

Conceptualizing the Design and Use of Augmented Reality Within a Common Operating Picture for Incident Command Systems

Interim Report #4

April 25th, 2022

**For Indiana University Crisis Technologies Innovation Lab
and Director of User Experience, Sonny Kirkley**

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Executive Summary

The fourth phase of the project began with a focus on creating a journey map to properly visualize the experience of what incident commanders will go through as they perform tasks while using AR technology. It is proving to be a valuable exercise as it easily illustrates how the technology and design impact the user's experience and can be used to help the future UX designers of this project empathize with the users. This journey map was split into two sections, the old system journey map, and the new system journey map. The old system journey map was completed according to plan and the new system is very close to being completed with just needing visuals added at the submission of this report.

In addition to the journey map, the team also worked on their dynamic prototype. The prototype is based on the culmination of research collected throughout the project term and data collected through interviews and feedback from subject matter experts. Prototype screens were mocked up to influence the design of the prototype and many meetings were conducted to discuss their development. Other deliverables that were previously planned during this 4th phase had to be canceled as discussed below, so the team decided to expand upon the original plan for this prototype. As a result, it is still under development and will be significantly more advanced upon its completion.

The group had previously planned to prepare a tree test to help find any usability issues within the interface of the dynamic prototype. After some reflection, the group decided to not create the deliverable because as the focus of this project is to discover UX requirements for implementing AR technology in Incident Command, there is not enough of a finalized prototype to properly layout full information architecture as tree-testing requires.

The group had also planned to conduct another interview with Chief Jacob Spence to go over the status of the dynamic prototype and get his feedback on anything that needed to be changed. Chief Spence did not respond to the team's communications however and as a result, the team had to move forward without his feedback. They conducted additional internal feedback sessions to address as many potential concerns as possible based on their knowledge.

To conclude this phase and overall research progress, a final report and presentation will be created to wrap up the team's involvement in the project. The deliverables will serve to inform the client on the project as a whole, as well as work as a handoff to the future team who will continue the project in its next phase.

Overview

In the fourth phase of the project, we completed the following activities:

- **“Old System” Journey Map (April 24)**

- A user journey map was created in order to help designers visualize and empathize with the Incident Commanders’ journey of performing tasks while using the AR tool.
- The journey map illustrates the current commander workflow and emphasizes the pain points in the current process.
- The journey map highlights areas of opportunity in the current command flow and will complement a future-state journey map that demonstrates how AR technology will address plainly identified pain points

- **Dynamic Prototype Progress (Ongoing, expected May 2)**

- Significant progress was put into the continued development of the prototype. Screens were mocked up to influence the design of the prototype and many meetings were conducted to discuss their development.
- The team decided to expand upon the original plan for this prototype as a result of a few other deliverables being canceled and it is still under development as a result.

- **Concept Art Progress (Ongoing, expected May 2)**

- Design development began to provide direction for prototype development.
- Initial direction was focused on creating the most major aspects of the design as that was initially all the team had planned to do, but with the cancellation of a few other deliverables during this phase, the team was able to continue into more minor aspects of the design.
- The team plans to finish up the concept art the following week in order to deliver it in the final report.

- **Unable to connect with primary subject matter expert**

- A review of both the journey map and in-progress prototype with our primary subject matter expert, Chief Spence, was not able to be scheduled due to lack of communication from his end. He had previously agreed to meet with us but we were unable to establish a time.
- This resulted in the allotment of extra time towards further development of the prototype and concept art.

- **4th Interim Report (April 25)**

- The summary and overview were expanded one last time to encompass what the team has learned and performed so far on the project.

What Was Learned

“Old System” Journey Map (April 24)

The scenarios generated in the previous phase were utilized to create a user journey map of the current workflow for incident commanders. The map was produced through synthesizing qualitative data accumulated throughout the project through interviews with subject matter experts.

The map walks through a scenario based on specific experience Chief Spence detailed and seeks to highlight the specific **pain points** he experienced during the operation. The following pain points were described in the map:

- The commander relies primarily on **audio data** to form a mental model of the scenario
 - This poses issues to the accuracy of mental models because the messages can be **contradictory** and **subjective**. The data can also be difficult to decipher because signals can **overlap and interrupt** each other.
- The commander must be able to **collaborate remotely** with other commanders
 - Currently this is done using radios, phones, and zoom calls. Valuable **time is wasted** verbally sharing knowledge among commanders to form a common operating picture. These seconds wasted are priceless and can cost potentially saved lives and property.
- The commander must be able to adapt the contingency plan to new data that comes in about a scenario and must be able to communicate these changes effectively.
 - The reliance on verbal communication for translating plan updates poses **time delays** and **communication errors**, thus prolonging the implementation of plan updates

Concept Art Progress (Ongoing, expected May 2)

Concept art development began with what the team defined as the most important features being the **Fire, Police, Medical and Public Works tabs** on the left hand side of the screen. Multiple iterations of these tabs were explored before the final design was settled on as shown in Appendix G.

