Intersectional transportation trends in Los Angeles County

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A research report from the Pacific Southwest Region University Transportation Center

Madeline Brozen, UCLA Lewis Center for Regional Policy Studies

Nataly Rios, UCLA Department of Urban Planning

Isabel Cardenas, UCLA Department of Urban Planning

Annaleigh Yahata Ekman, UCLA Department of Urban Planning

Ben Bressette, UCLA Department of Urban Planning

PSR Pacific Southwest Region UTC University Transportation Center

UCLA Lewis Center for Regional Policy Studies

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16. Abstract

The costs and benefits of the transportation system are distributed unequally, leading to people receiving less access to opportunities. This report sought to understand how this issue plays out within Los Angeles County by analyzing trends in transportation patterns across race/ethnicity, income, gender, age, ability, and geography. This report used data from the 2017 National Household Travel Survey California Add-On and 2013-2017 collision data from the UC Berkeley Transportation Injury Mapping System to report the number of trips and miles per day, transportation mode and purpose, and collision incidents for women and youth of color, Black people, people with disabilities, lower-income older adults, people living in families in poverty, and households living in priority population areas. We find similarities in the number of unlinked trips taken per day, but there are unique and diverging patterns in terms of average trip distances and duration. Women of color, Black people, and people living in priority population areas tended to have longer average trip distances. Meanwhile, the youth of color, people with disabilities, lower-income older adults, and people living in families in poverty had shorter average trip distances. All of these groups, except for women of color, traveled at slower average travel speeds than people overall in Los Angeles County, likely due to reliance on transit and walking. We also find significant differences in collision risks, especially by race and mode. Black people being overrepresented in collisions by every travel mode and walking in particular, and disparities extend to Black and Latino/a pedestrians. Overall, these trends highlight the need to make significant investments in transportation to ensure that the access benefits derived from the transportation system can fairly benefit everyone in LA County. The recommendations derived from this analysis are intended to help address transportation inequities in Los Angeles County and move towards a more equitable and justice-oriented future.

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About the Pacific Southwest Region University Transportation Center

The Pacific Southwest Region University Transportation Center (UTC) is the Region 9 University Transportation Center funded under the US Department of Transportation's University Transportation Centers Program. Established in 2016, the Pacific Southwest Region UTC (PSR) is led by the University of Southern California and includes seven partners: Long Beach State University; University of California, Davis; University of California, Irvine; University of California, Los Angeles; University of Hawaii; Northern Arizona University; Pima Community College.

The Pacific Southwest Region UTC conducts an integrated, multidisciplinary program of research, education and technology transfer aimed at *improving the mobility of people and goods throughout the region.* Our program is organized around four themes: 1) technology to address transportation problems and improve mobility; 2) improving mobility for vulnerable populations; 3) Improving resilience and protecting the environment; and 4) managing mobility in high growth areas.

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Disclosure

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The research team wants to acknowledge the tragedy of the topic of traffic violence in Los Angeles County. These fatal collisions represent real people's lives – real people taken from their families and communities just as they are trying to travel around the county. We hope this report sends a call to action to address this avoidable loss of life that disproportionally falls on families and communities of color.

Glossary

Environmental Justice: The fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies (California Gov. Code §65040.12(e)).

Mobility: The potential for movement, the ability to get from one place to another, an ability to move around. In general, faster speeds and more ease of movement lead to higher mobility (Byars, Wei, and Handy, 2017).

Mobility justice: a lens that focuses on how people and inequality inform the governance and control of movement and people's embodied experiences, the shaping of patterns of unequal mobility and immobility in the circulation of people, resources, data, information (Sheller, 2018).

Mode split: The overall distribution of travel modes (car, bike, walking, etc) used in a specified place at a specific time. For this report, the mode splits presented represent Los Angeles County in 2017 (Byars, Wei, and Handy, 2017).

Paratransit: (also known as ADA complementary paratransit service) The Americans with Disabilities Act (ADA) requires public transit agencies that provide fixed-route service to provide "complementary paratransit" services to people with disabilities who cannot use the fixed-route bus or rail service because of a disability. The ADA regulations specifically define a population of customers entitled to this service as a civil right. The regulations also define minimum service characteristics that must be met to be considered equivalent to the fixed-route service it is intended to complement. In general, ADA complementary paratransit service must be provided within 3/4 of a mile of a bus route or rail station, at the same hours and days, for no more than twice the regular fixed-route fare (National Center for Mobility Management)

People of color: This report defines people of color as people who identify as Black, American Indian/Alaska Native, Asian, Native Hawaiian, or some other race. Multi-racial people are also considered as people of color in this report.

People with disabilities: People who have difficulty traveling outside of their home or experience travel-limiting disabilities (Bureau of Transportation Statistics, 2018). This report does not include travel needs for people with intellectual or developmental disabilities who do not have trouble traveling outside their homes.

Priority Population Areas (disadvantaged communities): Spatially designated census tracts, as identified by CalEPA, based on geographic, socio-economic, public health, and environmental hazard criteria using the California Communities Environmental Health Screening Tool ("CalEnviroScreen"). California Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012) directs State and local agencies to make investments that improve California's disadvantaged communities by designating tracts representing the 25% highest scoring tracts in the state. SB535 also directs that at least 35% of California Climate Investments benefit the populations living in these communities (Byars, Wei, and Handy, 2017). Organizations have recommended moving away from deficit-oriented language including "disadvantaged community" and California agencies are moving towards the term priority populations.

This report uses both priority population areas and disadvantaged communities synonymously to represent the place-based definition which originated in CA Senate Bill 535.

Rideshare service: A rideshare service connecting passengers to a driver, typically through a digital application and typically for a fee. Drivers and companies work for-profit and typically offer rides that are not incidental to their own trips. In California, these services are called transportation network companies or TNCs. Traditional rideshare (not offered through a service or digital application) includes carpooling or vanpooling.

Transportation equity: Refers to fairness in access to the opportunities people need to lead quality lives. Transportation equity encompasses the needs of individuals historically marginalized because of their social status, including race, class, gender, and ability. Transportation equity ensures that no group receives a disproportionate share of the benefits, or shoulders a disproportionate burden or discrimination, or faces exclusion from meaningfully participating in the decision-making process.

Travel mode: How travel is done. Common travel modes for people include passenger car (driving alone or as a passenger), public transit (bus, subway, or train), walking, and bicycling.

Trip-chaining: A series of trips that are strung together in time sequence, also called a tour. Trip-chaining often includes two “anchor” destinations like work or home.

Abstract

The costs and benefits of the transportation system are distributed unequally, leading to people receiving less access to opportunities. This report sought to understand how this issue plays out within Los Angeles County by analyzing trends in transportation patterns across race/ethnicity, income, gender, age, ability, and geography. This report used data from the 2017 National Household Travel Survey California Add-On and 2013-2017 collision data from the UC Berkeley Transportation Injury Mapping System to report the number of trips and miles per day, transportation mode and purpose, and collision incidents for women and youth of color, Black people, people with disabilities, lower-income older adults, people living in families in poverty, and households living in priority population areas. We find similarities in the number of unlinked trips taken per day, but there are unique and diverging patterns in terms of average trip distances and duration. Women of color, Black people, and people living in priority population areas tended to have longer average trip distances. Meanwhile, the youth of color, people with disabilities, lower-income older adults, and people living in families in poverty had shorter average trip distances. All of these groups, except for women of color, traveled at slower average travel speeds than people overall in Los Angeles County, likely due to reliance on transit and walking. We also find significant differences in collision risks, especially by race and mode. Black people being overrepresented in collisions by every travel mode and walking in particular, and disparities extend to Black and Latino/a pedestrians. Overall, these trends highlight the need to make significant investments in transportation to ensure that the access benefits derived from the transportation system can fairly benefit everyone in LA County. The recommendations derived from this analysis are intended to help address transportation inequities in Los Angeles County and move towards a more equitable and justice-oriented future.

Executive Summary

People have uneven access to the benefits and costs provided by the transportation system due to a combination of 20th-century freeway construction practices, racist housing lending practices and racially restrictive covenants, and continued acceptance of this status quo. Because of this history, transportation access disparities exist through different identities — race/ethnicity, income, gender, age, ability, and geography — but especially across racial and ethnic identities. These racial and other identity disparities reproduce inequities that people in these groups face outside of transportation. Los Angeles County and California are making significant investments in the transportation system. Understanding differences among people facing inequity is an opportunity to target these investments towards the people with the highest needs to ensure that the transportation system does not exacerbate regional inequality.

This research works to present travel and collision data across various intersectional identities for Los Angeles County, drawing from previously published literature and empirical work. We examine these patterns through creating travel profiles across an array of intersectional and single identity groups: for women of color, youth of color, Black people, people with a mobility-related disability, low-income older adults, people living in families in poverty, and households residing in priority population areas (per the California Senate Bill 535 "disadvantaged communities" definition). Across these groups, people of color include all non-white non-Latino/a respondents in the sample. The primary sources of data include the 2017 National Household Travel Survey California add-on and collision data from 2013-2017 from the UC Berkeley Transportation Injury Mapping System. We then profile the key travel metrics (average number of trips per day, average miles, and minutes), examine the trip purposes and modes used across these groups. We then present the number of traffic collision victims, outlining the incidents per year, by mode, and other characteristics like race/ethnicity or disadvantaged community status.

This work confirms much of the previously established transportation behavior trends from the literature. We find that people with less advantage are more reliant on public transportation and walk more than more advantaged people (whiter, higher-income, non-disabled, non-Black, and non-disadvantaged geographies), and all of their peers in LA County as a whole. Some of the specific travel behavior findings include the following, with the caveat that this is a descriptive analysis that does not control for other aspects like geography, employment, or vehicle access.

- Women of color and Black people travel some of the longer average distances per trip; women of color tend to use cars more than other disadvantaged groups. In contrast, Black people overall (including Black women) use public transit more and walk less than people on average in Los Angeles County.
- Low-income older adults and people living in families in poverty take the shortest trips on average, likely due to their reliance on walking. Walking rates were the highest among the people living in families in poverty, with 25% of all trips by foot.
- People with disabilities (defined as a mobility impairment that makes travel outside of the home difficult) have the highest use of public transit – 10% of all trips. They also use fixed-route public transit ten times more than paratransit service.

- There is a considerable range of average miles traveled per trip (from 5.8 miles to 9.6 miles). However, the range of average duration is much smaller (from 25.3 minutes to 30.8 minutes). This contrast demonstrates that one of the issues facing these groups is how transportation speeds likely contribute to time poverty when shorter distances take the same if not longer duration.
- Within each group, we find large differences by race and ethnicity in terms of average trip distance and duration. Within women and youth of color, Asian people took shorter distance and duration trips than Black and Latino travelers. For people with disabilities, white people had significantly shorter average trips. Black people with disabilities average trip duration was nearly twice as long as their white counterparts. The average trip duration for Latino lower-income older adults was more than fifteen minutes longer than their white peers. Within priority population areas, white people took much shorter average trips than other people.

In terms of collision risk, the findings here are similar to other work highlighting the collision risk for Black and Latino people and within disadvantaged communities. In LA County, we find stark disparities in race/ethnicity, mode, and age within the collision analysis. In Los Angeles County, one in four fatal collisions was a Black or Latino/a pedestrian during this period. The travel behavior analysis found that Black people in LA County walk less than other groups, meaning that their representation as fatal victims is not a direct result of a higher exposure while walking. Black victims are overrepresented as fatal victims across all modes of transportation. Fatal traffic collisions, especially among pedestrians, are concentrated in priority population areas. We found that 54% of fatal pedestrian victims, 57% of fatal bicyclist victims, and 44% of all fatal victims were involved in collisions in priority population census tracts. This finding stands in contrast to the fact that areas outside of the priority population areas represent 11% of the land area in LA County.

While the empirical data used in this report sheds light on travel behavior and collision patterns, these data are missing information on the transportation experience and qualitative data on factors that shape mobility for these identities. Drawing from the literature review, we highlight how racial discrimination, harassment, and fear shapes transportation experiences for people of color, especially for Black people. Black people especially are the most at risk of being targeted by police while driving, walking, cycling, or using transit, and this risk can be fatal. This fear shapes Black people's mobility – whether it's the choice to walk, bicycle, use transit, or travel in general.

Combining our empirical findings with findings from other studies we reviewed, we arrived at a set of four recommendations for decision-makers and transportation professionals seeking to improve mobility and access in Los Angeles County:

1. *Improve the transportation system with people who have higher needs by race, income, ability, and gender at the center:* Strategies like improving public transit frequency and speed can help to reduce the time burden of public transit for people who rely on transit more than average. Improving the condition and quality of the walking and pedestrian environment is also crucial given the reliance on walking, including access to public transit.
2. *Focus on installing infrastructure improvements to reduce the number of people who die or are severely injured:* While Vision Zero programs are working to address this problem, this work highlights that these efforts are not being done on a scale that matches the problem, especially

in disadvantaged communities. Speed is a significant factor in causing traffic collisions, and implementing infrastructure that can reduce speeds along corridors is critically essential.

3. *Address concerns around policing by reconsidering the need for armed law enforcement in transportation environments:* Transportation professionals must recognize that armed law enforcement's involvement in transportation environments creates fear and risk for Black people and other people of color. Removing law enforcement from transportation environments and using investments in community ambassadors and bystander campaigns can improve safety without increasing the pervasive racial bias in enforcement.
4. *Improve collision data collection methods and standards:* This project was limited because nearly half of collisions did not have race/ethnicity information for the victim. In the interest of addressing racial disparities in crashes, California should mandate that these types of data are collected. Additionally, standard collision reports should collect Information on whether the victim was in a wheelchair or uses a mobility assistance device.

Chapter 1: Introduction

The benefits and burdens of the transportation system are distributed unequally, particularly across different groups of people. The main benefit of the transportation system is the access it provides people - the ability to access opportunities that they need to participate in social, political, and economic life (Handy, 2020; Martens & Golub, 2018; Pereira et al., 2017). But because transportation access is unequal across people by race, ethnicity, income, geography, and other identities, the transportation system can operate in reverse – making opportunities inaccessible and further burdening people through exclusion, pollution, and the dangerous results of traffic collisions. Rather than providing people with the ability to overcome access disparities they face—spatially, racially, and financially—the system ends up reproducing existing inequalities through transportation exclusion (Lucas, 2012).

Transportation inequities in the United States persist across cities and regions, and these disparities are determined by race, ethnicity, income, gender, age, and physical abilities (J. Barajas, 2021; Blumenberg & Agrawal, 2014; Blumenberg & Shiki, 2007; Karner et al., 2016; Remillard et al., 2021; Rosenbloom, 2001; Rosenbloom & Herbel, 2009a; Wong et al., 2020). Los Angeles is no stranger to this phenomenon, as transportation access disparities have been long-standing issues for communities of color and low-income communities (Melany De La Cruz-Viesca et al., 2018). Mid-twentieth-century freeway development combined with historic housing redlining practices increased racial segregation and concentrated poverty in Los Angeles (P. Ong et al., 2016). The adverse effects of segregation have perpetuated inequality and inequity ever since (ibid). The subsequent lack of access to adequate transportation, which created isolation and frustration among residents in South Los Angeles, was cited as a cause of the Watts uprisings in the 1960s and 1990s (McCone Commission, 1965; Scott, 1993). Access to reliable transportation continues to be a concern in South Los Angeles and among other racialized and low-income communities across LA (Advancement Project California, 2016; Carter et al., 2018; Investing in Place, 2021).

Los Angeles County and California are making significant investments in the transportation system with a growing emphasis on addressing transportation equity in the process (SB 535 Senate Bill - California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund., 2012; Los Angeles County Metropolitan Transportation Agency, 2017). Transportation equity refers to fairness in access to the opportunities people need to lead quality lives. Equity encompasses the needs of historically marginalized individuals because of their social status, including race, class, gender, and ability. This concept ensures that no group receives a disproportionate share of the benefits, shoulders a disproportionate burden or discrimination, faces exclusion from meaningfully participating in the decision-making process, or is discriminated against.

Given existing disparities, current and future transportation investments provide an opportunity to use knowledge to shape future investments and outcomes. To that end, this report seeks to help people understand people's and communities' transportation needs by race/ethnicity, income, gender, age, ability, and geography by focusing on travel behavior and traffic collisions. We use data from the 2017 National Household Travel Survey California add-on and the UC Berkeley Transportation Injury mapping system as our primary sources from which we draw our conclusions.

Historically, racialized and other marginalized identities, women, youth and older adults, disabled people and low-income people, suffer from the increased risk of being injured or killed while traveling

(Coughenour et al., 2017; Dai, 2012; Kraemer & Benton, 2015; Kravetz & Noland, 2012; Morency et al., 2012; Newgard, 2008). People of color, especially Black and Latino people and low-income individuals, have lower car ownership rates and access, higher dependency on public transit, and a greater risk of being killed or injured in traffic collisions. While a body of work highlighted in the following literature review has established these patterns, fewer analyses have tried to examine both travel behavior and collision risk at the same time. Additionally, the existing research tends to focus either on the travel needs of one particular identity/group of people or on an aggregate group who collectively experience transportation disadvantages using an equity/need index (Bhat et al., 2002; Dixit & Sivakumar, 2020; Neutens et al., 2010; Saghapour et al., 2016). These previous works have tried to examine both aggregate and disaggregated methods of understanding accessibility, and disparity and academic work are moving away from aggregated measures alone.

In addition to race, ethnicity, and income, transportation inequality and inequity manifests across age, gender, ability, and geography. There could be infinite combinations for these identities that intersect in a single person and their identity. Justice-oriented advocates, namely The Untokening and a growing body of academic literature, highlight the need for transportation equity to encompass the broader concept of mobility justice (Everuss, 2019; Karner et al., 2020; Sheller, 2018). The principles of mobility justice published by The Untokening define mobility justice as work that "centers on the experience of marginalized individuals and the most vulnerable communities" and that "bodies encounter different risks and have different needs" (*Untokening 1.0 — Principles of Mobility Justice*, 2017).

To speak to these intersectional and embodied differences in transportation, this report selected a small number of groups to focus on that represent a range of identities that shape transportation patterns, travel needs, and state investment patterns. Most of the groups we created are intersectional (more than one dimension), and two represent a single attribute – Black people and people with disabilities. We separately analyzed Black people as a group because while race and ethnicity shape transportation patterns, Black people have distinct experiences from other racial and ethnic groups due to anti-blackness in American society (Hannah-Jones, 2019; Osei-Opare, 2020; Thomas, 2020). People with disabilities face physical limitations distinct from other groups. While the Americans with Disabilities Act was signed into law in the United States over thirty years ago, significant gaps in compliance with ADA persist (Alderton, 2020; Alpert Reyes, 2015; Barron, 2018).

The last group represents people living in priority population areas (formerly referred to as disadvantaged communities). This group represents people who live in census tracts defined by the California EPA as being in the top 25% of heavily pollution burdened communities.

The groups are as follows and throughout the report are presented in this order:

1. Women of color (18+)
2. Youth of color (Under 18)
3. Black people (of all ages)
4. People with a disability (as defined as someone who responds that they have a condition that limits travel outside of the home)
5. Lower-income older adults (65+ with annual household incomes <$50,000)
6. People living in families in poverty (2 related people in a household, annual household incomes less than $14,99 for a family of two or more, less than $24,999 for a family of three or more, less than $34,999 for a family of five or more, or less than $49,999 for a family of seven or more[1]) and;
7. People living in priority population areas (per the California SB535 definition).

The need for mobility justice among people extends beyond the identities focused on for this report and analysis. This extension is particularly true for people of gender minorities, transgender people, people with different documentation statuses, or people who are unhoused. The intent here is that by focusing on the individual needs of marginalized people in these groups, future research can build upon this work and dive deeper into these other groups and identities. Later in this report, the proposed recommendations speak to the principles of mobility justice, which can help to be an umbrella of the types of improvements that can improve people's transportation experience for all.

One principle of mobility justice that this report does not speak to is that community voices are valued as essential data. The National Household Travel Survey data and the transportation injury mapping system are absent of qualitative data about people's transportation experiences. Given this, the literature review explicitly includes various qualitative and quantitative studies that highlight the transportation experiences by race, gender, age, and ability and how these experiences affect people's transportation patterns.

This project highlights key travel indicators for vulnerable and marginalized populations in Los Angeles County. It seeks to look at other questions about intersectional transportation patterns and needs, including: How are the needs for these groups of people different from those of LA County, in general, and their more privileged peers? What is the role of race within different identities? What needs and patterns are similar across these outlined groups, and what are different? Finally, how can transportation departments, providers, and those agencies whose work intersects with transportation address challenges people face?

The rest of the report is organized as follows. First, the methodology section outlines the process used for the literature review and describes the data used for the empirical analysis. This section also includes background information on the number of people in selected groups and their intersectional identities. Even before adding the population of people who live in priority population areas, we see that these

[1] Thresholds based on the national standards for poverty thresholds and does not take into account geographic differences in cost of living in Los Angeles County. While alternative thresholds like the California Poverty Measure take more factors into account, the federal poverty level is still the measure predominately used for means-based testing.

groups collectively represent the majority of LA County's population. We include demographic data on the people in the NHTS sample and the county overall across race/ethnicity, employment, household income, and vehicle access for all groups in Appendix A.

Following this background, the literature review summarizes themes from previous studies, including personal safety, accessibility and the built environment, and travel behavior across race, gender, age, and ability. Each section includes findings of transportation experiences, challenges, and needs. This critically important dimension is then considered in the recommendations as it's not included directly in the travel survey or collision data.

In chapter 3, we present the transportation profiles for our seven groups. Complete profiles include key travel metrics (miles and trips per day, trips by purpose and mode), differences by race/ethnicity, as well as collision profiles (by severity, mode, and race/ethnicity). The profiles for people with disabilities and people living in families in poverty do not include collision data because the collision data do not contain information on whether the victim was using a wheelchair, mobility device, mobility disability, or income information relating to the victim. The collision data presented within the lower-income older adult profile shows collision data for all older adults, regardless of income.

Chapter 4 provides comparisons of the travel and collision metrics in three ways using side-by-side comparisons for the travel metrics and modal splits, testing for significant differences in travel metrics between our groups of interest and their more advantaged peers. Third, we compare collision metrics by race/ethnicity, mode, and geography.

Using these descriptive and comparative analyses, we found that in Los Angeles County, people disadvantaged because of their race/ethnicity, gender, income, ability, and geography face real transportation disparities and hardships. Their hardships include longer-duration trips due to less reliance on automobile travel and heightened risk of being killed or severely injured while traveling, especially while walking. In the final chapter, we summarize these and other findings and propose a set of recommendations. These recommendations seek to improve the transportation experience and reduce the disparities that vulnerable and marginalized people face, both directly through service improvements or indirectly through improved data collection to understand better the issue at hand.

Chapter 2: Methodology, data analysis, and representation

Data sources

We used two main data sources to analyze how people move around in Los Angeles and understand their traffic fatalities and collisions risks. In addition, we used summary and micro-level data from the American Community Survey, 2013-2017 5-year estimate for population figures (Ruggles, et al, 2021).

1. National Household Travel Survey (NHTS) 2017 - California Add-on, confidential edition (FHWA, 2017).
2. California Statewide Integrated Traffic Records System (SWITRS) (TIMS, 2021).

