

UX 999 and 911 emergency services

Introduction:

The emergency medical services in London (999) and other cities like Phoenix and Chicago (911) were operating on outdated emergency services dispatch (CAD) software running on legacy Windows NT systems, necessitating a critical upgrade in both hardware and software. The project aimed to implement a unified UX pipeline across 999 and 911 services, introducing next-generation functionalities such as text messaging, media integration, and location services.

Problem Statement:

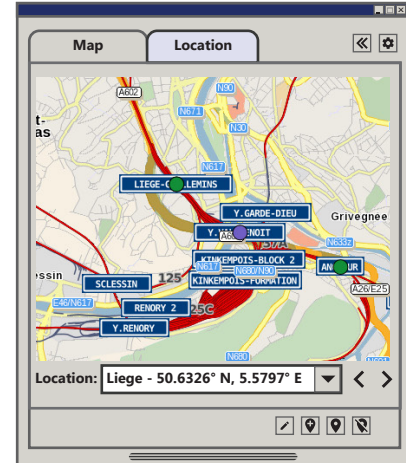
The urgency for this project stemmed from the outdated systems and the universal need to enhance emergency response capabilities across different cities and services. The initial request was generated from London, who wanted us to implement a UX pipeline to anticipate current and future needs beyond making the old software work on new hardware. We needed to modernize the software to improve efficiency and responsiveness and incorporate advanced features crucial for emergency services in both 999 and 911 scenarios.

Users & Audience:

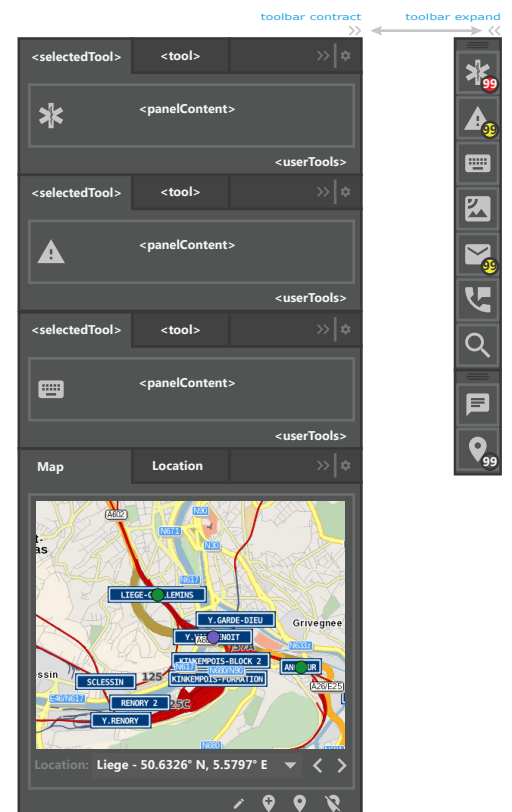
The primary users of the upgraded system were emergency dispatchers, medical service responders, and other personnel involved in 999 and 911 emergency services. Understanding their needs and challenges across different cities was fundamental to the project's success. Our primary support was to the dispatchers in each location; however, their responsibility was to the millions of people using the system. While London's 999 services are medical-only and don't include fire or police services, it is one of the busiest ambulance services in the world and the busiest in the United Kingdom. Phoenix and Chicago were also both quite busy and included dispatch for EMS, Fire, and Police.

Roles & Responsibilities:

As the lead designer, I oversaw the design team and collaborated with the research teams for each site. I participated in on-site week-long embedded research evaluations with the research teams, sitting with dispatchers and tracking calls firsthand. These embedded research efforts covered London, Phoenix, and Chicago. The collaboration included understanding the challenges and unique aspects of each location's emergency services and using researcher-provided tools for tracking users.



Example of legacy interface



The baseline upgrade gave us an initial place to begin

Scope & Constraints:

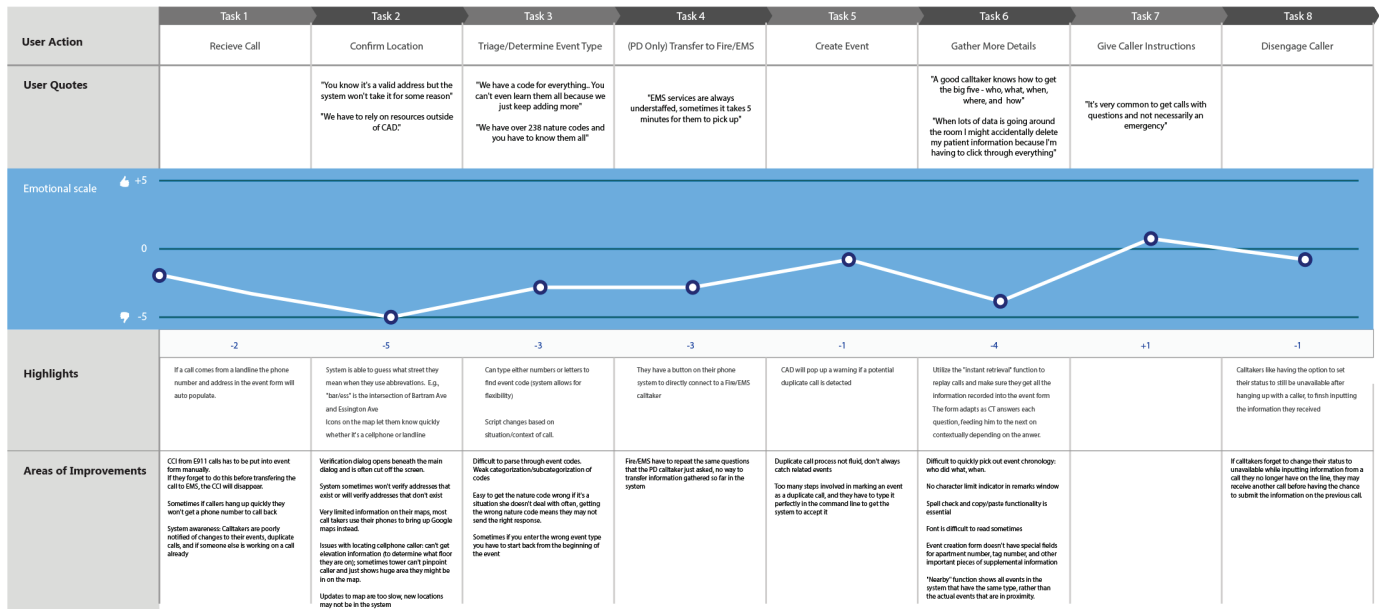
The project faced constraints such as the legacy system, budget considerations, the critical need for minimal disruption during the transition, and support for retraining veteran staff and recruits alike. The scope extended beyond a software upgrade to include a comprehensive overhaul of the user experience across multiple cities' emergency services, encompassing both 999 and 911 systems. Because of privacy and other concerns, it was not possible to work with callers directly, so we relied on the dispatchers to provide us with specific user problems like accurate location services for mobile users.

What We Did:

Our approach began with transitioning the emergency services software to a modern Windows platform. This move provided inherent benefits, including contemporary behaviors like customizable workspace views tied to log-in, sticky windows, and dockable toolbars. Working closely with dispatchers in each city, we identified additional challenges related to text messaging, media handling, and location services.

We incorporated extensive research on location service scenarios in London, where paramedic responders navigate a dense city on bicycles. The challenge of unreliable cellular-based location led to the development of methods to obtain consent for location services from different mobile platforms, ensuring seamless connectivity between paramedics and individuals calling from mobile phones in emergencies.

CALLTAKER JOURNEY MAP



In Phoenix, dispatchers were accustomed to keying in emergency codes through a text-based DOS-like prompt. We introduced a Contextual Command Console to retain the speed of keyboard commands while upgrading the interface. This console could be invoked using keyboard shortcuts from any place within the application. Its traits included being contextual, allowing customizable emergency function codes, and being available anytime through standard or user-defined custom shortcut keys.

Dispatch for 1786190
262-555-5555

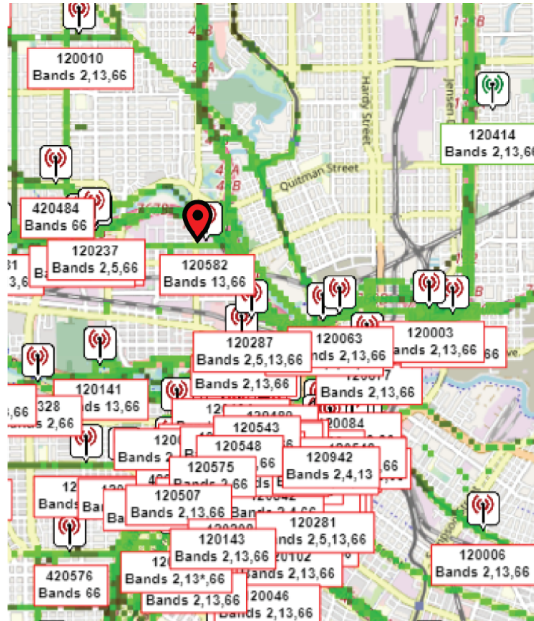
Location: Near 1128 148th Street
County: Cuyahoga
Cell Tower: 120582
Location services: Connecting...

- Central EMS
- Cuyahoga Police 12
- Fire 104 Quitman St.

