APPENDIX B: STATE OF THE CORRIDOR

Kumeyaay Corridor

Introduction

CMCP Description

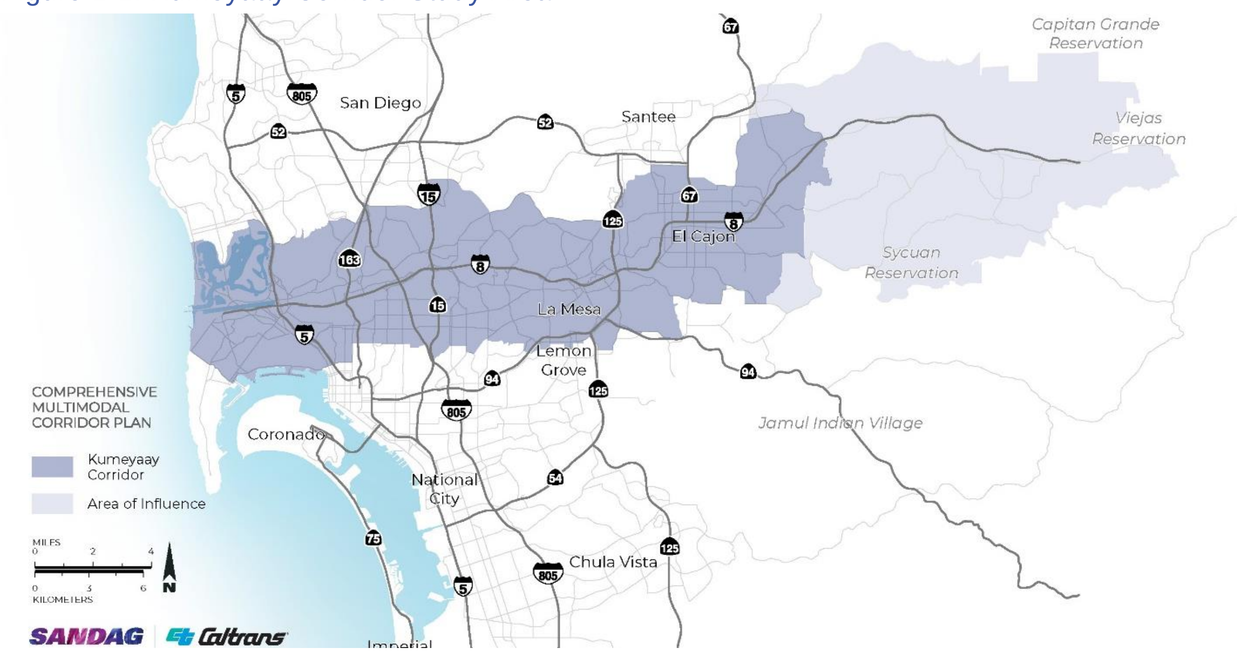
A Comprehensive Multimodal Corridor Plan (CMCP) is a strategic blueprint for identifying and implementing multimodal projects and services within communities predominantly along a specific corridor. The document is based on an integrated, ground-up planning process, which brings together residents, local jurisdictions, and other stakeholders.

A CMCP utilizes a multimodal planning process to create a balanced, equitable transportation system that integrates mobility options such as driving, biking, walking, transit, micro-mobility, and other mobility services to move people and goods within the designated corridor and beyond. A corridor study area may include multiple facilities such as local arterial roadways, state highways, rail lines, transit systems, and active transportation facilities.

A CMCP document plans for all modes of transportation by evaluating existing and future conditions, community priorities, and the potential benefit of proposed mobility strategies that align with state, regional, and project-specific goals.

SANDAG and Caltrans are developing a CMCP for the area surrounding Interstate 8 (I-8), referred to as the Kumeyaay Corridor CMCP. The Kumeyaay Corridor will provide multimodal mobility analyses to identify key issues and opportunities and develop recommendations within the project area. The project will take into consideration the findings and recommendations identified in previous studies and planning documents, and will be shaped by input from community members, public agency staff, and other project stakeholders at all project phases. **Figure 1-1** displays the Kumeyaay Corridor CMCP study area.

Figure 1-1: Kumeyaay Corridor Study Area



Source: SANDAG, 2022

Mission Valley Mobility Study

This project also includes the Mission Valley Mobility Study, which is a partnership with Caltrans, SANDAG and the City of San Diego that seeks to identify and prioritize near-term (0 – 10 years) mobility needs within the City of San Diego's Mission Valley Community Planning Area, as part of a Caltrans Planning Grant. The Mission Valley community is a regional destination for big box retail, strip malls, sporting events, and auto dealerships, and has become one of the fastest growing residential communities in the San Diego region.

In September 2019, San Diego City Council approved the Mission Valley Community Plan Update (CPU) which is proposed to add 28,000 housing units to the Mission Valley Community by 2050. This will include several new mixed-use residential towers, significant increases in affordable housing and multiple communities designed around transit supportive infrastructure. Since 2010, over 12,000 new units of housing have been added to the valley with concentrations along Friars Road, the major east west arterial that provides the backbone of circulation through Mission Valley.

The Mission Valley CPU has a 248 percent increase in population from 20,800 people in 2012 to 72,400 people in 2050. The San Diego State University (SDSU) Mission Valley Campus is one of the larger planned developments. This new campus is planned to feature 86 acres of parks, recreation, open space, 1.6 million square feet of campus uses, 4,600 residences, approximately 400 hotel rooms, retail, and an enhanced Green Line Trolley station that is better integrated into the area. The residential development will support student housing needs. A major anchor to the development is the new 35,000 seat stadium designed to support the SDSU Aztecs home games.

With all that is planned for the Mission Valley community, a detailed mobility study is needed to help effectuate the desired level of mode share shift from auto to transit via increased transit services, shared mobility and active transportation uses. The Mission Valley Mobility Study will build upon the mobility recommendations set forth in the Mission Valley CPU with a supplemental focus on transportation services and access options that decrease congestion and improve travel times for all transportation modes.

Purpose of this Report

This report builds on the challenges, opportunities, and planned improvements identified through the Relevant Document Review (provided in Appendix A) by reporting the current state of the Kumeyaay Corridor. This document examines the physical setting, demographics, land uses, and travel patterns. Available forecast information is also reviewed. Additionally, mode specific evaluations are presented for vehicles, public transportation, and active transportation to understand network connectivity, safety, and operations. These findings and data sources, combined with the literature review and community and stakeholder input, will serve as a starting point from which transportation solutions will be developed.

Corridor Context

This chapter serves to build an understanding of the users and travel behaviors within the Kumeyaay Corridor. Data related to topography and the built environment, demographics, land use, and travel patterns are used to explore what the corridor is like today, who are the users, and where are they travelling to and from.

This chapter includes the following sections:

- **Study Area Definitions** explains the process used to determine the study area for the Kumeyaay Corridor CMCP and Mission Valley Mobility Study.
- **Physical Setting** describes the natural features, built environment, and environmental risks related to flooding, sea level rise, and wildfire.
- **Demographics** presents characteristics of the residential population.
- **Land Uses, Housing, & Employment** discusses where people live and work.
- **Travel Patterns** examines the relationship between where people travel to and from within the study area.

Study Area Definitions

The study area determination process for both the Kumeyaay Corridor CMCP and Mission Valley Mobility Study are documented in this section.

Kumeyaay Corridor

The Kumeyaay Corridor CMCP study area originated as a 2-mile buffer area of I-8 between its western terminus and Lake Jennings Park Road in the unincorporated community of Lakeside to the east, a length of approximately 24 miles. A refinement from the generic 2-mile buffer around I-8 was warranted because the buffered extents did not account for other factors which may influence the freeway's hinterland, such as the presence of parallel or other regional transportation facilities, urbanization patterns and topography. These considerations are better captured by census geographic boundaries, which are often take these factors into account in their delineations.

Since demographic and socio-economic data are readily available at the Census Tract level of geography, refining the shape of the study area to align with those boundaries will also ensure less complexity and require fewer assumptions and intermediate steps when conducting analysis. Additionally, Census Tracts with higher concentrations of low-income populations in close proximity were also included. The justification for including these additional Census Tracts, despite a distance farther than two miles from the freeway, was made to ensure areas with concentrated disadvantaged populations within a moderately close distance were not excluded from the study and will receive consideration and benefit from the CMCP's recommendations.

Figure 2-1 illustrates the Kumeyaay Corridor study area development process.

Figure 2-1: Kumeyaay Corridor Study Area Development Process

Preliminary Study Area (black outlined area)

2-mile buffer along I-8, from western terminus to Los Coches Road.

Census Tracts with Centroids Inside Preliminary Study Area (gray area)

Study area was aligned with Census Tracts as demographic and socio-economic data are widely available at this level of geography.

Adjacent Low-Income Census Tracts (blue areas)

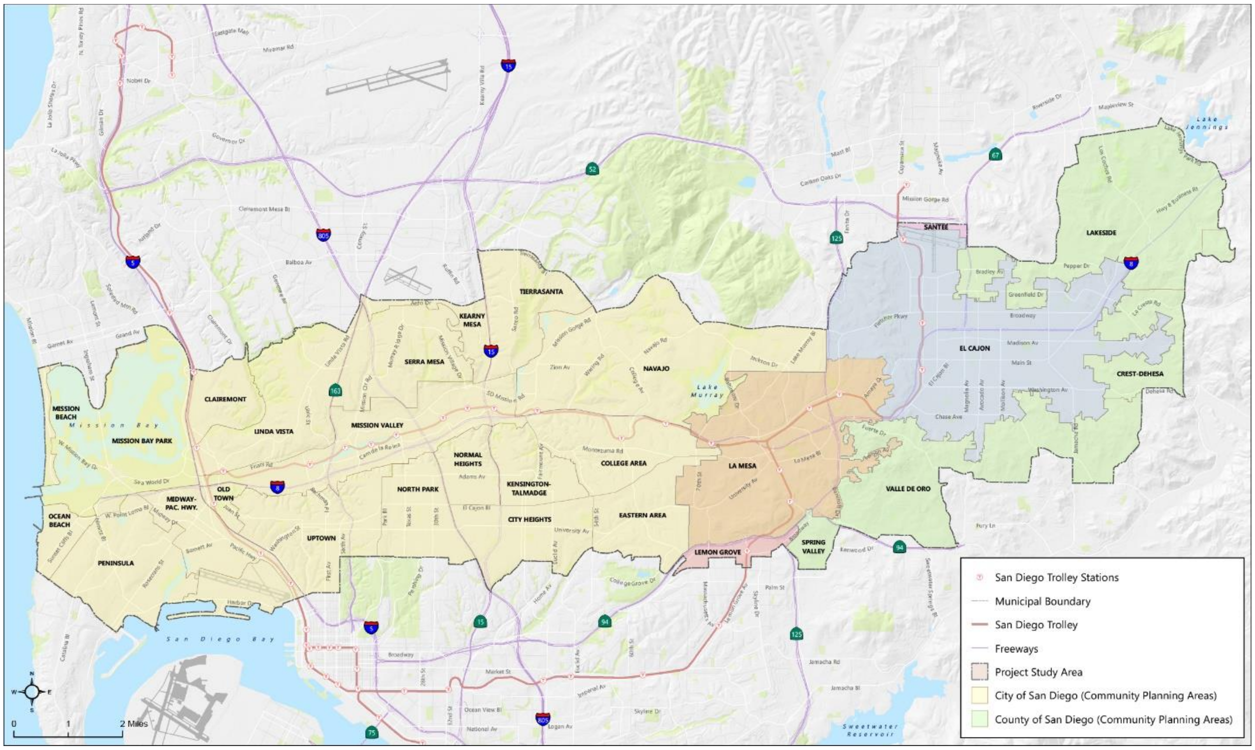
Census Tracts adjacent to the area comprised of 60% or more low-income populations were added to ensure the effort accounts for these community members.

Discretionary Refinements (green areas)

Additional Census Tracts were added to ensure sections of major roadways were not arbitrarily excluded.

The resulting Kumeyaay Corridor study area includes portions of the City of San Diego, City of La Mesa, City of Lemon Grove, City of El Cajon, City of Santee, and unincorporated County of San Diego. **Figure 2-2** displays the municipal boundaries as well as the City of San Diego Community Planning Areas and unincorporated County of San Diego community boundaries and names present within the study area.

Figure 2-2: Municipal and Community Boundaries within the Kumeyaay Corridor



Source: SANDAG, 2022

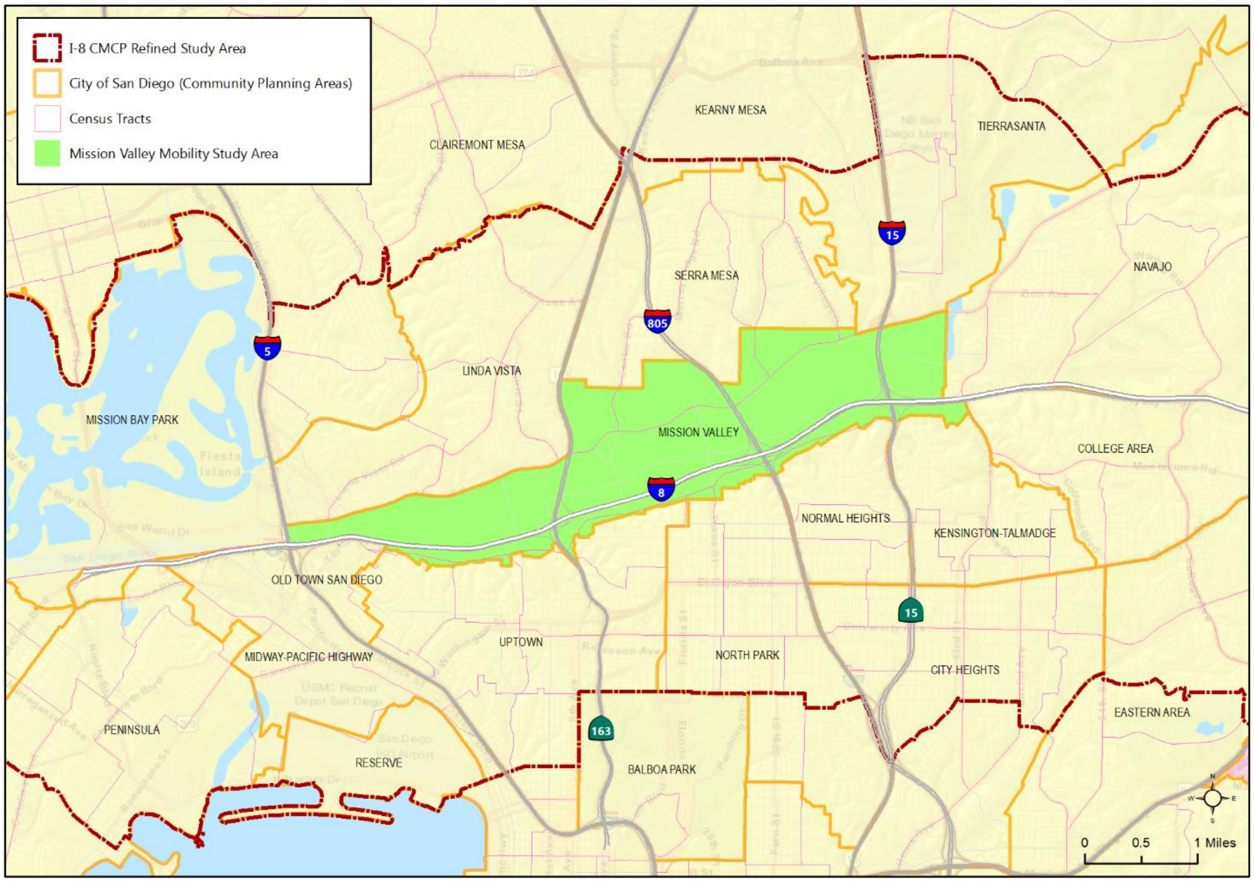
An area of influence was also established, previously shown in Figure 1.1, with the intent of expanding engagement efforts to include the community of Alpine and the Sycuan, Viejas, and Capitan Grande Bands of the Kumeyaay Nation, whose lands are close to I-8. Accessing these areas may rely on connections through the study area. Strategizing with these communities on transportation needs and solution development helps increase the reach of potential project benefits. To determine the area of influence, additional census tracts to the east of the project study area were selected as far east as the Viejas Reservation. The census tract centroids in the area of influence are within two miles of the freeway, making it consistent with the first refinement step of the project study area.

Mission Valley Mobility Study

The study area for the Mission Valley Mobility Study was developed to be consistent with the City of San Diego’s Community Planning Area (CPA) boundary for Mission Valley. The CPA boundary best conforms to the unique geographic features of Mission Valley, which isolate the community from its neighbors. A refinement process using census tract boundaries was considered, however determined not ideal due to their large sizes and irregular shapes which do not conform as closely with the recently developed areas.

Figure 2-3 displays the study area for the Mission Valley Mobility Study.

Figure 2-3: Study Area for the Mission Valley Mobility Study



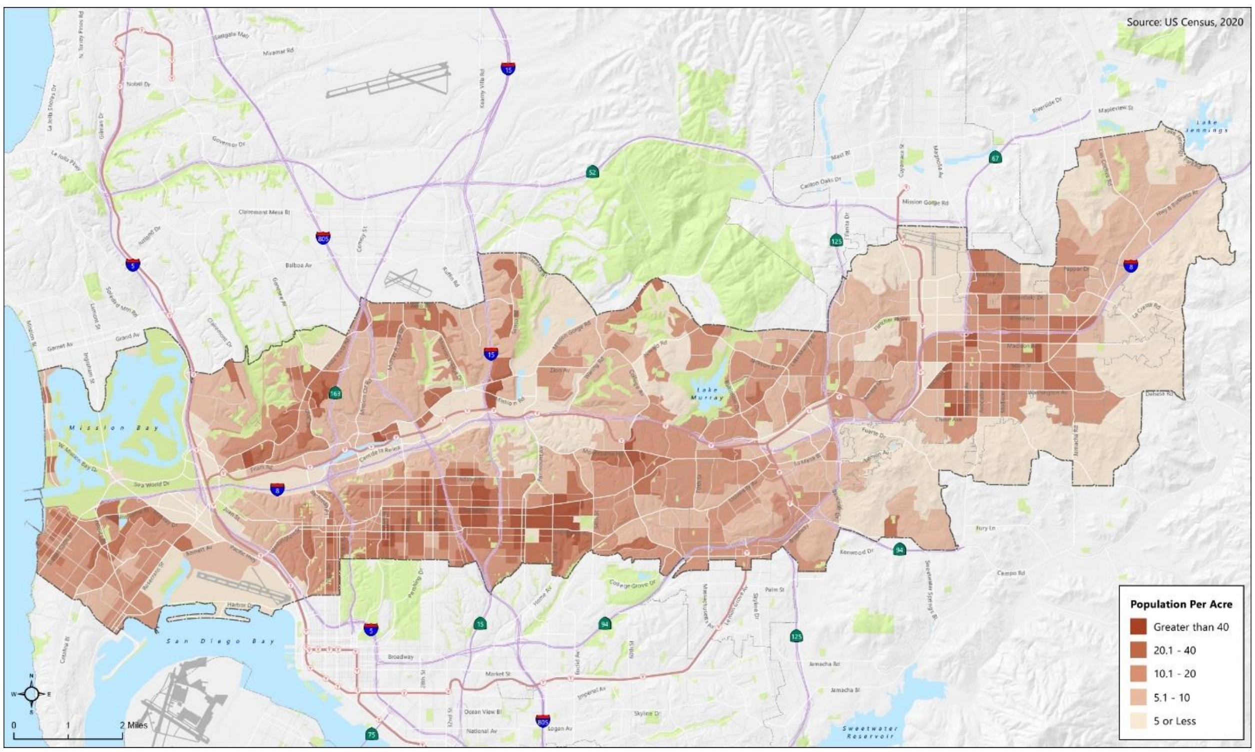
Source: SANDAG, 2022

Demographics

Those who live within the Kumeyaay Corridor study area are just as diverse as its topography. Demographic patterns can be responses to the terrain, employment, and social and economic influences of the area and greater region. Demographics are dynamic, continually changing with new developments and changes in economic conditions and other factors. The greatest planned growth is currently forecast in the Mission Valley community of San Diego, where over 50,000 new residents are anticipated by 2050. This growth, and other planned developments throughout the corridor and greater region, will be factored into solution identification.

Population density is shown in **Figure 2-4**. Higher density levels indicate greater concentrations of where people live – areas with the potential to be more supportive of shared transportation options like public transit, carshare, bikeshare, and scooter share. The greatest densities within the corridor are located south of I-8, near SR 15 within North Park, City Heights, Normal Heights, and El Cajon to the east. Locations near larger employment centers also exhibit higher densities including in the communities of Midway-Pacific Highway near the Sports Arena, western Ocean Beach, Linda Vista near the University of San Diego and Mesa College, in the College Area near San Diego State University, in Tierrasanta near Kaiser Permanente, and in Serra Mesa near Rady Children's Hospital.

Figure 2-4: Population Density (2020)

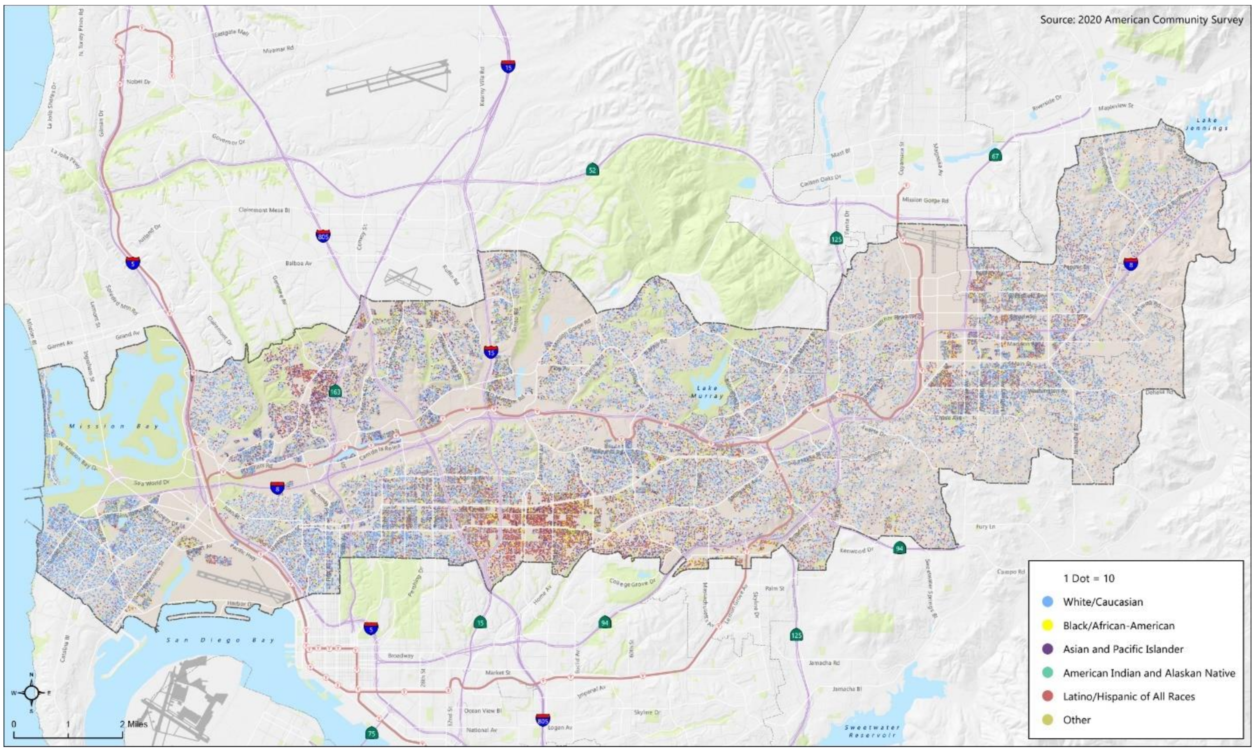


Source: US Census, 2020

Social equity focused communities refer to minority, low-income, and younger/older populations – groups that may have unique transportation needs yet have been historically underserved and underrepresented in planning processes. Identifying and engaging these community members contributes towards providing meaningful and equitable investments in vulnerable communities.

Figure 2-5 shows populations within the Kumeyaay Corridor by race. Approximately 60% of Kumeyaay Corridor residents identify with one or more minority races. Representations of each race category are shown throughout the corridor; however, minorities are most prevalent in Linda Vista just west of SR 163 and north of I-8, in City Heights east of I-805 and south of El Cajon Boulevard, and in El Cajon.