The National Household Travel Survey is a national-level sample of US households, collected in two parts. The household survey collects information about the household overall – e.g., household income, vehicle characteristics, and availability. The second part of the NHTS includes a person-level trip diary collected for every household member over age 5. This person-level data asks the respondent to record every trip taken within 24 hours, including the mode of transportation used, the time of day, and trip purpose. The survey also asks respondents to record individual components of trips, such as the walk to or from a transit stop. These individual components are referred to as "unlinked" trips. The analysis in this report presents information on unlinked trip components as linking individual trips within a person's journey is a complex process was outside the intended scope of this research. Readers should be aware that the number of trips per day represents the unlinked trips. For example, if someone walked to a bus, transferred to another bus, and then walked to their final destination, this journey would total four unlinked trips.

In the 2017 edition, Caltrans purchased an oversample that ended up including 26,095 households and 55,793 people across the state. We use the confidential edition to use the household location information to selected households living in Los Angeles County and identify households This process results in an unweighted subsample of 4,776 households and 6,907 individuals. We also used location information for identifying households living in priority population areas per the California SB 535 definition[2]. The geographic distribution of these tracts is presented in Figure 1.

[2] Priority population areas (disadvantaged areas) are designed as census tracts with disproportionate pollution burden and vulnerable to multiple sources of pollution. These tracts are scored using the CalEnviroScreen 3.0 tool.

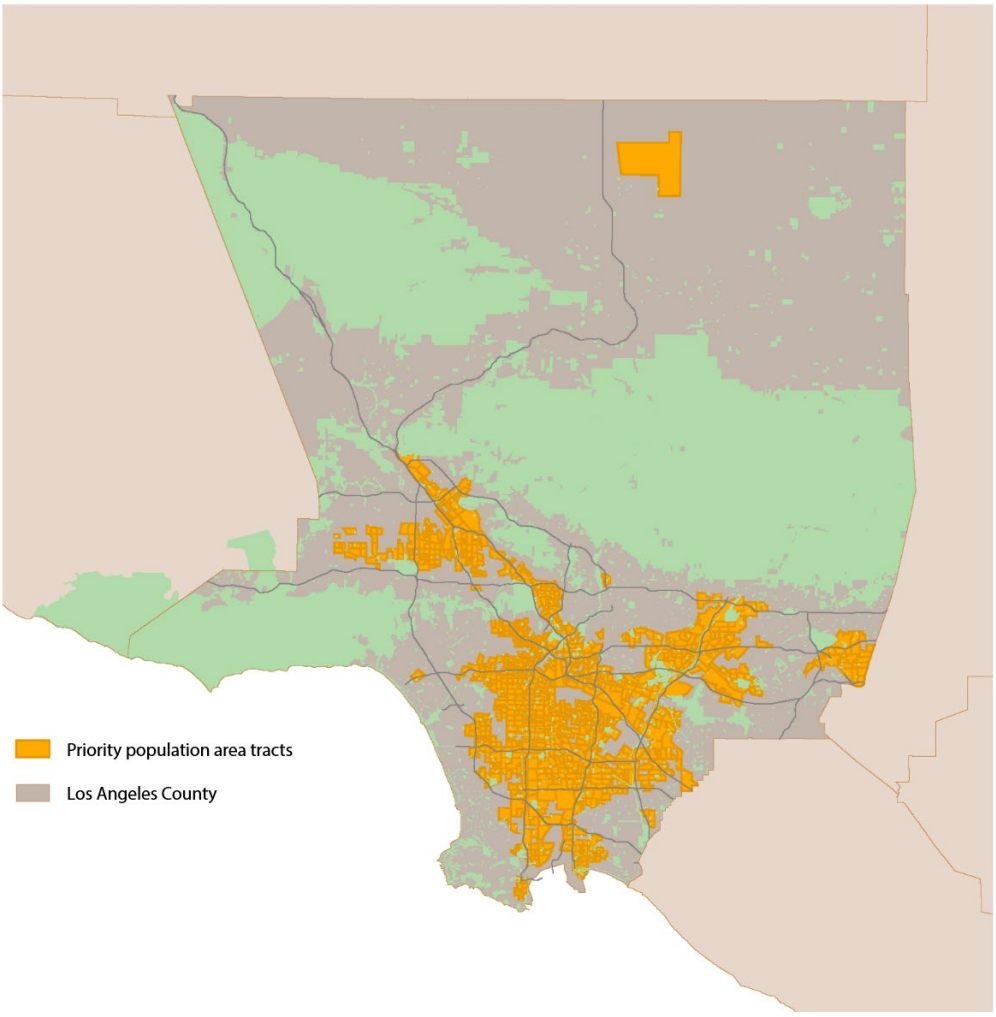

Figure 1: Priority populations area census tracts in Los Angeles County

Using data from the households, persons, and trips files, we calculated estimates of travel behavior at the individual level. Given the focus on daily travel, we excluded any trips longer than 100 miles (Aultman-Hall, 2018)[3]. Finally, we applied the person weights to the sample to estimate travel for all persons in LA County. The weighted file represented 9,110,201 individuals, a 90.7% estimate of the total population.

Next, we acquired all collision records from within Los Angeles County from 2013-2017 using the UC Berkeley Transportation Injury Mapping System to extract the California Statewide Integrated Traffic Records System (SWITRS) records. We used the victim, party, and collision files within this data set to create collision and victim records with variables relating to the collision victim's age, sex, race/ethnicity (where available), mode, and collision location.

[3] 100 miles is used as threshold for trips that are likely more reflective of long distance daily travel per the definition used in the 1995 American Travel Survey

We excluded 21,570 incomplete records (7.5% of the total collision dataset) that either did not include latitude and longitude information or where we could not identify the victim's mode of travel. The more significant data concern was missing race/ethnicity victim information as 53% of collisions in this dataset lacked victim race/ethnicity data. The degree of missing data did vary with the severity of the crash – almost all of the no injury collisions included victim race/ethnicity information, while victim race/ethnicity information was missing in a quarter of fatal collisions. Additionally, there are some issues with matching the race/ethnicity data in the collision records to population estimates because of differences in data collection. For the collisions, the officer at the scene records the victim's race/ethnicity and is instructed to "use observation and their best judgment only to determine the party's race." Officers can only record a single response in the form. In contrast, people self-identify their race/ethnicity and can select multiple racial/ethnic identities in the American Community Survey, which we compare to collision reports.

Last, we used American Community Survey (ACS) 2013-2017 5-year estimates to generate population estimates to generate specific estimates relating to our particular population groups and for Los Angeles County.

Group representation

Using the ACS Public Use Microdata Sample, we estimated the number of people in Los Angeles County that fall within our groups of interest (Table 1) and the overlaps between them. Table 1 demonstrates the intersections of vulnerable and marginalized identities between our groups. The bolded value indicates the number of people in Los Angeles County that fall within each group, with each column in this table totals 100%. Readers can interpret the table to understand the intersectionality between groups.

For example, within women of color in LA County, 5% of that group are women of color and lower-income older adults. Except for youth and older adults, this table highlights that every group contains overlaps with another group. The needs for one particular group are, therefore, inherently related to another. Overall, the people in these groups total over 5 million people in Los Angeles and collectively represent 51% of LA County's population. Appendix B compares demographics between the people living in the county's priority population tracts and the non-priority population tracts.

One caveat to this overlap is that people with a disability may be defined slightly differently between the NHTS sample and within the ACS data. In the ACS data presented in Table 1, people with a disability are defined as people reporting a "go outside the home disability" in the American Community Survey. This definition most closely matches the disability question in the NHTS – those who report difficulty traveling outside the home.

	Women of color		Youth of color		Black people		Lower-income older adults		Ppl living in a family in poverty		People with a disability	
Women of color	**3,796,639**		984,498	49%	438,427	53%	207,048	37%	632,998	48%	175,151	38%
Youth of color	984,498	26%	**2,008,728**		181,425	22%	0	0%	556,340	42%	7,304	2%
Black people	438,427	12%	181,425	9%	**827,443**		56,594	10%	118,257	9%	61,287	13%
Lower-income older adults	207,048	5%	0	0%	59,594	7%	**555,383**		74,555	6%	131,194	28%
Ppl living in a family in poverty	670,479	18%	531,994	26%	151,483	18%	145,502	26%	**1,312,813**		81,842	18%
People with a disability	175,151	5%	7,304	0%	61,287	7%	131,197	24%	43,615	3%	**464,502**	

Table 1: Intersections between selected groups

Data Limitations and Caveats

The National Household Travel Survey data is a national sample of households across the United States and the California add-on edition intends to match regional demographics. The primary use of these data is for national and regional estimates because the limited sample size in smaller geographies increases the uncertainty. We find this to be a limitation in using the California add-on data for Los Angeles County as the weighted estimate of people (using the person weights) underestimates the County's population by approximately 1 million people.

Table 2 presents the weighted numbers of people in the Los Angeles County NHTS sample, compared to their overall population estimates in the American Community Survey. In terms of distribution of the groups of interest in the sample, women of color appear to be the most underrepresented in terms of the proportion of the actual county population, followed by people living in disadvantaged communities. These limitations aside – the NHTS data represent a daily record of people's travel from across the LA region and can provide insights into their travel behaviors and patterns.

	Total weighted people (NHTS)		**Total people (ACS)**	
	#	%	#	%
LA County	9,110,201		10,105,656	
Women of color (adults)	1,995,453	21.9%	3,796,639	37.6%
Youth of color	918,307	10.1%	2,008,728	19.9%
Black people	585,330	6.4%	827,443	8.2%
People with a disability	368,246	4.0%	464,502	4.6%
Lower-income older adults	474,788	5.2%	555,383	5.5%
Individuals living in families in poverty	1,017,315	11.2%	1,312,813	13.0%
People living in disadvantaged communities	2,729,459	30.0%	4,486,459	44.4%

Table 2: Weighted sample demographics and overall population estimates in LA County

Sample demographics

We compared the demographic representation in the NHTS data to ACS estimates for LA County. Appendix A includes individual graphs for different demographic areas (race/ethnicity, employment status, household income, and vehicle access). The overall county sample NHTS population most closely resembles people's demographics, particularly race/ethnicity, income, and car ownership. The differences between the demographics in the NHTS sample and ACS data grow more prominent as the sample size decreases. Across all groups, there are differences in the number of employed people between the NHTS data and LA County. Other relevant differences between the NHTS sample, as compared to LA County include:

- The Asian population is underrepresented in the people with disabilities and low-income older adults, and overrepresented within the families living in poverty group.
- White people are very overrepresented among families living in poverty in the NHTS sample.

- The rates of employed people are very low among the sub-group of Black people and for people living in families in poverty.
- Youth of color from the highest income group are overrepresented.
- Households from the lowest income group (Less than $25,000/year) are overrepresented among Black people and people with disabilities.
- A higher proportion of households in disadvantaged communities have two or more vehicles in their household.

Chapter 3: Literature Review

This literature review provides information on key themes, behaviors, and experiences for these different identities. We searched academic literature using databases including Science Direct, Taylor and Francis and supplemented this with articles from other journals, including the Journal of Transportation and Land Use. The search strategy combined the specific key groups with keywords in transportation, including transportation needs, transportation access, public transportation, and other modes. The search focused on work from the recent work (in the last five years) conducted in the United States. We also searched and reviewed relevant articles published in news outlets or other online sources as they were available.

Within each article reviewed, we categorized the group or groups in focus based on:

- Race/ethnicity
- Gender
- Age
- Ability; and
- Income.

We then summarized the literature within these identified into themes relating to:

- Personal safety and harassment
- Accessibility and the built environment
- Traffic safety and collisions
- Travel behavior trends; and
- Other experiences, challenges, and needs.

While we organized this review into these five dimensions of individual identity –these factors commonly overlap. Each dimension brings its unique vulnerabilities – physical, financial, geographic – and these characters intersect and compound the challenges people face.

Common themes across these dimensions include:

- Lower levels of car ownership and higher reliance on public transportation, especially during the "non-peak" travel period.
- Increased reliance on low-cost or free forms of shared mobility such as carpooling or paratransit services (although people with disabilities rely more on fixed-route vs. paratransit services).
- Low rates of using ride-hailing services due to a combination of restrictions of physical access (for people with disabilities who use wheelchairs), financial access/price sensitivity, and comfort using technology.
- Increased fears of harassment and discrimination while traveling, especially due to walking/biking/driving while Black, and fears of interactions with police or discrimination and harassment from other travelers or transit operators.
- Increased risks of being injured or killed while walking or cycling, especially in low-income and communities of color where travel speeds are higher and safe street crossings are less frequent.

Race

Personal Safety

Black and Latino's people often experience higher racial discrimination behaviors and street harassment levels while traveling (Lubitow, Rainer, et al., 2017). This issue is especially true among racialized women, transgender, and gender-nonconforming individuals (Ceccato & Loukaitou-Sideris, 2020; Loukaitou-Sideris, 2016; Lubitow, Carathers, et al., 2017). The harassment and discrimination experienced by individuals within these groups come from various sources and can affect people in different ways. In a study from Portland, Oregon, mothers of color reported feeling like bus drivers were less willing to address their needs than white mothers. This includes behaviors like being less flexible with rules and regulations or not providing enough time to board/alight or sit down on the bus (Lubitow, Rainer, et al., 2017). In another study from Portland, interviews with Black transwomen of color revealed elements of racialized harassment that make it even more challenging to travel. Transgender women and gender-nonconforming individuals often navigate multiple systems of oppression, which heighten their experiences of harassment and violence (Lubitow, Carathers, et al., 2017).

These fears extend beyond personal safety concerns on public transit, as revealed through focus groups and surveys with Black and Latino/a people in New Jersey exploring the barriers to bicycle use and walking behavior. Personal safety fears, including fear of robbery/assault, fear of being profiled by police, fear of being stranded with a broken bicycle, were reasons cited by Black focus groups victims why they did not feel comfortable cycling (Brown, 2016). When comparing the relationship between personal safety and walking, other research from New Jersey found that survey respondents of color exhibited greater personal safety and crime-related concerns than white respondents in being afraid to walk (Deka et al., 2017). Additionally, focus group research from New Jersey found that personal safety while traveling was less of a concern among white women than women of color (Blickstein & Brown, 2016).

Other studies have highlighted how harassment and discrimination behaviors especially affect Black people and how this is particularly prevalent among interactions with armed law enforcement officers (Lubitow et al., 2019; Seo, 2019). Black people are more likely to fall victim to police violence while traveling (Cobbs, 2020; Roberts et al., 2019; Thomas, 2020). As such, police discrimination increases safety concerns among Black travelers in all age groups via all forms of transportation. Black people are the most likely to be stopped by the police while driving, biking, using public transit, and walking (J. Barajas, 2020; Curry, 2020; Patterson et al., 2020; Spieler, 2020). The presence of law enforcement officers and the bias they can carry against Black people shape and limit Black mobility. This issue extends to other people of color as Latino/a people also express racial profiling concerns as one of the top barriers preventing their bicycle use (C. Brown, 2016; Cox & Brown, 2017; Lubitow et al., 2019). Acknowledging law enforcement's contribution toward making people of color feel uncomfortable while traveling is essential to fully capturing the travel experience for people of color.

Accessibility, Built Environment, and Traffic Collisions

Racial segregation and housing discrimination shaped communities and the built environment, in many ways leading to the physical exclusion and separation in BIPOC and low-income communities (Golub et al., 2013; Patterson et al., 2020). This issue manifests in many different ways. BIPOC men, women, and even students often have to endure long commutes to work or school (Bierbaum et al., 2020; Ding et al., 2020; Loukaitou-Sideris, 2016; Preston & McLafferty, 2016). Black people are more likely to have the highest levels of public transportation use and walking trips. Yet, they often live in areas with limited public transportation access and a lack of safe walking infrastructure, such as inadequate sidewalks, pedestrian-scale lighting, safe street crossings, and crosswalks (McNeil et al., 2017; Patterson et al., 2020). Additionally, areas where BIPOC communities, and low-income communities live are often associated with lower sidewalk connectivity and higher presence of through traffic (Lowe, 2016).

In turn, these communities experience disproportionate levels of pedestrian crashes (Cloutier et al., 2021; Kravetz & Noland, 2012). Black, Latino, and Indigenous men are much more likely to be injured or die in car crashes (Roberts et al., 2019). Black pedestrians, specifically, are at greater risk of being hit by a car while walking (Haggerty et al., 2021; Patterson et al., 2020). Low-income and minority communities have higher bike-related fatalities rates (Smith et al., 2015). In contrast to White cyclists, among Black and Latino/a cyclists, cycling infrastructure in a neighborhood is not associated with reducing bicycling-related collisions. Other work finds that Black bicyclists also face the disproportionate risk of being involved in a collision, even controlling for traffic levels and the presence of bicycle infrastructure (Barajas 2018). Another study demonstrated that drivers are often less likely to yield to Black pedestrians compared to white pedestrians (Goddard et al., 2015).

In addition to the safety issues caused by the built environment that BIPOC communities often live in, living in high traffic density areas also leads to increased health-related risks. BIPOC individuals often experience higher exposure to traffic-related pollution, which influences health disparities, including higher asthma and other compounding health outcomes (Tessum et al., 2019).

Travel Behavior Trends

Black individuals have the highest rate of using public transportation to go to work and are the second largest group of public transit riders in general. They also spend the longest amount of time on public transportation trips to work, have the highest rates of intra-household carpooling and walking rates. Black households have the highest percentage of households without cars and the most underrepresented race/ethnicity in ride-hailing trips (Patterson 2020). Black people have low bike ridership levels, even after controlling for distance to shared bike stations. Understandable and well-established fears of being involved in a traffic collision prevent Black people from cycling.

Experiences, Challenges, and Needs

In addition to the previously described challenges, other transportation challenges and needs facing Black people include:

- Lower sidewalk connectivity and higher traffic density (Lowe, 2016; Patterson et al., 2020).
- Living in neighborhoods with less tree canopy, tree cover, and shade and being exposed to increased heat and sun exposure while walking (Rigolon et al., 2018).
- Higher car insurance premiums additional cost burden on their transportation needs (P. M. Ong & Stoll, 2007).

- Fears of danger due to "walking/driving/biking while Black" including fears of being killed by police (Edwards et al., 2019; Roberts et al., 2019).
- The role of community expectations and perceptions, including concerns around how someone who arrives at a social event via bicycle would be perceived. This mode was not appealing as friends expected people to arrive "clean" and not sweaty from the physical nature of riding a bicycle. Additionally, social perceptions that if someone arrives via bicycle, they are perceived a "broke" or that something must be wrong with their personal vehicle ((Cox & Brown, 2017).
- Racial discrimination from transit operators and other passengers (Cobbs, 2020; Lubitow et al., 2019; Thomas, 2020).
- Rising housing costs and gentrification pressures can displace Black households from urban areas with more public transit services (Hess, 2020; Tehrani et al., 2019).

Gender

Personal Safety

Women, transwomen, and other gender non-conforming individuals experience high levels of sexual harassment while traveling. Both safety perceptions, victimization, and assault experiences often lead women to avoid public transportation, especially at night (Blickstein & Brown, n.d.; Gardner et al., 2017; Hsu et al., 2019; Loukaitou-Sideris et al., 2020; Lubitow, Carathers, et al., 2017). Other studies have also identified that this intersects with age as young women and teenage girls experience harassment and are often uncomfortable walking around their neighborhoods. This fear can come from their own experience and the parental message about "stranger danger" (Roberts et al., 2019).

Safety concerns impact women's use of public transportation and walking habits, as well as their likelihood of biking. Women generally have lower bicycling rates, and several studies have associated these lower rates with different concerns from other groups. These include not feeling safe riding due to incomplete and unprotected infrastructure, fears of being harassed or victims of crime, and complex travel patterns less well suited to be done by cycling (LA County Metropolitan Transportation Authority, 2019). African American and Latina women also express greater concerns about safety in walking around and biking in their neighborhoods than their white female peers (Loukaitou-Sideris, 2016).

Transgender women and gender non-conforming individuals face even greater fears about sexual harassment and assault. They fear and experience harassment, including transphobic discrimination and fears of targeted violence against transgender people in their daily travel (Lubitow, Carathers, et al., 2017). For women, transgender women, and gender non-conforming people, these harassment fears lead them to take many precautions: avoiding certain stops or locations, changing the ways they dress, traveling less, and staying hyper-vigilant while traveling to minimize their visibility and avoid harassment.

Travel Behavior Trends

Women have more complex travel patterns than men, with more trips overall and more frequent trip chaining (where multiple stops are made on the way to a final destination) (Blickstein & Brown, n.d.; Loukaitou-Sideris, 2016). This complexity is especially true among women in single-parent households with young children who have the highest levels of trip changing (Blumenberg, 2016; Blumenberg & Pierce, 2017). As non-work trips make up a higher portion of women's travel, women are more likely to be traveling during mid-day during non-peak hours. Historically, women traveled shorter distances than

men, but this trend is beginning to converge (Blickstein & Brown, n.d.; Reyes, 2020). Even as women's travel patterns are more complex, they still tend to use public transportation and carpool more than men and are less likely to own a car or use a family vehicle (Loukaitou-Sideris, 2016).

This travel complexity is due to the disproportionate burden women shoulder. They are responsible for more care-taking and household-related trips, and in transportation terms, this requires trips like having to chauffeur children or go grocery shopping (Blumenberg, 2016; Taylor et al., 2015). This division holds even for women in heterosexual couples where both partners have high levels of education and pay.

Additionally, trade-service jobs, caregiving, and other low-income employment opportunities require people to travel at hours often not well served by public transportation (Delbosc & Ralph, 2017). Across all ethnic and racial groups, women tend to live closer to work and make less money than their male counterparts, leading to fewer financial resources to put towards things like transportation costs (McLafferty & Preston, 2019; Reyes, 2020). African American and Latina women tend to have longer commutes than white men, while the travel distances for commute trips are similarly converging between men and women.

Age and Disability

Quality transportation access provides older adults independence, well-being and helps to guard against social isolation and depression. Providing accessible transportation options for older adults is essential to ensuring that older adults can access basic service, maintain social support, and carry on with their everyday life and civil affairs (Brewer & Kameswaran, 2019; Kotval-K et al., 2020; Loukaitou-Sideris et al., 2018; Lubin et al., 2017; Putney et al., 2020). Older adults are not a homogenous group, and experiences and needs differ by age and ability. For example, 65-year-old adults have markedly different transportation needs than their older peers. The "oldest-old" age cohort, 80 and above are least likely to own a car and are most likely to be driven as passengers.

More than 40 million Americans, roughly 12% of the country, and one in four adults have some form of disability. Disability rates increase by age, with 47% of people over age 75 facing some kind of disability. Disability rates also differ by race/ethnicity. Native Americans face the highest rates of disability among all race/ethnic groups. By and large, persons with disabilities (PWD) experience more significant socioeconomic disadvantage; 62% of people with disabilities are unemployed. People with disabilities are similarly heterogeneous groups of people experiencing a range of physical/ambulatory, vision, hearing, and cognitive disabilities. The trends and experiences presented below likely differ based on the type, severity, and duration of one's disability.

Accessibility and the Built Environment

While having access to a vehicle can heavily increase both populations' mobility, people with disabilities and older adults, especially those with lower incomes, often live in households with low car ownership rates (Brumbaugh, 2018; Rosenbloom, 2007). Some studies have demonstrated that low car ownership rates among PWD are not primarily related to disability. Instead, PWD tends to live in low-income non-White households and have less access to car ownership (Brucker & Rollins, 2016; Brumbaugh, 2018). While many older adults rely on driving until very late in life, this is not necessarily the case for low-income older adults. To illustrate this difference, we used microdata from the 2013-2017 American Community Survey to examine car ownership differences by income and age. Among all older adults (over 65 years of age), 9% live in households with no access to a vehicle in the US. In

contrast, 16% of older adults living in households with annual median household incomes less than $50,000 have no household cars available.

