

APPENDIX P4

Environmental Justice & Title VI Analysis: Analysis Results



P4 Analysis Results

Analysis of Performance Areas

In the development of this report, SJCOG identified land use performance measures to analyze existing social and environmental equity in the region.

Detailed analysis is presented for the following land use performance areas:

- Land-use patterns
- Transit access
- Health equity
- Transportation investments
- Population share of investments

The analyses presented in this section includes the following:

- Quantitative analysis of potential benefits and burdens of proposed land use and transportation policies and projects on disadvantaged communities (environmental justice (EJ) 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-wage 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); and

- 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.

Analysis of Land Use Performance Measures

To conduct the analysis of benefits and burdens on EJ communities, SJCOG identified three land use performance measures, which are a subset of performance measures for the Draft Plan. The performance measures examined in this section include indicators that impact transit accessibility, air pollution exposure, and housing choice. Using SJCOG's Envision Tomorrow land use model, the performance measures are projected from the base year of 2016 to 2035 and controlled to 2046 numbers to compare the impact of the 2018 Plan and the Draft 2022 Plan.

Table P4-1 summarizes the modeled results for each of the land use performance measures, which was applied to EJ communities and the remainder of San Joaquin County.

Table P4-1. Summary of Results for Land Use Performance Measures¹

Performance Measure	Sub-Geography	Base Year ²	2018 Plan ³	Draft Plan ³
Percent (and number) of <i>total</i> households / employment located within ½ mile of high quality transit stops and centers	EJ Communities	18.9% / 29.9% (12,822 / 26,683)	19% / 25.6% (15,813 / 30,461)	23.9% / 30.1% (20,965 / 36,591)
	Non-EJ Communities	4.6% / 12.9% (7,333 / 19,327)	4.1% / 10.9% (9,011 / 21,064)	4.2% / 11.1% (9,032 / 21,161)
Percent (and number) of <i>total</i> households within 500 feet of freeway	EJ Communities	5.3% (3,557)	5.3% (4,423)	6.1% (5,354)
	Non-EJ Communities	5.4% (8,613)	5.6% (12,300)	5.7% (12,384)
Percent (and number) of <i>total</i> Housing Mix by Single Family / Multifamily Units	EJ Communities	69% / 31% (49,324 / 22,183)	66% / 34% (57,691 / 30,203)	60% / 40% (55,104 / 37,171)
	Non-EJ Communities	81% / 19% (137,256 / 31,856)	76% / 24% (176,531 / 55,689)	74% / 26% (169,457 / 58,442)

¹ Results projected to year 2035 and controlled to 2046 numbers

² Base year is 2016

³ Year 2046 projections

Transit Accessibility

High quality public transit is an important indicator for environmental justice communities (EJ communities), where car ownership rates are statistically lower and thus dependency on other modes of transportation are higher than the general population. Adding housing and jobs that are near high quality transit helps to improve the ability to get around without a car.

An analysis of the percent of total households and employment that are located within ½ mile of a high-quality transit stop and center provides an indication of the impact of Draft Plan investments on the

conditions within EJ and non-EJ communities.

Between the two sub-geographies, the Draft Plan has a much greater percent of total households and employment that are located near high quality transit in EJ communities compared to non-EJ communities (23.9% versus 4.2% and 30.1% versus 11.1%) (Table P4-1). This would indicate an overall positive impact in EJ areas, with the benefit to EJ areas exceeding non-EJ areas. Additionally, in the Draft Plan alternative, EJ communities will have a greater percent of households and employment than the 2018 Plan alternative (23.9 percent versus 18.9% and 30.1% versus 29.9%).

Exposure to Air Pollution

Numerous studies point to the health risks associated with high exposure to air pollution including higher rates of asthma, heart attack, stroke, and lung cancer. Given that living near a major transportation facility can increase population exposure to emissions and particulate matter from vehicles, an equity analysis was performed to compare the number and percentage of countywide households relative to EJ households located within 500 feet of a major transportation facility. In this analysis, a major transportation facility is defined as any roadway within the County that carries more than 500,000 daily vehicle trips. The major transportation facilities include: Interstate 5, Interstate 580, Interstate 205, State Route 99, the Crosstown Freeway (State Route 4), and State Route 120. Figure P3-9 includes the location of these major transportation facilities.

