

Project I Description

Project Name: Evacuation Strategy during Disasters:
Application for Greater Beirut Area Throughput

Sponsor: CNRS

Project Overview

Evacuation is an important response to disasters. Normally, such disasters cannot be easily averted; examples include earthquakes, floods, fires, hurricanes, wars, or even terrorist attacks. This project will focus on earthquake evacuations, as it is the most probable natural disaster in Lebanon. In most cities (such as Beirut), populations far outstrip the capacity of the highway network. This imbalance between evacuation supply and demand causes congestion, which increases the imbalance. To evacuate these areas in a timely manner, the road network must be used efficiently, which implies avoiding network breakdown and congestion. To accomplish this objective, an integrated transportation planning and management strategy is needed.

The objective of this project has two folds: the first is the evacuation management, with an emphasis on staging and routing strategies, and the use of analytical models to generate optimal strategies under realistic assumptions for the evacuation in the chosen network. The second is the development of a simulation-based model of the Beirut Area to capture the critical resources in the network and test the proposed analytical solutions under randomly occurring incidents, such as disasters. Also, the model will help depict the main locations of bottlenecks in the network, as well as the extent of the impact of a particular incident.

Project Areas

Simulation/Network Flow/ Transportation

Project Deliverables

- Developing optimal evacuation strategies that are easily understood by the public, implemented, and managed.
- Developing a simulation model to test the generated optimal evacuation strategies under realistic constraints and random incidence occurrence.
- A report that includes an extensive documentation of the above, as well as assessment of evacuee's behaviors and their influence on the evacuation strategies.

Team Size and Majors needed

INE: 2-3 students CIE: 1 student

Advisor: Dr. JP Arnaout

Students:

Rasha Ghizzawi
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