



YOLO TRANSPORTATION DISTRICT

YOLO 80 MANAGED LANES

SPATIAL ANALYSIS AND EQUITY MAPPING

Draft 2

September 5, 2025



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ACRONYMS AND TERMS

Acronym or Term	Description
ACS	American Community Survey
AMI	Area Median Income
BRT	Bus Rapid Transit
CA	California
Caltrans	California Department of Transportation
CARTA	Capital Area Regional Tolling Authority
CBO	Community-Based Organization
EEA	Exploratory Equity Action
EL	Express Lane
GHG	Greenhouse Gas
GPS	Global Positioning System
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
ITS	Intelligent Transportation Systems
KDE	Kernel Density Estimation
NV	Nevada
OD	Origin-Destination
PM	Postmile
POC	People of Color
Project	Yolo 80 Managed Lanes Project
SACOG	Sacramento Area Council of Governments
SWITRS	California Statewide Integrated Traffic Records System
TDM	Transportation Demand Management
UC Davis	University of California, Davis
US-	United States Route
YoloTD	Yolo Transportation District

1 BACKGROUND

Yolo Transportation District (YoloTD) is advancing the planning and development of the Yolo 80 Managed Lanes Project ("Project") in coordination with key stakeholders including the California Department of Transportation (Caltrans), the Sacramento Area Council of Governments (SACOG), and the Capital Area Regional Tolling Authority (CARTA). As shown in Figure 1-1, the Project will construct approximately 20.8 centerline miles of High Occupancy Toll (HOT) lanes in each direction of the Interstate 80 (Yolo 80) corridor between postmiles (PMs) 40.7 and R44.7 in Solano County, PMs 0.00 and R11.72 in Yolo County, and PMs M0.00 and M1.36 in Sacramento County; and on the US Route 50 (US-50) corridor between PMs 0.00 and 3.12 in Yolo County and PMs 0.00 and L0.617 in Sacramento County.

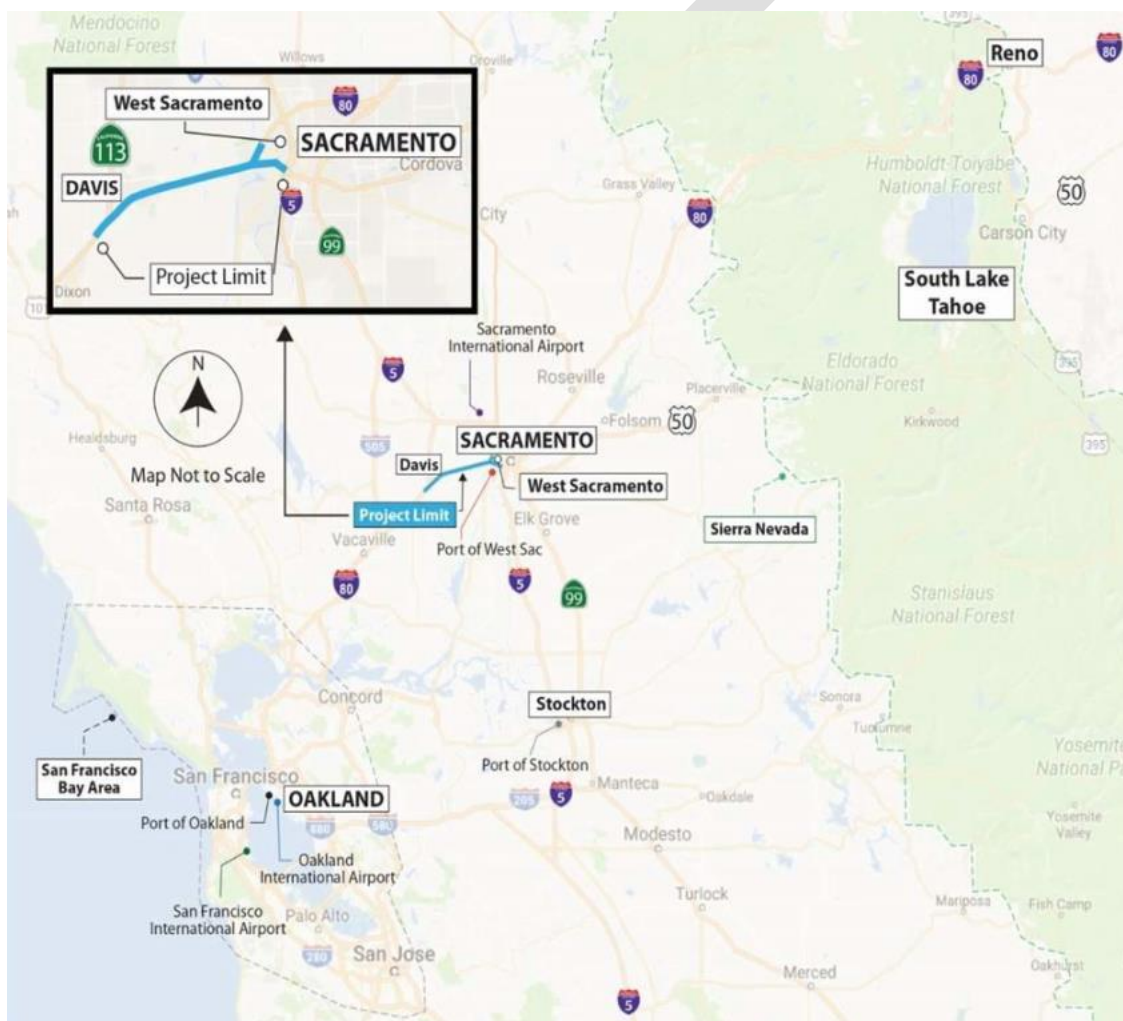


Figure 1-1: Geographic Context of the Project in the Sacramento Region

The managed lanes on Yolo 80 and US-50 will be constructed by restriping existing highway infrastructure and reconstructing the shoulder and median to add an additional lane within the same roadway footprint. The improvements will also include expansion and modification of existing Intelligent Transportation Systems (ITS) such as ramp meters, fiber-optic conduit, and overhead signs. Additionally, the Project will feature improvements to direct connectors, pedestrian/bicycle facilities and park-n-ride elements.

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The goals and outcomes that the Project seeks to achieve include:

- 1 Reducing congestion by providing the needed capacity to improve throughput and travel time reliability;
- 2 Improving freeway traffic operations on the mainline, ramps and interchanges with enhanced roadway design;
- 3 Supporting reliable transport of goods and services throughout the region;
- 4 Incentivizing multimodal transportation by prioritizing transit, carpool, and pedestrian/ bicycle modes to minimize greenhouse gas (GHG) emissions and improve travel time reliability;
- 5 Providing expedited travel information and monitoring systems to improve roadway incident response and awareness, and decrease non-recurring congestion;
- 6 Enhancing safety by improving weaving/merging areas and reducing cut-through traffic on local streets and rural roads; and,
- 7 Supporting equity by reinvesting toll revenue to local communities, with priority given to environmental justice communities.

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2 PURPOSE

This Study supports the development of a local Equity Framework by YoloTD for the Project. The overall purpose of the Study is to identify ways to establish important dialogues with local stakeholders, community-based organizations (CBO), and communities and develop a shared baseline understanding of local equity priorities through research and data analysis. The local Equity Framework will also inform and support an expected regional equity planning framework to be developed by CARTA.

This Study has already produced a Literature Review Memorandum, which documented existing equity policies and approaches at the state and regional levels, presented equity analysis frameworks and methodologies, and captured industry case studies of tolling equity programs from similar peer agencies.

This Spatial Analysis and Equity Mapping Memo is the second major component to the development of the framework. It references and builds upon the works cited in the Literature Review Memorandum to:

- **Understand who is impacted:** Identify which populations currently use or live near the corridor to assess how the Project might affect different demographic groups
- **Identify potential equity concerns:** Identify disparities in access, mobility, geography, and transportation and financial burden with respect to different races/ethnicities, income levels, transportation mode preferences, languages, housing tenure, environmental exposure, and exposure to safety incidents
- **Assess baseline conditions:** Establish a demographic and socioeconomic baseline to compare future outcomes and measure the equity impacts of the Project over time
- **Identify transportation challenges:** Highlight current mobility barriers faced by disadvantaged or underserved communities
- **Inform targeted outreach and engagement:** Guide meaningful stakeholder and CBO engagement by understanding the specific populations that need to be consulted and included in decision-making

In the broader Equity Task for the Project, the Literature Review, Spatial Analysis and Mapping Memo, and forthcoming outreach with local stakeholders and CBOs on county- and regional-level equity priorities will be used to develop a menu of tolling-focused equity policies and programs called Exploratory Equity Actions (EEA). It is important to state that these EEAs are not intended to be used as recommendations for equity programs to implement. Rather, EEAs will identify potential equity strategies for further research and regional coordination over the course of the Project's planning, development, and implementation phases.

3 OVERVIEW

Analysis in this memorandum has two areas of focus: User Analysis and Neighborhood Analysis. While there is some overlap between users and communities, the Yolo Causeway is distinctive in its high proportion of out-of-county travelers. Section 4, User Analysis, describes current users of the Yolo Causeway, highlighting key demographic indicators, trip characteristics and behaviors, and origin/destination patterns. These analytic components are compared between three main user groups: Users Overall, Users from Yolo County, and Users with Low Incomes. All three are also compared to overall demographics for residents Yolo County.

Section 5, Neighborhood Analysis, describes the characteristics of communities around the Causeway, focusing on census blocks in Yolo, Sacramento, and Solano Counties. While many Yolo County residents can be expected to use the express lanes, it is essential to incorporate consideration of equity for those who may not use the

Project directly but may still experience related benefits and challenges. Neighborhood analysis uses publicly available data sources to identify areas which may be particularly affected by changes in:

- Carpooling and transit mode resources;
- Safety and air quality related to diversion and congestion;
- The cost of transportation; and
- Traffic rules, especially related to ensuring that communication of changes is available in community members' native language.

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4 USER ANALYSIS

User analysis identifies the characteristics of those travelling through the Yolo 80 corridor. Understanding user demographics helps assess who directly benefits from the express lane and who may be excluded due to barriers such as cost, vehicle ownership, or language. This section begins with a description of the data sources, tools, and methodology used to analyze user demographics and behaviors. It follows this with a summary of findings, which highlights key results for each demographic data point at the head of each section.

4.1 METHODOLOGY AND BACKGROUND

4.1.1 Background

To provide a demographic and travel behavior analysis of Yolo 80, this study utilized Replica's "Places" Seasonal Mobility data set, focusing on activity surrounding the Yolo Causeway. Replica is a data platform that models person-level mobility and associated demographics by synthesizing anonymized location data, land use, and other public datasets. Replica generates an activity-based mobility model with disaggregated data outputs down to the network-link level to represent travel behavior for an average weekday and weekend day during a specified season. This Study utilized the most recent season available, Spring 2024.

4.1.2 Synthetic Population Modeling

Replica's synthetic population is constructed by integrating anonymized mobile location data with demographic profiles from the United States Census Bureau/American Community Survey (ACS), land use records, open transportation networks, and commercial data sources. Each synthetic individual is associated with a home location and daily activity chain through a probabilistic assignment process. This creates a representative modeled population with travel patterns representing various purposes – such as work, school, shopping, or recreation – and demographic characteristics – such as age, gender, race/ethnicity, household income, and employment status. These modeled behaviors are statistically imputed and weighed against anonymized travel data to align with local and regional control totals.

4.1.3 Origin-Destination Framework

For this analysis, Replica data for the California-Nevada megaregion was filtered using the Yolo Causeway as a middle filter, which allowed analysis to capture all trips that traversed this segment during the modeled season. The specific segments selected are shown in Figure 4-1. This approach allowed for isolation of travel patterns specific to the corridor and its surrounding neighborhoods, as well as travelers from out of area. The identified origin-destination pairs allowed trip flows, travel modes, and user characteristics to be analyzed by detailed trip-level information.

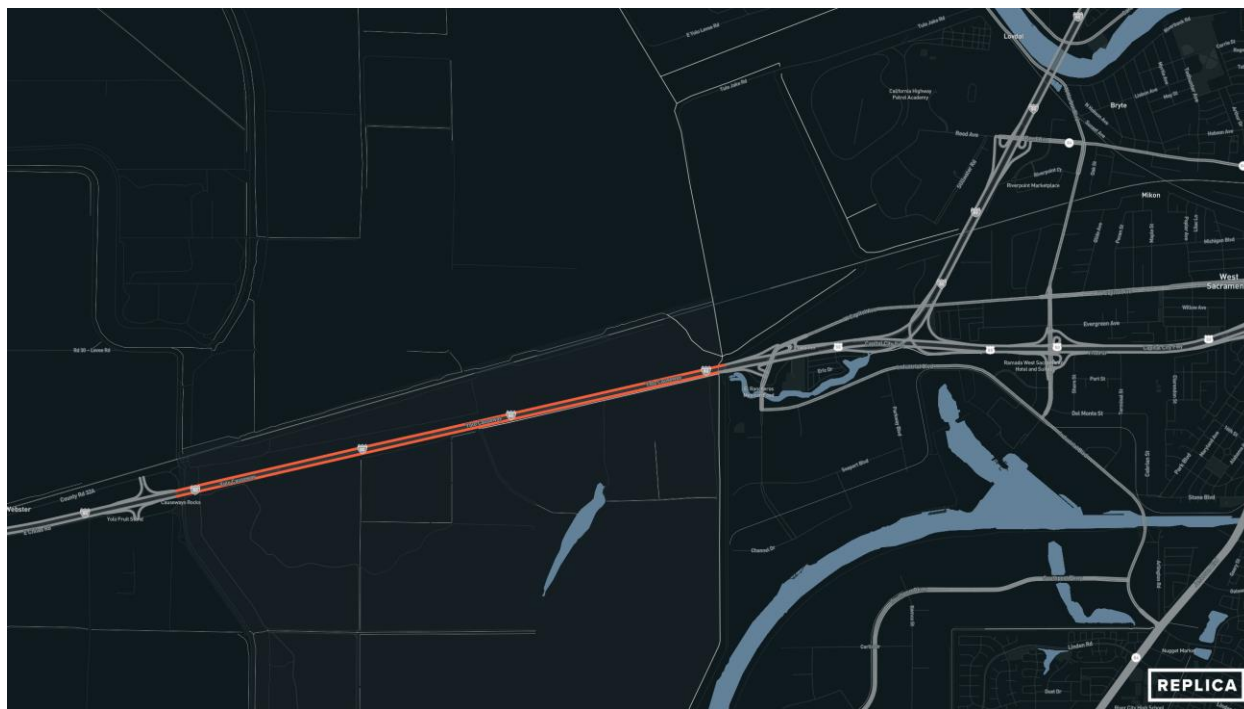


Figure 4-1: Network links selected for user analysis using Replica

4.1.4 Spatial Resolution and Aggregation

Trips and person-level attributes in Replica are available at wide to granular resolutions. For this analysis, outputs were mostly aggregated at the county level to best capture the regional and national effect of Yolo 80. However, figures in Section 4.2.13.3 also depict origin-destination data which is further disaggregated to the census block level to better describe locally originating trips and facilitate comparison with demographic neighborhood analysis described in Section 5.

4.1.5 Application to Equity Analysis for Yolo 80

Using Replica's socio-demographic user and trip attributes, the Study analyzed the demographic composition of corridor users by age, gender, race/ethnicity, employment, individual income, household income, household size, mode, vehicle access, housing tenure, primary language, weekday/weekend, trip origin/destination, trip duration, trip distance, and trip purpose. This enabled comparative analysis between corridor users and the broader regional population to identify potential disparities in access and corridor utilization by these equity-related variables.

4.1.6 Limitations

Replica, StreetLight, and similar transportation data platforms like INRIX, rely on mobile location data and synthetic modeling to produce insights about travel patterns. However, each do so to different extents and represent distinct tradeoffs. For example, a data service like StreetLight uses aggregated Global Positioning System (GPS) pings directly from mobile apps and connected vehicles to provide near real-time views of travel volumes and patterns, however it does not construct a synthetic population for modeling. Demographic information must be inferred through proxy data, which may introduce a greater bias toward users with higher incomes or more access to mobile technology. While a technology like StreetLight may offer better temporal precision, a service like Replica offers a more structured population model better suited for equity analysis that is equity-centered, longitudinal, and scenario-based.

For this study, although Replica’s synthetic population is calibrated to observed anonymized mobile location data and is statistically representative at the regional level, it may still underrepresent individuals without smartphones, which may include populations with low incomes and older populations. Replica applies weighting and bias correction methods to mitigate these concerns, but caution should be exercised when interpreting results for populations with lower digital visibility.

It should be noted that Replica is limited in the amount of detail it can provide for some trip purposes. For example, Replica can tell us a user is traveling to school but cannot specify if that user is traveling to university, community college, or a K-12 institution, which may impact what days, times, and frequency of travel may be for that trip purpose. Further research and discussion with stakeholders may provide additional detail that can be used to infer the purpose behind some travel patterns (e.g. school travel on weekends).

4.2 FINDINGS

4.2.1 Summary of Results

The study compared ACS 5-Year Estimates (2019-2023) to three user groups with characteristics aggregated from Replica data for the Yolo Causeway:

- **Overall Causeway Users** is aggregated data for all users who passed through the Yolo Causeway from all origins and destinations.
- **Users from Yolo County** describes users who pass through the Yolo Causeway from all origins and destinations, but have Yolo County indicated as “Home County.”
- **Users with Low Incomes** describes users who pass through the Yolo Causeway from all origins and destinations but have incomes less than 60% of the Yolo County Area Median Income, which is \$55,922 for households and \$26,164 for individuals.¹

Table 4-1 summarizes demographic comparisons between these user groups and Yolo County overall as described by the ACS for weekday and weekend trips. These demographics are described in more detail in subsequent sections.

¹ This Study does not present a combined profile of Yolo County users with Low Incomes in the User Analysis. This is not due to a lack of importance of this group, but due to data limitation: when the Replica results dataset is restricted simultaneously to Yolo County and Low-income Users, the resulting sample is too small for reliable estimates. For more detail on this group, see the Neighborhood Analysis section.

Table 4-1: Summary of Demographics

Demographics	Weekday				Weekend			
	Yolo County	Overall Causeway Users	Users from Yolo County	Users with Low Incomes	Yolo County	Overall Causeway Users	Users from Yolo County	Users with Low Incomes
Population	220,544	127,941	20,988	27,866	220,544	120,182	18,205	27,652
Households	77,230				77,230			
Income								
Median Individual Income	\$43,607	\$41,190	\$40,595	\$12,691	\$43,607	\$38,565	\$31,269	\$11,364
Median Household Income	\$93,203	\$113,550	\$102,146	\$27,725	\$93,203	\$112,515	\$88,596	\$25,606
Race/Ethnicity								
Percentage of people identifying as Hispanic	33.4%	22.7%	25.5%	25.9%	33.4%	22.0%	23.3%	25.2%
Percentage of people identifying as non-Hispanic	66.6%	77.3%	74.5%	74.1%	66.6%	78.0%	76.7%	74.8%
White alone	41.5%	47.4%	48.1%	41.0%	41.5%	47.8%	48.0%	41.1%
Asian alone	15.6%	17.7%	17.8%	16.7%	15.6%	18.2%	20.0%	17.4%
Black alone	2.9%	6.2%	2.3%	9.5%	2.9%	6.0%	2.5%	9.2%
American Indian and Alaska Native alone	0.4%	0.3%	0.3%	0.5%	0.4%	0.3%	0.3%	0.6%
Native Hawaiian or Other Pacific Islander alone	0.1%	0.7%	0.4%	0.9%	0.1%	0.6%	0.3%	0.8%
Two or More Races	5.5%	4.5%	5.2%	5.0%	5.5%	4.4%	5.1%	5.1%
Other	0.6%	0.5%	0.4%	0.5%	0.6%	0.5%	0.4%	0.5%
Employment								
Percentage of adult people (ages between 18-64)	67.1%	83.3%	86.4%	78.0%	67.1%	82.5%	88.4%	79.4%
Percentage of population employed	60.3%	68.5%	70.7%	43.1%	60.3%	65.3%	65.5%	40.3%

Demographics	Weekday				Weekend			
	Yolo County	Overall Causeway Users	Users from Yolo County	Users with Low Incomes	Yolo County	Overall Causeway Users	Users from Yolo County	Users with Low Incomes
(older than 16)								
Household Characteristics								
Percentage of population with household size of 1	23.6%	13.8%	13.9%	36.0%	23.6%	14.8%	16.4%	37.9%
Percentage of the population that owns home	48.3%	59.0%	52.7%	31.4%	48.3%	57.3%	45.0%	29.3%
Percentage of population that predominantly speaks English	65.8%	58.2%	56.8%	65.8%	65.8%	57.9%	57.1%	65.8%
Transportation								
Percentage of population without access to car	2.1%	4.6%	3.5%	11.5%	2.1%	5.0%	5.0%	11.4%
Percentage of population that commutes by private auto	62.2%	70.1%	74.7%	67.6%	62.2%	61.9%	62.6%	59.2%
Trips								
Percentage of non-commercial trips made by private auto		61.0%	54.0%	55.2%		57.5%	44.9%	52.8%
Median Trip Duration (minutes)		62	27	56		74	26	64
Median Trip Distance (miles)		57	21	50		74	22	64
Percentage of trips made for:								

Demographics	Weekday				Weekend			
	Yolo County	Overall Causeway Users	Users from Yolo County	Users with Low Incomes	Yolo County	Overall Causeway Users	Users from Yolo County	Users with Low Incomes
Work		22.1%	23.2%	17.5%		8.9%	9.5%	5.8%
Shop		13.1%	13.0%	15.2%		17.2%	19.5%	18.3%
Eating		8.5%	8.5%	9.5%		11.0%	13.0%	12.2%
Social		5.8%	4.5%	7.0%		8.4%	6.9%	9.0%
Recreation		3.8%	3.3%	4.2%		5.9%	5.7%	6.3%
School		2.2%	2.8%	2.3%		1.2%	1.3%	1.3%
Percentage pass-through trips		49.7%		53.0%		56.0%		52.4%
Percentage Yolo-Sacramento-Solano Intraregional trips²		49.9%		51.6%		43.2%		48.8%

² Yolo-Sacramento-Solano intraregional trips refer to the share of trips start and end within the three-county area (Yolo, Sacramento, and Solano counties). This includes trips that occur within one county (e.g., Sacramento-Sacramento) and trips between counties (e.g., Yolo-Sacramento, Sacramento-Solano)

4.2.1.1 HIGHLIGHTED FINDINGS BY USER PROFILE GROUP

Table 4-2 highlights certain trends and potential equity opportunities for user profile groups that surfaced over the course of user analysis. These findings help highlight overlapping needs between different user groups which may be addressed by similar strategies. By recognizing shared characteristics and distinct challenges, the analysis supports more inclusive and effective program planning. This allows for tailored strategies that address accessibility, affordability, and travel behaviors specific to each user group.

Table 4-2: Main User Profile Group Findings

User Profile	Findings	See Section(s)
Students	The low-income and young population is most likely due to the large population of UC Davis students residing in Yolo County. This user profile group is characterized by lower car reliance and/or access, high transit reliance, and comparatively higher proportion of travel along the Causeway during weekends. In addition, students who need to use express lanes may have to allocate a larger portion of their budget compared to other groups and are more likely to live in single-person households, increasing the risks and consequences of disruptions to transportation access. Students will benefit from equity strategies like weekend travel-focused engagement, strategies like mobility wallets that are not geared toward car owners, first/last-mile access improvements, mobility hub investments and income-based toll discounts. For outreach efforts, students are most effectively reached through partnerships with student groups affiliated with UC Davis, complemented by a broad digital strategy.	4.2.2 Income, 4.2.4 Age, 4.2.5 Employment Status, 4.2.7 Housing Tenure
Low-income Senior Population	Like students, older populations using the Causeway have low incomes and most likely belong to car-light and/or transit reliant households. Similar to student populations, senior populations with low incomes will also benefit from infrastructure improvements along the corridor that close the first/last-mile access gap and mobility hub enhancements. However, technology-focused strategies may be comparatively more difficult to adopt. Similarly, outreach efforts will be best done through in-person outreach, traditional media, pop-ups, and physical printed materials.	4.2.4 Age

User Profile	Findings	See Section(s)
Non-English Speakers	All user groups on the Causeway are about twice as likely to speak an Asian or Pacific Island language than Census data for Yolo County would suggest. Approximately 40% of express lane users will have a language other than English as their primary language. To ensure accessibility, all materials related to planning, education, engagement, and feedback should be available in multiple languages, with emphasis on identifying needed Asian or Pacific Island languages to employ in material development. Additionally, outreach efforts should be conducted in collaboration with CBOs that serve this user group.	4.2.9 Language
Low-income Single-person Household	Single-person households with low incomes face more financial pressure, making toll costs harder to manage. While express lanes often offer discounts for carpooling, these individuals may have fewer ways to access those cost savings. This user profile group will benefit from strategies and planning that consider carpool and ride-sharing matching options, better transit access, and eligibility rules that account for household size.	4.2.6 Household Size
Users from Yolo County	In addition to the trends described above, users from Yolo County also had different travel patterns from Overall Causeway Users, with a tendency to use the Causeway to take shorter trips (16-30 minutes), and a higher tendency to already be engaged in carpooling behavior (HOV2+) compared to other user groups, especially on the weekends. Users from Yolo County would benefit from strategies that incentivize existing behaviors, like carpool reward programs and trip count-based reward programs that serve those making shorter, more frequent trips on the Causeway.	4.2.13 Origins and Destinations

4.2.2 Income

Key Takeaways

- Users from Yolo County with incomes less than \$10,000 show a higher proportion of travel along the Causeway, when compared to Overall Causeway Users, on weekdays and weekends. This trend may be influenced by the large student population residing in Davis.
- A larger share of Users from Yolo County earning under \$10,000 travel via the Causeway on weekends, which Section 4.2.12 describes are resulting from increased social and recreational trips compared to other user groups.
- Higher-income households comprised of Users from Yolo County (over \$150,000) are less likely to travel on weekends, whereas Overall Causeway Users earning more than \$200,000 tend to travel more on weekends.
- Users with Low Incomes have less ability to access paid express lane services, so benefits are likely to be less evenly distributed toward these groups. Users from Yolo County have a higher percentage of individuals with incomes less than \$10,000 traveling along the Causeway, therefore equity strategies for Yolo County would benefit from the inclusion of mobility wallets providing free transportation benefits, and targeted outreach to community members with low incomes (e.g., University of California, Davis [UC Davis] student population).

