WEEK 02

FIELD TECHNIQUES

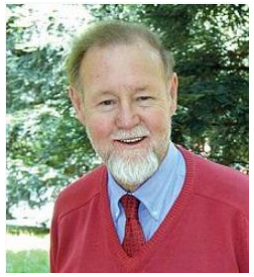
LECTURE

INSTRUCTOR: YANAN WU

FALL 2025

2.1 INTRODUCTION TO FIELD TECHNIQUES

HISTORY



1960s

Dr. Roger Tomlinson
Canada GIS

Arc/info, MapInfo

1980s

Desktop GIS

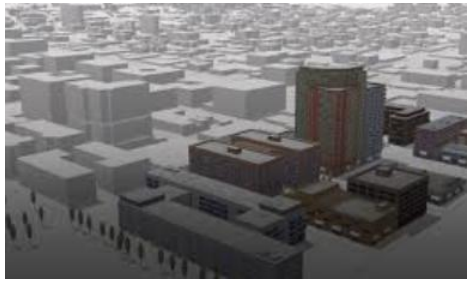
Web GIS 1.0

2000S

Mobile GIS& Cloud

2010S

Real-Time, 3D & Integrated GIS



2020s

GEOGRAPHIC FIELD TECHNIQUES

- **Why Mobile & Web GIS Matter**

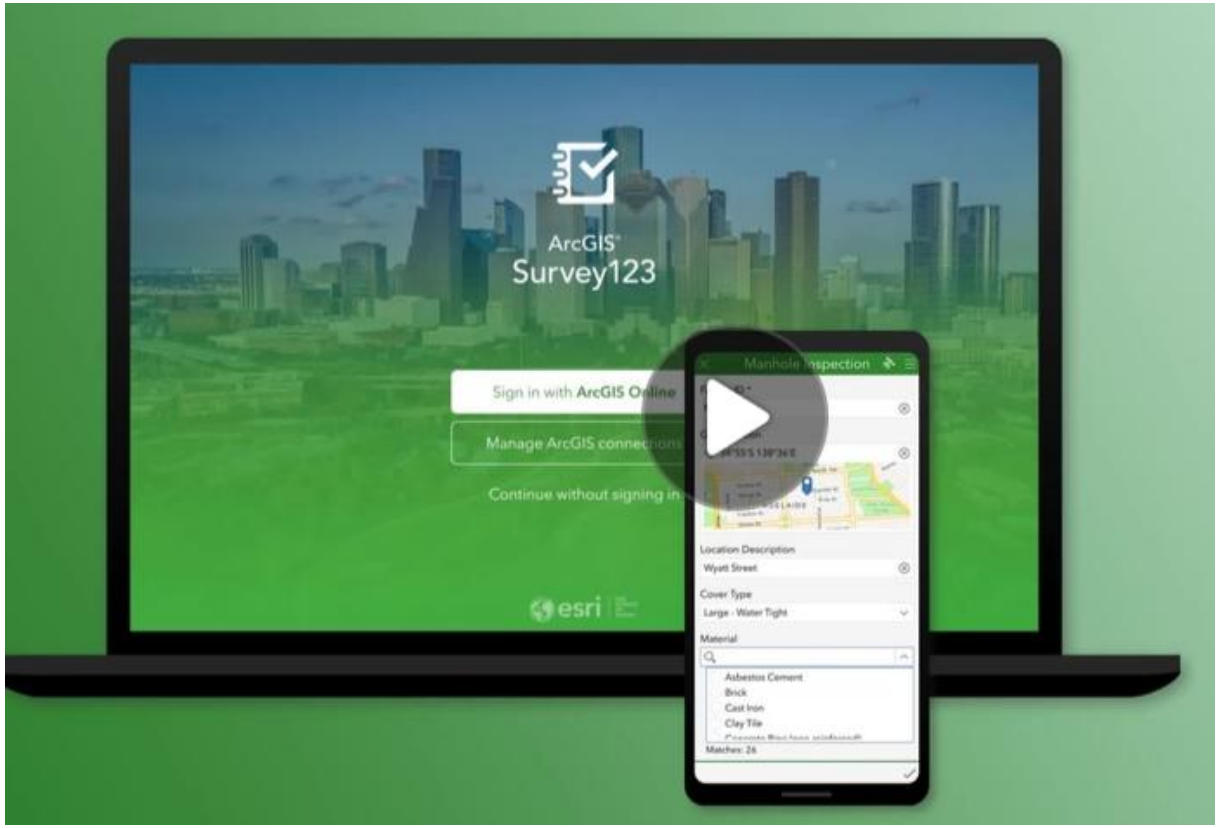
Accessibility: Anyone with a phone can collect data.

Location awareness: Technologies enable precise location tracking of mobile devices

GEOGRAPHIC FIELD TECHNIQUES

- **Why Mobile & Web GIS Matter**

Versatile communication tools: Mobile devices integrate with various communication methods to facilitate effective collaboration and communication among professionals and the public.



GEOGRAPHIC FIELD TECHNIQUES

- **Why Mobile & Web GIS Matter**

Widespread accessibility: The ubiquity of smartphones, tablets, and smartwatches has made GIS accessible to billions, significantly expanding the user base and applications of GIS.

More than 680,000 organizations use GIS to understand, plan for, and solve the world's complex problems.

