Speed-Related Collisions in West Hollywood: An Analysis

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Introduction

The City of West Hollywood is located in Los Angeles County, and it's celebrated for its thriving culture, architecture, music, and historical entertainment. Although the city welcomes people from across the world who seek to partake in this vibrant community, it also faces severe challenges such as traffic collisions caused by unsafe speeding. While comprehensive transportation policies are needed to promote safer and more accessible streets, further analysis is needed to understand how inequitable streets impact people based on race, income, and education level. This report uses ArcGIS Pro, US Census tract, and collision data sourced from UC Berkeley's Transportation Injury Mapping System (TIMS) to understand the impact of traffic collisions.

Issue Diagnosis

In 2015, LA's Vision Zero Initiative was introduced by Mayor Eric Garcetti to eliminate the number of fatalities caused by car collisions by 2025 (LADOT, n.d.). Despite the implementation of this safety strategy, the number of traffic collisions in LA continues to remain alarmingly high. According to the CA Highway Patrol (2019), over 269,000 people experienced some injury caused by traffic collisions while over 3,000 people were killed in 2019. These statistics indicate that strengthened street safety efforts need to be implemented to promote safer streets for all groups of people. Specifically, to address street safety concerns in West Hollywood, it's crucial to analyze traffic-level collisions around the city to identify areas in need of improved roadway infrastructure.

In line with the City of LA's commitment to eliminating traffic fatalities, the West Hollywood City Council introduced its own Target Vision Zero Plan in December 2023 (DKS, 2023). Similar to the LA Vision Zero strategy, West Hollywood's plan aims to enhance street

safety to ensure all communities are “safe, healthy, and equitable” (Target Vision Zero, n.d.). According to the WeHo Community news (2023), over 3,100 car collisions were reported from 2017-2019 which led to “78 severe injuries and four fatalities” (as Cited in SWTIRS). This report also finds that the majority of these injuries were caused by excessive speeding. Additionally, LADOT (n.d.) reports that vehicle collisions are a primary cause of fatalities among “children and older adults”. Therefore, improving road safety conditions around areas with high concentrations of children such as schools, parks, or playgrounds is particularly crucial.

Methodologies

Objectives

ArcGIS Pro is a powerful software well-suited to analyze traffic collision trends and patterns around the City of West Hollywood. This analysis specifically aims to achieve the following objectives:

1. Pinpoint areas around West Hollywood with a high frequency of traffic collisions caused by unsafe speeding that lead to some type of injury.
2. Identify how these collisions vary based on demographic data, such as median household, income, age, and race.

The results from this analysis intend to inform organizations such as West Hollywood Public Works, the LA Department of Transportation (LADOT), and the Southern California Association of Governments (SCAG) as they work to improve pedestrian safety and road infrastructure.

Data Sources

To analyze how traffic collisions impact people in the City of West Hollywood, census tract shapefiles were sourced from the US Census Bureau’s TIGER/Line Shapefile website. To

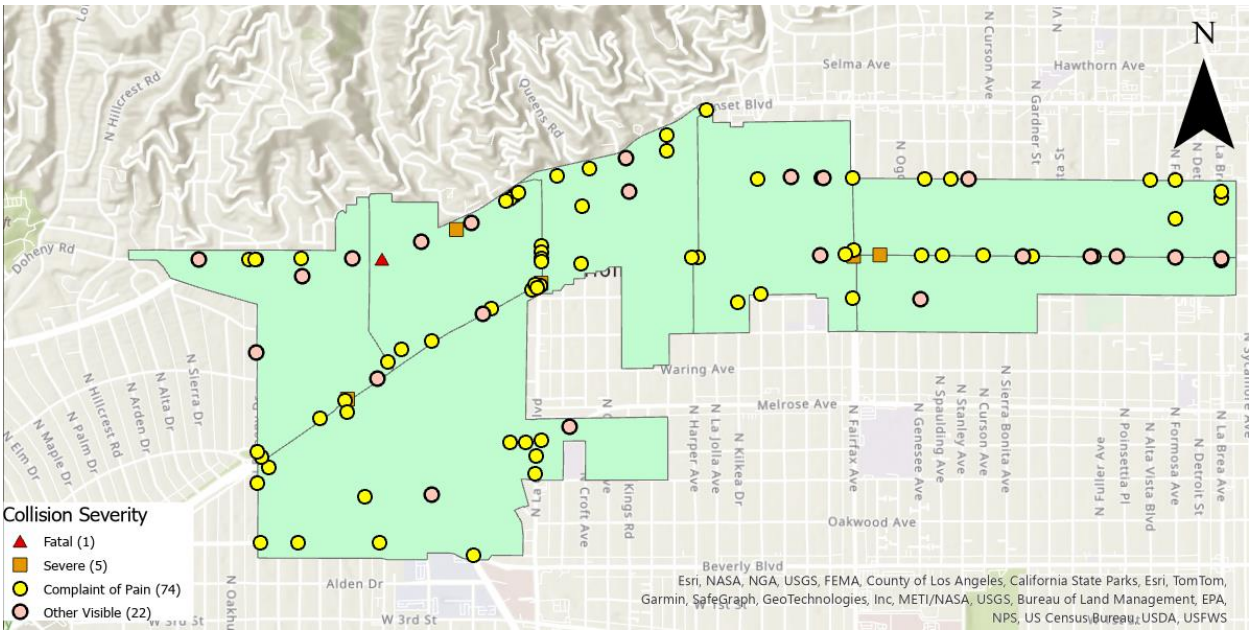
ensure that only West Hollywood's census tract boundaries were being used for this analysis, I utilized CensusReporter.Org to verify the census tract boundaries matched with West Hollywood.