Attachments



Dispatch Services



☰ Command Console 🔍

← 10-3

10-37 Burglary

10-38 Theft of property

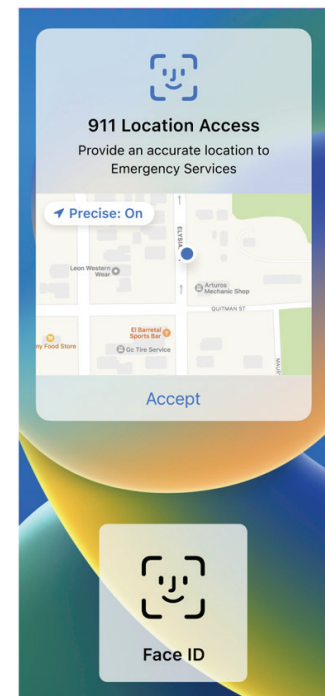
10-39 Fight

10-40 Gas

10-41 Assault

The UI persistence of the Command Console ensured seamless integration with dispatch codes for various emergencies. Directed autocomplete and code completion hints, enhanced user efficiency, and provided visual feedback on the nature of each given code to help prevent accidental typos. Users could also access presets, overrides, and shortcuts tailored to individual preferences. The console also allowed the export of data snapshots and the import/export of settings, providing flexibility and ease of use for flexibility in changing workstations or adding new dispatchers.

Extensive location service scenarios were developed to track both callers and medical service responders, particularly paramedics navigating the dense city on bicycles. Journey maps of dispatchers and emergency service callers were used to effectively communicate proposed solutions to high-level stakeholders across different cities and emergency service models. These artifacts were bundled into animated presentations following various scenarios from the initial call or text message through dispatch and final resolution. These animations played a crucial role during development, serving as guides for expected software behaviors and acting as checks for completed software. The tools developed during this phase were repackaged for client training, catering to a mix of veterans learning the new software and recruits encountering the software for the first time.



Location services are particularly troublesome as cell-tower information can be inaccurate, and user location requires consent and interactions taking valuable time during an emergency.

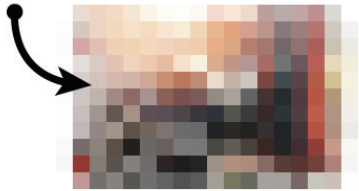
Conclusion:

The upgraded emergency medical service systems in London (999), Phoenix, and Chicago (911) introduced several new advanced functionalities and needs to the software development team. The collaborative insights from different emergency services and cities contributed to a more comprehensive and effective solution. Initially created for stakeholder communication, the animations became invaluable tools for developer guidance and training programs. Lessons learned from the project highlighted the importance of understanding the unique challenges faced by each service provider and tailoring solutions across diverse city landscapes and emergency service models.

Adding the Contextual Command Console in Phoenix showcased the project's adaptability to different user needs, and the resulting interface upgrade maintained speed while offering enhanced features. The console's contextual nature, customizable functions, and accessibility through shortcut keys significantly improved the user experience, providing a seamless transition from command line tools to the new window-based application addressing specific challenges faced by emergency services in Phoenix. In London, incorporating location service scenarios specifically for bicycle paramedics demonstrated the project's commitment to addressing real-world emergency challenges, ensuring seamless connectivity and efficient response. Additionally, by addressing the shared needs of handling text messages, user location services, and media integration, we improved the software for all three cities, establishing a baseline for dealing with scenarios beyond the traditional emergency phone call.

Today 8:32 AM
I'm going to send you a location request. Please agree to the request so that we can pinpoint your location for EMS.

Ok. I've accepted the request. My friend was hurt badly. Here is a picture.



Digital media can be helpful, but routing media for emergency services, potential evidence, or containing material that is potentially inappropriate for 911 call workers needs to be handled with care.

AMBER WRIGHT 9-1-1 Calltaker



"A good Calltaker knows how to get the big five - who, what, when, where, and how"
Age: 26 years old
Experience: 4 years

Amber is a public safety call taker in a very busy call center, who wants to do the best job possible to serve the public. Her empathetic and caretaking nature drives her to help others in their time of need. She is steadfast and able to remain calm on even the worst of calls.
Although she takes her job very seriously, she is light hearted and enjoys spending time with her coworkers, whom she treats like a second family. She is ambitious and is always looking for opportunities to advance her career, which is why she is currently work on a degree in criminal justice.

Primary User Concerns

- 1. Difficult schedule, long hours are very difficult to deal with
- 2. The job is mentally draining, and doesn't allow for full closure on extremely stressful calls
- 3. The increased call volume and low pay increases turnover rates, which adds to the stress

Primary User Goals

- Keep callers calm while she gathers all the information needed to send the correct response
- Help her community by providing fastest and best service possible

Technology

- 1. Has only a basic understanding of how CAD software works; doesn't utilize keyboard shortcuts
- 2. Comfortable with outside technology; uses a smart phone and Microsoft Office products in her daily life
- 3. Interested in applying newer technologies to her job, especially if it will help her save lives
- 4. Utilizes third party apps (e.g., Google Maps) in her day to day job to help provide best service possible