Disaster response program

Non-profit

Education

Conservation

2.2
MOBILE GIS

MOBILE POSITIONING TECHNOLOGIES

Before 2000, GPS technology was not commonly integrated into mobile phones

- Global Navigation Satellite System (GNSS): Uses satellite signals to pinpoint precise geographic locations (longitude, latitude, altitude).
- Cellular network-based positioning: Relies on cellular network infrastructure to locate devices.
- Bluetooth Low Energy (BLE): BLE is used in tracking technologies such as Apple's AirTags

MOBILE POSITIONING TECHNOLOGIES

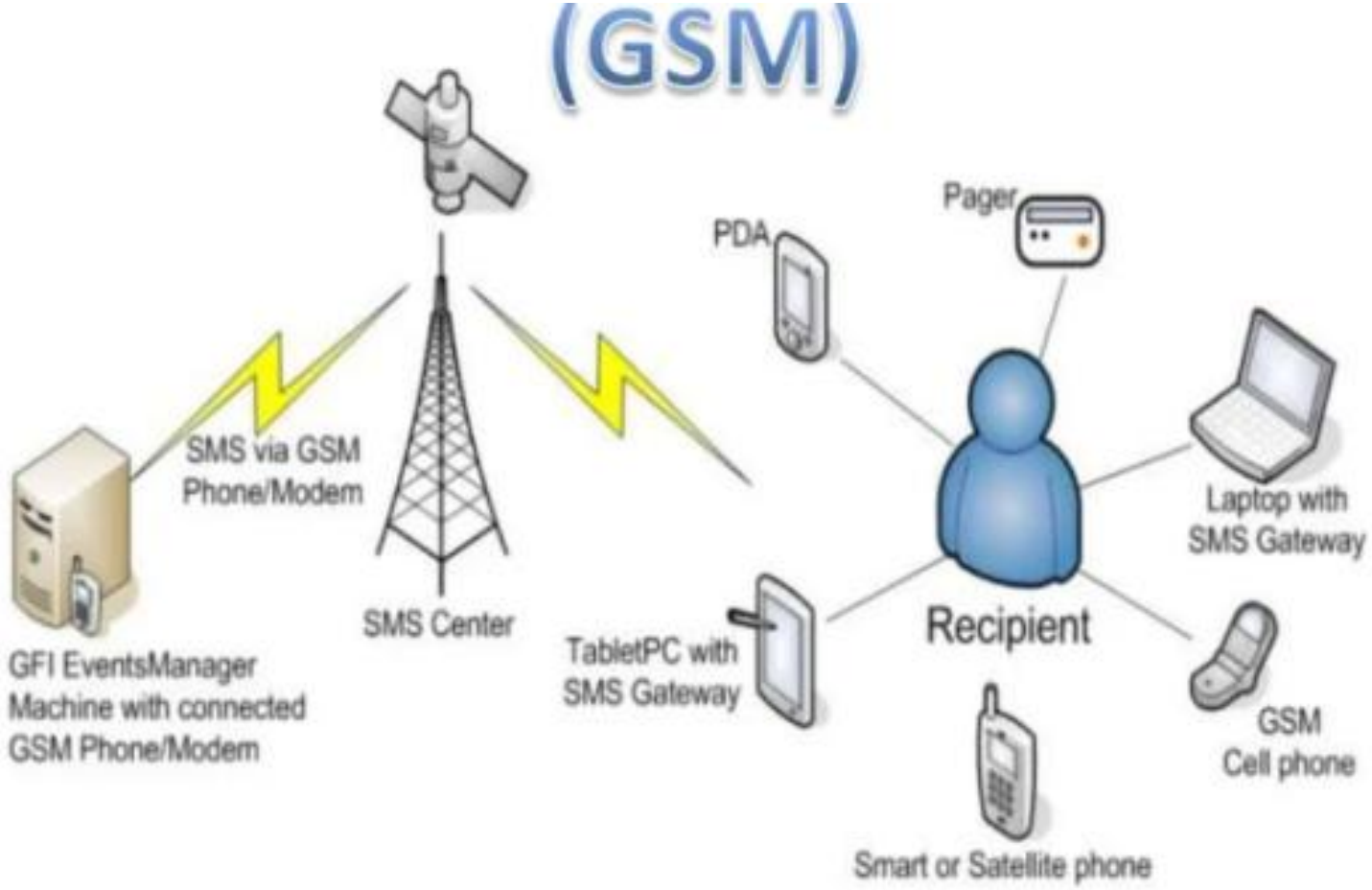
Visual Light Communication

VLC

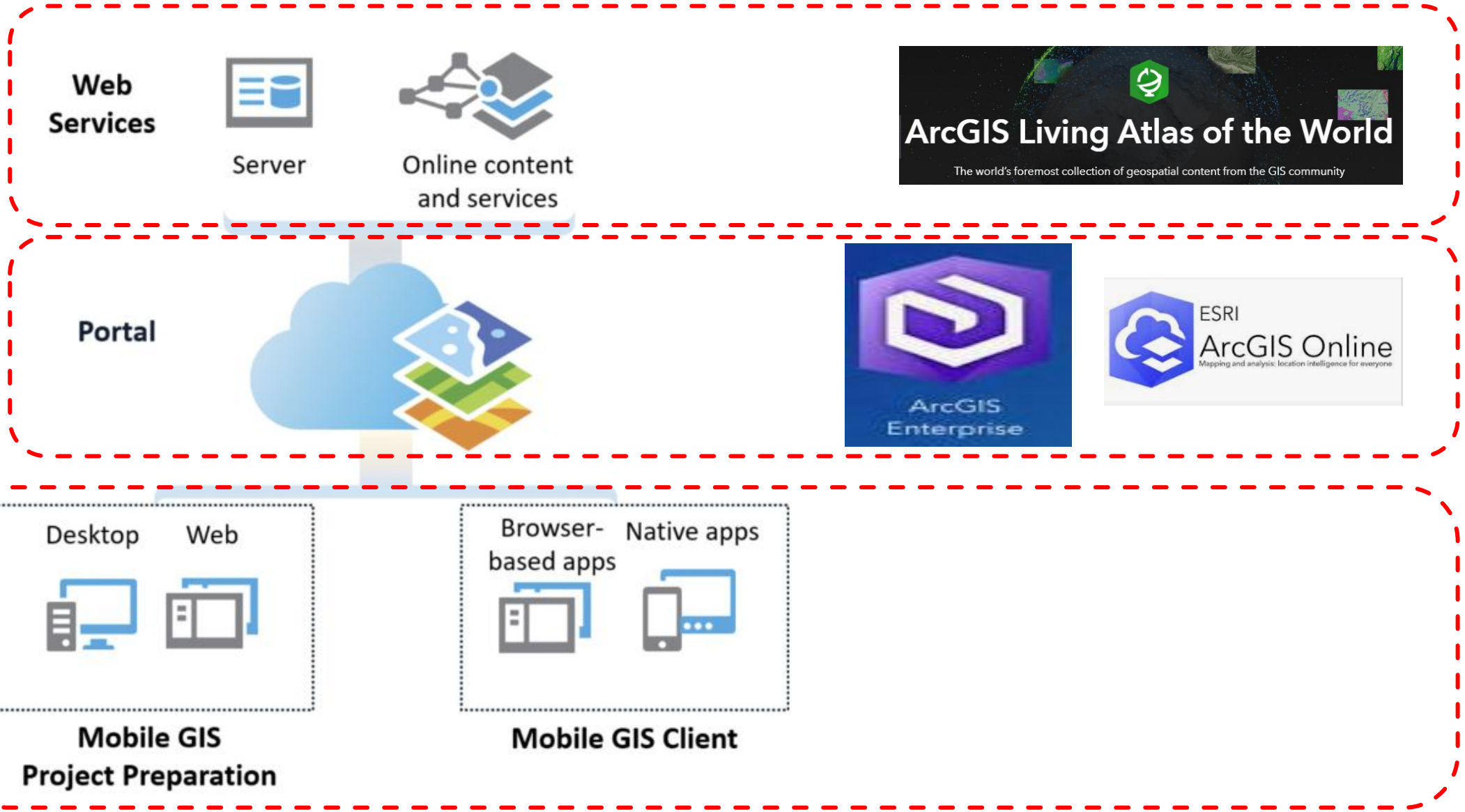
MOBILE POSITIONING TECHNOLOGIES

Global System for mobile Communication

- Cell tower track phone's location

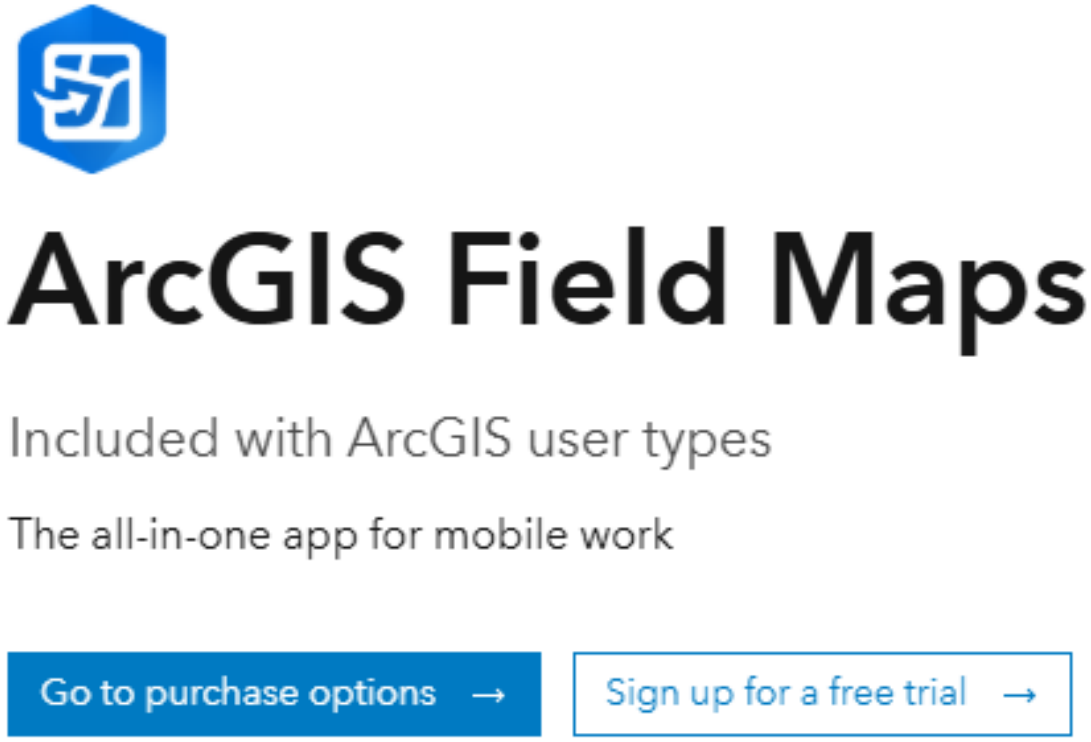


MOBILE GIS ARCHITECTURE



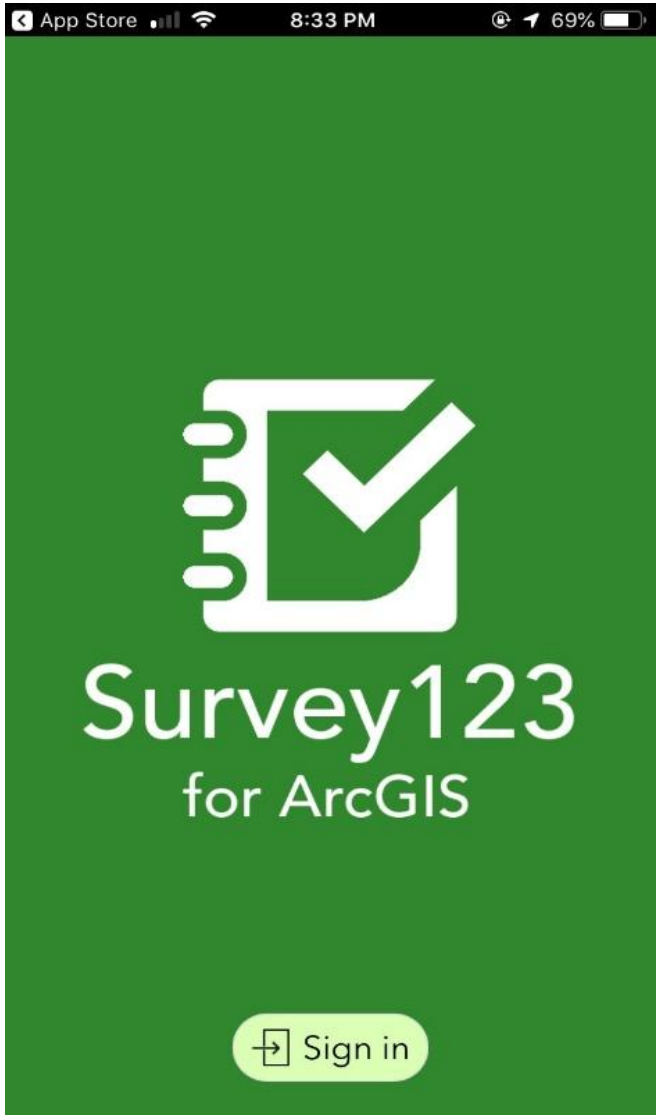
ARCGIS SUITE OF WEB AND NATIVE APPS FOR MOBILE GIS

