APPENDIX P2

Environmental Justice & Title VI Analysis:
Methodology

P2 METHODOLOGY

The purpose of Appendix P: Environmental Justice, Title VI, and Social Equity Report is to estimate the distribution of benefits and burdens of proposed land use and transportation policies and projects on disadvantaged communities, and to assess whether these benefits and burdens are shared equitably across population groups. To achieve these objectives, SJCOG conducted six types of analyses, summarized here:

- Quantitative analysis of potential benefits and burdens of proposed land use and transportation policies and projects on disadvantaged communities compared to the balance of the region based on three performance measures, using outputs from the SJCOG Envision Tomorrow land use model;

- Quantitative analysis of the relative benefit received from roadway expenditures by disadvantaged communities using the SJCOG Travel Demand Model;

- Spatial analysis of transit access to low-income jobs by disadvantaged communities;

- Quantitative analysis to estimate health outcomes resulting from proposed changes to the built environment in disadvantaged communities compared to the balance of the region, applying the National Public Health Assessment Model (NPHAM);

- Quantitative analysis of the share of potential benefits of proposed transportation investments that accrue to low-income and minority populations compared to non-low-income and non-minority populations, using available census data;

- Disparate impact analysis to demonstrate compliance with Title VI and Environmental

Justice laws. The results and findings from these analyses are summarized in Appendices P5 and P6.

The following section summarizes the various definitions and methodologies used by SJCOG to identify disadvantaged communities, to assess potential benefits and burdens, and to conduct quantitative and qualitative analyses.

Regulatory Background

Executive Order 12898 commonly referred to as "Environmental Justice" is a follow-up order to Title VI which was part of the 1964 Civil Rights Act. Title VI states that there should be no discrimination based on race, color, national origin, age, sex, disability or religion. Environmental justice included low income and minority populations to avoid disproportionally high and adverse effects of the planning and outreach efforts by Federal agencies and agencies receiving federal monies. It is for this reason that SJCOG staff used low income and high minority as the major criteria to identify Environmental Justice (EJ) communities. SJCOG prepared an environmental justice analysis as part of the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). This analysis first identifies EJ communities in San Joaquin County and then measures the transportation-related benefits and burdens these areas experience in comparison to the county average based on the transportation projects identified in the RTP/SCS.

The underlying methodology for conducting an equity analysis for the 2022 Plan relies on a comparison of benefits and burdens of proposed policies and investments on different population groups (minority vs. non-minority and low-income vs. non-low-income populations), and across different geographies (EJ communities vs. the balance of the

region). The section below defines these populations and geographies.

Demographics and Geographies of the Region

Minority Populations

San Joaquin County is a "majority minority" region, where non-Hispanic Whites do not make up an absolute majority (e.g. they make up less than 50 percent of the total population). In fact, this report uses the term "minority" primarily for maintaining consistency with the federal definition of disadvantaged populations.

Minority populations include persons who identify as any of the following groups as defined by the Census Bureau: American Indian or Native Alaskan Alone (non-Hispanic/non-Latino); Asian Alone (non-Hispanic/non-Latino); Black of African American Alone (non-Hispanic/non-Latino); Hispanic or Latino of Any Race; Native Hawaiian or Pacific Islander Alone (non-Hispanic/non-Latino); and Other (Some Other Race, Two or More Races). All residents who identify as Hispanic or Latino, even if they also identify with another race, are considered Hispanic or Latino. The "non-minority" population therefore consists of persons who identify as non-Hispanic Whites or "White Alone.

Table P2-1. Racial and Ethnic Composition of San Joaquin Region

	Estimate	% of Total Pop.
American Indian or Native Alaskan Alone	1,697	0.2%
Asian Alone	112,885	15.2%
Black or African American Alone	50,030	6.7%
Hispanic or Latino of Any Race	307,463	41.4%
Native Hawaiian or Other Pacific Islander Alone	4,055	0.6%
Other	956	0.1%
White Alone, Non-Hispanic/Latino	236,509	31.9%
Two or More Races (Not Hispanic or Latino)	29,008	3.9%
San Joaquin County Total Population	742,603	100.0%

