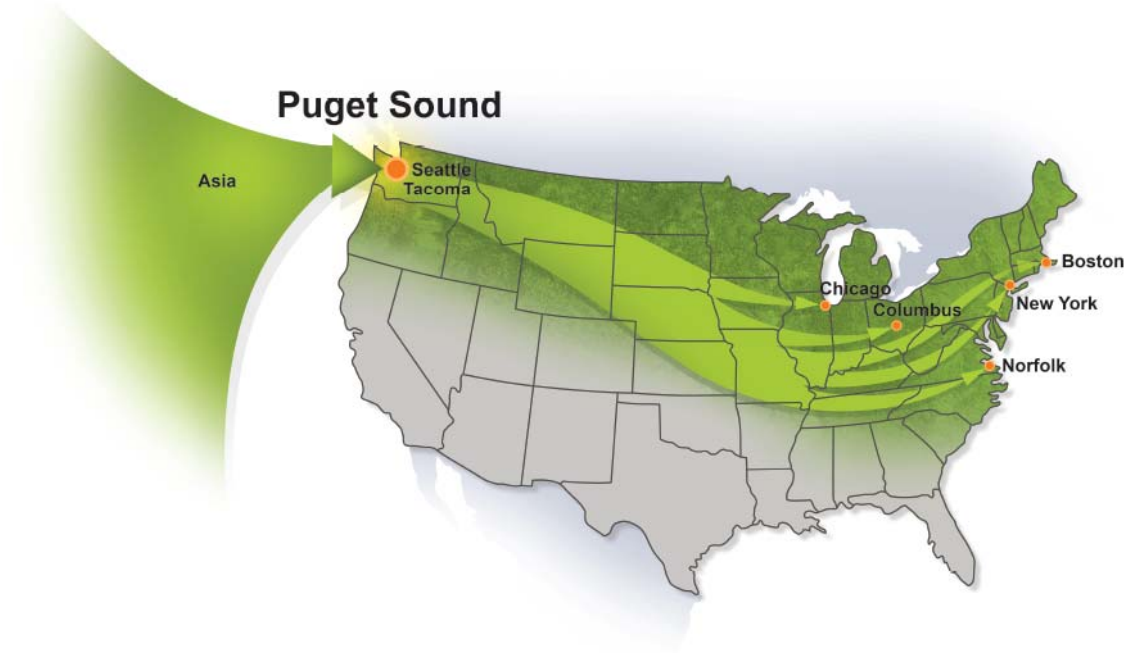
THE GREEN GATEWAY

The Ports of Seattle and Tacoma are the low carbon corridor for cargo moving between Asia and the American Heartland and all the way to the East Coast.



For ports of origin as far south as Singapore, carbon emissions for cargo moving by ship to Puget Sound and by rail to a broad swath of the United States are lower than on routes through the Panama Canal, Savannah, Norfolk, New York and California.

The findings were released in May 2009 by Herbert Engineering, a ship design, engineering, and transportation consulting firm commissioned by the Port of Seattle to analyze carbon footprints of trade routes between Singapore, Hong Kong and Shanghai, and the U.S. distribution hubs of Chicago, Columbus and Memphis.

Seattle and Tacoma are closer to Asia than any other U.S. port, resulting in shorter ocean transit times and lower fuel consumption on the ocean leg of the journey. But there's more to our strategy than geography.

How we got here

The effort to measure carbon footprints along trade routes is the latest step taken by the Puget Sound ports to quantify and reduce air emissions from maritime sources.

The Ports of Seattle and Tacoma partnered on the first maritime air emissions inventory for the Puget Sound region. Initiated in 2004, the Puget Sound Maritime Air Emissions Inventory was the most comprehensive maritime inventory to date, and the first to include greenhouse gas emissions. The study provided solid, scientific data on the nature and extent of air emissions from maritime sources in the Puget Sound and Georgia Basin Airshed.

The Northwest Ports Clean Air Strategy – a joint effort of the Port of Seattle, Port of Tacoma and Port Metro Vancouver – used the data from the inventory as a starting point for establishing emissions reductions benchmarks. The Clean Air Strategy establishes specific goals and dates for reducing emissions from ships, cargo-handling equipment and trucks that move cargo to and from the ports.

The goal of all of these efforts is to make our gateway more efficient and competitive, improve air quality, and reduce costs.

Ahead of the curve

The Puget Sound ports have been improving their environmental performance for some time. The Puget Sound Maritime Air Emissions Inventory and Northwest Ports Clean Air Strategy are groundbreaking efforts. They are unique not only because of the kind of information they contain, but also because of the cooperative approach they represent. The Ports have worked hand-in-hand with the transportation industry, regulatory agencies, community organizations, labor and environmental advocates. That cooperative approach has helped us move farther, faster without adding fees for port users.

As state and federal environmental agencies begin to implement policies to regulate maritime air emissions, the Puget Sound ports are ahead of the curve. In fact, the Port of Seattle has taken a leading role to ensure that such policies are based on sound data, working with World Ports Climate Initiative members to develop guidelines all

ports can use to measure the carbon footprint of their operations. The Port of Seattle Carbon Footprint Study is the first to review the greenhouse gas emissions of specific trade gateways. Part of our continued groundbreaking work, the carbon study will be an important tool in our larger effort to measure our environmental performance and enhance our competitive position.

As concerns about climate change and air quality grow, consumers are increasingly aware of the environmental impact of their purchases. Seattle and Tacoma's Green Gateway offers shippers and their customers the option of a trade lane that keeps costs competitive while protecting the environment, and helps build and capture value in emerging consumer demands.