Older adults of color and people with disabilities, especially those who live in dense central-city environments, heavily rely on public transportation to get around (Bascom & Christensen, 2017; Loukaitou-Sideris et al., 2019). Public transportation encompasses both fixed-route and on-demand paratransit services, and as a whole, people with disabilities typically rely on fixed-route over paratransit services (Bezyak et al., 2019). For older adults and people with disabilities, using public transportation can be more efficient and provide a greater sense of independence than relying on friends and family for rides (Bascom & Christensen, 2017; Putney et al., 2020). Reliance on public transit is the norm, even though public transportation can be physically challenging to use if stepping on and off the vehicle is uneven or if seats are unavailable at the front of the bus. Public transit service can be infrequent during off-peak mid-day hours, making social trips or short errands onerous.

Older adults and people with disabilities share concerns about accessibility and safety getting on and off the bus, even if they do not use wheelchairs or walkers for mobility (Lindsay, 2020; Loukaitou-Sideris et al., 2019; Wu et al., 2020). People who rely on wheelchairs have limited mobility and can have difficulty getting on (due to limited space) or maneuvering inside a bus (Lubitow, Rainer, et al., 2017). People with blindness or low vision, psychiatric disabilities, chronic health conditions, or multiple disabilities also have increased difficulty accessing public transportation (Bascom & Christensen, 2017; Bezyak et al., 2019). Based on a national online survey of people with disabilities, women and Latino people with disabilities face more significant problems using public transportation for community participation (i.e., work or school, healthcare, errands, socialization/recreation, and spontaneous activities).

People with disabilities and older adults typically walk or roll to access public transit. Research from New Jersey with older adults found this group to express greater concerns about traffic volumes and safety than concerns around crime and personal safety (C. Brown et al., 2018). This trend highlights the relationship between accessing public transit and high-quality sidewalk infrastructure and safe street crossings, especially as older adults' falling concerns are commonly top-of-mind. Falls can lead to the loss of their independence and other health problems for older adults or people with disabilities (Loukaitou-Sideris et al., 2019). There is a strong need to improve walking infrastructure, sidewalks, and street crossings, allowing people with different levels of mobility and ability to get around their neighborhood, live independently, and access public transportation (Rosenbloom, 2007.

In addition to public transportation and walking infrastructure, people with disabilities have limited access to paratransit and ride-hailing services. Some studies have indicated that increasing awareness and knowledge of these ride-hailing services can lead to uptake and mobility for these populations (Kotval-K et al., 2020; Luiu et al., 2018). However, often people are not aware that these services exist, know how to use them, are unsatisfied with the services provided in the case of paratransit, or face financial constraints to the use of ride-hailing. A long-standing body of research demonstrates how paratransit services commonly fail to provide a high-quality customer experience. This dissatisfaction includes needing to make a reservation day or days in advance, being inflexible to

changes in schedule, long travel times, and being ready at a moment's notice when the vehicle arrives (Rosenbloom, 2007).

Furthermore, ride-hailing services do not always accommodate the needs of many people with disabilities. For example, people with ambulatory difficulties might accrue extra charges for the times it takes them to get in or out of the ride-hailing vehicle. People with cognitive disabilities might find it challenging to use the app. People who rely on service animals may be denied travel by drivers who do not want an animal in their cars. Finally, people who are dependent on wheelchairs often cannot access most vehicle types offered by ride-hailing services (Ruvolo, 2020; San Francisco Muncipal Transportation Agency, 2019; Simek et al., 2018). While ride-hailing can increase mobility by providing point-to-point transportation or critical first and last-mile connections to public transportation services, these services can often exclude many people with disabilities (Mitra et al., 2019).

Traffic safety and collisions

As previously discussed, several characteristics in the built environment can increase pedestrian-related crashes, including the presence of multilane roads that force pedestrians to cross five or more lanes, traffic speed limits above 30 mph, and traffic volumes greater than 25,000 vehicles per day (Schneider et al., 2021). A recent study examining fatal pedestrian crash hot spot corridors nationwide found 75% of the identified corridors were bordered by low-income neighborhoods (Schneider et al., 2021). This study recommends a systemic approach to improving pedestrian safety, including efforts to reduce vehicle speeds and center the needs of Black and Latino/a residents of all ages in the planning process given the disparity these groups face in their communities.

Older adults are also very susceptible to collision-related injury and death. Since 2000, the number of older adults with driver's licenses has increased by over 60 percent. While driving helps older adults' mobility, the risk of injury or death in a traffic collision increases as people age. This risk is especially pronounced as older adults experience age-related vision problems and cognitive functioning declines (Newgard, 2008; Rosenbloom & Herbel, 2009b). While younger adults are more likely to be involved in more crashes than older adults, older adults are more likely to experience injury or death than their younger counterparts (Henary et al., 2006). Specifically, when controlling for vehicle mile travel, both men's and women's fatality rate rises sharply after 70 years of age (Rosenbloom & Herbel, 2009b). In addition to the dangers facing older adults, motor vehicle crashes are the leading cause of unintentional death among children and teenagers. One in five children killed in a traffic-related collision were walking (see Figure 9) (Centers for Disease Control and Prevention, 2018).

10 Leading Causes of Injury Deaths by Age Group Highlighting Unintentional Injury Deaths, United States – 2018

Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1	Unintentional Suffocation 977	Unintentional Drowning 443	Unintentional MV Traffic 341	Suicide Suffocation 361	Unintentional MV Traffic 6,308	Unintentional Poisoning 15,353	Unintentional Poisoning 14,978	Unintentional Poisoning 13,620	Unintentional Poisoning 10,854	Unintentional Fall 32,522	Unintentional Poisoning 62,399
2	Homicide Unspecified 125	Unintentional MV Traffic 292	Unintentional Drowning 130	Unintentional MV Traffic 360	Unintentional Poisoning 4,245	Unintentional MV Traffic 6,886	Unintentional MV Traffic 5,068	Unintentional MV Traffic 5,328	Unintentional MV Traffic 5,629	Unintentional MV Traffic 7,697	Unintentional MV Traffic 37,991
3	Unintentional MV Traffic 80	Homicide Unspecified 152	Unintentional Fire/Burn 99	Suicide Firearm 202	Homicide Firearm 4,107	Homicide Firearm 4,348	Suicide Firearm 3,222	Suicide Firearm 3,787	Suicide Firearm 4,421	Suicide Firearm 6,375	Unintentional Fall 37,455
4	Homicide Other Spec., Classifiable 68	Unintentional Fire/Burn 123	Homicide Firearm 57	Homicide Firearm 134	Suicide Firearm 2,995	Suicide Firearm 3,429	Suicide Suffocation 2,688	Suicide Suffocation 2,481	Unintentional Fall 2,766	Unintentional Unspecified 4,607	Suicide Firearm 24,432
5	Undetermined Suffocation 45	Unintentional Suffocation 112	Unintentional Suffocation 30	Unintentional Drowning 86	Suicide Suffocation 2,237	Suicide Suffocation 3,117	Homicide Firearm 2,569	Suicide Poisoning 1,396	Suicide Suffocation 1,934	Unintentional Suffocation 3,793	Homicide Firearm 13,958
6	Unintentional Drowning 39	Unintentional Pedestrian, Other 70	Unintentional Other Land Transport 20	Unintentional Fire/Burn 52	Suicide Poisoning 454	Undetermined Poisoning 824	Suicide Poisoning 990	Homicide Firearm 1,382	Suicide Poisoning 1,491	Unintentional Poisoning 3,269	Suicide Suffocation 13,840
7	Homicide Suffocation 30	Homicide Other Spec., Classifiable 66	Homicide Unspecified 17	Unintentional Suffocation 43	Unintentional Drowning 431	Suicide Poisoning 753	Undetermined Poisoning 780	Unintentional Fall 1,131	Unintentional Suffocation 858	Adverse Effects 3,100	Unintentional Suffocation 6,701
8	Undetermined Unspecified 30	Homicide Firearm 54	Adverse Effects 16	Unintentional Other Land Transport 37	Homicide Cut/pierce 256	Unintentional Drowning 482	Unintentional Fall 502	Undetermined Poisoning 876	Homicide Firearm 802	Unintentional Fire/Burn 1,404	Suicide Poisoning 6,237
9	Unintentional Natural/ Environment 22	Unintentional Natural/ Environment 38	Unintentional Pedestrian, Other 15	Unintentional Poisoning 23	Undetermined Poisoning 224	Homicide Cut/Pierce 455	Unintentional Drowning 414	Unintentional Drowning 456	Adverse Effects 766	Suicide Poisoning 1,133	Unintentional Unspecified 6,082
10	Two Tied 18	Unintentional Firearm 30	Homicide Other Spec., NEC[N] 14	Suicide Poisoning 20	Suicide Fall 205	Unintentional Fall 345	Homicide Cut/Pierce 340	Unintentional Suffocation 401	Undetermined Poisoning 704	Suicide Suffocation 1,014	Adverse Effects 4,604

Data Source: National Center for Health Statistics (NCHS), National Vital Statistics System.
Produced by: National Center for Injury Prevention and Control, CDC using WISQARS™.

Centers for Disease Control and Prevention National Center for Injury Prevention and Control

Figure 2: Leading causes of unintentional injury deaths by age, CDC

The top-cited reasons why children and teenagers face such risk in motor vehicle crashes include the lack of seat belts, intoxicated drivers, and vehicle design in the United States. In recent years, the increase in the number of SUVs sold that are both heavier and with higher front ends has been linked as a potential cause of the rise in pedestrian fatalities (Schmitt, 2020). The National Highway Traffic Safety Administration estimates that pedestrians struck by SUVs are two to three more likely to be killed compared to those hit by a sedan (National Highway Traffic Safety Administration, 2015).

Children who live in low-income areas face disproportionate risks of being collision victims (Cloutier et al., 2021). This issue is due to the relationship between low-income neighborhoods and high traffic volumes, and higher walking rates among children. This pattern extends to communities with a high percentage of multifamily housing and subsidized housing. The overall built form and structure of neighborhoods strongly impact the prevalence or absence of child pedestrian injuries. While programs like Safe Routes to School have worked to reduce collisions around school areas, other research shows that areas near parks have higher incidents of child-involved collisions than schools (Ferenchak & Marshall, 2017).

Beyond transportation mode, age, and location, individual characteristics relating to disability are less likely to be included in collision data. This omission then limits the evidence on the relationship between

collision rates and people with disabilities. One study has highlighted that people who use wheelchairs have a 36% higher mortality rate than the general population, with men having five times the risk of death than women using wheelchairs. This study also finds that men aged 50-64 who use a wheelchair have a 75% increased risk of dying in a car crash than the general population (Kraemer & Benton, 2015).

Travel Behavior Trends

Older adults

Overall, adults tend to take fewer trips as their age increases (J. Chen & McGeorge, 2020; Loukaitou-Sideris et al., 2019). They also often tend to have higher levels of disability as they age, contributing to the lower levels of driving (Adorno et al., 2018). Older adults' travel tends to vary by geography, and older work focuses on the intersection between age, race/ethnicity, and geography.

While some research on older adults finds increasing automobility, other work demonstrates the opposite trend for low-income minority older adults living in central parts of Los Angeles (Loukaitou-Sideris et al., 2019; Rosenbloom, 2001). Older adults with lower incomes living in the central city areas of Los Angeles take more frequent and short trips than other older whiter counterparts who live in more suburban parts of the city. These older adults also tended to take more trips than the average LA resident, walk and use public transportation at higher rates, and drive at lower rates than older adults living in less-dense areas.

This same study used interviews to explore more qualitative needs and perceptions. These interviews demonstrated that while these older adults could complete trips to fulfill their daily basic needs, they often had to endure long transit rides and uncomfortable walks due to poor sidewalk quality, feelings of unsafety, lack of shade or places to rest while walking. Most older adults in this study did not use ride-hailing services due to financial constraints and concerns, lack of technology fluency, and comfort in using credit cards for online purchases.

Another study of older adults' ride-hailing use in California found that older adults use ride-hailing services, but this is most common among those with higher incomes and more education (Agrawal et al., 2020). Another study using the 2017 National Household Travel Survey found that older adults that use ride-hailing services tended to take more trips, and often ride-hailing trips tended to connect these older adults to public transportation services (Mitra et al., 2019). This national survey finds that ride-hailing apps were most common among 65-74-year-olds with high education levels, living in the city, and males with a disability. However, adults between 75-85, with less education or carless, tended to not frequently use ride-hailing apps, even once they adopted and were trained to use the technology.

Youth and young adults

Much of the recent attention on the travel trends among younger people focus on recent reports of decreased driving among young people in the millennial generation. Studies explaining why millennials might be driving less than previous generations fall into two categories: On the one hand, there is literature that describes young adults, and specifically millennials that move to cities, who have reduced preference for using cars and higher preference for using public transportation (Delbosc & Ralph, 2017). The other category finds that young adults drive less not by choice but because of different life factors limiting their ability to own a car (A. Brown et al., 2016). Young adults with lower incomes and lower education might not afford a car and more likely to rely on public transportation.

Lack of household car access limits mobility among teenagers. A study examining how teenagers travel in Connecticut found that 71% of teenagers relied on being driven, 14% utilized public transportation, and 10% had access to a personal car (Auguste et al., 2020). Teenagers in higher-income households tended to have a higher number of vehicles and a higher number of people with licenses (ibid).

Children in low-income families, especially Black and Latino children, have longer school commute trips than their White and Asian counterparts (Bierbaum et al., 2020). Given their lower levels of household car access, they rely on the school bus and public transit service more to get to school. Children who are driven or walk to school fare better academically than those who ride the bus and typically get more sleep (Yeung & Nguyen-Hoang, 2020).

A study from Washington D.C. focusing on Black, Latino/a, and Indigenous youth also found high use of walking, cycling, or using public transit (Roberts et al., 2019). Youth of color also used active transportation more than their white counterparts and had overall positive views of these modes. The study participants identified several concerns that reduced their walking and bi. These fears were namely concerns with "walking while black/driving while Black/shopping while Black," including fear of potentially getting shot by a police officer but also about the risk of being hit by a car while walking. Among young women of color, their fears and experiences of sexual harassment or violence often limited their mobility and engagement with active transportation compared to boys (ibid).

People with disabilities

People with disabilities usually take fewer trips per day, even by car, than people without disabilities (Brumbaugh, 2018; Henly & Brucker, 2019). People with long-term disabilities tend to take fewer errands and shopping-related trips than people with short-term disabilities (i.e., temporary use of crutches/cane etc.) (Henly & Brucker, 2019). People with disabilities also make up more than half of homebound people (*Bureau of Transportation Statistics*, 2018). For non-home-bound people with disabilities, twelve percent of people with a disability face difficulty getting the transportation they need, compared to three percent of the general population. This includes no or limited public transit, not having a car, having a disability that makes transportation hard to use, or no one to depend on (for those that need mobility/other assistance).

A congressionally-mandated 2002 U.S. Bureau of Transportation Statistics comparative study that included over 5,000 people provides some of the richest information on this group's travel needs. They found that walking was a primary travel mode for PWDs of all ages; this definition includes someone in a wheelchair traveling without using another mode. Walking was more common than public transit use, and specialized transportation services, including paratransit, were used less than fixed-route public transportation (Sweeney, 2004). A more recent study found that PWDs rely on private cars less often and public transportation more often than previously reported (Bascom & Christensen, 2017).

For travel purposes, people with disabilities make a disproportionate amount of trips for healthcare purposes because they utilize health care more than non-disabled peers. PWDs travel the same distance as people without disabilities; however, it takes them longer to get to their healthcare location (Brucker & Rollins, 2016). This time-intensive travel burden extends to other trip purposes as well. A study of people with disabilities living in New York City found that PWD were more likely to experience longer commutes while earning less money than people without disabilities (Wong et al., 2020). Disability was

not the only factor affecting these disparities. In addition to disability status, transportation mode, level of education, marital status, work status, public assistance status, work location, and residential location all influenced wage and commute length disparities (ibid). Overall, as people with disabilities intersect with other identities that experience transportation exclusion, such as women or people of color, those people face even more burdens and difficulties in the public transit environment.

Other Experiences, Challenges, and Needs

The previous sections highlighted how older adults and people with disabilities especially face numerous mobility challenges. These particular barriers include 1) Physical barriers, 2) Psychological barriers, 3) Barriers to information exchange, including comfort with technology. Given that disability and age tend to trend together, older adults tend to have a higher level of difficulty accessing transportation services, with lower levels of driving. Although this isn't the case for everyone, some older adults prefer driving as a door-to-door travel option if they feel comfortable driving and have access to a vehicle. Additionally, older adults tend to have concerns for personal safety and security, including fears of falling, not being able to get on or off a bus safely, or fear of being assaulted by someone in the street (K. L. Chen et al., in press; Loukaitou-Sideris et al., 2019).

Community support can be an essential source of support for older adults in accessing basic services. This community support can be public transportation, medically arranged transportation, or state-subsidized paratransit service (when eligible) (Putney et al., 2020). Having to rely on social networks for transportation services can strain those relationships and limit older adults' and PWD independence. However, reliance on others is prevalent among older adults with family support.

Additionally, older adults are less likely to be employed full-time and spend more of their trips for shopping, recreation, healthcare, and social activities (Chudyk et al., 2015). Although this is not necessarily the case in all cities, being low-income, non-white, and without access to a vehicle increases barriers to transportation for accessing healthcare (Kotval-K et al., 2020). One qualitative study from Los Angeles found that regardless of fears of safety, financial limitations, or availability, older adult women prioritize medical appointments and travel to get food over trips that increase social wellbeing (Marshall, 2020).

Overall, people with disabilities, older adults, and youth to a degree all face vulnerabilities and safety concerns while trying to travel independently. The ability to trust in shared mobility is critical for these groups to travel and maintain participation in society. Studies have highlighted how trust between people and transit operators, taxi drivers, and volunteer drivers are critically important in ensuring a high-quality transportation experience for people in these groups. People with disabilities, older adults, and youth, alongside their caretakers, sometimes report feeling unsafe while traveling. Having trust in the human infrastructure in transportation environments can act as a source of solace and comfort (J. R. Brown et al., 2018; Martens, 2018; Silverstein & Turk, 2016).

Income

Accessibility and the Built Environment

As previously described across the other identity profiles, household income and wealth greatly influence people's access to reliable transportation options. People in the lowest income brackets face various accessibility issues when it comes to their transportation needs. Low-income individuals face difficulty keeping up with all types of living costs, which does not exclude transportation. Low-income households struggle to keep up with car-related expenses, owning and maintaining vehicles, and purchasing monthly transit passes (often with a slight batch discount) (Blumenberg & Agrawal, 2014).

Low-income people tend to live in households with lower access to private vehicles and have fewer driver's licenses than their wealthier counterparts. Restricted access to personal cars leads to limited mobility for low-income households (Auguste et al., 2020). These transportation challenges make it difficult for low-income people to access opportunities (Bhusal et al., 2021; Blumenberg & Pierce, 2017; Howland, 2020). Some studies highlight the importance of increasing car access for low-income families to better access jobs and other services (Blumenberg, 2016; Pendall et al., 2014). This lack of access to opportunity extends to creating transportation barriers to medical care, educational opportunities, and other social interactions. Vehicles provide low-income people with more job opportunities within a reasonable commuting distance and more effortless experience searching for jobs or housing.

Low-income women face accessibility barriers in their built environments and transportation options. Low-income mothers living in low-income neighborhoods tend to rely more on active transportation options such as walking, biking, or using public transportation, even in communities perceived as unsafe (D. Lee, 2018). This perception is based in reality as low-income families have increased collision risk, as children in low-income areas are disproportionately represented in child-related collisions (Cloutier et al., 2021; Maciag, 2014).

Across the United States, the combination of rising housing costs and stagnant wages adds pressure for low-income families to make ends meet. Spending more money on housing often leads low-income individuals to change their travel patterns and reduce travel. In addition to affecting travel patterns, rising housing costs and changing job locations affect low-income people and increase the suburbanization of poverty. These patterns increasingly force low-income households to live in more suburban areas (Kneebone, 2017). Given that transit access is also lower in suburban areas, families without a vehicle or with lower levels of vehicle access face greater disadvantages (Hu, 2015; *The Unequal Commute*, 2020). Additionally, low-income families living in suburban areas face higher collision risks while walking due to a higher likelihood of pedestrian-related fatalities and a lack of investment in pedestrian-friendly infrastructure (Kravetz & Noland, 2012; Maciag, 2014).

Low-income people also experience challenges accessing new transportation technologies such as bike-share, car-share, and ride-hailing services. Most research around the financial accessibility of these new transportation technologies focuses on bike-share options, while more work is emerging. Research examining shared mobility access beyond bike-share illustrates that the cost of using the

service, credit card requirements and smartphone access can be barriers to accessing these technologies even if they exist nearby (Dill & McNeil, 2020).

Travel Behavior Trends

Low-income families have lower car ownership levels, make fewer trips per day, and use transit more (Martin et al., 2016). Low-income families tend to be underrepresented in ride-hailing trips but have higher carpooling rates to work (Conway et al., 2018). Low-income families have the highest walking rates for shopping trips (Hwang et al., 2017). Many low-income mothers are more likely to walk or bike to public transit and are more likely to use active transportation in general when they perceive their neighborhood as unsafe (R. E. Lee et al., 2018).

BIPOC and lower-income families commonly live in communities with less access to quality sidewalks and biking infrastructure (Braun, 2021; McNeil et al., 2017). This lack of infrastructure can increase the collision risk for BIPOC and low-income families, who experience higher rates of fatalities among people walking or cycling (Dai, 2012; Kravetz & Noland, 2012; Loukaitou-Sideris et al., 2016; Schneider et al., 2021). The built environment and other neighborhood characteristics also affect bike-related fatality rates, as high poverty areas, high prevalence of people of color, and elevated traffic levels are associated with higher numbers of bicycle crashes (J. M. Barajas, 2018).

Experiences, Challenges, and Needs

The transportation experience and needs for low-income families have many overlaps with the women's transportation needs. Mothers in low-income households are typically responsible for care-related trips, and for those who rely on public transit, this experience is not easy. Mothers with small children can have difficulties accessing buses and often have to collapse strollers to get on and off the bus and worry about having enough time to sit down and get their children situated (LA County Metropolitan Transportation Authority, 2019; Lubitow, Rainer, et al., 2017). Additionally, parents in low-income families who work at off-peak times are not well served by public transit. The types of strategies that low-income families use to make their travel work include tight budgeting, reducing spending in other areas, and reducing travel/changing travel (Blumenberg & Agrawal, 2014).

Race and ethnicity also affect low-income families' access to safe and reliable public transportation. Examining bus access in four U.S. cities, researchers found that neighborhoods with a high percentage of low-income residents may receive poorer bus service delivery. Racial disparities further worsen this access gap as they find that the greater number of non-white residents worsens bus access (Wells & Thill, 2012). This disparity extends to experiences on the bus as well as mothers of color report that the bus driver often provides them with less flexibility than white mothers when ensuring that their kids are safe getting on and off the bus and sitting down while riding (Lubitow, Rainer, et al., 2017). Mothers and women of color and recent immigrants also often experience racism and discrimination when traveling, as previously described. Other issues include language accessibility on public transit for low-income families with recent immigrants or for parents for whom English is not their first language (R. J. Lee et al., 2017).

