



CVAG



Final Report

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY

June 2026

Kimley»Horn
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COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



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Acronym Guide

AB	Assembly Bill
ADT	Average Daily Traffic
ATP	Active Transportation Plan
BRT	Bus Rapid Transit
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
CVAG	Coachella Valley Association of Governments
EIR	Environmental Impact Report
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
HCD	California Department of Housing and Community Development
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LCI	Governor's Office of Land Use and Climate Innovation
LOS	Level of Service
MPO	Metropolitan Planning Organization
RTP	Regional Transportation Plan
RTP/SCS	Regional Transportation Plan / Sustainable Communities Strategy
RCTC	Riverside County Transportation Commission
RIVCOM	Riverside County Travel Demand Model
RIVTAM	Riverside County Travel Analysis Model
SCAQMD	South Coast Air Quality Management District
SB	Senate Bill
SB 743	Senate Bill 743
SB 375	Senate Bill 375
SHS	State Highway System
TAF	Transportation Analysis Framework
TAC	Transportation Analysis under CEQA
TAZ	Traffic Analysis Zone
TDM	Transportation Demand Management
TPPS	Transportation Project Prioritization Study
TRPA	Tahoe Regional Planning Agency
TUMF	Transportation Uniform Mitigation Fee
VMT	Vehicle Miles Traveled
WRCOG	Western Riverside Council of Governments



Executive Summary

The Coachella Valley Association of Governments (CVAG) Regional Vehicle Miles Traveled (VMT) Study was designed to integrate VMT into major regional planning and funding programs as well as provide resources for local planning efforts. Regional planning efforts considered as part of this study include CEQA implementation, the Transportation Uniform Mitigation Fee (TUMF), and the Transportation Project Prioritization Study (TPPS).

The study addresses the following regional planning objectives:

- Provide California Environmental Quality Act (CEQA) VMT regulatory clarity for development and permitting
- Quantify VMT impacts to support grant applications and funding decisions
- Integrate equity considerations into transportation and land use decisions
- Addresses jobs-housing balance
- Alignment with climate action and Sustainable Communities Strategy (SCS) requirements
- Provide CEQA mitigation solutions
- Identify VMT reduction strategies that address both congestion and multimodal access

This study positions CVAG to move forward with meaningful integration of VMT in their regional planning procedures and provide planning and compliance resources to member agencies.

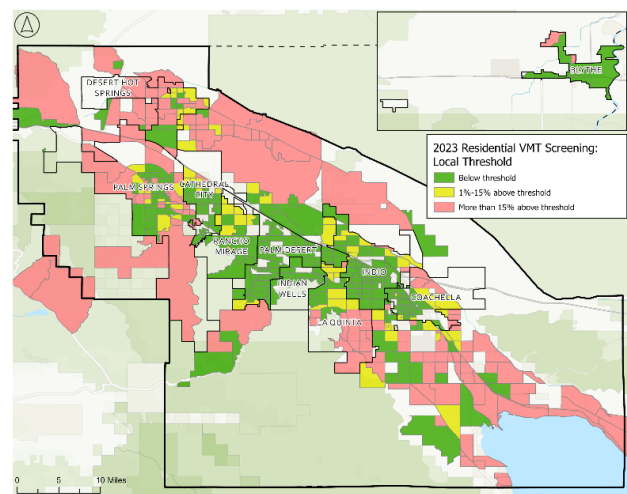
A Modernized Regional Travel Demand Model

At the core of this effort is a fully updated CVAG sub-area travel demand model (RIVCOM 4.0.1), advanced from a 2018 to a 2023 base year. This update is at the foundation of current and future planning efforts.

The updated model now reflects:

- Updated base year and consistency with 2023 American Community Survey and Census data
- Updated land use and socioeconomic conditions for the 2045 horizon year utilizing local and regional input
- Refined traffic analysis zones that reflect conservation zone boundaries
- Updated population synthesis to reflect the new base year conditions

Exhibit 1 - VMT Threshold Results from Updated Model



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The complimentary off-model tools developed for this project allow CVAG to estimate VMT benefits of active transportation and transit projects.

For the TPPS program, this establishes a current and technically robust analytical platform that allows CVAG to:

- Evaluate roadway, transit, and multimodal projects consistently
- Measure VMT impacts of capacity-enhancing projects
- Compare investments using updated growth forecasts
- Support potential TUMF restructuring
- Inform a VMT-neutral regional project strategy

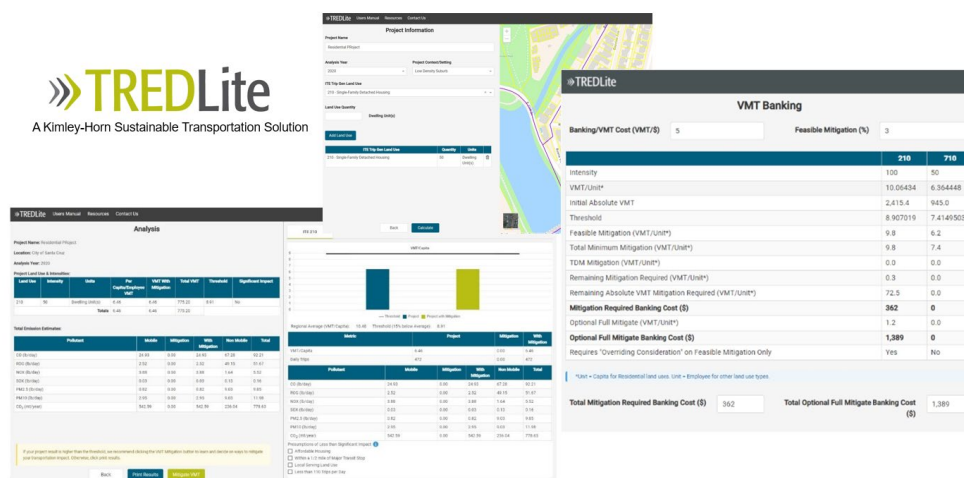
Previous TPPS discussions about incorporating VMT were constrained by model limitations. That constraint has now been substantially reduced. CVAG has the technical capacity to meaningfully integrate VMT into project scoring and regional programming.

CEQA Implementation Tools

The study developed several tools to support CEQA implementation and regional planning.

TREDLite is a parcel-level VMT screening and mitigation tool that improves predictability for both agencies and applicants. TREDLite is easy to use and configured to be CEQA compliant using recognized best practices for quantification of VMT reductions.

Exhibit 2 – TREDLite Dashboard



This project resulted in agency specific environmental documentation in the form of **model Supplemental Environmental Impact Report Templates** which allows jurisdictions to adopt VMT



thresholds through General Plan amendments and tier future development projects reducing cost, time, and litigation risk.

An online **TDM Toolbox and Calculator** resource was developed with over 75 strategies, linking:

- VMT reduction potential
- Equity considerations
- Funding sources
- Cost implications
- Quantification methodologies

This toolbox supports climate action planning, General Plan updates, grant competitiveness, and CEQA mitigation.

Exhibit 3 - Online CVAG TDM Toolbox



Integrating VMT into Regional Funding

The study evaluated how VMT can be incorporated into CVAG's core funding and programming tools. Three scalable approaches were analyzed:

Option 1: Add VMT as a TPPS Scoring Metric (Incremental Integration)

VMT can be incorporated into the TPPS ranking framework as an additional performance measure.

Finding:

With the updated model and newly developed off-model quantification tools, CVAG now has the analytical foundation to score projects based on their VMT impacts. This approach strengthens alignment with SB 743 and climate goals while preserving the existing TPPS structure.

Option 2: Replace Trip-Based TUMF with a VMT-Based Fee (Structural Adjustment)

The study recalculated the TUMF using both:

- Trip-based methodology (current structure)
- VMT-based methodology (distance-based approach)

Finding:

Shifting to a VMT-based fee changes how costs are distributed across land uses:

- Office and industrial uses (longer average trip lengths) see higher fees
- Retail (shorter trips and pass-by behavior) sees lower fees
- Residential uses see moderately higher fees, but lower than office and industrial increases.

A VMT-based approach is recommended as it strengthens the nexus between development impacts and system performance and better aligns fees with actual travel behavior.

Option 3: Develop a Net VMT-Neutral TPPS Project Portfolio (Comprehensive Shift)

Under this approach, the overall TPPS project list would be evaluated to balance capacity-enhancing projects with multimodal and demand-reducing investments.

Finding:

This approach represents a broader policy shift and would require extremely large packages of multimodal investments to offset capacity increasing projects for a net neutral plan. A more practical and incremental approach is to move towards a reduction of induced demand with transit and other multimodal investments, creating a pathway toward long-term regional VMT stabilization while maintaining mobility.

Regional VMT Mitigation Program

The study evaluated the feasibility of a Regional VMT Mitigation Program designed to provide standardized CEQA mitigation options across the Valley.



Several key lessons emerged:

1. **Market Timing Matters.**

Current development patterns do not yet produce a steady pipeline of projects that would sustain a fully regionalized mitigation bank. However, significant specific plan areas, particularly east of I-10 and in northern portions of the Valley, are positioned for future buildout. As those areas develop, demand for predictable, programmatic mitigation will increase.

2. **Induced Travel from Major Roadway Projects Is a Near-Term Consideration.**

Even in the absence of high development volume, corridor and capacity improvements may generate induced demand and related increases in VMT. A regional framework provides a mechanism to address those impacts proactively.

3. **Program Structure Must Be Flexible.**

Multiple models were evaluated (mitigation bank, exchange system, hybrid approaches). The most viable path forward may be phased; establish administrative and analytical frameworks now and tie future activation to market conditions.

4. **Predictability Benefits Economic Development.**

Even before full implementation, establishing a regional framework signals certainty to the development community and reduces project-by-project negotiation risk.

The study concludes that while immediate activation may not be necessary, preparing the framework now positions CVAG to respond strategically as growth accelerates.

Equity as a Core Principle

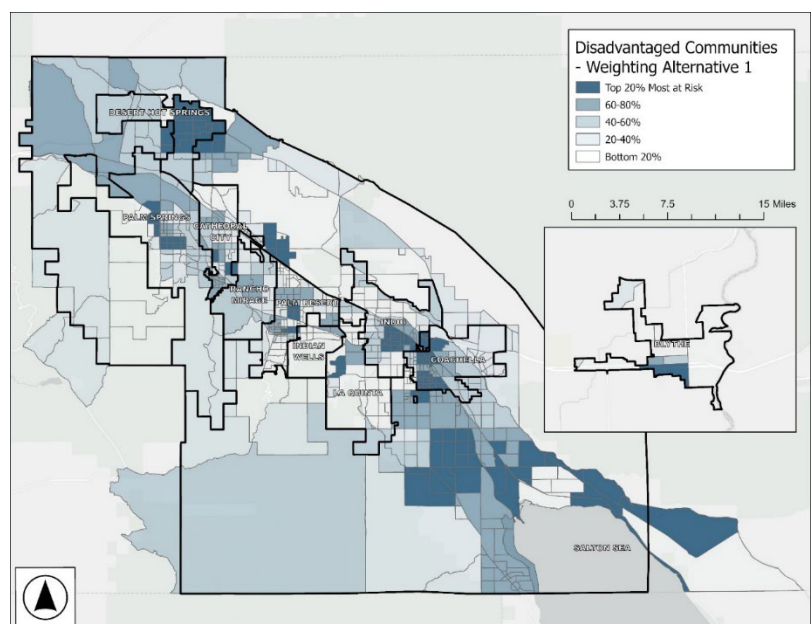
The study developed a locally tailored Disadvantaged Communities (DAC) methodology that integrates region-specific indicators using local and Census based datasets.

This ensures that:

- Transportation investments support communities with the highest need
- VMT reduction strategies improve access to opportunity
- Regional funding decisions advance equity goals

Equity is embedded in the prioritization framework, not treated as an afterthought.

Exhibit 4 - CVAG Disadvantaged Communities





Public Outreach and Community Insights

Public engagement was extensive and included:

- Local Advisory Committee coordination
- Stakeholder interviews and workshops
- Community pop-up events
- A statistically valid regional survey

The survey provided important insight into what types of investments are most likely to shift travel behavior in the Coachella Valley. Key findings included:

Safety is the top priority. Lighting, shading, and improved pedestrian environments were the strongest factors influencing willingness to shift modes.

Walking is the most appealing non–drive-alone mode. Investments in safe, comfortable pedestrian infrastructure are likely to generate measurable mode shift.

Subsidized microtransit and shuttle services are attractive. Flexible, lower-cost transit options resonated more strongly than traditional fixed-route expansions.

These findings informed the VMT reduction toolbox, project list development, and prioritization framework.

What This Study Means for CVAG

This study provides:

- An updated regional travel demand model
- Defensible VMT thresholds
- Practical CEQA streamlining tools
- Quantified multimodal investment strategies
- A framework to evolve TUMF to VMT based fees
- A pathway to integrate VMT into TPPS
- A foundation for a future Regional VMT Mitigation Program

The study provides the analytical foundation and policy options needed to align transportation investment with economic development, climate action, equity, and regional mobility goals while also supporting a move towards performance-based decision-making alongside ongoing CEQA compliance obligations.

Exhibit 5 - Pop-up Event Activities

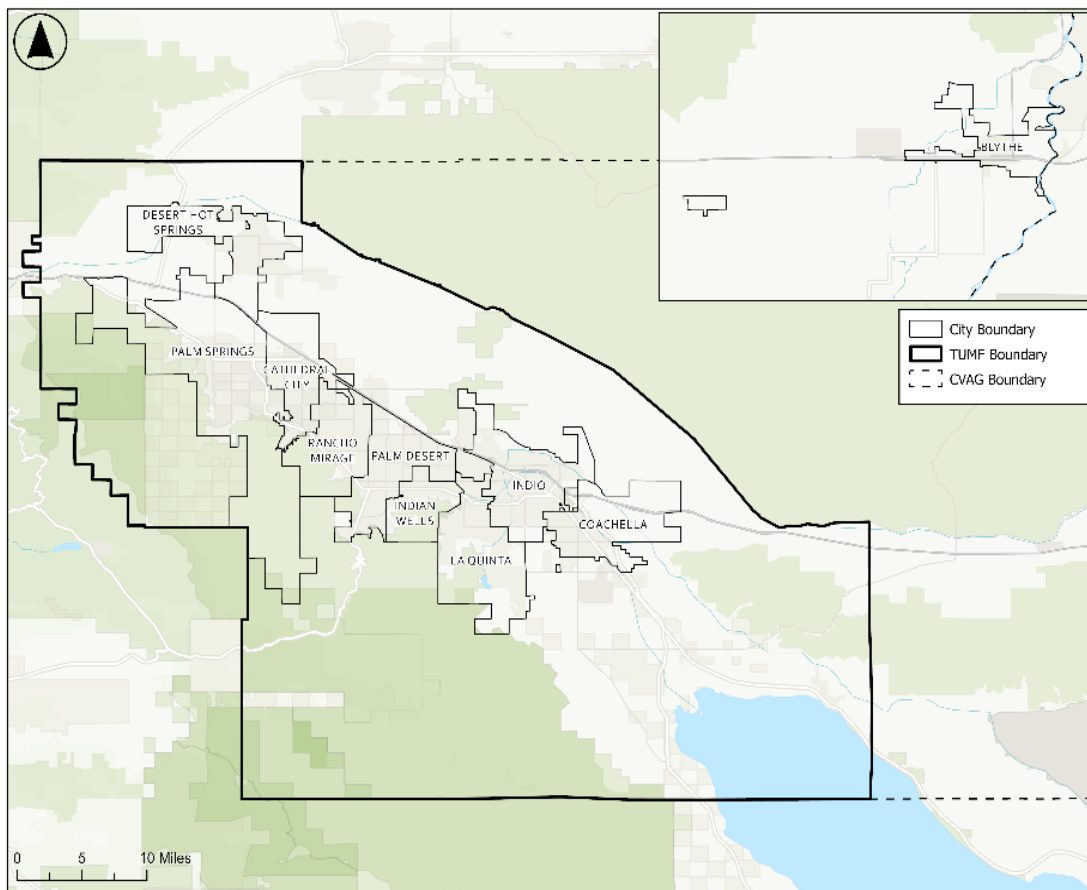




Introduction

In the Coachella Valley, the Coachella Valley Association of Governments (CVAG) plays a central role as the regional planning agency, with programs relating to transportation, environmental sustainability, and infrastructure development, among other regional needs. CVAG administers the Coachella Valley Transportation Uniform Mitigation Fee (TUMF) program, which funds critical roadway and infrastructure improvements guided by the Transportation Project Priority Study (TPPS), and manages key regional initiatives such as the CV Link, a multi-modal pathway designed for pedestrians, cyclists, and low-speed electric vehicles, and CV Sync, a Valley-wide intelligent transportation system. Transportation and air quality planning across the broader Riverside County region are managed in coordination with a range of partner agencies, including the Riverside County Transportation Commission (RCTC), the Southern California Association of Governments (SCAG), and the South Coast Air Quality Management District (SCAQMD), each of which plays a role in shaping the transportation context within which CVAG operates.

Exhibit 6 - Project Study Area





The implementation of Senate Bill (SB) 743 has fundamentally changed the context in which CVAG and its member agencies plan for transportation. By shifting the measure of transportation impact from vehicle delay and Level of Service (LOS) to Vehicle Miles Traveled (VMT), SB 743 requires a different way of thinking about where development happens, how people travel, and what investments are needed to maintain a functional and equitable transportation system. Coachella Valley's distinct character, including its desert climate, dispersed communities, and ongoing investment in transit and active transportation infrastructure, shapes both the challenges and the opportunities that come with this transition. Navigating it effectively requires both technical rigor and a clear understanding of local conditions.

In 2024, CVAG received Regional Early Action Planning Grant (REAP) 2.0 funding to support the Coachella Valley Regional Vehicle Miles Traveled Study. The study was designed to analyze how best to integrate VMT into CVAG's major regional planning and funding programs while providing practical resources for local planning and California Environmental Quality Act (CEQA) compliance. Its objectives include providing consistent VMT accounting across jurisdictions, identifying the most suitable Transportation Demand Management strategies for the valley, identifying pathways for integrating VMT metrics into CVAG's regional arterial and fee programs, and ensuring that transportation investments reflect the needs and priorities of all communities in the region, including those that have historically been underserved.

Equity is a central principle of this study, not a supplementary consideration. The Coachella Valley's geography, demographics, and land use patterns mean that the communities most reliant on alternatives to driving are often the same communities that have the least amount of access to transit, active transportation, and pedestrian infrastructure. Addressing that imbalance required both a locally tailored methodology for identifying disadvantaged communities and a robust public engagement program designed to reach residents who are rarely represented in conventional planning processes. Both efforts are described in detail in this report and are reflected throughout the analysis.

This report provides the analytical foundation and implementation resources that CVAG and its member agencies need to move forward with VMT mitigation in a coordinated and regionally responsive way. It documents existing conditions and policy context, examines programmatic approaches to VMT mitigation from across California, evaluates legal and economic considerations, and applies all of these concepts to the specific conditions of the Coachella Valley. The findings and tools presented here are intended to support a wide range of planning, regulatory, and funding decisions, from project-level CEQA compliance to long-term updates to the TUMF and TPPS.

This report is organized into multiple parts. The first chapter establishes the policy and analytical context for VMT in the Coachella Valley, including statewide guidance, regional conditions, and the drivers of VMT from both land use and transportation investments. The following chapter introduces the regional and local agencies that play a part in implementing policies to reduce VMT. A dedicated chapter on equity and community engagement describes the locally tailored disadvantaged communities methodology and the public outreach program conducted as part of this study. The report then examines programmatic approaches to VMT mitigation, including fee-based programs and examples from across California, including an evaluation of legal and policy considerations that shape implementation. Building on this foundation, the report applies these concepts to the Coachella Valley, assessing opportunities to

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incorporate VMT into regional planning, funding mechanisms, and project prioritization frameworks. The report concludes with recommendations and a summary of the study's findings and deliverables.

Several technical memoranda and supporting studies were prepared as part of this effort and are referenced throughout this report. These materials are included as separate appendices to provide additional documentation, methodology, and supporting analysis.



Background on VMT

SB 743 fundamentally changed how transportation impacts are assessed for proposed projects, including both land use developments, such as housing, and transportation projects, such as roadway expansions. The bill shifts the focus from vehicle delay and LOS to evaluating the VMT generated by a project, emphasizing regional impacts and greenhouse gas emission reduction goals over localized congestion.

Before SB 743, transportation impacts were primarily measured using LOS, a standard introduced in the first Highway Capacity Manual (HCM) in 1950. LOS focuses on vehicle travel speed and throughput, assessing how easily cars can move through intersections or along roadways. However, this approach prioritizes personal vehicle use over other modes of travel, such as biking, walking, and public transit. Since LOS centers on the driver's experience and the value of their time, common solutions to improve LOS include:

- **Increasing Roadway Capacity:** Adding lanes or building new roads to reduce congestion.
- **Building in Less Populated Areas:** Developing projects in rural or undeveloped areas to avoid congestion, leading to urban sprawl and increased greenfield development.

Over seven editions of the HCM, LOS became deeply ingrained in transportation decision-making. Yet, this focus on vehicle throughput has been linked to negative outcomes, including:

- **Induced Demand:** As roads are widened and lane supply is therefore increased, the demand also increases causing congestion to return.
- **Urban Sprawl:** Encouraging development far from city centers.
- **Adverse Effects on Active Transportation:** Discouraging biking, walking, and public transit.
- **Roadway Safety and Public Health Issues:** Prioritizing vehicles can lead to more dangerous conditions for non-motorized users and increased air pollution.

SB 743 seeks to reverse these trends by adopting VMT as the primary measure of transportation impact. VMT evaluates the total distance traveled by vehicles, offering a more comprehensive understanding of how a project affects the transportation system and the environment. Key objectives of the VMT-based approach include:

- **Promoting Urban Infill Development:** Projects in urban areas generally result in lower VMT due to proximity to jobs, services, and other key destinations.
- **Reducing Greenhouse Gas Emissions:** By focusing on VMT reduction, SB 743 aligns with California's broader climate goals.
- **Encouraging Sustainable Transportation:** VMT analysis promotes the use of public transit, biking, and walking, leading to healthier and more sustainable communities.

As this shift from LOS to VMT occurred, it highlighted the lack of practical, cost-effective mitigation options for suburban and rural projects. Many previously utilized LOS mitigations do not align with VMT

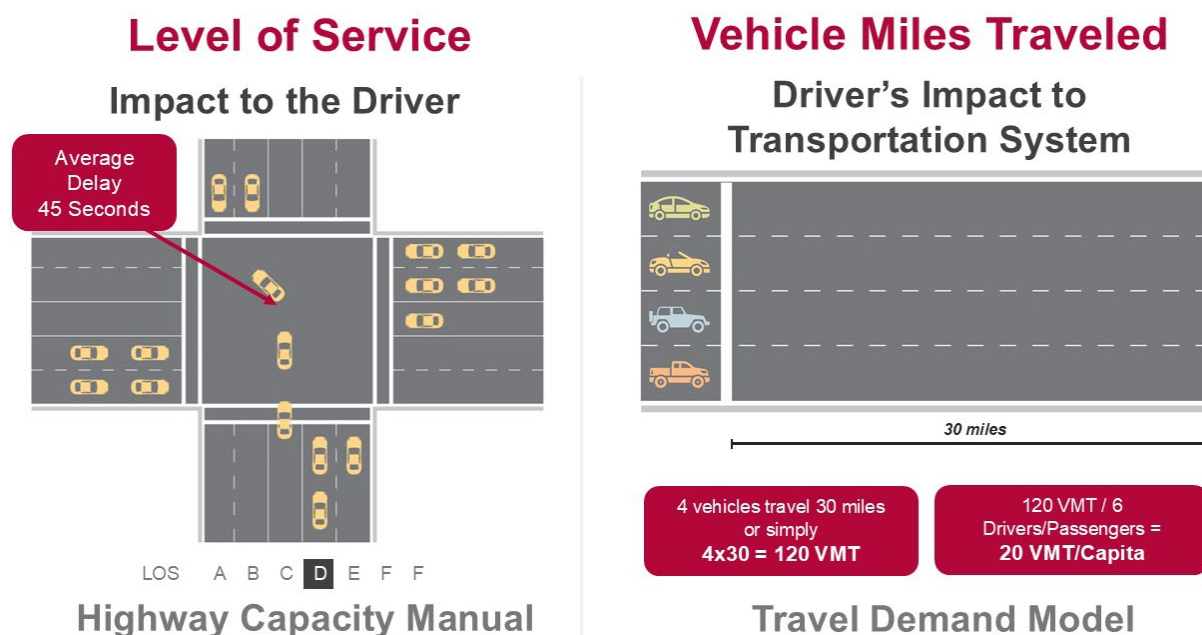


reduction goals. This change has led to very different outcomes for transportation analyses under CEQA and necessitated novel mitigation approaches.

How VMT is Measured

Exhibit 7 summarizes the key differences between LOS and VMT, highlighting how SB 743 reshapes transportation planning in California. VMT is calculated exactly as the term sounds: the sum of the number of miles traveled by each vehicle in a system.

Exhibit 7 – Level of Service vs. Vehicle Miles Traveled



When evaluating whether a project causes a significant transportation impact under CEQA, the project must be compared to a threshold of significance established by the governing jurisdiction. There are two main types of thresholds:

- **Efficiency Thresholds:** These measure VMT relative to a specific factor, such as VMT per capita (for residential projects) or VMT per employee (for office projects). This allows projects of varying sizes to be consistently evaluated against a single standard.
- **Net Change Thresholds:** These assess whether a project results in a net increase or decrease in regional VMT. This approach is often used for retail or customer-serving developments, which may not generate new trips but can influence trip lengths. In such cases, it's more appropriate to evaluate how the project's location affects regional VMT.