The Study examined both individual and household income. According to the ACS (2019-2023), there are approximately 220,544 individuals in Yolo County with an annual median individual income of \$43,607. For households, there are 77,230 households with an annual median household income of \$88,818³.

4.2.2.1 INDIVIDUAL INCOME

As shown in Figure 4-2, the distribution of individual incomes from the Yolo County ACS data differed from all three user analysis categories, with all user categories showing greater representation from users making less than \$10,000.

³ Based on Yolo County's median household income from 2019 to 2023 adjusted to 2023 dollars.

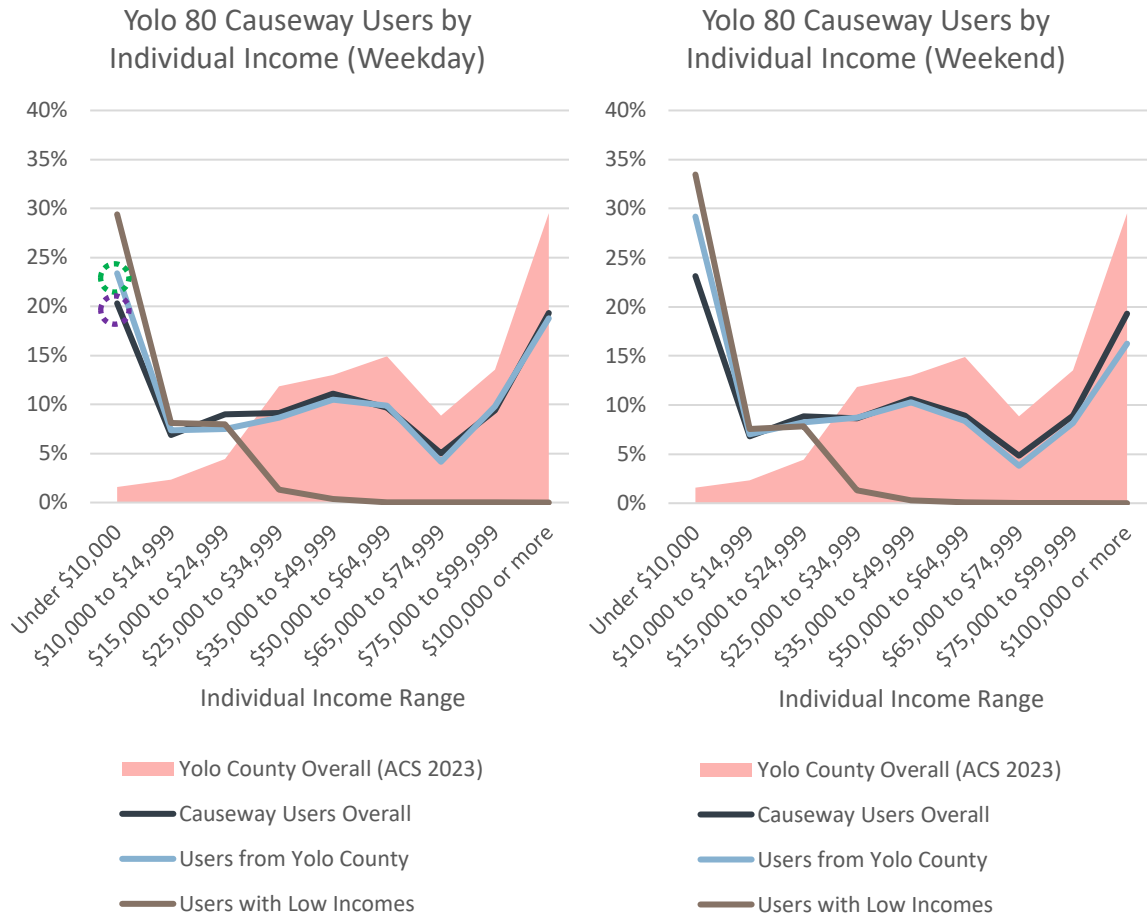


Figure 4-2: Individual Income Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

There are several potential explanations for this difference:

- Individual Income data is only available through the ACS for individuals who are full-time, year-round workers with earnings. Students, part-time workers, and users not in the workforce would not be represented. This would result in discrepancies between the income of these user groups and what Census data for Yolo County would suggest, considering there are significant student populations likely using Yolo 80 from UC Davis.
- With trip-based data such as that provided by Replica, an individual with low income can be overrepresented in trip data if they make many trips.
- Replica synthesizes income data using various sources like mobile location data, census demographics, and land use. Inferred trip data may over-classify some travelers as having low income based on behavior proxies.

Considering these points, comparisons between user groups make several trends evident:

- Users from Yolo County show a higher proportion of users with incomes less than \$10,000, when compared to overall Causeway users, on both weekdays and weekends. This may result from a higher proportion of student travelers in and out of UC Davis.
- When comparing weekday travel patterns to weekends:
 - A higher proportion of users with incomes less than \$10,000 use the Causeway for travel on the weekends for all user groups. This may indicate a higher instance of non-standard workdays or hours for users with low income, or higher levels of errand or recreational travel for students or other users not in the workforce.
 - For users with incomes greater than \$75,000, only Yolo County Residents demonstrated a slight decrease in weekend travel when compared to overall Causeway users, which remained consistent. Many Yolo County residents work in downtown Sacramento or at the UC Davis Medical Center, making weekday travel more common and reducing the need for weekend trips. However, this factor may represent only one of several influences shaping this pattern. While non-Yolo County Residents with high incomes are balancing this decrease by increasing their Causeway use.
 - Users with incomes between \$10,000 and \$75,000 remained largely consistent when comparing weekday to weekend.

4.2.2.2 HOUSEHOLD INCOME

Overall, household income trends demonstrate a different pattern of distribution than individual income. Lower proportions of users report household incomes less than \$10,000 when compared to individual incomes because households often contain one or more income earners. Household incomes can dampen extremes due to pooling (e.g., a partner with a low income and a partner with a high income). Household composition is also highly variable, resulting in additional shifts to the distribution curve. This may also result in a bimodal or skewed distribution that represents more diverse household structures and earning patterns.

Considering these points, and as shown in Figure 4-3, the Study notes the following trends:

- Distributions of household income are more closely aligned with Yolo County demographic expectations from the ACS when compared to individual income.
- For both weekday and weekend travel, users from Yolo County are more likely to have household incomes less than \$10,000 and less likely to have incomes greater than \$100,000 when compared to overall Causeway users.
- When comparing weekday to weekend travel, users from Yolo County with household incomes less than \$10,000 show significant increases in representation on the Causeway. Users from Yolo County with incomes greater than \$150,000 are less likely to travel on weekends, while overall Causeway users with incomes greater than \$200,000 show an increase in likelihood of travel on weekends. Users with incomes between \$10,000 and \$150,000 for all groups show little change when comparing weekday to weekend.

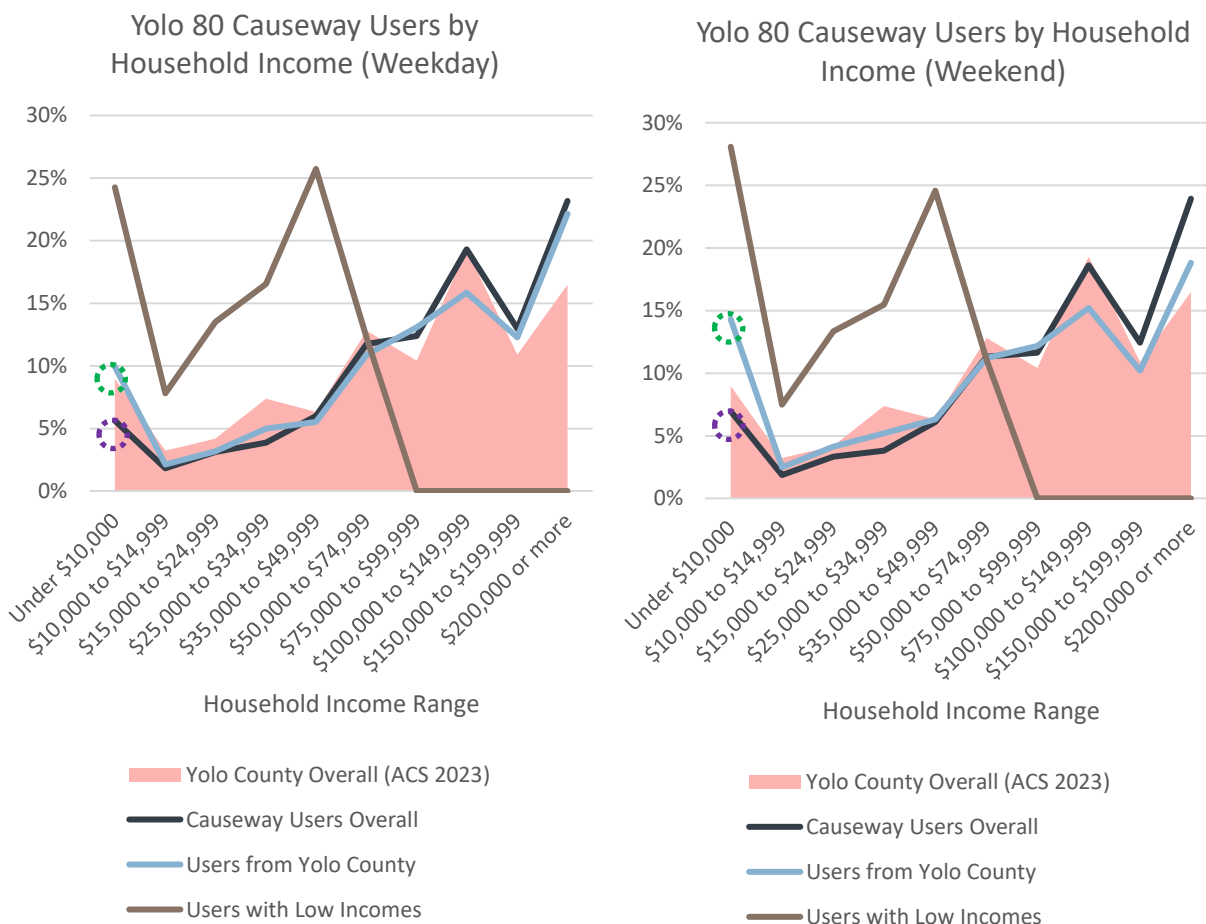


Figure 4-3: Household Income Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.2.3 IMPACTS

Income analysis for Overall Corridor Users generally supports anecdotal expectations that weekend users are more likely to have higher incomes and be from outside Yolo County, likely using the Corridor as a passthrough for recreational trips. However, the data also points to a bimodal distribution, with Users from Yolo County making less than \$10,000 also more likely to be using the Causeway on weekends. While one assumption may be that this results from Users with Low Incomes having atypical work schedules, analysis in 4.2.12 shows that Users with Low Incomes are less likely to be engaging in weekend travel for work, and more likely for social and recreational purposes when compared to other user groups. This pattern may stem from Yolo County's high student population.

Increased weekend use by non-Yolo residents with high incomes is likely to shape potential equity strategies under consideration for the Project by highlighting the importance of reinvesting revenues, particularly from weekend tolling, into improvements for Yolo County and/or the regional managed lanes network. However, the identification of the Users from Yolo County with very low incomes as being another significant weekend traveling population is also likely to have a few key effects on the remainder of the study. This user group stands

to be greatly affected by the introduction of a priced lane that runs on the weekend, and so outreach to this group, likely to be a predominately student population, would benefit from weekend travel-focused engagement and benefits which provide free benefits, like mobility wallets.

4.2.3 Race/Ethnicity

Key Takeaways

- Overall Causeway Users and Users from Yolo County were more likely to identify as white or Asian compared to the broader Yolo County population. Users with Low Incomes showed a higher likelihood of identifying as Black than ACS data for Yolo County would suggest as well.
- Across all user groups, a significantly smaller proportion identified as Hispanic/Latino compared to county demographics. This may indicate that neighborhoods with large Hispanic/Latino populations favor alternative travel routes, or that trips from historically Latino areas are less likely to use the Causeway.
- Express lanes can disproportionately impact non-white populations due to income disparities and geographic factors that limit transit alternatives, forcing reliance on congested highways. These inequities can lead to longer commute times and increased financial burdens, reinforcing existing transportation disadvantages. Equity strategies for Yolo County will benefit from outreach and public involvement in non-white communities to address historical injustices and ensure all populations have fair access to mobility options that meet their specific needs.

According to the 2023 ACS estimates, 33.4% of the population of Yolo County identified as Hispanic/Latino. With remaining populations identifying as non-Hispanic/Latino, 41.5% of the population identified as White, 15.6% as Asian, 6.2% as Black, 0.4% as American Indian and Alaska Natives, 0.1% as Native Hawaiian or Other Pacific Islander, 5.5% as two or more races, and 0.6% as other.

When compared to ACS expectations, and as shown in Figure 4-4, analysis of user groups revealed several trends:

- For both weekday and weekend travel:
 - Overall Causeway Users and Users from Yolo County were more likely to identify as white or Asian than the overall Yolo County demographic would suggest.
 - Overall Causeway Users and Users with Low Incomes were also more likely to identify as Black than ACS data for Yolo County would suggest.
 - All user groups showed a significantly smaller proportion of users identifying as Hispanic/Latino when compared to Yolo County's overall demographics. This may indicate that neighborhoods with high proportions of community members identifying as Hispanic/Latino, such as Knight's Landing, Winters, Woodland, and Esparto, may offer different travel corridors than Yolo 80 for local travel, or that trips originating in historically Latino neighborhoods in Davis and West Sacramento have fewer destinations that utilize the Causeway.
- The distribution of race/ethnicity demographics remained largely steady when comparing between weekday and weekend travel.

4.2.3.1 IMPACTS

With user demographics indicating that Hispanic Yolo County residents may not stand to benefit as much from the express lane, more research is needed to determine whether their ability to benefit from express lane improvements is limited by proximity to the corridor location, or whether there are other systemic barriers to access. Infrastructure investments in areas that primarily serve populations that are more white or affluent have the potential to exacerbate spatial inequality, particularly if public resources are disproportionately benefiting those populations already. Outreach to Hispanic/Latino communities should focus on confirming Causeway usage patterns. Similarly, Black users with low-income may be disproportionately affected by express lanes, and targeted outreach initiatives could contribute to greater understanding of usage patterns. Understanding how Yolo 80 can better benefit the needs of these communities, and what other regional planning investments can be prioritized in future project selection and funding if there are no barriers otherwise to Yolo 80 access.

Additionally, with a higher proportion of Asian users and higher proportions of Asian and Pacific Island language use as confirmed in Section 4.2.9, the Project should ensure that communications and outreach include culturally appropriate marketing and education campaigns with in-language materials.

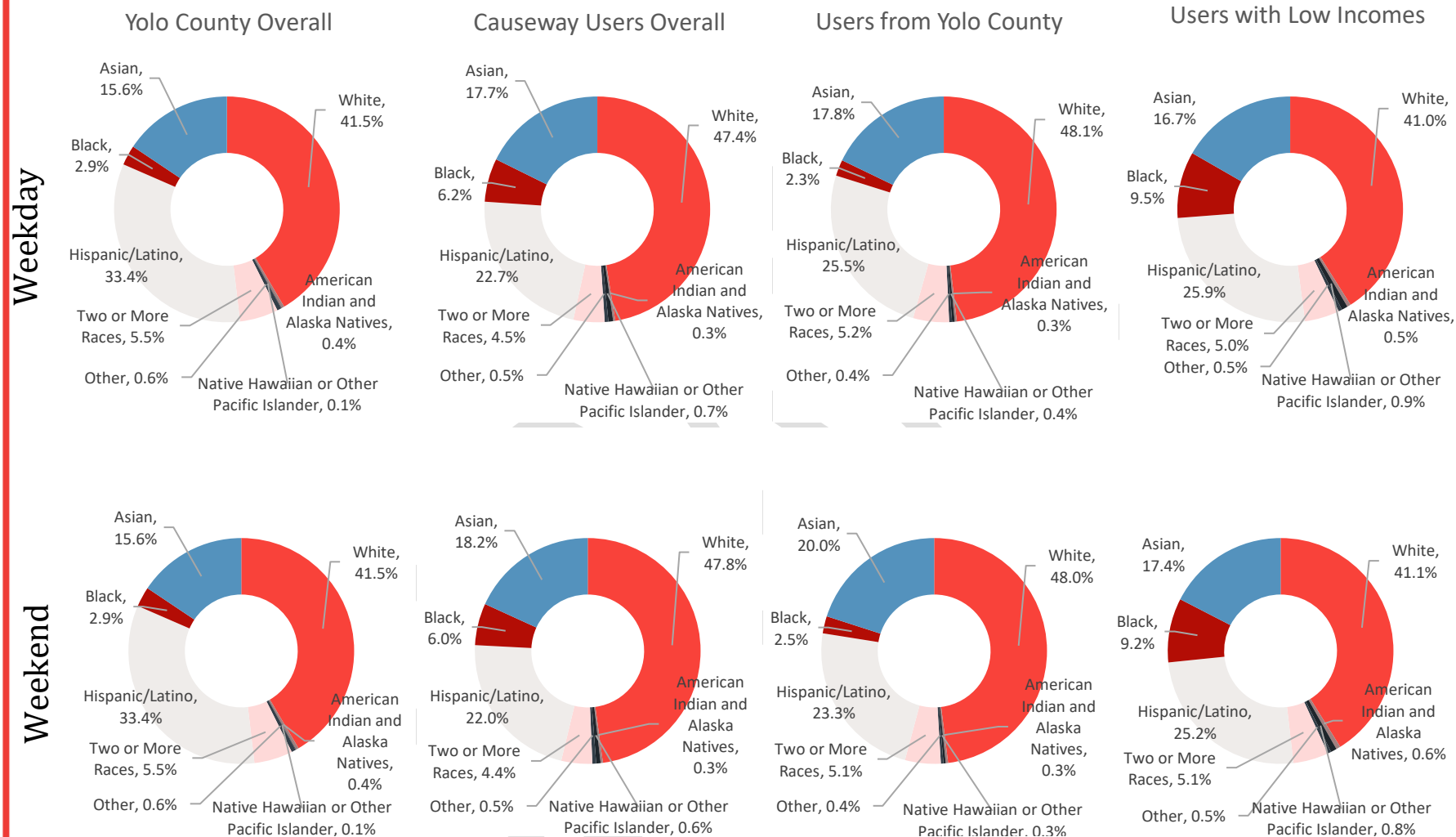


Figure 4-4: Race/Ethnicity Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.4 Age

Key Takeaways

- Users from Yolo County and Users with Low Incomes show a higher concentration of travelers aged 18-24, likely due to the area's large university population. This trend is even more pronounced on weekends, as university-age users may travel more for work, recreation, and shopping.
- Express lanes provide an option for university students, but they may present financial challenges for those with lower incomes. While they offer a choice, students unfamiliar with express lanes may accidentally use the lanes, leading to unexpected costs. Additionally, students who need to use express lanes may have to allocate a larger portion of their budget compared to other groups, making affordability a significant consideration. Equity strategies like first/last-mile access improvements, mobility hub investments, mobility wallets and income-based toll discounts could benefit this set of users.

According to the 2023 American Community Survey estimates, 67.1% of the population of Yolo County is between the ages of 18 and 64, 19.1% are children (under the age of 18), and 13.8% are older adults (65 or older).

As shown in Figure 4-5, all user groups showed less representation for users who are children, which aligns with expectation for corridor users. Compared to overall Corridor users, both users who live in Yolo County and users with household incomes less than 60% of Area Median Income (AMI) showed a higher distribution of users in the 18-24 age range, which aligns with expectations for a user base with a high proportion of university students. This trend is enhanced when comparing weekends to weekday travel, with an even greater proportion of users falling into this age category. University-age users may be more likely to be traveling on the weekend for recreation, social activities, and other trip purposes as described in Section 4.2.12.

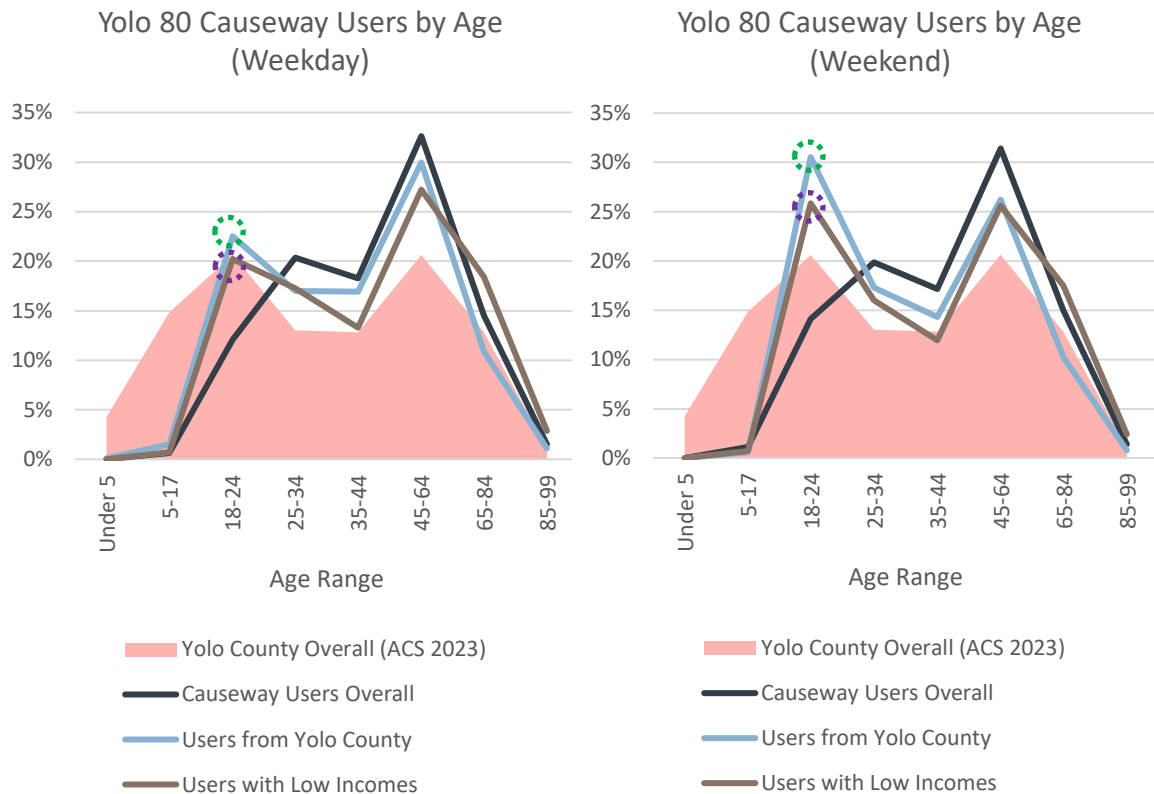


Figure 4-5: Age Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.4.1 IMPACTS

Data reveals that users in all user groups are more likely to be younger and have lower incomes than the ACS would suggest. Additionally, the age distribution for Users with Low Incomes is also more heavily weighted in the 65-84 age range than ACS data or other user groups. This pattern could reflect transit-dependent or car-light households, but may also capture older adults who appear low-income in ACS data due to retirement status while maintaining financial stability through assets, savings, or reduced living expenses.

Since both university-age populations and older populations with low incomes may be more likely to be utilizing transit on the corridor, access to the corridor would be further improved by closing gaps in first/last-mile access, micromobility, and shared-use infrastructure. Additional strategies for improving transit service include: increasing frequency, enhancing reliability through features such as signal priority, queue-jump lanes, or transit-only lanes, and offering fare reductions or discounted passes for longer-distance services like the Capitol Corridor. Revenue investments in mobility hub development and improvement could potentially encompass or provide additional support to all these strategies.

Traditional outreach methods may not reach or resonate with younger populations, which could have negative consequences if CARTA/YoloTD under-communicates with an emerging, highly affected user group. Institutional, CBO, and student group partnerships would likely be an effective strategy to overcome this,

particularly if paired with piloting mobility wallet, discounted transit pass integration, and carpool promotion strategies. These kinds of strategies could also be well-supported by data-sharing agreements with institutions like UC Davis to better understand travel needs and track progress through key performance indicators.

On the other end of the spectrum, innovative, digital outreach methods may not be effective for older populations. Effective strategies in this regard combine accessible, in-person, and trusted community methods like leveraging community organizations and networks, using print and physical materials, using traditional media, hosting in-person events/pop-ups, and providing live support.

4.2.5 Employment Status

Key Takeaways

- Users with Low Incomes were much less likely to be in the labor force than Overall Causeway Users and Users from Yolo County. This aligns with expectations for an area with a high student population.
- There was a small decrease in weekend numbers for employed Overall Causeway Users, but otherwise the numbers are mostly consistent between weekend and weekday.
- A greater percentage of Overall Causeway Users and Users from Yolo County were employed than the general population distribution would suggest, though the percentage share gets smaller once those under the age of 16 are factored out.
- Employment status shapes when, why, and how people travel, making it a crucial consideration in equity. As many users with low incomes are students or not in the labor force, traditional assumptions about work-related travel may not apply. To support users not in the labor force or working part-time—such as students or individuals, in precarious employment—strategies like income-based toll discounts, off-peak pricing, or partnerships with educational institutions can help ensure tolling does not limit access to opportunity.

The ACS (2019-2023) shows that 50.5% of Yolo County residents are employed, while 4.2% are unemployed, 29.0% are not in the labor force,⁴ and 16.3% are under 16.

As shown in Figure 4-6, when factoring out the population under the age of 16, both Overall Causeway Users and Users from Yolo County have a greater proportion of employed users. Users with Low Incomes have a much greater proportion of users not in the labor force, which aligns with expectations for a population with a high proportion of students. Comparing weekweekends weekend, employment status distributions remain largely consistent, with small decreases in users who are employed across all user categories.

⁴ “Not in the Labor Force” are not employed or actively seeking employment. This group includes students, stay-at-home parents, retirees, and individuals who are temporarily unable to work due to illness or disability.

