QuickRoute – Mobile Emergency Routing Services for First Responder Vehicles

## Optimizing Navigation for Emergency Vehicles

Every second counts when first responders are called to an incident, and they should not have to worry about whether the path they travel to get there will cause a significant delay in service. Getting to the scene fast—and safely—is the primary goal, and the Department of Homeland Security Science and Technology Directorate (S&T) is developing a new tool to help guide the way.

Responders face unique challenges when navigating roadways. Routing and directions provided in vehicle terminals can be out of date, and civilian mapping apps do not take into account the emergency routing rules afforded to law enforcement, fire and emergency medical services vehicles, which can significantly change the most efficient route. Civilian apps also do not factor in specific emergency vehicle requirements for turn radius, tunnel and bridge clearance and highway exiting. Weather, traffic and blocked roads all impact emergency vehicles traveling to a scene and transporting patients to hospital care.

S&T is working with Azimuth1, LLC to develop QuickRoute, a routing system for emergency vehicles that accounts for all of these challenges: inclement weather, road conditions, vehicle characteristics and department-level protocols for handling vehicle usage. The technology will ensure emergency vehicles have priority traffic in all areas of travel while responding to a call.

Leveraging Data to Deliver Real-time Routing

During the initial prototype development phase, S&T and Azimuth1 will work with first responders to make sure the technology meets their needs. The team is developing backend systems to support a custom routing app that will get emergency vehicles to and from incidents faster and with fewer interruptions. By measuring anticipated routes against real-world routes and responses, they are training the system to look for opportunities based on real-time, updated data on traffic, weather, hazards and construction provided by other emergency vehicle operators. The end result will be a 'smart' routing system that understands the options and constraints emergency vehicle operators have, and can use information to respond to incidents more efficiently.
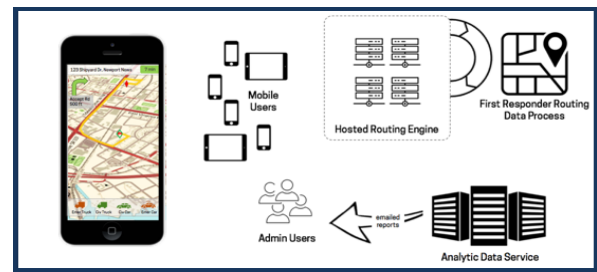
System Concept: Collaborative emergency routing optimization with mobile, server and administrative interfaces

Systems Come Together in an Emergency Response Mobile App

QuickRoute is a system of components, each of which plays an important part in its overall success. The diagram above shows how these components fit together:

- Responders use a mobile app to view maps and routes on portable devices, such as smartphones and tablets.
- Behind the scenes, the app receives custom route information from a hosted routing engine configured to use first responder routing data. This augments typical civilian data to suit emergency vehicle needs.
- An analytic data service compiles metrics on how efficient suggested routes were compared to civilian routes, and whether the vehicle indeed was able to traverse the suggested route. Reports can then be sent to system administrators daily, weekly or monthly.

The Road Ahead for QuickRoute

Development of the system began in March 2018. Azimuth1 is currently working on the QuickRoute hosted navigation service, which calculates routes based on a set of flexible rules representing both advantages and constraints when operating an emergency vehicle. This service will then be paired with a custom mobile app that will run on GPS-enabled phones and tablets—a prototype app will be available by early 2019. An operational field assessment will then test the system with first responders to obtain feedback and gauge readiness for commercial distribution. Based on the responder input, S&T and Azimuth1 will refine and improve the QuickRoute system to ensure it successfully meets first responder routing and navigation needs.

To learn more about QuickRoute, contact First.Responder@hq.dhs.gov.

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