Green actions to date

❑ Nearly 200 pieces of cargo handling equipment on Port of Seattle marine terminals have been retrofitted with emissions reducing devices and switched to biodiesel, low-sulfur diesel, or a blend of the two. All cargo-handling equipment at the Port of Tacoma runs on ultra-low-sulfur diesel or biodiesel.

❑ In 2005, Princess Cruises joined with the Port of Seattle, the Environmental Protection Agency, the Puget Sound Clean Air Agency (PSCAA) and Seattle City Light to bring the first shore power connection to the Pacific Northwest. Holland America Line followed in 2006 with a second connection. These shorepower connections reduce green house gas emissions by 29 percent per vessel call. All cruise ships calling that do not connect to shore power are required to use fuels with a sulfur content of 1.5 percent or less, reducing particulate matter emissions.

❑ In January 2009, the Port of Seattle and PSCAA implemented the At-berth Clean Fuels (ABC Fuels) program, which provides incentives for container ship operators to use low sulfur fuel (0.5% or less) while the vessels are docked in Seattle. As of April 2009, six carriers have signed up for the program (Maersk Line, CMA CGM, APL, Matson Navigation, Hapag Lloyd and Norwegian Cruise Line) and several others are considering participation. ABC Fuels is expected to reduce emissions of particulate matter from participating ships by 60 percent and sulfur dioxide by 95 percent. More than

half of the ships that call frequently at the Port of Tacoma voluntarily burn cleaner, low-sulfur distillate fuels while docked in Tacoma.

❑ In April 2009, the Port of Seattle Commission approved a plan to reduce emissions from trucks that serve the port. The Port of Seattle's plan calls for prohibiting the most polluting trucks (1994 model-year and older) from entering port terminals beginning January 1, 2011, in keeping with the 2010 standard of the Northwest Ports Clean Air Strategy. Approximately 1200 trucks (more than 75% of the fleet calling regularly at the Port of Seattle) meet that standard already. The program will include measures to scrap the old trucks, compensate truck owners for their older trucks, and help them buy or lease newer ones.

❑ About 86 percent of the trucks that call regularly at the Port of Tacoma already meet the 2010 standard of the Northwest Ports Clean Air Strategy. The truck program adopted by the Port of Tacoma Commission in March 2009 sets forth strategies for addressing the other 14 percent. Two trucking companies that serve Tacoma's substantial Alaska trade recently added diesel-electric hybrid trucks – the first at a West Coast port - and 2009 trucks with the latest available diesel engine technology to their fleets.

❑ The approach of both ports through all of these steps has been to partner with customers, tenants, community groups, environmental organizations and regulatory agencies. The result has been effective solutions that keep the port competitive and do not increase costs for shippers or carriers.

The Study

The Herbert study covers shipments from Shanghai, Hong Kong and Singapore to Chicago, Columbus and Memphis by vessel and rail through the ports of Prince Rupert, Seattle, Oakland, and Los Angeles/Long Beach. It also analyzes routes via the Panama and Suez Canals through the ports of Houston, Savannah, Norfolk and New York. Ships sized at 4,500, 6,500, 8,500, and 12,500 TEUs (twenty-foot equivalent units) were included in the study, as was the year 2014 expansion of the Panama Canal.

The Findings:

The results show that Puget Sound is the Green Gateway to 180 million American consumers.

❑ Puget Sound ports have a clear advantage in greenhouse gas emissions compared to East Coast ports for intermodal shipments from Asia to the Midwest.

❑ While ocean transportation emits less carbon per container TEU (twenty-foot equivalent unit) on a per-mile basis than rail, the ocean distance to West Coast ports is short enough to offset the carbon impact of rail transportation from the West Coast to inland destinations.

❑ Even in 2014, when the Panama Canal expansion is complete and larger ships begin to transit the canal, West Coast ports will maintain their carbon emissions advantage.

Example

The chart below shows the carbon emissions analysis for shipments from Shanghai to the U.S. through various North American ports to Chicago, Columbus and Memphis.

Origin: Shanghai*		**CO_2 emissions (metric ton/TEU)**		
Discharge Port	**Ship Size**	**Chicago**	**Columbus**	**Memphis**
Seattle	6,500 TEU	1.579	1.664	1.715
Oakland	6,500 TEU	1.686	1.772	1.694
LA/LB	6,500 TEU	1.663	1.748	1.663
Prince Rupert	6,500 TEU	1.598	1.680	1.725
New York via Panama Canal	4,500 TEU	2.520	2.468	2.574
Norfolk via Panama Canal	4,500 TEU	2.493	2.401	2.482
Savannah via Panama Canal	4,500 TEU	2.469	2.556	2.369
Houston via Panama Canal	4,500 TEU	2.470	2.510	2.323

To view the full study, "Carbon Footprint Study for the Asia to North America Intermodal Trade," go to www.portseattle.org/seaport/cargo/GreenGateway.shtml.

Prior to the release of this study, the Port of Seattle asked for independent reviews from the following experts:

- Anne Goodchild, Assistant Professor of Transportation, University of Washington College of Engineering;

- Greg Shelton; Managing Director of the Global Trade, Transportation and Logistics Studies (GTTL) program, University of Washington; and

- Charlie Cunniff, Director, Seattle Climate Partnership, City of Seattle Office of Sustainability & Environment.

For more information on Herbert Engineering, go to: http://www.herbert.com.