

Identification and Assessment of the Gaps in EMS Services in Rural Northern Los Angeles County

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Background



Introduction

Los Angeles County EMS responded to a total of 812,392 incidents in 2023. The same year 2023, 9-1-1 emergency transports accounted for 17% of all hospital visits in Los Angeles County. The EMS (Emergency Medical Response) is the backbone to the emergency response system that provides medical assistance during life threatening emergencies.

Study Area

Study area is Neenach, located in rural northern Los Angeles County. The community is unincorporated and EMS services are provided by Los Angeles County Fire Station #78. This fire station is located 15 miles away in the community of Lake Hughes. This creates a disparity in emergency response as Neenach is under served due to the significant distance between emergency services and the community.

Purpose

Purpose of the study is to identify and assess vulnerabilities of Neenach, and provide recommendations to alleviate the risk that

Overview of Available Services

The only kind of ambulance available is a basic life support (BLS) ambulance. This type of apparatus can only provide basic medical services and transport to hospital. In contrast, advanced life support (ALS) ambulances can stabilize patients before they get to the hospital. Fire station #78 is staffed by four personnel, one fire captain, two fire fighters, and one engineer. The station also contains two vehicles, one small roaming fire suppression unit and one large fire suppression apparatus.

Research Findings

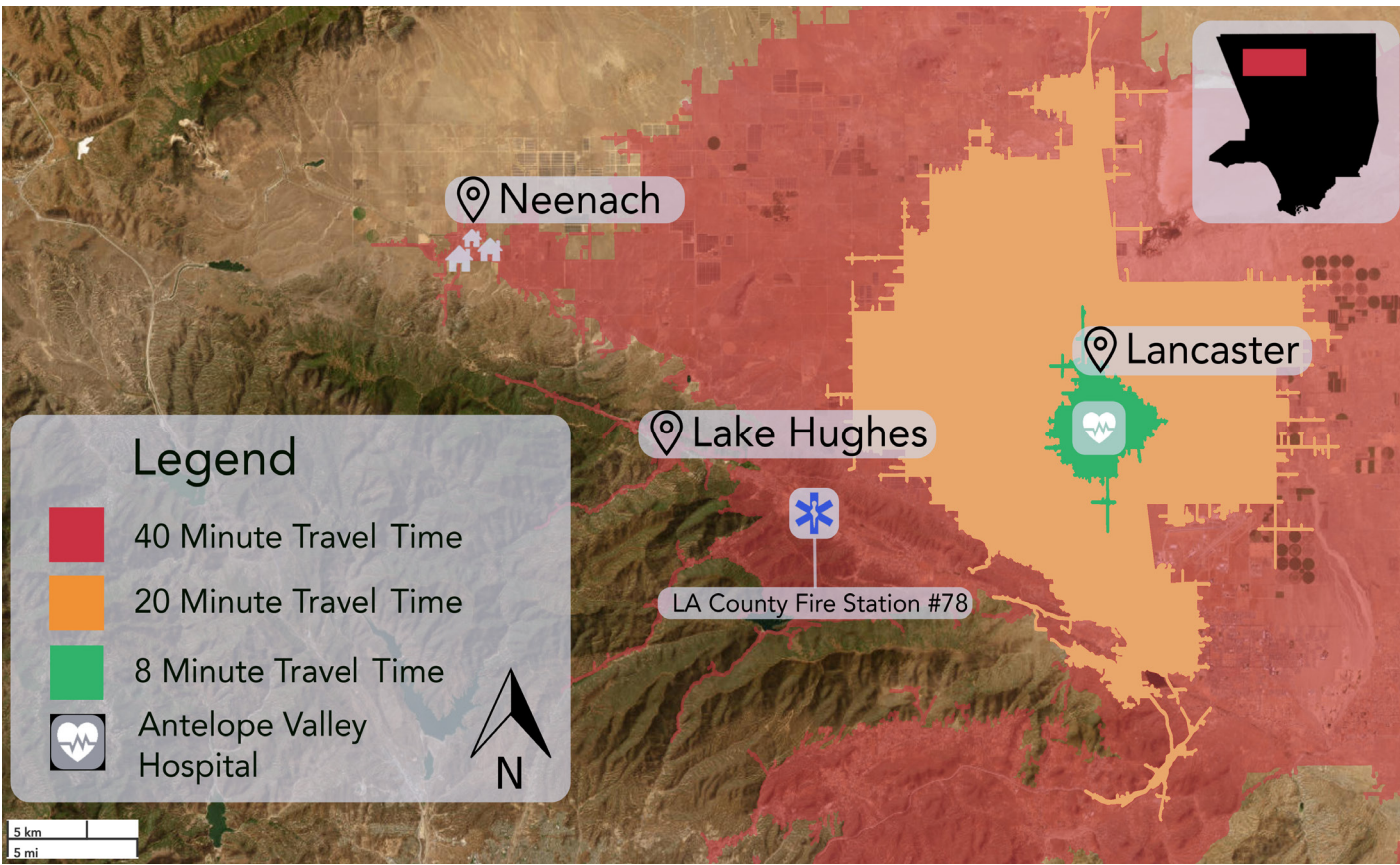
Age Demographics of Neenach

Characteristic	Neenach (% of total Population)	Los Angeles County (% of total Population)
Under 5 years	5.58%	4.90%
5 to 14 years	9.52%	11.30%
15 to 17 years	3.54%	3.80%
Total Child Population	19%	20%
65 to 74 years	13.88%	9.30%
75 to 84 years	6.94%	5%
85 years and over	0.54%	1.80%
Total Elderly Population	23%	16.10%
Total Vulnerable Population	41%	36.10%

Neenach and the surrounding area have a higher percentage population of elderly people (23%) than the average in Los Angeles County (16.1%) (US Census Bureau).

- The total vulnerable population is 41% compared to the 36.1% of Los Angeles County.
- The elderly population is more likely to experience cardiac arrest, coronary blockages, falls, or strokes as natural symptoms of aging. Children are more likely to suffer falls, cuts, burns, or poisonings because of curiosity while playing.
- The increased number of populations likely to receive injuries highlights the need for an expansion of emergency services to the area.

