MAKING RAIL, TRUCKS GREEN WITH ENVY

So what's one to think? The results of two recently released studies point to the vital economic and environmental role that tugs and barges play on a regional and national scale. A third scientific study, however, suggests that tugs are far bigger contributors of particulate matter to the air quality of ports.

The study, "A Modal Comparison of Domestic Transportation Effects on the General Public," examined the environmental and economic impact of the U.S. inland river barge system over a one-year period. The study was performed by the Texas Transportation Institute's Center for Ports and Harbors and co-sponsored by the U.S. Maritime Administration and the National Waterways Foundation (NWF). The research examined cargo capacity, congestion, emissions, energy efficiency, safety and infrastructure. It also compares the cargo capacity of barges, rail and trucks.

One hopper barge, for example, carries 1,750 short tons of dry cargo. To move this same cargo by rail would require 16 rail cars or 70 tractor-trailer trucks. As for liquid, a single inland tank barge can carry 27,500 bbls of gasoline. The same cargo would require 46 rail cars or 144 tanker trucks. Carrying the comparison further, a single 15-barge river tow has the same capacity as 216 rail cars pulled by six locomotives or 1,050 tractor-trailer trucks.

This robust carrying capacity translates into better fuel efficiency. The study shows that barges move a ton of cargo 576 miles with a single gallon of fuel as compared with 413 ton miles per gallon for rail and 155 ton miles per gallon for trucks.

As for the environment, the research showed that inland waterways transport generated fewer emissions on a grams/ton-mile basis than rail or trucks. For example, the study says that inland barges generated 0.011164 grams/ton-mile of particulate matter as compared with 0.01621 for rail and 0.018 for trucks. Inland river barge tows also showed better environmental results for hydrocarbons, CO_2 and NOx.

The inland waterways system includes about 12,000 miles of commercially navigable channels and some 240 lock sites. Waterways transport more than 60% of the nation's grain exports, about 22% of domestic petroleum and petroleum products, and 20% of the cal used in electricity generation.

On an annual basis, about 624 million tons of waterborne cargo transit inland waterways, a volume equal to about 14% of all intercity freight and valued at nearly $70 billion.

The study also looks at the hypothetical impact of a complete shutdown of the Mississippi and Illinois Rivers and its impact on the vicinity of St. Louis. The study uses the U.S. Federal Highway Administration's Highway Economic Requirements, State Version (HERS_ST) model to assess the estimated shifts of

More than 200 tugs are based in New York City, and include such operators as Bouchard Ocean Services, which recently added this new 35,000 bbl ocean tank barge

The Texas Transportation Institute study points out the environmental benefits of inland river barge transport

millions of tons of cargo from the inland river system to the city's interstate highways. HERS_ST is a Microsoft Windows application that helps transportation agencies plan and schedule highway work and determine future highway system needs. This software uses engineering principles to simulate future highway conditions and performance levels and identify deficiencies. The program then applies economic criteria to select the most cost-effective mix of improvements for system-wide implementation.

The study projects that highway costs over the next 10 years would increase from $345 million to over $721 million. The analysis also lays out a congestion nightmare, with truck traffic on St. Louis roadways increasing 200%, traffic delays jumping almost 500%, injuries and fatalities on interstates rising by 36 to 45%, and maintenance costs growing by 80 to 93%.

The Texas Transportation Institute study is a follow up to a report, "Environmental Advantages of Inland Barge Transportation," conducted by the Maritime Administration in 1994.

NEW YORK CITY STUDY

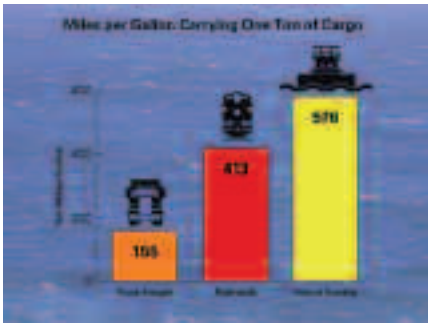
Meanwhile, this past June, the New York City Economic Development Corporation (NYCDEC) released the findings and recommendations of its Maritime Support Services Location Study. SUNY Maritime College was commissioned by NYCEDC and the Brooklyn Navy Yard to conduct the study to examine the economic impact of New York City's maritime industry and associated support services. It was funded in part by New York State's Department of State through its Environmental Protection Fund.

The study provides an excellent snapshot of the maritime activity in the region. The stacks of readily recognizable tug operators such Moran, McAllister, Bouchard, K-Sea, Reinauer and Penn can regularly be spotted in New York Harbor. New York City is home to more than 200 tugboats, representing 98% of the total fleet within New York Harbor, primarily based on the north shore of Staten Island and Erie Basin in Brooklyn. The tugboat fleet has grown by 37% since 1991, and the demand for their services continues to grow. Demand for barge services has also grown. The New York barge fleet represents almost one third of the total U.S. East Coast fleet. The New York region offers a system of navigable waterways that allows materials to be

transported via barge more economically than by truck. Demand for barge service has increased by 20%, growing from 1,000 to 1,200 since 1991.

"Maritime support services represent a significant share of the region's economic activity, generating more than $2 billion each year for the region and supporting approximately 12,000 jobs, of which 7,000 are waterborne," said NYCEDC Executive Vice President Madelyn Wils. "Finding innovative ways to support this important industry sector, which takes 3.1 million trucks off New York City roads annually, is consistent with the Bloomberg Administration's PlaNYC."

The NYCEDC numbers are based on one standard barge equating to 60 trucks, which was the traditional rough



equivalent prior to the release of the Texas Transportation Institute study, which updates the equivalent to 70 tractor-trailer trucks. The increasing use of the region's waterways to transport freight also reduces wear and tear on roadway infrastructure and serves to alleviate regional transportation congestion.

"The savings the maritime industry provides in both fuel and reduced commercial truck traffic congestion is priceless to our economy and environment," said New York City Council member Michael E. McMahon.

NOAA STUDY EXAMINES PM FROM TUGS

The U.S. National Oceanic and Atmospheric Administration and the University of Colorado recently reported the results of a study of particulate matter from commercial ships and vessels. These included harbor and escort tugs. The findings of the study, "Light absorbing carbon emissions from commercial shipping," were reported in the journal Geophysical Research Letters.

The lead author of the study was Daniel Lack from the NOAA's Earth System Research Laboratory and the NOAA-CU Cooperative Institute for Research in Environmental Sciences. Lack and his colleagues spent the summer of 2006 aboard the NOAA research vessel *Ronald H. Brown* observing emission plumes from some 96 commercial vessels in the Houston Ship Channel and the Gulf of Mexico.

The findings of the study suggest that tugs were the highest emitters (per unit of fuel burned) of light absorbing carbon aerosol. The measurements for the study were conducted using photoacoustic spectrometer equipment.

The results in Geophysical Research Letters states that "On average, MSD (medium-speed diesel) vessels emit more LAC (light absorbing carbon) aerosol per unit fuel consumed than other vessels by almost a factor of two." **ML**