

PORT AUTHORITY ADVISORY COMMITTEE



# 2022-2023 TEXAS PORT MISSION PLAN

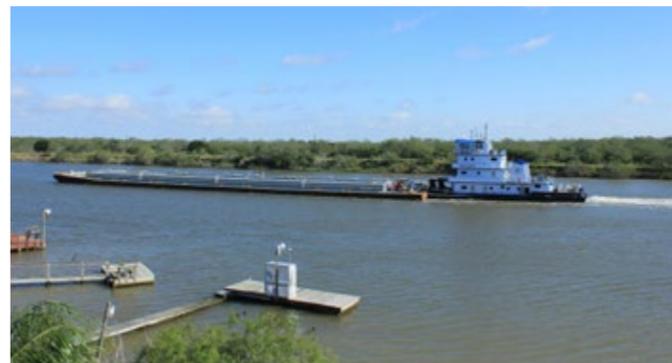
**87<sup>TH</sup> LEGISLATIVE SESSION**

# 2022-2023 TEXAS PORT MISSION PLAN

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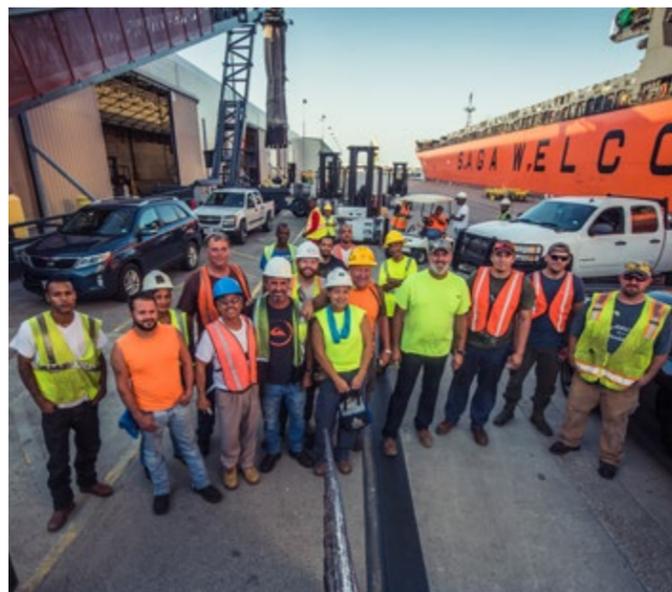
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## LETTER FROM THE CHAIRWOMAN

As chair of the Port Authority Advisory Committee (PAAC), I am pleased to present the 2022-2023 Texas Port Mission Plan. Texas is a port-driven state and relies on a strong port system to maintain its leading position as the nation's top exporter and importer by tonnage. In 2018, Texas ports moved nearly 569 million tons of cargo and nearly 2.2 million cruise passengers in 2019. According to the Texas Ports Association, in 2015 Texas ports provided more than \$368 billion in economic value to the state. The state's maritime system continues to be a critical gateway to international trade, which is vital to the Texas economy.

Our ports have seen some of the highest export revenue growth in the nation due to the increasing export demand of commodities such as oil, gas, liquefied natural gas (LNG), and plastics. Four Texas ports were cited among the top ten fastest growing U.S. ports from 2018-2019 in terms of export revenue. Despite the recent economic downturn and residual effects from COVID-19, export revenue is expected to continue to grow and oil and gas production in Texas is still forecasted to nearly triple by 2025.

The growth in the energy sector, combined with a steady economic recovery and growing consumer demand worldwide, indicates a strong upward trend in cargo to be handled at Texas ports for the foreseeable future. Keeping up with such growth is challenging with limited funding to modernize our port system. These funding challenges can be seen at the local, state, and federal level. Five Texas ports have authorized federal channel improvement projects that are receiving insufficient federal funding, causing delays at a time when they should be a national priority. Authorization for two more Texas channel improvement projects are pending.

Texas ports are investing heavily in upgrading their facilities. In the last five years, our ports have invested over \$1.7 billion into port facilities and have leveraged \$95.6 billion of private investments. We have also seen great support for ports from their surrounding communities, with two separate voter-approved bond packages that will help repair failing port facilities and fund the local cost-share to deepen one of our ship channels.

All Texas ports, large and small, stand to benefit from investments in the Texas port system. This plan identifies over \$3.6 billion of planned projects in the port system. Ports themselves will invest over \$3.2 billion into their port facilities and to cover their local share of ship channel deepening and widening of projects by 2023. We anticipate that this will leverage over \$68.7 billion of additional private investment in the next five years alone.

Presented in this Port Mission Plan are high-value projects that will enhance port efficiency, improve the movement of freight through intermodal systems, create new jobs, and attract private investment. The PAAC approved this document and requested state funding of \$2.19 billion. The Transportation Commission has included \$460 million of the PAAC's total request in their 2022-2023 Legislative Appropriations Request. State funding for these strategic, capital investments will help accelerate the implementation of these projects needed to support the growing Texas economy, currently the 9th largest economy in the world, for decades ahead.

We ask for your support of our ports, because investing in ports is investing in Texas.



**Phyllis Saathoff**  
Chairwoman  
Port Freeport  
Upper Coast Representative

## THE PORT AUTHORITY ADVISORY COMMITTEE (PAAC)

The Port Authority Advisory Committee (PAAC) develops the biennial Texas Port Mission Plan. This report highlights the funding needs of the Texas port system. The PAAC is comprised of nine members. Under Chapter 55 of the Texas Transportation Code, the Texas Transportation Commission appoints seven members of the PAAC to represent the upper coast, lower coast, and Port Houston. The Lieutenant Governor and the Speaker of the House of Representatives each appoint an additional PAAC member.

### Mission

"Elevate port issues as a vital component of the Texas transportation system and advise the Texas Transportation Commission and Department on matters relating to maritime transportation."

### PORT AUTHORITY ADVISORY COMMITTEE MEMBERS



**Phyllis Saathoff**  
Chairwoman  
Port Freeport  
Upper Coast Representative



**Michael Plank**  
Lieutenant Governor  
Appointee



**Allan Ritter**  
Speaker of the House  
Appointee



**Roger Guenther**  
Port Houston  
Permanent Member



**Chris Fisher**  
Port of Beaumont  
Upper Coast Representative



**Larry Kelley**  
Port of Port Arthur  
Upper Coast Representative



**Ronald Mills**  
Port of Port Mansfield  
Lower Coast Representative



**Sean Strawbridge**  
Port of Corpus Christi  
Lower Coast Representative



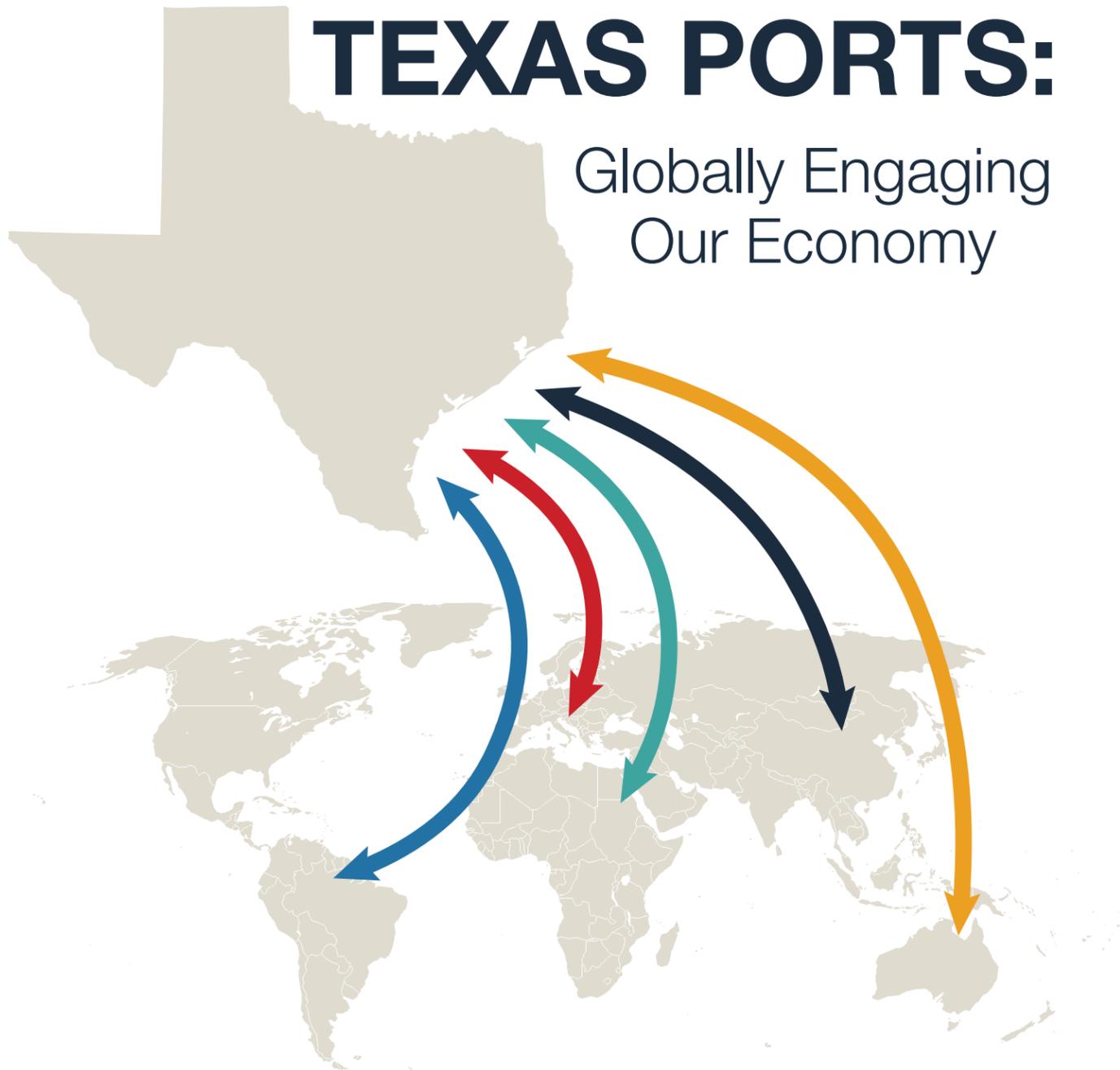
**Walker Smith**  
Port of Harlingen  
Lower Coast Representative

### Goals

- Identify high-priority and strategic port projects and make recommendations to the department for investment
- Incorporate maritime interests in TxDOT planning activities and documents
- Promote Texas ports for economic development opportunities
- Identify federal, state, or other funding opportunities for maritime investment

# TEXAS PORTS:

Globally Engaging  
Our Economy



## Annual Trade by Region<sup>1</sup>:

<p>South &amp; Central America</p> <p><b>\$50.2 B</b></p> <p>Exports: \$35.2 B Imports: \$14.9 B</p>	<p>Europe</p> <p><b>\$50.1 B</b></p> <p>Exports: \$26.0 B Imports: \$24.1 B</p>	<p>Africa</p> <p><b>\$7.4 B</b></p> <p>Exports: \$4.9 B Imports: \$2.5 B</p>	<p>Asia</p> <p><b>\$101.5 B</b></p> <p>Exports: \$43.0 B Imports: \$58.5 B</p>	<p>Australia &amp; Oceania</p> <p><b>\$1.7 B</b></p> <p>Exports: \$1.3 B Imports: \$0.4 B</p>
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**\$242.7 billion in trade value overall annually\***  
\$131.8 billion in exports and \$110.9 billion in imports

\*Values in dollars for annual combined waterborne import and export trade value for Texas averaged from 2015-2019.



Worker handling cargo at the Port of Brownsville.

## INVESTMENT STRATEGY

Texas ports are critical to the economic growth of Texas. In 2018, Texas ranked second nationwide for total waterborne tonnage handled and first nationwide for total foreign waterborne tonnage of imports and exports.<sup>2</sup> Ten of the state's ports ranked among the top 100 U.S. ports in total tonnage and five of the state's ports are ranked in the top 20 ports in the U.S. in total tonnage.<sup>2</sup> Three Texas ports were among the top five fastest growing U.S. ports in terms of absolute export revenue.<sup>3</sup> Trade through the State of Texas is a significant contributor in making Texas the world's 9th largest economy when comparing Texas GDP to national GDPs.<sup>4,5</sup> Whether urban or rural, coastal or inland dwelling, all Texans benefit from the port system.

Despite the strong position of the maritime industry in Texas, the single greatest challenge common to all Texas ports is the need for additional funding for capital improvements. Each Texas port is unique and has its own infrastructure challenges and funding needs. The Port Authority Advisory Committee (PAAC) puts forward the 2022-2023 Texas Port Mission Plan (PMP) as the maritime mission plan required in Chapter 55 of the Texas Transportation Code. The PMP includes this investment strategy and three major sub-reports:

- Port Capital Investment Report (PCIR)
- Ship Channel Improvement Report (SCIR)
- Port Connectivity Report

Collectively, the PMP highlights the importance of investing in the port system in order to benefit the state and meet the growth potential of global trade opportunities.

### STATEWIDE IMPACT

#### Texas Ports in 2018:

- Moved nearly 569 million tons of cargo, including nearly 414 million tons of international cargo, and nearly 155 million tons of domestic cargo<sup>2</sup>
- Handled over 2.3 million containers<sup>6</sup>
- Served nearly 2 million cruise passengers<sup>11</sup> (increased to 2.2 million in 2019<sup>7</sup>)
- Supported 1.1 million jobs in the state<sup>8</sup>



The Port of Port Isabel services the offshore oil and gas industry.

## PORT INVESTMENT IS A STATEWIDE GROWTH STRATEGY

In order to maintain Texas' position as a maritime trade leader and remain competitive in the future, the focus must be on critical capital investments that enhance and expand the Texas port system such as improved ship channels, multimodal connections, and replacement of outdated and failing port facilities. This will require support from all levels of government including the State of Texas.

### Capital Investment

The Texas port system relies on partnerships and funding from the ports, private partners, and all levels of government. Ports are typically responsible for funding facility improvements and partnering with the federal government to fund ship channel projects. Even as a maritime leader, the Texas port system still faces funding shortfalls. For example, the congressional authorization and appropriation process for ship channel improvement projects can take decades, which has contributed to the nearly \$96 billion backlog of federal water resource projects nationwide.<sup>9</sup> In the midst of such funding challenges, ports and their partners increasingly have to look for alternative means of funding projects such as public-private partnerships.

Capital investments in and around Texas ports have recently included:

- An estimated investment from public ports of over \$1.7 billion between 2013 and 2017 and an additional anticipated investment of \$3.2 billion in planned facility investments from 2018-2023.
- Roughly \$96 billion in investments between 2013 and 2017 made by private industry with an anticipated \$69 billion of planned investments between 2018 and 2023.

### Resiliency

Resiliency of the Texas maritime system is often overlooked until emergencies and disasters occur. Natural disasters can cause ports and waterways to shut down for days or even weeks. Shutdowns not only disrupt the flow of cargo into and out of Texas and the country, but also cost billions of dollars to the ports and related industries. Investing in port infrastructure, multimodal connections, and ship channels can improve the ability for the port system to both withstand and recover from a disaster.

Hurricanes can have major economic implications for the Texas ports. In 2017, Hurricane Harvey affected nearly every major port in Texas. It is estimated that Harvey<sup>10</sup>:

- Caused \$17.4 billion in economic impacts due to port closures and associated industry impacts.
- Caused nearly \$250 million in infrastructure impacts through damage to port facilities and channel shoaling.
- Cost \$1 to \$2 million per rerouted vessel.



Events like Hurricane Harvey further weakened aging port infrastructure such as these grain docks at the Port of Beaumont.

The congressional authorization and appropriation process for ship channel improvement projects can take decades, which has contributed to the nearly \$96 billion backlog of federal water resource projects nationwide.<sup>9</sup>

## DID YOU KNOW?

Three Texas ports were among the top five fastest growing U.S. ports from 2018-2019 in terms of absolute export revenue.<sup>3</sup>

### #1. Port of Corpus Christi Authority (\$5.47 billion in growth)

- Petroleum exports grew by 22%, an increase in value equal to \$4.5 billion.
- Pure iron exports grew by 1,000%, an increase in value of \$250 million from 2016 to 2019 with completion of the Voestalpine Facility.

### #3. Port Houston (\$3.43 billion in growth)

- Petroleum exports grew by 7%, an increase in value equal to \$3 billion.
- Containerized plastics exports grew by 19%, an increase in value equal to \$1.4 billion.

### #4. Port of Beaumont (\$3.16 billion in growth)

- Petroleum exports grew by 24%, an increase in value equal to \$3.4 billion

### Other noteworthy news:

- **Port of Brownsville** is facilitating the construction and use of a SpaceX launch facility in Boca Chica, Texas.
- **Port Freeport** saw a \$400 million increase in automobiles imported and has been exporting close to \$1.5 billion in autos assembled in Texas annually from 2015 to 2019 with the completion of a new Ro/Ro facility.
- **Port of Galveston** saw a \$400 million increase in automobiles imported and processed from 2015 to 2019 with the completion of a new Ro/Ro facility.



Freeport LNG has invested approximately \$14 billion to develop LNG facilities at Port Freeport which will produce approximately 2.2 billion cubic feet of gas per day.



The Orange County Terminal is a public-private partnership between the Port of Beaumont and Jefferson Energy Companies. At full build-out, the capital investment of Jefferson Energy Companies will be approximately \$1 billion.



Ro/Ro operations at the Port of Galveston.

## TYPES OF PORT FACILITIES

Ports vary greatly from one to the next, in large part based on their types of commercial activity. Each port has specific equipment and infrastructure needs in order to operate effectively. The following eight port typologies have been adapted from the U.S. Maritime Administration's port typology framework and are presented to summarize these ranging services provided by ports along the Texas coast.

**Break bulk ports** require large cranes or other equipment to move products like steel, lumber, wind turbines, and over-sized project equipment and materials. In addition to having port equipment for moving cargo, they frequently require large areas for laydown yards or warehousing. Port Houston is the national leader in handling break bulk cargo.

**Bulk ports** are those which use equipment such as cranes or elevators to handle loose commodities such as aggregate materials for construction or agricultural products such as grains. The Port of Harlingen exports 100% of the sugar produced in the Rio Grande Valley and imports most of the fertilizer used by South Texas farmers.

**Container ports** typically require specialized large-scale cranes to efficiently move containerized cargo. Similarly, vessels transporting container cargo are among the largest that call on Texas ports, requiring significant channel depths to avoid light loading. Both Port Freeport and Port Houston have Post-Panamax sized container cranes, with Port Houston standing as the fifth largest container port in the U.S. and the largest container port on the U.S. Gulf Coast.<sup>6</sup>

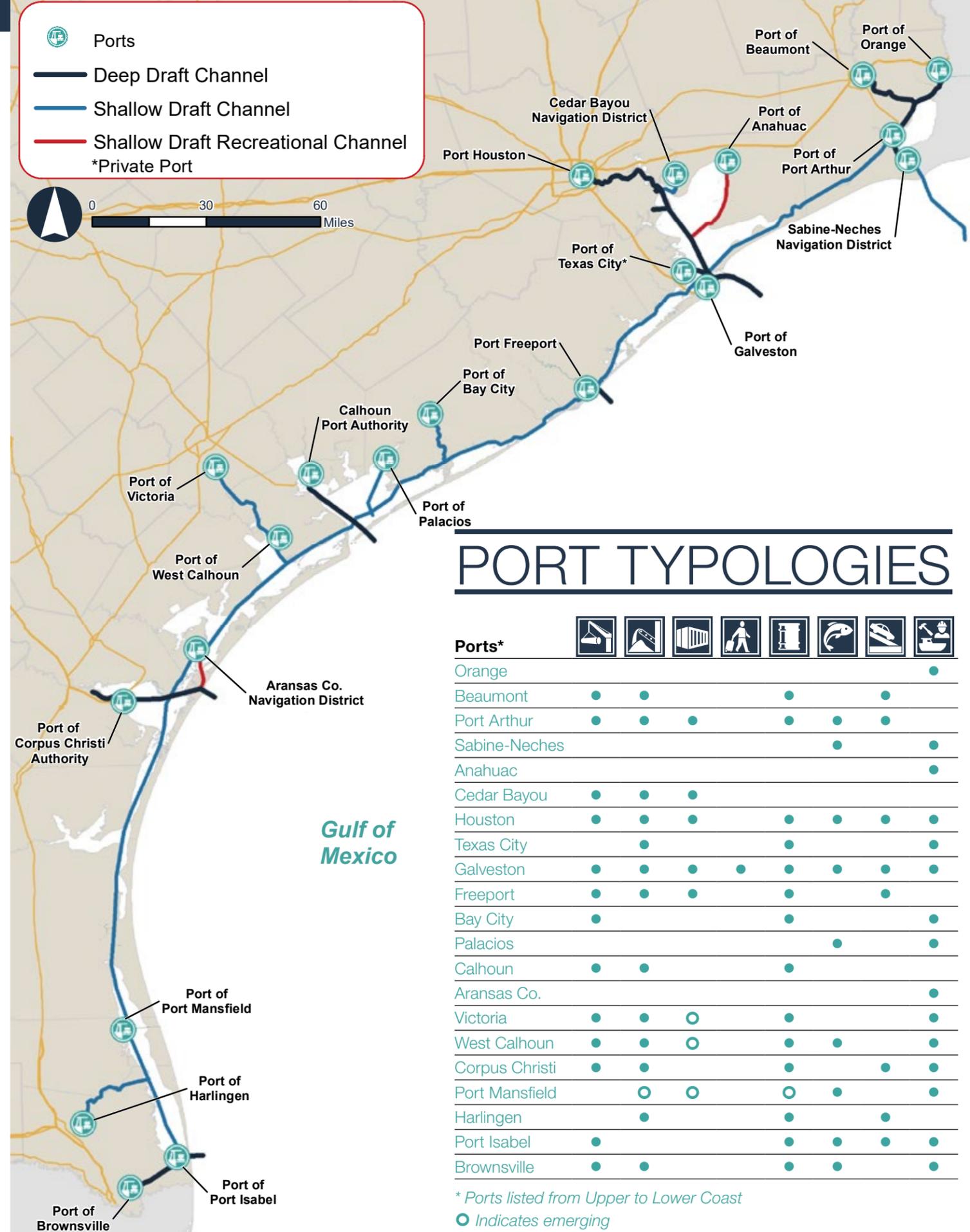
**Cruise terminals** provide for the recreational travel of passengers via ship and require separate access from the other secured port operating facilities. The Port of Galveston is the 4th busiest cruise port in the U.S.,<sup>11</sup> providing access for vacationing to the Gulf Coast of Mexico and the Caribbean.

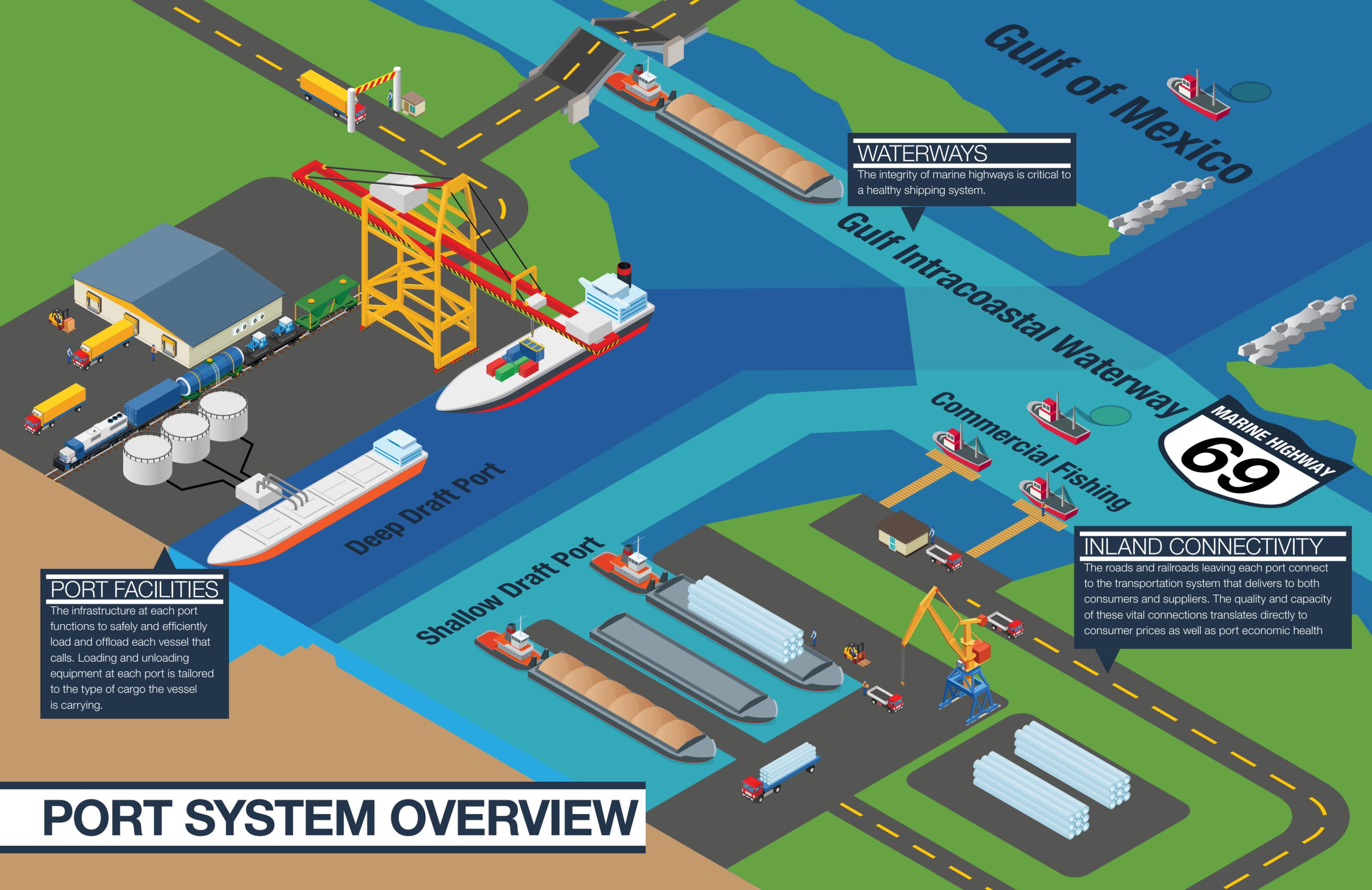
**Energy ports** allow for the import and export of liquid bulk such as petroleum products, chemicals, and liquefied natural gas. These port facilities often include large storage tanks and pipeline connections for product handling. Vessels calling on energy ports often require greater depths. The Sabine-Neches Waterway is the leading bulk liquid cargo waterway in the nation and is projected to be the largest LNG exporter in the country.

**Fishing ports** provide dockside access for fleets of commercial fishermen who catch finfish, shrimp, oysters, and crabs. Three Texas ports are among the top thirty largest commercial fishing ports in the country including the Port of Palacios, the Port of Galveston, and the combined Ports of Brownsville and Port Isabel.

**Ro/Ro (roll on/roll off) ports** process vehicles and other equipment that can be moved on and off vessels by using large ramps to connect with dock facilities. Ports that process vehicles will often have facilities for additional port-installed auto manufacturer options such as wheels, suspension, or other interchangeable parts. Ro/Ro ports in Texas play a critical part in supporting the movement of military cargo at the Port of Beaumont and Port of Port Arthur.

**Other** commercial activities are carried out at ports that don't fall into the above port typologies. Some of these activities include recreation, vessel and barge repair and construction, layberthing, ship recycling, support of offshore oil and gas, and support of emerging industries, such as space exploration by private companies.





### PORT FACILITIES

The infrastructure at each port functions to safely and efficiently load and offload each vessel that calls. Loading and unloading equipment at each port is tailored to the type of cargo the vessel is carrying.

### WATERWAYS

The integrity of marine highways is critical to a healthy shipping system.

### INLAND CONNECTIVITY

The roads and railroads leaving each port connect to the transportation system that delivers to both consumers and suppliers. The quality and capacity of these vital connections translates directly to consumer prices as well as port economic health

# PORT SYSTEM OVERVIEW



The Port of Palacios is one of the largest shrimping ports in the state.

## HOW THE PORT SYSTEM WORKS

Texas ports are strategic shipping hubs that house complex operating networks for handling the cargo and commodities that fuel and furnish the nation. There are three major components that are essential to each port's day-to-day activities: waterways, port facilities, and inland connectivity. Each one of these parts represents an indispensable piece of the supply chain and a critical area for strategic investment. All three combine to form the Texas port system and all of these parts intersect at the port.

Every industry served by ports relies on all three parts of the port system. All goods moving through Texas for export rely on trucks, trains, and pipelines to get to the port where they are then typically stored in a warehouse or laydown area. Goods are then transferred onto the vessels by using cranes or other equipment. Once loaded, vessels leave the port using waterways. A bottleneck in any one of the three parts of the port system can have a ripple effect and negatively impact other parts of the port system supply chain. If, for example, a ship channel is not deep enough, vessels may need to carry less cargo or be routed to another port with sufficient draft, even if the port facilities and landside connections are in working order. The port system's success requires thoughtful coordination and investment across all three areas.

**Domestic and international waterborne trade, the energy industry, seafood and commercial fishing markets, and cruising and tourism revenues all depend on the state of the Texas ports.**



The port system supports the movement of military cargo at the Port of Beaumont.

### Waterways

Any vessel entering or leaving a Texas seaport relies on well-maintained navigable waterways also known as ship channels. These waterways are the critical thoroughfares of trade, serving as marine "highways" that allow for the movement of goods and people in and out of ports. Deep draft channels allow for the movement of large vessels while shallow draft channels support smaller vessels and barge activity. The width, depth, and navigability of a waterway that serves a port directly affects the kinds of vessels and markets a port can serve. It is important to maintain Texas waterways so that vessels can continue to move in and out of ports safely and efficiently. Furthermore, some ports require deeper and wider channels so that they are equipped to receive the next generation of larger vessels.



The Houston Ship Channel is 52 miles long and is the busiest waterway in the United States.

### Port Facilities

The port facilities are the backbone of a port's operations. The port infrastructure and equipment is used by workers to help move goods and people between vessels and other modes of transportation. Port facilities can be developed by the port, by a private tenant, or as a shared responsibility through a public-private partnership. Typical port facilities include wharves and docks, mechanized equipment, storage facilities, port gates, and anything else that is needed to support the port's commercial activity. Ports not only have to maintain their facilities, they must also plan for future facility expansions and upgraded infrastructure. When port facilities are outdated or overburdened, the port can become a bottleneck that hinders the flow of cargo in and out of the state.



Bulk Dock #1 at the Port of Corpus Christi can load commodities directly to rail or trucks from a vessel.

### Inland Connectivity

Texas markets are connected to Texas ports through inland connections such as roadways, railways, and pipelines. Many of the trucks and trains that cross Texas are tied to the commercial activity that takes place around Texas ports, making inland connectivity the most visible part of the Texas port system to most Texans. These connections support Texas export supply chains and also bring in goods from across the world to our doorsteps. Ports rely on a strong network of inland connections that can help move goods to and from the port in a safe, quick, and reliable manner.



Trucks entering the Port of Brownsville.

# PCIR BENEFIT CATEGORIES

Projects are evaluated and scored using the following five benefit categories:

## ECONOMIC IMPACT

The proposed project results in an economic benefit to the state in terms of job creation, new business development, or retention of existing business.

## OPERATIONAL IMPACT

The proposed project demonstrates a significant operational benefit in terms of cargo movement, reduction in vehicle wait times, improved access, or other efficiency factors.

## ENHANCES CONNECTIVITY

The proposed project enhances connectivity to the state's multimodal transportation system.

## IMPROVES SAFE AND SECURE OPERATIONS

The proposed project improves safe port operations or supports port security and resiliency.

## OTHER BENEFITS

The proposed project provides additional secondary benefits in terms of environmental sustainability, air quality, quality of life, or other significant factors.

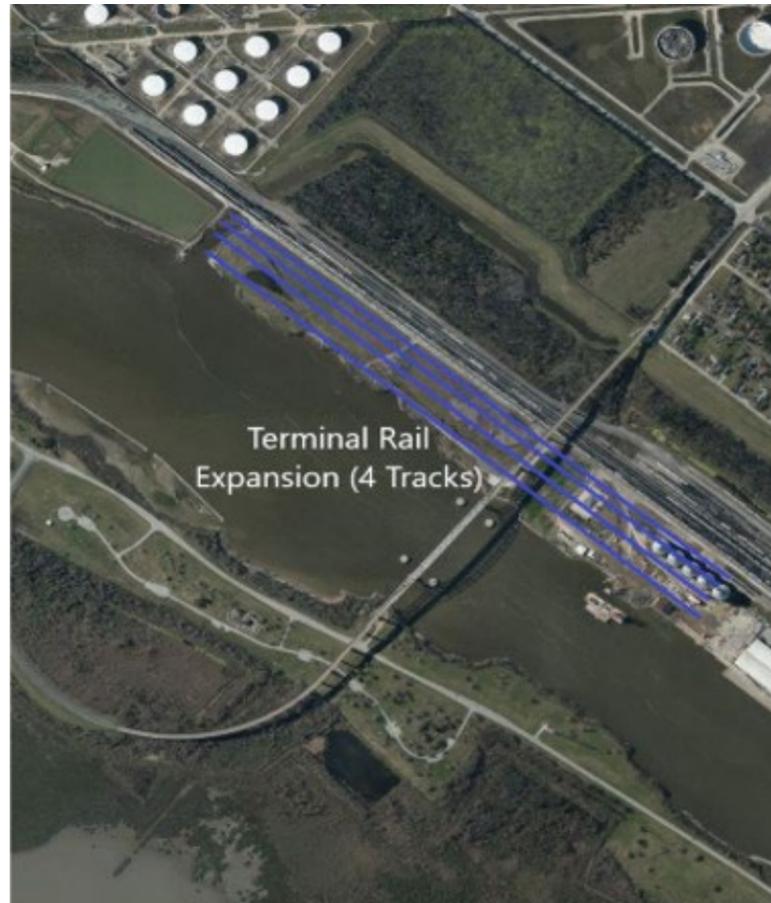


# Port Capital Investment Report

The 2022-2023 Texas Port Capital Investment Report is a key component of the Texas Port Mission Plan that is developed by the PAAC. The PCIR takes a broad view of the needs of the Texas port system and considers port facilities, waterways, and inland connections. Whereas waterways and inland connectivity needs are assessed in separate reports included in the Texas Port Mission Plan, the PCIR is the only statewide maritime plan that addresses port facility needs.

