GULF INTRACOASTAL WATERWAY
LEGISLATIVE REPORT

88TH TEXAS LEGISLATURE
This report is submitted by the Texas Department of Transportation on behalf of the Texas Transportation Commission to the 88th Texas Legislature as required by Chapter 51 of the Texas Transportation Code. The report’s purpose is to evaluate the impact of the Gulf Intracoastal Waterway (GIWW) on the state by assessing the importance of the GIWW. This includes examining the direct and indirect beneficiaries, identifying principal problems on the GIWW and their solutions, evaluating the need for significant modifications to the GIWW, and specifying recommendations for legislative action.

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As the Director of the Maritime Division at the Texas Department of Transportation (TxDOT), I’m pleased to present the Gulf Intracoastal Waterway Legislative Report on behalf of the Texas Transportation Commission to the 88th Texas Legislature.

The Gulf Intracoastal Waterway (GIWW) is an integral part of the state’s transportation system, providing a waterborne alternative to transporting cargo between ports and private terminals on the Texas coast and beyond. This allows cargo owners, particularly those in the petrochemical industry, to move their goods along the Gulf Coast in a manner that is safer for the public, better for the environment, more efficient and less damaging to the state’s roadways and bridges than moving the same goods via road or rail.

As the non-federal sponsor of the GIWW, TxDOT works with the U.S. Army Corps of Engineers (Corps) to ensure the continued viability of the waterway. In our most established role, we partner with the Corps to provide land, easements, and right-of-way for the disposal of material dredged from the GIWW. In 2019, the agency acquired Placement Area 88 near Freeport, TX per the Corp’s request; since then, we have worked to proactively assess the condition of dredged material placement areas along the coast to plan for possible future acquisitions, including the recent acquisition of Placement Area 86E. As good stewards of state resources, the Maritime Division is also exploring ways to collaborate with the Corps on Beneficial Use projects—using dredged material to restore wildlife habitat, nourish eroding beaches, or to improve parkland, for example.

The Maritime Division also contributes to Corps-led feasibility studies that assess the need for major improvements and modifications along the GIWW, such as the Brazos River Floodgate and Colorado River Locks Feasibility Study and the GIWW Coastal Resiliency Study. These projects are essential to bring our infrastructure up to modern standards and to provide protection against future storms. TxDOT participation on these study teams ensures that state and local interests are represented at the federal level.

All these efforts function best when the public, industry, interest groups and elected officials are aware of the work we do. That’s why we’re collaborating with the Corps to improve the accuracy of our data and expand our external communications. Our interactive map of dredge material placement areas, which shows capacity and easement status of each GIWW placement area in Texas, is just one example of this type of collaboration.

We hope this report tells the story of the GIWW and paints a clear picture of the many benefits the waterway provides for the people of Texas.

Geir-Olaf Kathgen
Director, Maritime Division
Texas Department of Transportation
EXECUTIVE SUMMARY

Background and Significance

The Gulf Intracoastal Waterway (GIWW) is an important part of the transportation infrastructure in Texas that enhances Texas’s economic competitiveness and provides societal and safety benefits. The waterway is a 1,100-mile shallow-draft channel that runs the length of the northern and western Gulf of Mexico. The Texas portion of the GIWW is designated as Marine Highway 69 within the official Marine Highway System. In 2020, 75 million tons of goods were moved on this portion of the waterway. By moving on the GIWW, these shipments avoided the need to transport the equivalent of at least 3 million truckloads on coastal highways (minimizing maintenance cost to the roadways), produced far fewer emissions than trucks or trains, and maintained an excellent safety record. The shipments also supported the efficient operations of Texas’s petroleum and petrochemical industries.

Chapter 51 of the Texas Transportation Code designates the State of Texas as the non-federal sponsor of the Texas portion of the GIWW-T. The Texas Department of Transportation (TxDOT) acts on behalf of the State to fulfill its responsibilities in this role, which include providing adequate disposal areas for material dredged from the main channel of the GIWW in Texas. TxDOT also consults with federal and state agencies regarding possible beneficial uses of the dredged material, rather than simply depositing it in placement areas. The U.S. Army Corps of Engineers (USACE) is responsible for maintaining the channel, using the disposal areas provided by TxDOT for the placement of material dredged from the main channel of the GIWW in Texas. USACE is also responsible for major modifications or improvements to the GIWW.