Source: U.S. Census Bureau, American Communities Survey 2015-2019 Five Year Estimates

Figure P2-1 Population by Race (San Joaquin County)

Source: U.S. Census Bureau, American Communities Survey 2015-2019 5 Year Estimates
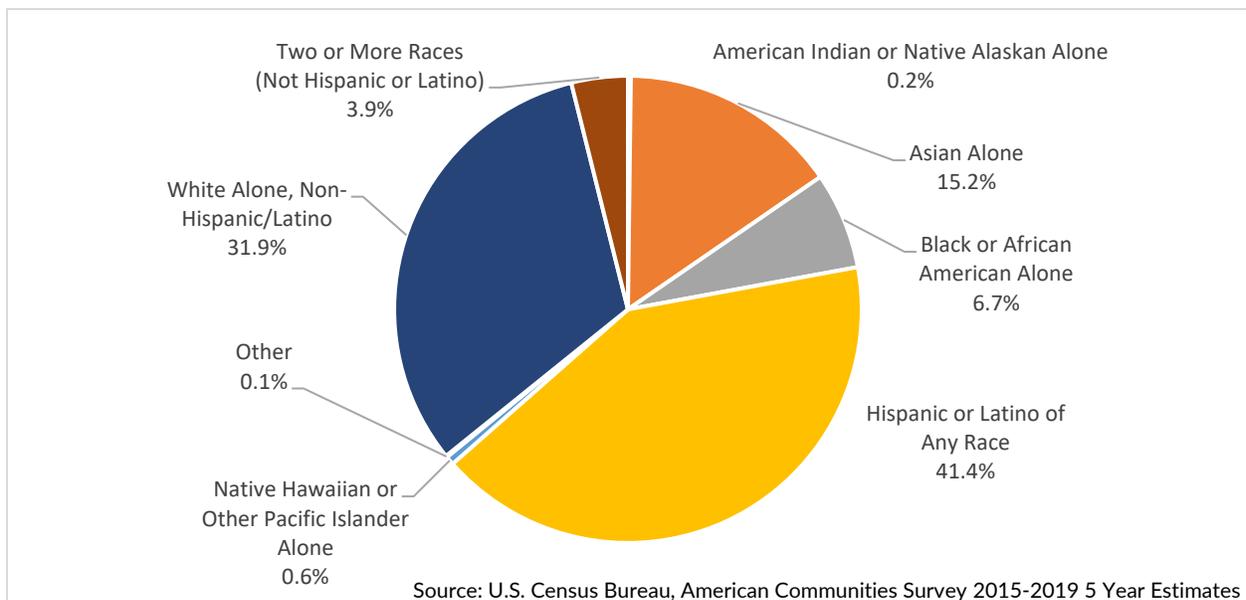
Low Income Persons

For the purposes of the environmental justice analysis, SJCOG defines persons as low-income if they are living at or below 150 percent of the federal poverty level as defined by the Census Bureau. The Census Bureau computes poverty status for individuals based on a combination of an individual's household composition, size and income. The official poverty guidelines are issued annually by the Department of Health and Human Services. In 2021, the federal guidelines defined the poverty level for individuals living alone at $12,880 and for a family of four at $26,500.[1] However, the guidelines do not vary geographically (except for Alaska and Hawaii) and thus do not account for the higher cost of living that exists in California. For this reason, SJCOG has used the 150 percent standard rather than the 100 percent standard for defining persons as low-income.

Table P2-2. Poverty Status in San Joaquin County

	Estimate	% of Total Population
Below 150% of Poverty Level	138,581	18.7%
Above 150% of Poverty Level	604,022	81.3%
San Joaquin Total Population	742,603	100.0%

Source: U.S. Census Bureau, American Communities Survey 2015-2019 Five Year Estimates

Environmental Justice Areas

CalEnviroScreen (CES) is an online tool that agencies use to identify SB 535 disadvantaged communities. According to the CES, disadvantages communities are census tracts that rank in the top 25th percentile in the state for pollution burden along with several other factors that reveal social and economic vulnerabilities. If the 25th percentile standard is used, the CES would identify 71 census tracts (out of 139) as SB 535 disadvantaged communities and would account for 51.5 percent of the total regional population. SJCOG staff during the preparation of the 2018 RTP/SCS determined this methodology did not focus enough on those areas that are most disadvantaged and have the greatest needs. Accordingly, SJCOG staff used an alternative methodology for 2018 RTP/SCS that identified areas as EJ that include approximately 30 to 35 percent of the total regional population. For the 2022 RTP/SCS, SJCOG staff used this same standard.