Table P4-2 provides detailed analysis of EJ versus total countywide households located within 500 feet

of the identified facilities. EJ households make up all households near the Crosstown Freeway (State Route 4), 32.97% of the households near Interstate 5, and 24.54% of households near State Route 99. EJ households make up 0.19% of households near State Route 120. There are 0% of EJ households near Interstate 205 and Interstate 580 as these facilities are in outlying parts of the County.

Table P4-1 shows the results of the analysis comparing EJ versus non-EJ communities. For the Draft Plan, EJ households will make up 6.1 % of households within 500 feet of a freeway while households in non-EJ communities will make up 5.7% of households within 500 feet of a freeway. In comparison to the 2018 Plan alternative, the Draft Plan alternative will result in a slighter higher percent of households within 500 feet of a freeway than the 2018 Plan alternative (6.1% versus 5.3%)

Table P4-2. Households within 500 feet of a Major Transportation Facility for San Joaquin County and Environmental Justice Areas, 2046

	Total Households	I-5		SR-99		SR-4 (Crosstown Fwy)		SR-120		I-205		I-580		Any Freeway	
		500'	%	500'	%	500'	%	500'	%	500'	%	500'	%	500'	%
San Joaquin County	304,178	6,757	2.2%	4,622	1.5%	1,920	1.0%	1,648	0.5%	1,146	0.4%	1,499	0.5%	17,423	5.7%
Escalon	2,990		0.0%		0.0%		0%	317	10.6%		0.0%		0.0%	317	10.6%
Lathrop	18,338	900	4.9%		0.0%		0%	22	0.1%	17	0.1%		0.0%	908	4.9%
Lodi	29,084	0	0.0%	871	3.0%		0%		0.0%		0.0%		0.0%	872	3.0%
Manteca	40,493		0.0%	1,433	3.5%		0%	1,260	3.0%		0.0%		0.0%	2,638	6.5%
Ripon	7,119		0.0%	314	4.4%		0%		0.0%		0.0%		0.0%	314	4.4%
Stockton	129,273	5,743	4.4%	1,246	1.0%		100%		0.0%		0.0%		0.0%	8,786	6.8%
Tracy	40,102		0.0%		0.0%		0%		0.0%	1,107	2.8%	1,474	3.7%	2,581	6.4%
Unincorporated	36,779	113	0.3%	759	2.1%		0%	103	0.3%	21	0.1%	25	0.1%	1,008	2.7%
San Joaquin County Environmental Justice Areas	87,641	2,227	2.5%	1,134	1.3%	1,920	2.2%	3	0.0%	0	0.0%	0	0.0%	5,159	5.9%
Escalon	-		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Lathrop	10,450	661	6.3%		0.0%		0.0%	3	0.0%		0.0%		0.0%	661	6.3%
Lodi	3,287		0.0%	185	5.6%		0.0%		0.0%		0.0%		0.0%	185	5.6%
Manteca	3,155		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Ripon	-		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Stockton	70,259	1,553	2.2%	909	1.3%	1,920	2.7%		0.0%		0.0%		0.0%	4,259	6.1%
Tracy	-		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Unincorporated	488	13	2.6%	40	8.3%		0.0%		0.0%		0.0%		0.0%	53	10.9%
EJ Households as a Percent of Total	28.81%	32.97%		24.54%		100%		0.19%		0.00%		0.00%		29.61%	

Housing Choice

Housing mix by type is an important performance measure in EJ communities, where housing affordability weighs heavily on a household's ability to pay for other necessities, such as health care, food, clothing, and transportation. A more diverse housing mix, which includes multifamily housing, as well as single-family housing, can help to assure that individuals and families at all income levels have a safe place to stay. An equity analysis of the housing mix was conducted to understand the Draft Plan's impact on housing choice throughout San Joaquin County.