The petroleum and petrochemical industries rely heavily on the GIWW. These industries use the GIWW to move raw materials and intermediate products between facilities for further processing. Over 65,000 people in coastal counties have jobs directly related to the use of the GIWW by these and other industries that depend on the GIWW for efficient, safe, and cost-effective movement of cargo.
Recommendations to the Texas Legislature
To maintain this asset and ensure its usefulness, this report presents four legislative recommendations:

1. Increase appropriations in support of TxDOT’s existing statutory responsibilities.
   State appropriations for support of the Texas portion of the GIWW are used to fulfill the state’s duties as the non-federal sponsor of the waterway. These include sustaining existing placement areas, acquiring real estate for new placement areas, and leveraging opportunities to beneficially use dredged material. Several placement areas are approaching capacity. Due to the increasing price of real estate along the coast, additional funds are needed for future land acquisitions for dredged material placement areas (DMPA).

   Beneficial use projects delay the need to improve DMPAs or acquire new ones. Federal law requires a non-federal sponsor or third-party organization to cover the initial costs above standard dredging practices. TxDOT and USACE can execute agreements to provide the framework for the use of TxDOT funds to support beneficial use projects.

2. Support additional federal funding for USACE’s operations and maintenance budget to maintain the authorized dimensions of the GIWW in Texas.
   USACE does not receive adequate funding to maintain the GIWW to its authorized dimensions. For fiscal year FY 2014 through FY 2021, the average annual allocation to the GIWW operations and maintenance program was $30 million. However, the average annual need for dredging was $54 million—80 percent more than the historical average. As a result, USACE has not been able to maintain the entire waterway to its authorized depth and width, leading to shipping inefficiencies on the GIWW.

3. Support the funding of the Brazos River Floodgates and Colorado River Locks project to timely completion.
   This project will improve the safety and efficiency of commercial navigation operations on the GIWW-T by constructing better-aligned and wider channels and new facilities at the Brazos River and Colorado River crossings. The floodgates and locks prevent the rivers from flowing into the GIWW and depositing sediment in the channel. The structures also control navigation when it would be dangerous to cross the river.

   While the project has been authorized by Congress, funds still need to be appropriated to construct the project. The President’s budget for FY 2023 did not include funding for this project. Congress will need to include funds for the project in appropriations bills to avoid delays. Delays inherently raise the cost of construction. Appropriations need to take place at a level sufficient for USACE to complete the project as quickly as USACE’s level of capability allows.

   The project is estimated to cost $414 million. Sixty-five percent is to be funded by appropriations from the general treasury, and 35 percent will come from appropriations from the Inland Waterways Trust Fund. The project received $6.93 million in Pre-construction Engineering and Design funds for FY 2022.

4. Support the GIWW Coastal Resilience Study recommended plan of action.
   Should the USACE’s GIWW Coastal Resiliency Study receive congressional authorization to move forward, USACE will need expedited funding to complete the recommended plan of action before any system failures take place. A major failure of the system that protects navigation would close the GIWW and disrupt freight movements. Given the heavy reliance the petrochemical and oil and gas industries place on the GIWW, such a failure would result in shortages and escalated costs for gasoline, diesel fuel, and a host of petrochemical products.
The Texas portion of the GIWW consists of a channel that is federally authorized to be 12 feet deep and 125 feet wide and that extends 379 miles from the Sabine River to Port Isabel, Texas. The GIWW-T serves as the backbone of the state’s inland water transportation system, connecting Texas’s 12 deep-draft and eight shallow-draft public ports, as well as numerous private facilities, via its many tributaries and intersecting ship channels. This intermodal connectivity is critical in supporting the petrochemical industry and the inland port facilities along the Texas coast. The Texas portion also includes floodgates and navigation lock structures at the Brazos and Colorado Rivers, respectively.