Moreover, to develop a comprehensive understanding of how traffic collisions may vary by demographics, I gathered the 2019 American Community Survey (ACS) 5-year estimate census-tract data on race, age, and median household income. This information was prepared in Excel to ensure that demographic and census-tract GEO IDs were appropriately cross-referenced. The goal of cross-referencing census-tract and demographic GEO-IDs would inform this analysis to accurately identify which demographic characteristics live in areas with higher traffic collision frequencies.

Additionally, collision-level data from 2016-2019 was obtained from the TIMS database, established by the UC Berkeley Safe Transportation Research Education Center (SafeTREC). According to UC Berkeley SafeTREC (n.d.), the goal of TIMS is to provide quick access to crash data through the "Statewide Integrated Traffic Records System (SWITRS)", a database administered by the California Highway Patrol (CHP). This dataset provides crucial information such as accident year, collision date, collision severity, primary collision causes, longitude, and latitude coordinates.

Furthermore, this analysis takes into account that traffic collisions occur for a variety of reasons. Therefore, the focus is specifically on traffic-related injuries caused by dangerous speeding. As seen in Figure 1, the map presents a visual illustration of traffic-related injuries and the type of injuries that occurred within West Hollywood.

Figure 1: City of West Hollywood Crash Map (2016-2019)



Analytic Techniques

While Figure 1 illustrates the distribution of traffic-related injuries in West Hollywood, advanced ArcGIS Pro techniques are needed to analyze these findings. The collisions caused by different collision severity types are aggregated into a single unit to understand the overall impact of traffic collisions by different demographics. Furthermore, I utilized the GEO-IDs from the race, median age, and median household income datasets and joined this with census-tract GEO-IDs. This would add data enrichment to this analysis.

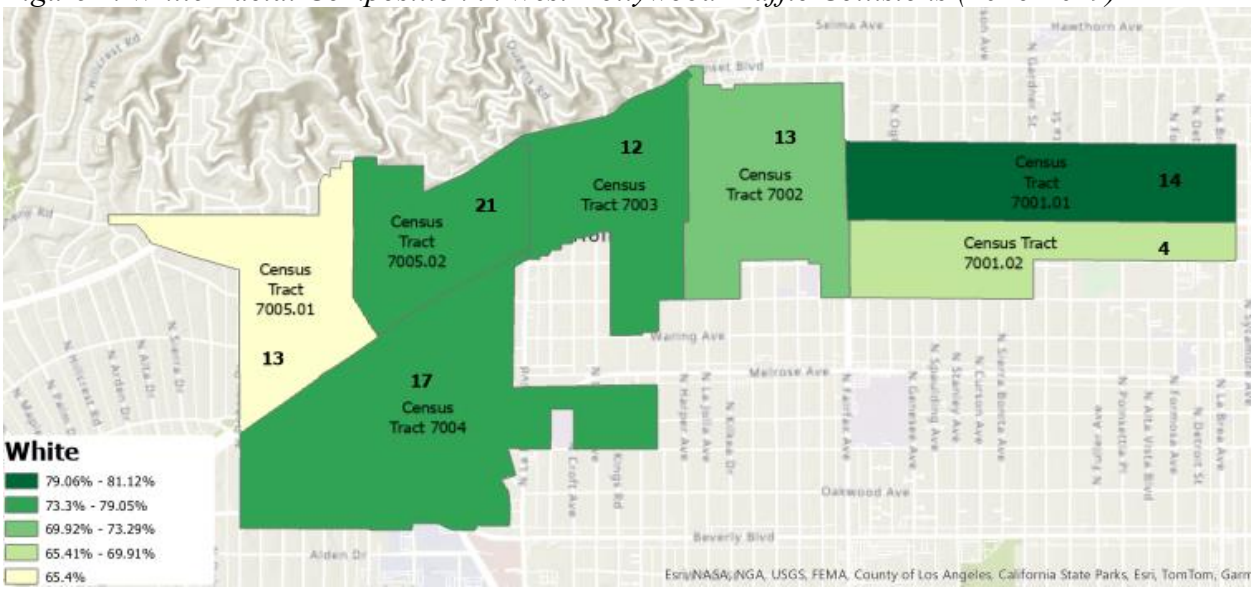
Additionally, I also performed a spatial join to combine census tract, demographics, and traffic-collision data sources. The number on each census tract refers to the aggregated amount of collisions that occurred as a result of driving at unsafe speeds from 2016 to 2019.

