Gulf Intracoastal Waterway

Photo by TexasGulfCoastOnline.com
Gulf Intracoastal Waterway in Texas

Figure 1 - Texas GIWW
Executive Summary

The Texas Department of Transportation (TxDOT) is the state agency charged with providing the safe, effective and efficient movement of people and goods. TxDOT fulfills its mission by focusing on five objectives:  

- Reliable Mobility  
- Improved Safety  
- System Preservation  
- Accelerated Project Delivery  
- Economic Vitality

To see that these objectives are met, TxDOT has recently created a simplified operating plan involving five steps, or strategies, for ensuring transportation facilities are the best they can be. They are:

- Plan It  
- Build It  
- Use It  
- Maintain It  
- Manage It

This report, the fifteenth in the series as required by the Transportation Code, is submitted on behalf of the Texas Transportation Commission (commission) to the Seventy-Ninth Texas Legislature, summarizing the state’s sponsorship efforts to maintain the Gulf Intracoastal Waterway (GIWW) in Texas. The activities of the GIWW fall under the strategy of “Maintain It.”

The Texas portion of the GIWW (Figure 1) is over 50 years old and presents a significant challenge to the state to maintain and optimize the benefits of this transportation system. The GIWW has some unique transportation advantages, and it is essential that it be recognized as an important feature during the development of an effective and safe transportation system.

The entire GIWW is a 1,300-mile-long, man-made canal that runs along the Gulf of Mexico coastline from Texas’ southernmost tip at Brownsville to St. Marks, Florida (Figure 2). The canal links all of the Gulf Coast ports and enables these ports to access the inland waterway system of the United States.

The GIWW is the nation’s third busiest waterway with the Texas portion handling over 58 percent of its traffic. In Texas, the GIWW is 423 miles long and is an important component of the state’s diversified multimodal transportation system. In 2002, over 63 million short tons of cargo were moved on the Texas portion of the waterway with a commercial value of over 25 billion dollars. In combination with ports, Texas ranked second in the nation in total waterborne tonnage moved in the United States.  

Balancing the environmental issues inherent to the unique Texas coast and the economic and developmental possibilities of the GIWW has been a difficult challenge. One location in particular, where objections have led to legal recourse, is the southernmost reach of the Texas GIWW which flows through the Laguna Madre. Landowners and environmental interests have raised objections to the placement of dredged material. To respond to these objections, the U.S. Army Corps of Engineers (Corps), along with TxDOT and numerous federal and state agencies, have worked for seven years to develop a new dredged material management plan and an update to the 1975 Environmental Impact Statement for this
portion of the waterway. The Dredged Material Management Plan and Final Environmental Impact Statement were completed in September 2003.

TxDOT and the Corps also initiated Section 216 Studies for the Texas portion of the GIWW. These studies address functional and environmental problem areas. Funding for these studies is through congressional actions and appropriation. In 2004, all of the GIWW studies were postponed due to funding constraints. TxDOT considers Section 216 Studies to be important and necessary for the current and future operation of the GIWW.

The GIWW was conceived, planned and built many years ago. To build, maintain and manage it in the future will require the continued support of the Texas Legislature. The GIWW is an essential component of the state’s and nation’s transportation network and is an integral part of the Governor’s priority goal: “provide for all of Texas transportation needs for the new century.” To facilitate future efforts towards this goal, the following items are recommended for consideration:

1. The state advocates the continuance of shallow draft navigation along with maintenance of the GIWW by the Corps.

2. The state advocates the continuation of the Corps Section 216 Studies, which will address current and long-term needs of the GIWW in Texas.

3. The state advocates that dredged material is to be used as a resource when possible, using the Corps Continuing Authorities Program, and that the Texas Coastal Management Program develop rules that
   a) reward sponsors of environmental beneficial usage of dredged material projects with mitigation credits
   and
   b) eliminate maintenance requirements for sponsors of beneficial usage of dredged material projects.
Plan It

The development of the Gulf Intracoastal Waterway (GIWW) required the concerted efforts of federal, state and local interests. Nearly 150 years ago, planning associated with this project began and continues today.

Development History
In 1850, five years after Texas was admitted to the Union, coastal business interests began to connect portions of the state’s coastline by dredging links between the natural bays, lakes, rivers and bayous. In 1854, the Galveston and Brazos Canal connected West Galveston Bay to the Brazos River. This canal ranged in depth from three to six feet and was the first navigable link to be constructed on the Texas coast.