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[1] U.S. Department of Health and Human Services, 2021 Poverty Guidelines. See:
https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references/2021-poverty-guidelines

Table P2-3. Population, SB 535 Disadvantaged Communities

	San Joaquin County Total	SB 535 Disadvantaged Communities	Percent of Total
Census Tracts	139	71	51.2%
Population	742,603	382,440	51.5%

Source: U.S. Census Bureau, American Communities Survey 2015-2019 Five Year Estimates

Identifying Environmental Justice Communities (EJ Communities) Using the Major Criteria

To focus on those areas that have the greatest needs and where transportation investments may have a greater impact, SJCOG staff used the following as the major criteria to identify EJ communities.

- Census tracts with at least 40 percent of the population living at or below 150 percent of the federal poverty level as defined by the Census Bureau.
- Census tracts where at least 80 percent of population is minority. The U.S. Census definition was used for minority persons.

The use of these thresholds resulted in selecting census tracts that included approximately 32 percent of the regional population (Table P2-4), which is similar to the resulting percentage from the 2018 RTP/SCS.

Identifying Other Possible Environmental Justice Communities

Staff wanted to identify possible EJ communities that were not identified as such after using the two

major criteria. Five criteria were developed and census tracts that met four of the five criteria will also be considered EJ communities. The criteria are:
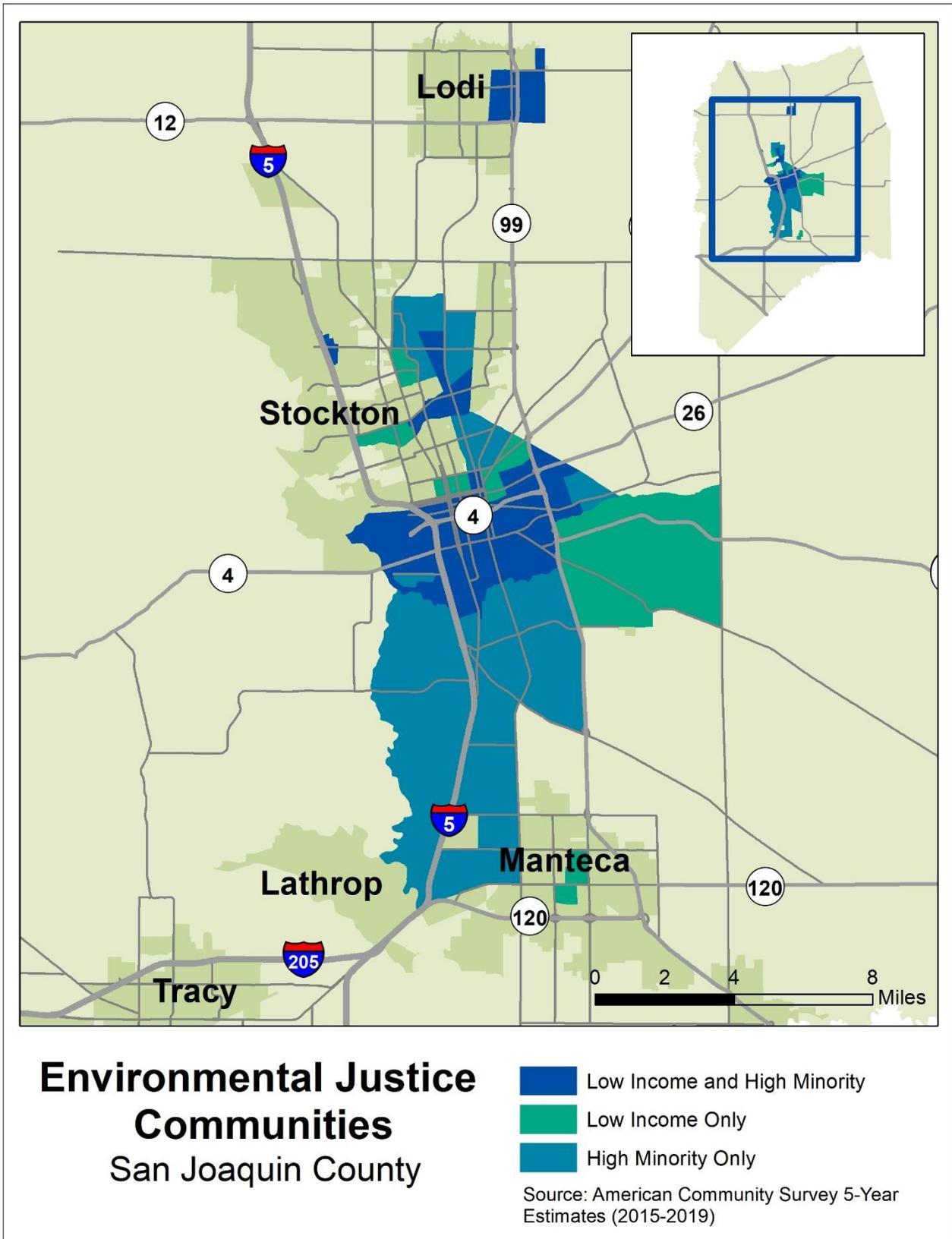
- At least 50 percent above the County average for percentage of population age 5 and over that speak English "less than very well".
- At least 50 percent above the County average for percentage of population that is age 65 and over.
- At least 50 percent above the County average for percentage of population that has a disability.
- At least 25 percent below the County average for percentage of households that have internet access at home.
- At least 50 percent of the County Average for percentage of population over 18 with no high school diploma.