Finding 1: Impact of Traffic Collisions on Race

According to the US Census Bureau (2024), individuals who identify as Hispanic/Latino represent the “largest ethnic/racial group in LA County”. Despite these demographic trends, the data from the ArcGIS maps indicate that White individuals represent the majority population

who live in West Hollywood. As seen in Figure 2, Census Tracts 7001.01 exhibits the largest racial composition of White residents. However, the largest share of traffic collisions caused by excessive speeding seemingly occurs in Census Tract 7005.02, a geographic unit that represents a more moderate representation of White individuals. As illustrated in Figure 1, Census Tract 7005.02 also accounts for a fatal injury that stemmed from reckless speeding. The next largest portion of traffic collisions occurs in Census Tract 7004, a census tract boundary that represents a substantially above-average number of White residents. To further investigate how these trends impact different groups, it's crucial to examine how these collisions impact Hispanic/Latino individuals.

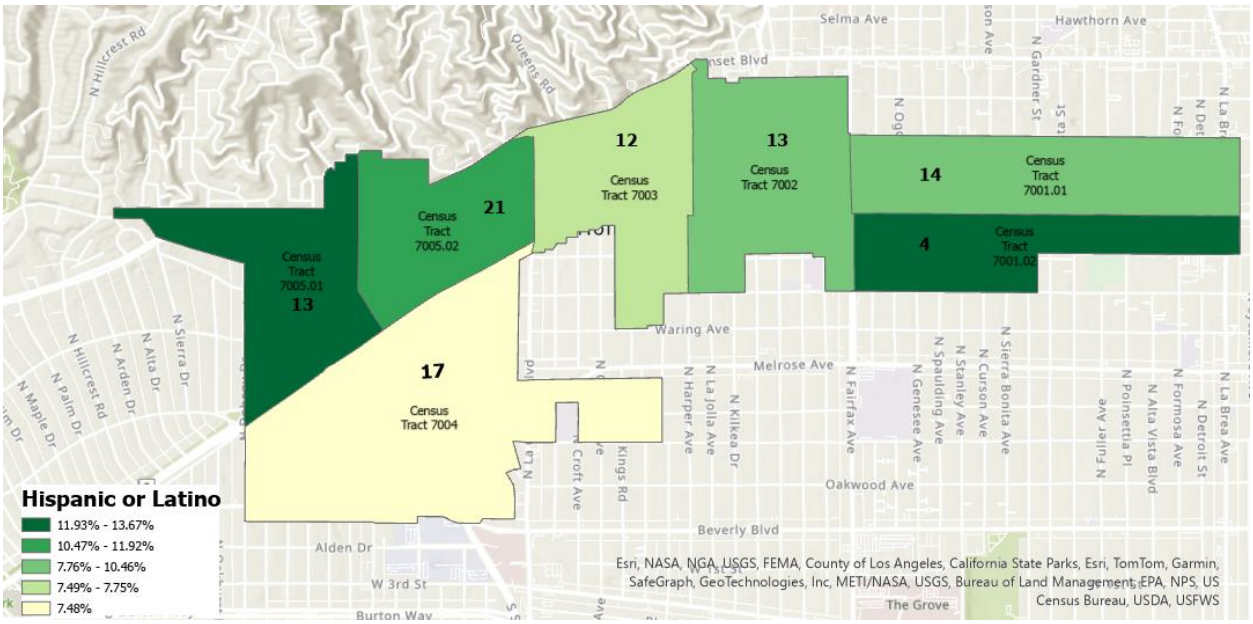
Figure 2: White Racial Composition in West Hollywood Traffic Collisions (2016-2019)