In 1873, the federal government passed the Rivers and Harbors Act of 1873. This act appropriated funds for a survey to “connect the inland waters along the margin of the Gulf of Mexico from Donaldson, Louisiana to the Rio Grande River in Texas by cuts and canals.” This act was the start of the development of the Intracoastal Waterway. A series of congressional acts passed between 1925 and 1942 allowed for continued expansion of the waterway. By 1941, the GIWW in Texas extended from the Sabine River to Corpus Christi with a bottom width of 100 feet and a depth of nine feet. Legislation passed in 1942 extended the canal to Brownsville and changed its dimensions to 125 feet by 12 feet deep. Construction was completed in 1949. Figure 3 depicts a timeline of the Texas GIWW history.

Texas GIWW History

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1854</td>
<td>Galveston-Brazos Canal completed</td>
</tr>
<tr>
<td>1895</td>
<td>First federal channel across Galveston West Bay</td>
</tr>
<tr>
<td>1902</td>
<td>Galveston - Brazos Canal bought by federal government</td>
</tr>
<tr>
<td>1942</td>
<td>Mississippi to Corpus Christi completed</td>
</tr>
<tr>
<td>1949</td>
<td>Corpus Christi to Brownsville completed - completing the GIWW from Mexico to Florida</td>
</tr>
</tbody>
</table>

Figure 3 - Timeline
Studies and Research
The Corps, under the authority of the Flood Control Act of 1970, has initiated various Section 216 Studies. These studies look at specific water resources projects that may have changed because of physical or economic reasons. TxDOT acts as the non-federal sponsor for the studies involving the GIWW in Texas.

For the Texas portion of the GIWW, the waterway was divided into five separate Section 216 study areas. These areas have been further divided into six studies to focus on complex or unique problems. Figure 4 illustrates the Section 216 Studies in Texas.

![Figure 4 - Section 216 Study Areas](image-url)
Limited federal appropriations resulted in the postponement of all of the Section 216 Studies in 2004. Studies to be continued in 2005 will be determined during the development of the Corps’ 2005 Appropriations Bill. These studies are a necessary and important review of the waterway, particularly since the GIWW in Texas is over 50 years old. Antiquated facilities, erosion and navigational hazards rank among some of the GIWW’s top challenges. Coupled with increased recreational traffic on the waterway, the challenges result in significant delays to commercial users of the GIWW.

In addition to the federal Section 216 Studies, TxDOT has initiated marine transportation-related studies. Several of these marine transportation-related studies were conducted through TxDOT’s research program. This program, plus interagency agreements, allowed TxDOT to participate in studies that address various needs of the GIWW. Research studies funded by TxDOT are shown in Table 1-1.

### TxDOT Sponsored Research

#### Table 1-1

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>STUDY</th>
<th>RESEARCHER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Planning Research</td>
<td>Containerized Freight Movement in Texas</td>
<td>University of Texas, Center for Transportation Research</td>
</tr>
<tr>
<td>State Planning Research</td>
<td>Landside Access Needs for Port and Waterway Facilities in Texas</td>
<td>University of Texas, Center for Transportation Research</td>
</tr>
<tr>
<td>Interagency Agreement</td>
<td>2022 Gulf Intracoastal Waterway Master Plan</td>
<td>Texas A&amp;M University, Texas Transportation Institute</td>
</tr>
</tbody>
</table>
Use and Maintain It

One of the initial functions of the GIWW was to provide protected inland transportation of goods and troops during World War II. It has since evolved into a multipurpose waterway used by recreational and commercial interests. Recreational uses include fishing, skiing, sightseeing and protected water transportation routes for travelers along the coast. Commercial uses include the movement of domestic and international cargo, harvesting of fish and shellfish, and servicing of the gulf and coastal oil and gas industry.

Direct and Indirect Benefits
The GIWW provides some important direct and indirect benefits to the state, such as:

1. In 1999, the GIWW facilitated commercial and sport fishing entities to catch an estimated 25.7 million pounds of shrimp, oysters, crabs and finfish within Texas bay systems amounting to a wholesaler’s value of $32.6 million.⁴

2. In 2002, 63.39 million short tons (one short ton equals 2,000 pounds) of goods were moved on the Texas GIWW. The estimated value of these goods was over $25 billion. This was accomplished by approximately 99,970 barge one-way trips.⁵

3. The movement of goods by barges on the intracoastal waterway is an efficient, economical and environmentally friendly mode of transportation (Figure 5).⁶