Finally, the continuation of the suburbanization of poverty means that low-income families increasingly live in suburban environments, where they have much lower access to public transit services (Kneebone & Holmes, 2015). This shift is associated with a lack of affordable housing and increasing housing costs in urban areas, taking low-income families away from opportunities, and increasing their commute times

(Howland, 2020; Reyes, 2020). For many groups, especially low-income families, solutions for addressing transportation and housing needs must go hand in hand. In the short term, increasing mobility and accessibility for low-income families may require providing access to cars through subsidized ownership and maintenance programs or access to low-cost car-sharing programs (Rodier et al., 2021). Cars can give mobility in instances where travel patterns are complex, people have personal safety concerns, and in areas with low levels of public transportation access (Blumenberg, 2016; Pendall et al., 2014; Smart & Klein, 2018).

Chapter 3: Group Profiles

This chapter presents profiles for the groups of interest in the following order:

1. Women of color
2. Youth of color
3. Black people
4. Lower-income older adults
5. Families in poverty
6. People with disabilities
7. People living in disadvantaged communities
8. LA County

Each profile includes three sections:

1. **Travel metrics, purpose, and modes**: This section includes the number of unlinked trips per day, total miles traveled on average, the average trip length, and duration. Each time someone changes location or mode, that leg is considered a separate unlinked trip. For example, if someone walks to a bus stop and then takes transit and then walks to their destination, this journey includes three unlinked trips. Similarly, if someone takes their child to daycare and then continues to their job location, this is considered two unlinked trips. Total miles traveled per day help to represent the overall size of the individual's travel activity space. Finally, the relationship between average trip length and average trip duration helps to demonstrate how the time someone spends traveling per day is a function both of how far they are going and the speed of the modes they use to get there. Next, the distribution of trips by purpose demonstrates the reasons for travel. For trips that the "why to" purpose was going home, the "why from" purpose was used instead. We present modal distribution for all trips and trips to key destinations: shopping/errands (the most significant trip purpose for all groups), commuting, and healthcare.
2. **Race/ethnicity descriptive analysis:** The average trip distance and average trip are presented by race/ethnicity to summarize racial and ethnic variation.
3. **Collision incidents:** The second section draws from the collision data to present the number of victims of traffic collisions. This profile includes the incidents per year (from 2013-2017), mode of the victim, and mode and geography, focusing on whether the collisions occurred in disadvantaged or non-disadvantaged tracts. Finally, we use z-tests to examine whether the distribution of victim mode is significantly different in the priority areas versus non-priority areas. Collision incident patterns are not included for families in poverty or people with disabilities because the collision data does not include income information for the victims or whether victims were using a wheelchair or mobility assistance device at the time of the collision. Collision incident patterns for low-income older adults reflect patterns only age and not income.

Women of color

This section presents the descriptive travel patterns for women of color, defined as women over 18 who identify as Asian, Black, Latina, some other race, or multi-racial. Our results find that women of color take 3.9 trips per day on average - a rate similar to other groups and LA County as a whole. Each trip is longer in distance and duration than other groups, which equates to traveling more miles per day on average. Like others, half of all trips are for shopping or errands, and women of color take a slightly higher percentage of trips for commuting purposes than LA County. The descriptive analysis results demonstrate an increased reliance on driving and personal vehicles for making these trips - with some variation by trip purpose. Women of color rely on private cars and public transit more to get to healthcare trips than driving and transit use for shopping.

We find variation in trip distance and duration by race, with Black women having the longest trips in duration and Latina women having the longest average trip distances. Asian women have a similar average trip distance as Black and Latina women. Still, their average trip duration is shorter, likely due to increased car access and travel than Black and Latina women. This finding demonstrates the differences that race and ethnicity play in the travel patterns for women of color.

Key travel metrics	
Avg. number of trips per day	3.9 trips
Avg. number of miles traveled per day	30.7 miles
Avg. trip length	9.6 miles
Avg. trip duration	30.7 minutes
Trips by primary purpose	
Work	20%
School/daycare/religious	3%
Healthcare	1%
Shopping/errands	50%
Social/recreational	10%
Transport someone	7%
Meals	8%
Something else	0%
Trips by mode	
Drive	82.0%
Walk	10.9%
Public transit	4.2%
Bike	1.2%
Taxi/TNC	1.1%
Paratransit	0.3%
Motorcycle	0.4%
Other	10.9%

Table 3: Travel metrics, women of color

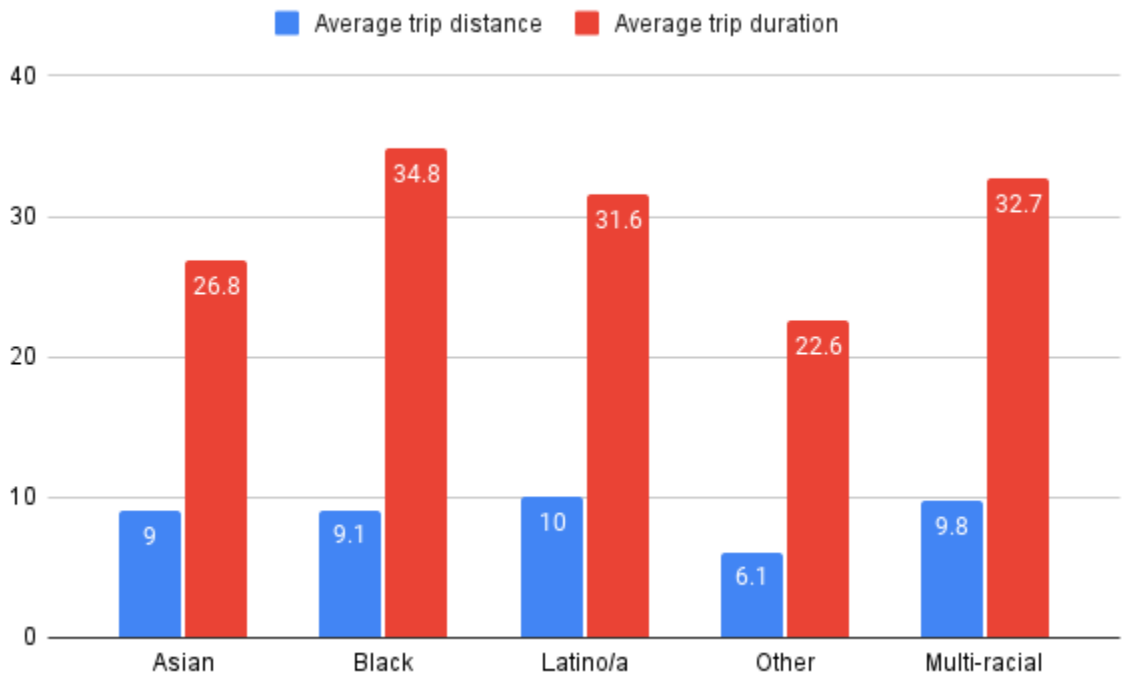

Figure 3: Travel metrics by race/ethnicity, women of color

	Shopping / Errands	Commute	Healthcare
Drive	80.5%	86.1%	91.6%
Walk	12.3%	6.8%	0.0%
Public transit	4.8%	3.8%	8.4%
Bike	1.0%	1.2%	0.0%
Taxi/TNC	0.7%	1.6%	0.0%
Paratransit	0.3%	0.3%	0.0%
Motorcycle	0.3%	0.3%	0.0%
Other	12.3%	6.8%	0.0%

Table 4: Travel mode by selected purposes, women of color

Traffic collision victim analysis

We find, on average, 80 women of color are killed in traffic collisions per year, and the number of women of color injured rose between 2013 and 2017. A majority of women of color who died during this time were walking. Finally, we find significant differences in the proportion of women of color victims in disadvantaged census tracts compared to the number of victims in non-disadvantaged areas. Women of color were more likely to be victims of traffic collisions while biking in priority population areas, in context, women of color take a tiny percent of their trips by cycling.

	Fatality	Injury	No Injury	Total
2013	73	13,379	55	13,507
2014	73	13,927	44	14,044
2015	77	15,899	50	16,026
2016	108	18,584	49	18,741
2017	77	18,741	33	18,851
	408	**80,530**	**231**	**81,169**

Table 5: Number of traffic collision victims by year, women of color

	Fatality		Injury		No Injury		Total	
Walk	241	59.1%	5,862	7.5%	0	0.0%	6,103	7.8%
Bike	3	0.7%	1462	1.9%	0	0.0%	1,465	1.9%
Car	156	38.2%	69,680	89.6%	224	98.7%	70,060	89.3%
Motorcycle	6	1.5%	528	0.7%	1	0.4%	535	0.7%
Other	2	0.5%	273	0.4%	2	0.9%	277	0.4%
	408		**77,805**		**227**		**78,440**	**100.%**

Table 6: Number and percentage of traffic collision victims by mode, women of color

	Priority population areas		Non-priority areas	
Walk	**3,430**	8.8%	**2,673**	6.8%
Bike	**792**	2.0%	**673**	1.7%
Car	**34,376**	88.2%	**35,684**	90.4%
Motorcycle	**241**	0.6%	**294**	0.7%
Other	**145**	0.4%	**132**	0.3%
	38,984		**39,456**	**100.00%**

Table 7: Number and percentage of traffic collision victims by mode and geography, women of color

Bolded values in table 7 represent statistically significant differences in the column proportions between the two groups using a z-test at the .05 level.

Youth of color

Youth of color are defined as people under 18 who identify as Asian, Black, Latino/a, some other race, or multi-racial. Youth of color travel less than others, taking fewer trips per day, traveling fewer miles, and taking shorter trips in terms of distance and duration. Trips for school-related purposes compose 1 in 5 trips. While a majority of youth of color drive/are driven to school, over twenty percent of these trips are taken by walking. Further, twelve percent of school trips are taken by public transit. For context, school districts in California can decide whether to provide busing for students and prior analysis estimates that less than 15% of students in California ride yellow school buses (Taylor, 2014).

We find evidence of racial/ethnic patterns within the youth of color. While there are similar average trip distances across racial/ethnic groups, trips among Black, Latino/a, and multi-racial youth take longer on average than their Asian counterparts.

Key Travel Metrics	
Avg. number of trips per day	3.4 trips
Avg. number of miles traveled per day	16.1 miles
Avg. trip length	5.7 miles
Avg. trip duration	25.3 minutes
Trips by primary purpose	
Work	1%
School/daycare/religious	20%
Healthcare	1%
Shopping/errands	50%
Social/recreational	11%
Transport someone	9%
Meals	7%
Something else	1%
Trips by mode	
Drive	74.7%
Walk	19.3%
Public transit	5.0%
Bike	0.6%
Taxi/TNC	0.1%
Paratransit	0.1%
Motorcycle	0.0%
Other	0.3%

Table 8: Travel metrics, youth of color

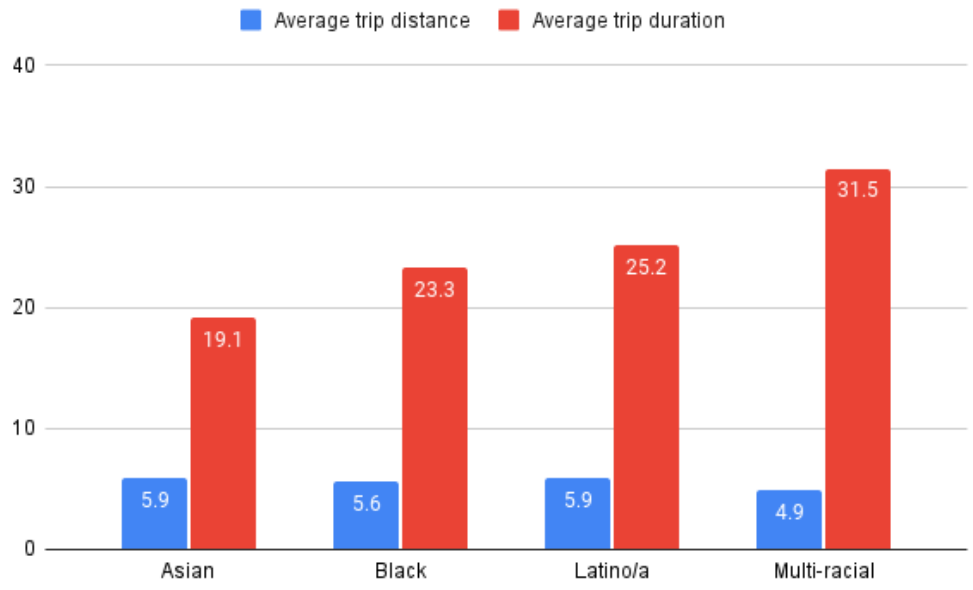

Figure 4: Travel metrics by race/ethnicity, youth of color

	Shopping / Errands	Commute	Healthcare
Drive	77.0%	65.8%	100.0%
Walk	19.8%	29.4%	0.0%
Public transit	2.6%	4.8%	0.0%
Bike	0.3%	0.0%	0.0%
Taxi/TNC	0.1%	0.0%	0.0%
Paratransit	0.0%	0.0%	0.0%
Motorcycle	0.0%	0.0%	0.0%
Other	0.3%	0.0%	0.0%

Table 9: Travel modes across all trips and selected purposes, youth of color

Traffic collision victim analysis

Approximately twenty youth of color died in traffic collisions per year on average. The majority of youth who died were walking, nine percent of victims were biking, a higher percentage than in LA County overall. There are significant differences in the distribution of youth of color traffic victims by mode between disadvantaged and non-disadvantaged tracts. Youth of color pedestrians are disproportionately injured while walking in priority population areas (42%) than in non-priority population area tracts (30%.) We find more youth of color traffic victims in the priority population area tracts overall, even though these tracts represent a much smaller percentage of the county land area.

	Fatality	Injury	No Injury	
2013	21	2,474	23	2,518
2014	20	2,375	19	2,414
2015	24	2,318	30	2,372
2016	16	2,439	39	2,494
2017	16	2,265	13	2,294
	97	**11,871**	**124**	**12,092**

Table 10: Number of traffic collision victims by year, youth of color

	Fatality		Injury		No Injury		Total	
Walk	50	51.5%	4,276	36.6%	0	0.0%	4,326	36.4%
Bike	9	9.3%	2,995	25.7%	0	0.0%	3,004	25.3%
Car	27	27.8%	4,060	34.8%	121	100.0%	4,208	35.4%
Motorcycle	10	10.3%	311	2.7%	0	0.0%	321	2.7%
Other	1	1.0%	28	0.2%	0	0.0%	29	0.2%
	97		**11,670**		**121**		**11,888**	**100.0%**

Table 11: Number and percentage of traffic collision victims by mode, youth of color

	Priority population areas		Non-priority areas	
Walk	**2,733**	41.7%	**1,593**	29.9%
Bike	**1,760**	26.8%	**1,244**	23.4%
Car	**1,844**	28.1%	**2,364**	44.4%
Motorcycle	**204**	3.1%	**117**	2.2%
Other	**20**	0.3%	**9**	0.2%
	6,561	**100%**	**5,327**	**100%**

Table 12: Number of traffic collision victims by mode and geography, youth of color

Bolded values in table 14 represent statistically significant differences in the column proportions between the two groups using a z-test at the .05 level.

Black people

Black people in Los Angeles County take four trips per day on average. These trips are slightly shorter than LA County as a whole on average but somewhat longer in duration. Black women take longer average trips (9 miles) than Black people overall (8 miles). Contrasting these findings with findings about women of color by race/ethnicity, we hypothesize that there are likely distinct differences by gender.

Black people take a relatively large percentage of trips by public transit and use transit more for shopping/errand and healthcare purposes than for trips overall. There are lower levels of taxi and ride-hailing services among Black people compared to LA County.

Key travel metrics	
Avg. number of trips per day	4.0 trips
Avg. number of miles traveled per day	27.2 miles
Avg. trip length	7.7 miles
Avg. trip duration	28.7 minutes
Trips by primary purpose	
Work	12%
School/daycare/religious	8%
Healthcare	2%
Shopping/errands	55%
Social/recreational	7%
Transport someone	9%
Meals	7%
Something else	1%
Trips by mode	
Drive	78.3%
Walk	11.9%
Public transit	7.7%
Bike	1.1%
Taxi/TNC	0.2%
Paratransit	0.0%
Motorcycle	0.3%
Other	0.5%

Table 13: Travel metrics, Black people

	Shopping / Errands	Commute	Healthcare
Drive	76.9%	88.3%	58.9%
Walk	13.6%	5.3%	12.5%
Public transit	8.0%	5.7%	28.6%
Bike	0.6%	0.0%	0.0%
Taxi/TNC	0.2%	0.6%	0.0%
Paratransit	0.0%	0.0%	0.0%
Motorcycle	0.3%	0.0%	0.0%
Other	0.4%	0.0%	0.0%

Table 14: Travel modes across select purposes, Black people

Traffic collision victim analysis

On average, 70 Black people died in traffic collisions per year, and the fatality incidence rose during the study period for fatalities and injury collisions. Almost half of these fatalities were among people walking. And fatalities among Black pedestrians were more common in disadvantaged census tracts. Further, there are significantly higher proportions of Black pedestrian or cyclist victims in priority population tracts. Black victims were more commonly traveling in a car when injured in a collision in a non-priority population census tract.

	Fatality	Injury	No Injury	Total
2013	52	5,463	21	5,536
2014	75	5,841	18	5,934
2015	66	6,588	17	6,671
2016	81	7,554	26	7,661
2017	82	7,860	13	7,955
	356	**33,306**	**95**	**33,757**

Table 15: Number of traffic collision victims by year, Black people

	Fatality		Injury		No Injury		Total	
Walk	171	48.0%	3,591	11.01%	0	0.0%	3,762	11.4%
Bike	20	5.6%	2,114	6.48%	0	0.0%	2,134	6.5%
Car	112	31.5%	24,793	75.99%	89	97.8%	24,994	75.6%
Motorcycle	53	14.9%	1,831	5.61%	1	1.1%	1,885	5.7%
Other	0	0.0%	296	0.91%	1	1.1%	297	0.9%
	356		**32,625**		**91**		**33,072**	

Table 16: Number of traffic collision victims by mode, Black people

	Priority population areas		Non-priority areas	
Walk	**2,281**	12.7%	**1,481**	9.8%
Bike	**1,276**	7.1%	**858**	5.7%
Car	**13,266**	73.9%	**11,728**	77.6%
Motorcycle	988	5.5%	897	5.9%
Other	149	0.8%	148	1.0%
	17,960	**1**	**15,112**	**100.0%**

Table 17: Number of traffic collision victims by mode and geography, Black people

Bolded values represent statistically significant differences in the column proportions between the two groups using a z-test at the .05 level.

People with disabilities

This profile presents information on people who report "having a condition that makes travel outside of the home difficult" in the NHTS questionnaire. Sixty-five percent of people with disabilities did not record a trip on their assigned travel day. Those who traveled outside the home are mobile, taking a similar number of trips per day as the average respondent in LA County. But, these trips are shorter in trip length and longer in duration. This increased duration is likely due to a combination of relying on slower moving modes (walking and public transit) and physical ability. People with disabilities take fewer trips for employment outside of the home and a more significant percentage of trips for healthcare and shopping/errand-related activities. People with disabilities take public transportation in sizable shares, which increases for shopping and healthcare-related trips. Walking trips represent a larger share of trips than public transportation or paratransit services combined.

There are considerable racial and ethnic differences. Black people with disabilities take longer trips (nearly 9 miles on average). White, Asian, and other racialized people with disabilities take the shortest trips. We hypothesize that these racial differences may be attributable to differences in where people live. Given residential segregation patterns in LA, It's likely that healthcare appointments and shopping for household-related travel are destinations located further away from Black people with disabilities homes. Finally, no information about disability status or wheelchair usage is provided in the collision data, and therefore, we have no information on collision incidents for this profile.

Key travel metrics	
Avg. number of trips per day	3.8 trips
Avg. number of miles traveled per day	20.4 miles
Avg. trip length	6.5 miles
Avg. trip duration	27.8 minutes
Trips by primary purpose	
Work	4%
School/daycare/religious	3%
Healthcare	6%
Shopping/errands	59%
Social/recreational	8%
Transport someone	7%
Meals	11%
Something else	1%
Trips by mode	
Drive	70.8%
Walk	16.7%
Public transit	9.8%
Bike	0.4%
Taxi/TNC	0.3%
Paratransit	0.8%
Motorcycle	1.1%
Other	16.7%

Table 18: Travel metrics, people with disabilities

	Shopping / Errands	Commute	Healthcare
Drive	69.6%	87.0%	55.7%
Walk	16.8%	8.4%	3.3%
Public transit	11.0%	4.6%	36.0%
Bike	0.4%	0.0%	0.0%
Taxi/TNC	0.5%	0.0%	0.4%
Paratransit	0.8%	0.0%	4.7%
Motorcycle	0.9%	0.0%	0.0%
Other	16.8%	8.4%	3.3%

Table 19: Travel mode across all trips and selected purposes, people with disabilities

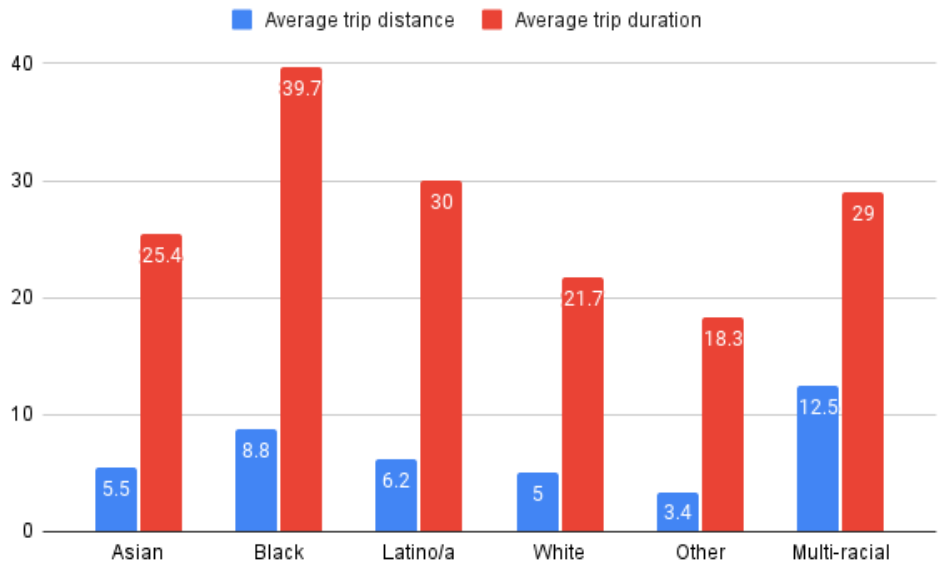

Figure 5: Travel metrics by race/ethnicity, people with disabilities

Lower-income older adults

The people in this section are over 65 years old and live in households with annual household incomes of $50,000 or less. Similar to people with disabilities, there is a bifurcation of travel patterns among lower-income older adults. Roughly half (45%) of the low-income older adults in the sample did not make a trip on their assigned travel day. The other half of people in the sample are very mobile, taking similar trip rates to everyone else in LA County at four trips per day. These trips are taken across a smaller range than most, with the average trip length at six miles and 20 miles per day. Over 75% of trips are taken for shopping and errands (66%) or social/recreational purposes (10%). In terms of modes, while most of these trips are taken by car, lower-income older adults take high proportions of their trips by foot (20%) and by public transit (8%). There is some variation in modes by purpose; public transit is used more for healthcare-related trips (16%), while shopping and errand-related trips are taken slightly more by foot (22%).

