

The Battle of New Orleans 2005: Lessons from the Transportation Industry

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Today's session was a history lesson. The experiences of Katrina viewed from the perspective of transportation carriers and shippers offer unique insights into the behavior these essential industries, in particular, and the private sector in general, in the face of a massive disruption in infrastructure, people and activities.

An essential characteristic of the transportation system is its interconnectedness with our society and economy. It is the sinew which links us to essential resources, to opportunity, and to each other. Thus, the responses of these transportation companies are important not merely from the perspective of their own self-interests, but also because their services are critical to our viability as a community and a nation. The companies represented in this discussion move goods of all types, including indispensable subsistence products such as food, medicine and energy. Their functioning affects their customers, and through them, all of society, and the livelihood of people as workers and wage earners.

At each step in the process – anticipation and preparation, impacts, crisis response and recovery – the businesses we heard from displayed a focus of mission and action different from governments in this case. There seemed to be no debate or discussion about the mission of each firm and the responsibility of its people. As a consequence, although the effects of Katrina were massive in terms of facilities and money, firms were able to act quickly to preserve resources and begin restoration of services.

The clarity of mission is understandable, and yet the firms represented in this session are both large and widely dispersed, and so it would not have been surprising to learn about command and control problems, confusion across the landscape, and even desertion of tasks to escape the fury of Katrina. Instead we learned about quick and directed response, reasonably effective communications, and a collaborative actions that extended beyond the boundaries of single firms to suppliers, customers, and even competitors.

This strong command and control structure was not created for Katrina. It was an integral feature of these firms, and one that seemed to hold together as conditions deteriorated. The lesson for the future hinges on another question: can such an integrated command structure be transferred to (non-military) governmental agencies, particularly in a context in which a hierarchy of governments needs to come together to respond to the emergency? Professor Haider's comments suggest it cannot, but because the next big disaster is a certainty, as Prof. Dowding warned, we must find a way to do this.

Effective planning for such a disaster, including anticipation of the threat, organization of response resources, and, where there was sufficient time, pre-deployment of key assets (including moving some resources to safety), was a common and successful strategy. While the public Hurricane Pam exercise in New Orleans in the summer of 2004 was a major planning effort, it appears that the failures of that simulation were recognized by government but not converted into remedial actions to prepare for the real thing. Transport carriers, in particular, have had the benefit of more routine service disruptions over the years – infrastructure failures, accidents, spills – which helped them develop the response resources and skills. The businesses we learned about implemented standard procedures to the extent that the threat itself was standard, and when it got out of hand, they quickly improvised, reached out for additional resources, and collaborated in innovative patterns.

A key strategy that was more characteristic of the firms we heard from in this session than it was of government was *system thinking*. This is big picture thinking, understanding and ensuring the functioning of the critical components of systems so that service protection and restoration could be rapid and effective. Systems thinking is a way of functioning in organizations and it probably has a lot to do with both effective command and control structures and corporate culture – a sense of integrated responsibility and operation.

Systems thinking means realizing that the people, communications, infrastructure, rolling stock, emergency electrical power, terminals, and even the customers and competitors play a role in system functioning and disaster response. In contrast, the evacuation of people from New Orleans at various times seemed to overlook mobility limitations, resistance to evacuate, subsistence needs, safe refuge, special requirements of those who are hospitalized or in nursing facilities, and information about what to do and how to do it.

Every experience should expand our understanding of those critical system interrelationships. These include the routine of daily operations and small disruptions, planning for disasters, practice drills, and even hurricanes themselves. Katrina was an advance course in system interconnections and disaster response.

A number of specific actions seem to be common to the business responses presented today. These include:

- Protecting people, not only employees, but their families as well. Each firm sought to account for the location and safety of its employees. Some provided support resources, and some built temporary communities with trailers, recreational vehicles and tents to house workers and their families. The strategy seemed to be “take care of our employees and they