The PAAC elevates matters related to maritime transportation to the Texas Transportation Commission and recommends strategic capital projects and studies to be considered for funding under the PCIR. To do this, the PAAC conducts a biennial assessment of port capital improvement project needs and studies throughout Texas. An independent panel of engineers evaluates projects that have been submitted by ports and navigation districts for their strategic importance to the individual port, the larger port system, and the state of Texas.

The 2022-2023 PCIR includes 30 capital projects and one study at eight different ports whose total project cost is just over \$2.18 billion. The PCIR project list includes the cost of four authorized ship channel improvement projects, which are also reflected in the Ship Channel Improvement Report and are eligible for funding from the Ship Channel Improvement Revolving Fund. All ports are willing to provide a minimum cost share of 25% for each project and study. The PCIR has not resulted in funding for these port projects from the State previously.



Proposed Terminal Rail Expansion at the Port of Port Arthur.

## Port Capital Investment Projects

Port	Project Name	Cost (\$M)*
Port of Orange	DRAVO Peninsula Industrial Site	\$2.5
	Orange County Dock 2	\$61.6
Port of Beaumont	South End Truck Queuing Area	\$9.0
	Puzzle Switch	\$1.5
Port of Port Arthur	Berth 3-5 Toe Wall Project	\$29.3
	Berth 1-2 Toe Wall Construction	\$21.7
	Railyard Flyover Project	\$15.0
	Queuing and Staging Area	\$11.2
	Shed 1 Rehabilitation	\$10.2
	Terminal Rail Expansion	\$7.2
	Berth 5 Backlands	\$3.0
	Multimodal Queuing Area	\$2.4
	In Port Cargo and Trailer Staging Area	\$1.5
	Truck and Trailer Cargo Queuing Area	\$0.8
Port of Galveston	West End Cargo Expansion	\$60.7
	Pelican Island Projects Phase I	\$51.2
	Terminal Parking Garage	\$29.2
	Terminal 3 Site Owner Obligations Project	\$14.0
	Old Port Industrial Road Utility Improvements and Gate Relocation	\$14.0
	Cruise Terminal Walkway Circulation Improvements	\$2.7
Port Freeport	Galveston Island Wayfinding Project	\$1.6
	Freeport Harbor Channel Improvement Project	\$324.6
	Parcel 14 Stabilization and Rail Development Phase II	\$55.7
Calhoun Port Authority	Velasco Terminal - Berths 9 and 10	\$45.0
	Matagorda Ship Channel Improvement Project	\$218.3
Port of Corpus Christi Authority	South Peninsula Development Phase I	\$62.3
	Corpus Christi Ship Channel Improvement Project	\$651.1
	Avery Point Terminal Redevelopment	\$155.5
	Rincon Complex Multimodal Infrastructure Development	\$14.0
Port of Brownsville	La Quinta Channel Deepening Study	\$3.0
	Brazos Island Harbor Channel Improvement Project	\$302.0

\* Costs provided by individual ports.



Funding projects listed in the PCIR would help improve cargo throughput at ports, via improvements such as new queuing and staging areas at the Port of Port Arthur.



Velasco Terminal at Port Freeport.



Oil tankers at the Port of Brownsville's Brazos Island Harbor Ship Channel.



Brazos Island Harbor Ship Channel is authorized to be deepened to 52 feet.



Sabine-Neches Waterway at the Port of Port Arthur is authorized to be deepened to 48 feet.

### Ship Channel Improvement Report

The Ship Channel Improvement Report identifies and summarizes congressionally authorized ship channel improvement projects and feasibility studies across the state. Federal ship channels are the responsibility of the U.S. Army Corps of Engineers, but ports and navigation districts act as “non-federal sponsors” and are responsible for funding a portion of the project cost. Ship channel improvement projects are investments that are costly and time sensitive. Delays in funding and implementing navigation projects can lead to missed opportunities for attracting tenants, increases in overall project costs, and loss of returns on the overall investment.

In 2017, the 85th Texas Legislature passed Senate Bill (SB) 28, establishing the Ship Channel Improvement Revolving Fund (SCIRF) and Loan Program. This creates a program to help finance the modernization of ship channels. By providing financing through the SCIRF, Texas has the ability to move forward on navigation projects in spite of limited federal appropriations and invest in the port system, enhance the state’s economy, and be repaid through the loan process.

### Ship Channel Improvement Projects

Channel	Cost (\$M)*
Sabine-Neches Waterway	\$1,400
Cedar Bayou Navigation Channel	\$52.8
Freeport Harbor Channel	\$324.6
Corpus Christi Ship Channel	\$651.1
Brazos Island Harbor Channel	\$302.0

\* Costs provided by ports/navigation districts

### Port Connectivity Report

The Port Connectivity Report assesses the current state of landside connectivity at 18 maritime ports along the Texas seacoast, focusing on roadway connections between port gates and major freight corridors. Transportation conditions and needs are unique to each port. These can include issues as diverse as incompatible surrounding land uses, modal incompatibility and conflicts, operational inefficiencies, and insufficient facility design for the needs of freight operators. In combination, these issues lead to inefficiencies for multimodal freight movement. This report evaluates the existing conditions of landside port access, identifies problems and areas of concern, and proposes potential solutions.



Freeport Harbor Channel is authorized to be deepened to depths ranging from 51-56 feet.



A truck drives along the Joe Fulton International Trade Corridor at the Port of Corpus Christi.



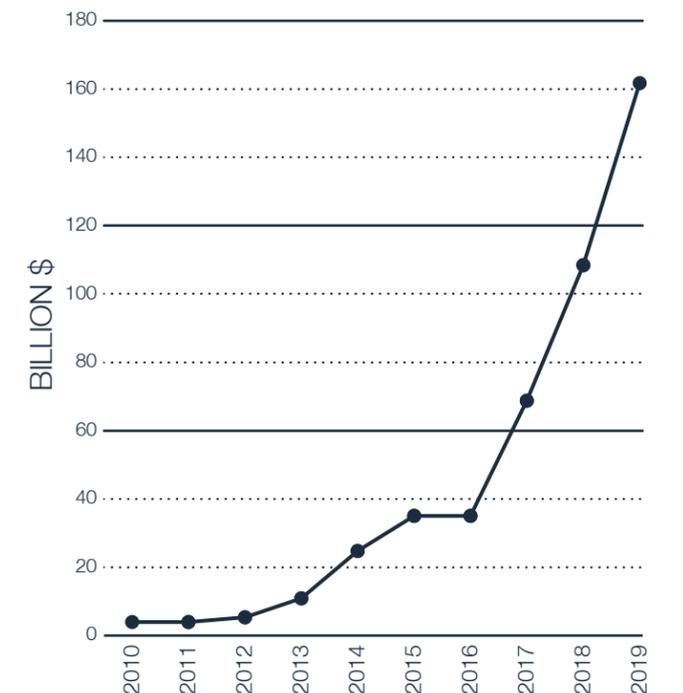
### TOP TEN IMPORT COMMODITIES<sup>1</sup>

1. Electric Machinery
2. Nuclear Reactors
3. Mineral Fuel
4. Vehicles
5. Articles of Iron or Steel
6. Medical Equipment
7. Special Classification Provisions
8. Furniture
9. Plastics
10. Organic Chemicals

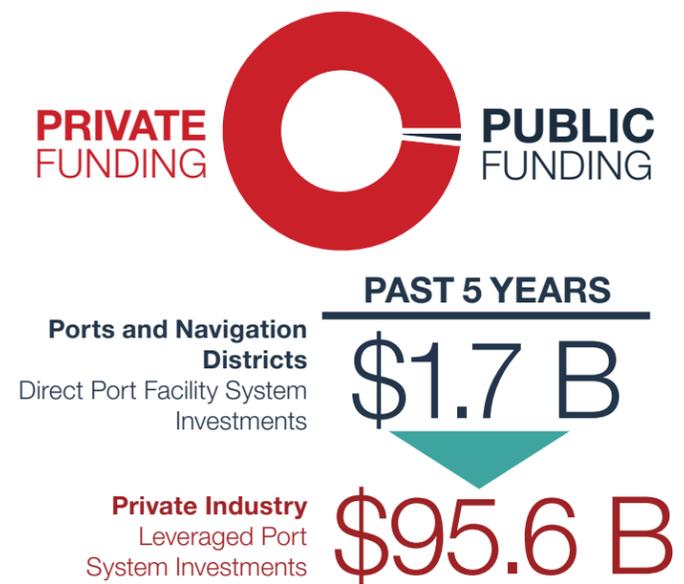
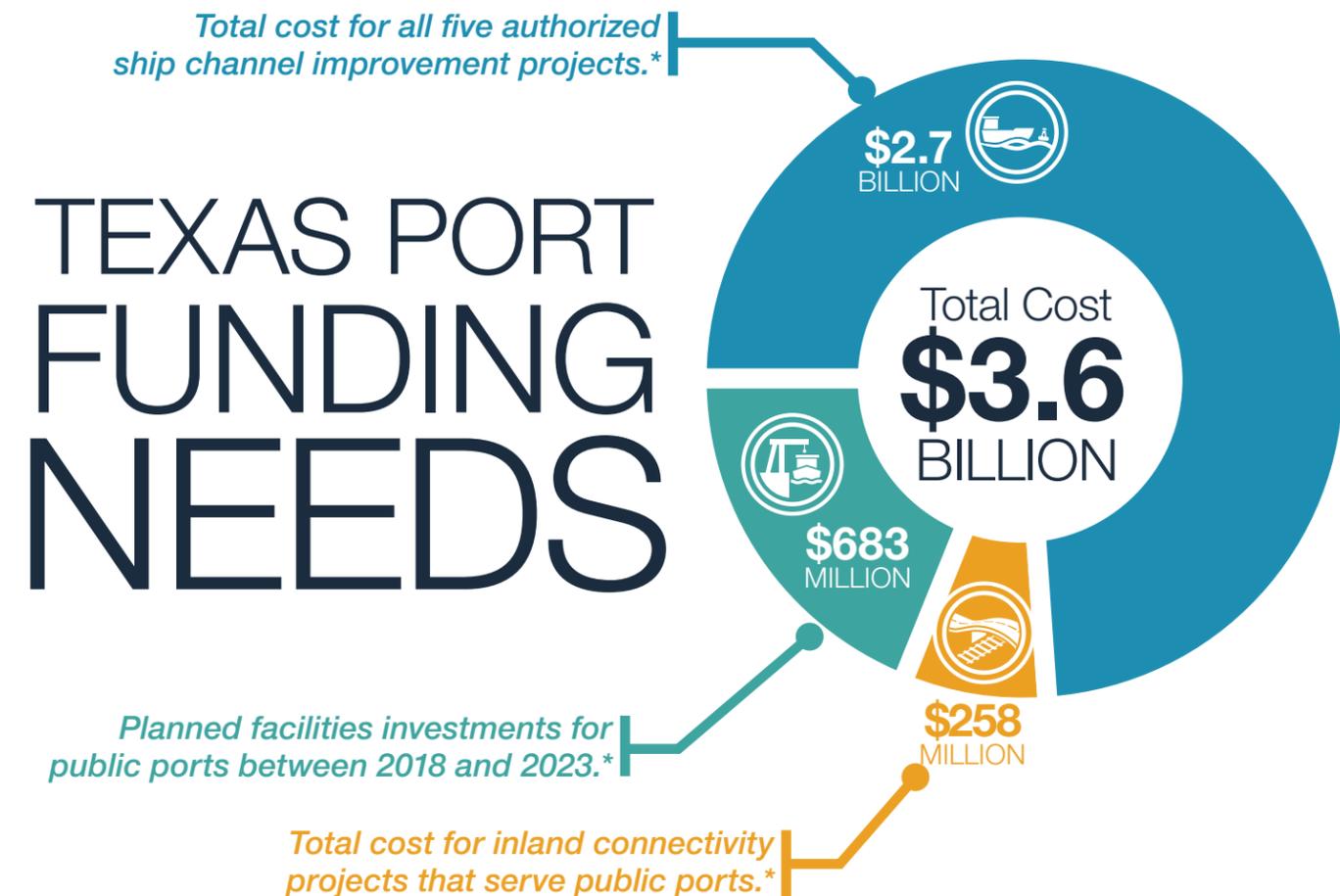
### TOP TEN EXPORT COMMODITIES<sup>1</sup>

1. Mineral Fuel
2. Nuclear Reactors
3. Electric Machinery
4. Plastics
5. Organic Chemicals
6. Vehicles
7. Aircraft and Parts
8. Medical Equipment
9. Miscellaneous Chemical Products
10. Articles of Iron and Steel

### VESSEL EXPORT OF OIL & GAS<sup>1</sup>



# PLANNED PORT SYSTEM INVESTMENT



# PLANNED PORT INVESTMENT

Texas ports and navigation districts need to secure **\$3.6 B of direct port system investments** through local, state, and federal funds over the next 5 years to capture and maximize future **private port system investments**.

\*Costs provided by the ports and navigation districts.

# FUNDING REQUESTED FOR THE PORT SYSTEM

Texas ports require continual enhancements and expansion to attract private investment for new industrial facilities. The funding requested represents a fraction of the biennial need, but is critical to give these projects the traction that will accelerate their implementation. The Texas Transportation Commission voted to include the following funding requests in TxDOT's Legislative Appropriations Request (LAR) based on PAAC funding recommendations.

## 2022-2023 Port Capital Investment Report



The Port Capital Investment Report is a prioritized list of projects that includes port facilities, waterways, and inland connections. The PAAC voted to recommend a funding request of \$130 million to help fund the projects included in the 2022-2023 PCIR, and the Commission voted to include the full amount of this request in the LAR. If funded, these projects will support improved logistics, increased capacity, and enhanced safety to keep Texas ports competitive.

*Funding Requested: \$130 Million*

## Ship Channel Improvement Revolving Fund (SCIRF)



Funding the SCIRF will help provide financing for eligible navigation projects that modernize waterways and allow for increased growth of waterborne commerce. There are five projects in Texas that are eligible to draw on the fund should it be capitalized. The PAAC voted to recommend a funding request in the amount of \$2.06 billion, the amount required to fully fund all five eligible projects. The Commission has elected to include \$330 million in the 2022-2023 LAR to cover the estimated drawdown for the eligible projects in fiscal years 2022-2023.

*Funding Requested: \$330 Million*

**Total Funding Requested: \$460 Million**



*Funding the PCIR would help expand the cargo and trailer staging area at the Port of Port Arthur.*

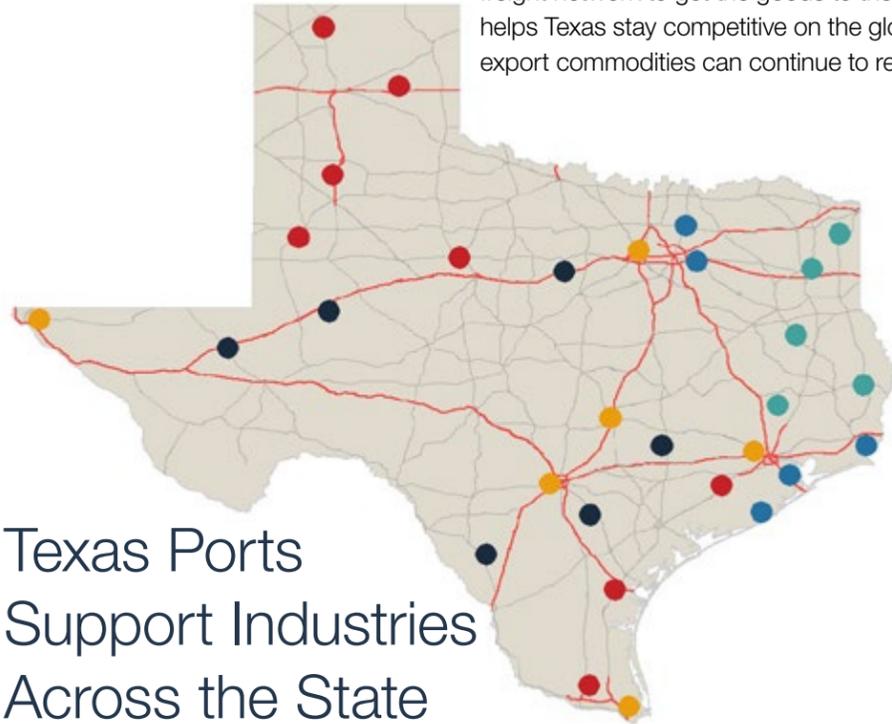


*The Corpus Christi Ship Channel has received \$248 M of federal appropriations for the \$397 M federal share. Delays in project implementation have led to a cost increase from \$327 M to \$651 M.*

# BEYOND THE TEXAS COAST

## Texas is a Port-Driven State

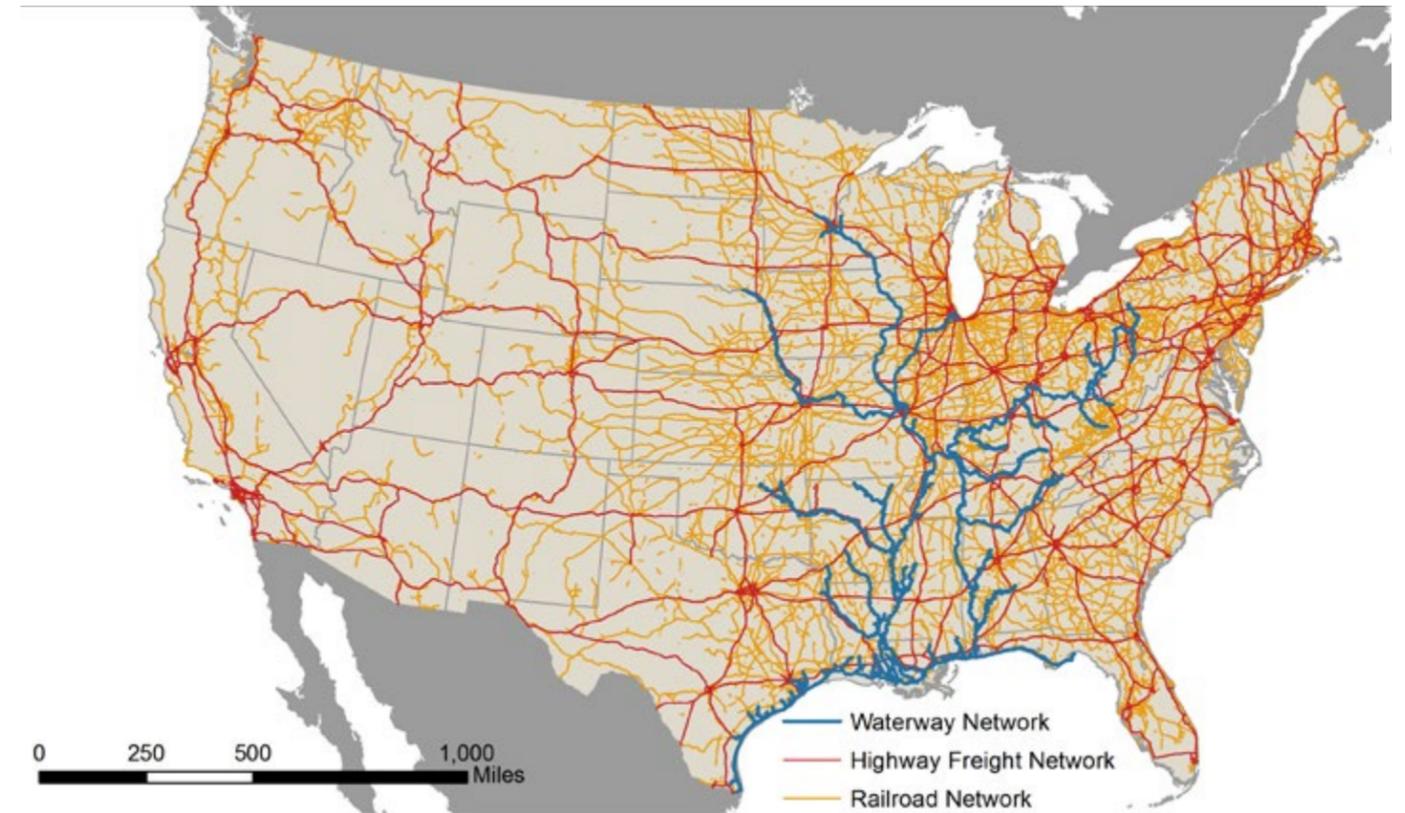
The Texas economy is largely driven by commodity supply chains that move goods to and from the state. Inland markets across the state rely on a strong multimodal freight network to get the goods to the ports for export. Enhancing our port system helps Texas stay competitive on the global market by ensuring that our inland export commodities can continue to reach their destinations worldwide.



Port Houston handled more tons of exports and imports than any other U.S. port in 2018.

## Texas Ports Support Industries Across the State

Timber Products <sup>13</sup>	Texas Forest	Primary Processing Mill	Export Distribution Center	Texas Port
Plastic Resins <sup>14</sup>	Petro Chemical Plant	Plastic Converter	Bagger Facility	Texas Port
Vehicle Parts <sup>15</sup>	Tier 1 Supplier	Parts Distribution Center	Texas Port	
Cotton <sup>16</sup>	Cotton Farm	Cotton Gin	Local Warehouse	Texas Port
Liquefied Natural Gas <sup>17</sup>	Well	Gas Processing & Liquefaction Plant	LNG Storage Tank	Texas Port



## Connecting with the Nation

The deep and shallow draft channels that allow for barge transit are a critical part of the national freight network. Barge transport is a highly fuel-efficient means to transport bulk and liquid cargo that also reduces truck congestion on roadways. The Texas portion of the Gulf Intracoastal Waterway (GIWW) connects all Texas ports to each other and to a robust network of Gulf Coast and inland waterways.



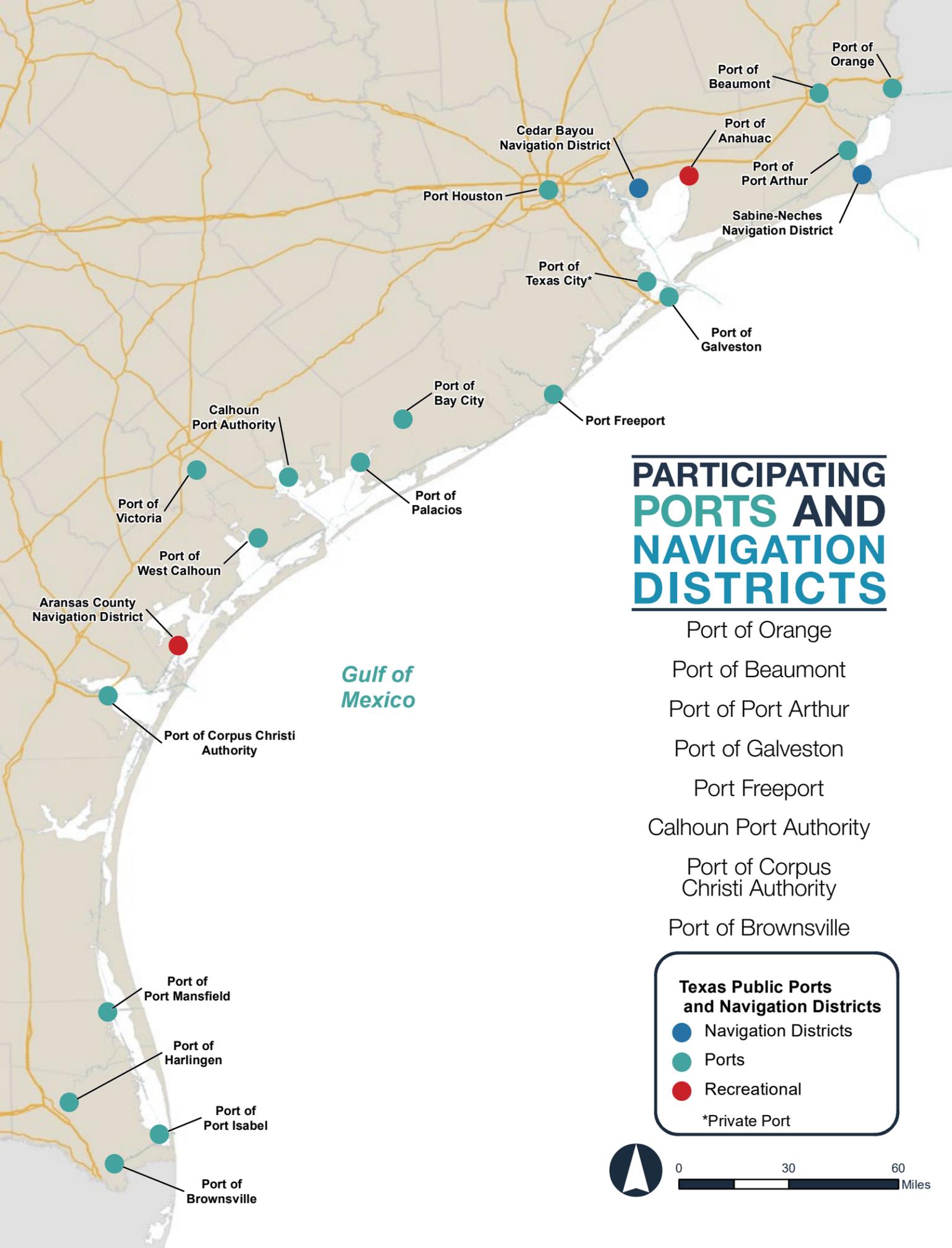
The Victoria Barge Canal is a 35-mile-long waterway that connects the Port of Victoria to the Gulf Intracoastal Waterway.

# DID YOU KNOW?

An average of 80 million short tons per year were transported along the Texas portion of the GIWW between 2015 and 2018.<sup>18</sup>



# PORT CAPITAL INVESTMENT REPORT



## PARTICIPATING PORTS AND NAVIGATION DISTRICTS

- Port of Orange
- Port of Beaumont
- Port of Port Arthur
- Port of Galveston
- Port Freeport
- Calhoun Port Authority
- Port of Corpus Christi Authority
- Port of Brownsville

**Texas Public Ports and Navigation Districts**

- Navigation Districts
- Ports
- Recreational

\*Private Port



## INTRODUCTION

The 2022-2023 Texas Port Capital Investment Report (PCIR) is a key component of the Texas Port Mission Plan that is developed by the PAAC. The PCIR takes a broad view of the needs of the Texas port system and considers port facilities, waterways and inland connections. Whereas waterways and inland connectivity needs are assessed in separate reports included in the Texas Port Mission Plan, the PCIR is the only statewide maritime plan that addresses port facility needs.

The PAAC elevates matters related to maritime transportation and recommends strategic capital projects and studies to be considered for funding under the PCIR. To do this, the PAAC conducts a biennial assessment of port capital improvement study needs from Texas Ports and Navigation Districts. A panel of professional coastal engineers evaluated projects that have been submitted by ports and navigation districts for their strategic importance to the port, the larger port system, and the state of Texas. Members of TxDOT's Maritime Division reviewed the project scores. The types of projects that are eligible to apply for inclusion in the PCIR are shown below.

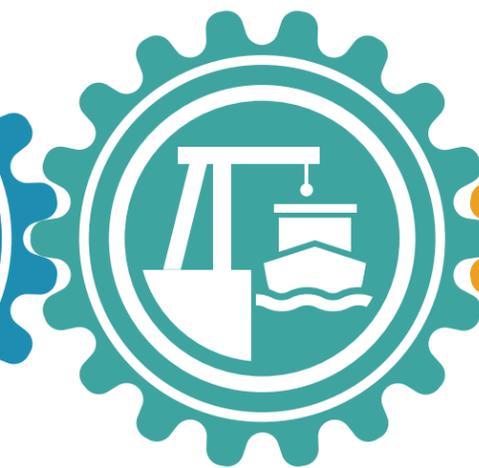
The PAAC voted to recommend a funding request of \$130 million to help fund the projects included in the 2022-2023 PCIR. This is only a fraction of the total project cost, which is approximately \$2.18 billion. Funding the PCIR will help accelerate the implementation of these projects so that Texas ports can remain competitive and continue to grow the state's economy. Ports are willing to provide at least a 25% project match for each project.

**The PCIR is the only statewide maritime plan that addresses port facility needs.**

**The PAAC voted to recommend a funding request of \$130 million to help fund the projects included in the 2022-2023 PCIR. This is only a fraction of the combined project cost, which is approximately \$2.18 billion.**



**Waterways**  
*Dredging*  
*Ship channels*  
*Turning basins*  
*Harbors*



**Port Facilities**  
*Wharves and docks*  
*Storage facilities*  
*Cruise terminals*  
*Mechanized equipment*  
*Land acquisition*



**Inland Connectivity**  
*Roadways*  
*Railroads*  
*Pipelines*  
*Airports*

# PORT CAPITAL INVESTMENT REPORT DEVELOPMENT

## Port Capital Investment Report Eligibility

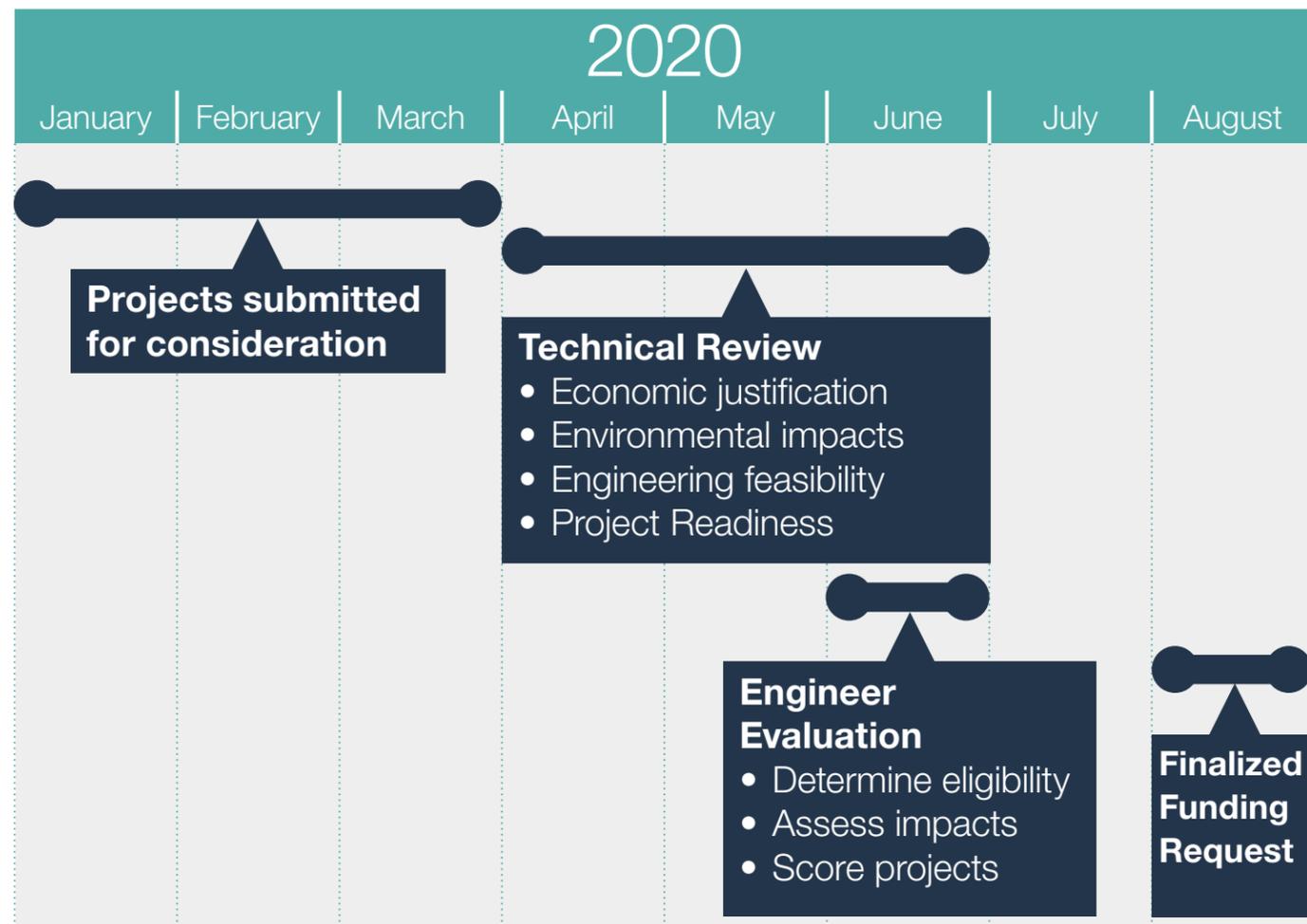
All Texas public ports and navigation districts may submit capital projects and studies that meet the eligibility requirements. The 20 public Texas ports and navigation districts were invited to submit proposed projects to be considered for the 2022-2023 Port Capital Investment Report. Eight public ports or navigation districts elected to submit projects.

