

of transportation security incidents or disasters that have already occurred or are imminent. While we can reasonably expect MARSEC Level 3 to increase the direct costs to businesses attributable to increased personnel or modified operations, we believe the indirect costs to society of the "ripple effects" associated with sustained port closures would greatly outweigh the direct costs to individual businesses.

The U.S. Marine Transportation System

The cost of MARSEC Level 3 can best be appreciated by the benefits of the U.S. MTS to the economy. Maritime commerce is the lifeblood of the modern U.S. trade-based economy, touching virtually every sector of our daily business and personal activities.

Annually, the U.S. MTS contributes significant benefits to the economy. More than 95 percent of all overseas trade that enters or exits this country moves by ship, including 9 million barrels of oil a day that heats homes and businesses and fuels our automobiles.¹ In addition, over \$738 billion of goods are transported annually through U.S. ports and waterways.²

Other benefits include the water transportation and shipping industry that generates over \$24 billion in revenue and provides nearly \$3 billion of payrolls.³ The annual economic impact of cruise lines, passengers, and their suppliers is more than \$11.6 billion in revenue and 176,000 in jobs for the U.S. economy.⁴ Our national defense is also dependent on the MTS. Approximately 90 percent of all equipment and supplies for Desert Storm were shipped from strategic ports via our inland and coastal waterways.⁵

The Ripple Effect of Port Closures on the U.S. Economy

We could expect not just the immediate effects of port and waterway closures on waterborne commerce as described above, but also serious "ripple effects" for the entire U.S. economy that could last for months or more, including delayed commerce, decreased productivity, price increases, increased unemployment, unstable financial markets worldwide, and economic recession.

To appreciate the impact, we can examine one sector of the economy:

agriculture. Many farm exports are just-in-time commodities, such as cotton shipped to Japan, South Korea, Indonesia, and Taiwan. Asian textile mills receive cotton on a just-in-time basis because these mills do not have warehousing capabilities. A port shutdown may cause U.S. cotton wholesalers to lose markets, as textile producers find suppliers from other nations. U.S. wholesalers would lose sales until shipping is restored.

Another example is the auto industry. A recent shutdown of West Coast ports due to a labor dispute caused an automobile manufacturer to delay production because it was not receiving parts to make its cars. We can see that a port shutdown can create a domino effect, from stalling the distribution of materials to causing stoppages and delays in production to triggering job losses, higher consumer prices, and limited selection.

The macroeconomic effects of the recent shutdown of West Coast ports, while not in response to a security threat, are a good example of the economic costs that we could experience when a threat would necessitate broad-based port closures. The cost estimates of this 11-day interruption in cargo flow and closure of 29 West Coast ports have ranged between \$140 million to \$2 billion a day, but are obviously high enough to cause significant losses to the U.S. economy.⁶

Another proxy for the estimated costs to society of nationwide port closures and the consequential impact on the U.S. supply chain can be seen by a recent war game played by businesses and government agencies.⁷ In that recent war game, a terrorist threat caused 2 major ports to close for 3 days, and then caused a nationwide port closure for an additional 9 days. This closure spanned only 12 days, but resulted in a delay of approximately 3 months to clear the resulting containerized cargo backlog. The economic costs of the closings attributable to manufacturing slowdowns and halts in production, lost

sales, and spoilage was estimated at approximately 58 billion. The simulation gauged how participants would respond to an attack and the ensuing economic consequences. Furthermore, a well-coordinated direct attack of multiple U.S. ports could shutdown the world economy by effectively halting international trade flows to and from the U.S. market—the largest market for goods and services in the world.

We believe that the cost to the national economy of a port shutdown due to extreme security threats, while not insignificant, would be relatively small if it only persisted for a few days and involved very few ports. However, if the interruption in cargo flows would persist much longer than the 11-day shutdown recently experienced on the West Coast, the economic loss is estimated to geometrically increase (double) every additional 10 days the ports were closed.⁸ At a certain point, companies would start declaring bankruptcies, people would be laid off indefinitely, and the prices of goods would increase. This effect would continue and intensify until alternate economic activities took place, such as the unemployed finding less desirable jobs or companies finding secondary lines of operations and suppliers. Regardless, the economic hardship suffered by industry, labor, and the loss of public welfare due to a sustained nationwide port shutdown may have as significant an effect on the U.S. as the act of terror itself.

Benefit Assessment

Why We Measured Benefits Using the N-RAT

A team of experts considered the benefits of various security measures that will be implemented and used the N-RAT to estimate the reduction in risk associated with these security measures. Before the results of this assessment are discussed, it is helpful to understand why the Coast Guard chose this methodology to measure regulatory benefits.

Traditionally, the Coast Guard's regulations intended to decrease marine-related casualties, which in turn reduced number of injuries, fatalities, and pollution (primarily oil) spilled into the marine environment. These sorts of safety and environmental benefits could be estimated with some degree of accuracy; the well-documented and detailed history of maritime incidents provides a solid foundation to estimate the "costs to society" that could be

¹ See MTS Fact Sheet available at www.dot.gov/mts/fact_sheet.htm.

² See 2000 Exports and Imports by U.S. Customs District and Port available at www.marad.dot.gov/statistics/usfwts/.

³ U.S. Census Bureau, 1997 Economic Census, Transportation and Warehousing-Subject Series.

⁴ See footnote 1.

⁵ See footnote 1.

⁶ See Lost Earnings Due to West Coast Port Shutdown—Preliminary Estimate, Patrick Anderson, October 7, 2002, available at <http://www.AndersonEconomicGroup.com>; An Assessment of the Impact of West Coast Container Operations and the Potential Impacts of an Interruption of Port Operations, 2000, Martin Associates, October 23, 2001, available from the Pacific Maritime Association. These two studies were widely quoted by most U.S. news services including Sam Zuckerman, San Francisco Chronicle, October 2002.

⁷ The war game simulation was designed and sponsored by Booz Allen Hamilton and The Conference Board, details available at <http://www.boozallen.com/>.

⁸ See Anderson footnote 6.