Four census tracts met four of the five criteria. All of these census tracts have already been identified as Environmental Justice Communities after the two major criteria were used.

Table P2-4. Identified EJ Communities

Methodology	Share of Census Tracts	Share of Population
Low Income Only	8 of 139	4.5%
High Minority Only	16 of 139	13.5%
Low Income/High Minority	27 of 139	13.8%
Total	51 of 139	31.8%

Figure P2-2. Identified Environmental Justice Communities

Environmental Justice Communities
San Joaquin County

Low Income and High Minority
Low Income Only
High Minority Only

Source: American Community Survey 5-Year Estimates (2015-2019)

RTP/SCS Plan Impact on Environmental Justice Areas

In measuring the outcomes of the Plan, SJCOG conducted analysis on all topics to identify any potential disproportionately high and adverse impacts for various environmental justice groups. According to the FTA, Adverse effects are disproportionate when they are:

1. "predominately borne by minority population and/or low-income population", or
2. "will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority and/or non-low-income population" (Federal Register Volume 77, Issue 137).

To determine if there are disproportionately high and adverse impacts to environmental justice communities (identified in the previous section), SJCOG conducted a regional analysis and drilled down to EJ communities to address the impacts of the 2022 RTP/SCS for a selection of performance areas.

Land Use Performance Measures

The analysis is conducted for the Draft Plan and compared to the 2018 RTP/SCS Plan (2018 Plan) using performance measures identified later in this section. The relative impacts are measured over a defined time period – in the case of the Draft Plan, the time period is 2016 to 2046, where 2016 is considered the baseline year and 2046 the plan horizon year. The 2018 Plan, also analyzed over this time period, refers to a scenario where the Draft Plan is not adopted. This comparison between the Draft Plan and the 2018 Plan is intended to capture the specific impacts of adopting the Draft Plan versus keeping the current plan, as required by state and federal environmental protection laws. To conduct the analysis of benefits and burdens on EJ areas defined previously, SJCOG identified three land use performance measures, which are a subset of performance measures for the entire plan. The

land use performance measures examined in this report include the following:

- Housing and jobs near high quality transit;
- Housing mix (multi-family and single-family); and
- Number and percent of all households within 500 feet of freeways.