Example: Evaluating a Residential Project Using VMT

Exhibit 8 illustrates how a residential project is assessed using a VMT efficiency threshold. Here's how the process works:

1. Calculate Total VMT: Each trip made by the household is measured, including both outbound and return trips.
 - Trip to child's school: 7 miles round trip
 - Trip to work: 8 miles round trip
 - Trip to the store: 15 miles round trip

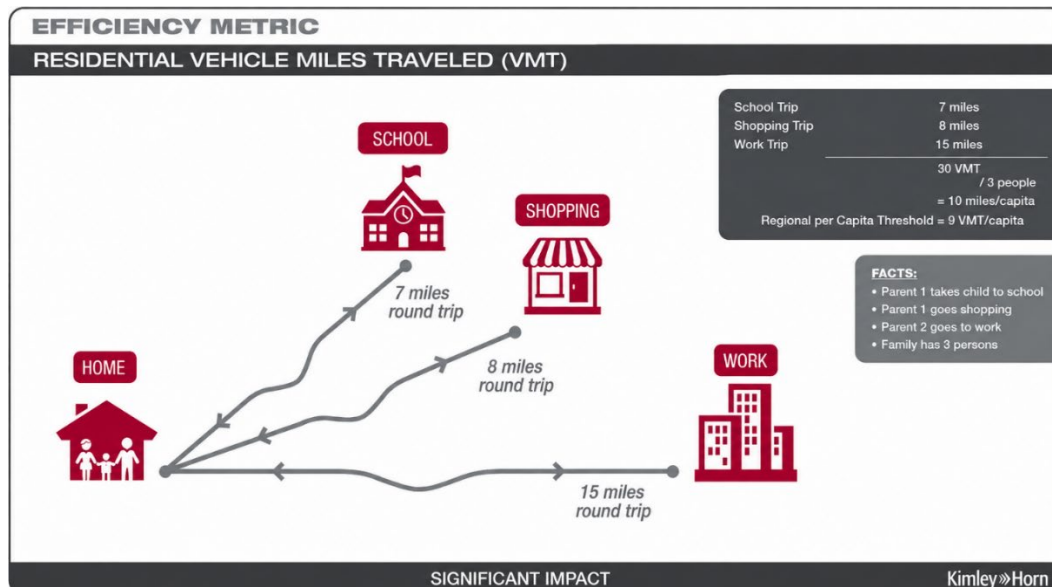
Total daily VMT: $7 + 8 + 15 = 30$ miles

2. Determine VMT per Capita:
The household has 3 people, so VMT per capita is calculated by dividing the total VMT by the household size:

VMT per capita = $(30 \text{ miles} / 3 \text{ people}) = 10$ VMT per capita

3. Compare to the Threshold:
If the jurisdiction's threshold for residential projects is set at 9 VMT per capita, this project would trigger a CEQA transportation impact, since its VMT per capita (10) is less efficient than the threshold.

Exhibit 8 – Vehicle Miles Traveled Residential Project Example





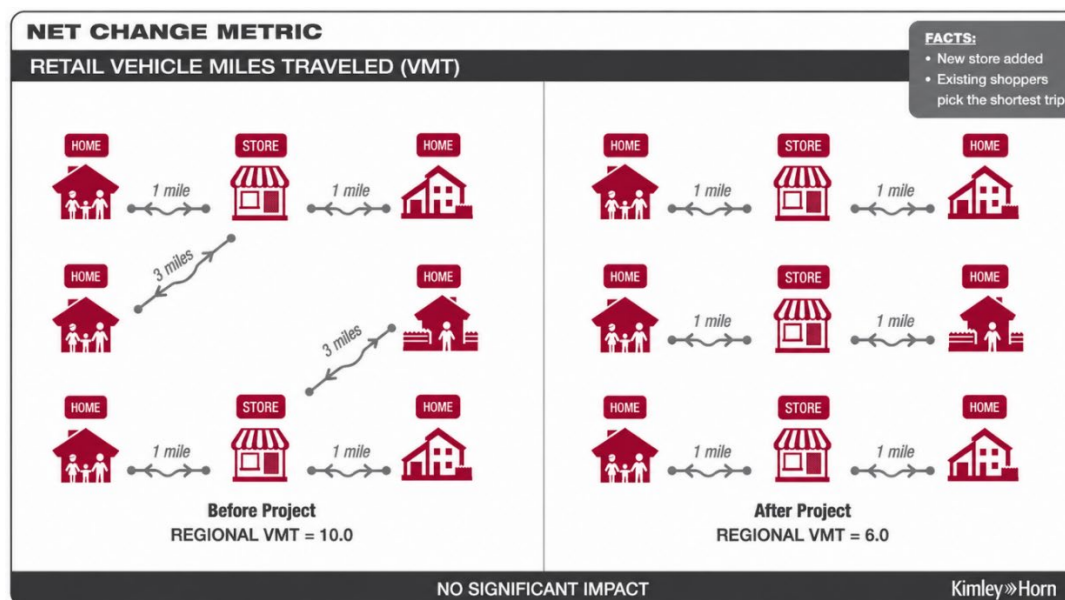
When evaluating VMT for retail projects, it's important to distinguish between regional retail (e.g., Lowe's, Target) and local-serving retail (e.g., coffee shops, restaurants, gas stations).

Local-serving retail primarily meets preexisting demand and typically does not generate new trips. Instead, it is assumed to reduce trip lengths because customers are likely to visit the new, closer store instead of traveling to a similar store farther away. For example, if a new coffee shop opens near a residential area, residents who previously drove several miles to another coffee shop may now make a shorter trip. This results in shorter trips on the roadway network.

In contrast, regional retail stores are designed to attract customers from a broader geographic area. These stores may offer benefits such as cost savings, a wider selection of products, or the ability to consolidate multiple types of shopping in one trip. Because of these factors, regional retail is not presumed to reduce trip lengths. Instead, it may draw new trips from across the region, potentially increasing overall VMT.

Exhibit 9 visually explains this concept. It shows how a new local-serving retail store redistributes existing customer trips, leading to shorter average trip distances and a reduction in VMT. For example, if a new store opens closer to a residential neighborhood, the average trip length might decrease from 3 miles to 1 mile, as customers opt for the more conveniently located option.

Exhibit 9 – Effect of Local-Serving Retail on Regional Vehicle Miles Traveled



Measuring VMT in the Coachella Valley

In support of this study, the Riverside County travel demand model (RIVCOM 4.0.1) was updated to develop a subarea model for the CVAG planning area. RIVCOM is the regional forecasting tool used throughout Riverside County for transportation planning, impact analysis, and programs such as the TUMF. The model base year was advanced from 2018 to 2023 to reflect post-pandemic travel behavior and updated land use conditions. Updates included revised household, employment, and school



enrollment data using American Community Survey data, local permit records, and agency input, as well as refinements to traffic analysis zones to better reflect conservation areas and current development patterns. The horizon year land use assumptions were also updated based on member agency input, housing element opportunity sites, and adopted specific plans. Following the updates, the model underwent validation using observed traffic volumes from Caltrans PeMS and StreetLight data and was found to perform consistently with the previously validated regional model. The updated model provides the analytical foundation for the VMT thresholds, mitigation estimates, and project evaluations presented throughout this study. More information on the work to update RIVCOM is provided in the “VMT Mitigation Strategies and Regional Program Integration” chapter below and Appendix E.

State Guidance

The State of California office of Land Use and Climate Innovation (LCI) published guidelines for the implementation of VMT thresholds to comply with SB 743. The [Technical Advisory on Evaluating Transportation Impacts in CEQA](#) provides recommendations for setting VMT thresholds of significance, methods for screening projects, and other technical considerations. Many local jurisdictions, including some within the Coachella Valley, have used this Technical Advisory as the basis for setting thresholds and reviewing projects for transportation impacts under CEQA. While the Technical Advisory provides detailed guidance for land use projects and overarching guidance for transportation projects, Caltrans was tasked with preparing more specific guidance for transportation projects, specifically those on the State Highway System (SHS).

Prior to the implementation of SB 743, Caltrans evaluated projects based on the potential increase in traffic in the immediate area. However, SB 743 prompted a change in the way the state measures the impacts of new development and transportation projects. Projects are now evaluated using VMT to analyze both the number of car trips generated and total length of those trips, giving a more regional analysis of a project’s impact rather than a localized analysis. Caltrans provides several resources for developers, local governments, and others seeking information on how to analyze projects in compliance with SB 743.

Land Use Generated VMT

The amount of VMT a development produces is largely dependent on the location and the surrounding land uses. A development built in a denser urban area will naturally generate short trip distances for discretionary trips, such as shopping or recreational purposes. Land use is a primary driver of VMT, so the most effective mitigations for VMT are rooted in land use strategies.

When determining if a new development results in a transportation impact under CEQA, the project must be compared to a threshold of significance, which is determined by the jurisdiction or lead agency. Two types of thresholds are used: efficiency thresholds and net change thresholds. Efficiency thresholds are typically used for residential and employment-based land uses and are expressed as VMT per capita and VMT per employee. Net change thresholds are typically used for retail land uses or customer-based land uses. **Table 1** below presents the efficiency thresholds for each of CVAG’s member agencies. Many of the agencies within the Coachella Valley are using the same thresholds, which were originally prepared and adopted by the County of Riverside. However, some agencies are following the methodology that was recommended by LCI in their Guidelines.



Table 1 – VMT Efficiency Thresholds²

	VMT per Capita	VMT per Employee
Blythe	21.96	30.57
Cathedral City	21.96	30.57
Coachella	21.96	30.57
Desert Hot Springs	21.96	30.57
Indian Wells	18.67	25.98
Indio	21.96	30.57
La Quinta	15.98	25.98
Palm Desert	21.96	30.57
Palm Springs ¹	39.14	39.14
Rancho Mirage	18.67	25.98
Riverside County	21.96	30.57

¹Palm Springs Local Methodology based on origin-destination VMT per service population

²See Table 7 – Current Threshold Methodologies which describes the methodologies.

VMT Mitigation Need from Land Use

The adopted VMT guidelines for each CVAG jurisdiction were used to evaluate the amount of modeled VMT that exceeds adopted thresholds under existing and horizon year conditions in the updated sub-regional model. This analysis is intended to illustrate the potential scale and geographic distribution of VMT exceedance across the region rather than quantify actual project-level mitigation obligations under CEQA. In practice, many development projects screen out of detailed VMT analysis or are determined to have a less-than-significant transportation impact through existing screening criteria, including the County of Riverside's small project greenhouse gas threshold and county-average threshold methodology.

This analysis was completed using Traffic Analysis Zones (TAZs), which are geographies within the regional travel demand model that are used to evaluate travel behavior and are similar in size to Census Blocks.¹ The TAZs within each jurisdiction that demonstrated VMT above the applicable threshold were identified, and the difference between the modeled VMT and the applicable threshold was multiplied by the associated population or employment to estimate the magnitude of VMT exceedance within that TAZ. The results were then totaled for each jurisdiction to provide a regional-scale understanding of where modeled VMT exceedance is concentrated.

In the base year (2023), the model identifies a total of 803,247 home-based-residential VMT and 1,035,164 home-based-work VMT above the applicable significance thresholds. The model forecasts 891,911 home-based-residential VMT and 865,707 home-based-work VMT above the thresholds for the horizon year (2050).² **Table 2** and **Table 3** show the amount of VMT over the threshold by CVAG

¹ For more information on the regional travel demand model and updates made as part of this project see "Travel Demand Model Update Technical Documentation" prepared for the Coachella Valley Regional Vehicle Miles Traveled (VMT) Study, January 2026.

² There were two horizon year scenarios developed for this project: a 2045 unconstrained scenario that was based on General Plans and Specific Plans and a 2050 constrained scenario that capped growth based on the SCAG

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member agency for the base year and horizon year, respectively. This analysis is useful because it provides a regional-scale understanding of where modeled travel patterns are associated with longer trip distances and higher VMT, helping identify the geographic areas and land use patterns where future VMT-reduction strategies, multimodal investments, or mitigation programs may be most effective. This topic is further addressed in the *VMT Mitigation Strategies and Regional Program Integration* chapter.

Table 2 – Base Year VMT Over Agency Thresholds

	Residential VMT	Employment VMT
Blythe	6,038	12,727
Cathedral City	36,728	67,964
Coachella	11,283	19,227
Desert Hot Springs	104,244	74,139
Indian Wells	163	13,094
Indio	23,767	71,194
La Quinta	119,704	46,512
Palm Desert	3,155	80,564
Palm Springs	64,489	392,864
Rancho Mirage	7,661	125,948
Unincorporated CVAG	426,016	130,930
CVAG Total	803,247	1,035,164

Table 3 – Horizon Year VMT Over Agency Thresholds

	Residential VMT	Employment VMT
Blythe	45,249	9,481
Cathedral City	5,251	45,692
Coachella	17,544	13,255
Desert Hot Springs	144,797	73,721
Indian Wells	0	4,298
Indio	24,224	18,604
La Quinta	133,834	15,547
Palm Desert	0	24,873
Palm Springs	46,014	415,729
Rancho Mirage	3	128,826
Unincorporated CVAG	474,994	115,680
CVAG Total	891,911	865,707

demographic forecasts. The figures cited here are from the constrained scenario. For more information refer to the "Travel Demand Model Update Technical Documentation" included as an Appendix to this report.



Transportation Project Generated VMT

In addition to development-driven VMT, transportation projects themselves can generate increases in vehicle travel that may require mitigation under CEQA. Capacity-enhancing investments, particularly on regional corridors and major arterials, can reduce travel time and cost, which may lead to additional trips, longer trip distances, or shifts in travel behavior over time. These changes, commonly described as induced demand, create a project-generated VMT impact that is distinct from the VMT associated with land development.

As the region advances updates to the TPPS and considers future transportation investments, it is important to evaluate whether certain projects could result in measurable increases in VMT and whether mitigation strategies may be warranted. This need is likely to vary depending on project type, scale, and location, as well as the level of congestion relief and accessibility changes introduced. In some cases, capacity projects may require programmatic mitigation approaches or offsetting investments—such as multimodal improvements, transportation demand management strategies, or land use coordination—to address induced travel. The following sections describe the policy context, analytical tools, and methodologies used to assess transportation project-generated VMT and to determine where mitigation may be appropriate.

Caltrans Guidance for Transportation Project Analysis

The Caltrans Transportation Analysis Framework (TAF) and Transportation Analysis Under CEQA (TAC) are tools that guide planning and environmental review in California for transportation facilities. The TAF provides methods and data to evaluate how transportation projects impact travel behavior, greenhouse gas (GHG) emissions, and VMT. The TAC focuses on meeting the requirements of CEQA, which mandates evaluating and minimizing environmental impacts from projects. Together, these tools ensure that transportation planning follows state laws, reduces emissions, and promotes sustainable development. **Exhibit 10** is reproduced from the current TAC Second Edition (September, 2025) and demonstrates the relationship between the two documents as they relate to analyzing transportation impacts.

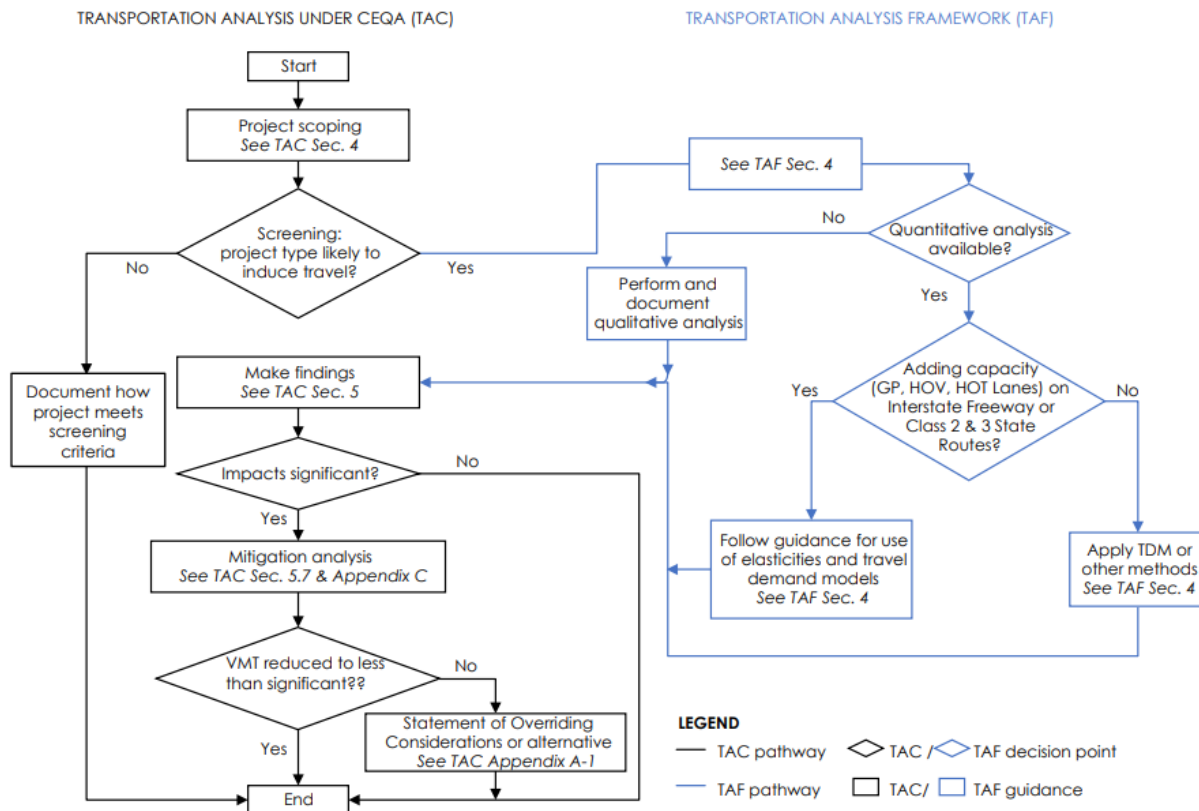
Governor Gavin Newsom signed Executive Order N-2-24 on July 31, 2024. The Executive Order directed Caltrans to actively identify and pursue opportunities to align transportation investments with the State's climate and housing goals. Specifically, Caltrans is tasked with leveraging transportation funding and project delivery to support infill housing, particularly affordable infill housing, as a recognized environmental mitigation strategy. To implement this, Caltrans must publish clear guidance on incorporating affordable infill housing as a mitigation measure within its TAC framework. This guidance should outline how such housing can reduce VMT and related GHG emissions, thereby helping projects achieve CEQA compliance through more sustainable land use patterns. Additionally, Caltrans is required to monitor, track, and report on the application of this strategy at the project level to ensure accountability, measure effectiveness, and promote consistent implementation across the state.

The updated draft TAC incorporated the directives from Executive Order N-2-24, which emphasizes the use of affordable infill housing as a strategy to mitigate environmental impacts. The TAC Second Edition acknowledges the importance of such strategies. Specifically, the guidelines note that "the most cost-effective [mitigation] measures... include transit-oriented development, transportation demand management, and VMT-efficient housing projects." Additional bills have since been enacted to establish



a statewide mitigation program that funds the development of affordable housing as a mitigation measure. Those bills and the impact on regional agencies such as CVAG are described further in the “Legal Considerations” section of this report.

Exhibit 10 - Relationship Between the TAF and TAC³



Induced Demand

A key aspect of VMT analysis is determining whether a transportation improvement could induce additional vehicle travel—commonly referred to as “induced demand.” Induced demand occurs when reduced travel times, most often resulting from capacity improvements, encourage additional vehicle trips, potentially increasing VMT, GHG emissions, and other pollutants. Given California’s legislative priority to reduce VMT and GHG emissions as part of its climate change mitigation strategy, induced demand has become a critical consideration in evaluating transportation projects, particularly those involving capacity enhancements.

³ California Department of Transportation. (2025). *Transportation analysis under CEQA* (2nd ed.): *Evaluating transportation impacts of State Highway System projects*. State of California.

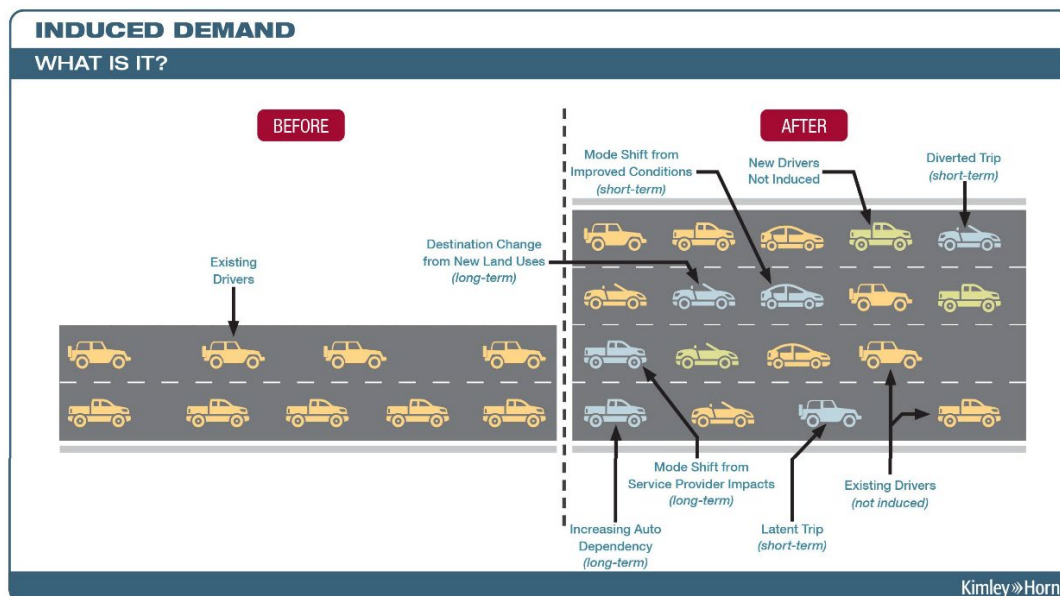


Additional vehicle trips are induced in the short term, one to three years after the improvement is constructed, or long term, more than three years after the improvement is constructed. The types of trips that are induced by each type of induced demand include:

- Short-term (1 – 3 years)
 - Mode shift from improved conditions (additional capacity provides a quicker route compared to alternate modes such as transit)
 - Trips diverted from adjacent roadways (additional capacity provides a quicker route than adjacent roadways even if trips are longer by distance)
 - Latent trips (quicker trips means a latent demand can be satisfied that was previously suppressed by the prior travel time)
- Long-term (3+ years)
 - Increasing auto dependency (investment in auto infrastructure encourages its reliance as compared to other travel options)
 - Mode shift due to service provider impacts (investment in auto infrastructure leads to less investment in other modes)
 - Destination changes from new land uses (the increased capacity leads to additional land use being located along a roadway leading to changes in destinations)

Exhibit 11 shows the various ways travel demand may be induced by capacity increases.

Exhibit 11 - What is Induced Demand?





NCST Calculator

The National Center for Sustainable Transportation (NCST) developed the California Induced Travel Calculator (“NCST Calculator”) to estimate the VMT induced annually as a result of expanding the capacity of publicly owned roadways, like those managed by the Caltrans, in California’s urbanized counties. The NCST Calculator applies only to publicly owned facilities with FHWA functional classifications of 1, 2, or 3. These functional classifications correspond to interstate highways (Class 1), other freeways and expressways (Class 2), and other principal arterials (Class 3). The NCST Calculator can be found here: <https://travelcalculator.ncst.ucdavis.edu/>.

The NCST Calculator was developed to provide an evaluation mechanism to estimate induced demand. In general, the studies that underly the development of the NCST Calculator show that a 10-percent increase in capacity is likely to increase network-wide VMT by 7 to 10-percent (an elasticity of 0.7 to 1.0) in the long run (3+ years), for capacity expansions on major roadways with FHWA functional classifications of 1, 2, or 3. These longer-term elasticities account for shorter-term shifts in travel (as people take advantage of the increased capacity and reduced cost of vehicle travel by driving more), as well as longer-run growth and dispersion of residential and business location and development.

The NCST Calculator estimates induced VMT using the following equation:

$$\text{Induced VMT} = \left(\frac{\text{New Lane Miles}}{\text{Total Existing Lane Miles}} \right) * \text{Existing VMT} * \text{Elasticity}$$

Rural Induced Demand Study⁴

The Rural Induced Demand Study evaluates the appropriateness of applying existing VMT guidance to rural contexts, particularly for analyzing induced demand. The study finds that many current tools, such as the NCST Calculator, are designed with urban conditions in mind and may overstate induced VMT in rural areas where congestion and latent demand are minimal or absent. In rural settings, highway improvements often prioritize safety, goods movement, and emergency evacuation over congestion relief, making urban-centric analysis tools ill-suited for these contexts.

The literature and methodological review reveal that state guidance frequently relies on elasticity-based models grounded in urban data, which limits their relevance to rural and suburban projects. Many induced demand studies also fail to account for important rural-specific factors, such as land development constraints and labor force characteristics. The NCST Calculator, for example, estimates induced demand based on lane miles rather than travel time savings, potentially overstating impacts in areas where congestion relief is not a major outcome. Furthermore, project-level analyses may overestimate induced VMT by counting entire trips that have simply shifted from other parts of the network, instead of focusing on the net change in VMT attributable to the project.

To address these limitations, the Rural Induced Demand Study recommends avoiding aggregate elasticity-based tools like the NCST Calculator for project-level CEQA evaluations in rural areas. It advocates screening projects to determine whether key conditions, such as significant congestion or travel time savings of at least 15 minutes, are present before estimating induced VMT. The study also calls for improvements to guidance documents like Climate Action Plan for Transportation Infrastructure

⁴ California Rural Counties Task Force. (2025, February). *Rural induced demand study*.



(CAPTI) and Regional Transportation Plan (RTP) Guidelines to incorporate rural-specific considerations, including model validations that reflect regional dynamics.

Enhancements to the NCST Calculator are also proposed, including the integration of context-sensitive elasticity values, the use of big data for latent demand estimation, and regular tool validation based on real-world outcomes. Within the context of the NCST, much of the Coachella Valley functions as a rural environment, with major interstates and highways largely located at the periphery of its jurisdictions rather than serving dense, congested cores. As a result, the findings of this study are particularly relevant to CVAG, providing a basis to support potential adjustments or reductions in estimated induced VMT where projects do not meet typical urban conditions for induced demand.