Figure 2-5: Population by Race (2020)

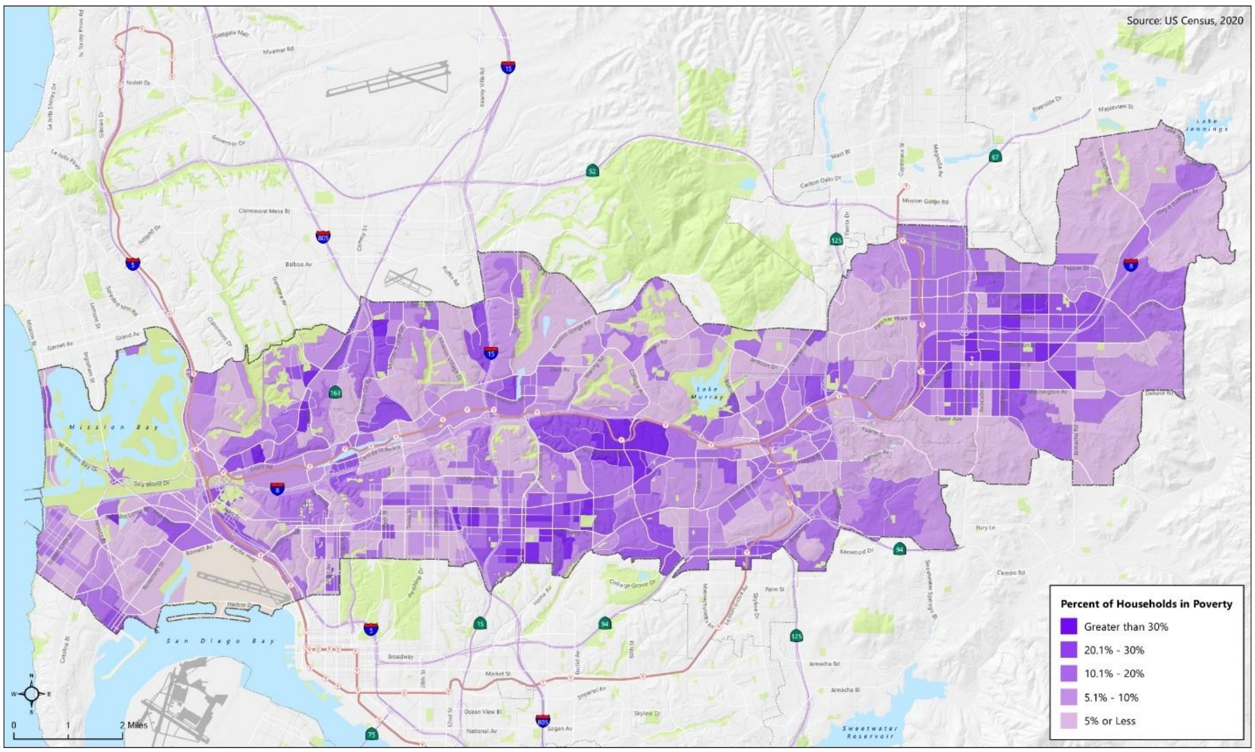


Source: US Census American Community Survey, 2020

Income can affect transportation choices. Many low income households cannot afford vehicle ownership which makes reliance on alternative travel options such as public transportation, walking, and bicycling vital to employment access. Ensuring these transportation choices are well provided in lower income areas helps ensure all community members have viable mobility options.

The US Census Bureau uses thresholds based on family size and age of the members to measure poverty. Poverty thresholds were derived from the cost of a minimum food diet multiplied by three to account for other family expenses and updated to reflect inflation using the Consumer Price Index. **Figure 2-6** identifies the percentage of households in poverty by census block group. Understanding where higher poverty rates are present can inform the development of recommendations and allocation of resources. Relatively higher concentrations of people in poverty are shown in the areas with greater population and minority density: Linda Vista, City Heights, and El Cajon. This is especially important when considering future transportation investments that will provide benefits to the greatest number of people.

Figure 2-6: Percentage of Households in Poverty (2020)

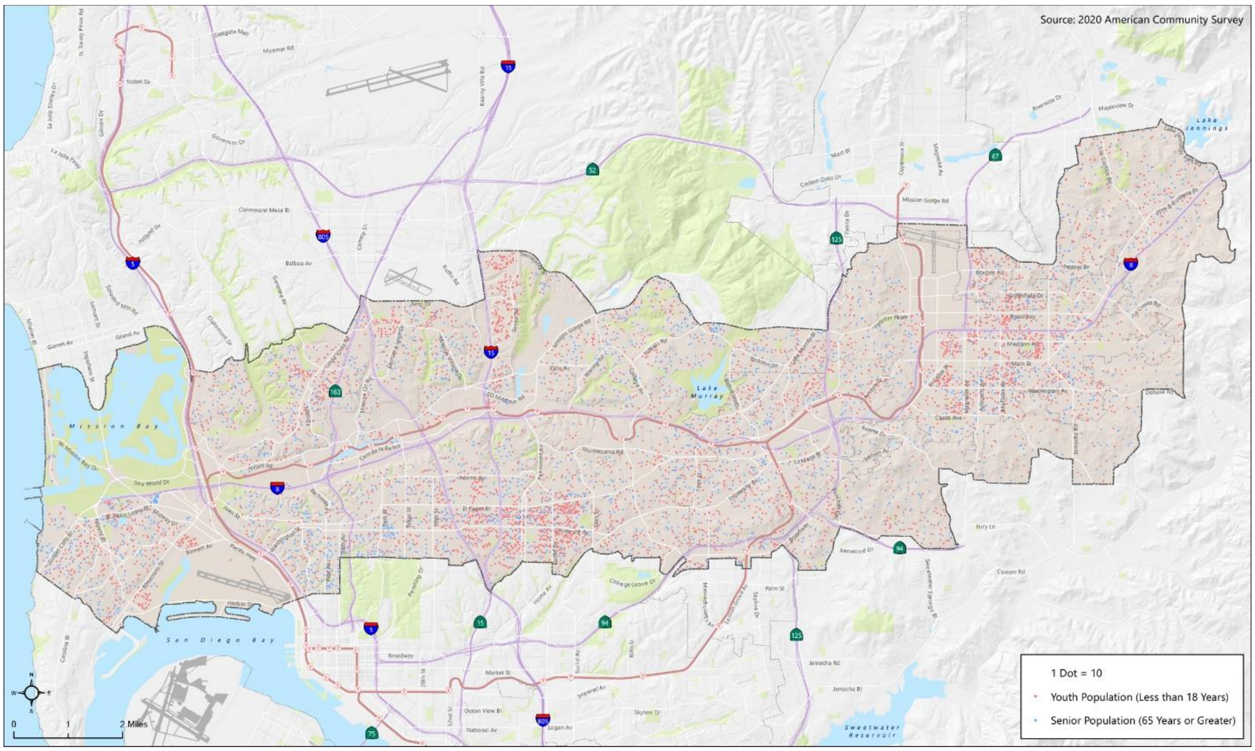


Source: US Census, 2020

Age can influence transportation needs and options. Youth (<18) and senior (>64) populations may not be able to drive due to age, underlying conditions, or lack of vehicle access. These challenges can make these populations more dependent on alternative modes of travel. Age can also be indicative of potential demand or need for things like on-demand shuttles, bikeshare, or scootershare.

Figure 2-7 presents a dot density analysis of the population by age. Greater concentrations of youth are shown in Serra Mesa, Tierrasanta, City Heights, Navajo, and El Cajon, while higher concentrations of seniors are present in Peninsula, Uptown, Clairemont Mesa, Kensington-Talmadge, and unincorporated San Diego County.

Figure 2-7: Youth and Senior Populations (2020)

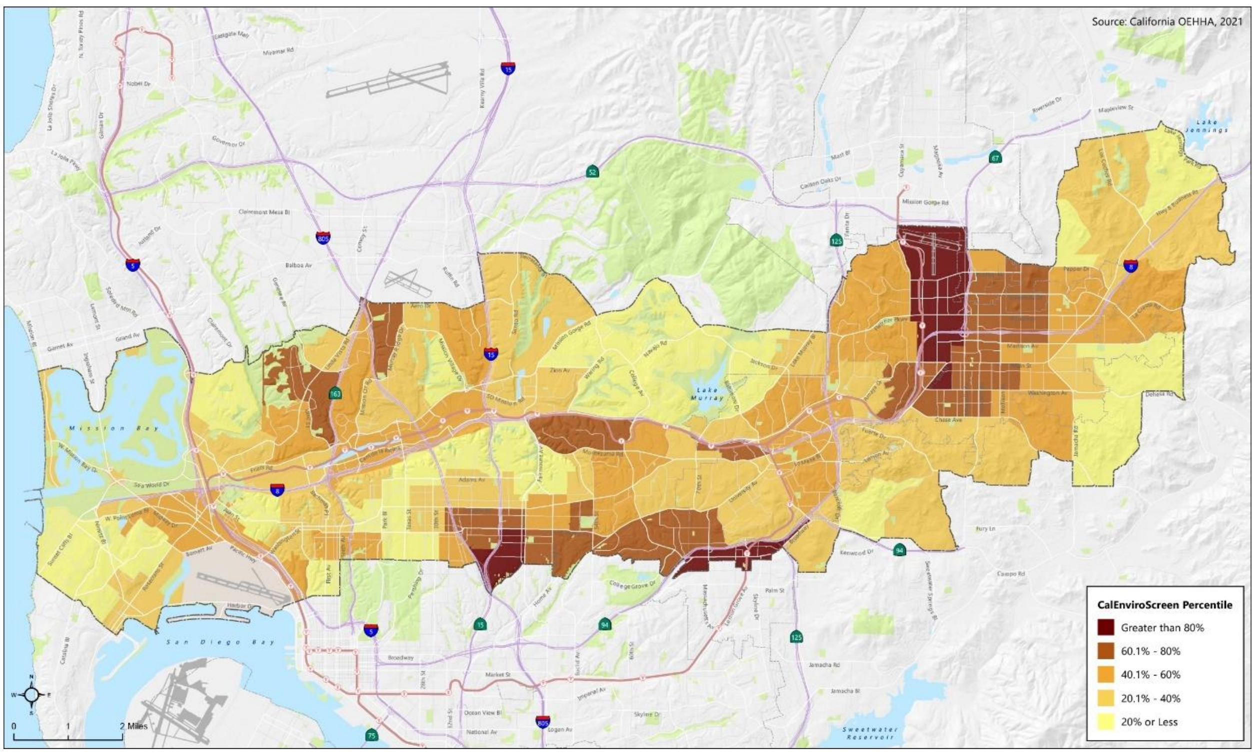


Source: US Census American Community Survey, 2020

It is important to establish not only who and where people reside within the Kumeyaay Corridor study area, but also how these different groups are exposed to the negative effects of our built environment. The CalEnviroScreen Index is a method established by the State of California for measuring pollution impacts. It takes into consideration those most vulnerable to pollution's effects including those with underlying health conditions or those with less socioeconomic resources. The CalEnviroScreen percentile score is shown in **Figure 2-8**.

Higher percentage levels indicate more vulnerable and exposed areas. The highest percentages are shown in in City Heights, Lemon Grove, and the industrial portion of El Cajon which includes Gillespie Field. Notably, each of these locations are adjacent to or encompass freeways interchanges where vehicular volumes are high. Pollution burden indicators with higher representation (90% or above) include the presence of groundwater threats, cleanup sites, solid waste, and impaired waters and greater exposure to diesel particulate matter and traffic.

Figure 2-8: CalEnviroScreen Statewide Percentile Score



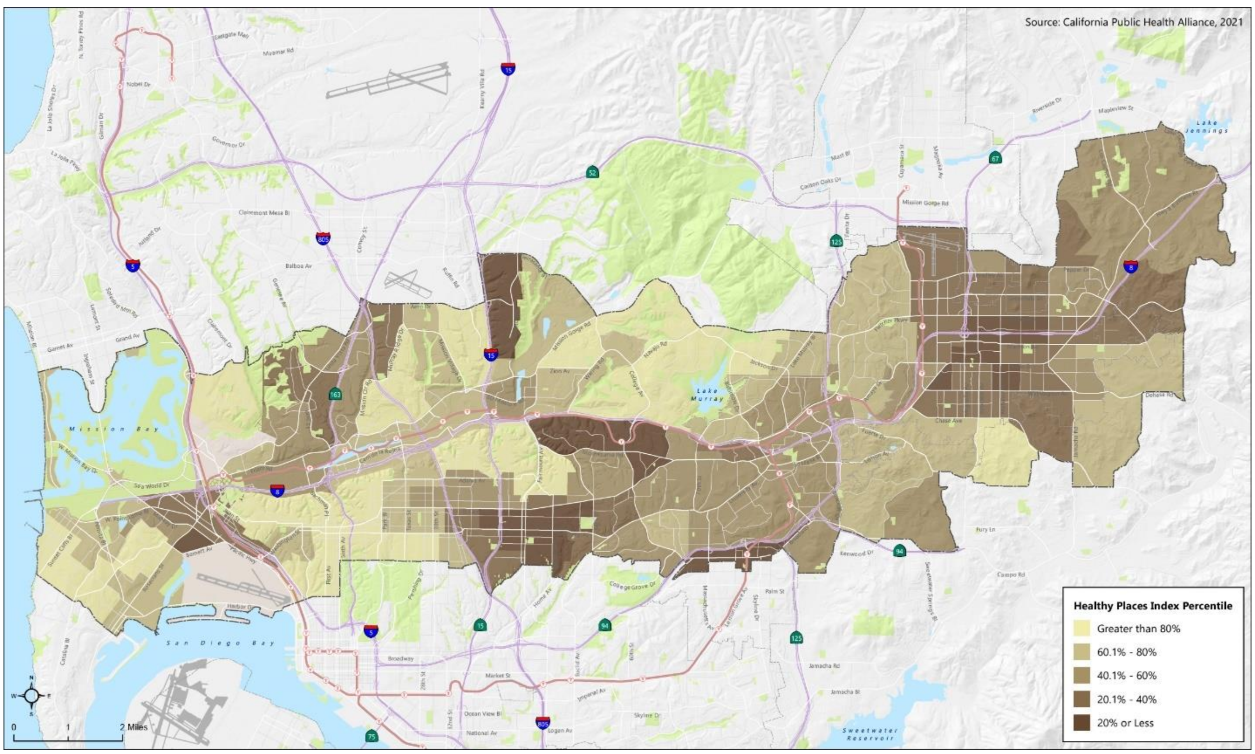
Source: California Office of Environmental Health Hazard Assessment, 2021

The Healthy Places Index (HPI) draws from socioeconomic and environmental data tied to health outcomes such as education, job opportunities, and clean air and water. Higher HPI scores indicate healthier communities, while lower scores identify less healthy areas. The HPI results presented in **Figure 2-9** demonstrate less healthy conditions are present within the Tierrasanta community just east of I-15 and south of Tierrasanta Boulevard, the College Area community directly south of I-8, City Heights, Spring Valley, and El Cajon south and east of the SR 67/I-8 interchange.

Some of the factors contributing to the lower scores include:

- Employment rates
- Per capita income
- Housing costs
- College education
- Park access
- Preschool enrollment
- Access to personal vehicles
- People living in poverty
- Health insurance rates
- Tree canopy

Figure 2-9: Healthy Places Index Statewide Percentile Score



Source: California Public Health Alliance, 2021

Physical Setting

Topography and Built Environment

The Kumeyaay Corridor is centrally located in urbanized San Diego County, encompassing the only east-west running interstate in the region, I-8. The 24-mile-long corridor spans a variety of topographical features like coastal and bay areas, the San Diego River, valleys, hills, and mesas. These features greatly shaped the existing transportation infrastructure and development patterns and influence all corridor users.

The west end of the Kumeyaay Corridor abuts the Pacific Ocean, San Diego Bay, and Mission Bay, features that create community edges and limit local access. Some of the major destinations in this area include the ocean, bays, marinas, San Diego International Airport, Pechanga Arena, and Sea World. Just east of Mission Bay, I-5 and rail service for the MTS Blue Line, COASTER, Amtrak, and BNSF run north-south.

A linear valley runs east-west, formed by steep grades to the north and south. I-8, the San Diego River, and Green Line Trolley all follow the valley floor. SR 163, I-805, and I-15 are additional north-south running freeways traversing the western half of the study area. Communities north of I-8 generally exhibit post-war suburban development patterns formed around the natural canyons, resulting in a circuitous street network with limited alternative connections. Destinations in western half of the study area include University of San Diego, Old Town San Diego, Presidio Park, Fashion Valley Mall, Westfield Mission Valley Mall, future San Diego State University West site, Kaiser Permanente Zion Medical Center, and Mission Basilica San Diego de Alcala. A significant complex of medical facilities is sited just south of where I-805 and SR 163 converge.

A relatively flat mesa with intermittent canyons is present south of the valley. The older communities in this area established a grid street pattern with mixed use environments along major corridors surrounded by residential neighborhoods. Balboa Park abuts the south side of the study area and is a major destination attracting trips from across the region and beyond. Scripps Mercy San Diego and University of California San Diego Medical Center are both located just west of SR 163, south of I-8. Additionally, the vibrant communities in these areas can be destinations in and of themselves.

To the east, the mesa south of I-8 becomes less flat, and roadways deviate from the grid pattern to follow the contours of canyons. San Diego State University is centrally located in this area. It includes a dedicated transit station served by the Green Line Trolley and multiple bus routes. The entirety of La Mesa and northernmost part of Lemon Grove are also within the Kumeyaay Corridor study area, each with Orange Line Trolley Stations. SR-94 and SR 125 also enter the study area in La Mesa and Lemon Grove. Downtown La Mesa, Lake Murray, Grossmont Center, and Sharp Grossmont Hospital are additional destinations in this part of the study area.

The valley floor widens east of SR 125, which enabled El Cajon to develop in a traditional grid pattern. El Cajon is the easternmost urbanized city in the study area, with unincorporated San Diego County communities further east and to the south. The Green Line Trolley ventures away from I-8 in El Cajon, heading to its terminus at the Santee Town Center just north of the study area. The southern terminus of SR 67 is at I-8 in El Cajon, providing connections to Santee and unincorporated communities to the north. Destinations in this area include Grossmont College, Main Street, and Gillespie Field. The Sycuan and Viejas Bands of Kumeyaay Indians have reservations just east of the study area, within the project area of influence, along with the unincorporated community of Alpine. The reservations provide a place for tribe members to reside and also serve as regional destinations due to the casinos, shopping, and resort facilities.

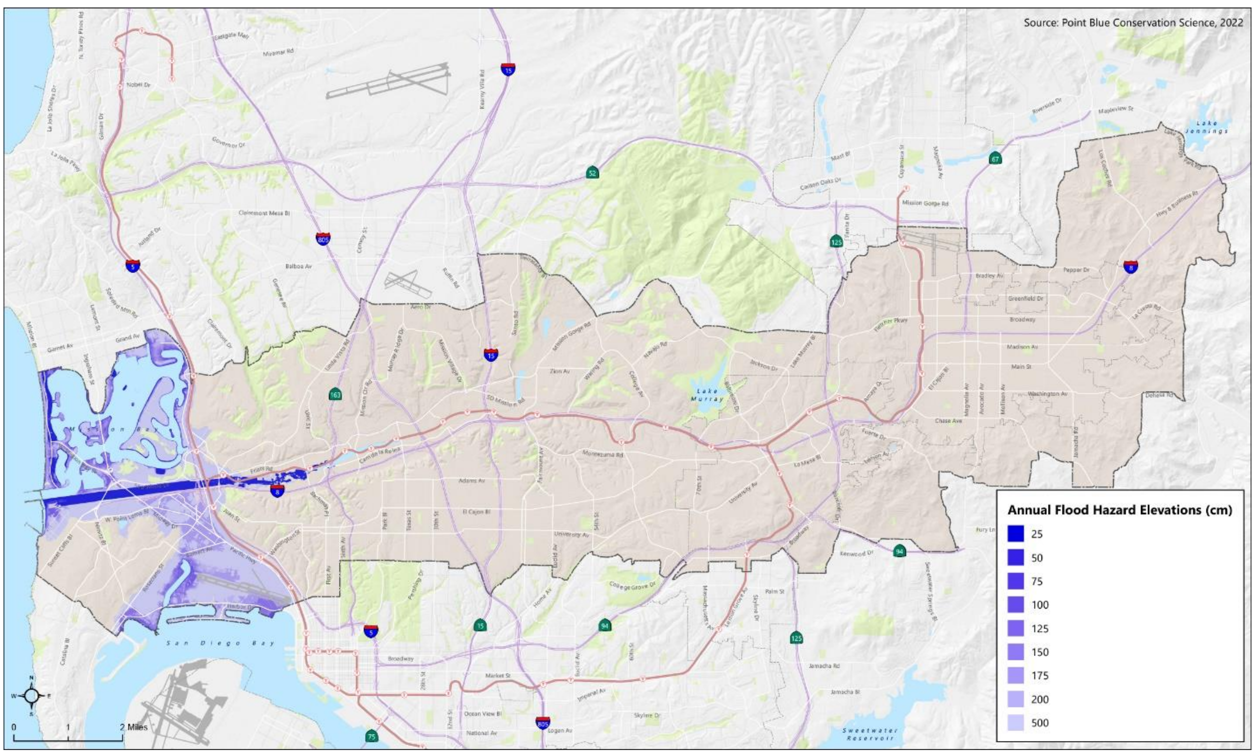
Climate Risks

Inland Flooding

Figure 2-10 illustrates flooding risks using FEMA 100-year floodplains. The Kumeyaay Corridor has many areas of intersection with the FEMA 500-year floodplain but remains largely separate from the FEMA 100-year floodplain, which runs as a narrow corridor along the San Diego River but does not extend to I-8. The FEMA 500-year floodplain reveals that sections of I-8 between Morena Boulevard and the I-15 are most exposed to inundation during a 500-year storm. Of this larger segment, the portion of highway between the intersections of SR 163 and I-805 will likely see the most profound flooding, with the floodplain extending significantly beyond both sides of the highway. With this in mind, the segment between these two highway exits should be prioritized for future flood fortifications, as it demonstrates the highest level of exposure to inland flooding. Additionally, a small segment of highway adjacent to the southeast corner of Navajo Canyon Open Space Park, west of the College Avenue exit, falls within the FEMA 500-year floodplain. The floodplain in this area covers both lanes of highway; however, it is not extensive and will likely only impact a small portion of the road.

Notably, FEMA floodplains are generated using local historical flood data, and as such, are not forward looking. In the future, storms in this region are projected to become more intense, which may lead to deeper and more extensive floodplains that could impact additional segments of the Kumeyaay Highway.

Figure 2-10: FEMA 100-Year Floodplains



Source: Point Blue Conservation Science, 2022

Sea Level Rise

Flooding from annual storm surge indicates areas that will flood during the highest tide of the year, which would be considered chronic flooding and could lead to issues with both transportation reliability and safety, as well as damage to infrastructure. Flooding from the 100-year storm indicates areas that will flood due to a storm that has a 1% annual chance of occurring, which is associated with less frequent but impactful flood events and a larger area being flooded.

Sea level rise plus the annual storm is expected to affect the general corridor but does not have much overlap with I-8 itself. At a lower amount of sea level rise (25 cm, which according to the California Ocean Protection Council is expected to occur by 2030 in the San Diego area), there are two key points of the corridor that are exposed to flooding: I-5 just north of I-8, and the SR 163 just north of I-8. This flooding associated with early sea level rise follows the San Diego River inland and resembles the current FEMA 100-year floodplain.

By 2050, the San Diego area is projected to experience between 2 and 2.8 feet of sea level rise. The main changes from 25 cm of sea level rise are increased flooding around Mission Bay and San Diego Bay, but not around Kumeyaay Highway itself.

Sea level rise of approximately 6.6 feet is projected to occur in the San Diego area between 2080 and 2100. At this level, I-8 is expected to be inundated west of Taylor Street along the south of Mission Bay and the San Diego River. Otherwise, the main areas in the corridor that are expected to experience inundation from 200 cm of sea level rise are the shorelines around Mission Bay and San Diego Bay, and the Midway community between these two bodies of water.

Looking at sea level rise in combination with the 100-year flood, there is not much difference in terms of area flooded compared to sea level rise with the annual flood. In most cases, the same areas are flooded, with some expansion of flood extent. The main change occurs around 175 cm of sea level rise, where the 100-year flood sees more of Midway and Bay shorelines flooded. Flooding in Midway may pose an issue for evacuation, as the flooded area cuts north and south between the two bays, effectively cutting off the Point Loma, Roseville-Fleet Ridge, Liberty Station, Point Loma Heights, and Ocean Beach neighborhoods from the rest of San Diego.

SANDAG is working with the Navy to develop adaptation roadmaps for Harbor Drive, Pacific Coast Highway, and SR 75. These roadmaps will identify sea level rise trigger points and soft (nature based) and hard (traditional engineered) solutions to keep the corridors resilient. The project looks out to 2100.

Wildfire

Most of the Kumeyaay Corridor between Mission Bay and Lake Murray Boulevard is within San Diego's current local responsibility area's very high fire hazard severity zone (FHSZ). This designation triggers certain codes and requirements that are meant to help reduce the risk of fire for development in the area. While these requirements largely apply to buildings in the very high FHSZ (e.g., AB-38, Government Code Section 51182), it is important for planners to be aware of such requirements.

Climate change is projected to increase the severity and extent of wildfires in California. Wildfire projections for California map the area that is projected to be at risk of burning in a given year. For the Kumeyaay Corridor, the intersection of I-5 and I-8 and eastern segments of I-8 near Lakeside are projected to experience moderate wildfire exposure by 2025 under a high emissions scenario (RCP 8.5). In this context, 'moderate exposure' is a measure developed by Caltrans and indicates that a given map cell is expected to have between 15 and 50 percent of its area burned. There is not a change in the wildfire risk to the corridor between 2025 and 2055, but by 2085 there are more areas at risk of burning. Specifically, segments of I-8 in Mission Valley from the I-5 to I-805, and parts of those freeways themselves, are projected to face moderate wildfire exposure. In addition, the area of I-8 near Mission Bay that faced moderate exposure in 2025 and 2055 is projected to increase its risk from moderate to high (i.e., 50 to 100 percent of a map cell's area is burned).

