Appendix E: Title VI Analysis and Engagement

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Title VI Analysis and Engagement

Introduction

The San Diego region thrives because of its diversity, encompassing a wide variety of races, ethnicities, and cultural influences from around the world. Home to 17 federally recognized tribal nations, the region's economy, history, and culture are deeply intertwined with our tribal communities. Sharing proximity and a strong interdependence with Mexico, the region also benefits from a unique and vibrant cross-border culture.

Transportation projects have a significant impact on the quality of life for a region's residents and visitors by shaping access to jobs, education, housing, services, and recreational opportunities. Without proper planning and development, transportation systems can have a negative impact on communities. The construction of roads, freeways, and rail transit systems have historically placed health burdens on many low-income communities, communities of color, and those who have been historically marginalized and underserved. Transportation projects may also physically divide communities, resulting in long-lasting social and economic costs.

Therefore, it is important to understand the impact of transportation investments on our most vulnerable communities. To do this, SANDAG has prioritized equity in engagement and planning efforts through:

- Engagement of underserved communities in the planning and decision-making process through an innovative and collaborative effort with Community-Based Organizations (CBOs) and Collaboratives from across the San Diego region
- A data-driven and informed process to identify where disadvantaged communities are located within the region and to design the transportation network to provide connections and transportation options to and from key amenities and destinations
- Improving methods for analyzing how the 2025 Regional Plan meets federal and state equity mandates and affects the populations outlined in those mandates, such as those laid out in Title VI of the Civil Rights Act of 1964
- Ensuring analysis methods reflect and respond to the needs of the disadvantaged communities in the region as defined by people in those communities

SANDAG recognizes that the language and terms connected to equity and representation are evolving. The terms used throughout this appendix are drawn from the data sources they are taken from, including the Census and American Community Survey (ACS). They may not always represent current best practices. SANDAG's use of these terms is done out of a need for consistency with data and information used in the appendix and not to cause offense or harm. The definition and source of these terms are provided as a footnote when used in the document.

Legal Framework

Title VI

Over the last several decades, federal law and guidance have been written to ensure that the spirit and intent of Title VI of the Civil Rights Act are incorporated into the guiding principles and missions of federal, state, and local public agencies. Title VI of the Civil Rights Act of 1964 states that:

> *"No person in the United States, shall, on the grounds of race, color or national origin be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance."*

In addition to conducting planning activities in compliance with Title VI, SANDAG must also prepare and submit a Title VI Program to the Federal Transit Administration (FTA). FTA Circular 4702.1 provides guidance and instructions necessary to carry out U.S. Department of Transportation Title VI regulations. Additional information about SANDAG's Title VI program can be found on the SANDAG website.

Title VI also prohibits language-based national origin discrimination. SANDAG provides meaningful access to programs, services and activities for limited English proficiency individuals through its Language Assistance Program. Additional information about SANDAG's Language Assistance Program can be found on the SANDAG website.

California Assembly Bill 805

California Assembly Bill 805 (Gonzalez Fletcher, 2017) (AB 805) amended Public Utilities Code Section 132360.1 to add subsection (c): "The regional comprehensive plan shall identify disadvantaged communities as designated pursuant to Section 39711 of the Health and Safety Code and include transportation strategies to reduce pollution exposure in these communities."[1] Health and Safety Code Section 39711 requires the California Environmental Protection Agency to identify disadvantaged communities for investment opportunities from various state programs. These communities shall be identified based on geographic, socioeconomic, public health, and environmental hazard criteria, and may include, but are not limited to, either of the following: a) areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation; b) areas with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment. To carry out this mandate, the California Office of Environmental Health Hazard Assessment (OEHHA) has developed a screening/mapping tool called the California Communities Environmental Health Screening Tool (CalEnviroScreen) to identify disproportionately impacted communities.

[1] California Public Utilities Code § 132360.1. Accessed May 2025.

SANDAG Board Policy No. 025

Board Policy No. 025, which is titled **Public Participation Plan** (PPP), incorporates concepts from federal and state laws and guidance. Ensuring the meaningful involvement of low income, minority, limited English speaking, disabled, senior, and other historically marginalized and underrepresented communities is a key component of SANDAG public participation activities. Board Policy No. 025 also states that social equity means ensuring that all people are treated fairly and are given equal opportunity to participate in the planning and decision-making process with an emphasis on ensuring that systemically marginalized and disadvantaged groups are not left behind.

Americans with Disabilities Act (ADA) and Senior Populations

In addition to the federal and state laws discussed above, SANDAG ensures its programs and projects comply with the federal ADA, which prohibits discrimination and guarantees that people with disabilities have the same opportunities as everyone else to participate in the mainstream of life. Although there is no law that specifically requires an equity analysis regarding seniors in the context of transportation planning, SANDAG analyzes effects on the senior population as another disadvantaged group and applies social equity principles.

Legal Framework Summation

The objective when complying with the above-described regulations is to ensure that SANDAG plans, policies, and actions do not result in a disproportionate effect for low-income populations or a disparate impact for minority populations. SANDAG has evaluated whether there are disproportionate effects or disparate impacts that will result from the 2025 Regional Plan by confirming equitable distribution of the 2025 Regional Plan's benefits and burdens such that minorities will not receive comparatively worse treatment when compared to non-minorities, and low-income populations will not receive comparatively worse treatment than non-low-income groups.

Engagement and Process

Everyone has a right to be involved in planning the future of their region. Yet, it's difficult for some to participate in the public feedback process. These barriers can include language proficiency, educational attainment, unfamiliarity with the process, technology access or skills, lack of trust in government, and in some cases, being made to feel that they aren't qualified to get involved.

Public Participation and Public Involvement Plans

SANDAG is committed to meaningfully including all community members and stakeholders in the regional planning and decision-making process regardless of background or experience.

The PPP describes the process for communicating with and obtaining meaningful input in all of SANDAG's work while the 2025 Regional Plan's Public Involvement Plan (PIP) describes engagement strategy and tactics specifically for this project.

Board Policy No. 025 was most recently amended by the Board of Directors in February 2018.

The PPP is aligned with FHWA regulations for metropolitan transportation planning, addresses nondiscrimination requirements related to Title VI of the Civil Rights Act. Included in the PPP are procedures, strategies, and outcomes associated with the ten requirements listed in 23 CFR §450.316. The PPP also incorporates the FTA's guidance on Public Involvement Techniques for Transportation Decision-Making.

The PIP discusses tactics and strategies for engagement efforts related to collecting transportation needs input for the Regional Plan. SANDAG actively sought and considered the needs of communities who have been traditionally under-resourced when developing the PIP, including working with a network of social-equity focused community-based organizations (CBOs) to encourage involvement of historically underserved communities around the region. A tribal consultation plan was also developed in parallel to guide government-to-government collaboration in addressing transportation issues of mutual concern and promote equity in our shared region.

For full details on the PIP and tribal consultation, see **Appendix J: Public Involvement Program** of the 2025 Regional Plan.

Partnering with Collaboratives and Community-Based Organizations in Disadvantaged Communities

To help ensure that all communities were meaningfully involved in the development of the 2025 Regional Plan, SANDAG developed an innovative partnership program in its PIP with community collaboratives and CBOs in vulnerable areas around the region, ensuring early and consistent engagement throughout the plan's development, and drawing on their leadership and knowledge of their communities.

Collaboratives are made up of a variety of social institutions, including social service providers, ethnic associations, schools, churches, chambers of commerce, and other CBOs within an underserved and systemically marginalized identified community, including low-income communities and communities of color.

CBOs are often non-profit service providers who work with the target populations in their community and are part of the community fabric, advocating for their needs. Often, their staff reflects the demographics of the communities they serve.

These groups, acting as forums for local institutions of all kinds, provide a culturally relevant structure for developing local protocols, crossing language barriers, and structuring meetings according to the needs of their communities. If their stakeholders make connections between their local concerns and regional planning efforts, they can begin to understand regional planning in a way that is relevant and meaningful to their communities.

SANDAG has worked collaboratively with CBOs for many years. Most recently, in 2022, 12 CBOs and Collaboratives from around the San Diego region were selected to partner with SANDAG to create a community-based network as part of the 2025 Regional Plan process. The CBO partners share several important qualities, including:

1. A well-established and trusted role in their respective communities with a reputation for consistency and excellence in service
2. Institutional capacity—the resources, staff, and time—to handle various outreach tasks such as survey distribution, community workshops, and other activities, in addition to their regular services

3. A capacity to convene large groups of community members, especially low-income populations, minority populations, people with limited fluency in English, youth, and senior populations, and catalyze significant public involvement from these groups
4. Representation of the different geographic areas in the region as identified by CalEnviroScreen 4.0[2] (California's tool to map environmental and social vulnerability) in order to maximize the amount and variety of people reached

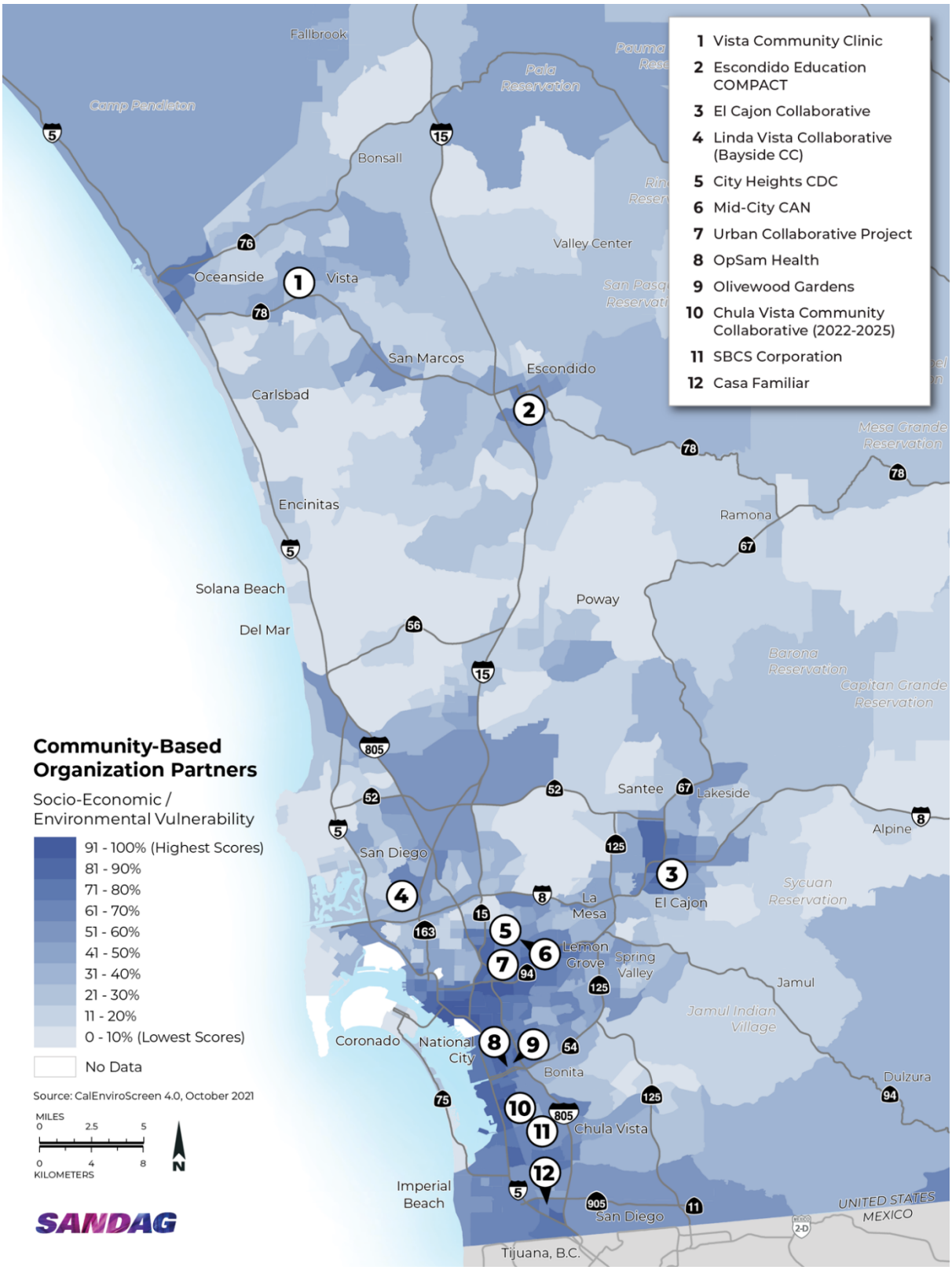
Community-Based Organization Partners

- Bayside Community Center
- Casa Familiar
- Chula Vista Community Collaborative (2022-2025)
- City Heights Community Development Corporation
- El Cajon Collaborative
- Escondido Education COMPACT
- Mid-City Community Advocacy Network (Mid-City CAN)
- Olivewood Gardens & Learning Center
- Operation Samahan Health
- South Bay Community Services Corporation (SBCS Corporation)
- Urban Collaborative Project
- Vista Community Clinic

The list above shows the geographic distribution of the selected CBO partners and their areas of outreach focus. For a more detailed description of each CBO Partner, the communities they serve, and a summary of their outreach efforts, see **Attachment E1: Community-Based Organization Outreach Summaries.**

[2] CalEnviroScreen 4.0 | Office of Environmental Health Hazard Assessment

Figure E.1: CBO Partners: Socioeconomic/Environmental Vulnerability



Source: CalEnviroScreen 4.0, October 2021

Role of Community-Based Organizations Outreach Network

The CBO partners began their work for the 2025 Regional Plan in the fall of 2022, working closely with SANDAG staff throughout the process. Regular meetings (at least once monthly) were held where participants learned about the planning process, shared their insights, helped develop and coordinate community outreach strategies, contributed to the social equity analysis, and brought their respective community's input into the process at key decision-making milestones. Their role in this process was fourfold:

CBO Outreach Network: Throughout the Regional Plan development process, SANDAG staff shared each step of the planning process with the CBO partner project managers, to make the engagement process meaningful and understandable. CBO project managers identified key moments in the process to articulate their issues and advocate for their community members. Regional transportation planning is complex, so a significant amount of time and effort was dedicated to the CBO Partner project managers understanding of what is involved in the development of a regional plan.

Social Equity Working Group: Comprised of policy-level staff from each CBO, the Social Equity Working Group provided feedback and input at each step in the process, providing a social equity perspective on key elements of the 2025 Regional Plan and contributing to the social equity analysis. The working group provided a public forum for other stakeholders to engage in a focused dialogue on social equity in the 2025 Regional Plan and related efforts.

Community Outreach/Engagement/Education: Each CBO partner utilized their community network and organizational structure to craft an outreach strategy appropriate to the needs and character of their community. The CBO partners provided an ongoing forum for discussion on the development of the 2025 Regional Plan at each key milestone and also educated their constituents on planning at the community, city, and regional scale.

Methodologies for Community-Based Outreach to Disadvantaged Communities: A key component of outreach was to develop context-specific methodologies that would help community members understand the elements of the 2025 Regional Plan and provide meaningful input. CBO and SANDAG staff worked together to turn the technical, jargon-laden information being shared into meaningful concepts that would be familiar to community members. Many CBO partners absorbed the information and created innovative ideas for how to share it with their community members and make the dialogue meaningful. This included translation into multiple languages, interactive games, presentations, and other engaging activities. CBOs were provided the flexibility to hold events on days and times that made the most sense in their communities and considered the availability of childcare, language assistance, meals, and incentives during their planning. While many in-person meetings and events resumed as COVID-19 pandemic restrictions were lifted, complimentary virtual options for engagement also continued to be offered.