Travel patterns for lower-income older adults vary by race/ethnicity, with white, Asian, and other respondents taking the shortest mileage trips. While white and Asian respondents have similar average trip distances, Asian trips are five minutes longer on average. Latino respondents are experiencing very long trip distances (7.8 miles), and resultantly, these trips take over 30 minutes on average.

Key travel metrics	
Avg. number of trips per day	4.0 trips
Avg. number of miles traveled per day	19.7 miles
Avg. trip length	5.9 miles
Avg. trip duration	27.1 minutes
Trips by primary purpose	
Work	3%
School/daycare/religious	3%
Healthcare	3%
Shopping/errands	66%
Social/recreational	10%
Transport someone	5%
Meals	9%
Something else	1%
Trips by mode	
Drive	68%
Walk	20%
Public transit	8%
Bike	1%
Taxi/TNC	1%
Paratransit	1%
Motorcycle	0%
Other	1%

Table 20: Travel metrics, lower-income older adults

	Shopping / Errands	Commute	Healthcare
Drive	64.8%	83.9%	76.5%
Walk	22.0%	6.9%	0.0%
Public transit	7.8%	9.3%	15.8%
Bike	1.5%	0.0%	0.6%
Taxi/TNC	2.1%	0.0%	0.6%
Paratransit	0.8%	0.0%	6.6%
Motorcycle	0.0%	0.0%	0.0%
Other	1.0%	0.0%	0.0%

Table 21: Travel mode across all trips and selected purposes, lower-income older adults

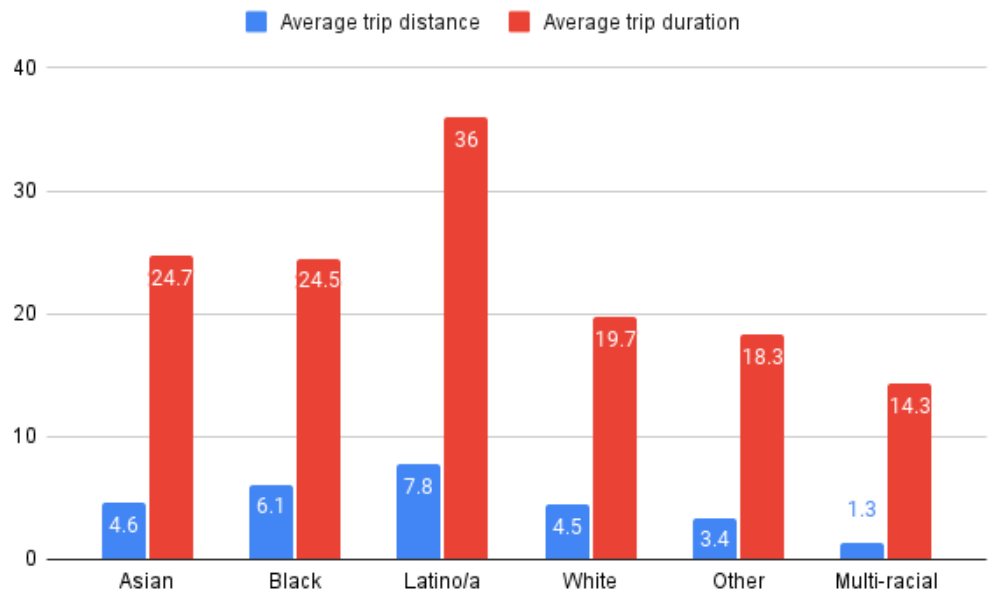

Figure 6: Travel metrics by race/ethnicity, lower-income older adults

Traffic collision victim analysis

The collision data only represent older adults since income-related information is not collected. On average, 130 older adults die in traffic collisions per year and the number of fatal older adult victims rose throughout the time analyzed. The number of injured older adult traffic collision victims also increased from 2013-2017. A majority of older adult traffic collision victims were walking when they were killed. In contrast, most older adults who were injured in traffic collisions were in a car. In priority population areas, a statistically significant proportion of the older adult traffic collision victims were walking. Comparatively, a higher proportion of older victims were in a car outside of priority population areas.

	Fatality	Injury	No Injury	Total
2013	114	6,761	2,580	9,455
2014	123	7,119	2,624	9,866
2015	117	7,845	2,987	10,949
2016	151	8,718	3,495	12,364
2017	144	9,214	2,132	11,490
	649	**39,657**	**13,818**	**54,124**

Table 22: Number of traffic collision victims per year, older adults

	Fatality		Injury		No Injury		Total	
Walk	348	54.5%	3,548	9.4%	2	0.0%	3,898	7.6%
Bike	28	4.4%	955	2.5%	29	0.2%	1,012	2.0%
Car	236	36.9%	31,999	84.6%	11,554	88.5%	43,789	85.0%
Motorcycle	24	3.8%	588	1.6%	47	0.4%	659	1.3%
Other	3	0.5%	729	1.9%	1,420	10.9%	2,152	4.2%
	639		**37,819**		**13,052**		**51,510**	

Table 23: Number of traffic collision victims by mode, older adults

	Priority population areas		Non-priority areas	
Walk	**1,896**	8.7%	**2,002**	6.7%
Bike	447	2.0%	565	1.9%
Car	**18,025**	82.5%	**25,764**	86.9%
Motorcycle	**227**	1.0%	**432**	1.5%
Other	**1,251**	5.7%	**901**	3.0%
	21,846		**29,664**	

Table 24: Number of traffic collision victims by mode and geography, older adults

Bolded values in table 29 represent statistically significant differences in the column proportions between the two groups using a z-test at the .05 level.

People living in families in poverty

The people in this group live in households with other people they are related to and where the household income is under the federal poverty guidelines for a family of that size. Federal poverty guidelines are not adjusted for regional cost of living. Therefore, the households in this group likely have very high levels of financial precarity given the high cost of living in LA County. People living in families in poverty take shorter trips and travel fewer miles per day than LA County as a whole. Still, the trip distribution by purpose is relatively similar to patterns in the County. Travel modes for families in poverty are distinct. While most trips are taken by car, the percentage of trips by car is lower (65%). The walking mode split is very high with one in four trips are taken by foot. The use of public transportation at 8% of trips is twice as high as LA County averages. The mode used by purpose varies; cars are used the most for commute trips, walking rates are higher for shopping trips, and people use public transit at much higher rates for healthcare-related trips. Trip patterns also vary by race/ethnicity as Latino/a and Black people in families in poverty take shorter mileage and longer duration trips than their white and Asian counterparts.

Key travel metrics	
Avg. number of trips per day	3.8 trips
Avg. number of miles traveled per day	19.0 miles
Avg. trip length	5.8 miles
Avg. trip duration	27.3 minutes
Trips by primary purpose	
Work	10%
School/daycare/religious	8%
Healthcare	2%
Shopping/errands	54%
Social/recreational	8%
Transport someone	11%
Meals	7%
Something else	1%
Trips by mode	
Drive	65%
Walk	25%
Public transit	8%
Bike	0.6%
Taxi/TNC	0.7%
Paratransit	0%
Motorcycle	0%
Other	0.3%

Table 25: Travel metrics, people living in families in poverty

	Shopping / Errands	Commute	Healthcare
Drive	63.1%	86.6%	48.8%
Walk	27.0%	6.8%	13.6%
Public transit	7.8%	5.1%	37.6%
Bike	0.6%	0.0%	0.0%
Taxi/TNC	1.1%	1.5%	0.0%
Paratransit	0.0%	0.0%	0.0%
Motorcycle	0.0%	0.0%	0.0%
Other	0.4%	0.0%	0.0%

Table 26: Travel mode for selected purposes, people living in families in poverty

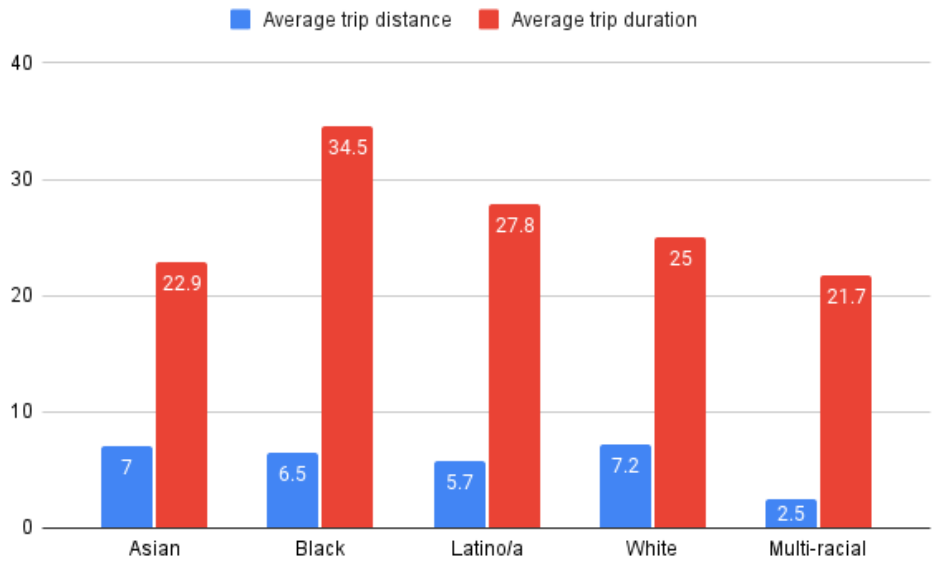

Figure 7: Travel metrics by race/ethnicity, people living in families in poverty

Priority Populations Areas

For people living in priority population areas, trips are 7.5 miles on average, shorter than LA County as a whole, with an average trip duration of 29 minutes, or slightly longer than LA County. Three-quarters of these trips are taken by car, 17% by walking, and six percent by public transit. Walking rates are higher and driving rates are lower for shopping and errand-related trips. Driving use is most common for commute trips, and public transit rates increase four-fold to 26% for healthcare-related trips.

Average trip distances and trip duration vary substantially by race/ethnicity. White people living in these census tracts take the shortest distance and duration trips. Asian people have the longest length trips, but the average time spent for each trip is similar to the average trip duration for Black and Latino/a residents. These racial/ethnic differences demonstrate distinct differences in average travel speed within this group. White people have the fastest average travel speeds at 18 mph, followed by Asian people at 17.8 mph. Black and Latino/a people have considerably lower travel speeds at 15.1 mph for Latino/a people and 14.5 mph for Black people.

Key travel metrics	
Avg. number of trips per day	3.9 trips
Avg. number of miles traveled per day	24.1 miles
Avg. trip length	7.5 miles
Avg. trip duration	29.1 minutes
Trips by primary purpose	
Work	14%
School/daycare/religious	6%
Healthcare	2%
Shopping/errands	52%
Social/recreational	10%
Transport someone	8%
Meals	8%
Something else	0%
Trips by mode	
Drive	74%
Walk	17%
Public transit	6%
Bike	0.8%
Taxi/TNC	0.9%
Paratransit	0.2%
Motorcycle	0.3%
Other	0.2%

Table 27: Travel metrics, priority populations

	Shopping / Errands	Commute	Healthcare
Drive	72.8%	82.5%	61.8%
Walk	18.7%	8.7%	9.7%
Public transit	6.7%	6.0%	26.2%
Bike	0.5%	0.6%	0.0%
Taxi/TNC	0.7%	1.7%	0.0%
Paratransit	0.1%	0.0%	2.3%
Motorcycle	0.3%	0.4%	0.0%
Other	0.2%	0.0%	0.0%

Table 28: Travel modes across select purposes, priority populations

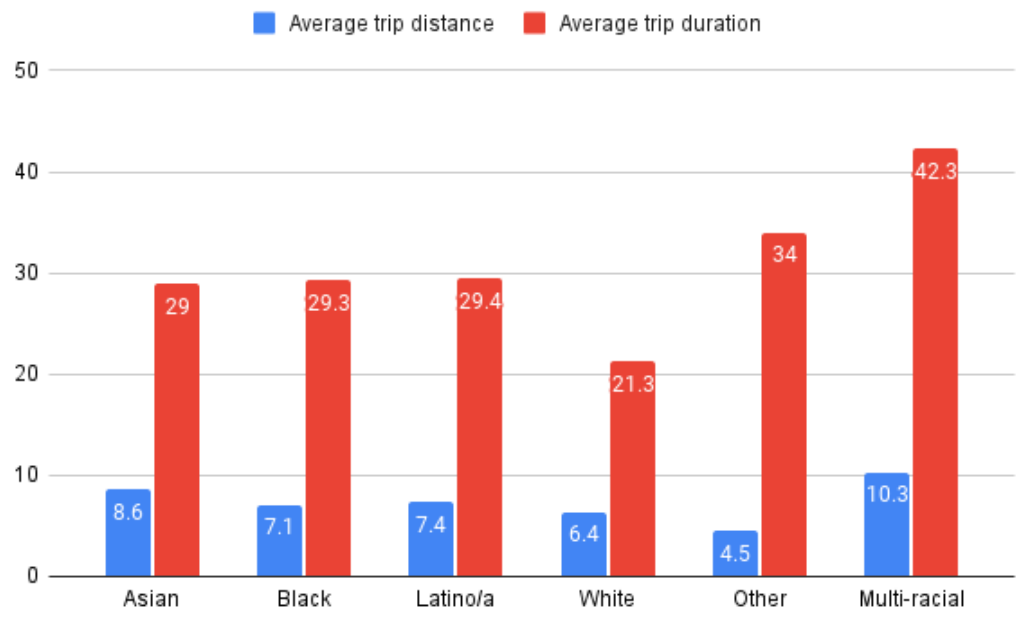

Figure 8: Travel metrics by race/ethnicity, priority populations

Traffic collision victim analysis

Over 300 deaths from traffic collisions per year occurred within the priority population areas, and fatalities rose during the 5-year analysis period. Injuries from traffic collisions also increased during this time. The most deaths from traffic collisions were among people walking, representing over 40% of all fatalities. In contrast, 17% of trips were taken by walking for people living in these communities. Between 2013 and 2017, more people died while walking than while driving in priority population communities within LA County. At least 14% of fatal victims were Black, and 45% were Latino/a. Black victims are the only group who are overrepresented in fatal collisions in priority population communities.

	Fatality	Injury	No Injury	Total
2013	275	33,973	11,981	46,229
2014	288	33,385	11,825	45,498
2015	301	37,127	12,459	49,887
2016	357	41,293	13,673	55,323
2017	341	41,702	7,278	49,321
	1,562	**187,480**	**57,216**	**246,258**

Table 29: Number of traffic collision victims by year, people living in priority population areas

	Fatality		Injury		No Injury		Total	
Walk	654	42.1%	14,153	7.8%	3	0.0%	14,810	6.2%
Bike	98	6.3%	10,253	5.7%	90	0.2%	10,441	4.4%
Car	570	36.7%	145,636	80.5%	51,651	94.0%	197,857	83.4%
Motorcycle	223	14.3%	8,117	4.5%	160	0.3%	8,500	3.6%
Other	10	0.6%	2,734	1.5%	3,016	5.5%	5,760	2.4%
	1,555		**180,893**		**54,920**		**237,368**	

Table 30: Number of traffic collision victims by mode, people living in priority population areas

	Fatality			Injury			No Injury		
		Valid %	Total %		Valid %	Total %		Valid %	Total %
Asian	63	5.2%	4.0%	7089	6.4%	3.8%	32	7.4%	0.1%
Black	217	17.8%	13.9%	18,057	16.3%	9.6%	49	11.3%	0.1%
Latino/a	702	57.6%	44.9%	60,941	55.1%	32.5%	229	53.0%	0.4%
Other	53	4.4%	3.4%	7,224	6.5%	3.9%	32	7.4%	0.1%
White	183	15.0%	11.7%	17,344	15.7%	9.3%	90	20.8%	0.2%
No race recorded	344		22.0%	76,825		41.0%	56,784		99.2%
Total (valid)	1,218		78.0%	110,655		59.0%	432		0.8%
Total (all)	**1,562**			**187,480**			**57,216**		

Table 31: Number of traffic collision victims by race/ethnicity, people living in priority population areas

	Fatality	Valid %	Total %	Injury	Valid %	Total %
Adult women (18-64)						
Asian	9	4.4%	3.1%	3,171	7.2%	4.3%
Black	49	23.9%	16.7%	8,166	18.5%	11.1%
Latina	116	56.6%	39.6%	23,480	53.2%	31.8%
Other	4	2.0%	1.4%	2,727	6.2%	3.7%
White	27	13.2%	9.2%	6,572	14.9%	8.9%
No race	88		30.0%	29,695		40.2%
Total (valid)	205			44,116		
Total (all)	293			73,811		
Adult men (18-64)						
Asian	21	2.8%	2.3%	2,935	5.4%	3.9%
Black	125	16.4%	13.5%	7,898	14.5%	10.6%
Latino	466	61.1%	50.4%	31,041	57.2%	41.5%
Other	40	5.2%	4.3%	3,741	6.9%	5.0%
White	111	14.5%	12.0%	8,695	16.0%	11.6%
No race	161		17.4%	20,415		27.3%
Total (valid)	763			54,310		
Total (all)	924			74,725		
Older adults (65+)						
Asian	33	16.1%	12.6%	892	12.1%	5.5%
Black	31	15.1%	11.9%	1267	17.2%	7.8%
Latino/a	92	44.9%	35.2%	2753	37.3%	17.0%
Other	8	3.9%	3.1%	621	8.4%	3.8%
White	41	20.0%	15.7%	1854	25.1%	11.5%
No race	56		21.5%	8760		54.3%
Total (valid)	205			7387		
Total (all)	261			16147		
Youth (Under 18)						
Asian	0	0.0%	0.0%	91	1.9%	0.5%
Black	12	26.7%	14.8%	724	15.0%	3.7%
Latino/a	28	62.2%	34.6%	3661	75.8%	18.9%
Other	1	2.2%	1.2%	135	2.8%	0.7%
White	4	8.9%	4.9%	222	4.6%	1.1%
No race	36		44.4%	14500		75.0%
Total (valid)	45			4833		
Total (all)	81			19333		

Table 32: Traffic collision victims by age and race, people living in priority population areas

LA County

This section presents information on all the people included in the Los Angeles County sample. On average, people take four trips a day, and half of these trips are for shopping or errand-related purposes. Commute trips compose 14% of all trips, and social or recreational trips are nearly as common as commute trips representing 11% of all trips. Driving is the most common mode of travel, and most people commute by car. Walking trips are the next most common, representing 14% of all trips, followed by public transit at 4% of trips. For healthcare-related trips, we find that public transit usage increases and driving declines.

We find variations in the average trip length and duration by race/ethnicity, with multi-racial, white, and Latino people having the longest average trip lengths. Multi-racial and Latino people also have the longest average trip duration. Black people have some of the shorter average trip lengths but longer average trip duration. White and Asian people have the shortest average trip durations.

Key travel metrics	
Avg. number of trips per day	4.0 trips
Avg. number of miles traveled per day	27.4 miles
Avg. trip length	8.3 miles
Avg. trip duration	27.4 minutes
Trips by primary purpose	
Work	14%
School/daycare/religious	5%
Healthcare	1%
Shopping/errands	50%
Social/recreational	11%
Transport someone	9%
Meals	8%
Something else	0%
Trips by mode	
Drive	80%
Walk	14%
Public transit	4%
Bike	1%
Taxi/TNC	1%
Paratransit	0.1%
Motorcycle	0.3%
Other	0.4%

Table 33: Travel metrics, Los Angeles County

	Shopping / Errands	Commute	Healthcare
Drive	79.4%	83.7%	76.3%
Walk	14.4%	9.0%	8.4%
Public transit	4.0%	4.2%	13.6%
Bike	1.0%	1.2%	0.1%
Taxi/TNC	0.6%	1.1%	0.1%
Paratransit	0.1%	0.0%	1.5%
Motorcycle	0.2%	0.4%	0.0%
Other	0.3%	0.4%	0.0%

Table 34: Travel modes selected trip purposes, LA County

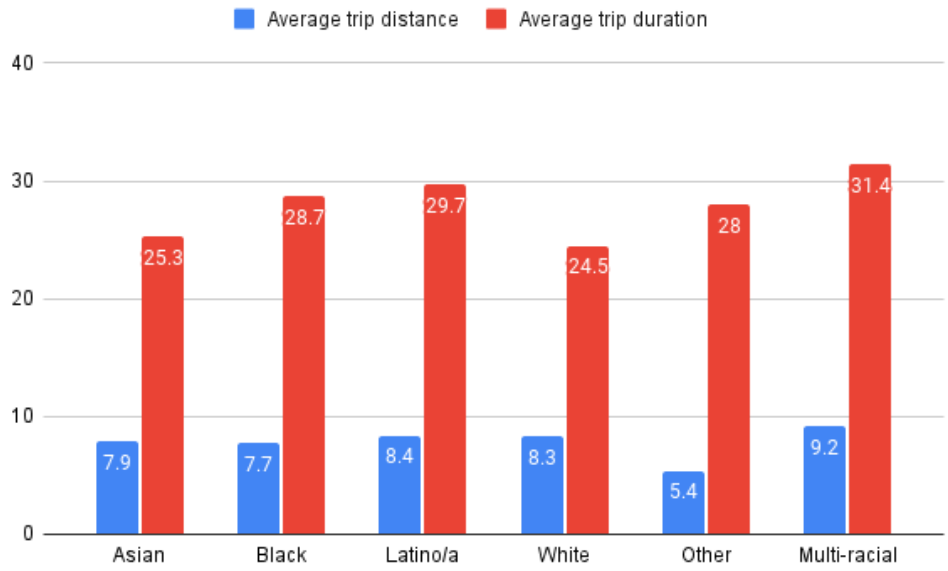

Figure 9: Travel metrics by race/ethnicity, Los Angeles County

Traffic collision victim analysis

On average, 708 people died, and over 82,000 people were injured in traffic collisions annually. The number of people killed and injured rose each year during this period. Of the people killed, 42% of victims were in a vehicle, and 35% were walking at the time of their deaths. In contrast, most people injured in traffic collisions are in cars. But also, the percent of people involved in crashes who were not injured were in vehicles. These trends highlight the dangers people face while walking in Los Angeles County. In terms of race/ethnicity, Black people make up 13% of all fatal victims, a higher representation than their population in Los Angeles County.

When examining race and age, we find that Black adult women are more overrepresented in fatal victims than Black adult men. Asian victims make up 14% of fatalities among older adults, and Black and Latino victims represent larger shares of fatal youth victims. These findings highlight how the relationships between race and ethnicity and traffic violence vary by age.

