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School Safety

Concho Valley Council of Governments (CVCOG), Texas

Exploring a New Way to Make Schools Safer Using GIS

CVCOG provides emergency communications services for approximately 16,300 square mile region in West Texas, supporting 15 Public Service Answering Points (PSAPs) within the thirteen-county region.

Project Overview

Working with 9-1-1 entities across the state, the Texas Commission on State Emergency Communications (CSEC) realized that indoor GIS maps of buildings across the state largely do not exist. Since there are over 10 million buildings in the state, creating new GIS maps of each building would present a significant challenge. As a result, the CSEC sought to design a proof-of-concept (PoC) project for crowdsourcing indoor map development of one particular high priority building type, high schools. The CVCOG 9-1-1 program expressed interest, and along with private contractor, GeoComm, helped the CSEC design a PoC project scope and charter. CVCOG 9-1-1 and Mason High School then became the test case for the PoC project.

"We are extremely proud of the opportunities to involve students, teachers, and first responders in this pilot project, whose work and participation will improve the public safety of our schools and communities," said Jeff Lopez, 9-1-1 Program Manager, CVCOG. **"GeoComm provided invaluable guidance, ensuring the team and project reached their full potential. We are hopeful that our work will be an impetus to accelerate indoor mapping efforts across the state."**

Project Quick Facts

Goal

Test and validate a new process in which GIS maps of schools, for use in 9-1-1 Public Safety Answering Points (PSAPs), can be created and maintained through a partnership between a regional Council of Governments and local school educational programs.

Approach

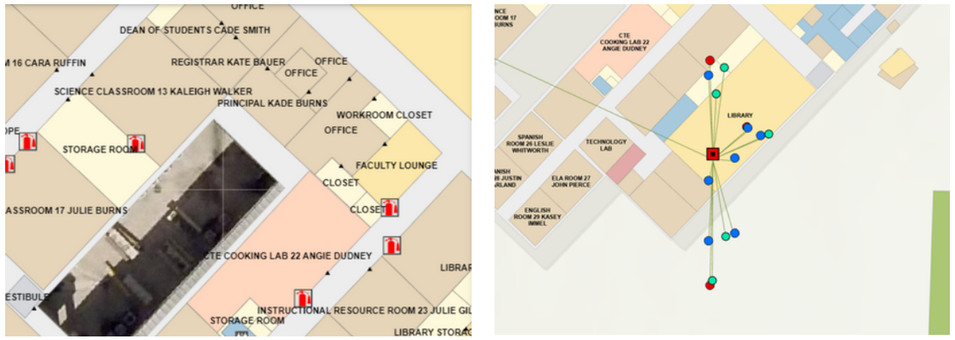
- Conduct a proof-of-concept (PoC) project with the CVCOG, Mason High School, and GeoComm for testing and validating the new concept
- Design curriculum for a unit in a high school technology class where students learn about GIS and 9-1-1
- Utilize multiple equipment packages for GPS, indoor positioning, and laser scanning to determine the best overall equipment combination
- Utilize a variety of GIS applications and resources from Esri, the globally leading GIS platform provider widely utilized across the State of Texas
- Provision the school GIS maps into a 9-1-1 PSAP mapping application
- Test several map maintenance cycles and update processes after the initial school map generation

Outcome

- Accurately mapped Mason High School and successfully tested pinpointing of 9-1-1 calls inside schools.
- Developed a best practices playbook enabling other schools and 9-1-1 entities to replicate this approach across Texas
- Students were educated on how 9-1-1 systems work, learned about GIS, and data collection with hands-on mapping activities.

Project Results & Key Learnings

Working together, CVCOG staff and Mason High School students and faculty successfully created a detailed indoor map of Mason High School and used it for 9-1-1 call location testing.