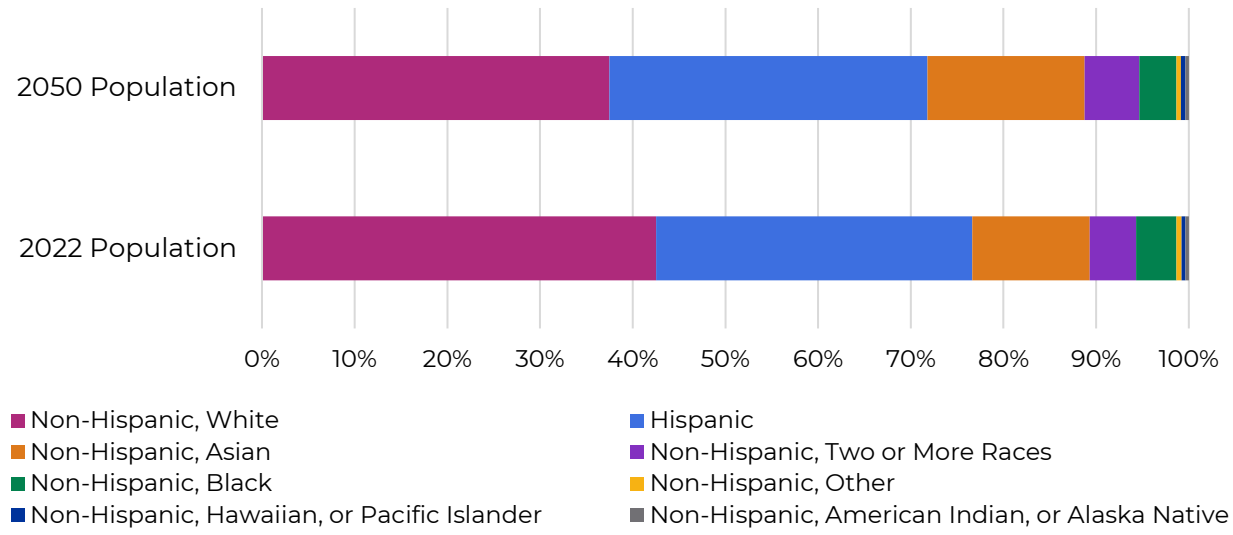
Demographics: Current and Future Conditions

San Diego Regional Population by Race and Ethnicity

Since the release of data from the 2010 census, San Diego officially became a "majority minority" county. This means that no single race or ethnic group comprises more than 50% of the region's total population. As the region continues to grow, its ethnic composition will continue to change. Figure E.2 displays the projected regionwide changes in population from 2022 to 2050 for six racial/ethnic groups: (1) Hispanic, (2) non-Hispanic White, (3) non-Hispanic Black, (4) non-Hispanic Asian, (5) non-Hispanic Two or More Races, and (6) non-Hispanic Other, according to SANDAG's Series 15 Regional Growth Forecast.[3]

By 2050, Hispanics are predicted to account for approximately 35% of the total population. The percentage of population who is non-Hispanic White is expected to decline from 42.5% of the total population in 2022 to 37.5% in 2050.[9] The non-Hispanic Asian population is expected to increase from about 12% to about 17%.[10] It is estimated that there will be virtually no change between 2025 and 2050 in the percentage of the following non-Hispanic race groups: Black, Hawaiian/Pacific Islander, Other, American Indian, and two or more races.

Figure E.2: San Diego Regional Population by Race and Ethnicity



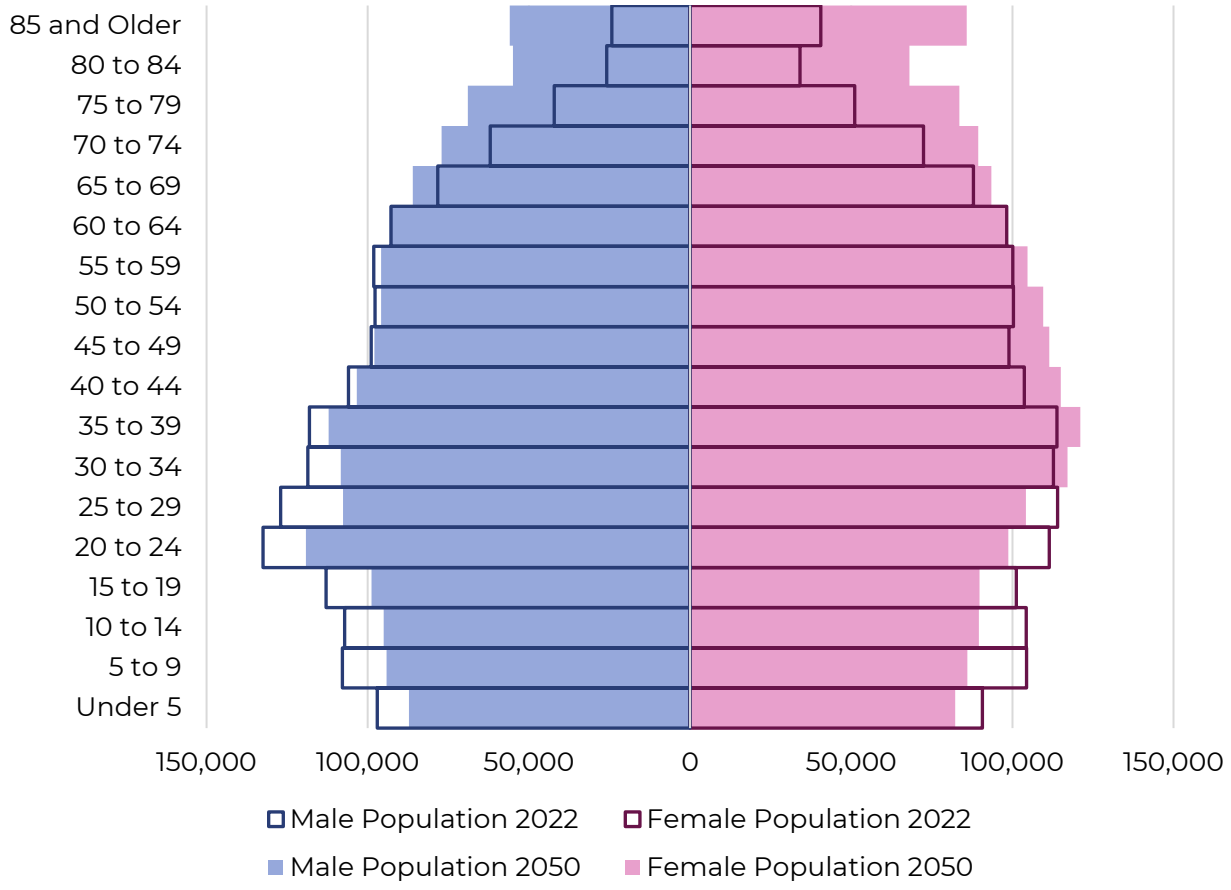
Source: SANDAG Series 15 Regional Growth Forecast

[3] "Series 15 Forecasts Population by Subregional Area," SANDAG Open Data Portal, accessed January 9, 2025, https://opendata.sandag.org/Forecast/Series-15-Forecasts-Population-by-Subregional-Area/wpt4-futw/about_data.

San Diego Regional Population by Age and Sex

In addition to racial and ethnic changes, the region's population is forecast to age considerably by 2050 (Figure E.3: San Diego Regional Population by Age and Sex).[4] During the 34-year forecast period, the region's median age is expected to increase by more than four years—from 36.1 to 40.3—as the Baby Boomer and Generation X generations live longer than previous generations. During the forecast period, the number of residents between 65 and 84 years old is expected to more than double, and the number of residents 85 years old and above is expected to increase almost threefold. Twenty-nine percent (29%) of the region's population growth between 2022 and 2050 is expected to be in the oldest age group (85 and older). By 2050, over 20% of the region's population will be 65 and older, the same percentage that is seen today in the states with the oldest populations in the country—Maine and Florida. Paying attention to this demographic's unique needs for transportation is critical. As the region continues to grow and evolve, transportation plans must adapt to support the needs of the region's changing population.

Figure E.3: San Diego Regional Population by Age and Sex



Source: SANDAG Series 15 Regional Forecast

[4] Series 15 Forecasts Population by Subregional Area," SANDAG Open Data Portal, accessed January 9, 2025, https://opendata.sandag.org/Forecast/Series-15-Forecasts-Population-by-Subregional-Area/wpt4-futw/about_data.

Population-Based Methods for Modeling Performance Measures for Metropolitan Planning Organizations

Metropolitan Planning Organizations (MPOs), such as SANDAG, are able to analyze transportation network impacts on disadvantaged population using the Activity-Based Model (ABM). The ABM models traveler sociodemographic characteristics (such as age, race, ethnicity, and income) at both the individual and household levels allowing for more detailed information and planning.

After examining mapped data using both the previous indicators and various populations proposed for a social equity analysis, and with input from the community based organizations, SANDAG selected three population groups that represent the disadvantaged populations that are analyzed in the transportation model: (1) minorities, (2) low-income populations, and (3) seniors. These are the same populations identified in the 2015 and 2021 Regional Plans, and the team determined this approach would maintain consistency and allow for comparison between these plans. Since the ABM simulates each individual traveler's travel choice (instead of groups of travelers), there is no need to have a threshold percentage for determining if a certain geographic area should be counted as "minority." It was, however, still necessary to select demographic thresholds for low income and senior populations that were appropriate for the San Diego region. The threshold for seniors selected was 75 and older. This threshold came from a dialogue with social equity stakeholders during the 2021 Regional Plan cycle regarding mobility and age, with the conclusion that at age 75, seniors may become transit dependent, but are still mobile. This threshold remained the same for the 2025 Regional Plan. For low-income populations, the threshold selected was populations with household income of less than 200% of the 2022 federal poverty level (FPL). The rationale to use less than 200% of the FPL was twofold. First, below 200% of the FPL reflects the higher cost of living in the San Diego region as compared to other areas of the state and nation that might choose 100% of FPL. Second, this indicator can be forecasted.

Geographic-Based Methods for Developing Pollution-Reduction Strategies

The second method for identifying disadvantaged communities geographically for the 2025 Regional Plan was through a statewide vulnerability index to ensure that the 2025 Regional Plan would include pollution-reduction strategies benefiting those communities. As described above, OEHHA developed CalEnviroScreen, a screening/mapping tool for evaluating multiple pollutants and stressors in communities. The purpose of CalEnviroScreen is to identify the areas of the state that historically have faced multiple pollution burdens so programs and funding can be targeted appropriately toward improving the environmental health and economic vitality of the most impacted communities.

For this region, CalEnviroScreen shows that communities of color disproportionately reside in highly impacted communities, while white people are overrepresented in the least burdened communities. The maps for the region from CalEnviroScreen provide a picture of the communities in the region that currently have the highest pollution burdens (Figure E.1). CalEnviroScreen is intended to provide a snapshot of existing conditions based on historical data, not to predict future conditions for disadvantaged communities. In addition, ACS data was used to create existing conditions maps depicting specific socioeconomic indicators of vulnerability that cannot be forecasted. Some of these are also included in the CalEnviroScreen index. More information on how CalEnviroScreen is used can be found in Appendix A, Attachment A1: California AB 805 Strategies to Reduce Pollution Exposure in Disadvantaged Communities.

Existing Conditions in Disadvantaged Communities in the Region

The process of defining disadvantaged communities (for the purpose of analyzing the impact of transportation investments) used indicators that were possible to forecast to 2050, but it is also important to understand vulnerable communities in the region in terms of existing conditions. In CBO network meetings, consensus was reached to maintain the definitions for disadvantaged communities from the 2021 Regional Plan for the 2025 Regional Plan. Additionally, some indicators of vulnerability that are not used for the purposes of the travel model and performance measures are documented in order to provide a current snapshot of cumulative socioeconomic and population characteristics that make some communities more vulnerable than others.[5]

In the San Diego region, 10.4% of the civilian, non-institutionalized population is disabled, 6% of residents are unemployed, and about 24% of the population is low income. "Low income" is defined as having an income that is less than 200% of the FPL. "Unemployment" is defined as the percentage of the population over age 16 that is in the labor force but unemployed. This excludes retirees, students, institutionalized persons, military personnel on active duty, and those who are not seeking employment. It is important to look at the regional variation in these measures, as they vary by neighborhood. Along with poverty and unemployment, measuring how much a household spends on monthly housing costs is an important indicator of a household's financial security. The ACS provides data on the percentage of a household's monthly income that is spent on rent or mortgage. In this appendix, this indicator is referred to as "housing cost burdened" and is used to assess how resilient a household is and what their ability might be to recover from economic setback. In the region, about 40.5% of households are considered housing cost burdened.

"Households with zero vehicles available" is another measure that is taken from the ACS data. It measures the number of households that have no vehicles available, meaning that these households would be dependent on transit services for their transportation needs. About 5.4% of all households in the region have zero vehicles available, and varies from neighborhood to neighborhood across the region.

Educational attainment is another important indicator that can be used to understand the employment opportunities that are available to an individual. In many cases, a high school education is required for employment and not having a high school diploma can impact an individual's income and earnings. In the San Diego region, about 11.3% of all persons age 25 and older do not have a high school diploma.

Another indicator of a person's employment opportunities is their English language fluency. In the San Diego region, about 39% of households speak a language other than English in the home; of these, about 6% do not speak English very well. This is sometimes referred to as "linguistic isolation" and can also indicate a household's ability to understand and hear important information if there is an emergency in their area.

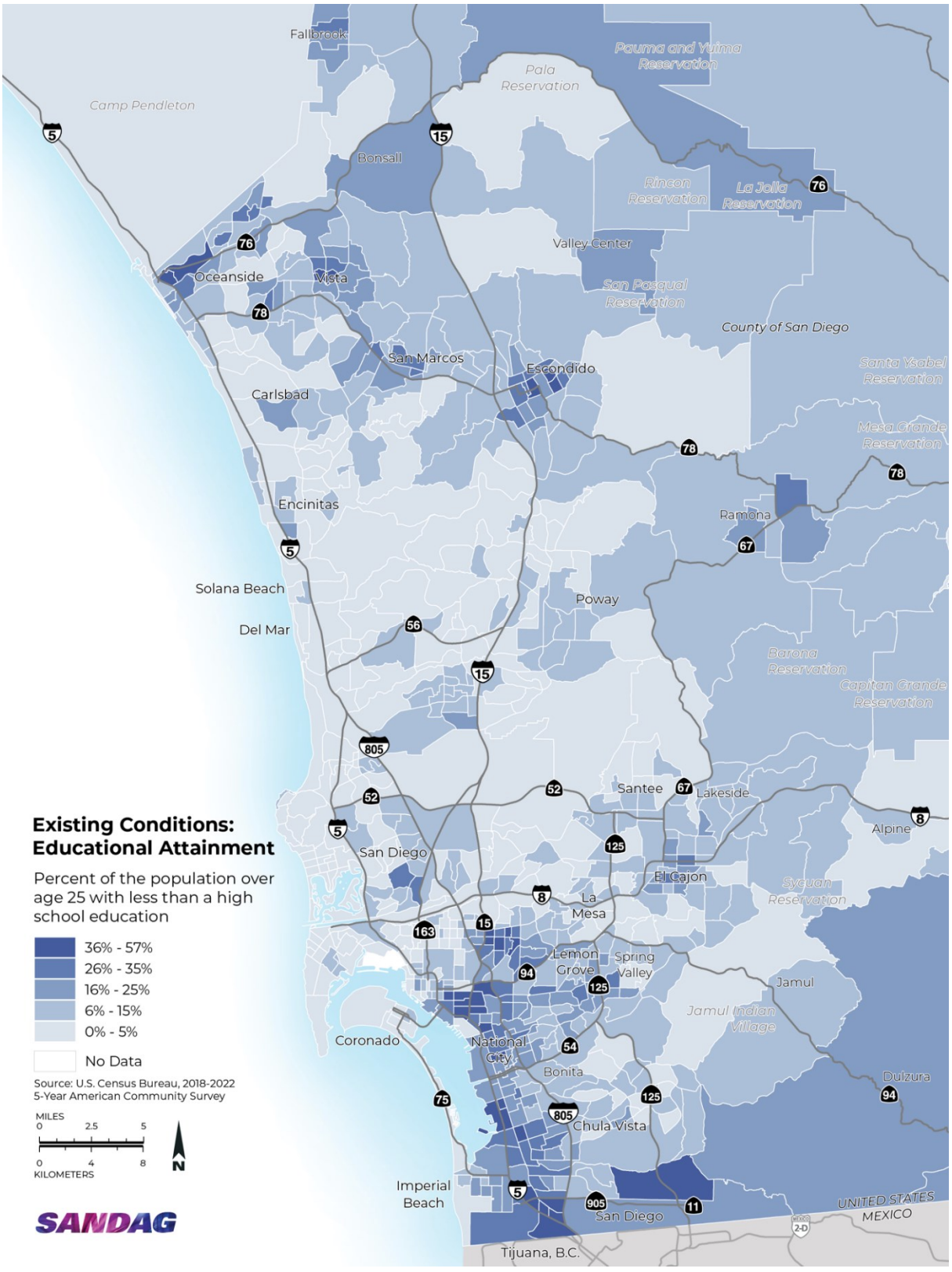
[5] For the Existing Conditions in Disadvantaged Communities in the Region section of this appendix, all data are from the ACS 5-year estimates, 2018-2022 unless otherwise specified.

