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# Tech Brief

## EMPTY INTERMODAL CONTAINER MANAGEMENT

FHWA-NJ-2006-005

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### HERE'S THE PROBLEM

Despite the increase in productivity, overall efficiency, safety and the reduction in cost and service time, intermodal shipping container transport has several inefficiencies associated with it. One of them is the accumulation of empty shipping containers, largely attributable to the chronic trade imbalance between the US and Asia, and Europe and Asia. Empty containers are stacked along the coasts, stored at empty depot locations, or shipped back to Asia. These alternatives are expensive and inefficient. This study evaluates alternative mechanisms and/or strategies that address the storage, accumulation, and cost efficient potential reuse, recycling, and disposal of the empty shipping containers.

### AND, HERE IS THE SOLUTION...

- Review national and international literature to determine the root causes for the accumulation of empty containers. Review trade journals and contact port authority and other industry stakeholders for an in-depth investigation of the causes of this problem.
- Determine the current state-of-practice in dealing with this problem. Examine alternative solutions like repositioning, cost-efficient potential reuse, recycling, disposal, secondary uses and IT assisted management.
- Create a methodology for dealing with the empty container accumulation problem, based on international experience and state-of-practice, and determine the optimal combination of alternative strategies for short, medium and long-term solutions.

### THIS IS WHAT IT CAN DO

- Address the factors or criteria that can help maintain empty containers as part of Transportation System

- Propose a system for making empty containers as attractive commodities for marketing during their complete life cycle.
- Propose innovative technologies for recycle or reuse of empty container including their benefit and cost estimates.
- Propose policy guidelines at federal and state level, stakeholder strategies, and operating and management measures to assist in empty intermodal container management.

### **BUT HOW CAN IT DO ALL THIS???**

A decision support tool, implemented within a GIS framework has been built with the purpose of assisting in the decision making process and facilitating dialogue among various stakeholders. The tool is meant to be used as a means to determine the most promising measures in terms of achieving desirable levels of empty container accumulation, while considering other direct and secondary impacts that implementation of these measures may have. Figure 1 shows the structure of the decision-support tool.