Principal Commodities

The GIWW is uniquely positioned to link the ports along the Gulf Coast to major inland ports, such as Memphis, Chicago, and Pittsburgh, via the Mississippi River and its tributaries. The GIWW also provides a means to connect domestic barge traffic with oceangoing vessels, making this waterway central to intrastate, interstate, and foreign trade in the United States. The GIWW is the third-busiest inland waterway in the United States and a critical component of the nation’s transportation network. In 2020, 35,000 tows transited the waterway carrying more than 101 million short tons of cargo. The Texas portion of the waterway saw more than 22,000 tows, accomplishing more than 48,000 barge movements and transporting 75 million tons of cargo (1). Two commodity groups make up almost 90 percent of the tonnage for the Texas portion—Chemicals & Related Products and Petroleum & Petroleum Products.

Activity is measured in terms of tows (a trip where a towboat pushes one or more barges) or number of barge movements (without regard to how many trips are required for the movements).
Role of the Texas Department of Transportation

In 1975, the Texas Coastal Waterways Act (codified as Chapter 51 in the Texas Transportation Code) established the State of Texas as the non-federal sponsor of the Texas portion of the GIWW and provided specific guidance on the roles and responsibilities of TxDOT and the Texas Transportation Commission as they relate to the waterway. By statute, TxDOT must acquire real estate for use by USACE as DMPAs for dredging activities required to maintain the waterway. TxDOT may also participate financially in projects to beneficially use dredged material, such as marsh creation for fish and wildlife habitat development, bird island restoration, beach nourishment, or industrial and commercial use.

Role of the Corps of Engineers

As the federal sponsor of the GIWW, USACE is responsible for the planning and execution of all construction, maintenance, and major rehabilitation on the GIWW to ensure that the waterway remains open for commerce. USACE is also tasked with monitoring channel conditions, usually through hydrographic surveys, and maintaining the channel to its authorized depth and width through continual maintenance dredging.

USACE has undertaken several measures to communicate its efforts and activities to stakeholders. This communication involves the benefits of the GIWW, USACE’s maintenance program, and tools to identify and evaluate needs and opportunities for investment in the GIWW. Two examples of these efforts are:

The petroleum and petrochemical industries make extensive use of the GIWW.
• **Operations Dashboard.** This web application provides location-aware data visualization and analytics for a real-time operational view of navigation contracts, draft restrictions, and hydrographic survey information. From a dynamic dashboard, managers and stakeholders can access the latest information on contract schedules, status, and milestones to make informed decisions at a glance. The dashboard can be accessed at [https://www.swg.usace.army.mil/Missions/Navigation/Navigation-Projects-Contracts/](https://www.swg.usace.army.mil/Missions/Navigation/Navigation-Projects-Contracts/).

• **Annual dredging meeting.** The Galveston District of USACE hosts an annual meeting in which the district’s dredging program and funding needs are presented. The presentations from the 2021 meeting are available at [https://www.swg.usace.army.mil/Missions/Navigation/Dredging-Conference/](https://www.swg.usace.army.mil/Missions/Navigation/Dredging-Conference/).

The GIWW is the third-busiest waterway in the nation. Its authorized width and depth must be maintained to allow safe and efficient use of the waterway.

**GIWW’s Designation in the Marine Highway System**

In June 2016, after several years of collaboration with TxDOT, the U.S. Maritime Administration (MARAD) designated the Texas portion of the GIWW as Marine Highway 69 (M-69). The national Marine Highway System currently consists of 27 marine highway (all-water) routes that run parallel to the nation’s most important inland highways. By promoting waterway transportation, these marine highways serve as extensions of the surface transportation system and can accommodate the waterborne movement of people and goods between two points that would have otherwise been connected only by road or rail.
To receive the M-69 designation, TxDOT demonstrated that the Texas portion of the GIWW provides additional capacity to landside corridors serving freight and passenger movements, thereby decreasing congestion in areas with high traffic and lessening air emissions. This designation allows TxDOT and Texas ports to apply for federal grant funding for projects that increase waterborne transportation along the corridor. Prior to the M-69 designation, the Texas portion of the GIWW was part of the larger Marine Highway 10 (M-10) corridor, which encompasses the entire length of the GIWW from Florida to Brownsville. The Texas portion of the GIWW is now dually designated, which makes it eligible for federal grant funding for both M-69 specific projects as well as M-10 projects. The Infrastructure Investment and Jobs Act appropriated $25 million in funding for the marine highway grant program, and the Consolidated Appropriations Act, 2022, added another $14.8 million. The grants target previously designated Marine Highway projects, providing funds for port and landside infrastructure as well as vessels.

