

## IE 482 Humanitarian Logistics

### Communication & Information Flow Strategy

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**Motivation:** The motivation behind tackling the communication and information flow problem in such disasters is to improve decision-making, where the influence and effect of such decisions are critical. Our intuition is to provide the proper aid in the correct quantity at the right time via effective communication and accurate information flow.

**General Solution:** Centralizing all operational and official information flow to establish a main operational base that supports and coordinates numerous sub-bases, where pivotal strategic decisions are finalized at the core base. It will ultimately respond to the Ministry of Transport and Infrastructure. The main base will share accurate information about anything related to the disaster and will eventually prevent misinformation. Models will be uploaded to the main base by the government, and the main base will share the results of the models.



Figure 1: Visualization of Solution

**Main Benefits:** Information accuracy is one of the main benefits of our solution. During disasters, preventing misinformation and accurately organizing the initial response flow is crucial. Since the information flow will be centralized, sharing important information during the earthquake will also be more accessible. Not only that, but it will also facilitate better coordination of response. Also, it is essential to note that our solution will generate faster response times; the first hours of a disaster are arguably the most important. In this way, the allocation of resources will be handled better, and the right amount of aid will be delivered on time. Lastly, the impairment of communications will have less effect since all operation-based points will be centralized.

#### Additional Ideas:

- A search & rescue hotline can be implemented.
- Mobilized telecommunications suppliers can travel to disaster areas when Wi-Fi is not available or weak.
- Integrating signal-providing/receiving properties for each phone in emergencies, possibly via a Government-issued mobile application, can also be considered.

#### Model:

For our general solution, the minimum-maximum facility location problem is considered for building an efficient communication web between locations like hospitals and disaster management centers.

A risk-integrated p-budget problem is suitable for our additional idea, where we will implement additional signal providers. This model considers risk assessment for the earthquake, which involves evaluating the probability of the earthquake and the damage it causes to infrastructure. Which compares affected areas by considering their risk matrices. P-budget is that they allocate resources financially to mitigate the impact of an earthquake based on assessed risks.