- Following this, the **floor view** of the building was conceptualized to provide insight into what a **floor plan layout** may look like.
- **Unit popups (Firefighter, Fire Vehicle, and Drone)** were then constructed to display what the user might see when clicking on a **specific unit** from the left hand tabs. These designs were also heavily debated and drew inspiration from the original designer's work.

- Several other minor designs were discussed and iterated upon and are included in the image shown in Appendix H.

Dynamic Prototype Progress (Ongoing, expected May 2)

After one of our initial interviews with a subject matter expert, they were able to present us with a small tour of their current software solution. Our team was able to identify plenty of pain points the city and their firefighters experienced, namely in terms of location tracking, resource management, and geospatial controls.

This project involved researching and conceptualizing a design system for augmented reality, but an opportunity presented itself when a team member started to prototype a solution that would work for both screens and mixed realities that contained the following:

- Utilizing **standardized iconography** that is recognized and used by multiple federal agencies, we can help bring multiple agencies together with recognizable symbolism.
 - The iconography was developed by the National Alliance for Public Safety GIS Foundation.
- By focusing on **3D models**, the product can add a level of detail unmatched with standard 2D **symbology**. All actionable resources, structures, and areas of operation are represented in three dimensions to improve situational awareness
 - The shapes and colors of various resources were given a jumpstart thanks to previous research and design done by the original designer.
- To properly allow **collaboration** among multiple levels of the incident command system, tools that each user can manipulate will be added. These features will allow commanders and other personnel to **draw out planning ideas, shapes, and even place symbols** detailing updates from on-the-ground personnel.
- Controls to allow users to **focus** on certain parts of each structure will be added to help commanders achieve their ultimate objective: **know where all of their resources are at all times**, especially in a multi-level structure. This feature was pleaded for when interviewing every subject matter as it was one of their top problems that needed a solution.
- Each interactable unit, vehicle, and structure will tap into **camera feeds** that will eventually be accessible by public organizations. With this functionality, the commander can get an idea of what's happening in front of these resources and plan accordingly. This will also allow commanders to **work in remote posts**, but understand what's actually happening through **video**.
- **Resource management** was another highly requested feature. The prototype will demonstrate the use of this functionality after researching external competition that use similar interfaces and experiences. This feature will allow users to easily find

assets and resources on the map, no matter how large the area of operation is. The ultimate goal with creating controls like this will be to provide a **common operating picture** for those who need it when providing emergency services.

Next Steps

Date	Action	Goals	Deliverable
April 29	Create a diagram to illustrate the journey of an incident command worker	Demonstrate the experiences and issues an Incident Commander will have while responding to an emergency	New System Journey Map
April 29	Develop user interface requirements document for future teams	Explain all visual and interactive experiences necessary for the incident commander	User Interface Requirements Document
May 1	Write up a final report containing all the research, findings, and ideas	Communicate the progress made over the semester and finalize information delivered to future teams	Final Report
May 2	Complete a dynamic prototype to put form to the data collected thus far	Possess a rough design system which can be used for future evaluation	Dynamic Prototype
May 3	Present all research, findings, and ideas	Communicate the progress made over the semester and finalize information delivered to future teams	Final Presentation
May 5	Share with the client the key research findings	Serves as an effective handoff to future teams	Client Debrief

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Appendix A: Journey Map - “Old System” (Part 1)

[Download Full Journey Map \(AR in COP - Journey Map - Old System v1 - 04_24_2022.png\)](#)

Stages	Stage 1	
Doing		
Doing	hears about situation	a
Touch Points	Chief Robert receives info from a situation. <ul style="list-style-type: none">• Radio• Sometimes Police scanner	c h
Thinking	<ul style="list-style-type: none">• What is the situation right now?• Where are crowds forming?• What resources are currently out in the field?	
Feeling	<ul style="list-style-type: none">• Questioning - don't know all the facts yet• Worried - don't want the situation to get out of hand• Determined - ready to get to work	

Appendix B: Journey Map - “Old System” (Part 2)

[Download Full Journey Map \(AR in COP - Journey Map - Old System v1 - 04_24_2022.png\)](#)