Table P4-1 (Page 2) shows the results of the analysis conducted on the mix of single-family and multifamily housing types available in the Base Year and 2046 for both 2018 Plan and Draft Plan alternatives. Of the two alternatives, the Draft Plan will increase housing choice the most in both EJ communities and non-EJ communities. The Draft Plan will also provide more housing choice in EJ communities (60% single family/40% multifamily) than in non-EJ communities (66% single family/44% multifamily).

While these outcomes are optimistic, there is also a growing body of research that indicates providing multifamily and subsidized housing options in all neighborhoods increases household access to opportunity by ensuring residents of all income levels are able to access high-quality schools, jobs and services. While the Draft Plan improves housing choice across the region, SJCOG acknowledges the potential for unintended consequences resulting in worsening conditions of concentrated poverty and segregation in identified EJ communities. Therefore, to promote federal and state fair housing goals, SJCOG will continue to work with local jurisdictions, which directly shape land use and zoning policy, to improve access to opportunity for all residents of San Joaquin County.

Roadway Expenditure Benefits

To gauge to the extent EJ communities

proportionately benefit from roadway expenditures compared to the general population, an equity analysis of the relative benefit received from roadway improvement expenditures was performed. Using the SJCOG travel demand model, a select link analysis was performed on regionally significant roadways identified for capacity improvements in the Draft Plan. The analysis yields the percentage of vehicle demand whose origin is an EJ community (i.e., TAZ) versus non-EJ community (TAZ).

To determine the environmental justice area's share of the use of the improved facilities, a representative list of improved regionally significant roadway facilities was first identified. These facilities are corridor-type facilities with regional significance (e.g., they are expected to carry over 20,000 ADT by 2046 according to the travel demand model) that are also programmed for improvements by 2046 according to the RTP project list. These roadways include:

- 11th Street
- Airport Way
- Arch/Sperry Road
- Byron Road
- Corral Hollow
- Eight Mile Road
- Grant Line Road
- Hammer Lane
- Lathrop Road
- Lower Sacramento Road
- Mountain House/International Parkway
- Thornton Road
- I-205
- SR 120
- SR 99
- I-5

In the travel demand model, the links within the project-limits of these roadway segments were specified by their A nodes and B nodes. Upon running the model with this set of selected links, a select link network file was generated in the model output. From this file, trips generated by EJ areas that also traverse these selected links were traced and the percentage share of these EJ trips in relationship to

the total forecasted traffic that uses these facilities was calculated.

Results indicate that approximately 40.8% of daily vehicle trips utilizing these improved roadways originate from EJ communities. This indicates that a significant proportion of EJ communities will benefit from future roadway investments resulting from the Draft Plan. The analysis shows that the benefit to EJ households from these facilities (40.8% of daily trips) is substantially higher than the overall percentage share of EJ households countywide (28.81%). The difficulty in definitively concluding disproportionate benefit in the analysis for roadway improvements in the RTP/SCS is a result of the difficulty in assessing proximity benefits from operation and maintenance improvements for EJ communities versus the general population as well as the limitation that available data covers only modal difference for work trips. Absent a definitive locational analysis, one might argue that projects in the maintenance category would exhibit an inverse relationship to the regional roadway expansion projects as roads are not slated to be otherwise improved would make up the bulk of the maintenance expenditures. Of additional import to the equity discussion is that while workers in low-income households make up approximately 23% of total work trips by automobile, nearly 90% of low-income households either drove alone or carpooled for their primary means of getting to work. In addition, investments in roadway improvements also benefit transit riders in the County given that transit within San Joaquin County is primarily bus transit.