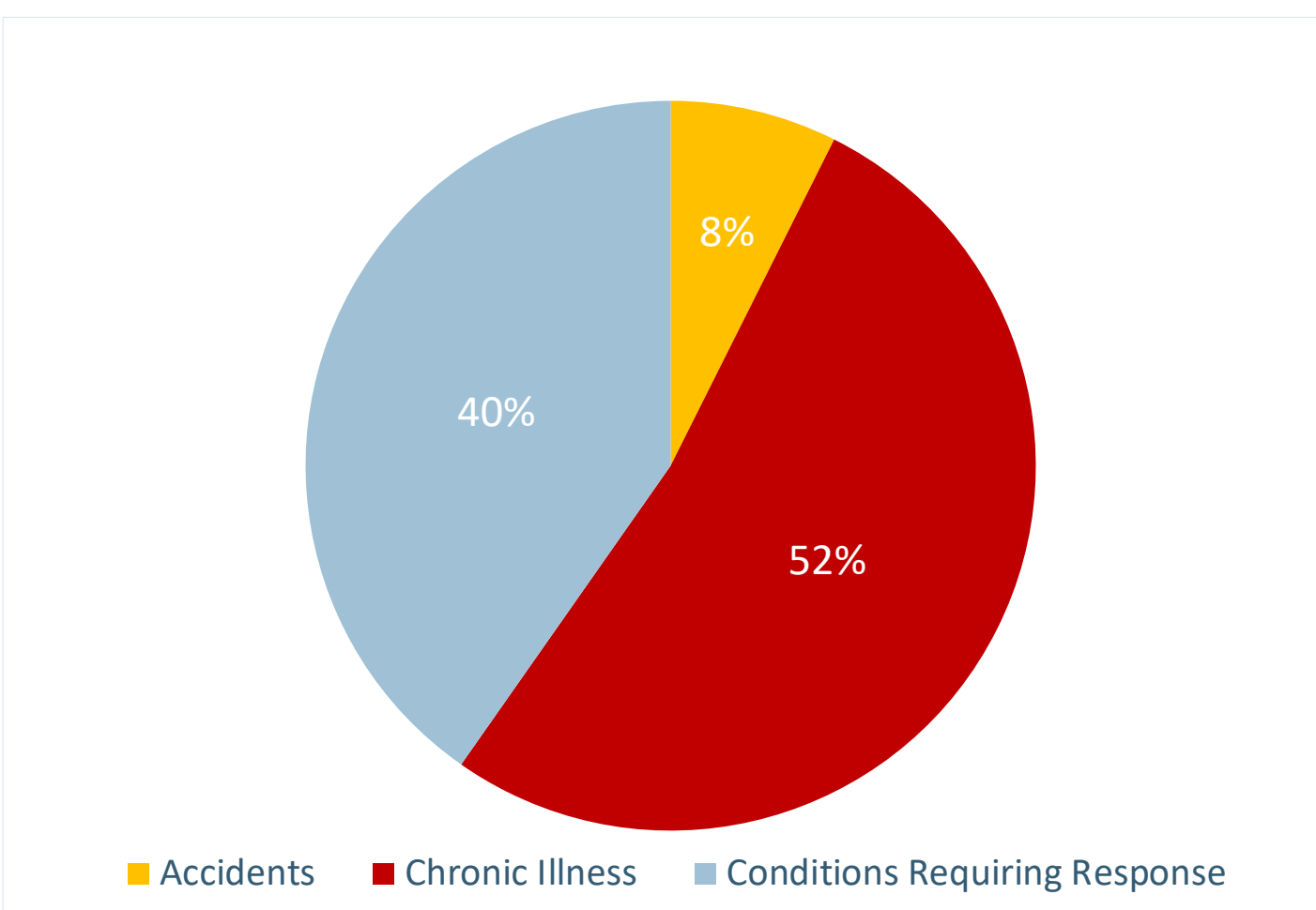
Distance From Neenach to Nearest Hospital



Antelope Valley Medical Center is the primary hospital serving Neenach. The medical center serves an estimated 416,000 people across the Antelope Valley (LACDPH).

- Within Lancaster, travel time to hospital is a brief eight minutes. However, as emergency vehicles come from further, more rural areas, the time that ambulances must travel is greatly increased.
- Medical emergencies such as a cardiac arrest or stroke require immediate medical assistance and stabilization. The distance from the community to the hospital makes survival unlikely.