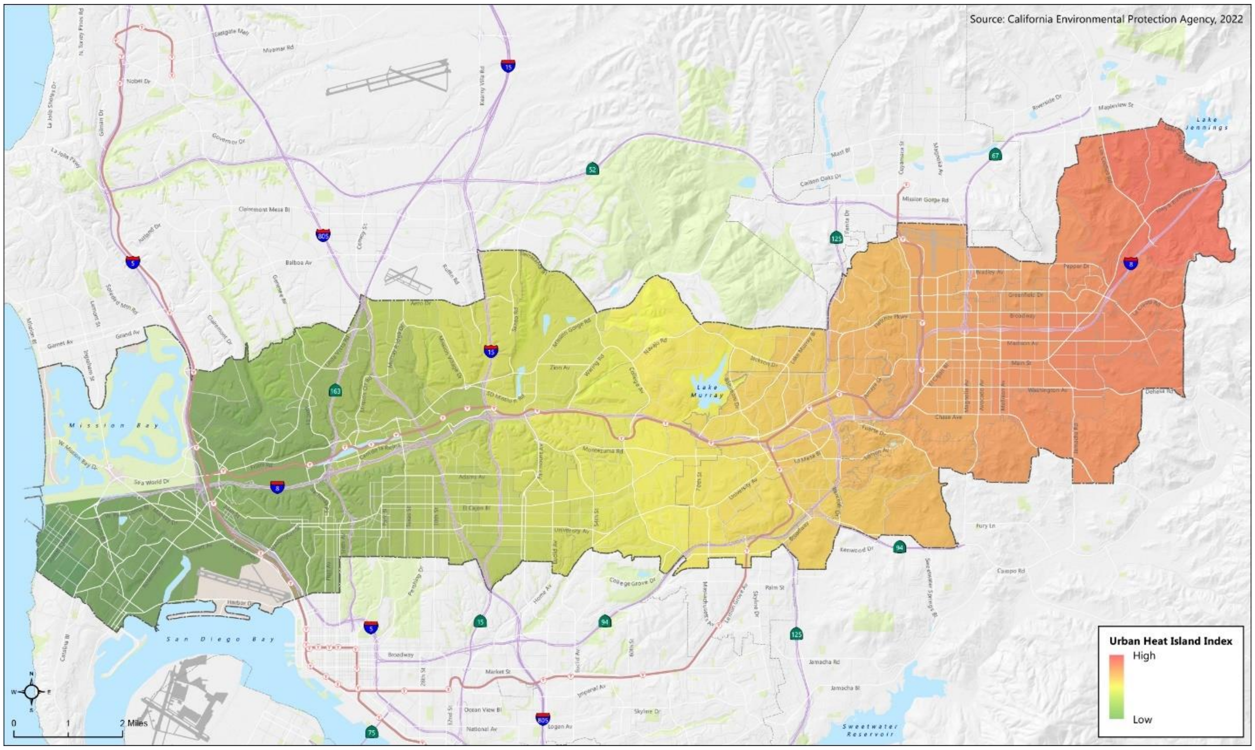
Wildfire risks are heightened east of the corridor, which poses potential issues for evacuation along I-8, especially when the risk extends to intersecting routes (i.e., I-5, SR 163, and I-805)– putting detours at risk as well.

Extreme Heat Risks

Temperatures are projected to increase in the Kumeyaay Corridor through late century, with the most profound increases occurring in eastern, inland portions. In the 2020s, average 7-day maximum temperatures are projected to increase by up to 1.9°F in segments of the corridor extending from the coastal area to I-805. Meanwhile, more inland portions of the highway may see temperature increases for the 7-day maximum ranging from 2°F to 3.9°F. In the 2050s, the entire highway, including the coastal zone, is projected to experience increases in average 7-day maximum temperatures ranging from 4°F to 5.9°F. Inland portions of the highway may see temperatures at the higher end of this range, and coastal portions may see temperatures closer to the lower end of the range. Finally, in the 2080s, the entire highway is projected to experience temperature increases ranging from 8°F to 9.9°F for this variable; again, the highest increases are projected to occur inland.

Figure 2-11 displays urban heat island index results for the Kumeyaay Corridor. The urban heat island (UHI) effect is also projected to be most intense around the inland portions of the Kumeyaay Corridor, where regional temperatures – especially in highly developed areas – aren't cooled by the sea breeze or proximity to ocean. High heat poses a health concern for active transportation and transit users, and planners should consider integrating protection measures such as shade structures and/or trees at bus stops and along pedestrian and bike routes. Due to the temperature differentials across coastal and inland portions of the highway outlined above, segments of inland road should be prioritized in heat resilience efforts. Although coastal segments are projected to also experience temperature increases, these increases will be relatively lower, suggesting that this area of highway can take second priority in adaptation measure implementation.

Figure 2-11: Urban Heat Island Index



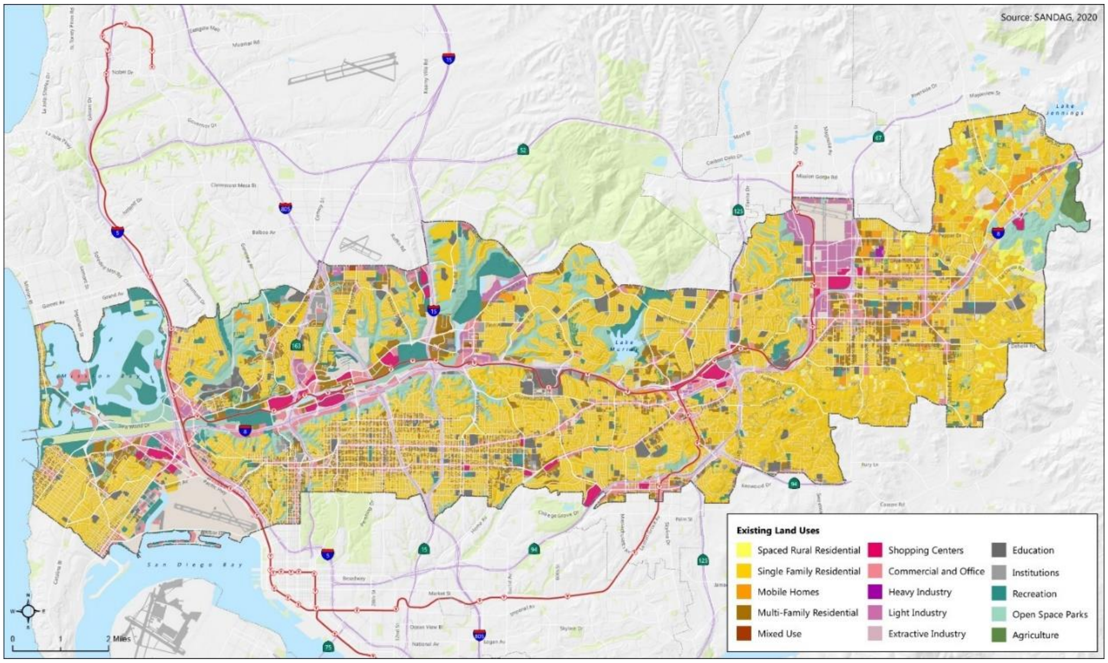
Source: California Environmental Protection Agency, 2022

Land Uses, Housing, & Employment

Land Use

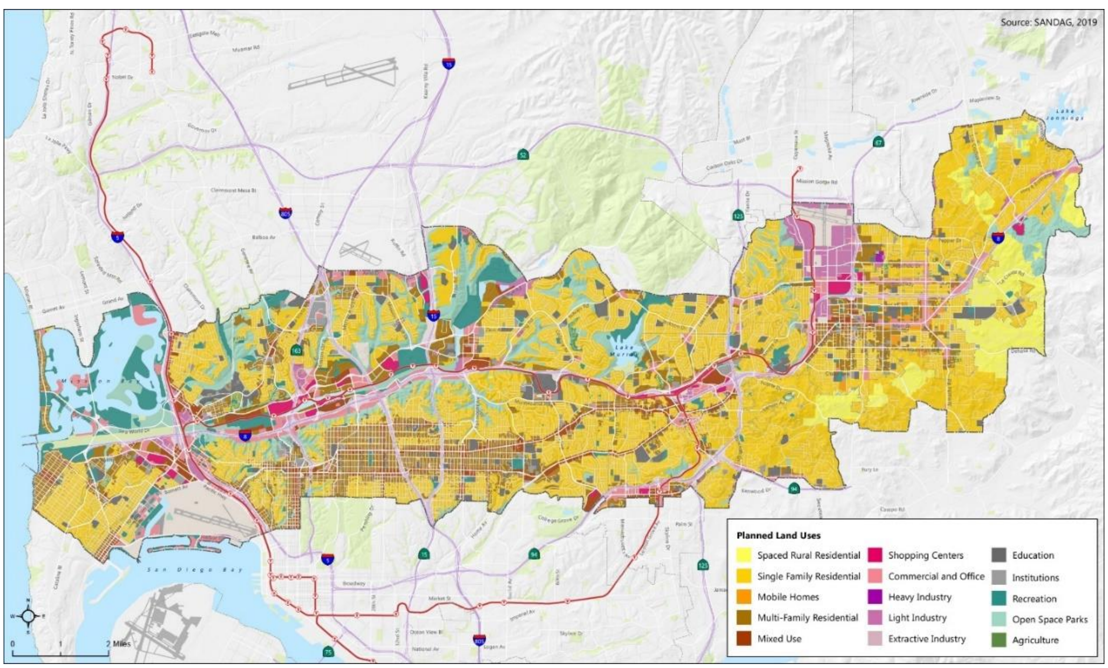
Existing and planned land uses are shown in **Figure 2-12** and **Figure 2-13**, respectively. Noticeable increases of multi-family and mixed-use designations are planned in Ocean Beach, Mission Bay, Mission Valley, Hillcrest, North Park, City Heights, La Mesa, and El Cajon. These changes are largely concentrated along major arterials such as Friars Road, El Cajon Boulevard, University Avenue, Mission Gorge Road, and La Mesa Boulevard. The increased residential density will put additional demand on the transportation system but also has the potential to make these areas more supportive of public transit and local commercial/retail businesses.

Figure 2-12: Existing Land Uses[1]



Source: SANDAG, 2020

Figure 2-13: Planned Land Uses[1]

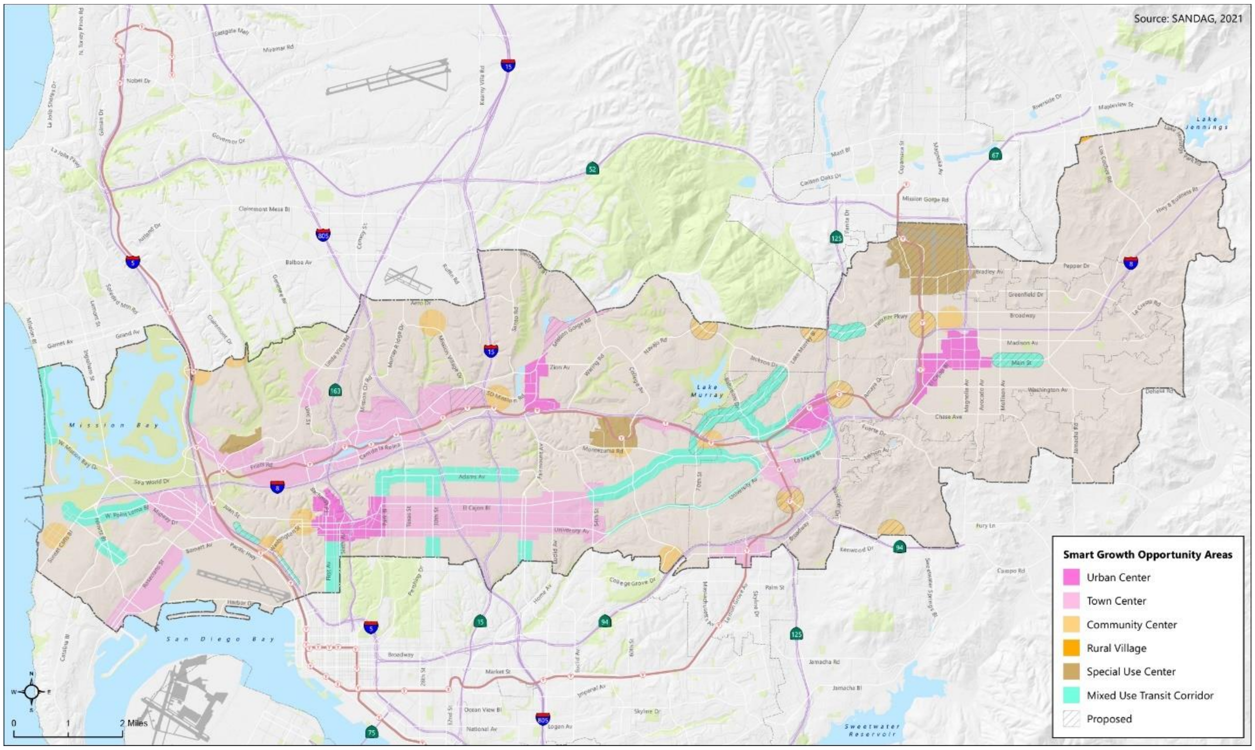


Source: SANDAG, 2019

1 Graphics depict the categories and data utilized in SANDAG's regional transportation model which is not reflective of all locally adopted planning documents, such as the Mission Valley Community Plan (2019). The most up to date land use information for City of San Diego communities can be obtained from the City of San Diego's website: https://www.sandiego.gov/planning/community-plans

“Smart growth” refers to development patterns that are compact, efficient, and environmentally sensitive. Smart growth focuses future growth and infill development near jobs, services, and public facilities to maximize the use of existing infrastructure and preserve open space and natural resources. Smart growth is characterized by more compact, higher density development in urbanized areas through the region. These areas are walkable, bike-friendly, near public transit, and promote good community design, resulting in housing and transportation choices for those who live and work in these areas. SANDAG’s Smart Growth Concept Map identifies locations in the region that can support smart growth and a variety of transportation modes. As shown in **Figure 2-14,** smart growth opportunity areas are present throughout the Kumeyaay Corridor.

Figure 2-14: Smart Growth Opportunity Areas



Source: SANDAG, 2021

Characteristics of each Opportunity Area type present within the study area include the following:

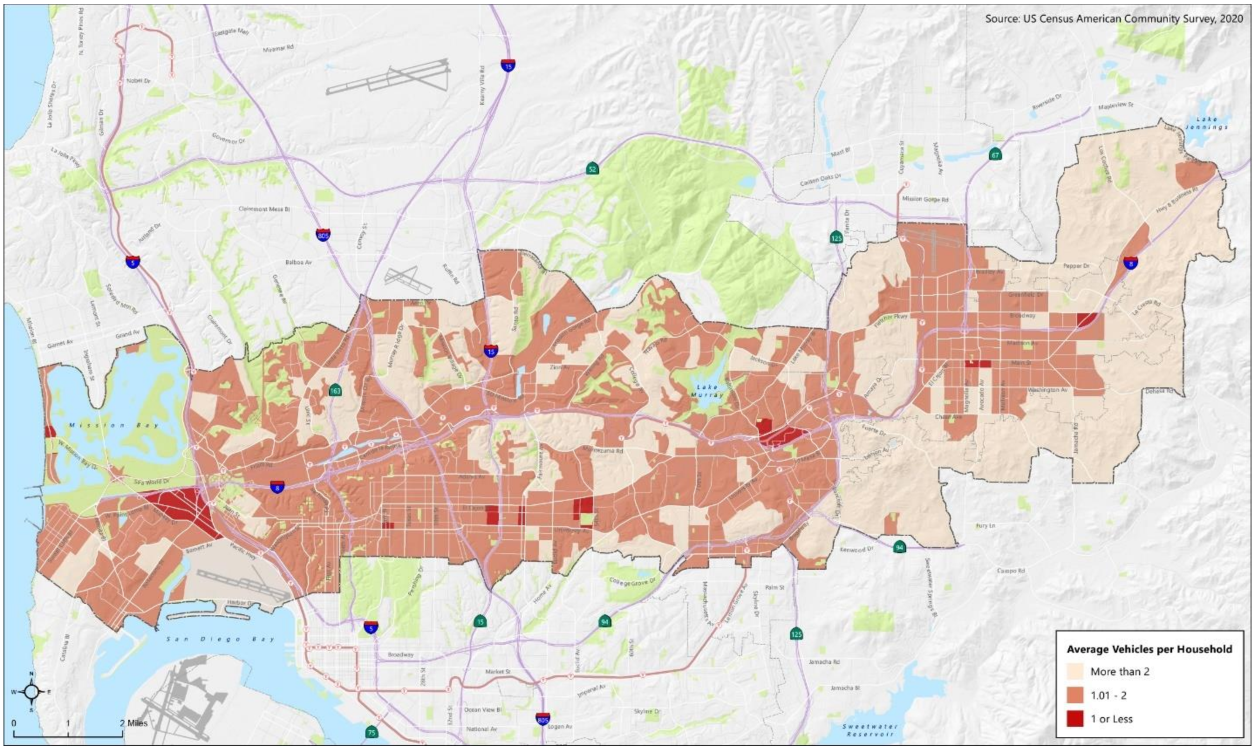
- **Urban Center**
  - Subregional business, civic, commercial, and cultural centers
  - Mid- and high-rise residential, office, and commercial buildings
  - Medium to high levels of employment
  - Draws people from throughout the region, with many from the immediate area
  - Served by transit lines and local bus services
- **Town Center**
  - Suburban downtowns within the region

    - Low- and midrise residential, office, and commercial buildings
    - Some employment
    - Draws people from the immediate area
    - Served by corridor/regional transit lines and local services or shuttle services
- **Community Center**
    - Areas with housing within walking/biking distance of transit stations
    - Low- to mid-rise residential, office, and commercial buildings
    - Draws people from nearby communities and neighborhoods
    - Served by local high-frequency transit
- **Special Use Center**
    - Employment areas consisting primarily of medical or educational facilities
    - Variety of low-, mid- and high-rise buildings
    - Dominated by one non-residential land use (e.g., medical or educational)
    - Draws people from throughout the region or immediate subregion
- **Mixed Use Transit Corridor**
    - Areas with concentrated residential and mixed use development along a linear transit corridor
    - Variety of low-, mid- and high-rise buildings, with employment, commercial and retail businesses
    - Draws people from nearby communities

Vehicles per Household

Examining the vehicles per household can inform transportation needs. Households with fewer vehicles may be more reliant on transportation modes other than driving. **Figure 2-15** depicts average vehicles per household throughout the Kumeyaay Corridor. Most of the Kumeyaay Corridor falls within the middle range of vehicular ownership (1.01 – 2 vehicles per household), while areas with fewer vehicles are shown in parts of the Midway and Mid-Cities communities, La Mesa, and El Cajon. Households with more than two vehicles are dispersed throughout the study area and more prevalent in the unincorporated San Diego County areas east of SR 125.

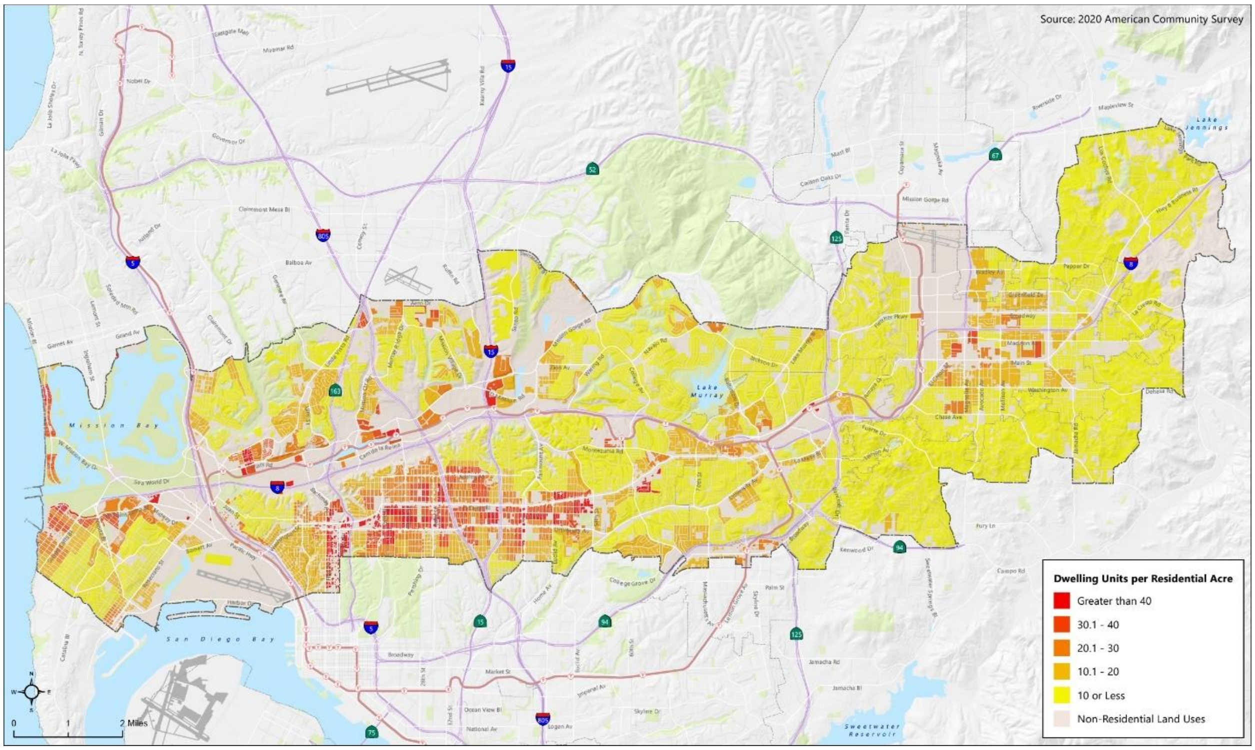
Figure 2-15: Average Vehicles per Household (2020)



Source: 2020 American Community Survey 5-Year Estimate (Tenure by Vehicles Available - B25044)

Figure 2-16 illustrates dwelling units per acre of residential land use. Residences, or dwelling units, are typical places for commute trips to originate and end at, therefore, areas with higher dwelling unit density are likely to have greater amounts of trips leaving during morning commute hours and returning during evening commute hours. The greatest concentrations of dwelling units are shown in the Uptown community between 4th Avenue and 6th Avenue and within Uptown, North Park, City Heights between University Avenue and El Cajon Boulevard.

Figure 2-16: Dwelling Units per Residential Acre (2020)

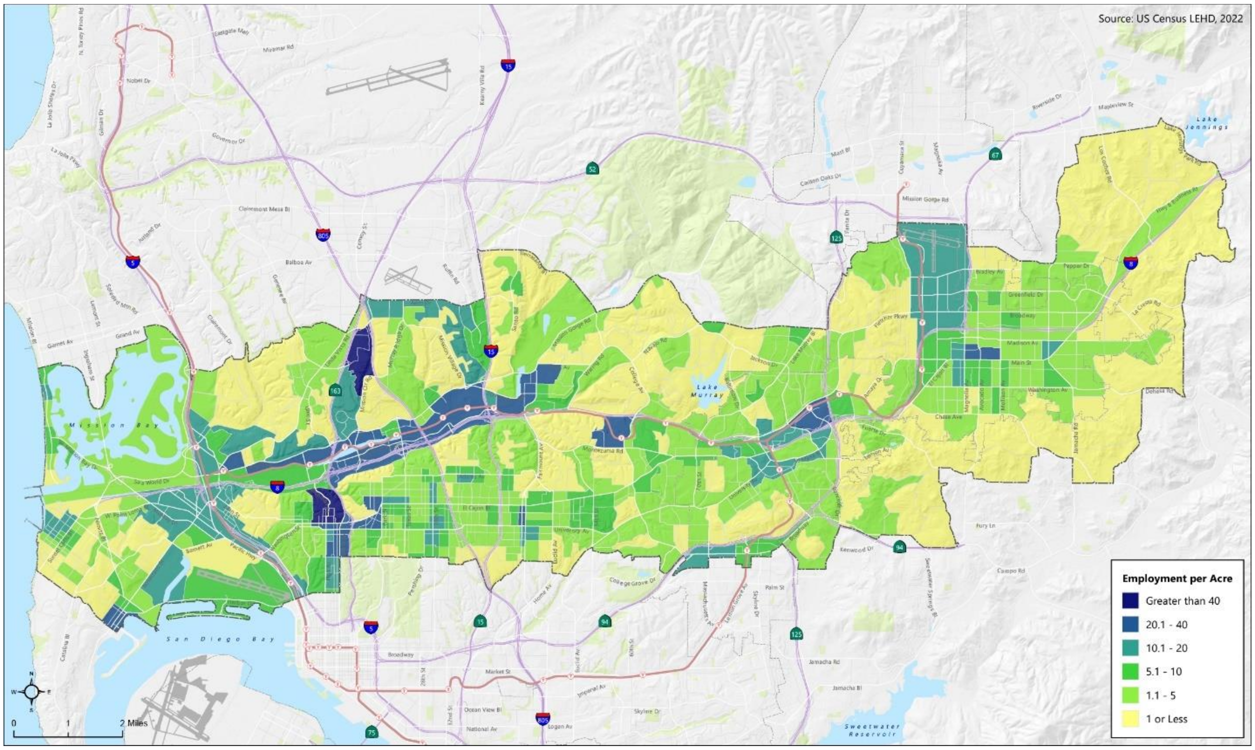


Source: 2020 American Community Survey 5-Year Estimate (Tenure by Vehicles Available - B25044)

Employment

While commute trips typically originate at residences, places of employment serve as the destination. Building an understanding of these locations helps plan for future transportation services and infrastructure improvements that are most needed. **Figure 2-17** displays employment density. Greater concentrations of jobs are located in Midway, Uptown, Linda Vista, Mission Valley, San Diego State University, central La Mesa, central El Cajon and around Gillespie Field.

