

Interregional Bicycle Tourism Plan

– Existing Conditions

Prepared for:
Tuolumne County Transportation Council

WC20-3704

FEHR  PEERS

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1. Introduction

In recent years, communities throughout the United States have seen an increase in recreational bicycle riding. This has led to environmental, health, and economic benefits to communities and community members across the nation. In 2017, the Outdoor Industry Association released a study¹ which found that wheel sports (which includes bicycling on paved roads, off-road bicycling, and skateboarding) contributes to approximately \$97 billion in retail spending and creates approximately 848,000 jobs in the United States. In an effort to encourage bicycling, create vibrant, healthy communities, and spur economic activity, the Tuolumne County Transportation Council partnered with Caltrans District 10, Alpine County, Calaveras Council of Governments (COG), Stanislaus COG, and San Joaquin COG, to develop an Interregional Bicycle Tourism Plan ("the Plan").

The goal of the Plan is to promote safe multimodal travel throughout the region and to improve and promote bicycle tourism for economic development with an emphasis on improving disadvantaged, low-income rural communities and small cities.

This report provides an overview of demographic data, collision data, an assessment of the current Level of Traffic Stress in the study area, equity and environmental justice data, and a review of the various plans and documents reviewed to assist with this study. **Figure 1** illustrates the study area of the Plan.

¹ *The Outdoor Recreation Economy*, https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf



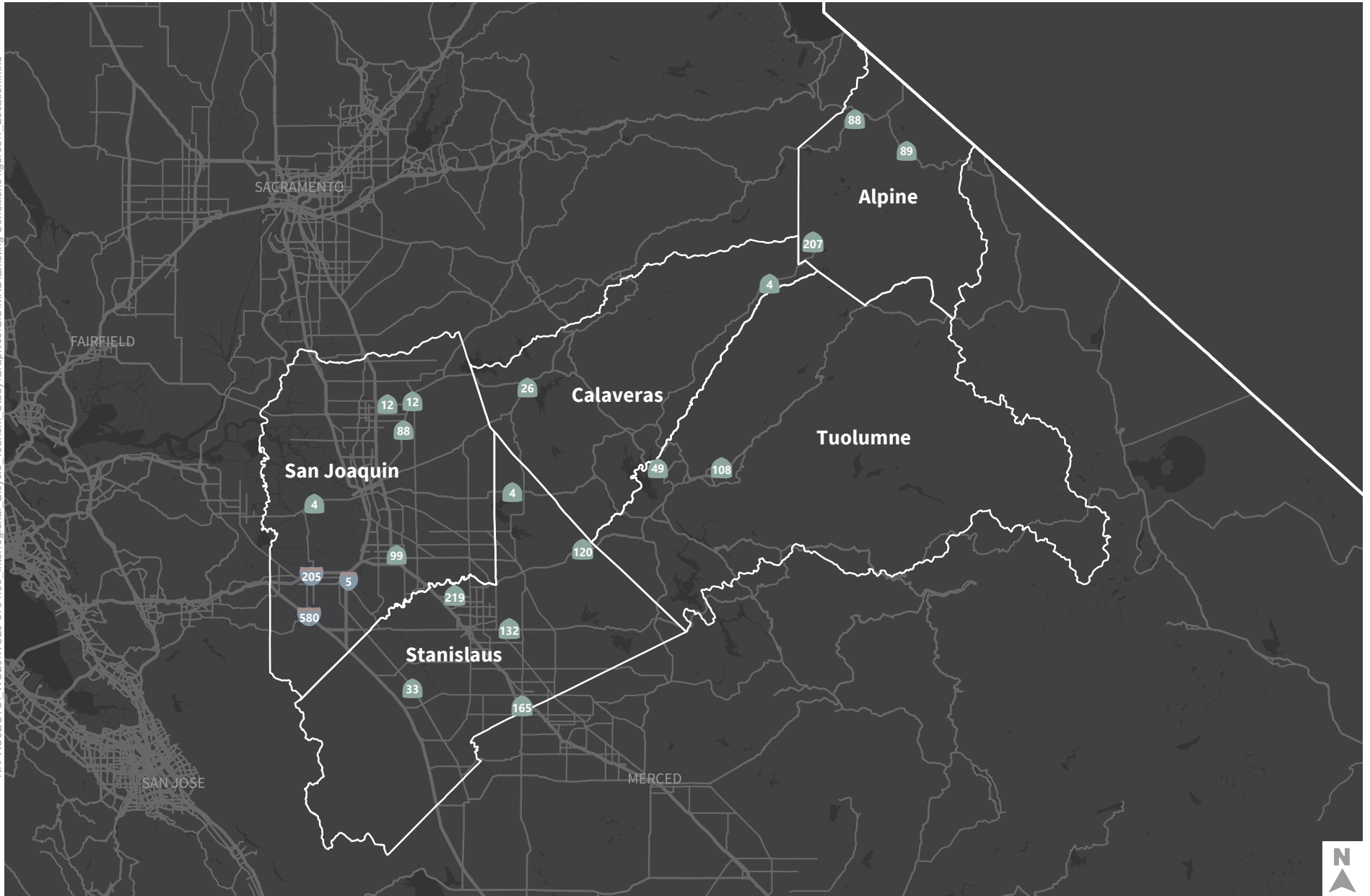


Figure 1
Study Area

2. Regional Profile and Demographics

The five counties differ both demographically and topographically. Alpine, Calaveras and Tuolumne County are more rural in nature with a hilly topography. Stanislaus and San Joaquin County are generally more urban, although smaller rural communities exist within each county, with a more level terrain. Detailed demographic information for each county is provided below.

2.1 Alpine County

Alpine County is located in the Sierra Nevada Mountain region at the California/Nevada border, approximately 15 miles south of Lake Tahoe. It is comprised of approximately 743 square miles and has a population of approximately 1,150². Three national forests are located within the County; El Dorado, Stanislaus and Humboldt-Toiyabe, and approximately 96% of land within the County is publicly owned. State Routes 4, 88 and 89 provide primary access to and throughout Alpine County. All three state routes are designated as scenic highways in Alpine County (see **Attachment A: Scenic Routes**).

Alpine County is a tourist destination for outdoor enthusiasts who can enjoy winter and summer activities at two major resorts, Bear Valley and Kirkwood, take advantage of fishing opportunities with over 60 lakes and streams, and enjoy camping at over 36 campgrounds or the thousands of acres suitable for dispersed camping.

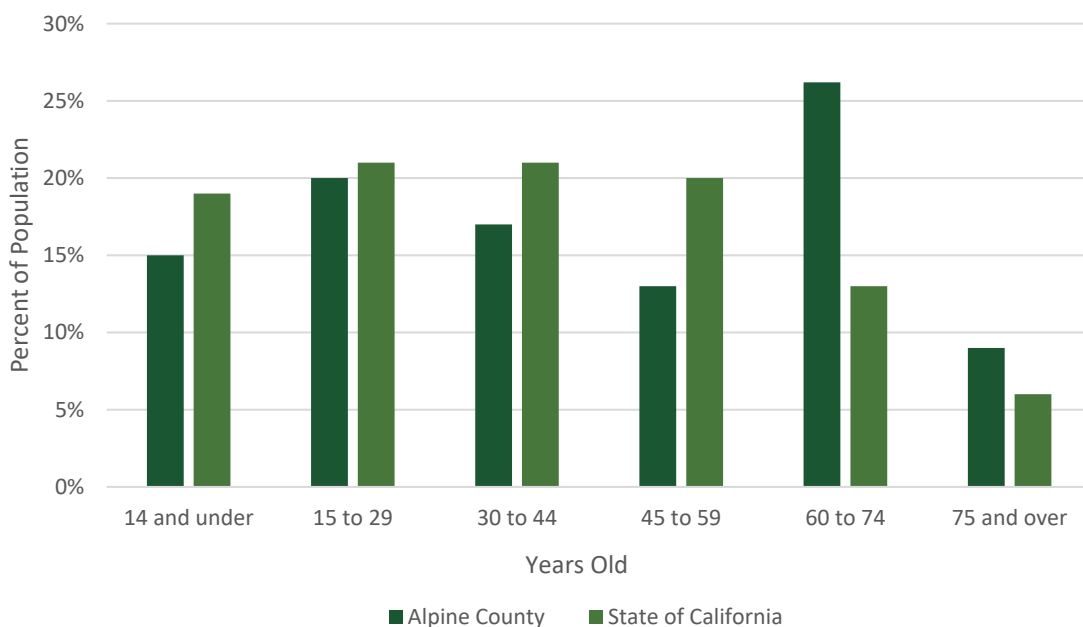
Thousands of bicyclists are drawn to the County every year for major events such as the Tour of the California Alps "Death Ride" and the Amgen Tour of California. The death ride started in 1978 and is now an annual summer event that features bicyclists traveling 129 miles through five passes with elevations of up to 15,000 feet. It attracts approximately 3,500 participants annually.

Figure 2 presents the population distribution by age in Alpine County compared to the State of California. As shown, Alpine County has a greater number of residents 60 years and older when compared to the state. The median age in Alpine County is 44 which is older than the statewide median age of 36.

² 2018 American Community Survey 5-Year Estimates; Table S0101



Figure 2: Alpine County Population Distribution by Age



The median household income in Alpine County is approximately \$64,700 which is approximately 9% less than the statewide median household income of \$71,200³. As a tourist destination, retail, arts, entertainment, recreation, accommodation services and food services are two of the largest industries in the County and approximately 33% of workers in the County work in these industries. **Table 1** displays the distribution of workers over the age of 16 by industry in Alpine County compared to the State of California.

³ 2018 American Community Survey – 5-Year Estimates; Table S1901



Table 1: Distribution of Workers by Industry – Alpine County

Industry	Alpine County	State of California
Agriculture, forestry, fishing, hunting and mining	3.9 %	2.3 %
Construction	5.9 %	6.1 %
Manufacturing	0.0 %	9.3 %
Wholesale Trade	0.0 %	2.9 %
Retail Trade	17.1 %	10.6 %
Transportation, warehousing, and utilities	11.5 %	5.1 %
Information, finance, insurance, and real estate	5.6 %	9.0 %
Professional, scientific, management, administrative services, and waste management services	7.9 %	13.3 %
Educational services, health care, and social assistance	16.3 %	20.6 %
Arts, entertainment, recreation, and accommodation and food services	16.3 %	10.4 %
Other services	4.2 %	5.3 %
Public Administration	11.2 %	4.4 %
Armed forces	0.0 %	0.7 %

Source: 2018 American Community Survey 5-Year Estimates; Table S0802

Table 2 displays the primary means of transportation to work in Alpine County and the State of California. Although Alpine County is comprised of rural communities, seven percent of workers walk to work which is more than twice as high as the statewide percentage. Additionally, almost 14 percent of workers work from home which is also more than twice as high as the statewide percentage. Zero percent bike to work in Alpine County which could be a result of a lack of bike infrastructure, narrow shoulders and heavy traffic volumes. The 2018 Alpine Active Transportation Plan included a public survey and over 90 percent of respondents indicated lack of bike lanes/paths, traffic, and narrow paths/shoulders were barriers to bicycling whereas 50 percent of respondents indicated lack of sidewalks, traffic, and narrow paths/shoulders were barriers to walking.



Table 2: Means of Transportation to Work – Alpine County

Means of Transportation to Work	Alpine County	State of California
Drive Alone	66.0 %	73.7 %
Carpool	11.5 %	10.3 %
Public Transportation (excluding taxicab)	0.3 %	5.1 %
Walk	7.0 %	2.7 %
Bike	0.0 %	1.0 %
Taxicab, motorcycle, or other means	1.4 %	1.6 %
Work at home	13.8 %	5.7 %

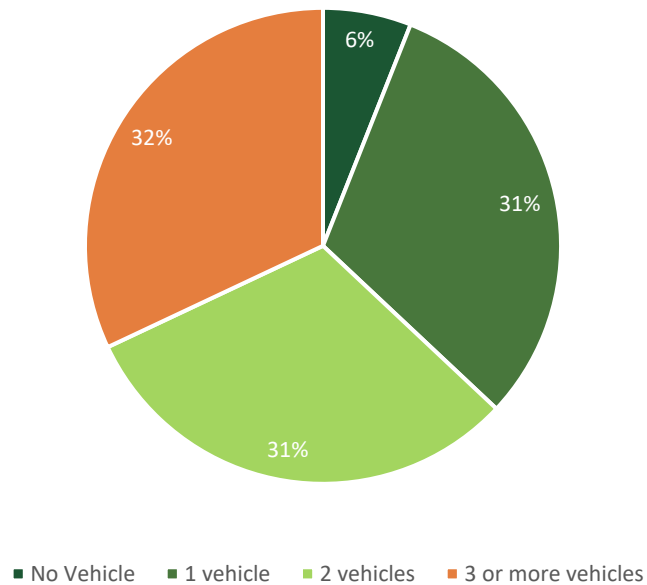
Source: 2018 American Community Survey 5-Year Estimates; Table S0802

Figure 3 presents the percent of residents with no vehicle available, one vehicle available, 2 vehicles available or three or more vehicles available⁴. As shown, approximately six percent of residents have no vehicle available. Given the rural nature of the County and minimal public transportation available, having no vehicle available could substantially limit access to goods and services.