Mason High School Indoor Map and 9-1-1 Call Location Testing

Highlights from the Project's Key Learnings

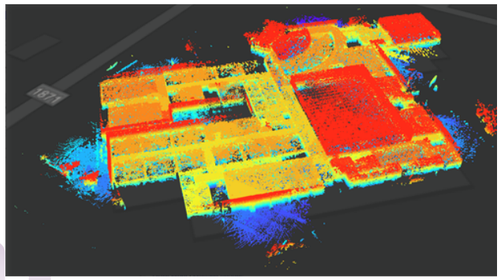
Mobile Technology is Intuitive for Students

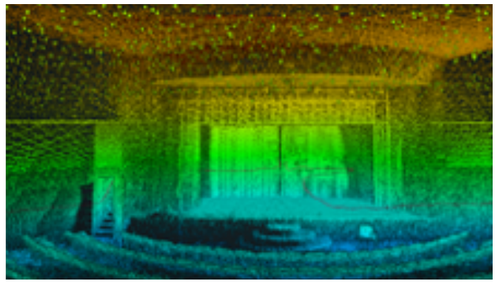
A light weight Esri ArcGIS Web AppBuilder application was created for smart phones and tablets which enables quick data capture and editing in a mobile environment. In addition, the Esri ArcGIS Pro application was available on classroom desktop computers. Students used both applications in their mapping work, but generally preferred the Esri ArcGIS Web AppBuilder application because of its intuitiveness and their familiarity with mobile devices. CVCOG GIS staff used ArcGIS Pro for heavy lifting and map finalization.

Frequent Map Changes

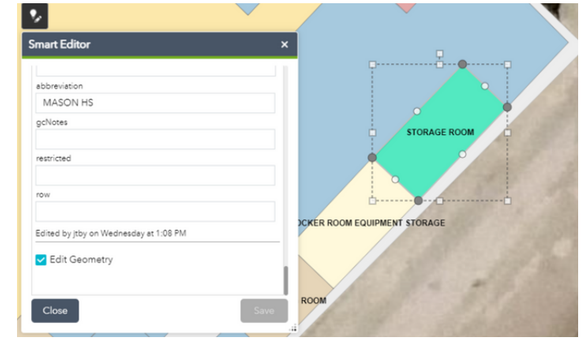
During the project, students reported frequent changes in function of classrooms – some by the semester, by the day, and even by the hour. Furthermore, students, staff, and faculty, think of rooms by the teacher's name or the room's function. For instance, in an emergency situation a 9-1-1 caller is likely to say, "I'm in Ms. Bode's room," rather than "I'm in room 108." This project ensured that the labels for each of the rooms were identifiable in the indoor map GIS data layers and accessible at ECCs.

To ensure indoor maps are accurate, rules must be built to continuously adjust the name and description of rooms in the school. Maps will be reliable and relevant, giving telecommunicators and first responders confidence with precise location information, especially when communicating with 9-1-1 callers inside buildings where first responders are unaware of current names for rooms inside the building. As part of the PoC project, best practices for on-going maintenance were determined and recommended.





Mason High School 3D LIDAR building scan



ArcGIS Web Appbuilder Indoor Map Editor

An Innovative Partnership

Building and maintaining indoor maps of schools requires local participation, knowledge, and expertise. CVCOG took an innovative approach to maximizing efficiency; they worked with Mason High School to help develop a GIS unit for a high school technology class that focused on the creation and maintenance of their school's indoor map. Through this approach, CVCOG would gain a high-quality indoor map for emergency response, students would learn valuable GIS skills for future career paths, and a playbook for scaling the approach statewide. GeoComm was selected as the PoC project coordinator.

"It was a great pleasure working with the innovative CVCOG 9-1-1 team, and the Mason High School faculty and students and staff," said John Brosowsky, Vice President of Innovation at GeoComm. **"Everyone enthusiastically dove into this project, and they were terrific partners, even though the COVID-19 pandemic introduced unforeseen challenges during the PoC. We look forward to the time when all Texas school districts can engage students and help make their communities safer with indoor maps."**

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