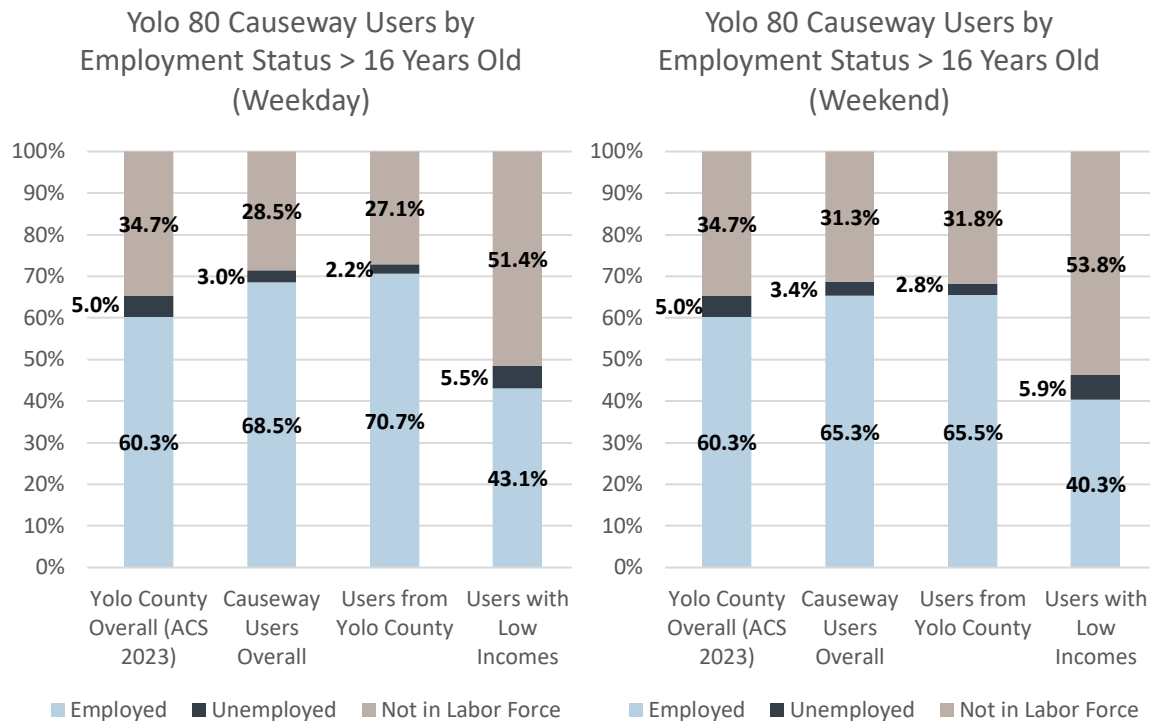


Figure 4-6: Employment Status Distribution for Population > 16 Years Old in Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.5.1 IMPACTS

While previous sections have reinforced the idea that many demographic patterns, particularly for Users with Low Incomes, are related to a high student population, it is important not to overgeneralize in this respect. Users with Low Incomes who are not students share the increased vulnerability to regressive impacts of tolling and the potentially great benefits from using express lanes for essential travel. For these groups, it is important to broaden equity evaluation metrics to include non-commute travel purposes; focus strategies on increasing accessibility to economic and social opportunities; partner with CBOs, social services, and workforce agencies; and pilot income-based tolling policies and mobility credits.

4.2.6 Household Size

Key Takeaways

- Two-person households are the most common in Yolo County (33.9%), followed by four or more members (25.7%).
- Household size does not significantly impact weekday vs. weekend travel patterns, but it does show notable trends when linked to income levels.
- Individuals earning less than 60% of the AMI are more likely to live alone, likely students or seniors with limited financial support.
- Household size shapes how transportation costs are absorbed, as individuals in smaller or single-person households with limited income may face higher per-person transportation costs and have fewer support networks for travel. Equity strategies could include tailoring toll discount eligibility not just by income, but also by household size, to better support those facing higher cost burdens.

Data from the 2023 ACS for Yolo County shows that 33.9% of households have two members, 25.7% of households have four or more members, 23.6% of households have one member, and 16.8% of households have three members.

While Figure 4-7 shows that there is no significant difference between weekday and weekend travel patterns based on household size, there are several trends related to the interaction of household size and income. While Users from Yolo County are almost identical to Overall Causeway Users, Users with Low Incomes are much more likely to have a household size of one, indicating that many Users with Low Incomes are likely to be students who may lack income support, or retired seniors with

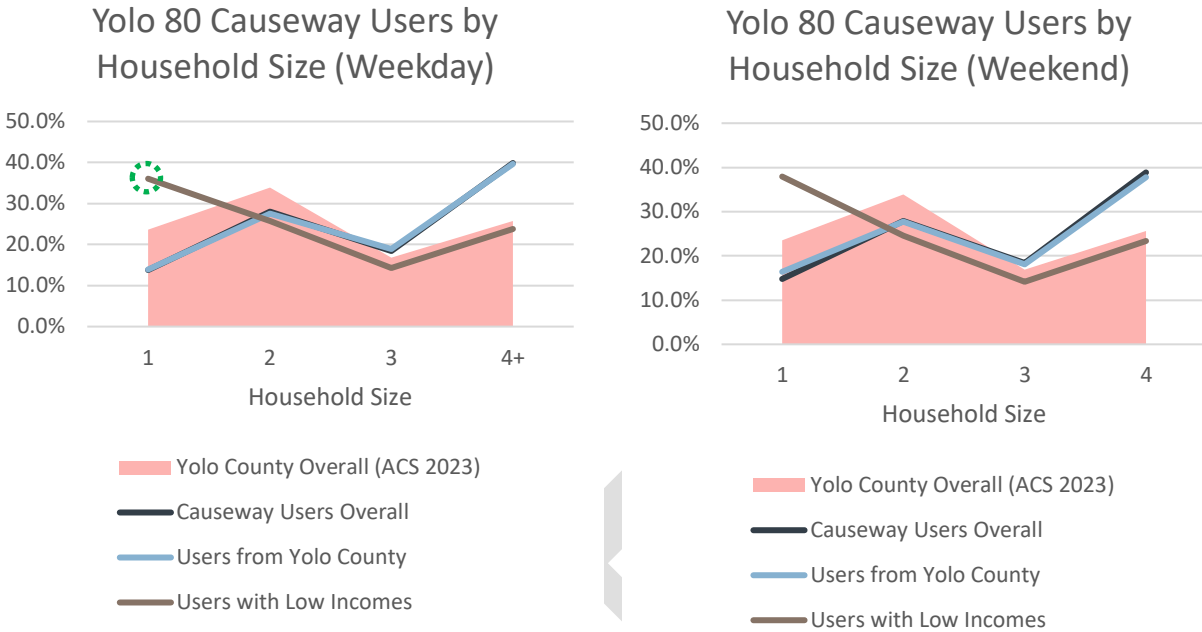


Figure 4-7: Household Size Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.6.1 IMPACTS

Single-person households with low incomes face greater financial pressure per individual, making toll impacts more regressive. Express Lane systems often reward carpooling with free or discounted access, but single-person households are less able to access these benefits. Single-person households may also make trips that are non-routine or highly individualized, such as accessing services, social networks, or part-time jobs, making them more sensitive to variations in trip characteristics that may result from dynamic pricing. These individuals may also be more reliant on transportation for staying connected to jobs, healthcare, and community, making barriers to affordable access particularly harmful.

Ensuring that these individuals are adequately considered in planning may include focusing on strategies that enable and encourage carpool, ride-matching, and shared travel incentives; investments in increasing transit access; or explicitly accounting for household size in eligibility requirements for programs.

4.2.7 Housing Tenure

Key Takeaways

- Overall Causeway Users and Users from Yolo County were more likely to be homeowners than the general Yolo County population. Users with Low Incomes were much more likely to be renters or living in group quarters, e.g., residence halls, residential treatment centers, nursing facilities, shelters, etc. This aligns with expectations for an area with a large student population, many of whom may reside on campus or in rented off-campus accommodations.

- Weekend Causeway travel increased particularly among renters and individuals in group quarters, with the most notable surge seen among users with low incomes. **These patterns could indicate increased student travel on weekends to jobs, recreation, or shopping.**
- Since Users with Low Incomes, like students, are more likely to rent or live in shared housing, they may be pushed farther from major transit hubs, increasing their reliance on the highway for travel. This makes it essential to assess how pricing impacts their mobility and economic opportunities. Implementing equity-focused strategies to enhance mobility and access can help mitigate these challenges and promote transportation inclusivity for these groups.

The 2023 ACS estimates that 48.3% of Yolo County residents own their homes, compared to 41.9% of residents who rent, and 9.8% of residents who live in group quarters.⁵ For both weekday and weekend, overall Causeway users and users from Yolo County had higher proportions of homeowners compared to information from the ACS, with a greater difference shown for Overall Causeway Users. Users with Low Incomes were much more likely to be renters or living in group quarters (See Figure 4-8).

When comparing weekday travel to weekend travel, all user categories showed increases in the number of renters and users living in group quarters. The increase in users living in group quarters was especially marked for users with low incomes.

⁵ “Group quarters” refers to places where people live or stay in a group living arrangement that are owned or managed by an organization providing housing and/or services for residents. These include college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, workers’ group living quarters, and facilities for people experiencing homelessness.

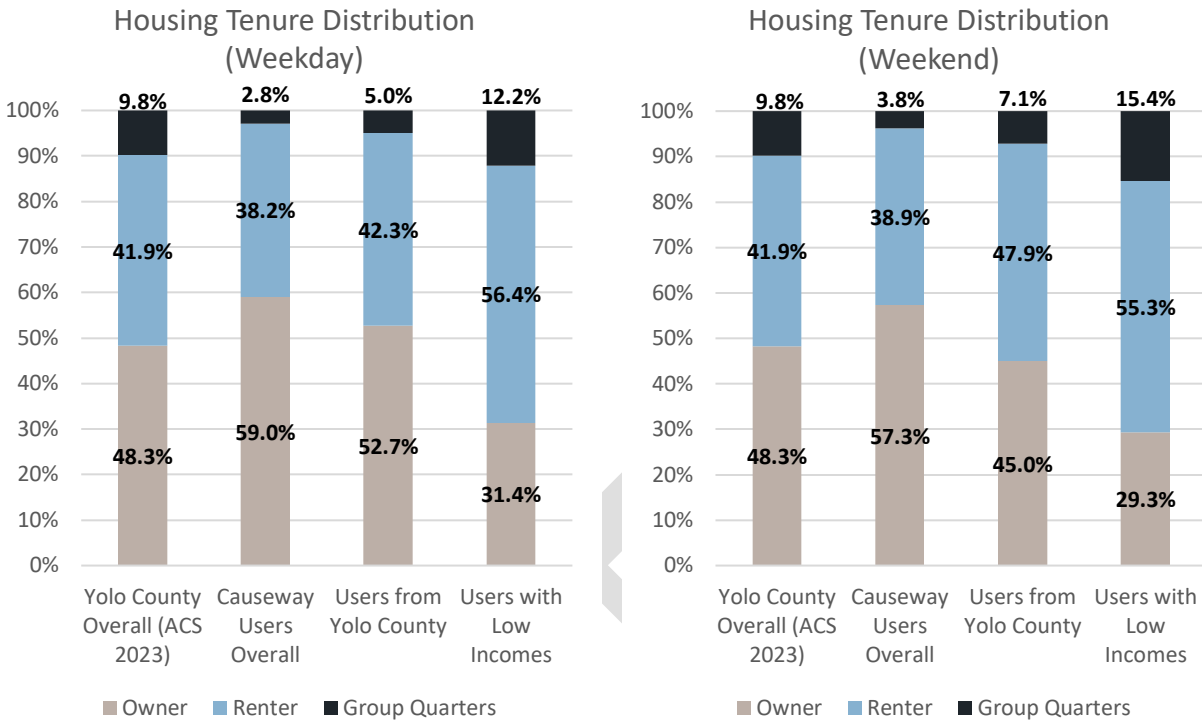


Figure 4-8: Household Size Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.7.1 IMPACTS

Because renters are more likely to move, they may not experience the full benefits of long-term express lane improvements, which affects equitable distribution of benefits at the individual level. At the collective level, however, the renter population remains relatively stable, so benefits may still accrue to renters as a group. Renters are also typically underrepresented in public engagement, leading to potential blind spots in outreach processes.

Strategies to help counter these effects include targeted outreach that explicitly tracks how renters and group quarters residents are served by the Project and tracks impacts over time; tying benefits to an account rather than an address to ensure that equity strategies move with the user; and prioritizing mobility access programs for residents in group quarters.

4.2.8 Vehicle Access

Key Takeaways

- Most residents of Yolo County have access to at least one vehicle, with the plurality (42.1%) having access to two.
- Users with Low Incomes are significantly more likely to have no vehicle access, over five times the rate of the general population.
- Vehicle access distribution remains consistent between weekdays and weekends across all user groups.
- As Users with Low Incomes are much more likely to lack access to a personal vehicle, which limits their flexibility and increases reliance on shared or public transportation, they could benefit from equity strategies that fund transit credits or excess toll revenue strategies to fund transit programs and studies.

As shown in Figure 4-9, the 2023 ACS estimates that 2.1% of the population of Yolo County has no access to a vehicle, compared to 18.5% with access to one, 42.1% with access to two, and 37.3 % with access to three or more. For both weekday and weekend, all user groups showed a higher instance of users with no access to vehicles than the ACS data for Yolo County would suggest. For Users with Low Incomes especially, the instance of zero vehicle access was more than five times that of Yolo County overall. Users with Low Incomes were also much more likely to only have access to one car, indicating potential consequences if that option became unavailable.

When comparing weekday travel to weekend travel, vehicle access distribution was consistent for user groups.

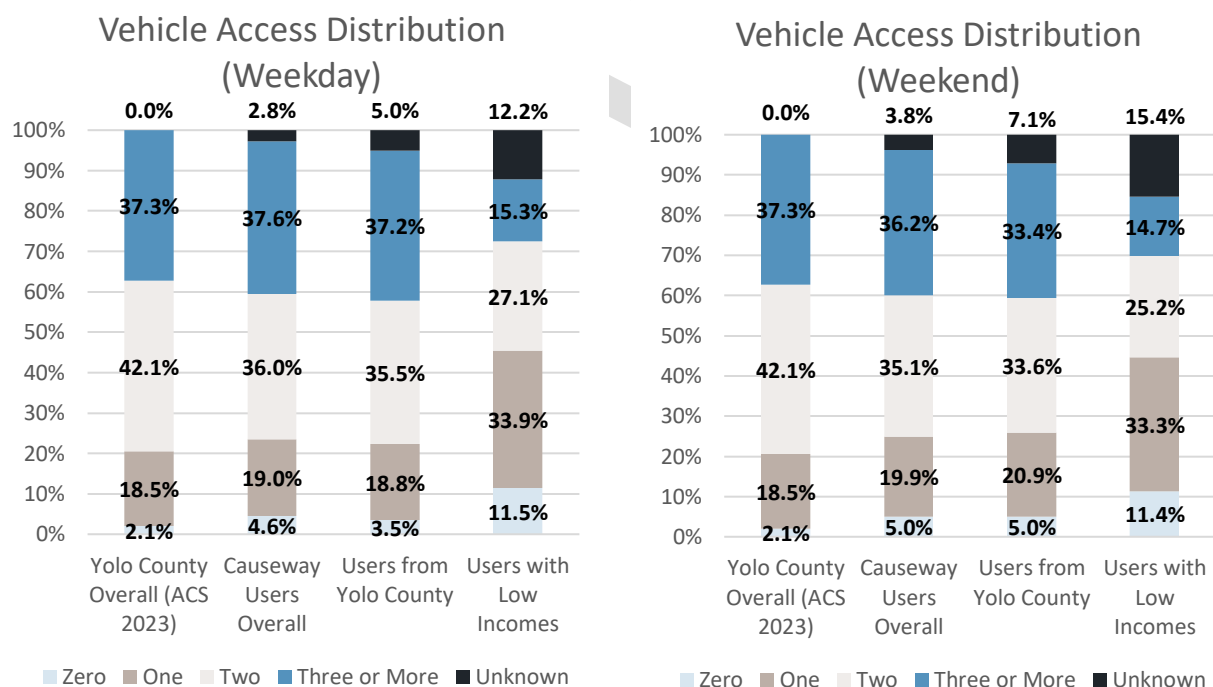


Figure 4-9: Vehicle Access Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.8.1 IMPACTS

Users with Low Incomes and no or one vehicle are more likely to depend on family members, carpool partners, rideshare services or transit to access the express lane, meaning they have less control over travel decisions and timing. These users are more vulnerable to sudden changes in car availability, like breakdowns or prioritization within the household. High rates of limited vehicle access indicate a strong need for public or shared transportation connections in areas with low incomes.

Potential strategies to consider include improving transit and shared ride access to the lane; coordinating with first/last-mile solutions like bike and/or scooter share, neighborhood shuttles, and vanpool programs; and ensuring that strategies are not dependent on the recipient being the owner of the vehicle, such as mobility wallets for non-drivers.

4.2.9 Language

Key Takeaways

- English is the predominant language in Yolo County, spoken by 65.8% of residents, followed by Spanish at 19.6%.
- All user groups are roughly twice as likely to speak an Asian or Pacific Island language compared to the general Yolo County population, with a corresponding shift in the proportion of English speakers.
- Language distribution among users remains largely consistent between weekdays and weekends.
- The significant proportion of non-English speakers among all user groups highlights the need for multilingual outreach and engagement to ensure all communities understand tolling policies. Communication through translated materials, community workshops, and partnerships with local organizations is essential to make the express lanes accessible and equitable for non-English speakers.

The 2023 ACS estimates that in Yolo County, 65.8% of residents predominantly speak English, while 19.6% speak Spanish, 6.1% speak an Asian or Pacific Island language, 8.5% speak an Indo-European Language, and 0.2% speak another language (See Figure 4-10).

Compared to Yolo County residents overall, all user groups were approximately twice as likely to speak an Asian or Pacific Island language. The difference was largely taken from users who speak English, the change in percentage of which was generally an equal decrease. Spanish, Indo-European, and other languages were consistent. There was very little variation between user groups, except that Overall Causeway Users were slightly more likely to speak an Asian and Pacific Island language and slightly less likely to speak Spanish than Users from Yolo County or Users with Low Incomes. There was also a high level of consistency between weekday and weekend users.

4.2.9.1 IMPACTS

Language access is not just a demographic consideration – it is a necessity to operations when non-native English speakers are a major portion of express lane users. Planning materials, signage, education engagement, and feedback mechanisms should all be accessible in primary user languages. Partnership with trusted CBOs that serve users in-language in a linguistically and culturally appropriate manner is important to create and reinforce community trust in the organization and facility.

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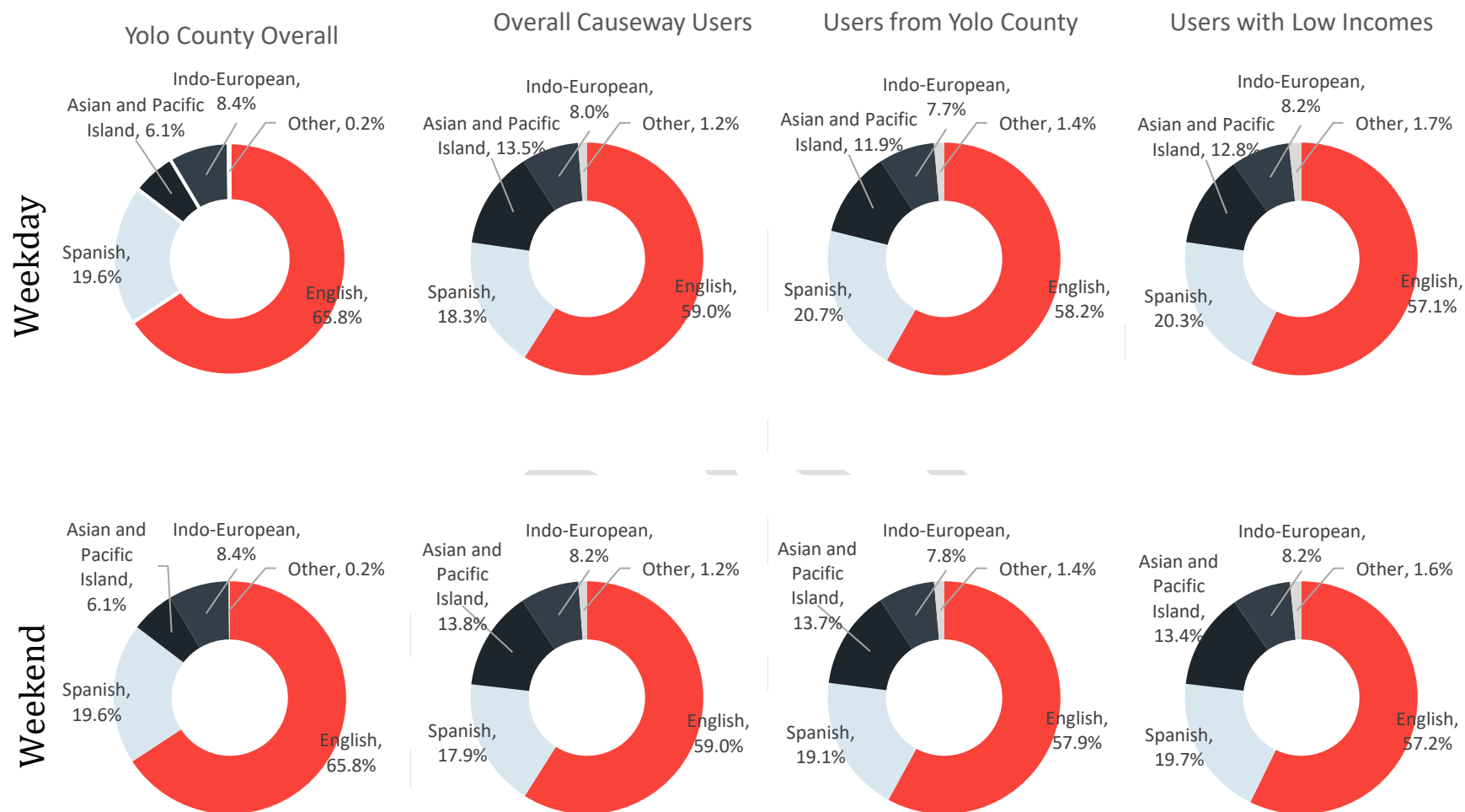


Figure 4-10: Language Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.10 Mode

Key Takeaways

- Mode analysis relies on a mix of trip-based and user-based data, preventing direct comparison to ACS data.
- Users from Yolo County and Users with Low Incomes were less likely to use private auto transport and more likely to carpool.
- Carpooling increased across all user groups on weekends, with a significantly larger rise among Users from Yolo County compared to others.
- As Users from Yolo County and Users with Low Incomes rely more on carpooling, toll discounts or credits based on household income and vehicle occupancy could help reduce financial burdens.

Mode is the first demographic category which relies on a mixture of trip-based data and user-based data from Replica. Trip-based data removes the possibility of comparison to ACS data, so these examples will only compare among user groups.

As shown in Figure 4-11, trip data from Replica indicates several trends for the actual modes used for trips. For both weekday and weekend users primarily travel by auto, with transit making less than 1% of the total mode share; and a marginal share of higher transit use among Yolo County residents. On weekdays and weekends, users from Yolo County and users with low incomes were less likely to use a private auto mode to get to their destination and were more likely to practice carpooling.

Weekend travel patterns expanded on this auto trip trend. All user groups showed an increase in carpooling behavior, but the increase for users from Yolo County was comparatively much greater than other user groups. Transit usage declines on weekends; however, Yolo County users demonstrate a marginally greater propensity for weekend transit travel in comparison to other user groups.

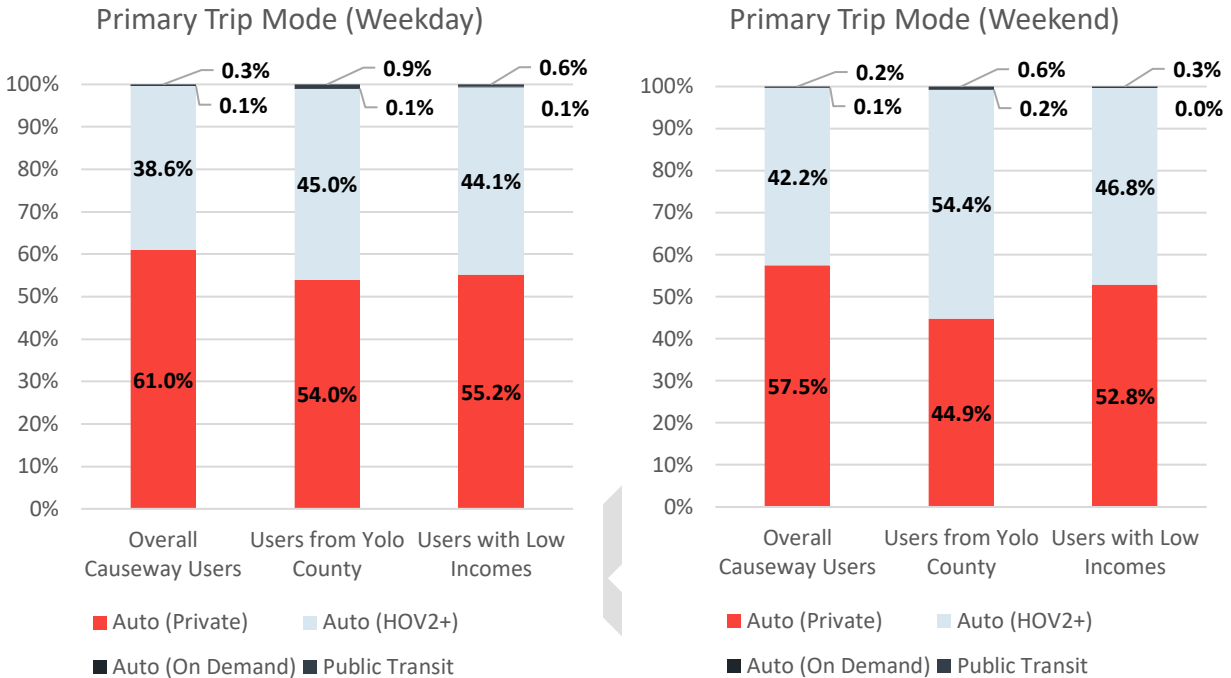


Figure 4-11: Trip Mode Distribution for Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

Commute mode is distinct from Trip Mode because rather than indicating the mode of an actual trip, commute mode describes the primary mode that a user normally takes to work. Commute mode is therefore more descriptive of a general travel behavior rather than the specific trip modeled in Replica.