### Project Eligibility

Eligible Projects	Project Examples	Minimum Criteria
<b>Plans or Studies</b>	• Planning Efforts	✓ Meets Texas Transportation Ch. 55 eligibility
	• Feasibility Studies	✓ Port will provide minimum 25% cost share
	• Project Development*	✓ Project lettable by the end of FY 2023
<b>Capital Projects</b>	• Port Facilities	✓ Project could be completed by the end of FY 2026
	• Inland Connectivity	✓ Shows economic, environmental, and engineering feasibility
	• Waterways	✓ Has proven project support

\*Up to 20% of design engineering

# EVALUATION PROCESS



## Evaluation Criteria

Applicants selected the two most pertinent benefit categories out of the five benefit categories listed below for each project submission to be scored on. This allowed small-scale projects that can only address some of the benefit categories to be compared equitably with larger, more complex projects. The maximum score achievable was 10 points for each benefit category, for a total of 20 points possible per project. A panel of professional coastal engineers evaluated each project, and total scores were averaged together to determine final project rankings.

### Project Benefits Assessed

<b>Economic Impact</b>	The proposed project results in an economic benefit to the state in terms of job creation, new business development, or retention of existing business.
<b>Operational Impact</b>	The proposed project demonstrates a significant operational benefit in terms of cargo movement, reduction in vehicle wait times, improved access, or other efficiency factors.
<b>Enhances Connectivity</b>	The proposed project enhances connectivity to the state's multimodal transportation system.
<b>Improves Safe and Secure Operations</b>	The proposed project improves safe port operations or supports port security and resiliency.
<b>Other Benefits</b>	The proposed project provides additional secondary benefits in terms of environmental sustainability, air quality, quality of life, or other significant factors.

The results of the full evaluation analysis are summarized in the chart below by cost and primary project types. The total cost of projects ranges from under \$850,000 to just over \$650 million.

### Results Summary

Project Type(s)	Eligible Projects	Cost Range of Projects
Port Facilities Only	15	< \$1 M to \$155 M
Inland Connectivity Only	3	\$1.5 M to \$15 M
Waterways Only	5	\$3 M to \$651 M
Port Facilities + Inland Connectivity	7	\$2 M to \$62 M
Port Facilities + Waterways	1	\$62 M

**“As the nation’s top exporting state, Texas plays a key role in ensuring American products reach markets across the globe, and international trade and the movement of goods are crucial to the Texas economy. Texas’ seaports play a critical role in maintaining our state’s economic strength, and keeping those ports competitive will be an important part of Texas’ growth in the coming decades.”**

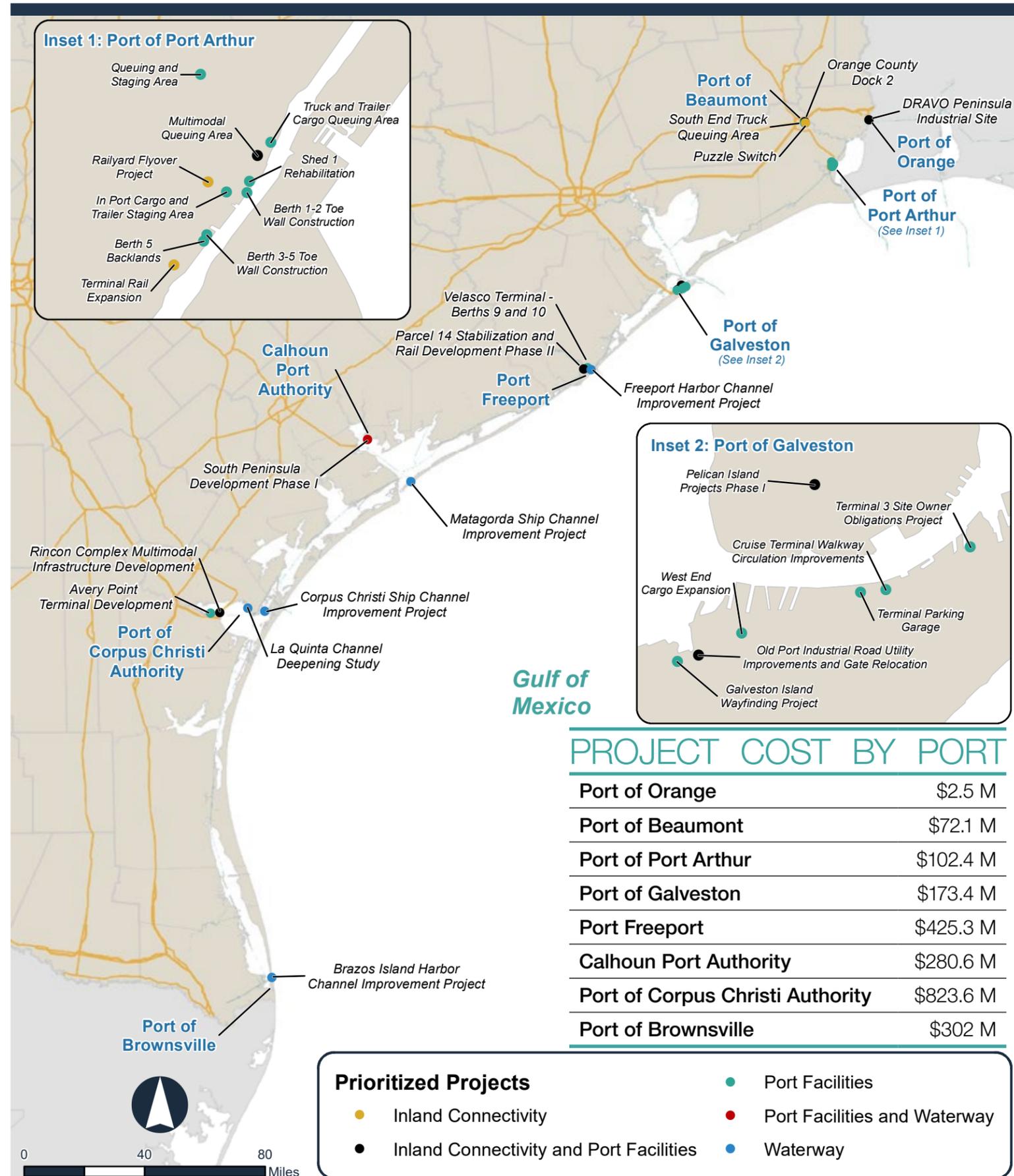
*Glenn Hegar  
Texas Comptroller of Public Accounts*

# 2022-2023 Port Capital Investment Report Projects by Rank

Rank	Port	Project Name	Project Type	Cost*	Page
1	Port of Beaumont	Puzzle Switch		\$1,462,600	B-12
2	Port of Corpus Christi Authority	La Quinta Channel Deepening Study		\$3,000,000	B-38
3	Port of Corpus Christi Authority	Corpus Christi Ship Channel Improvement Project		\$651,085,000	B-35
4	Port of Port Arthur	Multimodal Queuing Area		\$2,415,000	B-20
5	Port of Orange	DRAVO Peninsula Industrial Site		\$2,535,000	B-9
6	Port of Brownsville	Brazos Island Harbor Channel Improvement Project		\$301,952,000	B-39
7	Port of Port Arthur	Berth 5 Backlands		\$3,010,000	B-19
8	Port of Beaumont	Orange County Dock 2		\$61,600,000	B-10
9	Port of Port Arthur	Berth 1-2 Toe Wall Construction		\$21,680,000	B-14
10	Port of Port Arthur	Berth 3-5 Toe Wall Construction		\$29,331,000	B-13
11	Port of Corpus Christi Authority	Rincon Complex Multimodal Infrastructure Development		\$14,000,000	B-37
12	Port of Galveston	Old Port Industrial Road Utility Improvements and Gate Relocation		\$14,000,000	B-27
13	Port Freeport	Freeport Harbor Channel Improvement Project		\$324,590,000	B-30
14	Port Freeport	Velasco Terminal-Berths 9 and 10		\$45,000,000	B-32
15	Calhoun Port Authority	Matagorda Ship Channel Improvement Project		\$218,325,000	B-33
16	Port of Beaumont	South End Truck Queuing Area		\$9,000,000	B-11
17	Port of Corpus Christi Authority	Avery Point Terminal Redevelopment		\$155,508,988	B-36
18	Port Freeport	Parcel 14 Stabilization and Rail Development Phase II		\$55,700,000	B-31
19	Calhoun Port Authority	South Peninsula Development Phase I		\$62,311,295	B-34
20	Port of Galveston	Terminal Parking Garage		\$29,150,000	B-25
21	Port of Galveston	Terminal 3 Site Owner Obligations Project		\$14,000,000	B-26
22	Port of Port Arthur	In Port Cargo and Trailer Staging Area		\$1,500,000	B-21
23	Port of Port Arthur	Terminal Rail Expansion		\$7,210,282	B-18
24	Port of Port Arthur	Shed 1 Rehabilitation		\$10,225,000	B-17
25	Port of Galveston	Pelican Island Projects Phase I		\$51,200,000	B-24
26	Port of Port Arthur	Queuing and Staging Area		\$11,159,000	B-16
27	Port of Galveston	West End Cargo Expansion		\$60,704,452	B-23
28	Port of Galveston	Galveston Island Wayfinding Project		\$1,600,000	B-29
29	Port of Port Arthur	Railyard Flyover Project		\$15,000,000	B-15
30	Port of Galveston	Cruise Terminal Walkway Circulation Improvements		\$2,724,574	B-28
31	Port of Port Arthur	Truck and Trailer Cargo Queuing Area		\$828,000	B-22
<b>GRAND TOTAL</b>				<b>\$2,181,807,191</b>	
<b>TOTAL WITHOUT SHIP CHANNEL PROJECTS</b>				<b>\$682,855,191</b>	

\*Costs provided by the individual Ports, Port Authorities, or Navigation Districts

# PORT CAPITAL PROJECTS





# PROJECT PROFILES



Port of Brownsville.



Port of Galveston.



Port of Corpus Christi.



Port of Victoria.

### Project Details

Port Facility	Port of Orange
County	Orange
Project Status	Design Not Started
Project Category	 

### Project Description

South Childers Road is an unpaved gravel road that runs north-south along a thirteen-acre greenfield leading to the Port's dock slip on the Sabine River. Currently, road degradation from heavy use and rainfall requires repairs at least four times a year to accommodate traffic. Upgrading the road to asphalt paving will increase the reliability of Port access, allow safe passage of heavier cargo loads, and decrease traffic congestion. Stabilizing the greenfield, which is currently unusable during and after rain events, will provide additional lettable area and mitigate the runoff effects of heavy rainfall. This will reduce costly delays due to weather hazards and annual road maintenance.

### Funding & Support

	Total Cost	\$2,535,000
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### Need for Funding

Road improvement and greenfield stabilization are needed to ensure traffic safety and enable economic growth at the Port of Orange DRAVO Peninsula Industrial site. The proposed project will increase current operating capacity and provide reliable port access that will assist in retaining long-standing tenants and support growth of the Port with business development and new jobs.

### Project Support

- Port of Orange
- Orange County Economic Development Corporation
- Orange County
- Bludworth

### Project Benefits

#### Economic Impact

- Increased traffic and equipment transportation will increase current operating capacity
- Upgraded roads will attract new customers, such as a local chemical plant that has designated Orange County as one of two potential sites for an \$8 billion plant expansion
- Eliminates costly delays such as frequent maintenance and traffic congestion due to hazardous path conditions during and following rain events

#### Operational Impact

- Increased truck access to customers of the Port, expediting the transfer of cargo and equipment shipments
- Shorter transfer times will allow for an increase in transfers per day and decreased traffic congestion
- Facilitates development of the marine industrial site for vessel repairs and new vessel buildouts

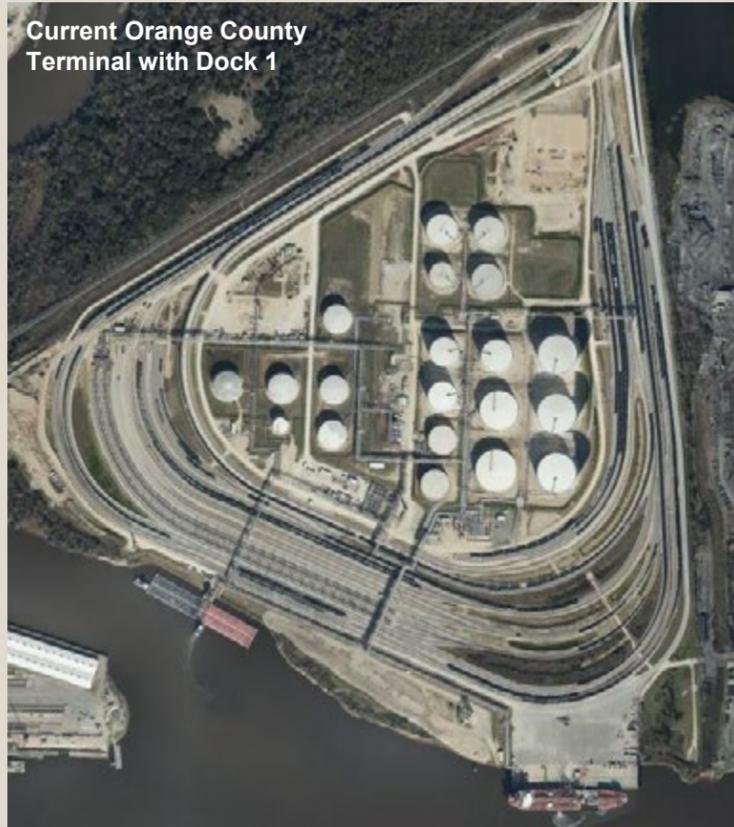


Proposed Project Area



Project Details	
Port Facility	Port of Beaumont
County	Jefferson
Project Status	Ready For Final Design
Project Category	 
Project Description	
<p>This project includes the creation of a new dock facility at the Port of Beaumont that will be capable of loading and unloading Suezmax vessels and will support foreign and domestic demand for crude and refined products. The new facility includes an approachway, access roads, and pipeline connectivity that will allow the Port to respond to growth in the crude oil and Ultra Low Sulphur Diesel (ULSD) market.</p>	

Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Capable of loading and unloading at a rate of 30,000 barrels/hr.</li> <li>Export products can be moved quickly from pipelines instead of train cars/trucks</li> <li>Annual estimated \$450 million increase in economic activity</li> <li>Docks would support movement of in-demand products including crude oil and ULSD</li> </ul>	
Safe and Secure Operations	
<ul style="list-style-type: none"> <li>Prevents the unintended release of hazardous materials by completing a pipeline-barge connection point</li> <li>Includes a control system to minimize oil spills at Port</li> <li>Allows for the multi-modal transfer of products from rail-to-ship, pipeline-to-ship, and ship-to-land</li> <li>Improves safety by transporting liquid fuel through a pipeline instead of truck or rail</li> </ul>	



Funding & Support	
 Total Cost	\$61,600,000
Need for Funding	
<p>For a project of this scale, state funding is needed. Due to the Port's continued increase in liquid bulk cargo volume, the expected approval of the TransCanada Keystone XL pipeline, and the additional \$450 million of improvements taking place across the Port of Beaumont, the need for increased efficiency and volume of energy product movement at the Port of Beaumont will be amplified.</p>	
Project Support	
<ul style="list-style-type: none"> <li>Port of Beaumont Board of Commissioners</li> <li>City, County &amp; Chamber of Commerce</li> <li>Local, State &amp; Federal Representatives</li> <li>Southeast Texas Economic Development Foundation</li> <li>Golden Triangle Business Roundtable</li> <li>Energy Texas</li> </ul>	

Project Details	
Port Facility	Port of Beaumont
County	Jefferson
Project Status	Design Phase
Project Category	
Project Description	
<p>This project will include the hard surfacing of thirty-seven acres that will serve 100,000+ dump trucks currently causing significant traffic on adjacent public roads. The paving material will be roller compacted concrete, which has a higher bearing load and longer lifespan than asphalt. The project area will be fenced and gated and will have a new drainage system to facilitate the movement of stormwater out of high-traffic areas, making this area usable during and after storm events.</p>	

Funding & Support	
 Total Cost	\$9,000,000
Need for Funding	
<p>This project is a continuation of the 2014 Port of Beaumont Master Plan to alleviate inter-city dump truck traffic congestion, by paving an underutilized area adjacent to the Port. The proposed specialized paving will address the heavy truck traffic that occurs on City streets outside the Port of Beaumont terminal affecting public commutes to schools, work, etc. This project is also expected to bolster the relationship between the Port and the public.</p>	
Project Support	
<ul style="list-style-type: none"> <li>Port of Beaumont Board of Commissioners</li> <li>Local, State &amp; Federal Representatives</li> <li>County and City officials</li> </ul>	

Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Increases production/cargo growth by approximately 10% or 650,000 tons/year</li> <li>Alleviates heavy and problematic dump truck traffic on City streets</li> <li>Reduces truck idling time and increases cargo movement volume</li> </ul>	
Operational Impact	
<ul style="list-style-type: none"> <li>Provides direct access to Port facilities for trucks entering the Port gate</li> <li>Minimizes congestion on adjacent City roads by removing dump trucks and heavy haul tractor trailer traffic</li> <li>Provides a second intermodal cargo exchange and staging yard</li> </ul>	





### Project Details

Port Facility	Port of Beaumont
County	Jefferson
Project Status	90% Complete Design
Project Category	

### Project Description

This project will replace the existing, aged railroad puzzle switch with a custom puzzle switch. The new puzzle switch will have the possibility of setting four routes, allowing the Port to move a high volume of cars within a compact space. This new puzzle switch will also increase the reliability of the rail switch to ensure maximum cargo handling for the Port by rail.

### Funding & Support

Total Cost	\$1,462,600
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### Need for Funding

This project will replace an aged, unreliable puzzle switch with a custom switch with optimized efficiency. The condition of the current puzzle switch impedes operations and is a safety hazard for cargo movements within this area of the Port. The engineering and permitting for this project are nearly complete, and this switch could be installed within a short amount of time.

### Project Support

- Port of Beaumont Board of Commissioners
- Kansas City Southern
- Burlington Northern Santa Fe
- Union Pacific
- Southeast Texas Regional Planning Committee
- Louis Dreyfus Company

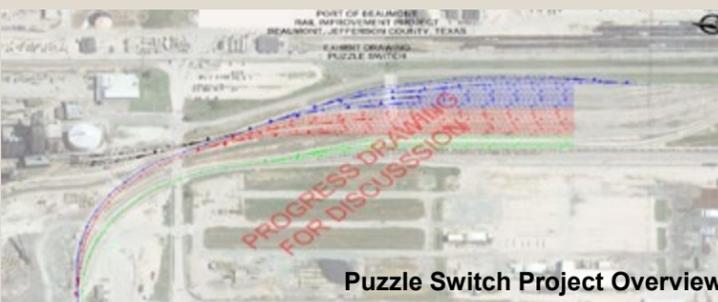
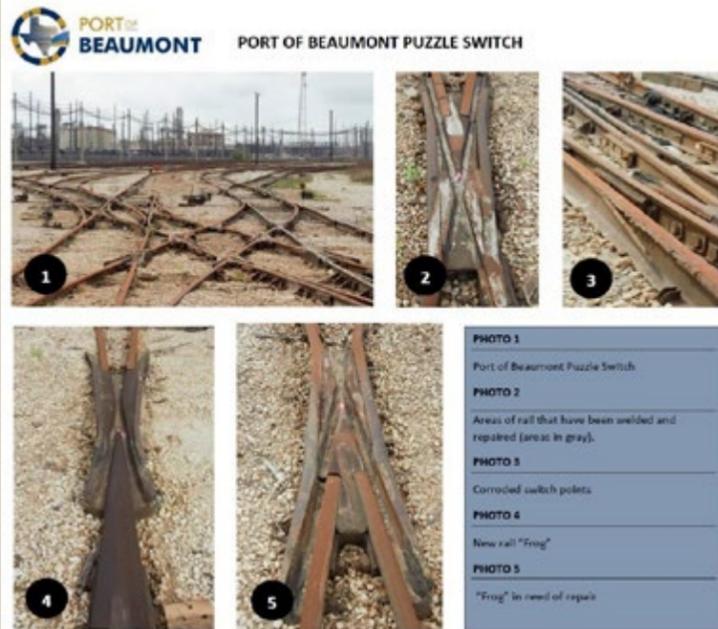
### Project Benefits

#### Operational Impact

- Improves efficiency and operability of cargo movements due to an improved switch design
- Ensures that reliable cargo movement of two unit trains can continue
- Saves the Port an estimated \$15,000 annually in switch maintenance costs

#### Safe and Secure Operations

- Replaces the current deteriorating puzzle switch that has lower structural integrity and bearing load than recommended
- Decreases the possibility for derailments, which are currently very common
- Increases the safety for rail cargo handlers, who will be able to handle two unit trains simultaneously



### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	

### Project Description

This project includes the addition of a subsurface, sheetpile retaining wall to provide stability for the berth and docking system for Berths 3, 4, and 5. The wall will measure 2,000 linear feet long and will be driven below the mudline to 48 feet in depth. The berth depth will match the proposed improvement of the adjacent Sabine-Neches Waterway to -48 feet that is currently underway. This project also involves the removal and replacement of the existing fendering system with added mooring bollards to accommodate breasting lines.

### Funding & Support

Total Cost	\$29,331,000
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### Need for Funding

The Sabine-Neches Waterway is currently being deepened to -48 feet; however, Berths 3, 4, and 5 can only accommodate vessels having up to 40-foot drafts. To enhance productivity and safety during berthing operations, it is essential to match the berth depths to the channel depths. Under current conditions, vessels that serve the Port of Port Arthur are required to light load, which significantly reduces the efficiencies and the earning power of these movements.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at large

### Project Benefits

#### Economic Impact

- Allows for increased vessel size and loading, increasing job sustainability and competitiveness for Texas
- Attracts customers to the area based on fully-loaded vessel handling
- Increases activity and cargo volume for various exports, such as wood pellets and diesel

#### Operational Impact

- Improves efficiency by allowing larger and fully-loaded vessels to use berths
- Reduces congestion with fewer vessels and enhances waterway traffic management
- Allows the third largest Port nationally for cargo handled at this location to operate more efficiently



Project Details	
Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	
Project Description	
<p>This project includes the addition of a subsurface, sheetpile retaining wall to provide stability for the berth and docking system for Berths 1 and 2. The wall will measure 2,000 linear feet long and will be driven below the mudline to 48 feet in depth. The berth depth will match the proposed improvement of the adjacent Sabine-Neches Waterway to -48 feet that is currently underway. This project also involves the removal and replacement of the existing fendering system with added mooring bollards to accommodate breasting lines.</p>	

Funding & Support	
Total Cost	\$21,680,000
Need for Funding	
<p>The Sabine-Neches Waterway is currently being deepened to 48 ft, however Berths 1 and 2 can only accommodate vessels having up to 40-foot drafts. To enhance productivity and safety during berthing operations, it is essential to match the berth depths to the channel depths. Under current conditions, vessels that serve the Port of Port Arthur are required to light load, which significantly reduces the efficiencies and the earning power of these movements.</p>	
Project Support	
<ul style="list-style-type: none"> <li>Board of Trustees of Port of Port Arthur</li> <li>City, County &amp; Chamber of Commerce</li> <li>State &amp; Federal Representatives</li> <li>Industries and Port Stakeholders at Large</li> </ul>	

Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Allows for increased vessel size and loading, increasing job sustainability and competitiveness for Texas</li> <li>Attracts customers to the area based on fully-loaded vessel handling</li> <li>Increases activity and cargo volume for various exports, such as wood pellets and diesel</li> </ul>	
Operational Impact	
<ul style="list-style-type: none"> <li>Improves efficiency by allowing larger and fully-loaded vessels to use berths</li> <li>Reduces congestion with fewer vessels and enhances waterway traffic management</li> <li>Allows the third largest Port nationally for cargo handled at this location to operate more efficiently</li> </ul>	



Project Details	
Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	
Project Description	
<p>This project will extend Denbo Avenue under or over the railroad intersection, so that public and Port traffic can continue without stopping at the intersection. This will decrease points of conflicts between trucks and trains and also give direct access to this portion of the Port. The improved access will aid in the development of the adjacent area, and expand the Port's footprint.</p>	

Funding & Support		
	Total Cost	\$15,000,000
Need for Funding		
<p>The Port of Port Arthur seeks to enhance the efficiency and value of its intermodal operations at the Class 1 railroad with a flyover to Denbo Avenue. This would decrease points of conflicts between trucks and trains and promote the development of land adjacent to the railyard for Port use. This proposed area requires City-funded maintenance because of the illegal dumping of tires and other large trash items.</p>		
Project Support		
<ul style="list-style-type: none"> <li>Construction Committee for the Board of Commissioners of the Port of Port Arthur</li> <li>City of Port Arthur</li> <li>Kansas City Southern Railroad</li> </ul>		

Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Improves safety by removing potential conflicts between trains and road traffic</li> <li>Provides access to an underutilized area the Port wants to develop for growth</li> <li>Allows for quick and reliable access from Denbo Avenue to the Port for cargo traffic, increasing cargo volumes</li> <li>Can create jobs and increase revenue with the potential for accessible, future development</li> <li>Encourages new customers to join Port, helping the Port to diversify</li> </ul>	
Enhances Connectivity	
<ul style="list-style-type: none"> <li>Removes conflict of rail and road, improving safety</li> <li>Improves efficiency of traffic along Denbo to the Port without the rail interruption</li> <li>Reduces response times for emergency services in case of accidents</li> </ul>	



### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	

### Project Description

This project will stabilize a former railroad lay down area, adding 19 acres of usable space for the Port. Currently, the Port struggles with limited multifunctional space, and this project will assist with this need as the Port continues to rapidly grow. The project will include adding pavement for a cargo staging and queuing area, located close to Berth 1. The project will also include lighting and cameras for improved cargo security.

### Funding & Support

Total Cost	\$11,159,000
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### Need for Funding

State funding is needed to help the Port meet both current and future cargo demands for clients. The Port of Port Arthur currently has a limited amount of multiuse area that can be used to handle and store various type of cargo. Local refiners and export terminals import a considerable volume of project cargo to support an estimated \$50 billion in expansions for Southeast Texas. Most of the project cargo by the ton is expected to move through the Port over the next 10 years. The project promotes economic gain for the State by supporting Texas exports and streamlines import commodities to Texas and U.S. markets.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

### Project Benefits

#### Economic Impact

- Allows more cargo to be stored in transit for Berth 1 and landside rail/truck docks, allowing the Port to handle more cargo
- Increases revenue and creates jobs for the Port
- Supports the following cargoes:
  - Military cargo
  - Construction material
  - Energy project cargo
- Makes the Port more attractive to existing and potential customers

#### Operational Impact

- Increases truck loading options, leading to improvements in efficiency and cargo handling volumes
- Allows for Port to have additional room for sorting, slotting and sequencing to optimize vessel loading
- Extends the usage of the area by paving it, allowing to be used by the Port despite any wet weather



Proposed Project Plan

### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	

### Project Description

This project will reconstruct Warehouse 1 and enhance the mobility within. The project will provide increased storage density and covered areas for loading/unloading truck or rail cargo. This project increases cargo capacity and reduces dwell time for trucks by adding all-weather access.

### Funding & Support

Total Cost	\$10,225,000
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### Need for Funding

State funding is needed to help the Port improve the storage of cargo moving through the Port. Jefferson County, one of the wettest counties in the state, frequently has rainfall that causes shut downs both before and after the storm event. Warehouse 1 is currently dilapidated and has interior columns and low rack heights which provides operational changes inside the warehouse. This project includes the construction of a clear span facility which will allow for trucks and rail loading/unloading to be covered. This construction will enable the Port to operate in all weather conditions and will protect against revenue losses incurred by weather delays. Improvements within the warehouse will allow the cargo to be stored and moved more efficiently.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

### Project Benefits

#### Economic Impact

- Increases cargo volume that can be stored in transit served by Berth 1
- Enables the Port to operate during inclement weather, decreasing the downtime of the Port
- Provides a 40% increase in storage efficiency by constructing a clear span facility
- Provides a 25% increase in truck loading efficiency, allowing more cargo to move and generating more revenue

#### Operational Impact

- Adds 20,000 square feet of storage space to Warehouse 1
- Allows for additional cargo to be moved and stored, removing the possibility of weather delays
- Expands the range of cargo though the construction of higher clearance heights in the warehouse and removal of internal columns



Proposed Project Plan

### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	

### Project Description

This project will enhance port connectivity and rail accessibility at the Port of Port Arthur by constructing approximately 15,000 feet of railroad track over four lines, parallel to the existing alignment. This project will allow loading and unloading of rail cargo to be done in bulk trains versus car by car, a significant operational improvement.

### Funding & Support

Total Cost	\$7,210,282
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### Need for Funding

State funding is needed to help improve Port connectivity and rail accessibility. The railyard is currently limited by the existing space, and operates at approximately 75% capacity during peak times. These additional lines would allow the trains to be bulk handled directly onto trucks or barges. This handling keeps the trains from being pulled apart and put back together, a process that is time consuming, logistically complex, and occasionally unsafe.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

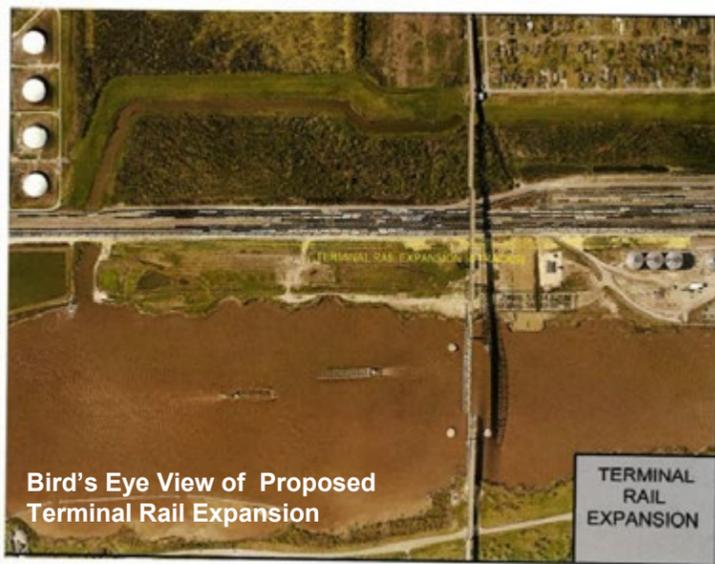
### Project Benefits

#### Enhances Connectivity

- Provides significant operational improvement through rail connectivity options
- Improves loading techniques by requiring double handling
- Benefits larger cargo that Port typically services, including:
  - Military cargo
  - Wind energy cargo
  - Other large-scale items

#### Safe and Secure Operations

- Reduces the physical handling of railcars from Port personnel, increasing safety
- Eliminates multiple hazards that result from moving railcars, by reducing breaking trains
- Reduces the potential for truck-to-rail accidents
- Reduces delays at residential and commercial crossings



Bird's Eye View of Proposed Terminal Rail Expansion

TERMINAL RAIL EXPANSION

### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Near Shovel Ready
Project Category	

### Project Description

Berth 5 is currently being constructed by this Port. This project adds pavement to allow better operational access to cargo and support the Berth 5 investment. This pavement will optimize the berth usage, allowing for more cargo volume to be moved around the berth. The addition of this pavement will also enhance the safety of personnel when handling steel in a purpose-built area.

### Funding & Support

Total Cost	\$3,010,000
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### Need for Funding

State funding is needed to help the Port improve their cargo storage. In order to support a \$40 million berth expansion project currently nearing completion, the Port of Port Arthur needs to improve the adjacent cargo storage area to better serve Berth 5. This project provides enhanced surface connectivity, operational efficiency, and port development. Improving the project site supports Texas exports and streamlines import commodities to Texas and U.S. markets.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

### Project Benefits

#### Economic Impact

- Supports a \$40 million berth expansion, currently underway
- Adds sustainability and cargo diversity to Port
- Increases area for the Port to store cargo by paving the area behind Berth 5
- Enhances utilization and allows more goods to be moved
- Allows area to be used during wet weather events, reducing downtime
- Increases Port revenue and creates jobs

#### Operational Impact

- Creates an open laydown area that minimizes traffic congestion for trucks
- Allows cargo access to high and wide trucks
- Increases cargo handling and allows for more cargo diversity
- Creates the Port's only true open laydown area adjacent to a deep draft dock



Proposed Berth 5 Backlands Project

BERTH 5 BACKLANDS

### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Not Started
Project Category	 

### Project Description

This project will create a new laydown yard and queuing area in what is currently a vehicle maintenance shed. The current location is partially paved, and this project will fully pave the area, allowing for use in all weather conditions. This project will also extend an existing rail within the loading area.

### Funding & Support

 Total Cost	\$2,415,000
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### Need for Funding

State funding is needed for the Port to promote multiple connectivity nodes that provide enhanced surface connectivity and operational connectivity, and create opportunity for additional Port development. This project reduces the number of nodal conflicts on roadways and railroad in the port area and local area. This project also:

- Provides an increased measure of separation between motorists, pedestrian, and cargo traffic.
- Creates a multiuse area less than 800 feet from Berth 1.
- Adds cargo staging in an area where facilities handle a variety of railcars transloading to/from center beam, tanker, bulk, hopper and gondola cars.
- Creates a new staging area that allows for truck queuing.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

### Project Benefits

#### Operational Impact

- Improves the flow of cargo and trucks in and out of the Port
- Reduces truck congestion and truck idling
- Promotes efficient cargo handling
- Allows trucks to load directly onto rail from both sides, ideal for specialty cargo
- Allows for a forklift to load and unload cargo on concrete

#### Enhances Connectivity

- Enhances freight connectivity for marine-rail-truck cargo
- Allows more efficient movement of cargo, including cargo that is difficult to move
- Increases storage lane for 18-wheeler commercial vehicles off of existing road infrastructure
- Reduces modal conflicts



Proposed Multimodal Queuing Area

### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Design Phase
Project Category	

### Project Description

This project will resurface the staging area near the Port of Port Arthur's Command Center. The area would also be expanded to a total area of approximately 1.5 acres, which would provide more utility space for the Port. This project area is critical to the Port because of its proximity to the Command Center. Increasing the size and durability will aid with Port operations.