	Fatality	Injury	No Injury	Total
2013	630	73,123	24,224	97,977
2014	644	75,039	24,420	100,103
2015	661	81,777	25,931	108,369
2016	847	90,621	28,874	120,342
2017	758	91,262	15,295	107,315
	3540	**411,822**	**118,744**	**534,106**

Table 35: Number of traffic collision victims by year, LA County

	Fatality		Injury		No Injury		Total	
Walk	1,211	34.6%	26,828	6.8%	4	0.0%	28,043	5.5%
Bike	172	4.9%	20,473	5.2%	159	0.1%	20,804	4.1%
Car	1,480	42.2%	324,244	81.8%	107,808	94.9%	433,532	84.4%
Motorcycle	625	17.8%	19,706	5.0%	351	0.3%	20,682	4.0%
Other	17	0.5%	5224	1.3%	5,305	4.7%	10,546	2.1%
	3,505		**396,475**		**113,627**		**513,607**	

Table 36: Traffic collision victims by mode, LA County

	Fatality	Valid %	Total %	Injury	Valid %	Total %	No Injury	Valid %	Total %
Asian	157	5.8%	4.4%	18,513	7.4%	4.5%	88	9.1%	0.1%
Black	356	13.1%	10.1%	33,306	13.3%	8.1%	95	9.9%	0.1%
Hispanic	1,243	45.9%	35.1%	111,429	44.4%	27.1%	412	42.8%	0.3%
Other	160	5.9%	4.5%	22,041	8.8%	5.4%	94	9.8%	0.1%
White	794	29.3%	22.4%	65,895	26.2%	16.0%	274	28.5%	0.2%
No race	830		23.4%	160,638	64.0%	39.0%	117,781		99.2%
Total (valid)	2,710			251,184			963		
Total (all)	**3,540**			**411,822**			**118,744**		

Table 37: Traffic collision victims by race/ethnicity, Los Angeles County

	Fatality	Valid %	Total %	Injury	Valid %	Total %
Adult women (18-64)						
Asian	21	5.1%	3.3%	8,399	8.3%	5.2%
Black	82	19.8%	12.8%	14,940	14.8%	9.2%
Latina	198	47.8%	30.9%	43,602	43.2%	26.8%
Other	11	2.7%	1.7%	8,572	8.5%	5.3%
White	102	24.6%	15.9%	25,531	25.3%	15.7%
No race	226		35.3%	61,910		38.0%
Total (valid)	414			101,044		
Total (all)	640			162,954		
Adult men (18-64)						
Asian	63	3.6%	3.0%	7385	6.1%	4.5%
Black	210	12.1%	10.1%	14862	12.3%	9.1%
Latino	865	49.9%	41.6%	57044	47.3%	35.0%
Other	105	6.1%	5.0%	10897	9.0%	6.7%
White	489	28.2%	23.5%	30297	25.1%	18.6%
No race	348		16.7%	42547		26.1%
Total (valid)	1,732			120485		
Total (all)	2,080			163032		
Older adults (65+)						
Asian	72	14.8%	11.1%	2315	11.6%	5.8%
Black	50	10.2%	7.7%	2220	11.1%	5.6%
Latino/a	139	28.5%	21.4%	5046	25.2%	12.7%
Other	38	7.8%	5.9%	2017	10.1%	5.1%
White	189	38.7%	29.1%	8435	42.1%	21.3%
No race	161		24.8%	19624		49.5%
Total (valid)	488			20033		
Total (all)	649			39657		
Youth (Under 18)						
Asian	1	1.3%	0.6%	412	4.3%	1.1%
Black	14	18.4%	8.5%	1280	13.3%	3.3%
Latino/a	41	53.9%	24.8%	5723	59.6%	14.8%
Other	6	7.9%	3.6%	554	5.8%	1.4%
White	14	18.4%	8.5%	1629	17.0%	4.2%
No race	89		53.9%	29134		75.2%
Total (valid)	76			9598		
Total (all)	165			38732		

Table 38: Traffic collision victims by age, gender, and race/ethnicity, Los Angeles County

Chapter 4: Group comparison analysis

Building on the travel profiles, this section presents information from these profiles in comparison in three ways. First, we compare differences and similarities across these groups for the travel metrics. Second, we test for significant differences between the individuals in our groups and their more advantaged counterparts. Last, we compare the incidences of collision victims by race, age, and geography.

Travel Metrics and modes

Figure 10 compares the average number of trips per day, and the average number of miles traveled per day for focus and LA County groups. Women of color are the only group that traveled more miles per day on average than LA County. There was a minor variation in the average number of trips per day than miles per day. Youth of color, low-income older adults, and individuals living in families in poverty all traveled the least amount of miles per day.

Figure 11 compares the average trip distance and duration (in miles and minutes) by each group. Women of color are taking farther trips on average than any other group and LA county as a whole. Each trip, on average, is also three minutes longer than the county average. Youth of color, low-income older adults, and people living in families in poverty all travel far less on average for each trip. We use the average trip distance and duration to calculate the average travel speed for each group and LA county. People living in families in poverty experience the lowest travel speeds. While we did not model these results, we hypothesize that this is due to a high reliance on walking as a primary mode of travel for these people living in very low-income households. People living in families in poverty, low-income older adults, and youth of color experienced the lowest average travel speeds.

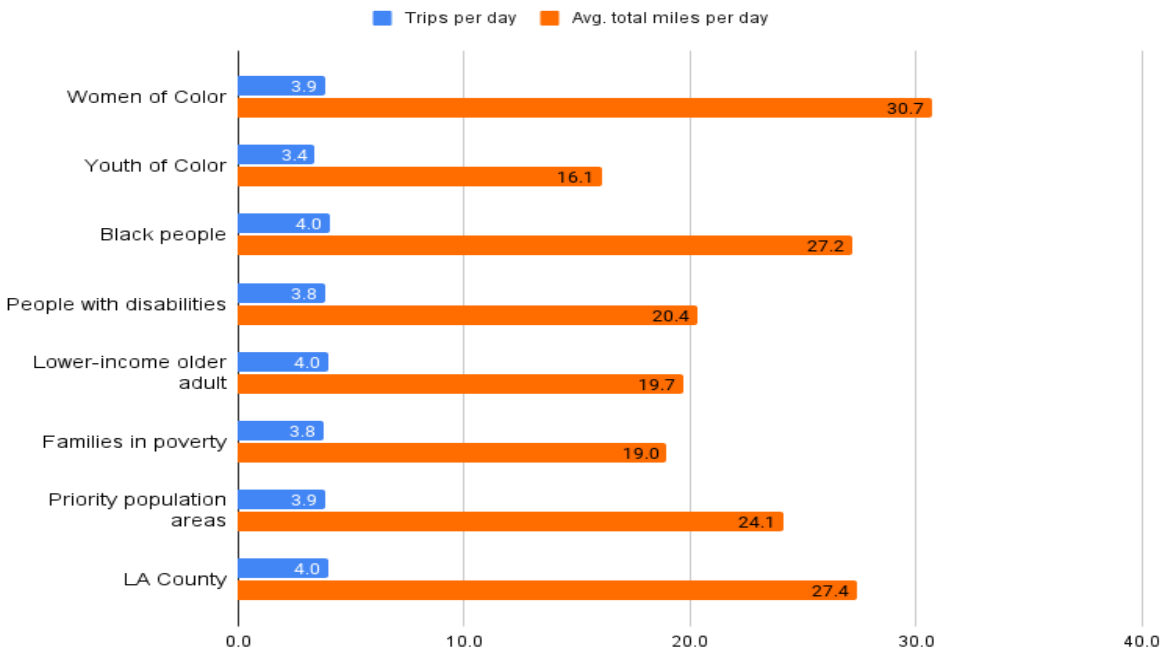

Figure 10: Average number of trips and average number of miles traveled per day by group

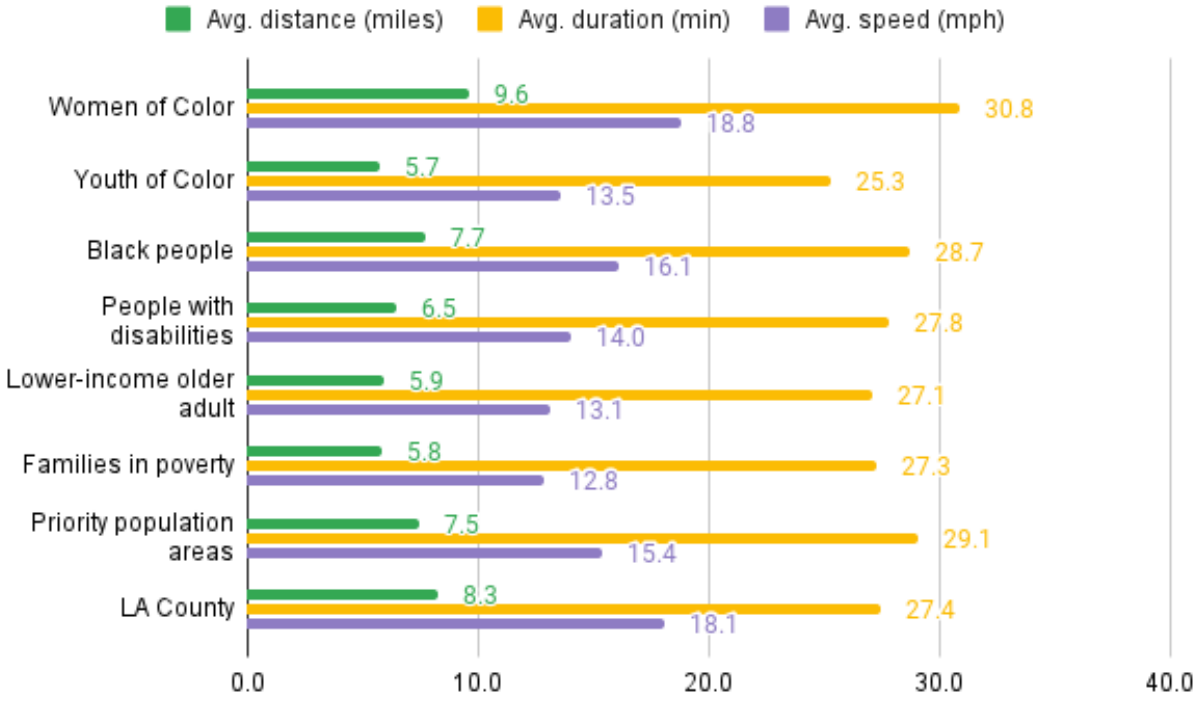

Figure 11: Average miles per trip and average trip duration in minutes per group

Figure 12 displays the percentage of trips by mode. This figure highlights several differences between these groups and LA County overall trends. These differences include:

- They are using public transit at and above County averages. People with disabilities, low-income older adults of all races, and people living in families in poverty are two times more likely to take transit than the average person in LA County.
- They are walking more on average for transportation purposes. There is a strong connection between household income and walking rates. People living in families in poverty have the highest modal share of walking trips (25%), followed by low-income older adults (20%). Women of color and Black people walked less on average than those in LA County.
- Driving less, except for women of color who use cars slightly more than the LA county average (82% vs. 80% respectively.)

The increased use of public transit and walking among the groups likely contribute to the lower overall travel speeds.

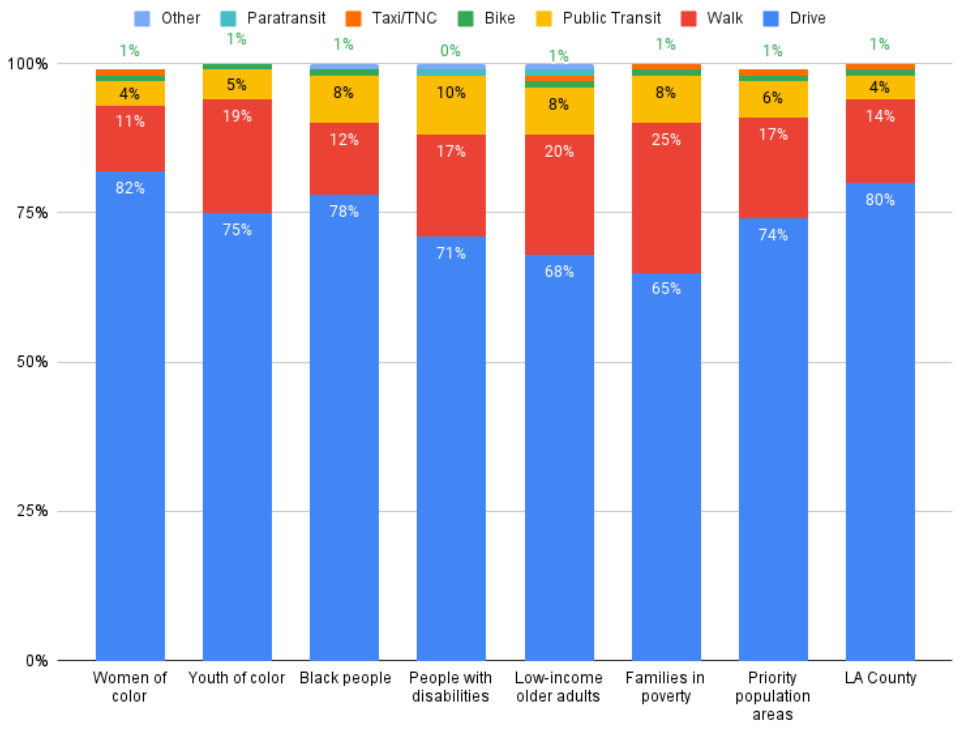

Figure 12: Percentage of trips by mode of travel for groups and LA County.

Comparing travel metrics between vulnerable groups and their advantaged peers

We wanted to more directly compare the travel metrics between independent groups of people rather than comparing to LA County (which they are a part of). This portion of our analysis compares three travel metrics - number of trips per day, average miles per trip, and average minutes per trip - between groups and their advantaged peers. We use t-tests to test whether there are significant differences between the groups in these metrics.

Group	Advantaged comparison group
Women of color	White women
Lower-income older adults	Higher-income older adults
People with disabilities	People without disabilities
Black people	Non-Black people
People living in priority population areas	People living in non-priority population areas

Table 39: Selected groups and comparison advantaged peer groups

Table 48 on the following pages presents the findings from this analysis. Every group had significantly different values than their comparison group in all three metrics. While there are significant differences in the number of trips per day, the extent of this difference is relatively minor. Most groups took a half to a quarter fewer trips per day than their comparison group. Black people were the only group who took significantly more trips than their non-Black peers; however, the mean difference was less than a tenth of a trip per day.

The differences between the groups and their comparison groups begin to grow larger when examining differences in trip distance. All of the groups took significantly shorter trips than their peers. For people with disabilities and low-income older adults, their trips, on average, are nearly two miles shorter than their comparison peers. People in priority population areas take trips that are 1.2 miles shorter than those outside of these communities.

Finally, all groups take longer duration trips than their comparison groups. This difference is most significant between women of color and white women, with women of color trips taking 4 minutes longer on average. The magnitude of the duration differences is smallest between people with disabilities and people without disabilities. However, while the duration is relatively similar, the distance is not. The average trip length for people with disabilities is nearly two miles shorter than their non-disabled peers. Still, on average, each trip takes 20 seconds longer for people with disabilities.

This analysis demonstrates two key patterns:

1. The groups in this study take fewer trips per day than their advantaged peers, but the magnitude of this difference is relatively minor.
2. The groups in this study take significantly shorter trips than their advantaged peers. However, these trips take significantly longer on average. Because of this trend, these people likely suffer from time poverty. In this concept, people do not have enough discretionary time to engage in activities beyond activities that meet their basic needs (Kalenkoski & Hamrick, 2014).

	N (weighted trips)	Mean (SD)	t	p-value	Mean difference
Trips per day					
Women of color	1,996,138	3.86 (2.18)	-179.27	0	-0.49
White women	1,096,805	4.35 (2.5)			
Black people	585,330	4.04 (2.1)	8.52	0	0.03
Non-Black people	6,974,370	4.01 (2.35)			
People with disabilities	368,246	3.83 (2.5)	-48.13	0	-0.19
People without disabilities	7,206,109	4.02 (2.32)			
Lower-income older adults	474,788	4.02 (2.06)	-43.51	0	-0.2
Higher-income older adults	440,358	4.22 (2.34)			
People in priority population areas	2,733,664	3.88 (2.25)	-119.69	0	-0.21
People outside of priority population areas	4,840,690	4.09 (2.38)			
Average miles per trip					
Women of color	1,996,138	9.64 (10.94)	-7.73	0	-0.11
White women	1,096,805	9.75 (12.4)			
Black people	585,330	7.71 (7.54)	-40.31	0	-0.62
Non-Black people	6,974,370	8.33 (11.6)			
People with disabilities	368,246	6.48 (10.8)	-98.55	0	-1.89
People without disabilities	7,206,109	8.36 (11.34)			
Lower-income older adults	474,788	5.93 (11.1)	-78.95	0	-1.86
Higher-income older adults	440,358	7.79 (11.49)			
People in priority population areas	2,733,664	7.47 (11.05)	-147.6	0	-1.26
People outside of priority population areas	4,840,690	8.73 (11.46)			

Table 40: Peer group comparison across travel metrics

	N (weighted trips)	Mean (SD)	t	p-value	Mean difference
Average minutes per trip					
Women of color	1,996,138	30.82 (31.7)	124.7	0	4.17
White women	1,096,805	26.66 (19.93)			
Black people	585,330	28.68 (20.02)	32.41	0	1.34
Non-Black people	6,974,370	27.34 (31.16)			
People with disabilities	368,246	27.78 (21.91)	6.96	0	0.35
People without disabilities	7,206,109	27.42 (30.8)			
Lower-income older adults	474,788	27.1 (31.71)	20.99	0	1.26
Higher-income older adults	440,358	25.84 (25.05)			
People in priority population areas	2,733,664	29.1 (32.05)	113.5	0	2.6
People outside of priority population areas	4,840,690	26.49 (29.42)			

Table 4041: Peer group comparison across travel metrics (continued)

Collision Comparisons by Race/Ethnicity, Geography and Severity

This section compares the percentage of victims of traffic collisions with those groups' representation in the LA County population by race/ethnicity, transportation mode, and geography. Figure 13 and Table 41 display the percentage and number of all victims and fatal victims by race/ethnicity. Black victims and victims of other races/ethnicities are the most overrepresented in fatal and all victims. Black people are 1.6 times more likely to be victims of traffic collisions than their county population. White (non-Latino) fatal victims are slightly overrepresented - 29% of fatal victims are white compared to 27% of the LA county population.

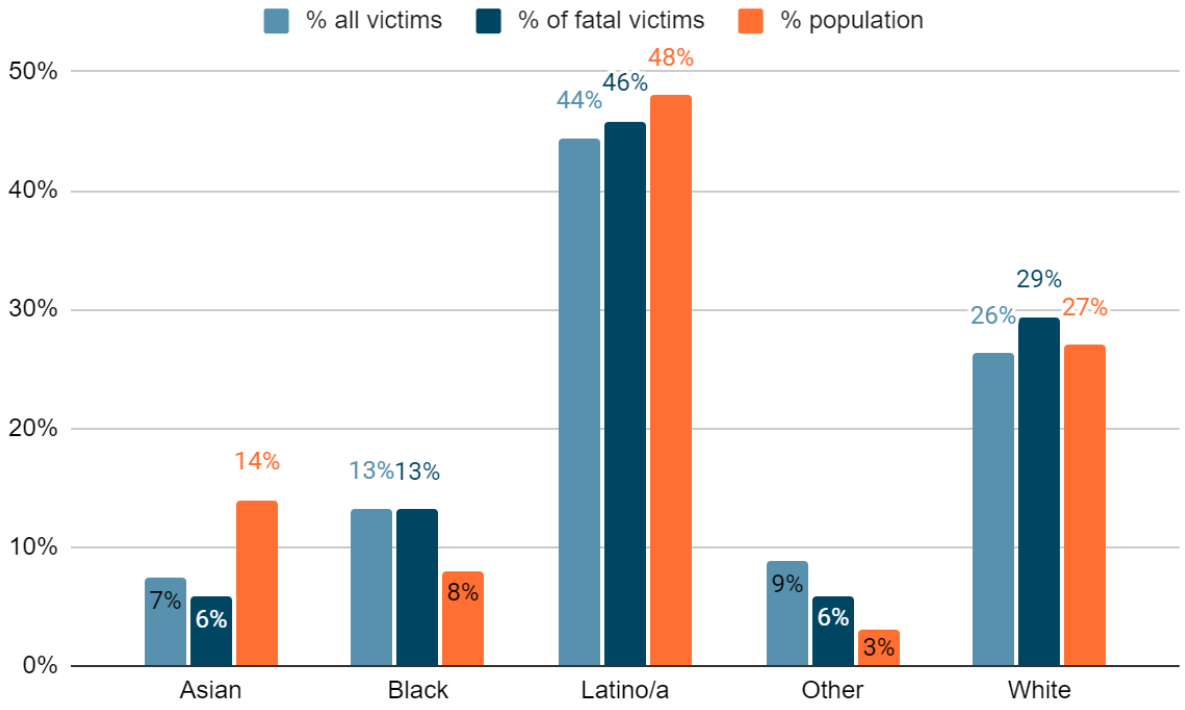

Figure 13: Percent of all victims and fatal collision victims by race/ethnicity

Table 41 repeats some LA County collision profile information and adds information about the breakdown relative to the County population. Black and victims of other races/ethnicities are over-represented in the victims by every mode. Latino/a victims are over-represented as victims while walking or biking. White victims are only over-represented in terms of victims riding a motorcycle and "other" modes. While this work did not estimate the percentage of miles traveled for these individual racial groups, other related work finds how racial disparities in fatal collisions tend to be greater than differences in modal use. Using national U.S. data from 2019, previous research found that Black pedestrians represented 20% of fatalities, while Black people took 12% of walking trips, accounting for 11% of miles traveled nationally (J. Barajas, 2021).

	County population	Walk	Bike	Car	Motorcycle	Other
Asian	14%	5.5%	4.3%	8.1%	4.6%	3.4%
Black	8%	16.9%	13.0%	13.2%	11.1%	17.1%
Latino/a	48%	50.8%	54.1%	43.2%	37.0%	39.3%
Other	3%	5.9%	4.3%	9.7%	7.3%	3.7%
White	27%	20.9%	24.3%	25.9%	39.9%	36.4%

Table 42: Percentage of fatal and injured victims by race/ethnicity and mode

Figure 14 displays the percentage of all fatal victims and those using active transportation modes (walking and cycling) by priority population areas. Forty-six percent of injured victims and forty-four percent of fatal victims are involved in collisions in priority population areas. While these trends mirror the population breakdown, these tracts only comprise 11% of the county land area, highlighting the spatial concentration of injury-resulting and fatal collisions.

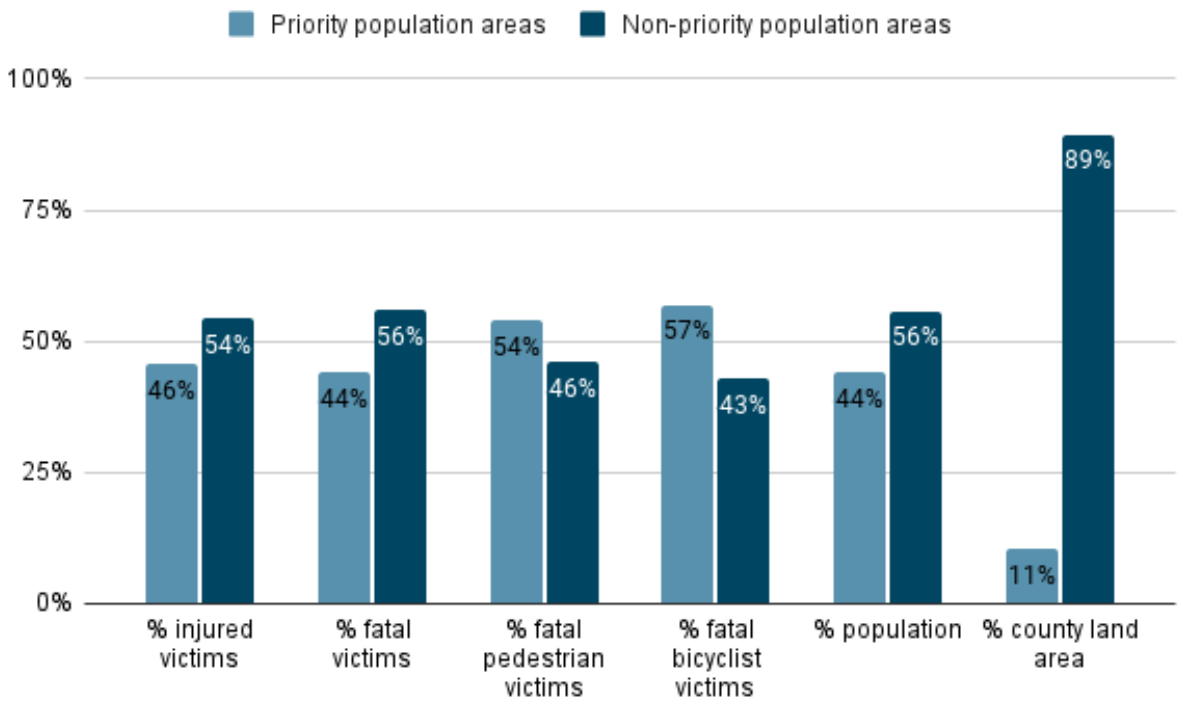

Figure 14: Percentages of fatal victims in priority population areas

Figure 15 displays the numbers of people that died in traffic collisions by mode and race/ethnicity. Over the five years, 1,480 people died while in a vehicle, 1,211 died while walking, 625 people died while using motorcycles, and 172 people died while biking. Black and Latino pedestrians made up nearly one in four fatal victims over this period. More Latino and Black fatal victims were killed while walking than while driving.