Figure 2-17: Employment Density (2019)

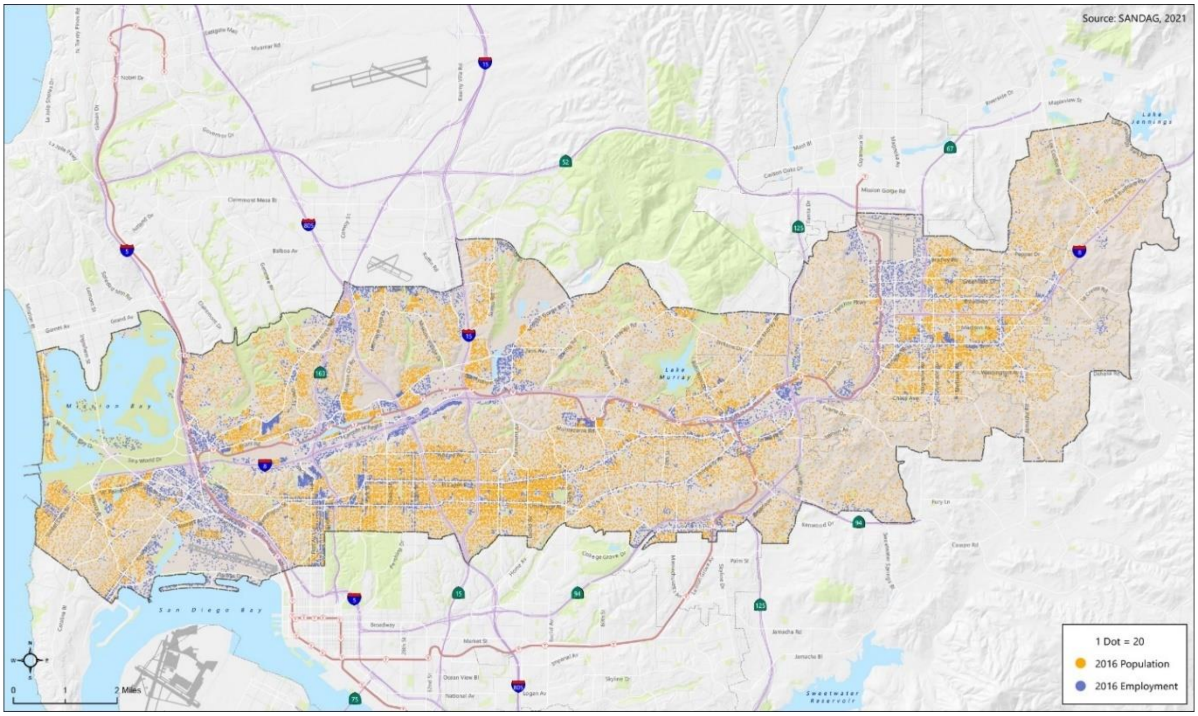


Source: LEHD LODES version 8 (2019)

Existing and future population and employment are shown in **Figure 2-18** and **Figure 2-19**, respectively. **Figure 2-20** and **Figure 2-21** summarizes the anticipated growth in population and employment by Traffic Analysis Zone, respectively.

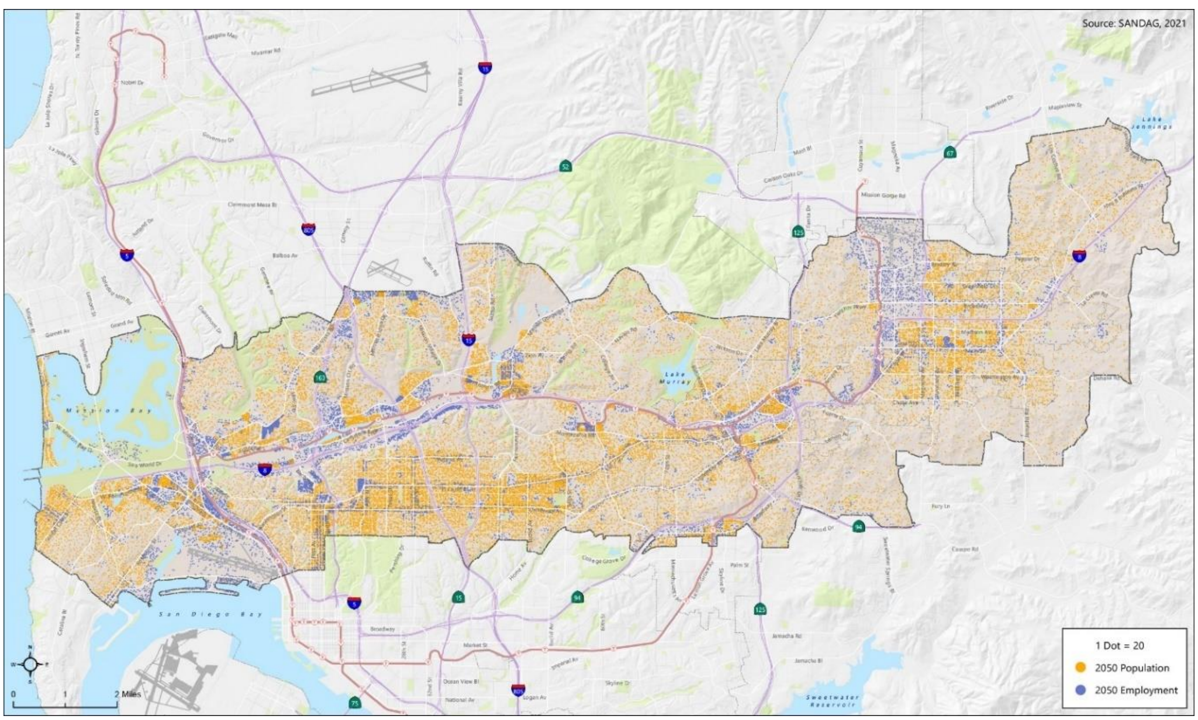
The greatest population growth is anticipated in Midway, Mission Valley, Serra Mesa, Grantville, City Heights, central La Mesa, and northwestern El Cajon. Greater employment growth is anticipated in Midway, Linda Vista, Mission Valley, and El Cajon. In most of these higher growth areas, the share of population and jobs is forecast to be more balanced, conditions that have the potential to facilitate shorter trip distances.

Figure 2-18: Existing Population and Employment (2016)



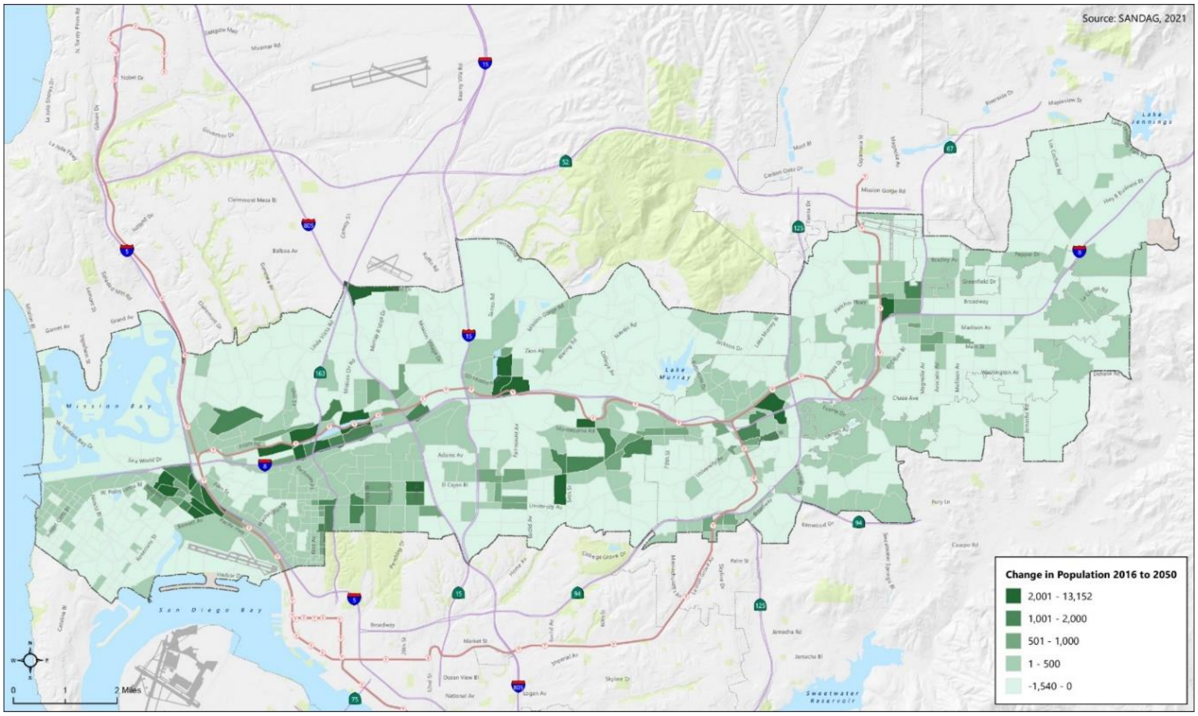
Source: SANDAG, 2021

Figure 2-19: Forecast Population and Employment (2050)



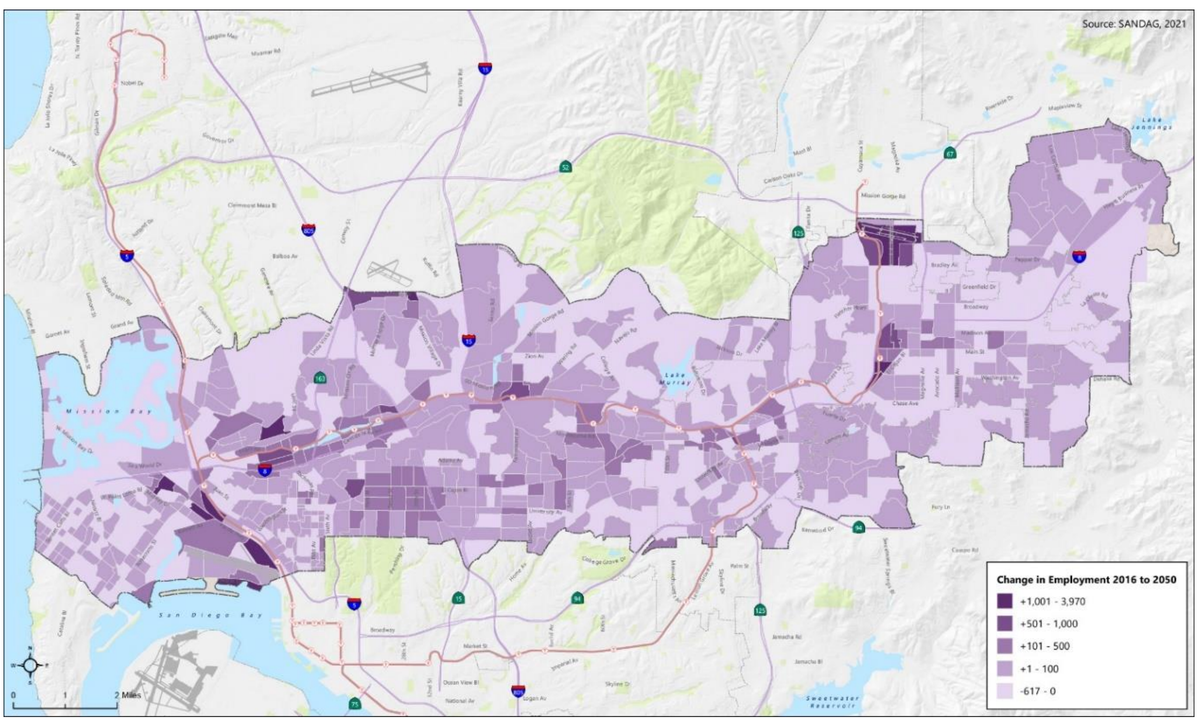
Source: SANDAG, 2021

Figure 2-20: Anticipated Change in Population (2016 – 2050)



Source: SANDAG, 2021

Figure 2-21: Anticipated Change in Employment (2016 – 2050)



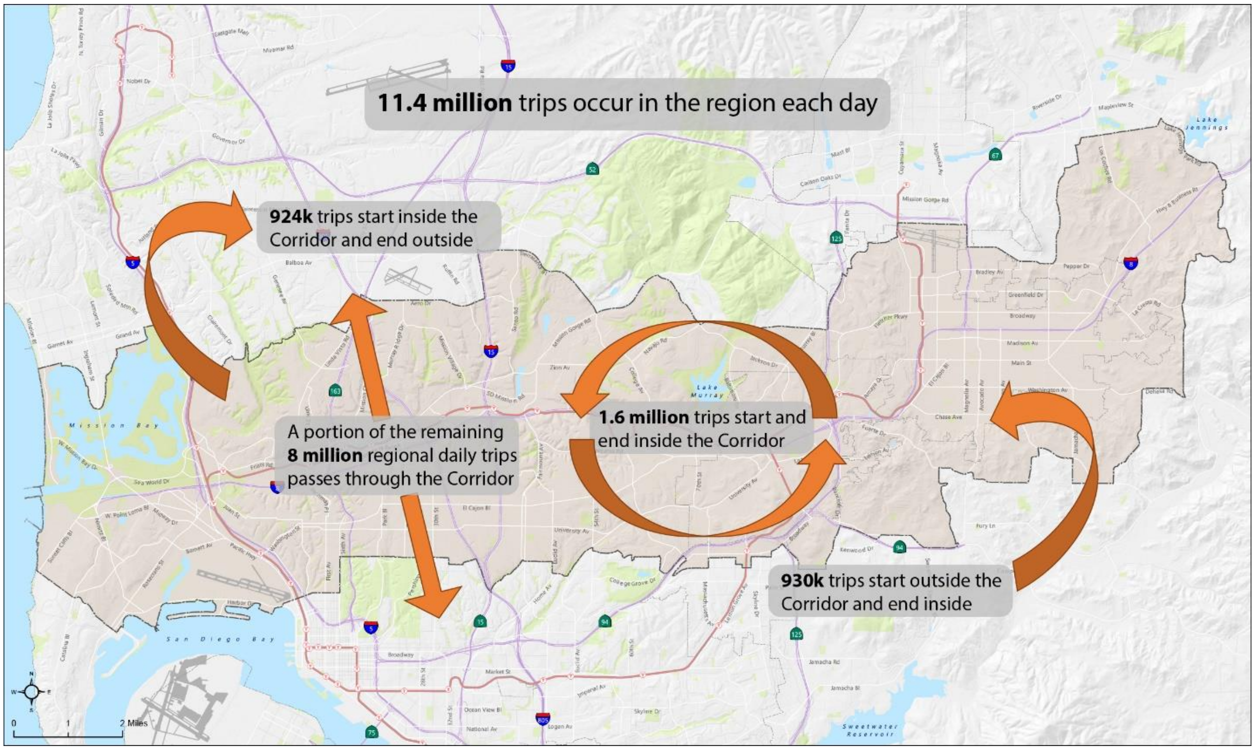
Source: SANDAG, 2021

Travel Patterns

Understanding travel patterns is vital to providing a transportation network that fulfills the users' needs. This section explores both non-commute and commute trips within the Kumeyaay Corridor. **Figure 2-22** summarizes regional travel flows as they relate to the Corridor. Over 30% of all daily travel (approximately 3.45 million trips) in the region starts and/or ends within the study area. The remaining 70% of trips occur outside of the Corridor. However, a portion of those trips are still likely to pass through it.

Of the 3.45 million daily trips, approximately 6% are by people walking, 1% on bicycles, and the remaining 93% in vehicles (including single occupancy cars, carpooling, rideshare, and public transportation). US Census data estimates 2.6% of commute trips in San Diego County are taken via transit, 8.7% carpool, and 73.9% drive alone.[2] Approximately 1.23 million trips (37% of daily trips) are for distances less than 2.5-miles.

Figure 2-22: Regional Travel Flows



Source: Cambridge Systematics / LOCUS, 2019

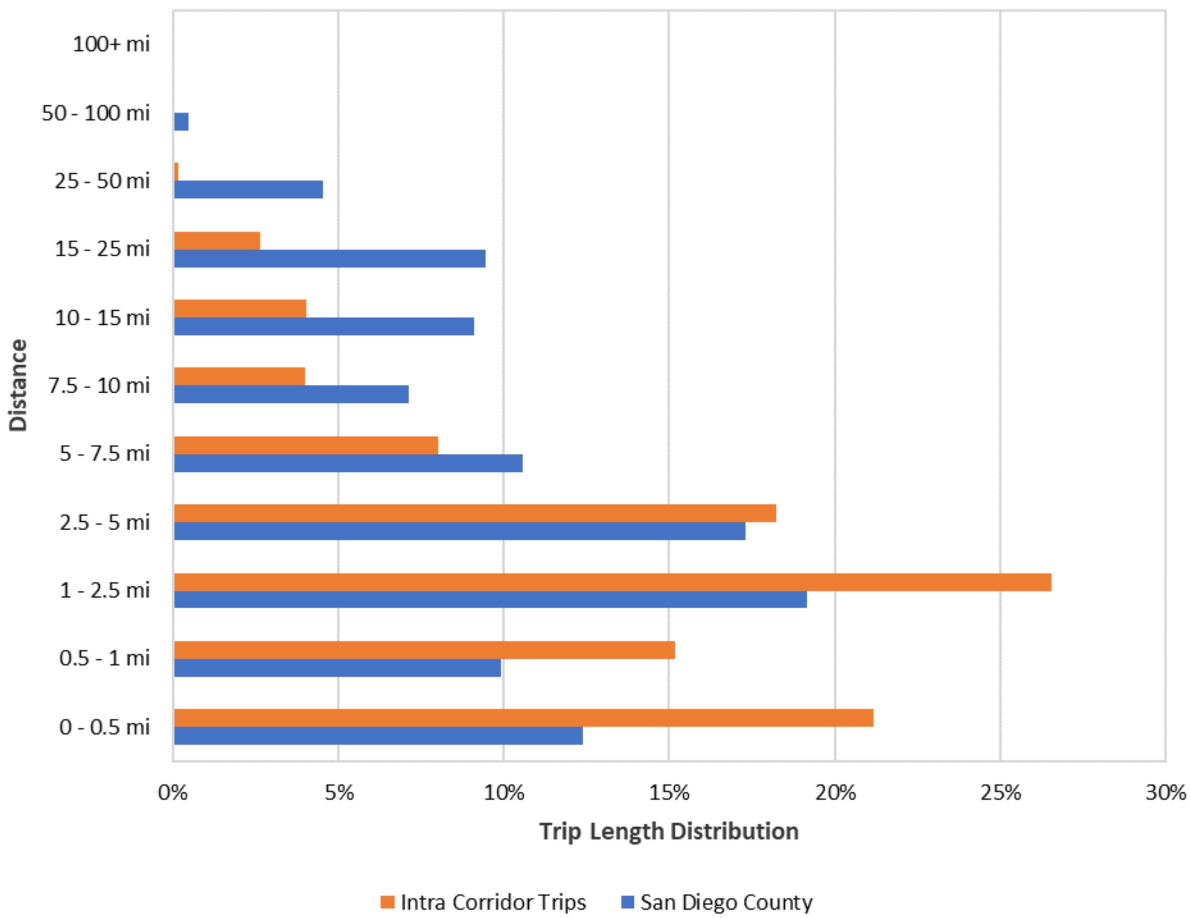
It is important to note that the projects and programs recommended by the Kumeyaay Corridor effort will benefit not only the people that live and work directly in the study area, but also those that commute, visit, shop, or move goods through and within the corridor. The study area includes, and facilitates access to, major destinations which attract people from throughout the region and beyond. This includes people from social equity focused communities that may be more reliant on alternative transportation modes.

[2] US Census, 2020 American Community Survey 5-Year Estimates

Figure 2-23 depicts the distribution of trip lengths for trips starting and ending within the Kumeyaay Corridor (intra corridor trips) to all trips within San Diego County. An estimated 63% of all intra Kumeyaay Corridor trips (1,000,468 trips) are less than 2.5 miles. Approximately 1.3 million intra-corridor trips are less than 5 miles. Providing multimodal infrastructure and services that conveniently connects people to their destinations helps make a variety of travel options more feasible.

The Corridor's shorter trips lengths are also reflected when comparing travel modes at the two geographies. Intracorridor walk and bike trips are nearly double for the Kumeyaay Corridor when compared to San Diego County (11% vs. 6% for walk trips; 2% vs. 1% for bike trips).

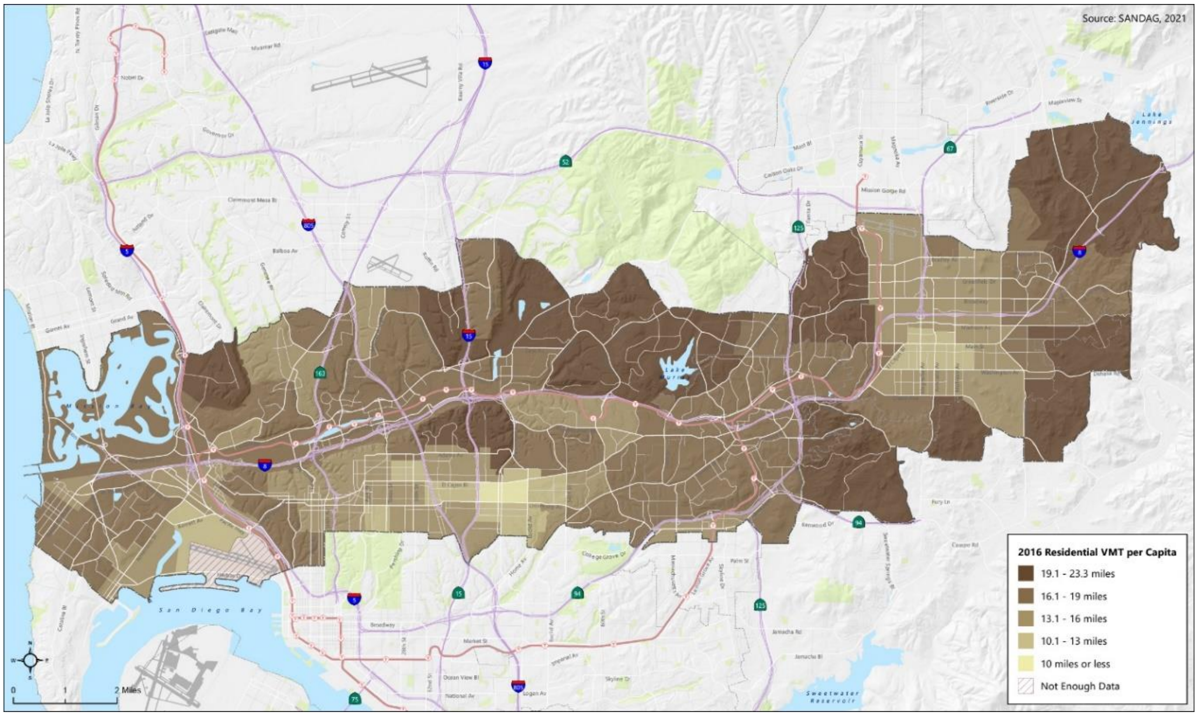
Figure 2-23: Trip Length Distribution



Source: Cambridge Systematics / LOCUS, 2019

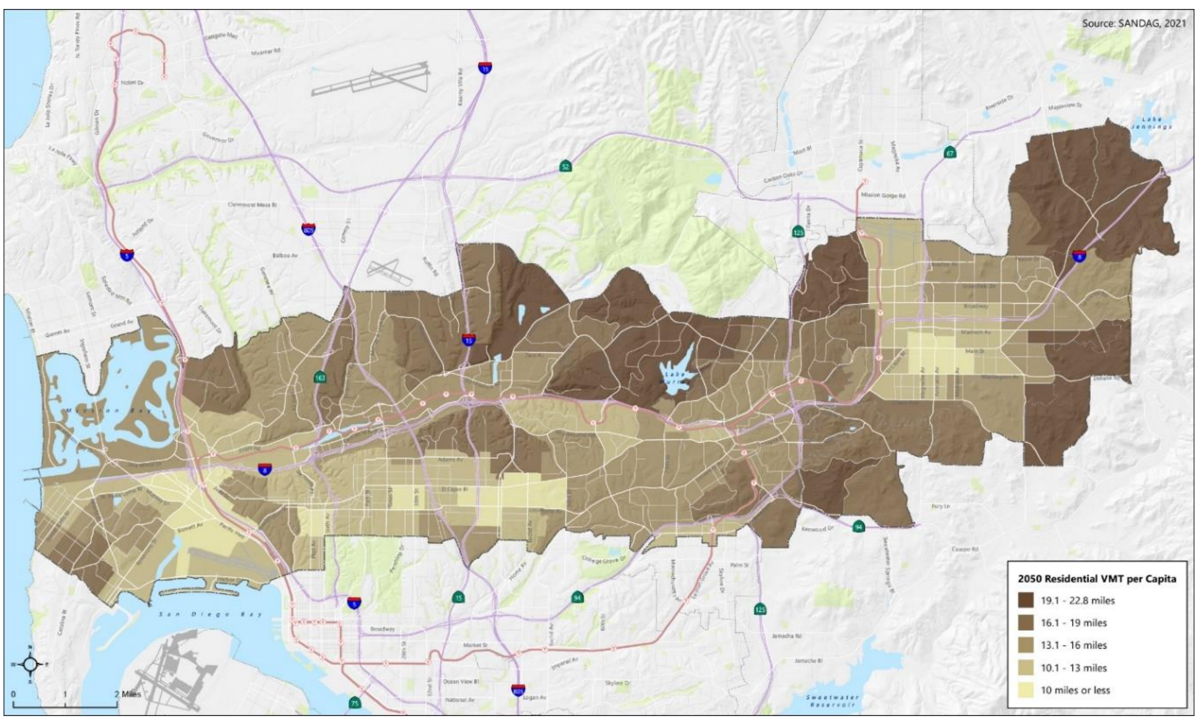
Figure 2-24 presents residential VMT per capita for existing conditions (2016) while **Figure 2-25** displays forecast conditions (2050). VMT per capita represents the average amount of personal, non-commercial, vehicle travel made on an average weekday by each resident who lives within that geographic boundary. Forecast VMT per capita is anticipated to decrease throughout most of the study area. Change is less pronounced in more rural areas, such as the easternmost part of the Kumeyaay Corridor in parts of the unincorporated County of San Diego.