Maps showing the western two-thirds[6] of the region illustrate each of these indicators, and profiles for each of the communities identified are described below with the following population characteristics:

- Figure E.4: Existing Conditions: Educational Attainment (Table B15003, ACS 5-year estimate, 2018–2022)
- Figure E.5: Existing Conditions: Linguistic Isolation (Table C16002, ACS 5-year estimate, 2018–2022)
- Figure E.6: Existing Conditions: Disability Status (Table B18101, ACS 5-year estimate, 2018–2022)
- Figure E.7: Existing Conditions: Housing Cost Burden (Table B25140, ACS 5-year estimate, 2018–2022)
- Figure E.8: Existing Conditions: Unemployment (Table B23025, ACS 5-year estimate, 2018-2022)
- Figure E.9: Existing Conditions: Zero Vehicle Households (Table B01201, ACS 5-year estimate, 2018–2022)

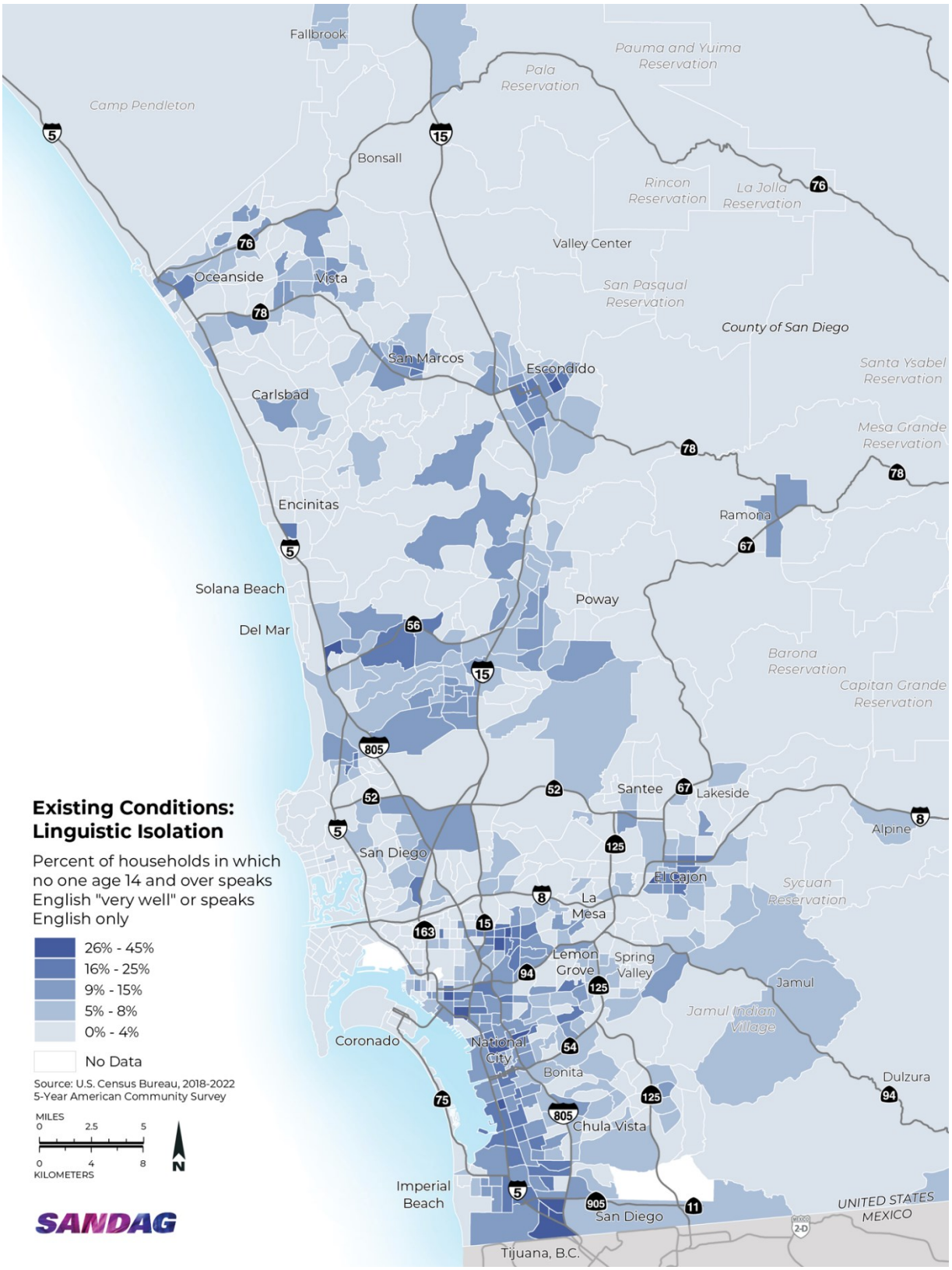
[6] FiguresFigure E.4 throughFigure E.9 focuses on population characteristics within the western two-thirds of the region since these areas are the most densely populated and receive most of 2025 Regional Plan investments.

Figure E.4: Existing Conditions: Educational Attainment



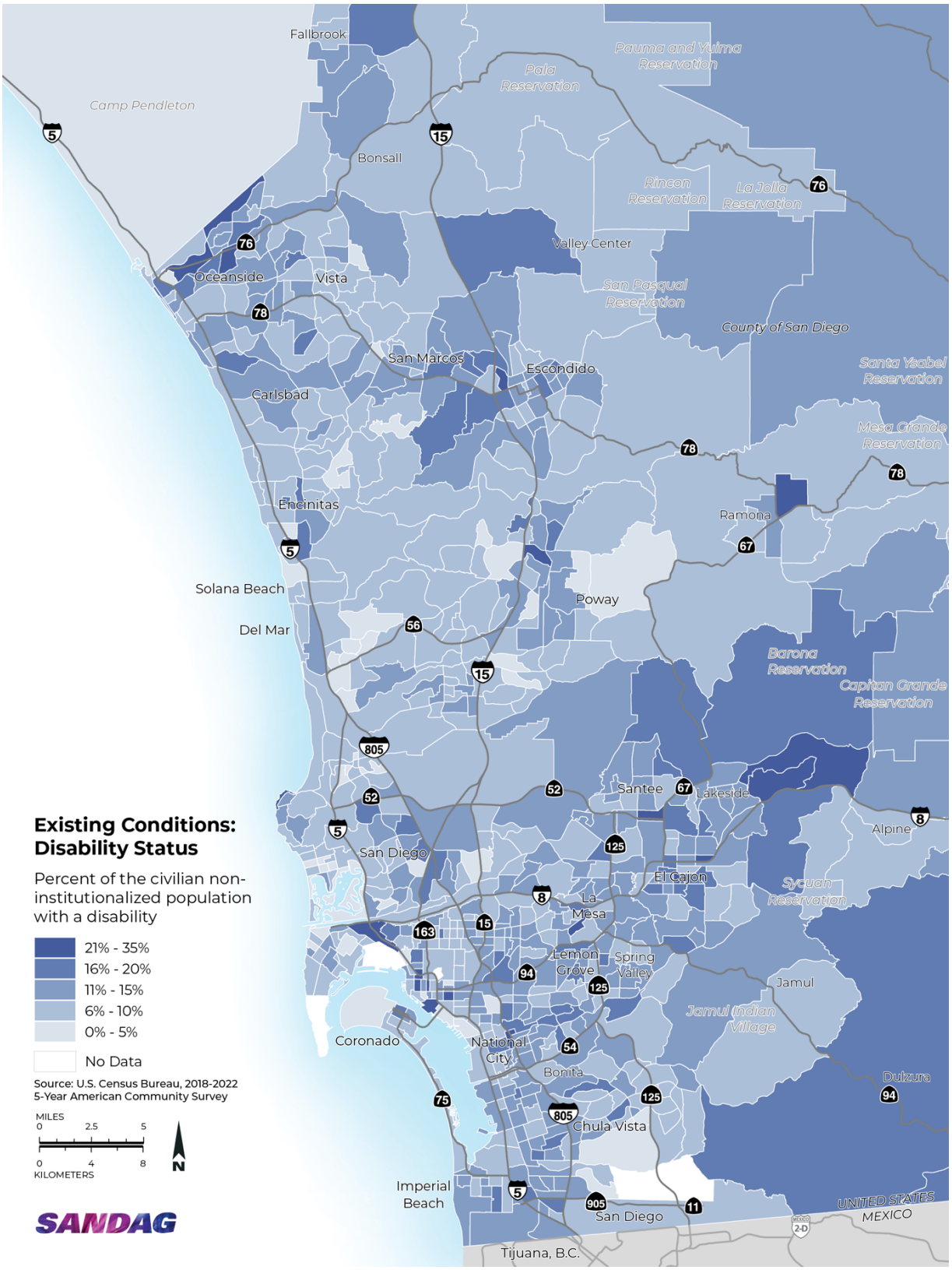
Source: U.S. Census Bureau, 2018-2022 5-Year American Community Survey

Figure E.5: Existing Conditions: Linguistic Isolation



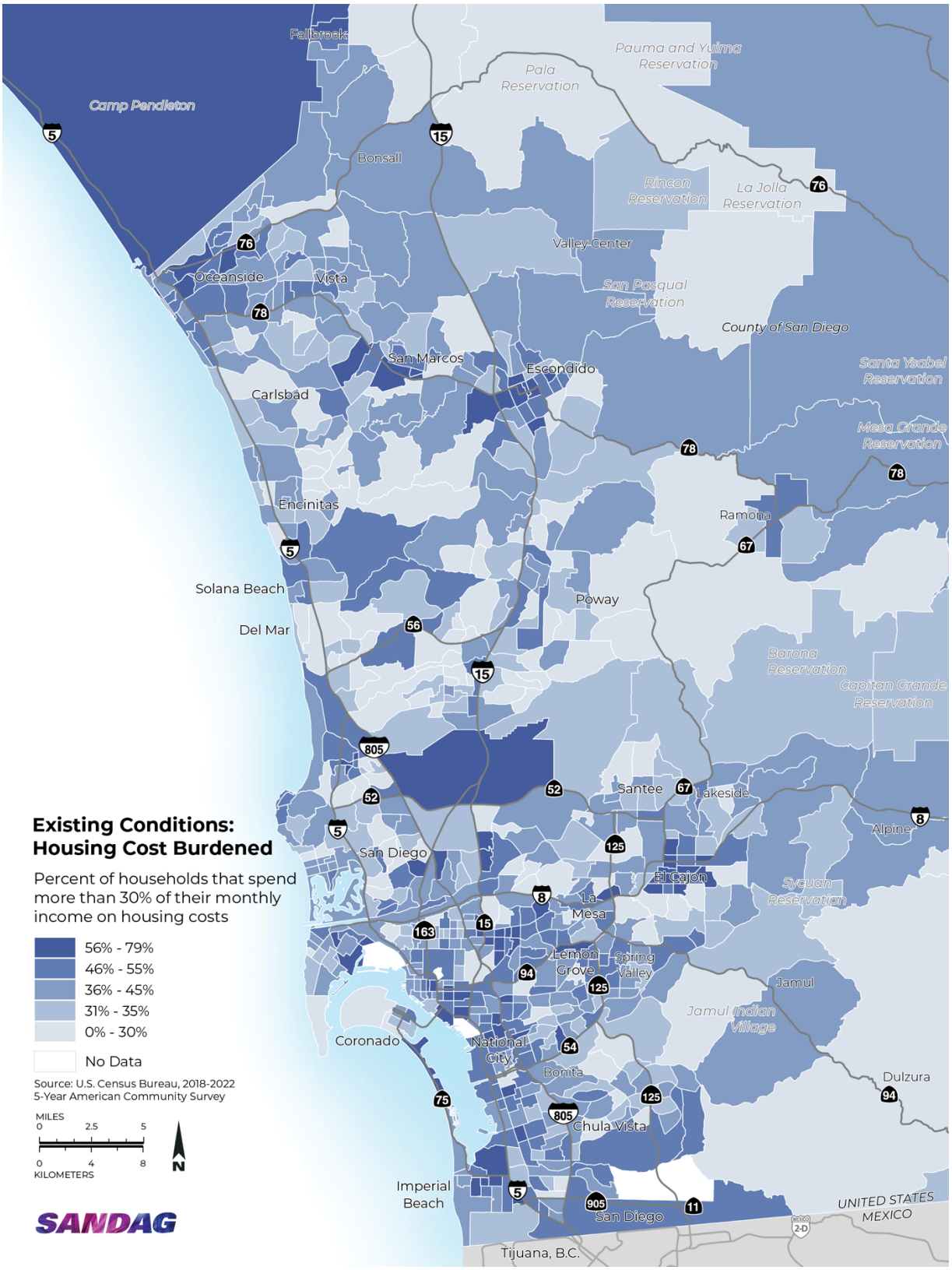
Source: U.S. Census Bureau, 2018-2022 5-Year American Community Survey

Figure E.6: Existing Conditions: Disability Status



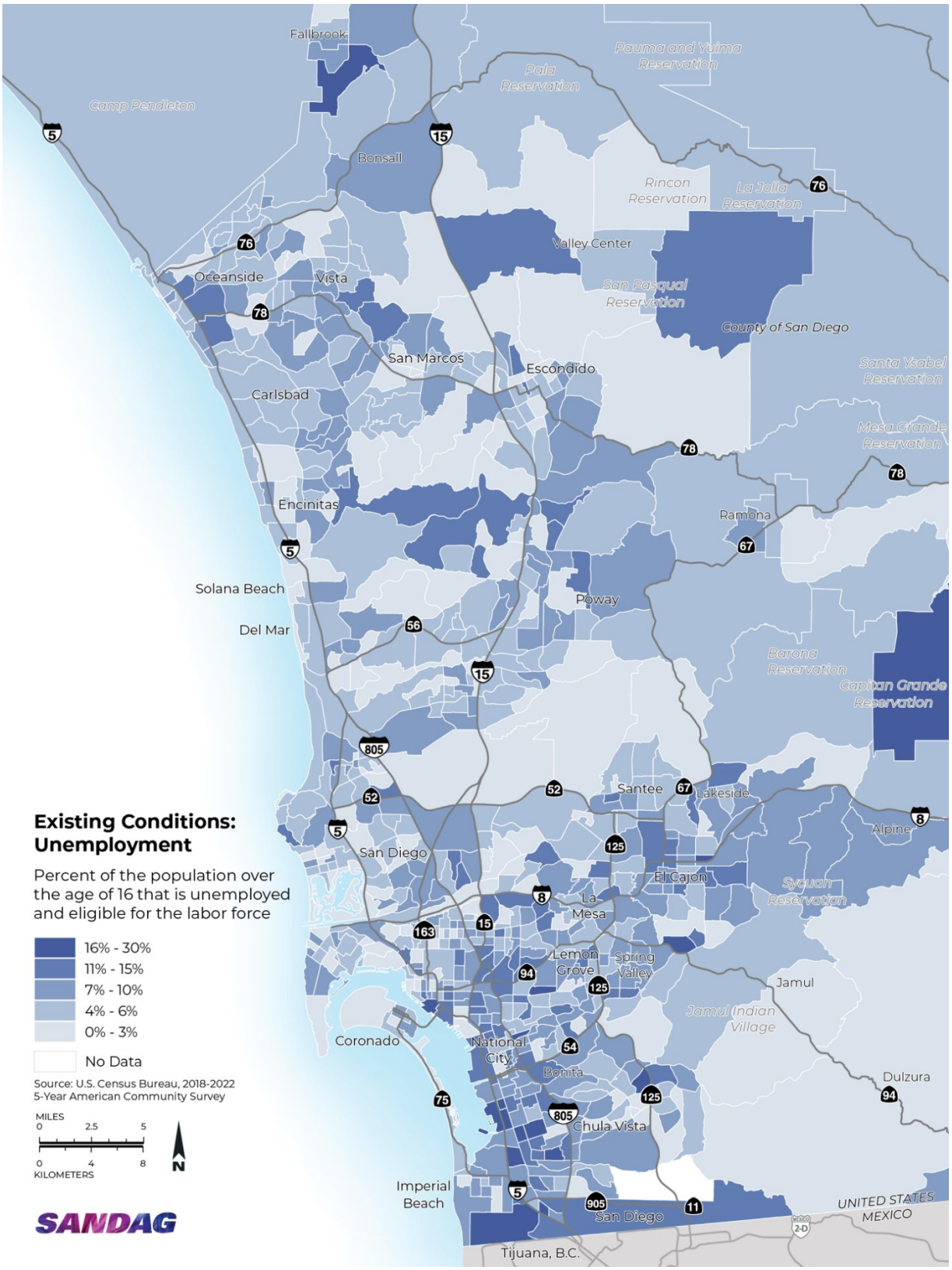
Source: U.S. Census Bureau, 2018-2022 5-Year American Community Survey

