

## CENTER FOR PORTS AND WATERWAYS

### Description

America's ports, waterways and intermodal connections are critical to our national transportation system. Economic, social, environmental and infrastructure issues tie ports to many aspects of the country's national interest as a whole.

To help preserve this vital economic component and to position the industry to take advantage of opportunities for growth, the Texas Legislature established the Texas Transportation Institute's (TTI's) Center for Ports and Waterways (CPW) in 1995. CPW provides valuable applied research at the local, regional and national levels.

From issues in water transportation to issues such as homeland security, TTI and CPW are uniquely qualified to help ensure the safety, efficiency and productivity of our nation's maritime interests — whether at a local, regional, national or international level.



### Operations and Logistics

CPW researchers have experience managing port operations. This experience gives CPW researchers first-hand knowledge of the activities and problems that occur on the docks, in the warehouses and on the water. CPW's research addresses the practical aspects of port and marine transportation issues.

Operational issues include:

- Security
- Barge transport (including container-on-barge)
- Terminal design and optimization
- Terminal, port and waterway management and operations
- Lock and dam operations
- Fleeting and queuing
- Container operations and handling
- Ferry operations
- Performance measures
- Logistics, shipping and container operations and handling
- Cataloguing fleet trends and forecasts

### Trade and Economics

CPW researchers have an in-depth understanding of global trade dynamics, logistical issues and their interactions. This understanding can assist those who set trade policy, as well as those who actively engage in trade with companies and governments overseas. CPW researchers are adept at identifying the economic consequences of an existing or proposed activity. They consistently offer recommendations that move their research sponsors in the direction they wish to go.

The following are examples of trade and economics issues which CPW can address:

- Trade growth and associated impacts
- Port financing
- Vessel, port and dock crew productivity
- Border trade/north american free trade
- Gulf Intracoastal Waterway usage
- Freight origin destination and market analysis
- Economics and policy issues of shipping and waterways
- Regional, national and worldwide intermodal trends





## Environmental

Ports, by their very nature, impact coastal environments. CPW encourages efficient and environmentally responsible port development. Researchers can evaluate the effects of port operations and development and analyze potential measures to mitigate or eliminate potentially harmful effects on the environment.

Environmental issues related to marine freight transportation include:

- Air quality issues and environmental monitoring
- Water quality issues
- Risk management of hazardous materials
- Sediment contamination and disposal
- Brownfield development
- Shore protection
- Beneficial use of dredged material
- Waste disposal
- Marine conservation

## Safety and Security

Security is a challenge that confronts all transportation modes — but possibly none more than waterways. A cargo container arriving at a U.S. States seaport today can be virtually anywhere in the heartland of America via truck and/or rail tomorrow. Approximately 95 percent of our nation's international trade moves by water.

CPW's research capabilities in this area are comprehensive, including knowledge related to security at port facilities and in the marine environment. Researchers recognize the need to examine and consider the security of physical assets as well as the security of maritime and port personnel and passengers. CPW's research solutions always include consideration of the intermodal nature of marine transportation.

Safety and security issues include both human factors and physical infrastructure, which leads to the need to address a diverse set of topics, including:

- Human factors in marine/port operations
- Marine safety impacts on recreational users
- Accident prevention strategies
- Vessel and structural safety
- Navigational aids
- Port and cargo security
- Inspections — drug enforcement administration, customs, immigration health, etc.
- Hazardous cargo movements
- Risk management
- National security

## Planning and Development

CPW researchers can examine port planning and development issues in the context of their interactions with the environment and the nation's transportation system across all modes.

Such issues typically include:

- Land use and port access
- Coastal zone management
- Highway connectors
- Mode shift analysis
- Development of former military base facilities
- Multimodal integration
- Port infrastructure sustainability
- Industrial and commercial port planning and development



## Policy and Legislation

CPW strives to analyze and present balanced perspectives on public policy issues related to ports and marine transportation. CPW conducts interdisciplinary research and communicates research findings in ways that have a positive impact on the public policy process. CPW's research defines the economic and environmental constraints and consequences within which port authorities and governments at all levels operate.

## Engineering and Technology

CPW researchers have access to a wide array of laboratories and engineering specialists. Whether the issue at hand is dredging, dock design, security sensor devices or vessel technology, CPW can form a team to provide in-depth, reliable evaluations and analyses of various engineering approaches and technology applications.

### TTI'S MISSION

*To solve transportation problems through research, to transfer technology and to develop diverse human resources to meet the transportation challenges of tomorrow.*

### Contact

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