4. The movement of goods by barge is a safe mode of transportation. In 2002, according to the Office of Hazardous Materials Safety, the total number of documented hazardous spills in Texas was 37 by air, 1,035 by highway, 126 by railway and two by water transportation.⁷
Chapter 2 Use and Maintain It

**Capacity**

<table>
<thead>
<tr>
<th>1 Barge = 15 Railcars = 60 Trucks</th>
<th>15 Railcars</th>
<th>60 Trucks</th>
</tr>
</thead>
</table>

**Efficiency**

*Distance one gallon of fuel carries one ton of cargo*

- 60 Miles by Truck
- 202 Miles by Railcar
- 514 Miles by Barge

**Emissions**

*Pounds produced to move one ton of cargo 1,000 miles*

- 0.09 Barge
- 0.46 Railcar
- 0.63 Truck
- 0.20 Barge
- 0.64 Railcar
- 1.90 Truck
- 0.53 Barge
- 1.83 Railcar
- 10.17 Truck

**Figure 5 - Mode Comparison**

**Operational Concerns**

The waterway, in its current form, is over 50 years old. During the past 50 years, the size of individual barges and towboats, the width and length of barges lashed together and pushed as a unit, and the volume of traffic have steadily increased. These factors have led many to believe that the 1949 dimensions of the GIWW and its associated structures do not adequately support the state of barge transportation today. The Brazos River Floodgates and the Colorado River Locks are, for example, two lock type structures on the waterway that may need to be removed or modified. The structures are only 75 feet wide. To move through the structures, vessel operators must park their
tows, break the barges apart, move them through the locks in smaller sets or individually, and then put them back together on the other side. This process, known as tripping, is difficult and causes delays estimated to cost over two million dollars a year to the towing industry at each location.\(^8\)

The area in West Galveston Bay, where the GIWW passes beneath the dual Interstate Highway 45 bridges and the Galveston Island Railroad Bridge, is also a major problem. The opening for barge traffic through these structures is only 105 feet wide for a distance of about 800 feet. Repairs to damages to the fender systems of these structures cost TxDOT an estimated half million dollars each year, and the towing industry has identified this spot as the greatest hazard to navigation on the entire 1,300 miles of the GIWW. TxDOT is currently building replacement highway bridges which will have a 300 feet opening for navigation interests. These replacement bridges have a 2008 estimated completion date. The Coast Guard and local legislators are working on replacing the railroad bridge under the authority of the Truman-Hobbs Act, but construction funding has not been secured at this time.

**TxDOT Areas of Focus**

For fiscal years (FY) 2003 and 2004, TxDOT was appropriated $1.35 million dollars for acquiring dredged material disposal sites. During this period, the Corps requested that TxDOT acquire 220 acres of land on the Bolivar Peninsula in Galveston County. The acquisition process to acquire this acreage had progressed to the condemnation phase as FY 2004 ended.

TxDOT, as the non-federal sponsor of the GIWW, works with the Corps to coordinate dredging activities during the year.

During 2003, approximately $27,400,000 in federal funds was expended by the Corps in 100 percent federally contracted and funded projects to operate and maintain the structures and navigability of the Texas GIWW. Approximately 7,810,000 cubic yards of sediment were dredged in eight separate projects. Of this material, approximately 4,600,000 cubic yards were placed in confined placement sites, 2,143,000 cubic yards were placed in open-bay sites, and 1,067,000 cubic yards were used beneficially.\(^9\) Figure 6 depicts the relative volumes that were removed and the location along the waterway.

During 2004, approximately $24,000,000 in federal funds was expended by the Corps in 100 percent federally contracted and funded projects to operate and maintain the structures and navigability of the Texas GIWW. Approximately 2,697,000 cubic yards of sediment were dredged in two separate projects. Of this material, approximately 1,282,000 cubic yards were placed in confined placement sites, 1,105,000 cubic yards were placed in open-bay sites, and 310,000 cubic yards were used beneficially.\(^9\) Figure 6 depicts the relative volumes that were dredged and their relative location along the waterway.
Figure 6 - FY 2003 and 2004 Dredging
During FY 2003–2004, TxDOT participated in two GIWW beneficial use projects with the Corps. TxDOT plans to combine $138,960 in state funds with over $3,000,000 from the Corps to create 42 acres of emergent and marshland habitat from 210,000 cubic yards of dredged material in Aransas and Calhoun counties. These projects are entering the first planting stage and should be fully completed by 2008. Figure 7 illustrates how a typical habitat creation beneficial use project works.