As shown in Figure 4-12, user commute mode choice differed significantly among weekday and weekend users. Weekday users were much more likely to prefer commuting by auto than Yolo County's population overall, with a marked increase for private auto and a smaller increase for High Occupancy Vehicles (HOV) with two or more occupants (2+). Much of this difference is explained by a similar decrease in the likelihood of working from home, which aligns with expectations. When comparing between user groups, weekday Users from Yolo County were more likely to prefer private auto and less likely to prefer carpooling. Users with Low Incomes, were more likely to carpool, use transit and commute by taxi, bike or motorcycle compared to all other users during weekdays. Yolo County users demonstrate a higher preference for transit, bicycle, taxi, and motorcycle modes relative to walking.

During weekends, all user groups were more closely aligned with commute behaviors estimated by the ACS, indicating a traveling population that is more representative of the general population, rather than weekday workers. Both Users from Yolo County and Users with low incomes showed a significant increase in users who normally commute by transit, taxi, bike, motorcycle, or pedestrian modes, indicating that weekend travel for these users relies more heavily on auto modes.

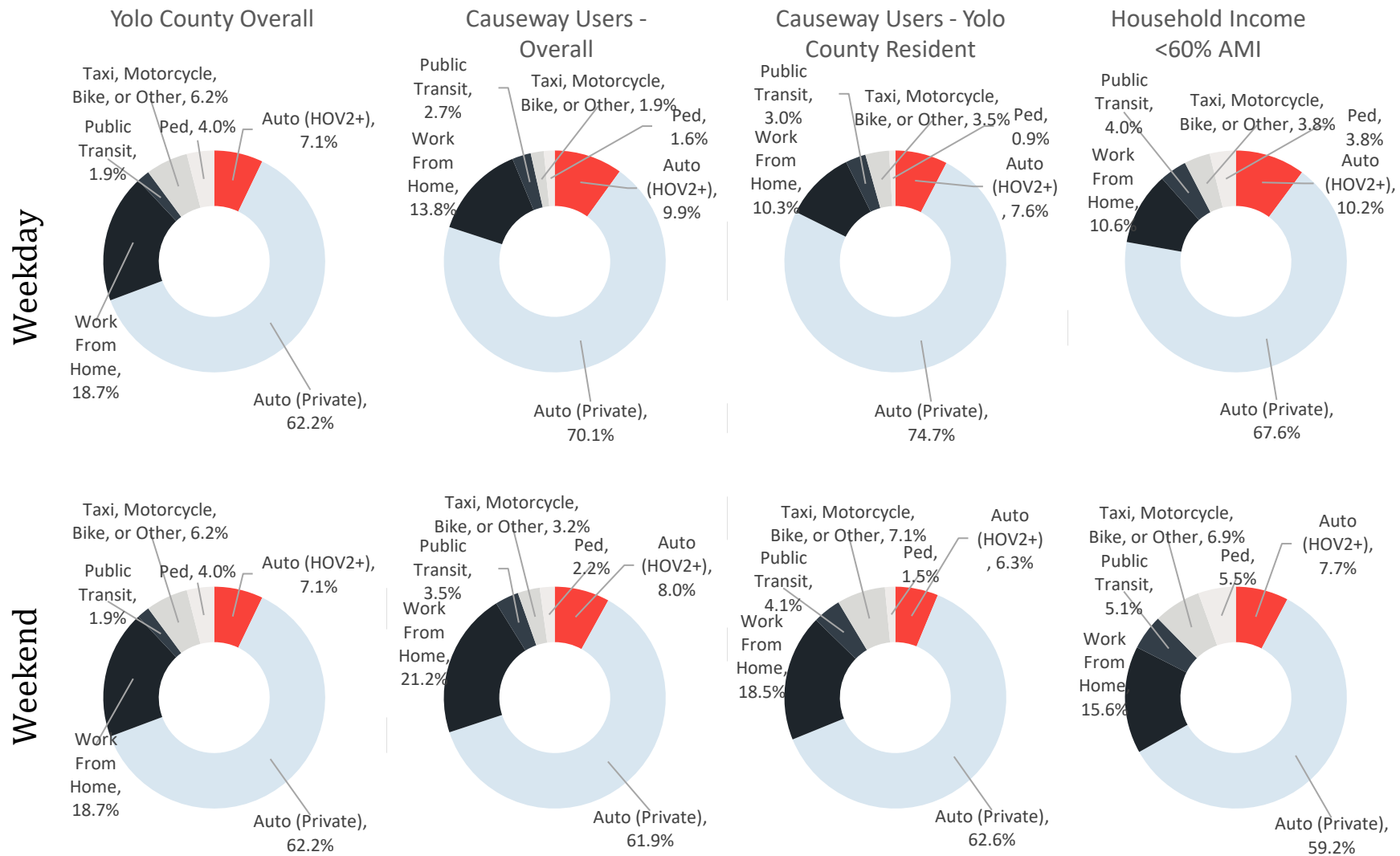


Figure 4-12: Commute Mode Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.10.1 IMPACTS

While Commute Mode distribution showed that all user groups highly favored private auto, trip data showed that Users from Yolo County and Users with Low Incomes already have a significant proportion of users who travel with more than one person in the car. Users from Yolo County particularly showed this behavior on weekends. This existing carpooling base points toward the importance of strategies that reward carpooling behavior as providing a significant benefit to Yolo County residents.

With a low commute preference for transit, reinforced by low proportions of users who commute by transit, transit strategies would need to be supported by significant changes in behavior. Transit investments would need to result in marked improvements in travel time, convenience, and reliability to be effective and successful.

4.2.11 Trip Characteristics

Key Takeaways

- Users from Yolo County are more likely to take trips in the 16–30-minute range, with this trend increasing on weekends, indicating a preference for local travel over long-distance recreational trips.
- Users with Low Incomes maintain consistent travel patterns from weekday to weekend, while higher-income users from outside Yolo County shift toward longer trips, especially in the 60–120-minute range.
- Overall Corridor Users show a weekend increase in trips spanning 51–150 miles, reinforcing the idea that higher-income travelers from outside Yolo County use the Causeway for long-distance recreational travel.
- Consistent, shorter trips by Users from Yolo County and Users with Low Incomes highlight their potential reliance on the Yolo 80 express lanes for everyday needs. Equity strategies could prioritize affordability and accessibility for local, low-income travelers who depend on these corridors for essential trips through targeted discounts for Yolo County residents.

While trips from Users with Low Incomes align closely with Overall Corridor Users, Users from Yolo County show a marked increase in the likelihood of travel for trips in the 16–30-minute range. This trend increases during weekend travel, indicating that Yolo County residents' weekend travel patterns are based more on local travel than long-distance recreational travel (See Figure 4-13).

Additionally, while users with low incomes have travel patterns that are similar from weekday to weekend, Overall Corridor Users show a shift in distribution from shorter to longer trips, with increases in the 60–120-minute trip category. This indicates that users from outside Yolo County with higher incomes are increasing trip times on the weekend, likely for recreational travel.

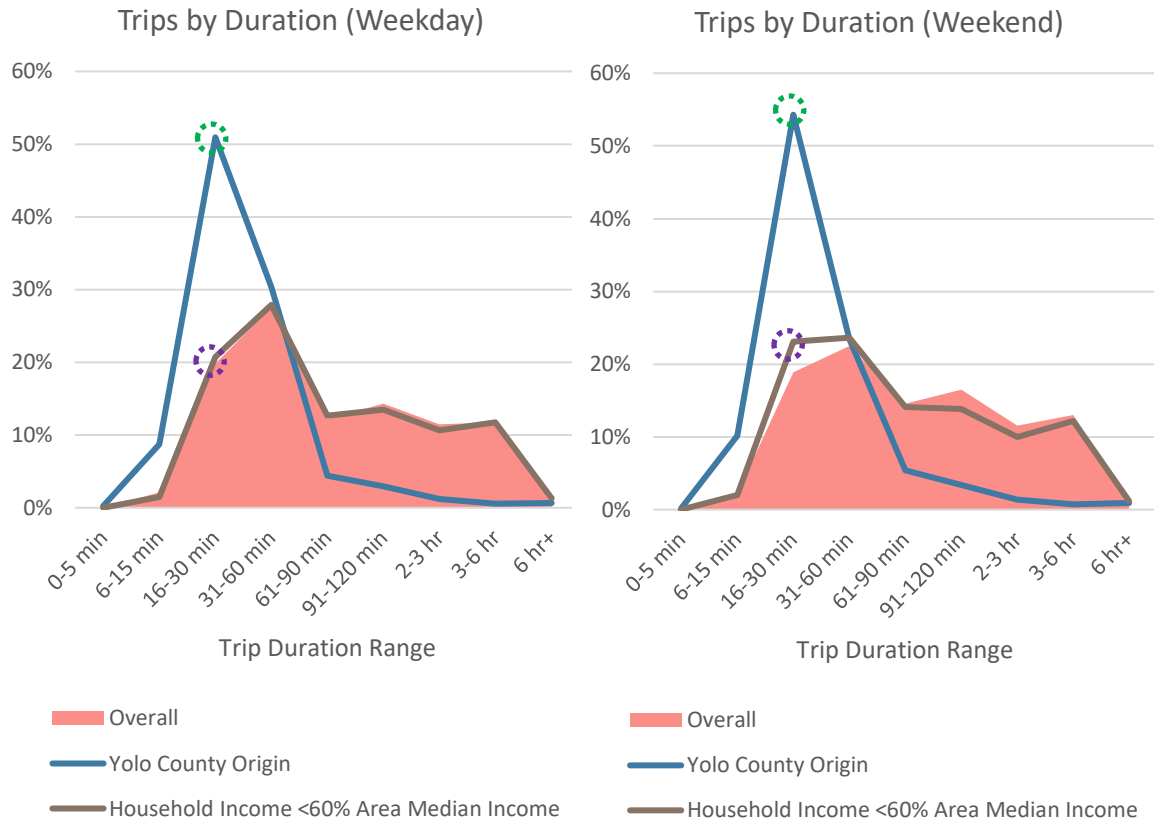


Figure 4-13: Trip Duration Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

Trip distance distributions echo these trends, with Overall Corridor Users showing a bump in travel in the 51–150-mile range during the weekend (Figure 4-14). This further supports the idea that users from outside Yolo County with higher incomes are using the Causeway for longer distance recreational travel.

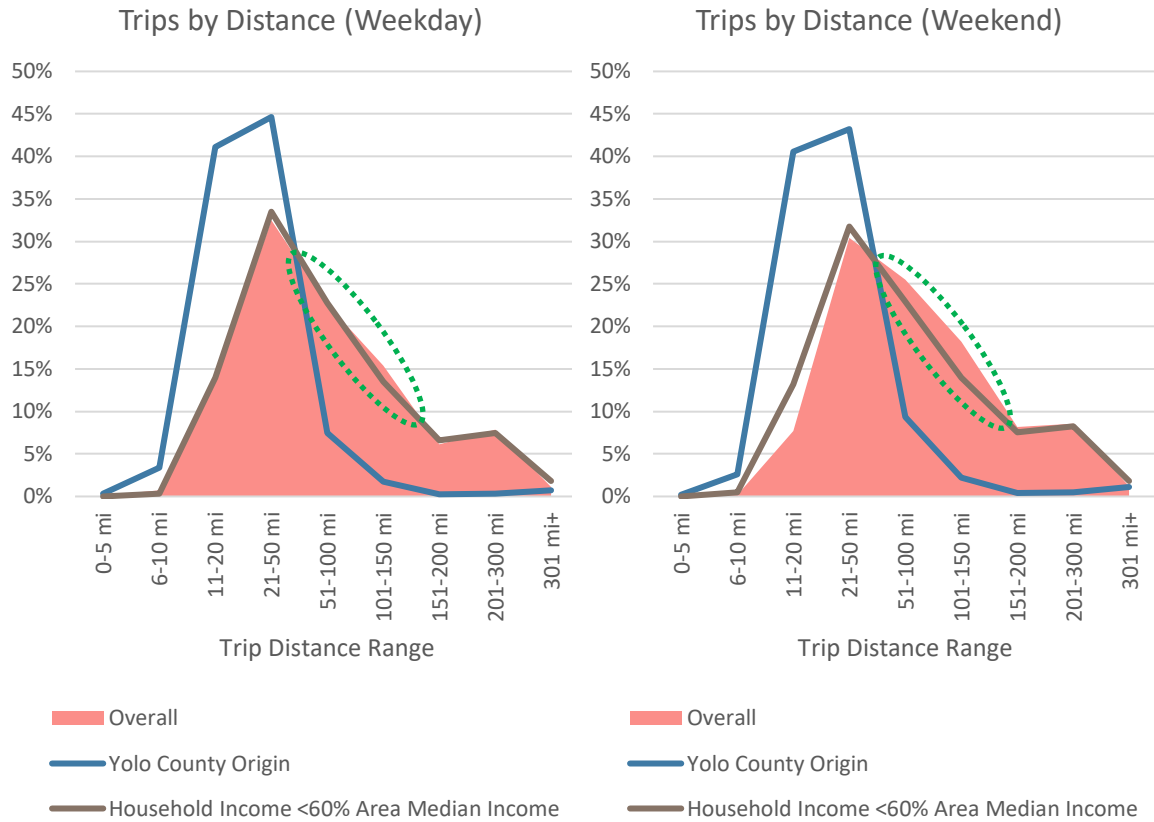


Figure 4-14: Trip Distance Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes

4.2.11.1 IMPACTS

Trip data shows that Users from Yolo County are using Yolo 80 for local, everyday travel. However, express lanes are typically associated with decreasing the time needed for trips of a longer distance or duration. In response, the Project should ensure that potential strategies and outreach for these users is focused on understanding how Yolo 80 can best benefit these more local trip purposes. Additionally, local travel-based strategies may enable easier implementation since eligibility can be more easily determined by proof of residency.

4.2.12 Trip Purpose

Key Takeaways

- Weekday travel is predominantly for work and school across all user groups, with other trip purposes being lower except for travel to home, which remains steady.
- Users with Low Incomes take a higher proportion of trips for shopping, eating, social, and recreational purposes, likely due to lower employment levels or trip chaining behaviors. This suggests that express lanes can provide benefits beyond commuting to work or school.
- On weekends, Users from Yolo County more likely to travel for eating, shopping, or work, while Overall Causeway Users and Users with Low Incomes are more likely to travel for social or recreational purposes.

As shown in Figure 4-15, there are also significant differences among all user groups for weekday versus weekend trip purpose distributions. For all user groups, weekday travel leans more heavily toward work and school purposes. All other trip purposes (except for travel to home, which aligns with expectations by remaining steady) are lower on weekdays for all user groups. Among user groups, weekday trip purposes are comparable for overall Causeway users and users from Yolo County. However, users with low household incomes tend to have comparatively high proportions of users traveling for shopping, eating, social, and recreational purposes. This may be reflective of lower employment levels, but may also be reflective of trip chaining behaviors, where users may have multi-purpose trips with many different stops. Additionally, it may suggest that low-income travelers need to travel farther across the Causeway to access recreational spaces and activities in Sacramento, highlighting potential disparities in the access to local amenities.

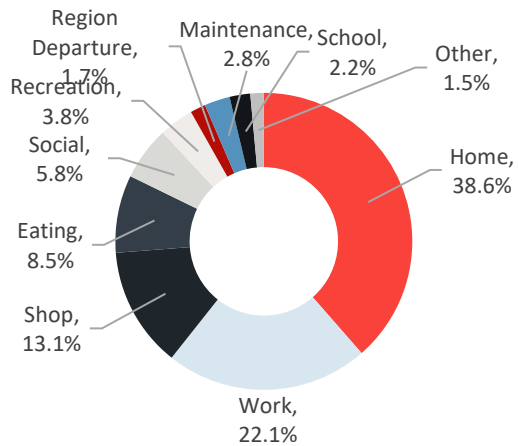
While weekend travel represents a decrease in work purposes across all user groups, there is some nuance between the remaining distribution of purposes. Users from Yolo County are comparatively more likely to be traveling for eating, shopping, or work purposes, while Overall Causeway Users and Users with Low Incomes are more likely to be traveling for social or recreation purposes.

4.2.12.1 IMPACTS

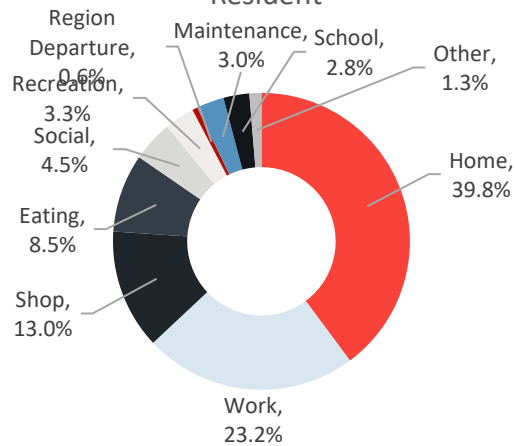
Understanding of trip purpose is highly related to trip characteristics described in the previous section, supporting any potential equity strategy decisions related to increasing benefits of the express lanes for local users. Trip purpose also affects the likelihood and willingness of users to pay to use the express lane, since the decision to pay is likely to be highly dependent on the urgency of trips related to work, health, or emergencies.

Weekday

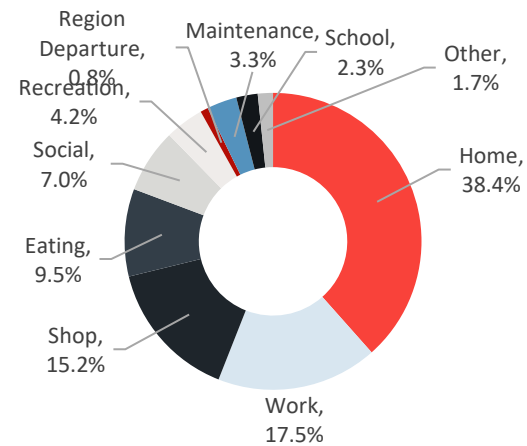
Causeway Users - Overall



Causeway Users - Yolo County Resident



Household Income <60% AMI



Weekend

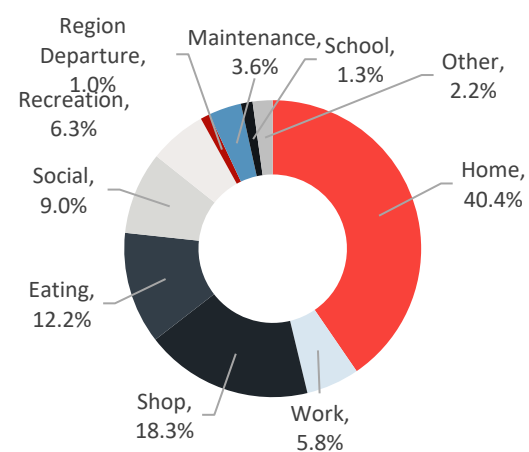
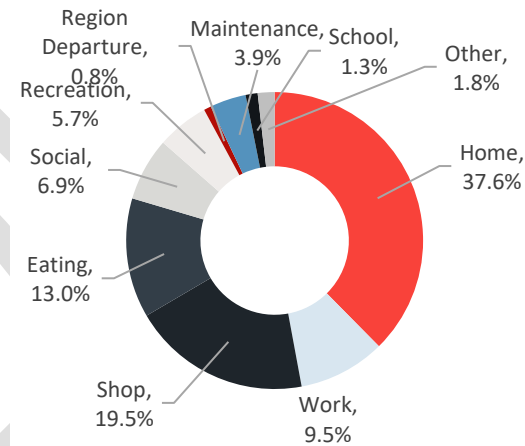
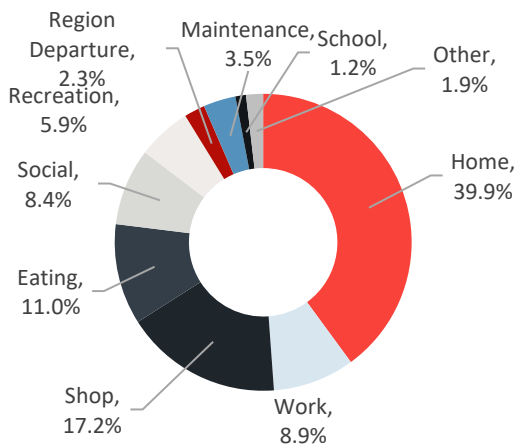
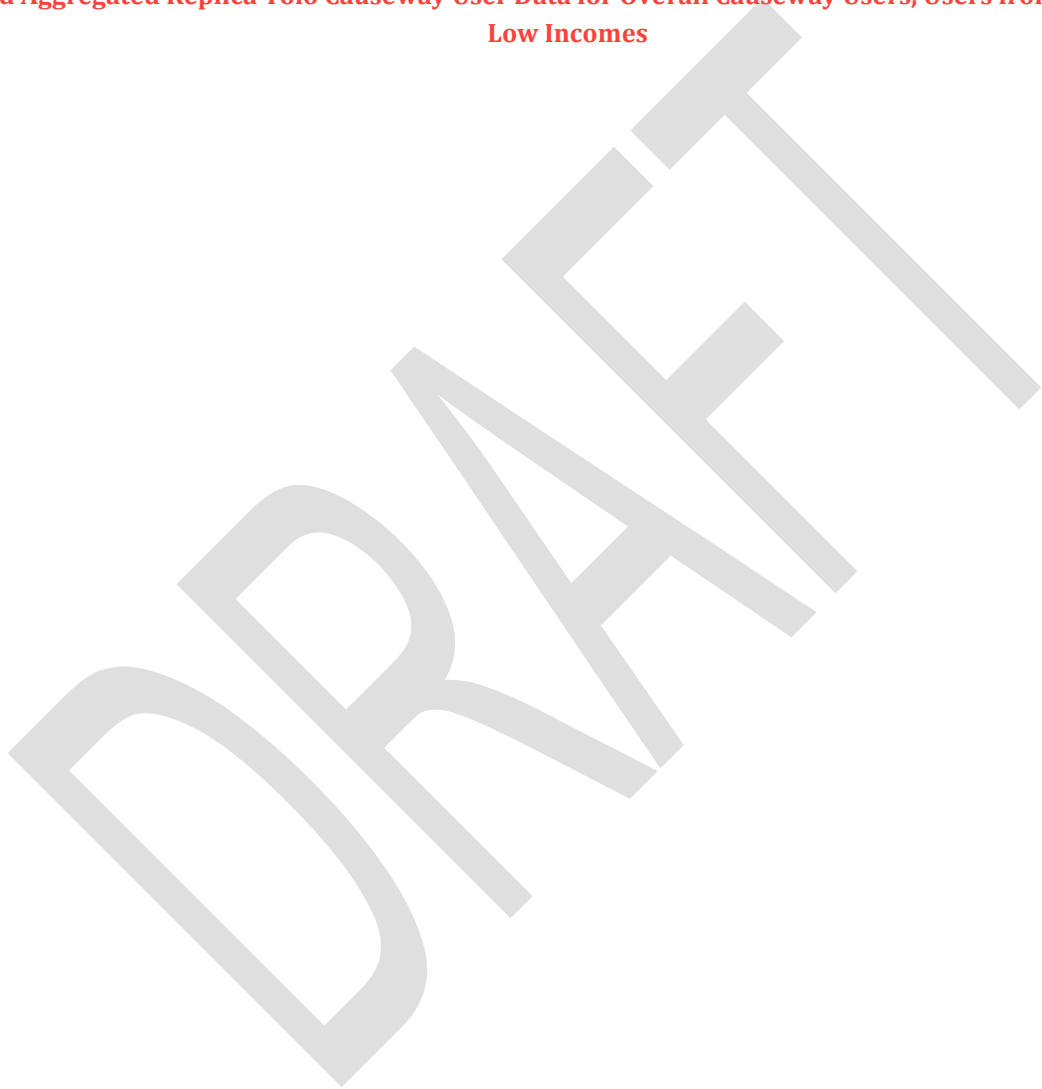


Figure 4-15: Trip Purpose Distribution for Yolo County Overall (American Community Survey 5-Year Estimate 2019-2023), compared to Weekday and Weekend Aggregated Replica Yolo Causeway User Data for Overall Causeway Users, Users from Yolo County, and Users with Low Incomes



4.2.13 Origins and Destinations

Key Takeaways

- Overall Causeway Users show increased passthrough travel on weekends, while Users with Low Incomes maintain relatively stable travel patterns. Longer-distance trips tend to be more common among higher-income users outside Yolo County.
- Users with Low Incomes show more concentrated travel patterns within Davis, West Sacramento, and Sacramento, while Overall Causeway Users have a more dispersed range of trip origins and destinations.
- Users with Low Incomes are more likely to travel within the three-county area or take long-distance trips without stopping in Yolo County, while higher-income users show more diverse travel patterns and are more likely to use the Causeway for longer regional connections.
- Users with Low Incomes generally make shorter, more focused trips within the local area, while higher-income users tend to travel longer distances across a wider region. Yolo 80 strategies for equity will benefit from offering targeted discounts or credits to support low-income travelers who depend on the express lanes for local trips.

Origins and Destinations were analyzed at two levels, depending on the user group – County-Level and Census Tract-Level. Given the Causeway’s interregional significance, the travel patterns of Overall Causeway Users and Users with Low Incomes were analyzed at the county-to-county level.

For intercounty travel, Users from Yolo County are largely captured in data for Overall Causeway Users, so analysis instead focuses more specifically on travel between census tracts, both for the broader Users from Yolo County group and for Users from Yolo County with Low Incomes. The top 20 origins and destinations for these two groups are highlighted.

4.2.13.1 OVERALL CAUSEWAY USERS

Table 4-3 describes high-level travel patterns among Overall Causeway Users. For weekday travel, trips within and between Yolo, Sacramento, and Solano counties (intraregional) make up **49.9%** of all trips, while trips with neither origins nor destinations in Yolo County make up **49.7%** of trips. This balance shifts significantly during the weekend, where intraregional travel decreases to **43.2%** and passthrough travel increases to **56.0%**.

Table 4-3: Aggregated County-Level Weekday Origin-Destination Patterns for Overall Causeway Users

	Thursday		Saturday	
	Count	%	Count	%
Yolo to Yolo	16106	6.4%	12985	5.4%
Yolo Origin	54556	21.6%	46381	19.3%
Yolo Destination	56485	22.3%	46576	19.3%
Pass-Through	125773	49.7%	134957	56.0%
Total	252920	100.0%	240899	100.0%
Yolo-Sacramento-Solano (Intraregional) ⁶	126317	49.9%	104125	43.2%

Table 4-4 describes the top 20 most frequent pairings of origins and destinations for trips that pass through the Causeway for weekday travel. The top 5 pairs, totaling **46.3%** of trips, all represent intraregional travel within Yolo-Sacramento-Solano (note that this figure differs from Table 4-3 due to the exclusion of Sacramento-Sacramento and Solano-Solano trips). With the exception of a Washoe-Alameda pair, all Origin-Destination (OD) pairs have an origin or destination within these three counties as well.