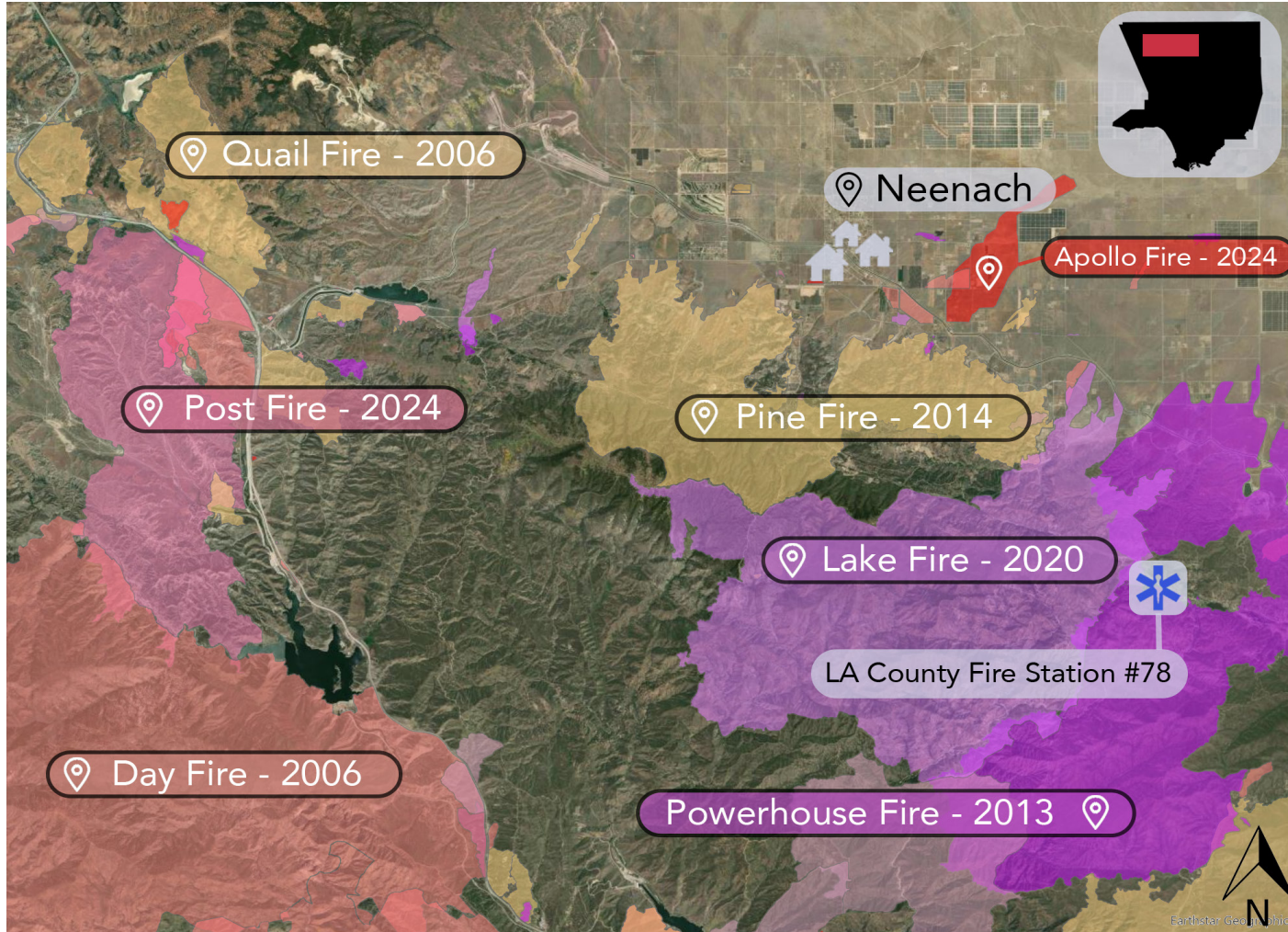
Mortality in Zip Code 93536 - 2019-2023



Mortality statistics provide insight into medical conditions that may need an immediate response from EMS professionals.

- Chronic illnesses do not require emergency response. Examples of these illnesses are cancerous tumors, diabetes, and chronic liver conditions.
- Accidents alone make up 8% of all deaths in the zip code.
- Examples of conditions requiring immediate response are heart conditions, strokes, seizures, and intentional self-harm events.
- Nearly half the deaths in the zip code are from single events where rapid response times may have been the difference between life and death.

History of Fires Since the Year 2000



The map depicts the historical fires in northern Los Angeles County. Many fires have occurred in northern Los Angeles County since 2000.

- The community has barely evaded the effects of devastating fires such as, Pine Fire (2014), Lake Fire (2020), and Powerhouse Fire (2013).
- Reports of fire near the community will generate a slow response due to the large distance of fire station #78.
- The frequency of these fire shows how Neenach must contend with the imminent danger of wildfires. This fire prone area remains at severe risk for more outbreaks, creating vulnerability.

Methodology

Research Methods

The research used quantitative methods to collect information about the population and vulnerability characteristics. The main portion of the study used secondary open-source data from state and county healthcare related organizations.

The data assess how vulnerable the population is to distant medical services and extensive travel times from service stations. The research assess the communities risk from an emergency situational perspective where the need for firefighters and EMS units would be necessary to facilitate the well-being of the community.

