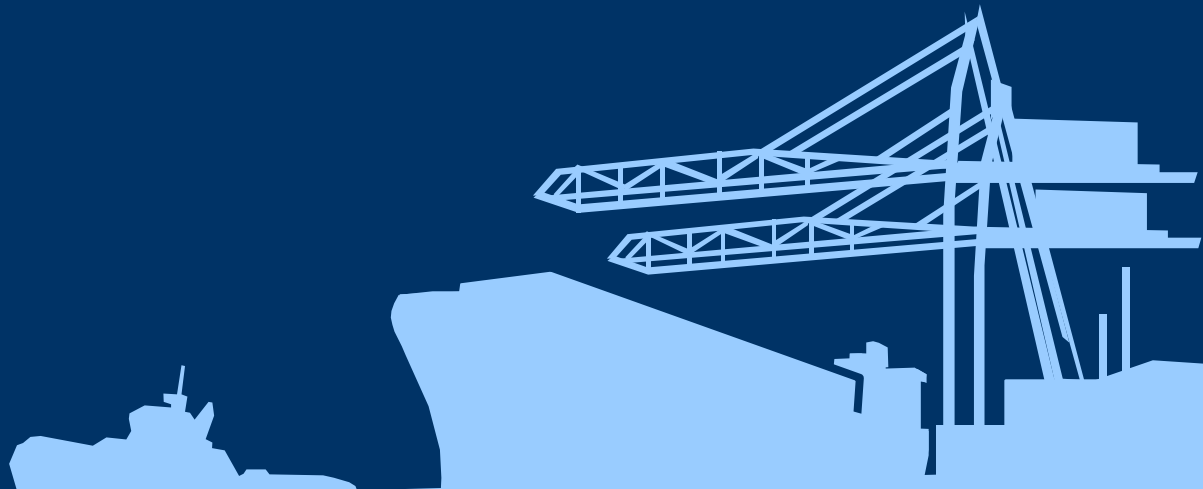
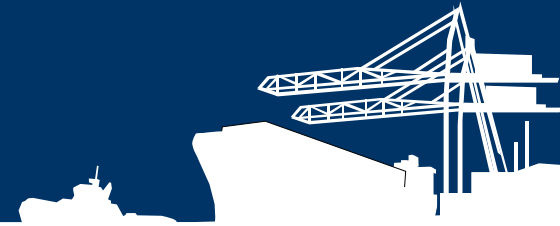