It is also notable that only four of these OD pairs do not have Sacramento County as an origin or destination, with travel starting or ending in Sacramento totaling **58.1%** of trips. Of all weekday OD pairs, around **7%** of total travel occurs from the central Bay Area counties (Alameda, Contra Costa, San Francisco, Santa Clara, and San Mateo) to Sacramento County via the Causeway, highlighting Sacramento as a key regional destination point for Bay Area travel.

⁶ Yolo–Sacramento–Solano intraregional trips refer to the share of trips start and end within the three-county area (Yolo, Sacramento, and Solano counties). This includes trips that occur within one county (e.g., Sacramento–Sacramento) and trips between counties (e.g., Yolo–Sacramento, Sacramento–Solano)

Table 4-4: Top 20 County-Level Weekday Origin-Destination Pairs for Overall Causeway Users

Top 20 Origin-Destination Pairs (Weekday)			
	Origin	Destination	%
1	Sacramento County, CA	Yolo County, CA	11.1%
2	Yolo County, CA	Sacramento County, CA	10.7%
3	Sacramento County, CA	Solano County, CA	9.5%
4	Solano County, CA	Sacramento County, CA	8.6%
5	Yolo County, CA	Yolo County, CA	6.4%
6	Sacramento County, CA	Alameda County, CA	2.1%
7	Solano County, CA	Yolo County, CA	2.0%
8	Sacramento County, CA	Contra Costa County, CA	2.0%
9	Alameda County, CA	Sacramento County, CA	1.8%
10	San Francisco County, CA	Sacramento County, CA	1.7%
11	Yolo County, CA	Solano County, CA	1.6%
12	Contra Costa County, CA	Sacramento County, CA	1.6%
13	Sacramento County, CA	San Francisco County, CA	1.6%
14	Sacramento County, CA	San Mateo County, CA	1.6%
15	Sacramento County, CA	Sonoma County, CA	1.5%
16	San Mateo County, CA	Sacramento County, CA	1.4%
17	Sonoma County, CA	Sacramento County, CA	1.3%
18	Santa Clara County, CA	Sacramento County, CA	0.9%
19	Washoe County, NV	Alameda County, CA	0.8%
20	Sacramento County, CA	Napa County, CA	0.8%
	Top 20 Total		68.9%

Table 4-5 describes the top 20 most frequent pairings of origins and destinations for trips that pass through the Causeway for weekend. While the top 5 OD pairs remain the same as weekday, the percentage of trips which fall in the top 5 drops considerably from **46.3%** to **40.5%**, indicating an increase in longer distance travel. Travel between Yolo County and Solano County drops, with both Yolo-Solano and Solano-Yolo trips dropping by approximately 7 ranks. While there are a few examples of increased ranking of longer distance OD pairs, such as San Mateo-Sacramento and Contra Costa-Sacramento, OD pairs tend to stay within the same quadrant of rank compared to weekday.

Table 4-5: Top 20 County-Level Weekend Origin-Destination Pairs for Overall Causeway Users

Top 20 Origin-Destination Pairs (Weekend)			
	Origin	Destination	%
1	Yolo County, CA	Sacramento County, CA	9.6%
2	Sacramento County, CA	Yolo County, CA	9.4%
3	Sacramento County, CA	Solano County, CA	8.3%
4	Solano County, CA	Sacramento County, CA	7.8%
5	Yolo County, CA	Yolo County, CA	5.4%
6	Sacramento County, CA	Contra Costa County, CA	2.3%
7	Sacramento County, CA	Alameda County, CA	2.2%
8	Alameda County, CA	Sacramento County, CA	2.1%
9	Contra Costa County, CA	Sacramento County, CA	2.0%
10	San Francisco County, CA	Sacramento County, CA	1.9%
11	Sacramento County, CA	San Francisco County, CA	1.8%
12	Sacramento County, CA	San Mateo County, CA	1.8%
13	San Mateo County, CA	Sacramento County, CA	1.6%
14	Sacramento County, CA	Sonoma County, CA	1.6%
15	Solano County, CA	Yolo County, CA	1.4%
16	Sonoma County, CA	Sacramento County, CA	1.4%
17	Yolo County, CA	Solano County, CA	1.2%
18	Santa Clara County, CA	Sacramento County, CA	1.2%
19	Washoe County, NV	Alameda County, CA	1.0%
20	Alameda County, CA	Washoe County, NV	0.8%
Top 20 Total			64.7%

Weekend travel to and from Sacramento County makes up **54.9%** of the top 20 OD pairs, with 15 OD pairs including Sacramento. Compared to weekdays, weekend travel from the central Bay Area counties is higher, making up **9%** of all OD pairs.

Contrary to expectations of heavy weekend travel from the Bay Area to leisure destinations like Lake Tahoe, the dominant weekend travel is principally connecting Sacramento with these central Bay Area Counties. Table 4-6 shows the share of weekend trips originating from the central Bay Area counties to Lake Tahoe counties (El Dorado County, CA; Placer County, CA; Carson City, NV; Douglas County, NV and Washoe County, CA). The central Bay Area counties together account for around **6%** of weekend trips to Lake Tahoe counties, compared to **9%** directly bound for Sacramento County.

This reinforces that weekend travel patterns are not only leisure-bound and more about ongoing ties related to housing, employment, social and economic ties between the Bay Area and Sacramento. A higher share Bay Area weekend trips on the Causeway are not simply “passing through” on the way to recreation but are instead connected to Sacramento County.

Table 4-6: Weekend Bay Area Counties Origins and Lake Tahoe Counties Destinations Pairs

Weekend Trip Shares from Bay Area Counties to Lake Tahoe Counties	
Bay Area Counties Origins	Lake Tahoe Counties – Total Destination Share
Alameda County, CA	1.8%
Santa Clara County, CA	1.3%
San Francisco County, CA	1.1%
Contra Costa County, CA	0.9%
San Mateo County, CA	0.8%
Total	5.9%

4.2.13.2 USERS WITH LOW INCOMES

Table 4-7 describes high-level travel patterns among Users with Low Incomes. For weekday travel, intraregional trips within and between Yolo, Sacramento, and Solano counties make up **51.6%** of all trips (compared to **49.9%** for Overall Causeway Users), while trips with neither origins nor destinations in Yolo County make up **52.7%** of trips (compared to **49.7%** of Overall Causeway Users). When compared to Overall Causeway Users, Users with Low Income from within the three-county area tend to make shorter, localized trips, staying within the region and Users with Low Income who reside outside the local area, are more likely to make longer-distance trips. This suggests that income level and place of residence could influence travel behavior. Local Users with Low Incomes prioritize nearby destinations, while non-local Users with Low-Income travel farther than their non-low-income counterparts. The higher incidence of overlap between the pass-through and intraregional trip categories also indicates that a higher proportion of Users with Low Incomes are traveling between Solano and Sacramento without stopping in Yolo County.

There are also important differences in weekend travel among Users with Low Incomes. For Overall Causeway Users, pass-through travel increased from **49.7%** to **56.0%** on the weekend, while for Users with Low Incomes, pass-through travel stayed steady, only slightly decreasing from **52.7%** to **52.3%**, indicating users from outside the three-county region are taking fewer long-distance, likely recreational trips. Generally, travel patterns stay largely consistent for Users with Low Incomes from weekday to weekend.

Table 4-7: Aggregated County-Level Weekday Origin-Destination Patterns for Users with Low Incomes

	Thursday		Saturday	
	Count	%	Count	%
Yolo to Yolo	2324	4.6%	2388	4.5%
Yolo Origin	10507	20.8%	11306	21.2%
Yolo Destination	11080	21.9%	11714	22.0%
Pass-Through	26684	52.7%	27857	52.3%
Total	50595	100.0%	53265	100.0%
Yolo-Sacramento-Solano (Intraregional)	26091	51.6%	25981	48.8%

The Top 20 weekday OD pairs for Users with Low Incomes, described in Table 4-8, show important similarities and differences compared to the travel patterns for Overall Causeway Users. The top 5 pairs are the same as those for Overall Causeway Users, with the share of these top 5 increasing from **46.3%** to **50.4%**, again indicating an increased likelihood for local travel. Several other OD pairs remained relatively stable in ranking, with a few exceptions. Travel between Sacramento-Sonoma and Sacramento-Napa both increased by six ranks. New OD pairs between Napa-Sacramento, Placer-Yolo, and Sacramento-Marin also placed in the Top 20. Travel between Sacramento and San Mateo in both directions also decreased by three ranks. The Solano-Yolo, Yolo-Solano, and Washoe-Alameda pairs also all dropped off in the Top 20. These patterns may indicate that while local travel is more concentrated for Users with Low Incomes, when travel is outside the three-county region, it may be longer distance and focused on particular industries. For example, the wine-producing regions of Napa and Sonoma generate significant economic activity, attracting hospitality workforce. Due to the high cost of housing in these areas, many hospitality workers are unable to afford living locally and instead commute from more affordable regions, such as the Sacramento area.

Table 4-8: Top 20 County-Level Weekday Origin-Destination Pairs for Users with Low Incomes

Top 20 Origin-Destination Pairs (Weekday)			
	Origin	Destination	%
1	Sacramento County, CA	Yolo County, CA	13.6%
2	Yolo County, CA	Sacramento County, CA	12.7%
3	Sacramento County, CA	Solano County, CA	9.9%
4	Solano County, CA	Sacramento County, CA	9.6%
5	Yolo County, CA	Yolo County, CA	4.6%
6	Sacramento County, CA	Contra Costa County, CA	1.9%
7	Alameda County, CA	Sacramento County, CA	1.9%
8	Sacramento County, CA	Alameda County, CA	1.9%
9	Sacramento County, CA	Sonoma County, CA	1.7%
10	Contra Costa County, CA	Sacramento County, CA	1.6%
11	Sacramento County, CA	San Francisco County, CA	1.6%
12	San Francisco County, CA	Sacramento County, CA	1.6%
13	Sonoma County, CA	Sacramento County, CA	1.5%
14	Sacramento County, CA	Napa County, CA	0.9%
15	Napa County, CA	Sacramento County, CA	0.8%
16	San Mateo County, CA	Sacramento County, CA	0.8%
17	Sacramento County, CA	San Mateo County, CA	0.8%
18	Santa Clara County, CA	Sacramento County, CA	0.7%
19	Placer County, CA	Yolo County, CA	0.7%
20	Sacramento County, CA	Marin County, CA	0.7%
Top 20 Total			69.6%

The Top 20 weekend OD pairs for Users with Low Incomes described in Table 4-9 indicates similar trends as the comparison between user groups for weekday travel. The top 5 pairs similarly remain the same, representing 47.6% of travel for Users with Low Incomes compared to 40.5% of travel for Overall Corridor Users. Travel between Sacramento and Sonoma Counties also was higher for Users with Low Incomes compared to Overall Corridor Users, while travel between San Mateo and Sacramento counties also dropped

four to six ranks. Santa Cruz-El Dorado, El Dorado-Santa Cruz, Yolo-Placer, and Placer Yolo are all new additions to the Top 20 when compared to overall users. Particularly with Santa Cruz-El Dorado, this likely indicates a willingness to travel very long distances for recreational trip purposes. Trips between Alameda and Washoe, and Solano and Yolo also dropped off the Top 20 for weekend as well.

Table 4-9: Top 20 County-Level Weekend Origin-Destination Pairs for Users with Low Incomes

Top 20 Origin-Destination Pairs (Weekend)			
	Origin	Destination	%
1	Sacramento County, CA	Yolo County, CA	13.3%
2	Yolo County, CA	Sacramento County, CA	12.7%
3	Sacramento County, CA	Solano County, CA	8.6%
4	Solano County, CA	Sacramento County, CA	8.5%
5	Yolo County, CA	Yolo County, CA	4.5%
6	Sacramento County, CA	Contra Costa County, CA	2.0%
7	Alameda County, CA	Sacramento County, CA	1.9%
8	Sacramento County, CA	Alameda County, CA	1.8%
9	Contra Costa County, CA	Sacramento County, CA	1.8%
10	Sacramento County, CA	Sonoma County, CA	1.7%
11	San Francisco County, CA	Sacramento County, CA	1.6%
12	Sacramento County, CA	San Francisco County, CA	1.6%
13	Sonoma County, CA	Sacramento County, CA	1.6%
14	Santa Cruz County, CA	El Dorado County, CA	1.2%
15	El Dorado County, CA	Santa Cruz County, CA	1.2%
16	Santa Clara County, CA	Sacramento County, CA	0.9%
17	San Mateo County, CA	Sacramento County, CA	0.9%
18	Sacramento County, CA	San Mateo County, CA	0.9%
19	Placer County, CA	Yolo County, CA	0.8%
20	Yolo County, CA	Placer County, CA	0.7%
Top 20 Total			68.3%

4.2.13.3 USERS FROM YOLO COUNTY

Figure 4-16 through Figure 4-19 highlight the top 20 census tracts where Users from Yolo County (home county of the users) travel to and from. These maps distinguish between weekday and weekend origins and destinations. Users from Yolo County demonstrate consistency in the top 20 OP pairs of Overall Causeway Users and Users with Low Income. On weekdays, travel patterns for users from Yolo County show a strong concentration of trips beginning in a few key areas, likely residential zones with high commuter activity. The most frequent destinations include **Sacramento, Davis, and West Sacramento**, suggesting that weekday travel is largely oriented toward employment centers, educational institutions, and government or commercial hubs.

On weekends, trip origins are more widely distributed, indicating that people are starting their trips from a broader range of neighborhoods or communities. Destinations also shift, with activity spread across more areas

rather than concentrated in a few dominant zones. This suggests that weekend travel is more flexible and varied and less centralized compared to weekday travel. Weekend travel pattern are more likely driven by leisure, errands, or social visits throughout a wider geographic area. Both weekday and weekend origins and destinations of Users of Yolo County follow a comparable pattern to Overall Causeway Users and Users with Low income, with similar high travel between the Yolo-Solano-Sacramento region.

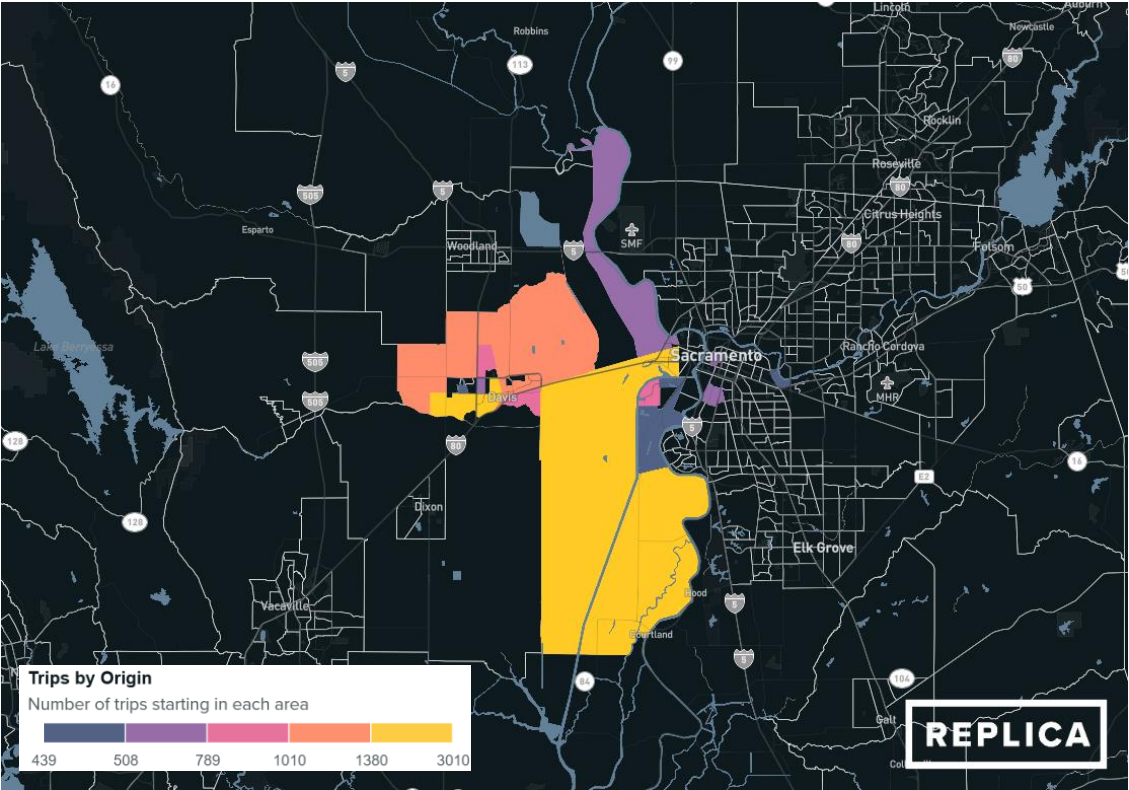


Figure 4-16: Top 20 Weekday Trip Origins for Users from Yolo County

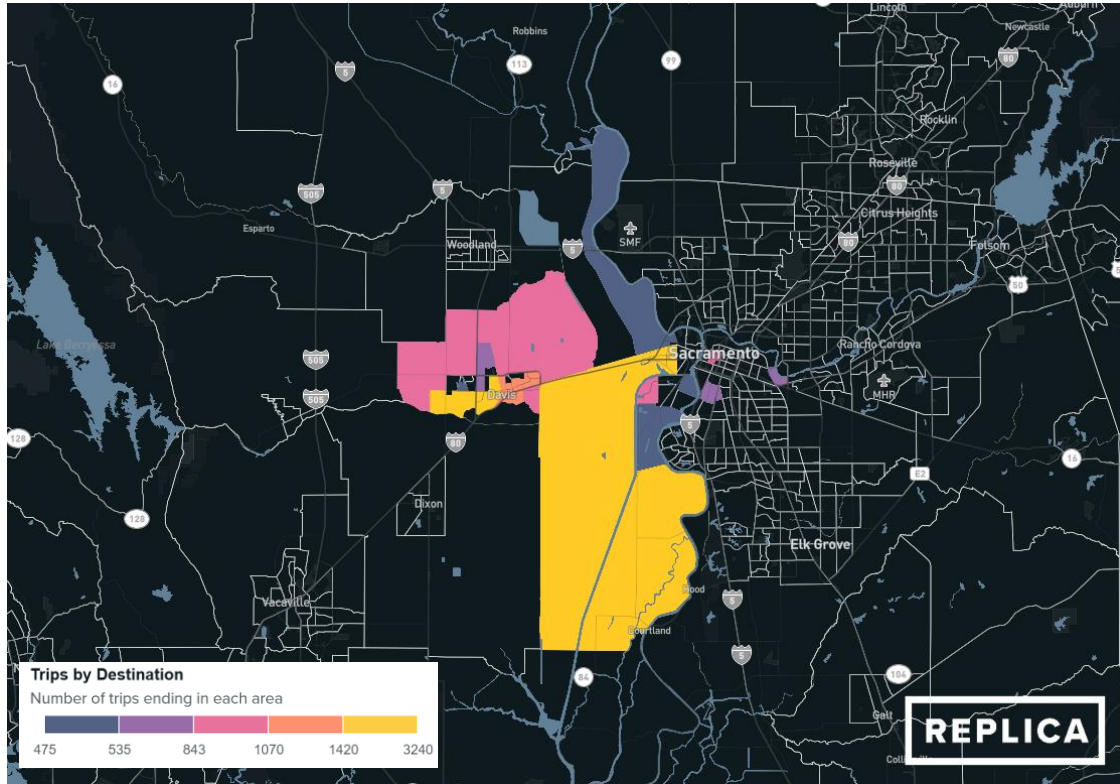


Figure 4-17: Top 20 Weekday Trip Destinations for Users from Yolo County

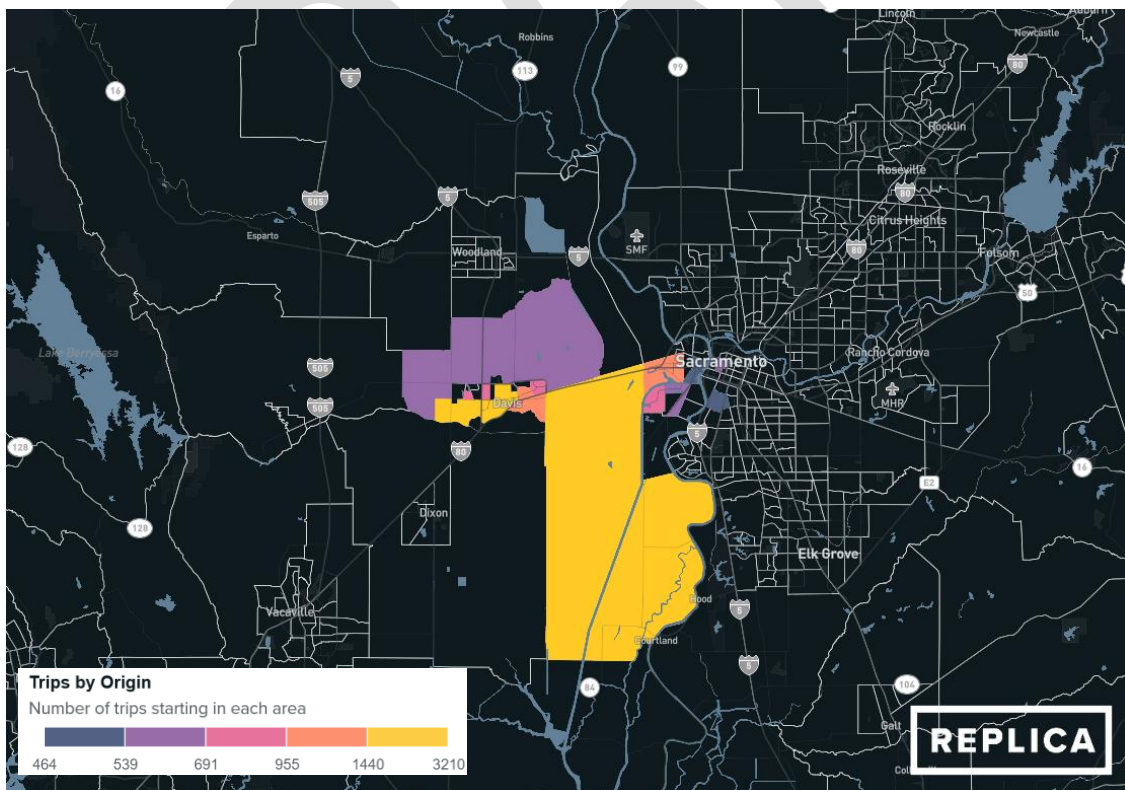


Figure 4-18: Top 20 Weekend Trip Origins for Users from Yolo County

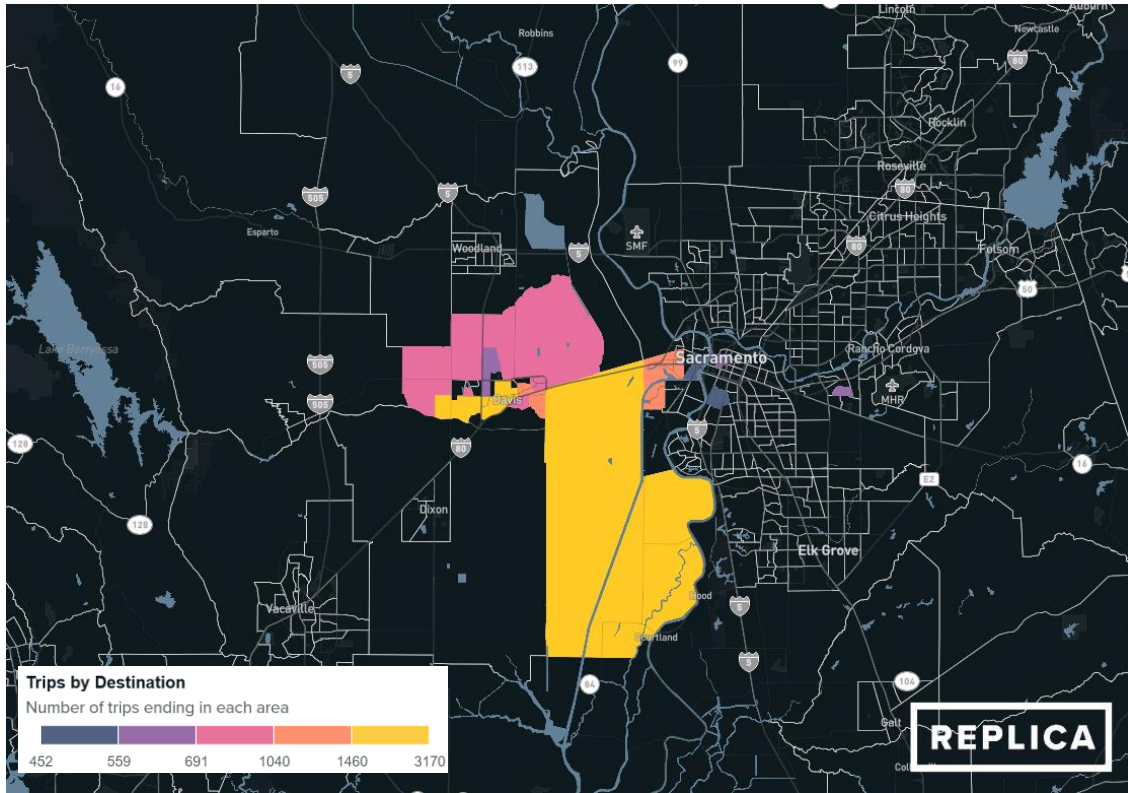


Figure 4-19: Top 20 Weekend Trip Destinations for Users from Yolo County

5 NEIGHBORHOOD ANALYSIS

This section describes the methodology and results of the spatial analysis which assessed the demographics of Yolo, county at the census tract level. The resulting maps provide detailed insights into the demographic characteristics of these communities to support the identification and assessment of communities most likely to be impacted by the Project. By leveraging spatial mapping, data can be visualized and analyzed to tell a story about the residents of these communities and the potential impacts of the Project. This approach ensures that the project planning and execution are informed by accurate and relevant demographic information.