**WHO BENEFITS FROM THE GIWW?**

**Industry**

The GIWW’s location on the Gulf of Mexico has a tremendous impact on the types of commodities that are shipped on the waterway. Over 47 percent of total U.S. petroleum refining capacity is located along the Gulf Coast, as well as 51 percent of total U.S. natural gas processing plant capacity (3). Consequently,
67 percent of the commodities that transit the GIWW-T are classified as petroleum or petroleum products, and an additional 22 percent are classified as chemicals and related products (1). Many petrochemical companies currently depend on the GIWW to transport commodities to other facilities along the Gulf Coast for further processing and refinement. Partial or full closure of the GIWW would force these companies to consider more frequent, lighter loads to reduce barge draft depths or consider alternate modes such as rail or truck transportation—a costly and inconvenient proposition.

The figure below shows the geographic layout of refineries in the Texas and Louisiana coastal areas. The figure highlights the fact that these facilities are typically served by marine transportation (4). Much of the traffic on the GIWW-T is shipments between Texas Gulf Coast plants and plants along the lower Mississippi River in Louisiana.

**Texas and Louisiana Refineries and Crackers**

*Refineries and crackers are located along the Texas coast and the lower Mississippi River in Louisiana. The GIWW serves as a link between the various complexes.*

**Recreation**

Recreational uses of the GIWW include fishing, water sports, sightseeing, and traveling in protected water transportation routes along the coast. More than 130 marinas and fish camps are located in coastal areas (5).

Comprehensive data on the economic impact of GIWW-related recreational activities do not exist. However, a study conducted on the impact of ecotourism in San Antonio Bay (west of Port O’Connor) in the early 2000s illustrates the importance of ecotourism. For example, in 2003, more than 71,000 people visited the Aransas National Wildlife Refuge to view migratory birds and other wildlife. The
visitors provided business to hotels, nature-tour operators, and restaurants. In addition, various hotels, RV parks, and nature tours highlight the GIWW-related recreational activities’ involvement in ecotourism (6).

Commercial Fishing
According to data provided by the Texas Parks and Wildlife Coastal Fisheries Division, in 2020, Texas commercial fishermen caught 10.9 million pounds of seafood valued at $41.6 million in Texas bays and estuaries. Shellfish accounted for most of the weight and value of all seafood landed. The GIWW and bay system also provide habitat for spawning, breeding, and growth of several species that are fished offshore, especially shrimp.

Economic Importance
The GIWW provides measurable benefits to the Texas economy. The GIWW creates jobs, supports industries such as commercial fishing, and mitigates congestion (and consequently maintenance expenses) on state highways and county roads.

Though the percentage of freight that travels on the GIWW is small when compared to other modes of transportation such as truck or rail, the waterway plays an important role in reducing landside congestion and increasing safety. The GIWW contributes to an efficient and cost-effective multimodal transportation system that connects rural regions with urban population centers, provides for the delivery of raw materials and the shipment of finished goods, and links areas of economic activity and production with centers of consumption. The Texas population has been growing dramatically and is expected to continue to do so for the foreseeable future. This growth will exhaust the capacity of highways and railroads to meet demand. The GIWW offers significant growth potential that will enable resources and goods to continue to move as needed.

Since the GIWW runs the length of the Texas coast and connects all the ports in the Texas port system, it provides relief for congested highway and rail links, system redundancy in the event of emergencies, cost savings, and industry benefits. With the severe truck driver shortage that exists in all parts of the country, the GIWW provides a cost-effective means of keeping freight moving. All of this is very important in light of Texas’s rapid population growth trend and in particular the emergence of the Gulf Coast and Texas Triangle megaregions (7).
**Societal Importance**

Barge transportation protects the environment and is much safer than transportation by either truck or rail. Fuel efficiency is far greater by barge—and as a result, harmful emissions are far less—when compared to the other modes. Inland waterway towboats can move one ton of cargo 675 miles with one gallon of fuel compared to 472 by rail and 151 by truck. The rate of spills of hazardous commodities is also far less. Barge transportation is also much safer—the rate of injuries and fatalities is much less than that experienced by truck or rail. Finally, because barges do not need to use highways, congestion is less, and there are no impacts to roadway traffic.