Reducing Marine Emissions

The Houston/Galveston Routine Vessel Identification and Traffic Study

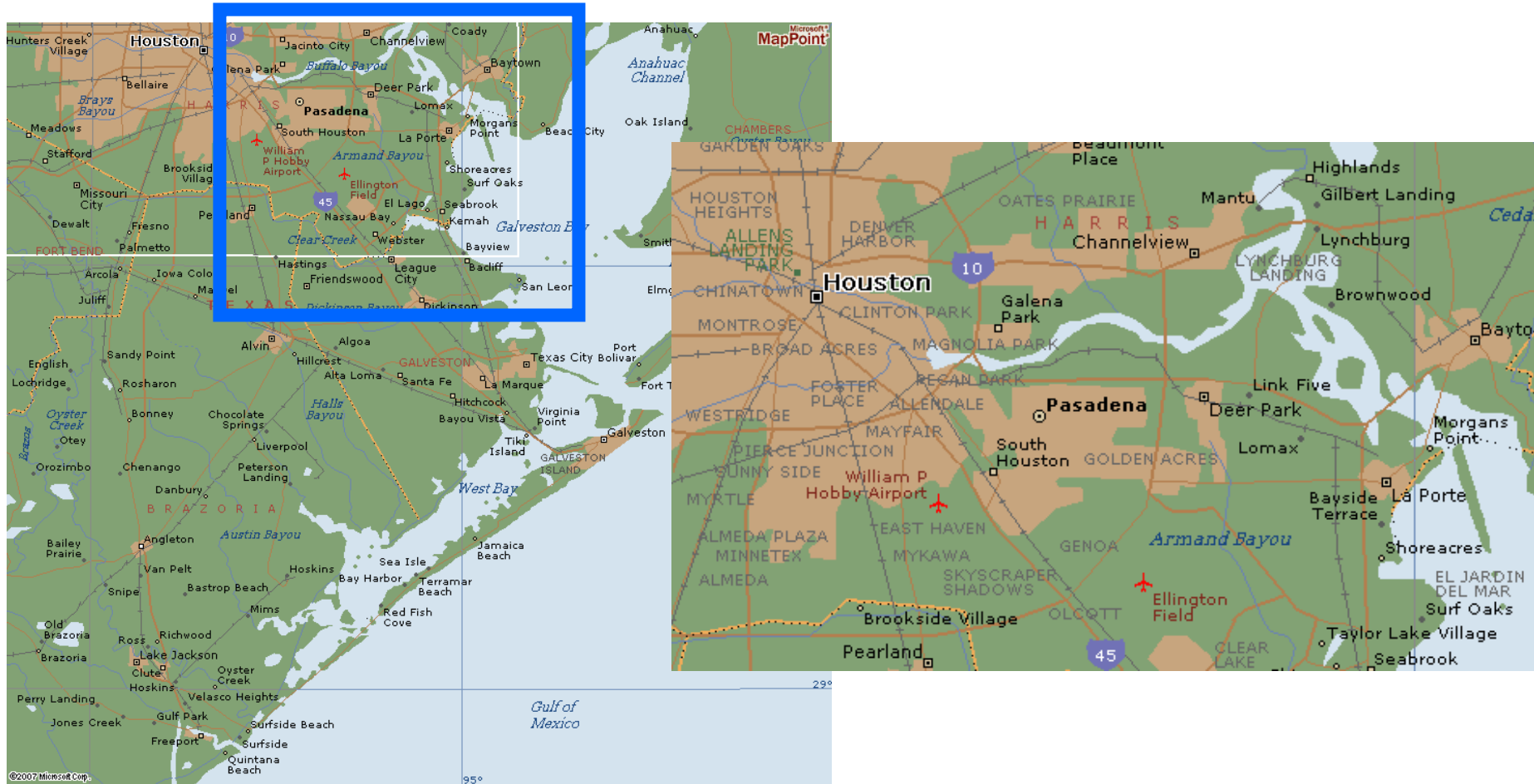


Introduction

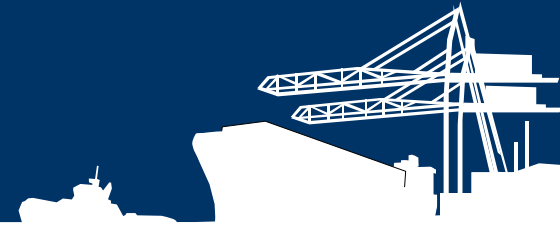


- ➔ The study focused on vessels that visited terminals along the Houston Ship Channel
 - ↳ **HSC excludes Freeport and Texas City**

Introduction

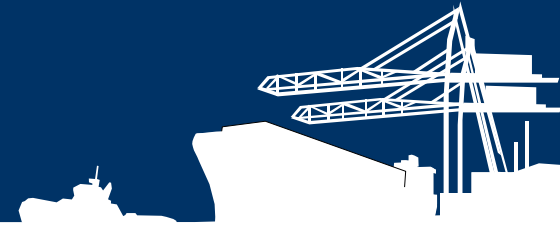


Introduction



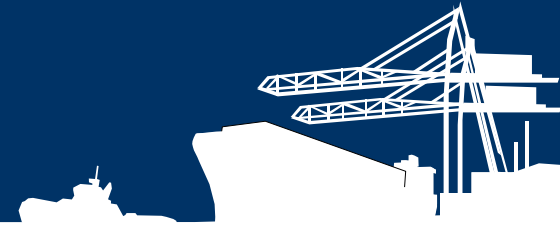
- ➔ The study focused on vessels that visited terminals along the Houston Ship Channel
- ➔ **Study evaluated vessel movements between January 2005 and May 2006**