5.1 MAPPING METHODOLOGY

To effectively assess the impact of the Yolo 80 Managed Lanes Project on communities within Yolo county, a systematic approach was used. This approach integrates various datasets and criteria into comprehensive quantitative policy indexes, or composite metrics created to quantify and visualize how certain communities align with specific policy-relevant characteristics. It is important to acknowledge that indexes have historically been criticized for oversimplifying complex realities, using subjective weighting, being subject to misinterpretation, and not including input from communities being measured. This Study acknowledges these important criticisms and emphasizes that these indexes are not intended as a sole source for decision- or policymaking. Rather, this Study's intention is to use indexes to highlight complex interactions between different demographic data as a first step in an equity process that is intended to be nuanced, inclusive, participatory, and considerate of multiple quantitative and qualitative data sources.

The methodology involves collecting multiple demographic, socioeconomic, transportation and environmental data points at the census tract level for each county, assigning weights to the relevant measurements, calculating scores, and averaging these scores to create a policy index. Each index conveys a unique data story, highlighting different aspects of community impact. By integrating these indexes with their geographical representations (maps), it becomes easier to visualize areas where the indexes are higher and to understand the underlying narratives of these communities. The visual maps provide a clear, intuitive way to identify and analyze regions most affected by the Yolo 80 Managed Lanes, facilitating a deeper comprehension of the socio-economic and demographic factors at play.

The following sections details the methodology for the mapping exercise and its results.

5.1.1 Data Sources and Criteria

Table 5-1 shows the different criteria, the measures used to analyze the criteria, and their corresponding source. Each criterion was selected based on its relevance to the project's goals and its potential impact on the community.

Table 5-1: Criteria, Measurement and Source for Indexes and Mapping

Criteria	Measurement	Source
Very Low-Income	% of households with income below 60% of the County's Area Median Income (AMI) ⁷	ACS 2023 5-Year Estimates
Limited Access to Personal Vehicle	% of households with zero cars	ACS 2023 5-Year Estimates
Transit Commuting	% of individuals commuting by transit	ACS 2023 5-Year Estimates
Carpooling Commuting	% of individuals commuting by carpool	ACS 2023 5-Year Estimates
Limited English Proficiency	% of individuals with limited English proficiency	ACS 2023 5-Year Estimates
Severe Housing Burden	% of households spending 50% or more of their income on housing costs	ACS 2023 5-Year Estimates
People of Color (POC) Population	% of individuals of all racial and ethnic groups other than non-Hispanic white	ACS 2023 5-Year Estimates
Pollution Burden	CalEnviroScreen 4.0 Pollution Burden Score	CalEnviroScreen 4.0
Pedestrian Safety	Density of crashes involving pedestrians from 2019 to 2023	California Statewide Integrated Traffic Records System (SWITRS)
Bicyclist Safety	Density of crashes involving cyclists from 2019 to 2023	SWITRS

5.1.2 Understanding Communities

After selecting the main criteria for equity — such as income, access to cars, pollution burden, etc. – a data story approach was adopted. This method combines various criteria to visually convey a narrative through indexes, each representing a specific aspect of community impact relevant to the project's equity scope. Table 5-2 shows the indexes created and the combination of criteria.

⁷ Based on Yolo County's median household income from the 2023 ACS 1-year estimates.

Table 5-2: Understanding Communities through Indexes

Index Name	Description	Criteria
Carpool Reliance	The Carpool Reliance Index shows the very low-income population within each census tract that relies on carpooling for their commuting and who have limited access to a personal vehicle.	• Very Low-Income • Limited Access to Personal Vehicle • Carpooling Community
Transit Reliance	The Transit Reliance index shows the very low-income population within each census tract that relies on transit for their commuting and who have limited access to a personal vehicle.	• Very Low-Income • Limited Access to Personal Vehicle • Transit Community
Public Participation	For engagement efforts, the Public Participation Index features very low-income population with limited English proficiency in each census tract and with limited access to a personal vehicle. This combination of features will highlight communities where particular care must be taken to ensure that public participation opportunities are accessible in terms of language, financial considerations, and location.	• Very Low-Income • Limited Access to Personal Vehicle • Limited English Proficiency
Affordability	The Affordability Index highlights census tracts where a high percentage of households spend at least half their income on housing, alongside very low-income areas. This index aims to identify census tracts with heightened economic vulnerability.	• Very Low-Income • Severe Housing Burden
Environmental Exposure and Resiliency	The Environmental Exposure and Resiliency index identifies areas where very low-income and minority populations face high pollution burdens, highlighting communities most vulnerable to environmental hazards.	• Very Low-Income • Minority Population • Pollution Burden
Environmental Justice and Safety	The Environmental Justice and Safety Index highlights areas where very low-income and minority populations are disproportionately affected by pedestrian and bicycle safety risks. The Index identifies areas with high concentrations of very low-income and minority populations but does not include safety data in its construction. Instead, pedestrian and bicycle crash data are	• Very Low-Income • Minority Population + Pedestrian/Bicycle Safety

Index Name	Description	Criteria
	overlaid onto the index to highlight communities facing heightened transportation risks.	

Each of these data stories results in an index and a corresponding visualization, which helps pinpoint areas where future equity measures might be needed. The visual representations make it easier to identify regions in Yolo county with higher index values and understand the underlying narratives of these communities. Section 5.2 illustrates the resulting data stories, while the next section explains how the indexes were calculated.

5.1.3 Index Calculation

The proposed policy indexes act as indicators for the impacts and potential outcomes of the Project and can:

- Transform multi-dimensional data to summarize complex realities
- Provide an easier understanding and comparison of separate indicators
- Condense a set of indicators without losing essential information
- Highlight issues at the selected geographic level and progress in policy discussions
- Support the creation of narratives and data storytelling (Surminski & Williamson, 2012)

For the Yolo 80 Managed Lanes project, policy indexes facilitate an “apples-to-apples” comparison of equity criteria at the census tract level in Yolo county. The following steps were all undertaken at the census tract level to create the policy indexes:

1. **Scaling Criterion Measurements:** Each criterion measurement was scaled to a common range of 1-100. This was done by setting the maximum measurement of all census tracts within each county to 100. For example, for the Very Low-Income criterion, the highest percentage of households with income below 60% of Yolo's AMI is 70.3% in census tract 105.01. This value is scaled to 100, making it the reference point for normalization:

$$\text{Very Low Income}_{105.01} = \% \text{ HH in 105.01 making } < 60\% \text{ Yolo's AMI} \times \frac{100}{\text{Max}(\% \text{ HH making } < 60\% \text{ Yolo's AMI})}$$

2. **Aggregation of Normalized Measurements:** After scaling, the values for each criterion for each census tract were summed depending on the data story. For example, for the Carpool Reliance analysis, three scaled measurements were added:

$$\text{Very Low Income} + \text{Carpool Commuting} + \text{Limited Access to Personal Vehicle}$$

3. **Average Index Computation:** The sum of the normalized values was then divided by the number of categories to calculate the arithmetic average, ensuring each criterion contributes equally to the overall index value. This final step produces an average index value, representing the overall impact of these criteria at the census tract level.

Carpool Reliance Index

$$= \frac{\text{Very Low Income} + \text{Carpool Commuting} + \text{Limited Access to Personal Vehicle}}{3}$$

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5.2 FINDINGS

5.2.1 Carpool Reliance

The Project adds approximately 17 miles of tolled managed lanes to I-80 and US 50 through a combination of new lane construction and enhancement of ITS. While the project adds a new lane to increase capacity and throughput, it will also incorporate toll policies that allow free use by HOVs with three or more riders (3+). Paid access will be allowed for vehicles with fewer than three passengers. As described in Section 4.2.10, Yolo County residents already travel by HOV in high percentages, particularly on weekends, so there is great opportunity to expand upon these behaviors with targeted strategies.

The implementation of strategies in this regard introduces several opportunities and challenges for existing carpoolers and users with low incomes who are not currently carpooling but may be willing to adopt the mode. Carpool users would, at minimum, be required to receive and apply information on usage rules (preferably in their primary language), adopt potentially new technologies, and create and maintain a FasTrak® account. Different carpool user profiles may have different resiliencies to these requirements to access benefits. Table 5-3 introduces a simplified combination of demographic characteristics that can begin to describe a few archetypical users who stand to benefit from the Project.

Table 5-3: Carpool User Profiles for Equity Priority Communities

Resident Profile	% Low Income	% Zero Car Households	% Commuting by Carpool
Carpool-Reliant	High	High	High
Active or Transit Mode-Reliant	High	High	Low
Cooperative Carpoolers	High	Low	High
Solo Drivers with Low Incomes	High	Low	Low

While these resident profiles are based on a simplified combination of publicly available demographic data points, they have the capacity to encompass a variety of lived experiences for Yolo County residents. For example:

- **Carpool-Reliant** communities are those with the highest coincidence of households with low incomes, zero car households, and carpool commuters, found in **Woodland** and **southwest Davis**. These community members are likely to already be dependent on carpooling to get to work, perhaps because of a lack of transit options and walkable job access in their neighborhoods. Their destinations may not be served by popular transit routes, and lack of car ownership encourages them to look to the community for travel resource-sharing. These community members stand to significantly and immediately benefit from the implementation of the Project, but may require targeted outreach, education, and technological assistance to take advantage of the benefit and avoid potential pitfalls like violations.

- **Active or Transit Mode-Reliant** communities are similar to carpool-reliant communities but exhibit less existing reliance on carpooling. These areas primarily located in and near the **University of California, Davis**, tend to rely on alternative transportation modes. Bicycling represents a significant mode share within Davis.
- **Cooperative Carpooler** communities are also similar to carpool-reliant communities, but instead have higher levels of car ownership, particularly around the **I-80/US 50 Connector**. These households are less constrained to carpooling as a mode but would still stand to greatly benefit from the cost- and time-saving benefits of the Project.
- **Solo Drivers with Low Incomes** communities also include users with low incomes but have higher access to personal autos and lower adoption of carpooling, found in **West Sacramento**. These community members may have uncommon origin-destination combinations or other transportation needs which require more personal flexibility. Such users may present an opportunity to encourage mode shift to carpooling, but may have reservations related to the difficulties, convenience, and safety concerns around the mode. These users are also the direct analog to solo drivers with higher incomes who may be paying to access extra capacity in the lane, but with less ability to pay for the benefit. While such users may perceive a large benefit when they choose to pay for lane access, this profile still represents the user base most likely to associate express lanes with being unfair or inequitable. Compared to the other profiles, these communities may benefit more directly from equity strategies such as means-based discounts rather than HOV incentives.

Figure 5-1 displays the individual criteria for the carpool reliance analysis, which includes very low-income households, households without access to a personal vehicle, and the percentage of people commuting by carpool. Figure 5-2 presents the composite Carpool Reliance Index synthesizing these criteria and highlighting possible areas of focus.

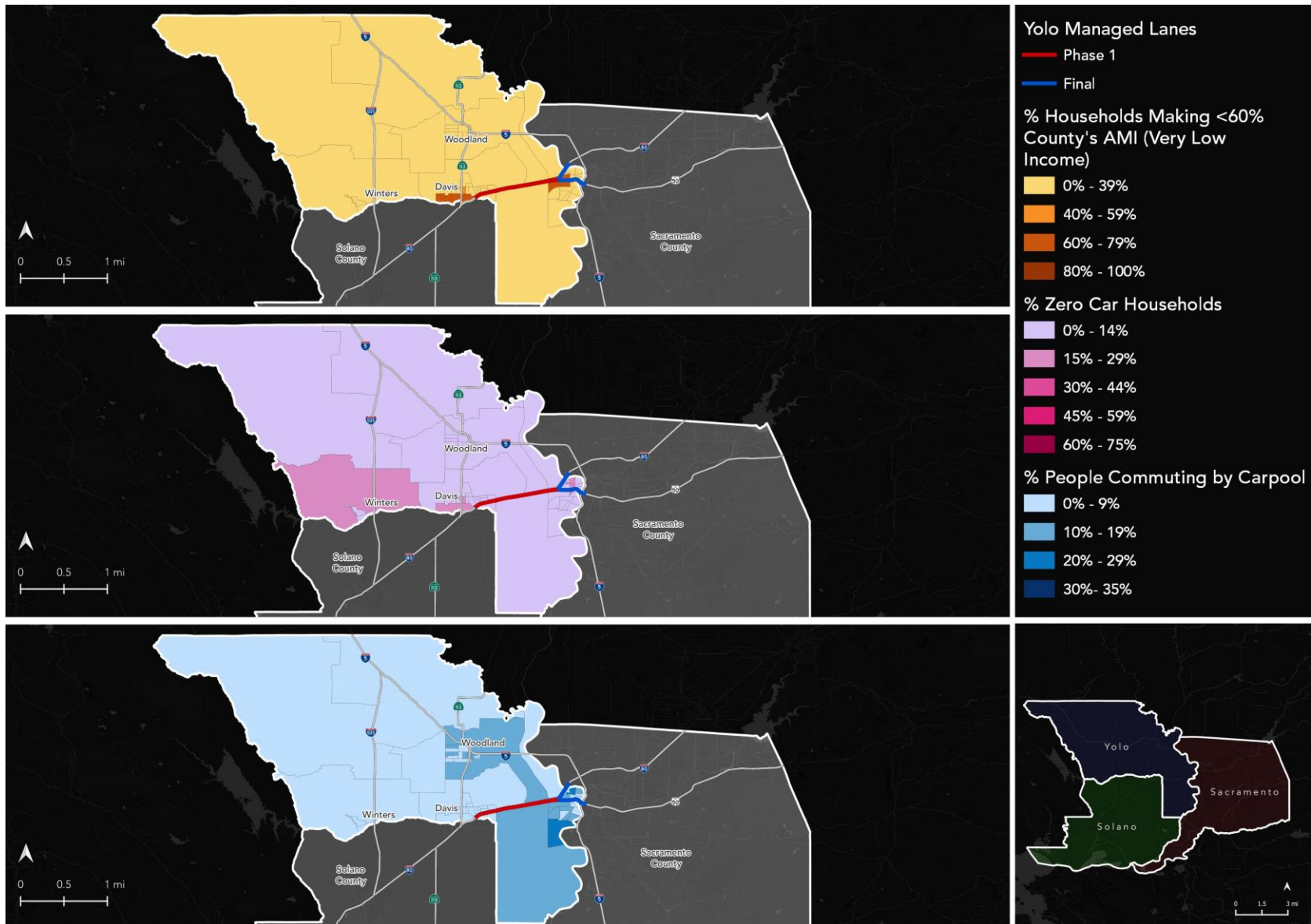


Figure 5-1: Carpool Reliance Index Criteria - Very low-income households, zero car households and percentage of people commuting by carpool

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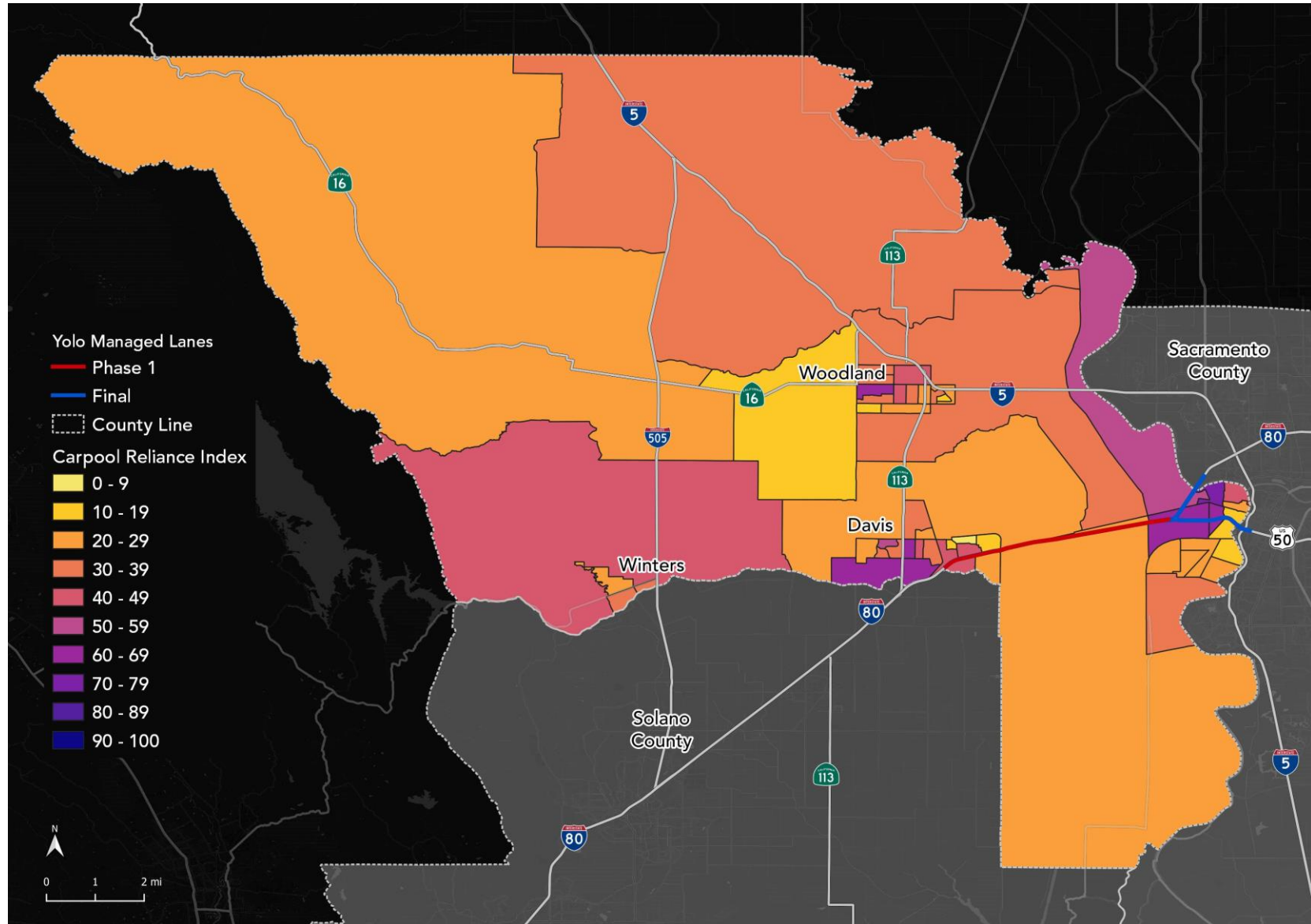


Figure 5-2: Carpool Reliance Index

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Table 5-4 summarizes the potential benefits and challenges that each resident profile from the carpool reliance analysis might receive from the implementation of the Project.

Table 5-4: Potential Project Benefits and Challenges per Carpool Reliance User Profile

Resident Profile	Benefits	Challenges
Carpool-Reliant	• Supports existing behavior – rewards those already carpooling • Increases speed and reliability for existing trips • Encourages stronger carpool networks	• Potential challenges in outreach and education esp. in cases of Low English Proficiency • Potential challenges in technology adoption • High consequence from accrual of violation fees
Active or Transit Mode-Reliant	• Potential benefits from vanpool and other transportation demand management (TDM) solutions • Incentivizes carpooling as new mobility option • Improves bus and other transit trip speed and reliability	• High outreach and education needs • No immediate benefit unless transit routes benefit • Existing social/structural barriers to forming carpools
Cooperative Carpoolers	• Supports existing behavior – rewards those already carpooling • Increases speed and reliability • Greater existing community infrastructure	• Potential challenges in outreach and education esp. in cases of Low English Proficiency • Potential challenges in technology adoption • High consequence from accrual of violation fees
Solo Drivers	• Motivates mode shift to carpooling or transit • Opportunity for targeting TDM matching programs	• No benefit without changing behavior • Direct inequity compared to solo drivers with higher incomes • Potential cultural, safety, or scheduling barriers

5.2.2 Transit Reliance

Unitrans is the primary public transit provider in the City of Davis, while YoloTD serves as the main provider of public transportation across Yolo County, including the cities of West Sacramento, Winters, and Woodland, as well as several unincorporated areas and neighborhoods. The **City of Davis** is notable for its large university population, which may influence the strong concentration of residents in this area who rank high on the Transit Reliance Index. Outside of Davis, communities that rank higher on the Transit Reliance Index can be found **in Winters, southwest Woodland**; and along the west side of the **Sacramento River from Knits Landing to the I-80/US-50 interchange in West Sacramento**. Census tracts that scored at 60 or higher in the Transit Reliance Index are in **West Sacramento and Davis**.

Travelers via transit (or in any vehicle with three or more passengers) would not pay to use the Express Lanes; therefore, those who primarily travel via transit may not experience immediate or direct impacts to their transportation budgets as a result of the Project. These users, however, could be indirectly benefited if their transit routes improve because of the Project (and contrarily, could be impacted if their transit routes experience challenges due to changing driver behaviors). The study seeks to identify any potential correlations between transit as a primary mode choice and equity indicators like zero-car access or incomes lower than 60% of the AMI.

Table 5-5 introduces a simplified combination of demographic characteristics that can begin to describe a few archetypical users who stand to benefit from the Project.

Table 5-5: Transit User Profiles for Equity Priority Communities

Resident Profile	% Low Income	% Zero Car Households	% Commuting by Transit
Transit-Reliant	High	High	High
Carpool- and Active Mode-Reliant	High	High	Low
Transit for Convenience and Affordability	High	Low	High

Extrapolating these profiles into a more nuanced narrative:

- **Transit-Reliant:** Residents with this profile are making under 60% of the AMI for their county of residence and do not have access to a personal vehicle. Transit-Reliant communities may be especially prevalent near **around Covell Park in Davis, and West Sacramento**. This resident profile relies on the transit modes available in Yolo County to commute and may include a large proportion of students from UC Davis. Though they do not drive themselves, they would likely still benefit from reduced congestion and more reliable trip times, especially for any transit routes that run along the Causeway. That said, this community may need additional outreach regarding any potential changes or negative impacts to travel due to diversion, and YoloTD may find this group more challenging to reach. Communication strategies should consider how those in zero-car households best receive information about changes and potential disruptions to their normal travel routes.

- **Carpool- and Active Mode-Reliant:** This resident profile is similar to the Transit-Reliant profile, but these communities are not as likely to commute via transit, even with limited access to a personal vehicle. Carpool and Active Mode-Reliant communities include **Winters** and the surrounding areas. Because the project directly supports and incentivizes carpooling with three or more passengers, those who already carpool may experience benefits in the form of improved trip time and reliability, reduced household or individual transportation costs, and increased programmatic support and visibility. Because this community is most likely to already have experience with carpool commutes, communicating about changes to a system they have already grown accustomed to may pose a challenge to YoloTD. Communities with this resident profile would benefit from educational materials that acknowledge how use of the Causeway may change with the Project's implementation. These materials could also include information about transit or active transportation to help reduce any barriers this group may experience with alternative modes.
- **Transit for Convenience and Affordability:** This resident profile represents those with incomes below 60% of the AMI who have access to a personal vehicle, but primarily commute using transit. These communities are represented at higher levels in **West Sacramento**. Communities with this resident profile may experience benefits to travel times and reliability on transit routes that use the Causeway, with increased mode choice flexibility due to their access to increased carpooling benefits. Alternatively, they could experience impacts to their travel off the Causeway as a result of diversion or other Project factors.

Figure 5-3 shows all the criteria for the transit reliance analysis, which includes very low-income households, households without access to a personal vehicle and the percentage of people commuting by transit. Figure 5-4 presents the Carpool Reliance Index integrating these criteria and highlighting the potential areas of focus.

