🔥🚑 Evaluating Locations for Emergency Services

🚑🔥 Where Every Second Counts ⏳

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Group Number: 5

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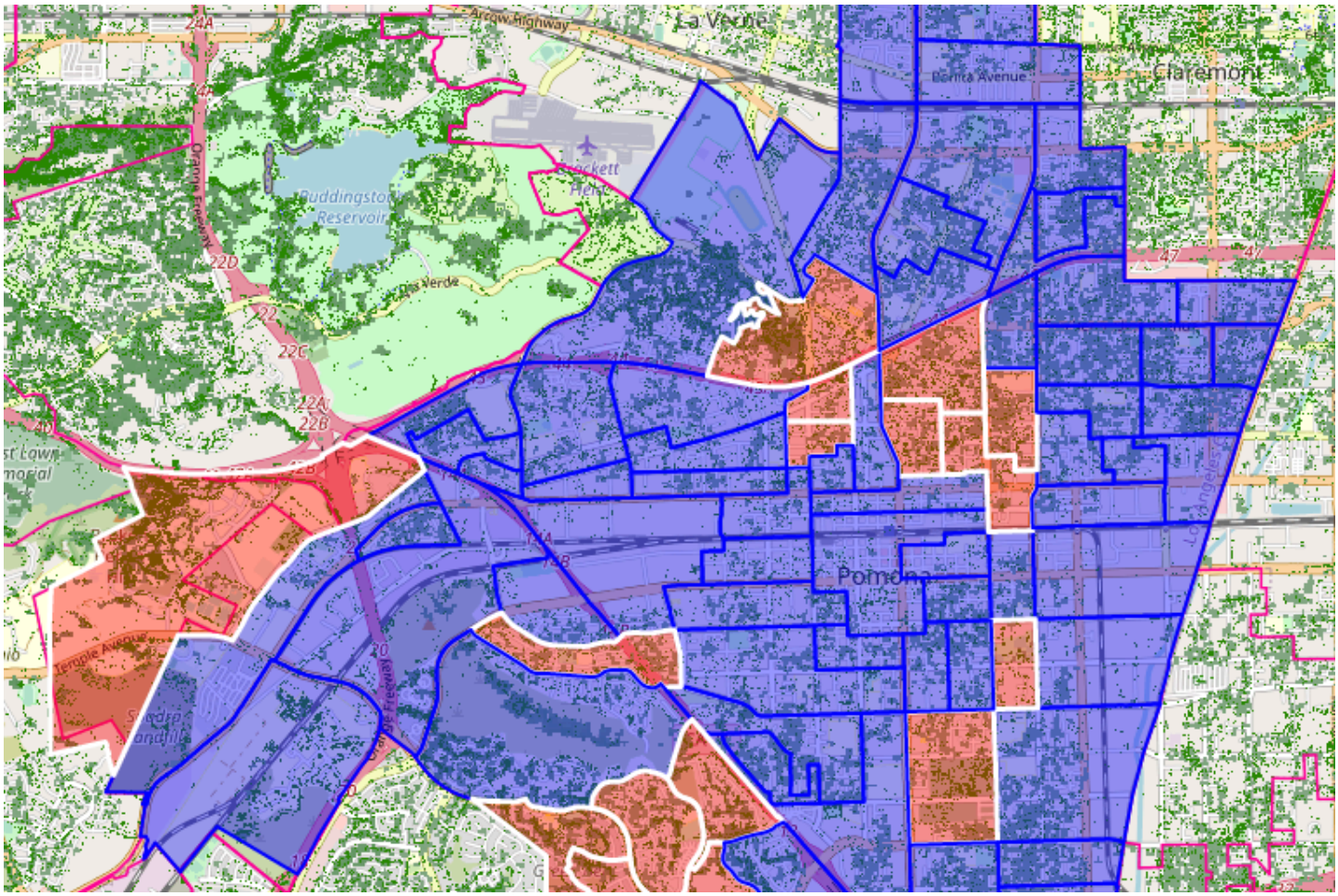
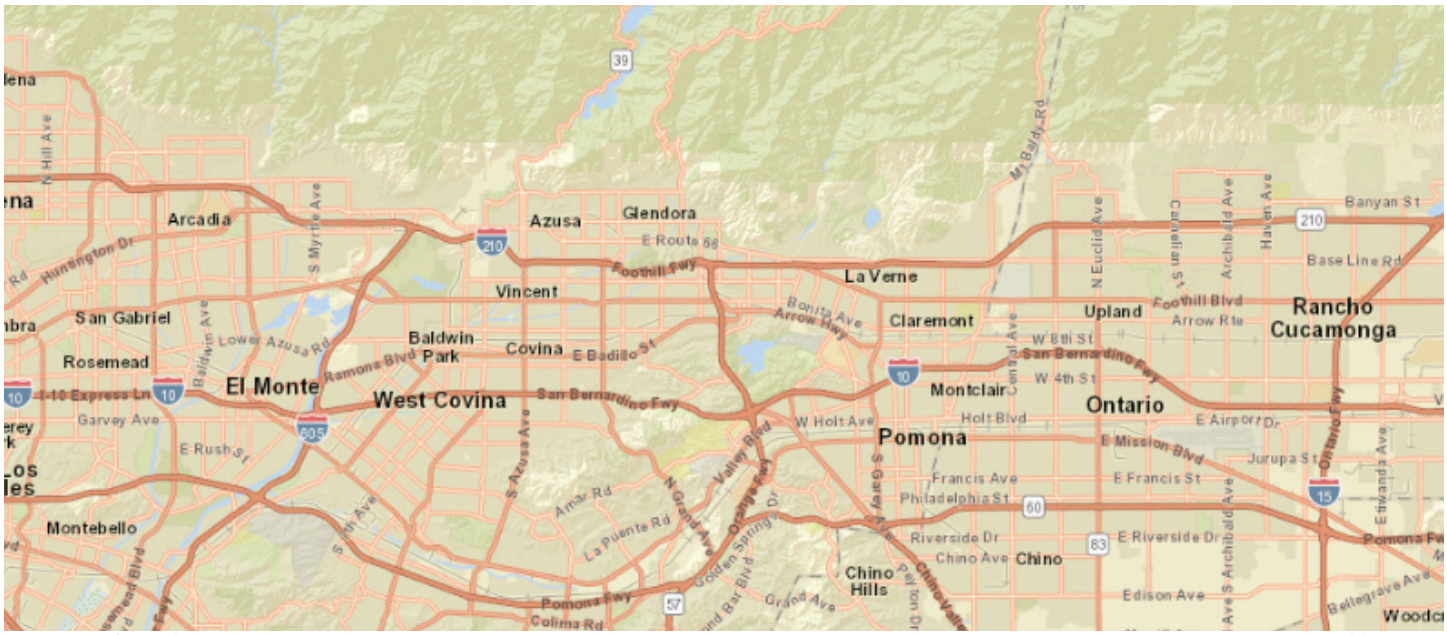
Where are the gaps in fire station coverage, and where should the next one be placed in Pomona, CA?