The GIWW:

- Provides an alternate means of transporting 75 million tons of goods that would otherwise have been moved on the surface transportation network.
- Produces fewer emissions than moving the same amount of cargo via roads or rail.
- Reduces road maintenance needs.
- Increases safety in the transportation system.

Barge transportation is far less dangerous to human health and safety than either trucks or rail. Injuries and fatalities are far less frequent with barges for the same amount of work accomplished.

In addition to producing far fewer emissions than other modes, barges have far less risk of hazardous materials spills.
Beneficial Use of Dredged Material

TxDOT would like to participate in beneficial use projects as a way to decrease the need for land acquisition for new DMPAs. Local, state, and federal agencies can work with each other and various stakeholder entities to develop dredged material management plans that benefit navigation interests and the coastal environment. Numerous projects along the Gulf Coast have illustrated that dredged material can be a valuable resource for coastal zone management (10). Rather than simply being deposited in a DMPA, dredged material can be used to renourish beaches, develop or restore marshes, restore bird islands, or even provide landfill cover.

Building and maintaining beneficial use sites can reduce the need for land acquisition while providing environmental benefits.

Opportunities for beneficial use projects in conjunction with maintenance dredging are identified through dredged material management planning efforts, interagency planning and management efforts (e.g., the Texas Master Plan for Beneficial Use of Dredged Material and the National Estuary Program), state or local planning efforts, or general coordination activities with federal and state resource agencies. Each of USACE’s beneficial use funding authorities includes a requirement for non-federal cost sharing of a minimum of 25 percent for incremental costs. Therefore, beneficial use projects require local leadership and local financial commitments to succeed. Experience to date with beneficial use projects indicates that this leadership can come from economic development agencies, environmental communities, or state/local government (11).

TxDOT has authority to participate in the funding of beneficial use sites but to date has not received appropriations to do so. Nevertheless, USACE has used GIWW dredged material for several beneficial use projects, as shown on page 12. Some examples include:

- The Gulf Intracoastal Waterway was cut through land along the north shoreline of West Galveston Bay. When the GIWW was first dredged to create the waterway, the dredged material was placed along the side of the GIWW, protecting the waterway from the open bay environment. These
protective islands have experienced significant continuing erosion. The Infrastructure Investment and Jobs Act identifies funds for the reconstruction of the barrier islands and the creation of bird island/marsh/sea grass areas using beneficial use placement areas. The plan is to mine material that has been placed in Placement Areas 64 and 65 to reconstruct the islands. The plan also includes a coordinated area where future material from the GIWW can be placed that will feed marsh/sea grass areas. The schedule calls for the work to commence in late 2022.

- Dredged material from the GIWW has been used to create 1,600 acres of marsh and provide shoreline protection at the Aransas National Wildlife Refuge. At Beneficial Use Site B, work is underway to raise the elevation of 3,600 feet of existing breakwater, construct 2,400 feet of new breakwater, install 156 concrete reef rings and 154 concrete reef balls, and install 10 warning signs. At Site J, the work consists of the installation of 723 concrete reef balls and 5 warning signs.

- When USACE conducted maintenance dredging of a 25-mile section of the GIWW along West Galveston Bay, multiple agencies joined forces to beneficially use the dredged material. Instead of discarding the dredged material in authorized placement areas, a portion of that material will be pumped to Pierce Marsh to create 87 acres of new wetland habitat. A large portion of this marsh complex has converted to open water due to a variety of negative environmental impacts. Open water lacks the nurturing habitat required for stimulating new aquatic life. This new material will raise the elevation of the bottom to allow plant life to grow. An estimated 130,000 cubic yards of material that would normally be deposited in Placement Areas 62 and 63 will now be used to increase the overall size and vitality of Pierce Marsh. USACE restored 80 acres of marsh during a 2016 maintenance dredging event and another 70 acres during the 2022 dredging event. Construction of additional marsh restoration cells at the site are planned.

Source: Shutterstock

_Dredged material from the GIWW has been used to create 1,600 acres of marsh and provide shoreline protection at the Aransas National Wildlife Refuge._
WHAT CHALLENGES EXIST?

