# Problem Statement

Indoor mapping is the next big frontier for the geospatial field. Lack of adequate indoor maps is a well-documented public safety issue reasserted with each building fire, earthquake, mass shooting, and other tragedies. While technology exists capable of mapping buildings, very few standards and best practices are available to create reliable, affordable, and consistent indoor maps.

The Point Cloud City Hancock County, Mississippi grant project allows public safety and geospatial subject matter experts to work hand in hand with federal oversight to further develop approaches which improve indoor mapping techniques and datasets in the US to make them more common. Because Hancock County is a rural area, any approach used here should be applicable nationwide.
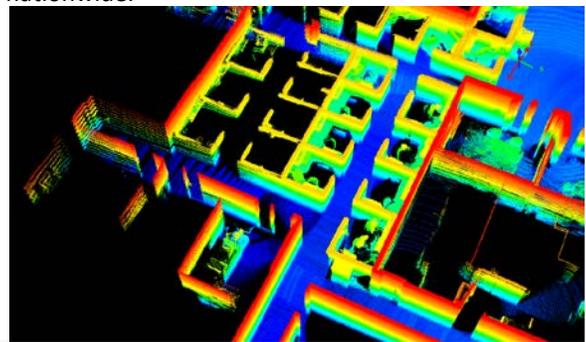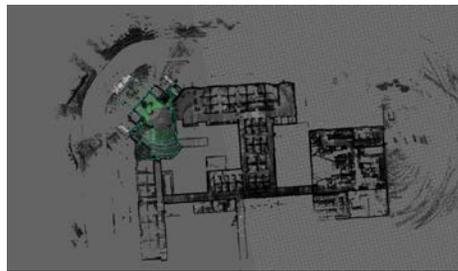
Project Concept

Location: 10 public schools comprising 1,201,082 sq ft of indoor space. Includes USDA Designated Rural Areas and SBA HubZones. Schools rebuilt after Katrina to similar specs.
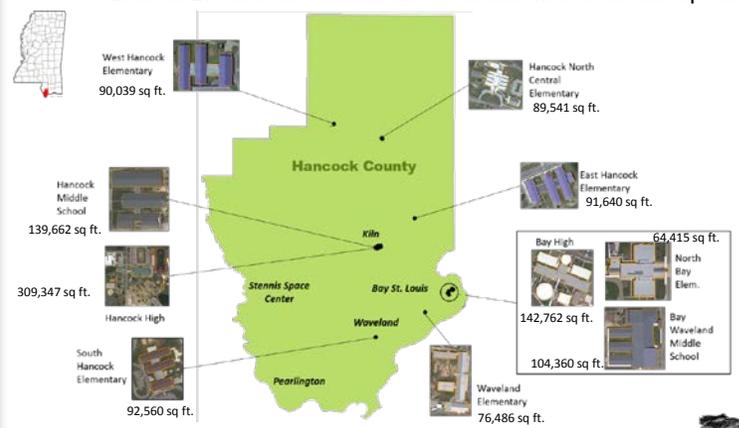
Approach/ Hardware: Teledyne-Optech Mobile Mapper. Backpack or push-cart mounted. Collects lidar data and 360-degree color photos.

West Hancock Elementary 90,039 sq ft.
Hancock North Central Elementary 89,541 sq ft.
Hancock Middle School 139,662 sq ft.
East Hancock Elementary 91,640 sq ft.
309,347 sq ft. Hancock High
Bay High 64,415 sq ft.
North Bay Elem.
142,762 sq ft.
Bay Waveland Middle School 104,360 sq ft.
South Hancock Elementary 92,560 sq ft.
Waveland Elementary 76,486 sq ft.

SYSTEM
Power Supply	9V – 36V DC
Weight	8.85 kg
Accuracy	2 cm (one sigma at 25 m)
Output	Up to 700 000 points per second
Imaging	Ladybug 5 Megapixels 30 MP

SOFTWARE
- Real-time web-based data display and feedback; moving map display; WiFi connection
- Distillery flexible format output that can be imported into third-party software

Processing/Viewing Software: esri — TELEDYNE OPTECH — QGIS — LAStools — python *OGR/LASpy/PDAL*

Key Milestones and Deliverables

Key Milestones
- Delivery of the Optech Sensor to Hancock County
- Training of personnel on data collection
- Collection of first building
- Processing of first dataset
- Completion of first-building lidar attribution, and vector feature extraction
- Completion of collection and processing for 5 buildings
- Completion of all 10 schools
- Availability of data on MARIS Distribution site
- Availability of developed tools on GitHub
- Final Report
- Presentation of results to external stakeholders

Key Deliverables

Month 1 – Month 12

- Scheduled Reports *Ongoing*
- Program presentations *Ongoing*

- 10 attributed, lidar data sets for 10 public schools
- Vector data set for relevant public safety indoor features
- Mississippi Automated Resource Information System (MARIS) data download page
- Any open-source software tools developed

Potential Impact of the Project

- New and improved approaches in public safety tactics
- Common standards and best practices for indoor maps
- Increased public/private research into indoor mapping due to high-quality, widely available reference datasets
- Increase in derivative technology research
- Open-source tools to make processing indoor data and creating maps easier
- Recognition of US as a global leader in Indoor Mapping technology

PSIAP Point Cloud City Grant