⁴ 2018 American Community Survey 5-Year Estimates; Table DP04



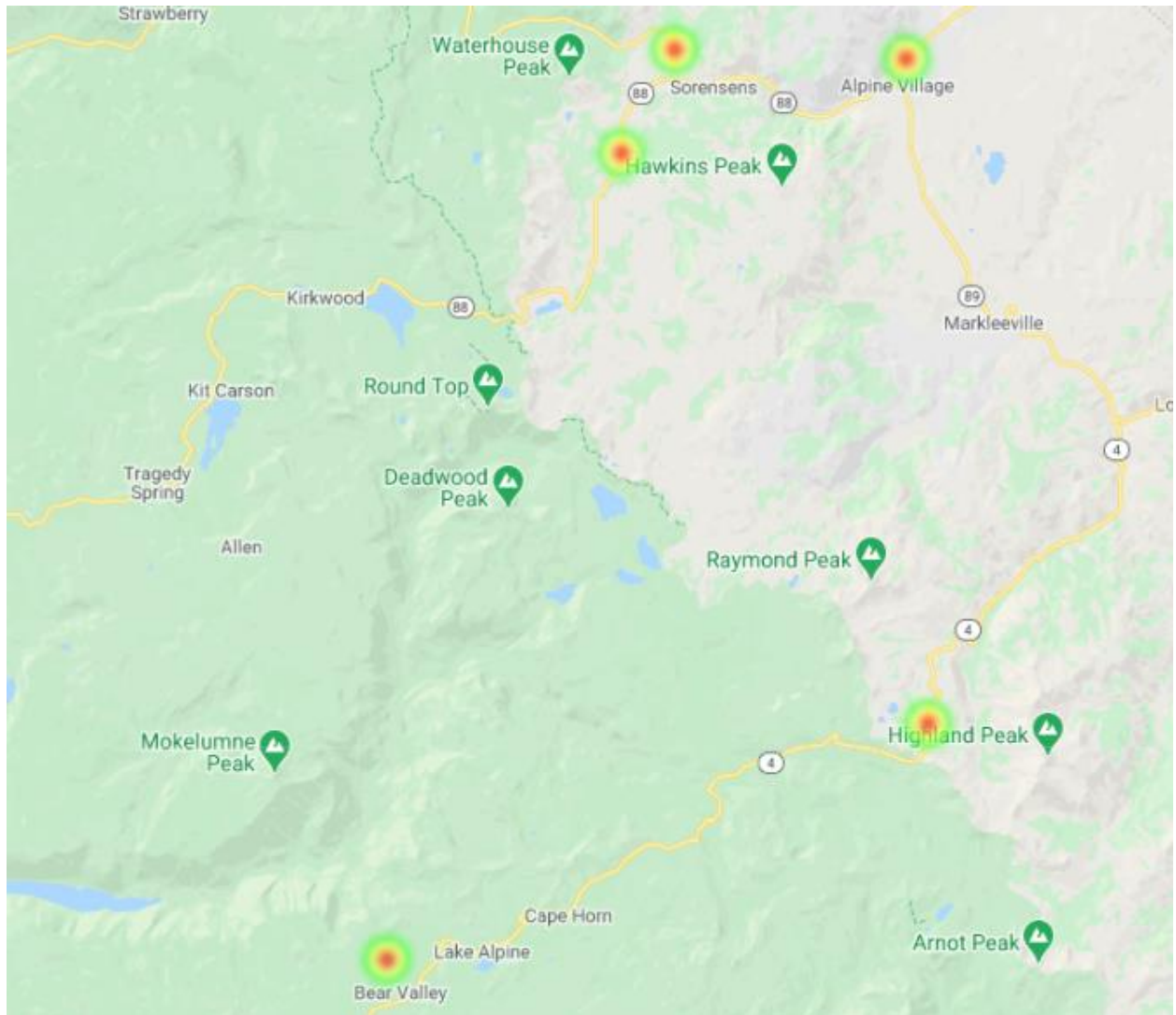
Figure 3: Vehicles Available per Household – Alpine County



Between January 1, 2015, and December 31, 2019, there were 170 collisions in Alpine County (excluding property damage only collisions); six of these collisions involved bicyclists and resulted in two fatalities and four injuries. No collisions involving pedestrians were reported during this time period. **Figure 4** is a heat map displaying the location of the collisions involving bicyclists. As displayed, most of the collisions involving bicyclists are on or near State highways. A map illustrating collisions can be found in **Attachment B**.



Figure 4: *Bicycle and Pedestrian Collision Heatmap – Alpine County*



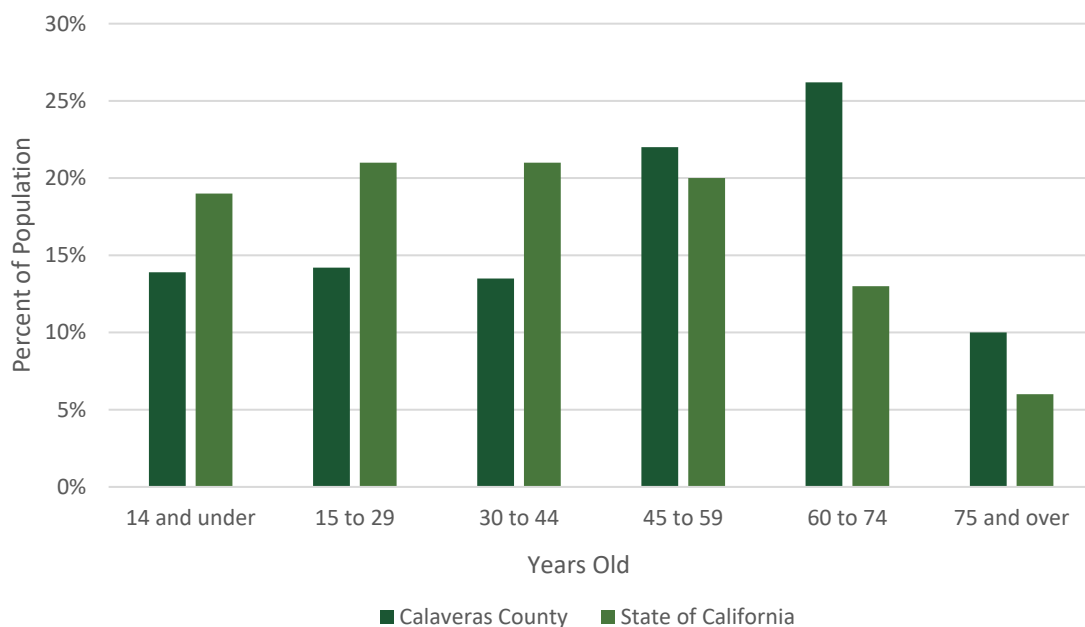
2.2 Calaveras County

Calaveras County is located in the foothills and mountainous terrain of the western slope of the Sierra Nevada Mountain region between Sacramento, Yosemite and Lake Tahoe. The County is comprised of approximately 1,020 square miles of land with variable topography. The County contains one incorporated City, the City of Angels; the rest of the County is unincorporated with clusters of rural communities. Primary access routes to and throughout the County include SR 4, 12, 26, and 49. As displayed on **Attachment A**, SR 4 is the only designated scenic route in the County.

Similar to Alpine County, Calaveras County provides an abundance of opportunities for outdoor enthusiasts and tourists. Attractions include boating, camping or fishing at the multiple lakes, reservoirs and rivers, hiking through State Parks such as Big Trees, skiing or snowboarding at Bear Valley, wine tasting, gold panning, cavern exploring and more.

Calaveras County has a population of approximately 45,200. **Figure 5** presents the population distribution by age compared to the State of California. Similar to Alpine County, Calaveras County has an older population when compared to the state, particularly when comparing those over 60 years old. This is also reflected in the median age which is 52 in Calaveras County and 36 in the State of California.



Figure 5: Calaveras County Population Distribution by Age

The median household income in Calaveras County is \$58,200. **Table 3** presents the distribution of workers over the age of 16 by industry. Educational services, health care and social assistance is the largest industry in the County with professional, scientific, management, administrative services and waste management services being the second largest industry.

Table 3: Distribution of Workers by Industry – Calaveras County

Industry	Calaveras County	State of California
Agriculture, forestry, fishing, hunting and mining	3.0 %	2.3 %
Construction	11.6 %	6.1 %
Manufacturing	8.0 %	9.3 %
Wholesale Trade	2.1 %	2.9 %
Retail Trade	11.2 %	10.6 %
Transportation, warehousing, and utilities	5.2 %	5.1 %
Information, finance, insurance, and real estate	6.2 %	9.0 %
Professional, scientific, management, administrative services, and waste management services	12.2 %	13.3 %
Educational services, health care, and social assistance	20.5 %	20.6 %



Industry	Calaveras County	State of California
Arts, entertainment, recreation, and accommodation and food services	7.7 %	10.4 %
Other services	4.4 %	5.3 %
Public Administration	7.7 %	4.4 %
Armed forces	0.2 %	0.7 %

Source: 2018 American Community Survey 5-Year Estimates; Table S0802

Table 4 displays the means of transportation to work. Approximately 76 percent of residents drive alone and 11 percent carpool; indicating approximately 87 percent of residents rely on a vehicle to get to work. Approximately 10 percent of residents within the County work at home.

Table 4: Means of Transportation to Work – Calaveras County

Means of Transportation to Work	Calaveras County	State of California
Drive Alone	75.6 %	73.7 %
Carpool	11.0 %	10.3 %
Public Transportation (excluding taxicab)	1.1 %	5.1 %
Walk	1.8 %	2.7 %
Bike	0.1 %	1.0 %
Taxicab, motorcycle, or other means	0.6 %	1.6 %
Work at home	9.7 %	5.7 %

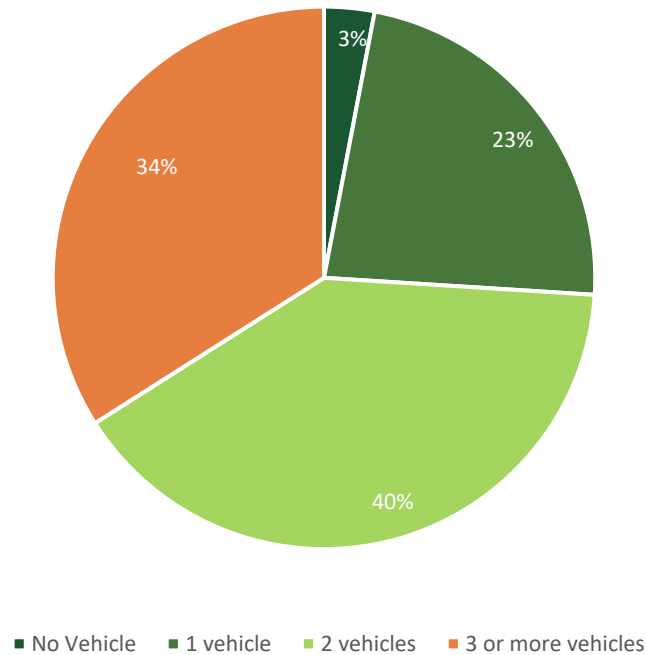
Source: 2018 American Community Survey 5-Year Estimates; Table S0801

Figure 6 presents the percent of residents with no vehicle available, one vehicle available, 2 vehicles available or three or more vehicles available⁵.

