Infrastructure Requirements of the Mississippi River

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**Mississippi River Drainage Basin**

**Basin Facts**
- Drains 41% of continental U.S.
- Includes 31 states & 2 Canadian provinces
- Total area drained between 1.7 million square miles
Our Mission

The New Orleans District, through partnering, provides for navigation, flood and hurricane protection, environmental stewardship, and other water resource needs to benefit the people of southern Louisiana and the nation.
Dredging

• Dredging is essential to maintain project depths.
• 268.9 million cubic yards material.
• On average, 37 million cubic yards of material removed from the 12 Mississippi River Crossings, the New Orleans Harbor, and Southwest Pass.
Mississippi River Deep Draft Crossings

- Baton Rouge Front
- Redeye
- Medora
- Bayou Goula
- Allhambra
- Sardine Point
- Granada
- Philadelphia
- Smoke Bend
- Rich Bend
- Belmont
- Fairview
- Lake Pontchartrain
- New Orleans

Mile 233.8
Mile 232.4
Mile 225.4
Mile 213.3
Mile 104.5
New Orleans District
Locks & Control Structures

Navigation Control Structure
Lock
Corps Facts

- **12,000 miles** of navigable waterways are maintained.
- **2,000 miles** of navigable waterways in Louisiana, supporting 1000 port facilities.
- In 2003, the Mississippi River stage had three peaks of 10, 13, and 14 feet.
Tonnage on Mississippi River Ports

1st Port of South Louisiana
4th Port of New Orleans
7th Port of Baton Rouge
8th Port of Plaquemines, LA
17th Port of Los Angeles
20th Port of Seattle
Comparing Modes of Transportation

Equivalent Units

- One 15 Barge Tow
- 2 1/4, 100 Car Trains
- 900 Large Semi Trucks

Source: Iowa Department of Transportation
Mississippi River Infrastructure

• Would you like to have a new 8-lane super highway built in your neighborhood?

• Or a new railroad line?

• Or maybe a new airport runway?
Construction Sequence

Existing Conditions
Construction of New Lock – lock sections floated in
Construction of New Lock is complete. Levee tie-ins. Claiborne Ave. Bridge is replaced with 2 week closure to vehicles.
Existing Lock is demolished.
New St. Claude Bridge is built. Mooring facilities built.
Project Complete.
Making use of modern technology has enabled us to better:

- Monitor channel conditions
- Locate obstructions
- Locate scour holes and steep banks
- Study land loss rates
- Provide unique engineering solutions
Early Mississippi River Navigation

1800s, the average life span of a steamboat was only 18 months
2002 Inland Electronic Navigational Chart (IENC) Development

Approximately 3,200 miles of initial S-57 charts compiled from surveys and channel information:

- Mississippi River (Baton Rouge to Rock Island)
- Ohio River
- Red River
- Atchafalaya River
- Black Warrior - Tombigbee
IENC – Inland Electronic Navigational Chart
Varying Scale – Varying Coverage Area
A Real-Time Navigation Positioning Solution
Carnival Conquest

Chalmette Powerlines (Mile 89.2)

Large Scale - Small Coverage Area

Authorized for Crescent Pilot Use on M/V Conquest

SOG: 13.35 MPH
HDG: 120.8 DEG
TIME: 18:21:13
ETA: ---
TTG: ---
DIST: --- SM
CTE: --- FT
DEPTH: --- --- FT

Total Distance: ------
Safety Depth: 27.0 ft
Gray Colors

0.75 sm
Data Collection and Analysis
Hog Point/Smithland Crossing

Weir Closure

Trenchfill Revetment

Bar

Hog Point/Smithland Crossing
3-D View of the Redeye Soft Dikes
Sunken Barges at Carrollton Bend Revetment
Burrwood Bayou Scour Hole

750 Ft. Channel Limits

Scour Hole

Pile Dikes
Flood Control Project Design Flood MR&T Flood Control System

Project design flood through the Old River complex = 620,000 cfs
U.S. Army Corps of Engineers
Lower Mississippi River

- Avg. Annual Flow: 534,000 cfs
- Lowest Flow at N.O.: 49,000 cfs (1939)
- Lowest Stage at N.O.: -1.6 ft (1872)
- Highest Flow at N.O.: 1,557,000* cfs (1927)
- Highest Stage at N.O.: 21.27 ft (1922)

*Currently regulated to 1,250,000 cfs
Old River Structures

Low Sill

Overbank

Auxiliary

Hydropower
Mississippi River Levee/Bank Monitoring

• The New Orleans District, partnered with the state levee boards, maintains 486 miles of levee along the Mississippi River (511 miles including the floodwalls).

• 84 existing revetment sites comprise approximately 360 miles of revetment.

Evolution Of Mississippi River Levees

Maintaining the levee system and providing sufficient draft for navigation requires a continuous river monitoring effort.
New levee supported by lime cement columns
To achieve $SF = 1.30$; Foundation improved from 260 psf to 2000 psf
Failure

2 foot wide trench cut to bottom of columns

12%

20%

Plan View

Side View
Freshwater Diversion Goals

- Reduce saltwater intrusion
- Re-establish favorable salinities
- Reduce the rate of land loss, and
- Improve fish and wildlife habitat
Past and Projected Wetland Loss in the BTNEP (1839 to 2020)
Change 1992-2002
Landsat TM 1992
Importance of Coastal Louisiana to the Nation

- Home to 35% of U.S. commercial fisheries
- Supplies U.S. with 27% of its oil and 32% of its natural gas by its infrastructure
- Maintain Louisana ports role as a primary transporter of commerce
- Home to 70% of Mississippi River Valley’s migratory waterfowl
- Coastal wetlands dampen hurricane surge
Caernarvon Freshwater Diversion Structure

Changes in habitat 1988-1997

1988

1997

- Fresh Marsh
- Intermediate Marsh
- Brackish Marsh
- Salt Marsh
- Salt Water
- Fresh Water
- Developed Areas
Mississippi River & Tributaries Project

- **Federal Expenditures:**
  - $11.5 Billion Invested
    - (1928 - 2002)

- **Flood Damages:**
  - $274.8 Billion Prevented
    - (1928 - 2002)
Conclusion

- The Mississippi River is the thoroughfare to the largest port complex in the world
- Over 50 seagoing vessels traverse this channel per day
- Utilizing the most up-to-date technology and methods to maintain Mississippi River Infrastructure is crucial to the economy, credibility, and reliability of our ports and local navigation
- The Corps contributes to our Nation’s Inland Navigation
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http://www.mvn.usace.army.mil
Service to the Public

Navigation
River Flood Control
Hurricane Flood Control
Environmental Enhancement
Wetlands Restoration
Support for Others