Generating over $242 billion in annual overall trade, Texas ports play an essential role in driving the Texas economy. In 2019, Texas became the number one state in maritime commerce by tonnage, overtaking Louisiana. Three of the top five ports in the U.S. based upon tonnage were in Texas with Port Houston becoming the tonnage leader among U.S. ports for the first time. Even during the coronavirus pandemic, Texas ports stayed in business—protecting jobs, bolstering the economy, and keeping shelves stocked with food and medical supplies for consumers. Despite the effects of the pandemic and in part due to the strong export market for oil and gas, Texas ports continue to thrive.

**FAST FACTS**

- **1.8 MILLION** jobs supported by the port industry (↑ 12.5% since 2015)

- **597.5 MILLION** total tons of cargo moved makes Texas 1st in U.S. maritime commerce (↑ from 2nd place in 2018)

- **$102 BILLION** personal income and local consumption supported by the port industry (↑ 11% since 2015)

- **$7.8 BILLION** state/local tax revenue generated by port industry (↑ 13% since 2015)
TEXAS MARITIME SYSTEM AND NEEDS

The Texas maritime system includes 11 deep draft ports, eight shallow draft ports, and the 379-mile-long Texas arm of the Gulf Intracoastal Waterway (GIWW). Ports are a vital part of the national freight network, helping farmers move their product to markets overseas, bringing raw materials to Texas manufacturers and clothes, electronics, and other consumer goods to all Texans. All of the Texas ports are interconnected by the GIWW, a shallow draft channel that links intrastate barge traffic with ocean-going vessels and handles both domestic and foreign trade.

Texas ports are critical to the economic growth of Texas and affect all Texans. The total economic value of the port and maritime cargo activity provided by the Texas ports and GIWW was estimated at just under $450 billion in 2018. To better support Texas businesses, the maritime industry must continually improve port facilities, waterways, inland connectivity to the ports, and the GIWW via maritime improvement projects. Port project needs are outlined in the 2022-2023 Texas Port Mission Plan.

MARITIME PROJECT TYPES

<table>
<thead>
<tr>
<th>PROJECT TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Facilities</td>
<td>Port facility improvements inside the gates include berth expansions, terminal developments, cargo laydown area expansions, and dock improvements.</td>
</tr>
<tr>
<td>Ship Channels</td>
<td>Projects are federally authorized construction projects for waterway deepening and widening.</td>
</tr>
<tr>
<td>Inland Connectivity</td>
<td>Projects outside the gates improve interchanges and intersections, reduce congestion and improve mobility, enhance safety, improve rail and bridge crossings, and improve pedestrian access.</td>
</tr>
<tr>
<td>Gulf Intracoastal Waterway</td>
<td>Projects include maintenance dredging, identifying new dredged material placement areas (DMPAs), and construction for navigation improvements.</td>
</tr>
</tbody>
</table>

Brazos River Floodgates & Colorado River Locks

The Brazos River Floodgates & Colorado River Locks are outdated structures that contribute to significant safety hazards and navigational delays on the GIWW. Beginning in 2016, TxDOT partnered with the U.S. Army Corps of Engineers to analyze various modifications to modernize these new facilities. The improvements outlined in the study would reduce bottlenecks and allisions on the GIWW that currently cause up to 12-hour-long delays.

This priority project was authorized by Congress in the Water Resources Development Act of 2020. Before construction on the planned improvements can begin, the project must receive funding from Congress, which is typically done via an Energy and Water Development Appropriations Act. The one-time construction cost is estimated at $409.7 million and will be borne entirely by the federal government.

Other GIWW Needs

1. Maintenance Dredging

The Corps does not receive adequate funding to maintain the GIWW to its authorized dimensions. Just one foot of lost draft across the GIWW system increases costs for barge operators by $58.7 million annually, a 14.8 percent increase in the cost of doing business. The average annual cost to maintain the GIWW to its authorized depth is $56 million. In FY 2020, the U.S. Army Corps dedicated $40.4 million—nearly 40 percent less than what is needed—to maintenance dredging.

2. Dredged Material Placement Areas

Dredged Material Placement Areas, or DMPAs, are sites that are authorized to contain dredged material after it is extracted from waterways. New DMPA acquisitions will be needed over the next several years as existing DMPA capacity decreases. The cost to ensure that TxDOT can make timely acquisitions of future DMPAs is estimated to be $1.6 million per biennium.
**VOLATILITY IN THE ENERGY MARKETS**

**During 2019 and 2020, leading petroleum producers Saudi Arabia and Russia increased exports to increase their world market shares. This increase in supply, combined with the coronavirus pandemic, caused a decrease in the world demand for petroleum and resulted in an oversupplied market. The resulting drop in crude oil prices below the cost of production significantly impacted Texas producers. As a result, weekly exports at Texas ports declined by almost half from June 2019 to June 2020, when exports began to rebound.**

The tickle-down effects associated with the volatility in the energy markets and subsequent loss of business impact port revenues over the long term. The uncertain future for the energy market has had repercussions for future planned pipelines, offshore crude terminals, and LNG export terminals in Texas.

