

# Bobcat Wildfire Consultants

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## ABSTRACT

Travis County faces new challenges in wildfire risk as the city of Austin has experienced extreme population growth in recent years. This has resulted in the development of many new communities. The Austin Fire Department (AFD) Wildfire Division utilizes GIS resources and visualizations to enhance their responses to incidents. The wildfire division recruited our team to assist in updating their database to accommodate for new developments. This involved the use of updated satellite imagery on ArcGIS pro to digitize new features. These include community polygons, points indicating where traffic is likely to bottleneck upon community evacuations, and points for large lots where first responders and escaping residents can assemble to address their status and immediate needs. Evacuation routes came next in our updating process. The escape routes were mapped using the Closest Facility Network Analysis tool, which marked bottlenecking points as the beginning of the routes, and classified assembly points as the destination. The network analysis factored the shortest distance as the determining variable. Ultimately, this project will provide properly updated data for the Wildfire Division in the Austin Fire Department and enhance their ability to respond to incidents and better direct evacuations.

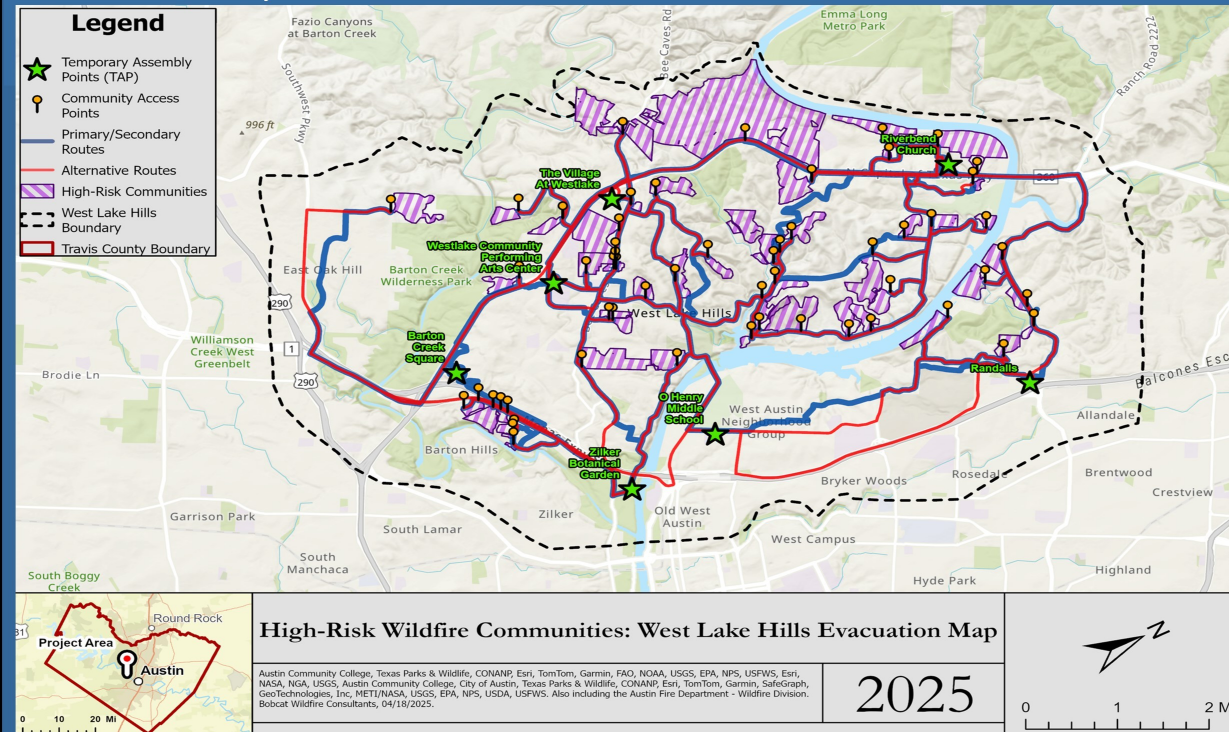
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## INTRODUCTION

With the utilization of GIS (Geographic Information Systems) Bobcat Wildfire Consultants are working with Austin Fire Department to map out evacuation routes for communities in Travis County that are faced with limited entrance or exit points. GIS offers a valuable tool for analyzing evacuation routes and improving emergency response strategies. Bottlenecking and congestion of cars can be a serious hazard, as it causes stagnation among an actively spreading fire. We address these challenges by updating correct routes and TAPs to go to from their communities where they can be accounted for and safe from the wildfires.



## METHODS AND MATERIALS

Bobcat Wildfire Consultants focus on limited ingress/egress communities with 20 or more homes. The Austin Fire Department provided the data for some of the communities, while we also identified and added new ones with the help of a density-based clustering tool that accumulated and color-coded address points to help us visually identify new communities.

TAPs are temporary assembly points where a small or large group of evacuees can evacuate to and be accounted for. These locations can be schools, churches, malls, etc. Ideally, the more parking the TAP has the better as more evacuees can gather. While we were already provided TAPs, we also identified and added new ones to accommodate for new developments.

Once we identified and mapped out the TAP locations, we conducted a network analysis that generated primary and secondary routes from communities with limited in/egress to their nearest TAPs, factoring in driving distance. Afterwards we performed a second network analysis to create two more additional routes that instead factored in driving time. This resulted in a total of four routes for each community to TAP locations. These alternative routes will help reduce traffic bottlenecking as residents make their way to TAP locations.

## RESULTS

While our final results includes the major metropolitan area for Austin, we have displayed only a sample map of our full network/route analysis for visual neatness. We chose the Westlake Hills area for our sample. This area is right in the Hill Country, which includes various hills, cliffs, and waterways (such as Lake Austin). There are many limited in/egress communities in this area and alternate routes are scarce or nonexistent. The geography of the area naturally limits access to entrance and exit points, making it extremely difficult for first responders and local fire departments to get to the affected area in a minimal amount of time, creating choke points during emergencies. We also looked at this community due to the Balcones Escarpment being a WUI towards these at-risk communities. The Balcones Escarpment is important as it makes a sharp transition between densely vegetated wildland areas and developed communities, making the West Lake Hills a critical zone for wildfire risk.

## CONCLUSIONS

With the route/network analysis identifying the quickest time for evacuation for limited in/egress communities, Bobcat Wildfire Consultants have enhanced the Austin Fire Department's GIS-based evacuation map. We hope this project will help by providing an updated map of key evacuation routes and TAP locations. With clear and current data, first responders and evacuees can improve emergency preparedness, enhance wildfire evacuation efforts, and ultimately save lives and protect property.

## REFERENCES

- Bontke, J. (2019). *Steiner Ranch residents reluctant about proposed evacuation routes*. CBS Austin.
- Cetin et al. (2023). *Assessment of emergency gathering points and temporary shelter areas for disaster resilience in Elazig, Turkey*. Springer Nature Link.
- Role of GIS in Disaster Management*. Ellipsis Drive. (n.d.).