⁵ 2018 American Community Survey 5-Year Estimates; Table DP04



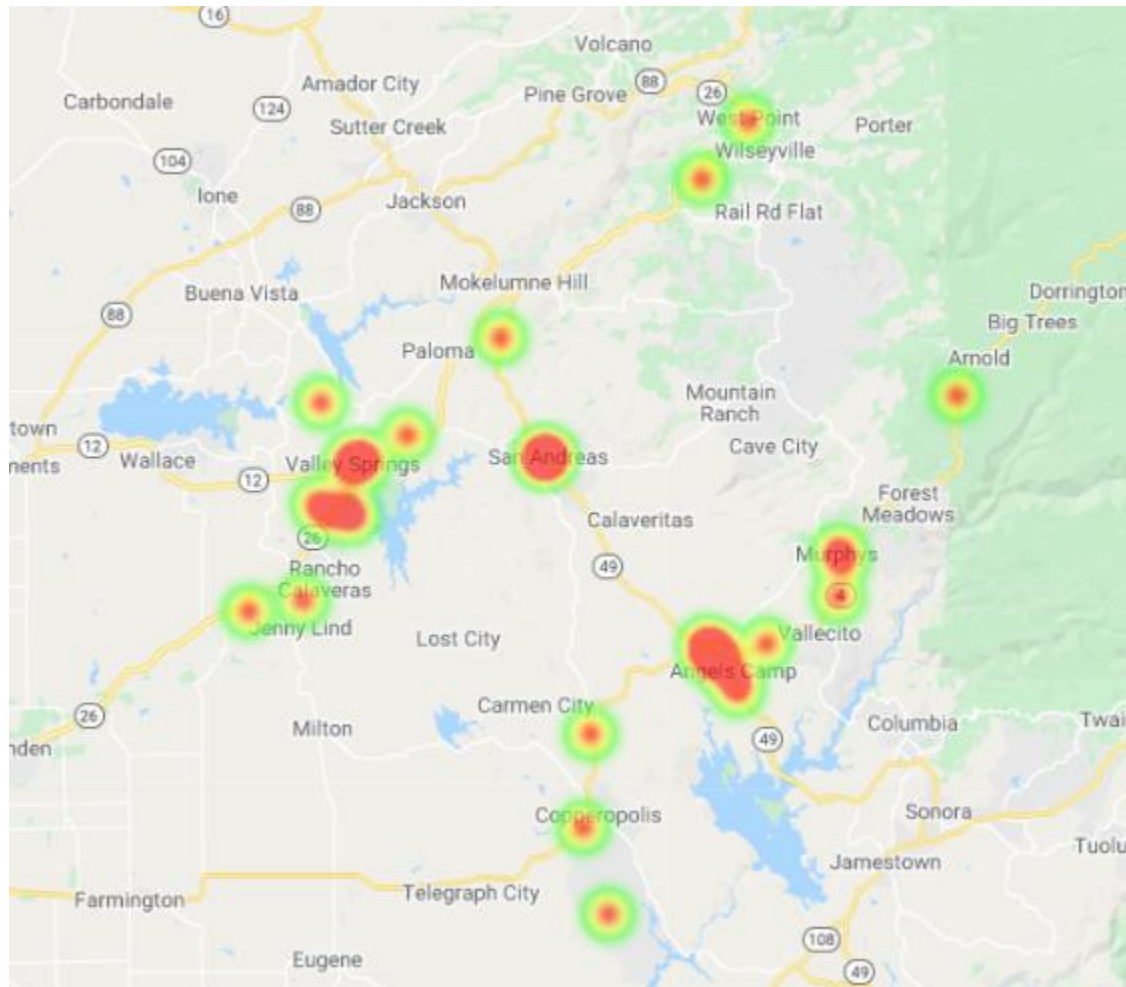
Figure 6: Vehicles Available by Households – Calaveras County



Between January 1, 2015 and December 31, 2019, there were 1,236 collisions in Calaveras County (excluding property damage only collisions); 27 of these collisions involved pedestrians and nine collisions involved bicyclists. Collisions involving pedestrians and bicyclists resulted in two fatalities and 38 injuries. **Figure 7** is a heat map displaying the location of the collisions involving pedestrians and bicyclists. As displayed, many of the collisions are on or near State highways. A full map of collisions can be found in **Attachment B**.



Figure 7: *Bicycle and Pedestrian Collision Heatmap – Calaveras County*



2.3 San Joaquin County

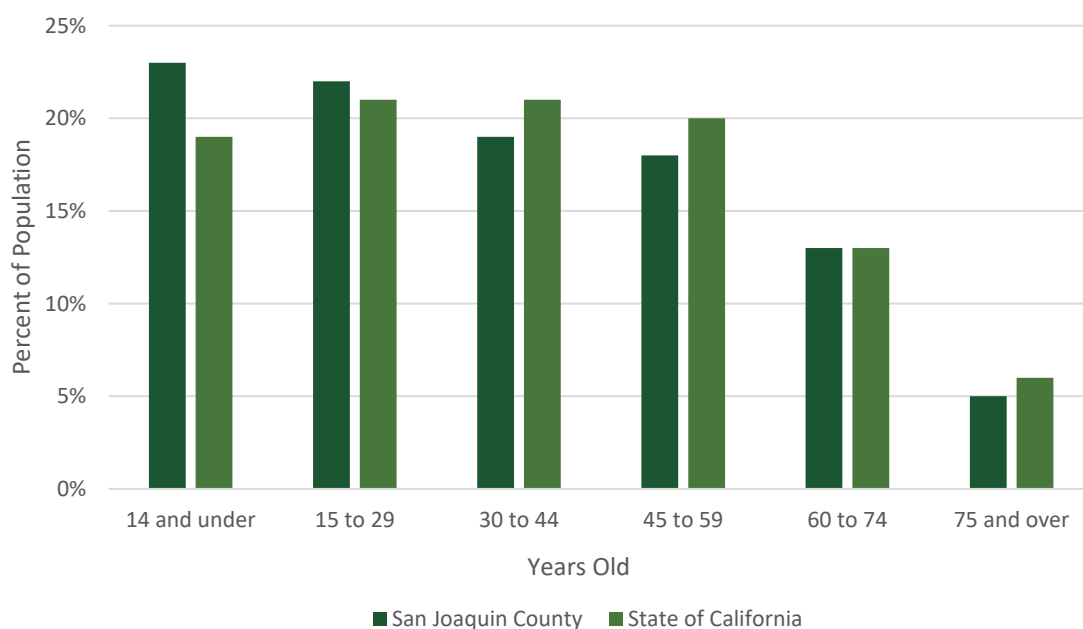
San Joaquin County is centrally located in the San Joaquin Valley, which is one of California's most productive agricultural areas. The County encompasses approximately 1,440 square miles of relatively level land; nearly 40 percent is encompassed by the Sacramento-San Joaquin Delta. The majority of land area is dedicated to agriculture but the following cities and communities integrate residential, commercial, and industrial development. Major communities include:

- Escalon
- Lathrop
- Lodi
- Manteca
- Mountain House
- Ripon
- Stockton
- Tracy

Multiple freeways, highways, and regionally significant roadways provide access to and throughout the County. The County has a population of approximately 732,200. **Figure 8** presents the population distribution by age compared to the State of California. The age distribution for San Joaquin County is generally consistent with the State; however, there are slightly more residents 14 and under. The median age in San Joaquin County is 34.



Figure 8: San Joaquin County Population Distribution by Age



The median household income in San Joaquin County is \$61,100. **Table 5** presents the distribution of workers over the age of 16 by industry. Educational services, health care, and social assistance and retail are the two largest employment industries in the County.

Table 5: Distribution of Workers by Industry – San Joaquin County

Industry	San Joaquin County	State of California
Agriculture, forestry, fishing, hunting and mining	4.7 %	2.3 %
Construction	8.0 %	6.1 %
Manufacturing	10.0 %	9.3 %
Wholesale Trade	3.5 %	2.9 %
Retail Trade	11.9 %	10.6 %
Transportation, warehousing, and utilities	8.2 %	5.1 %
Information, finance, insurance, and real estate	6.1 %	9.0 %
Professional, scientific, management, administrative services, and waste management services	9.6 %	13.3 %
Educational services, health care, and social assistance	20.1 %	20.6 %



Industry	San Joaquin County	State of California
Arts, entertainment, recreation, and accommodation and food services	8.0 %	10.4 %
Other services	4.8 %	5.3 %
Public Administration	4.9 %	4.4 %
Armed forces	0.1 %	0.7 %

Source: 2018 American Community Survey 5-Year Estimates; Table S0802

Table 6 displays the means of transportation to work in San Joaquin County. As displayed, approximately 92 percent of workers rely on an automobile to get to work.

Table 6: Means of Transportation to Work – San Joaquin County

Means of Transportation to Work	San Joaquin County	State of California
Drive Alone	78.2 %	73.7 %
Carpool	13.6 %	10.3 %
Public Transportation (excluding taxicab)	1.5 %	5.1 %
Walk	1.5 %	2.7 %
Bike	0.5 %	1.0 %
Taxicab, motorcycle, or other means	0.9 %	1.6 %
Work at home	3.9 %	5.7 %

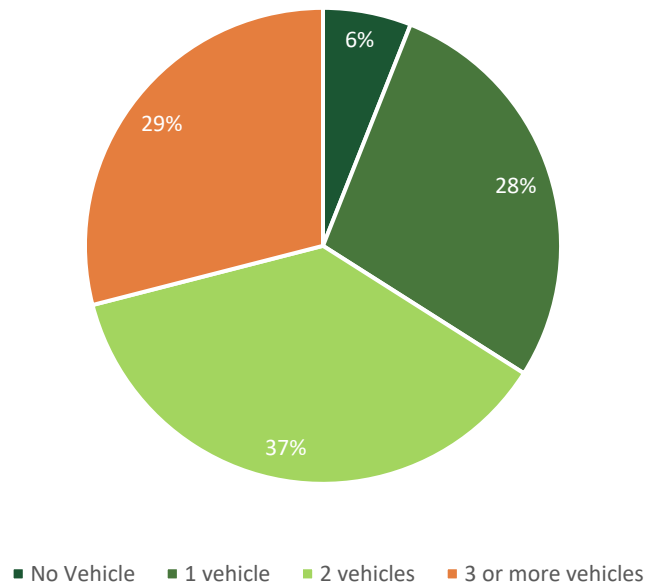
Source: 2018 American Community Survey 5-Year Estimates; Table S0801

Figure 9 presents the percent of residents with no vehicle available, one vehicle available, 2 vehicles available or three or more vehicles available⁶.

⁶ 2018 American Community Survey 5-Year Estimates; Table DP04



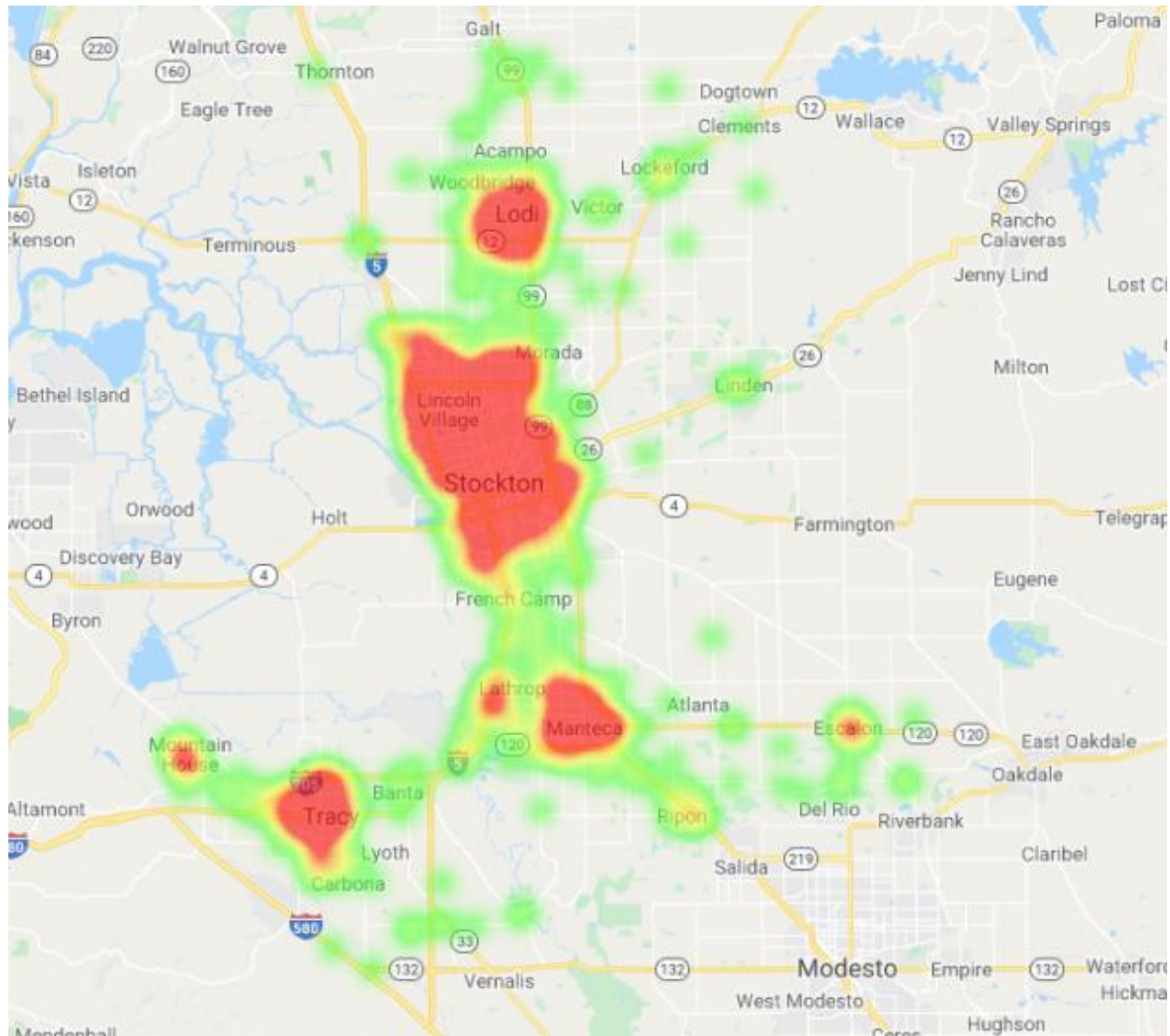
Figure 9: Vehicles Available by Household – San Joaquin County



Between January 1, 2015 and December 31, 2019, there were 20,598 collisions in San Joaquin County (excluding property damage only collisions); 1,203 of these collisions involved pedestrians and 986 collisions involved bicyclists. Collisions involving pedestrians and bicyclists resulted in 172 fatalities and 2,175 injuries. The overall number of collisions is significantly higher in San Joaquin County and Stanislaus County as compared to the other study areas, due in part to the difference in overall population. **Figure 10** is a heat map displaying the location of the collisions involving pedestrians and bicyclists. As displayed, the majority of these collision are located in the denser cities within the County such as Stockton, Manteca, Tracy and Lodi. A more detailed collision map can be found in **Attachment B**.