Purpose



- ⇒ Identify and count vessels that routinely visit or remain in the Houston/Galveston area
 - ↳ **HGA routine vessels**
- ⇒ Identifies other nonattainment areas visited by HGA routine vessels

Routine Vessels

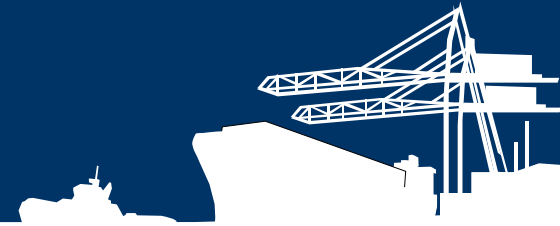


Routine Vessels

Vessels that visited the Houston-Galveston area seven or more times during the study period.

Vessel Group	Total Vessels	Total Port Visits	Routine Vessels	% of Total	Routine Visits	% of Total
Ocean-Going Vessels	3,293	17,109	571	17%	11,117	65%
Harbor Vessels	941	21,443	530	56%	20,194	94%
Total	4,234	38,552	1,101	26%	31,311	81%

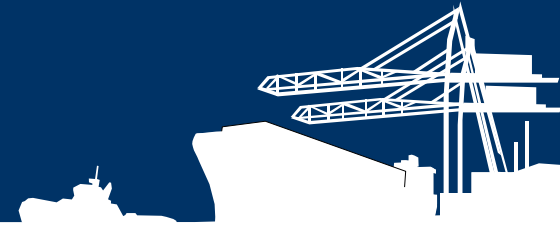
Ocean-Going Vessels



- ⇒ 3,293 vessels visited HGA during study period
 - ↳ 571 were routine vessels (17.3%)

- ⇒ 17,109 visits by ocean-going vessels during study period
 - ↳ 11,117 were from routine vessels (65%)

Ocean-Going Vessels



⇒ Offshore Support Vessels

Vessels that regularly travel to and from the offshore oil platforms in the Gulf of Mexico

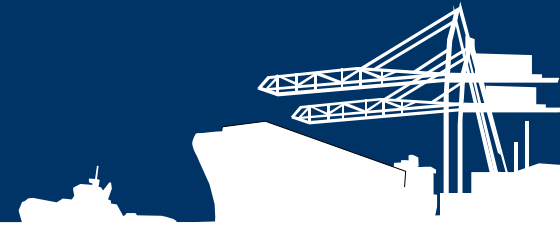
⇒ Tankers

Primarily transport oil, gas, and petrochemical products. Includes seven crude-oil lightering vessels.

⇒ Cargo and Container Ships

Transport freight containers and other cargo

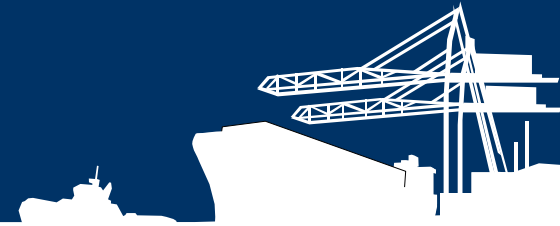
Ocean-Going Vessels



⇒ Offshore Support Vessels

- ↳ 173 routine vessels made 5,392 visits
- ↳ 30% of routine ocean-going vessels
- ↳ 49% of routine ocean-going traffic
- ↳ Each vessel averaged 1,110 hours in HGA
- ↳ Do not regularly travel to other ports