Figure 2-24: Existing Residential Vehicle Miles Traveled per Capita (2016)



Source: SANDAG, 2021

Figure 2-25: Forecast Residential Vehicle Miles Traveled per Capita (2050)



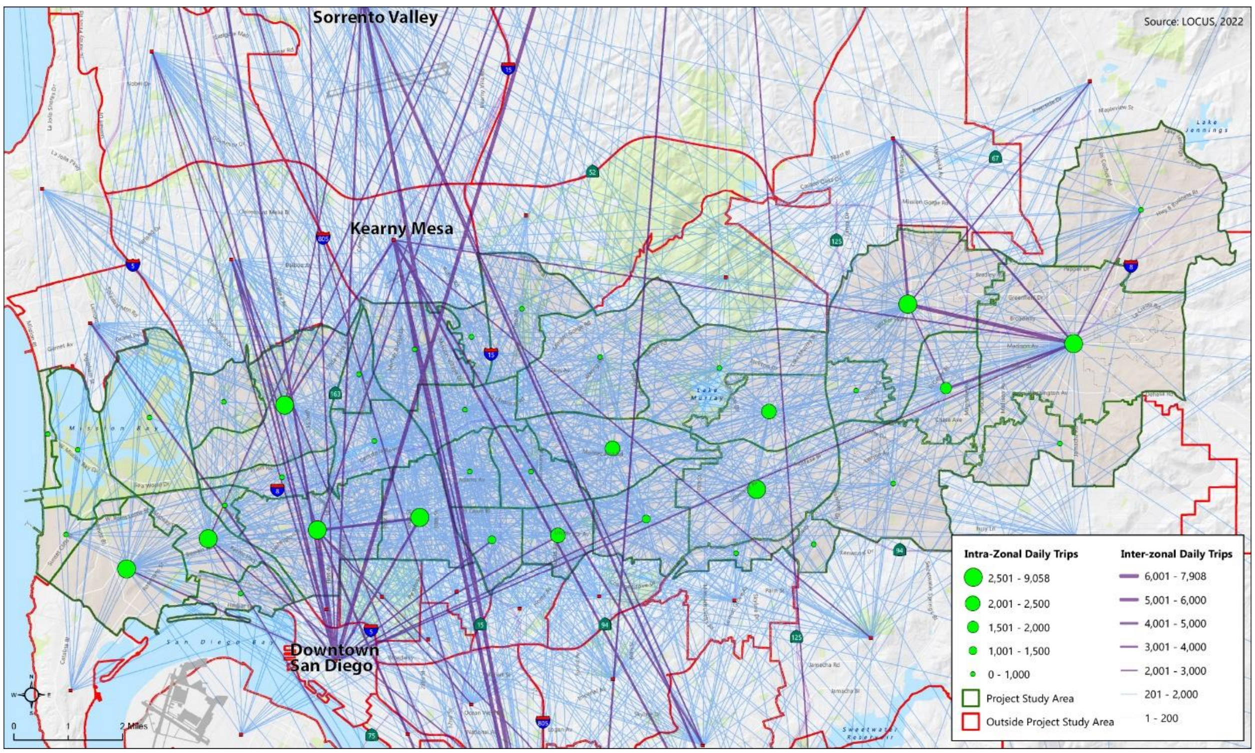
Source: SANDAG, 2021

VMT is generally anticipated to decrease throughout the Kumeyaay Corridor. Factors likely contributing to the decreases include the intensification of residential and employment land uses and implementation of transportation improvements identified in the 2021 Regional Plan.

Commute Trips

Origin and destination pairings for daily commute trips are shown in **Figure 2-26**. In addition to pairings between origin and destination "zones," the figure also illustrates the estimated amount of commute trips that both start and end within the same zone (intra-zonal daily trips). The region's major employment centers in Downtown San Diego, Kearny Mesa, and Sorrento Valley draw trips from across the Kumeyaay Corridor and throughout the region. Within the City of San Diego, a pattern of trips is shown between the Uptown and North Park communities. Higher trip frequencies are also shown between the central and western parts of El Cajon and the industrial areas around Gillespie Field.

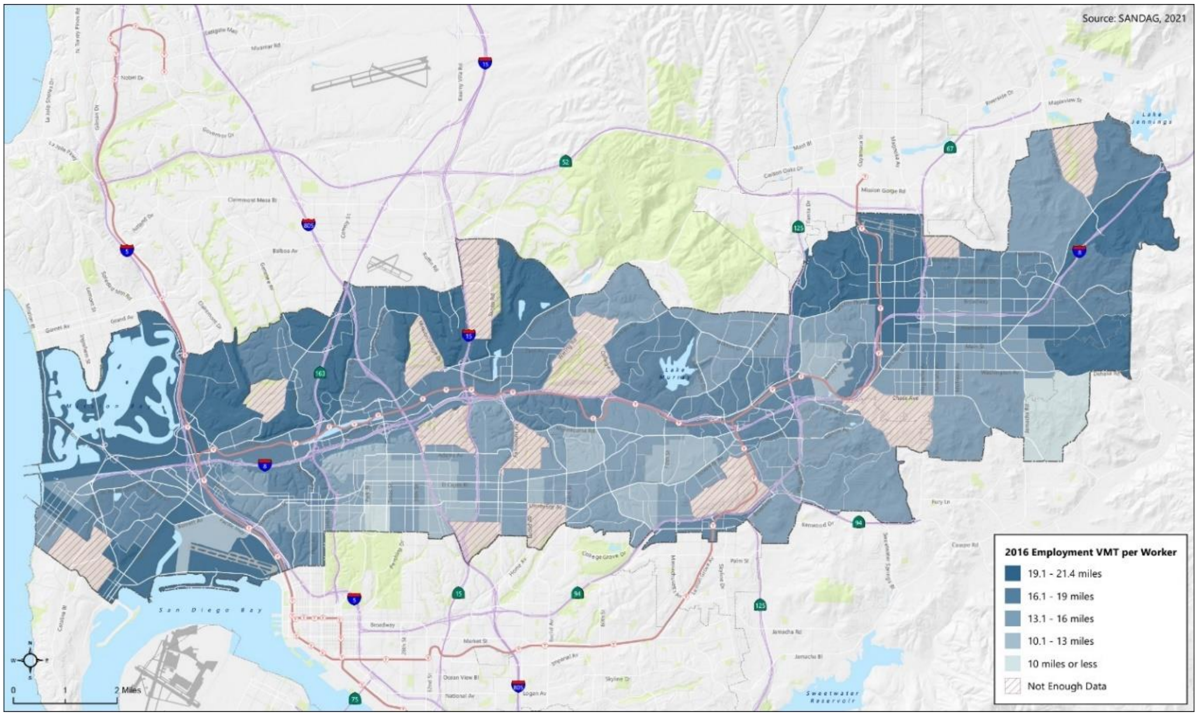
Figure 2-26: Commute Trip Origins and Destinations (2019)



Source: Cambridge Systematics / LOCUS, 2019

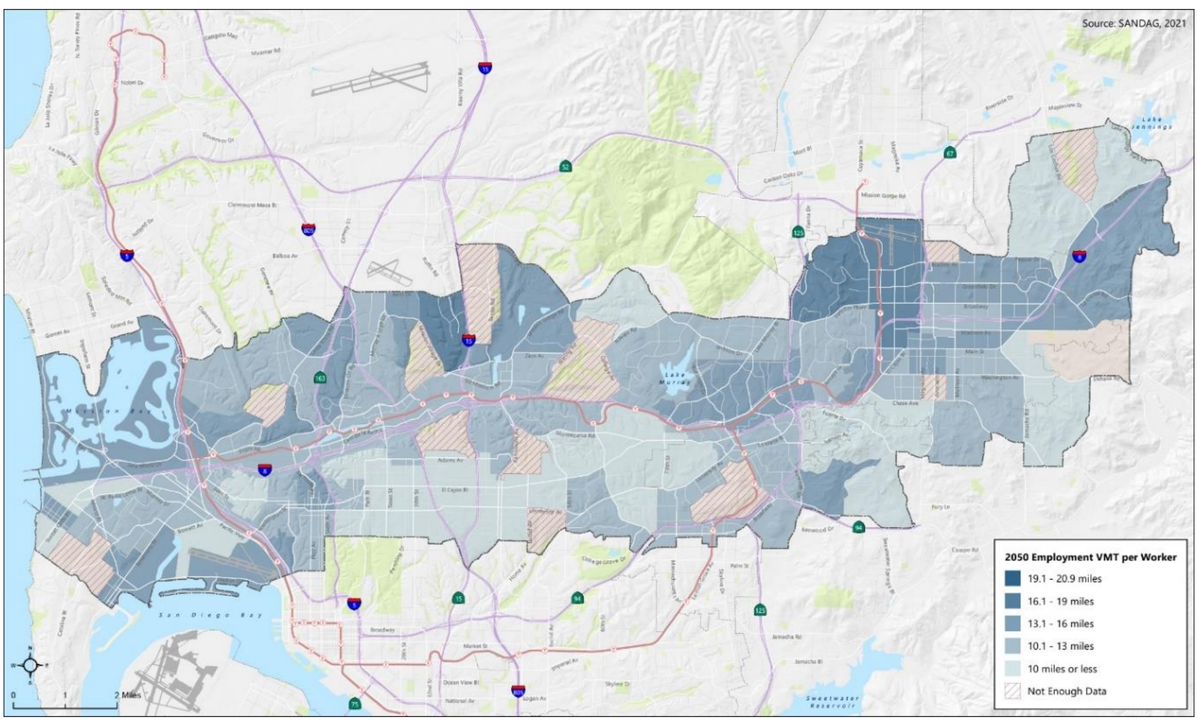
Existing (2016) and forecast (2050) employee VMT per worker is shown in **Figure 2-27** and **Figure 2-28**, respectively. Employee VMT per worker represents the average amount of personal, non-commercial, vehicle travel made on an average weekday by each resident employee whose employment/work location is within that geographic boundary. Similar to residential VMT per capita, forecast VMT per worker is anticipated to decrease across the study area. Increased residential and employment density in urban areas and improved multimodal transportation networks are contributors to the decreased VMT.

Figure 2-27: Existing Employee Vehicle Miles Traveled per Worker (2016)



Source: SANDAG, 2021

Figure 2-28: Forecast Employee Vehicle Miles Traveled per Worker (2050)



Source: SANDAG, 2021

Transportation

A complete multimodal transportation system is efficient and convenient. It serves the needs of all users, regardless of their travel mode. In planning for multimodal transportation networks, an understanding of existing needs and current plans is critical. This chapter reviews existing and planned transportation infrastructure and data related to local roads and freeways, public transportation, walking, and bicycling.

Vehicular System

This section examines the existing and future roadway networks, points of congestion, goods movement activity, and collision history.

Network: Freeways, Roadways, Goods Movement

The existing and currently adopted vehicular networks are depicted in **Figure 3-1** and **Figure 3-2**, respectively. I-8 is a principal east-west corridor for travel in the region, with several major intersecting freeways, including I-5, SR 163, I-15/SR 15, SR 125, and SR 67. The SR 163, I-805 and I-15 freeway-to-freeway interchanges are closely spaced together which result in weaving movements that contribute to congestion and safety issues.

New managed lanes and auxiliary lanes are planned, including freeway-to-freeway connectors and managed lane connectors. In addition to adding capacity to existing roadways, the future roadway network includes new connections. For example, new roadways in the Mission Valley community will improve connectivity across the San Diego River, Interstate 8 and through large parcels; Santo Road is planned to be extended to Mission Gorge Road, improving access to and from the Tierrasanta community.

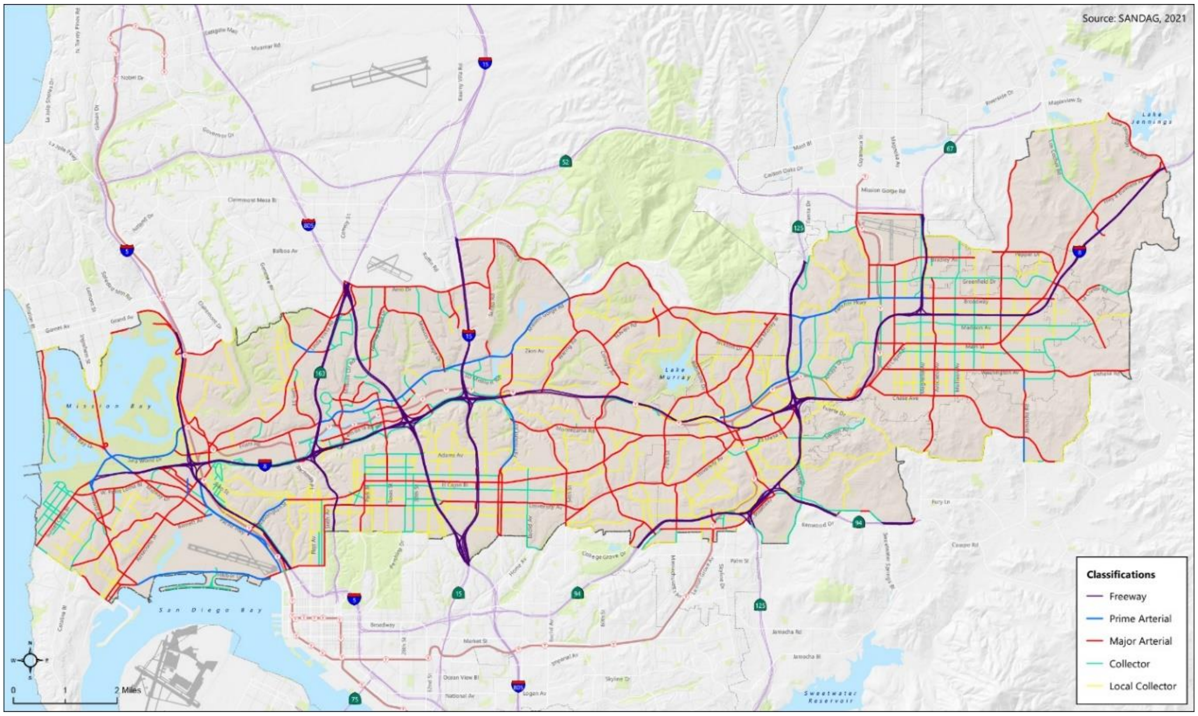
In addition to cars, freeways and local roadways serve other users, such as movers of commercial goods. The Kumeyaay Corridor is a historically significant trade route and remains critical to interregional goods movement today.

I-8 serves as a major east-west facility for the movement of freight that is facilitated by both truck and rail. This is because of I-8's strategic location as the exclusive major east-west freeway south of the Los Angeles metropolitan region and its proximity to key activity centers for the transport, distribution, processing, or consumption of goods. These goods originate from several sources and are distributed domestically to San Diego, the Los Angeles metropolitan region, the Imperial Valley, Yuma, and throughout the country. International freight to and from Mexico also uses I-8 to transport goods.

I-8 is a designated National Network truck route (i.e., a federal highway that allows doubles with 28.5-foot trailers, singles with 48-foot semi-trailers and unlimited kingpin-to-rear axle distance, unlimited length for both vehicle combinations, and widths up to 102 inches) along the entire length of the corridor.

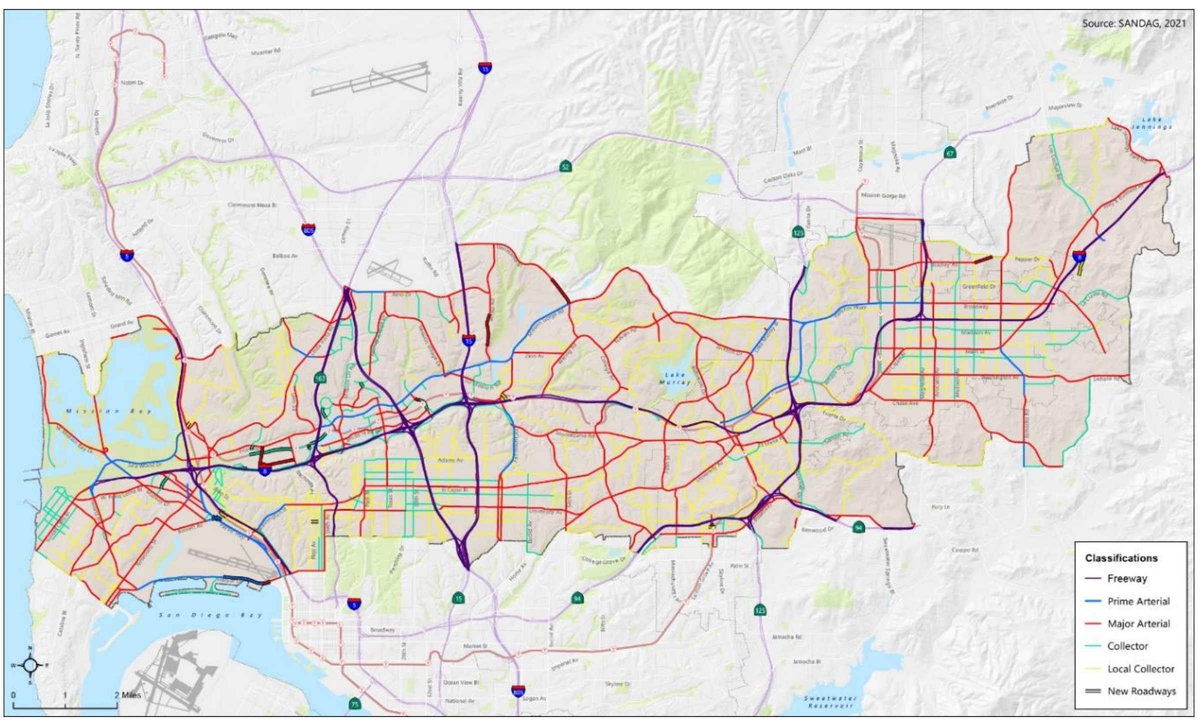
Figure 3-3 displays daily truck volumes and truck trip destinations by traffic analysis zone.

Figure 3-1: Existing Roadway Classifications



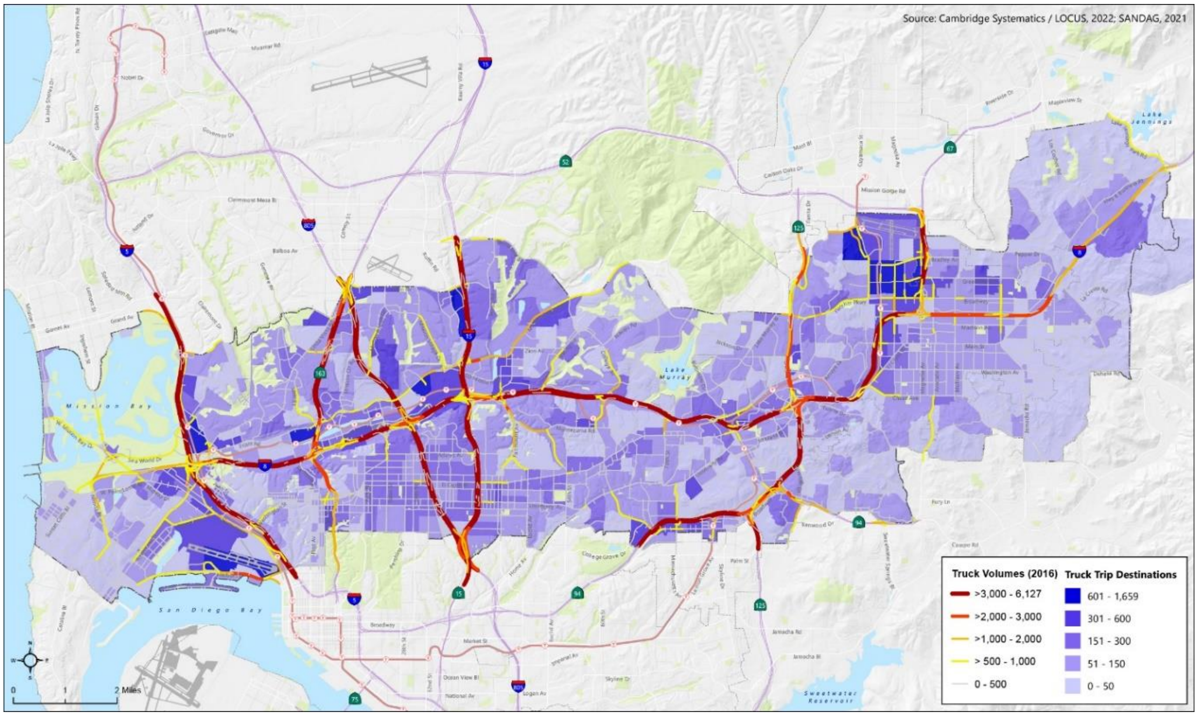
Source: SANDAG, 2021

Figure 3-2: Adopted Roadway Classifications



Source: SANDAG, 2021

Figure 3-3: Truck Volumes and Destinations by Traffic Analysis Zone



Source: Cambridge Systematics / LOCUS, 2019; SANDAG, 2021

The following is a list of top Goods Movement trip origins and destinations for truck trips that start and/or end within the Kumeyaay Corridor:

- San Diego International Airport
- Port of San Diego (office, industrial)
- Sorrento Valley/Mira Mesa
- Morena (light industrial, commercial/office)
- Mission Valley, SR 163 to Mission Gorge Rd (commercial/office land use and light industrial)
- Along Mission Gorge Road (extractive and light industry)
- East Kearny Mesa (commercial, industrial)
- Serra Mesa (primarily shopping centers, such as Walmart)
- Gillespie Field (light industrial)
- Santee (light industrial)
- La Mesa (light industrial, shopping centers, commercial/office)

I-8 carries the greatest volume of truck traffic among east-west corridors in the central San Diego region, and the segment between I-5 and SR 67 is on the Primary Highway Freight System. Limited freight rail services exist in the corridor, with the San Diego and Imperial Valley Railroad operating along the La Mesa Branch between Downtown San Diego and El Cajon on the same tracks as the MTS Orange Line Trolley.

Cargo aircraft operations at the San Diego International Airport are forecast to increase in coming decades. However, air cargo sorting currently relies on truck trips to and from the airport due to a lack of on-site sorting facilities. Most trucks originating from the airport and port do not have destinations within the I-8; they only pass through the corridor[3].

The Kinder Morgan pipeline system supplies the San Diego region with petroleum products. The Mission valley Terminal near the I-15/Friars Road interchange serves as a blending and loading facility for delivery via trucks to service stations throughout the region.

Most trucks travel during the middle of the day. Many urban commercial areas, including Uptown, North Park, and City Hights, lack dedicated on- or off-street loading/delivery zones. This leads to conflicts between trucks, active transportation users, transit vehicles, and passenger vehicles for curb space.

Truck speeds are between 40 and 60 mph during peak periods, throughout the study limits, suggesting there is no measurable slowdown due to topography, such as long grades.

The north-south freeway corridors, primarily I-5, I-805, and SR 15/I-15, also carry high volumes of truck traffic through and across the study area. This is consistent with interregional patterns, where goods move between the manufacturing and warehousing facilities in northern Baja California and Otay Mesa and the maritime ports, intermodal terminals, and warehousing facilities in the Los Angeles/Long Beach area and Inland Empire.

The highest truck volumes are shown along freeways and major arterials serving industrial areas such as Rosecrans Street, Harbor Drive, Pacific Highway, Morena Boulevard, Texas Street, Friars Road, Mission Gorge Road, Fairmount Avenue, Montezuma Road, Waring Road, College Avenue, 70th Street, Parkway Drive, Johnson Avenue, and N 2nd Street in El Cajon. Areas with greater concentrations of truck destinations include the San Diego International Airport, industrial hubs around Linda Vista, Rosecrans, Mission Valley and Fashion Valley malls, and south of Gillespie Field.

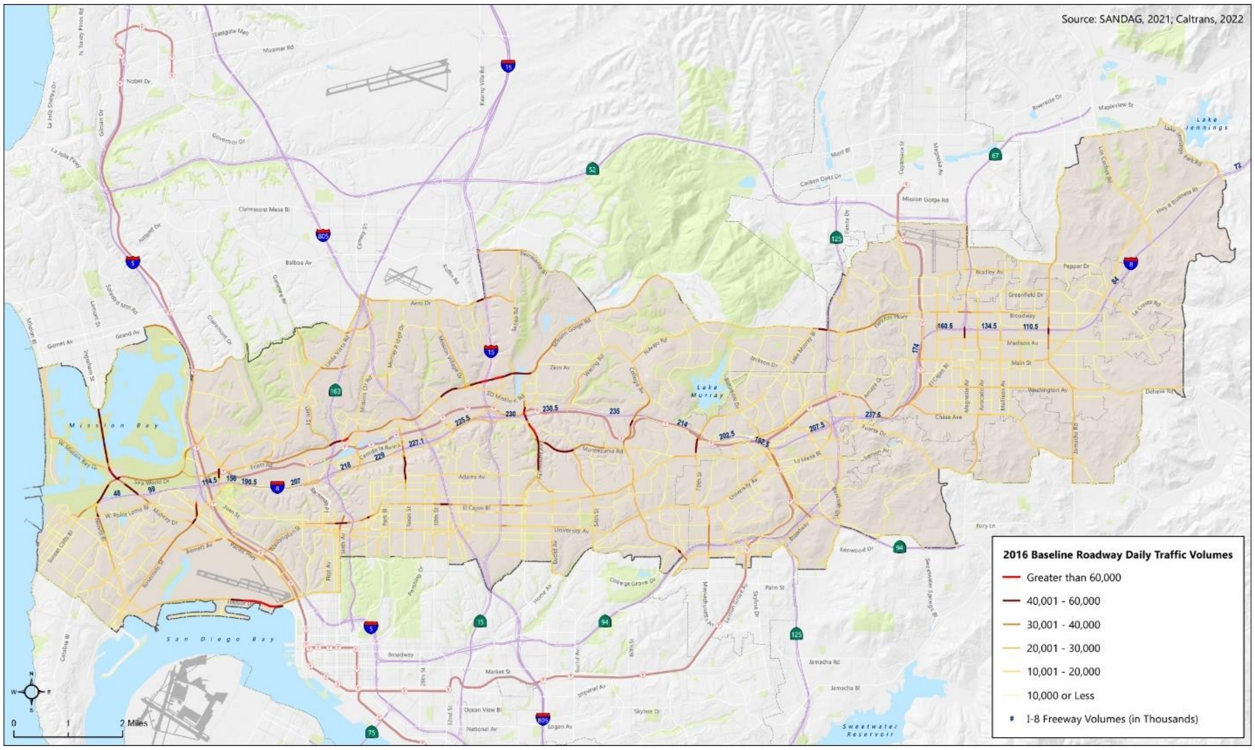
Daily Traffic & Congestion

Traffic volumes and travel speeds are used to help understand roadway operations. **Figure 3-4** presents daily traffic volumes for freeways and roadways. Along I-8 within the Kumeyaay Corridor, annual average daily traffic volumes (AADT) are lowest west of I-5 ranging between 48,000 and 99,000. I-8 volumes peak at 237,500 between SR 125 and the El Cajon Boulevard ramp in the City of El Cajon. Immediately east of El Cajon Boulevard the AADT decreases significantly (-27%) and then continues to decrease steadily until the eastern study limit. Interchange volumes are high between I-8 and intersecting north-south freeways which confirms the I-8 is being used as a connector for serving north-south travel.