- Field Maps: Integrates several earlier products, including ArcGIS Collector, ArcGIS Explorer, ArcGIS Tracker, and ArcGIS Workforce. Serves as an all-in-one solution that supports planning, recording and sharing location, understanding, and map centric data capture.

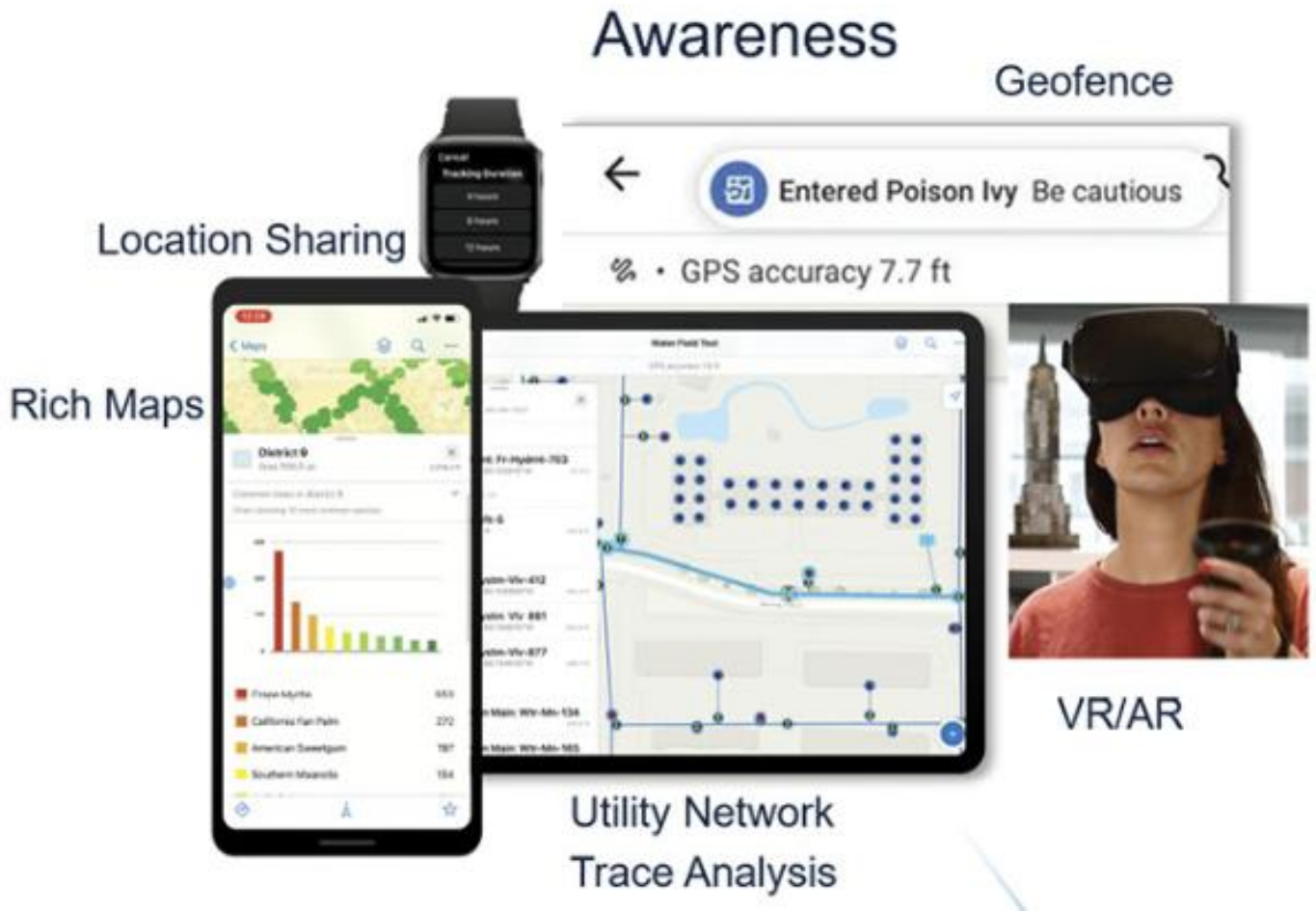


ARCGIS SUITE OF WEB AND NATIVE APPS FOR MOBILE GIS

- ArcGIS Survey123: This formcentric app allows users to create, share, and analyze surveys. It features smart forms with skip logic, defaults, flexible formulas, and powerful data-pulling capabilities.
- The app facilitates easy data collection through the web or mobile devices in any environment, requiring minimal training.



