

Optimizing Operation Unified Response

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The views expressed herein are those of the author and do not reflect the position of the United States Military Academy, the Department of the Army, or the Department of Defense.

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Abstract: The 2010 earthquake in Haiti caused nearly 112,000 fatalities making it one of the deadliest natural disasters ever recorded in the western hemisphere. In the weeks following the disaster, the United States Air Force Air Mobility Command moved over 29,000 passengers and 18,000 tons of relief aid in support of the relief effort, Operation Unified Response. During the first 96 hours of the operation 59% of aircraft transporting relief aid to Haiti arrived late. In order to assist planners in responding to future disaster relief efforts, we introduce a mixed integer programming model that minimizes the time required to deliver available relief aid into Haiti. The aircraft routing schedule outputted by the model demonstrates that our optimized airlift network increases the amount of relief aid delivered in the first 96 hours of the operation.

Keywords: Vehicle Routing, Mixed-Integer Programming, Heuristics, Humanitarian Relief