**Pipelines**

It was expected that 2019 and 2020 would be record years for crude pipeline and buildout projects. With the global pandemic, only a quarter of the planned pipeline capacity miles were constructed in 2020, and most pipeline construction projects have been deferred to 2021 or later. Without the construction of anticipated pipelines, the receiving ports (namely, Houston, Corpus Christi, Beaumont, Freeport) may be forced to defer expansion and capital improvement projects.

**Deepwater Crude**

Offshore oil terminals can load Very Large Crude Carriers, vessels with drafts too large to dock in most Texas ports. Constructing deepwater crude terminals would improve economies of scale for exporting oil by allowing these largest crude-carrying vessels to load. Several offshore terminals are planned for exporting oil from Texas, but their sponsors have delayed submitting permit applications because of lower prices and market uncertainty. The viability of new offshore oil terminals also depends upon the construction of additional pipelines to transport crude oil through Texas. The only operational offshore oil terminal in the U.S. was completed in 1981 for imports.

**LNG Export Terminals**

Liquefied natural gas (LNG) exports have increased rapidly in the U.S. since the first shipment in 2016, and the two LNG terminals in Texas completed in 2018 and 2019 now dominate U.S. LNG exports. The expanded Panama Canal allows efficient shipments of LNG from Texas to East Asia. Six additional export terminals are approved but are not yet under construction in Texas (three near Brownsville, and one each near Freeport, Port Arthur, and Corpus Christi). The expected future growth of this market would continue to bring revenues to Texas ports.

**CRUISE**

The pandemic had a significant impact on the cruise industry around the world. As Texas’ only cruise port, the Port of Galveston has seen tremendous impacts. Prior to the onset of the global pandemic, the Port of Galveston was experiencing robust growth—cruise revenue accounted for 65 percent of the Port of Galveston’s revenue and had been increasing rapidly through 2019. In 2018, the cruise industry generated $1.51 billion in total direct expenditures to the state’s economy and accounted for $115 million in onshore spending. This growth spurred the development of a new Royal Caribbean cruise terminal, which is targeted for completion in September 2022 (a one-year delay). While Royal Caribbean Cruise and Carnival Cruises canceled all cruises through February 2021, the Port of Galveston is prepared to weather the storm through conservative budget measures like instituting a hiring freeze, restricting salary increases, and allowing other kinds of ships to dock at cruise terminals.
**MARITIME TRENDS AND MARKET OUTLOOKS**

**TEXAS ENERGY OUTLOOK**

Despite the market uncertainties that arose during 2020, exports of petroleum products, such as oil, gas, LNG, and plastics, are some of the most profitable commodities that are moved through Texas ports. Port activities and priorities, including planned projects, often shift based on trends in the energy market.

Crude oil production in Texas increased by nearly 60 percent during the five years before the 2020 pandemic, primarily of light tight oil from the Permian Basin. In December 2015, a 40-year ban on U.S. crude oil exports was removed, and Houston and Corpus Christi became the leading ports for U.S. crude oil exports. These exports provided an essential market for increased crude oil production, as Texas refineries are not configured to efficiently refine this light oil.

Natural gas is a byproduct of tight crude oil production, and the domestic natural gas market has been oversupplied, resulting in historically low U.S. prices. Texas has the largest refinery capacity of any state, located primarily near Texas ports, and its refineries export a significant portion of their production. LNG is now efficiently shipped overseas from two Texas ports, increasing the available market for Texas natural gas.

**Crude Oil Production in 2020**

In spring 2020, the worldwide demand for crude oil collapsed because of the pandemic, and U.S. producers could not decrease supply fast enough to offset the decline in demand. The resulting shortage of storage capacity caused a negative price for near-term crude oil deliveries. During this extreme market turmoil, crude oil tankers at Texas ports took delivery of large amounts of crude oil until a market could be found, helping absorb some of the impacts of market fluctuations on crude oil production.

**Natural Gas Production in 2020**

Natural gas production in Texas increased and declined in tandem with crude oil production, with the worldwide demand for LNG declining in early 2020. Exports of natural gas require major multibillion-dollar investments in LNG facilities. Two Texas LNG facilities increased export capacity during the past few years, and more capacity is under construction. An abundance of natural gas in Texas has driven investment in plastic resin, steel, and chemical production, mostly near Texas ports with an intent to export the products.