Figure 10: *Bicycle and Pedestrian Collision Heatmap – San Joaquin County*



2.4 Stanislaus County

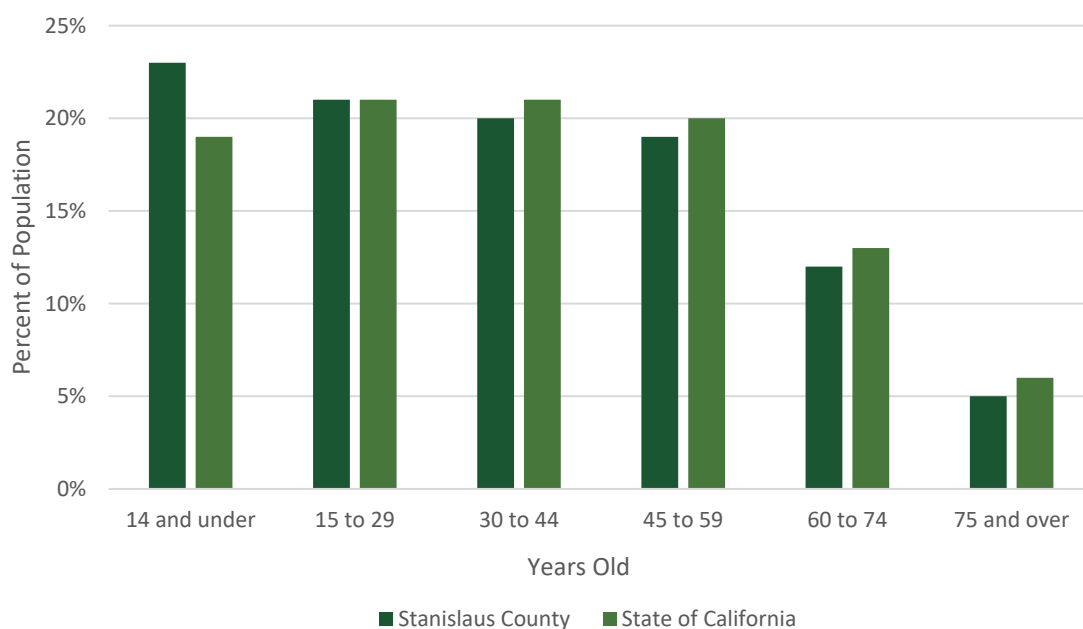
Stanislaus County encompasses nearly 1,500 square miles of land area in California's Central Valley, just south of San Joaquin County. The topography and geography range from elevations of 70 feet above sea level to over 3,300 feet above sea level. Much of the County is undeveloped or devoted to agriculture; approximately six percent of the County is urbanized. The majority of developed land is located in the center of the County or within the following incorporated cities:

- Ceres
- Houghson
- Modesto
- Newman
- Oakdale
- Patterson
- Riverbank
- Turlock
- Waterford

Multiple freeways, highways, and regionally significant roadways provide access to and throughout the County. Stanislaus County has a population of approximately 539,300. **Figure 11** presents the population distribution by age compared to the State of California. Similar to San Joaquin County, the age distribution for Stanislaus County is generally consistent with the State; however, there are slightly more residents 14 and under. The median age in Stanislaus County is 34.



Figure 11: Stanislaus County Population Distribution by Age



The median household income in Stanislaus County is \$57,400. **Table 7** presents the distribution of workers over the age of 16 by industry. Educational services, health care, and social assistance is the largest employment industry with retail trade and manufacturing as the second and third largest.

Table 7: Distribution of Workers by Industry – Stanislaus County

Industry	Stanislaus County	State of California
Agriculture, forestry, fishing, hunting and mining	5.3 %	2.3 %
Construction	7.9 %	6.1 %
Manufacturing	12.2 %	9.3 %
Wholesale Trade	3.9 %	2.9 %
Retail Trade	12.8 %	10.6 %
Transportation, warehousing, and utilities	6.3 %	5.1 %
Information, finance, insurance, and real estate	4.9 %	9.0 %
Professional, scientific, management, administrative services, and waste management services	8.9 %	13.3 %
Educational services, health care, and social assistance	21.1 %	20.6 %



Industry	Stanislaus County	State of California
Arts, entertainment, recreation, and accommodation and food services	8.1 %	10.4 %
Other services	4.7 %	5.3 %
Public Administration	3.6 %	4.4 %
Armed forces	0.1 %	0.7 %

Source: 2018 American Community Survey 5-Year Estimates; Table S0802

Table 8 displays the means of transportation to work in Stanislaus County. As displayed, approximately 91 percent of workers rely on an automobile to get to work.

Table 8: Means of Transportation to Work – Stanislaus County

Means of Transportation to Work	Stanislaus County	State of California
Drive Alone	81.6 %	73.7 %
Carpool	9.9 %	10.3 %
Public Transportation (excluding taxicab)	0.8 %	5.1 %
Walk	1.3 %	2.7 %
Bike	0.4 %	1.0 %
Taxicab, motorcycle, or other means	1.1 %	1.6 %
Work at home	4.8 %	5.7 %

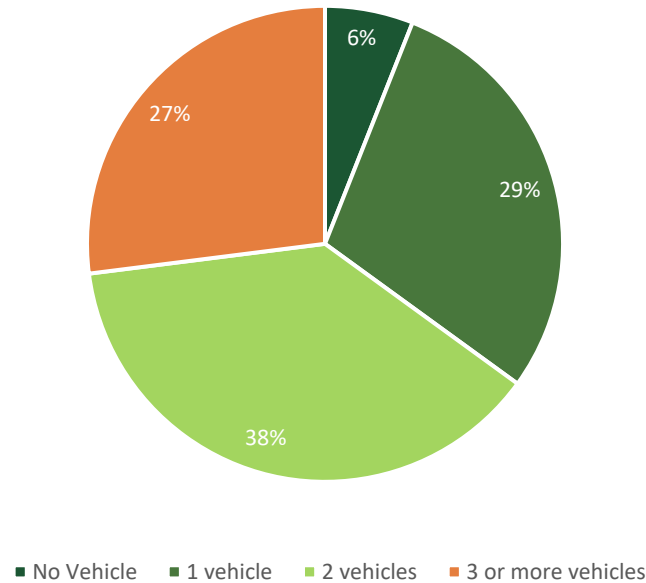
Source: 2018 American Community Survey 5-Year Estimates; Table S0801

Figure 12 presents the percent of residents with no vehicle available, one vehicle available, 2 vehicles available or three or more vehicles available⁷.

⁷ 2018 American Community Survey 5-Year Estimates; Table DP04



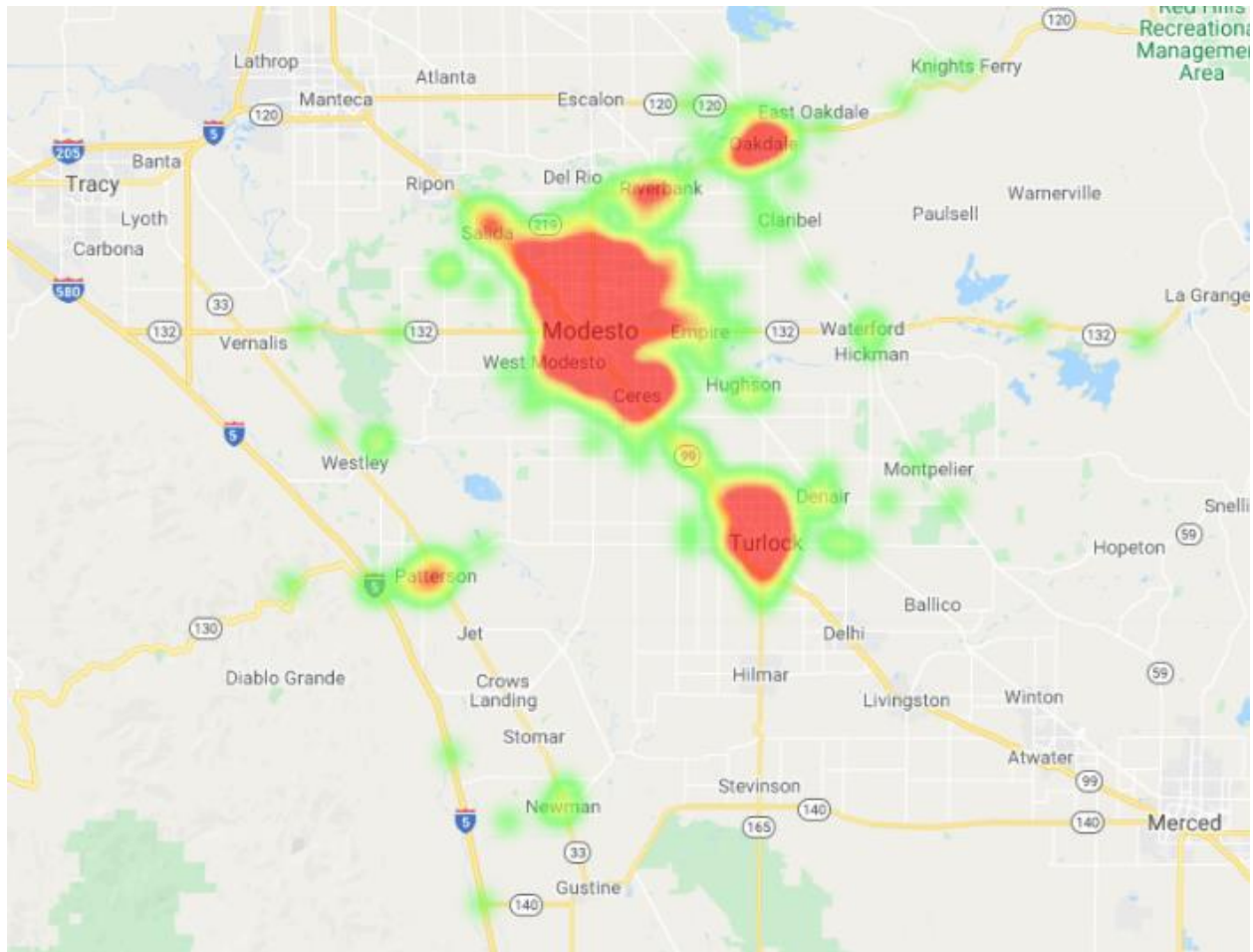
Figure 12: Vehicles Available by Household – Stanislaus County



Between January 1, 2015 and December 31, 2019, there were 25,603 collisions in Stanislaus County (excluding property damage only collisions); 956 of these collisions involved pedestrians and 792 collisions involved bicyclists. Collisions involving pedestrians and bicyclists resulted in 107 fatalities and 1,743 injuries. The overall number of collisions is significantly higher in Stanislaus and San Joaquin Counties as compared to other areas in the Plan, due in part to the greater overall population. **Figure 13** is a heat map displaying the location of the collisions involving pedestrians and bicyclists. As displayed, the majority of these collision are located in the City of Modesto; however, Ceres, Oakdale, Turlock, and Riverbank are also higher collision areas in comparison to the rest of the County. A map of collision locations can be found in **Attachment B**.



Figure 13: Bicycle and Pedestrian Collision Heatmap – Stanislaus County

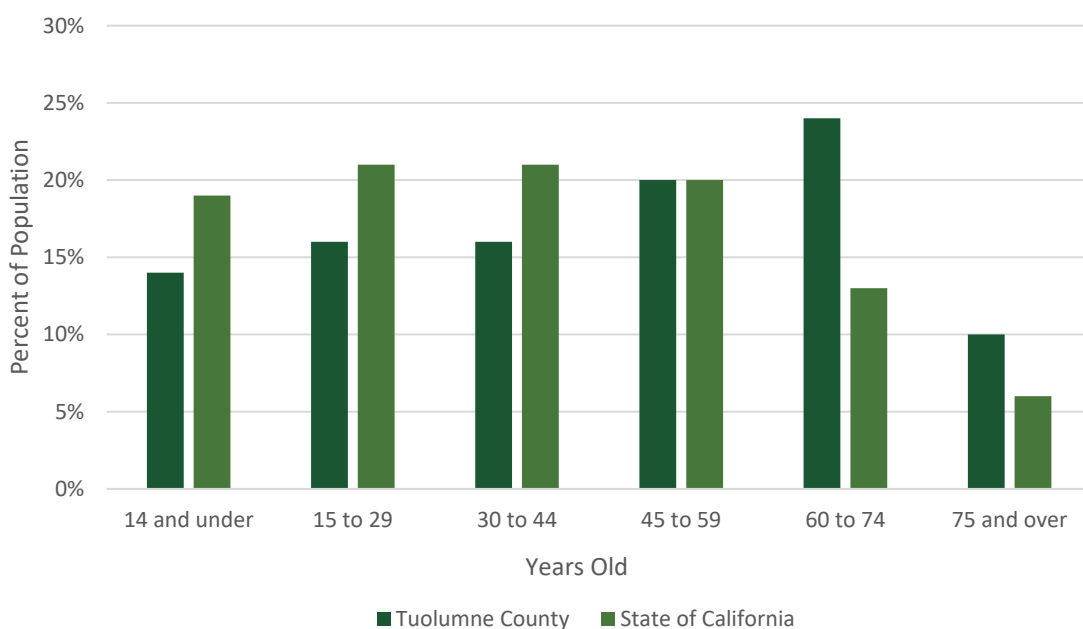


2.5 Tuolumne County

Tuolumne County encompasses approximately 2,270 acres of land area in the Sierra Nevada Mountain region; approximately 75 percent of the County is comprised of public land. Yosemite National Park and the Stanislaus National Forest attract millions of visitors to the region annually. Tuolumne County provides ample opportunities for hiking, camping, mountain biking, rock climbing, skiing, and roaming through historic towns such as Jamestown and Twain Harte. The County contains one incorporated city, the City of Sonora. Primary access to and throughout the County is provided by SR 49, 108 and 120. As displayed in **Attachment A**, all three highways are designated as scenic highways in the County.