Stages	Stage 2
Doing	
Doing	asks for crowd info
Touch Points	<p>Chief Robert goes to command center. Now has access to</p> <ul style="list-style-type: none"> Computers Phones TV (News feeds)
Thinking	<ul style="list-style-type: none"> Are crowds getting out of control? Where are the crowds forming? Where do we need to position our resources?
Feeling	<ul style="list-style-type: none"> Unsure - can't make a decision without all the facts first Apprehensive - hoping things don't get worse

Appendix C: Journey Map - “Old System” (Part 3)

[Download Full Journey Map \(AR in COP - Journey Map - Old System v1 - 04_24_2022.png\)](#)

Stages	Stage 3
Doing	
Doing	collaborating with other commanders
Touch Points	<p>Chief Robert collaborates with other officers in office and onsite.</p> <ul style="list-style-type: none"> • Phones • Computers • TV (News feeds) • Cell phones
Thinking	<ul style="list-style-type: none"> • What information do other departments have that I don't yet? • Am I not seeing the full picture? • What can we do to best protect people?
Feeling	<ul style="list-style-type: none"> • Tense - reports coming in are not looking good • On Edge - don't have the full picture yet • Unsure - want to make the best decisions possible

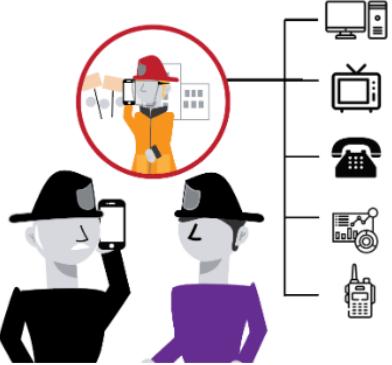
Appendix D: Journey Map - “Old System” (Part 4)

[Download Full Journey Map \(AR in COP - Journey Map - Old System v1 - 04_24_2022.png\)](#)

Stages		Stage 4
	Doing	
	Doing	communicating with resources on the ground
	Touch Points	Chief Robert collaborates with first responders onsite <ul style="list-style-type: none"> • Phones • Radios • Computers • TV (News feeds) • Cell phones
	Thinking	<ul style="list-style-type: none"> • Where are my trucks at? • What are my people on the ground doing? • Has crowd control been working?
	Feeling	<ul style="list-style-type: none"> • Weary - this incident is accelerating too quickly • Nervous - worried about the people in the field • Frustrated - want to make sure this goes in a good direction

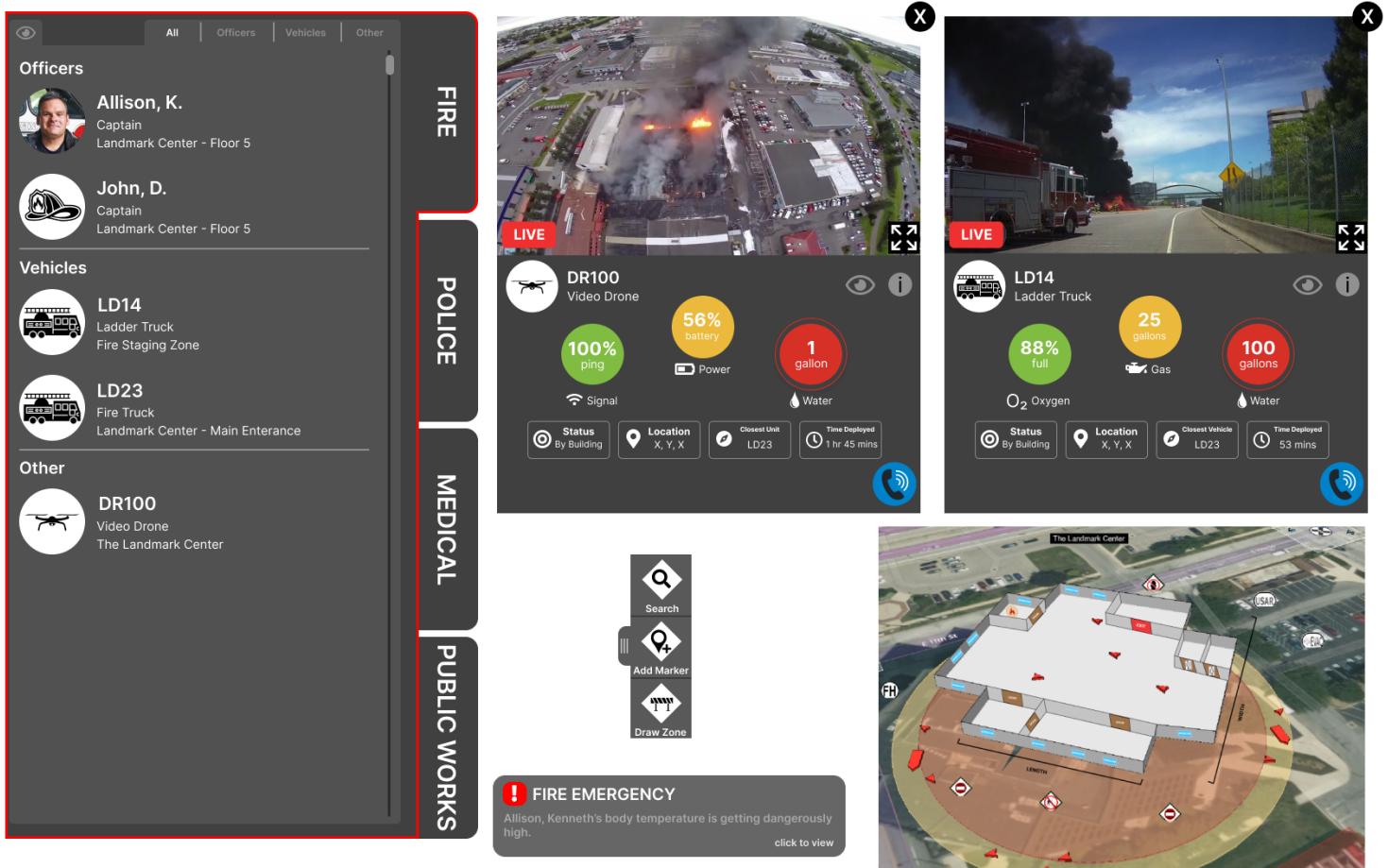
Appendix E: Journey Map - “Old System” (Part 5)