Figure E.7: Existing Conditions: Housing Cost Burden



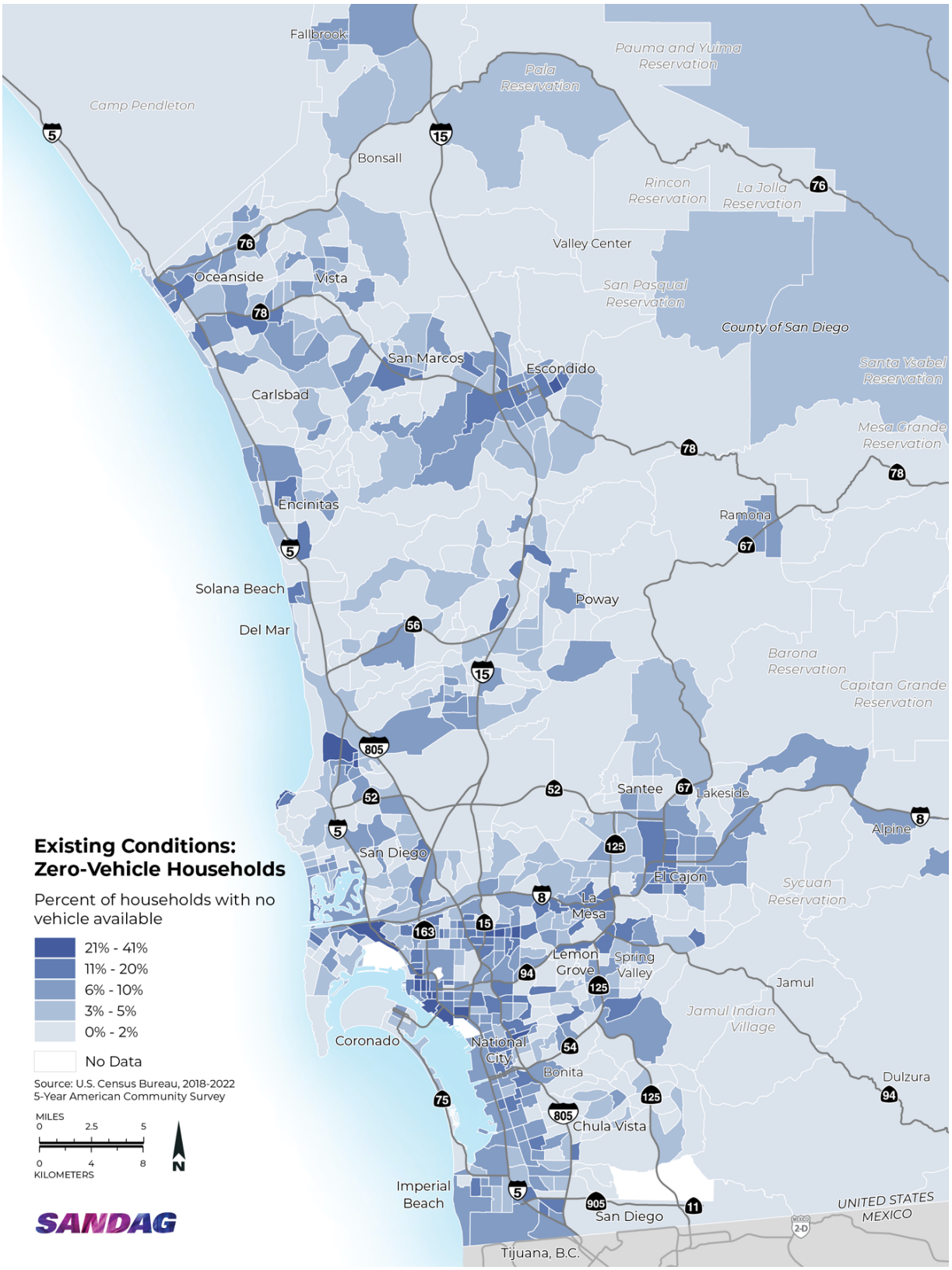
Source: U.S. Census Bureau, 2018-2022 5-Year American Community Survey

Figure E.8: Existing Conditions: Unemployment



Source: U.S. Census Bureau, 2018-2022 5-Year American Community Survey

Figure E.9: Existing Conditions: Zero Vehicle Households



Source: U.S. Census Bureau, 2018-2022 5-Year American Community Survey

Title VI (Social Equity) Analysis

Framework

The 2025 Regional Plan envisions a sustainable and resilient future for our region and economy – supported by a transportation network that is convenient, equitable, healthy, and safe.

Staff used a series of performance measures to evaluate the performance of the 2025 Regional Plan, which are listed in **Appendix N: Network Development and Performance**. Through the process of developing the performance measures, a subset of measures was identified as a framework for the social equity analysis in which data would be produced comparing three vulnerable populations against their respective counterpart populations (minority versus non-minority, low-income versus non-low-income, and senior versus non-senior). These measures include:

- Access to Basic Needs: Retail, Parks and Medical Facilities
- Access to Opportunities: Employment Centers and Higher Education
- Access to High Schools[7]
- Coastal Access
- Access to Rail or Next Gen Rapid Transit Stops
- Access to Bike Facilities
- Change in Percentage of Income Consumed by Out-of-Pocket Transportation Costs
- Average Particulate Matter ($PM_{2.5}$) Exposure per Person

Although Title VI prohibits only intentional discrimination, agency regulations adopted to implement Title VI, which were discussed earlier, direct SANDAG to ensure that it does not engage in practices that have the effect of discriminating on the basis of race, color, or national origin. In some analysis work, statistics are used as a way to screen for such unintentionally caused discriminatory impacts. The threshold percentage often used to screen for disparate impact or disproportionate effect is 20% due to the "four-fifths" or "80%" rule, because it is only presumed that a case for disparate impact or disproportionate effect is created when there is a substantially different rate of impact for a particular group.[8] A rate that is different by more than 20 percentage points is regarded as substantial because it is statistically unlikely to occur on a random basis. Although this relatively stringent standard is only required when checking for disparities for minorities under Title VI, SANDAG also analyzed low income and senior groups using this screening process.

[7] The Access to High Schools performance measure does not include access via school bus.

[8] The U.S. Equal Employment Opportunity Commission, Department of Labor, and Department of Justice has used the four-fifths (or 80%) rule when enforcing disparate impact prohibitions in Title VI of the Civil Rights Act. See 29 CFR §1607.4(D). A selection rate for any race, sex, or ethnic group which is less than four-fifths (or 80%) of the rate for the group with the highest rate will generally be regarded by the federal enforcement agencies as evidence of adverse impact, while a greater than four-fifths rate will generally not be regarded by federal enforcement agencies as evidence of adverse impact.

The modeled results are presented for three years: 2022, 2035 and 2050. The year 2022 serves as the existing transportation network, and the performance outcomes reflect the function of the region's existing transportation system. Years 2035 and 2050 are significant phases in the 2025 Regional Plan, when strategies are planned to be implemented. These phase years are included twice for each performance measure. They are included first for the No-Build scenario. The No-Build scenario includes projects that would be built in the region in absence of the 2025 Regional Plan because they are in progress or already completed as described in Appendix N. The second occurrence is with the revenue-constrained 2025 Regional Plan scenario as described in **Appendix A: Transportation Projects, Programs, Policies, and Phasing**. The differences in the performance between the No-Build scenario and 2025 Regional Plan (Build) are the expected changes from the strategies included in the 2025 Regional Plan.

During the process of evaluating the 2025 Regional Plan network for each disadvantaged population and its respective non-disadvantaged population, the percent difference was calculated between the No-Build projections and 2025 Regional Plan for each phase (2035 and 2050 to determine how each group fared. As part of the analysis, the percentages of each disadvantaged population group were compared to the comparable non-disadvantaged population group to determine whether the percentage point difference between the groups was substantial enough to potentially qualify for further evaluation as a disparate impact or disproportionate effect. Anything above a 20-percentage-point difference would result in further analysis. The results in this appendix compare the No-Build to the 2025 Regional Plan network. No disparate impacts or disproportionate effects were found through this analysis. Additional methodological information is provided in the section below titled "Results for Social Equity Performance Measures."

Defining Performance Measures for Social Equity Analysis

As part of the social equity analysis process, CBO partners helped identify performance measures that could be analyzed from a social equity perspective. Input from affected communities was incorporated into the performance measures that were ultimately utilized. Each of the performance measures analyzed in this Regional Plan and their relation to the Plan's goals are described in Appendix N. The measures used to analyze the performance of social equity efforts support the goals of the Regional Plan: convenient and reliable movement of people and goods, equitable access to essential needs and opportunities, healthy communities and environment for everyone, and a safe transportation network for all users. The analysis of the social equity performance measures will be discussed in this section.

Access to Basic Needs: Retail, Parks, and Medical Facilities

Access to key amenities is critical for everyone. We rely on the transportation system to go shopping, exercise at the park, or visit the doctor. This measure includes access to retail[9], parks[10], and medical facilities[11]. The access to retail and parks measure examines the percentage of the regionwide population who can travel to retail or a park within 15 minutes during midday travel periods via different transportation modes. The modes included in these measures are walk, bike, e-bike, microtransit/NEV, transit[12], and drive alone.

The access to medical facilities measure looks at the percentage of the regionwide population who can travel to a medical facility within 30 minutes during midday travel periods via different transportation modes. The travel time is increased to account for medical facilities being more dispersed throughout the region. The modes included in this measure are microtransit/NEV, transit[17], and drive alone.

For each measure, the total number of people who can access retail, a park, or a medical facility is divided by the regionwide forecasted population. The population values use the forecasted figures from SANDAG's Series 15 Regional Growth Forecast and SCS land use pattern.

Access to Opportunities: Employment Centers and Higher Education

The access to opportunities measures include access to employment centers and higher education institutions. The access to employment centers measure looks at the percentage of the regional adult population (18 years of age or older) who can travel via transit[17] to either a specific employment center tier or all employment centers within 30- or 45-minutes during a.m. travel periods.

The employment centers included in this measure are:

- **Tier 1** employment centers are areas with concentrations of more than 100,000 jobs. Three employment centers are included in Tier 1: Sorrento Valley, Kearny Mesa, and Downtown San Diego.
- **Tier 2** employment centers are areas with concentrations of 25,000 to 99,999 jobs. Fifteen employment centers are included in Tier 2: Mission Valley, Marine Corps Base Camp Pendleton, Carlsbad Palomar Airport, San Marcos Civic Center, Naval Base San Diego, Ocean Beach, El Cajon, San Diego Bayfront, National City, Escondido - Palomar, West Bernardo, Hillcrest, La Mesa, Chula Vista Northwest, and Scripps Poway.

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[9] Retail includes regional shopping centers, neighborhood shopping centers, specialty commercial, arterial commercial, automobile dealerships, other retail, and strip commercial.

[10] Parks include recreation areas and centers containing one or more of the following activities: tennis or basketball courts, baseball diamonds, soccer fields, or swings. Examples include Robb Field, Morley Field, Diamond Street Recreation Center, and Presidio Park. Smaller neighborhood parks with a high level of use are also included as active parks.

[11] Medical Facilities/Healthcare includes hospitals, community clinics, and medical offices (dentist or ophthalmologist). This definition does not consider emergency response times, but measures access to basic health services including hospitals, community clinics, and medical offices.

[12]Transit includes transit that can be accessed by walking or flexible fleet. Transit travel time includes in-vehicle travel time, access and egress walk time to and from station to origin or destination, and transfer wait time.

- **Tier 3** employment centers are areas with concentrations of 15,000 to 24,999 jobs. Fourteen employment centers are included in this tier: Miramar, Pacific Beach, Carmel Valley, El Cajon - Gillespie Field, Vista Tech Park, Chula Vista Southwest, Scripps Ranch, Rancho Bernardo, Carlsbad State Beach, Escondido Centre City, Mid-City, Naval Station North Island, Carroll Canyon, and Linda Vista.
- **Tier 4** employment centers are areas with concentrations of 2,000 to 14,999 jobs. Fifty-nine employment centers from around the region are included in this tier.

The access to higher education measure looks at the percentage of the regional adult population (18 years of age or older) who can travel via transit[17] to a higher education institution within 30- or 45-minutes during a.m. travel periods. Higher education includes public and private colleges, universities, community colleges, and vocational training centers.

For each measure, the total number of people who can access a specific employment center tier, all employment centers, or a higher education institution is divided by the regionwide forecasted population. The population values use the forecasted figures from SANDAG's Series 15 Regional Growth Forecast and SCS land use pattern.

Access to High Schools[13]

This measure looks at the percentage of the regional population who can travel via transit[17] to a public or private high school within 30 minutes during a.m. travel periods.

For this measure, the total number of people who can access a high school is divided by the regionwide forecasted population. The population values use the forecasted figures from SANDAG's Series 15 Regional Growth Forecast and SCS land use pattern.

Coastal Access

This measure looks at the percentage of the regional population who can travel to the coast within 30- or 45-minutes during a.m. travel periods via different transportation modes. The modes included in this measure are microtransit/NEV, transit[17], and drive alone. The coast includes areas that run along the ocean coastline, except those located on military bases, where people can experience coastal temperatures and activities, such as beaches and cliffs (e.g., Sunset Cliffs) allowing swimming, picnicking, and other beach-related recreational activities.

For this measure, the total number of people who can access the coast is divided by the regionwide forecasted population. The population values use the forecasted figures from SANDAG's Series 15 Regional Growth Forecast and SCS land use pattern.

Access to Rail or Next Gen Rapid Transit Stops

This measure looks at both the number and percentage of the regional population within 0.5 miles of a rail or Next Gen Rapid transit stop. The total number of people with access is divided by the regionwide forecasted population. The population values use the forecasted figures from SANDAG's Series 15 Regional Growth Forecast and SCS land use pattern.

[13] The Access to High Schools performance measure does not include access via school bus.

Access to Bike Facilities

This measure looks at both the number and percentage of the regional population within 0.25 miles of a Class I bike facility, Class II bike facility, cycletrack, or bike boulevard. The total number of people with access is divided by the regionwide forecasted population. The population values use the forecasted figures from SANDAG's Series 15 Regional Growth Forecast and SCS land use pattern.

Change in Percentage of Income Consumed by Out-of-Pocket Transportation Costs

Out-of-pocket transportation costs include auto operating costs, cost of tolls, parking costs, taxi and transportation network company fares, and transit fares. The total percentage of income consumed by out-of-pocket transportation costs is calculated by summing up these costs at the household level and then dividing this number by total household income. The change in percentage of income consumed by out-of-pocket transportation costs is derived by comparing the 2025 Regional Plan expenditures to 2022 expenditures (2025 Regional Plan percentage of income consumed by out-of-pocket transportation cost minus 2022 percentage of income consumed by out-of-pocket transportation cost equals change in percentage of income consumed).