Tuolumne County has a population of approximately 53,900. **Figure 14** presents the population distribution by age compared to the State of California. Similar to Alpine and Calaveras County, Tuolumne County has an older population when compared to the State, particularly when comparing those over 60 years old. The median age in Tuolumne County is 48.



Figure 14: Tuolumne County Population Distribution by Age

The median household income in Tuolumne County is \$56,500. **Table 9** presents the distribution of workers over the age of 16 by industry. Educational services, health care, and social assistance is the largest employment industry with arts, entertainment, and accommodation and food services being the second largest.

Table 9: Distribution of Workers by Industry – Tuolumne County

Industry	Tuolumne County	State of California
Agriculture, forestry, fishing, hunting and mining	3.1 %	2.3 %
Construction	6.8 %	6.1 %
Manufacturing	5.0 %	9.3 %
Wholesale Trade	1.0 %	2.9 %
Retail Trade	9.3 %	10.6 %
Transportation, warehousing, and utilities	5.7 %	5.1 %
Information, finance, insurance, and real estate	6.2 %	9.0 %
Professional, scientific, management, administrative services, and waste management services	9.0 %	13.3 %
Educational services, health care, and social assistance	23.0 %	20.6 %



Industry	Tuolumne County	State of California
Arts, entertainment, recreation, and accommodation and food services	15.9 %	10.4 %
Other services	6.6 %	5.3 %
Public Administration	8.5 %	4.4 %
Armed forces	0.0 %	0.7 %

Source: 2018 American Community Survey 5-Year Estimates; Table S0802

Table 10 displays the means of transportation to work in Tuolumne County. As displayed, approximately 91 percent of workers rely on an automobile to get to work.

Table 10: Means of Transportation to Work – Tuolumne County

Means of Transportation to Work	Tuolumne County	State of California
Drive Alone	81.4 %	73.7 %
Carpool	9.4 %	10.3 %
Public Transportation (excluding taxicab)	0.5 %	5.1 %
Walk	1.9 %	2.7 %
Bike	0.3 %	1.0 %
Taxicab, motorcycle, or other means	1.4 %	1.6 %
Work at home	5.2 %	5.7 %

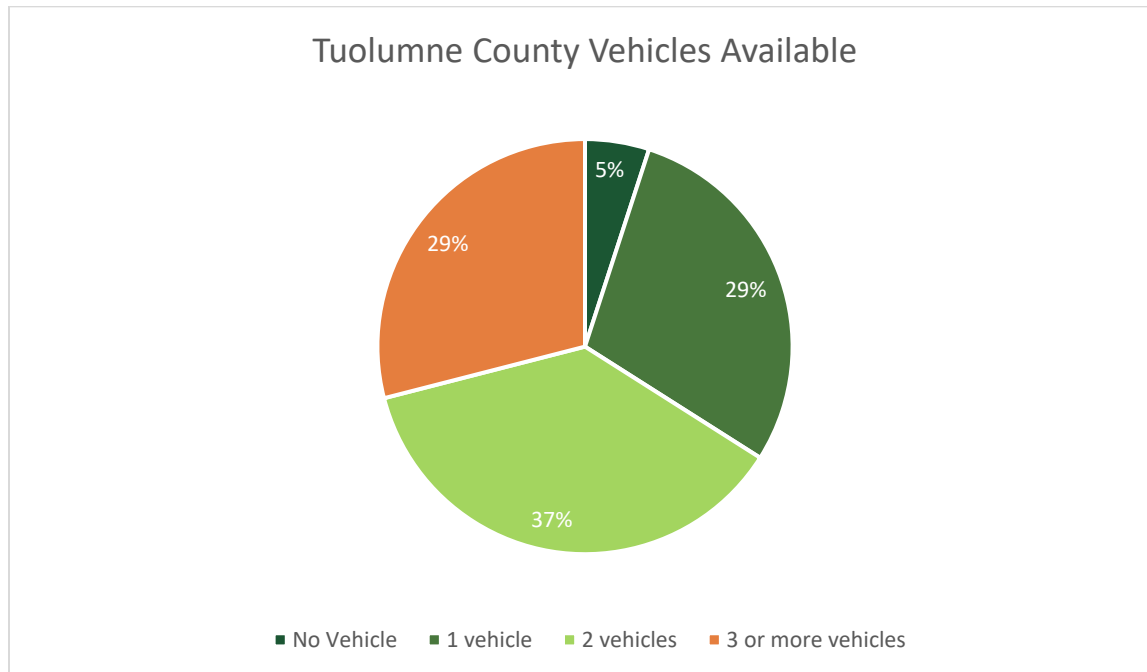
Source: 2018 American Community Survey 5-Year Estimates; Table S0801

Figure 15 presents the percent of residents with no vehicle available, one vehicle available, 2 vehicles available or three or more vehicles available⁸.

⁸ 2018 American Community Survey 5-Year Estimates; Table DP04



Figure 15: Vehicles Available by Household – Tuolumne County

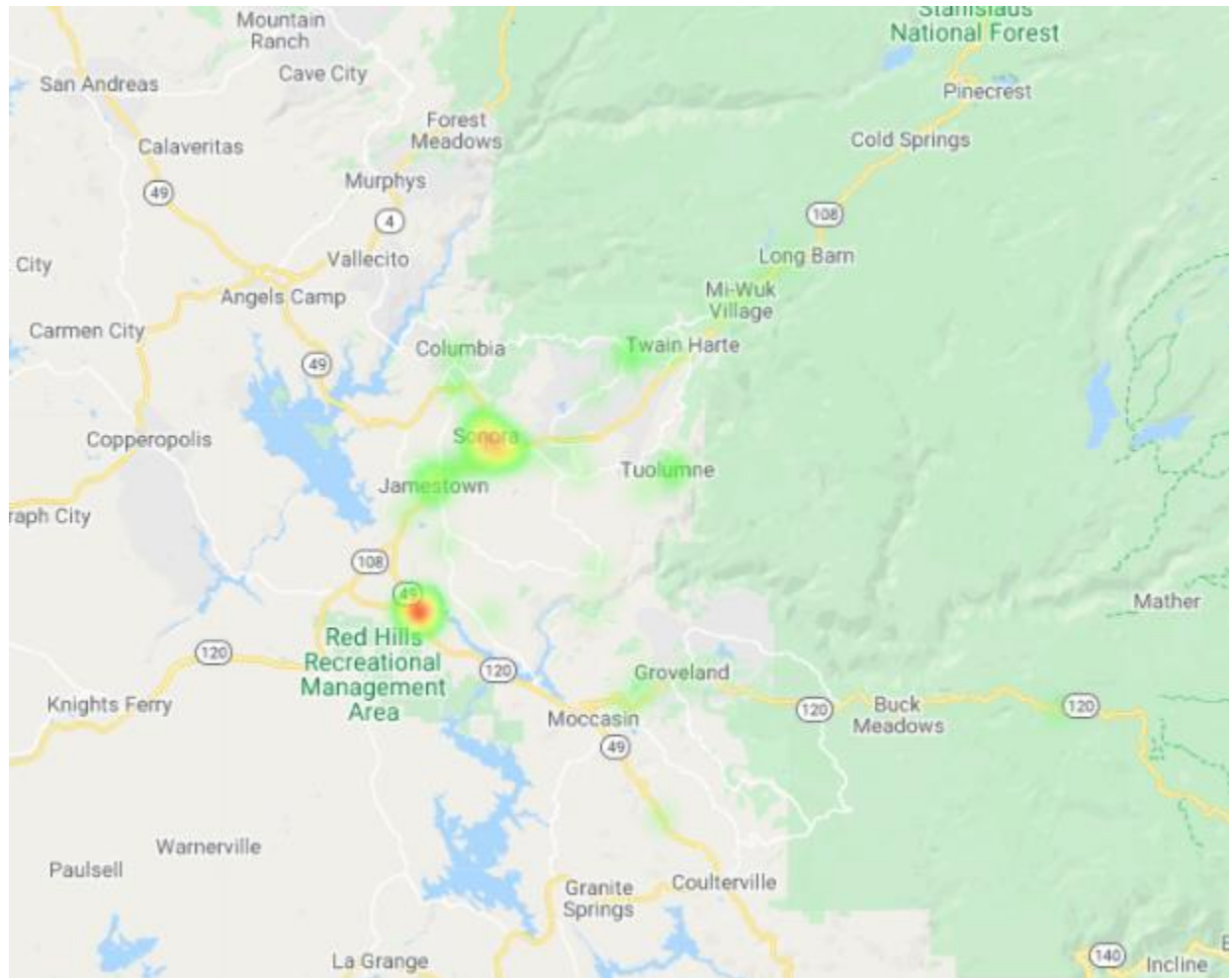


Between January 1, 2015 and December 31, 2019, there were 1,808 collisions in Tuolumne County (excluding property damage only collisions); 80 of these collisions involved pedestrians and 29 collisions involved bicyclists. Collisions involving pedestrians and bicyclists resulted in 5 fatalities and 115 injuries.

Figure 16 is a heat map displaying the location of the collisions involving pedestrians and bicyclists. As displayed, the majority of these collisions occur on state routes with a high proportion occurring near the SR 120/SR 49 split. A map of collision locations can be found in **Attachment B**.



Figure 16: *Bicycle and Pedestrian Collision Heatmap – Tuolumne County*



3. Equity and Environmental Justice

3.1 Median Household Income

Median household income data was mapped by census tract for each of the five counties (American Community Survey, 2014-18), and is shown in **Figure 17**. Median household income is symbolized in three tiers, with brown symbolizing communities with median household incomes of less than 80% the overall state median (approximately \$56,900 or below), grey symbolizing communities between 80% and 100% of statewide median household income, and green being communities that exceed the state median.

In general, lower-income communities tend to have fewer options and face more transportation safety issues. Census tracts that fell below the state median are found in every county studied under the Plan except Alpine County.

3.2 CalEnviroScreen

CalEnviroScreen is a California specific environmental justice database that accounts for social vulnerability and pollution exposure. This census tract level database combines 20 indicators into a score used to help identify disadvantaged communities with high exposure. The score from CalEnviroScreen is symbolized in **Figure 18**, with green being communities that scored in the first quintile (best) and brown being communities that scored in the fifth quintile (worst). State guidelines for the ATP program considers any census tract in the 75-100th percentile to qualify as a disadvantaged community.

Communities in San Joaquin and Stanislaus Counties (and particularly in the western portion of each county) rank among the most impacted in the state under CalEnviroScreen criteria. All of the census tracts within Alpine, Tuolumne, or Calaveras County score much better in the CalEnviroScreen rankings, falling within the third quintile or higher.

3.3 Healthy Places Index

The HPI is one of the criteria state guidelines for the ATP program uses to determine whether a community is disadvantaged. From the guidelines:

The Healthy Places Index includes a composite score for each census tract in the State. The higher the score, the healthier the community conditions based on 25 community characteristics. The scores are then converted to a percentile to compare it to other tracts in the State. A census tract must be in the 25th percentile or less to qualify as a disadvantaged community.

HPI by census tract is shown in **Figure 19**, with green being communities that scored in the 75-100th percentiles (best) and brown being communities that scored in the 0-25th percentiles (worst).



HPI scores vary more widely across the study area than CalEnviroScreen. Generally, lower scores in the categories of educational attainment, transportation access, and retail density contribute to lower overall HPI scores in the foothill communities, which is likely due in part to the geographic and development characteristics of more rural communities. In San Joaquin and Stanislaus counties, multiple factors are at play in low scoring census tracts, including housing costs, poverty, educational attainment, and environmental conditions.