**EXPORTS AND EMERGING MARKETS**

**Plastic Resins**

The abundance of low-cost natural gas provides the U.S. with a competitive advantage in the plastic resins export market. The majority of plastic resin manufactured in Texas occurs along the Gulf Coast, in proximity to the ports of Houston and Beaumont. Port Houston represents a significant share of U.S. chemical exports, handling approximately one-third of all exports in 2019. Prior to the economic downturn associated with the pandemic, annual global plastic consumption was expected to double by 2020, and investments in polyethylene manufacturing plants were surging in Texas. As of October 2019, it was expected that construction would begin on seven projects in Texas by 2020, which would increase annual production capacity by 5.1 million metric tons. Despite the economic slowdown, one polyethylene plant was opened in 2020. However, plants in Bayport and Corpus Christi that were due to open by 2022 are expected to be delayed.

**Steel**

Tianjin Pipe Corporation has invested $1.1 billion for a new steel pipe manufacturing facility adjacent to the La Quinta Channel of the Corpus Christi Ship Channel. The steel pipe produced will provide an alternative to imported steel pipe for the Texas petroleum industry. The new, $1 billion Voestalpine Co. direct reduction facility, which is also adjacent to La Quinta Channel, will process iron ore imports from Brazil into sponge iron for export and for domestic use. Steel Dynamics Inc. (SDI) is nearing completion of a $1.9 billion flat rolled steel mill in Sinton, Texas which will use. Steel Dynamics Inc. (SDI) is nearing completion of a new, $1 billion flat rolled steel mill in Sinton, Texas which will use. SDI will have the only flat rolled steel mill in the western U.S., expected to double by 2030, and investments in polyethylene manufacturing plants were surging in Texas. As of October 2019, it was expected that construction would begin on seven projects in Texas by 2020, which would increase annual production capacity by 5.1 million metric tons. Despite the economic slowdown, one polyethylene plant was opened in 2020. However, plants in Bayport and Corpus Christi that were due to open by 2022 are expected to be delayed.

**Cotton**

Texas is the largest producer of cotton in the U.S., accounting for more than 45 percent of all cotton produced domestically. Texas exports most of its cotton to China, Turkey, Mexico, Indonesia, and Vietnam; however, some of this is first shipped to other states and exported from ports outside of Texas. With the expansion of the Panama Canal in 2016, more of the cotton produced in Texas is able to be containerized and exported by Texas ports (mainly Port Houston), as opposed to another domestic port. From 2015 to 2019, the amount of Texas cotton exported from maritime ports increased by 78 percent, while the cotton exported from land ports of entry decreased by 31 percent. As a result, Texas ports have an increasingly critical role in the global cotton supply chain.

**Intermediate- and long-term projections by third-party market analysts still show PCCA providing between 35 and 55 percent of the U.S. energy export capacity.”**

- Jeff Pollack, Director of Planning
  Port of Corpus Christi Authority (PCCA)
FUNDING NEW PORT INFRASTRUCTURE AND MAINTENANCE

To enable economic growth for domestic and foreign trade, Texas ports must regularly upgrade their infrastructure. However, Texas ports and navigation districts face continual challenges to raise funds to consistently maintain channel depths, improve facilities, and construct new projects.

Since 2015, the State of Texas has awarded between $10 and $20 million in Port Access Improvement Program grants annually, which ports can use to fund infrastructure projects on publicly-accessible roads “outside the gates” of port property. Federal multi-modal grant opportunities, such as the FAST Act, INFRA program, and BUILD program, are also available to fund a variety of transportation projects, including those for seaports. These grant programs are highly competitive, and Texas ports compete with projects from across the U.S. for funding.

Texas ports also compete with other U.S. ports that receive state-funded subsidies to attract new tenants. Many ports outside of Texas have access to grants or low-interest loans through general revenues, economic development funds, tax incentives, or transportation 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.

The Future for Texas Maritime Transportation

The maritime transportation system is an economic engine for the state and the nation, having a critical role in the movement of domestic and foreign trade. Despite the economic downturn caused by the 2020 global coronavirus pandemic, activities related to the petroleum petrochemical, LNG, plastics, steel, and cotton industries have begun to rebound since the middle of 2020. In particular, investments in polyethylene, LNG, steel, and cotton industries in Texas have been on the rise. The cruise industry has not yet been able to resume operations, but is geared to reopen in 2021. Texas ports played a key role in light of the pandemic—keeping workers employed, providing critical storage capacity for excess petroleum product, and allowing normal operations to continue for shipping, fishing, manufacturing, and other key market sectors.

Sources of Direct State Funding for Port Improvements (Gulf and Select East Coast States)\textsuperscript{9,10}

<table>
<thead>
<tr>
<th>U.S. State</th>
<th>General Revenues</th>
<th>Transportation Fund</th>
<th>Bonds (General, Environmental)</th>
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<td>Alabama</td>
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<tr>
<td>Virginia</td>
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References

8. USA Trade Online, 2015-2019. U.S. Census Bureau, Economic Indicators Division. Port Level Exports; AECOM analysis.