

Evaluating the Economic Impact of Port Security Initiatives on Container Operations

Port security is an area of increasing national concern. Various security measures have been proposed in an effort to reduce perceived security threats. These measures have the potential to significantly increase both shipping cost and time. To help define and explore the tradeoffs between security and commerce, we have used system dynamics models to engage diverse representatives of business and government. In collaboration with domain experts, we have developed models of port performance on two relevant time scales. A short-term port operations model simulates the effects of a variety of security measures on port operations in terms of shipping cost and delivery time. A long-term port economics model simulates the possible consequences of port performance changes caused by security measures on the long-term competitiveness of the port. In workshops designed around these models, we have engaged government and business representatives in discussions about the ramifications of security policies. These workshops have catalyzed discussions among the diverse parties concerned with insuring secure and efficient shipping. Simulation results suggest that imposing new security measures uniformly across all ports in a region help maintain the existing competitive balance among the ports. Conversely, implementing new security measures in a piecemeal fashion (that is, at some ports long before others) results in significant competitive disadvantages to the early adopting ports. We found that subsidizing capital equipment costs was not sufficient to offset this competitive disadvantage since both O&M costs and increased inspection costs for detects can significantly impact a port's bottom line.

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