High Quality Transit Access to Low-Wage Employment

As an additional measure of transit accessibility for EJ communities, a spatial analysis was conducted by overlaying Longitudinal Employer-Household Dynamics (LEHD) data for San Joaquin County on a half-mile walk shed from high quality transit (HQT). High quality transit includes any bus transit line that operates with 15-minute frequency during peak

commute time, as well as any rail transit stations. LEHD data provides information to analyze the location of jobs by income, identifying total employment in three income categories: Low, Medium, and High. For this analysis, low-wage jobs were targeted, which LEHD defines as jobs with earnings that total \$1,250 per month or less. The analysis also identified low wage job categories and used employment sector forecast were used to determine the projected 2046 low wage employment.

As can be seen in Table P4-3, the highest number of accessible low-wage jobs within the region in 2046 will be located primarily within the urban core of San Joaquin County, within the City of Stockton (13,097). Approximately 74% of those jobs are located within Stockton's EJ areas. Outside of Stockton the next highest number of low-income jobs near high quality transit is projected in the City of Lodi (1,408), where approximately 13% of these jobs will be in EJ communities.

The results of the analysis show that of the total low-wage jobs in San Joaquin County, at least 22% of them in 2046 will be located near high quality transit. Additionally, of the low-wage jobs near high quality transit, approximately 62% will be located within the region's EJ communities. Except for rail stations scattered throughout San Joaquin County, existing and future high-quality transit lines are found primarily serving the urban core. Because it is challenging to predict the location of low-wage jobs in the future, this layer was held constant for the analysis. The existing and future high-quality transit lines and stations were then overlaid on the map, inferring improved access to low-income jobs resulting from planned investments in the Draft Plan. While high quality transit may be improving access to jobs within the urban core, access to jobs outside of the urban core will be limited to train station areas and non-high-quality transit service in outlying areas of the County in the future.

Table P4-3 High Quality Transit Access to Low Wage (LW) Jobs for San Joaquin County and Environmental Justice Areas

	1/2 Mile of HQT LW Jobs in EJ Areas		% of LW Jobs near HQT in EJ Areas	Total LW Jobs near HQT in County	% of Total LW Jobs near HQT	Total LW Jobs in County	% of LW Jobs County Total	Total Jobs in County	
	Existing (2016) TOT	Growth 2016-2042	Future (2046) TOT						
San Joaquin County	3,858	6,267	10,125	62%	16,283	22%	75,589	24%	311,427
Escalon	0	0	0	0%	0	0%	581	29%	2,030
Lathrop	32	36	68	70%	97	3%	3,406	24%	14,242
Lodi	169	13	183	13%	1,408	23%	6,136	23%	26,523
Manteca	111	112	223	27%	831	12%	7,089	28%	25,056
Ripon	0	0	0	0%	209	18%	1,156	24%	4,742
Stockton	3,546	6,105	9,651	74%	13,097	33%	39,426	25%	160,457
Tracy	0	0	0	0%	610	7%	9,173	23%	39,454
Unincorporated	0	0	0	0%	32	0%	8,623	22%	38,923

Health Equity Analysis

An additional analysis was conducted to consider the health equity impacts of the land use and transportation policies and projects included in the RTP. SJCOG piloted the use of public health performance metrics during the 2022 RTP/SCS cycle and applied these to conduct a spatially based equity analysis. The results of the analysis for the 2022 Plan are summarized in this section, however, the full health indicators report can be found in the Scenario Development Report (Appendix S).

The health equity analysis focuses on California Tax Credit Allocation Committee (TCAC) High Segregation and Poverty Opportunity Areas and Low Resource Opportunity Areas, which together are approximately equivalent to EJ communities. For more detail, please see Appendix P2. The analysis determines whether the 2018 Plan (Scenario A) and the Draft Plan (Scenario E) will improve health outcomes in the High Segregation/Poverty and Low Resource areas between 2016 and 2046. Tables P4-4 and P4-5 show the results of the analysis.

