Several major disasters have occurred in the United States and impacted coastal and river valley communities. The economic and societal impact of such disasters has demonstrated a need for better emergency planning, response, recovery, and adaptations. Through the understanding of the behavior, characteristics of past events, much informed decisions can be made. This study will utilize data from Hurricane Irma (2017) to compare traffic characteristics during the evacuation process and those obtained during routine non-emergency operations. The 2017 evacuation of Hurricane Irma has been referred to as the largest evacuation in the history of the United States. Approximately 6.5 million Floridians were placed under either mandatory or voluntary evacuation orders. The Saffir-Simpson rating for Hurricane Irma was fueled by several factors that were unique to the storm:

1) Hurricane Irma had already devastated a number of Caribbean islands, including the U.S. Virgin Islands and Puerto Rico, resulting in several known deaths at the time [2].
2) At one point, Hurricane Irma was the fifth strongest hurricane ever recorded in the Atlantic basin [3].
3) The storm’s path and “cone-of-uncertainty” threatened nearly the entire state of Florida.
4) Fluctuations in the storm’s path indicated possible devastating storm surge to nearly all of Florida’s coastal areas, where the majority of residents live.

These objectives are achieved through the simulation and modeling of roadway volumes collected based from ground sensors (predominately, in-vehicle (IVS)) and during hurricanes Irma (2017) evacuation. Two events provide a unique opportunity to study the evacuation phenomenon because it is among the largest in the history of the United States; it affected nearly all of the major population centers of the state; and traffic volumes are recorded on a geographic scale and at levels of fidelity rarely achieved in prior evacuation studies.

The project seeks to provide a system for state departments of transportation and emergency management agencies to integrate future ad-hoc based evacuations. The method also facilitates parametric comparisons between evacuation events, an area needed to continue to evolve and improve evacuation practices. Standardized measures for hurricane evacuations are needed to facilitate systematic evaluations of performance.

Data analysis using VISSIM can be used to develop and validate evacuation models. This project is an example of the potential use of evacuation models to assess evacuation planning and management.