[Download Full Journey Map \(AR in COP - Journey Map - Old System v1 - 04_24_2022.png\)](#)

Stages	Stage 5
Doing	
Doing	<p>A command system is set in place for on-going communication. After so many days, the incident is under control.</p>
Touch Points	<p>Chief Robert maintains the situation using.</p> <ul style="list-style-type: none"> • Phones • Computers • TV (News feeds) • Cell phones
Thinking	<ul style="list-style-type: none"> • How can we have better communication in the future? • I wish I had known all of the information sooner
Feeling	<ul style="list-style-type: none"> • Relieved - glad the incident has ended • Encouraged - everyone did their best in managing the incident

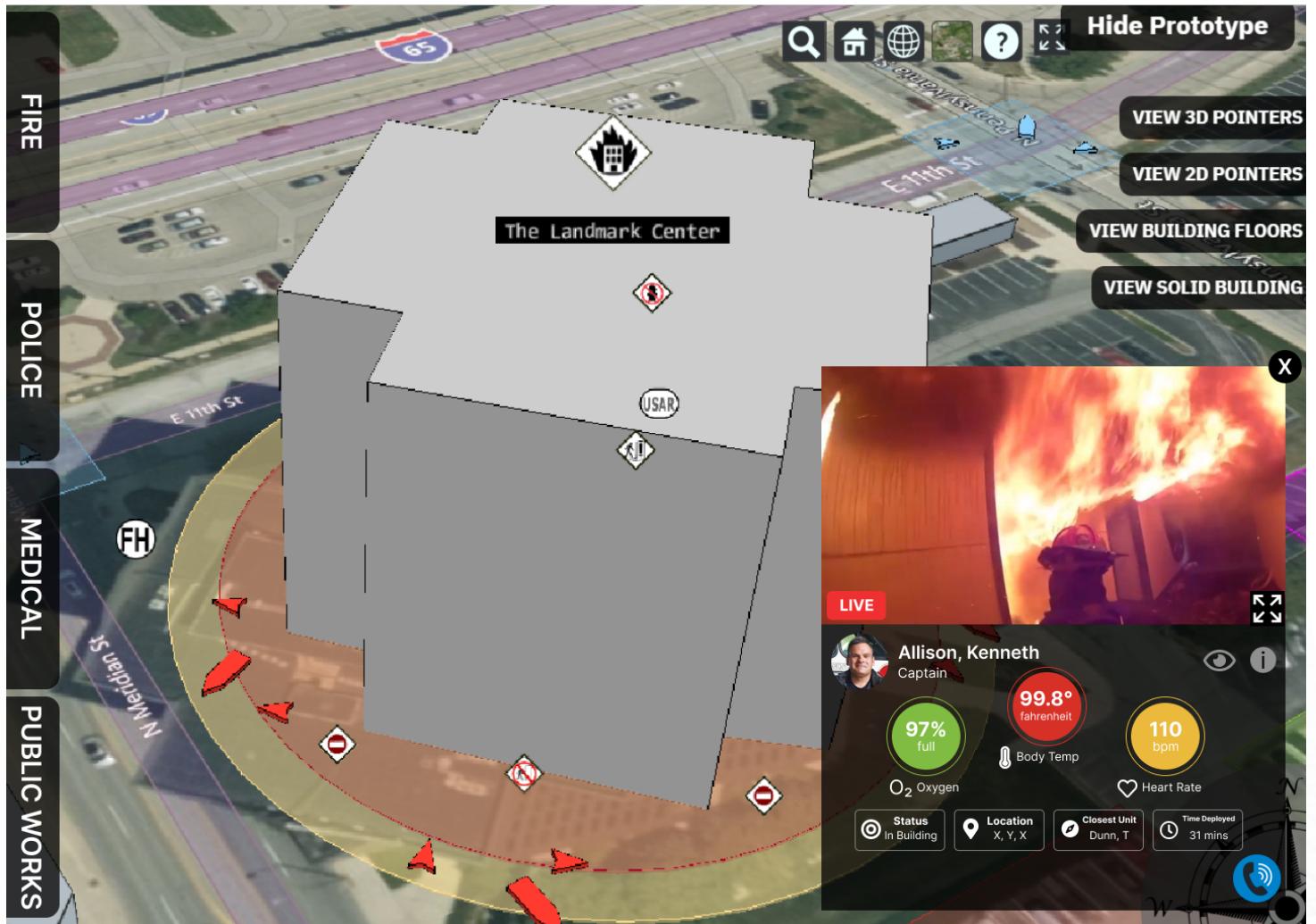
Appendix F: Concept Art (Part 1)