Highlighted in Figure 3, Census Tracts 7005.01 and 7001.02 constitute the largest composition of people who identify as Hispanic/Latino. As discussed previously, Census Tract 7005.02 represents the highest aggregated number of traffic collisions. However, despite having a significantly lower population of people who identify as Hispanic or Latino compared to White

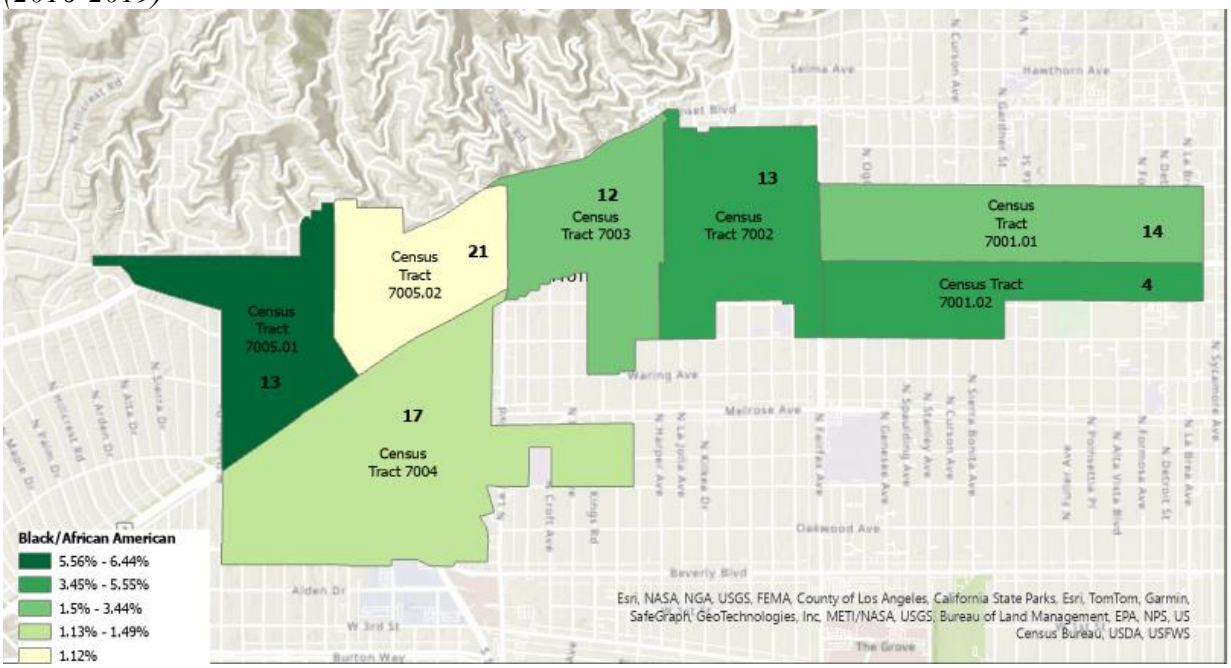
residents, Census Tract 7005.02 also represents an average share of Hispanic/Latino populations who live around areas that are more impacted by unsafe streets. These trends indicate that the city needs to increase public safety improvements around Census Tract 7005.02. To explore these insights in greater detail, the next map analyzes how hazardous speeding impacts people who are Black/African American.

Figure 3: Hispanic/Latino Racial Composition in West Hollywood Traffic Collisions (2016-2019)



Presented in Figure 4, people who self-identified as Black/African American on ACS 5-year estimates account for the smallest demographic group in West Hollywood. According to this map, Census Tract 7005.01 also accounts for the highest concentration of people who are Black/African American, while Census Tract 7005.02 has the lowest amount. Considering that Census Tract 7005.02 produces the most traffic-related injuries, these patterns suggest that additional factors may present clearer insights into why certain areas are disproportionately impacted. Diving more deeply into these insights, additional factors such as median age are used to understand which age groups are more affected by traffic collisions.