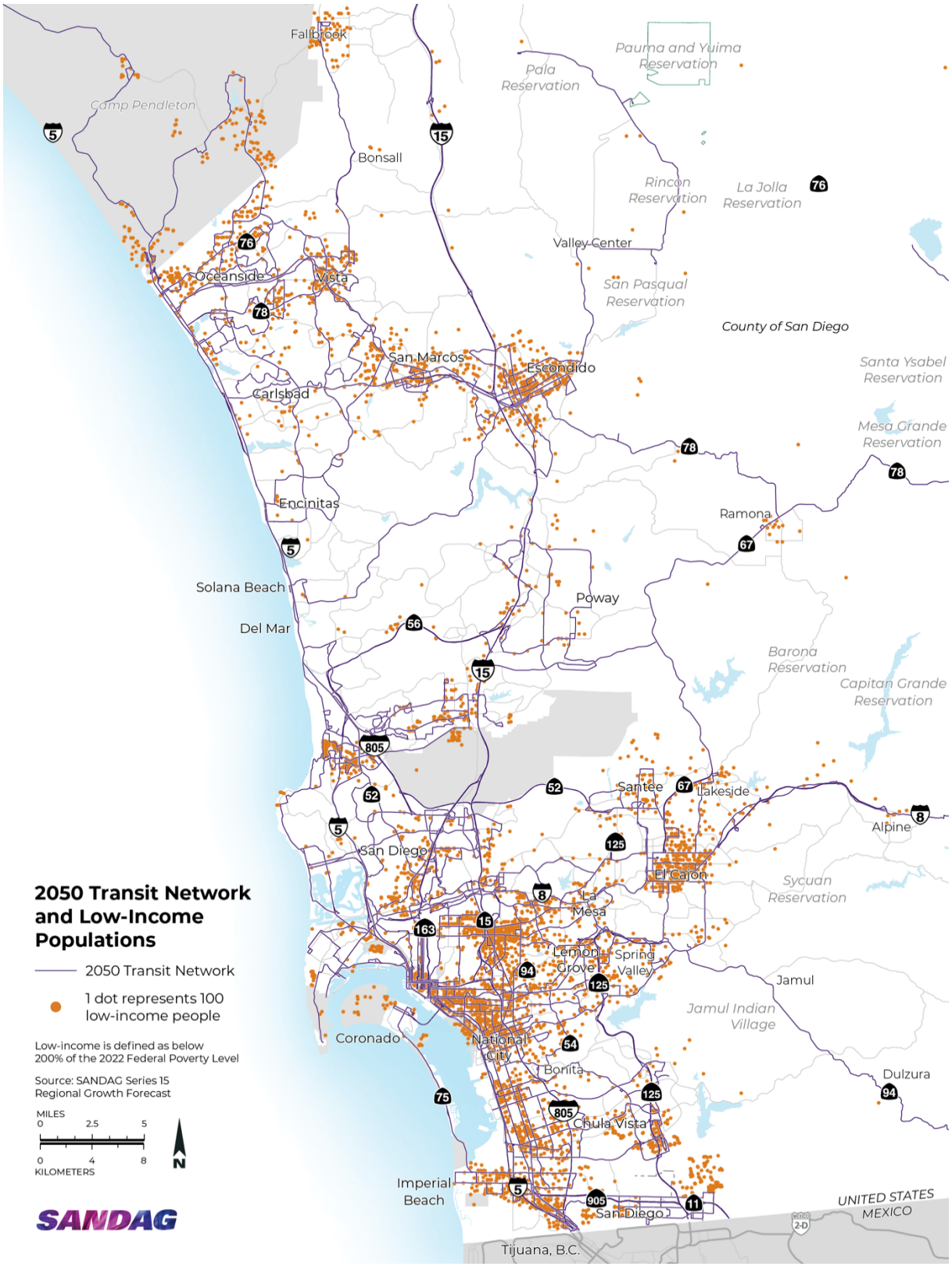
Average Particulate Matter ($PM_{2.5}$) Exposure per Person

This measure calculates the average particulate matter ($PM_{2.5}$) (type of toxic air particulates that are 2.5 micrometers or smaller in diameter) exposure from on-road transportation sources per person, per day. To measure this, the transportation network segments called "links" (e.g., SR 76 from Melrose to I-5) represent emission source locations. Roadway $PM_{2.5}$ emissions are calculated at the link-level by multiplying the link's vehicle miles traveled with a corresponding speed bin for truck and non-truck vehicle class along with emission factors of corresponding speed bin and vehicle class from CT-EMFAC 2017. A speed bin is a speed category by 5 mph increments, from 5 mph to 70 mph. Likewise, the San Diego region is divided into 100×100-foot grid cells that serve as emission receptor or exposure locations. Average person $PM_{2.5}$ exposure is calculated by taking the total link emissions for $PM_{2.5}$ and calculating the total exposure at varying distances within a buffer of 1,000 feet of the link, decaying the total $PM_{2.5}$ exposure as distance increases. The sum of total $PM_{2.5}$ link emissions exposure is calculated for each grid cell. Then the average zonal $PM_{2.5}$ exposure is calculated across grid cells for each zone (approximately 24,300 zones, each about the size of a census block). Finally, the average $PM_{2.5}$ exposure is calculated across zones weighted by total forecasted population or disadvantaged populations of the region from the Series 15 Regional Growth Forecast and SCS land use pattern. This measure does not account for the wind dispersion factors when calculating the potential $PM_{2.5}$ emissions exposure, and it mainly serves as a screening tool to compare the potential disparity impact between disadvantaged populations and non-disadvantaged populations.

Baseline Mapping

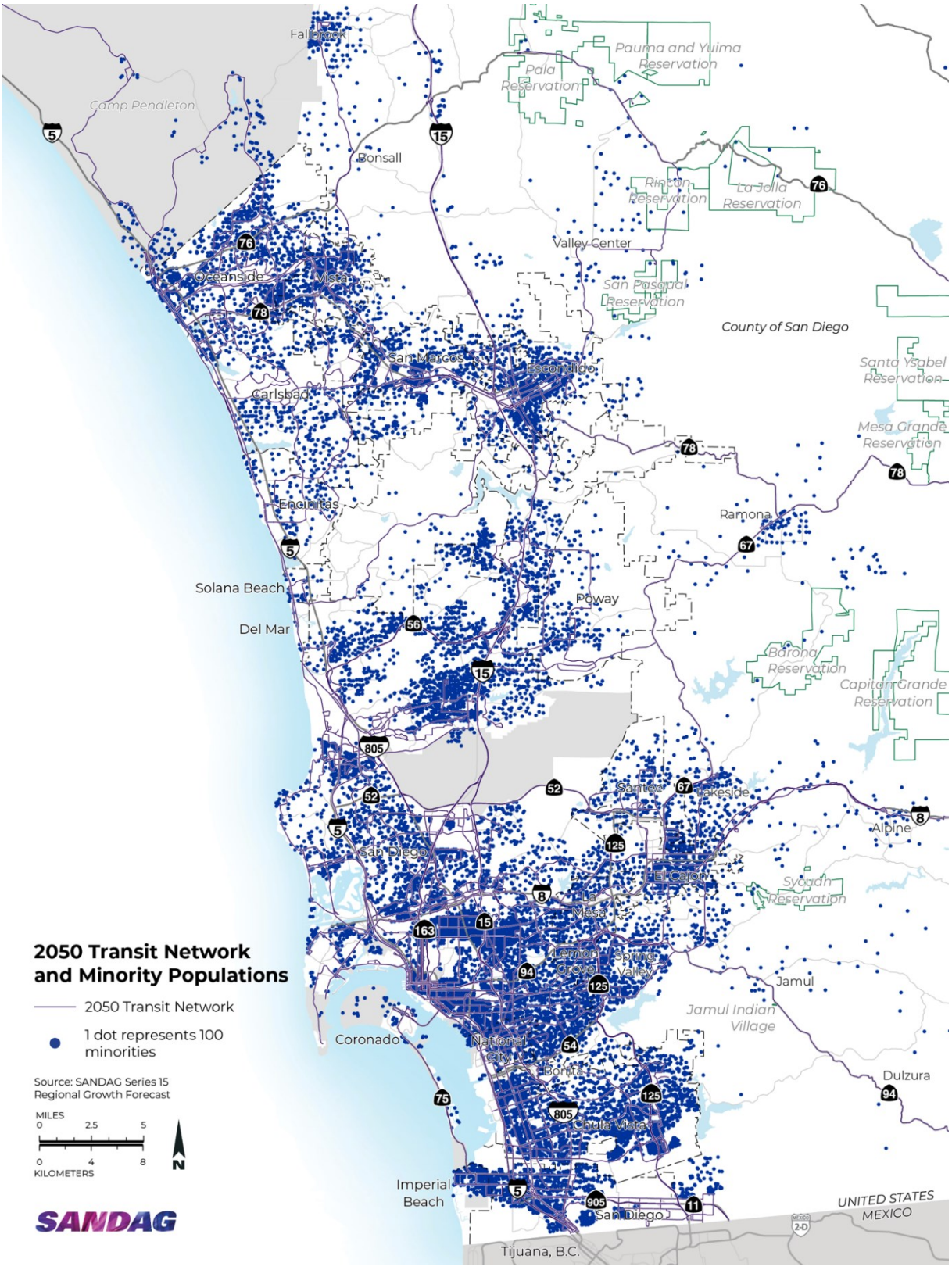
To create a point of reference for analyzing how the distribution of transportation investments detailed in the 2025 Regional Plan may affect disadvantaged populations being modeled, a set of baseline maps were created to aid stakeholder discussions. Each map shows the 2050 population with the 2050 Plan Transit Network, reflecting all planned improvements between 2022 and 2050, or the anticipated transit network in 2050. Figure E.10 shows the 2050 low income (less than 200% of the FPL) population. Figure E.11 shows the 2050 minority population. Figure E.12 shows the 2050 senior population, age 75 and older.

Figure E.10: 2050 Transit Network and Low-Income Populations



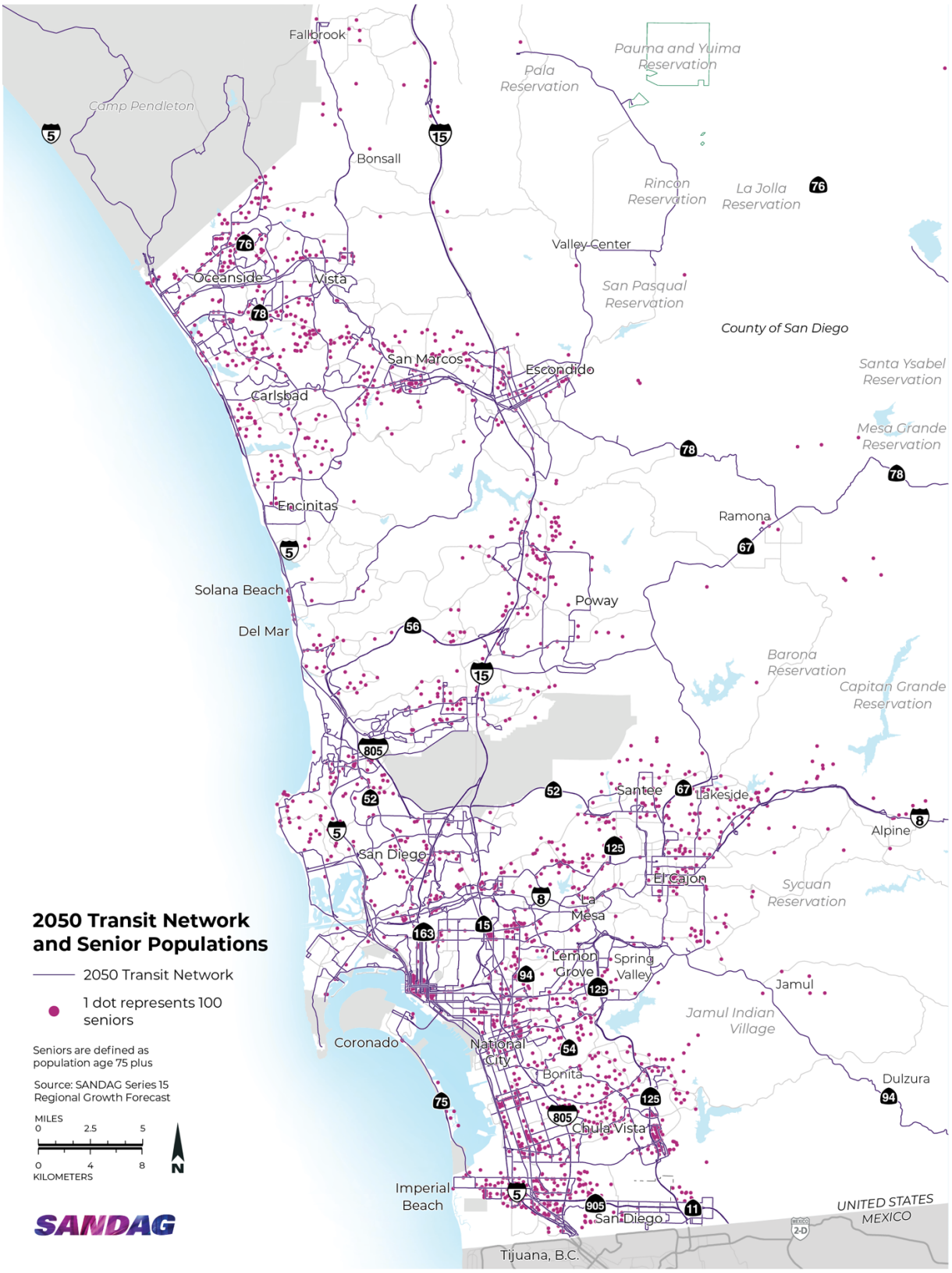
Source: SANDAG Series 15 Regional Growth Forecast

Figure E.11: 2050 Transit Network and Minority Populations



Source: SANDAG Series 15 Regional Growth Forecast

Figure E.12: 2050 Transit Network and Senior Populations



Source: SANDAG Series 15 Regional Growth Forecast

Results for Social Equity Performance Measures

An analysis of the 2025 Regional Plan network was conducted to determine whether the benefits and burdens of the projects would be equitably distributed between minority and non-minority populations and between low income and non-low-income populations. In addition, a similar analysis was done for seniors age 75 and older and non-seniors.

The social equity analysis determined that there are no statistically significant differences between the No-Build scenario and the 2025 Regional Plan network for any of the disadvantaged populations. The summary of the findings below is based on each of the social equity calculation tables shown for each performance measure. In most cases, there were some differences; however, no result approached the 20-percentage-point difference that SANDAG used as a threshold for determining potential disparate impact or disproportionate effect. Most social equity calculations were within 5 percentage points.

Table E.1: Summary Results for the Social Equity Performance Measures Calculations on All Metrics

Metrics	Low Income	Minority	Seniors
Access to Basic Needs: Retail, Parks, and Medical Facilities	✓	✓	✓
Access to Opportunities: Employment Centers and Higher Education	✓	✓	N/A
Access to High Schools	✓	✓	N/A
Coastal Access	✓	✓	✓

No disparate impacts were found for low-income, minority or senior populations for any of the social equity performance measures analyzed.

The results for the social equity performance indicators referenced above show that the 2025 Regional Plan improves conditions for disadvantaged populations significantly compared with the 2050 No-Build alternative.[14] SANDAG conducted analyses of low income, minority, and senior populations and modeled the impacts on these populations separately.

The following sections of the social equity analysis highlight disaggregated data of each performance measure to facilitate understanding the results. Included are summaries of the social equity calculation tables that correspond with their given performance measure. For some of these metrics, maps provide a graphic display of the performance of the 2050 Plan Network.

For each performance measure, the social equity calculation was conducted as follows:

- **Step 1:** For each disadvantaged and non-disadvantaged population, percentage differences between the 2025 Regional Plan (Build) and the No-Build scenario were calculated for each horizon year (2035 and 2050).

[14] Check marks in each column indicate that for each metric, there is no disparate impact between its disadvantaged population and non-population.