Induced Demand in Coachella Valley

The TPPS was developed to provide CVAG with an objective method for identifying and ranking regional transportation improvement projects to help inform funding decisions. The study area covers roadways across the nine incorporated cities and unincorporated areas of Riverside County. The outcome of the TPPS is a list that represents the universe of identified regional transportation needs and their relative priority.

Table 4 provides a list of currently funded agency-led projects in the 2018 TPPS that are potential candidates for induced demand. These projects involve improvements that increase capacity through the addition of new lanes or the construction of new interchanges and would be subject to SB 743 requirements as the environmental documentation was not completed prior to the deadline for implementing VMT into transportation analysis metrics under CEQA.

To quantify the magnitude of induced travel demand associated with these projects, the NCST Calculator is used. The Calculator is limited to roadways classified under FHWA functional classes 1–3 (interstates, other freeways and expressways, and other principal arterials), so only the capacity increasing projects that meet this criterion are quantitatively assessed for induced VMT.

Table 4 – Potential Induced Demand Causing Projects from TPPS

Agency	Project Name	Added Capacity [miles]	Induced VMT [million VMT/year]	Induced VMT [thousand VMT/day]
Riverside County	Portola Ave I-10 Interchange	2.59	7.3	20.0
Indio	Golf Center Parkway & I-10 Interchange	0.95	2.7	7.4
Indio	Jefferson St widening from Ave 38 to Sun City Blvd.	0.52	1.5	4.1

As noted above, the NCST Calculator may overstate VMT impacts in rural areas. Therefore, it is highly recommended that as each project approaches environmental review the lead agency consider the recommendations from the Rural Induced Demand Study.

While understanding the magnitude and drivers of VMT in the Coachella Valley is essential, the ability to address these impacts depends on the agencies responsible for planning, funding, and implementing



transportation and land use strategies. The following chapter outlines the institutional landscape that governs SB 743 implementation and VMT reduction efforts across the region.



Institutional Landscape for SB 743 and VMT Reductions

The implementation of SB 743 and the transition to VMT as the primary transportation impact metric under CEQA has introduced new roles and responsibilities across multiple levels of government. Unlike traditional LOS-based analysis, which was largely addressed at the local project level, VMT reduction and GHG mitigation require coordination across jurisdictions, agencies, and planning frameworks that operate at local, regional, and state scales.

In the Coachella Valley, this institutional structure is complex. A wide range of agencies including local jurisdictions, regional planning bodies, subregional planning agencies, state transportation agencies, transit providers, and air quality districts each play distinct but interconnected roles in shaping transportation outcomes. These entities are responsible for establishing VMT thresholds, reviewing projects under CEQA, funding and implementing infrastructure, and advancing policies that influence travel behavior and land use patterns.

Understanding this institutional landscape is critical to identifying feasible pathways for VMT mitigation. The ability to implement effective mitigation strategies depends not only on the technical tools available, but also on how responsibilities are distributed across agencies and how those agencies coordinate planning, funding, and implementation. The following sections describe the key agencies involved in SB 743 implementation within the Coachella Valley and their respective roles in advancing VMT reduction and GHG mitigation.

Regional Agencies

The Western Riverside Council of Governments (WRCOG) is CVAG's counterpart for Western Riverside County with similar responsibilities. The Riverside County Transportation Commission (RCTC) oversees countywide transportation planning, funding, and project implementation, including highways, public transit, and commuter rail. The Southern California Association of Governments (SCAG) develops long-range transportation plans and sustainability strategies as the metropolitan planning organization (MPO) for the region. Air quality oversight is managed by the South Coast Air Quality Management District (SCAQMD) and the Mojave Desert Air Quality Management District (MDAQMD), which enforce regulations and programs to reduce emissions and improve air quality. Additionally, the California Department of Transportation (Caltrans) District 8 oversees state highway operations and maintenance. Together, these agencies collaborate to address Coachella Valley's unique transportation and environmental challenges, with CVAG playing a key leadership role in shaping regional solutions.

Coachella Valley Association of Governments

CVAG manages several major programs in the Coachella Valley that maintain and improve infrastructure, including the TUMF. The TUMF was established in 1989 under the California Mitigation Fee Act as a one-time impact fee charged on all new developments in the Coachella Valley. Monies collected through the TUMF program are applied to transportation-related capital facilities and infrastructure required to serve new growth in the region and are intended to compliment revenue generated through Riverside County's Measure A sales tax.

Measure A funds are disbursed by RCTC to CVAG for use on highway and regional arterial projects, to municipalities for local streets and roads, and to the Sunline Transit Agency for public transit. CVAG

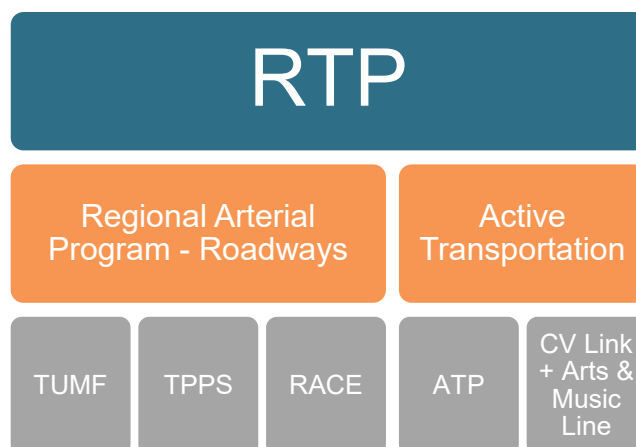


uses its portion of Measure A funding alongside revenues generated by the TUMF program for Regional Arterial System projects. Costs for these projects are shared with member jurisdictions. Participation in the TUMF program is required for local jurisdictions to receive their local share of Measure A funding.

Planning and Funding

CVAG is charged with more than just distributing TUMF funds. As the recognized transportation planning agency, along with RCTC, it is CVAG's responsibility to prepare and adopt a Regional Transportation Plan (RTP) for the Coachella Valley. Responding to the context of the RTP guidelines and California state legislation, CVAG maintains a family of documents that serve as the RTP: the TPPS, the Regional Arterial Cost Estimate (RACE), and the Active Transportation Plan (ATP). These three documents were designed to be updated simultaneously due to their interconnectedness in serving as the region's RTP. In 2014, CVAG's Executive Committee unanimously confirmed an approach that involved integrating ATP projects, such as CV Link, into the overall update of the TPPS. Collectively, the TPPS, RACE and ATP create the summary of needs and priorities for the ultimate regional transportation network used to develop the project list for the TUMF Nexus Study.

The TPPS serves as a methodological ranking system for roadway projects to provide CVAG with direction in determining funding distributions for regional arterials by prioritizing eligible study segments. Projects proposed for the TPPS are considered for inclusion based on how many jurisdictions they traverse, the roadway's general plan classification, the average daily traffic (ADT) along the roadway, whether the roadway includes important river crossings, and their connections with the interstate system. Criteria for ranking the projects in the 2018 TPPS include roadway surface conditions, system continuity, level of service, and accident rates. The TPPS currently does not use VMT as a criterion for ranking projects, but CVAG is currently undergoing a review of the criterion to assess whether it should be included in their next update to the TPPS and may integrate VMT and add other types of criteria for project ranking. After all segments have been analyzed, they are then merged or divided into logical and feasibly constructible buildable projects, and assigned a ranking based on how they are evaluated against the prioritization criteria.



RACE is a methodology used to create planning level cost estimates that are used to determine the approximate amount of funds required to construct each project. The cost estimates include multiple cost elements including the construction costs, right-of-way costs, level of improvement standard, costs related to engineering, design, and construction management, owner's administrative costs, and contingency. The RACE provides cost estimates for all projects in the TPPS and the ATP.

The Regional ATP includes projects for each of CVAG's member agencies and is consistent with other regional planning efforts, including CV Link and the Neighborhood Electric Vehicle (NEV) Plan. Adoption of the Regional ATP by CVAG's member agencies makes them eligible for Caltrans' Active



Transproation Program (Caltrans ATP) funding, as well as allows each agency to meet the requirements of the Complete Streets Act of 2008.

Regional Infrastructure Projects

CV Link is a 40-mile, multi-use pathway in the Coachella Valley. It connects cities from Palm Springs to Coachella, providing a safe and scenic route alternative to Highway 111 for walkers, runners, cyclists, and low-speed electric vehicles.

The Arts and Music Line is a 9-mile bike route that will improve the cycling experience and safety for all users along Avenue 48, between Washington Street and Dillon Road out to the Whitewater River. The route will feature local art, and will connect to local schools, housing, retail, festivals, and employment centers in parts of Coachella, Indio, and La Quinta. The route will also connect to CV Link.



Photo of CV Link

CV Sync is an innovative approach to improving how residents and visitors travel in the Coachella Valley. The project consists of upgrading existing legacy traffic signal controllers, traffic management systems, and communication systems throughout the Coachella Valley with the latest off-the-shelf technologies in order to provide inter-agency traffic signal synchronization. Phase I of the project, now operational, spans three regional roadways: Highway 111, Ramon Road and Washington Street. The project improvements include advanced traffic management systems (ATMS), advanced transportation controllers (ATC), selected Intelligent Transportation System (ITS) elements, ITS sub-systems, and Ethernet/IP-based communications that will be expandable and scalable for future integration of ITS technologies and strategies, such as Integrated Corridor Management (ICM), Smart Cities, and connected and autonomous vehicles (CAVs). This project also includes a Regional Traffic Management Center (RTMC) and local Traffic Operation Centers (TOC) that will have the capability to monitor and control the connected traffic signals, and be used as a monitoring tool for research and analysis to help determine regional system enhancements, operations, and maintenance.

Riverside County Transportation Commission

CVAG and RCTC work collaboratively to address transportation planning, funding, and project implementation within the Coachella Valley. While CVAG focuses solely on the Coachella Valley region, RCTC oversees countywide transportation planning and funding. It manages larger infrastructure projects, including highways, rail systems, and commuter services, while securing federal and state funding for transportation improvements. CVAG often works with RCTC to coordinate regional priorities, secure funding for projects in the Coachella Valley, and ensure local transportation plans align with broader countywide and regional strategies.

Short and long-range transportation planning within Riverside County is a key responsibility of RCTC, including coordination and funding of public transit services, the approval of capital projects for public



transit and highway projects, and the identification of staging and scheduling of project development and construction relative to programming documents such as the Federal Transportation Improvement Program (FTIP) and Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). RCTC plans and implements transportation and transit improvements, particularly those that affect more than one jurisdiction.

In 1988 the Measure A half-cent sales tax was approved by Riverside County voters, along with a 20-year expenditure plan. RCTC became the agency charged with implementing the mobility improvements funded by Measure A. In 2002, voters approved an extension of Measure A until 2039. Measure A funds are distributed to each of the three geographic areas within Riverside County: Western Riverside County, the Coachella Valley, and the Palo Verde Valley. Measure A funds are distributed to the three regions within Riverside County in proportion to the sales taxes they contribute.

The Riverside County Long Range Transportation Study (LRTS) outlines strategies to address transportation challenges and plan for future mobility needs in Riverside County through 2050. The study includes a Congestion Management Plan (CMP), which incorporates projects funded, in whole or in part, by the TUMF, as well as TDM projects. In 1991, all local agencies adopted TDM ordinances to comply with State CMP statutes. In 1996, the State substantially reduced the mandatory enforcement provisions associated with the CMP, including requirements related to LOS deficiency plans, and therefore, RCTC has not required agencies to update their respective TDM ordinances. RCTC facilitates the implementation of TDM projects through the Measure A Commuter Assistance Program, and the implementation of a number of TDM projects (in cooperation with Caltrans and local agencies in Riverside County and in adjoining counties) to achieve TDM objectives. Such TDM strategies include the development of Park-N-Ride lots, commuter rail stations, and public transit feeder services.

The 2024 Riverside County Traffic Relief Plan, developed by RCTC, outlines strategies to enhance transportation infrastructure and services across the county, including the Coachella Valley. The Plan identifies transportation-related improvements across seven categories. In the Coachella Valley, all transportation-related improvements are prioritized through the valley wide TPPS described above.

RCTC also manages a traveler information website that provides real time traffic and travel options for commuters in Riverside County including information on ridesharing and the regional emergency guaranteed ride home program which is offered to employees of employers who have registered for the benefit. [IE Commuter](#) can be used for Rule 2202 compliance, described further below, by Western Riverside County employers.

Southern California Association of Governments

The Southern California Association of Governments (SCAG) is the MPO for six counties, including Riverside County. SCAG is responsible for developing long-term regional plans to address transportation, housing, economic development, and sustainability. Its primary role includes preparing the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), “Connect SoCal,” which guides infrastructure investments and policies to improve mobility, reduce greenhouse gas emissions, and promote equitable growth throughout Riverside County and the other five counties it covers. The SCS aims to reduce VMT and associated GHG emissions by promoting compact development, transit-oriented communities, and alternative transportation options, helping the state achieve its targets for lowering GHG emissions from cars and light-duty trucks. SCAG is also



responsible for developing the region's Federal Transportation Improvement Program (FTIP) and for administering certain federal and state funds. The FTIP is a federally mandated, four-year program of all surface transportation projects that will receive federal funding or are subject to a federally required action. The FTIP is a comprehensive listing of transportation projects proposed over a six-year period. This listing identifies specific funding sources and fund amounts for each project. It is prioritized to implement the region's overall strategy for providing mobility and improving both the efficiency and safety of the transportation system, while supporting efforts to attain federal and state air quality standards for the region by reducing transportation related air pollution.

Connect SoCal

The Connect SoCal Plan is a long-term regional strategy for sustainable growth and transportation development. As part of the state's mandate to reduce per-capita GHG emissions from automobiles and light-duty trucks, Connect SoCal presents strategies and tools that are consistent with local jurisdictions' land use policies and incorporates best practices for achieving the state-mandated reductions in GHG emissions at the regional level through reduced per-capita VMT. The plan projects a 19-percent reduction in GHG emissions per capita by 2035, along with a 5-percent decrease in VMT per capita. Investments in infrastructure within the Connect SoCal Plan are expected to generate 168,400 new jobs and improve health outcomes through reduced pollution.

To achieve these goals, Connect SoCal allocated \$7.3 billion over the course of the plan to implement transportation demand management strategies throughout the region. There are three primary goals of this program:

- Reduce the number of single-occupancy vehicle (SOV) trips and per capita VMT through ridesharing (which includes carpooling and vanpooling) and providing first/last mile services to/from transit.
- Redistribute vehicle trips during peak demand periods by supporting telecommuting and alternative work schedules.
- Reduce the number of SOV trips through use of other modes such as improvements to transit, rail, bicycling, and walking, or other micro-mobility modes.



Transportation Demand Management

In addition to allocating funding for TDM, SCAG provides tools, resources, and direction for TDM programs as one of the methods to reduce VMT in the region. The Transportation Demand Management Strategic Plan for the SCAG region provides an objective-driven, performance-based planning framework for identifying TDM strategies and programs that increase the efficiency of the transportation system through alternative modes of travel. The plan identifies goals, objectives, and performance measures aligned with regional and state policies, including greenhouse gas reduction targets.

Key recommendations include expanding data collection, leveraging new technologies, fostering public-private partnerships, and improving regional coordination. The plan also introduces a TDM Toolbox with 32 strategies, categorized into education, incentives, infrastructure upgrades, parking management, and supportive policies, to help municipalities and agencies implement effective TDM programs. Additionally, it emphasizes collaboration, training, and data standardization to enhance program effectiveness and ensure measurable impacts. The TDM Toolbox is further refined for easy reference as a technical appendix to Connect SoCal.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is the regulatory agency responsible for improving air quality in Southern California, including Riverside County. Its primary responsibilities include developing and enforcing regulations to control air pollution from stationary and mobile sources, monitoring air quality levels, and implementing programs to reduce emissions. SCAQMD also ensures compliance with federal and state air quality standards, oversees emissions reduction plans, and provides grants and incentives for clean-air technologies. Portions of eastern Riverside County outside the South Coast Air Basin, including Blythe, fall under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD), which performs similar regulatory and planning functions for desert communities.

Rule 2202, adopted by the SCAQMD, aims to reduce air pollution caused by employee commutes. It helps employers comply with state and federal Clean Air Act requirements by offering various strategies to lower vehicle emissions. The rule applies to employers with 250 or more employees working at a single site for six consecutive months. Employers must notify the district when they meet this threshold and have 90 days to comply. Employers must meet emission reduction targets based on the number of employees and their commuting patterns. They can achieve compliance by:

1. Employee Commute Reduction Programs (ECRP): Implementing strategies such as carpooling, vanpools, public transit incentives, and telecommuting to improve Average Vehicle Ridership (AVR).

Education & Marketing

Safe Routes to School Programs

Implementors

Employers / Property Managers / TMA's

- TMA's/TMO's
- Educational institutions
- Property managers – residential

VMT Reduction:



Impact varies based on number of students and parents interacting with TMA's, schools and property managers.

Public Agencies / Transportation Providers

- School districts
- Municipalities
- Transit agencies
- Regional government/MPO's

VMT Reduction:



Impact varies based on size of school district and active transportation infrastructure.

Sample Report Card for a TDM measure from the Connect SoCAL TDM Toolbox.



2. Emission Credit Programs: Purchasing or generating emission reduction credits (ERCs, MSERCs, or VTECs) to offset emissions.
3. Alternative Programs: Participating in the Air Quality Investment Program (AQIP) to fund regional emission reduction projects.

Employers that choose to participate in Option 1 can develop a ECRP that uses measures from the SCAG TDM Toolbox or through participation in the RCTC IE Commuter program.

Transit Agencies

Riverside County is served by a network of public transit agencies that provide vital transportation options for residents, commuters, and visitors. The SunLine Transit Agency is the primary transit provider in Coachella Valley, offering fixed-route bus services, paratransit options, and on-demand rideshare programs to connect communities, businesses, and tribal lands. In the Palo Verde Valley, the Palo Verde Valley Transit Agency, or PV Ride, provides local fixed-route and demand-response transit services centered around the City of Blythe and surrounding unincorporated communities. Beyond the Coachella Valley, the Riverside Transit Agency (RTA) operates a comprehensive system of local, express, and commuter bus routes across western Riverside County, linking urban centers, suburban areas, and rural communities. Metrolink, a regional commuter rail service, provides connections between western Riverside County and neighboring counties. SunLine provides a connection between local bus services in the Coachella Valley and Metrolink services.

In addition to these major providers, specialized transportation services address the needs of specific populations. Dial-A-Ride programs are available through both SunLine Transit Agency and RTA, ensuring mobility for seniors and individuals with disabilities who require flexible, door-to-door transportation options. Vanpool and rideshare programs, facilitated by agencies like RCTC, support commuters with cost-effective and environmentally friendly travel alternatives. Furthermore, tribal transit services, including shuttles and ridesharing partnerships, enhance connectivity for Native American communities, particularly for those living on or near tribal lands.



SunLine Transit Agency



Photo of SunLine Transit Bus courtesy of SunLine Transit.

Established in 1977, SunLine Transit Agency operates fixed-route bus services that connect cities and communities across the Coachella Valley, including Palm Springs, Palm Desert, Indio, Coachella, and surrounding areas. SunLine's jurisdiction covers 1,120 square miles of the Coachella Valley. Its routes link key destinations such as shopping centers, medical facilities, schools, and major employment hubs. SunLine, the local bus service, currently operates nine local routes in its service area. The local bus network is made up of trunk routes and connector or feeder routes. Trunk routes serve highly traveled corridors with more frequent headways, including routes 1EV, 1WV, and 2. Connector/feeder routes operate in less dense areas and connect to the trunk routes.

The Route 10 Commuter Link is designed to improve regional service between the Coachella Valley and the Inland Empire. For students, the Route 10 Commuter Link provides a direct connection between California State University, San Bernardino's (CSUSB) campuses in Palm Desert and San Bernardino. It also provides service to the San Bernardino Transit Center (SBTC) for connections with Metrolink trains and routes served by the RTA, Omnitrans, Victor Valley Transit Authority, and Mountain Transit.

In 2002, SunLine raised its base cash fare from 75 cents to \$1. In 2011, a SunLine fare study recommended both eliminating the 25-cent transfer fare and incrementally raising the base cash fare to \$1.50, but these recommendations were not implemented. The SunLine Board of Directors has directed staff to explore fare-free operations.

To enhance accessibility, SunLine also provides SunDial, a paratransit service offering curb-to-curb transportation for individuals who are functionally unable to use regular bus routes. SunDial operates within three-quarters of a mile on either side of the SunBus route network and is available by advanced reservation only. Reservations may be made based on the service hours of the fixed routes serving passengers' origins and destinations and may be used only at the same times, days, and frequency as local fixed route service.

In recent years, SunLine has expanded its offerings with SunRide, an on-demand rideshare program that provides flexible, affordable, and convenient travel options within designated zones. SunRide serves seven zones in the Coachella Valley— Cathedral City, Coachella, Desert Hot Springs (including the community of Desert Edge), Indio, Mecca-North Shore, Palm Desert, and Palm Springs. The



SunRide fare is \$3 per person, which includes a free transfer to/from the intersecting fixed bus routes. SunRide's on-demand service allows a rider to book a trip within 15 minutes or to schedule a trip up to seven days in advance.

SunLine's Vanpool Program, SolVan, is operated through a third-party lease arrangement, where SunLine contracts with a consulting firm to competitively procure leasing vendors, who then provide a leased vehicle to vanpool groups. SolVan provides a monthly subsidy of \$400 per vanpool for qualified vans that agree to report on daily riders, miles, hours, and expenses. This subsidy increases to \$500 if a zero-emission vehicle is used for the vanpool. To receive a vanpool subsidy, the vanpool must meet the following criteria: either originate or travel to a work site within a ZIP code in eastern Riverside County, commute at least 25 miles round-trip, commute a minimum of 12 or more days per month, and have at least five riders. Vehicles must also be at least seven-seat vehicles and can seat up to fifteen passengers.

Recently, agricultural-related vanpools have served farm workers living and working in the eastern Coachella Valley, including Thermal, Mecca, Coachella, and Indio. Around 20 vehicles have been provided during each key harvesting month. Non-farm, more traditional vanpools serve work sites throughout eastern Riverside County. The number of vehicles serving these traditional work sites has varied from six to seven per month during the past year, with seven at present.

Additionally, SunLine is committed to sustainability and operates one of the cleanest fleets in the country, utilizing compressed natural gas (CNG) and zero-emission hydrogen fuel cell buses. The agency also participates in regional transit programs, enabling connections to neighboring counties and Metrolink commuter rail services.

Employer and TDM Programs

SunLine offers a 31-day pass to businesses in the Coachella Valley with five or more employees interested in using transit. The pass can be used for unlimited rides on any of SunLine's fixed route services and is priced at \$24 a month. The pass is \$10 less than the 31-day adult pass and is designed to encourage greater use of alternative modes of transportation.

In August 2018, SunLine launched its Haul Pass Program to improve student access to Coachella Valley's colleges and university. Both the College of the Desert and the CSUSB Palm Desert Campus are partners. To ride SunLine, students at these schools can simply swipe their active student ID card through the SunBus card reader when they board. The program began after receiving a grant from California's Low Carbon Transit Operations Program (LCTOP) program. On August 1, 2021, the program expanded to provide free local service to all high school students in grades 9 to 12.

Palo Verde Valley Transit Agency (PV Ride)

The Palo Verde Valley Transit Agency (PV Ride) provides public transit services in the Palo Verde Valley, including the City of Blythe and surrounding unincorporated communities near the Arizona border. Services include fixed-route transit, deviated fixed-route service, and dial-a-ride operations designed to provide mobility for residents, seniors, and individuals with disabilities in this rural portion of Riverside County. PV Ride serves an important role in connecting residents to employment, medical services, schools, and commercial destinations in an area characterized by long travel distances and limited transportation alternatives.



Amtrak

Amtrak provides intercity rail service in Riverside County. The Amtrak Southwest Chief and Texas Eagle routes pass through the County, connecting Riverside to major destinations such as Los Angeles, San Diego, Phoenix, and Chicago. The Amtrak Pacific Surfliner, a popular route along the Southern California coast, also serves Riverside County, providing connections to cities like San Diego, Santa Barbara, and San Luis Obispo. Stations in the County, including those in Riverside, Palm Springs, and Perris, serve as key access points for travelers seeking long-distance and regional transportation options. Amtrak Thruway buses further enhance connectivity by linking rail stations to areas without direct rail service. Together, these services offer a vital transportation alternative, supporting tourism, commuting, and regional mobility while complementing local and regional transit networks.

Future Transit

RCTC certified the Final Tier 1/Program-Level Environmental Impact Statement/Environmental Impact Report (EIS/EIR) in July 2022 for proposed daily intercity passenger rail service between Los Angeles and the Coachella Valley named Coachella Valley Rail (CV Rail). The service would provide improved access to jobs and education centers while reducing VMT and air pollution. In addition, the rail service would significantly expand economic opportunities by opening travel to restaurants, resorts, music festivals, sports facilities, and commercial and retail centers. The nine stations also offer a host of transit-oriented development opportunities. The proposed service would extend approximately 144 miles between Los Angeles and the Coachella Valley with stops in Los Angeles, Orange, San Bernardino, and Riverside counties, including up to six stations in the Coachella Valley. CV Rail would also comprise a substantial segment of Amtrak's Tucson-Los Angeles corridor. The Tucson-Phoenix-Los Angeles corridor would connect passengers to Amtrak's Coast Starlight, Pacific Surfliner, Southwest Chief, Sunset Limited, and Texas Eagle routes, broadening travel opportunities nationwide.

Following certification of the Final Tier 1/Program-Level EIS/EIR, RCTC and Caltrans initiated the Tier 2/Project-Level environmental analysis, which is currently underway and includes evaluation of specific station locations and detailed engineering for construction of CV Rail.

CVAG Member Agencies

Across CVAG's member agencies, the region has established many of the foundational elements needed to support VMT compliance and future regional coordination, although implementation approaches and levels of program development vary by jurisdiction. Collectively, these differences reflect the evolving nature of SB 743 implementation across California, where agencies have adapted statewide guidance to local conditions and priorities. **Table 5** summarizes the key VMT planning tools currently in place across CVAG member agencies. Full agency profiles, including General Plan summaries, active transportation plan details, and municipal code citations, are provided in Appendix C.