Local roads with the greatest volumes generally provide access to and from the freeways. Higher volumes are present along Harbor Drive, Ingraham Street, Sunset Cliffs Boulevard, Rosecrans Street, Friars Road, Texas Street, El Cajon Boulevard, Fairmount Avenue, Montezuma Road, 70th Street, Magnolia Avenue, and 2nd Street in El Cajon.

[3] Cambridge Systematics / LOCUS, 2019.

Figure 3-4: Baseline Traffic Volumes (2016)



Source: SANDAG, 2021; Caltrans PeMS, 2022

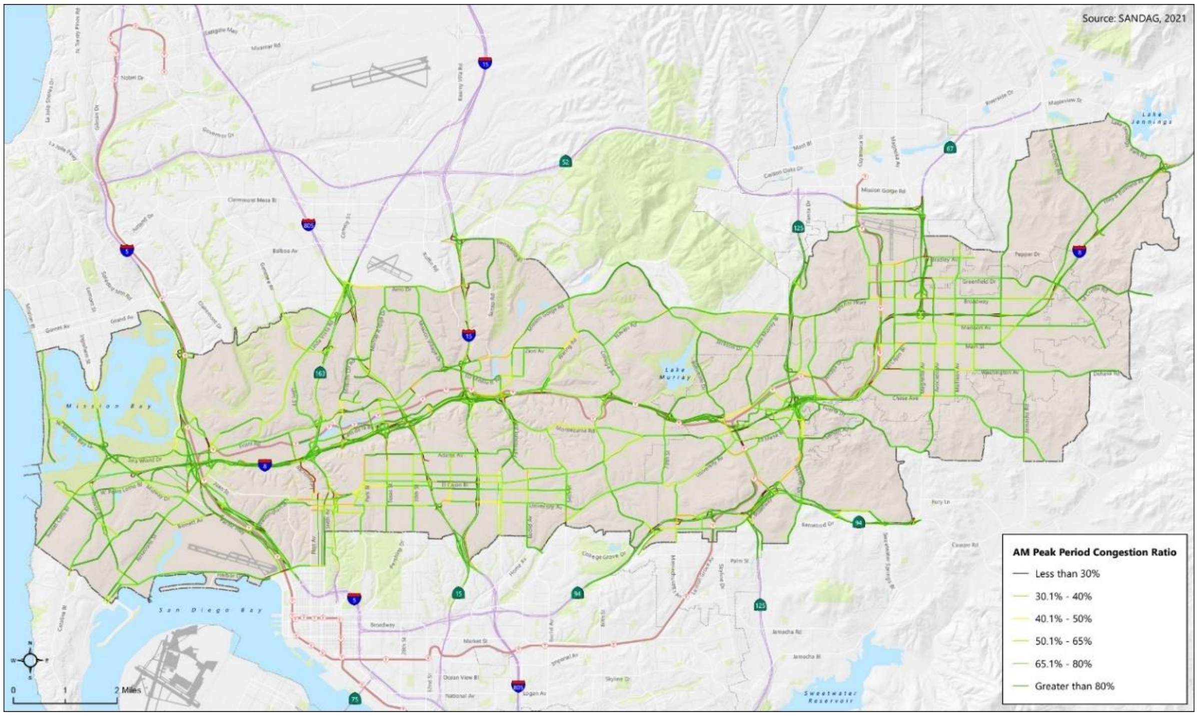
Congestion ratios compare average peak travel speeds to posted speed limits. The congestion ratio results are presented in **Figure 3-5** for AM peak period and **Figure 3-6** for PM peak period.

Approximately 11% of roadway segments (11.6% during the AM, and 11.2% during the PM) experience congestion. These largely consist of roadways providing access to and from freeways.

The study area transportation network is also used to access many of the region's major event venues and destinations, which can result in congestion outside of traditional commute peaks or contribute further towards peak hour congestion. Events at places like the Sports Arena, Viejas Arena, Balboa Park, and the Snapdragon Stadium site can increase demand on surrounding arterials, ramps, and freeways.

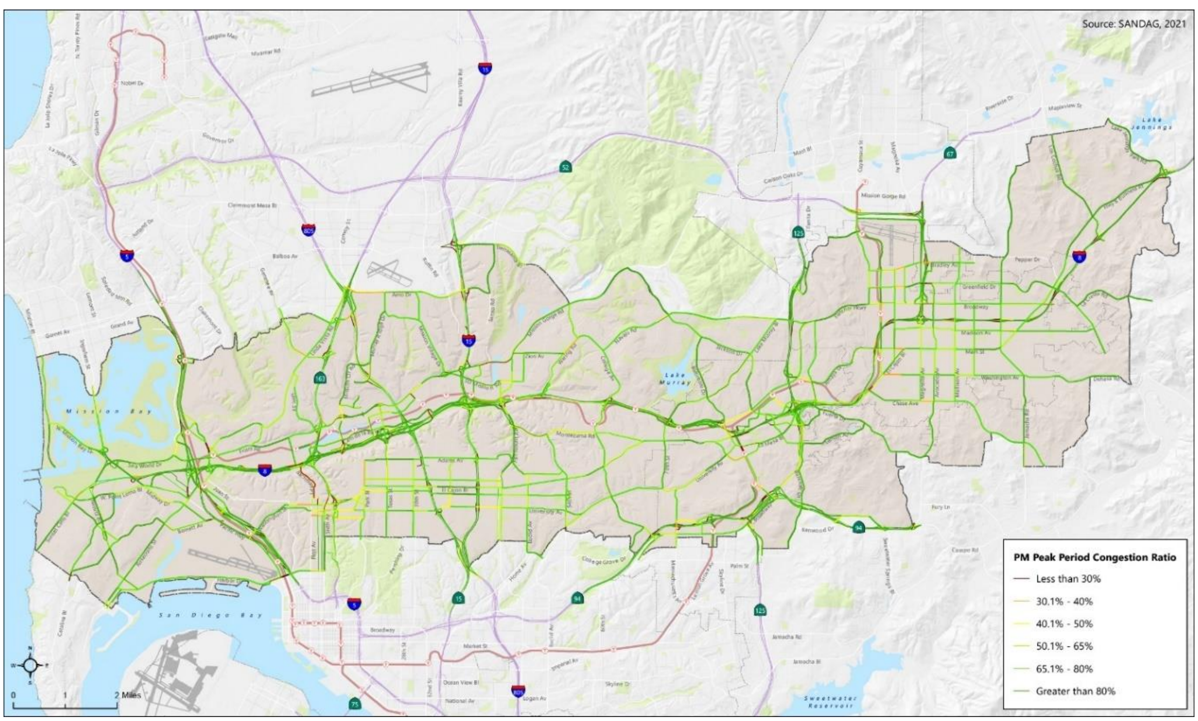
Travel patterns can also shift seasonally. Coastal areas may experience greater travel demands during summer months and hotter weather, while major shopping destinations, such as the Fashion Valley Mall and Grossmont Center, may draw more trips during the holiday season.

Figure 3-5: AM Congestion Ratio (2016)



Source: SANDAG, 2021; CR Associates, 2022

Figure 3-6: PM Congestion Ratio (2016)



Source: SANDAG, 2021; CR Associates, 2022

Freeway congestion is defined as segments experiencing speeds 50% or less of the free flow speed. **Table 3-1** summarizes the share of congested freeway facilities during the AM and PM peak hours. Many freeway ramps are metered during peak period, with mainline operations indicating the meters are effective.

Table 3-1: AM and PM Peak Hour Congestion by Freeway Facility Type

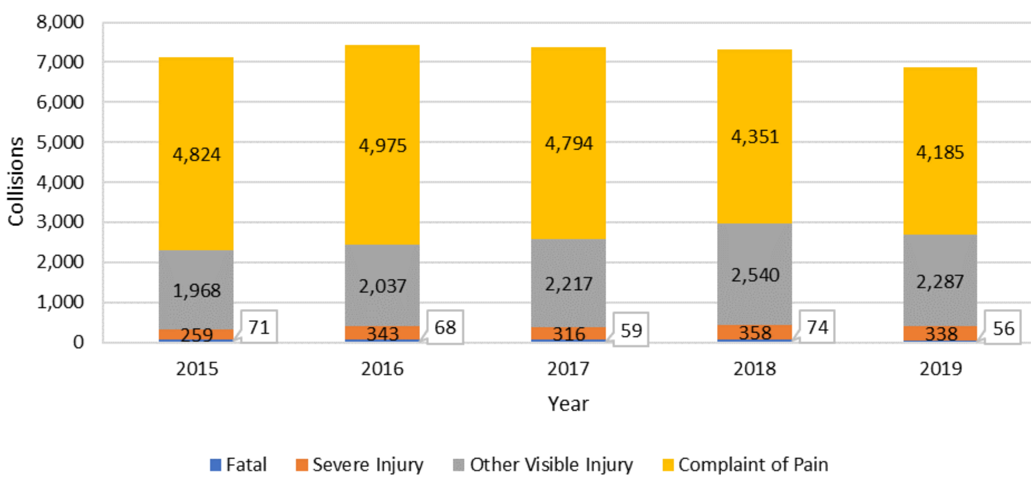
AM and PM Peak Hour Congestion by Freeway Facility Type		
(2021, 2022)		
Facility Type	**AM Peak**	**PM Peak**
Mainline	3.1%	0.9%
Connector Ramps[4]	14.8%	11.3%
Local Ramps[5]	31.9%	30.7%

Source: SANDAG, 2021; CR Associates, 2022

Collisions

A total of 36,120 vehicle-only injury collisions (excluding those involving pedestrians and bicyclists, which are discussed in Section Active Transportation) were reported within the Kumeyaay Corridor between 2015 – 2019, including 13,360 collisions on freeways and 22,760 collisions reported along local roadways. **Figure 3-7** presents vehicular-only injury collisions by year and level of injury severity for five years of data. Total collisions peaked in 2016 with 7,423 records, with the lowest total reported in 2019 (6,866 collisions).

Figure 3-7: Vehicular Collisions by Year and Injury Severity (2015 – 2019)



Source: Transportation Injury Mapping System (TIMS), 2022

[4] Connector ramps enable vehicles to transition between freeways without existing to local street.

[5] Local ramps enable vehicles to enter and exit the freeway from local streets.

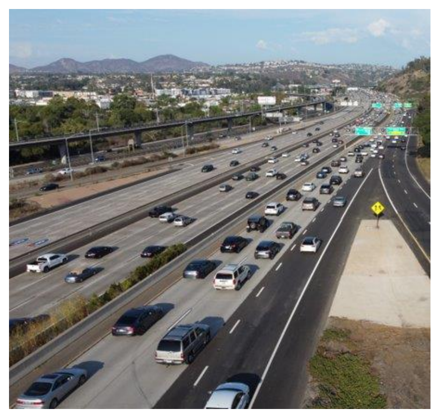
Table 3-2 provides a summary of crash types, distinguishing between those occurring along freeways and local roadways. On local roadways, broadside collisions (35%) and rear end collisions (29%) account for the majority of crash types. When considering collisions that resulted in a severe or fatal injury on local roadways, broadside collisions remain the leading category (33%), however, hit object collisions become second (22%) followed by head-on collisions (14%). Over half of the collisions on freeways were rear end collisions (57%), followed by hit object collisions (18%). Rear end and head on crash types were also the most frequently reported crash type for collisions that resulted in a severe or fatal injury on freeways, each reported for 32% of the records.

Table 3-2: Crash Types by Roadway Location (2015 – 2019)

Crash Types by Roadway Location (2015 – 2019)			
	Local Roadway	**Freeway**	**Total**
Head-On	1,892	90	1,982
Sideswipe	2,508	1,911	4,419
Rear End	6,540	7,573	14,113
Broadside	8,005	334	8,339
Hit Object	1,900	2,430	4,330
Overturned	743	950	1,693
Total	22,760	13,360	36,120

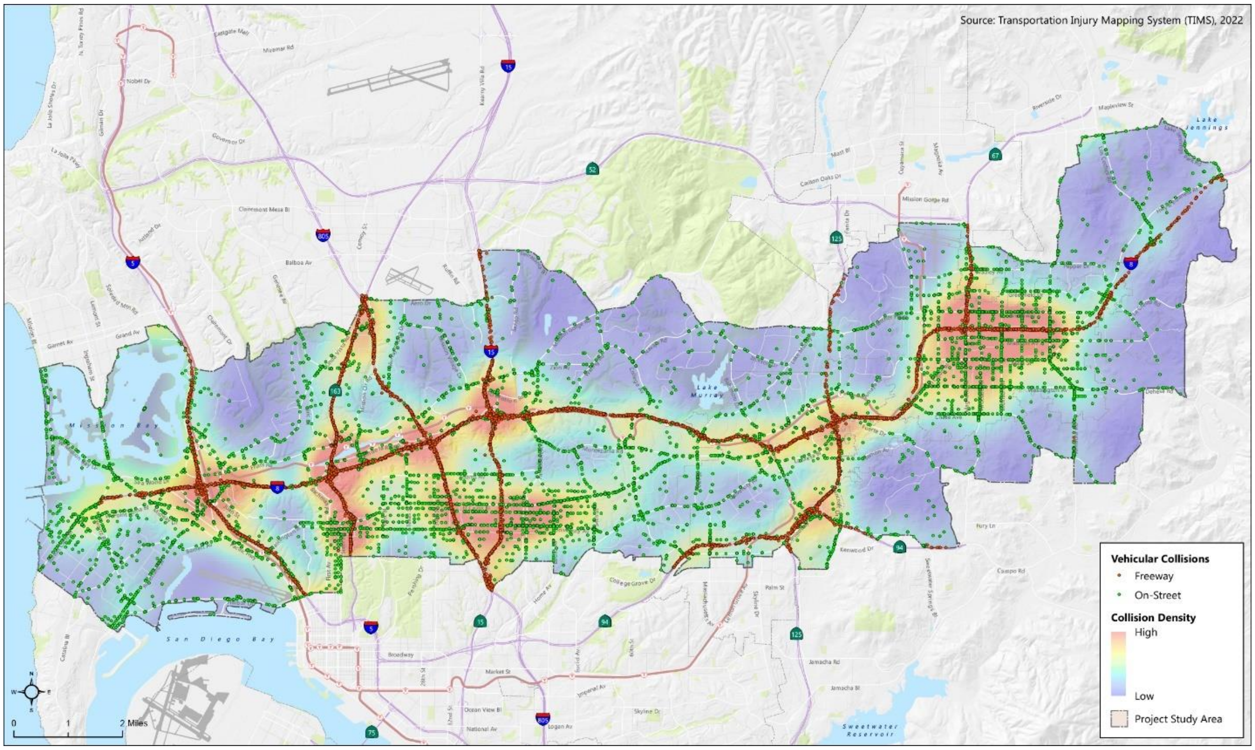
Source: Transportation Injury Mapping System (TIMS), 2022

Figure 3-8 displays the collisions across the corridor. Freeway collisions were most concentrated near freeway interchange locations where high volumes of cars weave between lanes to transition between freeways. Concentrations along local roads are present in the Mid-Cities area and El Cajon. Unsafe speed for prevailing conditions was reported as the leading collision cause for collisions on local roadways and freeways, attributed to approximately 36% of all vehicular collisions – nearly twice as many collisions as the second leading cause, improper turning (19%). Additional leading collision factors reported include automobile right-of-way violations (13%), traffic signals and signs (9%), and driving under the influence (6%).



Vehicles transition from I-15 onto eastbound I-8.

Figure 3-8: Vehicular Collisions (2015 – 2019)



Source: Transportation Injury Mapping System (TIMS), 2022

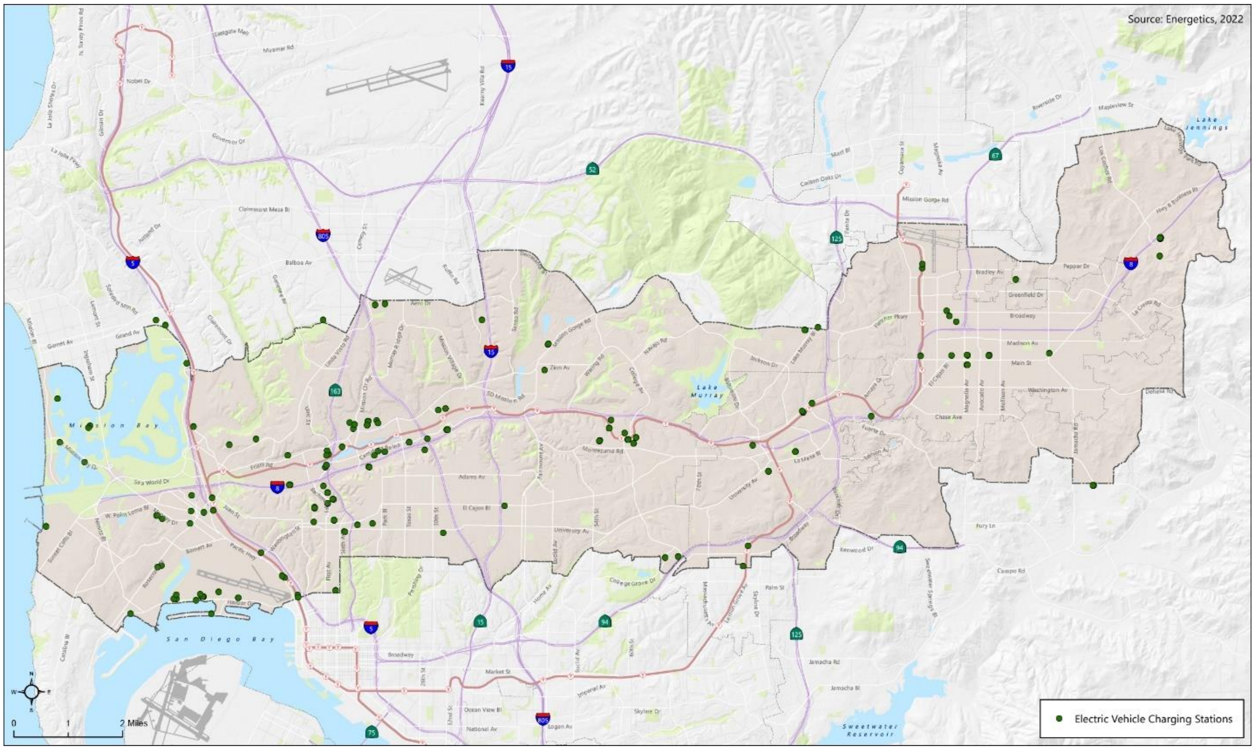
Electric Vehicles

Electric vehicles (EV) are becoming more prevalent and are one tool to reduce greenhouse gas emissions and local air pollution from cars, trucks, and buses. California has an objective to achieve five million zero-emission vehicles (ZEVs) on the road by 2030 and 250,000 electric vehicle charging stations by 2025 as directed in the Executive Order (E.O. B-48-18). Further, by 2035, all new cars and passenger trucks sold in California must be ZEVs (E.O. N-79-20). Additionally, goods movement and transit vehicles are also required to transition to ZEVs by 2045.

Providing a comprehensive charging network is commonly viewed as one major challenge and deterrent to further EV adoption. The Federal Highway Administration (FHWA) is establishing a network of corridors along the national highway system that can advance alternative fuel use through fueling and charging infrastructure. I-8 is designated as an FHWA Alternative Fuel Corridor, which will make the area eligible to compete for grant funding, including the National Electric Vehicle Infrastructure Program (NEVI), to deploy publicly accessible EV charging and hydrogen fueling infrastructure. Resiliency planning for electric vehicle infrastructure will become important along this corridor to keep charging available in times when utility power may be limited or shut off.

Figure 3-9 identifies existing EV charging stations within the Kumeyaay Corridor. Existing charging stations tend to be clustered around employment centers and major destinations. Notable gaps in the infrastructure include City Heights, and areas with fewer non-residential land uses such as the Navajo community and Unincorporated San Diego County.

Figure 3-9: Electric Vehicle Charging Stations (2022)



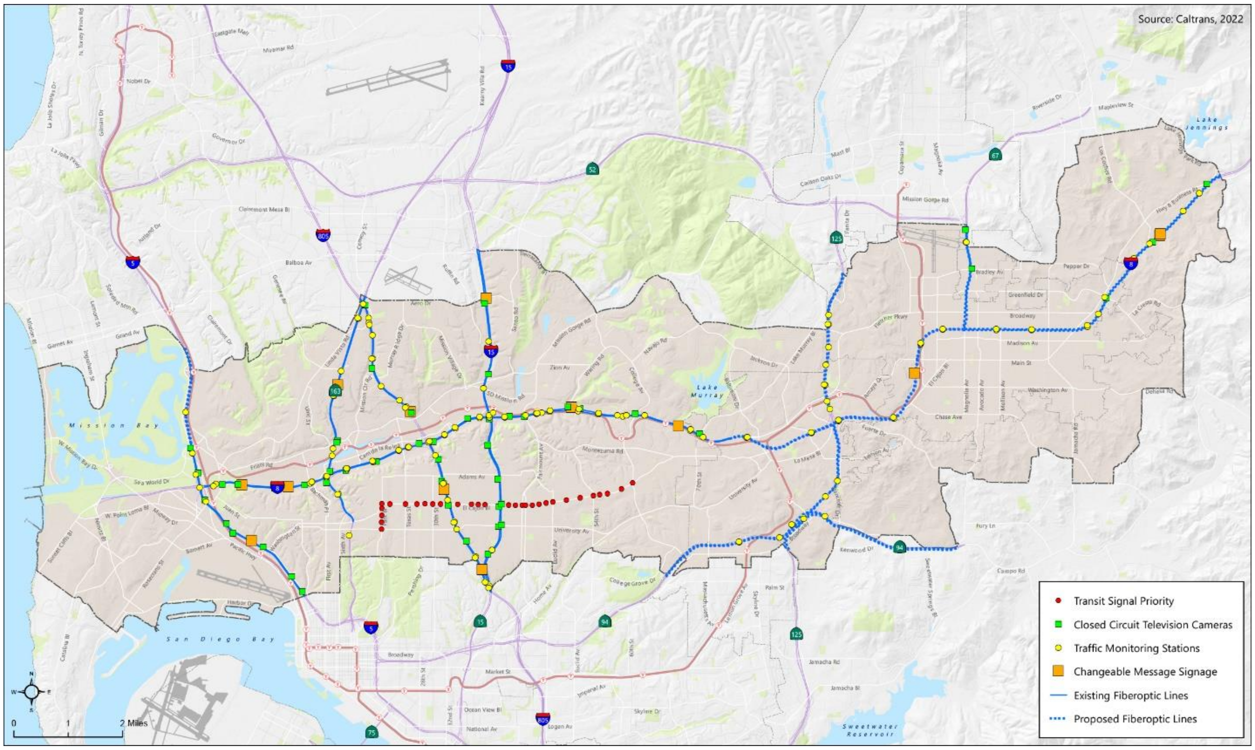
Source: Energetics, 2022

Intelligent Transportation Systems (ITS)

ITS leverages technology to improve transportation safety and mobility. Technology can be used to track and respond to changes in travel patterns throughout the day, however, supporting infrastructure and cross-jurisdictional communications must be interconnected to facilitate data transmission. Ensuring these communications are supported is critical to deploying corridor- and region-wide ITS solutions.

Existing ITS infrastructure within the Kumeyaay Corridor is identified in **Figure 3-10**. Closed circuit television cameras and traffic monitoring systems provide information to agencies monitoring activity on the transportation system, while changeable message signs provide users with real time information such as traffic incidents, travel times, and detours. Enhanced data management and analytics allow for more informed and responsive planning and decision making about public infrastructure investments. Additionally, it allows streamlined collaboration and operations across agencies and mobility service providers (public and private) to make operations more efficient and provide a smooth transportation experience for people and goods. Transit signal priority modifies signal timing or phasing when transit vehicles are present. For example, queue jumpers give transit vehicles a head start at intersections, signal priority can modify the signal phase to prioritize transit vehicles, while signal synchronization can improve transit vehicle flow by reducing time spent at red lights.

