

Project Title: Integration of Real-Time Mapping Technology in Disaster Relief Distribution

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Vehicle routing in humanitarian logistics, such as disaster relief distribution, involves many challenges that distinguish these problems from those in commercial settings, given the time sensitive and resource constrained nature of relief activities. While operations research approaches can improve the effectiveness of relief routing, these challenges must be addressed in routing models in order to realize the potential of the approaches. There have been many promising advances in the literature on relief routing, and aid organizations have been collaborating with academic researchers to increase the practicality of such models. Increases in the availability and use of information technology in the wake of disasters can further the effectiveness of routing models for aid distribution. Presently, challenges still remain to make routing models more applicable to humanitarian aid delivery and more integrated with new streams of imagery, mapping, and crowd-sourced real-time data.

The proposed research focuses on dynamic routing models for the distribution of relief supplies in humanitarian settings. We focus on the potential to improve these models, and thus improve the effectiveness of humanitarian relief, by using new mapping technologies and real-time information to mitigate the effects of dynamic changes during humanitarian crisis and disasters and the significant uncertainty that exists in these settings. Our proposed work will evaluate the improvements from these technologies for relief organizations in the field and develop a set of test cases for the research community to better design and test their routing models and solution approaches. To facilitate wide implementation and potential commercialization of our work, the developed test cases will be available online to practitioners and academicians, through a server dedicated to Humanitarian and Non-Profit Logistics at Northwestern University.