Maintaining the Authorized Depth and Width of the GIWW

USACE is responsible for maintaining the GIWW to its authorized 12-foot depth and 125-foot width—an ongoing and expensive obligation. Sediment is continuously deposited in the channel from rivers and streams that intersect the Texas portion of the GIWW and from wind and wave action in the Gulf of Mexico. Irregular weather events, such as inland flooding, tropical storms, or hurricanes, can increase sedimentation in the GIWW and can cause significant shoaling in a few days or even hours.

The federal government funds this work in its entirety with funds from both the general treasury and the Inland Waterway Trust Fund. From FY 2014 through FY 2021, the Galveston District of USACE awarded $19 million in GIWW contracts annually to dredge an average 3.9 million cubic yards each year. In the last two years, there has been a significant increase in dredging activity, resulting in an annual average of almost $29 million in dredging contracts to remove an average of 5.5 million cubic yards.

The table on page 13 shows the expenditures for dredging the main stem of the Texas portion of the GIWW (which is TxDOT’s area of responsibility) for FY 2014 through FY 2021 along with the amount of material dredged and the cost per cubic yard.
GIWW Dredging Expenditures and Quantities

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<th>Fiscal Year</th>
<th>Expended in Fiscal Year (Dollars)</th>
<th>Actual Dredged Quantity (Cubic Yards)</th>
<th>Cost per Cubic Yard</th>
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<td>2021</td>
<td>$27,740,009</td>
<td>5,450,578</td>
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<td>2020</td>
<td>$29,758,169</td>
<td>5,627,108</td>
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<td>2019</td>
<td>$20,221,218</td>
<td>3,972,321</td>
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<td>2018</td>
<td>$10,840,153</td>
<td>1,639,670</td>
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<td>2017</td>
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<td>2016</td>
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<td>2015</td>
<td>$14,007,785</td>
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<td>2014</td>
<td>$15,803,853</td>
<td>3,538,744</td>
<td>$4.47</td>
</tr>
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</table>

Source: U.S. Army Corps of Engineers Galveston District

Although the authorized dimensions of the Texas portion of the GIWW are 12 feet deep and 125 feet wide, many portions of the channel cannot be maintained to those specifications. A lack of funding has necessitated that USACE prioritize—and thus limit—its maintenance practices. Because of the difference between the authorized and actual depth of the GIWW, barge operators routinely light load their vessels. This means that vessels are not loaded to capacity so that they sit higher in the water. It has become standard practice for vessel operators to leave an additional 2 feet of clearance below the vessel, which reduces the available water depth for vessels and barges. The loss of 1 foot of draft reduces a dry cargo barge capacity by 200 tons. A liquid cargo barge loses a capacity of between 275 barrels and 400 barrels, which equates to a loss of 35.5 to 51.6 tons, or 11,550 to 16,800 gallons. These reductions increase the cost per ton (or gallon) and increase the number of trips that must be made for a certain volume of cargo. This reduction in carrying capacity raises transportation costs for shippers (and ultimately consumers), increases fuel consumption, and produces more air emissions.

Additionally, when the GIWW-T is not maintained to its design dimensions, delays in cargo movements that have significant supply chain impacts occur. This can also increase the risk of an environmental discharge into Texas coastal waters due to groundings, contact with other vessels/collisions, or impacts with other structures.

Although there has been a rapid escalation of dredging costs over the last several years, USACE’s budget has not increased to offset these costs. Several factors have contributed to dredging projects being deferred or downsized: inadequate federal funding, cumbersome federal letting process, limits on the U.S. dredge fleet, and environmental restrictions on when dredging can be performed. As a result, USACE is unable to consistently maintain the authorized dimensions along the entire length of the channel. Past studies have shown that certain segments of the channel are periodically shoaled to depths of less than 10 feet, which makes the waterway impassable to fully laden barges. There are currently segments of the waterway that are washed out and in need of dredging and repairs. Barge operators have reported issues.

Loss of 1 foot of draft reduces dry cargo capacity by 200 tons (eight or more truckloads) and liquid capacity by 16,800 gallons (more than two truckloads).
in the GIWW west of Galveston. The Texas Coastal Resiliency Master Plan identifies another serious issue west of Sargent Beach.