**Table P4-4 TCAC Opportunity Areas Health Metrics
High Segregation and Poverty Areas**

Health Metric Categories	Percentage in TCAC Opportunity Area of High Segregation & Poverty			Absolute Difference from Baseline			Relative Difference from Baseline		
	Baseline	Scenario A	Scenario E	Baseline	Scenario A	Scenario E	Baseline	Scenario A	Scenario E
Percent of Adults with a BMI>25	68.0%	66.6%	65.6%	-	-1.4%	-2.4%	-	-2.06%	-3.53%
Percent of Adults with a BMI>30	32.4%	31.2%	30.5%	-	-1.2%	-1.9%	-	-3.70%	-5.86%
Percent of population with Type 2 Diabetes	10.7%	10.5%	10.2%	-	-0.2%	-0.5%	-	-1.87%	-4.67%
Percent of population with Coronary Heart Disease	2.6%	2.6%	2.6%	-	0.0%	0.0%	-	0.00%	0.00%
Percent of Population with Hypertension	29.6%	28.8%	28.0%	-	-0.8%	-1.6%	-	-2.70%	-5.41%

**Table P4-5 TCAC Opportunity Areas Health Metrics
Low Resource Areas**

Health Metric Categories	Percentage in TCAC Opportunity Area of Low Resource			Absolute Difference from Baseline			Relative Difference from Baseline		
	Baseline	Scenario A	Scenario E	Baseline	Scenario A	Scenario E	Baseline	Scenario A	Scenario E
Percent of Adults with a BMI>25	67.7%	66.3%	66.1%	-	-1.4%	-1.6%	-	-2.07%	-2.36%
Percent of Adults with a BMI>30	31.8%	30.4%	30.2%	-	-1.4%	-1.6%	-	-4.40%	-5.03%
Percent of population with Type 2 Diabetes	10.3%	9.4%	9.3%	-	-0.9%	-1.0%	-	-8.74%	-9.71%
Percent of population with Coronary Heart Disease	2.8%	2.6%	2.6%	-	-0.2%	-0.2%	-	-7.14%	-7.14%
Percent of Population with Hypertension	30.0%	28.4%	28.3%	-	-1.6%	-1.7%	-	-5.33%	-5.67%

Highlights of the health equity results) are as follows:

- Percent with BMI>25: This is an indicator of community health. Being overweight is a risk factor for other chronic and infectious diseases. Scenarios A and E are expected to reduce the percentage of the population with BMI >25. Scenario E will result in the largest reduction.
- Percent with BMI> 30: Scenarios A and E are expected to reduce the percentage of the population with BMI >25. Scenario E will result in the largest reduction.
- Type 2 Diabetes: The largest reductions in the percentage of the population with diabetes will occur in Low Resource areas for Scenarios A and E, with the largest reduction in Scenario E. High Segregation/Poverty areas will see smaller reductions with the largest reduction in Scenario E.
- Coronary Heart Disease: Scenarios A and E are not expected to significantly reduce the percentage of the population with coronary heart disease in High Segregation/Poverty areas. In Low Resource areas, both scenarios A and E will reduce the percentage of the population with coronary heart disease.

- Hypertension: In High Segregation/Poverty areas, the largest reduction will be in Scenario E . In Low Resource areas, both scenarios are similar in the expected impact.

In general, it was found that both Scenarios A and E will improve health outcomes in both high segregation/poverty and low resource areas with the largest improvements in Scenario E.

Transportation Investment Analysis

This section summarizes the results from an analysis of Draft Plan investments for their relative benefit on minority and low-income populations, compared to non-minority and non-low-income populations. The methodology for conducting the transportation investment analysis is described in more detail in Appendix P2. The legal context for the analysis is provided in Appendix P1.

The transportation investment analysis includes the following components:

- The transportation investment analysis is a population-based analysis, which quantifies the benefits of the region’s transportation investments, and assigns these benefits to low-income and minority populations based on their share of system usage. This share of

benefits is then compared to the overall share of minority and low-income populations in the region.

- A public transit investment analysis, which satisfies Title VI requirements.

