





Towards a Safer California

Addressing the Road Safety Needs of Older Adults

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Abstract

With an aging state population, it is crucial to understand the factors that contribute to road safety among adults aged 65 and older and identify at-risk neighborhoods for targeted interventions. In this context, this report analyzes fatal and serious injury (FSI) trends and patterns among aging road users, including older pedestrians and bicyclists, with a focus on identifying neighborhoods at risk for crashes based on senior FSI rates. 2178 census tracts (32.7%) were deemed as being potential at-risk neighborhoods, as they all exceeded the state average senior FSI rate of 120 per 100,000 individuals (0.12%). The report also discusses factors that contribute to road safety among older adults, including physical changes associated with aging and the impact of new mobility technologies. By identifying at-risk neighborhoods and exploring factors that contribute to senior road safety, this report aims to inform targeted interventions to improve road safety for older adults.

Introduction: Aging Population of California

"Globally, the World Health Organization projects that the population aged 65 years and above is expected to grow from 524 million in 2010 to nearly 1.5 billion in 2050." (Foundation, C. L. R., Bay City News., 2022). This aging boom will be significantly greater in California (26% in 2060) than in the US (23% in 2060) as the population of seniors in the state is expected to grow by two-thirds in the next two decades. According to the State Department of Finance's Demographic Research Unit estimates, people aged 65 and above will account for nearly 26% of California's total population by 2052. (Foundation, C. L. R., Bay City News., 2022).

With the second-highest life expectancy in the country, California needs significant investment in planning for the holistic well-being of its aging population. The new Master Plan for Aging, published in 2021 by the California Department of Aging lists five goals: 1) create millions of new housing options to age well, 2) close the equity gap and increase life expectancy, 3) keep increasing life satisfaction as we age, 4) create one million high-quality caregiving jobs, and 5) close the equity gap in and increase seniors' economic sufficiency. To achieve these goals, it is essential to secure the mobility needs of the senior population. Given the population density of urban areas, addressing safety in urban areas is imperative for realizing statewide goals. It should be noted that safety, mobility, and transportation choice are also substantial challenges in suburban and rural areas and need to be addressed. It is concerning that 15.45% of all fatalities from traffic crashes in California in 2022 involved older adults¹ (SafeTREC, UC Berkeley, 2022). Hence, this research brief investigates the safety and accessibility challenges faced by California's aging population, especially when urban centers are increasingly moving towards digital mobility solutions and new micro-mobility alternatives.



Figure 1 Population projection in California

Source: <u>https://localnewsmatters.org/2022/03/31/an-aging-state-how-is-california-preparing-for-the-shift-to-an-older-population/</u>

¹ In 2022, out of the 3515 fatalities reported in California, 543 were older adults.

Mobility Barriers for Older Adults

As the population of older adults continues to grow, it is increasingly important to consider the unique challenges that this demographic faces. One of the most pressing challenges for many older adults is mobility, as physical changes associated with aging can make it more difficult to move around independently. In California seniors face a range of barriers that can limit their travel, and thus access to essential services, social activities, and community resources.

• Linguistic barriers limit their access to information.

31.5% of California's senior population faces linguistic barriers in accessing services due to limited English proficiency (Let's Get Healthy California, 2014-2018). Aging-related health limitations and environmental barriers may limit older adults' capacity to commute safely to social activities and needed services (Black, Dobbs, & Young, 2015). These challenges are compounded for those who also face linguistic and cultural barriers (Da & Garcia, 2015). Many late-life immigrants do not have driver's licenses and limited public transportation access (Blumenberg & Smart, 2010).

• Physical and cognitive barriers limit their access to transportation options.