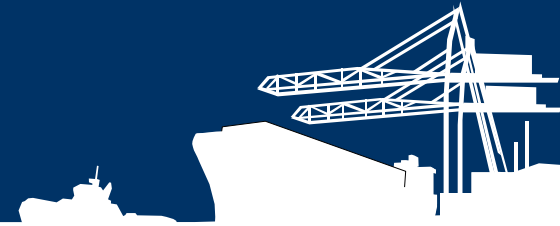
Ocean-Going Vessels



⇒ Tankers

- ↳ 227 routine vessels made 3,045 visits
- ↳ 40% of routine ocean-going vessels
- ↳ 27% of routine ocean-going traffic
- ↳ Each vessel averaged 734 hours in HGA
- ↳ Primary destination ports:
 - ✓ Texas ports: Freeport, Beaumont, Port Arthur, and Corpus Christi
 - ✓ Nonattainment areas: Norfolk, VA; New York, NY; Baltimore, MD; and Philadelphia, PA

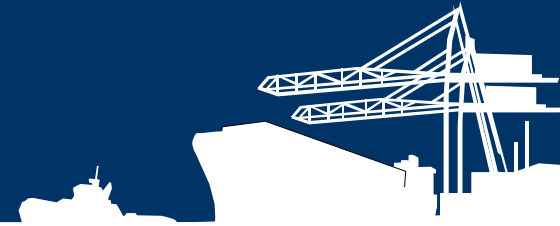
Ocean-Going Vessels



⇒ Cargo and Container Ships

- ↳ 120 routine vessels made 1,611 visits
- ↳ 21% of routine ocean-going vessels
- ↳ 14% routine ocean-going vessel visits
- ↳ Average hours in HGA
 - ↳ Cargo Ships average 818 hours in port per vessel
 - ↳ Container Ships average 318 hours in port per vessel
- ↳ Primary destination ports:
 - ✓ Nonattainment areas: Norfolk, VA and New York, NY

Harbor Vessels



⇒ Harbor Vessels

Includes tugs that travel along the coast, intercoastal waterways, and inland rivers, as well as assist tugs that operate within the port

⇒ 941 tugs and tows identified

⇒ 530 were routine vessels

↳ 56% of the tug and towboat fleet

↳ 94% of tug and towboat traffic

National Fleet



➔ HGA vessels visited 75 different U.S. ports

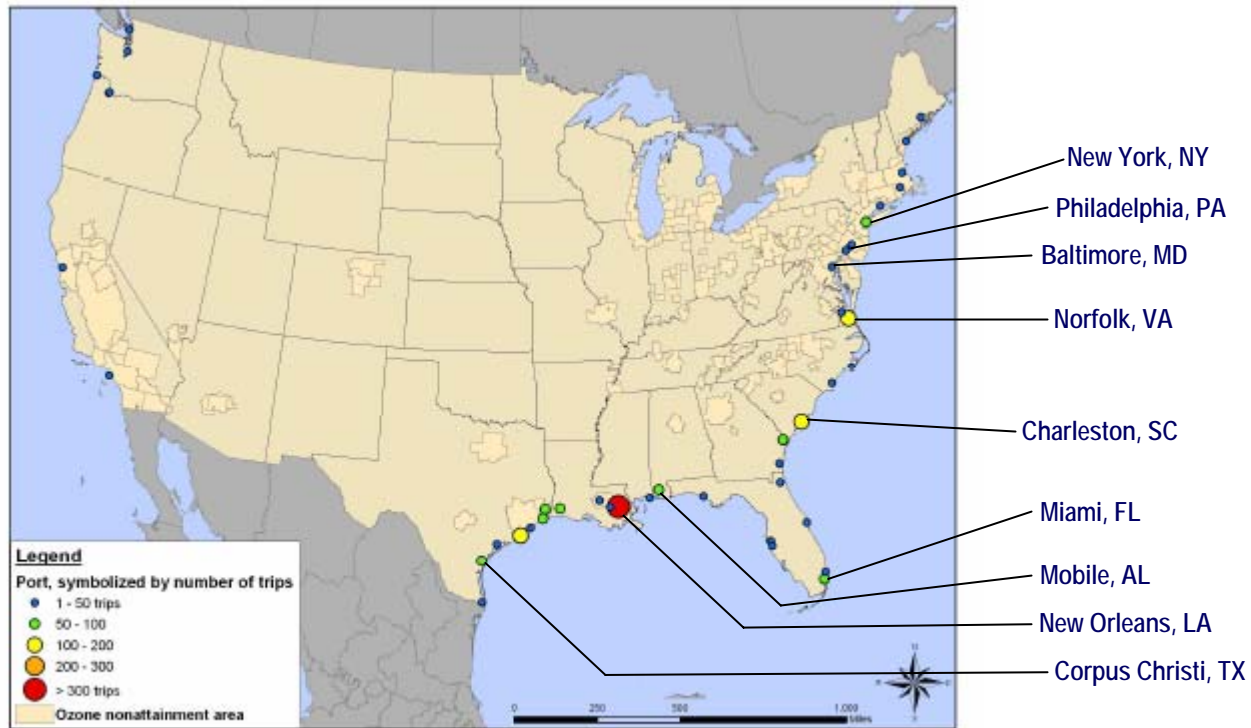
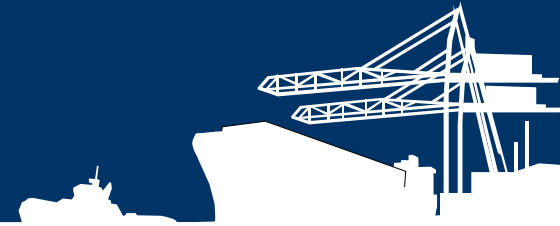