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Table 5 - CVAG Member Agency Planning Tools

Agency	VMT Threshold Approach	Active Transportation Plan	Parking Reductions	TDM Ordinance
Blythe	County of Riverside guidelines (county-average VMT per resident/employee)	None	None	None
Cathedral City	County of Riverside guidelines (county-average VMT per resident/employee)	Yes — Adopted Feb. 2023; phased bike/ped improvements; DAC focus; SunLine + CV Link connections	Yes — Joint use, up to 50% reduction (CUP required)	Yes — 100+ employees; 10% trip reduction; Ch. 9.102
Coachella	County of Riverside guidelines (local CEQA guidelines do not set VMT thresholds)	Yes — Coachella Valley ATP (2020); bike lanes, sidewalks, CV Link integration; DAC focus	Yes — Reduced parking in Sixth Street core; 1 space/unit residential; shared parking with study	Yes — 100+ employees; 10% trip reduction; Ch. 12.4
Desert Hot Springs	County of Riverside guidelines (county-average VMT per resident/employee)	None	Yes — Joint use, up to 50% reduction	Yes — 100+ employees; SCAQMD-consistent; Ch. 10.56
Indian Wells	LCI Technical Advisory (15% below city/regional average); no locally adopted thresholds	None	None	Yes — 100+ employees; SCAQMD-consistent; Ch. 16.50
Indio	County of Riverside guidelines (county-average VMT per resident/employee)	None	Yes — Unbundled parking required; 30% max reduction; reductions for transit	Yes — 100+ employees; SCAQMD-consistent

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Agency	VMT Threshold Approach	Active Transportation Plan	Parking Reductions	TDM Ordinance
			proximity, carpool, car-share, shared parking; bike parking required	
La Quinta	Locally adopted (June 2020); LCI-aligned; 15% below city or regional average, whichever is more stringent	No formal ATP; GHG Reduction Plan targets 15% VMT reduction via walking/biking	Yes — Shared parking per ULI methodology; 5% FAR bonus incentive; §9.150.060	Yes — 100+ employees; AVR 1.3 performance metric (not trip reduction %)
Palm Desert	County of Riverside guidelines (county-average VMT per resident/employee)	No formal ATP; Walk & Roll program (phased bike/ped infra); PD Link (CV Link connections); Haystack traffic calming	Yes — Joint use, up to 50% reduction; bike parking required	Yes — 100+ employees; AVR 1.3 metric; requires bike, rideshare, and golf cart facilities
Palm Springs	Locally adopted (June 2020); LCI-aligned; buildout VMT per service population as threshold; link-level boundary VMT trigger	No formal ATP; Pedestrian Master Plan (sidewalks, crosswalks, Safe Routes to School)	Yes — Joint use parking	Yes — 10% trip reduction; bike and rideshare facilities required
Rancho Mirage	Locally adopted and updated; LCI-aligned; 15% below city or regional average; broadest screening criteria of any member agency	Active Transportation Guidelines and Best Practices; Class I–III bikeway standards; CV Link integration;	Yes — Shared parking per §17.26.050; additional reductions for mixed-use and rideshare; bike parking required	Yes — 50+ employees (stricter than valley norm); TDM coordinator required; baseline + annual reporting; TMA formation option

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Agency	VMT Threshold Approach	Active Transportation Plan	Parking Reductions	TDM Ordinance
		Highway 111 focus		
Riverside County	Locally adopted (Dec. 2020); county-average VMT per resident/employee; GHG screening table (3,000 MTCO ₂ e/yr) for small projects; RIVCOM sketch tool available	None	Yes — Reductions for shared parking, bike parking, ridesharing, and other TDM measures; bike parking minimums	Voluntary — Optional participation; TDM plan required if enrolled; Ch. 10.36
Tribes	Tribal lands under federal jurisdiction; standard CEQA VMT thresholds generally do not apply	None; significant transportation access barriers due to checkerboard land base and infrastructure gaps	N/A	N/A

One of the most significant areas of variation is in VMT threshold methodology. Seven of the member agencies currently rely on the County of Riverside guidelines, which use countywide average VMT per resident and per employee thresholds. Indian Wells and Rancho Mirage use thresholds based on LCI's Technical Advisory, including a residential threshold set at 15 percent below citywide VMT per capita and an employment threshold set at 15 percent below regional VMT per office employee. La Quinta and Palm Springs have locally adopted approaches that differ from both of these methodologies. Because thresholds directly determine when projects require VMT analysis and mitigation, these differing approaches can result in different regulatory outcomes for similar projects across jurisdictional boundaries. Advancing a more consistent regional framework, which this study supports by providing agency-specific General Plan Supplemental EIRs to adopt such thresholds, would improve predictability for project applicants and strengthen the analytical foundation for any future regional mitigation program.

TDM ordinances also demonstrate a broad regional commitment to reducing vehicle travel, with eleven of twelve agencies having adopted some form of TDM requirements. Many of these ordinances are structured around large employers, typically applying to projects with 100 or more employees and targeting a 10 percent trip reduction. While these ordinances establish a common regional baseline,



some jurisdictions have expanded beyond those minimum standards. For example, Rancho Mirage applies a lower applicability threshold, requires a designated TDM coordinator, and includes ongoing monitoring and reporting requirements. However, enforcement of these ordinances is uneven as local agencies often struggle to find staffing capacity. As agencies continue refining their SB 743 implementation approaches, there may be opportunities to further align and strengthen these programs to support broader regional VMT reduction objectives.

Active transportation planning represents another important area for continued regional development. Several agencies have formally adopted active transportation plans, while others have implemented active transportation programs or projects through alternative planning efforts. Because bicycle, pedestrian, and transit improvements form the basis of most VMT mitigation programs reviewed as part of this study, expanding the region's inventory of active transportation projects could support both CEQA compliance efforts and the long-term development of a regional mitigation strategy.

The Coachella Valley is also home to four federally recognized tribal nations — the Agua Caliente Band of Cahuilla Indians, the Cabazon Band of Cahuilla Indians, the Torres Martinez Desert Cahuilla Indians, and the Twenty-nine Palms Band of Mission Indians — whose lands fall outside the standard CEQA VMT framework. Tribal transportation planning operates under federal jurisdiction and presents distinct challenges, including fragmented land bases, limited infrastructure funding, and historical barriers to connectivity that affect the broader regional network. A full discussion of tribal transportation conditions and considerations is provided in Appendix C.



Equity and Community Engagement

The shift to VMT as one of the primary performance measures in transportation planning creates an opportunity to reorient regional transportation planning toward outcomes that are more equitable and sustainable. But that opportunity is not automatic. VMT-based planning can still produce inequitable results if the investments chosen to reduce driving are concentrated in wealthier, more accessible parts of the region or if investments overlook commute sheds and safety.

The Coachella Valley's geography, land use patterns, weather, and demographic composition mean that the communities most reliant on alternatives to driving live in locations that are harder to access such as Thermal, Mecca, and North Shore. For a regional VMT study to be meaningful, it must grapple with these conditions directly rather than treating equity as a supplementary consideration. For this reason, equity was embedded as a core principle of the study from the outset rather than applied as a filter at the end. This took two forms: the development of a locally-tailored methodology for identifying disadvantaged communities to guide investment decisions, and a robust public engagement program designed specifically to reach and reflect the priorities of underserved residents.

Identifying Disadvantaged Communities

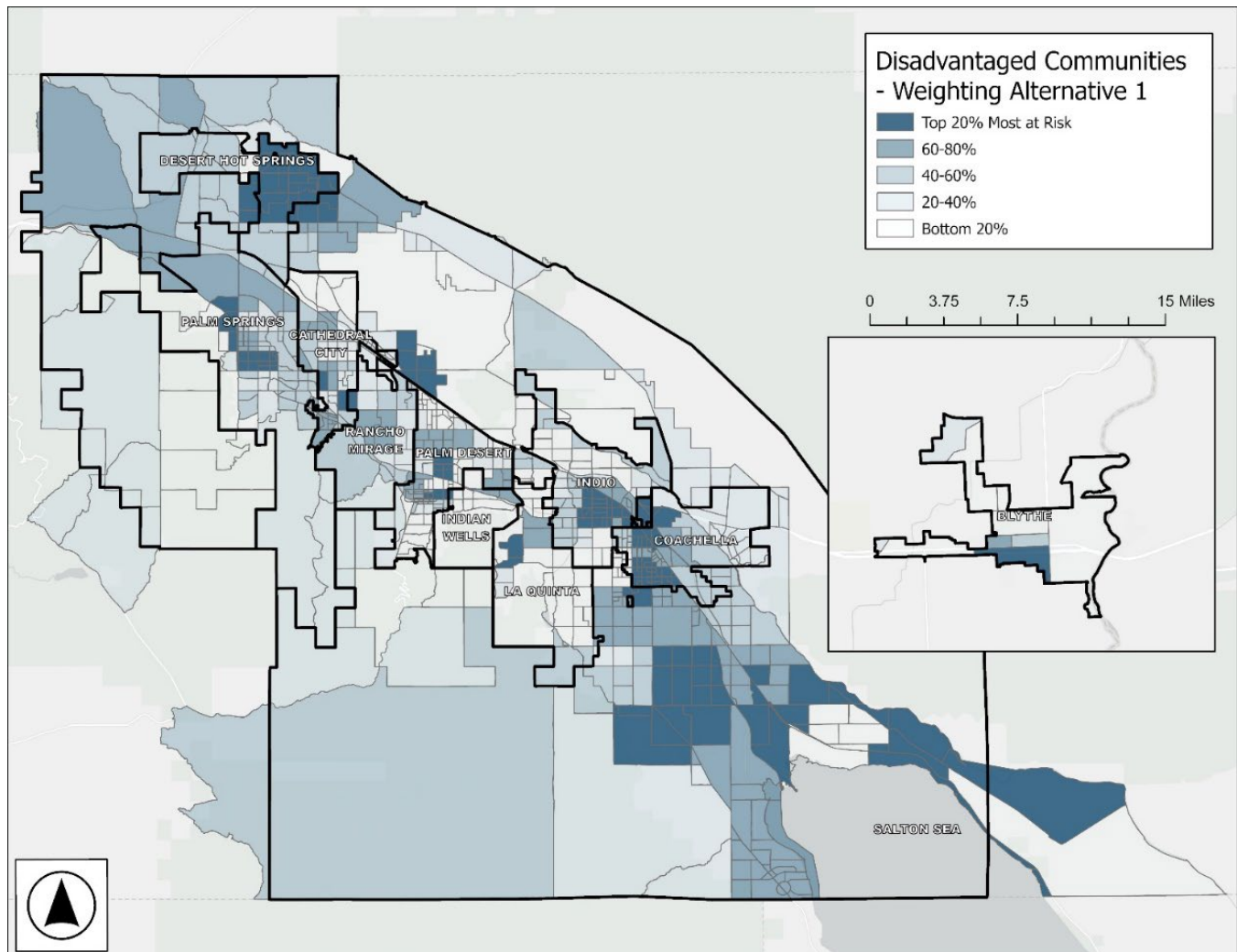
Statewide tools for identifying disadvantaged communities, such as CalEnviroScreen 4.0 and the definitions used by the Regional Early Action Planning Grant program, provide a useful starting point but are not always well-suited to the specific conditions of a given region. A definition developed for statewide application may not fully capture the particular combination of economic hardship, environmental burden, housing instability, and limited mobility access that characterizes disadvantage in the Coachella Valley.

To address this, the study developed a locally-tailored DAC methodology that integrates state and federal guidance with region-specific indicators. Multiple frameworks were considered including the REAP 2.0 program guidelines, the Safe Streets and Roads for All grant program criteria, and CalEnviroScreen 4.0. Indicators were selected across four domains: economic hardship, housing burden, environmental and health conditions, and mobility access. Specific indicators include concentration of poverty, housing cost burden, below-market rate housing availability, SNAP recipient concentration, free and reduced price meal eligibility, pollution burden, prevalence of asthma and cardiovascular disease, zero-car household concentration, and concentration of residents with disabilities.

Four alternative scoring approaches were evaluated, varying whether indicators were scored as simple binary yes or no values or on a scaled basis that assigned partial credit, and whether the three scoring categories were weighted equally or differently. Testing these variants against the full project dataset showed minimal differentiation in project rankings regardless of which approach was used, supporting selection of the simplest option, the binary unweighted model, on the basis of transparency and ease of application by member agencies. Under this approach, communities ranking in the top 40 percent across the combined indicator set are identified as DACs for purposes of project scoring. The full methodology is documented in the Disadvantaged Communities Definition and Methodology memorandum prepared as part of this study and provided as Appendix F. The results of the analysis are shown in **Exhibit 12 - Disadvantaged Communities**.



Exhibit 12 - Disadvantaged Communities



Note: Disadvantaged Communities are considered those in the top two quintiles: top 20 percent and 60-80 percent.

Community Engagement

Understanding how people actually travel in the Coachella Valley and what would need to change for them to drive less required direct engagement with residents, particularly those in communities that are rarely reached through conventional planning processes. The study's outreach program was designed from the start to be genuinely inclusive rather than procedurally compliant, with particular attention to Spanish-speaking residents, farmworker communities, and affordable housing residents.

Engagement was structured across four rounds aligned with key stages of the study, allowing community input to inform the analysis at each phase rather than being collected after decisions had already been made. Activities included virtual workshops, in-person pop-up events at existing community gatherings, an interactive mapping activity, community surveys, a project ranking exercise,



and a statistically valid survey. Alianza and the Coachella Valley Housing Coalition (CVHC) were engaged as community-based organization messengers. Alianza conducted canvassing in Thermal and Mecca, reaching 525 households and businesses in one round. CVHC conducted two rounds of canvassing within its affordable housing communities, reaching over 4,500 residents combined. All materials and events were bilingual in English and Spanish, and virtual workshops were scheduled in evening hours to reduce participation barriers for working residents.

Across 19 events and four rounds of engagement, the program directly engaged over 1,180 community members and collected 1,355 responses through structured engagement tools. The statistically valid surveys conducted in Round 2 generated 757 responses representative of residents across the Coachella Valley and Blythe, providing a quantitative foundation for understanding regional travel behavior and preferences. A Local Advisory Committee comprising representatives from local agencies and community-based organizations met five times throughout the study to review findings, validate technical approaches, and provide guidance on implementation.

Community Responses

Across all four rounds and all engagement formats, several themes emerged consistently: safety concerns, a strong preference for increased transit services, and addressing connectivity gaps.

Safety was the most frequently cited barrier to walking and biking. Residents described the absence of continuous sidewalks, lack of shade and lighting, and dangerous crossing conditions along high-traffic corridors as the primary reasons they do not walk or bike even for short trips. This was particularly pronounced in the eastern valley and in unincorporated communities where pedestrian infrastructure is sparse or entirely absent. The consistency of this finding across different communities and engagement formats underscored that active transportation investments in the region cannot focus solely on facility type or mileage: the quality and safety of the environment matter enormously.

Connectivity gaps were the second major theme. Community members described a fragmented network where jobs, schools, healthcare, grocery stores, and social services are often not accessible without a car, even when transit nominally serves an area. The interactive mapping activity was particularly revealing in this regard, with participants identifying specific gaps, missing sidewalk segments, bus stops without shelters, and routes that require multiple transfers for short trips that are not always visible in aggregate travel data. These gaps were concentrated in lower-income communities and reinforced the importance of geographic equity in project selection.

Transit improvements generated the strongest interest as a strategy for reducing driving. Participants consistently expressed a preference for more frequent service, extended hours, expanded geographic coverage, and fare reductions. Subsidized and flexible transit options, including microtransit and rideshare programs, resonated more strongly than fixed-route expansion alone, reflecting the region's dispersed land use patterns.

The VMT-reducing project ranking activities, conducted at pop-up events and a CBO luncheon, asked participants to prioritize specific transit and bicycle projects based on both personal preference and perceived community benefit. Transit improvements, particularly fare reductions, frequency increases on key routes, and expanded service to underserved communities were ranked highest. Among bicycle improvements, projects providing safe and connected infrastructure in densely populated and lower-



income areas scored highest, consistent with the equity weighting applied in the technical scoring methodology.

Incorporating Equity and Community Input into Project Feasibility

In addition to identifying disadvantaged communities and conducting focused outreach, this study evaluated how future transportation investments could both reduce VMT and respond to community priorities. As part of this study, hundreds of projects were evaluated for their potential to reduce VMT and serve disadvantaged communities. These projects were drawn from adopted local and regional planning documents and include bicycle, pedestrian, transit, and other transportation demand management improvements.

Equity did not just inform which communities were engaged for this project, but was also factored into the project scoring process. The co-benefits scoring framework developed for this study evaluates each project across three dimensions: equity, VMT reduction potential, and mode share. The equity component, which accounts for 60 of the 100 possible points, gives the highest scores to projects located within or adjacent to disadvantaged communities, and within areas that contain existing or planned affordable housing. The VMT component scores projects higher when they are located in zones that currently exceed adopted thresholds. The mode share component prioritizes zones with high drive-alone rates, where the potential for mode shift is greatest. The project evaluation process and highest-scoring projects are discussed further in the “Projects that Reduce VMT in Coachella Valley” section later in this report as well as Appendix G.

The result is a scoring framework that operationalizes the community’s expressed priorities. Projects that serve the communities most in need, in the places where driving is most prevalent, and where affordable housing residents live, score highest. The average score across all 1,172 projects evaluated was 56 out of 100, with 90 projects receiving perfect scores. High-scoring projects are concentrated in Indio, Palm Springs, and Desert Hot Springs, though strong candidates exist throughout the region. While it was not within the scope of this project to identify new projects, the scoring process included projects from adopted plans across the region including active transportation plans, climate action plans, and specific plans. The eastern valley communities of Thermal, Mecca, and Oasis are characterized by lower densities, dispersed services, and a rural land use pattern that has historically supported fewer active transportation facilities. As these communities continue to grow and as local planning efforts advance, there is an opportunity to develop active transportation plans that would expand the pipeline of eligible VMT-reducing projects for future program cycles. However, the transit projects that scored highest -- including fare reductions, increased service on Highway 111 and Route 8, as well as vanpool service -- all provide services to the Thermal, Mecca, and Oasis areas.

As described above, the focused outreach conducted within disadvantaged communities allowed the project team to gather more detailed input on specific project types and generally reinforced the broader themes identified earlier in the engagement process. Safety remained the highest priority, with strong preference given to projects that improve separation between pedestrians or bicyclists and vehicle traffic. Transit-related improvements, including fare subsidies, vanpool programs, and flexible services such as microtransit, were also consistently identified as desirable investments among disadvantaged community members.

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This integrated approach, grounding technical analysis in a locally-tailored equity framework, is what distinguishes this study from a conventional transportation planning exercise. The project list reflects not just what models suggest will reduce VMT, but what the communities of the Coachella Valley have said they need. As CVAG and its member agencies move forward with implementation, the equity framework and community relationships built through this process provide a foundation for continued engagement. Decisions about which projects to fund, sequence, and advance can be evaluated against the same principles that shaped this analysis, ensuring that the communities who participated in this study see their input reflected in outcomes over time.



Programmatic Fee-Based Approaches to VMT Mitigation

Following the overview of the institutional landscape, it is clear that implementing SB 743 and achieving meaningful reductions in VMT and associated GHG emissions requires coordination across a wide range of agencies. While local jurisdictions retain primary responsibility for project-level CEQA compliance, regional entities, state agencies, transit providers, and air quality districts all play complementary roles in shaping transportation outcomes and advancing VMT reduction strategies.

This multi-agency framework creates both opportunities and challenges. On one hand, it enables a broad range of policy tools, funding sources, and implementation mechanisms. On the other hand, it can make it difficult to deliver consistent, scalable mitigation, particularly for projects that are unable to fully reduce VMT through on-site measures alone. As a result, there is a growing need for coordinated, programmatic approaches that can operate across jurisdictional boundaries and align with regional transportation and climate goals.

One approach that has emerged in response to this need is the use of fee-based VMT mitigation programs. These programs provide a mechanism for project applicants to contribute toward larger, regionally beneficial VMT-reducing investments when on-site mitigation is insufficient. Rather than relying solely on project-by-project solutions, fee-based programs allow multiple developments to collectively fund strategies such as active transportation infrastructure, transit improvements, and transportation demand management programs.

This chapter presents a review of fee-based VMT mitigation program approaches that have been developed and implemented across California. It examines key program types including VMT banks, exchanges, and impact fee programs, as well as variations in structure, administration, and application. Together, these examples provide insight into how jurisdictions are translating SB 743 requirements into practical, scalable mitigation frameworks.

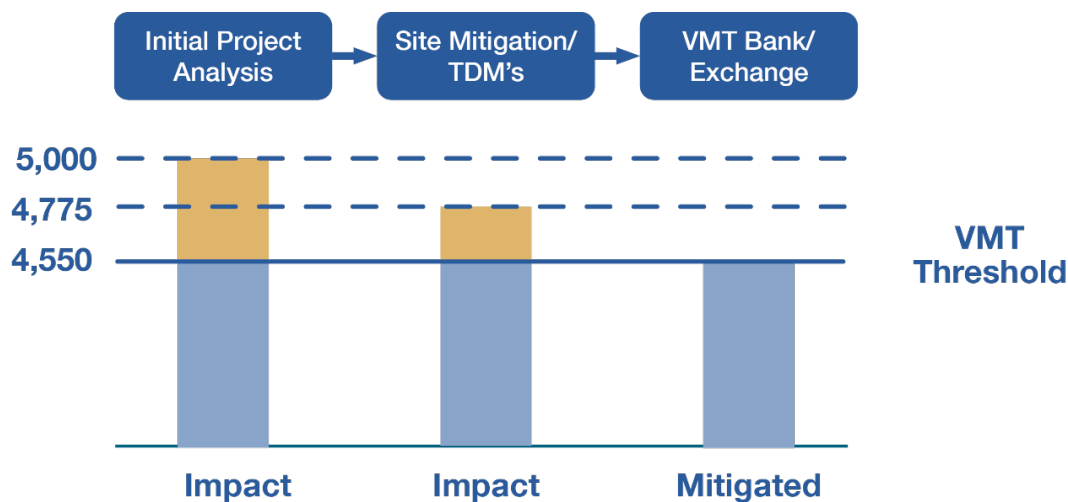


Fee-Based Programs

Exhibit 13 illustrates the general process for mitigating transportation impacts within a fee-based VMT mitigation framework. Even where such programs exist, project applicants are typically required to first implement all feasible on-site mitigation measures to reduce VMT. Regional programmatic options are then used to address any remaining impacts.

As illustrated in the example below, if a project exceeds the applicable threshold by 450 VMT, the applicant would first apply on-site TDM measures to reduce that impact. If those measures reduce the impact by 225 VMT, the remaining 225 VMT would be mitigated through participation in the fee-based program.

Exhibit 13 – Application of a VMT Mitigation Program



Although VMT mitigation programs can take multiple forms, the three most common program types are VMT banks, VMT exchanges, and VMT impact fees.



VMT Bank

As shown in

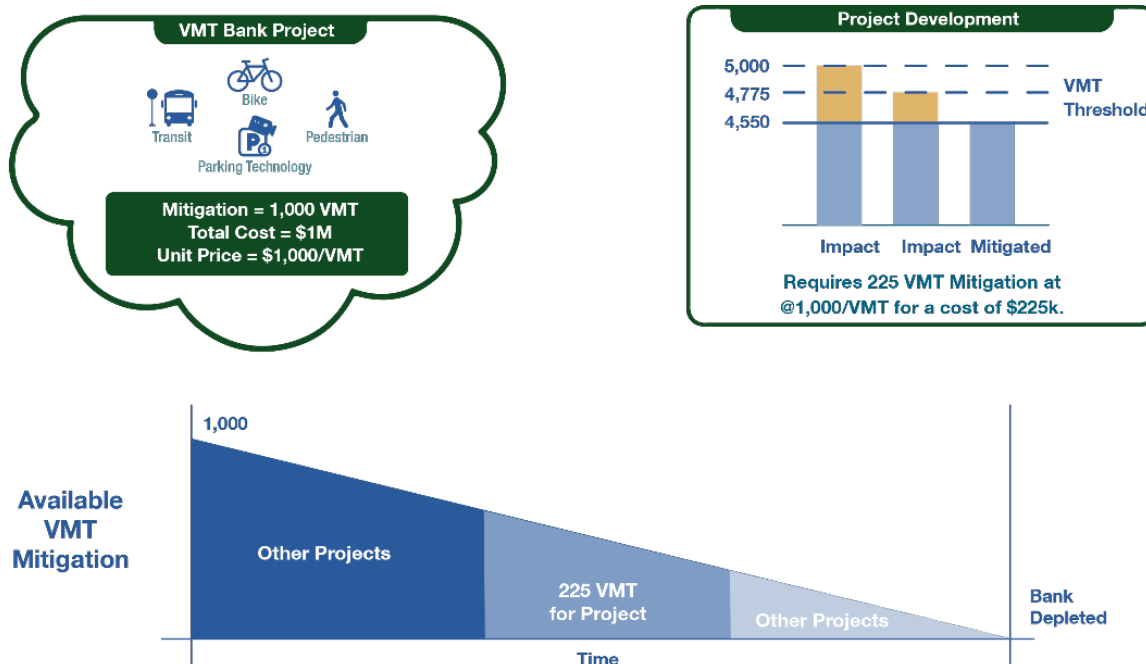
Once established, projects can offset their VMT impacts by purchasing credits from the bank. For example, a project requiring mitigation of 225 VMT would pay \$225,000 based on a cost of \$1,000 per VMT reduced. As credits are used, the bank must be replenished with additional VMT-reducing projects.

Exhibit 14, a VMT mitigation bank is established through the following steps:

1. Identify VMT-reducing mitigation measures (e.g., bicycle facilities, pedestrian infrastructure, transit improvements).
2. Estimate the VMT reduction associated with each measure.
3. Aggregate the total VMT reduction (e.g., 1,000 VMT).
4. Calculate total implementation costs (e.g., \$1 million).
5. Determine a cost per VMT reduced (e.g., \$1,000 per VMT).

