



ARKE

The Situational Intelligence Platform for Rapid Emergency First Response

Matthew Guardiani , Cole Kirstein, Brandon Carmosino, Steven Jiang, Matthew Schofield, John Stranahan, Benny Liang, Brandon Graham



Executive Summary

700,000 calls are placed to 911 every day; 8 calls per second. On average, it can take 9 minutes or more for help to arrive [1]. Reducing the national average emergency response time by just one minute, could save 10,000 lives each year [2]. Inspired by this mission, Rowan University students have developed a next-generation mobile situational awareness platform to put First Responders on-scene digitally, before they arrive. This could be accomplished by “developing a scalable and holistic solution that addresses the unique operational Public Safety challenges at Medium and Large Hub Airports, in a post-pandemic world, by leveraging modern technology.”

Problem & Background

Despite their best efforts, the limited tools firefighters, law enforcement, and emergency medical personnel have to collect, consume, and share information often prevent them from arriving to an emergency in time. Fighting to beat the clock, responders often unknowingly rush towards dangerous situations with incomplete, or inaccurate information about the incident; putting both the caller, and the responder at risk. The First Response operating model hasn't changed materially in over 50 years, and is the primary driver of “Five Universal Public Safety Challenges” identified through our research: (1) Manual data entry and exchange, (2) Decision fatigue, (3) Legacy Systems, (4) Not Responder Focused, (5) No Common Operating Picture.

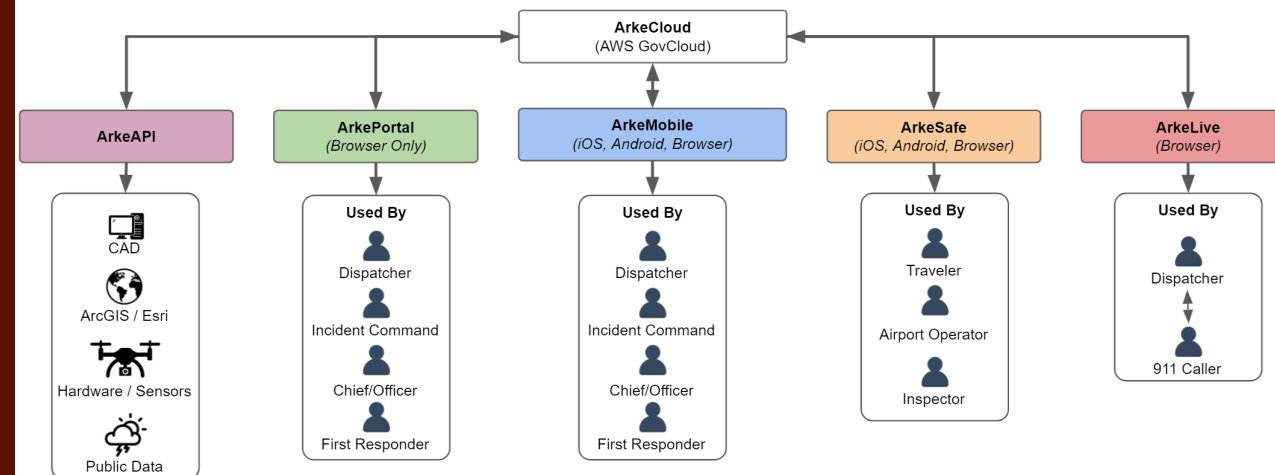
Concept

ARKE is a cloud-based, hardware-agnostic, mobile software platform that connects First Responders to life-saving information on their cell phones and tablets before they arrive on scene. ARKE uses a proprietary data-fusion algorithm to ingest, organize, and serve the most relevant and critical response information to mobile users based on the type of emergency and their responder profile. It then collects and records that data so it can be recalled later for after action reporting, regulatory compliance, and training. ARKE is comprised of six primary functional modules which are described below:



1. Prevention & Mitigation (Remote Inspections, Incident Pre-Planning, & Data-Collection)
2. Mobile Alerting & Response (Mobile Responder Phone / Tablet Application)
3. After Action Reporting, Analytics, & Compliance (NFIRS, NEMSIS, ICS, NIMS etc.)
4. Staffing, Certification, & Training Records Management (Responder Accountability)
5. Inventory Management & Asset Tracking
6. Community Engagement (Automated Public Safety Data Collection & Communication)

The ARKE software platform is comprised of six subsystems, which extensively cover an airports first response and emergency management needs. The platform architecture is displayed below:



[1] National Emergency Number Association. (n.d.). nena.org. Retrieved February 27, 2021, from <https://www.nena.org/>
[2] Federal Communications Commission. (2018, March 23). Location-Based Routing For Wireless 911 Calls. (FCC 18-32), 20. <https://docs.fcc.gov/public/attachments/FCC-18-32A1.pdf>

Impact

Proposed Advantages

- Airport and Passenger Safety
- Aircraft Rescue and Firefighting Operations (ARFF)
- Natural Disaster Response
- Fires, Hazardous Material Spills, Counter Terrorism Operations
- Utility Failure Response

Passenger Experience

- Fewer Delayed Departures
- Simplified 911 Reporting Process
- Reduced 911 Response Time for Callers

Research and Testing

A national research campaign has been conducted to gain insight and feedback regarding the ARKE technology. This campaign included findings from third-party resources, direct outreach with an in-house generated survey and questionnaire via email, and direct “face-to-face” interviews (conducted via Google Meet). This outreach campaign has led to four beta-testing partners, located throughout two different states within the U.S.

Beta-Testing Partners

- SJTA Aircraft Rescue and Fire Fighting Department - Atlantic City International (ACY)
- Erma Volunteer Fire Company - Cape May Airport (WWD) Primary FD
- Glassboro Fire Department - Rowan University, Gloucester County, NJ
- Bushkill Township Volunteer Fire Company - Bushkill Township, PA