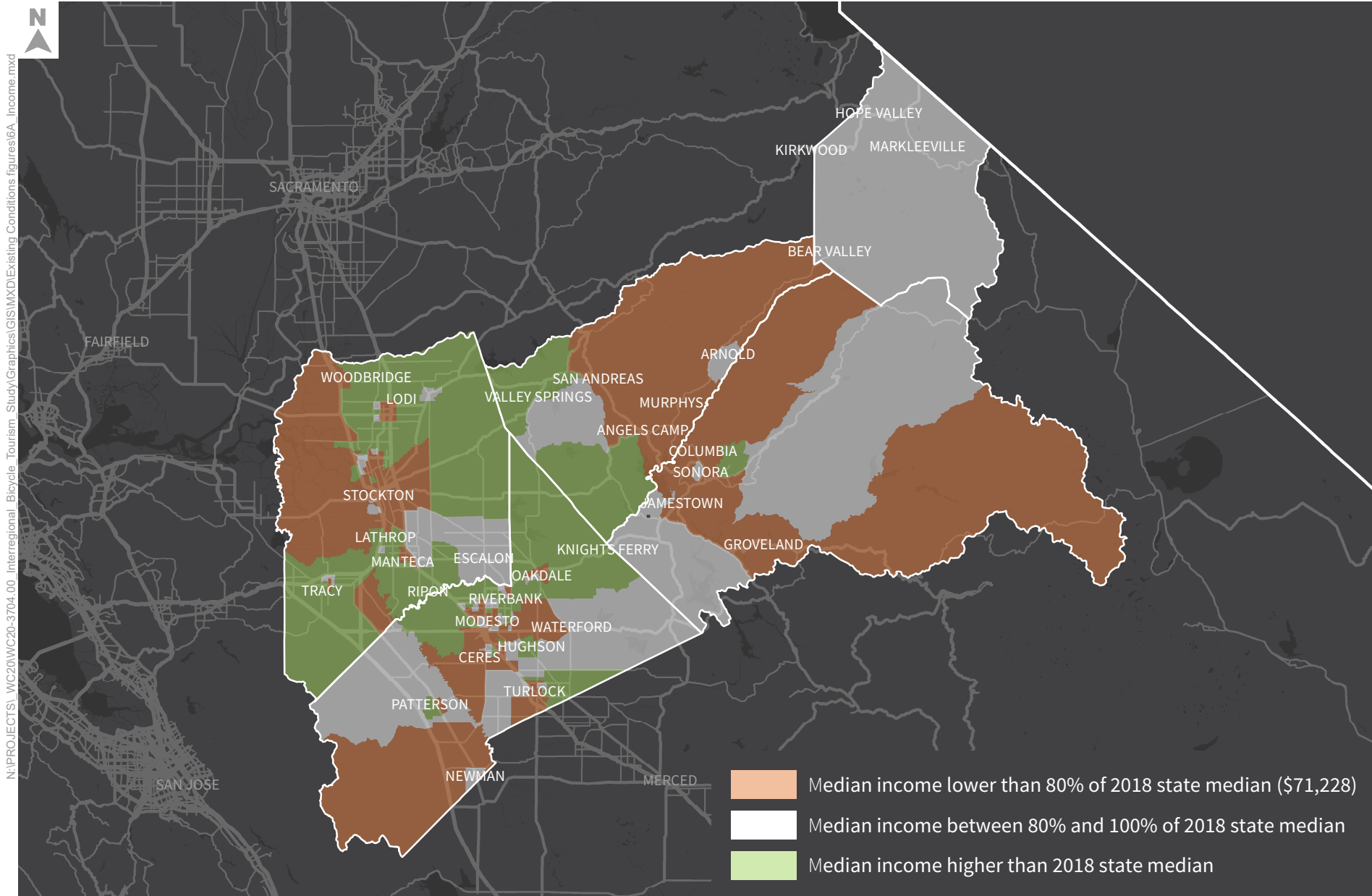
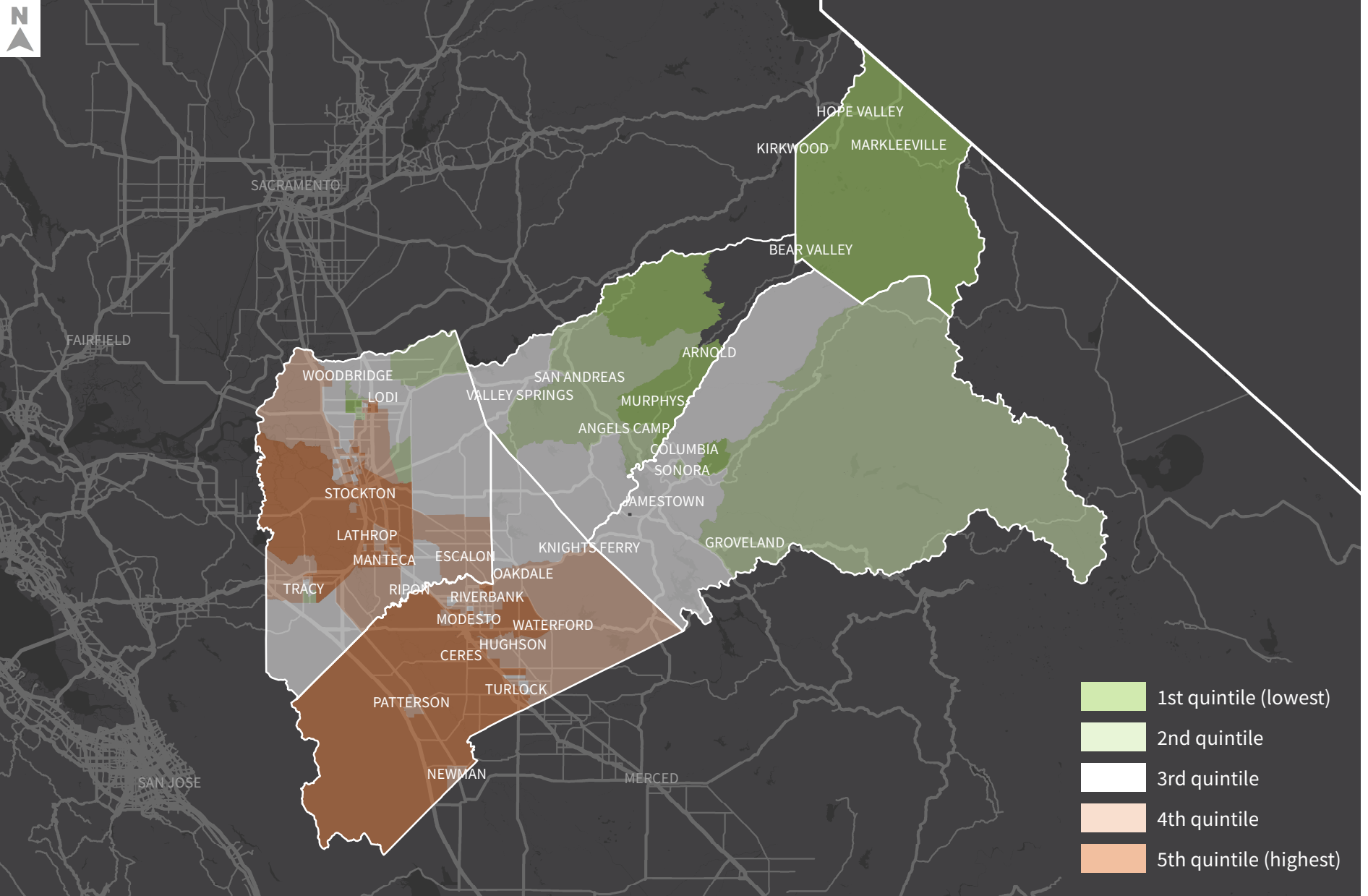


Figure 17
Median Household Income by Census Tract (American Community Survey, 2014-18)



- 1st quintile (lowest)
- 2nd quintile
- 3rd quintile
- 4th quintile
- 5th quintile (highest)



Figure 18
Results from CalEnviroScreen 3.0 (2018)

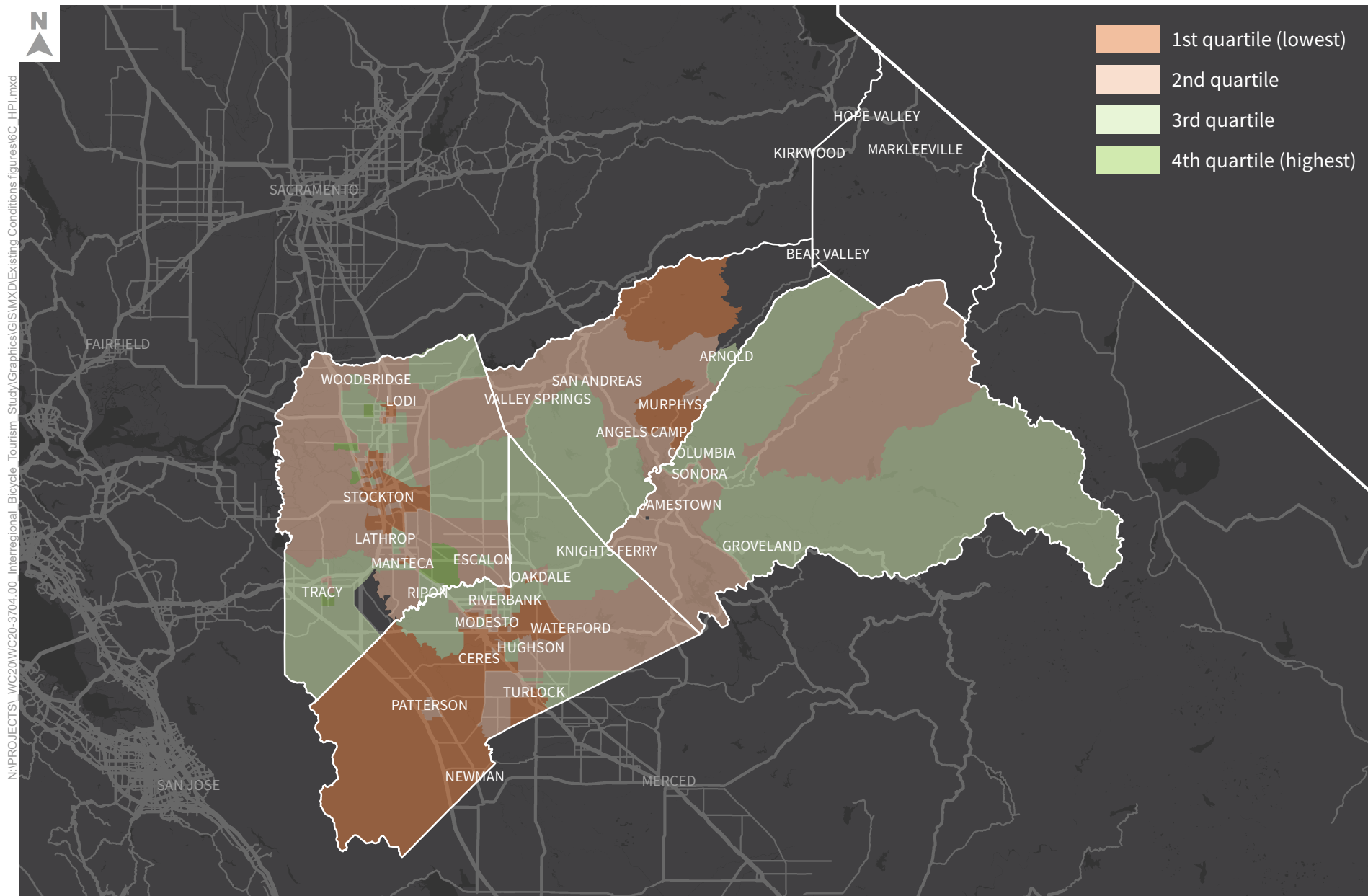


Figure 19
Census Tracts in the Project Area by the California Healthy Places Index (HPI)

4. Level of Traffic Stress

LTS is an approximate measure of the level of stress felt when riding a bicycle on a given stretch of roadway, with 1 being the lowest level of stress and 4 being the highest. Generally, an LTS level of 1 indicates that a given stretch of roadway is suitable to bike for all users, including children, while an LTS level of 2 is roughly the tolerable stress of the average adult bicyclist. Many of the roadways within the study area are LTS 3 or 4, indicating that the facility is suitable only for very confident bicyclists or those with a high roadway stress tolerance. A number of contextual factors are considered when calculating LTS, including speed limits, roadway width, number of lanes, presence of bike facilities, and others.

Figure 20 shows LTS values for major roadways within the study area. All major highways score at an LTS 4, with the exception of a few small segments that fall within places like Yosemite National Park and Columbia State Historic Park.

In order to attract a broader array of users for bicycle tourism, projects developed as part of the Plan will need to emphasize low-stress bikeways suitable for all ages and abilities. A set of maps showing the LTS on key local roadways along with lodging, attractions, and bicycle shops for each of the project Showcase Areas can be found in **Attachment C**.



Figure 20

Level of Traffic Stress on Major Highways

5. Document Review

Multiple documents were reviewed for each jurisdiction to identify existing and planned bicycle improvements and evaluate opportunities or hindrances to successfully promoting bicycle tourism in the five-county region. Documents that were highlighted by Steering Committee members for focused review are detailed below.