Figure 2-2. Other Ports that Houston Routine Vessels Visit

National Fleet



- ➔ HGA vessels visited 75 different U.S. ports
- ➔ Of the 75 ports, 32 are located in nonattainment counties
 - ↳ The result...Emissions reductions applied to HGA routine vessels will impact air quality in other nonattainment areas

Other Marine Emission Issues



✓ Barge VOC Emissions

- ➔ Identified on the gasfindIR
- ➔ Industry Voluntary BMP Implementation ongoing
- ➔ Speciation and quantification

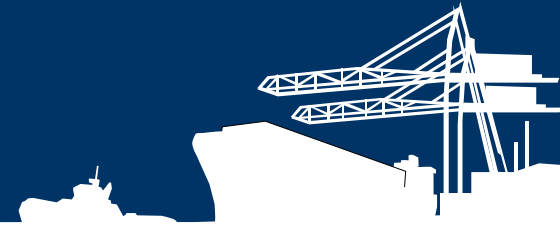
✓ Gulf Coast Crude-Oil Tanker Lightering

- ➔ Occurs in designated zones outside state waters (I think)
- ➔ Tanker to tanker transfer

✓ Houston Ship Channel Barge Lightering

- ➔ Barge to barge transfer
- ➔ Very infrequent

Going Forward



- ✓ Marine Diesel Standards

 - Local, Regional, National or Global

- ✓ Marine Vessels

 - ➡ New Marine Vessels

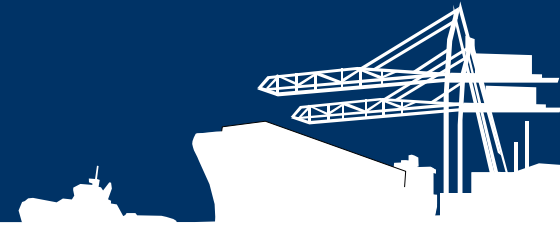
 - ➡ Retrofits on Existing Vessels

- ✓ Shorepower

- ✓ New Technology Research and Development

 - Current grant program to evaluate tug/tow emissions control technologies

Going Forward



✓ Partnerships for ports with “shared” fleets

➡ Texas fleet

- ✓ Beaumont/Port Arthur
- ✓ Corpus Christi

➡ Regional and National Fleet

- ✓ Ocean-Going
 - New York
 - Philadelphia
 - Virginia
 - New Orleans
- ✓ Tug and Towboat
 - Gulf Coast fleets
 - Intercoastal Canal and Inland River fleets

Contact

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Questions?

Corrections?