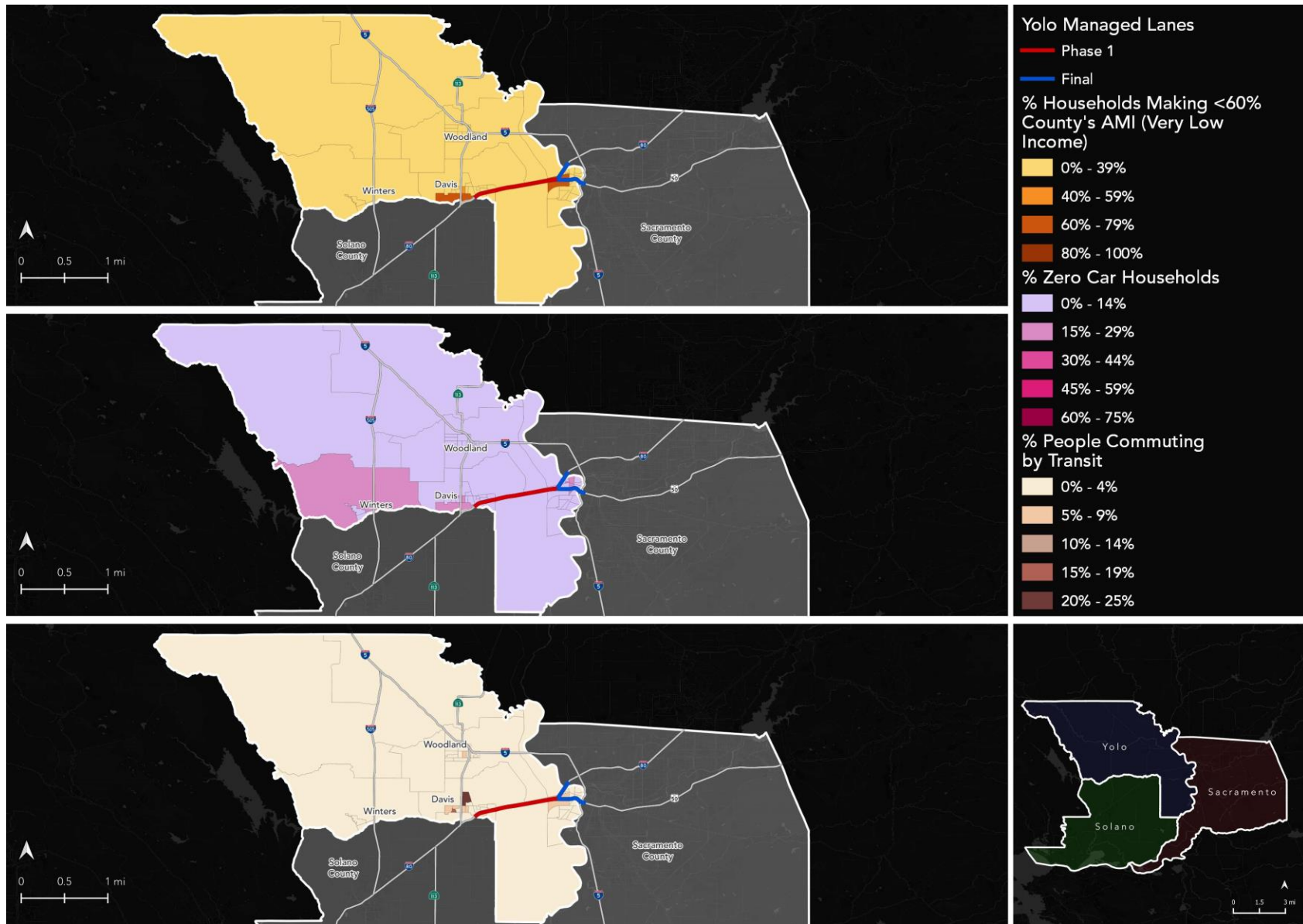


Figure 5-3: Transit Reliance Index Criteria - Very low-income households, zero car households and percentage of people commuting by transit

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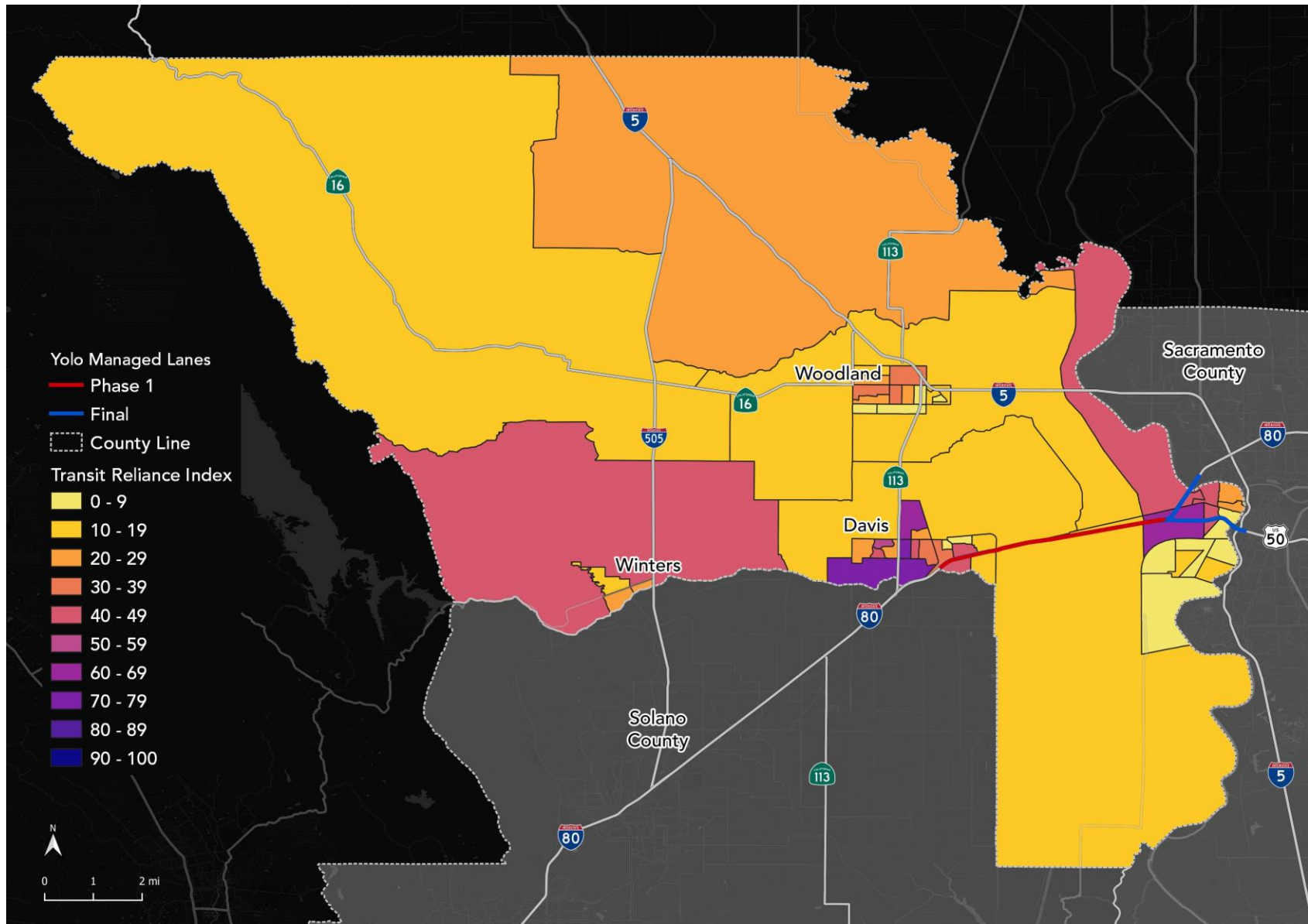


Figure 5-4: Transit Reliance Index

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Table 5-6 provides a summary of the potential benefits and challenges associated with the Project as identified by each resident profile during the transit reliance analysis.

Table 5-6: Potential Project Benefits and Challenges per User Profile

Resident Profile	Benefits	Challenges
Transit-Reliant	- Improves bus and other transit trip speed and reliability - Creates visibility for carpooling as an additional mobility option - Opportunity for TDM matching programs	- No immediate benefit unless transit routes benefit - No benefit without changing behavior for those who travel primarily by transit and/or bike - Potential travel challenges as a result of diversion - Existing social/structural barriers to forming or joining carpools or other alternative modes of transportation
Carpool- and Active Mode-Reliant	- Supports existing behavior – rewards those already carpooling - Increases speed and reliability for existing trips - Encourages stronger carpool networks - Opportunity for targeting TDM matching programs	- Potential challenges in technology adoption - High outreach and education needs - High consequence from accrual of violation fees
Transit for Convenience and Affordability	- Improves bus and other transit trip speed and reliability - Increases mode choice due to vehicle access and introduction of greater carpool benefits	Potential inequity when compared to transit users who are <i>reliant</i> on the mode

5.2.3 Public Participation

Public participation is critically important to the planning process to ensure that community members and potential users' needs are heard and incorporated into both the planning and the outcomes of the Project. Public outreach should be meaningful, demonstrate respect for participants' insights and time, and meet participants where they are as much as possible.

Some potential barriers to meaningful public participation include (but are not limited to) transportation to in-person events, timing conflicts, childcare costs, and language. By analyzing circumstances and locations where residents may be more likely to have income, language, and transportation constraints, the Project team can

identify opportunities to reduce barriers to public participation. YoloTD’s role in reducing these barriers can look like providing compensation, incentives, or childcare for participants with low incomes; providing translation or interpretation services for linguistically isolated residents; or helping residents with limited mobility by reducing the distance between engagement opportunities and participants, providing transportation, or hosting virtual public participation events.

Table 5-7 introduces a simplified combination of demographic characteristics that can begin to describe a few archetypical users who stand to benefit from the Project.

Table 5-7: Public Participation Profiles for Equity Priority Communities

Resident Profile	% Low Income	% Zero Car Households	% Limited English Proficiency
High-Priority, Targeted In-Language Outreach	High	High	High
Convenient English Outreach for Non-Auto Users	High	High	Low
High-Impact Carpooling Communications	High	Low	High
Translation/Interpretation-Targeted Express Lane (EL) Users	Low	Low	High

While these resident profiles are based on a simplified combination of publicly available demographic data points, they have the capacity to encompass a variety of lived experiences for Yolo County residents. For example:

- High Priority, Targeted In-Language Outreach:** This resident profile is representative of communities with incomes below 60% of the AMI, no access to a personal vehicle, and who experience some level of linguistic isolation due to limited English proficiency. This group requires direct, strategic, thorough outreach in multiple languages to ensure they have access to the information they need to use the express lanes successfully and without incurring violations or fees. While residents in this group may not have as much access to a personal vehicle, they could still be carpooling and in community with other linguistically isolated residents who do. Of the language groups spoken throughout Yolo County, residents with this profile will likely be speakers of Asian or Pacific Islander languages, followed by Spanish speakers. Census tracts in **south Davis**, along with **West Sacramento**, scored highest on the Public Participation Index, reflecting a greater concentration of residents with this profile. To be successful, YoloTD will need to establish trusted channels and messengers for non-English speaking communities to receive information about the project and provide input on their specific needs. YoloTD will also need to determine methods for making public participation activities more accessible for residents who may not have private transportation, and for sharing those methods widely and in non-English languages.
- Convenient English Outreach for Non-Auto Users:** Similar to the profile above, this resident profile is representative of communities with low incomes and no access to a personal vehicle, though these

residents do speak and understand English proficiently. Within Yolo County, this profile is most prevalent in **Winters and central Davis**. This group will benefit from as-needed outreach regarding updates and changes to the Project, though they may not be as concerned with toll fees since they already do not drive a personal vehicle. This profile and the High Priority, Targeted In-Language Outreach profile will need additional interventions to ensure geographic access to any public participation activities. For YoloTD, this could look like providing transportation, reaching out to community members at existing events, or hosting virtual events. Although these areas have households that speak languages other than English, such households represent a smaller proportion compared to other profiles. Delivering outreach in English will reach many members of this group; nonetheless, maintaining in-language support remains essential to foster inclusive participation and ensure households needing communication in another language are not excluded.

- **High-Impact Carpooling Communications:** This resident profile demonstrates low incomes and limited English proficiency, like the “High Priority, Targeted In-Language Outreach” group above. However, this group is much more likely to use a personal vehicle to commute, and may be more likely to carpool with others, or to consider it if they are not already. These communities, found in **Woodland**, will need in-language engagement early and often about the Project, system enrollment, and carpooling programs or other benefits available to them. An in-language, culturally sensitive education campaign could encourage congestion-reducing behaviors while also mitigating against system violations and fees that could result from mistranslated or inadequate information.
- **Translation/Interpretation-Targeted EL Users:** These are users who make over 60% of the AMI and have access to a personal vehicle but have limited English proficiency. Neighborhoods along the **western edge of the Sacramento River north of the I-80/US-50 interchange and south of the Verona neighborhood in Davis** are more likely to have communities with this resident profile. This area includes large portions of agricultural land and open green space and is not likely to be densely populated. Being linguistically and spatially isolated could make travelers in these areas more likely to have issues navigating the new Express Lane system or understanding English-language engagement material. As a result, this group may be disproportionately found responsible for violations and fees that could be avoided with better access to and understanding of Project information. Multilingual informational materials and roadway signage can help this user profile understand how the Project is changing travelers’ use of the Causeway and where to go for more information.

Figure 5-5 shows the criteria for the public participation data story and includes very low-income households, households without access to a personal vehicle and populations with limited English proficiency. Figure 5-6 shows the Public Participation Index and the possible areas of interest.

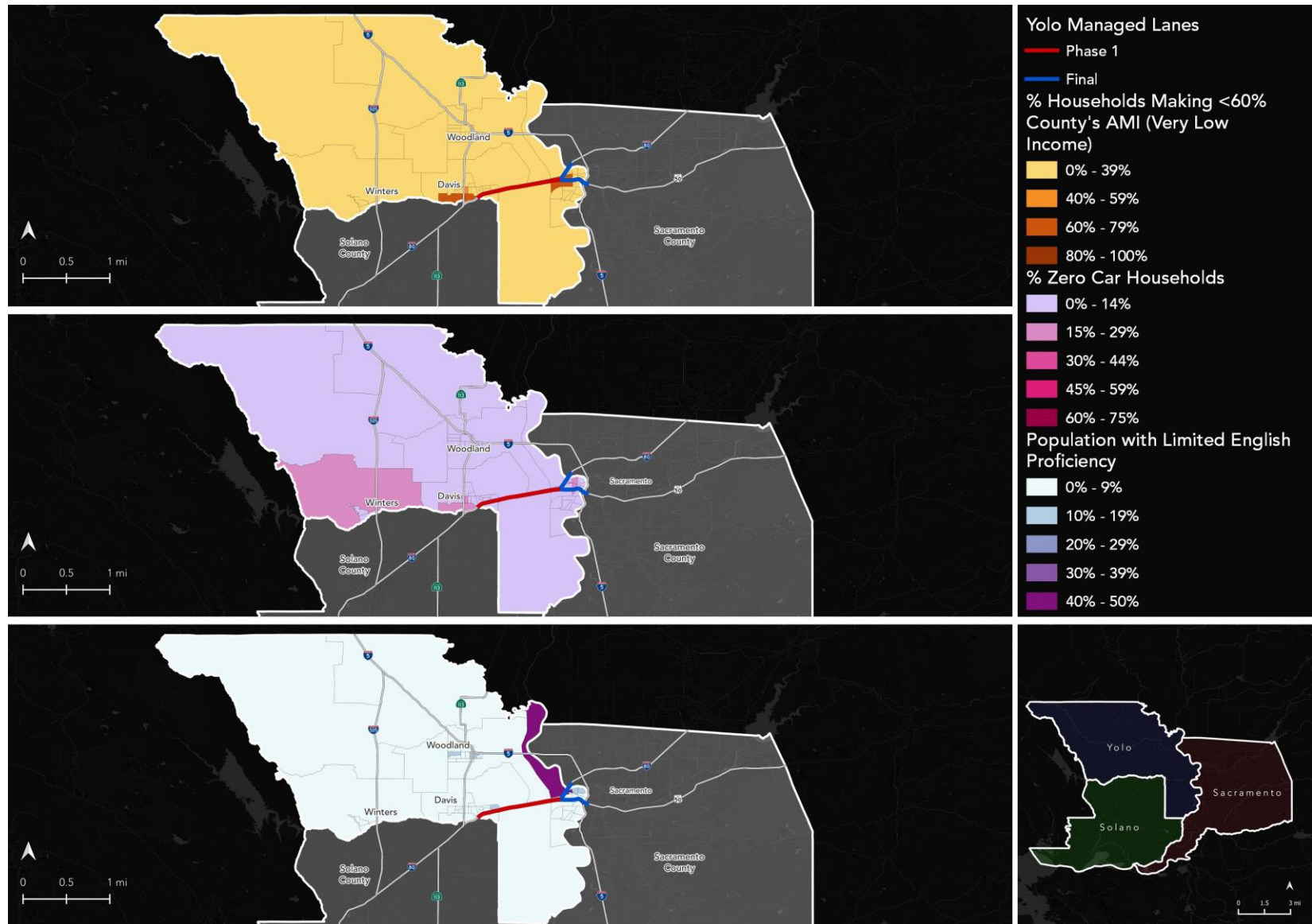


Figure 5-5: Public Participation Index Criteria - Very low-income households, zero car households and population with limited English proficiency

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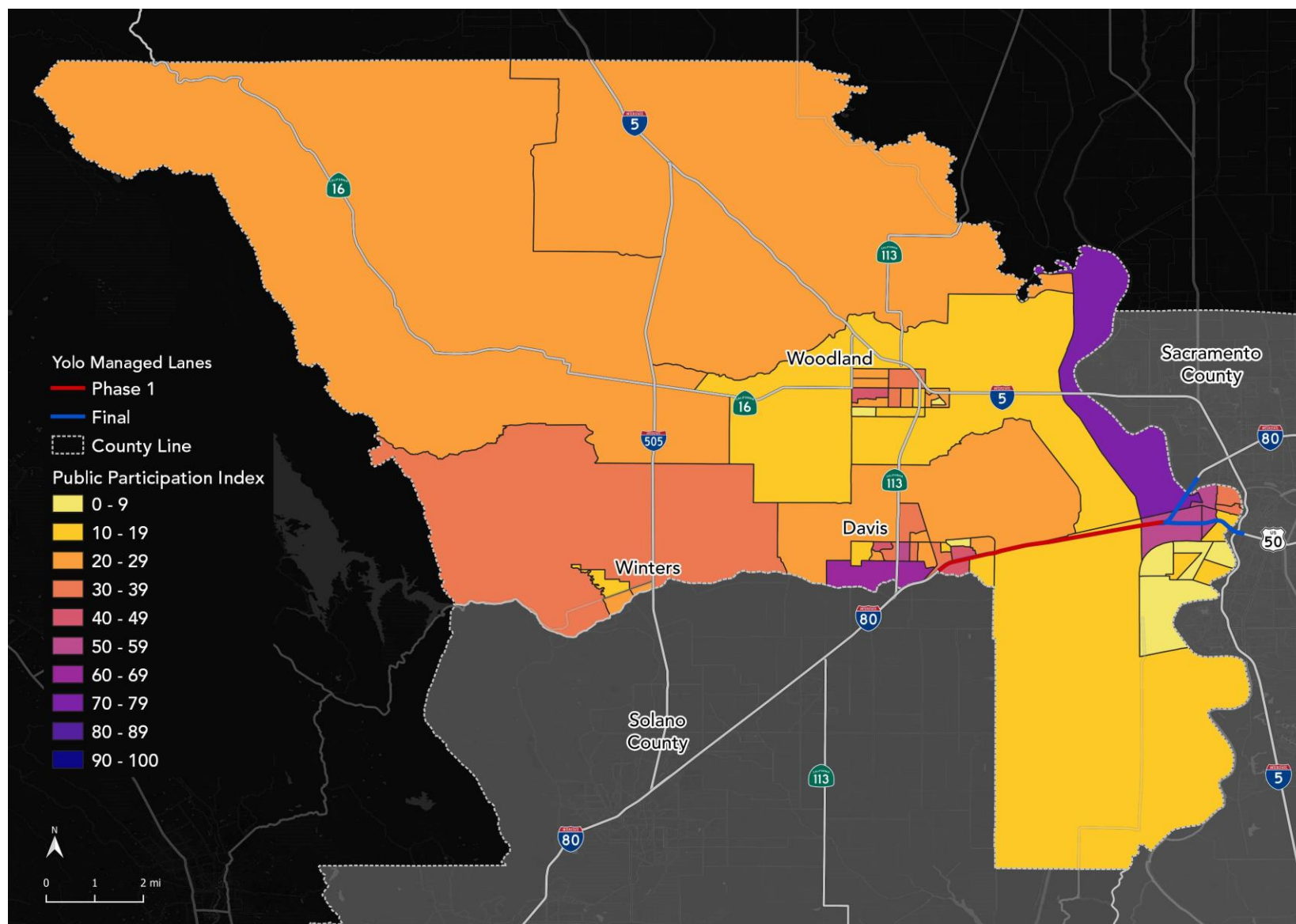


Figure 5-6: Public Participation Index

Table 5-8 outlines the potential benefits and challenges that each resident profile identified in the public participation analysis might face from the implementation of the Project.

Table 5-8: Potential Project Benefits and Challenges per User Profile

Resident Profile	Benefits	Challenges
High Priority, Targeted In-Language Outreach	- Improved bus and other transit trip speed and reliability - Greater existing community infrastructure - Opportunity to develop TDM matching programs and solutions for people with inadequate mobility options - Supplies information in a way that is understandable for people of all backgrounds.	- High outreach and education needs - Potential challenges in outreach and education esp. in cases of Low English Proficiency - Direct inequity compared to drivers who speak English - No immediate benefit unless transit routes benefit - Potential cultural, safety, or scheduling barriers - May require behavior change to experience benefits
Convenient English Outreach for Non-Auto Users	- Increased speed and reliability for existing trips - Incentivizes carpooling as a new or additional mobility option - Potential benefits from vanpool and other TDM solutions	- Potential access or scheduling barriers to outreach - No benefit without changing behavior
High-Impact Carpooling Communications	- Motivates mode shift to carpooling - Rewards those carpooling already - Increased speed and reliability for existing trips - Encourages stronger carpool networks - Incentivizes carpooling as new or additional mobility option	- Similar potential challenges in outreach and education esp. in cases of Low English Proficiency - High consequence from accrual of violation fees - Behavior change needed to experience benefits - Potential challenges in technology adoption

Translation/Interpretation-Targeted EL Users

- Potential benefits from vanpool or other TDM solutions
- Increased speed and reliability for existing trips
- Motivates mode shift to carpooling
- Encourages stronger carpool networks
- Builds greater community infrastructure
- Opportunity for targeting TDM Matching programs
- High consequence from accrual of violation fees
- Geographic isolation could pose scheduling, notification, and access challenges for both public participation and alternative forms of travel
- Linguistic isolation could pose challenges for outreach and education
- Direct inequity compared to drivers who speak English and live in areas with more frequent contact/outreach.

5.2.4 Affordability

The affordability of the Express Lanes can highly impact drivers' ability or willingness to use the facilities and/or do so in compliance with its operating rules. Tolls are a regressive cost, meaning they take a larger percentage of income from users with low incomes than other user groups. Communities with low incomes may have difficulty absorbing the additional cost of Express Lane travel if they are already burdened economically. Additional recurring expenses – like increased costs for transportation – can force trade-offs with essential needs. For users with low incomes, housing is often the highest cost burden, with households sometimes spending 50% or more on shelter. High housing burden additionally correlates with other financial stressors and fewer resources for unplanned expenses. In California in particular, it is also important to note that while renters are more likely to have lower incomes, fewer assets, and less stability, homeowners may still be considered housing burdened if their mortgage exceeds 50% of their income.

Users with low incomes are less likely than other user groups to be able to avoid the most punitive travel times in terms of congestion and cost. These users may have more rigid work schedules due to hourly and shift-based jobs, or multiple jobs, and are therefore not as likely to have flexible commute hours or options to work from home. Parents or caregivers with low incomes may be more dependent on facilities and services like daycare or school which operate on fixed schedules. This means they cannot avoid peak hours when express lanes would be tolled the highest. Users with low incomes may also have long commutes from more affordable housing areas, and their commute times may intersect with peak hours by default. Such users may be limited in the routes they are able to take, even if it means sitting in traffic or paying tolls.

In contrast, users with low incomes may also be more likely to work during irregular or non-traditional work hours or be unemployed or informally employed. Such users would be more able to avoid toll surges at peak hours but may still be unlikely to afford tolls regardless of time or may make more use of non-car modes depending on geographic location and transit system quality. Such users may benefit more from investments in multi-modal options or off-peak travel incentives.

Table 5-9 introduces a simplified combination of demographic characteristics that can begin to describe a few archetypical users who stand to benefit from the Project.

Table 5-9: Transit User Profiles for Equity Priority Communities

Resident Profile	% Low Income	% Households with Severe Housing Burden
Free Use-Focused	High	High
Infrequent, High-Impact Users	High	Low
High Income, Low Discretionary Spending	Low	High

While these resident profiles are based on a simplified combination of publicly available demographic data points, they have the capacity to encompass a variety of lived experiences for Yolo County residents. For example:

- Free Use-Focused:** This resident profile is representative of users who have incomes below 60% of the AMI and are heavily rent- or mortgage burdened, meaning they spend over 50% of their budget on housing costs. This profile can be found in **Davis**. These community members are the most economically vulnerable, with limited disposable income after housing costs. They may struggle to meet food, healthcare, transportation, and childcare needs; have a high risk of displacement; and have a limited ability to absorb unexpected costs or price shocks. They may be more likely to rely on older vehicles, carpooling, or transit; live farther from job centers; and have less access to transponder accounts or credit cards. Residents with this profile may be much more focused on opportunities for free use of the Causeway due to the economic burdens they already have, which would include strategies like income-based toll discounts to provide congestion relief access, mobility wallets that provide extra funds for transportation at no cost, and improvements to transit reliability for transit services that use the express lanes. Without such programs, express lanes are likely to be financially inaccessible, and violation fees resulting from lack of understanding or inability to pay may have serious financial consequences.
- Infrequent, High-Impact Users:** This resident profile describes households that have low income but are currently not overburdened by housing costs and can be found predominantly in **West Sacramento**. Generally, these community members may still experience financial stress but may be more able to save or invest in transportation. Car access may be more likely than in high-housing burden areas, but travel patterns may still include longer commutes or multiple job sites. When it comes to the implementation of a new express lane, community members may be more able to absorb toll costs, but it may be difficult to absorb regularly. They also may be more likely to see credit/banking access or online systems as barriers. In response, easy-to-use enrollment portals, educational outreach to promote discounts or programs, and frequent, affordable transit options for the corridor are likely to have the most impact.
- High Income, Low Discretionary Spending:** This resident profile describes households with moderate incomes, but the impact of such incomes is diminished by high housing costs. This profile

can be found in **North Davis, Winters** and west **Woodland**. Such neighborhoods can be described as gentrifying areas, cities with high housing prices, or containing families with recent declines in income. Households in this profile may not qualify for most programs and subsidies, even if they are financially strained. As a result, they may struggle to save, handle emergencies, or pay for additional costs like childcare. They may also be at greater risk of worsening financial conditions if costs rise further. While such households may be more likely to own vehicles, tolls may be seen as a luxury which may only be used occasionally for emergencies or time-sensitive trips. They could benefit indirectly if general purpose lanes become less congested, or if they can access transit that benefits from the express lane. Such users would also be most likely to benefit from equity strategies with middle income tiers, or strategies like mobility wallets that would better enable more infrequent use.

Figure 5-7 maps the criteria for the affordability analysis which includes very low-income households and severely housing burdened households (households spending over 50% of their income on housing costs). Figure 5-8 is the resulting Affordability Index, highlighting potential focus census tracts.