[Download AR in COP - Concept Art 1 v1 - 04 24 2022.png](#)



Appendix G: Concept Art (Part 2)

[Download AR in COP - Concept Art 2 v1 - 04_24_2022.png](#)



Appendix H: Prototype Screen (Part 1)

[AR in COP - Prototype Screen 1 v1 - 04_24_2022.png](#)



Appendix I: Prototype Screen (Part 2)

[AR in COP - Prototype Screen 2 v1 - 04_24_2022.png](#)



Appendix J: Prototype Screen (Part 3)

[AR in COP - Prototype Screen 3 v1 - 04_24_2022.png](#)



Appendix K: Annotated Bibliography

[Download Full Annotated Bibliography \(AR in COP - Annotated Bibliography.pdf\)](#)

Data Collected

US Department of Transportation - ARC-IT Architecture Overview - April 9th, 2022:

An overview of the USDOT's ARC-IT architecture which can help influence how a public organization organizes objects and views.

- [Download US DOT - ARC-IT V8 Architecture Overview - 04_09_2022.pdf](#)

Chris K. Bailey - Finav Process Book - April 10th, 2022:

A book detailing the process that Team Ember took to accomplish objectives in creating Finav: a firefighter management system that crosses some of the same paths our research takes.

- [Download Finav Process Book - Chris K. Bailey - 04_10_2022.pdf](#)

Edgybees - GeoRegistration Checklist eBook - April 11th, 2022:

An eBook describing the benefits and requirements to find a solution to accomplish situational awareness by use of “GeoRegistration” and other related concepts.

- [Download GeoRegistration Checklist eBook - Edgybees.com - 04_11_2022.pdf](#)

References

Chris K. Bailey. “Finav: Firefighter Management System.” n.d.

<https://www.chriskbailey.com/finav>

Bailey developed a Fire Management System (Finav). The page has a vision video for how this technology is used and provided great reference material for the team's prototype.

- [Direct Web Link](#)

Edgybees. “Public Safety & Government - Edgybees.” n.d.

<https://edgybees.com/who-we-serve/public-safety-government/>

Geospatial intelligence for aerial and satellite videos and images. This portion of the site details its use for public safety purposes. EdgyBees augments roads, landmarks, and other mission-critical data on top of live video feeds to provide visibility in complex and opaque disaster scenes.

- [Direct Web Link](#)

D4H. “Incident Management Software - D4H.” n.d.

<https://d4h.com/incident-management>

D4H is a cloud platform for emergency response. The site details the importance of the 3 R's (Readiness, Response and Re-evaluation) as they relate to D4H as well as the full capabilities of the software.

- [Direct Web Link](#)

Adashi. “Adashi C&C Incident Command Software.” n.d.