This study uses GIS to identify areas in Pomona that fall outside the 10–15 minute emergency response range. By overlaying population density with drive-time analysis, we locate underserved neighborhoods and recommend the best site for a new fire station to improve response times and public safety.



Main Objectives

1. **Identify EMS Gaps:** Find underserved areas beyond 10–15 minute response zones.
2. **Evaluate Accessibility:** Use drive-time, roads, and population data to locate unserved neighborhoods.
3. **Support Planning:** Provide insights to help city planners decide where new EMS facilities are needed.
4. Our main goal is to save more lives



Geographical Region of the Project (Area of Interest)

Primary Focus: Pomona, California

Why Pomona, California?

Pomona, in eastern Los Angeles County, is a densely populated city with high traffic, high crime rate and major highways like I-10 and SR-71. These factors impact emergency response times. This project identifies gaps in EMS coverage and recommends the best location for a new fire station to improve public safety and reduce delays.

Potential Value of the Project

This project provides **critical insights into the spatial distribution of emergency medical services (EMS)** in Pomona, CA. By identifying underserved areas beyond standard response-time thresholds, the analysis offers the following valuable contributions:

- *Improved Public Safety: Identifies underserved areas to reduce emergency response time and enhance safety.*
- **Equitable Access:** Promotes fair EMS coverage for high-population and underserved communities.
- **Informed Planning:** Helps city officials plan future fire station or hospital placements effectively.
- **Efficient Resource Use:** Minimizes service overlap and supports strategic investment.

- **Scalable Approach:** Methods can be reused for other cities or services like police or healthcare.

Possible Spatial Analysis Method (s) :

- Buffer Analysis
- Drive-time analysis
- Hotspot analysis

📏 Initial Distance Buffer Analysis (1.5 Miles)

This map shows a **preliminary proximity analysis** using 1.5-mile buffer zones around existing fire stations (red dots).

- Each **blue circle** represents a 1.5-mile radius around a fire station.
- While this method gives a **quick visual reference** for potential coverage, it does **not account for road networks, travel speed, or traffic**.
- This analysis served as a starting point to highlight areas that may lack coverage, later refined through more accurate **drive-time analysis**.

🗺️ Drive Time Analysis: 5, 10, 15 Minutes

This map visualizes emergency response coverage in Pomona, CA using **drive-time zones** around existing fire stations (red dots).

- The **light orange areas** represent regions reachable within **5 minutes**.
- The **medium orange areas** indicate a **10-minute** drive time.
- The **darkest orange zones** show areas that take up to **15 minutes** to reach.

The goal is to evaluate how quickly emergency services can respond to different parts of the city. As shown, most central and southern neighborhoods are well-covered. However, some **northern and northeastern parts of Pomona** fall outside the 15-minute response area, highlighting **service gaps** where additional fire stations may be needed.

👥 Population and Service Gap Analysis

This map overlays **population density** (blue grid) with **EMS drive-time coverage** (orange areas) and existing **fire stations** (red dots).

- The **blue grid** highlights populated areas based on 2024 demographic data.
- **Darker orange zones** represent longer emergency response times (up to 15 minutes).
- Areas where **blue population blocks fall outside the orange drive-time zones** indicate **service gaps** — neighborhoods not reachable within a standard response time.
- These underserved zones, especially in the **north and northwest of Pomona**, represent priority areas where a new

fire station could **significantly improve access** and reduce emergency response delays.

🚒 Recommended Fire Station Location

The **blue dot** on the map represents the **proposed fire station** location.

This site was selected because:

- It lies in a **high-population area** (based on grid overlays).
- It falls **outside the 15-minute drive-time coverage** (shown in darker orange).
- There are **no existing fire stations nearby**, leaving this neighborhood underserved.
- Placing a new fire station here would **improve emergency response times**, especially for the northern part of Pomona,

and help ensure **more equitable access** to life-saving services.

Conclusion

This GIS-based analysis of emergency service coverage in Pomona reveals clear gaps in fire station accessibility, particularly in high-population areas beyond the 15-minute drive-time threshold. By combining drive-time analysis, population density data, and spatial overlay methods, we identified underserved neighborhoods and proposed a strategic location for a new fire station. Implementing this recommendation can enhance response times, improve public safety, and promote more equitable access to emergency services across the city. This data-driven approach also provides a replicable framework for future planning in other urban areas.

Data Sources

Population Density Data:

=> U.S. Census Bureau(https://www.census.gov/)

=> ESRI Business Analyst Online

Existing Fire Stations & Hospitals:

=> (https://pomona-utilities.maps.arcgis.com/)

=> (https://malibucity.maps.arcgis.com/)

=> Los Angeles GeoHub(https://geohub.lacity.org)

Emergency Response Time Data:

=> National Fire Protection Association (NFPA - Open Data Portals (https://data.gov/)

Road Network Data:

=> OpenStreetMap (https://www.openstreetmap.org/) - ArcGIS Living Atlas

Land Use & Zoning Data:

=> City Planning Departments

=> ESRI BAO

Emergency Incident Hotspots:

=> Local fire department datasets

=> NFIRS (National Fire Incident Reporting System)

Real-time Traffic Data:

=> Google Maps API (for route optimization)