Figure 3-10: ITS Infrastructure



Source: Caltrans, 2022

Communications system moves information between technologies to share with other systems. Regional Broadband and Fiber allows us to integrate ITS applications and services with data sources.

Existing fiberoptic lines support coverage along I-8 between I-5 and I-15. Changeable message signs (CMS), which provide traveler information during incidents and congestion, are not present along I-8 between I-15 and SR 163. Gaps in ITS coverage exist on the eastern half of the Corridor. Fiberoptic lines, cameras, CMS, and vehicle detection sensors (VDS) are all sparse or non-existent between SR 125 and SR 67. ITS infrastructure could be used to support emergency evacuation events in this part of the corridor, if available. There are no VDS on I-15 or I-5 south of I-8 within the study area that may assist with traffic volume and congestion information. Broadband is absent east of SR 125 along I-8 within Caltrans's right-of-way, yet is anticipated to be installed by 2026. Active ramp metering is employed along I-8 to manage freeway congestion and merging, however, communication between Caltrans and local agency infrastructure is currently limited.

Transit signal priority (TSP) infrastructure is limited to Park Boulevard and El Cajon Boulevard within the study area. Deploying TSP technology along arterials and at freeway ramps with designated high occupancy vehicle (HOV) lanes with Rapid and/or local bus routes throughout the corridor could shorten transit travel times.

Centralized traffic monitoring and management occurs at the Caltrans Transportation Management Center (TMC) located in Kearny Mesa, while local jurisdictions also have varying levels of operations monitoring and management centers. A centralized train control center and communication system is used for light rail operations. Integrating TSP and other ITS infrastructure with management centers can help capitalize on their potential benefits and address operational challenges in real time.

MTS is currently piloting public Wi-Fi installed on ten buses, which operate on six routes in MTS' service area; four of which operate within the Kumeyaay Corridor (Routes 7, 11, 35, and 215). The pilot will monitor Wi-Fi performance, connectivity, speed, etc. All routes in the study area with the public Wi-Fi pilot run between downtown San Diego and Mid-City. The regional bus fleet currently uses a Computer-Aided Dispatch/Automatic Vehicle Location (CAD/AVL) system for daily fleet monitoring and operations.

The Regional Plan recognizes the value ITS can provide in improving mobility for all modes throughout the region. Concepts such as managed lanes Active Transportation Demand Management (ATDM) strategies are proposed as part of the Complete Corridors. These strategies, and other operational features will be regionally integrated through the Next OS, which is foundational to a connected system where all ITS systems work together.

Next OS compiles information from sources like passenger vehicles, delivery trucks, e-bikes and scooters into a centralized data hub. Analysis of this data will improve how transportation is planned, operated and experienced by managing supply and demand and modifying how infrastructure and services are used throughout the day for efficiency, optimization, and safety. For this to be successful, ITS infrastructure is needed to connect the corridor.

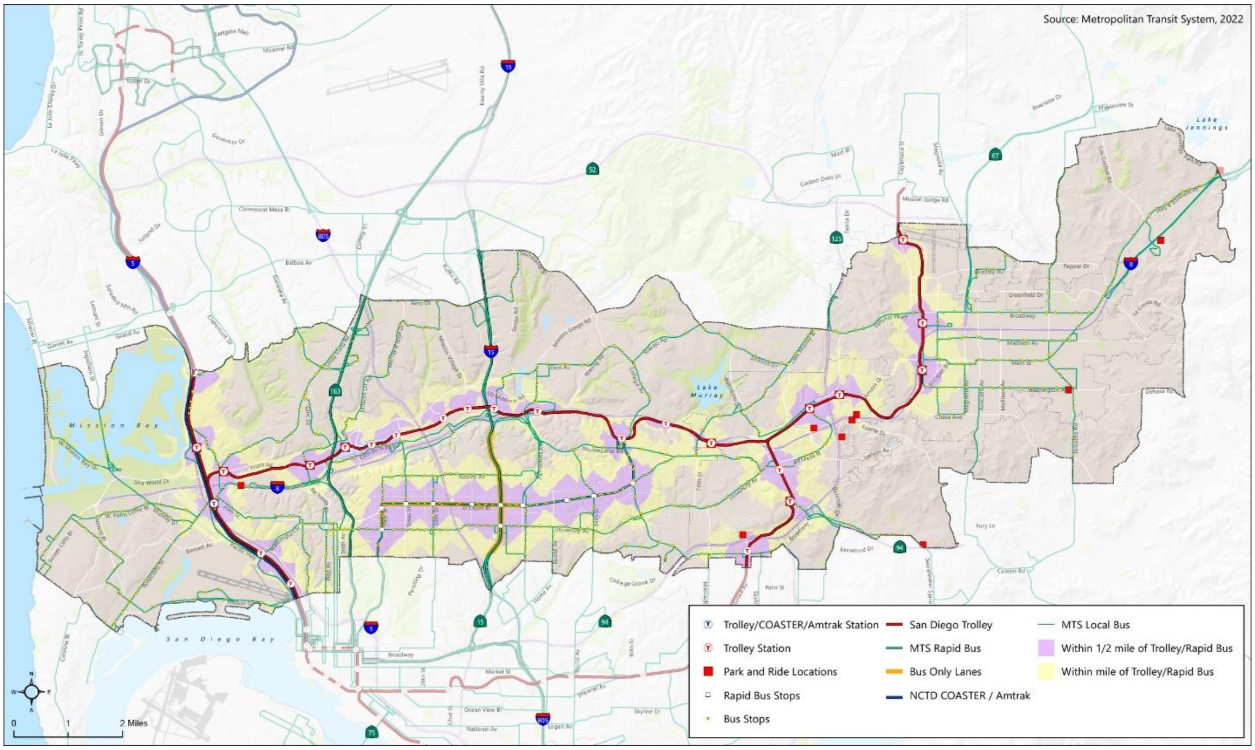
Public Transportation

Public transportation is an efficient travel mode, capable of moving large volumes of people while utilizing minimal space and resources. Accessibility, connectivity, reliability, and travel time can influence the choice to utilize transit, when available.

Routes & Stops

Existing public transportation services within the Kumeyaay Corridor consist of trolley (light rail), local and Rapid bus, COASTER commuter rail, and Amtrak intercity rail. **Figure 3-11** displays the routing of the different service types, including 1/2-mile and 1-mile network buffers around trolley and Rapid stations.

Figure 3-11: Existing Public Transportation Routes and Stops



Source: MTS, 2022

Existing north-south connections are constrained by topography and available right-of-way:

- Route 6 (connecting Fashion Valley Transit Center with 30th St. and University Ave via Texas Street) operates at 20-minute headways during much of its service period and is a vital link between each side of I-8. Improvements may be needed to support reliability and rider comfort.
- Route 13 (connecting Kaiser Hospital with the 24th Street Transit Center in National City) is an important north-south route with connections to many key activity centers and several high schools. It also includes important transit network connections at the Grantville Trolley Station (Green Line and Routes 14 and 18), El Cajon Boulevard, University Avenue, Euclid Avenue Transit Center (Orange Line and seven local bus routes), 4th Street, and Plaza Boulevard.
- Route 14 operates between the Grantville Trolley Station and City of La Mesa with 60-minute headways, connecting communities just north of I-8 to those just south. Its circuitous route provides service along low density, auto-centric areas with challenging topography and connections at four Green Line stations (Grantville, Mission San Diego, SDSU Transit Center, and 70th St). A more flexible service type may be warranted.

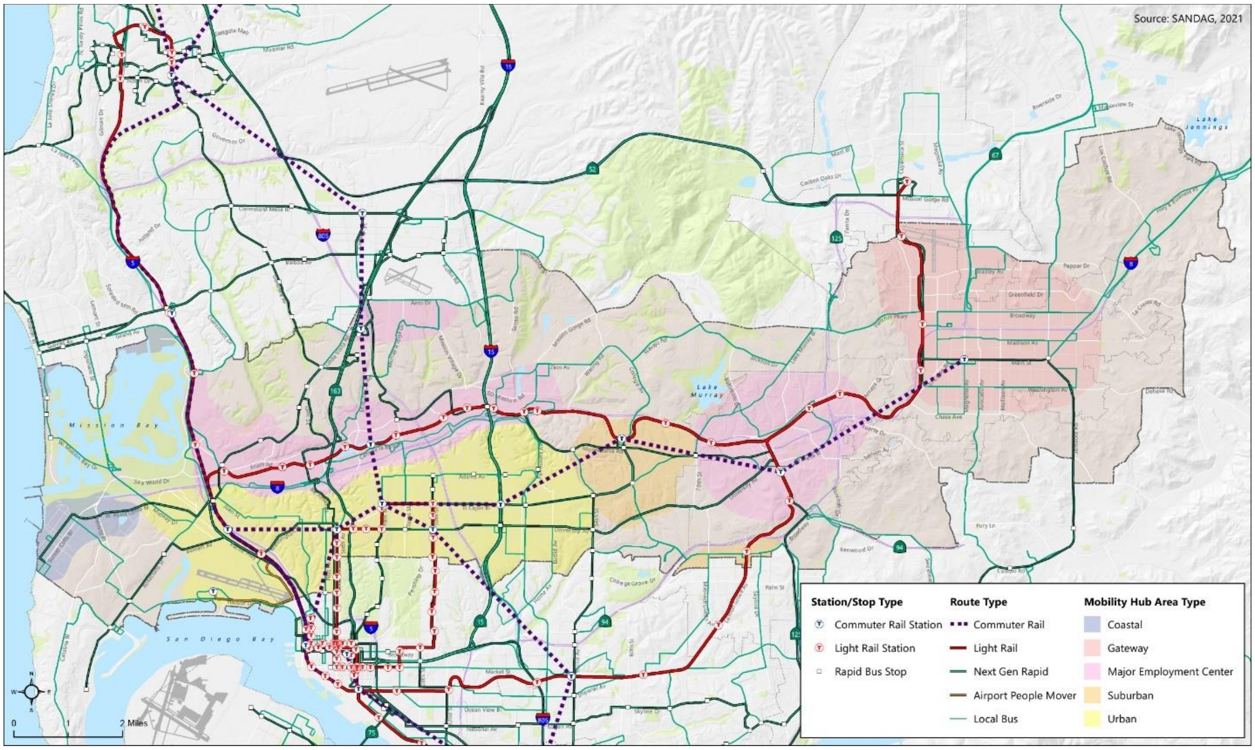
East-west running service is more abundant through the Kumeyaay Corridor, accommodated through the Green and Orange Line Trolleys, Rapid, and local bus. Notable bus routes include:

- Route 1 connects the Fashion Valley Transit Center to the La Mesa Boulevard Trolley Station, running primarily along El Cajon Boulevard.
- Route 7 connects the intersection of College Avenue and University Avenue to the Santa Fe Depot in Downtown San Diego via University Avenue, Park Boulevard and Broadway.

- Route 10 runs between the Old Town Transit Center and the intersection of College Avenue and University Avenue along Pacific Highway, Washington Street, and University Avenue.
- Rapid Route 215 connects SDSU to Downtown San Diego via College Avenue, El Cajon Boulevard, Park Boulevard, and Broadway. Rapid 215 is also the only route that benefits from transit signal priority technology along El Cajon Boulevard and Park Boulevard.

Figure 3-12 displays the planned public transportation network as shown in the adopted 2021 Regional Plan.

Figure 3-12: Planned Public Transportation Routes (Adopted 2021 Regional Plan)



Source: SANDAG, 2021

Three new commuter rail services are planned, which could better connect the Corridor to major employment centers and regional destinations:

- Commuter rail 581 Downtown San Diego to El Cajon via SDSU and La Mesa
- Commuter rail 582 Sorrento Mesa to National City via UTC, Kearny Mesa, and University Heights
- Commuter rail 583 Central Mobility Hub to US border via Downtown San Diego

Other notable planned services include:

- Next Gen Rapid Route 10 La Mesa to Ocean Beach via Mid-City, Hillcrest, and Central Mobility Hub
- Next Gen Rapid Route 28 Point Loma to Kearny Mesa via Central Mobility Hub, Linda Vista
- Next Gen Rapid Route 41 Fashion Valley to UCSD via Genesee Avenue and UTC
- Next Gen Rapid Route 120 Kearny Mesa to Downtown via Mission Valley

- Next Gen Rapid Route 292 Pacific Beach to Santee to Otay Mesa via Kearny Mesa, El Cajon, Jamacha, and Otay Lakes
- Next Gen Rapid Route 295 South Bay to Sorrento Valley via La Mesa & Kearny Mesa
- Next Gen Rapid Route 625 SDSU to Palomar Station via City Heights, Southeast San Diego, and National City
- Next Gen Rapid Route 637 North Park to Naval Base San Diego (Pacific Fleet) via Golden Hill
- Light Rail/Tram Route 555 Downtown to Logan Heights, Golden Hill, South Park, North Park, University Heights, Hillcrest
- LRT 510 Green Line and LRT 520 Orange Line double/third track and grade separations
- Upgrades to Commuter Rail 398 Oceanside to Downtown San Diego (includes upgrades to Pacific Surfliner, COASTER, Metrolink, freight LOSSAN services, wooden bridge replacements, additional station)
- Airport connector Central Mobility Hub to Car Rental lot and Harbor Island East basin connecting with I-8 corridor

The new routes provide improved service throughout the Kumeyaay Corridor, including many social equity focus areas. Multiple new Next Gen Rapid Bus routes will serve the Midway and Linda Vista communities, while Next Gen Rapid Route 10 will run the length of University Avenue, traversing City Heights. Next Gen Rapid routes 292, 870, and 890 will provide high quality options serving El Cajon.

Mobility Hubs

The 2021 Regional Plan identified the concept of Mobility Hubs – places where different travel options come together. They are intended to provide an integrated suite of services, amenities and technologies to better connect high-frequency transit to trip origins and destinations. Mobility Hubs go beyond the immediate transit station, including features to support transit users, people walking and bicycling, and drivers. The infrastructure and features within Mobility Hubs are intended to support the various travel options while connecting people with their destinations and businesses with their customers. These activity centers are also planned to accommodate future growth and development.

In addition to the 2021 Regional Plan, the Mid-Coast Mobility Hub Strategy and Regional Mobility Hub Strategy identify the following locations as potential mobility hubs:

- Tecolote Road Station
- Clairemont Drive Station
- Grossmont Transit Center
- City Heights Transit Plaza (SR 15 & University Avenue)

The Alvarado, Grantville, SDSU, Mission Valley, Fashion Valley, and Hazard Center trolley stations also have potential to serve as mobility hubs. Downtown La Mesa and downtown El Cajon offer potential for additional mobility hub deployments and concepts, as well as smaller village areas like the residential community of Civita in north Mission Valley, which may benefit from first/last mile mode support.

Moving east-west between potential mobility hubs is currently difficult due to lack of local east-west arterial roads given the topography, especially without access to a car. When there is access to a vehicle, I-8 is a more attractive option than parallel arterials. Removing barriers to access mobility hubs (lack of sidewalks, gaps in bicycle network) is crucial.

The Kumeyaay Corridor also has several Park & Ride lots. These free lots provide places to meet for carpool or vanpool services, while some locations also offer bike lockers and/or access to transit service.

On-Time Performance

On-time performance can be used as an indicator of transit reliability. The most recent three years of on-time performance data (FY2019, 2020 and 2021) was obtained from MTS to understand routes serving the study area. **Table 3-3** identifies underperforming routes serving the Kumeyaay Corridor for the three data years. FY2020 and 2021 data show great improvements in transit reliability over FY2019 data, however, these periods occurred partially or completely during the COVID-19 pandemic during which travel patterns were irregular.

Table 3-3: Public Transportation On-Time Performance: Underperforming Routes (FY2019 – 2021)

Public Transportation On-Time Performance: Underperforming Routes (FY2019 – 2021)			
Route	**FY19**	**FY20**	**FY21**
Goal of 90%			
14	89%	85%	--
20	85%	--	--
25	84%	88%	--
60	72%	79%	--
88	--	86%	--
965	89%	86%	87%
Goal of 85%			
2	83%	--	--
3	78%	83%	--
6	83%	--	--
7	79%	--	--
10	84%	--	--
11	82%	--	--
30	78%	--	--
41	84%	--	--
44	83%	--	--
120	82%	--	--
833	81%	--	--
838	84%	--	--
848	83%	--	--
852	82%	--	--
856	84%	--	--
874/875	81%	--	--
916/917	84%	83%	--
923	81%	--	--
928	80%	--	--
992	78%	81%	78%

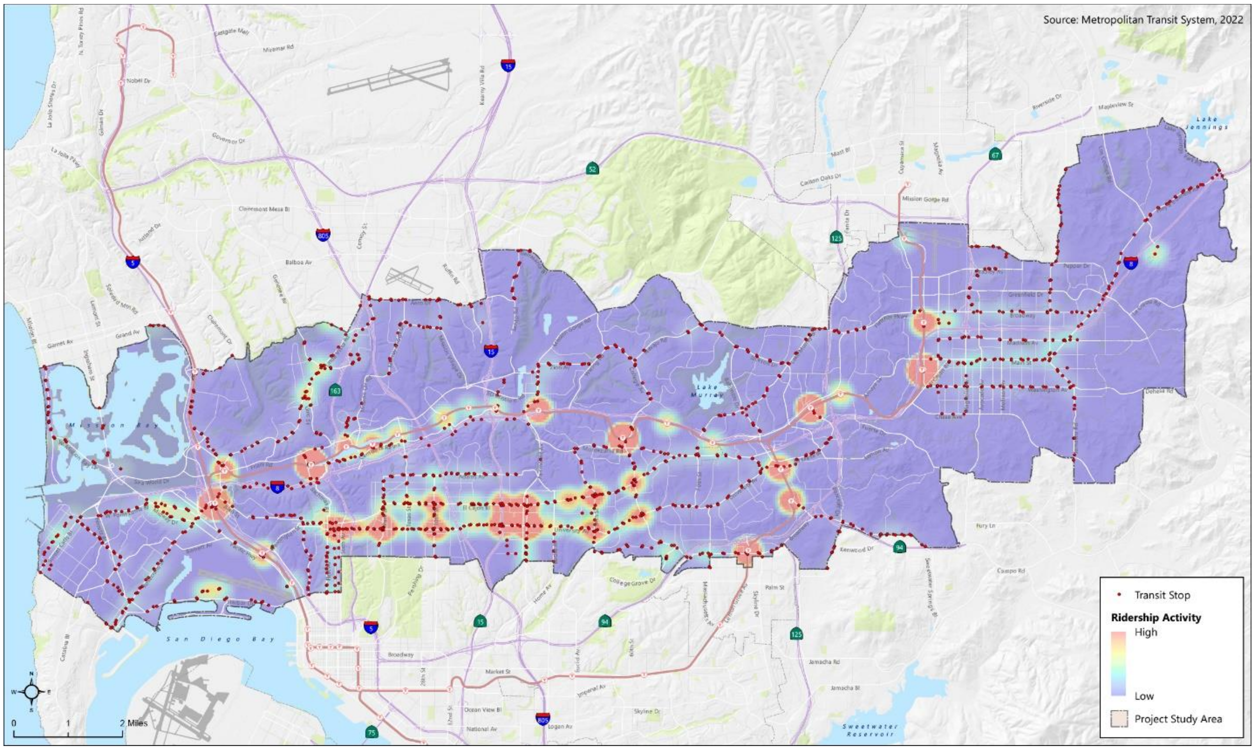
Source: MTS Policy 42 Performance Monitoring Report FY 19, 20, and 21, 2022

Note: Routes no longer in service were excluded.

Ridership

Figure 3-13 presents ridership activity levels in the study area. The highest activity areas are generally located at major transit centers and trolley stations where light rail and multiple bus services converge. Examples include the Old Town Transit Center, Fashion Valley Transit Center, SDSU Transit Center, and El Cajon Transit Center. Higher activity is also present along the El Cajon Boulevard and University Avenue corridors, served by several high-frequency bus routes, including Rapid 215 and Rapid 235.

Figure 3-13: Transit Ridership Activity (Weekday 2019)



Source: MTS, 2022

Flexible Fleets

Flexible fleets refer to on-demand shared mobility services such as bikeshare, scootershare, and on-demand rideshare. These travel options support first-/last-mile connections by making it easier for people to access transit and their final destinations.

Micromobility services are largely concentrated on the western-most portion of the study area. Popular micromobility services like Lime, LINK, Bird, and Spin do not currently operate in the eastern part of the corridor. No providers operate east of SR 125 in the City of El Cajon. Additionally, the City of La Mesa is a no-ride or park zone for shared services without permits to operate. Micromobility service is also limited in residential areas north of I-8. Micromobility services currently operate in the City of San Diego, yet, communities like Civita and Grantville are outside of the service area of some providers. SANDAG's Flexible Fleet Implementation Strategic Plan identifies City Heights and El Cajon as Priority Pilot Areas for deployment given the land use patterns, density, and demographic composition.

Carshare in the study area is extremely limited in providers and locations, with companies like Zipcar located almost exclusively near student populations like SDSU, USD, and the UCSD Medical Center Hillcrest. Carshare services also usually restrict the physical boundaries by which users can operate in. Improved connections to transit centers and mobility hubs may benefit from more flexible, on-demand services, particularly in non-urban areas. Currently, the corridor is predominately served by fixed route bus, rapid bus, and trolley routes.

Policy guidance at the local level can be used to encourage safe and convenient flexible fleet use while also addressing operator needs. Dedicated spaces for micromobility device staging can limit the devices from obstructing walkways and business while also establishing areas for users to access. Reserved curb space for rideshare loading/unloading can improve safety for all roadway users, reduce VMT, and preserve vehicular operations. Appropriate speed limits and infrastructure for devices to operate within is also important to user safety and encouraging use.

These services can be further supplemented by private shuttles offered by developments, employers, and institutions such as SDSU. The Civita development in Mission Valley offers a morning and evening shuttle service seven days a week, connecting the community to the Hazard Center and Fenton Marketplace shopping centers and transit stations. This type of service can reduce single occupant vehicle trips and provide first-/last-mile connections to the larger transit network.

Active Transportation

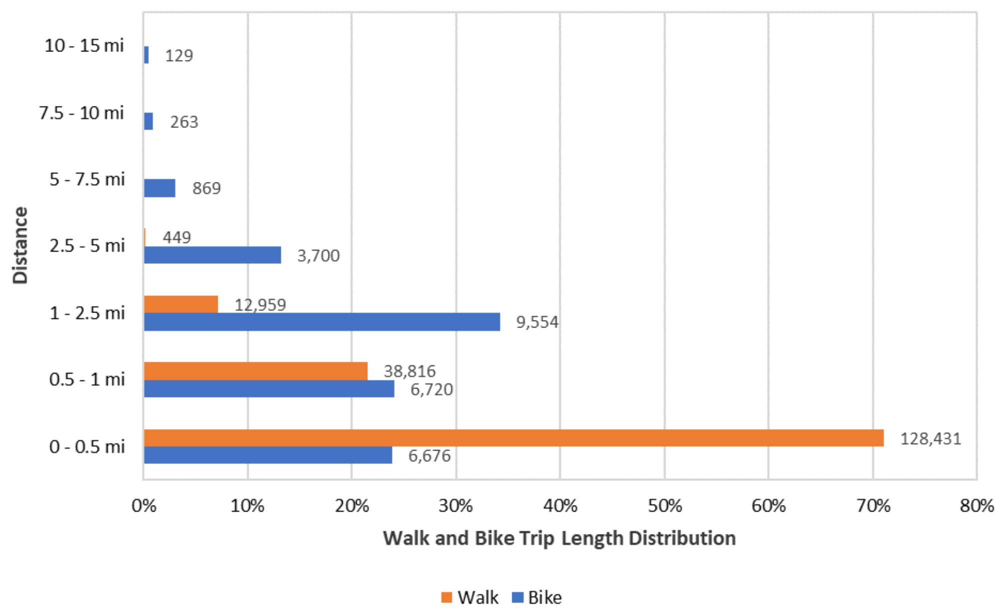
Active transportation refers to human powered travel modes like walking and bicycling. These are critical modes in the transportation system, considering all trips often involve some walking. Throughout San Diego County, approximately 6% of trips are made by walking, while 1% are made by bicycle. Within the Kumeyaay Corridor these numbers nearly double: 11% of 1.6 million trips are made by walking and 2% of trips are made by bicycle.

Many of the areas with higher active transportation activity align with higher transit ridership areas and/or social equity focused communities. The greatest activity levels occur around the following areas:

- Northwest Ocean Beach
- Mission Bay
- University of San Diego
- San Diego State University
- Uptown between Washington Street and University Avenue
- North Park around 30th Street and University Avenue
- City Heights between El Cajon Boulevard and University Avenue
- Downtown El Cajon

Figure 3-14 below summarizes the distances for weekday pedestrian and bicycle trips. Most pedestrian trips within the corridor are less than a half-mile, while the greatest share of bicycle trips are 1- to 2.5-miles.

Figure 3-14: Active Transportation Trip Distance (Weekday)

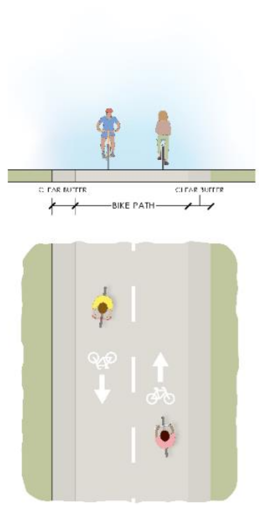


Source: Cambridge Systematics / LOCUS, 2019

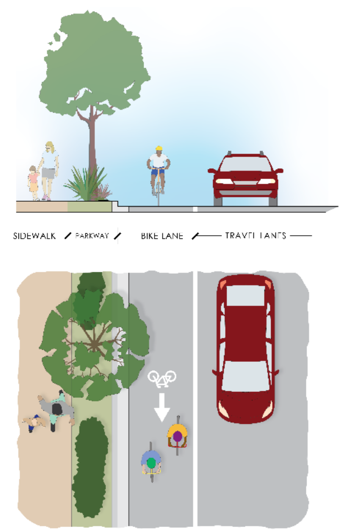
BikeNetwork

The four types, or classifications, of bicycle facilities are identified in **Figure 3-15**. Each classification type is represented within the Kumeyaay Corridor. Bike network planning takes the roadway environment (ex., posted speed limit, vehicular volumes, number of vehicle travel lanes, right-of-way constraints) into consideration to guide facility selection with the intent of creating a network that is safe, comfortable, and well-connected.