Variables

The research looks at factors that make this community especially vulnerable to increased response times. Variables include populations with medical conditions, elderly populations, disabled populations, population of children, distance to services, fire hazard severity, and population type (urban or rural). Each variable represents a particularly vulnerable demographic or data set that makes the community more vulnerable to delayed emergency response times.

Unit of Analysis

The unit of analysis for this research is the block group and census tract.

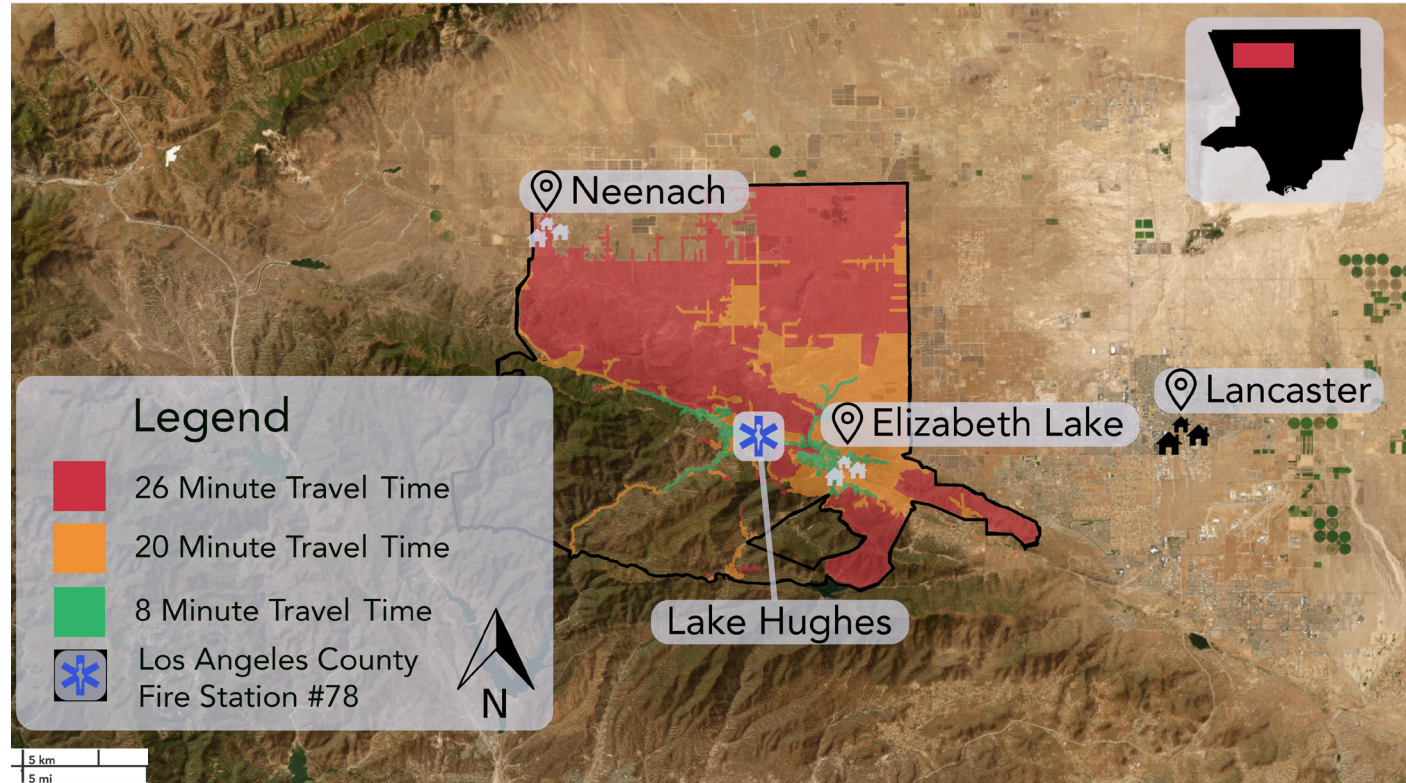
Financial Indicators of Neenach

Characteristic	Census Tract 9012.09 (Neenach)	Census Tract 9201.02 (Lake Hughes)	Census Tract 9012.10 (Elizabeth Lake and Leona Valley)	Los Angeles County (All Census Tracts)
Total Households	447	1,670	665	3,485,810
Percent of Households Where Poverty Status is Determined	25.6%	8.6%	5.5%	13.7%
Median Income by Age				
15 to 24 years	-	-	-	\$50,208
25 to 44 years	-	\$112,344	\$152,685	\$100,492
45 to 64 years	\$74,375	\$103,362	\$148,958	\$101,420
65 years and over	\$38,125	\$36,837	\$59,500	\$66,563
AMI	\$65,433	\$85,294	\$120,977	\$90,845