Population-Based Analysis

This analysis illustrates the distribution of the investments relative to different population subgroups in the region by comparing the estimated share of investments that benefit low-income and minority populations to the share of their respective use of the transportation system. This evaluation centers on populations of concern, low-income and minorities, to estimate the average distribution of benefits across the region.

To conduct the analysis, the Draft Plan investments were divided into categories matching available data on means of transportation to work. Draft Plan investments were divided into five categories: Regional Roadways and Highways, Roadway Operations and Maintenance, Bus Transit, Rail Transit, and Bicycle and Pedestrian. Overall, the Draft Plan investment strategy is a balanced approach to support the development of a multi-modal transportation system. Table P4-6 displays the funding amounts made available by modal category in the Draft Plan.

TABLE P4-6. DRAFT PLAN FUNDING BY MODAL CATEGORY

Modal Category	Funding (in millions)	Percent of Total Funding
Regional Roadways and Highways	\$2,721	21.8%
Roadway Operations and Maintenance	\$4,638	37.2%
Bus Transit	\$3,247	26.0%
Rail Transit	\$1,485	11.9%
Bicycle & Pedestrian (Active Transportation)	\$384	3.1%
Total	\$12,476*	100%

*Total funding is \$12.670 (billions) with airport projects.

For the population-based analysis, as a first step, share of transportation system usage by income and minority status was determined using the most recent data available from the Census Transportation Planning Package (CTPP). Alongside demographic information, the CTPP data includes detailed estimates of means of transportation to work. Using this data, the share of transportation system usage was determined by calculating the percent of work trips by means of transportation by income and minority status and summarized in Table P4-7.

For this analysis, low-income workers were defined using the Regional Housing Needs Assessment (RHNA) income guidelines, which include extremely low, very low, and low-income households. ¹ Using this definition, households with income below \$51,545 were designated as low-income households for the transportation investment analysis. To match this income limit with available data, workers from households with income below \$50,000 were used for the analysis.

Table P4-7. Share of Transportation System Usage by Income and Minority Status

Means of Transportation to Work	Income Status*		Minority Status	
	Low-Income	All Other	Minority	Non-Minority
Drove Alone or Carpool	26.0%	74.0%	63.2%	36.8%
Bus	38.3%	61.7%	76.9%	23.1%
Rail	12.0%	88.0%	62.5%	37.5%
Bicycle or Pedestrian	45.1%	54.9%	54.3%	45.7%

Source: U.S. Census Bureau, American Community Survey 2012-2016 Five Year Estimates. Special Tabulation: Census Transportation Planning Package

*Using 2016 dollars

To determine relative benefits by income status, transportation investments from the Draft Plan were assigned to either low-income households or all other households. Following in Table P4-8, expenditure by modal category was determined by allocating expenditures by the respective share of transportation system usage by low-income population. The share of benefit for all other workers was then calculated by subtracting the calculated share for low-income workers from all expenditures

for each modal category of funding. Overall, project investment totaled to \$3.5 billion for low-income households, while investment totaled \$8.9 billion for all other households. Compared to their share of total population in the region (26.4%), low-income households receive 28.1% of total benefit from Draft Plan investments based on their share of usage of the transportation system.

¹ SJCOG Regional Housing Needs Assessment. See: <http://www.sicog.org/113/Regional-Housing-Needs-Allocation>

Table P4-8. Funding Expenditure by Mode and Income Status

Modal Category	All Expenditures	Low-income Households	All other Households
Share of Total Population		26.4%	73.6%
Regional Roadways & Highways	\$2,721,354,416	\$707,552,148	\$2,013,802,268
Roadway Operations and Maintenance	\$4,638,416,071	\$1,205,988,178	\$3,432,427,893
Bus Transit	\$3,247,248,040	\$1,243,695,999	\$2,003,552,041
Rail Transit	\$1,484,605,791	\$178,152,695	\$1,306,453,096
Bicycle and Pedestrian	\$384,078,224	\$173,219,279	\$210,858,945
Total	\$12,475,702,542	\$3,508,608,300	\$8,967,094,242
Share of Total Benefit		28.1%	71.9%

Source: U.S. Census Bureau, American Community Survey 2012-2016 Five Year Estimates. Special Tabulation: Census Transportation Planning Package

Table P4-9 summarizes the calculated benefit by minority status. Overall, Draft Plan investment benefit totaled \$8.3 billion for minority populations, while for non-minority populations the benefit totaled \$4.2 billion. Compared to their share of total

population in the region (62.5%), minority populations receive 66.4% of total benefit of Draft Plan investments based on their share of usage of the transportation system.