Once established, projects can offset their VMT impacts by purchasing credits from the bank. For example, a project requiring mitigation of 225 VMT would pay \$225,000 based on a cost of \$1,000 per VMT reduced. As credits are used, the bank must be replenished with additional VMT-reducing projects.

Exhibit 14 – VMT Bank Example



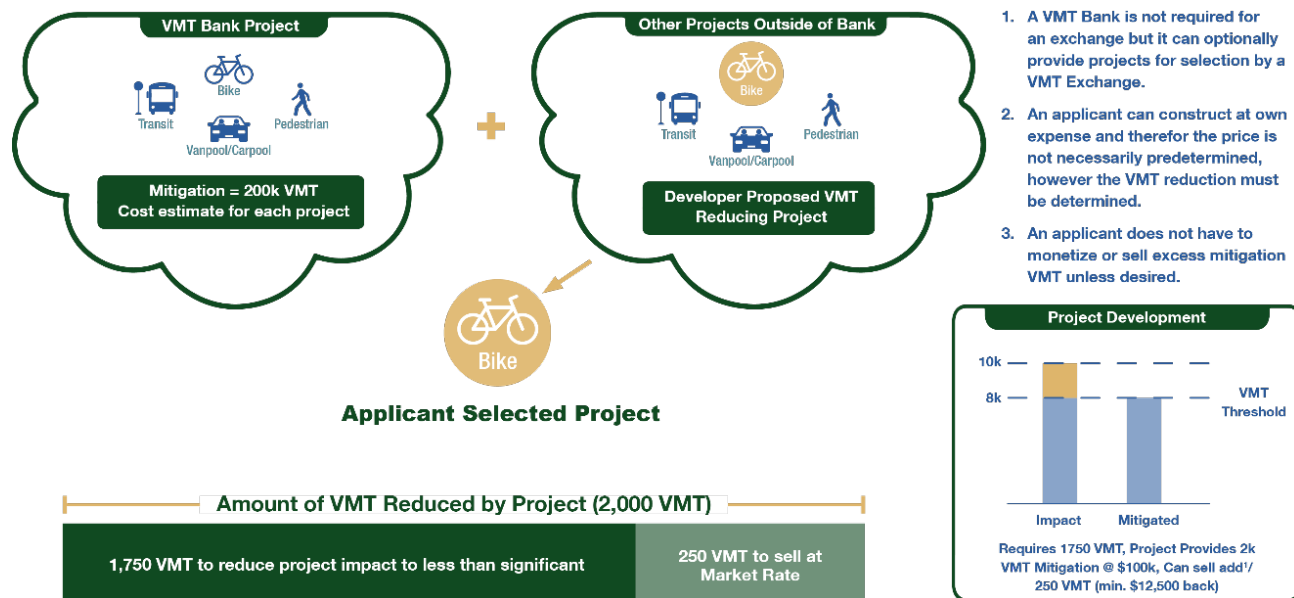


VMT Exchange

VMT exchanges operate similarly to banks but provide greater flexibility. Project applicants may select from a predefined list of mitigation measures or propose new measures for approval.

Unlike a bank, VMT reductions do not necessarily need to be monetized upfront. If a project implements mitigation that exceeds its required reduction, the surplus VMT may be sold as credits to other applicants. As shown in **Exhibit 15** below, a project reducing 2,000 VMT but only requiring 1,750 VMT mitigation would generate 250 VMT in surplus credits.

Exhibit 15 – VMT Exchange Example





VMT Impact Fee

A VMT impact fee program is structured similarly to traditional development impact fees but is focused exclusively on funding VMT-reducing projects.

Under this approach, fees are calculated based on projected VMT generated by different land uses over a defined planning horizon. Total mitigation costs are allocated across land use categories based on their share of VMT generation. Fees are then assessed per dwelling unit or per square foot of development.

For example, as shown in **Exhibit 16**, if residential uses account for 50 percent of future VMT mitigation needs and total mitigation costs are \$1 million, then \$500,000 is allocated to residential development. If 250 units are anticipated, the resulting fee would be \$2,000 per unit.

In some cases, regions may establish multiple benefit areas to reflect geographic differences in VMT. Areas with lower-than-average VMT may be exempt from fees, while higher-VMT areas may be subject to higher fees. As shown in

Exhibit 17, the areas that combine to form Zone 1 all fall below the regional VMT threshold for both residential and non-residential uses, resulting in no fees being administered for projects in that zone. Alternatively, Zone 2 has the worst VMT performance and contains the highest fees charged for the region.

Exhibit 16 – VMT Impact Fee Example

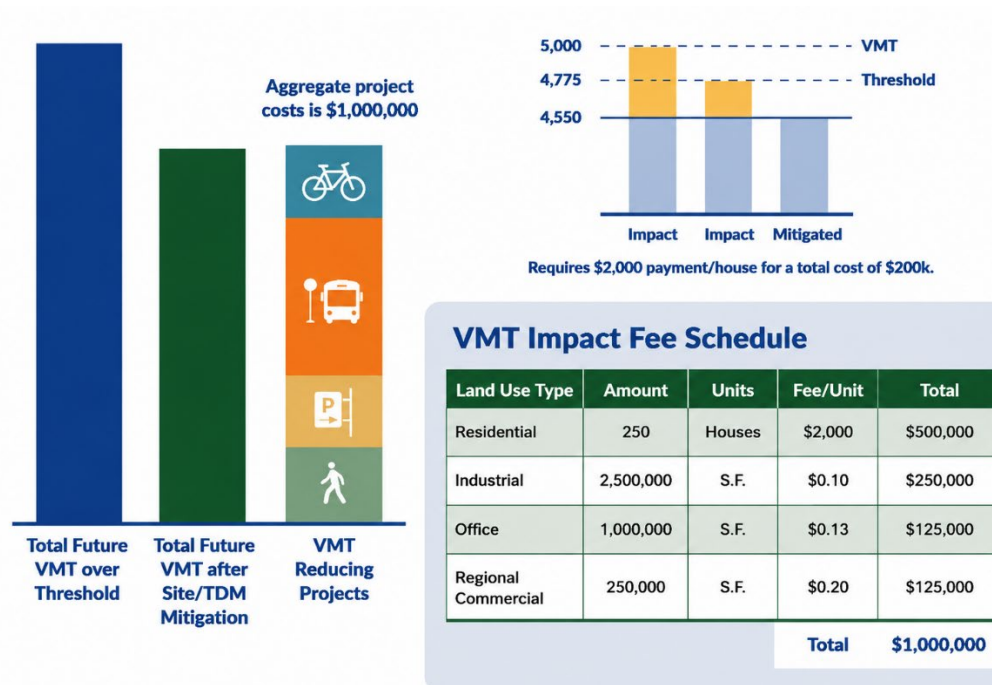




Exhibit 17 – VMT Impact Fee Program with Multiple Benefit Areas



	Zone	Units	Fees/Unit
1	Residential	Houses	0
	Industrial	S.F.	0
	Office	S.F.	0
	Regional Commercial	S.F.	0
2	Residential	Houses	\$2,200
	Industrial	S.F.	\$0.12
	Office	S.F.	\$0.15
	Regional Commercial	S.F.	\$0.22
3	Residential	Houses	\$1,500
	Industrial	S.F.	\$0.08
	Office	S.F.	\$0.11
	Regional Commercial	S.F.	\$0.17

Program Variants

Alongside the three primary fee-based VMT mitigation program frameworks, several alternative models have been explored by agencies in California, including:

Micro (Localized) VMT Banking

This approach considers establishing multiple VMT banking programs instead of a singular regional program. This method allows for funding smaller groups of mitigation measures simultaneously, potentially addressing geographic equity issues, or concerns about benefits of VMT reducing projects being realized by the neighborhoods that are experiencing the negative impacts of increased development. Alternatively, a micro VMT bank could be integrated with a regional VMT bank or VMT exchange. Smaller jurisdictions in less-populated areas may not have as many mitigation measures included in the bank or exchange due to lower efficacy with smaller population densities. In these cases, multiple smaller jurisdictions may join to form a single multi-jurisdictional banking program or participate in the regional-scale program as a backstop while funding smaller groups of mitigation measures through their local bank.

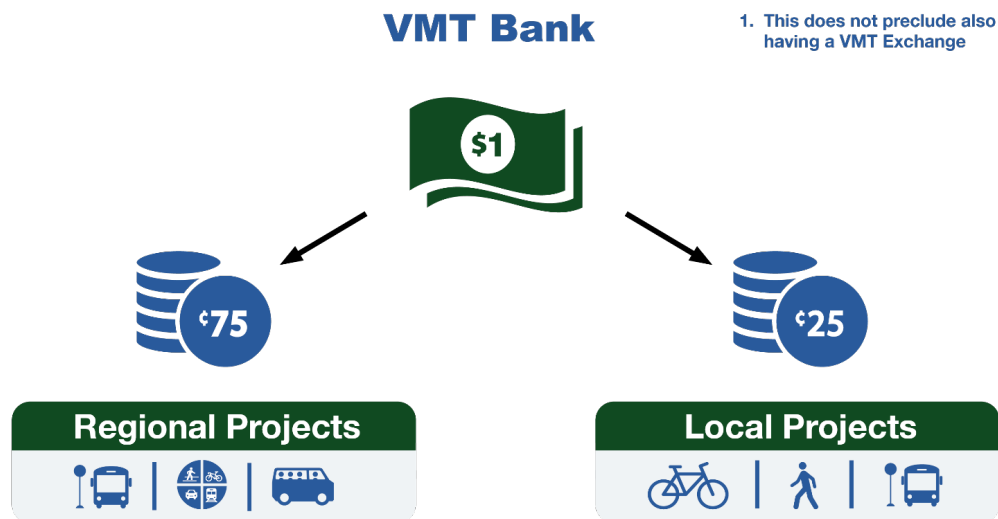
Hybrid VMT Mitigation Programs

This approach involves a combination of different strategies, in particular regional and micro VMT banking. In this case, mitigation funds are distributed both regionally and locally by a predetermined value, utilizing the efficiency of regional mitigation measures while supporting local communities. **Exhibit 18** demonstrates graphically how this might work for each dollar collected by the program. This hybrid model also addresses equity concerns by funding VMT mitigation measures in the communities where the development projects are located. Similarly, a program may wish to form multiple “benefit basins” or



zones within their respective regions to keep a sufficiently local focus under the rubric of a program administered by a single entity.

Exhibit 18 – VMT Bank with Regional and Local Split



Key Considerations for Program Options

Exhibit 19 and **Exhibit 20** provide a framework for comparing variations of fee-based VMT mitigation programs, highlighting the tradeoffs that agencies must weigh when considering implementation. It distills the differences between program types into their practical implications for administration, cost, equity, and alignment with community goals. While all approaches are potentially viable, they vary in complexity, predictability, and scalability. For example, exchanges provide flexibility but raise concerns about proportionality, while impact fees offer more predictability but can add administrative burden and reduce geographic flexibility.

**Exhibit 19 – Fee-Based VMT Mitigation Program Framework Variations**

	VMT Bank	VMT Exchange	VMT Bank with Exchange	VMT Impact Fee
Predefined Projects	YES	NO	YES/NO	YES
Applicant Can Select a Predefined Project	NO	NO	YES	NO
Applicant Can Provide a Project Option	NO	YES	YES	NO
Option to have Regional/Local Distribution	YES	NO	YES	YES
Additionality Options	YES	YES	YES	YES
Non-Fee Funding Excluded	YES	YES	YES	YES
Voluntary Non-Fee Funding	YES	YES	YES	YES
Required Non-Fee Funding	YES	NO	YES/NO	YES/NO
Complexity to Administer	MEDIUM	HIGH	HIGH	LOW
Potential Cost Per Unit of VMT Mitigation	LOW	MEDIUM	MEDIUM	HIGH
Supportive of All SB 743 Goals	YES	YES	YES	YES/NO

Key considerations for evaluating program suitability include:

Legal: Does the fee-based VMT mitigation program meet CEQA and statutory requirements, including additionality?

Effective: Does the fee-based VMT mitigation program result in a long-term, financially feasible mitigation program?

Geography: Can the fee-based VMT mitigation program scale to meet the region's needs?

Administration: Does the fee-based VMT mitigation program fund oversight and management of the program and maintain analysis and technical requirements for administering the program?

Equitable: Does the fee-based VMT mitigation program avoid disproportionate impacts to disadvantaged and/or low-income communities? Does the program encourage an equitable benefit distribution throughout the region?

Alignment: Does the fee-based VMT mitigation program support good design of projects and align with community values and existing plans?

Exhibit 20 below provides a qualitative summary of how each type of VMT mitigation program performs against the above considerations. Yellow dots indicate a “concern” that the complexity of a specific program element or the lack of practical experience with it may represent a challenge to its implementation. As it is believed that all the program types are ultimately implementable, these designations should simply be thought of as areas of consideration that will require additional evaluation prior to their respective programs being considered for implementation.



Exhibit 20 – Regional VMT Mitigation Program Evaluation

		VMT Bank	VMT Exchange	VMT Bank with Exchange	VMT Impact Fee
					
	Legal	●	●	●	●
	Effective	●	●	●	●
	Geography	●	●	●	●
	Administration	●	●	●	●
	Equitable	●	●	●	●
	Alignment	●	●	●	●

● Feasible ● Concern

A VMT exchange raises concerns about nexus and proportionality if an applicant or a city were to request improvements that were disproportionate in consideration of the impact and/or not closely tied to the VMT threshold of the region. Additionally, administering a program where unknown mitigation measures are proposed raises questions about the predictability of VMT reductions available to the region. Since a VMT exchange allows for mitigation measures that may not be on the radar or in the plans of the jurisdiction, there are also questions as to whether proposed mitigation measures would align with jurisdictional goals as established in community plans. Lastly, such mitigation measures could be implemented indiscriminately around the region and/or with a bias towards certain areas, therefore raising concerns about equitable distribution of mitigation.

While a VMT impact fee addresses many of the concerns raised by the VMT Exchange model, it is fixed regarding geographic implementation and does not allow for as much flexibility to respond to development mitigation needs. The way impact fees are calculated adds more complexity to the program's administration and more staff time on both the part of the jurisdiction and the bank organization.

While the preceding discussion outlines the primary structures and design considerations for fee-based VMT mitigation programs, the practical application of these frameworks varies significantly across jurisdictions. Differences in local context, including development patterns, institutional capacity, funding availability, and policy priorities, have led agencies throughout California to implement a wide range of program types and adaptations.

To better understand how these approaches function in practice, the following section highlights illustrative examples of VMT mitigation programs currently being implemented or actively developed across the state. These case studies demonstrate how jurisdictions have translated programmatic concepts into operational frameworks, including how mitigation measures are selected, how costs are



determined, and how programs are administered. Collectively, these examples provide insight into the opportunities and challenges associated with different approaches and help inform potential pathways for application within the Coachella Valley.

Illustrative Programs

Several local and regional agencies in California have developed or are actively developing VMT mitigation programs in response to SB 743. These programs vary in structure, scale, pricing methodology, eligible mitigation measures, and administrative approach. Across these efforts, agencies are increasingly looking beyond traditional transportation improvements and considering a broader range of VMT-reducing strategies, including affordable housing, transit-oriented development, transportation demand management, mobility hubs, micromobility, transit improvements, and active transportation projects.

Many agencies are also taking an iterative approach to program development. Rather than beginning with a fully defined bank, exchange, or fee program, agencies often first evaluate whether there is a sufficient inventory of feasible, cost-effective, and monitorable mitigation projects. This reflects a practical challenge common to VMT mitigation programs: strategies such as transit and active transportation can produce meaningful VMT reductions, but may have high implementation costs, uncertain timing, or complex monitoring requirements. As a result, several programs prioritize projects that are already planned, partially funded, or have seed funding and are capable of being accelerated through mitigation funding.

Table 6 summarizes VMT mitigation programs and related initiatives identified during preparation of this study. More detailed profiles of selected programs are provided in Appendix A: Illustrative Program Profiles. While each program reflects its local planning context, three examples are especially relevant to CVAG: WRCOG's VMT Exchange Program, the City of Riverside's VMT Bank Pilot Program, and VTA's emerging regional VMT mitigation framework and are described further below.

Table 6 – Summary of VMT Mitigation Programs in California

Agency	VMT Mitigation Program Type	Current Status	Proposed Pricing
<i>Local Agencies</i>			
City of Escondido	VMT Exchange	Implemented in 2023, with a cost basis varying for each mitigation measure	--
City of Fresno	Hybrid Urban Design Calculator and VMT Bank	Under development	--
City of Hollister	VMT Bank	Under development	--

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Agency	VMT Mitigation Program Type	Current Status	Proposed Pricing
City of Lancaster	VMT Mitigation Impact Fee Optional Program	Implemented in 2023	\$150/VMT
City of Palmdale	VMT Bank	Implemented in 2024	\$261/VMT
City of Riverside	VMT Bank Pilot	Implemented in 2025	\$94/VMT
City of Salinas	VMT Bank	Under Development	--
City of San Diego	Active Transportation In-Lieu Impact Fee	Implemented in 2020	\$1,400/VMT
City of San Jose	Transportation Analysis Policy	Implemented in 2018	\$2,300 / VMT for Residential and \$3,200 for Commercial
City of Tracy	VMT Bank	Under Development	--
City of Watsonville	VMT Bank	Implemented March 2023	\$1,524/VMT
City of West Sacramento	TBD	Being evaluated as part of an upcoming study	--
County of Santa Cruz	VMT Bank Pilot	Under Development	\$500-\$1,000/VMT
Town of Los Gatos	Not Determined	Study completed in 2024.	--
<i>Regional Agencies</i>			
Contra Costa Transportation Authority (CCTA)	Hybrid VMT Exchange / In-Lieu Fee Pilot	Study completed in 2023. Pilot program under development.	--
Fresno COG	VMT Bank	Study completed in 2023. An additional study is underway to define remaining program elements required for implementation.	--
Los Angeles County Metropolitan	VMT Bank for Metro Projects on State Highway System	Program adopted by Metro Board in 2024.	Varies

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Agency	VMT Mitigation Program Type	Current Status	Proposed Pricing
Transportation Authority (Metro)			
Sacramento Transit Authority (STA)	TBD	Being evaluated as part of an upcoming study	--
San Bernardino County Transportation Authority (SBCTA)	VMT Bank	\$2,000,000 in grant funds awarded in 2024 to seed identified mitigation measures.	--
San Luis Obispo Council of Governments (SLOCOG)	VMT Bank Pilot	Study completed in 2023. An additional study is being considered to define remaining program elements required for implementation.	--
Santa Clara Valley Transportation Authority (VTA)	TBD	Adopted 2025 as an exchange with the option to switch to a bank	--
Stanislaus Council of Governments (StanCOG)	TBD	Being evaluated as part of an upcoming study	--
Tahoe Regional Planning Agency	Mobility Mitigation Fee Program	Implemented April 2021	Up to \$218/VMT based on Development Category
Western Riverside Council of Governments (WRCOG)	VMT Exchange	Adopted 2025	--

Western Riverside Council of Governments VMT Exchange Program

WRCOG's VMT Exchange Program is the most directly relevant regional example for CVAG because it was developed by a neighboring subregional agency within Riverside County. The program is structured as a voluntary exchange, with WRCOG serving as the program administrator. Member agencies may



opt into the program, submit eligible VMT-reducing projects, and make those projects available for purchase by public or private entities seeking VMT mitigation credits.

For CVAG, WRCOG's approach demonstrates the potential value of a regional administrative structure that allows for active local agency participation and project identification. This may be useful in the Coachella Valley, where jurisdictions vary in their adopted VMT thresholds, planning documents, and readiness to participate in a regional program. However, this approach does require local agencies to participate on an ongoing basis and actively propose projects. The WRCOG model also illustrates the importance of having a clear project intake process, participation agreement, administrative fee, and project list refresh process.

City of Riverside VMT Bank Pilot Program

The City of Riverside's VMT Bank Pilot Program is relevant to CVAG because it shows how a jurisdiction can begin with a smaller, lower-cost pilot program rather than launching a full-scale bank at the outset. Riverside evaluated multiple project portfolios and found that costs varied substantially depending on the type of mitigation measures included. Bicycle projects produced the lowest cost per VMT reduced, while transit and pedestrian measures increased the available mitigation supply but also significantly increased program costs.

For CVAG, the key lesson is that early implementation should focus on projects that are easy to quantify, relatively low cost, and feasible to deliver. A pilot approach could allow CVAG and its member agencies to test administrative procedures, pricing, monitoring, and applicant demand before committing to a larger regional program. Riverside's experience also highlights the importance of coordinating with the development community so that the program is both technically defensible and financially usable.

Santa Clara Valley Transportation Authority Regional Framework

VTa's program is relevant because it presents a phased regional model that begins as a VMT exchange and may later transition into a VMT bank. The framework allows participating jurisdictions to opt into a coordinated regional program while maintaining local control over participation. Initial mitigation strategies focus on scalable and relatively cost-effective measures, including bus speed and reliability improvements, e-bike incentives, and vanpool or shared mobility programs.

For CVAG, the VTA framework is useful because it demonstrates how a regional program can begin with projects that are relatively easy to administer, quantify, and monitor before expanding into more complex mitigation strategies. A focus on scalable projects is particularly applicable in the Coachella Valley, where the need for mitigation is currently low, but will grow over time as specific plans are built out. The opt-in structure may also be relevant given the variation in local VMT policies, planning priorities, and implementation readiness among CVAG member agencies.

Legal Considerations

The development of a regional VMT mitigation program must be consistent with CEQA requirements governing feasible mitigation, proportionality, enforceability, and implementation timing. While fee-based VMT mitigation programs are increasingly being explored across California, most programs remain relatively new and continue to evolve alongside emerging legislation, guidance, and case law. A more



detailed discussion of the legal framework applicable to regional VMT mitigation programs is provided in Appendix B: Legal Framework for Regional VMT Mitigation Programs.

One of the most important considerations is additionality. Under CEQA, mitigation measures funded through a VMT mitigation program must provide reductions that would not otherwise occur through existing funding commitments or already programmed projects. In practice, this means that projects included in a VMT bank or exchange generally must either represent unfunded improvements, accelerated implementation of planned projects, or provide gap funding that makes the project possible. Closely related to additionality is verification, which refers to the ability to quantify, monitor, and document that the anticipated VMT reductions are actually achieved over time.

Regional Transportation Plans (RTPs) and Sustainable Communities Strategies (SCSs) influence how VMT mitigation programs are structured with regard to additionality. Because RTPs already identify many planned transportation investments, regional mitigation programs must carefully evaluate whether projects included in a bank or exchange satisfy additionality requirements and provide meaningful incremental VMT reductions beyond already funded improvements.

Another key consideration is the concept of feasible mitigation under CEQA. Courts have generally held that mitigation measures must be enforceable, reasonably proportional to the impact being addressed, and capable of being implemented within a reasonable timeframe. For regional VMT mitigation programs, this reinforces the importance of establishing clear administrative structures, transparent methodologies for calculating VMT reductions, and identified implementation pathways for funded projects. Appendix D: Economic Feasibility in CEQA Mitigation contains a detailed discussion of feasibility with a focus on financial feasibility.

Regional VMT mitigation programs must also address concerns related to deferred mitigation. CEQA generally discourages mitigation measures that are undefined or speculative at the time of project approval. However, courts have recognized that mitigation may be implemented over time where the lead agency commits to specific performance standards, identifies the types of projects capable of achieving those reductions, and establishes a clear mechanism for implementation and monitoring. This is one reason many regional programs begin with a defined set of identified projects and quantifiable VMT reduction methodologies.

Recent legislation has also accelerated the evolution of VMT mitigation practice in California. AB 1244 established a statewide Transit-Oriented Development Implementation Program that allows project applicants to satisfy transportation mitigation requirements through contributions to a state-administered fund supporting affordable transit-oriented housing and related infrastructure. AB 130 and SB 131 further expanded CEQA streamlining and introduced additional exemptions and implementation tools including a statewide VMT mitigation bank. Collectively, these laws reinforce the state's broader policy direction toward integrating transportation, land use, housing, and climate objectives.

Key Takeaways for CVAG

The programs reviewed in this chapter demonstrate that there is no single standard model for implementing fee-based VMT mitigation under SB 743. Agencies across California are testing a range of approaches, including banks, exchanges, impact fees, and hybrid models. Each approach reflects different legal, financial, geographic, and administrative considerations, and each requires a clear



relationship between the VMT impact being mitigated, the projects or programs being funded, and the expected VMT reduction.

Several themes are particularly relevant to the Coachella Valley. First, regional coordination is important because many VMT-reducing strategies, including transit improvements, active transportation investments, and transportation demand management programs, do not stop at jurisdictional boundaries. A regional framework can help provide more consistent mitigation options while still allowing local agencies to retain authority over CEQA determinations and local project priorities.

Second, the reviewed programs show the importance of identifying feasible, cost-effective, and monitorable mitigation projects before selecting a final program structure. Many agencies are beginning with projects that are already reflected in adopted plans, have partial or seed funding, can be implemented relatively quickly, or can be monitored using straightforward methodologies. This is especially relevant for CVAG because mitigation demand may vary by jurisdiction and may increase over time as larger specific plan areas and regional transportation projects advance.

Third, the comparison of banks, exchanges, and impact fees highlights the tradeoffs CVAG would need to consider in any future program. Exchanges provide flexibility and local agency participation, but may require more case-by-case review to ensure nexus, proportionality, and equitable distribution of benefits. Impact fee programs provide more predictability, but can be less flexible and may require more extensive nexus documentation and administration. Banks can provide a clearer inventory of pre-quantified mitigation opportunities, but depend on having a sufficient pipeline of eligible projects and a process for replenishing credits over time.

These takeaways provide the basis for the next chapter, which applies these concepts to the Coachella Valley. That chapter evaluates the updated regional travel demand model, threshold consistency, the inventory of VMT-reducing projects, the potential role of a regional mitigation program, and opportunities to integrate VMT into CVAG's existing TUMF and TPPS frameworks.