Financially disadvantaged communities are more at risk of adverse health conditions as they do not have the means to regularly visit healthcare professionals.

- The annual median income for the area is significantly lower than the neighboring census tracts.
- The financial indicators display how poverty and distance to healthcare services create increased vulnerability to the gap in emergency services. The chart further depicts the inequity in how service stations are placed in rural Los Angeles County.

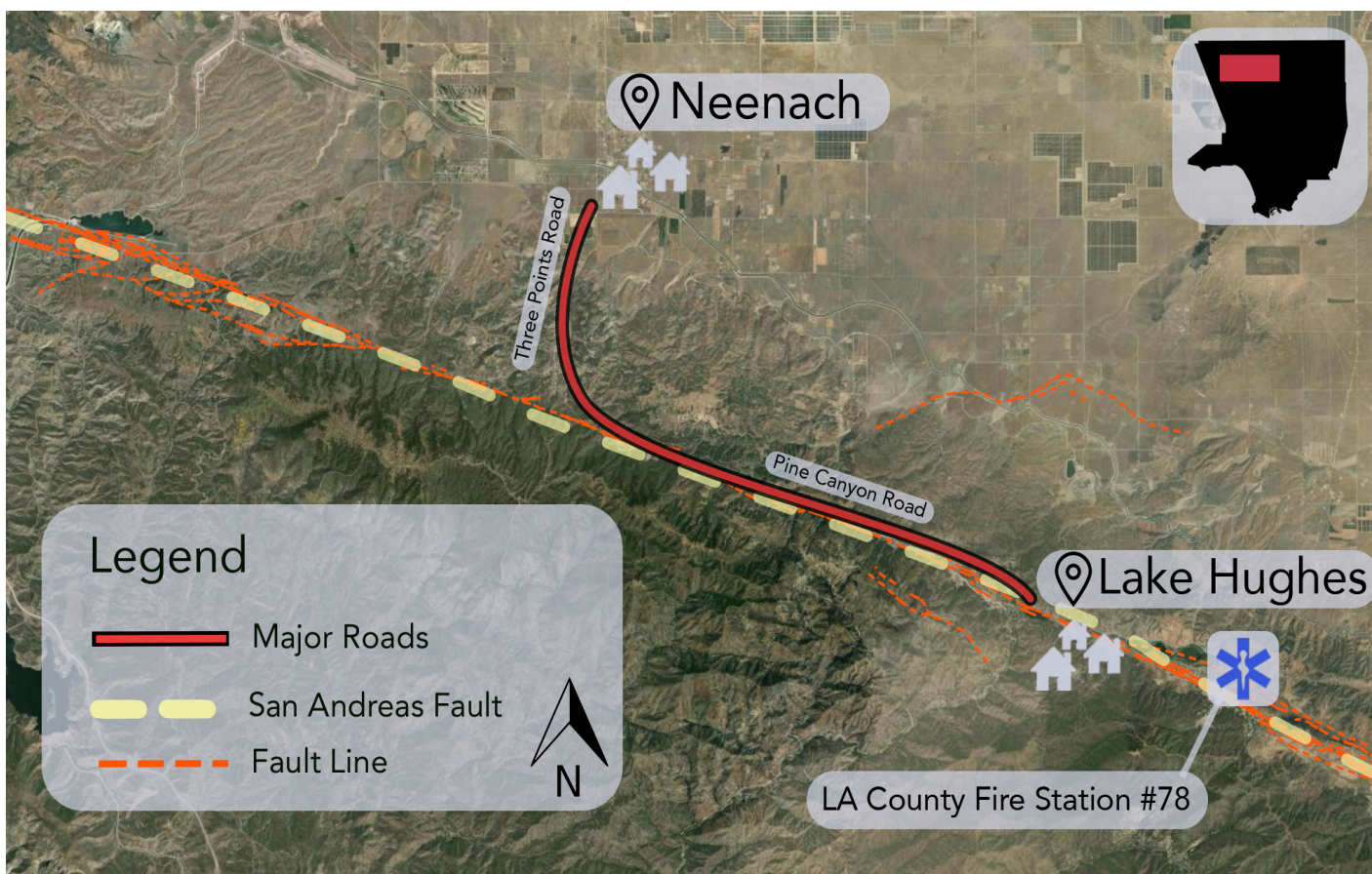
Distance From Neenach to Service Fire Station