### Funding & Support

 Total Cost	\$1,500,000
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### Need for Funding

State funding is needed to help improve and expand the surface of this critical area within the Port. This area has many functions for the Port, including providing port security to stage truck drivers and trailer storage, and providing storage for certain cargoes of a sensitive nature that require segregation. This area within the Port services sensitive military cargoes and this cargo is usually moved in trucks, typically in groups of 10-12. The process for unloading this cargo halts the traffic to this area, restricting customers to enter the area during its use. This often results in traffic gridlock within the Port until the entire shipment is ready to be moved to the next destination. Expanding the limits of the staging area will also improve safety by providing more space for vehicle storage and increasing distance between vehicle traffic and Port personnel.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

### Project Benefits

#### Economic Impact

- Increases the loading and unloading rate for trucks and trailers, allowing more cargo to move through the area
- Prevents gridlock when servicing long trains of cargo for continuous operation
- Adds sustainable longshore labor jobs
- Expands the diversity of the Port

#### Operational Impact

- Increases the storage capacity for the Port for specialty goods requiring secure storage
- Expands secure truck loading options
- Reduces traffic congestion by utilizing part of the longshore lot for parking
- Allows goods to move more efficiently and more securely with paved area
- Raises productivity and efficiency
- Limits congestion caused by trucks requiring escorts through the Port



Proposed Staging Area

### Project Details

Port Facility	Port of Port Arthur
County	Jefferson
Project Status	Near Shovel Ready
Project Category	

### Project Description

This project will pave a currently underutilized area that can be used for additional storage for cargo and truck queuing. The area is currently partially paved and partially vegetated. The Port of Port Arthur would like to provide additional area for truck drivers to safely drop and hook trailers, increasing the amount of available storage and expanding usage options by increasing the area.

### Funding & Support

Total Cost	\$828,000
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### Need for Funding

State funding is needed to help the Port improve the efficiency and operations of cargo deliveries. To do this, the Port of Port Arthur wants to expand and stabilize the area located at the end of Lakeshore Drive. The tenant next to this proposed area is a large commercial shrimp yard that provides 95% of the County shrimp and 20% of the State shrimp. The land is owned by the Port and rented by the shrimp business owner. Improvements to this area would also allow the shrimpers to expand their already booming business.

### Project Support

- Board of Trustees of Port of Port Arthur
- City, County & Chamber of Commerce
- State & Federal Representatives
- Industries and Port Stakeholders at Large

### Project Benefits

#### Economic Impact

- Supports additional truck cargo moving in and out of the Port
- Increases efficiency for customers
- Increases Port revenue
- Allows for movement of more goods, leads to more jobs
- Expands the use of trailer shuttling to mitigate dwell time by drivers

#### Operational Impact

- Reduces truck idling and congestion at the Port
- Increases safety for motor carriers by increasing distances
- Allows for more trucks to service the Port and increases the space between trucks and cargo
- Increases the efficiency of loading and unloading by allowing for cargo to be segregated by type
- Expands the volume of truck cargo
- Reduces in-Port congestion by giving trucks a queuing area to keep the trucks off of the road
- Supports local shrimpers' ability to increase operations because of the increasing demand



Proposed Truck and Trailer Cargo Queuing Area Project

### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	Design Not Started
Project Category	

### Project Description

This project proposes to fill outdated ship slips between the Port of Galveston's Piers 38-39 and Piers 39-40, effectively repairing damaged and decaying infrastructure not currently being utilized. The scope of work includes dredging, constructing two fill-retaining structures, placement of fill, improving storm sewers, installing flexible pavement, and replacing the deteriorated bulkhead at Piers 39-40.

### Funding & Support

Total Cost	\$60,704,452
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### Need for Funding

State funding is needed to create additional uplands in the West End area of the Port. The uplands would support growing break bulk and Ro/Ro cargo operations. The uplands will be created by placing fill material behind the bulkhead. The balance of this project includes dredging of the slip to create a solid foundation for fill material, demolition of the deteriorated wharf structure, hydraulic placement of fill material, and installation of wick drains to accelerate consolidation of sediment.

### Project Support

- Board of Trustees of the Galveston Wharves
- City of Galveston
- Stakeholders within Port complex

### Project Benefits

#### Economic Impact

- Consolidates cargo to West End area and reduces congestion of other traffic
- Reduces cargo movement, which reduces costs
- Generates 239 jobs, including 81 direct jobs, 112 induced jobs, and 45 indirect jobs
- Estimated \$20.7 million total income/consumption impact
- Estimated \$9.3 million total for local businesses to receive as a result of sales revenue
- Results in a total of \$1.6 million of direct induced and indirect state and local revenue to be generated annually throughout the State

#### Operational Impact

- Increases laydown capacity to 15 acres
- Relieves congestion on roads through professional management of the corridor
- Reduces emissions
- Mitigates congestion by reducing idle time
- Reduces truck travel time, allowing for more cargo movement



Proposed Project Plan



Proposed Project Plan

### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	Design Not Started
Project Category	 

### Project Description

This project will begin the initial work for an island-wide roadway infrastructure improvement to prepare for future development of the island. Phase 1 of this project includes developing an LNG terminal and an automobile processing Ro/Ro facility, improving the existing Pelican Island Causeway (including the addition of a bicycle path), developing a new truck road and rail bridge with access to I-45, and beginning initial design work of the interior roadway system.

### Funding & Support

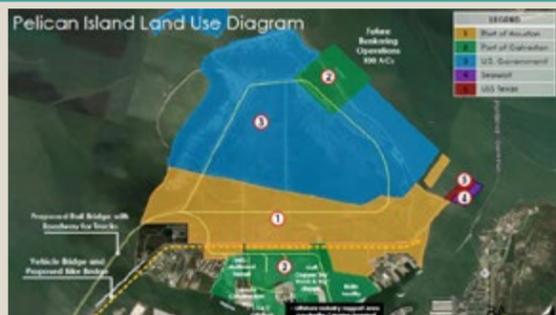
 Total Cost	\$51,200,000
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### Need for Funding

State funding is needed to improve the infrastructure to and within Pelican Island, to prepare for future island development. This project is the first of three phases and is part of the Port of Galveston's 20-year Strategic Master Plan. The project supports the Board's Master Plan objective of promoting development and growth of the Port of Galveston. The project is being completed in conjunction with other project partners. The portion of the project specific to Galveston includes developing an automobile processing Ro/Ro facility and berth.

### Project Support

- Board of Trustees of the Galveston Wharves
- City of Galveston
- Stakeholders within Port complex



### Project Benefits

#### Economic Impact

- Provides infrastructure to aid industrial and cargo expansion
- Increases automobile (Ro/Ro) imports/exports by 26% through 2035 after the construction of an automobile processing Ro/Ro facility
- Leads to the diversification of products by attracting other industries
- Generates the following according to the terminal and processing facility in the full Strategic Plan:
  - 1,023 jobs (407 direct)
  - \$104.8 million in personal income and consumption
  - \$152.7 million in revenue to local businesses
  - \$7.9 million of state and local taxes annually
- Supports the change in fleet characteristics through the development of LNG infrastructure
- Optimizes projected revenue growth

#### Enhances Connectivity

- Extends the Port of Galveston's capacity to ship around the world
- Enables direct access to Galveston Railway and then on to other rail networks through the construction of a rail bridge across West Bay
- Reduces truck traffic and truck idling time on the causeway through the construction of a dedicated channel crossing for truck-based shipping



### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	Shovel Ready
Project Category	

### Project Description

The Port of Galveston is seeking to optimize and expand its existing cruise business. In order to expand, the Port must improve its insufficient infrastructure and facilities to provide for operational efficiency and enhance the cruise experience for passengers. This project is important because of the increasing sizes of cruise ships and the trend of increasing numbers of cruise passengers.

### Funding & Support

 Total Cost	\$29,150,000
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### Need for Funding

A new cruise terminal parking structure is needed for cruise Terminals 1 and 2 to accommodate an increase in cruise line passengers. This project would construct a parking garage at Pier 25 to serve both Terminals 1 and 2. This garage could be split into multiple phases, as needed. Constructing the garage would require the modification of cruise terminals to create the space for the garage. In the future, this project may be expanded to include a parking garage for proposed Terminal 3.

### Project Support

- Board of Trustees of the Galveston Wharves
- City of Galveston
- Stakeholders within Port complex

### Project Benefits

#### Economic Impact

- Provides an additional 3,000 parking spaces for cruise passengers, a significant source of revenue for the Port
- Prepares for increases in cruise passengers, estimated to be 5 million annually by 2038
- Enhances the dynamic environment of Downtown Galveston by promoting and complementing existing retail, dining, entertainment, accommodation, and meeting venues; increasing revenue and opportunity for Galveston businesses

#### Safe and Secure Operations

- Reduces traffic volume of cars and shuttles on the roadway, enhancing safety of cruise passengers and the public
- Increased effectiveness of lighting with fewer dark and potentially dangerous areas
- Increased visibility of signage and wayfinding capability
- Reduced operational costs associated with signing and lighting
- Increased handicap accessibility with vehicles close to stair and elevator cores having a direct path to key movement patterns of the facility
- Avoidance of carbon monoxide build-up when air flow is adequately designed for through mechanical and/or natural ventilation



### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	Planning and Design Phase
Project Category	

### Project Description

This project would improve the ground parking areas around the proposed Terminal 3, as well as the ability of the wharf to support larger, more modern cruise ships, specifically the Royal Caribbean "Oasis Class" vessels. The proposed Terminal 3 will be located on Pier 10. The wharf on Pier 10 was originally designed in the 1970s to berth container ships and is not adequate to berth modern cruise ships. Improvements/rehabilitation of the existing structure are proposed, as well as the installation of 15 berthing and 6 mooring dolphins. Adjacent wharf structures built in the 1940s must also be rehabilitated.

The project also includes a planned 2,000-space ground parking area that will be designed with shuttle stations, access roads, and designated pedestrian walkways. This area is intended to be flexible enough to be used for alternative revenue activities when not being used for parking. This project is specifically for the utility improvements, and the remaining project components will be funded by Royal Caribbean.

### Funding & Support

 Total Cost	\$14,000,000
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### Need for Funding

State funding is needed to improve Terminal 3 to provide access for larger cruise vessels, expected to call on this Terminal. Parking area and wharf improvements at Terminal 3 would provide 10-acres of land that can be developed by Royal Caribbean Cruise Lines into a terminal. This terminal is intended to support both Oasis Class cruise ships and the planned LNG-powered Icon Class cruise ships. This project will enable the Port of Galveston to take advantage of that growth, which would be expected to bring economic growth to the area.

### Project Support

- Board of Trustees of the Galveston Wharves
- Royal Caribbean
- Stakeholders within Port complex

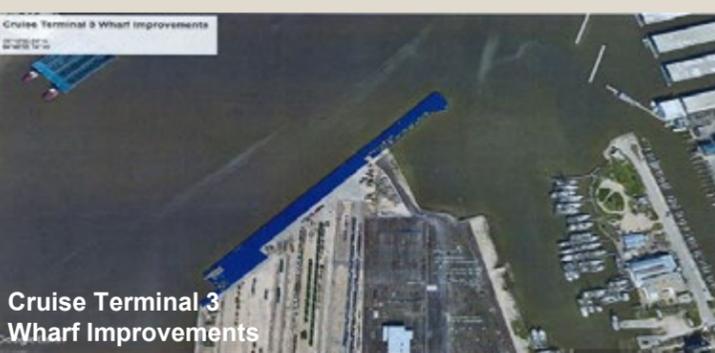
### Project Benefits

#### Economic Benefits

- Cruise industry in Galveston generated \$1.5 billion and 26,000 jobs in Texas in 2018, and this revenue is expected to significantly increase
- Increases in vessel capacity to support more cruise passengers with expected growth over the next 5 years
- Increased revenue through multipurpose parking garage

#### Enhances Connectivity

- Improved throughput of passengers embarking and disembarking from cruise ships
- Improved ground transportation access to cruise terminal
- Alternative traffic plans being studied to help alleviate traffic off Harborside Drive
- Shuttle stations to be built throughout parking lot to lessen traffic from around the island



### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	In Procurement
Project Category	 

### Project Description

The project includes the development of Old Port Industrial Road, an internal road within the Port. This project will be completed in sections, and supports the Port's growing cruise and cargo sectors. The improvements will remove thousands of cars, trucks, and buses from Harborside Drive each year by giving them internal road access to the Port.

### Funding & Support

 Total Cost	\$14,000,000
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### Need for Funding

State funding is needed to improve Old Port Industrial Road, a critical road for Port access. The first phase of this road improvement (between 28<sup>th</sup> and 33<sup>rd</sup> Streets) began in 2019 and was funded equally by the Port and the Texas Department of Transportation. This funding request is for the second phase of the road improvements, which includes the addition of a 40<sup>th</sup> Street gate. This project also includes adding security fencing; raising, paving, widening the road to three lanes; and adding a bike path alongside the roadway. This improvement will allow additional traffic (cruise passenger and commercial supply trucks) into the Port.

### Project Support

- Board of Trustees of the Galveston Wharves
- City of Galveston
- Stakeholders within Port complex

### Project Benefits

#### Operational Impact

- Improves the efficiency of traffic moving into the Port by adding an additional entrance from Harborside Drive to Old Port Industrial Road
- Re-routes large trucks supplying cruise ships from Harborside Drive to Port interior for faster access and deliveries with less congestion
- 40th Street gate relocated to demarcate the new Old Port Industrial Road and include truck scale for more efficient processing
- Consolidates two cargo lots for more versatility and improved internal handling

#### Enhances Connectivity

- Creates sustainable, viable, and more accessible alternative routes for truckers and cruise passengers
- Provides a more direct path to Port facilities for larger vehicles carrying cargo
- Greater connectivity between the Port and Texas highway system
- Increases access to the Texas highway system for non-Port traffic



### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	Near the End of Design Phase
Project Category	

### Project Description

This project will improve the existing elevated walkway between the SMP Garage and Cruise Terminal One for use by the public and more than 1 million anticipated annual cruise passengers. This project scope of work includes installing air conditioning, two elevators, and two escalators, as well as structural repairs, and pedestrian improvements at both ends of the walkway. The project will reduce traffic on Harborside Drive, encourage visits to the restaurants at the waterfront and Galveston's historic downtown, secure ADA compliance, and will provide safer travel for pedestrians by moving the foot traffic from Harborside Drive up to the overhead walkway.

### Funding & Support

 Total Cost	\$2,724,574
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### Need for Funding

The walkway is already in existence and approximately 90 percent of the architectural and engineering design has been completed for the structural and interior improvements. However, funding is still needed to install elevators, escalators, air conditioning, and pedestrian improvements at both ends of the walkway that will allow reopening of the elevated walkway to the public. Opening the walkway to the public after installing the improvements will not only help the Port continue its vision of accessibility, but will process passengers more expeditiously, conveniently, and safely. In addition, it encourages pedestrians to visit the nearby local historical districts, potentially increasing revenue for both the Port and City of Galveston.

### Project Support

- Board of Trustees of the Galveston Wharves
- City of Galveston
- Stakeholders within Port complex

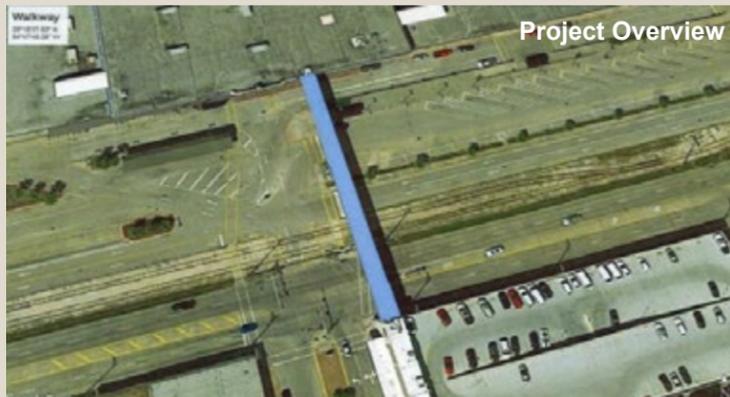
### Project Benefits

#### Economic Impact

- Enhances local economy's sustainability by reviving a vital artery between divided areas of the downtown sector
- Reduces delays, improving system performance and throughput
- Increases the efficiency of moving people, goods, and services on and off ships
- Attracts more cruise customers with the ease of boarding and off boarding

#### Operational Impact

- Continues the Port's vision of accessibility by integrating advanced technologies and improvements into transportation system management and operations
- Platform digital displays communicate real time transportation information, improving mobility and reducing congestion
- Reduces potential traffic-related incidents occurring between motorists and the pedestrians
- Eliminates congestion of pedestrians attempting to cross Harborside



### Project Details

Port Facility	Port of Galveston
County	Galveston
Project Status	Planning and Scoping
Project Category	

### Project Description

The scope of this project includes redeveloping signage within the Port to help alleviate traffic impacts from the Port of Galveston's future growth plans. Wayfinding is needed to aid motorists and pedestrians, particularly visitors to the cruise terminal who may not be familiar with the area. The current wayfinding scheme is non-standard and has proven ineffective over time. Preliminary review will also identify existing signage for opportunities to consolidate signs. The resulting wayfinding system would plan for cohesion, legibility from a distance, and attractiveness. Integration with local architectural themes is intended.

### Funding & Support

 Total Cost	\$1,600,000
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### Need for Funding

State funding is needed to complete this ambitious terminal and industrial expansion plan which will invite more people and traffic to the Port exacerbating problems with the existing wayfinding scheme. A concise, legible, and non-intimidating wayfinding system will improve driver and pedestrian safety. The wayfinding project will help restore efficiency in movement across the Port.

### Project Support

- Board of Trustees of the Galveston Wharves
- City of Galveston
- Stakeholders within Port complex

### Project Benefits

#### Safe and Secure Operations

- Improves driver and pedestrian safety by improving wayfinding system
- Improves traffic flow in and out of the Port
- Alleviates traffic through residential areas surrounding the Port, carrying benefits of safety improvements to residential areas

#### Other Benefits

- Enhances tourism and the Port's brand through providing cohesive wayfinding system to the visitor experience
- Improves ease of access to and from the mainland through coordination with TxDOT signage at I-45
- Benefits tenants, tourists, residents, and cruise passengers



Wayfinding Upgrades

### Project Details

Port Facility	Port Freeport
County	Brazoria
Project Status	Shovel Ready
Project Category	

### Project Description

Congress authorized this project in the Water Resources Reform and Development Act of 2014 (WRRDA 2014) to widen the main channel and deepen it from the 45-foot existing channel depth down to 55 feet. This will accommodate Post-Panamax container vessels and Post-Panamax tankers.

### Funding & Support

	Total Cost	\$324,590,000
	Federal Cost Share	\$194,590,000
	Local Cost Share	\$130,000,000

### Need for Funding

The federal cost share for this project is 60% and the Port will need to match the other 40%. State funding is needed to complete the remaining reaches for timely completion of the Freeport Harbor Channel project. The additional depth will allow larger vessels to navigate the channel, leading to an increase in cargo volume entering the port. Thousands of direct and indirect jobs and millions of dollars in additional revenue will be created in the area as a result of the finished channel expansion.

### Project Support

- Port Freeport Commission
- U.S. Army Corps of Engineers approved
- Congressional approval through WRRDA 2014

### Project Benefits

#### Economic Impact

- Benefit-cost ratio of 1.53
- \$13.9 million net benefits through transportation cost reduction
- Could add 15,000-30,000 distribution and industrial jobs within the SH 36A corridor, with 2/3 of these in Freeport
- \$800 million increase in annual income and sales tax revenues
- Major commodities impacted by this project are:
  - Crude oil, petroleum, and chemical products
  - Containerized goods like consumer products
  - Offshore service and exploration vessel

#### Operational Impact

- Will accommodate larger Panamax class vessels
- Improved safety for all vessels at berth or in transit
- Accommodates larger vessels and supports more efficient vessel movements

The Freeport Harbor Channel is authorized to be deepened to depths ranging from 51-56 feet



### Project Details

Port Facility	Port Freeport
County	Brazoria
Project Status	Design Phase
Project Category	

### Project Description

Port Freeport is currently constructing a multi-modal rail facility on Parcel 14. This project will include the stabilization of approximately 180 acres of property on this site as needed. The project will also establish warehousing for resin packaging and cross-dock operations like CES customs exams and cargo transfers. Lastly this project includes the second phase of the rail development, which has already begun.

### Funding & Support

	Total Cost	\$55,700,000
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### Need for Funding

Funding this project would promote major growth for manifest rail moves and Ro/Ro cargo of all types. This project includes the construction of a multi-modal facility to accommodate this growth in phases. Currently, 21,000 feet of track are already under construction at Parcel 4. Funding is needed to add four 5,000-foot loading track lines which will primarily be utilized to move aggregate, resin, and Ro/Ro cargo.

### Project Support

- Port Freeport Commission
- Energy and petrochemical industry



### Project Benefits

#### Economic Impact

- Economic Impact Statement calculates \$180 million in total economic benefits
- Additional 80 acres for Ro/Ro cargo expected to support 120 new jobs producing an annual payroll of approximately \$3.75 million per year
- Facility will have capacity to process 72,000 vehicle equivalent units/year, generating more than \$2 million annually in fees, local purchases, and taxes

#### Operational Impact

- Stabilization of Parcel 14 would help the Port manage the growth of its Ro/Ro, plastics, and heavy machinery businesses by providing storage and operational capacity for rail operations and loading and unloading of auto, resin, and manifest unit trains
- Project would support future multimodal movement of:
  - Ro/Ro cargo, like autos and construction equipment
  - Project and heavy lift cargo, like cranes
  - Conventional breakbulk and containers
  - Plastic resin

Ongoing construction of the 15,000 feet of new rail serving the multimodal industrial park



Feeder rail connecting to Parcel 14 under construction

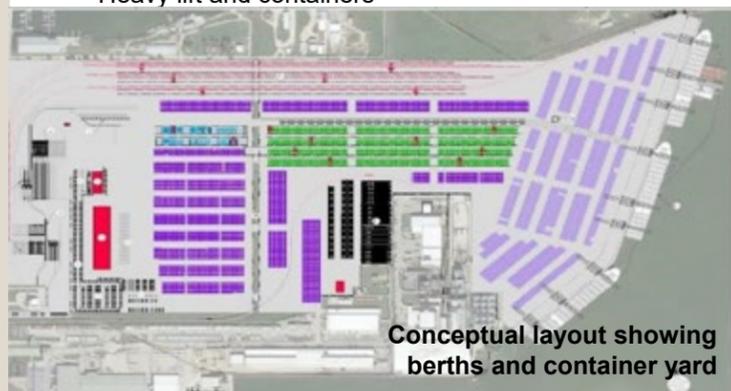


Project Details	
Port Facility	Port Freeport
County	Brazoria
Project Status	Shovel Ready
Project Category	
Project Description	
<p>This project will expand the Velasco Terminal to support growth of the container and Ro/Ro cargo. This project includes the construction of three berths which will add 1,600 feet of berth and a Ro/Ro ramp at the port facilities. The terminal will be equipped with five new cranes. Additionally, the project will stabilize the remaining nearby staging area.</p>	

Funding & Support	
Total Cost	\$45,000,000
Need for Funding	
<p>Port Freeport is the second largest container handling port in Texas. State funding would support the construction of the Velasco Terminal project, which is being built in phases. The Port will construct berths 8, 9, and 10 to provide additional container and Ro/Ro dock space. Also, the Port aims to purchase five state-of-the-art Post-Panamax container cranes and stabilize all backlands.</p>	
Project Support	
<ul style="list-style-type: none"> <li>Port Freeport Commission</li> <li>Energy industry and area petrochemical resin producers</li> <li>Included in the Port's 5-year capital plan</li> </ul>	



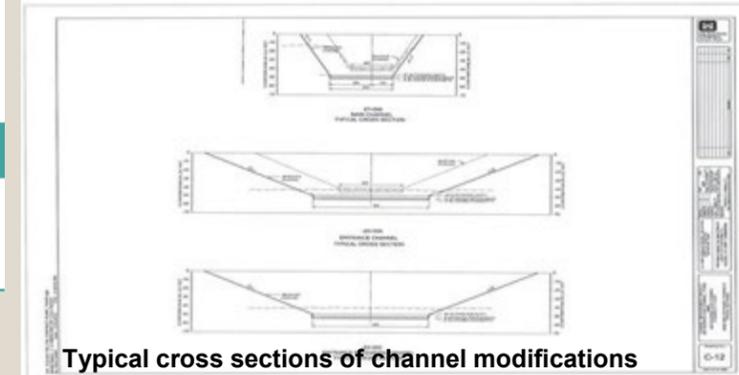
Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>At full buildout, Velasco Terminal could create 3,182 direct jobs, 2,340 induced jobs, and 3,462 indirect jobs</li> <li>The Velasco Terminal may generate \$350 million or more in economic impact annually, based on full build out of this terminal</li> <li>Local business revenue would increase by \$405 million</li> <li>Local purchases would increase by \$375 million</li> <li>An additional \$424 million generated in state and local taxes</li> </ul>	
Operational Impact	
<ul style="list-style-type: none"> <li>Provides opportunity for the Port to expand into Panamax vessel operations</li> <li>Improves Port's overall throughput capability</li> <li>Project would support movement of:                             <ul style="list-style-type: none"> <li>Containerized goods, such as fresh fruit and plastic resin up to 1.5M-2M TEUs annually at full build-out</li> <li>Project cargo and breakbulk operations</li> <li>Heavy lift and containers</li> </ul> </li> </ul>	



Project Details	
Port Facility	Calhoun Port Authority
County	Calhoun
Project Status	Permit Received
Project Category	
Project Description	
<p>This project proposes modification of the Matagorda Ship Channel, including a turning basin expansion to accommodate larger vessels, extension of the Entrance Channel to allow for deepening to -49 feet and widening to 550 feet, and deepening and widening of the Main Channel to -47 feet and 300 feet, respectively. The Port will also relocate 16 pipelines and create a 165-acre sand engine through Beneficial Use of Dredged Material.</p>	

Funding & Support		
Total Cost		\$218,325,000
Federal Cost Share		\$138,661,000
Local Cost Share		\$79,664,000
Need for Funding		
<p>The Section 10/404 permit has been approved, as of September 2020, and state funding is needed to begin the construction phase of this project. The design is fully complete, and funding the improvements to this ship channel would be a substantial benefit to this area and the customers and tenants that use the channel.</p>		
Project Support		
<ul style="list-style-type: none"> <li>Calhoun Port Authority Board of Commissioners</li> <li>Future Industries, Tenants, and Stakeholders</li> <li>U.S. Army Corps of Engineers – Galveston District</li> </ul>		

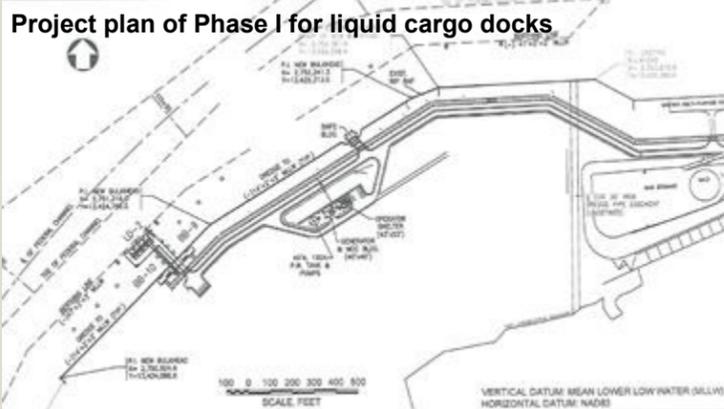
Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Increases the capacity of the Port to export bulk liquid products, increasing revenue</li> <li>Creates temporary and permanent jobs</li> <li>Supports development of new business ventures for the Port and the region</li> <li>Attracts customers and tenants to the Port</li> </ul>	
Operational Impact	
<ul style="list-style-type: none"> <li>Improves cargo movement capabilities by modifying aids to navigation</li> <li>Reduces vehicle wait times</li> <li>Improves vessel access</li> <li>Increases safety with wider channel</li> <li>Moves more cargo more efficiently by having the capacity to use larger and heavier loaded ships</li> </ul>	



Project Details	
Port Facility	Calhoun Port Authority
County	Calhoun
Project Status	Permit Received
Project Category	
Project Description	
<p>The Calhoun Port Authority is planning the construction of one deep-water berth (Liquid Cargo Ship Dock) and two barge berths (Liquid Cargo Barge Docks), along with onshore infrastructure. This is Phase 1 of a larger project that includes the construction of three deep-water bulk liquid petrochemical berths and six brown-water barge bulk liquid petrochemical berths.</p>	

Funding & Support	
Total Cost	\$62,311,295
Need for Funding	
<p>State funding is needed to support the growing demand from existing and new tenants for additional brown-water and deep-water facilities to import and export petrochemical products and crude oil. This is expected to increase the revenue-generating potential of the Port.</p>	
Project Support	
<ul style="list-style-type: none"> <li>Calhoun Port Authority Board of Commissioners</li> <li>Current and Future Industries, Tenants, and Stakeholders</li> </ul>	

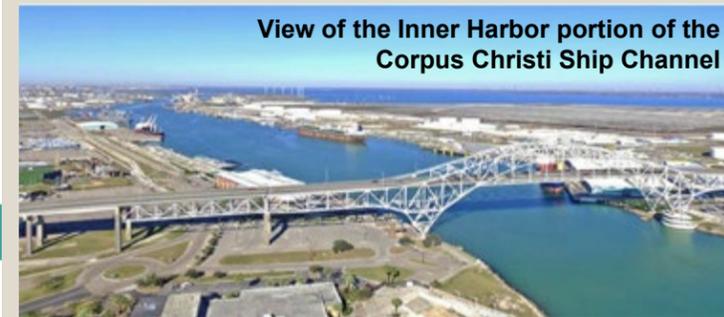
Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Creates 50 full time permanent jobs at the Port and locally</li> <li>Increases the economic potential of the Port by increasing the diversity and volume capability</li> <li>Allows local industry to move more product used in the manufacturing of plastic and crude oil exports, increasing revenue</li> </ul>	
Operational Impact	
<ul style="list-style-type: none"> <li>Improved cargo movement capabilities</li> <li>Improved barge access</li> <li>Will reduce truck transport of crude oil on public highways</li> <li>Docks would support the movement of:               <ul style="list-style-type: none"> <li>-Crude oil and natural gas condensate</li> <li>-Liquid petrochemical products, including those used in plastics manufacturing</li> </ul> </li> </ul>	



Project Details	
Port Facility	Port of Corpus Christi Authority
County	Nueces
Project Status	Construction Ready
Project Category	
Project Description	
<p>As the leading exporter of American energy to global markets, the highest priority capital project at the Port of Corpus Christi Authority (PCCA) is the Corpus Christi Ship Channel Improvement Project. Deepening and widening of the Corpus Christi Ship Channel will extend the channel into the Gulf of Mexico an additional two miles and deepen the entire 34-mile channel from -47 feet to -54 feet Mean Lower Low Water (MLLW). The project also includes widening the channel to 530 feet and adding barge shelves on each side of the channel for the safe passage of shallow-draft vessels.</p>	

Funding & Support		
Total Cost		\$651,085,000
Federal Cost Share		\$394,125,000
Local Cost Share		\$256,960,000
Need for Funding		
<p>In September 2017, through the Project Partnership Agreement with the U.S. Army Corps of Engineers, PCCA approved accelerating funding of \$32 million to expedite initial construction. In March 2018, the Port Commission approved a Plan of Finance specifically to support this project. PCCA has developed a robust and aggressive capital improvement program to build new infrastructure to meet these growing demands and to accelerate the deepening and widening of its ship channel. To date, Federal funding allocated for this project totals \$148 million. The project has been included in the USACE budget at \$100.4 million for the 2021 federal fiscal year.</p>		
Project Support		
<ul style="list-style-type: none"> <li>Port of Corpus Christi Commission</li> <li>Congressional Authorization through WRRDA 2014</li> <li>U.S. Army Corps of Engineers</li> <li>City of Corpus Christi</li> <li>Stakeholders within Port Complex</li> </ul>		

Project Benefits	
Economic Impact	
<ul style="list-style-type: none"> <li>Increases goods exports value by nearly \$35 billion annually, reducing the national trade deficit</li> <li>Increases export of oil and gas, supporting U.S. trading partners and bolstering domestic energy production               <ul style="list-style-type: none"> <li>- PCCA exported \$6 billion of crude oil in 2017</li> </ul> </li> <li>Provides over \$100 million in annual transportation cost savings, not including crude oil exports</li> <li>Supports a future \$18 billion liquefied natural gas (LNG) liquefaction facility with capacity of 22 million tons annually</li> </ul>	
Operational Impact	
<ul style="list-style-type: none"> <li>Accommodates deeper draft vessels and allows two-way traffic without channel closure, which will create an operational advantage and provide for a more secure port through less standby traffic</li> <li>Deeper/wider channel supports movement of:               <ul style="list-style-type: none"> <li>- Petroleum products and crude oil (especially exports from Permian and Eagle Ford shale production)</li> <li>- Bulk grain, including sorghum and corn</li> <li>- Goods for Port ranked 4th in U.S. in total tonnage</li> </ul> </li> </ul>	



**Project Details**

Port Facility	Port of Corpus Christi Authority
County	Nueces
Project Status	Design Phase
Project Category	

**Project Description**

The three liquid bulk docks at the Avery Point Terminal—situated on the south side of the Inner Harbor of the Corpus Christi Ship Channel (CCSC)—are the Port of Corpus Christi Authority's most productive Port-owned docks. The proposed project is the phased redevelopment of the Avery Point Terminal, as there are several critical issues with the current configuration of the terminal. The Avery Point Docks (4, 7, and 11) are, on average, 56 years old and display moderate to severe degradation of key components. Docks 4, 7, and 11 cannot currently accommodate modern vessel fleets, and three Suezmax class vessels cannot dock simultaneously. The docks pose various safety and operational constraints/concerns, including protrusion into the CCSC that creates a choke point for passing vessels.