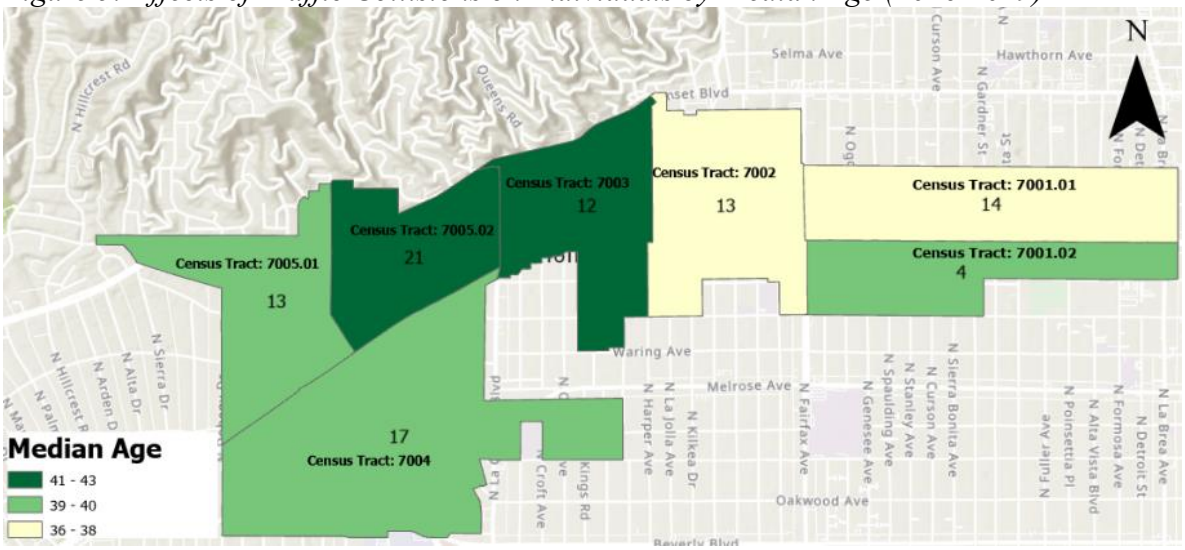
Figure 4: Black/African American Racial Composition in West Hollywood Traffic Collisions (2016-2019)



Finding 2: Impact of Traffic Collisions on Median Age

As depicted in Figure 5, this ArcGIS map utilizes median-age data sourced from ACS 5-year estimates. Based on these results, individuals between the ages of 41-43 are most impacted by unsafe streets. Particularly, Census Tract 7005.02 has the largest representation of people of this age group. According to Galvez-Perez et al. (2022), older groups experience a greater impact of traffic-related injuries as a result of reduced "physical and mental" capabilities that are typically associated with age. This report also suggests that limited built environmental factors such as inadequately maintained "signals, traffic lights, and street junctions" exacerbate the challenges caused by inequitable streets. These patterns point to the need to implement sustainable solutions that consider the advancement in the ages of people. Furthermore, median household income is also used for this analysis.

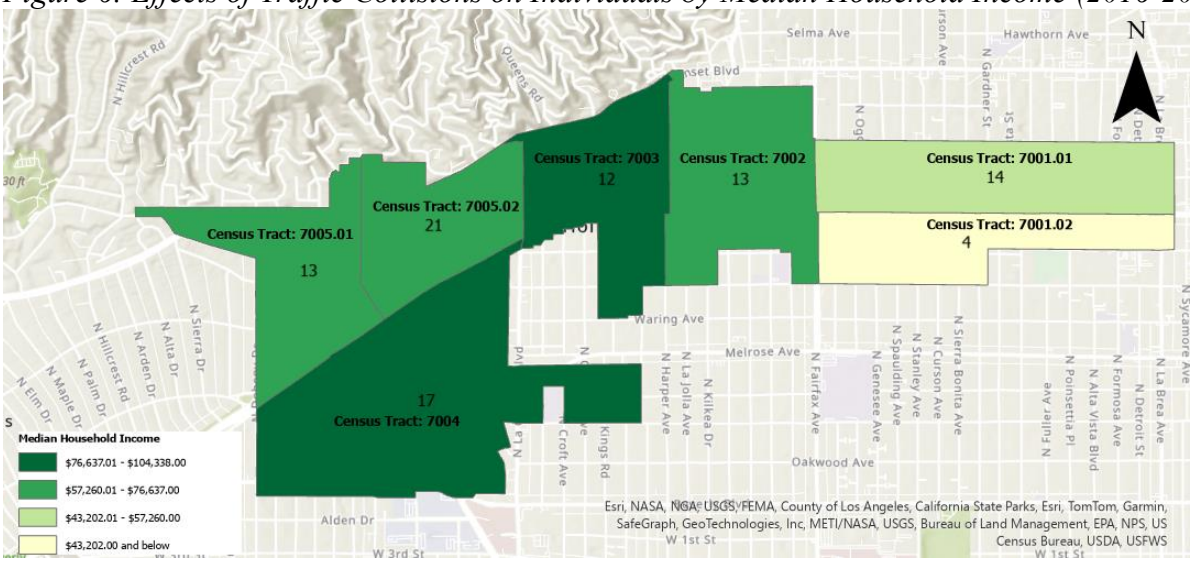
Figure 5: Effects of Traffic Collisions on Individuals by Median Age (2016-2019)