Rapid EMS response time is critical to patient survival. An eight minute or under is the response time that it should take first responders to get to the site of an emergency.

- The range of rapid response, eight minutes or under, is limited to only Lake Hughes and Lake Elizabeth while Neenach and surrounding rural areas have more than double the response time.
- Responding units will have to travel to Antelope Valley Hospital which is another 40 minutes driving distance.

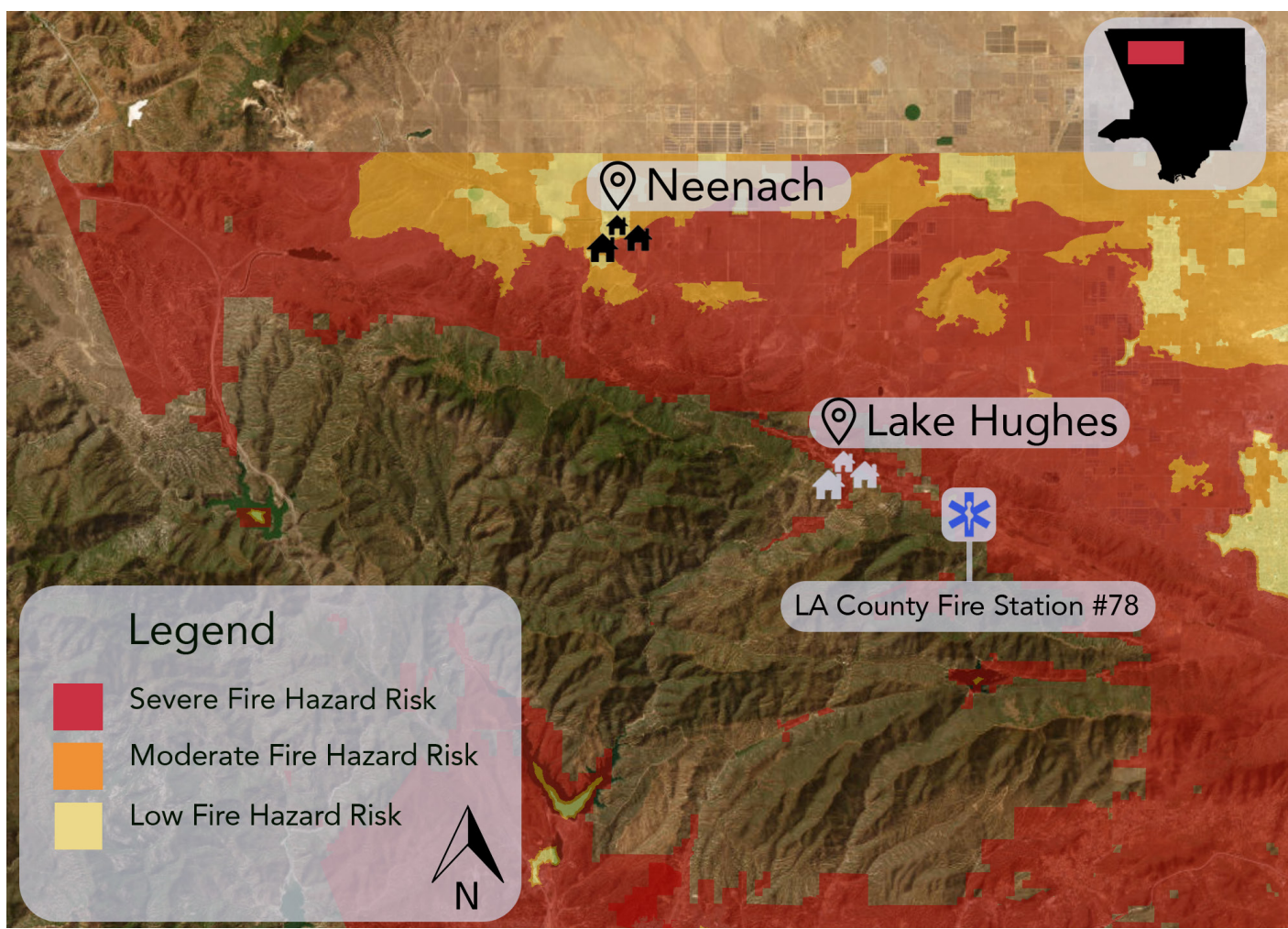
Fault Lines and Earthquake Hazard



Neenach is exceptionally vulnerable to earthquakes as the San Andreas Fault resides just a few miles south of the community.

- The American Society for Civil Engineers (ASCE) seismic hazard report of the area documents Neenach as highly seismically active.
- PGA is measured in a percentage of "g" which is the force of a falling object due to gravity (Shroder). Generally, 0.5g to 1.0g causes strong shanking and creates the potential for structural damage to buildings.
- Neenach would experience a PGA 0.78g, indicating a very strong shaking force in the event of an earthquake. This creates the potential for buildings, utilities, and infrastructure to be severely damaged.

Fire Hazard Severity



Fire hazard severity is the likelihood of an intense wildfire occurring. It measures the danger of fire risk in the area.

- Neenach is surrounded by moderate to high fire risk areas.
- If a fire were to begin in Neenach, response from Station #78 would be sluggish as the fire station is 15 miles away.
- In the event of a fire in the service area of the station, Neenach would be cut off from emergency services.

Recommendations

Scope and Purpose

Purpose of the recommendations is to provide solutions that close the disparity in emergency services that Neenach experiences. The multitude of suggestions focus on how Los Angeles County can improve availability of emergency services to Neenach, creating equity in how the community is served.

Recommendation #1