According to a study by the California Department of Aging, 70% of Californians over the age of 65 have at least one chronic health condition² (California Healthcare Foundation, 2015). Older adults with major chronic diseases have higher disability rates across all Instrumental Activities of Daily Living (Fong, 2019), including getting around outside and traveling to places outside of walking distance (Legislative Analysts Office, 2016). Older adults with difficulties walking and those who do not drive are less likely to receive regular health check-ups, are less civically engaged, and are more socially isolated compared to those without these mobility limitations (Shumway-Cook, Ciol, & York, 2005). Many older adults may also rely on public transportation as their primary mode of transportation (Bailey, 2004).

While public transit is a viable option in urban communities, it is limited in rural and suburban communities, where older adults are most likely to live (Fry, 2020). The COVID-19 pandemic exacerbated this issue, as public transit became more limited, and many older adults were concerned about the use of public transportation due to health concerns. This has made accessing essential services even more challenging for the elderly.

• Digital divide limits their access to urban transportation systems and new mobility options.

While technology has the potential to alleviate social isolation by enabling both in-person and virtual social participation, challenges remain in terms of the accessibility, practicality, and willingness of older adults to use different forms of mobility technology. The grey digital divide constitutes a major challenge for the elderly to participate in and benefit from the digital revolution. People may face problems with basic tasks such as booking tickets, renewing bus cards, or claiming transportation-related Medicaid benefits (AARP, 2022) because most of the urban transportation systems are digitized (Mubarak & Suomi, 2022). Further, the broadband issues and lack of connectivity affect access in less urbanized areas. Financial means for subscribing to adequate data plans may be a barrier for many.

² Chronic conditions include asthma, diabetes, heart disease, high blood pressure, and serious psychological distress.

• Increased fragility and susceptibility to crashes make older adults among the most vulnerable road users.

Physical changes that may be associated with aging, such as reduced vision, hearing loss, and cognitive decline, can impact the ability to navigate streets safely. They also experience an increase in reaction time, which can be critical in avoiding crashes. These conditions increase the risk of injury in the event of a crash. For older people, crashes more frequently lead to death, as older motorists and pedestrians may have increased fragility due to chronic medical conditions and may take much longer to recover from severe injuries (Trentacoste, 2010).

Newer mobility options add to this risk. Electric vehicles offer reduced carbon emissions and lower noise pollution. However, since they produce less noise than vehicles with an internal combustion engine, they may pose more danger to those who are blind or visually impaired or those who are deaf or hard of hearing.

The rise of personal mobility devices (PMD) such as electric scooters and shared bikes has also led to a growing contestation of sidewalk spaces, as these modes of transportation are commonly used on pedestrian walkways, given inadequate or unsafe space on the street. While they offer a sustainable and convenient mode of transportation, especially for short distances, their growing use on sidewalks has sparked debates over pedestrian safety. They have a higher mass than pedestrians and move at higher speeds. PMDs are also quiet vehicles and do not have the same powerful lighting as cars and motorbikes. This makes them particularly difficult for pedestrians to anticipate, especially for seniors and those who are deaf or hard of hearing (Nisson, Ley, & Chu, 2020).

Furthermore, the presence of bikes and electric scooters on sidewalks can create obstacles for all older adults and people with disabilities, making it difficult for them to navigate and use public spaces. For example, parked scooters or bikes can block the path of a wheelchair or a walker, forcing the individual to detour or navigate around the obstacle. This can be particularly challenging for those with mobility disabilities or balance issues. (Issues related to access for e-scooters and bicyclists are also an issue, but not addressed in this brief.)

Senior Motor Vehicle Fatalities and Serious Injuries Trends and Patterns in California

In this context of an aging population, challenging roadway environment, and technological changes, it is important to analyze trends and patterns in senior injuries, particularly fatalities and serious injuries (FSI), to better understand the challenges faced by this vulnerable population. This section will examine these issues, focusing on the state of California and dividing the senior population into vehicle users and vulnerable road users for comparison purposes. Vehicle users include motor vehicle drivers and passengers and vulnerable road users (VRU) include pedestrians and bicyclists. Senior road users, including drivers and passengers, are already at a higher risk of crashes or injuries per mile driven than the average road user. However, like all pedestrians and bicyclists, senior pedestrians and bicyclists are even more vulnerable than those traveling by motor vehicle because they do not have the same physical protection that a vehicle provides.