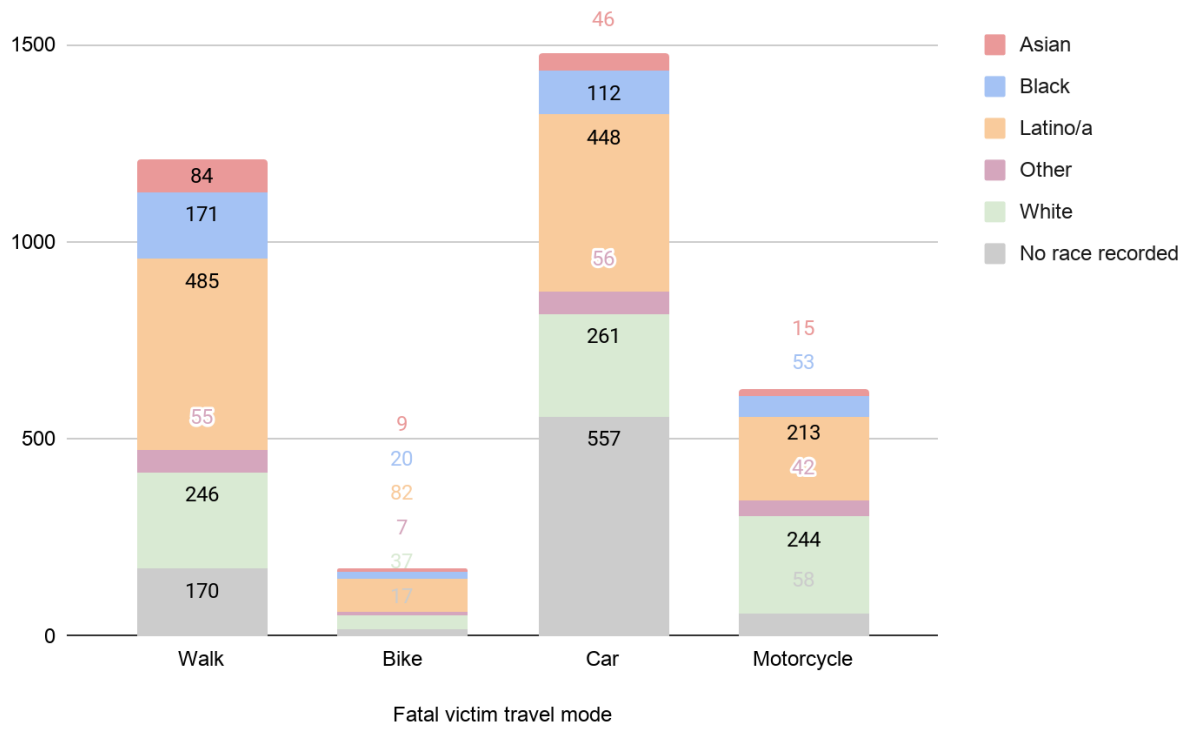

Figure 15: Number of fatal victims by mode and race/ethnicity

Figure 16 and Table 50 display fatal victims by mode and age. Older adults are overrepresented as fatal victims across nearly all modes except for motorcycles. The most significant disparity is in terms of fatal pedestrian victims - older adults make up over a quarter of fatal pedestrian victims while making up 13% of LA county's population. Over 100 more older adults died while walking than traveling in a car over this period.

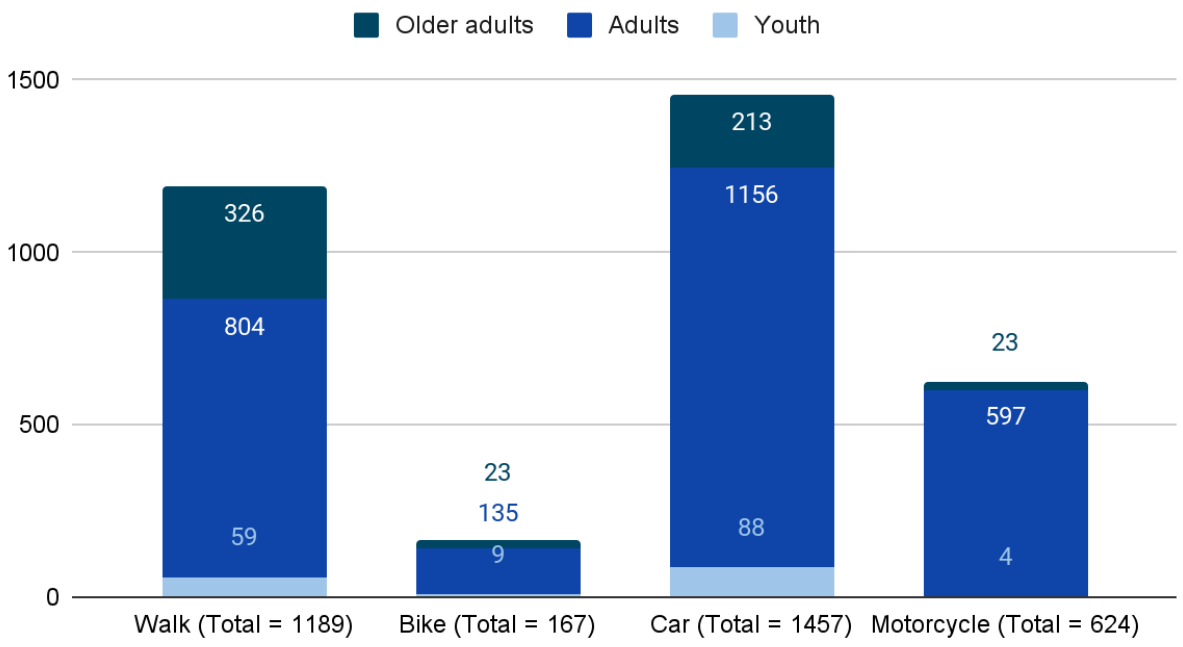

Figure 16: Fatal collision victims by mode and age

	County population	Walk	Bicycle	Car	Motorcycle
Youth	23%	5.0%	5.4%	6.0%	0.6%
Adults	65%	67.6%	80.8%	79.3%	95.7%
Older adults	13%	27.4%	13.8%	14.6%	3.7%

Table 43: Fatal victims by age and mode compared to LA County population

Chapter 5: Findings, Solutions, and Recommendations

Key Findings

- People with less advantage because of their race, gender, income, ability, and geography face transportation disparities in two main ways: being more reliant on transportation modes other than cars and a higher risk of being injured or killed while traveling.
- Women of color, Black people, low-income older adults, and people with disabilities have increased reliance on public transportation and travel long distances. These trends mean that trips take longer for these groups, contributing to having less time available in the day. In the most extreme cases, this trend may even lead to time poverty, where these people have little ability to meet more than their basic needs.
- Within priority population areas, transportation patterns are distinct from non-priority areas, especially walking and public transit use. Travel behavior for households living in these areas is not homogenous. We find distinctly shorter average trip distances and average trip durations for white people than other race/ethnic groups within the priority areas.
- Traffic collisions in LA County represent a large number of unintentional deaths and injuries. The burden of these losses falls disproportionately onto Black and Latino/a victims, people in disadvantaged communities, and older adults. People walking face a higher risk than people traveling by other modes, but this risk is not shared equally across race, geography, or age.
- Victims that were walking make up a large share of fatalities (34.5%) from traffic collisions. The disproportionate share of fatal pedestrians is even starker when considering that vehicle miles traveled in cars is 4-5 times greater than in walking miles traveled
- Travel surveys and collision metrics do not fully capture the transportation experience for people of color, low-income families and older adults, women, and people with disabilities. The literature review highlighted how understanding transportation challenges by analyzing these data provides a limited picture of people's experiences, especially regarding personal safety, harassment, discrimination, or police violence. Fears of harassment, discrimination, and violence from armed law enforcement officers affect Black people while traveling in particular.

Proposed Solutions and Recommendations

Make improvements to the transportation system with people's embodied at the center

Analyzing the NHTS demonstrated how Black people, women and youth of color, low-income families and older adults, people with disabilities, and people living in priority population areas travel. This disparity is created through a combination of reasons - where they live relative to where they need to go and their modes to get there. This distinction means often, but not always, taking shorter distance trips that take the same or more extended amounts of time. Part of this is due to the increased use of public transportation. To make public transit times more competitive to other modes, strategies like bus-only lanes along key corridors can help to reduce the time burden for transit riders. Service improvements like increased transit frequency can help to further reduce the time burden of transit trips by reducing the time spent waiting for transit to arrive.

The NHTS analysis also demonstrated how people use transportation as a means to access a variety of opportunities - work, shopping, social activities, recreational opportunities, healthcare, eating, education, and more. Commute trips contributed to less than a quarter of all trips people made. Transportation systems planning and academic research are often hyper-focused on meeting and understanding commute needs (Grengs, 2015). This analysis highlighted the need to consider how transportation services can better meet transportation needs for more than solely commute trips. Improving public transportation service to better service more times of day than rush hours and smoother service across all days of the week is one of the implications for servicing transportation needs for more than commute purposes.

In addition to increased transit use, our selected groups, especially those groups that included people with lower incomes, take a higher proportion of trips by walking. To better meet these pedestrian needs, long-standing recommendations of improving the walking environment through fixing sidewalks, adding ramps, ensuring quality lighting at night, ensuring shade and sun protection while walking and safe street crossings are critically important. Ensuring that communities have a high-quality pedestrian environment is required to allow people with disabilities, older adults, low-income people to travel safely and freely.

Focus improvements on reducing the number of people who die or are severely injured

Improving the quality of the physical built environment is essential to improving mobility and traffic safety for everyone. Traffic collisions are a significant contributor to avoidable deaths and injuries in Los Angeles. As LA County experienced a rise in traffic collisions and fatalities from 2013 to 2017, there is a need to drastically and imminently improve the transportation system to reduce deaths and injuries. Pedestrians, particularly older adults, have the highest vulnerability to traffic collisions. However, other groups, including children in priority population areas and Black individuals, represent a disproportionate number of deaths caused by traffic collisions. While the City and County of Los Angeles and other cities in the region have Vision Zero programs that seek to reduce traffic fatalities, it is evident that the scale of these investments does not meet the scale of the problem. We found that traffic fatalities concentrate in priority population areas and that those communities are in dire need of infrastructure investments that can reduce travel speeds. Since the likelihood of someone being killed or severely injured exponentially increases as speed increases, reducing vehicle speeds along corridors is necessary to reduce fatalities.

Automated speed enforcement is one strategy to reduce speeding behavior in all communities across Los Angeles. Considerations of deploying automated speed enforcement need to recognize that speeding behaviors likely occur in all communities and not only priority population areas. While this intervention removes the risk of interactions between travelers and armed law enforcement, it comes with other financial threats and burdens. The current system of traffic fines and citations disproportionately punishes low-income people of color. California's traffic fines are some of the highest rates in the United States. The burden of failure to pay fines and related fees falls unevenly (Lawyers Committee for Civil Rights of the San Francisco Bay Area, 2017). Drawing on the principles of mobility justice to reject policing as a street safety solution, discussions of automated speed enforcement cameras need to be aware of this connection and community concerns about surveillance.

Address concerns around policing by reconsidering the need for armed law enforcement in transportation environments

Findings from our literature review reveal how police investment not only fails to prevent crimes that people experience, like sexual harassment or assault, but that the presence of law enforcement perpetuates harassment and discrimination, especially among Black people, and Black men in particular. From using public transportation to driving, walking, or riding a bike, instead of increasing a sense of safety, police presence within the transportation system creates fear, and, in the worse cases, these interactions can have deadly consequences in the form of police brutality and killings. Given the pervasive racial bias in policing, this reality raises questions about whether armed law enforcement effectively addresses safety problems.

To work towards mobility justice, transportation agencies must seek to eliminate the harassment and racial profiling against Black people when traveling and its effects on other racialized people. Transportation agencies should work with local communities to identify solutions that best fit the needs of their communities. Potential solutions include replacing law enforcement officers with community ambassadors in public transit and using infrastructure rather than enforcement to improve safety and reduce fears. Additionally, providing bystander training resources to have passengers help each other in public transit situations, combined with community ambassadors, provides people with help on transit without using armed law enforcement.

Improve data collection methods

This study demonstrated the importance of improving data collection methods for understanding people's transportation needs. There is a strong need to ensure a complete recording of the race/ethnicity information for the victims of traffic collisions. Over half of all the crashes did not have complete race/ethnicity information. Future research should also examine the perpetrators of these collisions and whether there are racial dynamics in terms of the drivers involved in these collisions.

Future state policy reform in California could follow in the vein of Assembly Bill 953, the Racial and Identity Profiling Act, and require that officers recording collision reports include the perceived race or ethnicity of all parties involved. Collision reports should also be required to include information on whether any parties involved were in a wheelchair, using a mobility device, or suffering from other disabilities like blindness or lack of hearing. We were limited in this analysis because of the lack of this information in the collision reports. The lack of this information in the vast majority, if not all, traffic collision reports limit our ability to understand how often people with mobility impairments are the

victims of traffic collisions. As a starting point to improve this understanding, collision reports should be required to collect this information.

Using the NHTS California add-on data provided a valuable sample of people's travel. While we could isolate different groups travel needs, the LA County undersampling issue and the differences between the sample demographics and people in LA were a limitation for this work. Researchers commonly rely on NHTS data to understand travel. Therefore, future surveys should address the under-sampling of non-white and less affluent travelers. Overall, this study highlights the critical need to better capture and understand the transportation needs of a diverse set of people. These improvements will include doing more regular data collection about people's travel patterns and using more qualitative methods to understand better the challenges, experiences, and barriers people face. Given the scale of capital investment happening in the Los Angeles region, collecting better quality, more informative data about vulnerable, marginalized, and underserved populations can better meet their needs in the short and long term.

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Data Management Plan

Products of Research

This project used three data sources: National Household Travel Survey 2017 California add-on confidential data provided by Caltrans, collision data from the Statewide Integrated Traffic Records System accessed via the UC Berkeley Transportation Injury Mapping System, and American Community Survey data including microdata from IPUMS.

Data Format and Content

NHTS 2017 California-add on data were originally provided in database format containing information relating to the household, persons, trips, and vehicles and the confidential dataset also included location information. The non-confidential version of the dataset is available from the Transportation Secure Data Center at https://www.nrel.gov/transportation/secure-transportation-data/tsdc-nhts-california.html. These data were processed into a flat .csv file at the person level with variables including the person weight, the number of trips per day, total minutes traveled per day, average miles per trip, and flags relating to whether or not the person was a member of the various groups analyzed in this study (woman of color, youth of color, Black person, low-income older adult, person with disability, persons living in family in poverty, people living in priority population areas).

The collision data combined information across the collisions, victims, and party files provided by the UC Berkeley Transportation Injury Mapping System for 2013-2017 for collisions within Los Angeles County. The research team created a combined .csv dataset with schema available in the table starting on the following page.

ACS micro-data was accessed online via https://usa.ipums.org/usa/

Data Access and Sharing

NHTS and ACS data are publically available via the links provided above. Data access to the confidential data from the NHTS California add-on is available via Caltrans at https://nhts.dot.ca.gov/

Access to the complied collision data for Los Angeles County 2013-2017 can be requested by emailing the PI, Madeline Brozen at mbrozen@g.ucla.edu. Other datasets used for this research are publically available.

Reuse and Redistribution

Users should cite the original sources of these data if interested in further analysis.

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Collision data fields and description

Field Name	Field Description	Code	Code Description
CASE_ID	Case ID number	#	
ACCIDENT_Y	Accident Year	#	
NUMBER_KIL	Count of Victims Killed	#	
NUMBER_INJ	Count of Victims Injured	#	
PARTY_COUN	Count of Parties involved	#	
GEOID	Census Tract Number	#	
CalEnviroScreenScore	CalEnviroScreen 3.0 Score		
Disadvantaged	Census Tract among the 25% highest scoring census tracts in CalEnviroScreen 3.0, in accordance w/ SB535 guidelines (See Data Codes)	1 2	Yes No
All	Indicates collision (for pivot table purposes)	1	collision
All_Killed	Indicates if collision involves victim with (victim degree of injury 1)	1 0	Yes No
All_Killed_Count	Counts the victims in the collision with (victim degree of injury 1)	#	
All_Injured	Indicates if collision involves victim with (victim degree of injury 2, 3, or 4)	1 0	Yes No
All_Injured_Count	Counts the victims in the collision with (victim degree of injury 2, 3, or 4)	#	
All_noharm	Indicates if collision involves victim with (victim degree of injury 0)	1 0	Yes No
All_noharm_Count	Counts the victims in the collision with (victim degree of injury 0)	#	
WomanVictim_All	Indicates if collision involves victim with (victim sex F)	1 0	Yes No
WomanVictim_Killed	Indicates if collision involves victim with (victim sex F) and (victim degree of injury 1)	1 0	Yes No
WomanVictim_Killed_Count	Counts the victims in the collision with (victim sex F) and (victim degree of injury 1)	#	
WomanVictim_Injured	Indicates if collision involves victim with (victim sex F) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
WomanVictim_Injured_Count	Counts the victims in the collision with (victim sex F) and (victim degree of injury 2, 3, or 4)	#	
WomanVictim_noharm	Indicates if collision involves victim with (victim sex F) and (victim degree of injury 0)	1 0	Yes No
WomanVictim_noharm_Count	Counts the victims in the collision with (victim sex F) and (victim degree of injury 0)	#	
Over64Victim_All	Indicates if collision involves victim with (victim age >=65)	1 0	Yes No
Over64Victim_Killed	Indicates if collision involves victim with (victim age >=65) and (victim degree of injury 1)	1 0	Yes No

Over64Victim_Killed_Count	Counts the victims in the collision with (victim age >=65) and (victim degree of injury 1)	#	
Over64Victim_Injured	Indicates if collision involves victim with (victim age >=65) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
Over64Victim_Injured_Count	Counts the victims in the collision with (victim age >=65) and (victim degree of injury 2, 3, or 4)	#	
Over64Victim_noharm	Indicates if collision involves victim with (victim age >=65) and (victim degree of injury 0)	1 0	Yes No
Over64Victim_noharm_Count	Counts the victims in the collision with (victim age >=65) and (victim degree of injury 0)	#	
Under18Victim_All	Indicates if collision involves victim with (victim age <18)	1 0	Yes No
Under18Victim_Killed	Indicates if collision involves victim with (victim age <18) and (victim degree of injury 1)	1 0	Yes No
Under18Victim_Killed_Count	Counts the victims in the collision with (victim age <18) and (victim degree of injury 1)	#	
Under18Victim_Injured	Indicates if collision involves victim with (victim age <18) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
Under18Victim_Injured_Count	Counts the victims in the collision with (victim age <18) and (victim degree of injury 2, 3, or 4)	#	
Under18Victim_noharm	Indicates if collision involves victim with (victim age <18) and (victim degree of injury 0)	1 0	Yes No
Under18Victim_noharm_Count	Counts the victims in the collision with (victim age <18) and (victim degree of injury 0)	#	
RaceIdentified	Primary Party Race is identified for at least 1 victim	1 0	Yes No
AsianParty_All	Indicates if collision involves party lead with (race ASIAN)	1 0	Yes No
AsianParty_All_Count	Counts the primary parties with (race ASIAN)	#	
AsianParty_Killed	Indicates if collision involves party lead with (race ASIAN) and (primary party degree of injury 1)	1 0	Yes No
AsianParty_Killed_Count	Counts the primary parties with (race ASIAN) and (primary party degree of injury 1)	#	
AsianParty_Injured	Indicates if collision involves party lead with (race ASIAN) and (primary party degree of injury 2, 3, or 4)	1 0	Yes No
AsianParty_Injured_Count	Counts the primary parties with (race ASIAN) and (primary party degree of injury 2, 3, or 4)	#	
AsianParty_noharm	Indicates if collision involves party lead with (race ASIAN) and (primary party degree of injury 0 or -1)	1 0	Yes No
AsianParty_noharm_Count	Counts the primary parties with (race ASIAN) and (primary party degree of injury 0 or -1)	#	
OtherParty_All	Indicates if collision involves party lead with (race OTHER)	1 0	Yes No
OtherParty_All_Count	Counts the primary parties with (race OTHER)	#	