**Funding**

 Total Cost	\$155,508,988
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**Need for Funding**

Because of the high utilization of these docks, they cannot be decommissioned long enough to allow for reconstruction unless the berth capacity can be recreated elsewhere. The expansion of Oil Dock 3 (Phase 1 of 4, funded through a 2020 USDOT Maritime Administration Port Infrastructure Development Grant) will create 44% capacity at each of Docks 4, 7, and 11 by allowing 90% of barge traffic to be diverted to Dock 3. This will create enough surplus capacity to allow for phased decommissioning and reconstruction (Phases 2 to 4) of each of the three Avery Point Docks.

**Project Support**

- Port of Corpus Christi Commission
- City of Corpus Christi
- Stakeholders within Port Complex

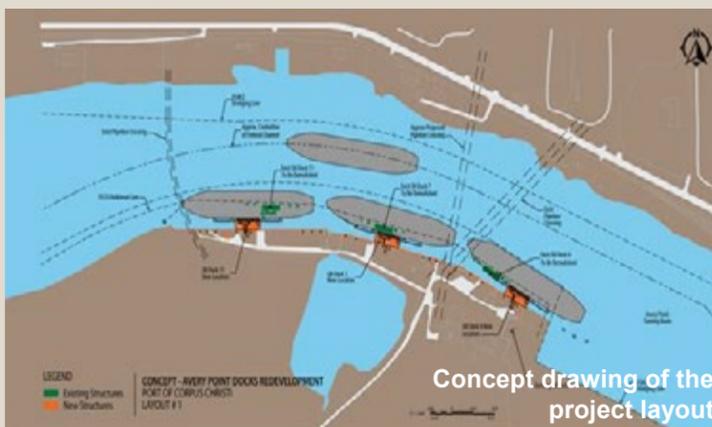
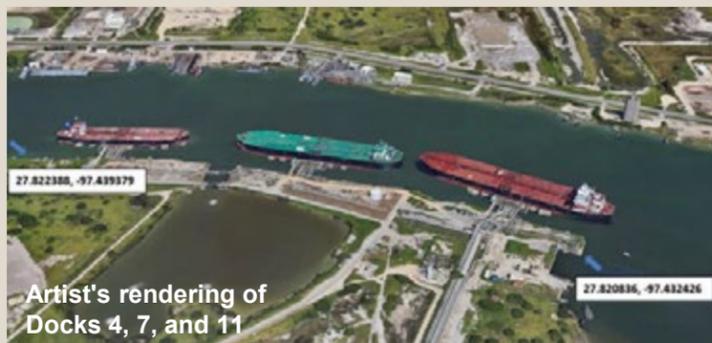
**Project Benefits**

**Economic Impact**

- Increases export crude volumes, which increases revenue and amplifies U.S. trade within the international crude trade market
- Provides an entire additional dock for exporting
- Increases capacity to hold Suezmax fully-loaded vessels, which will move a significantly increased amount of cargo
- Allows for three docks to be used simultaneously, significantly increasing the operational capacity

**Operational Impact**

- Improves safety and operational concerns over mooring lines holding the vessels, formerly crossing each other
- Allows three Suezmax vessels to dock at one time, one per dock – a significant improvement from two of three
- Relocates docks out of the ship channel and closer to shore
- Allows for two-way traffic within the channel to prevent idling



**Project Details**

Port Facility	Port of Corpus Christi Authority
County	Nueces
Project Status	Under Construction
Project Category	 

**Project Description**

The Joe Fulton International Trade Corridor (JFC), which stretches approximately 7 miles along the north side of the Inner Harbor of the Corpus Christi Ship Channel, is the Port of Corpus Christi Authority's primary freight corridor. This project will extend the JFC the full length of Rincon Road by adding 3,400 linear feet of paved roadway surface. To complete the multi-modal terminal at the Rincon Industrial Complex, the project will also add approximately 3,800 linear feet of bulkhead with relieving platforms along Rincon Canal B to provide additional barge berths and waterfront storage, and to facilitate intermodal operations (barge/rail/truck). The proximity to industries within this area is a specialty for the Port, and these industries will flourish with the improvements.

**Funding**

 Total Cost	\$14,000,000
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**Need for Funding**

This project has multiple phases that are on different schedules. The three ladder tracks of rail are considered at substantial completion. The roadway design is currently underway as of July 2020. The bulkhead for this project is at approximately 10% construction. However, without external funding, completing this construction will be difficult to fund independently.

**Project Support**

- Port of Corpus Christi Commission

**Project Benefits**

**Economic Impact**

- Increases wharf utilization in a specialized area, promoting the ability to move more product through
- Allows the Port to pursue opportunities involving pipelines for crude transport
- This type of loading is already in demand in this area from requesting customers; the Port's revenue will increase and jobs will be created

**Operational Impact**

- Rail connectivity allows the transloading process to occur directly from barge to rail to unload oil
- Reduces the number of vehicles and congestion within the Port, with vehicle freight being moved to barge
- Crude oil and other products will be moved more efficiently and safely, and will draw more customers to the Port

Rincon Complex Multimodal Infrastructure Development Concept



**Project Overview**

### Project Details

Port Facility	Port of Corpus Christi Authority
County	Nueces
Project Status	Study Authorized
Project Category	

### Project Description

The 2016 Water Infrastructure Improvements for the Nation (WIIN) Act study for the Corpus Christi Ship Channel includes the La Quinta Channel, a segment of the Corpus Christi Ship Channel (CCSC) system. The study will evaluate the feasibility of deepening the La Quinta Channel to -54 feet MLLW to match the authorized depth of the main Corpus Christi Ship Channel.

### Funding

Total Cost	\$3,000,000
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### Need for Funding

The La Quinta Channel reach serves some of the Port of Corpus Christi Authority's largest customers, including an \$18 billion liquefied natural gas (LNG) liquefaction facility with the capacity of 22 million tons annually and a world-scale steel producer. Although both operations are years away from full production capacity, traffic on this channel reach has increased markedly year over year for the last several years. Deepening the La Quinta Channel to match the depth (-54' MLLW) of the rest of the CCSC will allow for deeper draft vessels and more efficient cargo movements out of La Quinta, thereby effectively increasing channel capacity and supporting incremental growth in maritime commerce. This Channel Deepening Study is the critical first step toward ultimately deepening the La Quinta Channel to match the authorized depth of the rest of the CCSC.

### Project Support

- Port of Corpus Christi Commission
- U.S. Army Corps of Engineers
- City of Corpus Christi
- Stakeholders within Port Complex

### Project Benefits

#### Economic Impact

- Reduced transportation costs by allowing fully laden Very Large Crude Carrier (VLCC) vessels to operate the channel with a deeper draft, one-way traffic turning basin
- Increased movement of a larger volume of LNG out of the channel with additional trains scheduled to be built, which increases the volume of cargo in and out of the Port

#### Operational Impact

- Reduced transit times and increased efficiency for multiple customers in the La Quinta Channel area
- Allows fully laden VLCC fleet to transit into the channel from the Gulf of Mexico, allowing the fleet to move cargo more efficiently and economically
- The study will be a step towards allowing larger vessels into the channel, decreasing traffic and creating a safer channel



View of the La Quinta Ship Channel



1st US crude oil export departing on the Theo T via the Corpus Christi Ship Channel

### Project Details

Port Facility	Port of Brownsville
County	Cameron
Project Status	Construction Ready
Project Category	

### Project Description

Congress authorized this project in WRDA 2016 (formally the Water Infrastructure Improvements for the Nation Act of 2016). This project will deepen 16 miles of the Brazos Island Harbor (BIH) Ship Channel from its previously authorized depth of -42 feet MLLW down to -52 feet MLLW. The project includes deepening of the entrance and jetty channels from Station (Sta.) -17+000 to Sta. 0+000 from -44 feet to -54 feet MLLW, which is 2 feet deeper than the interior channel to allow for vessel pitch, roll, heave and yaw from strong currents, waves, and wind. Deepening from Sta. 0+000 to Sta. 84+200 will be from the current -42 feet to -52 feet MLLW.

Deepening the BIH Channel is expected to generate approximately 18 million cubic yards of new work material and 94 million cubic yards of maintenance material over the 50-year period of economic evaluation. New work material is to be placed into a new work Ocean Dredged Material Disposal Site and existing Placement Areas. Dredged material placement for this project is to be provided in accordance with the Dredged Material Management Plan developed during the study that identified the least cost base plan for placement of dredged material.

### Funding

Total Cost	\$301,952,000
Federal Cost Share	\$116,116,000
Local Cost Share	\$185,836,000

### Need for Funding

The Chief of Engineers of the U.S. Army Corps of Engineers reports that this project will contribute significantly to the economic efficiency of commercial navigation in the region.

### Project Support

- Brownsville Navigation District Commission
- Congressional Authorization under WRDA 2016
- Broad Community and Regional Support

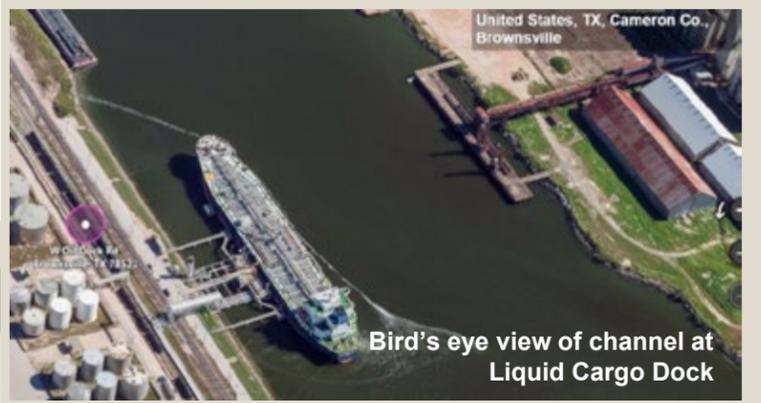
### Project Benefits

#### Economic Impact

- Benefit-cost ratio of 6.4 to 1
- The major commodities enhanced by this project include:
  - Oil drilling rigs
  - Petroleum products
  - Steel products

#### Operational Impact

- Increased cargo movement
- Reduced transit times
- Enhances operational safety by allowing deeper, more fully loaded vessels to carry cargo and reduce the number of vessels in transit; allowing them to pass more easily side by side
- Reduced risk of grounding
- Deeper channel supports the increased movement of:
  - Petroleum products and crude oil
  - Dry bulk material, like limestone and sand
  - Fabricated metal, iron ore, iron, and steel
  - Large semi submersible oil rigs – this port and the Port of Pascagoula in Mississippi have the only dry docks in the US for jack-up and semi-submersible rig service



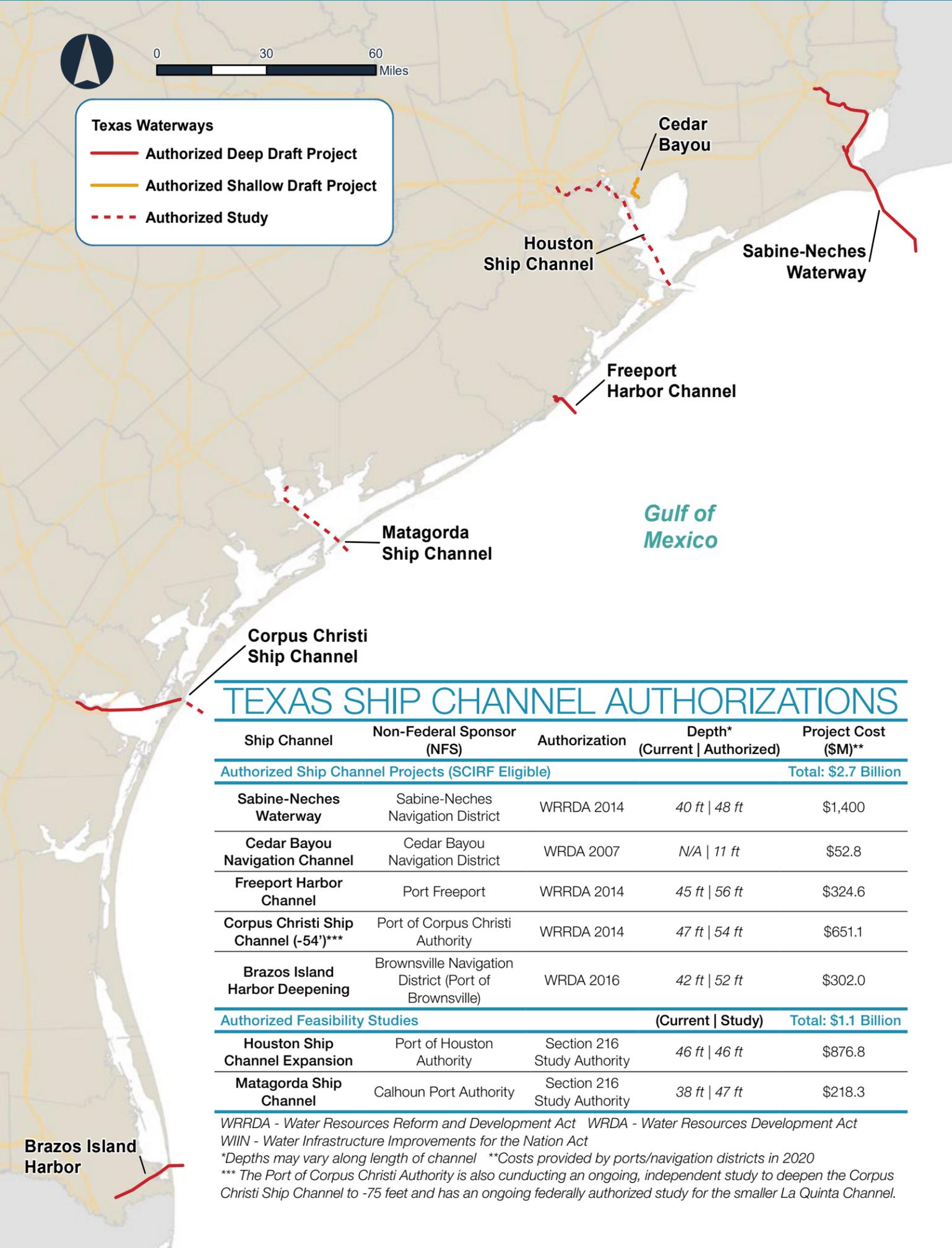
Bird's eye view of channel at Liquid Cargo Dock



Break bulk cargo at Docks 15 and 16



SHIP CHANNEL  
IMPROVEMENT  
REPORT



## TEXAS SHIP CHANNEL AUTHORIZATIONS

Ship Channel	Non-Federal Sponsor (NFS)	Authorization	Depth* (Current   Authorized)	Project Cost (\$M)**
<b>Authorized Ship Channel Projects (SCIRF Eligible)</b>				<b>Total: \$2.7 Billion</b>
Sabine-Neches Waterway	Sabine-Neches Navigation District	WRRDA 2014	40 ft   48 ft	\$1,400
Cedar Bayou Navigation Channel	Cedar Bayou Navigation District	WRDA 2007	N/A   11 ft	\$52.8
Freeport Harbor Channel	Port Freeport	WRRDA 2014	45 ft   56 ft	\$324.6
Corpus Christi Ship Channel (-54')***	Port of Corpus Christi Authority	WRRDA 2014	47 ft   54 ft	\$651.1
Brazos Island Harbor Deepening	Brownsville Navigation District (Port of Brownsville)	WRDA 2016	42 ft   52 ft	\$302.0
<b>Authorized Feasibility Studies</b>			<b>(Current   Study)</b>	<b>Total: \$1.1 Billion</b>
Houston Ship Channel Expansion	Port of Houston Authority	Section 216 Study Authority	46 ft   46 ft	\$876.8
Matagorda Ship Channel	Calhoun Port Authority	Section 216 Study Authority	38 ft   47 ft	\$218.3

WRRDA - Water Resources Reform and Development Act WRDA - Water Resources Development Act  
 WIIN - Water Infrastructure Improvements for the Nation Act  
 \*Depths may vary along length of channel \*\*Costs provided by ports/navigation districts in 2020  
 \*\*\* The Port of Corpus Christi Authority is also conducting an ongoing, independent study to deepen the Corpus Christi Ship Channel to -75 feet and has an ongoing federally authorized study for the smaller La Quinta Channel.

## TEXAS SHIP CHANNELS

Any vessel entering or leaving a Texas seaport relies on well-maintained, navigable ship channels. These waterways are critical thoroughfares of trade, serving as marine “highways” that allow goods to be moved into and out of ports.

Texas has 270 miles of deep-draft channels that allow large, ocean-going vessels carrying goods to and from foreign and domestic markets to Texas ports. Another 750 miles of shallow-draft channels in Texas support barges and other smaller vessels that move goods around the Gulf of Mexico and other Texas waterways. The width, depth, and navigability of a waterway that serves a port directly affect the kinds of vessels and markets a port can serve. It is important to both maintain Texas waterways so that vessels can continue to move in and out of ports safely and efficiently, and also to deepen and widen certain channels so that they are equipped to receive the next generation of larger vessels to accommodate an anticipated increase in cargo tonnage.

Texas is home to 11 deep-draft ports with ship channels at least 30 feet deep and seven shallow-draft ports, all of which rely on their waterways to move goods in and out of the port. The U.S. Army Corps of Engineers (USACE) operates and maintains the federal ship channels with ports and navigation districts serving as Non-Federal Sponsors (NFS) that are responsible for funding a portion of channel improvement project costs. Securing federal funding for navigation projects remains a challenge. The congressional authorization and appropriation process for USACE projects, including ship channel improvement projects, can take decades, which has contributed to the nearly \$98 billion backlog of federal water resources projects nationwide.<sup>19</sup>

This Ship Channel Improvement Report is part of the 2022-2023 Texas Port Mission Plan (PMP), the maritime port mission plan required in Chapter 55 of the Texas Transportation Code, developed by the Texas Department of Transportation (TxDOT) Maritime Division. The PMP highlights the importance of investing in the port system in order to meet the growth potential of global trade opportunities. Ship channel improvement projects are investments that are costly and time-sensitive. Delays in funding and implementing navigation projects can lead to missed opportunities for attracting tenants, increases in overall project costs, and loss of returns on the overall investment. The Ship Channel Improvement Report summarizes the status of congressionally-authorized ship channel improvement projects and feasibility studies across the state.

## WHAT IS THE SHIP CHANNEL IMPROVEMENT REVOLVING FUND?

The 85th Texas Legislature passed Senate Bill (SB) 28 in 2017, establishing the Ship Channel Improvement Revolving Fund (SCIRF) and Loan Program. This creates a program to help finance congressionally-authorized ship channel deepening and widening projects. The SCIRF has not been capitalized, but should it receive funding, it will serve as a financial tool for Non-Federal Sponsors to advance projects while they await federal funding.



## NEED FOR CHANNEL IMPROVEMENTS

**Deepening and widening ship channels is important for safety. Deeper channels mean fewer ships having the risk of running aground when loaded. Wider channels allow for safer passing of vessels, making it easier for pilots to navigate the channel, and allowing more ships to move through the channel safely. This is especially important in Texas, as many of the vessels traveling to and from the ports are oil tankers and ships carrying hazardous materials.**

The world vessel fleet is increasing both in number and vessel size. The Panama Canal, which had been the benchmark for vessel sizes traveling to the U.S. since its original construction in 1914, was expanded in 2016 to accommodate a newer, larger fleet connecting the Texas economy with countries across the Asian region. Even before the completion of the Panama Canal expansion, larger vessels were already calling on Texas ports via oceanic trade routes as the shipping industry began transitioning the maritime fleet operating along the U.S. coast to larger sizes.

Ships can only stop or “call” at ports with channels that are deep enough to accommodate their draft, which is the vertical distance between the waterline and the bottom of the ship. At ports where the current draft of the ship channel is not sufficient to support larger vessels, vessels must be light-loaded to allow ship bottom clearance into the channel. This process allows larger ships to call on Texas ports, but is inefficient and increases shipping costs.

Shipping lines enjoy substantially lower costs with larger vessels. Between technological advances that allow for the development and operation of larger ships and the growing global demand for goods, shippers reap the benefits of the economies of scale that larger ships provide. Even if these larger ships don’t call at Texas ports now, there may be a cascade effect later as larger ships replace the current fleet, increasing the average size of ships calling at ports.

### Panama Canal

In 2016, the Panama Canal Authority completed a major expansion project by constructing two new sets of locks that allow larger ships to transit the canal. Now container ships with nearly triple the previous capacity, as well as a new generation of liquefied natural gas (LNG) and bulk carriers, can safely transit the canal. As the Panama Canal is the most efficient trade route for Texas to import and export cargo to and from East Asia, these larger vessels will enable shippers in Texas to more competitively export the state’s energy, chemical, and agricultural products worldwide. “Panamax” is a shipping industry term describing the maximum size vessel that could traverse the former Panama Canal. With the completed expansion, larger New Panamax vessels are now able to transit the Panama Canal, increasing the traffic to the Gulf of Mexico of these larger, more efficient vessels.

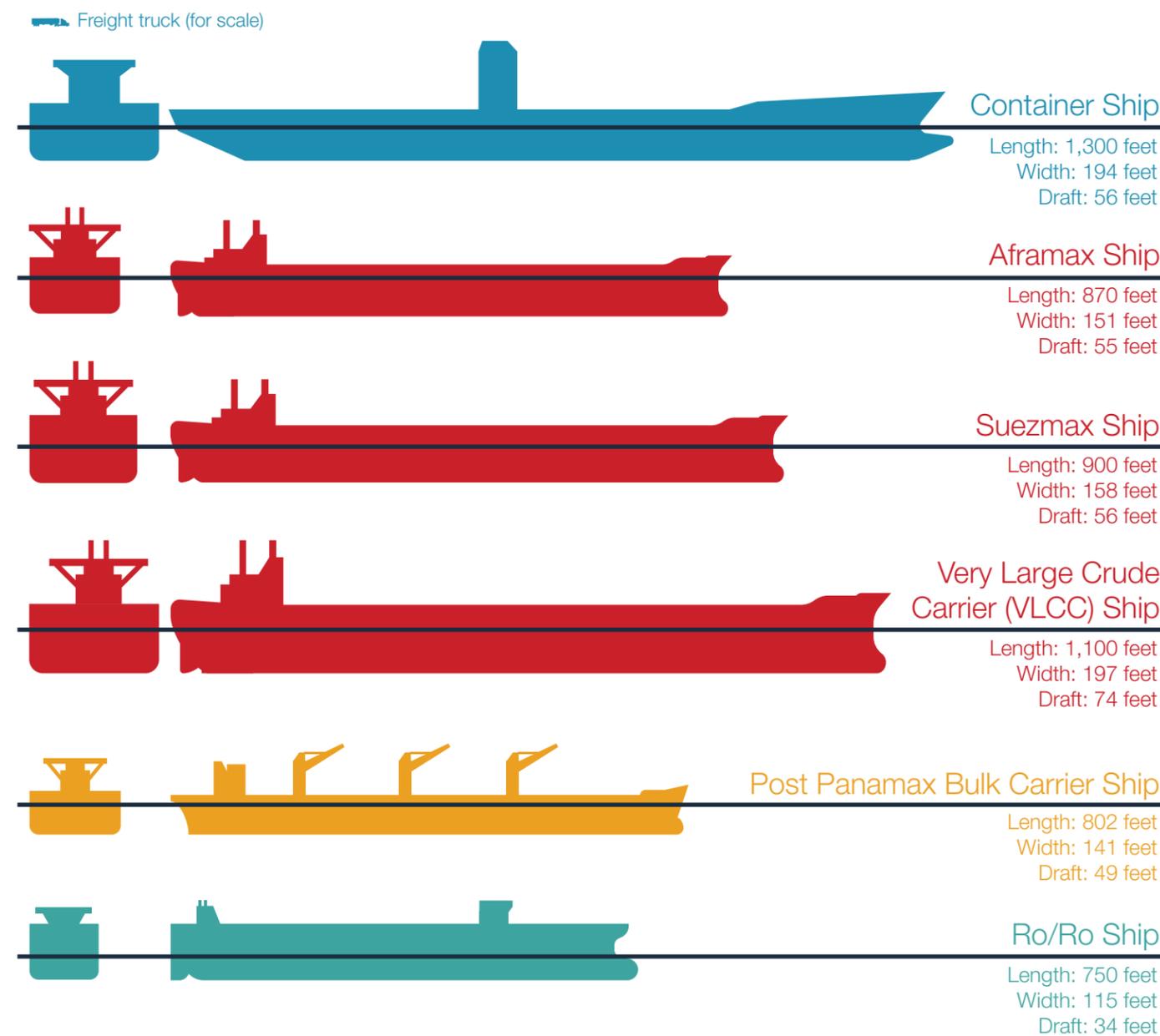
### Vessel Trends

The range of vessels calling on Texas ports is highlighted on the following page.<sup>20</sup> As the leading exporting state in the nation, Texas is well-positioned to take advantage of the Panama Canal expansion to increase exports to new and existing markets across the globe. Increasing deep-draft channel capacity in Texas will help ensure that Texas ports will be better able to accommodate larger vessels and remain economically competitive. At their current channel depths and widths, Texas ports will not be able to accommodate the largest of the New Panamax vessels, which have a draft depth of 50 feet and maximum beam width of 168 feet. As an example of the increased capacity provided by the Panama Canal expansion, Panamax containerships generally have a capacity of 5,000 TEUs (twenty-foot equivalent units) and New Panamax containerships have a capacity of up to 14,400 TEUs.<sup>23</sup>

## MOST COMMON TYPES OF VESSELS:

- **CONTAINER SHIPS** – Cargo ships carrying their entire load in truck-size intermodal containers.
- **OIL TANKERS OR BULK LIQUID CARRIERS** – Ships fitted with tanks to carry liquid bulk cargo such as crude petroleum, petroleum products, chemicals, liquefied gases, wine, molasses, and similar product tankers (e.g., Aframax, Suezmax, VLCC).
- **BULK CARRIER** – Vessels designed to carry various cargos in bulk quantities such as grain, fertilizers, ore, coal, and cement.
- **SPECIALIZED VESSELS** – Ro/Ro ships carrying cars, trucks, or wheeled containers; refrigerated “reefers” transporting insulated cargo; or heavy lift ships carrying oversized cargo.

## SHIP SIZE COMPARISON



	PANAMAX <sup>20</sup>	NEW PANAMAX <sup>21</sup>
Length	965 ft	1,200 ft
Width	106 ft	168 ft
Draft	39.5 ft	50 ft

**TEXAS GULF INTRACOASTAL WATERWAY (GIWW)<sup>22</sup>**

- The Texas GIWW carries over 25 percent of total U.S. intrastate maritime tonnage.
- Only 26 percent of the Texas GIWW is currently dredged and passable at the authorized depth.
- Congress has varying commitments to fund the dredging program. There are no guarantees that the dredging needs will be met year over year.

### FEASIBILITY STUDY INITIATION

- Section 203 of WRDA 1986 and amendments from recent WRDA issuances allow the Non-Federal Sponsor to initiate the study through a Memorandum of Agreement
- Non-Federal Sponsor is obligated to fund, at a minimum, 50 percent of the feasibility study
- USACE funding and participation require allocations in their annual work plan budget for the specific study

### FEASIBILITY STUDY

- Evaluates proposed solutions and alternatives
- Identifies plan that maximizes National Economic Development benefits
- Currently a standardized three year process, but many Texas ship channel studies have taken over a decade
- Upon USACE approval, culminates with signed Chief's Report (Assistant Secretary of the Army)
- Currently, the La Quinta Channel Improvement at the Port of Corpus Christi is in this step of the process

### CONGRESSIONAL PROJECT AUTHORIZATION

- An individual project requires federal authorization for construction through a signed bill or WRDA
- WRDA bills have been issued as frequently as biennially or as infrequently as once a decade
- Currently, the Houston Ship Channel and Matagorda Ship Channel Projects are in this step of the process

### PROJECT FUNDING, DESIGN AND CONSTRUCTION

- A Project Partnership Agreement (PPA) provides a legally binding agreement between the Federal Government and a Non-Federal Sponsor for construction of a ship channel improvement project
- The PPA documents the required local match percentage designated in the approved Chief's Report, which varies based on the identified improvements
- Federal funding is infrequent and variable, presenting a need for local and state funds to initiate work and provide funds to leverage
- Over time, a project that has been inactive might need to be updated through a Limited Reevaluation, or worse, could be deauthorized and have to restart the Feasibility Study process
- The five authorized channel projects in Texas are awaiting full federal funding

## PROJECT DEVELOPMENT AND FUNDING

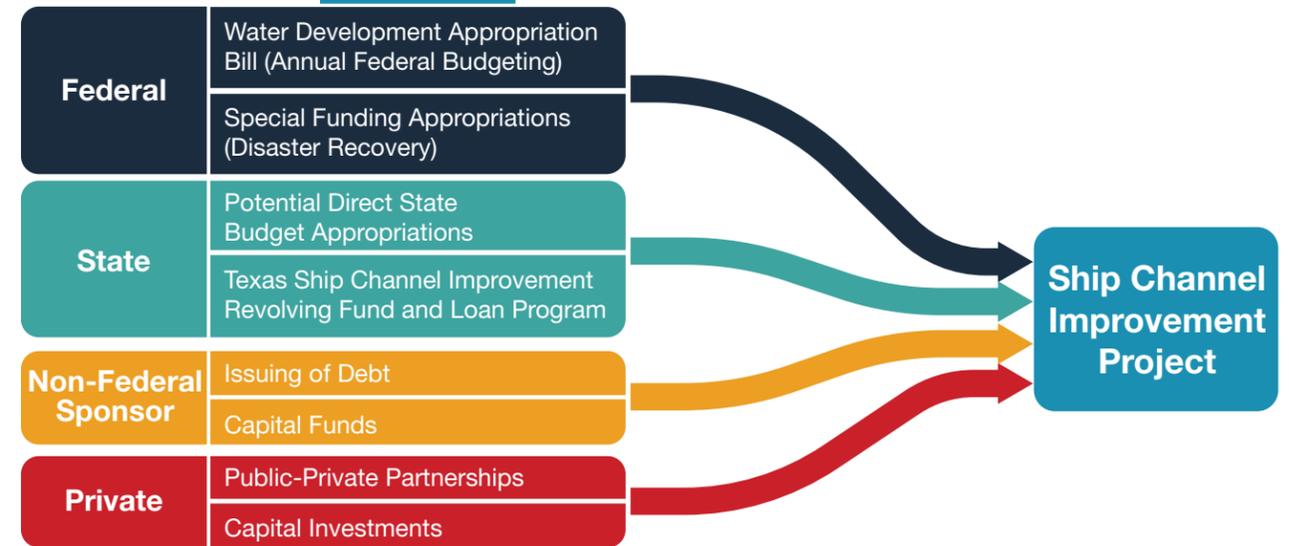
Ship channel improvement projects are required to go through a lengthy and costly federal process in order to be approved by the USACE and authorized by Congress. Under this process, a local entity can serve as the Non-Federal Sponsor (NFS) and can initiate a study to determine the feasibility of a ship channel improvement project, as permitted by past Water Resources Development Acts (WRDA) enacted by Congress, or the USACE can initiate the study through their annual work plan. While ship channel improvement projects are often viewed with a focus on construction costs or "hard costs", they also incur significant "soft costs" that relate to the feasibility study, planning, engineering and design elements of the projects. Failing to plan for these soft costs can cause schedule delays, ultimately delaying the economic benefits of implementing these improvements.

While up front costs can create challenges to advancing projects, it is necessary to meet the requirements that are in place to justify authorization of federal funds. Once a ship channel improvement project is authorized for development, it is not guaranteed federal funding for the construction. Federal authorization of a project obligates federal funds to maintain the improved ship channel upon successful completion of the project. It is possible under WRDA Section 204(f) to have a ship channel improvement project constructed without federal funds while maintaining the federal obligation to fund and conduct maintenance dredging of the channel upon its deepening and/or widening.

### Project Development

The project development required to get to project authorization takes many years and incurs significant costs to both the federal and non-federal sponsors. Texas currently has five authorized projects, including four deep-draft and one shallow-draft. These projects are further discussed in the project profiles at the end of this report. Since 2000, just four WRDAs have passed, including WRDA 2007, 2014, 2016, and 2018. The America's Water Infrastructure Act, representing WRDA 2020, is under consideration for authorization by the U.S. Senate. The legislation has provisions to de-authorize projects if construction funds are not obligated within a specified amount of time. The actual construction phase of the project begins once sufficient funding has been secured for the project through the federal government and the NFS. Once construction has started, it can still take many years to complete a project if there are delays in funding the project.

### FUNDING



### Project Funding

Even after a lengthy authorization process, the project is not guaranteed to be constructed. While projects require funding both during the feasibility study and construction phases, the difference in scale between them results in frequent success in securing funds for studies and funding shortages and delays for the construction phase. For all projects, there is a federal and non-federal project cost share that can vary based on the ship channel improvement dimensions and magnitude, as outlined in the Chief's Report and subsequent Project Partnership Agreement (PPA). Once authorized, the project may get funding from any of the four funding arms to execute construction work: federal funding, state funding, ports and navigation districts (typically serving as the NFS), and private investments.

Historically, Texas ship channel projects, once authorized, have been in a holding pattern for construction while awaiting federal funds to be appropriated (planned) within the annual USACE budget to the authorized project, and then allocated (committed) to the project in the annual USACE work plan. Only the Corpus Christi Ship Channel project has received full federal appropriations for funding at this point in time with \$248.4 million appropriated (\$148 million allocated). The Cedar Bayou Channel Improvement Project has been appropriated approximately 88 percent of its federal funding, while the Sabine-Neches Waterway Channel and Freeport Harbor Channel Improvement Projects have received less than 10 percent apiece.