VMT Mitigation Strategies and Regional Program Integration

The preceding chapters of this report outline the broader policy context, institutional framework, and range of programmatic approaches available for addressing VMT impacts under SB 743. While these statewide practices provide a foundation for understanding how VMT mitigation programs are structured and implemented, their applicability ultimately depends on local conditions, including development patterns, local lead agency thresholds, and regional travel behavior.

This chapter focuses on how these concepts apply within CVAG's regional planning context. It evaluates the region's existing and projected VMT conditions, identifies opportunities to reduce VMT through planned and potential projects, and assesses the extent to which currently identified strategies can address the region's overall mitigation need. This includes consideration of the need for mitigation to address both land use-generated VMT and transportation project-generated VMT, including the role of induced demand.

Regional VMT mitigation programs can help regions grapple with the mitigation deficits that occur when a land use project cannot fully mitigate impacts on site or when a transportation project cannot mitigate within its corridor. However, in order to develop a useful programmatic solution each region must consider the actual potential need based on current growth trends, planned development and infrastructure, as well as their VMT thresholds. This chapter provides a clearer understanding of the scale of the VMT challenge and the potential role of a coordinated regional mitigation framework for the Coachella Valley. It also considers incorporation of VMT into the TUMF in order to align the region with a broader movement towards VMT as one of the primary performance measures used in transportation planning. Underpinning all of the analysis presented in this chapter is an update to the regional travel demand model, which was necessary to ensure that VMT thresholds and projections reflect current conditions rather than the pre-pandemic baseline carried in the prior model version.

Regional Travel Demand Model Update

A critical foundation for the analytical work completed as part of this study was an update to the RIVCOM travel demand model, the countywide forecasting tool maintained by the Western Riverside Council of Governments and used by local agencies throughout Riverside County to inform transportation planning, environmental review, and impact fee programs including the TUMF. Prior to this study, the model had a base year of 2018, meaning that VMT thresholds derived from it reflected pre-pandemic travel conditions and land use patterns that had shifted in the intervening years. Updating the model to a more recent base year was necessary to ensure that the thresholds and analyses produced by this study reflect current conditions and remain defensible for use in CEQA documentation and regional planning.

The update focused on land use inputs and zonal structure across all of Riverside County, recognizing that many member agencies use a countywide threshold rather than a jurisdiction-specific one. Household data was updated using 2023 American Community Survey estimates, disaggregated to the traffic analysis zone level using assessor parcel data to distinguish between single-family and multifamily units. Employment data was updated using permit records from the CVAG and WRCOG



TUMF programs, converted to employee counts using ITE trip generation rates and validated against aerial imagery and SCAQMD employment records. School enrollment was updated using California Department of Education and National Center for Educational Statistics data for the 2022-2023 school year.

In addition to updating socioeconomic data, the zonal structure of the model was refined to better reflect conditions in the Coachella Valley. A number of traffic analysis zones covering large, unincorporated areas were split to separate developed land from areas designated as conservation areas under the Coachella Valley Multiple Species Habitat Conservation Plan, which restricts the amount of development that can take place within them. This correction addressed a longstanding issue in which population and employment growth was being assigned to conservation areas, producing inaccurate VMT estimates for affected zones.

The horizon year land use assumptions were also updated to reflect current planning conditions, incorporating input gathered directly from each CVAG member agency as well as housing element opportunity sites and specific plan data. Several major specific plan areas in the northern and eastern portions of the Coachella Valley were examined individually given their potential to significantly influence future growth patterns in the region. Total growth was constrained to the 2024 Connect SoCal demographic forecasts for the 2050 horizon year.

Following the updates, the model underwent static validation comparing modeled roadway volumes to observed counts from Caltrans PeMS and Streetlight data at the same locations used in the original 2018 validation. The updated model performs consistently with the validated 2018 model, meeting industry-accepted thresholds for percent root mean square error and correlation coefficient. The updated model provides CVAG and its member agencies with a current and technically robust analytical platform that supports VMT threshold screening, the TUMF recalculation, project prioritization, and future planning efforts. Full documentation of the methodology is provided in Appendix E, Travel Demand Model Technical Documentation, prepared as part of this study. Beyond improving the accuracy of regional travel forecasts, the updated model also provides a stronger technical foundation for how VMT impacts are evaluated and mitigated across CVAG member agencies.

Threshold Adoption and Regional Consistency

A foundational step for many agencies is establishing their own VMT thresholds of significance, which provides predictability for project applicants and a consistent basis for impact assessment. While agencies may rely on another jurisdiction's adopted thresholds with appropriate justification, having locally adopted thresholds streamlines the review process and reduces uncertainty. Additional considerations include determining the most appropriate type of CEQA documentation, clarifying whether the program itself requires environmental clearance, and defining the level of CEQA evaluation needed for individual mitigation projects.

As shown in **Table 7**, VMT thresholds currently vary across CVAG member agencies. Most agencies follow the County of Riverside Transportation Analysis for Level of Service and Vehicle Miles Traveled



guidance⁵, which uses the county average VMT per resident and per employee as the threshold of significance. A smaller number of agencies, including Indian Wells and Rancho Mirage, apply thresholds derived from LCI's Technical Advisory on Evaluating Transportation Impacts in CEQA, setting the threshold at 15 percent below the city or regional average. La Quinta and Palm Springs have locally adopted policies that reflect variations on these approaches. This variation creates inconsistency in how VMT impacts are evaluated across the region, and can produce meaningfully different outcomes for similar projects depending solely on which jurisdiction they are located in.

Table 7 – Current Threshold Methodologies

Agency	Thresholds in Use	Residential	Employment
County of Riverside	County of Riverside Transportation Analysis for Level of Service and Vehicle Miles Traveled	County Average per Resident	County Average per Employee
Blythe			
Cathedral City			
Coachella			
Desert Hot Springs			
Indio			
Palm Desert			
Indian Wells	Technical Advisory on Evaluating Transportation Impacts in CEQA	15% Below City per Capita	15% Below Regional per Office Employee
Rancho Mirage			
La Quinta	Locally Adopted Policy/Threshold	15% below City per Capita OR 15% below regional per capita whichever is more stringent	15% below Regional VMT per Employee
Palm Springs		Baseline VMT per Service Population Exceeds Buildout VMT OR Baseline link-level Boundary VMT per Service Population increases	

As shown in **Exhibit 21** through **Exhibit 24**, the choice of threshold methodology has a meaningful effect on how development projects are evaluated across the region. The local threshold map reflects

⁵ Riverside County Transportation Department. (2020). *Transportation analysis guidelines for level of service and vehicle miles traveled*. County of Riverside. <https://trans.rctlma.org/sites/g/files/aldnop401/files/migrated/Portals-7-2020-12-15-20--20Transportation-20Analysis-20Guidelines.pdf>



the variation in approaches currently used by member agencies, resulting in a patchwork of screening outcomes that can differ significantly depending on jurisdiction. The county method map, which applies the county average threshold consistently across all agencies, shows a broader distribution of TAZs screening below threshold, particularly in the more urbanized core of the valley. For project applicants, the threshold methodology in effect directly determines whether a project screens out of detailed VMT analysis or requires full assessment and potentially mitigation. Advancing a consistent regional approach reduces the variation in outcomes that currently exists across jurisdictional boundaries and creates a more predictable regulatory environment for development throughout the valley.

To support member agencies in implementing the study's findings, agency-specific model Supplemental Environmental Impact Reports were prepared for each CVAG jurisdiction as part of this study. These documents are designed to serve two related purposes. First, they provide a pathway for each agency to amend its General Plan to formally adopt VMT thresholds consistent with SB 743, establishing a defensible CEQA baseline for future transportation impact analysis. Second, once a General Plan amendment is adopted using the model SEIR, subsequent development projects can tier off that documentation rather than preparing independent VMT analyses from scratch, substantially streamlining the project-level environmental review process.

A secondary but important motivation for developing these documents was to advance consistency in how VMT thresholds are applied across the region. While both the county methodology and the OPR-aligned approach are legally defensible, the variation creates unpredictability for developers working across multiple jurisdictions in the valley. By providing agency-specific model SEIRs that reflect a consistent methodological approach, the study creates a more uniform regulatory environment that reduces uncertainty for project applicants while maintaining each agency's ability to make independent CEQA determinations.

While threshold consistency affects how projects are evaluated under CEQA, a regional mitigation program also depends on having a clear inventory of projects that can deliver measurable VMT reductions. For this reason, the next step in the study was to identify potential VMT-reducing projects from existing local and regional plans, as well as transit project concepts provided directly by SunLine. The study also developed off-model tools that allow CVAG to estimate VMT reductions from projects that are not captured in the regional travel demand model. These tools are important not only for evaluating potential mitigation projects, but also for helping CVAG measure the VMT effects of bicycle and pedestrian projects that may be proposed for the concurrent TPPS update. Existing plans were prioritized because the projects they contain have already been reviewed by local agencies, informed by prior community engagement, and incorporated into broader planning or funding priorities. The transit concepts provided by SunLine also reflect several community priorities identified through this study's outreach, including fare affordability, increased service, vanpool options, and flexible transit service.



Exhibit 21 – Residential Threshold Screening Map Using Current Methodologies

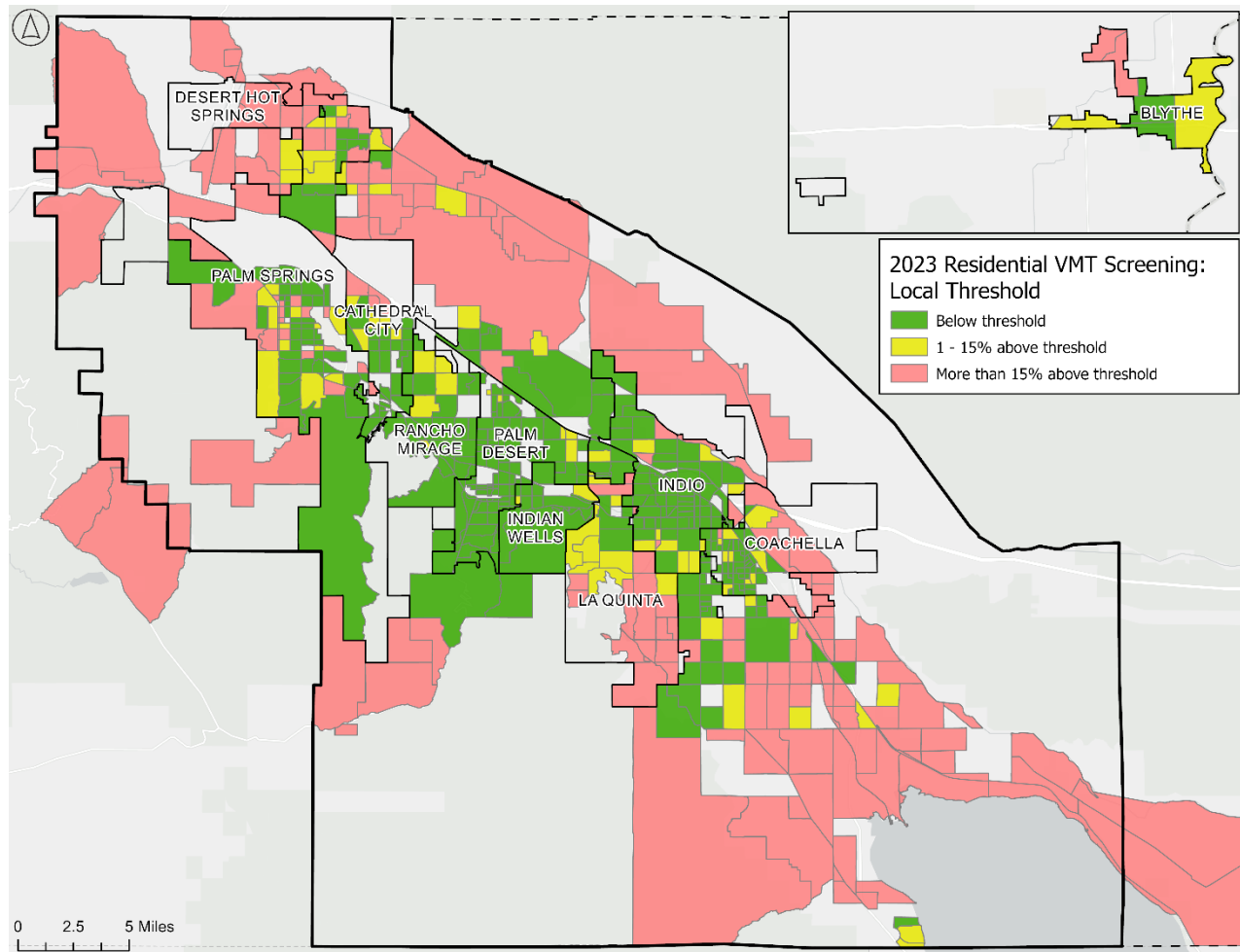




Exhibit 22 – Residential Threshold Screening Map Using County Methodology

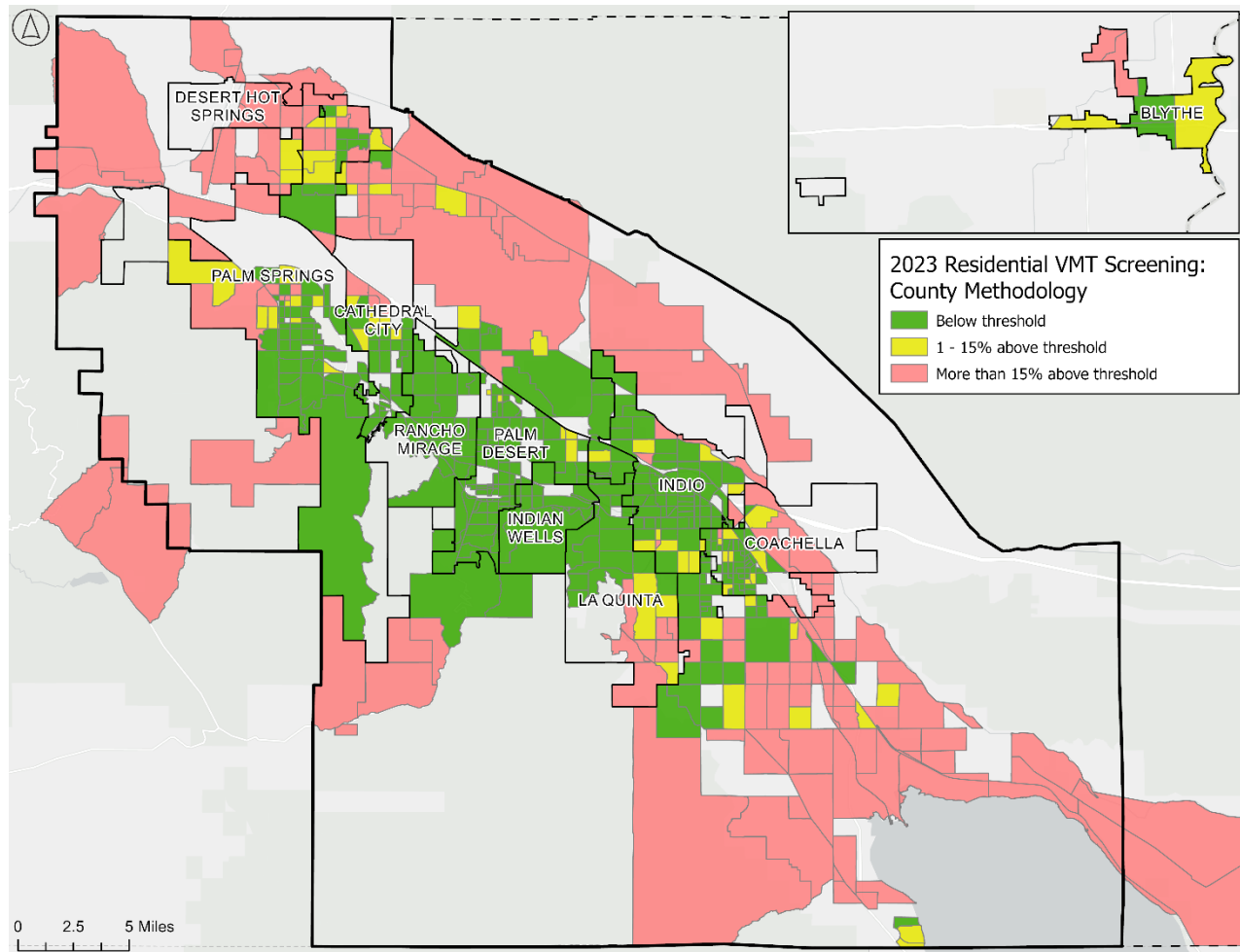




Exhibit 23 – Employment Threshold Screening Map Using Current Methodologies

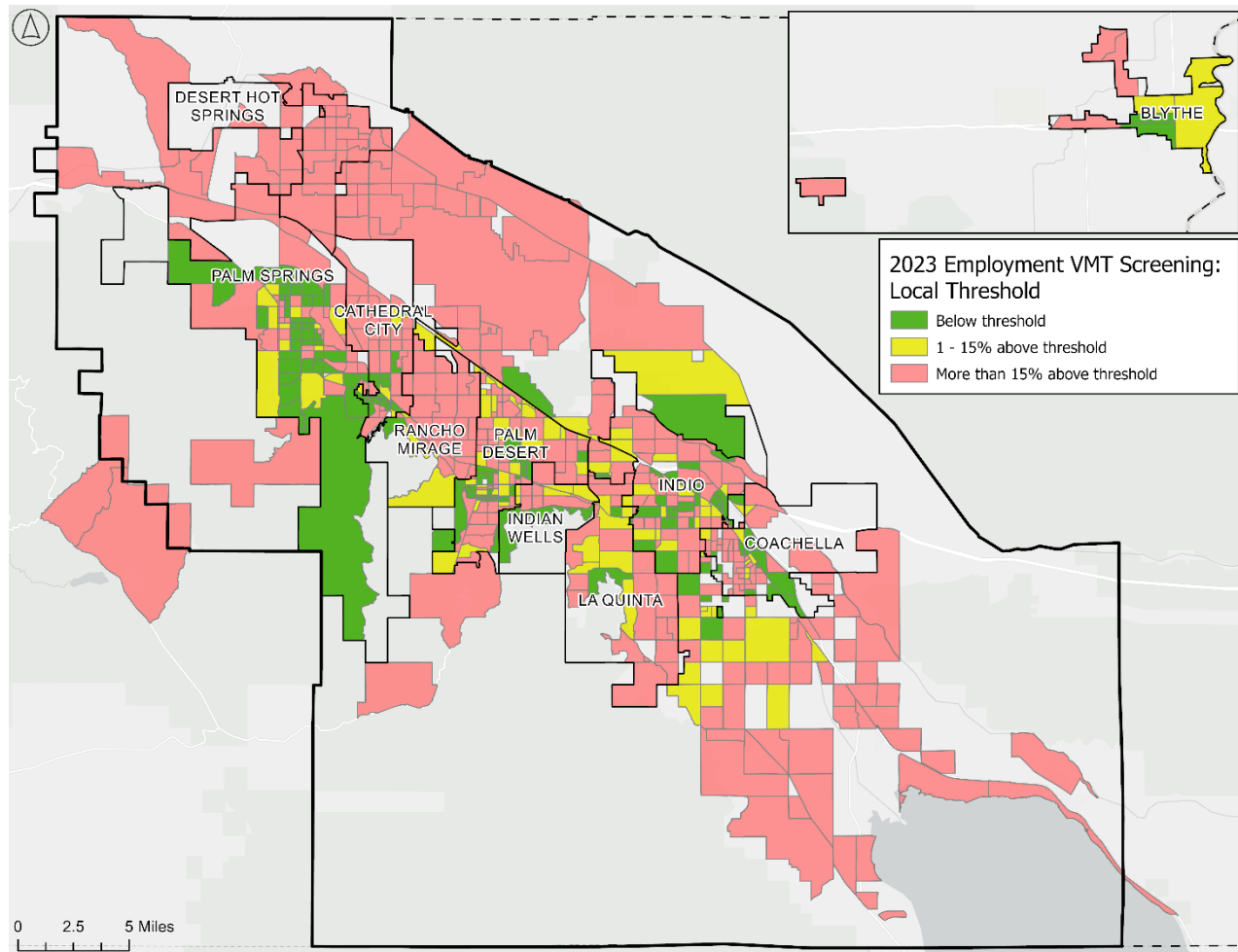
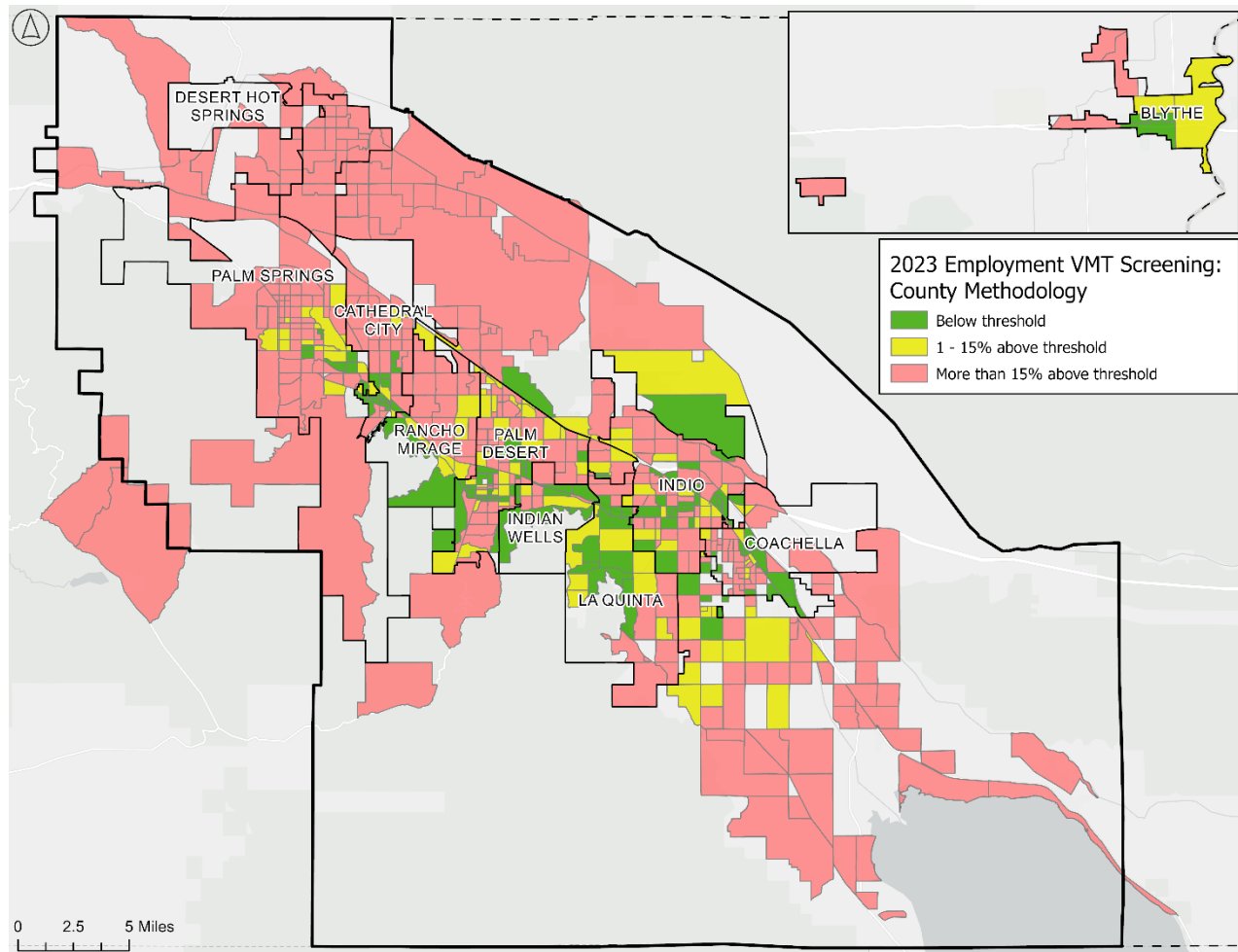




Exhibit 24 – Employment Threshold Screening Map Using County Methodology





Projects that Reduce VMT in Coachella Valley

To understand the region's potential mitigation capacity, this study evaluated planned and potential VMT-reducing projects within the Coachella Valley, including bicycle, pedestrian, and transit investments. This analysis helps identify which investments offer the greatest potential to reduce travel demand, support SB 743 objectives, and contribute to closing the region's VMT gap. It also supports the development of a coordinated regional mitigation strategy by identifying projects that could be considered for future funding or mitigation programs. As described in the Equity and Community Engagement chapter, community input gathered through the study's outreach program directly informed both the identification of projects and the prioritization framework applied here. The methodologies used to estimate VMT reductions from these projects are documented in Appendix H: Methodologies for Off Model Estimation of VMT Reducing Projects.

Transportation Demand Management Strategies

Transportation Demand Management, or TDM, refers to a broad set of strategies designed to reduce the number and length of vehicle trips by influencing how, when, and whether people travel by car. TDM approaches travel behavior through a combination of incentives, disincentives, land use design, and service improvements. Strategies range from transit fare reductions and vanpool programs to parking management, and active transportation infrastructure. In the context of SB 743, TDM strategies are among the most commonly used tools for mitigating project-level VMT impacts, and their effectiveness depends heavily on local conditions including land use patterns, transit access, employment density, and community demographics.

For the Coachella Valley, where dispersed development, extreme heat, and high drive-alone rates create a challenging environment for VMT reduction, having a clear and locally calibrated understanding of which TDM strategies are most likely to be effective is particularly important. General plans, climate action plans, specific plans, and CEQA documents across the region increasingly reference TDM as a mitigation strategy, but local agencies and applicants have historically had limited guidance on which strategies are appropriate for local conditions, what VMT reductions they can be expected to achieve, and what they are likely to cost.