<https://www.adashi.com/incident-command-software/>

Adashi C&C is an incident management platform currently being used around the world which is designed to help commanders handle everyday incidents and large-scale disasters. It provides fire and police commanders with enhanced situational awareness, improved interoperability, and detailed accountability tracking to manage incidents effectively and prevent line of duty deaths. The product helps commanders with real-time collaboration, tactical planning, resource management, and incident reporting.

- [Direct Web Link](#)

UX Matters. “How to Create Better Alerts and Symbols in Your Designs.” April 6, 2020.

<https://www.uxmatters.com/mt/archives/2020/04/how-to-create-better-alerts-and-symbols-in-your-designs.php>

UX Matters covers standard uses for alerts in symbols in current technology. It discusses the several different types of alerts and how they are typically designed. It also discusses industry standard symbols and how they are interpreted.

- [Direct Web Link](#)

OnPage. “OnPage.com Homepage.” n.d.

<https://www.onpage.com/>

OnPage is an incident alert management system that enables response teams to get the most out of their digital technology investments. Physicians and IT teams use OnPage's rock-solid escalation features, on-call capabilities and persistent notifications to ensure that critical alerts are never missed. Whether to minimize IT infrastructure downtime, or to reduce incident response time for healthcare providers, organizations trust OnPage for all their critical notification needs.

- **[Direct Web Link](https://www.onpage.com/)**

Appendix L: Project Definition and Scope

[**Download Project Definition and Scope \(AR in COP - Project Definition and Scope.pdf\)**](#)

Summary of Project

The Indiana University Crisis Technologies Innovation Lab (IUCTIL) is in the process of developing an augmented reality (AR) design system that assists both incident commanders and first responders in resolving emergency situations in an efficient manner. The future innovations and use of AR within heads-up displays (HUDs) have already proven to be a viable asset in many hands-on industries. Utilizing research and data from interviews, cognitive analysis, and other user experience design techniques, we are looking to uncover what most incident command operators are wanting in a futuristic environment that incorporates the use of AR. Features, workflows, client requirements, and proper contextual user-centered design will be at the forefront of recommendations to a design and development team that will create prototypes. The anticipated research and work from this project will impact the following:

- Demonstrate the value of precise location-tracking, asset management, and other necessary data within incident commander workflows
- Demonstrate the value of using AR in emergency scenarios to assist with situational awareness and decision making while saving more lives compared to conventional measures
- Generate user interface and experience design criteria and requirements for an augmented reality interface
- Recommend a standardized interface and design restraints from requirements set by incident commanders and first responders

Incident command personnel will be the focus of this project; specifically, commanders that work directly with first responders. Understanding their workflows, problems, and goals will be paramount to our research on using augmented reality when performing duties.

The Project Goals

To accurately conceptualize and recognize the user experience in augmented reality for incident commanders, five (5) main goals have been defined:

1. Understand the current workflow of incident commanders in emergencies

- a. The current toolsets being used, the steps taken to accomplish tasks, finding the data and information necessary to achieve goals, and other potential cognitive processes involved
- b. Understanding AR is secondary—this is not our focus when receiving user feedback
- c. Attempt to fix problems that incident commanders have when responding to emergencies and propose solutions

2. Learn what smart-tracking or indoor location-tracking interfaces and ideas would benefit incident commanders

- a. Investigate the data that is useful to the incident commander and determine how detailed it needs to be
- b. Discover the usefulness of their current toolset and how future effort can iterate and improve upon the incident commander's productivity and flow
- c. Explore what information is currently available for an incident commander during an emergency and uncover any unknown data points that would be beneficial

3. Investigate the use of location-tracking and other techniques to assist in workflow enhancement

- a. Demonstrate the value of highly accurate location-tracking in workflows
- b. Validate the use of AR in these settings to assist with situational awareness and decision making
- c. Research if AR can assist current incident commander workflow regarding role assignment, asset management, and resource allocation with a heavy emphasis on location-tracking

4. Research the benefits of augmented reality interfaces and controls when creating common operational pictures (COP)

- a. Identify current processes, designs, and tasks that COP applications utilize
- b. Explore tools that handle COP workflows and understand why or how they deliver experiences for their users
- c. Investigate the addition of AR within these interfaces and tools to verify advantages and disadvantages
- d. Discover if modern AR concepts have enhanced experiences for their userbases, particularly for indoor location-tracking, command and control, and other similar situations, such as emergency response

5. Gather enough ideas and concepts to easily hand-off user interface requirements to an external development team

- a. Prepare UX design criteria with AR techniques at the forefront
- b. Create workflows for designers and developers to build and materialize
- c. Deeply understand user workflows and how AR would best fit within them
- d. Design AR specific features and functionality at a prototyping level
- e. Find the high-value tasks in incident command workflows and capture them accurately for AR experience purposes

These outlined goals will keep our focus and priorities on client requirements while delivering detailed recommendations about our target user base.