Table P4-9. Funding Expenditure by Mode and Minority Status

Modal Category	All Expenditures	Minority	Non-Minority
Share of Total Population		62.5%	37.5%
Regional Roadways & Highways	\$2,721,354,416	\$1,719,895,990	\$1,001,458,425
Roadway Operations and Maintenance	\$4,638,416,071	\$2,931,478,957	\$1,706,937,114
Bus Transit	\$3,247,248,040	\$2,497,133,743	\$750,114,297
Rail Transit	\$1,484,605,791	\$927,878,619	\$556,727,172
Bicycle and Pedestrian	\$384,078,224	\$208,554,476	\$175,523,748
Total	\$12,475,702,542	\$8,284,941,786	\$4,190,760,756
Share of Total Benefit		66.4%	33.6%

Source: U.S. Census Bureau, American Community Survey 2012-2016 Five Year Estimates. Special Tabulation: Census Transportation Planning Package

In addition to calculating total benefit to low-income and minority populations based on transportation system usage, a comparison of funding expenditures per household was conducted. To calculate relative benefits for low-income households, the total benefit for each modal category in Table P4-10 was divided by the total estimate of low-income households which results in per household expenditures by

modal category. Using similar methods for the minority population, per capita expenditures by modal category are summarized in Table P4-11.

On a per household basis, the result of the analysis indicates a disproportionate share of Draft Plan expenditures accruing to non-low-income households (Table P4-10). Modal category expenditures

benefitting low-income households are less when compared to all other households except for bicycle and pedestrian. The disparity is most pronounced in the roadway and rail categories.

On a per capita basis, the result of the analysis

indicates that non-minority populations are receiving a disproportionate share of Draft Plan expenditures (Table P4-11) except for bus transit. Modal category expenditures benefiting minority populations are slightly less when compared to non-minority populations.

Table P4-10. Funding Expenditures per Household by Income Status

	All	Low-Income Households	All Other Households
Households	228,567	88,898	139,669
Regional Roadways & Highways	\$11,906	\$7,959	\$14,418
Roadway Operations and Maintenance	\$20,293	\$13,566	\$24,575
Bus Transit	\$14,207	\$13,990	\$14,345
Rail Transit	\$6,495	\$2,004	\$9,354
Bicycle and Pedestrian	\$1,680	\$1,949	\$1,510
Total	\$54,582	\$39,468	\$64,202

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

Table P4-11 Funding Expenditures per Capita by Minority Status

	All	Minority	Non-Minority
Population	742,603	506,094	236,509
Regional Roadways & Highways	\$3,665	\$3,398	\$4,234
Roadway Operations and Maintenance	\$6,246	\$5,792	\$7,217
Bus Transit	\$4,373	\$4,934	\$3,172
Rail Transit	\$1,999	\$1,833	\$2,354
Bicycle and Pedestrian	\$517	\$412	\$742
Total	\$16,800	\$16,370	\$17,719

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

An important limitation to this analysis is that it relies on data regarding means of transportation to work, thus only capturing a specific trip purpose. Therefore, the calculated share of transportation system usage may not represent a comprehensive picture of actual system usage by the region's population.

To provide further understanding of benefits to

environmental justice communities, additional analyses are included to assess equity impacts of roadway (see Roadway Expenditure Benefits) and transit projects (see High Quality Transit Access to Low-Income Employment) included in the Draft Plan. For further discussion and analysis of public transit investment, please refer to Appendix P5 for the Title VI Report.