odem Junction Wye

**Project Cost Estimate**
**Corpus Christi Major Freight Facilities Impact Study**
**Odem Junction Wye**

**WSA Project No. 1030060**
**Date of Estimate: 01-15-2010**

| FTA SCC No | Description | Estimated Quantity | Unit | Unit Price Dollars | Price Dollars |
|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS** | | | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 110 | TF | 1,400.00 | 154,000 |
| 10.05 | Guideway: Built-up fill | 800 | CY | 12.00 | 9,600 |
| 10.11 | Track: Ballasted | 900 | TF | 175.00 | 157,500 |
| 10.12 | Track: Special (switches, turnouts) | 2 | EA | 150,000.00 | 300,000 |
| | | | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | | | - |
| 40.01 | Demolition, Clearing, Earthwork (300 TF removed) | 1 | LS | 25,000.00 | 25,000 |
| | | | | | - |
| **50 SYSTEMS** | | | | | - |
| 50.02 | Traffic signals and crossing protection | 2 | EA | 400,000.00 | 800,000 |
| | | **Subtotal (Cost Category 10 to 50)** | | | **1,446,100** |
| | | | | | |
| **100 FINANCE CHARGES** | | | | | |
| | **Design Fee and Design Administration @** | 17% | | | 245,837 |
| | **Escalation to 2010 @** | 0% | | | - |
| | **Construction Management and Administration @** | 15% | | | 216,915 |
| | **Sub Total Project Estimate** | | | | 1,908,852 |
| | | | | | |
| | **Contingency @** | 30% | | | 572,656 |
| | | | **Total Project Cost Estimate** | | **2,481,508** |

Notes: 1. Cost are for 2010, therefore no escalation is provided.
2. Estimate does not include utility relocation, building or pavement removal.
3. It is assumed that no train control or signal improvements are necessary.

## 11.2 Planning Level Cost Estimate for Sinton Junction Wye

**Project Cost Estimate**
**Corpus Christi Major Freight Facilities Impact Study**
**Sinton Junction Wye**

**WSA Project No. 1030060**
**Date of Estimate: 01-15-2010**

| FTA SCC No | Description | Estimated Quantity | Unit | Unit Price Dollars | Price Dollars |
|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS** | | | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 200 | TF | 1,400.00 | 280,000 |
| 10.05 | Guideway: Built-up fill | 900 | CY | 12.00 | 10,800 |
| 10.11 | Track: Ballasted | 1,050 | TF | 175.00 | 183,750 |
| 10.12 | Track: Special (switches, turnouts) | 2 | EA | 150,000.00 | 300,000 |
| | | | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | | | - |
| 40.01 | Demolition, Clearing, Earthwork (500 TF removed) | 1 | LS | 42,000.00 | 42,000 |
| | | | | | - |
| **50 SYSTEMS** | | | | | - |
| 50.02 | Traffic signals and crossing protection | 2 | EA | 400,000.00 | 800,000 |
| | | **Subtotal (Cost Category 10 to 50)** | | | **1,616,550** |
| | | | | | |
| **100 FINANCE CHARGES** | | | | | |
| | **Design Fee and Design Administration @** | 17% | | | 274,814 |
| | **Escalation to 2010 @** | 0% | | | - |
| | **Construction Management and Administration @** | 15% | | | 242,483 |
| | **Sub Total Project Estimate** | | | | 2,133,846 |
| | | | | | |
| | **Contingency @** | 30% | | | 640,154 |
| | | | **Total Project Cost Estimate** | | **2,774,000** |

Notes: 1. Cost are for 2010, therefore no escalation is provided.
2. Estimate does not include utility relocation, building or pavement removal.
3. It is assumed that no train control or signal improvements are necessary.