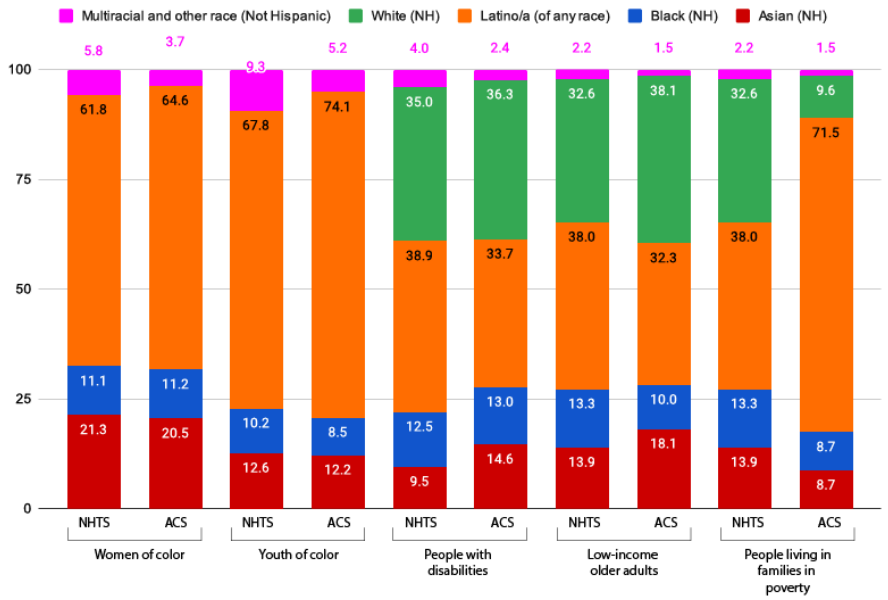
OtherParty_Killed	Indicates if collision involves party lead with (race OTHER) and (primary party degree of injury 1)	1 0	Yes No
OtherParty_Killed_Count	Counts the primary parties with (race OTHER) and (primary party degree of injury 1)	#	
OtherParty_Injured	Indicates if collision involves party lead with (race OTHER) and (primary party degree of injury 2, 3, or 4)	1 0	Yes No
OtherParty_Injured_Count	Counts the primary parties with (race OTHER) and (primary party degree of injury 2, 3, or 4)	#	
OtherParty_noharm	Indicates if collision involves party lead with (race OTHER) and (primary party degree of injury 0 or -1)	1 0	Yes No
OtherParty_noharm_Count	Counts the primary parties with (race OTHER) and (primary party degree of injury 0 or -1)	#	
BlackParty_All	Indicates if collision involves party lead with (race BLACK)	1 0	Yes No
BlackParty_All_Count	Counts the primary parties with (race BLACK)	#	
BlackParty_Killed	Indicates if collision involves party lead with (race BLACK) and (primary party degree of injury 1)	1 0	Yes No
BlackParty_Killed_Count	Counts the primary parties with (race BLACK) and (primary party degree of injury 1)	#	
BlackParty_Injured	Indicates if collision involves party lead with (race BLACK) and (primary party degree of injury 2, 3, or 4)	1 0	Yes No
BlackParty_Injured_Count	Counts the primary parties with (race BLACK) and (primary party degree of injury 2, 3, or 4)	#	
BlackParty_noharm	Indicates if collision involves party lead with (race BLACK) and (primary party degree of injury 0 or -1)	1 0	Yes No
BlackParty_noharm_Count	Counts the primary parties with (race BLACK) and (primary party degree of injury 0 or -1)	#	
WhiteParty_All	Indicates if collision involves party lead with (race WHITE)	1 0	Yes No
WhiteParty_All_Count	Counts the primary parties with (race WHITE)	#	
WhiteParty_Killed	Indicates if collision involves party lead with (race WHITE) and (primary party degree of injury 1)	1 0	Yes No
WhiteParty_Killed_Count	Counts the primary parties with (race WHITE) and (primary party degree of injury 1)	#	
WhiteParty_Injured	Indicates if collision involves party lead with (race WHITE) and (primary party degree of injury 2, 3, or 4)	1 0	Yes No
WhiteParty_Injured_Count	Counts the primary parties with (race WHITE) and (primary party degree of injury 2, 3, or 4)	#	
WhiteParty_noharm	Indicates if collision involves party lead with (race WHITE) and (primary party degree of injury 0 or -1)	1 0	Yes No

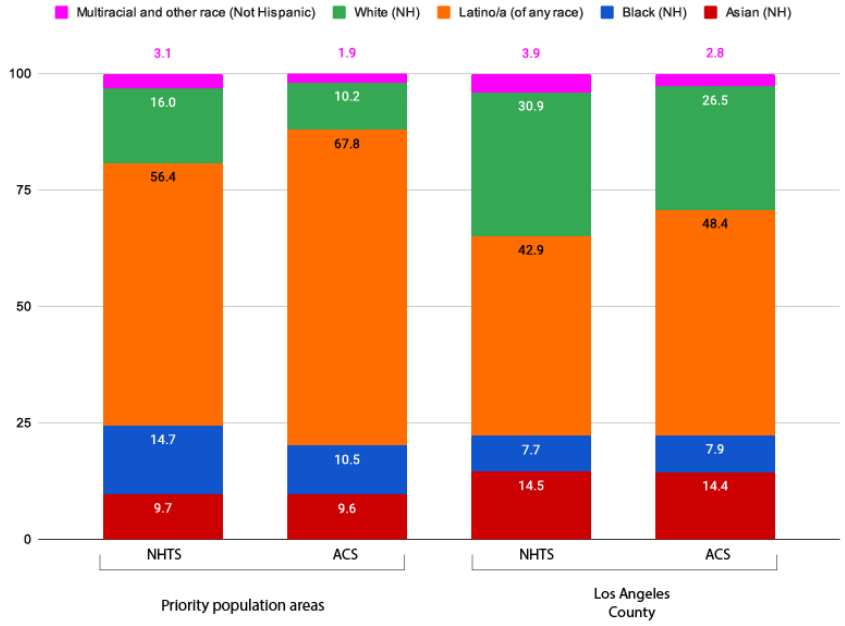
WhiteParty_noharm_Count	Counts the primary parties with (race WHITE) and (primary party degree of injury 0 or -1)	#	
HispanicParty_All	Indicates if collision involves party lead with (race HISPANIC)	1 0	Yes No
HispanicParty_All_Count	Counts the primary parties with (race HISPANIC)	#	
HispanicParty_Killed	Indicates if collision involves party lead with (race HISPANIC) and (primary party degree of injury 1)	1 0	Yes No
HispanicParty_Killed_Count	Counts the primary parties with (race HISPANIC) and (primary party degree of injury 1)	#	
HispanicParty_Injured	Indicates if collision involves party lead with (race HISPANIC) and (primary party degree of injury 2, 3, or 4)	1 0	Yes No
HispanicParty_Injured_Count	Counts the primary parties with (race HISPANIC) and (primary party degree of injury 2, 3, or 4)	#	
HispanicParty_noharm	Indicates if collision involves party lead with (race HISPANIC) and (primary party degree of injury 0 or -1)	1 0	Yes No
HispanicParty_noharm_Count	Counts the primary parties with (race HISPANIC) and (primary party degree of injury 0 or -1)	#	
VictimMode_Pedestrian	Indicates if collision involves victim with (victim mode PEDESTRIAN) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
VictimMode_Pedestrian_Count	Counts the victims in the collision with (victim mode PEDESTRIAN) and (victim degree of injury 2, 3, or 4)	#	
VictimMode_Bicycle	Indicates if collision involves victim with (victim mode BICYCLE) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
VictimMode_Bicycle_Count	Counts the victims in the collision with (victim mode BICYCLE) and (victim degree of injury 2, 3, or 4)	#	
VictimMode_Drove	Indicates if collision involves victim with (victim mode DROVE) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
VictimMode_Drove_Count	Counts the victims in the collision with (victim mode DROVE) and (victim degree of injury 2, 3, or 4)	#	
VictimMode_PassengerDrove	Indicates if collision involves victim with (victim mode PASSENGERDROVE) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
VictimMode_PassengerDrove_Count	Counts the victims in the collision with (victim mode PASSENGERDROVE) and (victim degree of injury 2, 3, or 4)	#	
VictimMode_Bus	Indicates if collision involves victim with (victim mode BUS) and (victim degree of injury 2, 3, or 4)	1 0	Yes No

VictimMode_Bus_Count	Counts the victims in the collision with (victim mode BUS) and (victim degree of injury 2, 3, or 4)	#	
VictimMode_Motorcycle	Indicates if collision involves victim with (victim mode MOTORCYCLE) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
VictimMode_Motorcycle_Count	Counts the victims in the collision with (victim mode MOTORCYCLE) and (victim degree of injury 2, 3, or 4)	#	
VictimMode_Other	Indicates if collision involves victim with (victim mode OTHER) and (victim degree of injury 2, 3, or 4)	1 0	Yes No
VictimMode_Other_Count	Counts the victims in the collision with (victim mode OTHER) and (victim degree of injury 2, 3, or 4)	#	
Exclusion	Indicates whether collision should be excluded according to criteria	#N/A	collision included
		-1	collision excluded

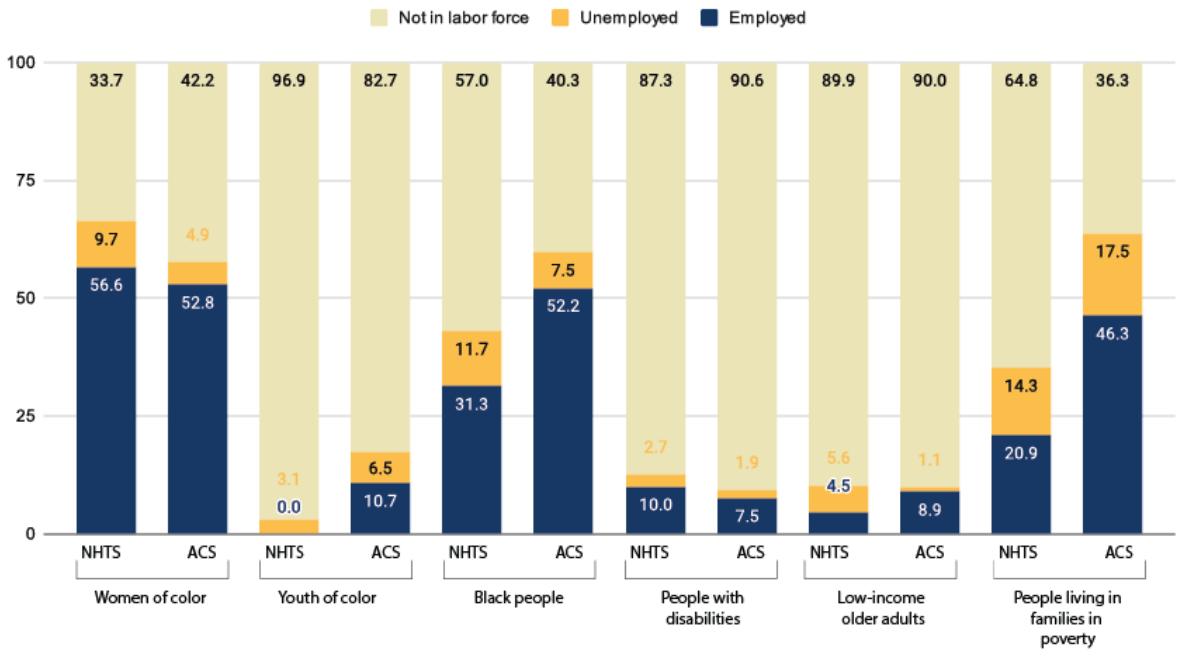
Appendix A: NHTS sample demographics compared to ACS estimates, LA County

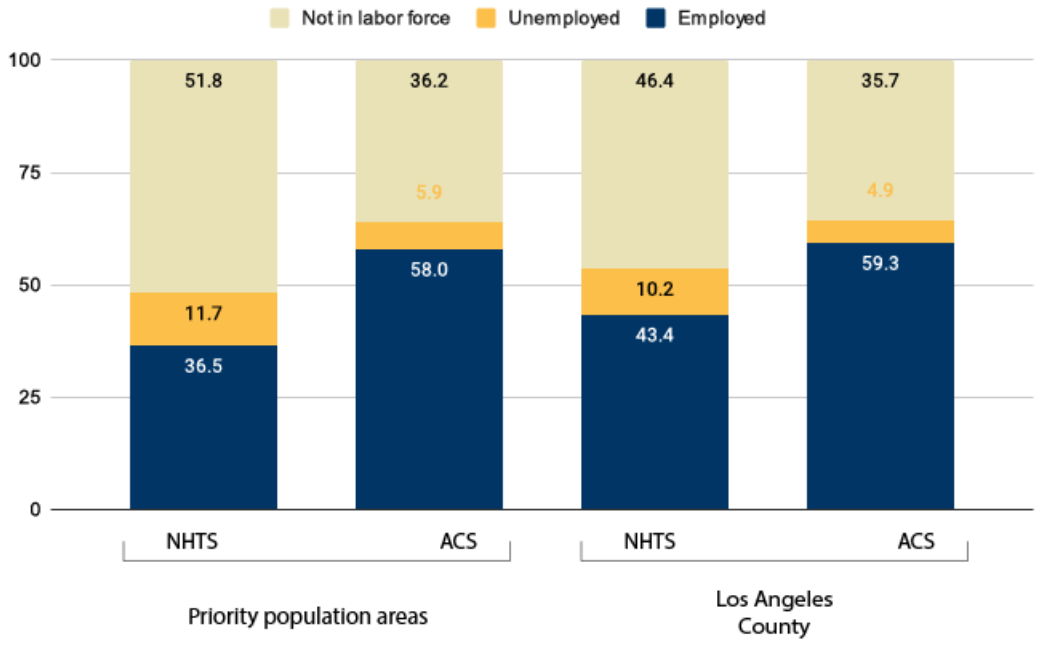
Race/ethnicity demographic comparison



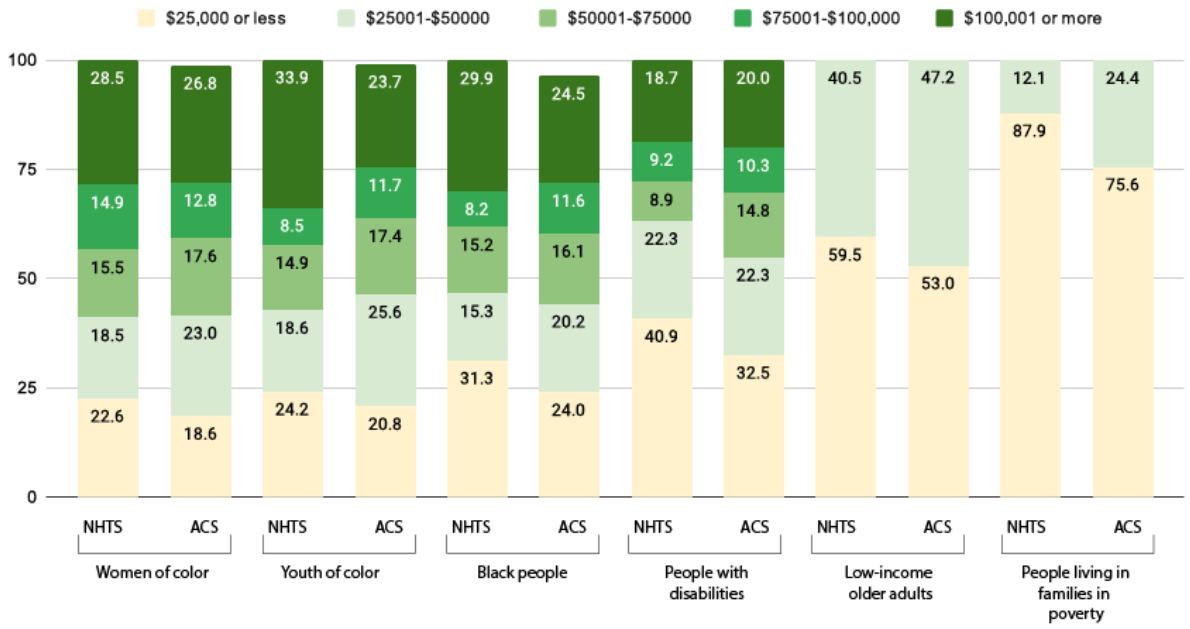


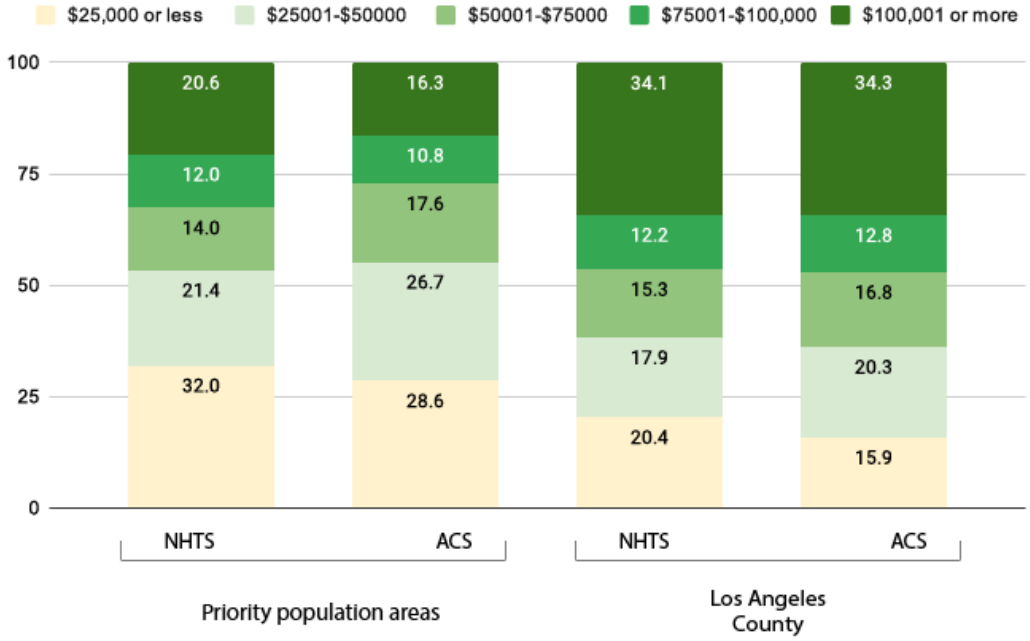
Employment status





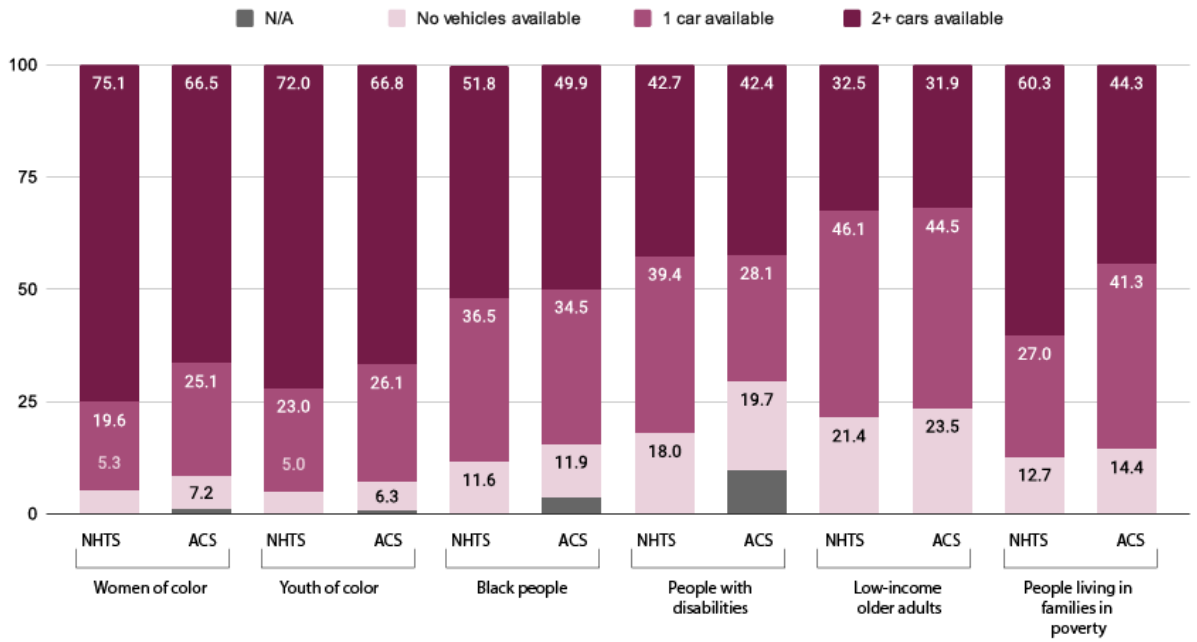
Median household income

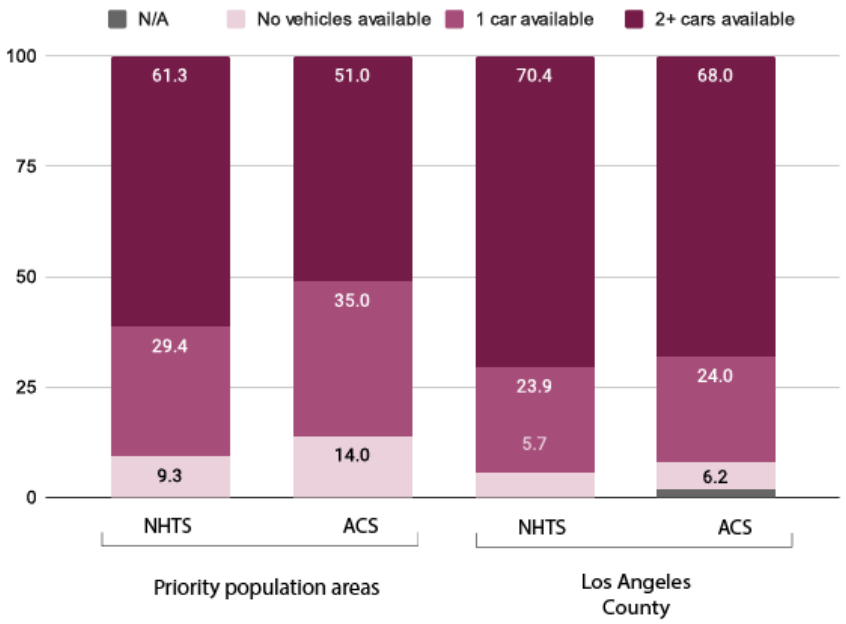




Vehicle availability

Note: N/A represents populations living in institutional settings





Appendix B: Demographics by priority population community status, LA County

	Priority areas		Non-priority areas		LA County	
	n	%	n	%	n	%
Employed People (16 and over)						
Employed (includes those employed in armed forces)	2020177	58%	2789092	60%	4809269	59%
Unemployed	204134	6%	202292	4%	406426	5%
Not in labor force	1261655	36%	1625052	35%	2886707	36%
Total	3485966	100%	4616436	100%	8102402	100%
HH Income (n=households)						
$24,999 or less	369601	29%	329727	16%	699328	21%
$25000-$49999	344921	27%	344743	17%	689664	21%
$50001-$74999	227869	18%	312019	16%	539888	16%
$75001-$99,999	140055	11%	247447	12%	387502	12%
$100,000 or more	211535	16%	767281	38%	978816	30%
Total	1293981	100%	2001217	100%	3295198	100%
Median Household Income	$45,654		$82,535		$66,213	
Vehicles per household (n=household)						
No Vehicles	174370	14%	128929	6%	303299	9%
1 Vehicle	458521	35%	671819	34%	1130340	34%
2 or More Vehicles	661090	51%	1200469	60%	1861559	57%
Total	1293981	100%	2001217	100%	3295198	100%
Race/Ethnicity						
White (NH)	457686	10%	2219296	40%	2676982	27%
Black (NH)	470686	11%	328893	6%	799579	8%
Asian (NH)	432304	10%	1010273	18%	1442577	14%
Hispanic (of any race)	3041130	68%	1852449	33%	4893579	48%
Multiracial and other race (Not Hispanic)	84653	2%	208352	4%	293005	3%
Total	4486459	100%	5619263	100%	10105722	100%
Age						
Under 5	315650	7%	316261	6%	631911	6%
5 to 17	815682	18%	825987	15%	1641669	16%
18 to 65	2901372	65%	3665786	65%	6567158	65%
65+	453755	10%	811229	14%	1264984	13%
Total	4486459	100%	5619263	100%	10105722	100%

	Priority areas		Non-priority areas		LA County	
	n	%	n	%	n	%
Poverty Status						
In Poverty (Living below the poverty line)	1041983	23%	646522	12%	1688505	17%
Not In Poverty	3401063	77%	4865905	88%	8266968	83%
Total	4443046	100%	5512427	100%	9955473	100%
Mode of Transportation to Work						
Drove Alone	1384134	70%	2067826	76%	3451960	74%
Carpool	221998	11%	227887	8%	449885	10%
Public Transportation	191184	10%	109793	4%	300977	6%
Walking	59407	3%	69044	3%	128451	3%
Work From Home	68798	4%	180692	7%	249490	5%
Other Means	46326	2%	58112	2%	104438	2%
Total Workers (over 16)	1971847	100%	2713354	100%	4685201	100%