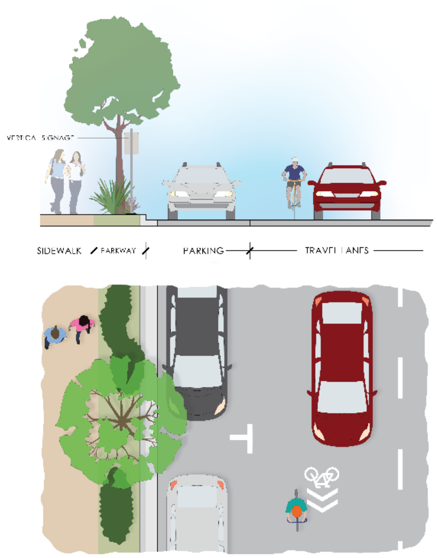
Figure 3-15: Bike Facility Classifications



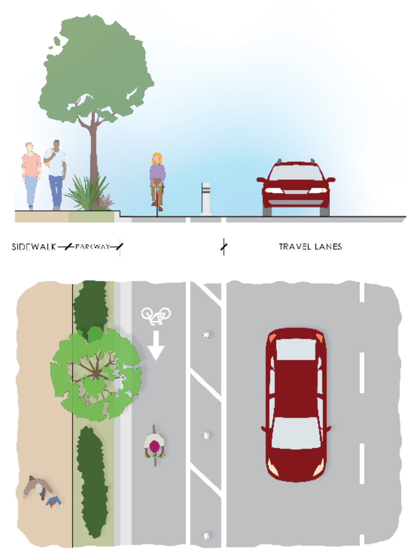
Class I Bike Path



Class II Bike Lane



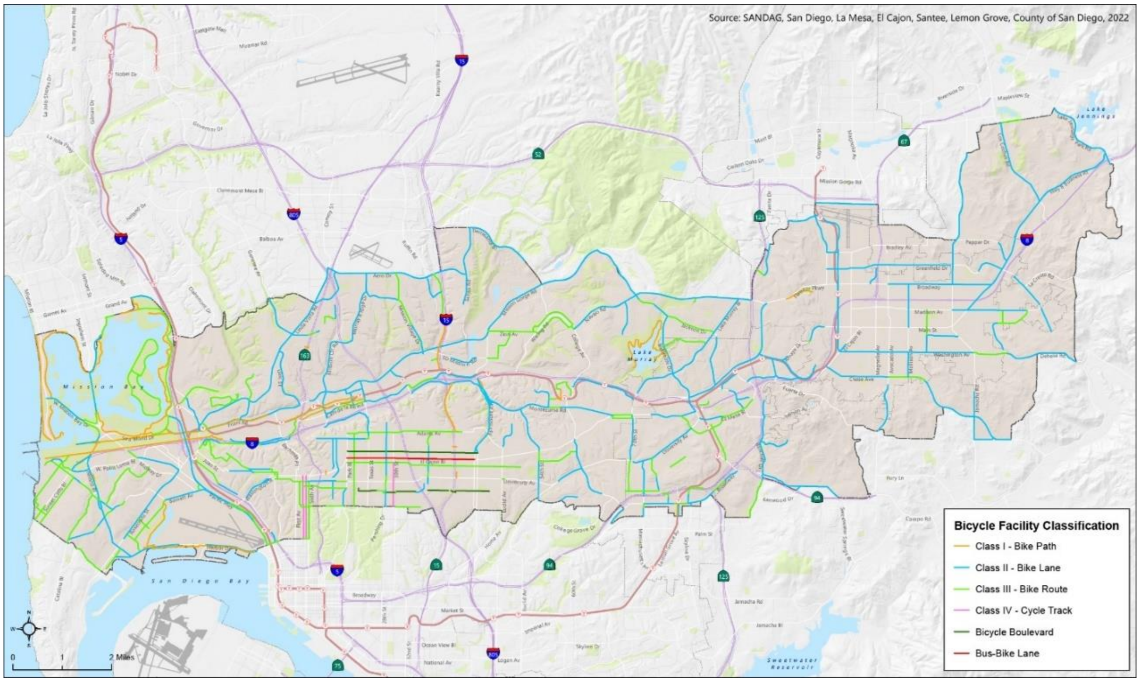
Class III Bike Route



Class IV Separated Bikeway

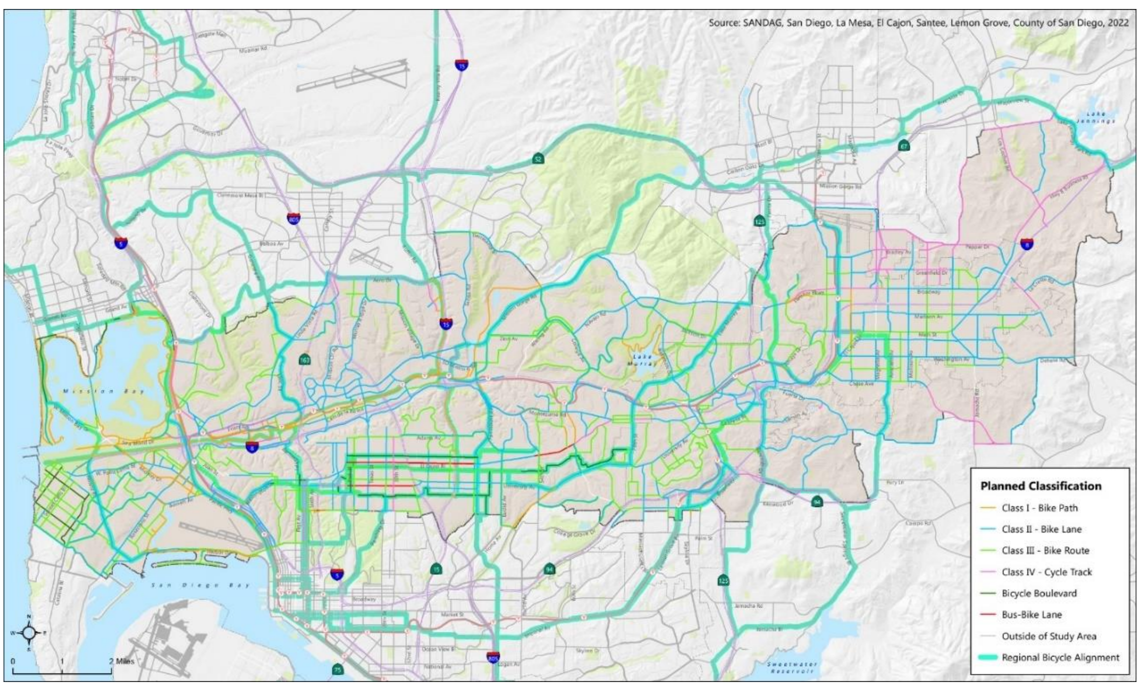
The existing bike facilities in the Kumeyaay Corridor are displayed in **Figure 3-16** while facilities currently planned from local and regional planning documents are shown in **Figure 3-17**.

Figure 3-16: Existing Bike Facilities



Source: SANDAG, City of San Diego, City of La Mesa, City of El Cajon, City of Santee, City of Lemon Grove, County of San Diego, 2022

Figure 3-17: Planned Bicycle Facilities



Source: SANDAG, City of San Diego, City of La Mesa, City of El Cajon, City of Santee, City of Lemon Grove, County of San Diego, 2022

The existing network is primarily comprised of bike lanes and bike routes, facilities that do not provide physical separation from vehicular traffic. Interstate 8 is a barrier to active transportation travel because Crossings, sidewalks (or walking paths), and bike facilities that traverse the freeway are infrequent and where present often include freeway ramps. Additionally, the steep topography that shapes the valley provides inherent challenges for those seeking to make active transportation trips between destinations in the valley and those on the adjacent mesas.

The planned facilities demonstrate increases in separated bike facilities (Class I and IV), however, the distribution of these facilities is not even across the study area. Roadway environments, collision records, and existing and proposed facility types will be reevaluated as recommendations are developed.

Table 3-4 summarizes the centerline mileage of existing and planned bike facilities.

Table 3-4: Existing and Planned Bicycle Network Mileage by Classification

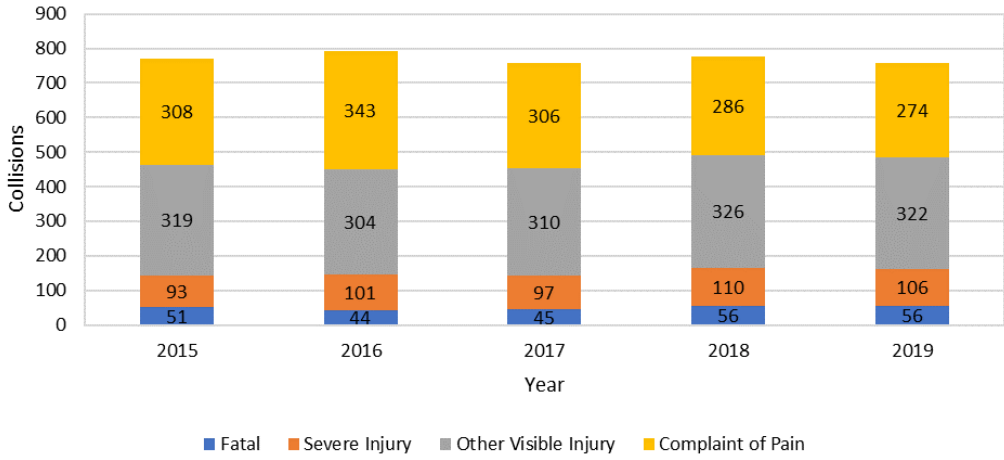
Existing and Planned Bicycle Network Mileage by Classification			
(2022)			
	Existing	**Planned**	**Change**
Class I Bike Path	35.9	62.5	+26.6
Class II Bike Lane	151.5	271.6	+120.1
Class III Bike Route	67.6	174.5	+106.9
Enhanced Class III Bike Route (Bike Boulevard)	5.1	19.2	+14.1
Class IV Separated Bikeway	3.5	65.3	+61.8
Bus-Bike Lane	3.9	6.2	+2.3
TOTAL	267.5	599.3	+331.8

Source: SANDAG, City of San Diego, City of La Mesa, City of El Cajon, City of Santee, City of Lemon Grove, County of San Diego, 2022

Active Transportation Collisions

Figure 3-18 summarizes five-years (2015-2019) of pedestrian-involved collisions by year and level of severity. While the number of annual collisions have remained relatively consistent, ranging from 758 collisions in 2017 and 2019 to 792 collisions in 2016, fatalities over the five years of recent data have increased and lower-injury crashes (complaint of pain) have decreased.

Figure 3-18: Pedestrian-Involved Collisions by Year and Injury Severity



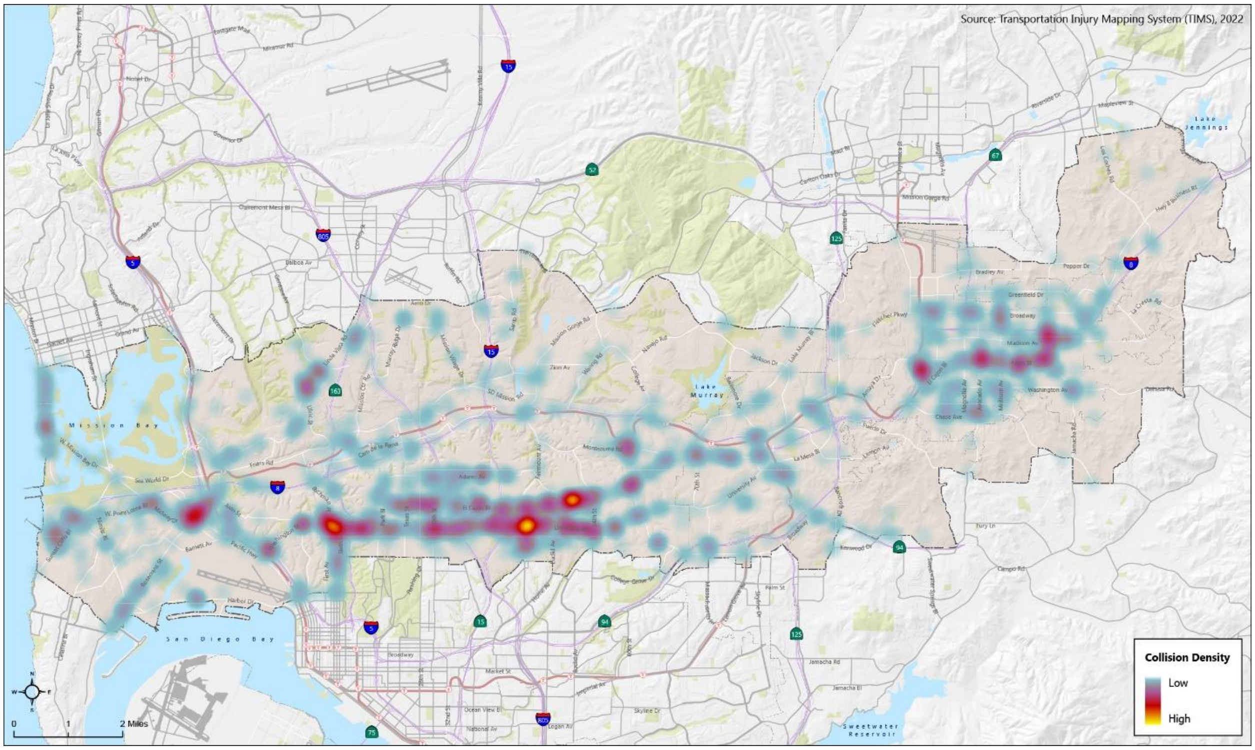
Source: Transportation Injury Mapping System (TIMS), 2022

Pedestrian-involved injury collisions are shown across the Kumeyaay Corridor in **Figure 3-19**. The map utilizes a kernel density analysis to depict collision concentrations relative to the study area. Notable hotspots include areas around the following intersections:

- Rosecrans Street and Sports Arena Boulevard
- Fifth Avenue and University Avenue
- Fairmount Avenue and University Avenue
- Euclid Avenue and El Cajon Boulevard
- Marshall Avenue and Palm Avenue
- Avocado Avenue/Ballantyne Street and Main Street
- Second Street/Jamacha Road and Main Street
- Second Street and Oakdale Avenue

Greater concentrations are shown in areas with higher population density and higher rates of household poverty are present. These areas generally have development patterns characterized by short blocks and a gridded street network – conditions that are more supportive of active transportation trips.

Figure 3-19: Pedestrian-Involved Injury Collisions (2015 – 2019)

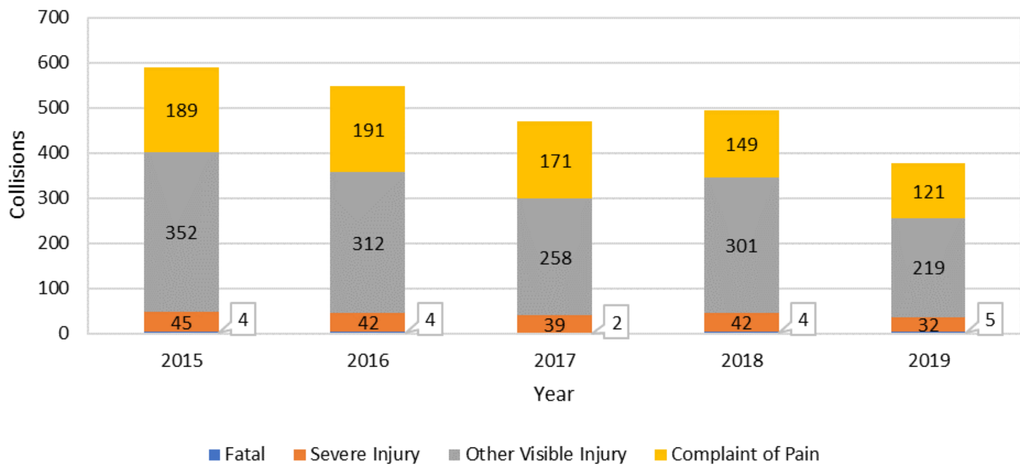


Source: Transportation Injury Mapping System (TIMS), 2022

Drivers were at-fault for 60% of reported pedestrian-involved collisions. At intersections, drivers were responsible for over 76% of collisions. Approximately 40% of reported collisions were categorized as being a result of pedestrian violations, which largely occurred outside of the intersection. The most common pedestrian violation reported was California Vehicle Code (CVC) 21954(a) pedestrians failing to yield to drivers while crossing outside of crosswalk locations.

A total of 2,482 bicycle-involved injury collisions were reported in the Kumeyaay Corridor during the five-year study period (2015-2019). Collisions are summarized by year and level of injury severity in **Figure 3-20**. Bicycle collisions trended in the downward direction during the five-year period, with the fewest total collisions reported in the most recent data year (2019). The trend of fewer collisions in more recent data years was also observed across vehicular only and pedestrian-involved collisions.

Figure 3-20: Bike-Involved Collisions by Year and Injury Severity

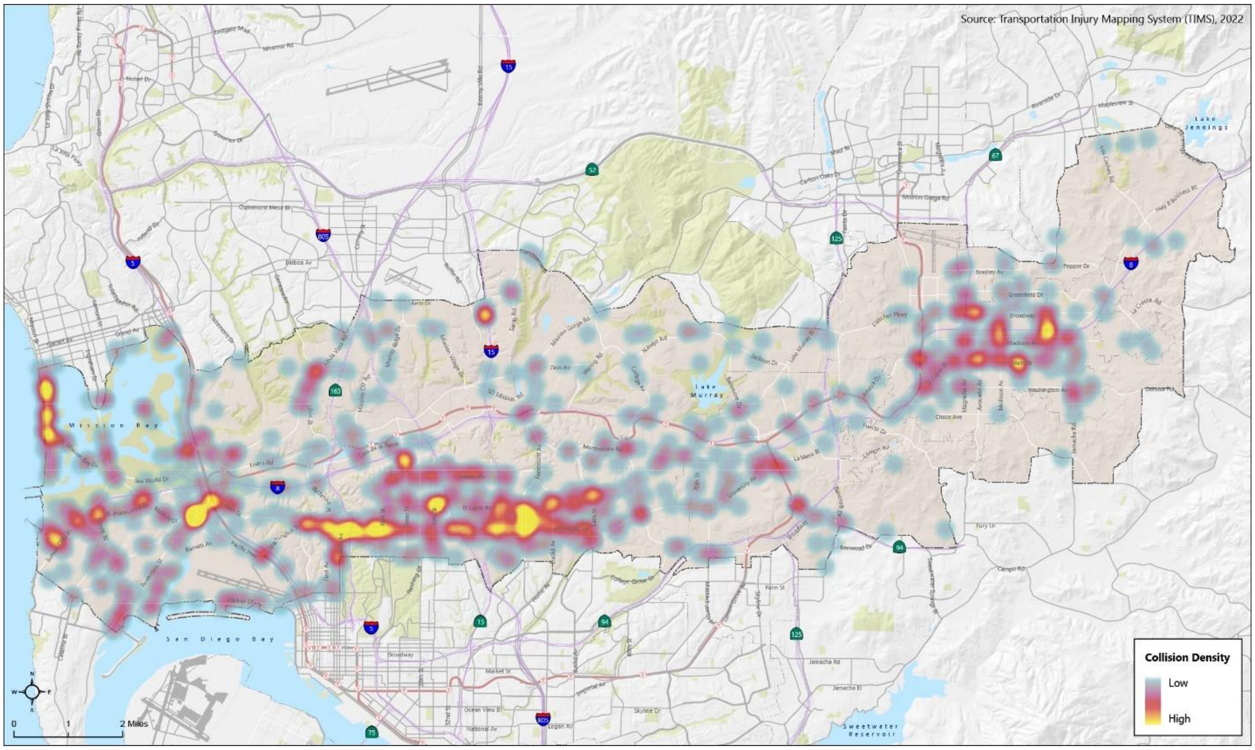


Source: Transportation Injury Mapping System (TIMS), 2022

Bike involved injury collisions are presented in **Figure 3-21**. Collision concentrations are very similar to pedestrian collision patterns, with concentrations in Midway-Pacific Highway, North Park, City Heights, and central El Cajon areas. Additional concentrations are present near the coast in the Mission Bay community.

Over 65% of the bike collisions were reported at mid-block locations, outside of the intersection. Improper turning was reported to be the leading cause of crashes at mid-block locations (22% of mid-block collisions) as well as for all bike-involved collisions (18% of all collisions). At intersections, automobile right-of-way violations (23% of intersection collisions) were reported as the primary cause, with the most common violation being CVC 21801(a), failure to yield while making a left-turn.

Figure 3-21: Bike-Involved Injury Collisions (2015 – 2019)



Source: Transportation Injury Mapping System (TIMS), 2022

Key Takeaways & Next Steps

Key Takeaways

The data analysis, document review, and discussions with public agency representatives informed the identification of transportation needs and related opportunities throughout the Kumeyaay Corridor, summarized in this section. The summary is organized around topics related to traffic congestion and safety, transit service, active transportation, and resilience.

While these challenges may persist throughout the study area, transportation needs are further heightened in areas with greater concentrations of low income, minority, senior, and other historically underserved and underrepresented communities. Understanding where these social equity focus communities are located and their specific transportation needs informs the development of solutions and assures proposed recommendations provide improved and equitable access to transportation options, to basic needs, and to opportunity. Areas with relatively higher population and/or employment densities may also warrant additional considerations due to the higher number of transportation users and thus greater potential for realizing benefits.

Improve vehicular safety and reduce traffic congestion

- Address major weaving issues between closely spaced access locations and interchanges along freeways and arterials. Utilize physical infrastructure and deploy technology solutions to reduce conflicts, harmonize speeds, facilitate movement, and expand dynamic traveler information.
- Alleviate peak hour traffic congestion. Enhance dynamic-signal coordination (e.g., adaptive signals) and consider flexible lane use along arterials.
- Provide competitive and comfortable travel options to encourage multimodal trips and reduce single occupancy vehicle demand.
- Slow vehicle speeds along major arterials. Deploy speed-calming infrastructure, repurpose travel lanes, and minimize lane width.

Provide reliable and accessible transit service with competitive travel speeds

- Reduce transit travel times through service and infrastructure enhancements. Consider new Rapid service, express Trolley service, freeway shoulder running service, and transit priority measures.
- Improve transitions between east-west and north-south running services. Evaluate potential Purple Line alignments and transfers to the Green Line. Evaluate benefits of relocating transit stops/stations to expedite access and the potential for an aerial tram to improve connectivity.
- Strengthen first-last-mile connections to transit stations and access to basic needs (food and medical), opportunity (education and jobs), and residential neighborhoods. Evaluate areas with higher potential for micro-transit or flexible fleet options.

Provide comfortable, safe, and convenient active transportation options

- Collisions involving people walking or riding bicycles are more prevalent in areas with higher concentrations of social equity focus community members and higher densities. Providing enhanced physical infrastructure and operational priority supporting these modes can improve user safety and further encourage multimodal trips.

- Freeways are major barriers to people walking and bicycling. Improve active transportation safety and comfort through widened facilities, removal of free turn movements, square ramps, and new connections.
- Bicycle facilities are often incompatible with the roadway environment. Provide separated bike facilities and protected intersections along high speed and high-volume roadways. Improve access to the regional bike network from adjacent communities, and explore opportunities for alternative connections along slower speed, parallel roadways.
- Intersection safety can be enhanced for people walking and bicycling. Prioritize pedestrian and bicycle safety at intersections with priority signal phases, raised intersections, dedicated signals, narrow vehicular lanes, tightened turn radii, and other measures that increase visibility of active transportation users and slow vehicular traffic.

Provide resilient infrastructure that can adapt to emergencies and climate change.

- Sea level rise and inland flooding is anticipated to pose the greatest flooding risks around Mission Bay, San Diego Bay, the San Diego River, and along I-8 between SR 163 and I-805. Future flood fortifications should be prioritized in these locations. Permeable surfaces, increased drainage capacity, new elevated facilities, and rainfall flood sensors are some examples of potential solutions to explore.
- Seek methods to address the effects increasing temperatures will have on transit and active transportation users, particularly in the eastern part of the Kumeyaay Corridor where greater temperatures are anticipated. Increased shading at bus stops and transit centers, and shade trees along active transportation corridors may be considered.
- Reduce wildfire potential through vegetation management.
- Provide operational plans and/or ITS solutions to address congestion resulting from emergency evacuation and flooding disruptions that cannot be mitigated through capital improvements.
- Incorporate renewable energy, microgrids, and battery storage to provide resilient energy sources during power safety shut off events or other emergencies that affect the grid.

Next Steps

The data reviewed in this State of the Corridor provides a snapshot of current conditions and anticipated future year environments based on current planning documents. This information builds upon the Relevant Document Review and will be further supplemented through discussions with representatives from the various public agencies with jurisdictions or services within the Kumeyaay Corridor, as well as community members. Combined, these sources of information will be used to determine areas or topics to focus transportation solution strategy development. As strategies are explored, the datasets summarized in this document will be revisited to aid in strategy selection and evaluation.