SJCOG conducted an analysis using these performance measures at two stages. First, the analysis was conducted during scenario evaluation and then again, with a draft preferred scenario. The underlying methodology for assessing the land use impacts of the 2022 Plan on EJ communities is detailed below:

1. Designate each of the region's 139 census tracts as either EJ or non-EJ. Based on the EJ definition, this report identifies 51 tracts that are EJ. The remaining 88 census tracts are designated as non-EJ and represent the balance of the region. The process to identify EJ communities is described in detail in the Demographics and Geography section.
2. Using SJCOG's Envision Tomorrow land use model, calculate the performance measures for both EJ areas and non-EJ areas for each alternative.
3. Evaluate the Draft Plan results relative to the No Build Alternative to assess whether:
   - The alternative has a beneficial effect on EJ areas; and
   - This benefit is similar or greater than the benefit to non-EJ areas.

Roadway Expenditure Benefits Analysis

Using the SJCOG travel demand model, a select link analysis was performed on regionally significant roadways identified for capacity improvement expenditures in the Draft Plan. Select link analysis provides information of where traffic comes from and goes to at selected links. In this case, the regionally significant roadways are the select links. The analysis yields the percentage of vehicle demand

whose origin is an EJ area versus non-EJ area, using the Traffic Analysis Zone (TAZ) as the unit of spatial analysis.

Transit Access to Low Income Jobs

As an additional measure of transit access, an analysis was conducted to determine access to employment for EJ communities. In contrast to the land use performance measure discussed previously, this analysis looks primarily at access to the low-income labor market segment defined in Longitudinal Employer-Household Dynamics (LEHD) data for San Joaquin County. Accordingly, LEHD defines low-income jobs as the labor market segment earning $1,250 per month or less. The analysis compares existing and future high-quality transit access to low-income jobs by EJ areas compared to the county as a whole.

Health Equity Analysis

For the 2018 RTP/SCS cycle, SJCOG piloted the use of the National Public Health Assessment Model (NPHAM) This pilot included (1) an analysis of predicted regional behavior and health metrics and (2) a spatially-based equity analysis. A summary of the health equity analysis is partially discussed in this report; however, the full health indicators report can be found in the Scenario Development Report (Appendix S).

For a spatially-based equity analysis, NPHAM was applied to predict health-related behaviors for TCAC Opportunity Areas with High Segregation/Poverty and Low Resource opportunity areas mostly consistent with previously identified EJ areas. The health-related behaviors and outcomes examined average body mass index (BMI), percent of population with diabetes, coronary heart disease and hypertension.

The health-related behaviors and outcomes were analyzed for the draft Scenario A (2018 Plan) and Scenario E (draft 2022 Plan) through the year 2046 and compared to 2016 baseline conditions. Results were then used to calculate a percent change impact

of transportation investments on health equity in San Joaquin County.

Transportation Investment Analysis

SJCOG carried out an off-model analysis of the Draft Plan's overall transportation investment strategy. This analysis illustrates the distribution of the investments relative to different population subgroups and communities in the region. The analysis serves two primary functions, including:

- Complying with Title VI regulations (per FTA Circular 4702.1B, issued in October 2012) by conducting an assessment with "charts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes…" and "an analysis of impacts… that identifies any disparate impacts on the basis of race, color, or national origin…"; and
- Complying with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…"

To carry out these functions, the transportation financial analysis relies on two different methodologies described in this section to determine whether the Draft Plan's investments are shared equitably among low-income and minority populations, and to determine whether there is any disparate impact at the regional level on the basis of race, color or national origin. No specific federal standard currently exists for conducting an environmental justice assessment. Similarly, FTA's Title VI guidance for MPOs does not provide any specific benchmarks for the analyses. Therefore, for

this analysis, SJCOG is building on its prior work analysis. [2]

Population Based Analysis

The population-based investment analysis compares the estimated share of investments that benefit low-income and minority populations in comparison to the share of their respective use of the transportation system and to their respective share of the region's population.

As an example, if a higher share of low-income populations relies on the transit system for their commute needs, and if the Draft Plan invests a higher share of revenues in the transit system, then the low-income population will accrue a bigger share of the benefits. This scenario would therefore be considered equitable to low-income populations. The analysis relies on means of transportation to work data provided by the most recent Census Transportation Planning Package (CTTP).

