



## Crisis Data Relay (CDR)

**Aggregation of Data from First Responders to Smartphone API Display  
ELECOMP Capstone Design Project 2022-2023**

### **Sponsoring Company:**

#### **Research and Development Solutions Inc.**

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### **Company Overview:**

Research and Development Solutions (RDSI) is a Service-Disabled Veteran Owned Small Business (SDVOSB) that performs a wide range of engineering, technical, and programmatic functions in support various Government and commercial clients and specializes in delivering affordable, scaled, state-of-the-art solutions to government and industry clientele. The RDSI Department of Defense (DoD) portfolio includes expertise in the areas of Submarine Imaging, Electronic Warfare, Weapons, Acoustics, Communication, Antennas, Special Projects, and software development. In support of Public Safety projects and clientele, RDSI works with RIDEM, RIEMA, RIDMAT, FAA, FEMA, and NRC. Our diverse commercial and academic support includes Walt Disney Imagineering, Pfizer, Alexion, Sea Research Foundation, Tyco, LAX Airport, Providence College, and the University of Pennsylvania, allowing RDSI to provide the products and types of services required by an increased demand for more efficient and effective utilization of resources.



## Technical Directors:

### **Bruce Torman**

Engineering Manager

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### **Eric Tattrie**

Electrical Engineer

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## Project Motivation:

RDSI has strong connections with local Public Safety efforts, such as the Rhode Island Office of the State Fire Marshal. Our President, Mr. John Evans, is a volunteer Fire Chief for the Town of Lyme, CT, and has close relationships with first responders for fire and emergency medical service situations. The incident management sector has a constant need for new technology, and organizations within that sector have received little innovation to their tools in the recent years. Designing and developing an application for firefighters will be beneficial in bringing the departments toolset up to modern day needs. This overall effort will have a lasting impact on the incident management sector and will benefit the lives of those who provide an invaluable service to our communities.

## Anticipated Best Outcome:

- A. Design and develop a prototype phone application tailored towards a specific organization within the incident management sector, Fire Department, and other potential participating organizations, and design specialized features towards their unfulfilled needs.
- B. Using the prototype phone application, demonstrate which needs that are met for the end user and determine if additional functionality is required.
- C. Identify and highlight additional areas of the incident management sector like Emergency Medical Services and Police which may require a similar application, using the original prototype as a framework for specialization.

## Project Details:

The objective of this project is to research, design, and develop a mobile phone application for either Android or iPhone, or both simultaneously, that will be beneficial to the Fire Department. The specific programmed events that are required for this mobile phone application are not available at present, but these will be known at the start of the Fall semester. RDSI has connections with multiple members of different Fire Departments throughout Rhode Island, and Mr. Evans is deeply invested in the safety and process improvements for those members. The successful outcome of this project will fulfill a critical need for these departments and opens the door for further development of similar applications for Emergency Medical Service, Police, Security, or Military need. The envisioned outcome will feature an integrated software application which will operate on a Commercial Off-the-Shelf (COTS) hardware, e.g., iPhone, Samsung, Google Pixel, etc., while performing all necessary end user functions.

### Hardware Task:

1. Determine which COTS hardware (commercial phone) will offer functionality required by the application.

### Firmware Tasks:

1. Develop the framework for a prototype application with the functionality design requested by the end user.
2. Collaborate with fellow members of the RDSI design team to develop the hierarchy of the application.
3. Develop a user interface and user-friendly experience that will provide ease of use for the end user.

## Composition of Team:

- 1-2 Computers Engineers (or Electrical Engineers with mobile application development)

*(Team will be supported by a representative/consultant from a Fire Department with 10 or more years of experience)*

## Skills Required:

### Electrical Engineering Skills Required:

- Organization and documentation
- User interface design / GUI design
- User experience design
- Integrated Development Environments (Android IDE and XCode)
- Testing, debugging, and validating code

### Computer Engineering Skills Required:

- Organization and documentation
- Knowledge of common programming languages
- User interface design / GUI design
- User experience design
- Integrated Development Environments (Android IDE and XCode)
- Testing, debugging, and validating code

## Anticipated Best Outcome's Impact on Company's Business:

If successful, this project will provide a previously unmet need for Rhode Island's Fire Departments and State Fire Marshal, while opening the possibility for future relationships with local police, emergency medical services, local security entities, as well as Homeland Security.

## Broader Implications of the Best Outcome on the Company's Industry:

This project fulfills an unmet need for members of the community that focus on the safety and wellbeing of those around them. By tailoring the features of this project directly to a specific organization, this application will offer solutions to direct problems. With the resolution of these issues, the organization's members will be able to conduct their business with increased efficiency and in a timelier fashion, allowing for increased safety and the continued wellbeing of the community which is paramount.