Finding 3: Impact of Traffic Collisions on Median Household Income

Median house household income data collected from ACS 5-year estimates is employed to illustrate the potential socioeconomic disparities of sidewalk quality. As evident from Figure 6, this analysis finds that households that make between $57,260-$76.637 experience a disproportionate number of traffic-related collisions caused by driving at unsafe velocities. According to Kirkeby (2023), families of four earning around $63,050 are considered very low-income (p. 8). As reported by Thornton et al. (2016), the potential connection between income levels and traffic collisions is associated with insufficient community funding. This report explicitly finds that lower-income communities often have “fewer sidewalks, traffic lights, and marked crosswalks” (p. 207). These findings potentially explain why some areas are more disproportionately impacted by car collisions.

Figure 6: Effects of Traffic Collisions on Individuals by Median Household Income (2016-2019)



Limitations

While the UC Berkeley SafeTREC's TIMS database provides reliable data on traffic collisions, this analysis is limited as a result of only scrutinizing traffic collisions caused by speeding. Without utilizing other traffic collision causes such as driving under the influence, failure to obey traffic signals, or mechanical failures, this analysis doesn't present holistic perspectives around multiple factors that result in traffic collisions. Despite these limitations, narrowing the focus of this analysis to reckless speeding enabled this map to become user-friendly while reducing excessive data.

Additionally, although SWITRS provides comprehensive vehicle crash data, it's important to note that CA doesn't have a mandate that requires local authorities to report all car collisions that do not lead to some fatal or severe injury. Moreover, a law enforcement officer is

not always present at the scene of a collision. Consequently, the true number of car collisions in West Hollywood could be higher than initially reported.

Furthermore, while employing ACS 5-year estimates is beneficial to assess how communities are evolving based on demographic changes, this analysis is also limited as a result of not using other relevant variables. Throughout the semester, I was interested in assessing how factors such as driver behavior, road infrastructure, or traffic volume contribute to traffic collisions. As a result of resource constraints and limited expertise, there was not enough time to incorporate these factors into this project. Considering time limitations, there wasn't sufficient time to collect demographic-level data on injured people to understand the demographic trends of individuals impacted by unsafe speeding. Consequently, this analysis is also limited as a result of lacking insights into whether neighborhood residents living in the respective census tracts are affected by unsafe speeding.

According to Lampe (2020), while census tract-level data is useful for identifying how traffic collisions vary by certain areas, these do not always "align perfectly with local neighborhood boundaries". Therefore, this could lead to potential spatial mismatches that could impact the accuracy of these findings. Initially, I was interested in utilizing neighborhood boundaries that accurately represent the specific communities of West Hollywood. Due to time constraints, I didn't have enough time to request this information from the city.

Conclusion

To meet the goals of West Hollywood's Target Vision Zero plan, collaboration amongst research institutions, advocacy groups, nonprofits, and government agencies is crucial to engage communities that are disproportionately impacted by traffic collisions. Through meaningful relationship-building interventions, an effective research team can collect the narratives of

everyday people who want to push for safer streets within their communities. ArcGIS is also an effective resource for developing story maps, a resource that can be used to communicate narratives and data-driven stories more effectively.

While this analysis is limited as a result of not using additional variables that are associated with traffic collisions, the information can be used to inform government agencies about areas that have a higher frequency of traffic collisions. This information can promote overall public awareness of the need for increased street safety initiatives. Finally, the findings produced from this report can also inform policy development to create environments that are safe and equitable for all people.

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