2018 Alpine County Active Transportation Plan

The 2018 Alpine County Active Transportation Plan identifies existing and future infrastructure and programs related to active transportation. The ATP included an extensive public outreach process that used a project website and Facebook to distribute information and discuss the project, public meetings, and an online questionnaire via SurveyMonkey. Multiple projects including safe crossings on state highways, wayfinding signage and kiosks, and specific community projects such as crosswalks, bike lanes, and trails are identified to facilitate active transportation and create a more comfortable bicycle and pedestrian network.

2015 Calaveras County Regional Bicycle, Pedestrian and Safe Routes to School Master Plan

The Calaveras County Regional Bicycle, Pedestrian, and Safe Routes to School Master Plan was developed by the Calaveras Council of Governments, in coordination with member agencies and public outreach efforts, to identify bike and pedestrian projects that improve connectivity and provide access for residents and community members, prioritize funding, and facilitate implementation. The plan identifies approximately 22 miles of existing bikeways and trails in Calaveras County and Angels Camp. A comprehensive needs assessment, which included community outreach and a community survey, collision analysis, commute patterns analysis, and other important considerations, identified approximately 17 miles of recommended bikeway projects in Angels Camp and approximately 237 miles of recommended bikeway projects in the County.

Stanislaus Council of Governments (StanCOG) Non-Motorized Transportation Master Plan (2020)

The StanCOG Non-Motorized Transportation Plan provides a countywide understanding of existing conditions and countywide priority bicycle and pedestrian improvements. The intent of the plan is to prioritize investments that serve countywide and local interests, increase accessibility of competitive grant funding sources, and update the 2013 StanCOG Non-Motorized Transportation Plan. Recommended improvements are provided for unincorporated Stanislaus County and each of the nine cities within the County.



2020 Tuolumne County Active Transportation Plan

The Tuolumne County Active Transportation Plan sets a goal to enhance walking, biking, and multimodal mobility throughout Tuolumne County. The plan was developed in coordination with the County, the City of Sonora, Caltrans District 10, federally recognized Native American tribal governments, the Caltrans Tribal Liaison, and community members and other stakeholders. Existing and planned projects are identified for the City of Sonora as well as rural communities in the County such as Columbia, Jamestown, Groveland, Twain Harte, and Tuolumne.

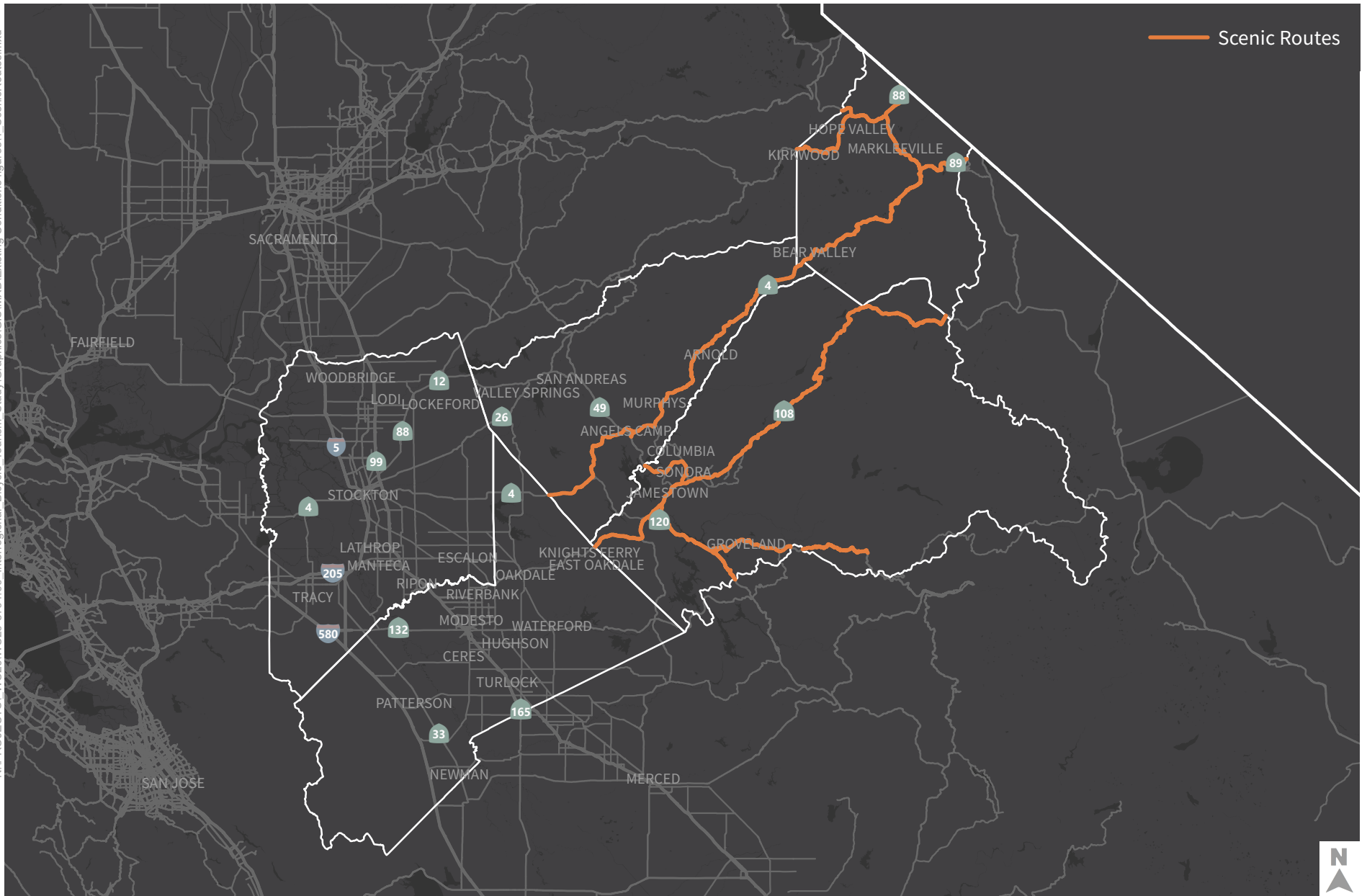
Additional Documents

The following relevant documents were also reviewed as part of this study:

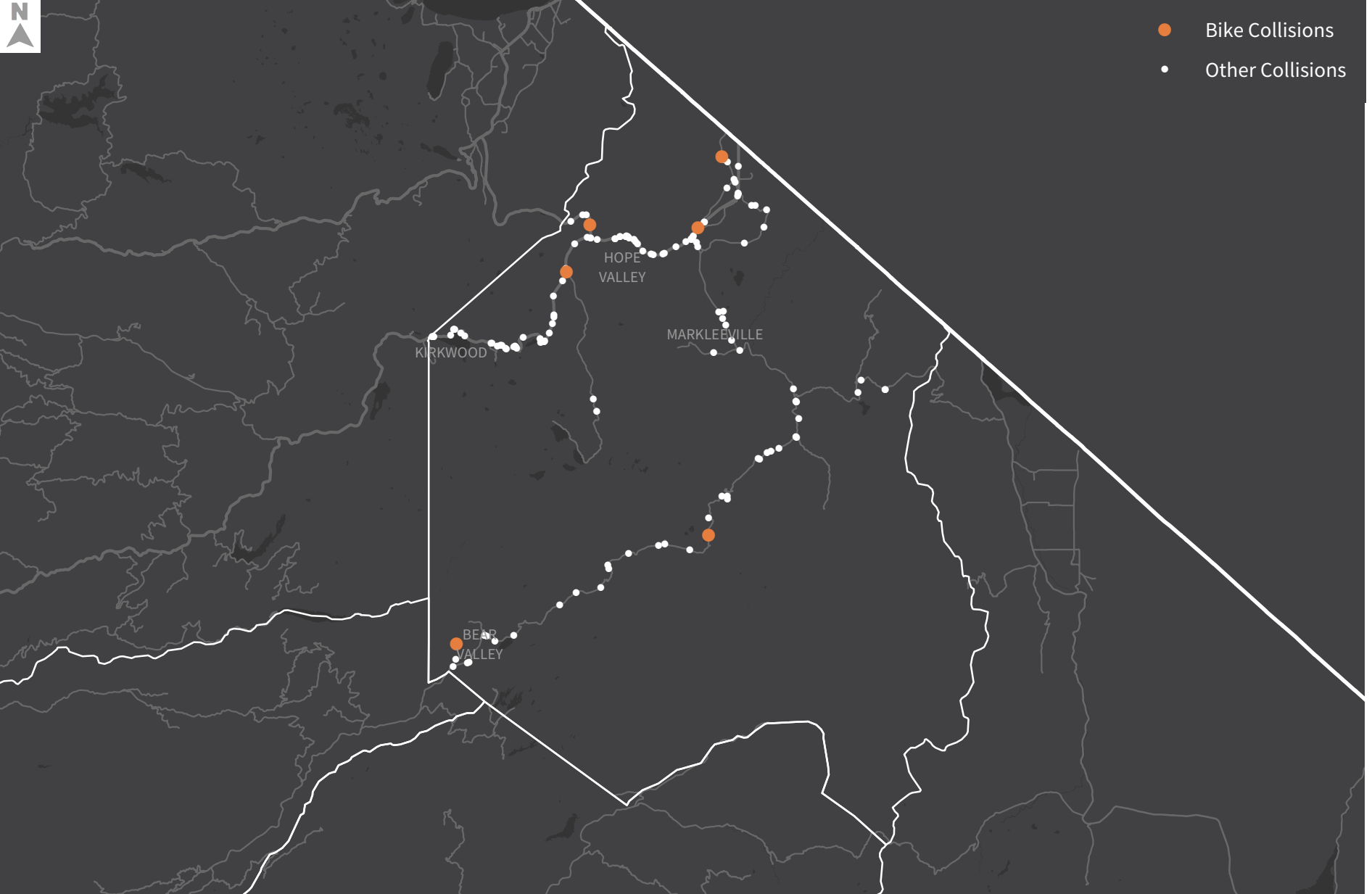
- Calaveras Regional Transportation Plan (2017)
- Calaveras County Systemic Safety Analysis Report (2018)
- Stanislaus County Circulation Element (2015)
- Oakdale Accessibility Master Plan (2017)
- Groveland Active Transportation Circulation Plan (2015)
- Sierra Railway Trail Report (2004)
- Trails to Health and Prosperity (2011)
- Caltrans State Highway Operation and Protection Program (2020)
- San Joaquin County Bicycle Master Plan (2020)