Figure 2 Chart showing the comparison between the yearly rate of change in the total number of FSI crashes and the number of FSI crashes involving senior road users in California.

Source: SWITRS Final 2013-2020, SWITRS Provisional 2021-2022

Decadal Fatal and Serious Injury Crash Trends in California

On average, 16% of all fatal and serious injury crashes in California from 2013 to 2022 involved senior road users. Between 2013 and 2022, the total number of fatal and serious injury crashes increased by 52%. However, the yearly rate of change for crashes involving senior road users has consistently been higher than the overall rate of change. The number of fatal and serious injury crashes involving seniors increased by 4% while the total number of fatal and serious injury crashes decreased by 7% in 2022 as compared to 2021. This trend is likely to continue given the increasing senior population in the state.

Fatal and Serious Injury Crashes by Time of Day for All Senior Road Users

Figure 3 shows the number of senior pedestrians, bicyclists, drivers, and passenger fatalities in a particular location at various times of the day. The data shows that senior pedestrian fatal and serious injury crashes are highest in the evening and early morning, with the peak occurring between 6 and 9 pm. Senior bicyclists' fatal and serious injury crashes are highest in the morning, while senior driver and senior passenger fatal and serious injury crashes are highest during the afternoon.



Figure 3 chart showing the number of fatal and serious injury crashes by the time of occurrence for various senior road users. Source: SWITRS Final 2013-2020, SWITRS Provisional 2021-2022

Fatal and Serious Injuries Involving Senior Road Users

The number of fatal or serious injuries involving senior road users has fluctuated over the years. Interestingly, between 2013 and 2022, the number of fatal or seriously injured vehicle users declined by 44%, reflected in part, by contributions of senior driver safety initiatives in the state and improvement in vehicle safety technologies. However, the number of fatal or seriously injured VRUs declined by only 15%. The disparity in the reduction of fatal or seriously injured vehicle users and VRUs highlights an equity issue related to transportation safety. Individuals who can afford to own and drive a vehicle may have access to safety features and technologies that are not available to those who rely on walking or cycling for transportation. This disparity signals the need for more targeted solutions for pedestrians and bicyclists.

For fatal and serious injury crashes involving vehicle users, 73% occurred on state highways, while a small proportion (13%) occurred at intersections and ramps each. For fatal and serious injury crashes incidents involving VRUs, a slightly smaller proportion of incidents (64%) occurred on state highways, with a larger proportion of incidents (22%) occurring at intersections. Hence, to reduce the incidence of crashes on state highways and at intersections, targeting improvements of both state highway and intersection infrastructure is needed.

Pedestrian Right of Way violation is the single largest cause of crashes involving senior pedestrians, accounting for 44% of crashes. This suggests that drivers are not yielding to senior pedestrians who have the right of way, leading to crashes. The most common cause of crashes involving senior bicyclists is Automobile Right of Way violation, which accounts for 20% of incidents. This suggests that drivers are not yielding to senior bicyclists who have the right of way, leading to senior bicyclists who have the right of way, leading to crashes. Improper Turning is responsible for 18% of incidents, suggesting that drivers may not be checking for bicyclists before making turns.



Figure 4 chart comparing the decadal trend of senior fatal and serious crash injuries among vehicle users and vulnerable road users in California

Source: SWITRS Final 2013-2020, SWITRS Provisional 2021-2022



Figure 5 chart showing the type of location where senior fatal or serious injury crashes were recorded.

Source: SWITRS Final 2013-2020, SWITRS Provisional 2021-2022

At-Risk Neighborhoods in California

Analyzing injury rates among seniors in California and identifying at-risk neighborhoods in the state is necessary to contextualize the problem and target solutions. This analysis uses Fatal and Serious Injury Crash data involving seniors between 2018 and 2022 from SWITRS and the American Community Survey's 2021 5-year data to compute the injury rates at the census tract level.