The steps involved in conducting the population-based analysis include:

1. Using Census data, determine the share of low-income population in the region.
2. Using CTTP data, calculate the share of means of transportation to work by mode for low-income and all other workers.
3. Using the Draft Plan transportation investment strategy, total the investments by modal category.
4. For roadway investments, assign a share of the investment to the low-income population based on their share of work trips by driving alone or carpooling. Repeat for all other workers.
5. For transit investments, assign a share of the investment to the low-income population based on their share of work trips by transit. Repeat all other workers.
6. For bicycle and pedestrian investments, assign a share of the investment to the low-income population based on their share of

work trips by walking or biking. Repeat for all other workers.
7. Sum all the investments by income status.
8. Compare the share of population and trips by mode to the share of assigned investments to assess the level of benefit accrued to low-income populations compared to the remainder of the region.
9. Repeat Steps 1-8 to determine the sum of all investments by minority status.
10. While this approach takes advantage of the available data on work trips for low-income and minority populations provided by CTTP, it is still a rough analysis with the following limitations:
    - Because the data set only captures work trips, it underestimates the share of transportation system usage on all modal categories.
    - The analysis does not account for benefits and burdens at the project level.
    - The analysis assumes that the share of work trips by mode by a particular population group remains the same in future years, regardless of investments that improve efficiency, safety, capacity or access.
    - The analysis does not adjust for the relative size of populations in future years.

Public Transit Funding Financial Analysis - Please see Title VI Analysis for further details on methodology.

Title VI Analysis

As described in Appendix P1, the Federal Transit Administration (FTA) provides guidance specifying how metropolitan planning organizations like SJCOG must demonstrate compliance with Title VI of the Civil Rights Act of 1964 and DoTs Title VI regulations in the metropolitan planning process. This section describes the methodology for conducting the analysis that demonstrates

compliance with these requirements, including the methodology for conducting a disparate impact analysis

SJCOG has the data to distinguish between public transportation investments that receive state and federal funds for the population-based analysis. The state and federal fund sources included in the Title VI analysis are:

- Federal – Congestion Mitigation Air Quality (CMAQ);
- Federal – Federal Transit Administration;
- State – Senate Bill 132; and
- State – State Transit Assistance.

To conduct the disparate impact analysis, the results of the population-based analysis of public transit investments using state and federal funds are assigned to minority and non-minority populations

on a per capita basis. A comparison of the per capita investments for the two groups determines whether there is any disparate impact.

Although FTA does not provide specific guidance or standard benchmarks to determine whether any given result represents a disparate impact, a general practice in such analysis is to use the percentage result to determine whether any differences between benefits for minority or non-minority populations may be considered statistically significant. If a disparate impact is found to be statistically significant, consideration must then be given to "whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact."

Table P2-5. FTA Requirements for Title VI Analysis

Requirement	Related Draft Plan Analysis	See Appendix/Pages
"All general requirements set out in [the general requirements section] of this Circular…"	Table of FTA requirements for Title VI analysis	Appendix P2 Pg. P2-9
"A demographic profile of the metropolitan area…"	Regional trends analysis	Appendix P3 Pgs. P3-1 to 5
"Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data…"	Demographic maps that overlay the location of minority and non-minority populations throughout the region.	Appendix P2 Pg. P2-5 Appendix P3 Pg. P3-3
"…[C]harts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes…"	Population-based analysis of public transit investments using state and federal sources.	Appendix P5 Pgs. P5-1 to 3
"An analysis of impacts identified [in row above] that identifies any disparate impacts on the basis of race, color, or national origin…"[3]	Disparate impact analysis comparing Draft Plan investments for minority and non-minority populations.	Appendix P4 Pgs. P4-10 to 14 Appendix P5 Pgs. P5-1 to 3

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[3] Federal Transit Administration Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients. See: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf

Environmental Justice Analysis

Under Executive Order 12898 and the associated DOT Order on Environmental Justice, SJCOG must assist DOT, FTA, and the Federal Highway Administration (FHWA) in their mission "to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects," on environmental justice (EJ) populations. For the EJ analysis, adverse effects are estimated using the 3 land use performance measures, as well as the select link analysis, to determine whether minority communities or low-income communities, or EJ areas, share in the benefits of the Draft Plan's investments without bearing a disproportionate share of the burdens.