- **Step 2:** Figures for the disadvantaged populations were compared to their respective non-disadvantaged populations to determine the percentage point difference between the groups. When the social equity calculation returns a positive percentage point, such as 1%, it indicates that the disadvantaged population is projected to receive a larger benefit relative to the non-disadvantaged population over the phase years of the 2025 Regional Plan, with the *exception* of the change in percentage of income spent on out-of-pocket transportation costs and exposure to $PM_{2.5}$. Since these are burden measures, increase in value is an increased burden. For the other measures, when the social equity calculation is a negative percentage point, it indicates that the disadvantaged population is projected to receive less of a benefit than the non-disadvantaged population over the phase years of the 2025 Regional Plan. A social equity calculation of 0.0% would be parity; in other words, it would indicate that conditions for the two populations were improving at the same rate (Table E.2: Example Social Equity Calculation).
- **Step 3:** Differences of more than 20% in the Step 2 social equity calculation would be considered a potential disparate impact or disproportionate effect. If a potential disparate impact or disproportionate effect had been found, SANDAG would have considered alternatives and mitigation that would reduce the impact or effect.

Table E.2: Example Social Equity Calculation

Demographics	2050 No-Build (NB)	2050 Regional Plan Build
Low Income	50.0%	49.9%
Non-Low Income	49.5%	49.6%

Step 1: Percentage Difference
Low Income = 2050RP - 2050NB = 49.9%-50.0% = -.1 %
Non-Low Income = 2050RP - 2050NB = 49.6%-49.5% = .1%

Step 2: Percentage Point Difference between Pop/Non-Pop
(Low Income Percentage Difference - Non-Low Income Percentage Difference)
(-0.1%-0.1%) = -0.2%

Access to Basic Needs

The focus of the narrative analysis is on the transit mode access to key amenities, as drive alone was 99.8% or higher for all populations (all persons driving alone can reach these destinations at the 15- or 30-minute markers). Transit access to key amenities, has the most significant mode shift results for this metric. Results in Tables E.3, E.4, and E.5 show that the 2025 Regional Plan's Build scenario will mostly increase disadvantaged populations' access via transit across all three indicators with more substantial increases for microtransit/NEV and transit. For parks and retail, walking and biking were included.

Retail: Disadvantaged populations' access to retail within 15 minutes of travel in the base year 2022 substantially differs by mode (Table E.3: Percentage of Population Regionwide within 15 Minutes of Retail via Transit). For example, when considering low-income populations, access to retail by bike is 94.4% in the base year of 2022. By transit, baseline access is 81.7%. Transit access in the No-Build scenario decreases to 79.8% by the 2050 horizon year, while the Build scenario projects an increase of access to 82.2%. For minority populations, transit access in the baseline year of 2022 is slightly less than for low-income populations, with 75.4% having access. The No-Build scenario projects a decrease to 73.8% by 2035 and continual decrease to 73.6% in 2050. The Build scenario sees significant improvements in projected access for minority populations. In 2035, access via transit is 76.7%, then increases to 77.1% in the 2050 horizon year. In terms of disparity, minority populations start with slightly more benefit than non-minorities, with a percentage point difference of 0.7 in 2035, increasing to a greater benefit of 1.2 by 2050.

Table E.3: Percentage of Population Regionwide within 15 Minutes of Retail via Transit

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	81.7%	80.7%	79.8%	82.1%	82.2%
Non-Low Income	68.3%	68.1%	68.7%	71.2%	72.1%
Minority	75.4%	73.8%	73.6%	76.7%	77.1%
Non-Minority	65.1%	66.0%	66.9%	68.2%	69.2%
Senior	68.8%	69.2%	70.8%	71.2%	73.2%
Non-Senior	71.2%	70.9%	71.1%	73.6%	74.2%

Table E.3.1: Social Equity Calculation: Percentage of Population Regionwide within 15 Minutes of Retail via Transit

Demographics	2035	2050
Low Income vs. Non-Low Income	-1.7%	-1.0%
Minority vs. Non-Minority	0.7%	1.2%
Senior vs. Non-Senior	-0.7%	-0.7%

Parks: While disadvantaged populations access to parks via bike is more in line with that seen for driving alone in the base year of 2022, access by transit is lower across all populations (Table E.4). For instance, the percentage of low-income populations with transit access to parks in the 2022 base year is 73.7%. For the No-Build scenario, this slightly decreases to 73.2% in 2035 and to 72.0% in 2050. The Build scenario projects show improvement over the No-Build scenario, with 75.8% having access in 2035, and remains the same through 2050. Non-low-income populations have slightly more access relative to low-income populations through the phase years with a social equity calculation of −0.7 by 2050. However, it does not meet the 20-percentage-point threshold. There is a relative benefit between minority and non-minority populations, with percentage point differences of 0.4 in 2035 and 1.2 in 2050. Seniors access to parks by transit in the base year is 59.9%. In the No-Build scenario, that figure climbs to 61.0% by 2035 and 62.6% by 2050. In the Build scenario, access improves more substantively, with the percentage in 2035 of 63.4% already surpassing the 2050 No-Build improvement. By the horizon year of 2050, seniors access to parks by transit is 65.9%. In terms of disparity, seniors start with less benefit than non-seniors, with a percentage point difference of −0.9 and that difference slightly increases by 2050 to −1.0. All social equity calculations are almost at parity in terms of improvement in transit access; therefore, there is no disparate impact or disproportionate effect.

Table E.4: Percentage of Population Regionwide within 15 Minutes of Parks via Transit

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	73.7%	73.2%	72.0%	75.8%	75.8%
Non-Low Income	59.5%	59.8%	60.1%	63.5%	64.6%
Minority	67.9%	66.7%	66.0%	70.1%	70.6%
Non-Minority	55.0%	56.4%	57.0%	59.4%	60.4%
Senior	59.9%	61%	62.6%	63.4%	65.9%
Non-Senior	62.6%	62.8%	62.6%	66.1%	66.9%

Table E.4.1: Social Equity Calculation: Percentage of Population Regionwide within 15 Minutes of Parks via Transit

Demographics	2035	2050
Low Income vs. Non-Low Income	-1.1%	-0.7%
Minority vs. Non-Minority	0.4%	1.2%
Senior vs. Non-Senior	-0.9%	-1.0%

Medical Facilities: Transit access to healthcare is a very important indicator of social equity, especially for seniors who may lose the option of driving. Results are shown in Table E.5. For seniors, access to medical facilities via transit is 76.1% in 2022. The No-Build scenario projects an increase to 77.7% by 2050. The Build scenario projects improvements in access for seniors, starting with 80.6% in 2035 and increasing to 82.2% in 2050. In terms of disparity between senior and non-senior access, all years show a relative benefit to non-seniors by less than 1%. For low-income populations, 86.8% have transit access to healthcare facilities as a baseline. The projected access in the No-Build scenario drops to 84.8% by 2050. The Build scenario provides greater benefit than the No-Build: increasing to 87.8% by 2050. Non-low-income populations have more access relative to low-income populations through the phase years with a social equity calculation of −2.2. This does not meet the 20-percentage-point threshold, however. For minority populations, access via transit in the base year of 2022 is 82.3%. The No-Build scenario projects that access will drop to 80.3% by 2050. The Build scenario eliminates the projected decrease, with access increasing from 84.9% in 2035 to 85.2% in 2050. The social equity calculation for minority access within 30 minutes shows a relative benefit, with a percentage point difference of .5% by 2050.

Table E.5: Percentage of Population Regionwide within 30 Minutes of Medical Facilities via Transit

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	86.8%	85.7%	84.8%	87.8%	87.9%
Non-Low Income	76.1%	76.1%	76.1%	80.7%	81.4%
Minority	82.3%	80.9%	80.3%	84.9%	85.2%
Non-Minority	72.9%	74.0%	74.1%	77.9%	78.5%
Senior	76.1%	76.7%	77.7%	80.6%	82.2%
Non-Senior	78.5%	78.3%	78.0%	82.3%	82.7%

Table E.5.1: Social Equity Calculation: Percentage of Population Regionwide within 30 Minutes of Medical Facilities via Transit

Demographics	2035	2050
Low Income vs. Non-Low Income	-2.5%	-2.2%
Minority vs. Non-Minority	0.1%	0.5%
Senior vs. Non-Senior	-0.1%	-0.2%

Access to Any Employment Center

Overall access to any employment center (within a 30- or 45-minute travel time via transit) for disadvantaged populations is relatively high in the base year of 2022 and increases in the Build scenario more so than the No-Build scenario (Table E.6). For low-income populations, access slightly decreases in the No-Build scenario, lowering from 86.8% in the 2022 base year to 86.0% by 2035, where it continues to decrease through the 2050 horizon year. In the Build scenario, access increases from 86.8% in 2022 to 88.1% by 2035 and continues to increase to 88.5% by 2050. This results in a −1.3 percentage point difference between the relative improvement of access for the low-income population relative to the non-low-income population by 2050. Although a negative social equity calculation, it is not significant (an indicator of 20 percentage point difference is the threshold for determining significance and is explained in the framework section); therefore, there is no disparate impact or disproportionate effect.

For minority populations, access in the 2022 base year is 83.3%. Under the conditions of the No-Build scenario, access decreases to 82.3% in 2035, then decreases again to 82.1% by the horizon year of 2050. However, the access is higher in the Build scenario. In 2035, access improves to 85.9% and increases slightly to 86.3% in the horizon year of 2050. In terms of disparity, minority populations start with slightly less benefit than non-minorities, with a percentage point difference of -.2 for the 2035 build versus No Build scenarios, then continue to see greater benefit than non-minorities by 2050, with a difference of 0.4%.

Access to employment centers for the senior population, age 75 and older, was not analyzed as the majority of this group no longer works.

To understand how the social equity calculation was conducted, please refer to the example listed in Table E.2.

Table E.6: Regionwide Access to Any Tier Employment Center via Transit

Demographics	Travel Time	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	30 min	86.8%	86.0%	85.5%	88.1%	88.5%
	45 min	86.9%	86.1%	85.6%	88.2%	88.6%
Non-Low Income	30 min	77.6%	77.8%	78.3%	81.9%	82.6%
	45 min	77.8%	78.0%	78.5%	82.2%	82.9%
Minority	30 min	83.3%	82.3%	82.1%	85.9%	86.3%
	45 min	83.4%	82.4%	82.3%	86.0%	86.5%
Non-Minority	30 min	74.8%	75.7%	76.3%	79.5%	80.1%
	45 min	75.1%	76.0%	76.6%	79.8%	80.4%

Table E.6.1: Social Equity Calculation: Regionwide Access to Any Tier Employment Center via Transit

Demographics	Travel Time	2035	2050
Low Income vs. Non-Low Income	30 minutes	-2.0%	-1.3
	45 minutes	-2.1%	-1.4%
Minority vs. Non-Minority	30 minutes	-0.2%	0.4%
	45 minutes	-0.2%	0.4%

Transit Access Tier 1 and Tier 2 Employment Centers

Transit access to Tier 1 (Table E.7) and Tier 2 (Table E.8) Employment Centers improves over the phase years of the 2025 Regional Plan for low income and minority populations. In the Build scenario, low-income access to Tier 1 employment centers in the 2050 Plan Network increases from 39.8% in the base year to 48.1% by 2050. Relative access for low-income populations in the 2022 base year was higher than for non-low-income, with 39.8% of low-income populations having access versus 31.5% for non-low-income populations. The social equity calculation shows that the low-income population relative to non-low-income is at 0.8% in 2035 and 0.6 % in the 2050 horizon year. This indicates that access for low-income populations improves relative to the non-low-income population. For Tier 2, the same pattern holds. Because the low-income population had more access in the base year at 74.7%, the relative improvement favored the non-low-income population, whose access in the 2022 base year is 60.0%. However, the social equity calculation is only −3.1, which, although negative, still does not indicate any disparate impact or disproportionate effect. Minority access to Tier 2 employment centers within 30 minutes increases from 67.2% in the base year to 76.0% for the 2050 Plan Network. The social equity calculation shows that minority access benefits relative to minorities with a percentage point difference of 1.5 in the 2050 Build versus No-Build scenario.

Table E.7: Regionwide Access to Tier 1 Employment Centers via Transit

Demographics	Travel Time	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	30 min	39.8%	39.8%	40.2%	46.5%	48.1%
	45 min	53.6%	53.4%	53.5%	62.1%	64.5%
Non-Low Income	30 min	31.5%	32.5%	33.4%	38.4%	40.7%
	45 min	43.8%	44.4%	45.2%	55.1%	57.4%
Minority	30 min	36.4%	36.4%	36.9%	41.5%	43.8%
	45 min	50.4%	50.1%	50.5%	60.5%	62.7%
Non-Minority	30 min	29.2%	30.8%	31.8%	37.9%	39.5%
	45 min	40.2%	41.1%	41.8%	51.2%	53.2%

Table E.7.1: Social Equity Calculation: Regionwide Access to Tier 1 Employment Centers via Transit

Demographics	Travel Time	2035	2050
Low Income vs. Non-Low Income	30 minutes	0.8%	0.6%
	45 minutes	-2.0%	-1.2%
Minority vs. Non-Minority	30 minutes	-2.0%	-0.8%
	45 minutes	0.3%	0.8%

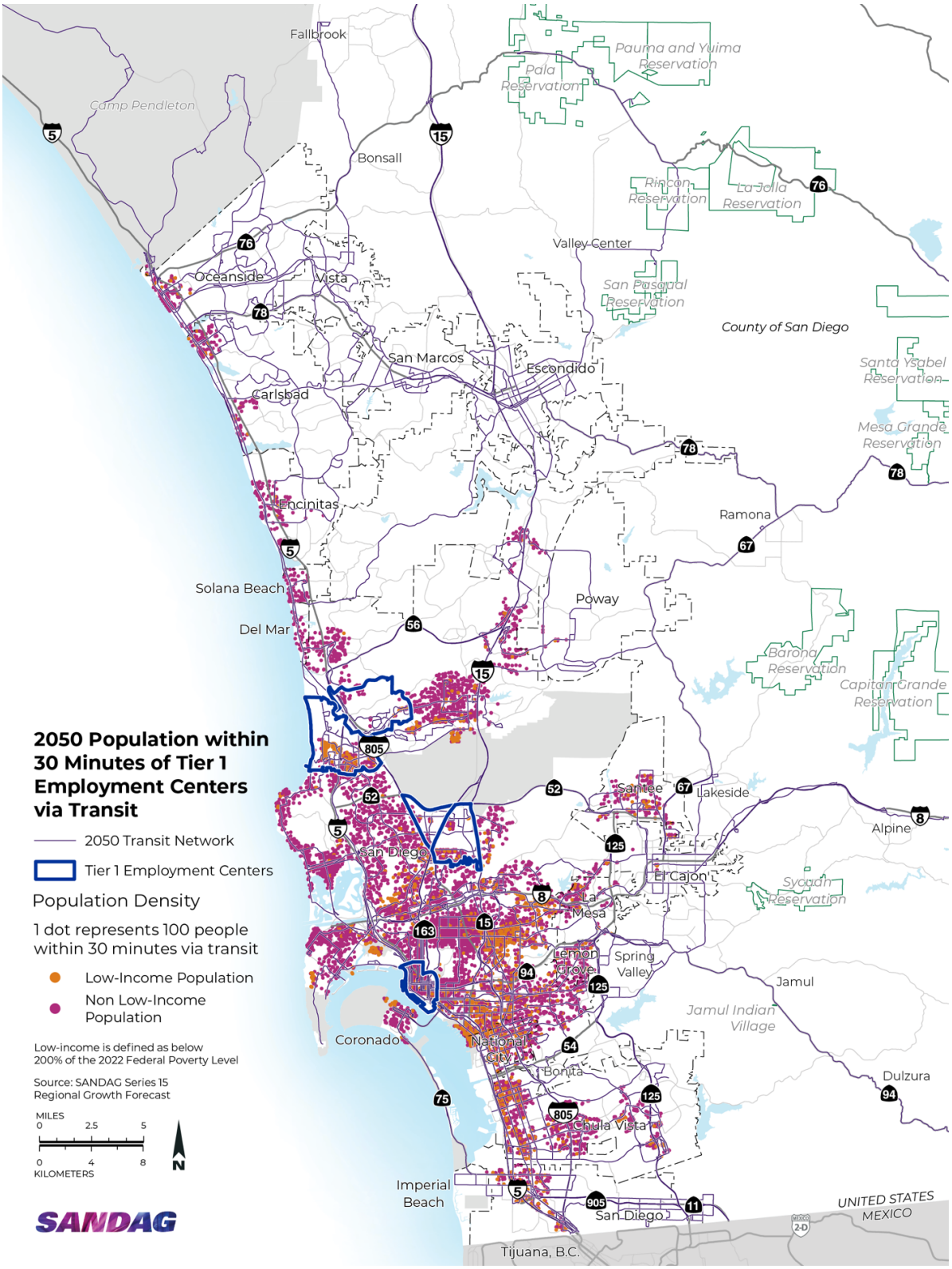
Table E.8: Regionwide Access to Tier 2 Employment Centers via Transit

