

Development of Flood Information Distribution Systems for the Houston TranStar Emergency Response Center

1. Background:

For several decades, the City of Houston (Houston) has always been one of the important centers of many major businesses and industries both domestic and international one of the largest medical centers in U.S., the Texas Medical Center (TMC) located in the Harris County. Because of the unique geographical structure and location, the city of Houston often encounters with a number of thunder storms and hurricanes each year. The nature of these storms in Houston tends to include very large amounts of rainfall for a short duration. This type of storm typically produces temporary street flooding that occurs where water quickly rises and then recedes in a matter of minutes to hours. To most, this is merely inconvenient; however, to the Emergency Management Services (EMS) system, the delays can be a matter of life or death where seconds or minutes frequently make the difference in saving lives.

To resolve these problems, the greater Houston and Harris County, Texas region (Region) have been setting the pace relative to traffic mitigation and emergency management for many years. At the current point in time, the day-to-day street flooding in Harris County and resulting traffic navigation and mitigation issues are still acknowledged as unresolved problems. The inability to effectively inform and navigate emergency vehicles through flooded streets in and out of the affected area has led to a number of deaths and numerous injuries. The interesting point is that this inability is not actually caused by insufficiency of current technologies but is in fact caused by the lack of proper integration of available technologies.

Therefore, our goal is to develop a decision support tool that integrates existing telecommunication technologies, and available TranStar's Flood Monitoring tools. Providing such a tool to emergency service providers can help address the problem when certain areas are flooded. The following Figure 1 illustrates the current version of the proposed software.

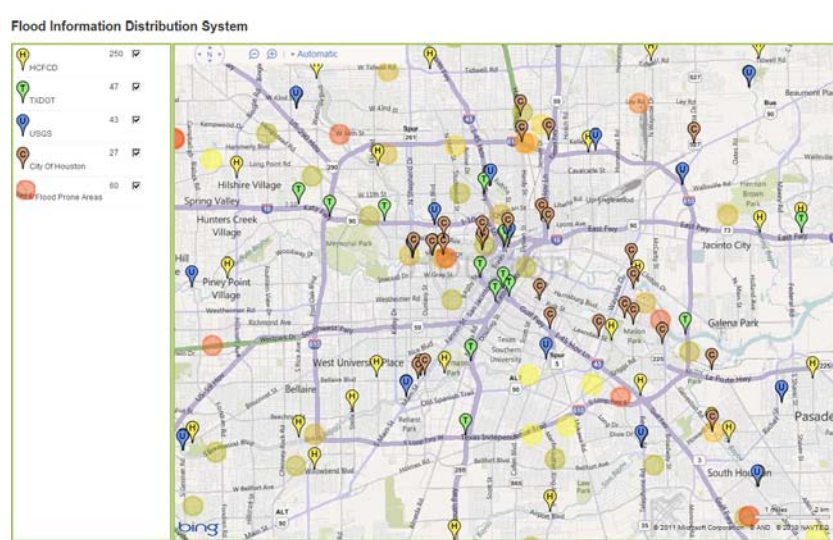


Figure 1: User Interface of the Proposed Software

2. Project Tasks (Deliverables)

2.1 Inventory of the Existing Flood Database Systems: The objective of this component is to survey and develop an inventory of the existing flood database systems in Harris County.

2.2 A Comprehensive Flood Management Database Design: The objective of this component is to develop a computer based system that merges existing flood data into one comprehensive resource.

2.3 Traffic Management System – Traffic Data Analysis and Electronic Map Generation: This component of the proposed project seeks to fully utilize the information generated by components 1 and 2 and provide electronic maps summarizing real-time street flooding and traffic information to a designated area in Houston. This summary information in the electronic map format will assist the emergency personnel to most effectively facilitate the movement of emergency vehicle traffic into and out of the affected area.

2.4 Central Database, Web-Server, and System Integration: The main goal of this component is to develop a Dynamic Emergency Traffic Alert System (DETAS) that can reliably transmit the real time road network information to emergency response personnel. In addition to DEAS, we will utilize Houston Public Broadcasting System (PBS). The University of Houston is the license holder for the educational broadcast television station KUHT-TV/DTV. By utilizing any existing technologies as well as new techniques from the broadcasting industry can be used to enable fast moving mobile receiving platforms to have the robust data reception capability.

3. Principal Investigator

Dr. Gino J. Lim, Industrial Engineering, University of Houston
(713) 743-4194, ginolim@uh.edu

Note: Contract under Mr. J. Whaley at Houston TranStar