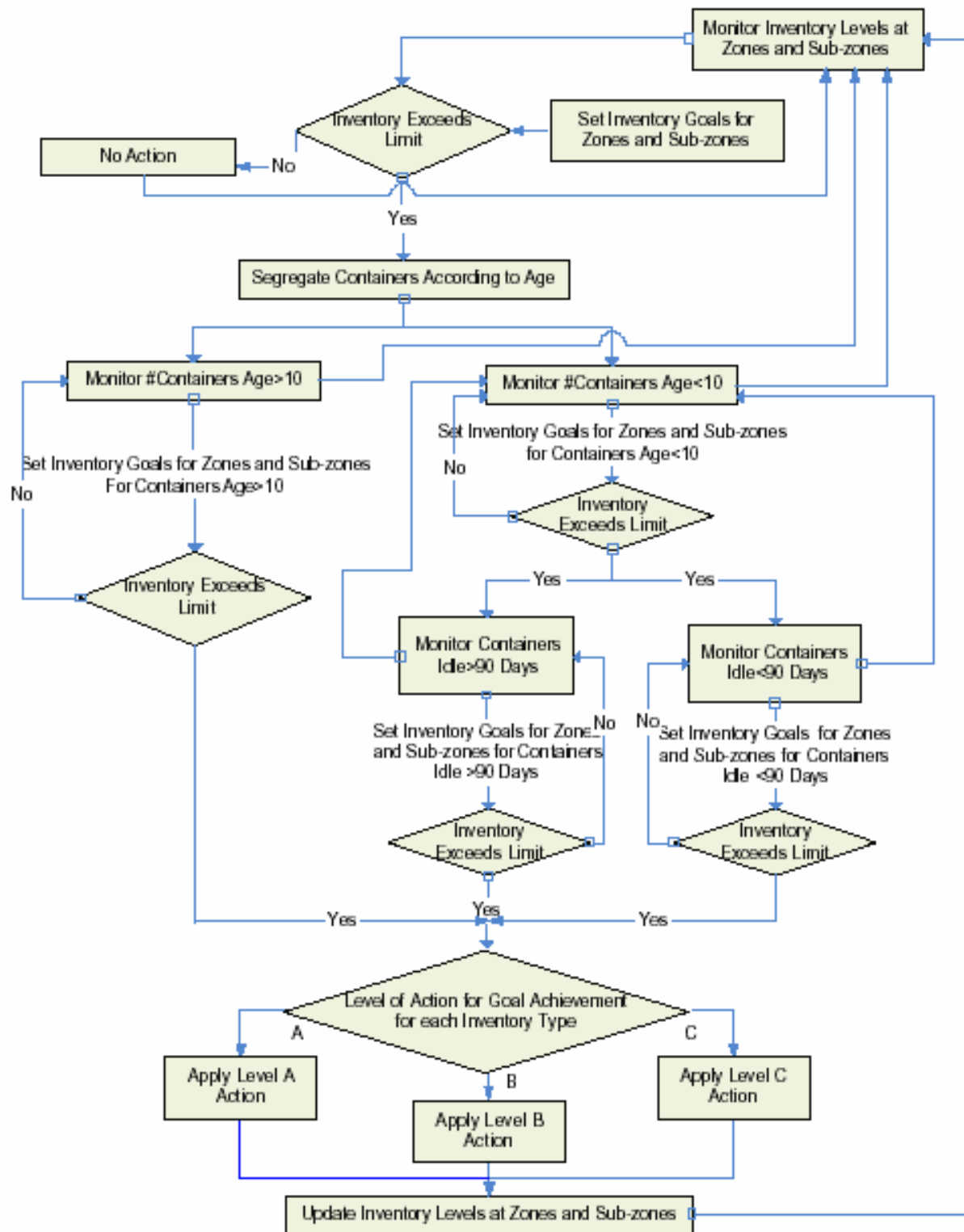
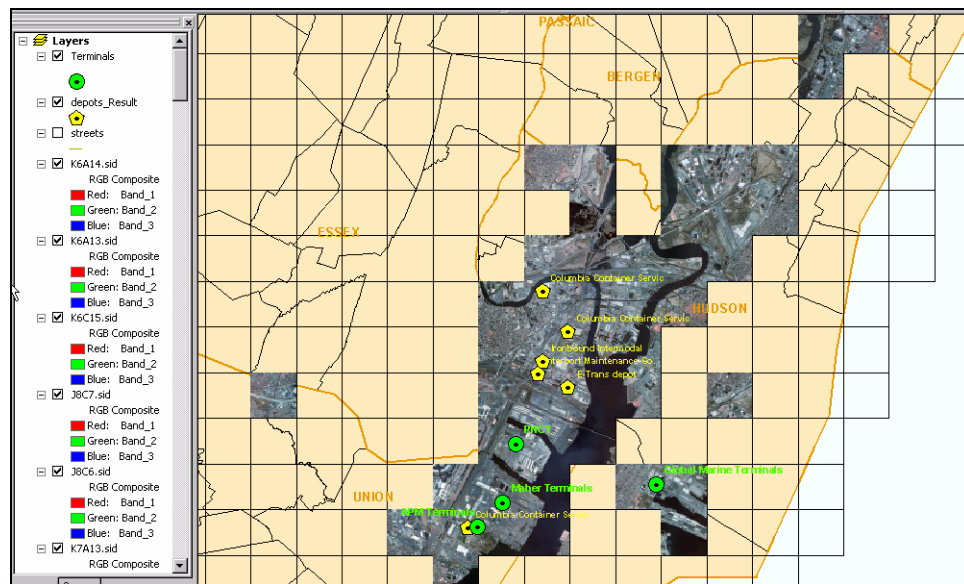


Figure 1: Structure for Decision Support Tool

## AND, HERE'S WHAT WE DID...

Through discussions with key industry stakeholders we developed a better understanding of the dynamics, interactions, and constitutional and organizational barriers of the industry. Container movements were mapped at three different levels: global, regional and local.