In addition to the cost of dredging, there is a need for additional DMPA capacity. In the last legislative cycle, TxDOT acquired land for Placement Area (PA) 88, near Freeport. Two other areas are nearing their capacity: PA 86 (adjacent to PA 88) and PA 35 (near Rollover Pass). TxDOT will need to ensure that the timing of its land acquisitions will allow USACE to continue uninterrupted dredging.

The chart on page 15 shows the level of USACE funding for GIWW operations and maintenance for the last few years. This funding is used for maintenance dredging, DMPA improvements, lock and floodgate operations and maintenance, mooring buoy installation/maintenance, hydrographic surveying, chemical testing of dredged material, and coordination with federal/state agencies and entities. All improvements to lock and gate structures and potential new work dredging are cost-shared with federal construction appropriations and Inland Waterway Trust Fund dollars. USACE has the capability to manage more than the appropriations that it has received for the GIWW. The ability to dredge is directly affected by the level of funding. When Congress does not appropriate sufficient funds, USACE cannot maintain channels to their authorized depths and widths. Consistent annual funding at $54 million is necessary to maintain the channel at its authorized dimensions on a continuous basis. As shown in the chart, USACE is receiving far less than this amount.

In the Infrastructure Investment and Jobs Act (Public Law 117-58), USACE was appropriated $14.7 million to accomplish work related to maintaining the GIWW that is ancillary to dredging but not actually dredging. This includes mining of placement areas to assist with barrier island reconstruction, beneficial use sites, and damage repair of erosion protection measures (12).
Mooring Facilities along the Channel

Operators frequently have to stop at bays and major river crossings and wait on weather conditions to abate before crossing—sometimes for a day or two. At the locks and floodgates, operators often have to wait for moorings to open up before they can secure the tow to trip barges (move them one by one) through the structures. Having buoys in these areas to secure the barges saves fuel, lessens wear and tear on the equipment, and benefits the environment by not having engines running and propellers stirring up mud or having barges being pushed on uplands to secure them. USACE currently maintains 10 mooring locations with 171 buoys to meet this need.

Mariners have reported the need for additional mooring facilities at locks and in certain bays, especially during high wind and foggy conditions and in areas where locks or heavy shoreline development dictate one-way traffic flow. USACE has been actively working on upgrading and expanding the capacity of mooring facilities. The map on page 16 shows the location of the mooring areas with the number of authorized buoys at each location.
WHAT MODIFICATIONS ARE NEEDED?

Brazos River Floodgates and Colorado River Locks

The GIWW intersects several rivers along the coast, including the Brazos and Colorado Rivers. Historically, sediment flowing down the Brazos and Colorado Rivers would accumulate in the GIWW, resulting in the need for frequent maintenance dredging in these areas. To control the sediment and silt flows, USACE built 75-foot gates at each river in the 1940s. When vessels were not in transit, these gates could be closed, allowing sediment to continue downstream rather than build up in the GIWW. In 1954, USACE upgraded the gates on both sides of the Colorado River to a 1,200-foot earthen lock structure, which increased the number of vessels that could cross.

The Brazos River Floodgates and the Colorado River Locks have been the highest-priority concern for users of the GIWW for years. They are considered some of the most difficult and dangerous areas to transit on the entire GIWW because they have not been modernized to accommodate the changes in marine equipment dimensions over the years, causing delays and extremely hazardous conditions at times. The floodgates are frequently struck and require repairs (65 incidents annually at the floodgates, and 8 annually at the locks), which in turn causes delays while repairs are made.

Each year, 30 million tons of freight valued at $117 billion pass through these structures (14). The delays caused by the floodgates can be very costly to barge operators and USACE because of the required repairs and downtime. The narrow opening of the gated structure creates an impedance to the flow of water, causing the water to swell and rise locally, which accelerates the water through the structure,
creating hazardous navigation conditions. Also, the 75-foot opening causes the tows that are assembled two barges wide to break down to single wide and move the barges through the floodgates or locks in two trips instead of one in a process known as tripping. After all barges have been shuttled across the river, they are reassembled by cabling them back together into their original tow configuration. These problems combine to create massive average delays to navigation (12 hours per tow at the Brazos River Floodgates and 3 hours at the Colorado River Locks) and contribute to hazards to mariners (13).