FOUR PILLARS OF MOBILE GIS CAPABILITIES



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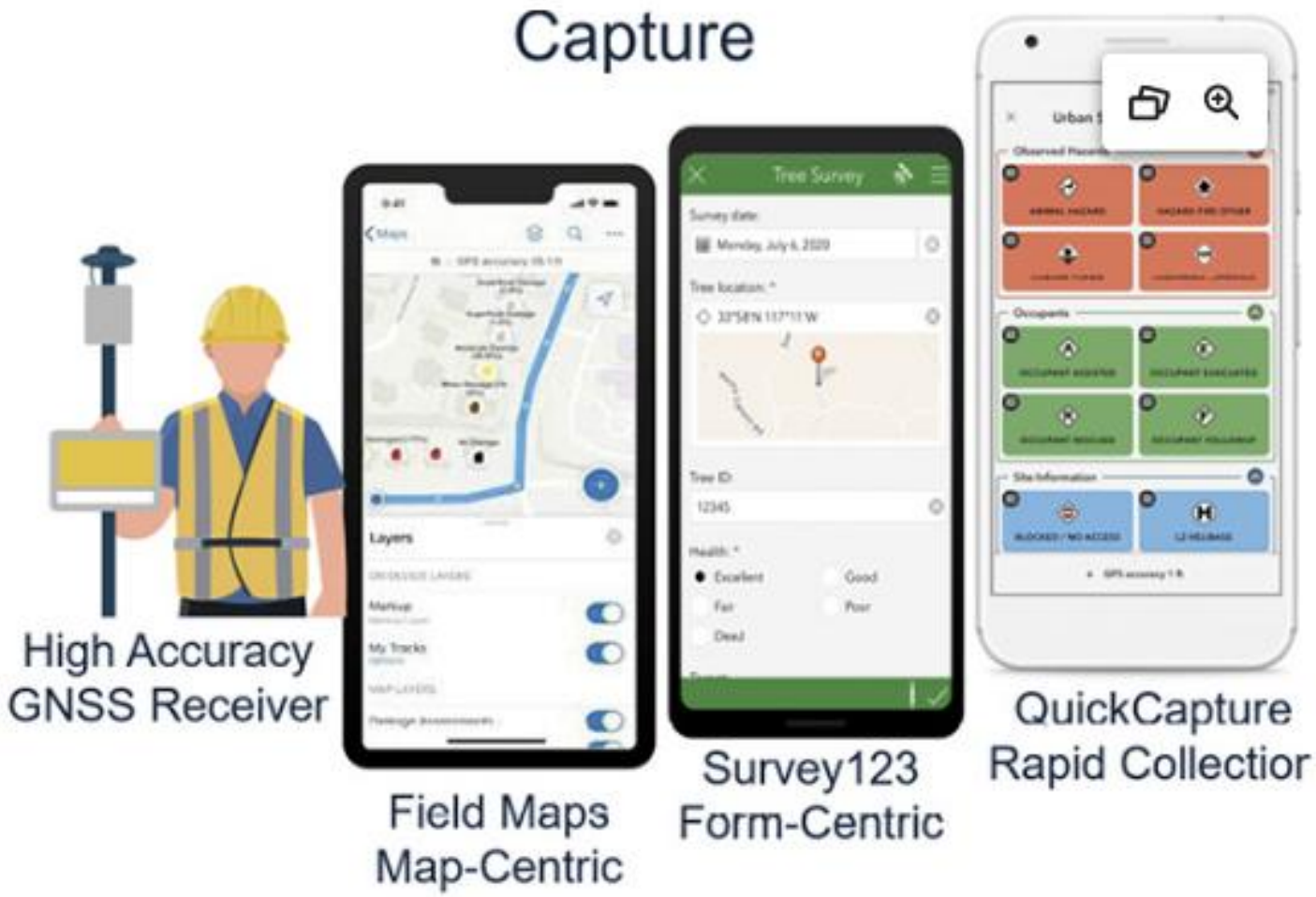

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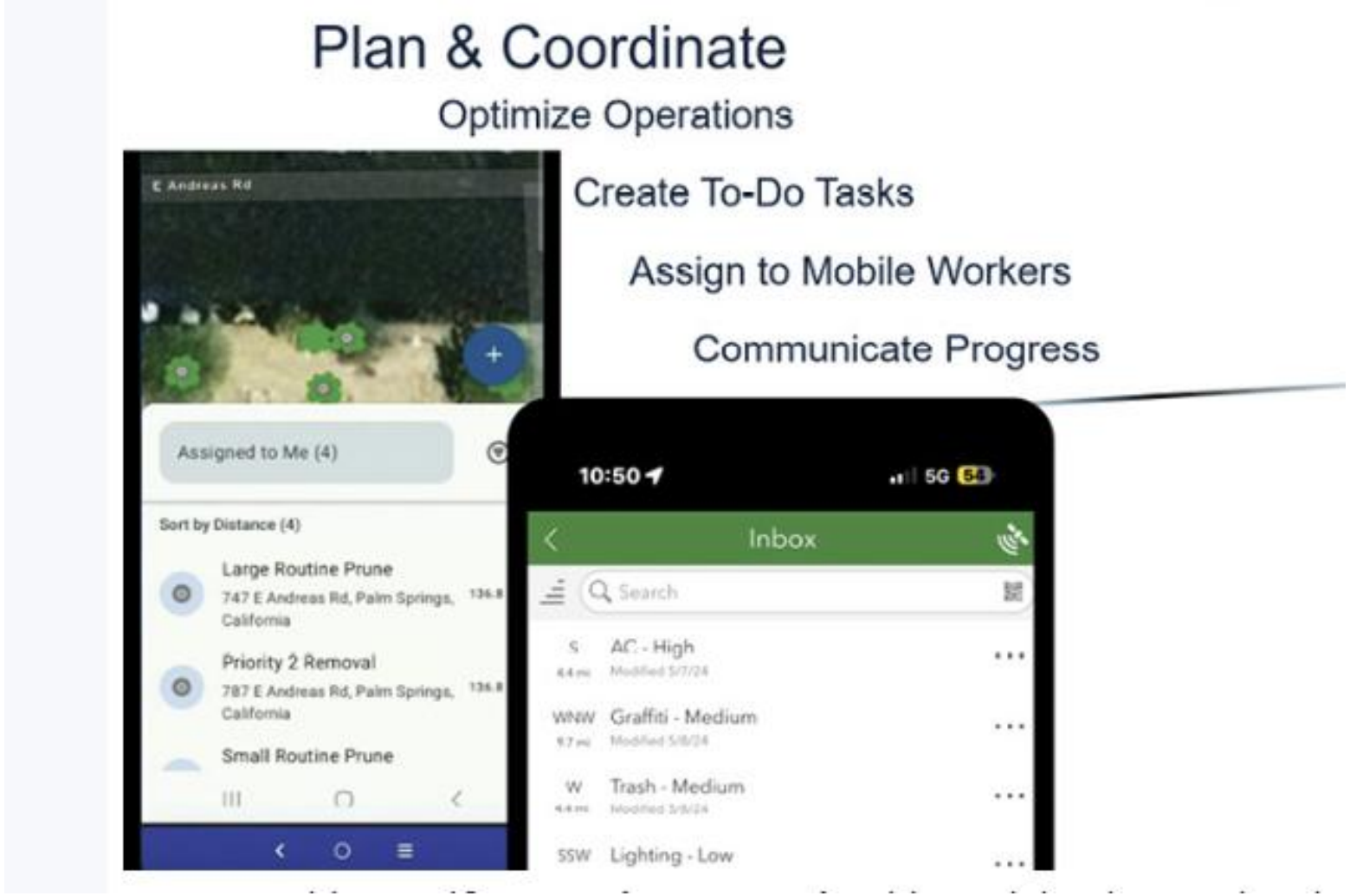