Because of the unpredictable and infrequent nature of securing federal funds for navigation construction projects, as outlined in the Federal Funding Challenges section later,

it is important for Texas ports and navigation districts to identify other opportunities for funding these projects in order to ensure that the state can accommodate these larger vessels and remain competitive. When non-federal funds are made available by any of the three remaining funding arms, it may kick-start project implementation, and may also provide additional justification for getting federal funds allocated. Both the Port of Corpus Christi Authority and Port Freeport passed bonds in 2018 in excess of \$100 million each to provide local funds to accelerate their associated ship channel projects. Private funding, while less common, can also be used to speed up the process to construct ship channel improvements. In the 2022-2023 biennium, Port Houston expects to spend approximately \$667 million through port and private industry funding to begin construction of the Houston Ship Channel, once the project receives Congressional authorization for construction.

### SCIRF FUNDING

Funding the SCIRF will help provide financing for eligible navigation projects that modernize waterways and allow for increased growth of waterborne commerce. There are five projects in Texas that are eligible to draw on the fund should it be capitalized. The PAAC voted to recommend a funding request in the amount of \$330 million to cover the estimated drawdown for the eligible projects in Fiscal Years 2022-2023.

**FUNDING REQUESTED: \$330 MILLION**

# PROJECT IMPLEMENTATION CHALLENGES

## Federal Funding Challenges

WRDA is solely authorizing legislation; the funding to implement authorized studies and projects is provided separately under the annual appropriations budgetary process. The rate of authorizations typically exceeds the rate of annual appropriations; therefore, only a small number of authorized activities are included in the President’s budget request and eventually funded.

Direct Congressional allocations are appropriated to the USACE. Annual USACE appropriations for civil works projects, including navigation projects, have remained steady or slightly increased during the last decade, ranging from \$4.5 billion to just under \$6 billion. About 40 to 50 percent of these funds are then appropriated to the navigation sector. The congressional authorization and appropriation process for ship channel improvement projects can take decades, which has contributed to the nearly \$98 billion backlog of federal water resource projects nationwide.<sup>19</sup>

The USACE Civil Works Fiscal Year (FY) 2021 budget included nearly \$2.4 billion for the study, design, construction, operation, and maintenance of inland and coastal navigation projects nationwide.<sup>24</sup> Texas has typically received anywhere from \$60 million to \$120 million in the last several years for navigation projects, with the exception of higher FY 2019 appropriations of \$268.7 million due to higher Congressional appropriations in the same year.<sup>25</sup> In FY 2020 and 2021, Texas navigation projects were appropriated roughly \$155.5 million and \$190 million, respectively.<sup>26,27</sup> The majority of navigation appropriations in Texas typically goes to Operations & Maintenance (O&M) at over 90 percent, with less than 10 percent for construction and studies. With the FY 2020 and 2021 appropriations, nearly 45 percent of the Texas navigation funding will go to construction – approximately \$154 million in funding.<sup>26,27</sup> This represents a significant increase in federal appropriations for construction, yet this still accounts for only 14 percent of the construction costs of the authorized channel improvement projects.

## FEDERAL APPROPRIATIONS FOR SHIP CHANNEL CONSTRUCTION THROUGH FY 2021

Corpus Christi Ship Channel	\$248.4 M
Sabine-Neches Waterway	\$34.6 M
Freeport Harbor Channel	\$19.0 M
Cedar Bayou Navigation Channel	\$41.7 M



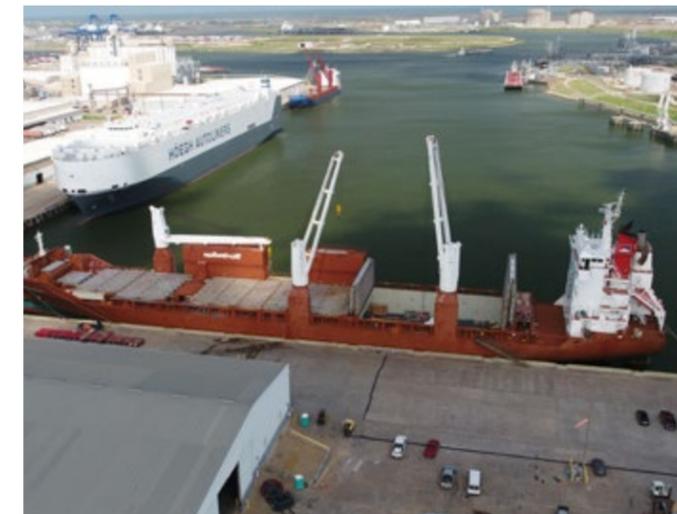
With \$248 M of USACE appropriations for the Corpus Christi Ship Channel, the Port of Corpus Christi Authority has received the most federal funding for any authorized channel improvement project in Texas. Although Texas channels received higher than typical level of appropriations for FY 2021, it does not cover the total cost of the authorized ship channel improvement projects. The ports representing the four other ship channels will have to compete for additional federal funding in upcoming fiscal years.

## Impacts of Funding Delays to Projects

Ship channel improvement projects are investments in the nation’s infrastructure that are time-sensitive. Delayed funding for projects can have many negative impacts on the project. Each cycle of funding authorization in which the project does not get funded can present the following consequences:

- **Post Authorization Change Report (PACR)** – If the cost of an authorized ship channel project exceeds a specified threshold before construction starts, the USACE will request an updated economic and cost analysis, known as a PACR. Each time a PACR is conducted, it costs the project another year or more and results in missed Congressional budget cycles. The cost of channel dredging projects has been increasing steadily because of the increasing cost of disposing dredged material.
- **Loss of Economic Benefit** – Delays in funding can cause a loss of economic benefits of the project to the port, the supported industry, and the communities.
- **Opportunity Cost** – There are increases in overall project costs between congressional authorization and execution of the PPA, as well as missed opportunities for attracting tenants with improved channel access, both of which lessen the potential future earning capacity of the ship channel improvement project and the return on investment.
- **Deauthorization** – Approved projects can be deauthorized if the project has not started construction or signed a PPA within seven to ten years, depending on the authorizing WRDA (Section 6001, WRRDA 2014; Section 1302, WRDA 2016; and Section 1302, WRDA 2018), and must go through the lengthy process to become re-authorized – and confront the added cost.
- **Increase in Project Cost** – Due to inflation, growth of the U.S. economy, and increases in construction and material costs after the initial authorization of a project, the total project cost continues to increase while a project waits for funding.

Additionally, even if projects are included in the federal budget, the budget recommendations may fall significantly short of what is actually needed and continue to delay project construction.



The Freeport Harbor Channel Improvement Project will not only provide port access for larger deep-draft vessels, but also see significant improvements in the ability for vessels to safely maneuver in the meandering channel layout.

## CASE STUDY: THE CORPUS CHRISTI SHIP CHANNEL

- The Corpus Christi Ship Channel deepening and widening was authorized by Congress in 1990, but has taken nearly 30 years to complete its feasibility study and receive the federal funding necessary to begin construction.
- During the 10 years it took to go from authorization to execution of the PPA, the project costs increased from \$188 million to \$327 million.<sup>28</sup> The current project cost is estimated to be \$651 million.
- Through 2020, the federal government will allocate \$148 million for construction of the Corpus Christi Ship Channel, about 70 percent of the \$209 million federal responsibility to construct the channel improvements.<sup>29</sup>



The Brazos Island Harbor Channel was authorized under WRDA 2016. This deepening project will improve the economy of deep-draft vessels calling on the Port of Brownsville.



The Houston Ship Channel Expansion Channel Improvement Project is currently in the Congressional Authorization and Design phase.

**In 2018, Texas' robust maritime system ranked second in the nation in total tonnage (i.e. total tons handled) and first in total imports and exports.<sup>30</sup>**



The Matagorda Ship Channel is awaiting congressional authorization for improvements to its depth and width.

## BENEFITS OF SHIP CHANNEL IMPROVEMENTS

Texas' navigation industry is an economic engine for the nation. Like roadways, ship channels also require maintenance and upgrades so that Texas ports remain competitive and don't lose business to other states.

Ship channel improvements are typically only authorized if they generate a positive return on investments. For instance, the proposed Brazos Island Harbor Deepening Project would inject \$6 billion into Cameron County's economy during construction; after construction, it would return \$326 million to the County's Gross Product annually – an increase of 3.7%.<sup>31</sup> All Texas ship channel projects exceed a minimum of \$1.50 returned to \$1.00 invested based on each channel's final USACE feasibility study. These returns on investment are based on current port users and commodity movement. They do not account for new private investment to build or enhance facilities as a result of the increased shipping efficiencies captured by ship channel improvement projects.

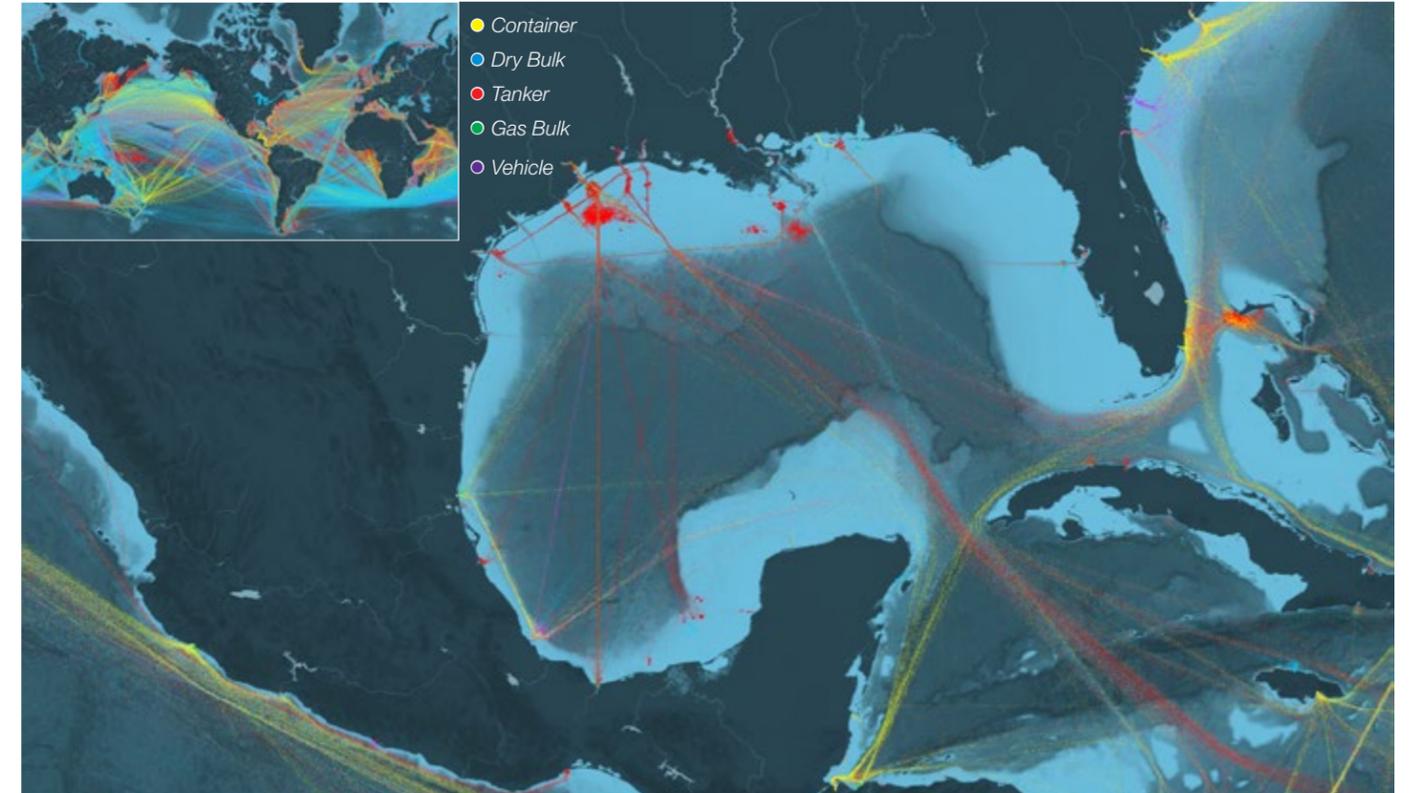
While most of the focus of this report is on deep-draft channels, shallow-draft channels are also a critical part of the freight network. Barge transport is a highly fuel-efficient means to transport bulk and liquid cargo that also reduces truck congestion on roadways. Barge shipments have significantly more cargo capacity than their land-based freight counterparts. A single barge ship can carry the equivalent of 70 to 144 trucks worth of cargo or 16 to 46 rail cars worth of cargo depending on the cargo type.<sup>32</sup> It is important to not only deepen and widen deep-draft channels, but also maintain and improve the shallow-draft channels and facilities, such as locks and floodgates.

### CASE STUDY: THE SABINE-NECHES WATERWAY

One study estimated the net benefits of deepening the Sabine-Neches Waterway, which serves the Port of Beaumont, Port of Port Arthur, and the Port of Orange, to be \$103.2 billion in gross product and an additional 529,000 permanent jobs in the United States. In Texas, this accounts for \$67.4 billion in gross product and an additional 336,000 permanent jobs. Despite this, the project took 17 years to gain congressional authorization and has only received a small portion of appropriations for the federal cost share.<sup>33</sup>



The Sabine-Neches Waterway provides deep-draft access to the Gulf of Mexico for the Port of Beaumont.



Gulf of Mexico shipping routes by cargo type with global inset (credit www.shipmap.org).

## U.S. Trends for State-Funded Ship Channel Improvements

Other U.S. ports competing with Texas ports receive state-funded subsidies to attract new tenants and have access to grants or low-interest loans for their channel improvement projects through economic development funds, general revenue, tax incentives, or transportation programs. These revenues subsidize channel deepening and widening projects, dockside infrastructure, and cruise terminals.

Some states have appropriated funds for ship channel projects, apart from any ongoing programs. These subsidized port enhancements can make non-Texas ports more attractive to shippers and potential tenants, luring firms, trade, and jobs away from Texas. In order to remain competitive, Texas can invest in modernizing the port system, as well as pursue public and private partners to generate a strong consensus to invest in navigation and shipping industries. Examples of state-funded improvements include:

- In 2015, the Port of Miami completed \$205.6 million of improvements to deepen the main harbor to 52 feet and widen the entrance channel to 800 feet. The project was made possible through a combination of federal, state, and local funds that accelerated the project schedule on the order of years.<sup>34</sup> Since its completion, the port has seen an average annual growth of 5.8 percent for total tonnage,

up from -2 percent average annual growth in the ten years prior to the improvements.<sup>35</sup>

- In 2018, the Port of Boston began a three-year, \$350 million dredging project to deepen the channel. The state and Port of Massachusetts Authority are committing \$130 million, with the federal government funding the remaining \$220 million.<sup>36</sup>
- In 2019, the Port of Virginia began dredging 2.5 years ahead of schedule to deepen its channels, with depths ranging from 55 feet to 59 feet, and to widen select areas to 1,400 feet to allow two-way traffic for ultra-large container vessels. The Virginia Legislature committed \$350 million to fund the full cost of the project.<sup>37</sup>

## Ship Channels Drive the Economy

Texas ship channels have a powerful impact on the Texas and U.S. economies, and help to transfer Texas' respected exports all over the world. These assets must be looked after to ensure they meet future demands to continue economic success. An investment in ship channel improvements is a guarantee to increase Texas' revenue and opens up opportunities for not just the state, but the country, as well.

# SHIP CHANNEL IMPROVEMENT COMPONENTS

Ship channels are the critical roadways of waterborne commerce between the open ocean and ports. To the casual onlooker, a ship channel may look like just water, but beneath the surface there is a complex infrastructure network that supports the movement of ships. Like roadways, ship channels are designed to move goods and users in a safe and efficient manner. Their design takes into consideration the types of markets they serve – such as breakbulk or container – as well as the vessels that use these channels now and anticipated future vessels.

Ships can only stop or “call” at ports with channels that are deep enough to accommodate their draft, which is the vertical distance between the waterline and the bottom of the ship. Both the size of the ship and the volume of cargo it carries affect the required draft. In order to call at certain ports, larger ships might have to reduce their draft by carrying less cargo, a practice known as “light loading.” Even with light loading, some ports might not be accessible to larger ships.

Because the depth of a channel has such a direct effect on the size of ships and quantity of cargo a port can receive, ports look to channel deepening as a way to remain economically competitive. However, a port alone is not able to deepen its channel and be assured of

federal maintenance, since the depth approved for federal maintenance of a ship channel is determined by USACE and requires authorization by Congress. There is a long federal process that the ports must embark on to be eligible to dredge and expand their channels.

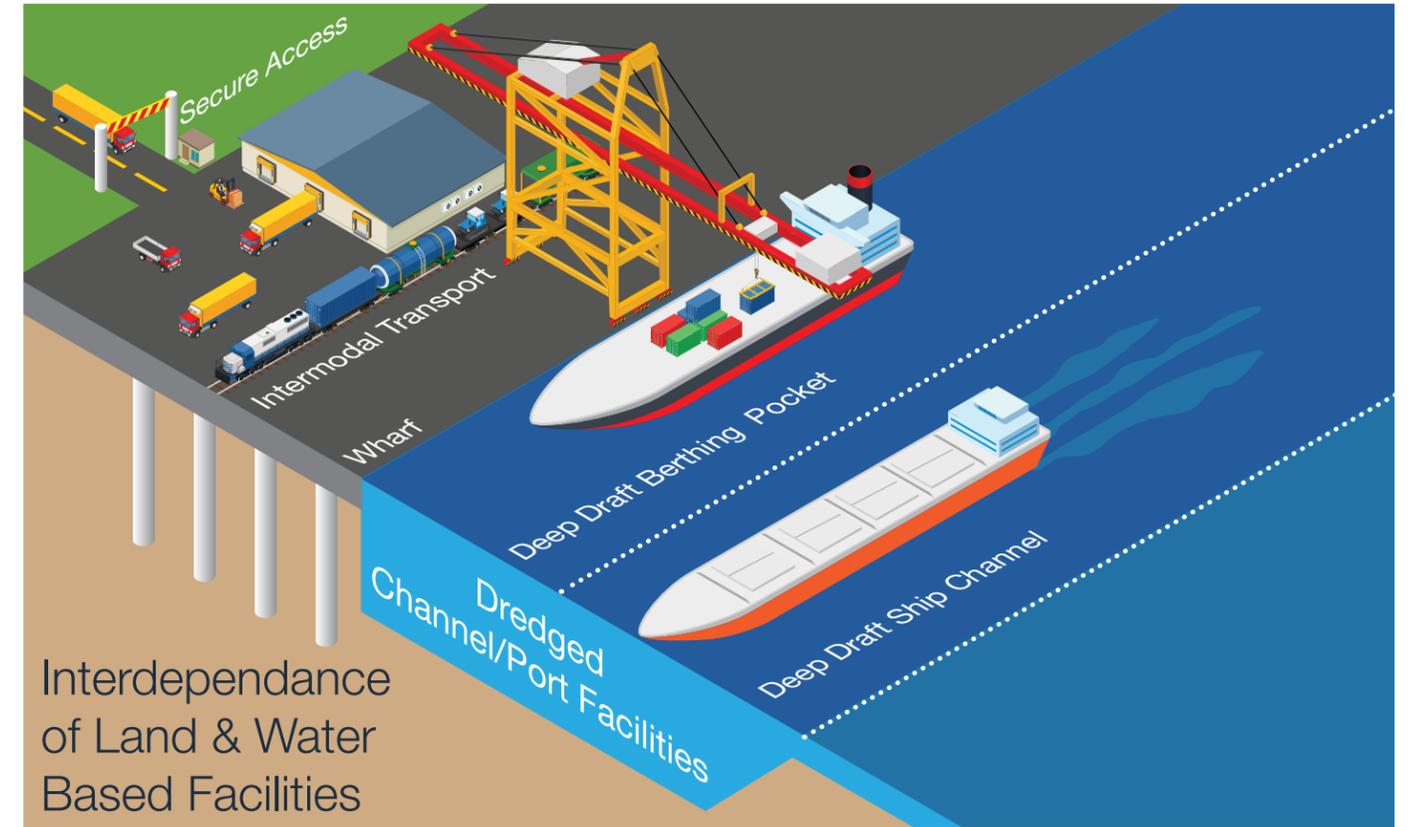
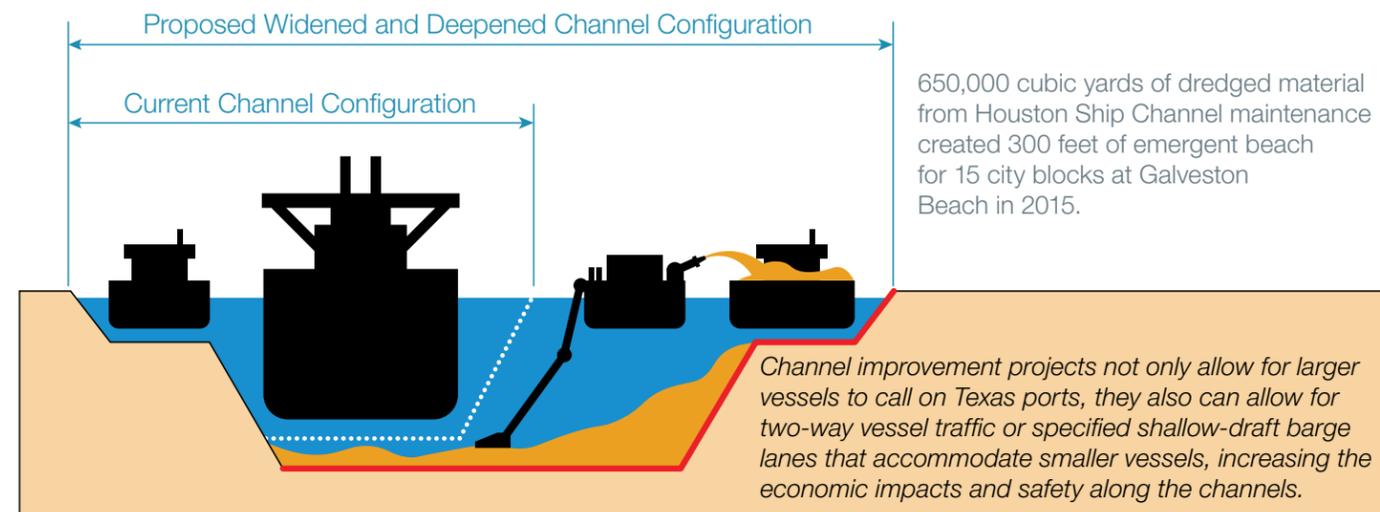
## Channel Width and Depth

The depth and width of the ship channel determines the size of ships that can use it as well as the amount of cargo that the ships can carry. The depth should be adequate to safely accommodate the ship with the deepest draft expected to use the waterway. A ship needs enough water to safely move from the ocean to the port without touching the bottom of the channel. Deeper channels will reduce the risk of ships running aground when loaded.

Similar to needing adequate depth of channel, ships also need room to safely navigate in the channel, including passing other vessels and turning. Wider channels reduce the number of ships that have to wait to enter the channel based on channel capacity. This means a lower overall transit time for the ships and more goods moving in and out of the ports. The safety of wider channels is especially important in Texas, where many of the vessels traveling to and from the ports are oil tankers and ships carrying hazardous materials.

The width of a ship channel is measured by the flat bottom of the channel and can be widened on one side or both. The minimum channel width for a specific project will depend on the size and maneuverability of the vessels, channel alignment, traffic congestion, current conditions, and wind conditions. The amount of ship traffic and the length of a channel determine whether one-way or two-way traffic is appropriate.

**The depth of a ship channels is not constant, but fills in with sediment that is disturbed as the channel is used. When this happens, the ship channel needs to be dredged out again to maintain its authorized depth. With planning, the dredged material can be used to create islands, widen beaches, and more.**



## Ship Channel Typical Elements

In addition to channel deepening and widening, other navigation improvements help ships move to and from the port. Typical elements needing improvements include channels; jetties and breakwaters; locks and floodgates; basins or water areas for vessel maneuvering, such as turning basins, anchorages, and mooring areas; removal of wrecks, obstructions, drift and debris; and bridge replacements or modifications.

Ship Channel Component	Description
<b>Anchorage Area</b>	An area where ships anchor to wait for berthing areas to become available or for more favorable transit conditions.
<b>Barge Lane (or Shelves)</b>	A narrower, shallower channel adjacent to the main channel for the purpose of separating the faster, deep-draft ship traffic from the slower, shallow-draft barge traffic.
<b>Bend</b>	An even curve that allows a channel to turn in a specific direction.
<b>Berth, Dock, or Wharf</b>	A designated location in a port or harbor where a vessel may be moored or anchored, usually for the purposes of loading and unloading.
<b>Channel Limits</b>	The location of the authorized channel as designated on project design documents and depicted on hydrographic survey sheets. Often provided as a channel width on navigation charts.
<b>Entrance Channel</b>	The main access channel into a bay, harbor, or port from the deeper ocean.
<b>Harbor</b>	A fully or partially enclosed body of water offering safe anchorage or reasonable shelter to vessels against adverse weather conditions.
<b>Interior Channel</b>	The access channel inside a bay or harbor that connects the entrance channel to port facilities.
<b>Passing or Maneuvering Lane</b>	A widened portion of channel where a vessel can safely pass an approaching vessel. The maneuvering lane should be wide enough to account for current, wind, and bank effect.
<b>Turning Basin</b>	A large, excavated area that provides for the complete turning of a ship in order to change direction, enter a dock or berth, or depart from the port. Turning basins are usually located at the upper end of the interior channel.



Project Details	
Non-Federal Sponsor (NFS)	Sabine Neches Navigation District (SNND)
Project Authorization	WRRDA 2014
Channel Length (Current   Authorized)	64 miles   <b>77 miles</b>
Channel Depth [Ft, MLLW**] (Current   Authorized)	40'   <b>48'</b> 42'   <b>50' (Offshore)</b>
Channel Width [Ft] (Current   Authorized)	700'   <b>700'</b>

**\*\*Mean lower low water (MLLW)** refers to the lowest of the two low tides per day, averaged over a 19-year period (currently from 1983 to 2001).

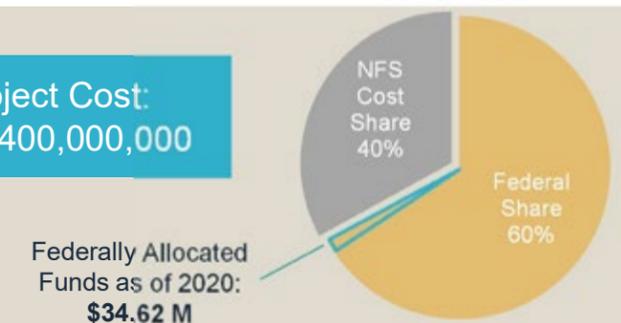
### Waterway and Project Description

The Sabine-Neches Waterway (SNWW) is an approximately 64-mile federally authorized and maintained waterway located in Jefferson and Orange counties in southeast Texas. The area surrounding the waterway is generally referred to as the "Golden Triangle" and is delineated by the three major Texas ports of Port Arthur, Beaumont, and Orange.

The SNWW is a system of navigation channels that has been dredged and maintained in the Sabine-Neches region. The system includes Sabine Pass, the Port Arthur Ship Canal, the Sabine Neches Canal, and goes upstream along the Neches River. The Sabine Neches Canal portion that runs in front of the Port of Port Arthur can pose some additional navigational challenges because it is used by both large vessels and barge traffic that are using the GIWW. There are three bridges that cross over the waterway that can limit the vertical clearance of the vessels that can use the waterway. Sabine Pass is stabilized by jetties that extend 4.1 miles into the Gulf of Mexico.

The authorized project will deepen the waterway by eight feet and extend the channel 13 miles further into the Gulf of Mexico. Additional widening of Taylor Bayou Channel and existing turning and anchorage basins will enhance the safety of vessels transiting the waterway.

**Project Cost:**  
**\$1,400,000,000**



### Key Waterway Facts

- #1 bulk liquid cargo waterway in the U.S.
- #3 largest waterway by cargo volume in the U.S.
- Projected to be the largest LNG exporter in U.S.
- Refineries produce 60% of the U.S. commercial jet fuel
- \$40 billion in gross product
- 375,000 jobs provided by the SNWW currently

### Project Benefits

The Sabine-Neches Waterway has grown tremendously since the last improvement project authorized in 1962, more than 50 years ago. According to SNND, expanding and deepening the channel eight feet will keep Texas competitive with other U.S. ports, and generate \$330 billion in new business activity along with 528,000 permanent jobs. Additionally, the project will increase tax revenue, better manage waterway traffic, and stimulate further economic development by allowing larger vessels to access the ports and reducing the need to light load existing vessels.

### Project Readiness and Implementation

This project was authorized in WRRDA 2014 and is currently seeking federal appropriations for construction. This project was awarded \$18 million in New Start appropriations in the USACE FY 2019 Work Plan, and an additional \$16.62 million to dredge the Sabine Pass jetty channel in the FY 2020 Work Plan. The SNND is pursuing local and state funding options, including user fees and loan opportunities, while awaiting additional federal funds to be appropriated to the project. The SNND and USACE signed a PPA in August 2019. Construction is estimated to take seven to 10 years.

### Waterway Supported Port Facilities

**Ro/Ro**

**Bulk**

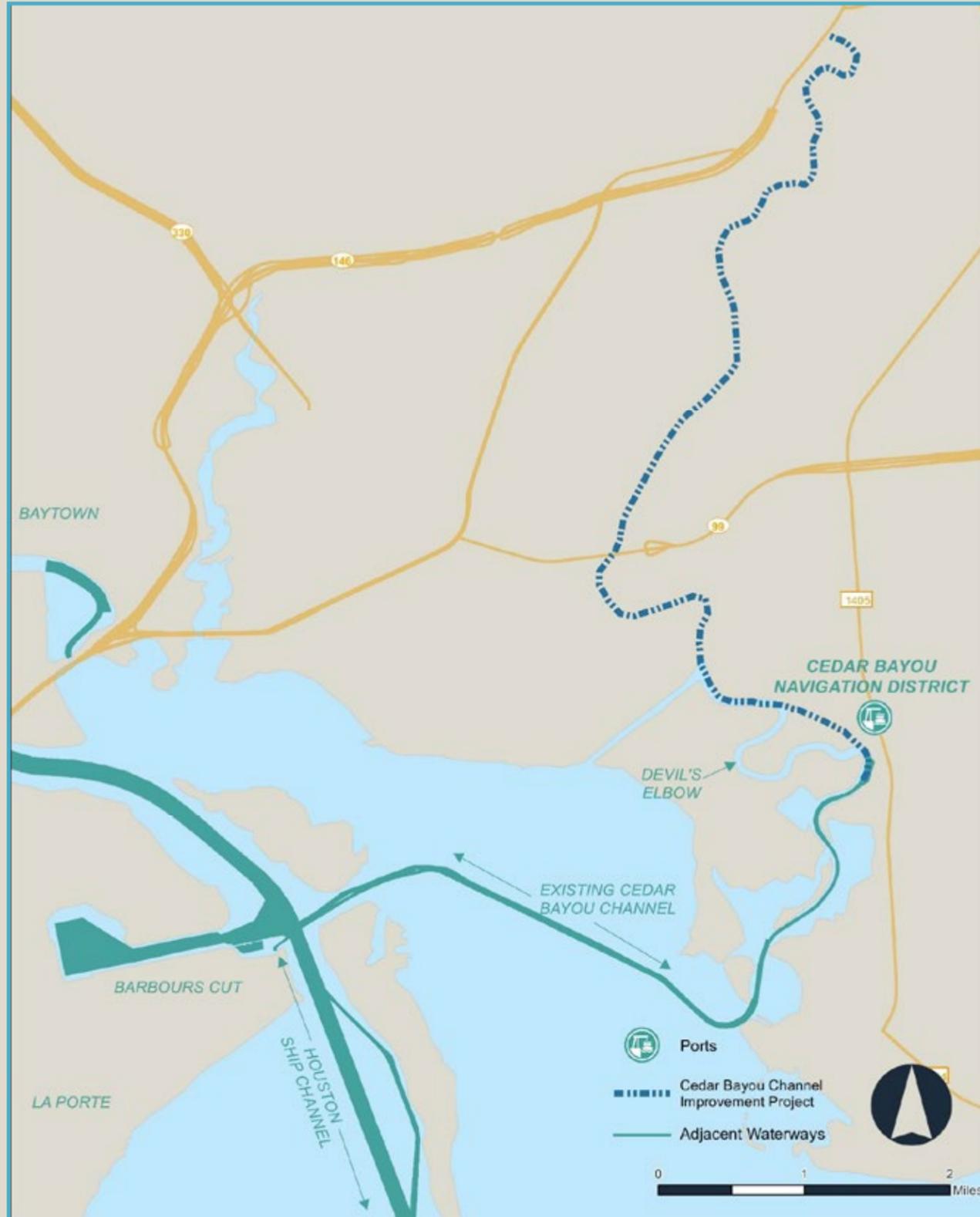
**Fishing**

**Energy**

**Break Bulk**

**Other**

# CEDAR BAYOU CHANNEL IMPROVEMENT PROJECT



Project Details	
Non-Federal Sponsor (NFS)	<b>Cedar Bayou Navigation District (CBND)</b>
Project Authorization	WRDA 2007
Channel Length (Current   Authorized)	6 miles   <b>14 miles</b>
Channel Depth [Ft, MLLW] (Current   Authorized)	Varies   <b>11'</b>
Channel Width [Ft] (Current   Authorized)	Varies   <b>100'</b>

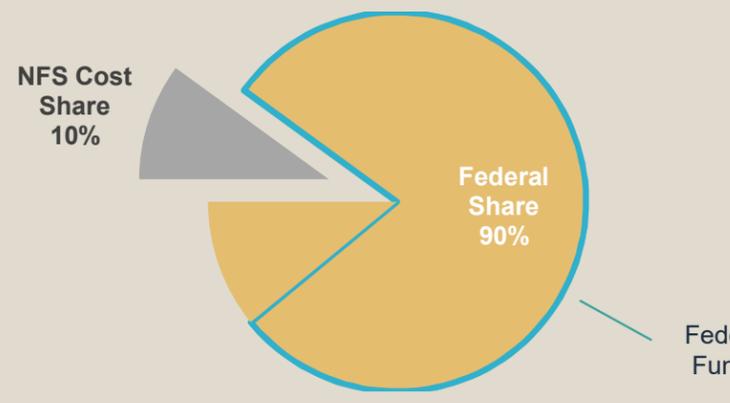
## Waterway and Project Description

Cedar Bayou is a coastal waterbody that is navigable as it runs along the eastern portion of the City of Baytown. Upon its confluence with Galveston Bay, the Cedar Bayou Channel provides direct connection to the deep-draft Houston Ship Channel.