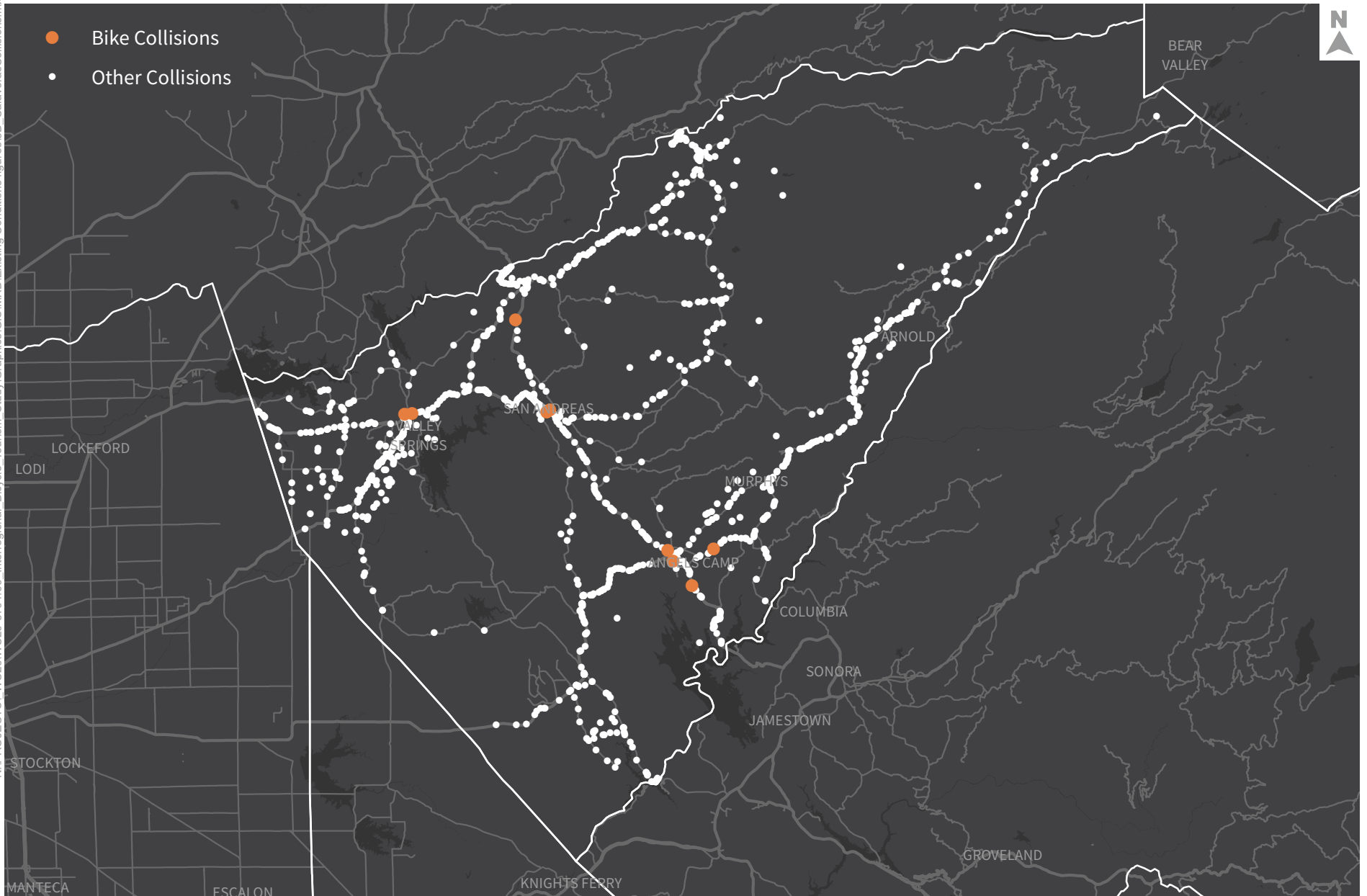


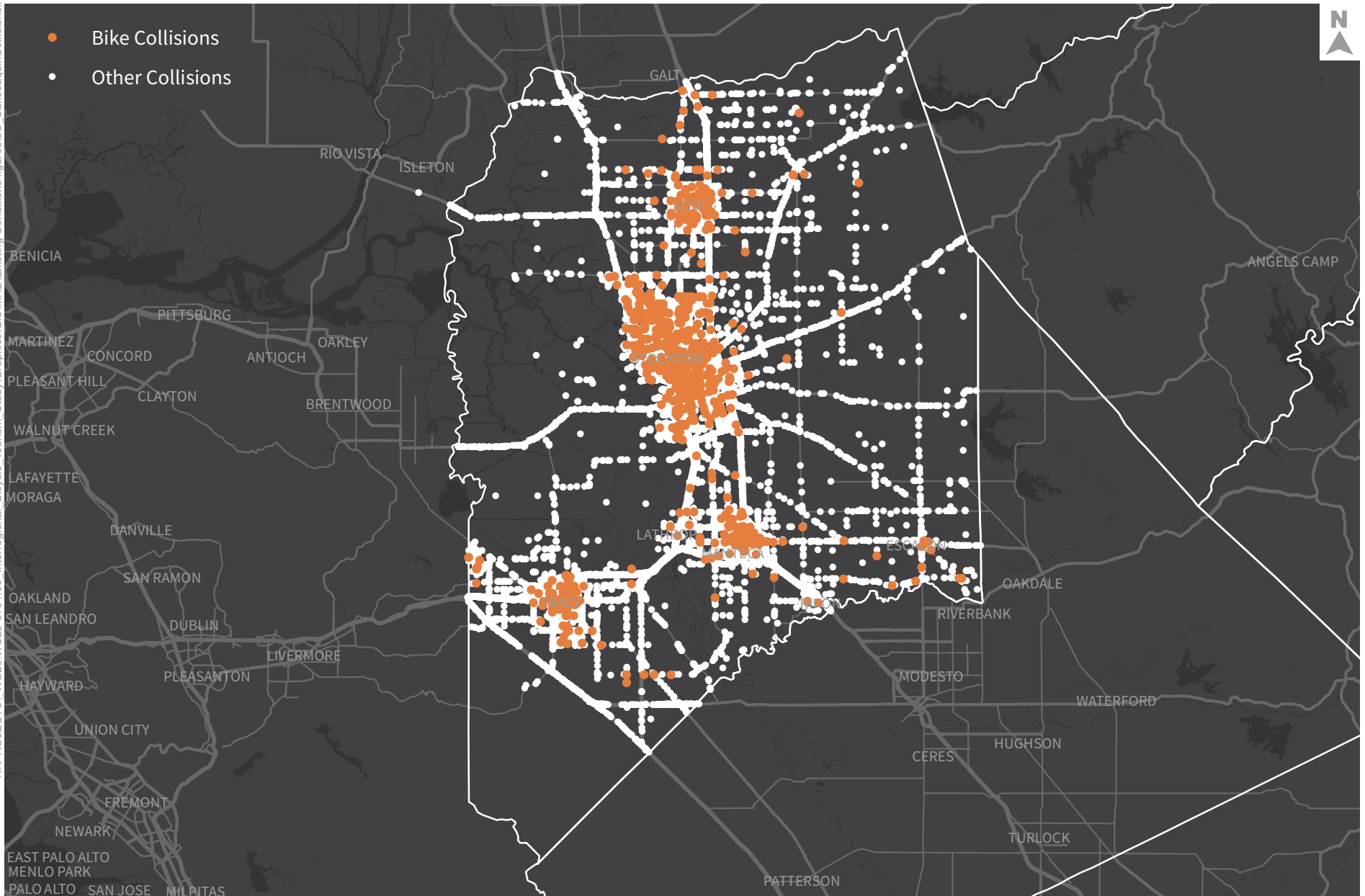
Attachment A: Scenic Routes

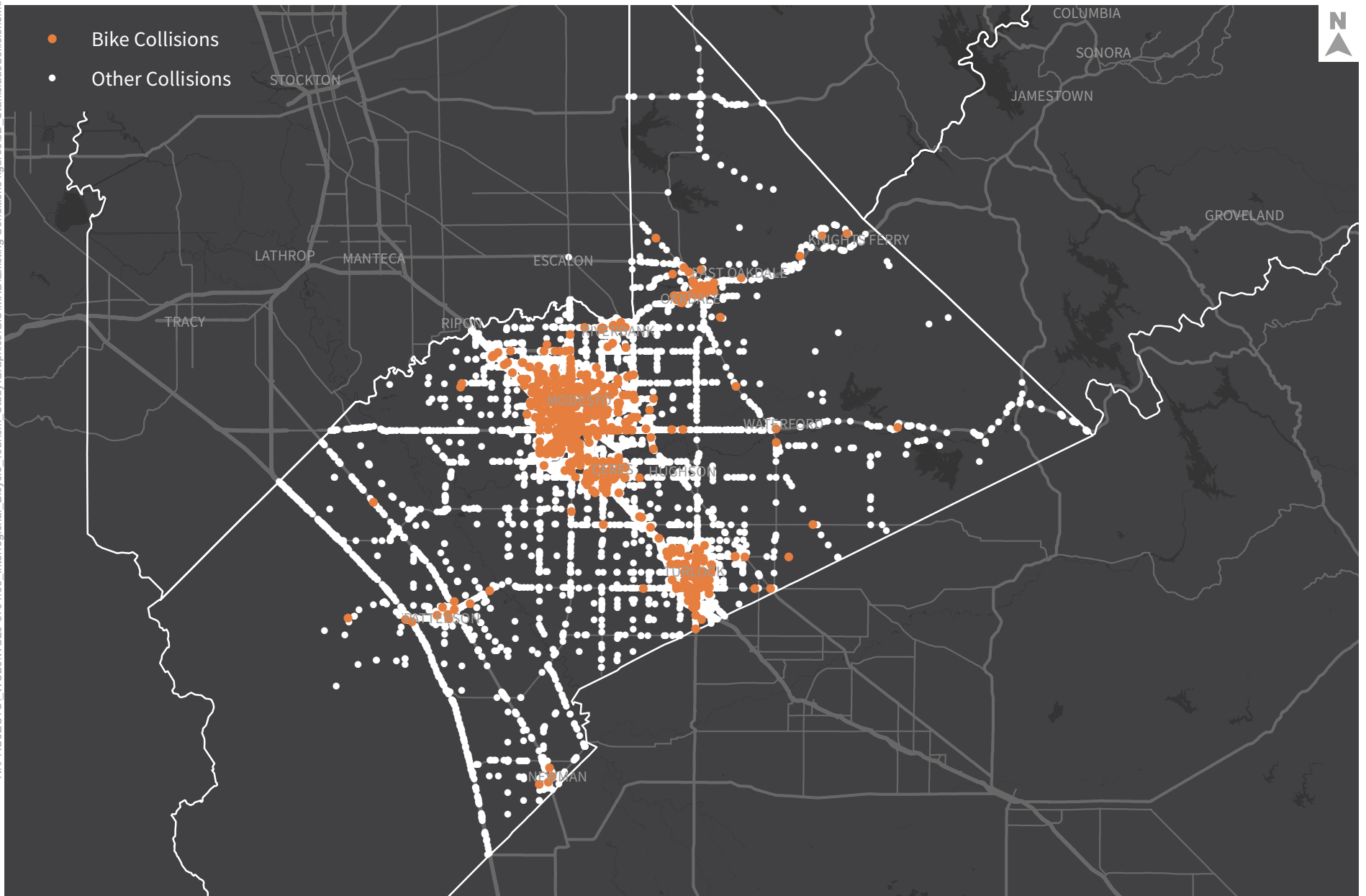


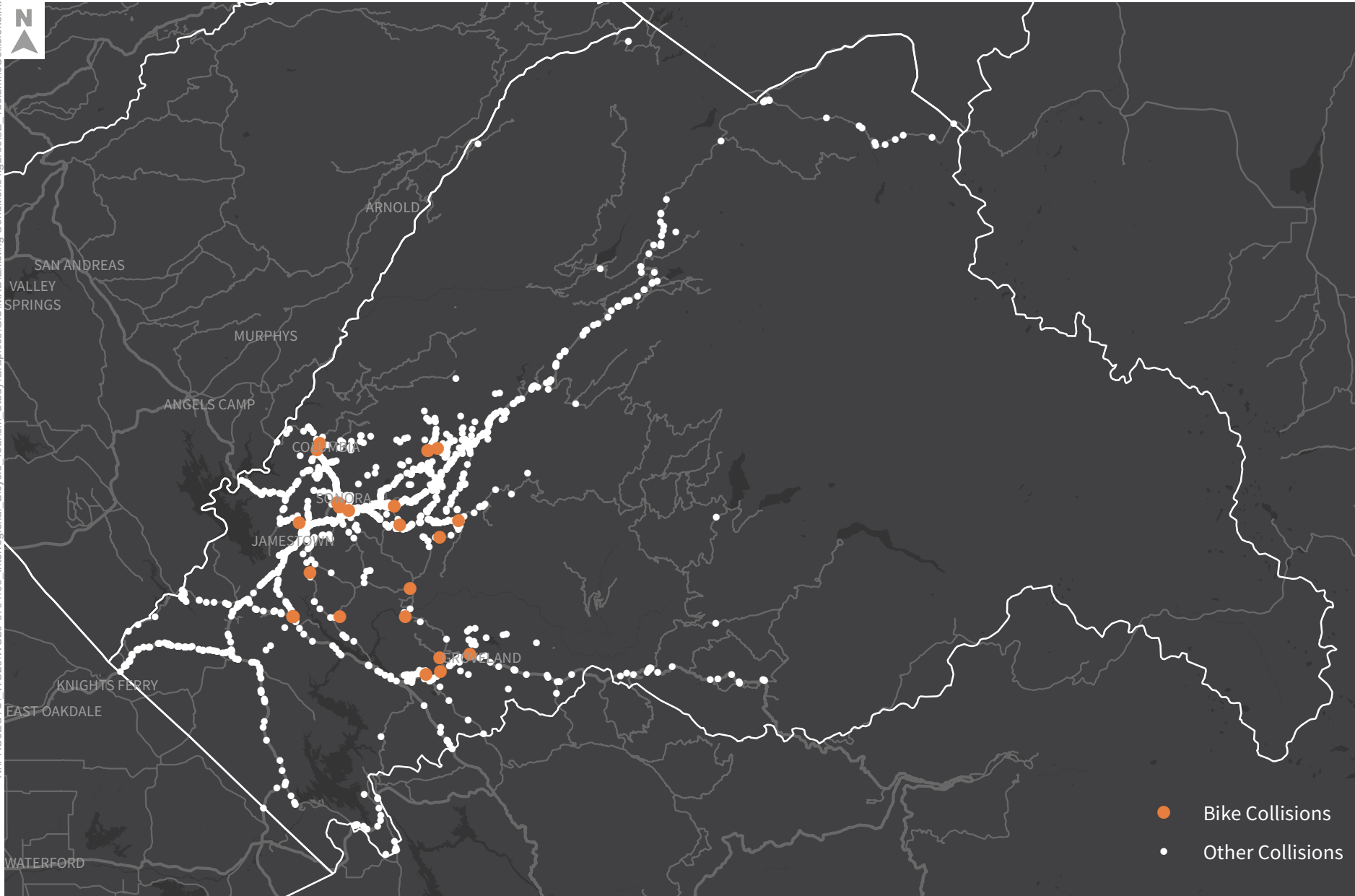
Attachment B: Collision Maps











Attachment C: Level of Traffic Stress and Tourism Factors