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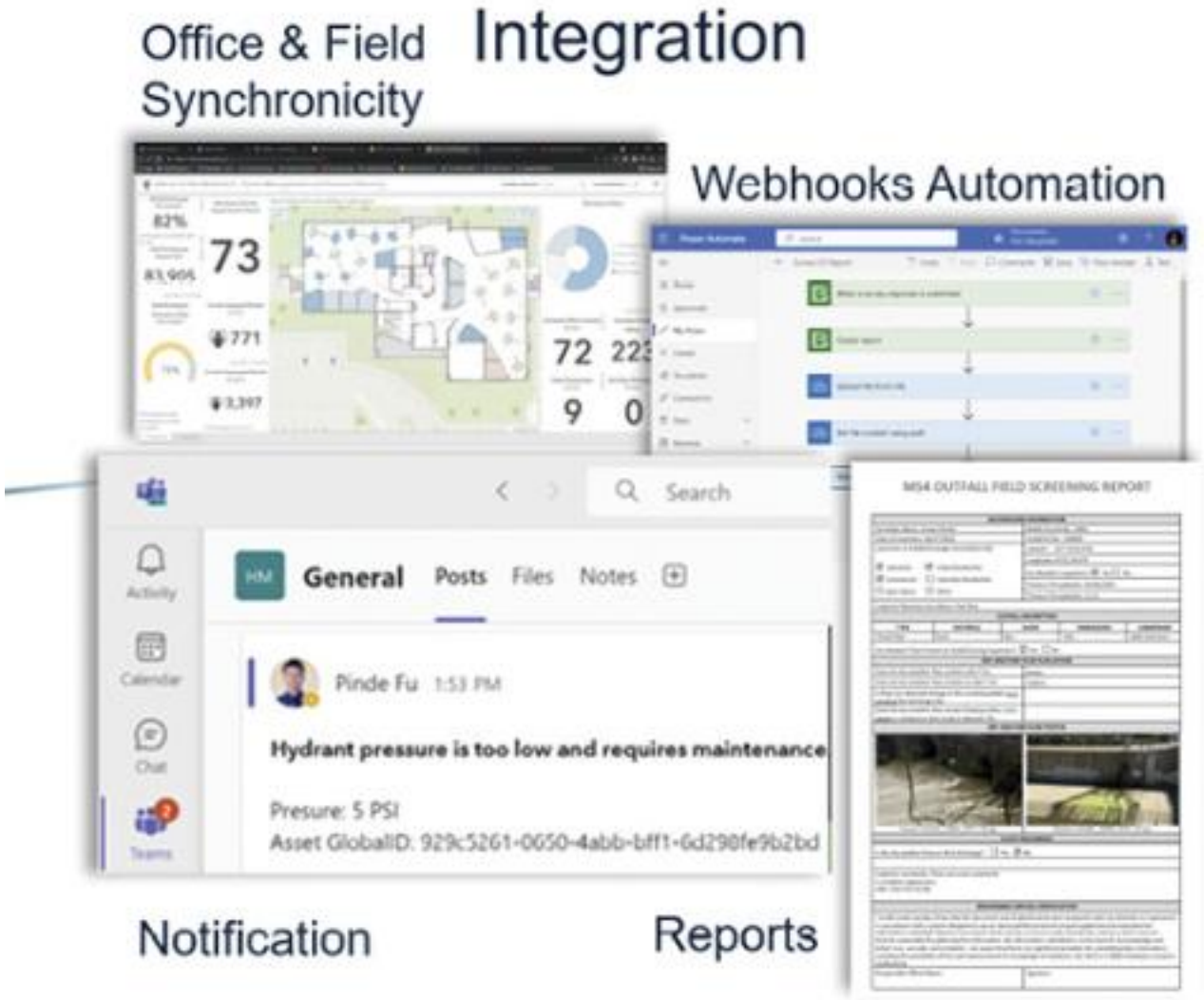


REAL-WORLD APPLICATIONS:

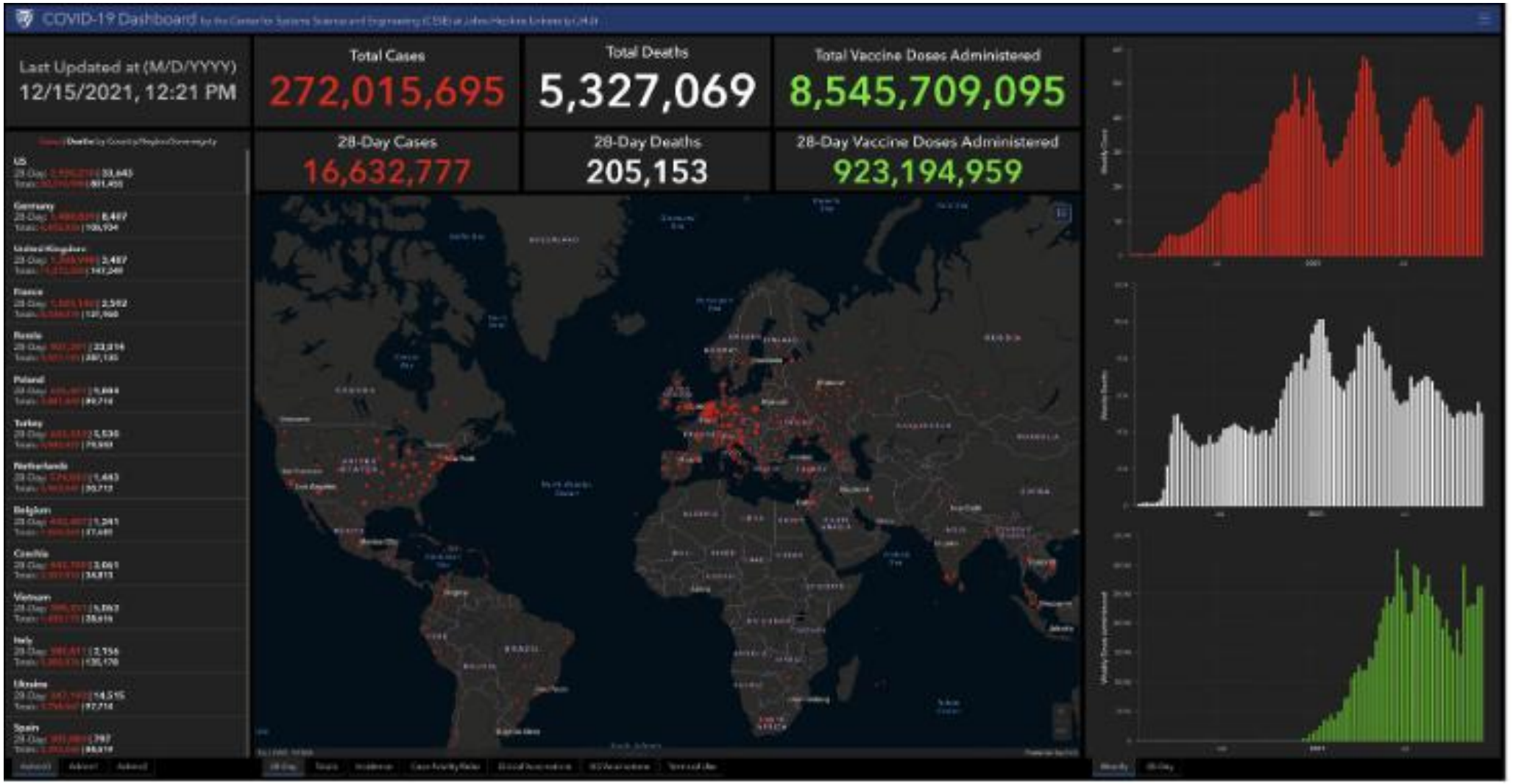
- **Emergency management:** Survey123 help in Emergency response and Recovery

REAL-WORLD APPLICATIONS:

- Fire Department : Field Maps help in Hydrant Inspection

2.3
DESKTOP GIS

DASHBOARD

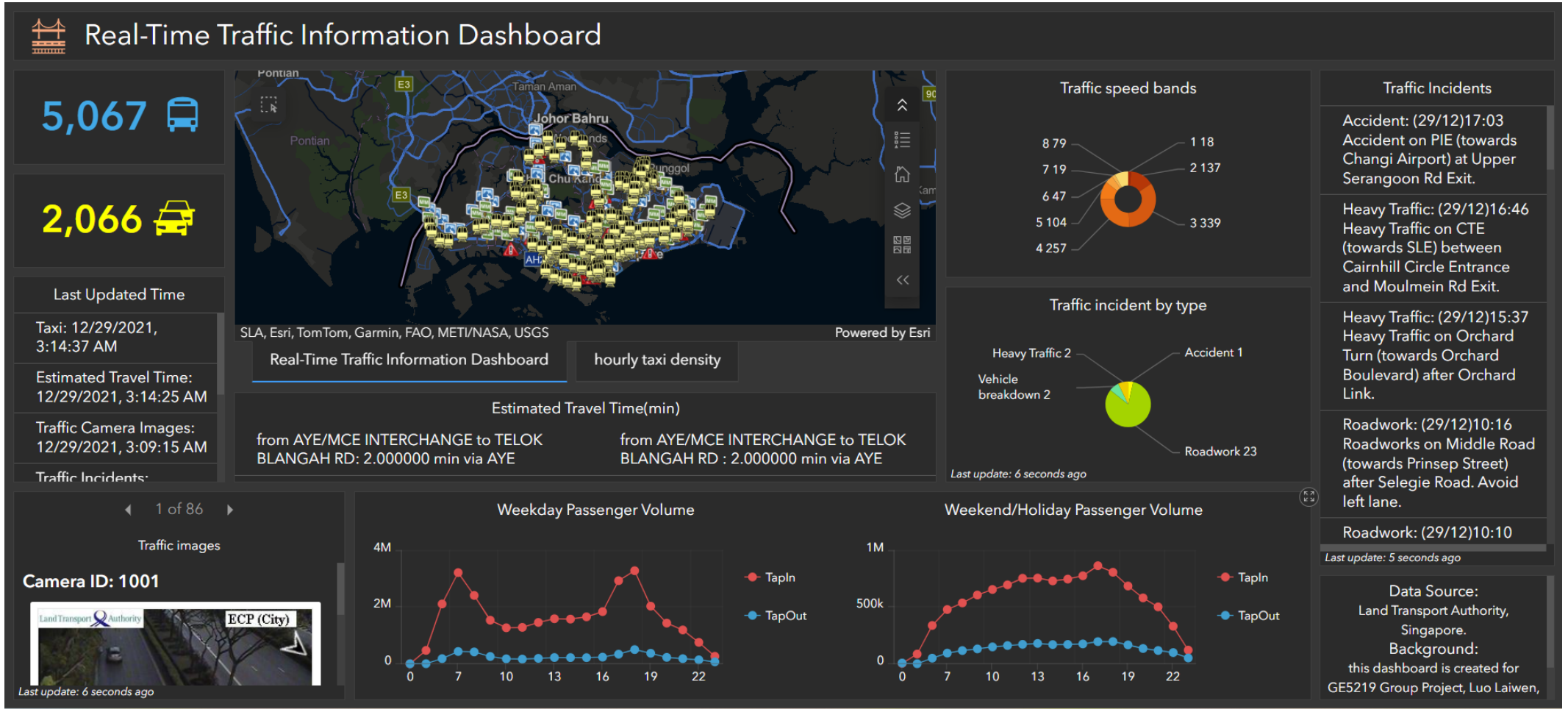


The COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU).

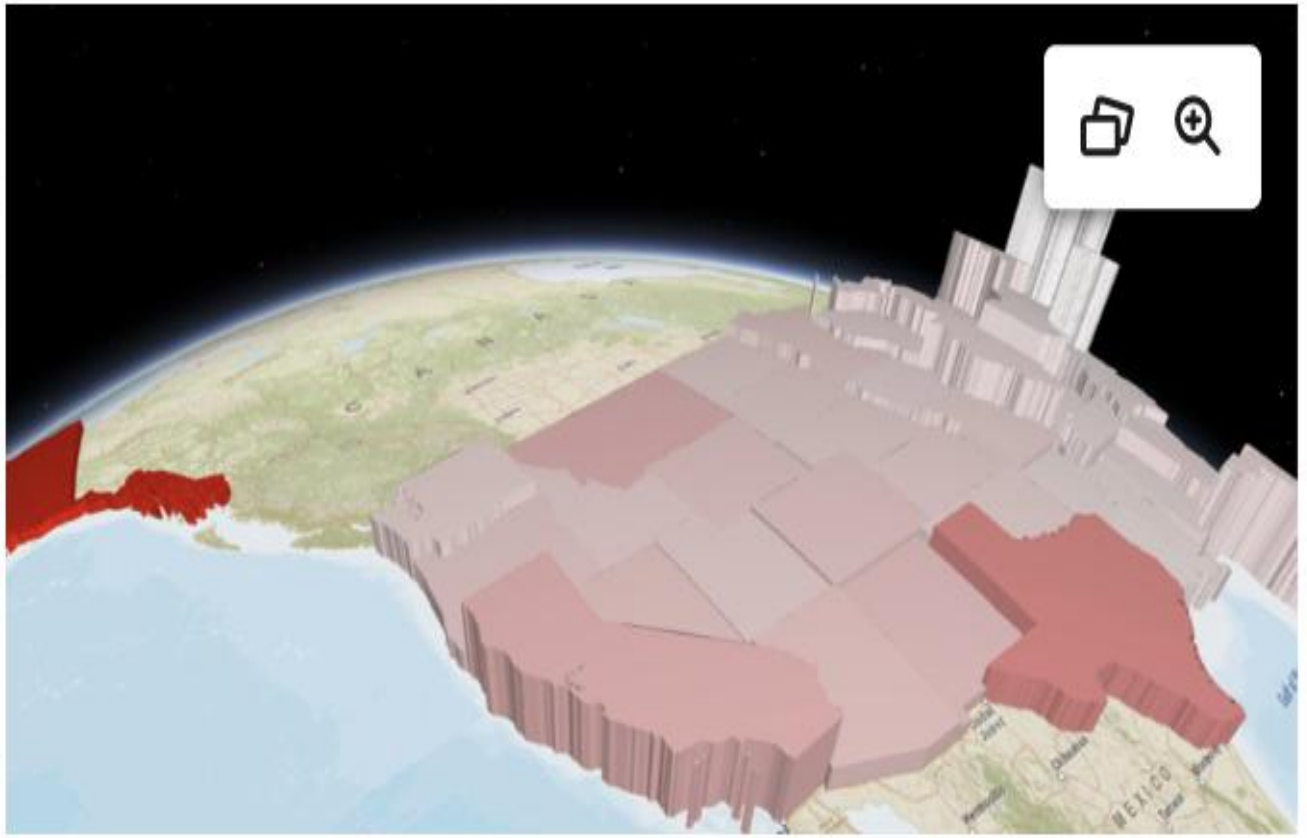
STORYMAP

2025 ArcGIS StoryMaps Competition

SPATIAL-TEMPORAL AND REAL-TIME GIS



3D WEB SCENES



2.4
DRONE AND GPS

Survey tools

- DJF Phantom IV

John

- DJF Ground Station Pro (only iPad)

- DJF GO 4

https://www.dji.com/downloads/djiapp/dji-go-4

GNSS segment

- User segment
  - ✓Comprises of Hundreds of thousands of civil, commercial, and scientific users
  - ✓In general, GPS receivers are composed of an antenna, receiver-processors, controller, and a highly stable clock.

https://unstats.un.org/unsd/geoinfo/UNGEGN/docs/_data_ICAcourses/_HtmlModules/_Selfstudy/S06/S06_05a.html

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LAB 01: INTRODUCTION TO ARCGIS PRO

Due by Midnight (11:59 pm) on Monday, Sep 1, 2025

Submit a word document only include questions and answers