To address this gap, the study developed the CVAG TDM Toolbox⁶, an online interactive resource available at cvagtdmtoolbox.com and as a standalone document. The Toolbox catalogs over 75 TDM strategies organized across six categories: land use, neighborhood design, parking and road pricing and management, school programs, transit, and trip reduction programs. Each strategy includes a description, real-world application examples, and information on VMT reduction potential, cost, return on investment, equity considerations, and relevant funding sources. Strategies can be filtered by land use context, including urban, suburban, and rural settings, as well as by trip type, scale of implementation, and implementation timeline, making it straightforward for agencies to identify strategies that are relevant to a specific project or planning context.

Paired with the Toolbox is a TDM Calculator, which allows users to estimate the VMT reductions associated with specific strategies or combinations of strategies for a given project or plan. The

⁶ CVAG TDM Toolbox Mitigation Calculator. (2026). *CVAG TDM Toolbox Mitigation Calculator*. Retrieved May 2026, from <https://cvagtdmtoolbox.com/>



Calculator is intended to support grant applications and planning processes by providing a methodology-based quantification tool that agencies and applicants can use to demonstrate the effectiveness of proposed TDM measures. Together, the Toolbox and Calculator give CVAG member agencies and project applicants a practical, locally calibrated resource for identifying, evaluating, and documenting TDM strategies across a wide range of planning and regulatory contexts.

While the TDM Toolbox supports planning and policy decisions at the program level, the following section turns to a specific inventory of projects evaluated for their ability to reduce VMT in the context of CEQA impact analysis and the development of a regional VMT mitigation program.

VMT Mitigation Project Pipeline

Bicycle, pedestrian, and transit projects were evaluated and scored using VMT reduction potential, co-benefits scoring, and return on investment. Co-benefits scoring assessed each project's impact on Disadvantage Communities, while return on investment compared estimated VMT reductions against project costs to help prioritize investments that deliver the greatest impact per dollar. Off-model VMT reduction quantification methodologies were used because RIVCOM does not have the capability to model VMT or vehicle trip reductions from bicycle, pedestrian, or transit improvements. To fill this gap, the study developed a suite of spreadsheet-based tools calibrated to local conditions using data from Replica, SunLine, and the National Transit Database. Bicycle projects were evaluated using the NCHRP 552 methodology, which estimates ridership uptake and VMT reduction based on population and employment proximity to new facilities. Pedestrian projects were evaluated using the California Climate Investments Board methodology. Transit projects were evaluated using a range of CAPCOA measures depending on the type of improvement, covering service frequency and coverage expansion, fare reductions, BRT, vanpool, and microtransit. These tools are documented in Appendix G, Co-benefits Methodology, and Appendix H, Methodologies for Off Model Estimation of VMT Reducing Projects, and remain available to CVAG to evaluate future projects as the program develops.

As part of the Study, a total of 841 VMT reducing projects were identified. A project short list was created by filtering for the projects with the highest VMT reduction potential. A co-benefits and return on investment criteria were then sorted to determine the top 20 VMT reducing projects, as shown in **Table 8 – Top 20 VMT Reducing Projects**. Bicycle projects were limited to all projects that are not currently under construction and not already fully funded to meet additional requirements. These were sourced from local agencies' planning documents, including specific plans, climate action plans, active transportation plans, general plans, and safe routes to school plans. Transit projects were sourced from Sunline Transit agency's short range transportation plan and conversations with staff.

Table 8 – Top 20 VMT Reducing Projects

Project Type	Agency	Project Description
Transit	Sunline	50% Fare Reduction for general users
Transit	Sunline	Sunline Transit Agency Rideshare Program
Transit	Sunline	Express route/BRT conversion for Route 1
Transit	Sunline	Fare subsidies – low income
Transit	Sunline	Fare subsidies – elementary students

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Project Type	Agency	Project Description
Transit	Sunline	Sunline Transit Vanpool Pilot Program - Eastern CV
Transit	Sunline	Route 3: Increase weekday frequency
Transit	Sunline	Increased service coverage in DAC
Transit	Sunline	Route 5: Increase weekday frequency
Transit	Sunline	Route 6: Increase weekday frequency
Transit	Sunline	Route 8: Increase weekday frequency
Transit	Sunline	Route 2: Increase service frequency
Bike	Indio	Oasis St: Class II (bike lane)
Bike	Indio	Miles Ave: Class III (bike route)
Bike	Indio	Requa Ave: Class III (bike route)
Bike	Indio	Arabia St: Class III (bike route)
Bike	Desert Hot Springs	Ocotillo Rd: Class III (bike route)
Bike	Coachella	Tyler St: Class II (bike path)
Bike	Indio	Civic Center Dr: Class III (bike route)
Bike	Indio	Monroe St: Class II (bike lane)

Through the application of VMT reducing projects, the excess VMT above each agency's thresholds is anticipated to decrease, narrowing the gap between forecasted conditions and a VMT-neutral outcome.⁷ Following the VMT project quantification methodologies, **Table 9** provides the magnitude of VMT decreased by the VMT reducing projects in the existing and horizon year scenarios. As shown in **Table 9** below, the identified 841 projects are estimated to reduce 178,131 residential-based VMT and 52,618 employment-based VMT (total of 230,749 VMT). However, these estimated reductions are likely not sufficient to neutralize the VMT mitigation need to below currently adopted thresholds. Additionally, since **Table 9** represents VMT from land use and does not account for induced demand from transportation projects, the need could be greater than what is shown.⁸ Together, these findings support the case for a comprehensive regional VMT mitigation program that extends beyond currently planned projects, enabling CVAG to more effectively address remaining VMT gaps at a systemwide level.

⁷ See **Table 7** – Current Threshold Methodologies.

⁸ See **Table 4** – Potential Induced Demand Causing Projects from TPPS.



Table 9 – Daily VMT Mitigation Need

Category	Daily VMT Over Threshold ¹	Daily VMT Reduction from Top 20 Projects ²	Remaining Daily VMT to Mitigate	Daily VMT Reduction from All Projects ¹	Remaining Daily VMT to Mitigate
Base Year					
Residential (VMT per Capita)	803,247	-86,239	717,009	-178,131	625,116
Employment (VMT per Capita)	1,035,164	-52,618	982,546	-52,618	982,546
Horizon Year					
Residential (VMT per Capita)	891,911	-86,239	805,672	-178,131	713,780
Employment (VMT per Capita)	865,707	-52,618	813,088	-52,618	813,089

¹ Daily VMT uses thresholds currently in place at each local agency rather than assuming regional consistency.

² VMT reduction quantifications based on existing data.

The scale of the remaining VMT gap, combined with the limits of currently identified projects, points to the need for a coordinated programmatic approach that can be activated as mitigation demand emerges. The next section evaluates the need and recommendations for a regional VMT mitigation program.

Regional VMT Mitigation Program Approach for CVAG

The project team conducted multiple one-on-one interviews with each of the Coachella Valley member agencies to better understand land use trends and transportation infrastructure needs across the region. Several jurisdictions described relatively slow near-term growth and indicated that little additional large-scale development subject to CEQA is anticipated. Other cities, particularly those along the I-10 corridor, continue to grow and, in some cases, are annexing land that could accommodate future development. In theory, these areas could generate sufficient development activity to support a regional VMT mitigation framework. In practice, however, much of this growth is expected to occur over a longer time horizon, and recent development trends suggest a near term slowdown in projects that would trigger project-level VMT mitigation requirements. The larger projects that have advanced in recent years have tended to be logistics-focused and have frequently screened out of VMT impacts due to either lower passenger vehicle travel and fewer employees or, in the case of housing projects, have been determined to have a less-than-significant impact using small project thresholds or location efficiency screening mechanism.

These findings demonstrate that despite travel demand model results showing overall VMT that exceeds current thresholds, the practical experience of local agencies is that many projects are screening out. In other words, the structure of the threshold methodology currently in use across most CVAG jurisdictions



has reduced the volume of projects requiring full VMT assessment. Most member agencies rely on the County of Riverside methodology, which includes a small projects screening threshold based on greenhouse gas emissions expressed in metric tons of CO₂. Projects falling below that threshold are presumed to have a less-than-significant transportation impact without requiring a detailed VMT analysis. Combined with the fact that much of the recent growth in the Coachella Valley has occurred in locations and land use categories that perform relatively well against the county average threshold, this has meant that relatively few projects have triggered the kind of project-level mitigation requirement that would drive demand for a regional VMT mitigation program in the near term.

While current market conditions may not yet support the immediate implementation of a regionwide, development-driven VMT mitigation program, trends across the Coachella Valley indicate that such a program will become increasingly valuable in the future. As larger specific plan areas begin to build out, particularly those east of I-10 and in northern portions of the Valley, development activity is expected to generate a more consistent and scalable need for VMT mitigation solutions. At the same time, the region's continued investment in major roadway and corridor improvements will require thoughtful strategies to address induced demand and ensure alignment with SB 743 and long-term climate goals. In particular, the updated TPPS will play an important role in determining where this need may emerge. Depending on the mix, scale, and geographic distribution of projects identified through the TPPS, especially capacity-enhancing projects, there may be a clearer case for establishing a regional VMT mitigation program, even in the absence of a robust near-term development-driven mitigation market. Establishing the framework for a regional VMT mitigation program now helps to position CVAG to proactively manage growth, provide certainty to the development community, and create a reliable, coordinated mechanism for addressing future transportation impacts as market activity accelerates.

In the meantime, a statewide VMT Mitigation Program, currently under development through HCD, offers one potential compliance pathway that could be used in lieu of a regional program. While this option provides a streamlined and consistent compliance mechanism, it does not guarantee that funds contributed by a project will be reinvested within the same community or subregion in which they are collected. This raises practical and political concerns that are likely to shape how the program is received across the Coachella Valley. Regional agencies and member jurisdictions operate under return-to-source principles, expecting that fees and contributions generated by local development will fund improvements that benefit the communities where that growth occurs. A statewide program that pools mitigation funds and directs them based on statewide housing priorities may not align with those expectations despite attempts to structure funding priorities within the region where funds are collected. These concerns do not diminish the value of the statewide program as a compliance tool, but they do reinforce the case for maintaining a parallel regional framework that gives CVAG and its member agencies greater control over how mitigation revenues are directed.

In this context, a statewide program could serve as a valuable complement to a regional VMT mitigation program, rather than a replacement. It's recommended that, as a long-term strategy CVAG pursue a regional approach with low administrative burdens that can be phased into operation as demand for VMT mitigation increases, such as a pilot banking program focused on easily monitored projects. In the near-term it's recommended that CVAG continue discussions with local agencies about such an approach and maintain resources that allow agencies to pursue project-by-project mitigation strategies. In the long term a regional approach would allow CVAG and its member agencies to retain greater



control over how mitigation funds are invested, ensuring that revenues are directed toward locally relevant transportation improvements, such as multimodal infrastructure, demand management strategies, or corridor-specific solutions. This strategy also allows CVAG to right size project mitigation and address equity concerns by intentionally allocating mitigation funding to projects that directly serve disadvantaged communities.

Transportation Uniform Mitigation Fee Program and VMT

Assembly Bill 1600, the Mitigation Fee Act, established the legal framework for local agencies to charge development impact fees to fund public facilities needed to serve new growth. Within the Coachella Valley, this authority led to the creation of the Transportation Uniform Mitigation Fee (TUMF) in 1989 as a one-time fee applied to new development. The TUMF program is designed to fund transportation capital infrastructure needed to accommodate population and employment growth. TUMF revenues are used alongside other regional funding sources, including Riverside County's Measure A sales tax, to implement Regional Arterial System projects and related transportation investments, such as interchanges, identified through the Transportation Project Prioritization Study (TPPS). The current TUMF fee structure was adopted in 2018 following updated nexus and prioritization analyses, which established revised project cost assumptions and trip-based fee calculations derived from Institute of Transportation Engineers (ITE) trip generation rates. The program remains a foundational growth-management tool for funding infrastructure needed to serve new development and is currently undergoing an update.

The VMT Study evaluates how the TUMF could evolve to better align with the statewide shift towards VMT as a performance metric and regional mobility goals. One focus is whether incorporating a VMT-based fee structure into the TUMF would strengthen the nexus between development impacts and transportation system performance by tying fees more directly to how much and how far people drive. This approach would shift the emphasis from trip generation alone to overall travel behavior, while creating incentives for location-efficient development patterns and land uses that reduce VMT.

The study also considers how introducing VMT as a project prioritization metric within the TUMF program could influence regional investment decisions. Applying a VMT lens to project selection redirects emphasis away from roadway capacity projects and toward multimodal investments that reduce driving and expand travel options. This would serve a similar purpose to the TUMF's core objective of maintaining an operationally acceptable transportation system, but through a broader set of strategies that address travel demand rather than capacity alone. Under this framing, investments that reduce vehicle trips contribute to system performance just as roadway improvements do, and the project portfolio can be evaluated accordingly. This approach also creates an opportunity to reduce the overall infrastructure investment needed to accommodate growth: projects and programs that eliminate or shorten trips reduce the demand that would otherwise require new or expanded facilities, potentially allowing the region to achieve acceptable system performance with a smaller and less costly capital program.

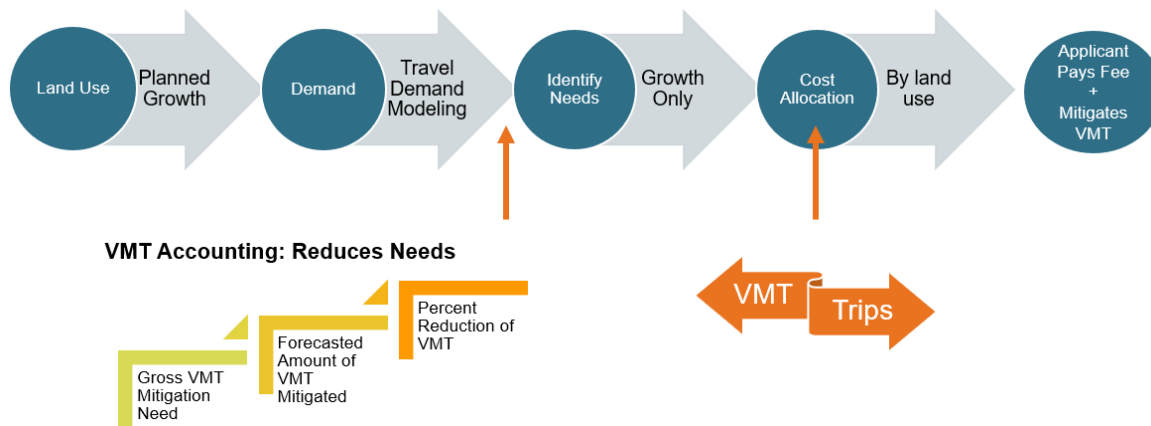
**Exhibit 25 – Potential Roles of VMT Within the TUMF Framework**

Exhibit 25 illustrates two potential ways VMT could be incorporated into the TUMF framework. First, VMT-reducing projects and programs can reduce overall travel demand, which in turn reduces the amount of future transportation infrastructure needed to accommodate growth. Under this approach, multimodal investments and transportation demand management strategies effectively lower the region's long-term infrastructure need by reducing vehicle travel before roadway capacity expansions become necessary. Second, the exhibit illustrates how the TUMF fee structure itself could shift from a traditional trip-based methodology toward a VMT-based methodology. Rather than allocating costs based primarily on the number of vehicle trips generated, a VMT-based approach allocates costs based on both the number and length of trips, more directly linking fees to overall travel behavior and system impacts.

In practice, this frames a coordinated but distinct regional approach. Both the TUMF and a potential regional VMT mitigation program share the same underlying goal of maintaining a transportation system that can accommodate growth, but they serve different functions. The TUMF is a long-range regional infrastructure funding program that collects fees from new development to help construct planned transportation improvements identified through the TPPS and related regional planning efforts. A regional VMT mitigation program, by contrast, would function as a CEQA mitigation tool, allowing project applicants to fund or implement VMT-reducing strategies to offset project-specific transportation impacts. Used together, these tools provide a more complete framework for managing the transportation impacts of growth than either program could achieve alone.

Calculating the TUMF Using VMT

VMT is increasingly recognized not only as a CEQA compliance metric but as a more accurate measure of how development affects the transportation system. A project's impact on roadway demand is a function of both how many trips it generates and how far those trips travel. A trip-based fee treats a short local errand the same as a long regional commute, while a VMT-based fee reflects the actual distance traveled and therefore the actual burden placed on the regional network. This approach has been explored and adopted by other California jurisdictions as a more defensible basis for nexus fee programs, precisely because it directly connects the fee charged to the impact created. This distinction has meaningful policy implications: retail uses, which generate high trip volumes but short average trip



lengths, would see lower fees under a VMT-based approach, while office and industrial uses, which generate longer average trips, would see higher fees. This recalibration more fairly distributes the cost of regional infrastructure among land uses based on their actual contribution to system-wide travel demand.

To explore this evolution, the project team recalculated the TUMF fees using a VMT-informed framework alongside the traditional trip-based methodology. The recalculation maintained the core nexus principles required under the Mitigation Fee Act, relating fee revenue to the cost of transportation facilities needed to serve growth, while testing how VMT could be substituted for a trip-based metric to allocate costs. This included using the updated travel demand model completed for this project, which included updated land use assumptions and a new base year of 2023. While the TUMF and TPPS project list is currently under revision, this analysis provides a foundation for comparing the implications of a trip-based fee versus a VMT-adjusted fee, and for identifying how future updates to the TUMF could support both infrastructure delivery and long-term VMT reduction objectives.

Methodology

The methodology used in recalculating the TUMF is consistent with the methodology outlined in the *Transportation Uniform Mitigation Fee Nexus Report* (2018).⁹ The 2018 TUMF relied on the Riverside County Traffic Analysis Model (RIVTAM) with a 2018 base year. To allow for a direct comparison of trip-based and VMT-based fee structures using an apples-to-apples comparison, the previous TUMF fees were recalculated using the updated RIVCOM 4.0.1 model with a 2023 base year and a 2045 horizon year.

To determine the travel metric used for fee setting, the study focuses on trip ends in the CVAG TUMF boundary (trips that either start or end within CVAG), rather than counting all traffic that may use the network. Internal-internal trips (trips starting and ending in CVAG) account for two trip ends. Internal-external (trips starting in CVAG and ending outside CVAG) and external-internal trips (trips starting outside of CVAG and ending inside CVAG) account for one trip end. This distinction is important because only trips generated by growth within the CVAG region can be used to determine the fees charged. Using the updated RIVCOM travel demand model, the analysis estimates existing and forecasted average daily trip ends and defines the growth in trip ends over the planning horizon as the development-driven increment used for cost allocation and fee calculation.

The TUMF per growth total was calculated two ways, a per-trip TUMF rate and a per-VMT TUMF rate. The per-trip, or trip-based, TUMF rate is calculated by pairing (1) the net cost of the TUMF program attributable to new development with (2) the projected growth in average daily trips (ADT) from 2023 to 2045. Similarly, the per-VMT, or VMT-based, TUMF rate is calculated by pairing (1) the net cost of the TUMF program attributable to new development with (2) the projected growth in VMT from 2023 to 2045. VMT growth was determined by summing all VMT generated by vehicle trips¹⁰ for the following trip purposes: residential home-based productions, home-based work attractions, and home-based other attractions.

⁹ Economic & Planning Systems, Inc. (2018, March). *Transportation Uniform Mitigation Fee (TUMF) 2018 fee schedule update*.

¹⁰ Vehicle trip classifications are derived from RIVCOM and include drive alone, shared ride 2, shared ride 3+, and ride hail.



Net TUMF cost is derived after accounting for other funding sources and offsets (e.g., obligated funds, external funding, policy-based local match assumptions, Measure A contribution, and other adjustments summarized in the net cost table). The resulting “Net TUMF Costs” value is divided by the modeled growth in ADT and VMT to yield an average cost per new daily trip or vehicle mile traveled. As shown in **Table 10** below, the resulting calculations are \$232 per ADT and \$34 per VMT.

Table 10 – TUMF cost per ADT and VMT

	Trip-Based [ADT]	VMT-Based [Miles]
Net TUMF Cost	\$263,335,000	\$263,335,000
2023- 2045 Growth	1,134,766	7,711,959
TUMF Rate	\$232	\$34

The TUMF rates are translated into land use specific fees using the ITE 10th Edition trip generation rates for representative residential and non-residential categories, consistent with the methodology used in the 2018 update. For the trip-based approach, each land use’s fees are calculated as:

$$(\text{ITE daily trips per unit}) \times (\text{average TUMF cost per ADT})$$

For the VMT-based approach, each land use category is assigned a representative trip purpose from the RIVCOM model¹¹. Then, a weighted average trip distance from the model was calculated for each of the representative trip purposes. Each land use’s fees are calculated as:

$$(\text{ITE daily trips per unit}) \times (\text{average weighted trip distance}) \times (\text{average TUMF cost per VMT})$$

For retail land uses, the 2018 Nexus study applies a 35% reduction to the per-trip rate to account for pass-by trips typical of shopping trips before calculating the final retail fee. This reduction was maintained for this analysis to ensure consistency. Results for both methods are shown in **Table 11** below. All other supporting steps and assumptions not called out above are described in the report as being consistent with the prior nexus approach and are carried forward in the same manner for this update.

As shown in **Table 11**, using VMT to determine fees results in an increase in fees for all land use categories except for retail, which would have a reduction in fees charged. The change in fees using VMT reflect trip distance and travel behavior: retail uses experience the shortest trip distance while industrial and office uses experience the longest trip distances and therefore have the largest increase in fees charged using VMT. Fees charged using a VMT metric may better reflect usage of the roadway network and therefore more fairly distribute the cost of improvements necessitated by the growth over the horizon, but could also result in economic impacts by making certain developments more costly.

¹¹ Residential land uses assigned Home-Based productions; industrial and office assigned Home-Based Work attractions; retail assigned Home-Based Other attractions.



Table 11 – TUMF by Land use Category

Land Use Category	Daily Trip Rate	ITE Trip Unit	Trip Distance [mi] ¹²	Trip Based Fee ¹³	VMT Based Fee	Fee Difference
Single-Family	9.44	Dwelling unit	7.72	\$2,190	\$2,490	+\$300
Multi-Family	7.32	Dwelling unit	7.72	\$1,700	\$1,930	+\$230
Industrial	4.96	1 KSF	16.61	\$1,150	\$2,810	+\$1,660
Office	9.74	1 KSF	16.61	\$2,260	\$5,520	+\$3,260
Retail¹	37.75	1 KSF	5.54	\$5,690	\$4,640	-\$1,050

¹Includes a 35% reduction for pass-by trips

Incorporating VMT Considerations into the TPPS

As the region updates the TPPS, there is an opportunity to integrate VMT into how projects are evaluated and advanced. Historically, TPPS project identification and ranking have focused on delay, roadway surface conditions, continuity, and safety. Incorporating VMT introduces a complementary lens that considers how transportation investments influence travel behavior, land use patterns, and long-term regional emissions outcomes.

One approach is to include VMT as a scoring metric within the existing TPPS ranking framework. Under this option, projects would continue to be evaluated using traditional performance measures, with VMT added as an additional criterion. Projects that demonstrably reduce driving, such as active transportation infrastructure and infill supportive roadway enhancements, would receive additional consideration during prioritization. This approach maintains the current structure of the TPPS while incrementally introducing multimodal and demand-focused considerations into project selection. It allows the region to better align investment decisions with SB 743 and climate objectives without fundamentally restructuring the project list or financing strategy.

While this approach has been considered in previous TPPS iterations, it was not advanced due to limitations in the regional travel demand model's ability to reliably capture project-level VMT effects. Since that time, the CVAG portion of the model has been updated to reflect a 2023 base year and more current local land use and socioeconomic data. These updates improve the accuracy of model outputs and forecasts. WRCOG is also initiating a broader model update, which is expected to further improve overall accuracy for the same reason. In addition, the CVAG VMT Study project has developed and provided supplemental off-model tools to estimate VMT reductions due to bicycle and pedestrian projects, transit investments, and transportation demand management strategies, including plan-level

¹² The model does not provide distinct trip lengths for single versus multi family.

¹³ Note that the trip-based fees differ from those in the 2018 update to the TUMF due to the change in model used to evaluate the trips (RIVCOM vs RIVTAM) and the change in analysis years, both base and horizon.



calculators and project-specific spreadsheet methodologies. Together, these resources establish a more reliable technical basis for incorporating VMT considerations into TPPS project evaluation moving forward.

A second approach to incorporating VMT is to develop a TPPS project list that is VMT neutral over the planning horizon. Under this framework, the combined effect of the projects included in the TPPS would be evaluated to ensure that capacity-enhancing investments are balanced with projects and strategies that reduce or offset induced travel. This would represent a more comprehensive shift in how projects are defined, bundled, and advanced. A VMT-neutral project list would likely be larger and more multimodal, requiring significant additional investments in transit, active transportation, and demand management to offset increases in driving associated with roadway improvements. Implementing this approach would also have implications for financing and programming, as traditional funding sources and delivery mechanisms are often structured around capital roadway projects. Additionally, it may not be possible to identify an affordable set of VMT reducing projects to offset capacity increasing projects depending on how many capacity increasing projects are included in the updated TPPS. New or expanded funding strategies, phasing approaches, and interagency coordination would be necessary to support a portfolio that balances mobility needs with VMT outcomes.

Both approaches provide a pathway for integrating VMT into regional decision-making but differ in scale and complexity. Incorporating VMT as a ranking metric represents an incremental policy shift that builds on the existing TPPS structure, while a VMT-neutral project list would require a broader reconsideration of project development, prioritization, and funding practices.



Conclusion

The Coachella Valley is at an inflection point in how it plans for transportation and growth. The implementation of SB 743 has shifted the foundational measure of transportation impact from vehicle delay to vehicle miles traveled, requiring agencies and developers to think differently about where development happens, how people move through the region, and what investments are needed to maintain a functional and equitable transportation system. This study was designed to help CVAG and its member agencies navigate that transition in a way that is technically defensible, practically useful, and reflective of the communities the region serves particularly disadvantaged communities.