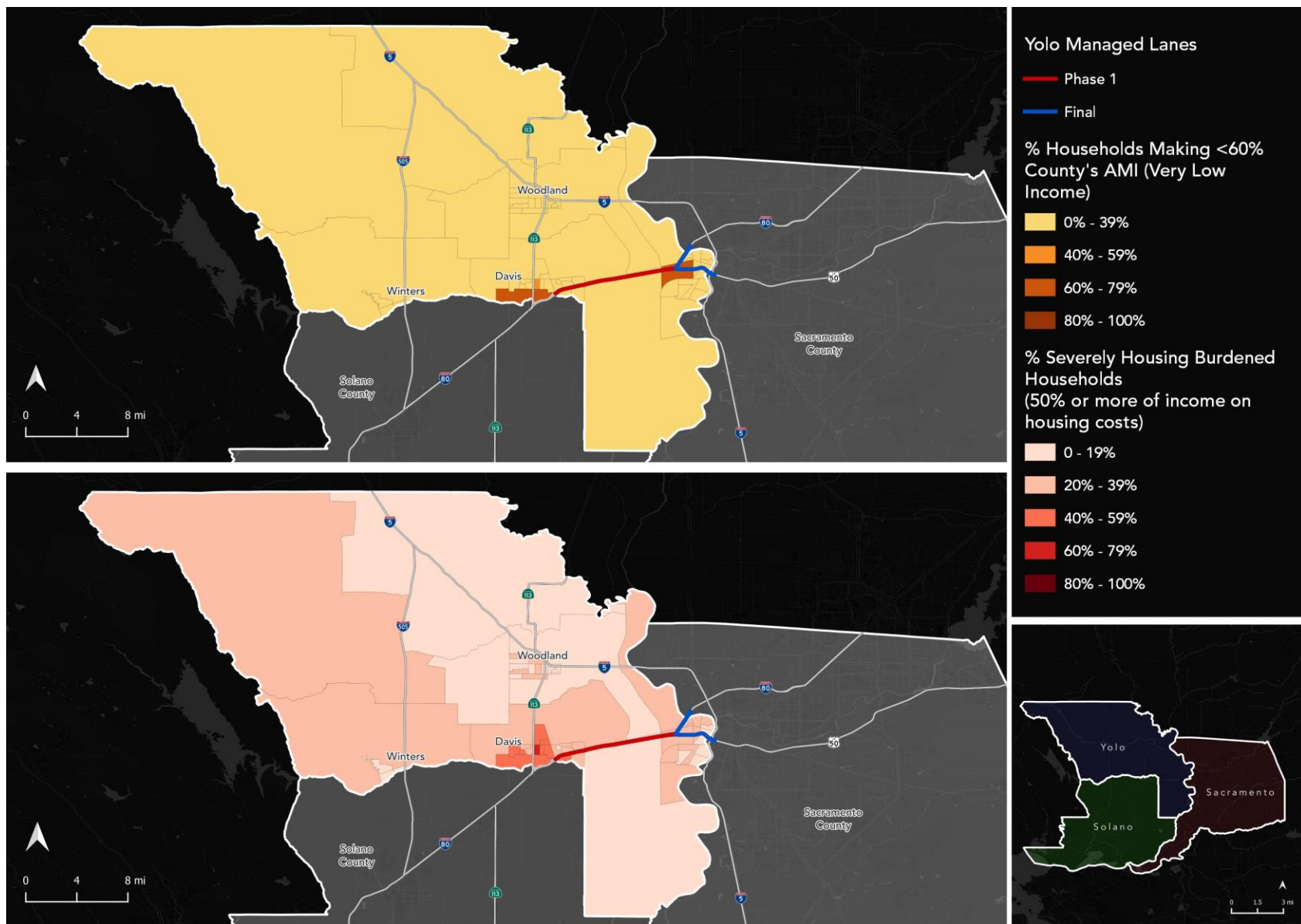


Figure 5-7: Affordability Index Criteria - Very low-income households and severely housing burdened households

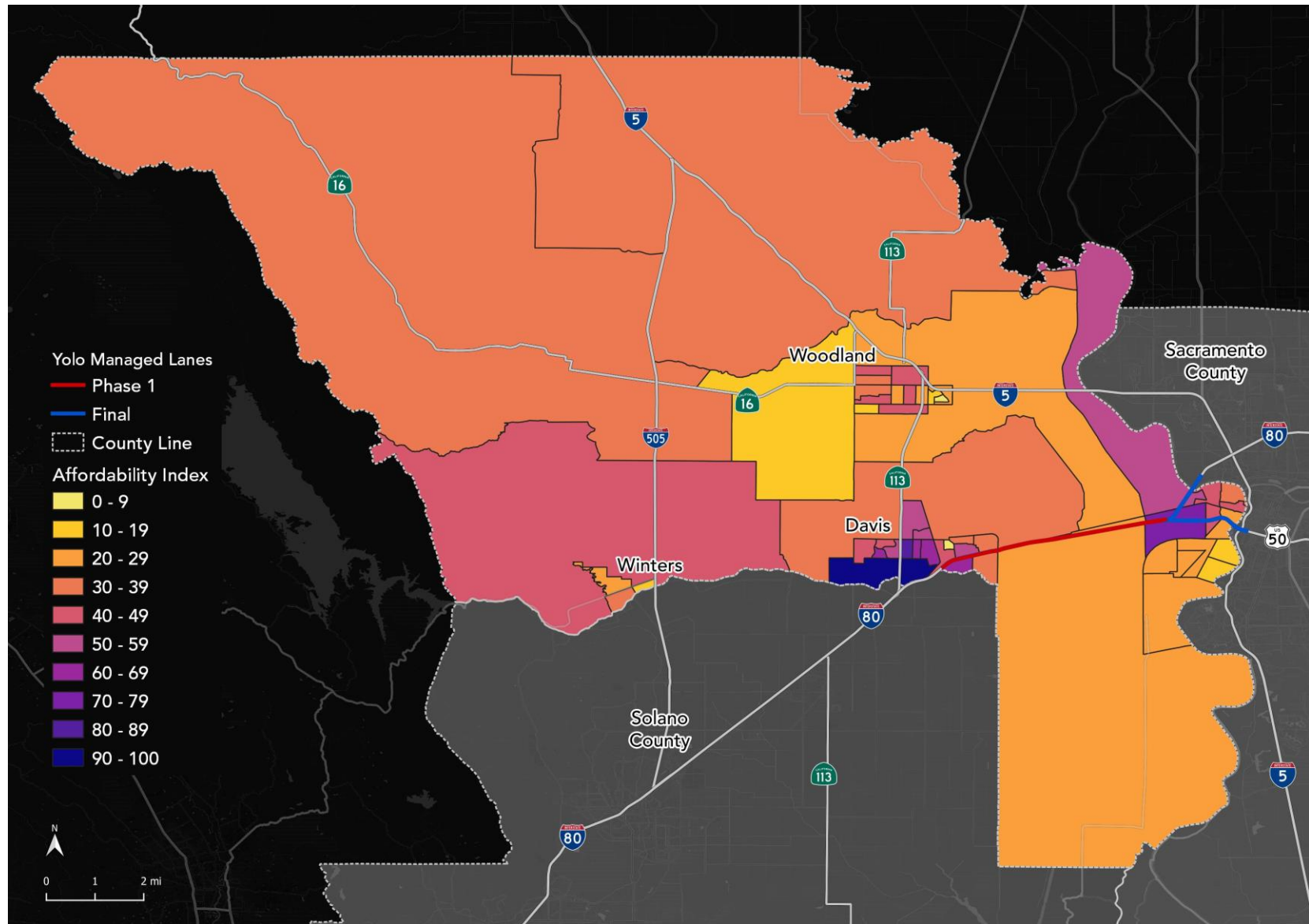


Figure 5-8: Affordability Index

Table 5-10 shows the potential benefits and challenges that different resident profiles identified in the affordability analysis might experience from the implementation of the Project.

Table 5-10: Potential Project Benefits and Challenges per User Profile

Resident Profile	Benefits	Challenges
Free Use-Focused	• Most likely to meet eligibility requirements or pre-qualify. • Faster time-sensitive or emergency travel given strategies that provide affordable access • Likely to benefit from vanpool or Bus Rapid Transit (BRT) tie-ins	• Least able to afford tolls, even at discounted rates – express lanes may effectively be off-limits for solo use • Highest risk of penalty accrual from toll violations, missed payments, or lack of registration • May experience displacement pressure or indirect gentrification if corridor improvements increase land values or neighborhood desirability
Infrequent, High-Impact Users	• Likely to qualify for toll discount programs, with more financial capacity to take advantage of them • Can likely benefit from occasional access to tolled lanes, even without access to discount programs. • Likely to benefit from reliability improvements for transit and other high occupancy modes	• Tolls may still be unaffordable for routine use • May miss out on benefits without strong outreach due to digital access, language, or awareness barriers • Vulnerable to toll violations, especially if systems are complex or auto-pay methods are not accessible
High Income, Low Discretionary Spending	• Likely to benefit from occasional express lane use for high-priority or emergency trips, even if eligibility requirements are not met • Indirect benefit from congestion relief on general purpose lanes	• Incomes may not be low enough to qualify for programs, but too burdened to pay regularly • Perception of unfairness or exclusion, which may lead to public pushback or mistrust

5.2.5 Environmental Exposure and Resiliency

It is critically important to analyze the potential impacts that Projects may have on environmental and/or safety hazards for all surrounding communities. Within this topic area, it is also important to evaluate

emissions in the context of environmental justice. Communities that have historically faced poor air quality (often low-income and/or non-white communities) may be less resilient to the public health outcomes of highway expansion and have more limited access to healthcare. Evaluating whether these communities are more likely to experience potential health impacts is key to understanding the environmental justice implications of the Project and the need for related interventions

While there are some neighborhoods which exhibit high coincidence of racial, income, and environmental exposure factors, particularly **Davis** and **West Sacramento** in Yolo County, there does not appear to be a consistent correlation between air pollution burden and race or income distribution across the Study area. Any equity-related outreach to these neighborhoods should still include a focus on the potential impacts of congestion and diversion.

Figure 5-9 shows the criteria used to construct the Environmental Exposure and Resiliency Index, which synthesize in a single measure the very low-income households, non-white population, and the pollution burden score from CalEnviro Screen 4.0. Figure 5-10 presents the resulting Environmental Exposure and Resiliency Index.

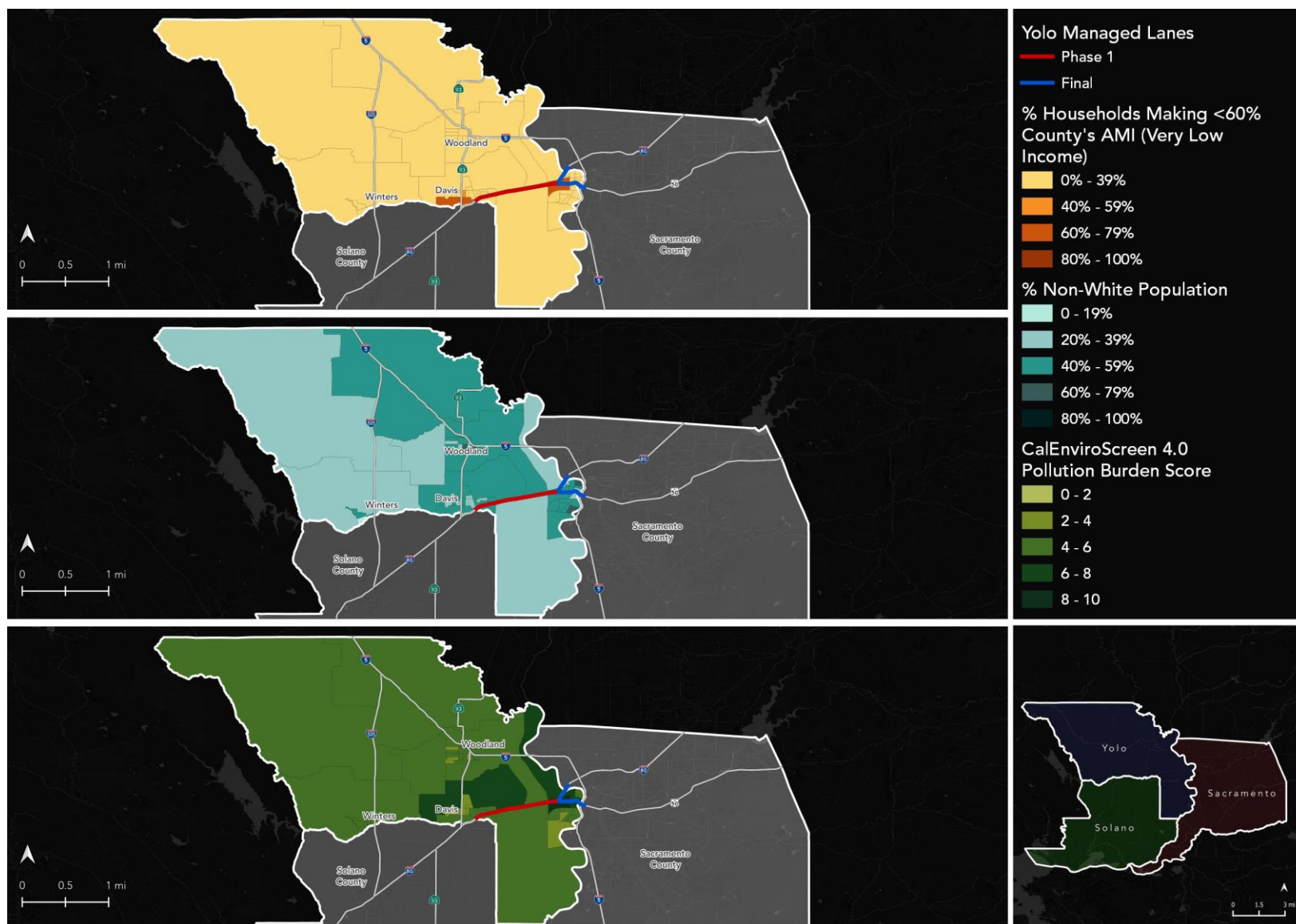


Figure 5-9: Environmental Exposure and Resiliency Index Criteria - Very low-income households, non-white population, and CalEnviroScreen 4.0 Pollution Score

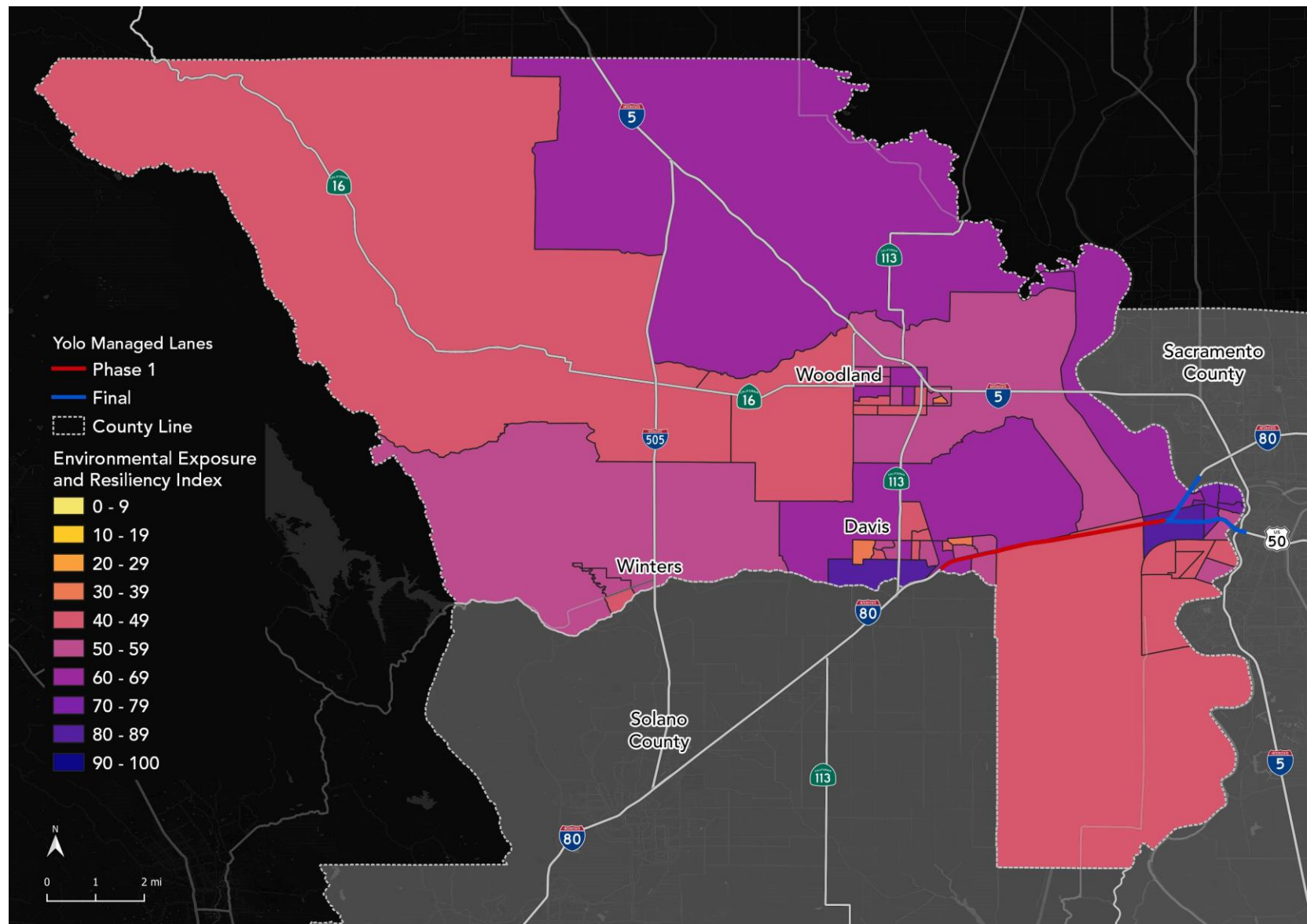


Figure 5-10: Environmental Exposure and Resiliency Index

5.2.6 Environmental Justice and Safety

It is also important to study the potential for Express Lanes projects to disproportionately impact nearby communities regarding safety, including Environmental Justice communities (i.e., non-white groups and those with low incomes). Construction activities and traffic changes could encourage diversion into general purpose lanes and arterials in neighborhoods adjacent to the Project. Areas that become hot spots for diversion could see increases in public safety incidents due to speeding, increased volume, and/or inadequate travel facilities and infrastructure. The Project also aims to determine if Environmental Justice communities are more likely to experience negative impacts of diversion due to where they live, work, play, or travel.

Pedestrian and cycling crash data were processed using Kernel Density Estimation (KDE) to highlight where crashes cluster spatially. For pedestrian and bicycle crashes between 2019 and 2023, 250-meter bandwidth was applied, and crash severity was incorporated through weighting (fatal crashes = 3, severe injury = 2, minor injury = 1). Areas with a higher frequency of crashes and more severe incidents are represented by higher KDE values, which are shown as darker regions on the map. Hotspot zones were then defined using the percentiles of density values to emphasize the most intense clusters. It's important to note that KDE reflects concentrations of crashes (or relative density, how concentrated crashes are in an area) but not the underlying risk or rate of crashes. An area may show up as a hotspot simply because many people are traveling there, not necessarily because conditions are more dangerous per person. These maps are best used as an exploration tool to flag areas for closer review, ideally paired with exposure data or more formal statistical hotspot analyses.

Similar to the previous section, while there are pedestrian and bicycle hotspots evident in **Davis**, crash incidents do not appear to be disproportionately affecting environmental justice communities. Density of crashes appear to be evenly distributed across more urbanized areas throughout Yolo County. Outreach in environmental justice communities should still be sure to sensitively incorporate discussion of potential safety concerns when performing public outreach and education.

Figure 5-11 and Figure 5-12 illustrate the Environmental Justice and Safety Index, which combines very low-income and non-white population data. Figure 5-11 overlays the index with pedestrian crash density from 2019 to 2023, while Figure 5-12 presents the same index alongside cyclist crash density.

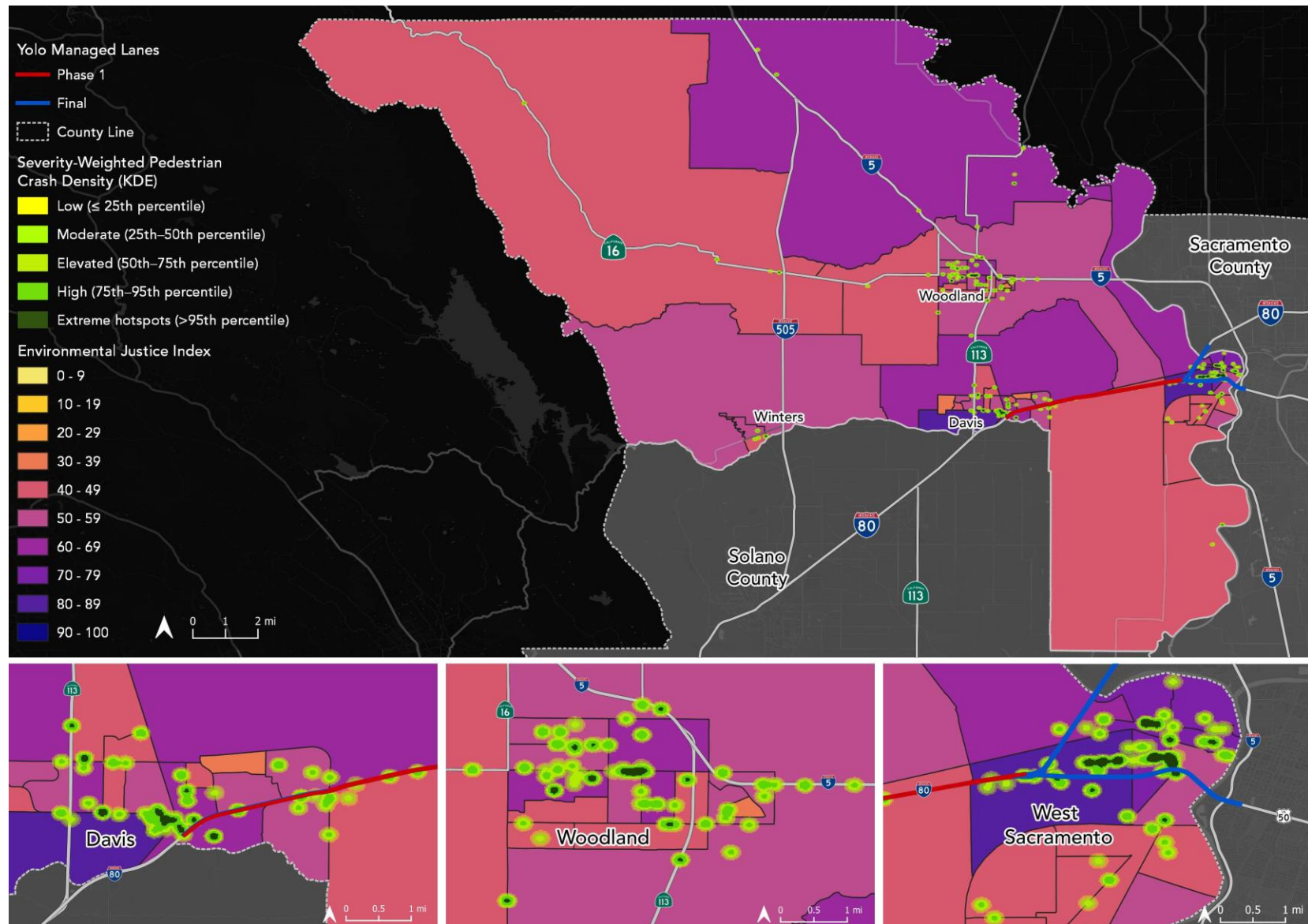


Figure 5-11: Environmental Justice and Safety Index & KDE Density of crashes involving pedestrians (2019 to 2023)

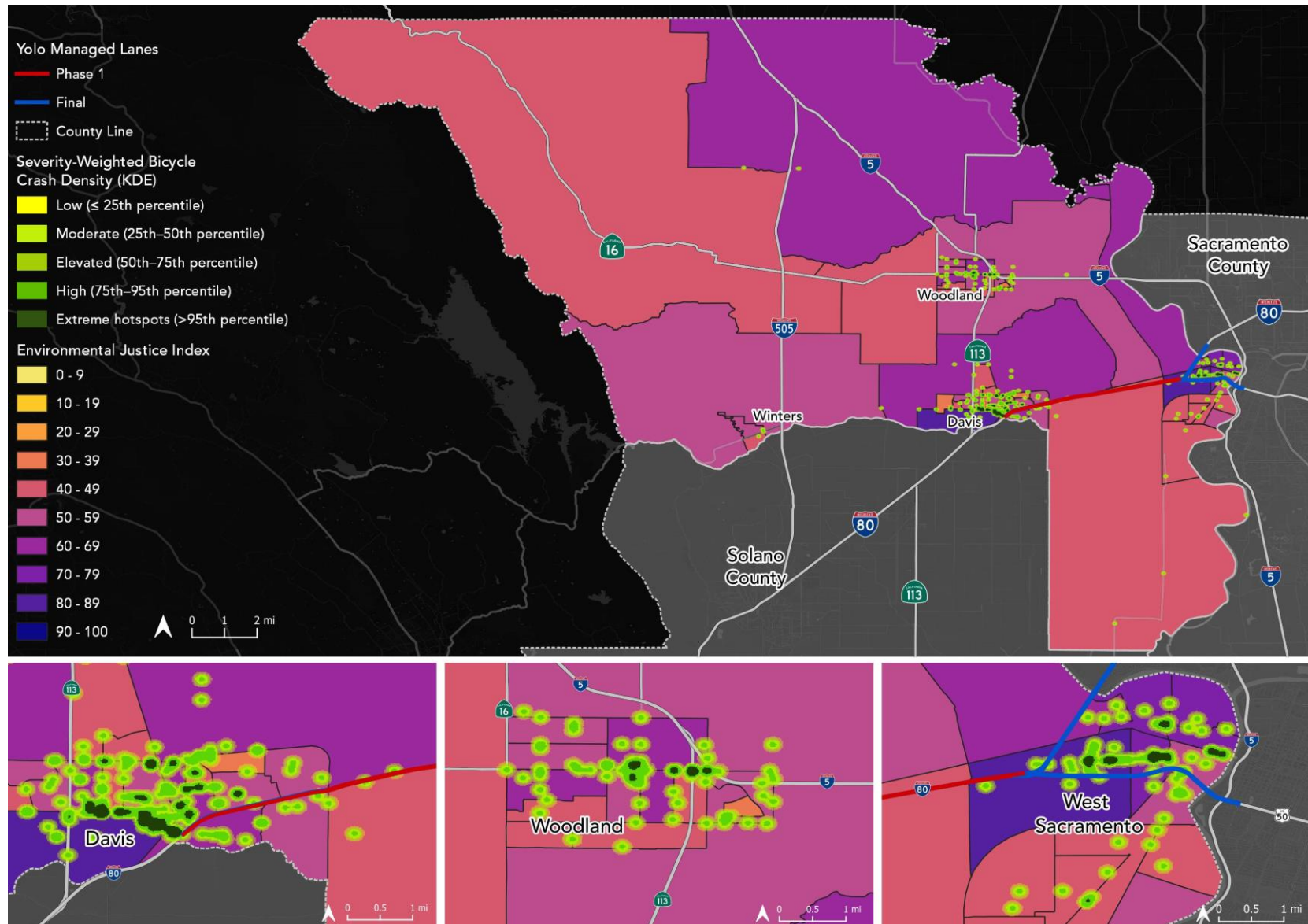


Figure 5-12: Environmental Justice and Safety Index & KDE Density of crashes involving cyclists (2019 to 2023)