Various regions around the world facing empty intermodal container accumulation issues were examined. The case of the Port of New York/New Jersey was studied in-depth. Aerial orthographic tiles/pictures were imported into GIS to understand and visualize the extent of the problem in the port vicinity. Figure 2 shows a snapshot from the GIS, highlighting the empty container storage sites near the port vicinity with major depots and terminal locations.



**Figure 2: Aerial pictures of locations in NJ where empties are stored with major depot and terminal locations**

The options that may help keep containers as part of the intermodal transportation system, while minimizing the inefficiencies caused by these containers moving empty or sitting idle in a yard or depot were studied. Several different reuse and recycling techniques, along with a list of effective strategic, tactical and operational policies were built.

## HERE'S WHAT WE CAME UP WITH...

- The major cause of the empty container accumulation problem is the fundamental global imbalance of trade between the East and the West and the associated trade imbalance in the US. Other causes of empty container accumulation are tariff imbalances and the related cost of repositioning empty containers from surplus to deficit areas, cost of inland transportation, marginal and volatile profitability of the leasing industry, cost of manufacturing and

purchasing new boxes in relation to the cost of leasing containers, terms of leasing contracts between leasing companies and ocean carriers and cost of inspection and maintenance for aged containers.

- Empty container logistics is a global issue, influenced by international transportation practices, governed by global trade patterns and mostly dictated by major ocean carriers' interests. Complete and direct control of empty container accumulation at a regional and local level falls far beyond the ability of local and regional authorities and other interested stakeholders, and institutional, fiscal or regulatory measures can be proved inefficient if the global environment is not considered in formulating the regional conditions.
- A monitoring system, mapping the conditions prevailing in empty container accumulation over time, could be implemented. Such a monitoring system could be part of a broader system for equipment tracking and tracing, used to improve productivity, efficiency and security of facilities and services.
- A study of the industry players' behavior is needed to understand the factors affecting their behaviour and the extend to which policies and strategies could lead to industry actions that may have a negative overall impact to the region.
- Strategically located inland depots, possibly linked through an information sharing system could help ease congestion at marine terminals and depots near by these terminals. It may also facilitate selling of older containers in the secondary market.

### ***THE BOTTOM LINE...***

Trade imbalance is the number one factor causing accumulation of empty intermodal containers at various regions around the world. To accommodate trade and maintain the efficiencies that currently exist in the freight transportation and logistics industry, temporary storage of empty containers is inevitable. We examined the state-of-practice in dealing with related issues around the world and synthesized factual data to develop a detailed mapping of how containers move at a global, regional and local level, including moving and accumulation of empty intermodal containers with a focus into the New York New Jersey region. Findings of this study highlight the fact that empty container logistics is a global issue, greatly influenced by international transportation practices, governed by global trade patterns and mostly dictated by major ocean carriers' interests. To address empty container accumulation at a regional level requires collaboration among all stakeholders, to ensure that any policies or measures proposed to be implemented will not prove detrimental to the competitive position of transportation resources of this region in the international marketplace.

The study identifies various key efforts such as development of a monitoring system; study of the behavior of key players in the empty container industry; a systems approach that may investigate the optimal location of empty container depots in the region; and a systems approach to the study of the secondary market, which if implemented, could bring a better understanding of the industry improving the decision making process.

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A final report is available online at <http://www.state.nj.us/transportation/research/research.html>

If you would like a copy of the full report, please FAX the NJDOT, Bureau of Research, Technology Transfer Group at (609) 530-3722 or send an e-mail to [Research.Bureau@dot.state.nj.us](mailto:Research.Bureau@dot.state.nj.us) and ask for:

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