Expected Activities and Deliverables

For each of our project goal's success, multiple activities and deliverables have been identified. The efforts will range from collecting various sets of data and research, conducting interviews with multiple subject matter experts, and developing documents that will help the next team understand what users will require in their workflows and tasks.

1. Interviews with subject matter experts

- a. Conduct seven (7) or more interviews
- b. Initial interview will assist in further defining the scope of the project
- c. Second interview will target our users' workflows and understanding their wants, needs, and problems
- d. Third interview will help define persona attributes, needs, wants, and problems
- e. Fourth interview will be explicitly about task-analysis and investigating what works well, what doesn't work well, and what can be improved
- f. The fifth interview will be about reviewing all effort completed with an expert and assist with creating suitable scenarios and storyboards
- g. Two (2) interviews will be conducted with a subject matter expert who is involved in the augmented reality space and has an understanding of how AR can help ICS; may also get more industry connections from these interviews as well
- h. All interviews will attempt to help understand workflows of emergency personnel, information that is necessary or beneficial for the actual user, and conceptualize modern interfaces that can use AR to enhance experiences
- i. Visit in-person the various facilities that today's incident commanders will use when responding to emergency situations or large events

2. Persona development

- a. Three (3) unique personas will be developed
- b. Each persona will be idealized as personnel on different command levels in an incident command system hierarchy
- c. These personas will help future developers understand the types of users that are envisioned to use this technology and help guide their team in the right direction

3. Affinity map

- a. Using an affinity map will help organize findings, ideas, and pursue concepts uncovered throughout the project
- b. The affinity map will assist in defining common themes through qualitative data gathered from the informal interviews conducted. This data will be used to help create personas that will enable designers to greater empathize with the future end users

4. Empathy map

- a. An empathy map will guide us through visualizing our target users' behaviors and create a deeper understanding of their mindset

- b. An empathy map will facilitate a shared understanding of the users' needs and perspectives among the design team and client

5. Experience/journey map

- a. The experience of what the user goes through when accomplishing tasks and goals will need to be properly visualized through the use of an experience map
- b. The experience map will serve to illustrate the user's journey through an emergency scenario using AR technology. The map will be used by future designers to empathize with the users and recognize the key parts in the user's journey that are impacted by the design

6. Scenarios and storyboards

- a. Scenarios will help with predictions on user behavior while delivering potential experiences and interactions
- b. To help properly explain a journey (story) the user participates in, storyboards can give a visual representation. The story boards will be used to demonstrate the value of using AR technology to enhance situational awareness

7. Secondary literature review

- a. Reviewing previous research will uncover solutions and problems that other research teams have encountered. Some examples of this research include:
 - A framework for AR Usability Evaluation in the public safety communication research realm ([PSCR 2021: Augmented-Reality \(AR\) Usability Evaluation Framework for PSCR](#))
 - Presents grants and funding opportunities for AR in public safety communications research, as well as descriptions of ongoing projects ([PSIAP Augmented Reality \(AR\) Funding Opportunity](#))
 - Research portfolio for User Interface / User Experience work with the public safety community ([NIST User Interface/User Experience Research Portfolio](#))
 - Description of the CHARIoT Challenge in which participants built AR interfaces or IoT data emulators for first responder communications ([2020 CHARIoT Challenge: Advancing First Responder Communications](#))
 - A roadmap for planning public safety communications research ([Public Safety User Interface R&D Roadmap](#))

8. User Interface Requirements Document

- a. After analyzing tasks, feedback, and other requirements, a document will be created to help guide future development teams
- b. Various user interface designs that are proven necessary for the user will be recommended
- c. The document will contain research artifacts, such as the personas, empathy map, experience map, and more, to enable future designers to grasp the context for which they will be designing.

9. Dynamic Prototype

- a. Take previous researched design ideas, concepts, and interfaces to build out a prototype that can help incident commanders visualize a system
- b. The prototype would utilize feedback from subject matter experts and current design flows
- c. The prototype would also act as an “incremental” step towards a software solution that was built with incident command and emergency response in mind

The expected activities and deliverables will assist in developing a better understanding and thought process for the design and development team in their effort on creating viable features and prototypes.

The Project Timeline

Four Phases, January 31 – May 5

The expected timeline has been outlined for the next four months and broken out into individual phases. All actions and deliverables are tentative. If any changes or updates happen, the timeline will be refreshed accordingly.