Demographics	Travel Time	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	30 min	74.7%	74.2%	73.3%	80.0%	80.5%
	45 min	80.7%	80.5%	79.8%	85.5%	86.9%
Non-Low Income	30 min	60.0%	60.8%	61.0%	69.7%	71.1%
	45 min	70.4%	71.1%	71.4%	78.8%	80.2%
Minority	30 min	67.2%	66.6%	65.9%	75.0%	76.0%
	45 min	76.6%	76.0%	75.8%	83.1%	84.2%
Non-Minority	30 min	57.8%	59.4%	59.9%	67.2%	68.5%
	45 min	67.4%	68.9%	69.3%	76.2%	77.6%

Table E.8.1: Social Equity Calculation: Regionwide Access to Tier 2 Employment Centers via Transit

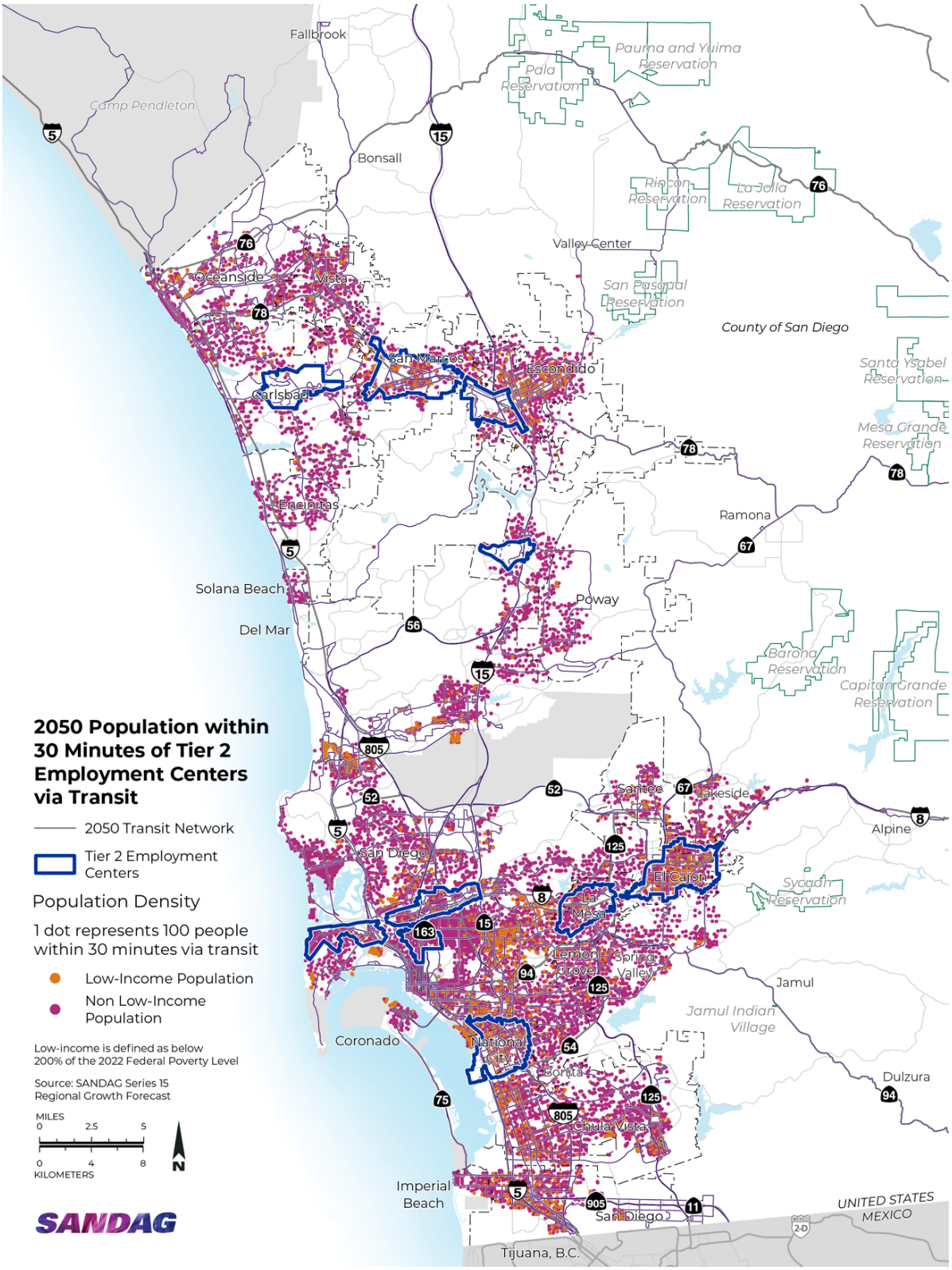
Demographics	Travel Time	2035	2050
Low Income vs. Non-Low Income	30 minutes	-3.1%	-2.9%
	45 minutes	-2.8%	-1.7%
Minority vs. Non-Minority	30 minutes	0.6%	1.5%
	45 minutes	-0.2%	0.1%

Figure E.13: 2050 Population within 30 Minutes of Tier 1 Employment Centers via Transit



Source: SANDAG Series 15 Regional Growth Forecast

Figure E.14: 2050 Population within 30 Minutes of Tier 2 Employment Centers via Transit



Source: SANDAG Series 15 Regional Growth Forecast

Access to Higher Education

Overall, access to higher education for disadvantaged populations in the 2050 Plan Network begins relatively high, within 30 and 45 minutes of travel time, and improves (Table E.9). For access via transit within 30 minutes of travel time, the figures are lower. In the 2022 base year, 78.6% of low-income populations already had access to higher education via transit. For the No-Build scenario, their access decreases by less than 1%. In the 2050 Plan Network, low-income transit access is projected to be 81.9% in 2035 and to increase to 82.6% by 2050 (Figure E.16). This results in a –2.7 percentage point difference between low income and non-low-income populations' access to higher education by 2050 under the conditions of the 2050 Plan Network.

For minority populations, the percentage with transit access within 30 minutes of higher education increases from 73.9% in the base year of 2022 to 80.0% for the 2050 Plan Network. The No-Build scenario projects that access will decrease slightly to 73.9% by the horizon year 2050. The social equity calculation indicates that access for minority populations improves slightly less relative to the non-minority population, but is almost at parity, with a percentage point difference of −0.9 It should be noted that, as with most other transit access measures, low income and minority populations start with significantly higher access in the 2022 base year than their respective non-disadvantaged populations and continue to achieve significantly higher access rates through the phase years.

The impact of access to higher education for the senior population, age 75 and older, was not analyzed as the majority of this group does not need access to higher education.

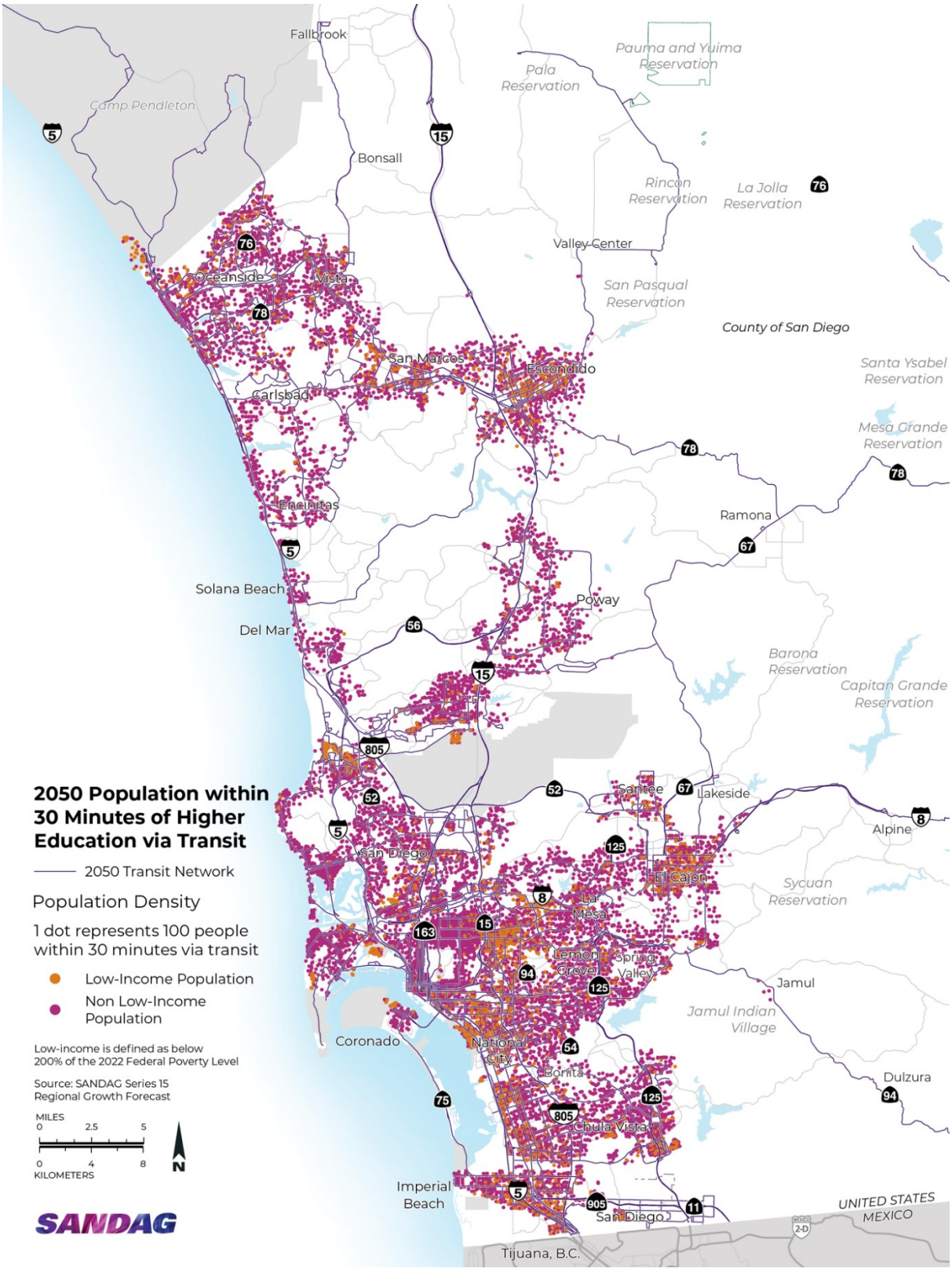
Table E.9: Regionwide Access to Higher Education via Transit

Demographics	Travel Time	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	30 min	78.6%	78.5%	78.1%	81.9%	82.6%
	45 min	83.4%	83.0%	82.4%	85.6%	86.2%
Non-Low Income	30 min	65.7%	67.0%	67.5%	73.7%	74.7%
	45 min	73.3%	73.9%	74.3%	79.3%	80.1%
Minority	30 min	73.9%	74.0%	73.9%	79.4%	80.0%
	45 min	80.2%	79.6%	79.3%	83.9%	84.5%
Non-Minority	30 min	61.6%	63.2%	63.7%	69.8%	70.7%
	45 min	69.5%	70.7%	71.1%	76.0%	76.7%

Table E.9.1: Social Equity Calculation: Regionwide Access to Higher Education (30 and 45 Minutes) via Transit

Demographics	Travel Time	2035	2050
Low Income vs. Non-Low Income	30 minutes	-3.3%	-2.7%
	45 minutes	-2.8%	-2.0%
Minority vs. Non-Minority	30 minutes	-1.2%	-0.9%
	45 minutes	-1.0%	-0.4%

Figure E.15: 2050 Population within 30 Minutes of Higher Education via Transit



Source: SANDAG Series 15 Regional Growth Forecast

Access to High Schools

Access to high schools is an important indicator of social equity as it directly impacts educational attainment in the region. High school students are also more likely to ride and depend on transit in comparison to younger students. Results are shown in Table E.10. The senior population is not included in this measure as most seniors are not attending or visiting high schools. Low income and minority populations begin with a higher level of access to high schools via transit compared to their non-populations. For instance, transit access to high schools for low-income populations is 86.1% in the 2022 base year. Through the No Build 2035 phase year, access decreases to 85.3% and continues to decrease to 84.6% in the 2050 horizon year. The Build scenario projects an increase to 87.4% through the 2035 phase year and slightly increases to 87.6% by 2050. For minority populations, transit access is 81.8% in the 2022 base year and decreases to 80.5% by the 2050 horizon in the No Build scenario. With the Build scenario, transit access for minority populations is projected to increase to 84.6% by the 2050 horizon year. The percentage point difference in the 2050 horizon year for low-income populations is -1.7. For minority populations, the percentage point difference in the 2050 horizon year is 0.2. Both percentage point differences are close to parity and do not indicate a disproportionate impact.

Table E.10: Percentage of Population Regionwide within 30 Minutes of High Schools via Transit

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	86.1%	85.3%	84.6%	87.4%	87.6%
Non-Low Income	75.3%	75.5%	75.8%	79.8%	80.5%
Minority	81.8%	80.7%	80.3%	84.2%	84.6%
Non-Minority	71.9%	72.8%	73.4%	76.8%	77.5%

Table E.10.1: Social Equity Calculation: Percentage of Population Regionwide within 30 Minutes of High Schools via Transit

Demographics	2035	2050
Low Income vs. Non-Low Income	-2.2%	-1.7%
Minorities vs. Non-Minorities	-0.5%	0.2%

Coastal Access: Coastal access is a key benefit for people living in San Diego, especially for those who live in areas prone to extreme heat in the region. For low-income populations, coastal access via a 30-minute transit trip is 20.8% in the 2022 base year. The No-Build scenario projects a slight increase to 22.4% in 2035 into a slight decrease to 22.2% in the 2050 horizon year. Comparatively, coastal access for low-income populations in the Build scenario shows an increase to 26.8% by 2050. The percentage of minority populations with transit access to the coast is 18.8% in the 2022 base year. For the No Build scenario, this slightly increases to 20.4% in 2035 and remains marginally the same at 20.3% in 2050. The Build scenario projects improvement over the No Build scenario, with 24.5% having access in 2035 and 25.1% having access in 2050. Non-low-income populations have slightly more access relative to low-income populations through the phase years, with a social equity calculation of −0.5 by 2050. However, it is almost at parity in terms of improvement in transit access, indicating no disparate impact. Seniors' coastal access via transit slightly increases from 22.5% in the 2022 base year to 24.0% in 2035 and remains the same through 2050 in the No Build scenario. The Build scenario projects an increase in coastal access for seniors to 29.2% in 2035 and 29.7% in 2050, both of which surpass the 2050 results of the No Build scenario. Results are shown in Table E.11.