When the floodgates are closed, they completely block the flow of water between the river and the GIWW. Each year, 30 million tons of freight valued at $117 billion pass through these structures (14).

Many mariners would prefer to have the floodgates and locks removed, but USACE has studied the situation and determined that they are necessary. With financial assistance from TxDOT, the Galveston District of USACE completed a feasibility study and environmental impact statement that was approved by USACE’s Chief of Engineers on October 23, 2019. The project proposed in the study was authorized by Congress in the Water Resources and Development Act of 2020 at a cost of $414 million. Sixty-five percent of the cost will come through appropriations from the federal general treasury, and 35 percent will come through appropriations from the Inland Waterways Trust Fund.

Preliminary engineering design should be completed by September 2023. Construction is scheduled to begin in late 2023 and be completed in December 2025. The project received $6.9 million in funds for FY 2022 for the pre-engineering design of the Brazos River Floodgates only. No funds have been allocated to the Colorado River Locks (15). The President’s budget for FY 2023 did not include funding for this project. Congress will need to include funds for the project in appropriations bills to avoid delays.

**Recommended Modifications to Brazos River Floodgates and Colorado River Locks**

<table>
<thead>
<tr>
<th>Brazos River</th>
<th>Colorado River</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of gates east of river</td>
<td>Removal of riverside gate structures while retaining outer gates, creating wider (125-foot) and much longer forebay</td>
</tr>
<tr>
<td>New 125-foot-wide east-sector gate structure approximately 300 feet south of existing alignment</td>
<td></td>
</tr>
<tr>
<td>Removal of gates west of river</td>
<td></td>
</tr>
<tr>
<td>Minimum 125-foot channel on west side of river</td>
<td>Hydrologic and hydraulic modeling</td>
</tr>
</tbody>
</table>
GIWW Coastal Resilience Study (Texas)

The Gulf Intracoastal Waterway Coastal Resilience Study, Texas: Draft Integrated Feasibility Report and Environmental Assessment was released in January 2022 (16). The objective of this study was to improve navigation resiliency—the ability of the GIWW navigation system to withstand, respond to, and recover from episodic disturbances (storms, hurricanes, and floods) and ongoing erosion processes. It focuses on 85 miles of the GIWW in Matagorda and Brazoria Counties where sections of the GIWW protective barrier islands have been lost or are being lost rapidly.

The USACE project delivery team evaluated the zones and determined that the high-priority shoaling areas (shown in the graphic above), including barrier loss, occurred in:

- Caney Creek (Zone 12; industry has been expressing concerns about this zone since 2003).
- Exposed segments (Zones 13 and 15; Zone 13 is considered the weakest link in the system).
- Eroding barriers (Zones 14, 16, and 18).

The study proposes restoring or reinforcing the barrier islands, allowing for protected navigation in the GIWW. Through this restoration, the study intends to reduce wind-wave activity from the bays and reduce overall sediment coming into the GIWW that results in shoaling and potential groundings. The protective islands would also allow for greater resiliency of the GIWW from coastal storms. If the recommended improvements are funded ($251 million), they will help users maintain regular schedules and increase transit safety.

USACE has continued to refine costs and benefits for Zones 12 and 13 following the draft report release. USACE sought additional comments from peer review, industry, the public, and state and federal agencies.
CONCLUSION

The GIWW is a vital component of the Texas economy and coastal environment. The waterway has many advantages over the other modes of freight transportation, but these advantages can only be realized if the GIWW is fully maintained. The legislative proposals in this report will enable TxDOT and USACE to work together to realize the maximum possible benefit of the GIWW.

Tank barges move approximately 90 percent of the tonnage on the Texas portion of the GIWW.
REFERENCES


OUR PARTNERS

U.S. Army Corps of Engineers – Galveston District
U.S. Maritime Administration
U.S. Coast Guard
U.S. Fish and Wildlife Service
National Oceanic and Atmospheric Administration

Texas Transportation Commission
Texas General Land Office
Texas Parks and Wildlife
Texas Commission on Environmental Quality
Texas Water Development Board

Gulf Intracoastal Canal Association