

New England University Transportation Center



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Problem Addressed:

Despite the heightened attention disaster preparedness and emergency management have received over the past decade, serious weaknesses in the United States' emergency response capabilities remain at all levels of government and across a wide range of functional areas (as evidenced, perhaps most vividly and tragically, in 2005 during Hurricane Katrina). Through the UTC 19 project Improving Emergency Preparedness and Crisis Management Capabilities in Transportation, a Harvard Kennedy School research team has thus examined the progress one such functional area – surface transportation – has made in the past several years with improving its preparedness and response capabilities and with integrating itself into the broader comprehensive emergency management system that the United States has committed itself to developing in the aftermath of the 9/11 terrorist attacks and then again following Hurricane Katrina. The principal focus of this work was on emergency evacuation under conditions of natural disaster.

Given the important role surface transportation plays in evacuating residents away from (and bringing responders to) the scene of an emergency – and given the fundamental problems Hurricanes Katrina and Rita revealed in 2005 regarding evacuation readiness along the Gulf Coast and at the national level – the team focused its research on examining whether and how major metropolitan areas across the country are working to improve their capacities to adequately plan for and effectively execute mass evacuations in preparation for future large-scale emergencies.

Research Approach and Methodology:

In recognition of the regional nature of evacuation planning and implementation, researchers examined the issue from national, state, and local perspectives, conducting empirical research in five metropolitan areas (greater Houston, Los Angeles, New York City, New Orleans, and the San Francisco Bay Area) and at the federal level. Semi-structured, elite interviews were done in person (and, in select cases, by telephone) with senior officials representing the domains most relevant to evacuation planning (including transportation, emergency management, public safety, and public health). Interviews were transcribed and then analyzed by study staff. Researchers also conducted extensive literature searches and reviewed published academic studies; newspaper articles and other media sources; and governmental reports. In addition, the study's principal investigator concurrently served as a member of a National Academies Transportation Research Board (TRB) committee that was formed to examine the role of mass transit in emergency evacuations (Committee on the Role of Public Transportation in Emergency Evacuation). In this capacity, he had access to additional documentary materials and was able to consult at length with other experts in the field.

Research Findings/Conclusions/Recommendations:

To date, research findings have been disseminated through several different publications.

One member of the research team has written a series of Harvard Kennedy School teaching case studies on evacuation planning and implementation in major metropolitan areas along the United States' Gulf Coast. Much of the material included in the case studies is based on research conducted as part of this project.

The first case in this series (Moving People Out of Danger [A]) focuses on the failure of authorities in the metropolitan New Orleans area and in the State of Louisiana to adequately prepare for an evacuation of the city's special needs residents (i.e., individuals with conditions that preclude them from getting out of the city by their own means) prior to 2005. As a consequence, once the levees in the area were breached and the city flooded in the immediate

aftermath of Katrina, local, state, and national agencies were forced to undertake a costly and time-consuming search and rescue operation in order to find and then relocate tens of thousands of people stranded in the city. Among the issues raised in this case are the inadequacies of special needs evacuation planning prior to 2005, the challenges of inter-agency and multi-jurisdictional coordination in the face of a major disaster, and the special problems of evacuating citizens out of a disaster zone post-event.

The second case (Gridlock in Texas) looks at the evacuation of the Houston-Galveston area in advance of Hurricane Rita. With Rita threatening to hit coastal Texas just a few weeks after Katrina, millions of area residents took to the roads at roughly the same time, quickly overwhelming highway capacity and throwing evacuation plans into disarray. This case raises important points about planning sufficiently for worst-case scenarios, anticipating the capacity of regional transportation networks, the need for multi-jurisdictional coordination among neighboring communities and between different levels of government, the importance of effective risk communication, and the usefulness of a traffic management measure known as contra-flow, which, simply put, is the movement of traffic in one direction along both sides of a highway.

The third case (Moving People out of Danger [B]) returns to Louisiana, examining post-Katrina planning and its effectiveness in the face of Hurricane Gustav, which threatened greater New Orleans in the summer of 2008. It highlights major advances made between 2005 and 2008, including a significantly heightened reliance on mass transit to evacuate special needs individuals out of the city. It also points to some continued challenges, including the need for better reentry planning.

The final case (Easing the Gridlock) focuses on the work conducted by Texas authorities in the aftermath of Rita and how the revised plans measured up when Hurricane Ike crashed ashore in September 2008. It points to improved approaches to multi-jurisdictional coordination as well as to more nuanced methods of risk communication and better preparedness for implementing contra-flow measures as major advances.

In his capacity as a member of the Transportation Research Board Committee on the Role of Public Transportation in Emergency Evacuation, the study's principal investigator was also a key contributor to the TRB report *The Role of Transit in Emergency Evacuation*. Findings featured in the report were informed in part by research conducted by this study team. They include the fact that many metropolitan areas continue to lack sufficient evacuation plans; that existing plans have failed to adequately incorporate mass transit as an important player in evacuation operations (although some locations, such as New York City, can serve as models as to how to more fully involve transit); that few metropolitan areas have thought about the regional, multi-jurisdictional nature of evacuation planning; that although transit can play a key role in evacuating special needs individuals, most evacuation plans fail to adequately take this population into account and that progress is slow-coming (as in LA, where establishing a special needs database has taken considerable time, given the lack of dedicated funding and staff; yet, it should be noted, that both New Orleans and Houston have greatly improved their capacity to deal with their special needs residents); and that transit and highway systems in many areas lack the capacity for supporting evacuation operations (for instance, the gridlock experienced by Houston area residents during Rita demonstrates the inadequacies of its highway network for evacuating large numbers of people quickly).

The research team is currently completing additional analytic work on the subject, and resulting publications are forthcoming.