The previously authorized and improved portion of the channel extends from the junction with the Houston Ship Channel to the mouth of Cedar Bayou and upstream 3 miles. This shallow-draft channel is 11 feet deep by 100 feet wide.

This authorized project will extend the maintained channel upstream from mile 3 to mile 11 where it intersects with the Highway 146 bridge. While this section of the channel is currently navigable and is in use for barge transport, this project will standardize the channel so that it is also 11 feet deep by 100 feet wide, enhancing barge access and improving navigation safety.

**Project Cost: \$52,800,000**



## Key Waterway Facts

- Carries more than 1.5 million tons of cargo per year
- The channel primarily serves chemical, aggregate, steel and asphalt industries
- Supports container-on-barge movement with connections to Port Houston container terminals

## Project Benefits

Standardizing this portion of the channel and easing several of the bends will improve barge operations in the area. The cutoff of the bend at Devil's Elbow will also provide a safer route for transporting goods. Together, these improvements will benefit navigability in the channel so that operators don't have to light load or slow down as much to navigate the currently unmaintained channel.

The final channel design was selected in order to minimize the environmental impact along the shoreline and placement areas. Land will be restored and set aside for conservation as part of this project.

## Project Readiness and Implementation

This project was authorized in WRDA 2007 and is currently seeking federal appropriations for construction. Pre-Construction Engineering and Design are complete. As of 2020, the federal government has appropriated approximately \$41.73 million for project implementation. A formal PPA was signed in September 2019 between USACE and CBND.

Construction is expected to begin in 2020.

## Waterway Supported Port Facilities





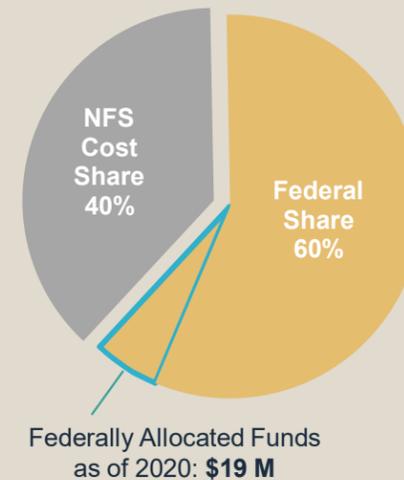
Project Details	
Non-Federal Sponsor (NFS)	<b>Port Freeport</b>
Project Authorization	WRRDA 2014
Channel Length (Current   Authorized)	9.2 miles   <b>11.9 miles</b>
Channel Depth [Ft, MLLW] (Current   Authorized)	N/A   <b>26' Reach 4</b> 46'   <b>51' Reaches 2, 3</b> 46'   <b>56' Reach 1</b> 48'   <b>58' Offshore</b>
Channel Width [Ft] (Current   Authorized)	400'   <b>400' Onshore</b> 600'   <b>600' Offshore</b>

### Waterway and Project Description

The Freeport Harbor Channel (FHC) is a deep-draft navigation channel that connects industrial facilities in Freeport, Texas, with the Gulf of Mexico. The main channel consists of multiple segments, with reduced channel widths and depths as the channel approaches the 180 degree turn around the Dow complex. The channel also provides barge access through multiple adjacent waterways.

The project will extend the existing Outer Bar Channel 1.3 miles further into the Gulf of Mexico while deepening it by 10 feet. It also deepens the main channel by 10 feet, with widening at critical channel bends and at turning basins, while the main channel remains unchanged. The middle segments of the channel are deepened by 5 feet. The project will also reauthorize the upper portion of the channel, the section designated as Stauffer Channel to open the potential for future work in that section.

### Project Cost: \$324,590,000



### Key Waterway Facts

- \$46.2 billion of economic activity annually for Texas
- More than 900 vessel calls per year
- Serves Port Freeport, the 21<sup>st</sup> largest U.S. port in foreign trade, and the 6<sup>th</sup> largest Texas port
- 122,000 port-related jobs

### Project Benefits

The Freeport Ship Channel supports a large oil and gas and petrochemical complex, which has invested over \$27 billion in facility expansions. The project will support larger vessels and the expected 30%+ increase in vessels calling Freeport Harbor terminals. By increasing channel depth, vessels will be able to handle the growing import and export demand with greater efficiencies and more competitively serve Texas and Middle America.

Port Freeport has seen the jobs and economic impact from the facilities double in a span of four years, from 2012 to 2016. Providing waterway infrastructure to keep up with the growth will help attract additional economic investment and jobs in the region and state.

### Project Readiness and Implementation

This project was authorized in WRRDA 2014 and is currently seeking federal appropriations for construction. In May 2018, the U.S. Army Corps of Engineers approved a reevaluation report for the project, adding additional project elements to address safety and navigation needs in addition to the 2012 approved feasibility study. In May 2018, voters in the Port Freeport Navigation District approved a \$130 million bond to support implementation of the project.

Port Freeport and USACE signed a PPA in June 2020, moving the project into the construction phase. Engineering and design for the first segment and award of the first contract is expected in 2020. USACE included \$19 million in funding for the project in its FY 2020 Work Plan as one of two projects nationwide to receive a "new start" designation to begin construction.

### Waterway Supported Port Facilities





# CORPUS CHRISTI SHIP CHANNEL IMPROVEMENT PROJECT



Project Details	
Non-Federal Sponsor (NFS)	Port of Corpus Christi Authority
Project Authorization	WRDA 2007 WRRDA 2014 <i>Project Re-Authorized at Updated Costs</i>
Channel Length (Current   Authorized)	36 miles   <b>38 miles</b>
Channel Depth [Ft, MLLW] (Current   Authorized)	N/A   <b>14' Barge Lanes</b> 47'   <b>54'</b> 49'   <b>56' Offshore</b>
Channel Width [Ft] (Current   Authorized)	400'   <b>530' +400' for Barge Lanes</b> 700'   <b>700' Offshore</b>

Key Waterway Facts
<ul style="list-style-type: none"> <li>\$150 billion of economic activity for the U.S.</li> <li>\$50 billion in regional investment</li> <li>80,000 port-related jobs</li> <li>Home to the Port of Corpus Christi Authority:               <ul style="list-style-type: none"> <li>#1 U.S.-produced crude oil export port                   <ul style="list-style-type: none"> <li>2.3 million barrels/day forecasted for 2020</li> </ul> </li> <li>#3 largest U.S. port by 2019 tonnage                   <ul style="list-style-type: none"> <li>Greater than 140 million tons forecasted for 2021</li> </ul> </li> </ul> </li> </ul>

## Waterway and Project Description

The Corpus Christi Ship Channel (CCSC) provides deep water access from the Gulf of Mexico to the Port of Corpus Christi via Port Aransas, Redfish Bay, and Corpus Christi Bay. Access points include the La Quinta Channel, the Gulf Intracoastal Waterway, and the Rincon Canal. The waterway extends from deep water in the Gulf of Mexico through the Port Aransas jettied entrance to the Corpus Christi Turning Basin and the landlocked industrial areas within the city known as the Inner Harbor. The La Quinta Channel extends from the CCSC near Ingleside, Texas, and runs parallel to the eastern shoreline of Corpus Christi Bay to the San Patricio Turning Basin.

The authorized project will deepen the waterway by 7 feet and extend the channel 2 miles further into the Gulf of Mexico. The channel will be widened to 530 feet in the Upper and Lower Bay Reaches. Barge lanes will be constructed from the CCSC junction with the La Quinta Channel to the entrance of the channel at the Inner Harbor, which will be 200 feet wide and 14 feet deep on both sides of the CCSC.

## Project Benefits

The Corpus Christi Ship Channel Improvement project is expected to add nearly \$40 billion in incremental goods value exports, which will aid in reducing the rapidly expanding trade deficit. The project will provide over \$100 million in annual transportation cost savings.

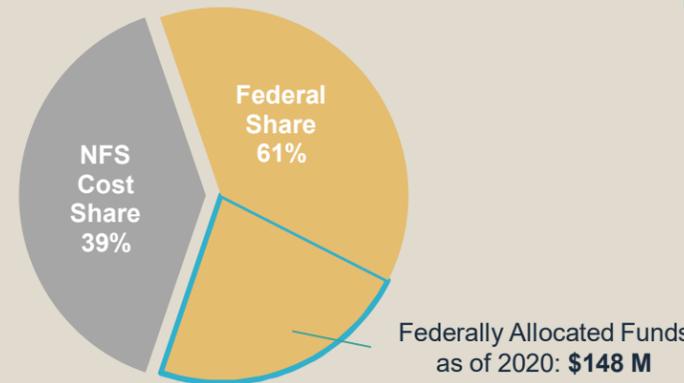
The proposed improvements to the Upper Bay Reach on the Main Channel include the construction of two 200-foot barge shelves, reducing traffic conflicts between deep-draft vessels and barges while enabling more efficient movement of cargo.

## Project Readiness and Implementation

This project was re-authorized in WRRDA 2014 and is currently seeking federal appropriations for construction. As of 2020, the federal government has allocated \$148 million for project implementation. An additional \$100.4 million is proposed in the USACE FY 2021 budget.

The Port of Corpus Christi has provided \$78 million in funds to accelerate construction of the project, initiating contracting for work to be performed at the CCSC entrance. The Port of Corpus Christi Authority also sold \$216.2 million in bonds in July 2018 to provide funds for the deepening and widening project along with other port capital projects.

## Project Cost: \$651,085,000



## Waterway Supported Port Facilities





Project Details	
Non-Federal Sponsor (NFS)	<b>Brownsville Navigation District (Port of Brownsville)</b>
Project Authorization	WRDA 2016
Channel Length (Current   Authorized)	19.4 miles   <b>20.2 miles</b>
Channel Depth [Ft, MLLW] (Current   Authorized)	42'   <b>52'</b> 44'   <b>54' Offshore</b>
Channel Width [Ft] (Current   Authorized)	250'   <b>250'</b>

### Waterway and Project Description

The Brazos Island Harbor Channel (BIH), also known as the Brownsville Ship Channel, is an existing deep-draft navigation project located on the lower Texas coast, serving as the southernmost navigation channel in Texas. The channel passes south of South Padre Island through the mile long jetties protecting the inlet at Brazos Santiago Pass. The BIH also serves as the southern origin of the Texas Gulf Intracoastal Waterway (GIWW), which makes BIH the gateway for movement of goods in and out of Mexico, a key trade partner for Texas.

The BIH connects Brownsville and the Lower Rio Grande Valley to the Gulf of Mexico, as it is the only deep draft channel south of Corpus Christi. The authorized project will deepen the waterway by ten feet and extend the channel 0.8 miles further into the Gulf of Mexico. The first two miles of dredged material is identified as beneficial use material that will be placed to enhance the South Padre Island beach and dune system, providing additional recreational and tourism benefits to the region.

### Key Waterway Facts<sup>11</sup>

- #2 foreign trade zone in the U.S. by value of exported commodities
- 4 million square feet of storage
- \$3 billion of economic activity for Texas
- 44,000 port-related jobs

### Project Benefits

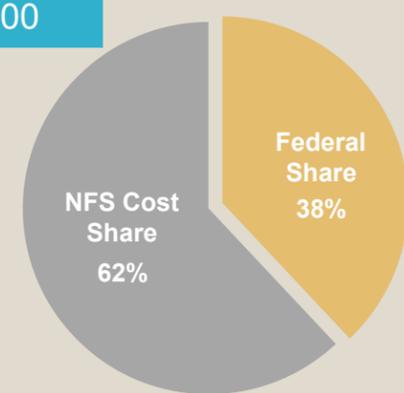
The Brazos Island Harbor Channel has grown tremendously since the last improvement project authorized in 1980, more than 30 years ago. Expanding and deepening the channel ten feet will keep Texas competitive with other U.S. ports, and greatly improve the navigation efficiency of deep draft vessels and offshore oil rigs. Additionally, the project will increase tax revenue, better manage waterway traffic, and stimulate further economic development by allowing larger vessels access to the ports and reducing the need to light load existing vessels.

### Project Readiness and Implementation

This project was authorized in WRDA 2016 and the Port of Brownsville is currently seeking federal appropriations for construction. The Port is pursuing local and state funding options, including loan opportunities, while awaiting federal funds to be appropriated for the project. Pre-construction, engineering and design is underway. The project was permitted in June 2019 and construction is expected to begin as early as 2020.

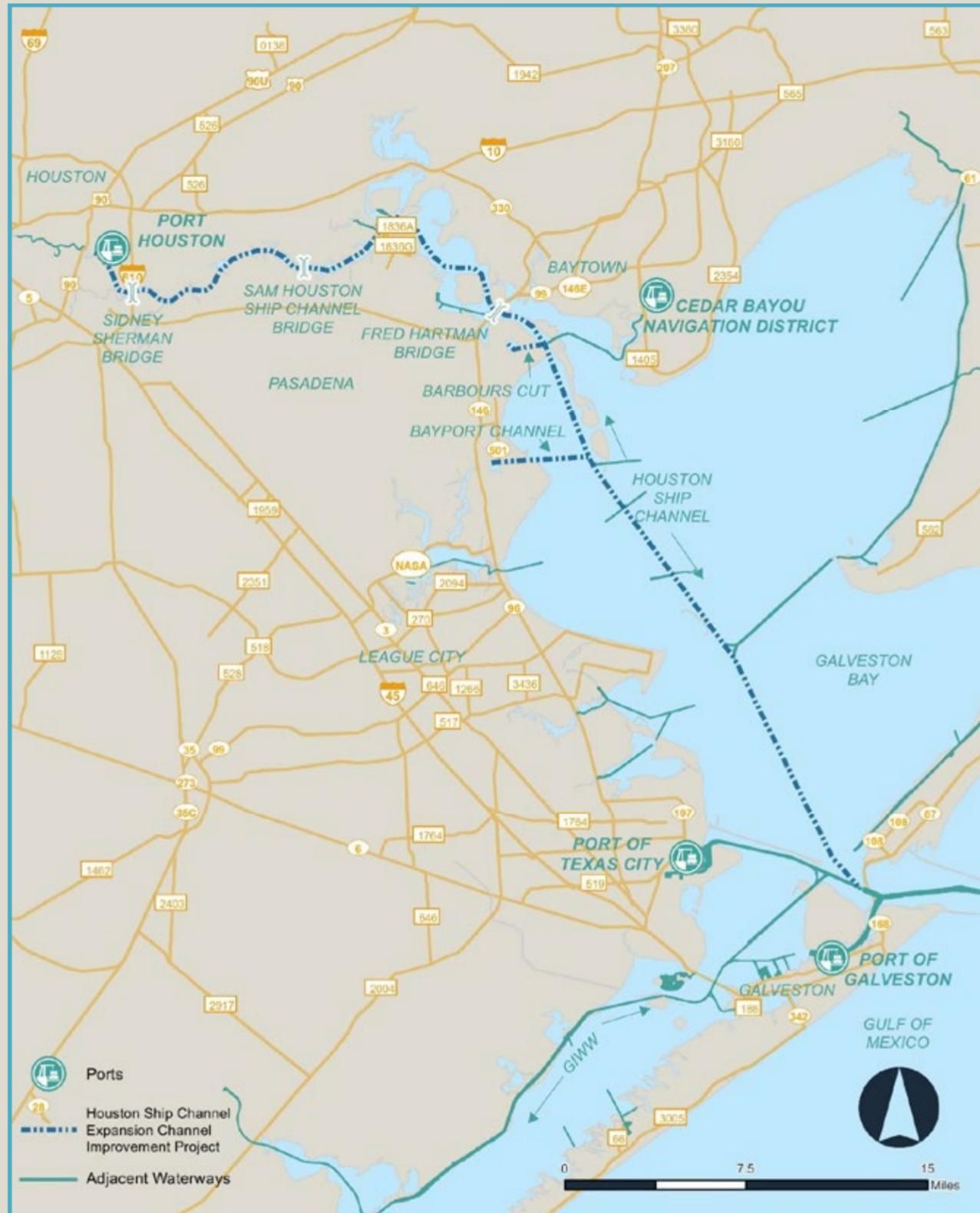
Construction of the authorized project will require dredging of an estimated 14.1 million cubic yards of new work material, or enough to fill more than one million dump trucks.

Project Cost:  
\$301,952,000



### Waterway Supported Port Facilities





## Project Details

<b>Non-Federal Sponsor (NFS)</b>	<b>Port of Houston Authority</b>
<b>Study Authority</b>	Section 216 - Flood Control Act of 1970
<b>Channel Length (Current   Proposed)</b>	50 miles   <b>50 miles</b>
<b>Channel Depth [Ft, MLLW] (Current   Proposed)</b>	37.5'   <b>41.5'</b> 41.5'   <b>46.5'</b> 46.5'   <b>46.5'</b>
<b>Channel Width [Ft] (Current   Proposed)</b>	400'   <b>530'</b> 530'   <b>700'</b>

## Key Waterway Facts

- The HSC is the busiest waterway in the U.S.
- Receives 8,000 vessel calls annually
- Transporting more than 230 million tons of cargo
- Serves the largest petrochemical complex in the nation
- Serves Port Houston which provides:
  - \$265 million in economic impact
  - \$5 billion in local & state taxes
  - 1.2 million jobs throughout Texas

## Waterway and Project Description

The Houston Ship Channel (HSC) is in southeast Texas, crossing portions of Harris, Galveston, and Chambers counties. The HSC is uniquely complex. In addition to the main 50-mile long channel, the HSC system facilitates four deep-draft tributary channels along with multiple shallow-draft channels and cuts.

The HSC Improvement Project includes widening the HSC to 700 feet from Bolivar Roads to Barboours Cut Channel near Boggy Bayou. From Boggy Bayou, the HSC has various width and depth configurations, reducing in both depth and width as the channel moves upstream of Boggy Bayou first, then Sims Bayou second, and ultimately terminates at the Main Turning Basin immediately upstream of the I-610 Bridge. This results in addressing the project as six unique segments: four segments in the main channel, Barboours Cut, and Bayport Channel.

The Recommended Plan in the Chief's Report to the Secretary of the Army proposes a wide range of channel improvements, including: widening of HSC segments from Bolivar Roads to Barboours Cut, deepening the HSC from Boggy Bayou to the Main Turning Basin, federalization of NFS improvements to Barboours Cut and Bayport Channel, and various bend easings and flare expansions.

## Project Benefits

The HSC serves a large and diverse group of users, and as a result, provides transit access for a varied vessel fleet. This project would provide for more safe and efficient vessel transit along the channel. Examples of benefits that can be achieved through implementation of this project include:

- Reduced "lightering" for Very Large Crude Carriers, which entails the process of transferring cargo from larger to smaller draft vessels
  - Increased barge movement efficiency and safety
  - Vessels longer than 1,200-feet overall would have access, which they currently do not because of bend restrictions
  - Vessels longer than 1,100-feet would not be restricted to one-way traffic, which causes channel congestion
- The expansion project will help alleviate these issues by improving the use and navigation for current and future vessels. This will help reduce delays, and increase safety and economic growth.

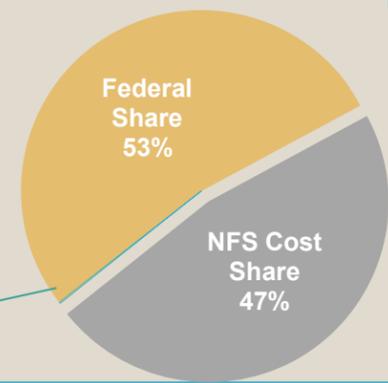
## Project Readiness and Implementation

The Feasibility Study and Environmental Impact Statement were completed in late 2019. Both were made public in January 2020. The USACE Chief's Report was signed in April 2020. The project received \$1.13 million in the USACE FY 2020 work plan for pre-construction, engineering and design. The project is awaiting federal authorization for construction.

**Project Cost:**  
\$876,848,000\*\*

\*\* Expected first construction cost based on Feasibility Study

Federally Allocated Funds as of 2020: **\$1.1 M**



## Waterway Supported Port Facilities

**Ro/Ro**

**Bulk**

**Fishing**

**Energy**

**Break Bulk**

**Container**



Project Details	
Non-Federal Sponsor (NFS)	<b>Calhoun Port Authority</b>
Study Authority	Rivers and Harbors Act of 1958; Section 216 - Flood Control Act of 1970
Channel Length (Current   Proposed)	26 miles   <b>28.5 miles</b>
Channel Depth [Ft, MLLW] (Current   Proposed)	38'   <b>47'</b> 40'   <b>49' Offshore</b>
Channel Width [Ft] (Current   Proposed)	200'   <b>300'</b> 300'   <b>550' Offshore</b>

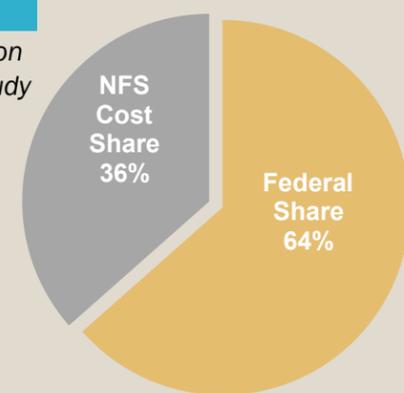
### Waterway and Project Description

The Matagorda Ship Channel (MSC) is a 26-mile federally authorized and maintained deep-draft waterway located in Calhoun and Matagorda counties. The channel provides access to the Gulf of Mexico for the Calhoun Port Authority, as well as shallow-draft vessels from Port Lavaca and the Port of Palacios. The majority of the deep-draft users are located in the vicinity of the Calhoun Port Authority facilities, which are located at the upstream terminus of the deep draft federal channel.

The USACE Chief's Report recommends adding a new 1,200 foot turning basin in the Lavaca Bay reach to accommodate the larger vessels; extending the entrance channel 13,000 feet into the Gulf of Mexico to allow for deepening to -49 feet MLLW; dredging a 1,600 foot long sediment trap in the area of the offshore bar; widening the Entrance Channel from 300 to 550 feet and the Main Channel from 200 to 300 feet; deepening the Entrance Channel from -40 to -49 feet and the Main Channel from -38 to -47 feet MLLW.

**Project Cost:**  
**\$218,325,000\*\***

\*\* Expected first construction cost based on Feasibility Study



### Key Waterway Facts

- \$12.3 billion of economic activity
- \$125 million in state and local taxes
- \$200 million in Federal taxes
- 48,000 port-related jobs

### Project Benefits

The existing channel was designed for vessels with loaded drafts of less than 38 feet MLLW. Due to this, many larger vessels are forced to light-load before entering the port. Deepening and widening the channel will fix this issue, reduce navigation costs, increase port efficiencies, and produce large amounts of sediments for beneficial use.

The existing channel was built to accommodate 25,000 – 30,000 deadweight ton (DWT) vessels; under current use, vessels up to 80,000 DWT access the channel. In the future with-project condition, it is expected that the port will begin to see mid-size Aframax tankers, which will provide nearly double the tonnage capacity of the existing lightered Panamax vessels for transporting crude oil and petroleum products.

### Project Readiness and Implementation

The Feasibility Report and Environmental Impact Statement were completed in August 2019 and the USACE Chief's Report was signed in December 2019. The project will require Congressional authorization to move forward with construction. USACE referenced the Matagorda Ship Channel Improvement project as a key project to support Congress's consideration of introducing WRDA 2020.

Construction of the proposed project will require dredging of an estimated 20 million cubic yards of new work material, or enough to fill roughly 1.7 million dump trucks, which can be used to create islands, widen beaches, and more.

### Waterway Supported Port Facilities

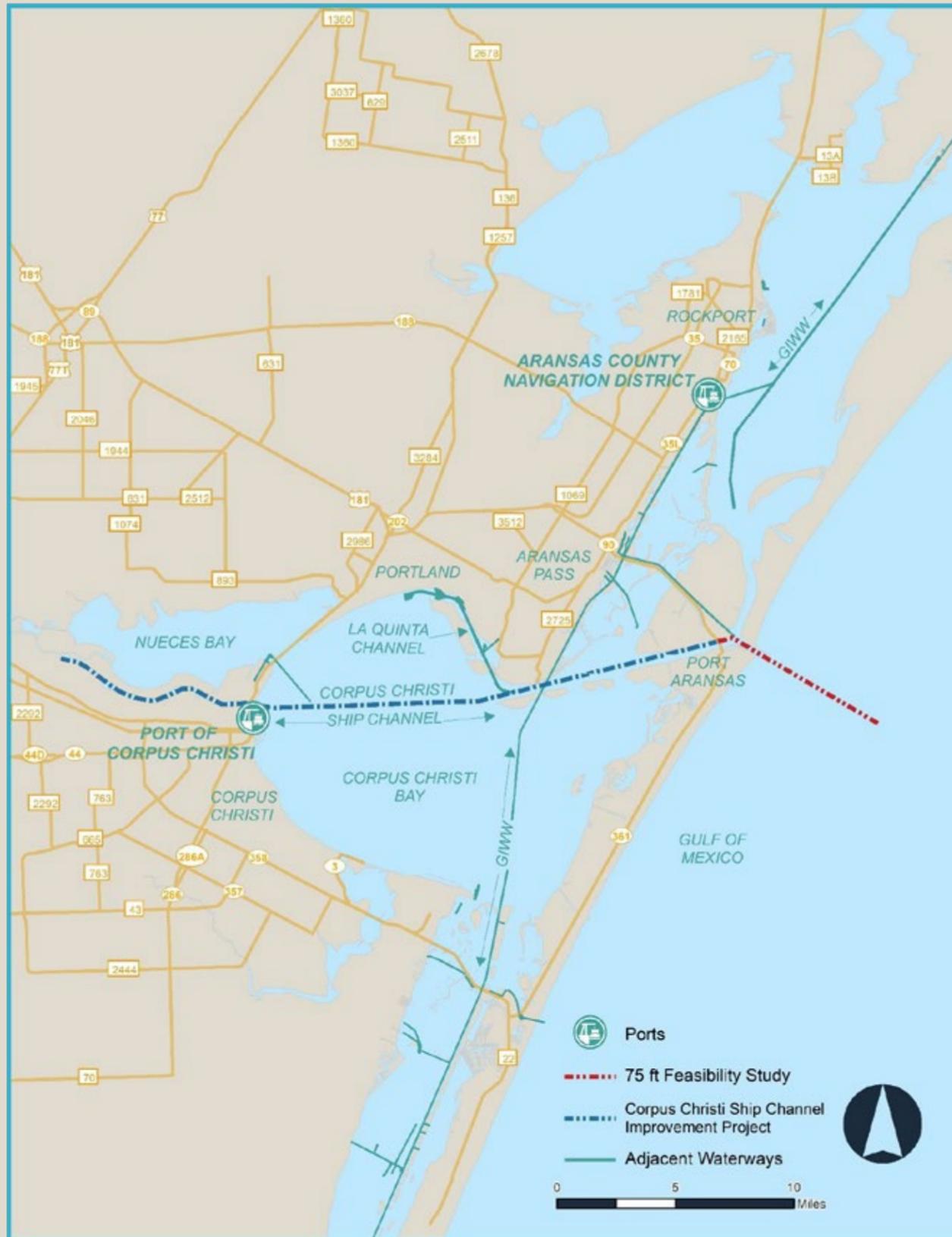
**Energy**

**Break Bulk**

**Bulk**



# CORPUS CHRISTI SHIP CHANNEL DEEPENING PROJECT FEASIBILITY STUDY



Project Details	
Non-Federal Sponsor (NFS)	Port of Corpus Christi Authority
Study Authority	WIIN 2016/WRDA 2016
Channel Length (Current   Proposed)	36 miles   <b>49 miles</b>
Channel Depth [Ft, MLLW] (Current   Proposed)	54' Ongoing   <b>75' Channel</b> 56' Ongoing   <b>77' Offshore</b>
Channel Width [Ft] (Current   Proposed)	530'   <b>530'</b> 700'   <b>700' Offshore</b>

Key Waterway Facts
<ul style="list-style-type: none"> <li>\$150 billion of economic activity for the U.S.</li> <li>\$50 billion in regional investment</li> <li>80,000 port-related jobs</li> <li>Home to the Port of Corpus Christi Authority: <ul style="list-style-type: none"> <li>#1 U.S.-produced crude oil export port <ul style="list-style-type: none"> <li>2.3 million barrels/day forecasted for 2020</li> </ul> </li> <li>#3 largest U.S. port by 2019 tonnage <ul style="list-style-type: none"> <li>Over 140 million tons forecasted for 2021</li> </ul> </li> </ul> </li> </ul>

### Waterway and Project Description

The Corpus Christi Ship Channel (CCSC) is currently authorized for deepening improvements as part of the 54-foot CCSC Improvement Project, shown previously. The feasibility study for the 54-foot project was authorized in 1990; the Chief's Report was released in 2003, and the project was authorized by Congress in the 2007 WRDA. Additional studies of the main channel continued until 2015 while the La Quinta Channel was lengthened and deepened.

### Project Benefits

A full benefit-cost analysis has not yet been developed for this project. Qualitatively, the project is expected to eliminate or reduce the need for light-loading, thus increasing the efficiency of export facilities, reducing vessel congestion in the channel, and increasing the total tonnage moved through the port.

Other benefits could include:

- Accommodating future port growth/expansion;
- Beneficially using dredged material to construct special aquatic site habitats; and
- Reducing CO<sub>2</sub> emissions from hoteling vessels.

Foreseeing that the timeline for future construction could be decades, the Port of Corpus Christi Authority (PCCA) is conducting a new study concurrent with the 54-foot improvements. The main goals of the new study will be to allow PCCA to increase crude oil export efficiency from a proposed crude oil export terminal at Harbor Island by eliminating or reducing light loading and to accommodate fully-laden, larger vessels, such as Very Large Crude Carriers. It is expected that the channel depth will range from approximately -75 feet within the channel to -77 feet offshore in the Gulf of Mexico. In order to facilitate this deepening, the entrance channel will be extended an additional 10 miles into the Gulf of Mexico. No additional widening is expected, but the existing inner turning basin at Harbor Island would be expanded.

### Project Readiness and Implementation

The Feasibility Study and Environmental Impact Statement have been initiated and are expected to be completed in 2022. Funding is entirely provided by the Port of Corpus Christi Authority.