The average senior FSI rate³ in California is 120 per 100,000 seniors. 83% percent of the census tracts in the state have a significant⁴ senior FSI rate. 32.7% of the census tracts (n=6660) have a senior FSI rate higher than the state average. These areas may be considered at-risk neighborhoods and could be the starting point for targeted interventions.



Choropleth Map of Senior FSI rates across California (2018-2022)

Figure 6 map showing the senior FSI rates for census tracts in California. Source: SWITRS Final 2018-2020, SWITRS Provisional 2021-2022

3 Senior FSI rate is calculated as the ratio between the number of fatal or serious injuries involving seniors and the total senior population in the census tract. The rate was calculated based on the SWITRS 2018-2022 crash data and population data from the 2021 American Community Survey 5-year dataset.

4 Census tracts where the elderly population is less than the county average minus 1 standard deviation were excluded from the analysis. 6660 out of the 8057 census tracts in the state emerged as significant.

This analysis also provides insight into the geographical distribution of at-risk neighborhoods in California. As seen in Figure 7, Los Angeles County has the highest number of at-risk neighborhoods with 675 census tracts recording a senior FSI rate greater than the state average. This is not surprising, given that Los Angeles is the most populous county in California and has a high number of seniors. San Diego County and Orange County followed with 181 and 151 census tracts, respectively. Analysis shows that there are at-risk neighborhoods in 56 out of 58 counties in the state. But 61% of at-risk neighborhoods (n= 2178) are in Southern California.

In conclusion, the data presented in this analysis highlight the high incidence of senior FSI rates in California. However, it is important to note that the problem is widespread across the state, with 25 counties reporting census tracts with high senior FSI rates. Therefore, targeted interventions must be implemented to address this issue. These interventions should take into consideration the contextual factors that contribute to the high injury rates in specific census tracts, such as the physical environment and demographic characteristics of the residents. Prioritizing interventions in the areas with the highest concentration of at-risk neighborhoods, such as Los Angeles County, can help make a significant impact on reducing the incidence of senior injuries in the state.



Figure 7 chart showing the top ten counties with the highest number of at-risk census tracts. Source: SWITRS Final 2013-2020, SWITRS Provisional 2021-2022

Way Forward

California has taken several initiatives to improve road safety for older adults. The state has implemented a mature driver improvement course to help older adults improve their driving skills and maintain their licenses. The state also requires drivers over 70 years old to renew their licenses in person every five years to help ensure that they can still drive safely (California Department of Motor Vehicles, 2021).

Additionally, the State of California's <u>Strategic Highway Safety Plan (SHSP</u>), including the Department of Transportation (Caltrans) and Office of Traffic Safety (OTS) adopted the <u>Safe Systems Approach</u> in 2022 to eliminate deaths and serious injuries on California roadways (State of California, 2022). This is a fundamental shift in organizational culture, where safety is seen as a collective responsibility rather than an individual one. It also reimagines roadways as 'Complete Streets' where the safety of all users is paramount.

While these initiatives are a step in the right direction, the findings from the crash data analysis suggest a need for continued efforts to improve road safety and create a Safe System for elderly drivers in California. To take a comprehensive approach these efforts may include:

- 1. Creating a safe environment by designating senior safety zones in neighborhoods with high injury rates and creating protected intersections and bike lanes;
- 2. Bridging the linguistic and digital divide by offering transportation assistance services in multiple languages and developing senior-friendly transportation apps including larger font sizes, voice-enabled functions, and simplified user interfaces, as well as increasing broad-band services and connectivity in rural areas; and
- 3. Providing more transportation options for seniors by improving accessible public transportation options as well as creating more walkable neighborhoods and bike-friendly infrastructure.

These measures will improve road safety for older drivers, benefit all road users, and create more livable and age-friendly communities.

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