PHASE 1 <i>January 31 – February 21</i>	
ACTIONS	DELIVERABLES
<ul style="list-style-type: none">● Continue reviewing secondary literature and researching applicable material● Perform interview with subject matter expert utilizing a developed protocol in collaboration with a different team● Update the project definition and scope from feedback given within interview and from client● Create the first interim report on success and failures for the project	<ul style="list-style-type: none">● January 31<ul style="list-style-type: none">○ Initial draft of Project Definition and Scope● February 11<ul style="list-style-type: none">○ Complete interview with Subject Matter Expert● February 21<ul style="list-style-type: none">○ Revised Project Definition and Scope● February 23<ul style="list-style-type: none">○ 1st Interim Report

PHASE 2

February 22 – March 15

ACTIONS	DELIVERABLES
<ul style="list-style-type: none">● Pursue a second interview with a knowledgeable candidate that can help define our future persona attributes, wants, goals, and problems● Invited to a tour of the IMPD's incident command center to get a better understanding of our user's environment● Develop an affinity map based off research and interview feedback● Connect with and interview with a leading expert in AR tech with an emphasis in incident command systems● Develop two (2) unique personas that are representations of users within an incident command structure● Develop an empathy map for each persona that targets four main areas: what things they are saying, thinking, doing, and feeling● Produce a second interim report and potentially update project definition and scope	<ul style="list-style-type: none">● February 25<ul style="list-style-type: none">○ Complete interview with focus on building personas● March 2<ul style="list-style-type: none">○ Tour of Incident Command Center● March 5<ul style="list-style-type: none">○ Affinity Map● March 8<ul style="list-style-type: none">○ Interview with AR subject matter expert● March 10<ul style="list-style-type: none">○ Empathy Map● March 13<ul style="list-style-type: none">○ Personas Document● March 14<ul style="list-style-type: none">○ 2nd Interim Report

PHASE 3

March 16 – April 6

ACTIONS	DELIVERABLES
<ul style="list-style-type: none">• Complete the second interview with the AR subject matter expert on more specifics with what is being fielded today• Complete interview to help develop scenarios and storyboards based on real incidents• Implement past research and development of augmented reality design systems in a rough dynamic prototype• Based off interviews and research completed this phase, produce scenarios and storyboards that help conceptualize the incident command workflow in AR• Create a presentation detailing key success, key issues, and next steps for peers to present feedback• Produce a third interim report and potentially update project definition and scope	<ul style="list-style-type: none">• March 22<ul style="list-style-type: none">◦ Complete second interview with AR subject matter expert• March 25<ul style="list-style-type: none">◦ Complete interview focused on building scenarios and storyboards with ICS subject matter expert• March 29<ul style="list-style-type: none">◦ First Scenario◦ First Storyboard• March 30<ul style="list-style-type: none">◦ First draft of dynamic prototype• March 31<ul style="list-style-type: none">◦ Project update presentation to get feedback from UX peers• April 1<ul style="list-style-type: none">◦ Complete second interview with ICS subject matter expert focusing on dynamic prototype and features• April 3<ul style="list-style-type: none">◦ Two more scenarios, focused on AR tooling◦ Two more storyboards, focused on AR tooling• April 4<ul style="list-style-type: none">◦ 3rd Interim Report

PHASE 4

April 7 – May 5

ACTIONS	DELIVERABLES
<ul style="list-style-type: none">• Demonstrate the experiences and issues an Incident Commander will have while responding to an emergency situation with a journey/experience map• Address any overlooked problem areas and ensure the best deliverable for future teams• Since this research is being handed off to an external team, develop user interface requirements that will explain all visual and interactive experiences necessary for the incident commander. This effort will build on previous research and create/innovate where there are gaps• Present all the research, findings, and ideas in one final report and presentation• To end the research effort, our team will debrief the client about all of our efforts and recommend the next steps to take in the near future	<ul style="list-style-type: none">• April 29<ul style="list-style-type: none">◦ Journey/Experience map• April 29<ul style="list-style-type: none">◦ User Interface Requirements Document• May 1<ul style="list-style-type: none">◦ Final Report• May 2<ul style="list-style-type: none">◦ Dynamic Prototype• May 3<ul style="list-style-type: none">◦ Final Presentation• May 5<ul style="list-style-type: none">◦ Client Debriefing

Conclusion

Our team is excited to explore the first responder's cognitive work flow during times of crisis to analyze how many enhancements can be completed regarding their situational awareness. First responders and other emergency personnel place their own lives on the line every day to assist the general public. Our belief is that augmented reality interfaces and controls can assist in streamlining their processes with innovative technology and utilizing modern concepts. We hope the future of our work results in saving the lives of many for generations to come.