Table E.11: Percentage of Population Regionwide within 30 Minutes of the Coast via Transit

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	20.8%	22.4%	22.2%	26.2%	26.8%
Non-Low Income	21.6%	22.8%	22.7%	27.5%	27.8%
Minority	18.8%	20.4%	20.3%	24.5%	25.1%
Non-Minority	25.0%	26.2%	26.4%	31.4%	31.7%
Senior	22.5%	24.0%	24.0%	29.2%	29.7%
Non-Senior	21.4%	22.5%	22.4%	27.0%	27.3%

Table E.11.1: Social Equity Calculation: Percentage of Population Regionwide within 30 Minutes of the Coast via Transit

Demographics	2035	2050
Low Income vs. Non-Low Income	-0.9%	-0.5%
Minority vs. Non-Minority	-1.1%	-0.5%
Senior vs. Non-Senior	0.7%	0.8%

Access to Rail and Rapid Transit

Access to high quality transit corridors (light rail or Next Gen *Rapid*) improves significantly for all disadvantaged populations in the 2025 Regional Plan (Build scenario). For low-income populations, access to rail or Rapid transit stops improves from 17% in the 2022 base year to 43.3% by 2050. For comparison, the projection for 2050 is 20.1% in the No-Build scenario. For all social equity populations, access to high quality transit corridors more than doubled from 2022 to 2050 (Table E.12). Low-income populations' benefit is greater than that of non-low-income populations, with a percentage point difference of 4.2 in 2035 and 3.7 in 2050. With implementation of the plan, there is also a significant improvement in access to high quality transit corridors for minority populations. In the base year of 2022, minority populations' access to high quality transit corridors is 12.7%, which increases to 35.5% by 2035 and 36.5% in the horizon year of 2050. For comparison, projected access is only 15.3% in the No-Build scenario by 2050. Compared to non-minority populations, minority populations show a difference of 1.5 percentage points in 2035 and 1.6 percentage points in 2050. This indicates that minority populations will benefit more, relative to the non-minority population in the Build scenario (Figure E.16). For seniors, access to high quality transit corridors also improves significantly, going from 8.9% in the base year to 33.3% by the 2050 horizon year. For comparison, projected access in 2050 is 12.7% in the No-Build scenario. There are slight differences between seniors and non-seniors over the life of the 2025 Regional Plan. Initially, the relative benefit for non-seniors is −0.5, but by 2050, the percentage point difference shows a slight -.1% benefit for non-seniors.

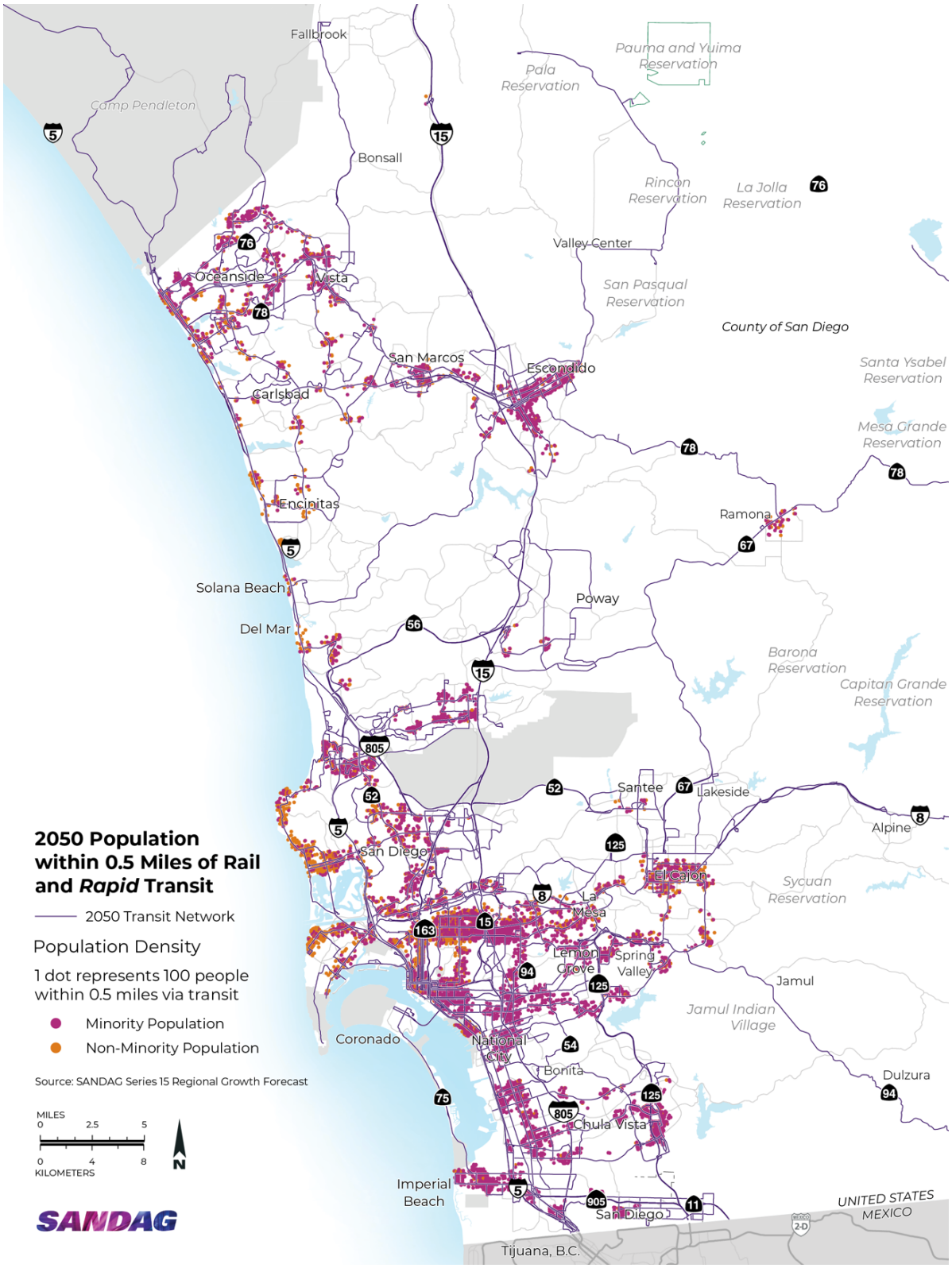
Table E.12: Regionwide Access to Rail or Next Gen Rapid Transit Stops: Percentage of Population within 0.5 Miles of either a Rail or Next Gen Rapid Transit Stop via Transit

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	17.0%	19.0%	19.6%	42.7%	43.3%
Non-Low Income	10.0%	12.2%	13.0%	31.7%	33.0%
Minority	12.7%	14.7%	15.3%	35.5%	36.5%
Non-Minority	9.7%	12.0%	12.9%	31.3%	32.5%
Senior	8.9%	11.4%	12.7%	31.2%	33.3%
Non-Senior	11.6%	13.9%	14.6%	34.1%	35.3%

Table E.12.1: Social Equity Calculation: Access to Rail or Next Gen Rapid Transit Stops via Transit

Demographics	2035	2050
Low Income vs. Non-Low Income	4.2%	3.7%
Minorities vs. Non-Minorities	1.5%	1.6%
Senior vs. Non-Senior	-0.5%	-0.1%

Figure E.16: 2050 Population within 0.5 Miles of Rail or Next Gen Rapid Transit Stops



Source: SANDAG Series 15 Regional Growth Forecast

Access to Bike Facilities

As the Regional Bike Network for the 2025 Regional Plan is implemented, disadvantaged populations will have greater access to bike facilities (Table E.13). The percentage of people within a quarter mile of a bike facility for all disadvantaged populations improves compared to the No-Build scenario projections and is comparable or better than the respective non-disadvantaged populations. For example, 77.8% of low-income populations will have access to a bike facility within a quarter of a mile in 2035, a figure that increases to 87.2% by 2050. The No-Build scenario access is 75.0% in 2035 and decreases to 74.7% in 2050. The low-income population is expected to gain greater access relative to the non-low-income population by 2050; therefore, the difference is positive (greater benefit to low-income populations) in this performance measure. The same pattern exists for minority populations. For the Build scenario, 78.6% of minorities will have access to a bike facility in 2035, a figure that increases to 88.0% in 2050, with minority populations deriving greater benefit than non-minorities in both 2035 and 2050.

Table E.13: Regionwide Access to Bike Facilities (Class I and II, Cycletrack, or Bike Boulevard)

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	70.4%	75.0%	74.7%	77.8%	87.2%
Non-Low Income	71.6%	74.4%	74.3%	76.4%	86.4%
Minority	72.3%	75.8%	75.4%	78.6%	88.0%
Non-Minority	70.1%	72.6%	72.6%	73.8%	84.2%
Senior	70.2%	73.6%	73.8%	75.5%	86.8%
Non-Senior	71.4%	74.6%	74.5%	76.8%	86.5%

Table E.13.1: Social Equity Calculation: Regionwide Access to Bike Facilities (Class I and II, Cycletrack, or Bike Boulevard)

Demographics	2035	2050
Low Income vs. Non-Low Income	0.8%	0.4%
Minorities vs. Non-Minorities	1.6%	0.9%
Senior vs. Non-Senior	-0.2%	0.9%

Change in Percentage of Income Consumed by Out-of-Pocket Transportation Costs

The change in percentage of income spent on out-of-pocket transportation costs stays relatively constant for all populations throughout the term of the 2025 Regional Plan (Table E.14). There is no significant gap in the percentage point differences for any of the disadvantaged groups over all phases of the 2025 Regional Plan. For minority populations, the change in percentage of income consumed by out-of-pocket transportation costs decreases by 1.4% in the 2035 No Build scenario and 1.6% in the 2050 No Build scenario. The minority population relative to the non-minority populations have a relative benefit of .2% beginning in the 2035 Build scenario which increases through the 2050 Build scenario. For low-income populations, the change in percentage of income consumed by out-of-pocket transportation costs increases to .4% in the 2050 Build scenario. Relative to the non-low-income population, low-income populations have a 1.5% relative benefit in the 2035 Build scenario, which increases slightly to a 1.6% relative benefit in the 2050 Build scenario. Senior populations experience an increase in percentage of income consumed by out-of-pocket transportation costs by .2% in the 2035 Build scenario and .7% in the 2050 Build scenario. Non-senior populations have a relative benefit of .1% in both the 2035 and 2050 Build scenarios. The change in percentage of income consumed by out-of-pocket transportation costs increases slightly for nearly all populations by the 2050 Build horizon year. Based on the percentage point differences between the disadvantaged and their non-populations, there is no disparate impact or disproportionate effect.

Table E.14: Change in Percentage of Income Consumed by Out-of-Pocket Transportation Costs

Demographics	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	-2.6%	-2.5%	-0.2%	0.4%
Non-Low Income	-0.9%	-1.0%	-0.1%	0.4%
Minority	-1.4%	-1.6%	-0.4%	-0.1%
Non-Minority	-1.0%	-0.9%	-0.2%	0.3%
Senior	-0.7%	-0.7 %	0.2%	0.7%
Non-Senior	-1.2%	-1.2%	-0.2%	0.2%

Table E.14.1: Social Equity Calculation: Change in Percentage of Income Consumed by Out-of-Pocket Transportation Costs

Demographics	2035	2050
Low Income vs. Non-Low Income	1.5%	1.6%
Minorities vs. Non-Minorities	0.2%	0.4%
Senior vs. Non-Senior	-0.1%	-0.1%

Exposure to Particulate Matter$_{2.5}$

A review of the $PM_{2.5}$ emission data for all populations in Table E.15shows a slight increase in daily pollution exposure in the 2025 Regional Plan, but less than the No-Build scenario. Comparing the disadvantaged populations to their respective non-disadvantaged populations, the social equity calculation in Table E.15.1: Social Equity Calculation: Average Particulate Matter per day shows that the non-low income and non-minority populations fare slightly better by the 2050 Build scenario. Non-seniors begin with a relative benefit in the 2035 Build scenario and evens out to 0.0% by 2050. $PM_{2.5}$ exposure for low-income populations in the Build scenario is 5.02 grams per person per day in 2035, a slight increase from 4.91 grams in the 2022 base year. In 2050, the average daily exposure increases slightly to 5.16 for low-income populations in the Build scenario. While exposure increases in the Build scenario, it is less than the projected figure of 5.34 grams in 2050 in the No-Build scenario. The percentage point difference for the Build scenario for low income relative to non-low income slightly benefits the non-low-income population, with −0.3 in 2035 and −0.2 in 2050. In terms of disparity, the low-income population will benefit less relative to the non-low-income population. For minority populations, daily exposure to $PM_{2.5}$ increases from 4.73 grams in the 2022 base year to 4.94 grams per day in the 2050 Build scenario, while exposure would increase to 5.11 grams per day in the No-Build scenario by 2050. By 2035, minority populations are nearly at parity with non-minorities with a social equity calculation of -0.1 and will experience slightly more exposure than non-minorities throughout 2050. For seniors, exposure follows the same pattern as the low-income population, with slight increases in exposure from 2035 through 2050, however both less than the No Build scenarios. Seniors and non-seniors reach parity by the 2050 Build horizon year. The social equity analysis for $PM_{2.5}$ did not show any disparate impacts or disproportionate effects for disadvantaged populations in the region.

Table E.15: Average Exposure to Particulate Matter 2.5 per day

Demographics	Base Year 2022	No-Build 2035	No-Build 2050	Build 2035	Build 2050
Low Income	4.91	5.13	5.34	5.02	5.16
Non-Low Income	4.39	4.68	4.89	4.59	4.74
Minority	4.73	4.92	5.11	4.81	4.94
Non-Minority	4.17	4.55	4.77	4.46	4.61
Senior	4.30	4.58	4.79	4.48	4.63
Non-Senior	4.51	4.79	5.01	4.69	4.84

Table E.15.1: Social Equity Calculation: Average Particulate Matter per day

Demographics	2035	2050
Low Income vs. Non-Low Income	-0.3%	-0.2%
Minorities vs. Non-Minorities	-0.1%	-0.2%
Senior vs. Non-Senior	-0.1%	0.0%

AB 805 Strategies to Reduce Pollution Exposure in Disadvantaged Communities

In accordance with California AB 805, SANDAG has identified the location of disadvantaged communities as designated pursuant to Section 39711 of the Health and Safety Code (Figure A1.1 of Appendix A, Attachment 1: California Assembly Bill 805 Strategies to Reduce Pollution Exposure in Disadvantaged Communities). SANDAG utilized the CalEnviroScreen 4.0 index to identify the projects, strategies, and programs included in the Regional Plan that reduce pollution exposure to those affected communities.

A detailed list of the transportation strategies, including projects, policies, and programs that reduce pollution exposure in these communities in the 2025 Regional Plan can be found in Appendix A, Attachment 1.

Data Sources

The information in this appendix relies upon a variety of sources, including the following:

1. U.S. Census Bureau ACS, 2018-2022, 5-year estimates
2. California Department of Finance Population Projections, series published January 2020
3. SANDAG 2022 Population and Housing Estimates
4. SANDAG 2050 Regional Growth Forecast – Series 15, SCS land use pattern
5. Third-Generation SANDAG Activity-Based Model (ABM3+)
6. OEHHA CalEnviroScreen 4.0

Since 1972, SANDAG has produced long-range forecasts of population, housing, and employment that are used as a resource by elected officials, planners, academics, and the general public. Among other applications, the Series 15 Regional Growth Forecast and its SCS land use pattern are used as the basis for the 2025 Regional Plan. In addition to population, jobs, and housing, the forecast also provides detailed information on race, ethnicity, and various socioeconomic indicators such as income. Part of the inputs to the ABM is a synthetic population, a representative population that looks like the real San Diego. A synthetic population is a table that has a record for every individual and household, with the individual's and the household's characteristics. The synthetic population characteristics are controlled to closely reproduce the Regional Growth Forecast scenario. The data, together with information from the ABM, forms the foundation for social equity analysis and provides the data used to identify and analyze disadvantaged populations. For more information on the Series 15 Regional Growth Forecast and the SCS land use pattern, see **Appendix F: Regional Growth Forecast and SCS Land Use Pattern.**

Wherever possible, SANDAG uses the smallest level of geographic detail available for analysis and mapping. As discussed above, with the ABM, social equity analysis can now be done at a disaggregate level: the individual and household. With ABM's powerful analytic capability, it is possible to determine at the household level not only which of the region's households qualify as "disadvantaged," but also how the members of that household travel to and from different activities during a typical day. For example, the ABM can tell us the number of households in the San Diego region that it projects are low income in addition to providing information on each household's location, socioeconomic detail, and travel behavior. For more information on the ABM, see **Appendix M: Travel Demand Modeling Tools**.

Attachments

- Attachment E1: Community-Based Organization Outreach Summaries (expected to be released in fall 2025.).