*PCCA has not received federal authorization for the -75-foot project study, and is working to complete the study independently. Concurrently, PCCA is also conducting a study for the smaller La Quinta Channel, which is a federally authorized study.*

### Waterway Supported Port Facilities



**Ro/Ro**



**Bulk**



**Energy**



**Break Bulk**

**Project Cost:**  
**\$525,000,000\*\***

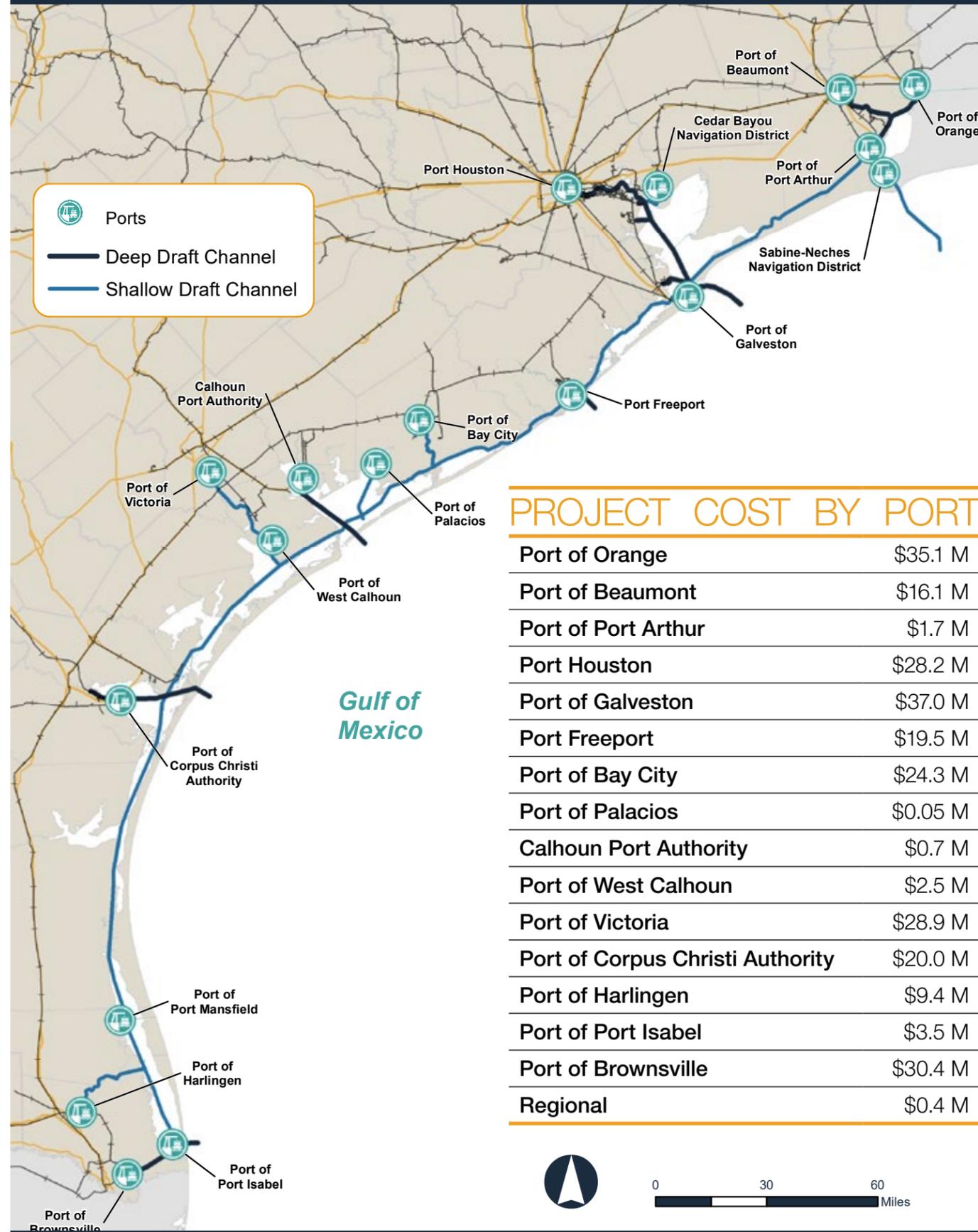
NFS Cost Share  
**100%**

\*\* Expected first construction cost provided by PCCA



PORT  
CONNECTIVITY  
REPORT

# Ports Studied



## PROJECT COST BY PORT

Port of Orange	\$35.1 M
Port of Beaumont	\$16.1 M
Port of Port Arthur	\$1.7 M
Port Houston	\$28.2 M
Port of Galveston	\$37.0 M
Port Freeport	\$19.5 M
Port of Bay City	\$24.3 M
Port of Palacios	\$0.05 M
Calhoun Port Authority	\$0.7 M
Port of West Calhoun	\$2.5 M
Port of Victoria	\$28.9 M
Port of Corpus Christi Authority	\$20.0 M
Port of Harlingen	\$9.4 M
Port of Port Isabel	\$3.5 M
Port of Brownsville	\$30.4 M
Regional	\$0.4 M



# INTRODUCTION

Texas seaports rely on a multi-modal freight network with safe and efficient landside connections – including roadways, railroads, and pipelines – that facilitate the movement of materials, goods, and people to and from the ports. Even the perception of landside mobility challenges can cause customers to route ships away from Texas ports. Investments in inland intermodal connectivity not only make the individual ports more competitive, but can also benefit communities through creating more efficient and safer transportation systems while supporting the state’s economic vitality. The state should consider both direct investments in port-centered connectivity improvements and work with the ports and their communities to secure funding from other non-state sources. These investments will sustain expected increases in shipping and support employment and improved quality of life in Texas’s seaport cities.

The Port Authority Advisory Committee (PAAC), working with the Texas Department of Transportation Maritime Division, has completed this evaluation as part of the 2022-2023 Texas Ports Mission Plan (PMP), the maritime mission plan required in Chapter 55 of the Texas Transportation Code. The PMP highlights the importance of investing in the port system in order to meet the growth potential of global trade opportunities. The Port Connectivity Concise Report summarizes an effort to assess the current state of inland connectivity at 20 public ports and navigation districts along the Texas Gulf Coast. It focuses on roadway connections – and in some instances rail and pipeline links – between the

port gates and major freight corridors. This study evaluates the existing conditions of landside port access roads, identifies deficiencies or areas of concern, and evaluates potential solutions to address those issues. The outcome of this analysis is a list of recommended solutions directed at the ports’ most pressing connectivity issues that the ports and TxDOT can evaluate for potential implementation.

## Challenges for Port Connectivity

Transportation conditions and needs are unique to each port. These can include diverse challenges like incompatible surrounding lands uses, modal conflicts, and design and operational inefficiencies. Texas’s seaports face a range of intermodal connectivity issues that in combination create impacts rippling throughout the transportation system.

Some of the major challenges for port connectivity include:

- Freight Conscious Roadway Design
- Truck Queuing
- Modal Conflicts
- Incompatible Land Uses



# FREIGHT CONSCIOUS ROADWAY DESIGN

## Description of Issue

Local roadway access routes between Texas ports and the highway network provide the final, critical link in the complex system that has evolved to move freight through the state and beyond. The location, design, and operational conditions of local truck routes affect both the efficiency of freight movement and the impacts of truck traffic on communities surrounding ports. By designing roadways that better support the movement of trucks, connecting goods to the transportation system can be made more efficient, safer, and less disruptive to residents and the traveling public. Local roadways providing the “last mile” connections between ports and the highway freight network may have narrow lanes, lack sufficient shoulders, have small turning radii at key intersections, and may lack wayfinding signage. Additionally, these roads may not be constructed for oversize/overweight (OS/OW) vehicles that are often traveling in and out of ports, which may deteriorate pavement conditions faster than anticipated. Even on limited access facilities, freight design is important since trucks need longer acceleration and deceleration lanes than passenger vehicles. Because of their higher center of mass, trucks are susceptible to overturning on sharp roadway curves. Changes in roadway elevation can limit sight distance, which can affect safe stopping distances. With the trends of freight movement by truck projected to increase, designing for freight is critical to maintaining safe and operational roadways.



Oversize/overweight cargo moving from the Port of Port Arthur on local road network.



Port of Brownsville wind turbine cargo.

## Case Study

The Port of Port Arthur is an important facility for handling break-bulk cargo, including forest products, steel, and military deployments. It is located 20 miles from the National Highway Freight Network and the heavy truck traffic generated by port activities relies on the state and local networks to move goods into and out of the Port. Currently, the intersection of SH 82 and SH 87 is a crash hotspot due to inadequate turning radii, short turn lanes, and an adjacent at-grade railroad crossing. The existing left-turn lane is approximately 80 feet long, which is only enough storage for one truck. With a freight-conscious redesign of the intersection, a longer turn lane would provide storage for more vehicles, reducing congestion and delays and potentially improving safety. Additional lane reconfiguration, restriping and retiming of traffic signals would alleviate heavy peak period traffic at this intersection.

**Freight movement by truck is projected to increase. Designing for freight is critical to maintaining safe and operational roadways.**

# FREIGHT CONSCIOUS ROADWAY DESIGN

## Solution

Consider these roadway design factors during rehabilitation or reconstruction planning for local roads that accommodate significant freight traffic:

**Direct link to Highway Freight Network:** A local freight route can minimize conflicts with other roadway users and adjacent land uses when it offers the most direct practical connection. The shortest route between the port and the freight network that offers the least indirection of travel for trucks is the most desirable. Routes that present few complexities such as turns or one-way street segments ease navigation.

**Adequate Road Geometry:** Trucks and other large vehicles operate most efficiently when roadway design is appropriate for their size, turning ability, and acceleration/ deceleration characteristics. Important geometric considerations include number of lanes, intersections with adequate turning radii and queuing lanes for long vehicles, adequate shoulder width to allow disabled trucks to move out of traffic, absence of physical bottlenecks that can cause congestion, minimal steep grade changes, and the absence of right-of-way encroachments.

**Adequate Bridge and Pavement Maintenance and Design:** Deteriorated pavement and structures are causes of concern for truck operators. Trucks create high levels of wear on roadway surfaces and bridges. In some cases, pavement or bridge conditions may deteriorate to the point that weight restrictions are necessary, forcing trucks to find alternate connections to the freight network.

**Adequate Vertical Clearances:** Bridges, sign structures, utility lines, signal structures and other overhanging items can cause safety and operational issues for truck traffic. Older bridges, especially those not constructed to current vertical clearance standards, can be particularly problematic, especially if roadway overlays have gradually reduced these clearances even further.

**Operational Characteristics:** Several key roadway operational factors can affect the utility of truck routes. Such factors include adequate signal clearance phases or protected turn phases and adequate signage for trucks to utilize designated routes for port access.



Port Arthur cargo at gates.

# TRUCK QUEUING

## Description of Issue

Safely and efficiently accommodating high volumes of truck traffic is critical to port operations and requires specially designed facilities. These accommodations include truck queuing lanes, designated truck parking areas, and designated staging areas. During peak activity, trucks often must wait along state and local roadways to access the port entrances, exacerbating congestion and causing safety problems by blocking cross streets and creating bottlenecks along thoroughfares. Not providing proper accommodations for trucks creates inefficient and unsafe conditions for trucks and other users.



*Trucks queued at entrance to the Calhoun Port Authority.*



*Trucks queued during grain season on the Joe Fulton International Trade Corridor in Corpus Christi.*

## Case Study

The Port of Corpus Christi Authority experiences an influx of truck traffic along the Joe Fulton International Trade Corridor during the grain season when product must be transferred quickly to its destinations. Currently, the port facilities have limited parking and queuing areas for trucks waiting to access loading areas. There is limited roadway space on the access route and trucks often have to wait on the side of the road, affecting mobility in the area. The Port of Corpus Christi Authority was recently awarded Port Access Improvement Program funding for a roadway improvement project adding a truck queuing area with a buffer zone to separate waiting trucks from moving traffic. Construction improved safety and eased congestion on the Joe Fulton International Trade Corridor.

## Solution

Texas ports generate high volumes of truck traffic. Without adequate storage, accommodating these volumes can have negative consequences for safety and operations of the roadway system. Transportation officials can identify appropriate areas to provide truck queuing lanes, staging areas, and parking for trucks. The facilities can be located in proximity to port terminals and intermodal operations and can be designed to facilitate truck movement to and from the regional highway system.

# MODAL CONFLICTS

## Description of Issue

When thinking about mobility needs for ports, it is important to consider the various types of commercial activity and users a port serves. Mixing multiple modes such as trains, trucks, passenger vehicles, and pedestrians can cause safety issues and may lead to increased congestion, even in areas where land use is largely industrial or devoted to port activities. At-grade railroad crossings can cause significant delays for trucks and passenger vehicles as well as safety concerns at more remote crossings which may be located on higher speed roadways with limited signage and advanced warning. Additional safety concerns arise when pedestrians and cyclists are mixed with vehicular traffic, both with and without proper accommodations such as sidewalks and shared use paths. It is difficult for pedestrians to cross streets with heavy truck traffic due to the vehicles' slow acceleration and deceleration and limited maneuverability.



*Pedestrians walk to the Port of Galveston cruise terminal.*

## Solution

Transportation facilities should balance the mobility needs of various users. Pedestrian facilities should be provided where needed for public safety. Such facilities would benefit cruise passengers and port employees by safely separating them from truck and rail traffic. This could include improvements such as sidewalks or separated paths, pedestrian signals at intersections, street hardscaping, pedestrian lighting, and wayfinding.

## Case Study

The Port of Galveston is the only cruise port in Texas and is the 4th busiest in the United States. The Port also handles containerized cargo, dry and liquid bulk, break-bulk, roll-on/roll-off cargo, and project cargo. Cruise terminals require civilian access separated from the secured port operating facilities. Port Industrial Road serves as one of the principal routes taken by traffic entering and exiting the Port of Galveston facilities. In addition to serving heavy truck traffic, this road is used by cruise ship passengers, many of whom park in the parking lots west of the terminal and then walk to the terminal. Although shuttles to the cruise terminal are provided, some passengers choose to walk to the terminal even though the road is in poor condition and doesn't have pedestrian facilities. This leads to safety concerns for pedestrians.

**Mixing multiple modes such as trains, trucks, passenger vehicles, and pedestrians can cause safety issues and may lead to increased congestion, even in areas where land use is largely industrial or devoted to port activities.**

# INCOMPATIBLE LAND USES

## Description of Issue

Many cities grew up around ports, but as port operations and industries have grown, the presence of the port can impact community quality of life. Truck traffic can create conflicts with surrounding land uses due to noise and emissions from diesel engines, induced congestion, increased safety risk, vehicle width, hazardous cargo and other factors. Heavy truck traffic is especially disruptive to residential areas and conflicts may arise between transportation users in areas with considerable pedestrian and bicycle activity, such as schools, parks, small scale retail districts, transit routes, or areas sensitive to noise such as hospitals, cemeteries, and community facilities.



Residential areas are adjacent to port facilities at the Port of Beaumont.

## Case Study

The Port of Beaumont is located adjacent to a residential area with parks, schools and places of worship. Trucks and trains accessing the Port must traverse through this neighborhood. As the Port facilities have expanded over time to handle increasing port activity, safety has become a major concern for the residents due to conflicts between port traffic and others. Aggregate material dump trucks accessing the east port entrance and trucks accessing the Exxon facility don't have a direct access route and must drive along residential streets to reach their destinations. Because of the lack of a direct route for industrial uses, trucks carrying hazardous cargo to and from the Exxon facility often use the same road that serves as a bus route through the community.



Designated hazardous materials route near the Port of Beaumont is located in a residential area.

## Solution

Designated or highly utilized truck routes should be located in areas with low intensity uses, lower traffic volumes, and lower development density such as industrial or agriculture areas. Where feasible, provide alternate routes to remove truck traffic from areas with incompatible land uses and to separate heavy truck traffic from local traffic such as passenger vehicles, pedestrians and bicyclists. In the case of the Port of Beaumont, providing a direct access road that serves both the Port and Exxon would minimize conflicts and improve safety and quality of life in the neighboring community while also improving truck operations in the area.



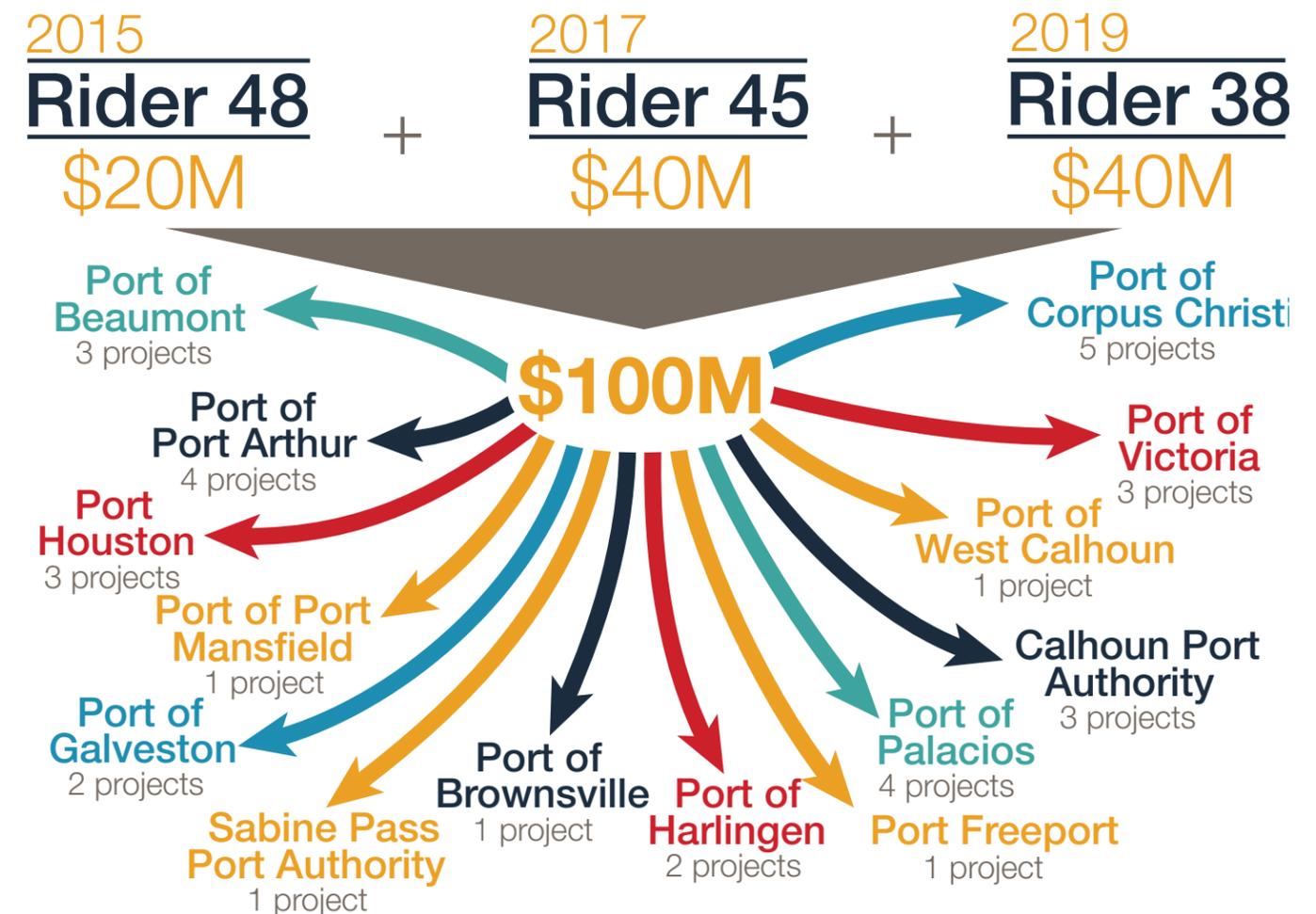
Hazardous cargo being transported on road adjacent to private residence.

# PREVIOUS CONNECTIVITY ACTIVITIES

While the state has funded multi-modal infrastructure, funds are limited since they can only come from sources that are not constitutionally dedicated to highway purposes. This greatly limits flexibility to fund port access roads, many of which are off-system facilities that do not fall under traditional TxDOT planning processes and funding sources.

During past legislative sessions, the Texas Legislature has included three separate riders to help fund port access improvements. The 84th Legislative Session adopted Rider 48 which allocated up to \$20 million of Texas Mobility Fund (TMF) funds to port capital improvements. The 85th Legislative Session adopted Rider 45, which allocated up to \$20 million each fiscal year for a total \$40 million to be spent on port access improvements. Finally, in 2019, Rider 38 allocated an additional \$40 million to be expended over two fiscal years. The \$100 million from these riders has been committed to 34 public roadway projects proposed by the ports, selected by the Port Authority Advisory Committee, and approved by the Texas Transportation Commission. As of September 2020, 11 of these projects were completed, and eight were underway.

The \$100 million from three Riders has been committed to 34 public roadway projects proposed by the ports, selected by the Port Authority Advisory Committee, and approved by the Texas Transportation Commission.



# CONNECTIVITY FUNDING NEEDS

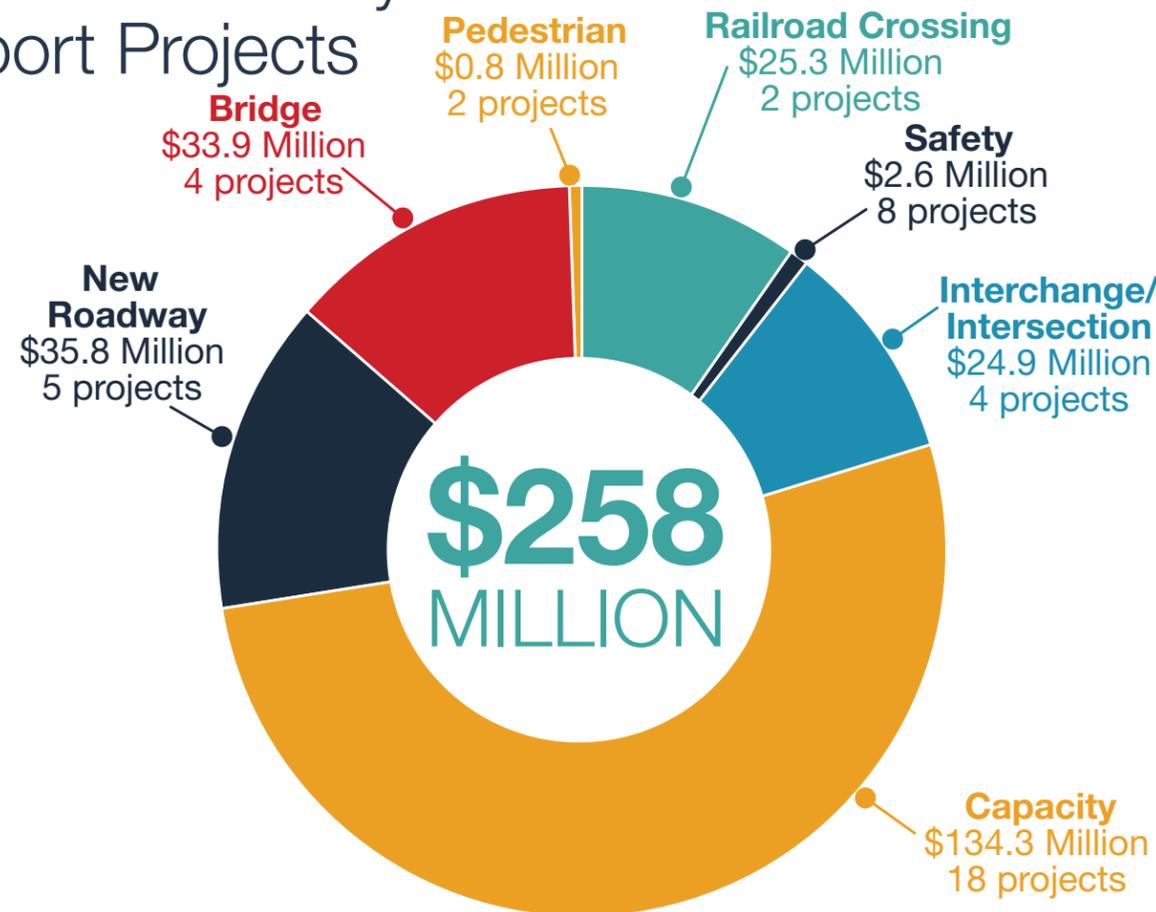
In 2017, TxDOT completed a comprehensive freight mobility plan, which identified, among other items, \$3.2 billion in projects designed to improve port-related freight movement. Approximately \$3 billion worth of those port related projects have yet to be undertaken or funded. The 2020-2021 Texas Ports Mission Plan Connectivity Analysis identified a further 42 projects worth approximately \$210 million to benefit port-related mobility. These included projects in seven categories: interchange/intersection improvements, capacity enhancement, new roadway construction, rail crossing improvements, bridge projects, safety enhancements, and pedestrian improvements.

This report identifies and prioritizes projects drawn from both those planning efforts, as well as new projects designed to enhance port connectivity in response to emerging markets served by Texas seaports. The 2022-2023 PMP prioritizes an additional 43 projects in those seven categories worth approximately \$258 million. The majority of those projects are currently unfunded.



Intermodal connectivity at Port of Port Arthur.

## Port Connectivity Report Projects



# IDENTIFYING PORT CONNECTIVITY NEEDS

To assess each port's connectivity to the roadway, rail, and pipeline networks, and to identify deficiencies in those connections, the study team interviewed port administrators and analyzed technical data. This effort provided a full picture of existing port connectivity issues and identified future needs as the ports evolve to serve emerging freight markets.

Interviews were conducted with port administrators to identify the key multimodal connectivity issues facing the ports at the interface between maritime navigation and the state's other transportation systems. The ports operate at varying scales, to facilitating the transport of a range of goods including petroleum products, agricultural goods, finished cargoes, and the catches of the commercial fishery.

The interviews focused on five elements:

- Connectivity projects begun or completed since the 2020-2021 PMP
- Future of port operations
- Major roadway issues facing the port and its tenants
- Major rail or pipeline issues facing the port and its tenants
- Desired connectivity projects

The information compiled from these interviews complements a thorough review of connectivity data to identify key issues and a suite of shorter- and longer-term improvements to the overall transportation systems moving goods from the ports across the globe.



Port Freeport 2013-2017 crash density, railroad crashes are shown as purple triangles and truck related crashes are shown as green circles.

Access Route Limits	Fatal and Incapacitating (K&A crashes)		Railroad Related		Truck Related	
	Crash Count	Crashes/mile	Crash Count	Crashes/mile	Crash Count	Crashes/mile
<b>E. Broad Street</b> Pine St.-Terminal St.	0	0	0	0	1	2.8
<b>Terminal Street</b> E. 8 <sup>th</sup> St.-E. 2 <sup>nd</sup> St.	0	0	0	0	0	0
<b>E. 8<sup>th</sup> Street</b> Pine St.-Terminal St.	0	0	0	0	0	0
<b>Pine Street</b> Nolan Ryan Expy-E. 8 <sup>th</sup> St.	0	0	1	2.4	5	11.9
<b>Pine Street</b> E. 8 <sup>th</sup> St.-Old Surfside Rd	0	0	0	0	6	5.7
<b>Navigation Blvd.</b> Old Surfside Rd.-Baldwin St.	0	0	0	0	1	1.4
<b>Baldwin Road</b> Navigation Blvd.-SH 332	0	0	2	1.9	14	13.5
<b>FM 1495</b> Quintana Rd. Nolan Ryan Expy	0	0	0	0	0	0
<b>Nolan Ryan Expressway</b> Pine St.-SH 200	2	1.1	0	0	6	2.4

Source: TxDOT CRIS data, 2013-2017

Table reporting the type of crashes on each roadway at Port Freeport.

# IDENTIFYING PORT CONNECTIVITY NEEDS

To assess each port's connectivity to the roadway network, relevant roadway data were compiled into a Geographic Information System to provide a visual assessment of the current conditions and needs and to identify and locate barriers to connectivity. Following this needs assessment, potential solutions were identified, evaluated for their ability to address identified needs, and ranked against performance criteria to generate a final list of solutions to enhance port connectivity.

## Selected Data

<b>Data Collected</b>	<ul style="list-style-type: none"> <li>National Highway Freight Network (NHFN)</li> <li>Texas Highway Freight Network (THFN)</li> <li>Oversize/Overweight (OSOW) Routes</li> <li>Class I Railroads</li> <li>Other Railroads</li> <li>5-years (2013-2017) of crashes, including those related to trucks and rail</li> </ul>	<ul style="list-style-type: none"> <li>Railroad crossing type (at-grade, overpass, underpass)</li> <li>Vertical clearances at bridges</li> <li>United States Army Corps of Engineers (USACE) dock locations</li> <li>USACE maintained dredged channels</li> </ul>
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Data collection focused on roadway performance measures, conflicts with railroads, identifying primary and secondary freight routes between port facilities and the highway freight network, gate and dock locations, and port development plans.

## Landside Connection Evaluation Criteria

<b>Roadway Network Data</b>	<ul style="list-style-type: none"> <li>Roadway Related</li> <li>Known Railroad Conflicts</li> <li>Within 5 Miles</li> <li>Public Road</li> </ul>	<ul style="list-style-type: none"> <li>TxDOT Facility</li> <li>Connected to NHFN</li> <li>On THFN</li> <li>Connected to THFN</li> </ul>
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<b>Port Connectivity Data</b>	<ul style="list-style-type: none"> <li>Within 1 Mile</li> <li>Serves Developed Terminal</li> <li>Serves Emerging Terminal</li> </ul>
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<b>Planned Improvements Data</b>	<ul style="list-style-type: none"> <li>Statewide Transportation Improvement Plan (STIP)</li> <li>2017 Texas Freight Mobility Plan</li> <li>Rider 48/45 Projects</li> <li>Port Capital Program</li> </ul>	<ul style="list-style-type: none"> <li>2018 Unified Transportation Plan (UTP)</li> <li>2017 Texas Port Access Study</li> </ul>
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Roadways were evaluated based on their capacity, truck volumes, bridge sufficiency ratings and clearances, safety performance, and other characteristics. Performance thresholds were established in order to identify the segments with the greatest transportation inefficiencies. These recognize both current and projected issues and as the ports respond to emerging market opportunities over the next decade.

## Performance Data

### Mobility



- Peak hour/peak direction Volume to Capacity (v/c) ratio
- Number of at-grade rail crossing
- Daily truck volume
- Texas Critical Freight Corridors

### Structures



- Bridge posting
- Sufficiency rating
- Vertical clearance

### Safety



- Fatal crashes per mile
- Incapacitating injury (K & A) crashes per mile

# CONNECTIVITY SOLUTIONS

The analysis culminated in a list of recommended solutions to address key port connectivity deficiencies. The ports and TxDOT may continue to evaluate these solutions for implementation. These solutions were derived from three sources:

- Projects developed or requested by port administrations
- Projects developed or recommended in previous iterations of the PMP
- Projects developed by the study team, including the input of planners, roadway designers, structural engineers, and other professionals.

TxDOT's performance-based process for prioritizing and programming potential transportation projects was used to evaluate the universe of potential projects for their ability to improve these factors: Safety, Preservation, Congestion, Connectivity, Environmental, Economic. Solutions were also evaluated for their readiness for implementation.

Key solutions with the greatest potential to meet port connectivity needs and provide additional local and regional transportation benefits are highlighted in the PMP Connectivity Report and its appendices. These solutions feature improvements to the roadway and rail systems and range in scale from small studies and operational adjustments to major infrastructure investments. All are considered to improve connectivity for the goods transported through the state's seaports, and many have the potential to improve transportation more generally for all travelers.

This study identified 43 priority solutions to address connectivity and safety concerns within the study area. These projects total approximately \$258 Million.



**TxDOT's performance-based process for prioritizing and programming potential transportation projects was used to evaluate the universe of potential projects for their ability to improve these factors: Safety, Preservation, Congestion, Connectivity, Environmental, Economic.**

# PORT CONNECTIVITY PROJECT LIST

Port	Improvement Type	Project Name	Cost Estimate (\$M)
Port of Orange	Safety	Add medians along SH 87 between I-10 and Green Ave	\$1.5
	Safety	Complete access management study along SH 87 between I-10 and Green Ave	\$0.1
	Capacity	Expand Alabama St	\$3.3
	Capacity	FM 1006 expansion and resurface for oversize/overweight (OS/OW)	\$30.2
Port of Beaumont	Capacity	Improve Marina St access to Industrial Island for OS/OW including bridge over Neches River	\$6.1
	New Roadway	Construct Carroll Street overpass	\$10.0
Port of Port Arthur	Safety	Safety & Access Management Study of US 69 from SH 73 - SH 87	\$0.1
	Intersection	Intersection of SH 82/87 - Signalize slip lanes and add all red traffic signal phase to intersection	\$0.9
	Capacity	Reduce at grade RR crossings by dead ending local streets north of port entrance	\$0.7
	Safety	Jacintoport Road Area Freight Safety and Operations Plan	\$0.3
Port Houston	Capacity	Jacintoport Road improvements	\$27.0
	Safety	Federal Road access management and safety study	\$0.3
	Capacity	Upgrade Clinton Dr to 3 lane with two way left turn lane	\$0.3
	Safety	Barbours Cut Area Operations & Safety Study	\$0.3
	Capacity	Develop Port to I-45 Connectivity Plan	\$0.4
Port of Galveston	Capacity	Four lane extension on 61st St from Broadway/SH87 to Harborside Drive/SH-275	\$17.3
	Bridge	Improve Pelican Island Causeway Bridge to increase loading and reconfigure roadways around Texas A&M Galveston campus	\$18.5
	Pedestrian	Add sidewalks along Harborside Dr between 37th and 25th St	\$0.1
	Pedestrian	Improve pedestrian bridge over Harborside Dr and RR	\$0.7
Port Freeport	Safety	FM 1495 Operations & Safety Study	\$0.03
	Bridge	Replace Pine St bridge	\$15.0
	New Roadway	Develop frontage/backage roadway system to SH 36 for port expansion	\$2.8
	Capacity	Roadway improvements, signage, and security system for main gate complex	\$1.7
Port of Bay City	Capacity	FM 2668 widening/capacity improvements	\$23.2
	Capacity	FM 3057 expansion for permanent truck queuing	\$1.1



Railroad crossing in Victoria.

Port	Improvement Type	Project Name	Cost Estimate (\$M)
Port of Palacios	Capacity	Designate Henderson Ave (SH 35) as primary truck route	\$0.01
	Safety	Conduct access management study and complete safety improvements	\$0.04
Calhoun Port Authority	Intersection	Improvements to intersection of SH 35/FM 1593	\$0.7
Port of West Calhoun	Capacity	Improve truck route into Seadrift: truck route designation, Gates Rd improvement, intersection improvement	\$2.5
	Intersection	Intersection of US 59/SR 185 congestion & safety improvements (Texas U-turn, one-way frontage roads)	\$3.3
Port of Victoria	Capacity	Widen public access road to allow for truck queuing that doesn't restrict movement	\$0.6
	Railroad	Replace Rail Lift Bridge over the Victoria Barge Canal at Bloomington	\$25.0
Port of Corpus Christi	New Roadway	Add 5,100' of frontage road along the inside of future rail corridor adjacent to JFIT Corridor	\$5.5
	Capacity	Planning to develop OSOWOH Route from Port to T/NHFN - Study	\$0.2
	Railroad	Improve RR crossing signage and warning devices on SH 361	\$0.3
	New Roadway	New Roadway (SH 200) - West of Ingleside	\$14.0
Port of Harlingen	Capacity	Widen and Improve FM 106 to accommodate OS/OW	\$9.2
	Capacity	Designate FM 509 to FM 106 as primary truck route; capacity improvements at FM 509/106 intersection	\$0.2
Port of Port Isabel	New Roadway	Bypass road from Port to SH 48	\$3.5
Port of Brownsville	Intersection	Improvements to SH 550 - high congestion at SH 511 interchange	\$20.0
	Capacity	Internal Port Road Improvements (Ostos Rd)	\$10.4
Regional Projects*	Bridge	MLK Bridge improvement and location study	\$0.3
	Bridge	Develop OSOW plan for SH 35 bridges between Bay City and Corpus Christi	\$0.1
<b>Total</b>			<b>\$257.7</b>

\*Blue shading represents the TxDOT Beaumont District and green shading represents the Yoakum and Corpus Christi Districts.



Port Houston navigation channels.

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*Front Cover: Port of Brownsville.  
Back Cover: Port of Victoria.*