- Los Angeles County Fire Department should consider establishing a new fire station in Neenach. The county can justify creation of a new fire station with an assessment of vulnerability and establish precedent by comparing Neenach to areas with existing fire stations.

Recommendation #2

- Los Angeles County should consider implementation of ALS ambulance support for this portion of the county. The county could contract with the current provider of ambulance services or fund a new fleet vehicle through the fire department.

Recommendation #3

- Currently, physical distribution of fire stations across Los Angeles County is inequitable as rural areas are overlooked. Los Angeles County must consider restructuring how construction and maintenance funding is allocated for fire stations in rural areas.

Alternatives

Scope and Purpose

Purpose of the alternatives is to provide budget-friendly alternatives to the proposed recommendations. The alternatives do not end the disparity in service. However, they narrow the gap and provide support to the isolated community.

Alternative #1

- Fire Station #78 should be expanded or refurbished to accommodate more trucks and staff. Currently, the fire station operates with four staff which includes, one fire captain, one engineer, and two firefighters. Furthermore, the station is only equipped with two fire apparatuses, one roaming small scale fire unit, and one large fire engine.

Alternative #2

- Los Angeles County should consider creating a volunteer fire station. The station could reside in the center of Neenach and provide the tools and training necessary to respond to life threatening emergencies and fires.

Conclusion

Neenach is a community in rural northern Los Angeles County that experiences significant gaps in emergency services resulting in increased vulnerability. Implementation of the solutions will provide assistance to an especially vulnerable population, ensuring that no community in Los Angeles County is under served by emergency services.