To make this determination, this report uses DOT's definition of a "disproportionately high and adverse effect," which relies on meeting the following conditions:

- An adverse impact is predominately borne by minority and/or low-income populations, and
- An adverse impact on minority and/or low-income populations is significantly more severe or greater in magnitude than the adverse effect on non-minority and/or non-low-income populations.

To test the first condition, the analysis compares the effect of the 2018 Plan and the 2022 Plan on EJ communities. This analysis shows whether the measure is moving in the right direction for EJ populations. To test the second condition, the analysis compares the effect of the 2022 Plan on EJ populations and non-EJ populations. An EJ population is determined to experience "disproportionately high adverse effect" when this condition is met AND the EJ population is more impacted by the 2022 Plan compared to the 2018 Plan.

Table P2-6. FTA Requirements for Environmental Justice Analysis

Requirement	Related Draft Plan Analysis	See Appendix/Pages
"…[Determine] whether minority populations and/or low-income populations will experience potential environmental or health impacts from a proposed program, project or activity…"	Quantitative analysis of potential benefits and burdens of proposed land use and transportation policies and projects on EJ areas based on 3 land use performance measures and a select link analysis on regionally significant roadways	Appendix P4 Pgs. P4-2 to 4 Pgs. P4-7 to 10
"…[Determine]… whether the activity will result in a 'disproportionately high and adverse effect on human health or the environment"	Disparate impact analysis comparing the impacts of the Draft 2022 Plan on EJ areas compared to non-EJ areas	Appendix P6 Pgs. P6-1 to 3

Data Sources

Except where noted, this report primarily uses the Census Bureau's 2015-2019 American Community Survey data and Decennial Census geographies for analysis. This is the most recent data that is also compatible with SJCOG's existing unit for conducting spatial analysis in the travel model – the traffic analysis zone (TAZ). This cross-walk allows demographic characteristics from the Census to be linked to travel characteristics from travel model outputs. This is useful for comparing benefits and burdens of transportation investments in EJ Areas.

This section includes a description of data sources used in this report.

Decennial Census and American Community Survey

The Decennial Census is conducted every 10 years by the U.S. Census Bureau to determine the number of people living in the United States. Data collected includes basic demographic and household characteristics, which are used to plan and determine funding for a wide array of federal, state, local, and tribal programs. The American Community Survey disseminates more current and detailed demographic and household characteristics, based on continuous data collection.

National Public Health Assessment Model

The National Public Health Assessment Model (NPHAM) is a public health impact analysis tool to assist with analyzing the predicted public health outcomes resulting from a change in built environment conditions, as defined by SJCOG in the Envision Tomorrow software. NPHAM establishes baseline conditions by using the National Environmental Database (NED), which provides spatially resolute objectively measured built, natural and social environment conditions from data from various sources including the US Environmental Protection Agency, U.S. Department of Housing and Urban Development and the National Land Cover Database.

SJCOG Forecasts

As the metropolitan planning organization, San Joaquin Council of Governments (SJCOG) is responsible for maintaining the regional population, household, and employment forecasts for the region. The forecasts are developed through a partnership with the Center for Business and Policy Research at the University of the Pacific Eberhardt School of Business. The estimates are important because they are used throughout the plan development process, providing the inputs for land use and transportation modeling applications.

SJCOG Travel Demand Model

The model is a transportation planning application used by SJCOG to analyze how the package of transportation investments included in the Draft Plan will affect a range of indicators related to travel within the San Joaquin region's transportation network.

Envision Tomorrow Land Use Model

Envision Tomorrow (ET) is a scenario planning application used by SJCOG to analyze how current growth patterns and future decisions impacting growth will affect a range of indicators relating to land use, housing, demographics, economic growth, fiscal impacts, transportation, environmental factors, and quality of life.