The Role of Intermodal Transportation in Humanitarian Supply Chains


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Project Objective
The main objective of this study is to identify the role and impact of intermodal transportation on the performance of response and recovery operations following a disaster. This objective will be achieved by pursuing two specific aims:

- Identify and assess the current response operations. Determine how (if at all) and why humanitarian organizations utilize different modes of transportation to move the goods and personnel effectively and efficiently in responding to and recovering from a disaster.
- Identify factors that will potentially improve the attractiveness of using intermodal transportation.

Project Abstract
After the Tsunami that struck Asia and Africa, and after Hurricane Katrina, which devastated parts of some southern states in the U.S., it became apparent that complex and coordinated supply chains are required for effective relief efforts. The commercial sector has realized a few decades ago that significant cost savings can be achieved by optimizing the supply chain as a whole. However, the creation of efficient supply chain operations is not high on the agendas of humanitarian organizations (Thomas, 2005). It is not clear if and how intermodal transportation affects the operations of humanitarian organizations.

Some of the tools developed for commercial supply chains can be used in humanitarian supply chains, but there are differences in the two types of systems, such as the motivation for streamlining processes. Thus, there is an urgent need to understand better how to make humanitarian supply chains more effective and efficient. Studies done by the Fritz Institute, a non-profit humanitarian organization, demonstrate the need for models and tools that can be used
to improve the efficiency and effectiveness of humanitarian supply chains. There is also a critical gap in the education and training of students on issues related to the challenges faced in providing relief in disasters. The majority of about 300 logisticians surveyed at major aid organizations indicated that they typically get their education and training on the job by co-workers (Thomas and Mizushima, 2005). The lack of experienced and skilled logisticians in the field due to poor education and training practices prohibits aid organizations from providing effective logistics support. Until it is known how to optimally coordinate the logistics activities of humanitarian supply chain, it is unlikely that relief efforts will become more efficient and effective than has been the case in the recent past. The proposed study is a step towards understanding how intermodal transportation might help improve the disaster response and recovery operations through the use of focus groups, surveys, and interviews with disaster relief agencies.

**Intermodal Orientation of the Project**

This project will focus on the use of air, rail, and trucks in providing aid following a disaster. Although primary focus will be freight transportation, following a disaster aid providers also need to transport volunteers and field operators to help with the response and recovery operations. Humanitarian organizations will be surveyed to assess the role and impact of intermodal transportation in responding to disasters.

**Task Description**

The research project will be conducted in two phases. The first phase consists of information gathering and methods development. To ensure adequate representation of disaster relief agencies that operate in the United States, a comprehensive listing of all such agencies will be developed. The records will include information related to the scope of relief operations. Effort will also be used to find reliable contact information for each agency. This includes names, email addresses, and phone numbers for agency representatives. It is expected that there will be multiple contacts at each agency.

Once the agency list is developed, approximately five to ten local agency representatives will be contacted. The project team will interview each representative via telephone to further examine the extent of the agency’s disaster relief operations. Additionally, the one-on-one conversations with the agency representatives will be used to refine the questions posed to the focus groups.

After the telephone interviews have been conducted, a focus group will be conducted. Agency representatives from agencies geographically local to Mississippi will be included. The focus group will be used to gather information on the selection and use of transportation modes for relief operations. The focus groups will consist of between 3-5 representatives, in addition to project members. Therefore, two different focus groups will be used. To better facilitate this information gathering, the focus groups will be conducted using teleconferencing.

The final step of phase one is survey development. Using information gained in the telephone interviews as well as focus groups, an online survey will be created. The survey will address issues related to the use of transportation modes, factors affecting transportation decisions, and general operations planning. The survey will also ask for more specific information about each agency and the scope of their disaster relief work.
The second phase of the project will be data collection, analysis, and dissemination. While many of the organization contacts will be related to gulf coast disaster relief, agency representatives from across the United States will be asked to complete the survey. This will allow the analysis to include a breadth of community and transportation factors. A survey invitation will be sent via email to the agency contacts identified early in phase one.

Information collected through the survey will be compiled and analyzed to determine trends related to the following:
- Agency characteristics (type of relief offered, size of operations)
- Utilization of various transportation modes
- Factors considered when coordinating relief transportation
- Origins and destinations of relief supplies
- Constraints guiding relief transportation decisions

The analysis will highlight the use (or lack of use) of intermodal transportation by disaster relief agencies. It will also identify factors that lead to transportation system selection.

Once data analysis is complete, the results will be disseminated to both the scholarly and practitioner communities. Research results and methods will be shared with the research community through scholarly publication (conference papers and presentation, journal article, etc.). The results will also be shared with the relief organizations themselves through summary reports and suggestions for future improvements.

**Technology Transfer**
The results garnered from the focus groups and survey will be shared with the participating disaster relief agencies in two ways. First, survey respondents will be able to indicate interest in receiving survey results. On the final page of the online survey, they can enter their contact information to “opt-in” to the results distribution. Those that choose this option will be sent a summary report detailing the findings of the survey.

Second, agency representatives that participated in the phone interviews and focus groups will be contacted by telephone after the results have been compiled. The summary report will be shared with them as well, followed by a discussion of the results. Their reaction to the results, as well as thoughts on future research needs and obstacles will be discussed.

Finally, the results will be disseminated to the research community. This will be done through conference presentations and peer reviewed publications. It is our hope that this project will initiate increased funding and collaborations for research in humanitarian relief supply chain.

**Benefits of Project**
To the Industry: The proposed research is expected to uncover the factors that will allow intermodal transportation to play an important role in providing relief to disaster stricken areas. Thus, the outcomes are expected not only to help aid organizations, but also to have highly positive societal impact.
To the general body of knowledge: To the best of our knowledge there is no study that looks into the role of intermodal transportation in disaster response and recovery operations. It is reasonable to assume that there is urgency in response operations. Thus, intermodal transportation may not be a viable solution. However, recovery operations are longer-term activities compared to response operations, and as such intermodal transportation can play a significant role. Understanding these issues will be a significant contribution to the general body of knowledge.