- will take care of the business.” It appears that the employees responded in kind.
- Securing reliable communications. Satellite telephones seem to have been the norm, based on the expectation that the electrical grid would not be functioning, thus disabling both wired and wireless telephones. Unfortunately, with satellite phones the standard, bandwidth capacity was quickly overwhelmed, and this channel became uncertain. More satellite bandwidth available for emergencies seems essential in the future.
 - Quick assessment of the condition of assets. Knowing the post-hurricane condition of system components provided a basis for targeted response and recovery. This was accomplished with boots-on-the-ground as well as aerial surveillance – helicopters and fixed wing aircraft to bring experts to view dispersed transportation assets and return reports and photographs. Aerial access was restricted in some cases when rescue efforts brought government aircraft to the scene. Advanced air traffic management systems supported by quick response mobile air traffic control resources and emergency coordination protocols should be considered.
 - Redundancy of transportation networks allowed rerouting around flood zones and broken links. The geography and network structure around Lake Ponchartrain limited the local redundancy. In the case of the CSX railroad, rerouting to distant locations, in some cases using competitor’s rights of way, permitted rapid restoration of service to customers and long term detour arrangements while coastal bridges and other facilities are being rebuilt.
 - It is worth remembering that preserving some redundancy in networks is insurance against future disruptions. Balancing this need for capacity to respond to local surges in demand or to recover from an emergency -- with the commercial market’s relentless pressure to minimize inventory and streamline operating assets -- is an ongoing challenge for transport firms and those who design supply chains, as Professor Chopra remarked.
 - Utilizing network redundancy in some cases required alliances between competitors. That this was possible is an important measure of collaboration in the broader transportation system. In a sense it is an investment firms make to protect their own interests against future disasters.
 - If necessity is the mother of invention, the focused will to act is surely the father. When the power grid failed, Colonial Pipeline brought in truck-mounted generators from across the country and was back in business in 55 hours. CSX built a temporary city for employees and their family in their Gentilly, New Orleans yard. Ingram Barge contracted salvors from Pittsburgh to recover stranded and damaged equipment when local resources were not quickly available. Several firms voluntarily prepaid local tax bills to provide these governmental units with liquidity for swift

- reestablishment of critical public services. The pattern might be called informed improvisation. These firms were not reluctant to do this.
- Concern for the customers and the victims was paramount. Responding quickly to bring emergency resources to the scene, and to restore customer functionality was a clear priority, a mission understood and accepted.

And what of the future? There are lessons to be learned about disaster preparation and rebuilding the infrastructure to make it more resilient to natural disasters. These include options such as:

- Ensuring the effectiveness and functionality of the command and control process. Industry seemed to handle this well, but initially, government did not. This takes clarity of mission and responsibility. When mission and responsibility are clear, dispersed forces need not wait for an order to act effectively.
- Building in more secure places – on higher ground, behind secure flood walls, with greater damage resilience, or in different locations altogether.
- Using more robust designs – for example, stronger shear connectors on bridge decks to reduce the likelihood that they will be washed away, and alternative ballast materials that stay in place under storm surges.
- Planning redundancy into systems to ensure effective responses where the risks of disruptions warrant:
 - Acquiring and pre-deploying redundant power supplies to keep essential systems operating when the power grid fails.
 - Redesigning and reconstructing critical highways for safe, contra-flow operation for evacuation.
 - Considering the risks of service interruption when evaluating decisions to reduce network redundancy.
 - Adding secure communications capacity – investing in re-deployable satellites to make communications bandwidth more flexible.
 - Promoting interoperability and open standards to facilitate redeployment of assets in connected networks.
- Thoughtfully stockpiling critical and relatively low cost resources in preparation for a future need:
 - Temporary housing facilities – trailers, tents, even facilities for care of pets to help overcome reluctance to evacuate.
 - Communications gear.
 - Blankets, clothing and nonperishable food stocks.
 - And, of course, transportation equipment for evacuations – buses and boats, and trained operators for them.

Planning for the next major disaster should consider Prof. Chopra's discussion of trading inventory (stockpiling) for capacity (redundancy and the capacity to rebuild). We can also learn from the comments of Profs. McGuire and Haider

that the nature of the backup resources – their costs, how often they are likely to be used – as well as the capacity to make these investments, should influence who is responsible for acquiring them. The responsibility for higher cost, less frequently used, resources should be shared, and at a higher level of responsibility.

Finally, Prof. Binford reminds us that the history of New Orleans and the Gulf Coast is a story of the struggle between Man and Nature. Learning from that history means understanding the risks, and preparing for them in the decisions we make as individuals, communities and businesses.