Current development patterns suggest that a robust, development-driven VMT mitigation market may emerge gradually rather than immediately. Near-term growth trends indicate relatively limited CEQA-triggering development in some jurisdictions, while planned longer-term growth, particularly in eastern and northern areas of the valley, has the potential to generate a more consistent demand for mitigation. At the same time, the region's ongoing investment in major transportation infrastructure introduces a parallel and potentially more immediate need to consider how transportation projects themselves contribute to VMT and how those impacts are addressed at a programmatic level. Establishing the framework for a regional VMT mitigation program now positions CVAG to respond strategically as growth accelerates, providing certainty to the development community and a reliable mechanism for addressing future transportation impacts. A VMT mitigation bank would, in the long term, allow CVAG to address return to source concerns, right size project mitigations, and intentionally direct funding to communities in greatest need addressing equity issues.

The recent passage of Assembly Bill 130, which introduces a statewide VMT mitigation pathway, signals that the transition to VMT is accelerating at the state level as well. While the statewide program provides a useful compliance pathway, maintaining a regional framework gives CVAG and its member agencies greater control over how mitigation revenues are directed and ensures that investments reflect local priorities and return-to-source expectations.

The relationship between VMT mitigation and existing regional funding frameworks, particularly the TUMF, further illustrates the broader transition underway. While the TUMF has historically been structured around trip generation and roadway infrastructure delivery, the analysis shows that incorporating VMT into fee calculations and project prioritization would more directly link development to systemwide travel outcomes. Therefore, it is recommended that the region move the TUMF toward a VMT-based fee. This shift reflects a broader realignment of transportation finance toward supporting multimodal investments, demand management strategies, and land use patterns that reduce reliance on vehicle travel.

This study highlights the evolving role of VMT as a central metric shaping transportation and land use decision-making in the Coachella Valley. With the implementation of SB 743, the region is transitioning from a system historically focused on congestion relief and roadway capacity toward one that considers travel behavior, land use patterns, and long-term climate outcomes. The analysis completed for this study demonstrates how VMT can be used not only as a compliance requirement under CEQA, but also as a framework that increasingly influences how transportation investments are prioritized, funded, and evaluated across the region.



The study also underscores a structural consideration in how VMT impacts are generated and how they may need to be addressed as development activity grows. Both land use development and transportation projects can contribute to VMT increases, and as more projects trigger VMT analysis under SB 743, project-by-project mitigation limited to on-site strategies is unlikely to provide the scale, cost efficiency, or geographic flexibility needed to address these impacts comprehensively. In practice, this has led to growing interest in regional fee-based mitigation approaches that can pool resources and deliver larger and more effective VMT-reducing investments. The range of program types explored in this report, including banks, exchanges, and impact fees, illustrates that while multiple implementation pathways exist, each involves tradeoffs related to administration, equity, predictability, and alignment with local priorities.

Taken together, these findings point to a region that is well-positioned to take a proactive role in shaping how VMT mitigation is implemented. Pursuing a regional bank program as a long-term approach allows CVAG to monitor need and focus on evolving the TUMF and TPPS approach in the near term. A regional program can also be phased into operation with a pilot as demand for VMT mitigation actually materializes. The work completed as part of this study provides the analytical foundation to move forward with confidence when that time comes.

Deliverables and Implementation Resources

The study produced a substantial set of analytical resources and implementation tools designed to support CVAG and its member agencies to implement VMT reducing strategies across a range of planning, regulatory, and funding contexts. At the core of this work is an updated regional travel demand model, advancing the RIVCOM base year from 2018 to 2023 and updating the 2045 horizon year to 2050 based on detailed input from each member agency. This update corrects longstanding data issues, reflects post-pandemic travel conditions, and provides a technically current platform for VMT threshold screening, impact fee calculations, and project prioritization.

Building on the updated model, the study developed updated VMT thresholds for each member agency following the County methodology and prepared agency-specific model Supplemental Environmental Impact Reports to support General Plan amendments to adopt these thresholds. These documents give each jurisdiction a pathway to formally adopt consistent, defensible VMT thresholds under SB 743, streamlining future project-level CEQA review and reducing uncertainty for developers working across multiple jurisdictions in the valley.

To support project applicants directly, CVAG subscribed to TREDLite, a parcel-based analysis platform customized for the region. TREDLite allows developers and project sponsors to evaluate project-level VMT impacts and identify potential mitigation strategies early in the planning process, giving applicants a consistent and accessible tool that reduces uncertainty and helps streamline CEQA review for both applicants and member agencies.

To support planning and policy decisions at the program level, the study developed the CVAG TDM Toolbox and Calculator. This online resource catalogs numerous demand management strategies with associated VMT reduction estimates, equity considerations, funding sources, and cost information, giving agencies a practical tool for identifying and documenting TDM measures in general plans, specific plans, corridor studies, and grant applications.



A locally tailored Disadvantaged Communities methodology was also developed, integrating state and federal guidance with region-specific indicators to identify the communities most in need of transportation investment. This framework was embedded directly into the project prioritization process, ensuring that the VMT-reducing projects identified through this study reflect both technical merit and the expressed priorities of underserved communities. The public engagement program, which reached over 1,180 residents across 19 events and collected 757 statistically valid survey responses, provided the community foundation for that prioritization work.

For project-level analysis, the study developed a suite of off-model quantification tools for estimating VMT reductions from bicycle, pedestrian, and transit investments, filling a critical gap in the regional modeling toolkit. These tools were applied to an inventory of hundreds of VMT-reducing projects drawn from adopted local plans, producing a scored and ranked project list that can serve as the starting point for a regional VMT mitigation program. A grant toolbox was also developed to help member agencies identify funding opportunities aligned with the study's project and strategy recommendations.

Finally, the study evaluated two pathways for integrating VMT into CVAG's core funding and programming tools. The TUMF recalculation demonstrates how a VMT-based fee structure would distribute costs more directly in proportion to actual system impacts, with meaningful implications for how different land uses are treated. The TPPS integration analysis identifies options for incorporating VMT as a scoring metric or developing a VMT-neutral project portfolio, establishing a technical basis for advancing either approach as the TPPS is updated.

Individually, each of these products addresses a specific need in the region's planning and regulatory toolkit for incorporating VMT into the planning process. Collectively, they represent a comprehensive shift in how CVAG and its member agencies can approach transportation planning, moving from a system organized around vehicle capacity and congestion toward one that considers travel behavior, land use patterns, equity, and long-term climate outcomes. As CVAG and its member agencies move forward, this body of work provides the analytical foundation, implementation resources, and community relationships needed to advance VMT mitigation in a coordinated, equitable, and regionally responsive way.

Appendices



CVAG



Appendix A: Travel Demand Model Update Technical Documentation



CVAG





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Abbreviations

AADT	Annual Average Daily Traffic
ABM	Activity Based Model
ACS	American Community Survey
CDE	California Department of Education
CVAG	Coachella Valley Association of Governments
CVMSHCP	Coachella Valley Multiple Species Habitat Conservation Plan
DOF	Department of Finance
EIR	Environmental Impact Reports
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
ITE	Institute of Transportation Engineers
LEHD	Longitudinal Employer-Households Dynamics
MFDU	Multifamily Dwelling Units
NCES	National Center for Educational Statistics
PeMS	Performance Measurements System
PUMS	Public Use Microdata Sample
RCTC	Riverside County Transportation Commission
RHNA	Regional Housing Need Assessment
RIVCOM	Riverside County Model
RMSE	Root Mean Square Error
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SFDU	Single Family Dwelling Units
TAZ	Traffic Analysis Zones
TUMF	Transportation Uniform Mitigation Fee
VMT	Vehicle Miles Traveled
WRCOG	Western Riverside Council of Governments

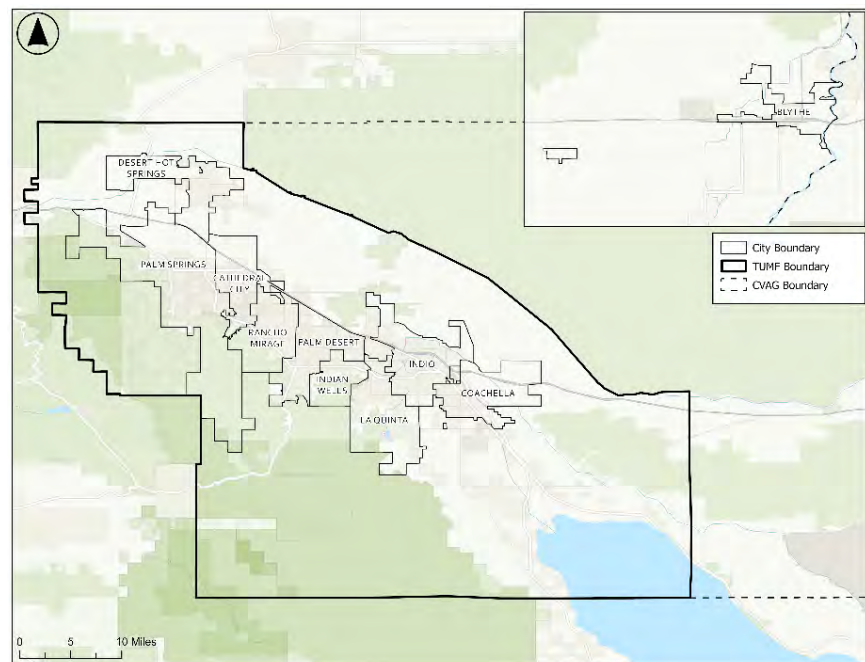
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Background

This report describes the methodology used to update the RIVCOM travel demand model for the Coachella Valley Association of Governments (CVAG). The RIVCOM model is a countywide travel demand forecasting tool developed to support transportation planning and policy decisions in Riverside County and is maintained by the Western Riverside Council of Governments (WRCOG). RIVCOM is a traditional four-step model that estimates future travel patterns based on land use, population, employment, and transportation network data. The model is designed to analyze vehicle trips and travel behavior within Riverside County. RIVCOM is regularly used by local agencies, including CVAG, to inform transportation mitigation needs, regional planning efforts, and the development of impact fees such as the Transportation Uniform Mitigation Fee (TUMF) program. The model is calibrated to reflect baseline conditions and is updated periodically to incorporate the latest socioeconomic data, travel surveys, and transportation network changes. The current base year for RIVCOM is 2018 and the horizon year is 2045.

Figure 1: Project Study Area



The RIVCOM model was used for the CVAG Vehicle Miles Traveled (VMT) Study to calculate baseline VMT and potential reductions to future VMT due to VMT reducing projects. The project study area for the CVAG Regional VMT Study includes all of CVAG's member agencies. This document describes the methodology used to update the base year to the study year to provide VMT thresholds that reflect post-pandemic travel behavior.

In addition to using the RIVCOM model, the project team considered updating VMT thresholds using Replica and Streetlight data. The exploration of those data sources is discussed in Appendix B. Ultimately, it was decided that the RIVCOM model was the most applicable source for estimating VMT and provides CVAG's member agencies with consistency and predictability given that it is the most commonly used resource for Environmental Impact Reports (EIRs) and impact fees.

To ensure the RIVCOM model remains applicable to current VMT thresholds used in the region, the project team updated land use inputs for both the base year and horizon year. The base year

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was updated to 2023 to reflect the most recent Census data available at the time. Land use information for the 2045 horizon year was updated to reflect each local agency's current long term planning efforts and anticipated development, effectively creating an unconstrained 2045 scenario. An additional update conducted towards the end of the project timeline also provided an updated 2050 horizon year that was constrained for consistency with SCAG's 2024 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) update.

Given that WRCOG is anticipated to undertake a broader model update in the near term, the updates to RIVCOM focused on land use data and zonal structure, along with a targeted review and validation of resulting model performance. No changes or updates were made to external gateway data, population synthesis procedures, or the roadway network, as these elements would overlap with planned efforts under the concurrent TUMF project and WRCOG project to update RIVCOM.

The sections that follow provide additional detail on the zone split refinements, land use updates, and the resulting validation findings.

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Traffic Analysis Zone Splits

Traffic Analysis Zones (TAZs) are fundamental geographic components of travel demand modeling that group land use and socio-economic data of a defined area. TAZs function as both the origins and destinations so a travel demand model can estimate trips between TAZs based on the land use and demographic data. TAZs are often modified to reflect changes in the spatial distribution of land use for policy and administrative purposes.

In the Coachella Valley, many of the unincorporated areas outside of the cities and unincorporated communities are bounded by Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) designated conservation zones. These areas prohibit land development. In the existing RIVCOM model some large TAZ are primarily covered by conservation zones but contain small clusters of employment and/or households located outside the conservation zone boundaries. This results in employment, population, and VMT growth incorrectly being produced in a conservation zone. To more accurately represent the travel conditions of Coachella Valley and assist in supplementary analysis, splits were applied to the TAZs intersecting with the CVMSHCP conservation zones. Splits were only applied when all the following criteria were met:

- (1) More than 50% of a TAZ is covered by a CVMSCHP conservation zone;
- (2) The TAZ contains at least one cluster of households and/or employment; and
- (3) The cluster of households and/or employment is outside the conservation zone boundary.

Remaining consistent with the RIVCOM 4.0.1, TAZ splits followed existing roadways or conservation boundaries. Each split required the addition of a centroid connector to route the assigned trips. To avoid impacting the traffic assignment, additional roadway links were minimized.

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Base Year Updates

RIVCOM version 4.0.1 was used as the baseline for the Coachella Valley-specific version of the model as it is the latest version of the model. RIVCOM v4.0.1 contains a base year of 2018 and a horizon year of 2045. A base year of 2023 was selected due to the availability of socio-demographic data representing 2023 conditions at the time the project was started. Although the scope of the effort specifically focuses on a Coachella Valley-specific version, many member agencies use a Riverside County threshold to determine VMT related impacts. For this reason, the entirety of Riverside County was updated to represent 2023 conditions.

Given the magnitude of edits to the socio-economic data, the population synthesizer tool within the RIVCOM model was run to generate updated population totals. All updates discussed in the following sections are inputs for the region-wide socio-economic data for the RIVCOM population synthesizer. While a full population synthesis was conducted, no updates were made to the procedures. Differences in the geographic boundaries of the 2010 Public Use Microdata Area (PUMA) and 2020 PUMA boundaries will require additional work to align TAZs with these updated boundaries. To maintain consistency and stability in the modeling framework, the Public Use Microdata Sample (PUMS) data was not updated. However, it is recommended that the next model update include the reassignment of TAZs to account for the new PUMA boundaries and allow for inclusion of updated PUMS data in the population synthesis procedures.

Households

RIVCOM v4.0.1 requires total occupied housing units, or households, as an input for the socio-economic data. A comparison of estimated total households across the limited data sources available was conducted including Replica¹, the American Community Survey (ACS)², PUMS³, and the California Department of Finance⁴ (DOF). PUMS and DOF data was not available at the level of granularity needed to update TAZs within RIVCOM. However, these sources provided a cross check for reasonableness when using either ACS or Replica data. After comparing Replica data to ACS for 2023 and cross checking city and county level totals with PUMS and DOF data, it was determined that ACS data would be more consistent with other available data sources. This is primarily due to the overestimates of multifamily dwelling units (MFDU) observed in Replica data, as summarized in **Table 1** below.

¹ Replica Places, Spring 2024.

² U.S. Census Bureau, American Community Survey 5-Year Estimates (2023), Table B25002: Occupancy Status

³ Public Use Microdata Sample, ACS 5-Year Estimates Public Use Microdata Sample 2023 for Riverside County PUMAs, including 0606501-0606515 - Fields used included BLD (structure type), VACS (vacancy status), and TEN (tenure)

⁴ California Department of Finance, Table E-1 Cities, Counties, and the State Population and Housing Estimates with Annual Percent Change – January 1, 2023

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Table 1: Comparison of Data Sources for Households Units in Riverside County

ACS 5-Year 2023		Replica 2024		Department of Finance 2023	
Total Units	MFDUs	Total Units	MFDUs	Total Units	MFDUs
860,042	207,803	858,210	251,712	872,930	137,465

As part of the population synthesizer, non-institutionalized group quarters (college dormitories, military barracks, group homes, missions, and shelters) are integrated into the household totals. The 2023 ACS data accounts for all occupied housing units, excluding group quarters. After the occupied housing units were distributed to TAZs, group quarters (including institutional and non-institutional) population were distributed using 2020 census block level data. This procedure resulted in a greater number of households within Riverside County when compared to the ACS 5-Year estimate, however it provides consistency with the procedures of the RIVCOM population synthesis.

Because a full travel demand model update was not within the scope or timeframe of this effort, the initial strategy to update RIVCOM from 2018 to 2023 was to use the 2018 model year as the foundation. The 2023 scenario would be developed as an interim year for Riverside County by adjusting households to reflect current ACS data. However, after assigning 2023 ACS data to the TAZs, a significant number of TAZs showed notable declines in households from 2018 to 2023. Further analysis was completed that compared 2018 ACS data to the RIVCOM model, which revealed discrepancies in reported households. When compared to 2018 ACS, more than 65% of TAZs had a greater than 10% variation in housing unit totals. 44% of TAZs had a deviation of 50% or more and 26% of TAZs had a deviation of 100% or more.

After reviewing the discrepancies, a revised allocation method was used to redistribute households across all TAZs. It is important to note that RIVCOM TAZ boundaries do not align with Census Block Groups, requiring the use of assessor parcel data to disaggregate ACS estimates. This parcel data included classifications for single-family and multifamily residential units. **Figure 2** illustrates the distribution of residential parcels across the project study area. For multifamily parcels, household totals from the parcel data were provided as ranges. The midpoint of each range was used to estimate the number of units per parcel. This methodology produced an updated allocation of single-family and multifamily households across all TAZs within the project study area.

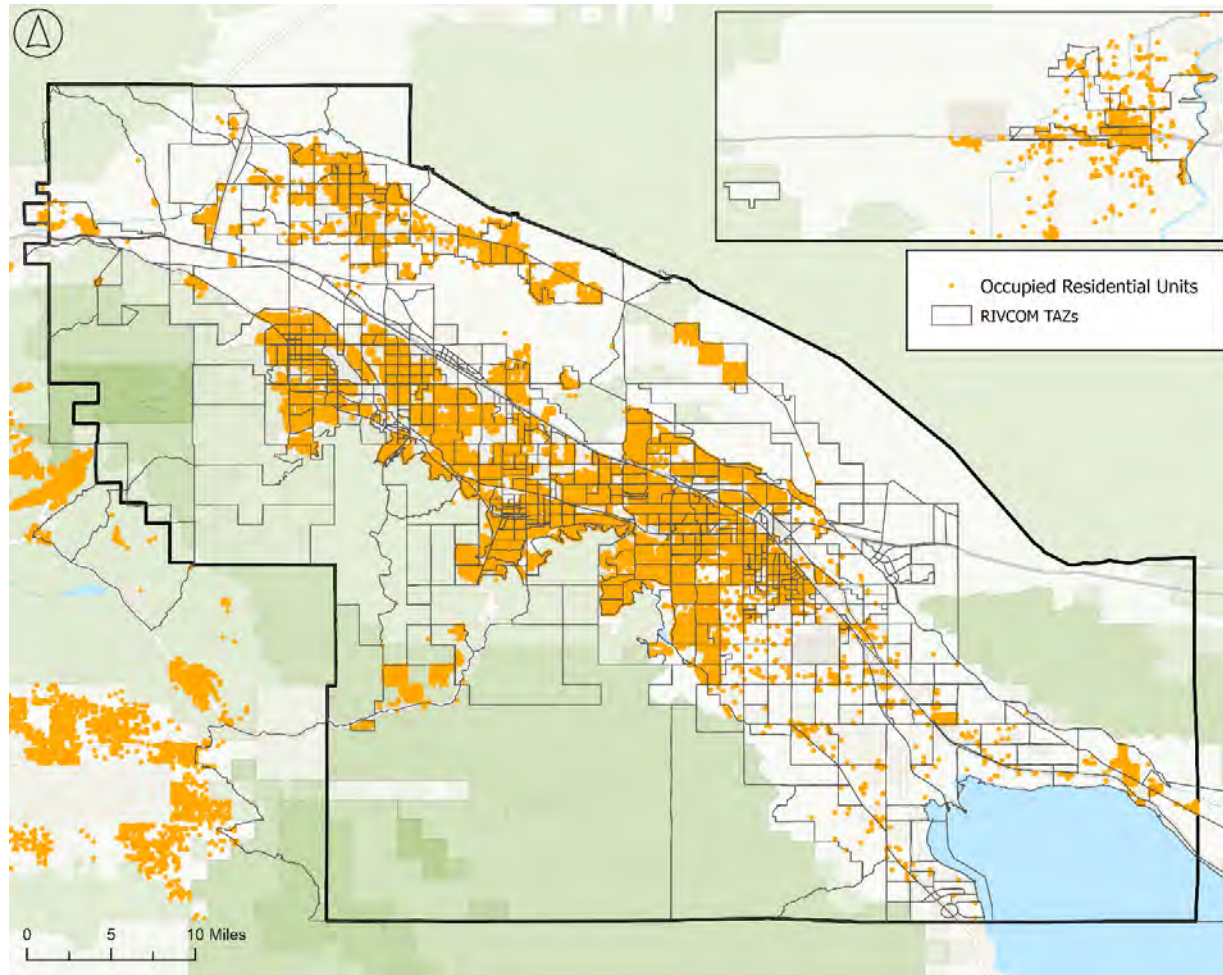
Figure 3 and **Figure 4** illustrate the percentage shift in households by each city from RIVCOM's 2018 base year to the updated reallocated 2023 base year. Red highlights indicate a decrease of households from the previous 2018 base year, while blue highlights indicate an increase. As shown in **Figure 3**, a majority of the shifts that occur in the CVAG region are due to TAZ splits (splitting one larger TAZ into two or more smaller TAZs to provide a greater level of detail). **Figure 4** depicts major household percentage shifts in Beaumont, Eastvale, and Canyon Lake, and minor to no shifts in the rest of Riverside County. These percent shifts can be attributed to growth or correction of misplaced households from the 2018 base year socio-economic data. **Table 2**

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compares the city totals from 2018 RIVCOM with the updated 2023 RIVCOM base year for Riverside County. Although growth may have occurred from 2018 to 2023, the difference in households between 2023 and 2018 is not purely growth, rather a combination of growth and the results of redistribution using the parcel allocation method described above.

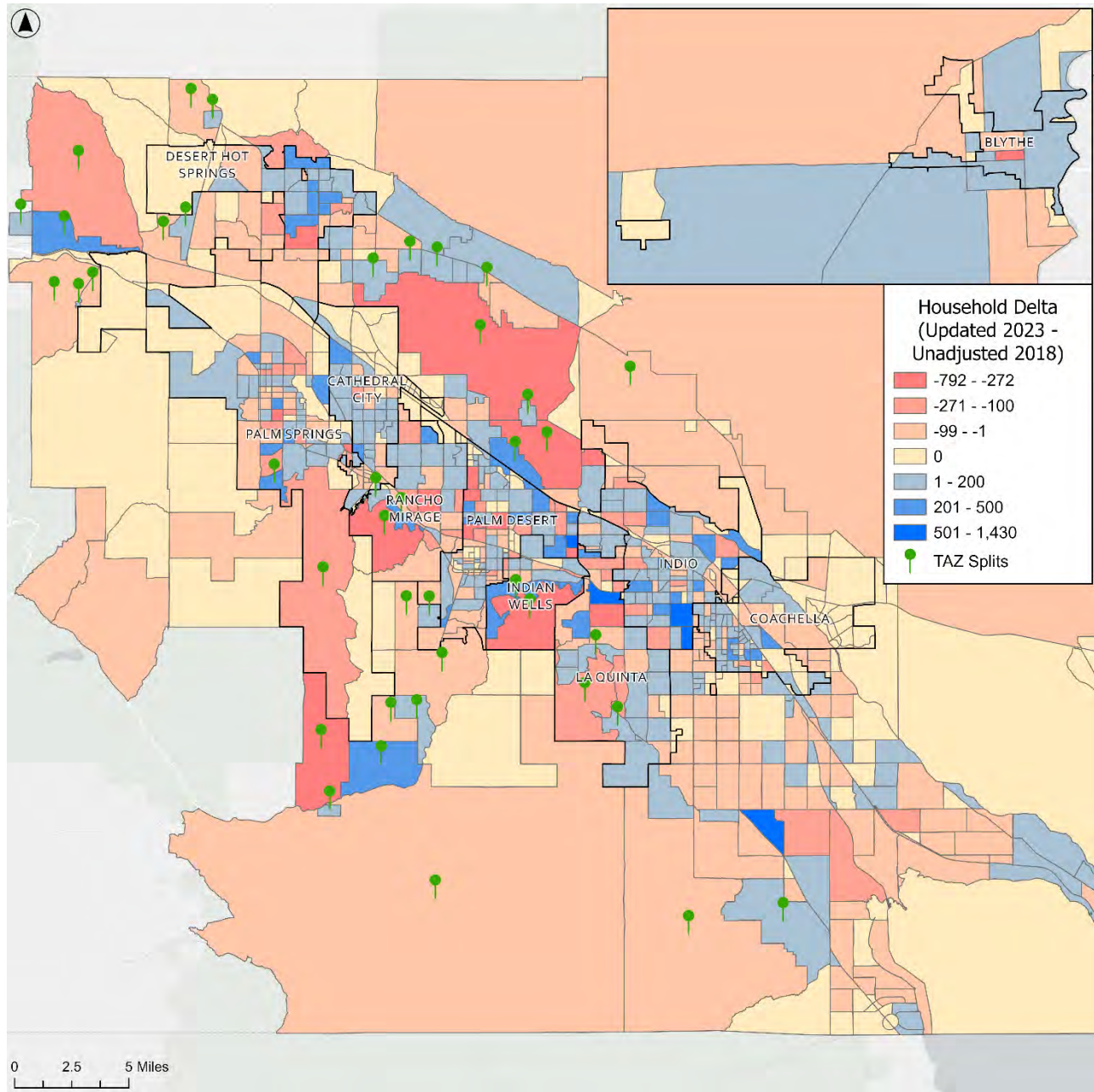
Figure 2: Residential Parcels in Project Study Area



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Figure 3: Household Comparison of 2018 and 2023 RIVCOM Base Years – CVAG Region

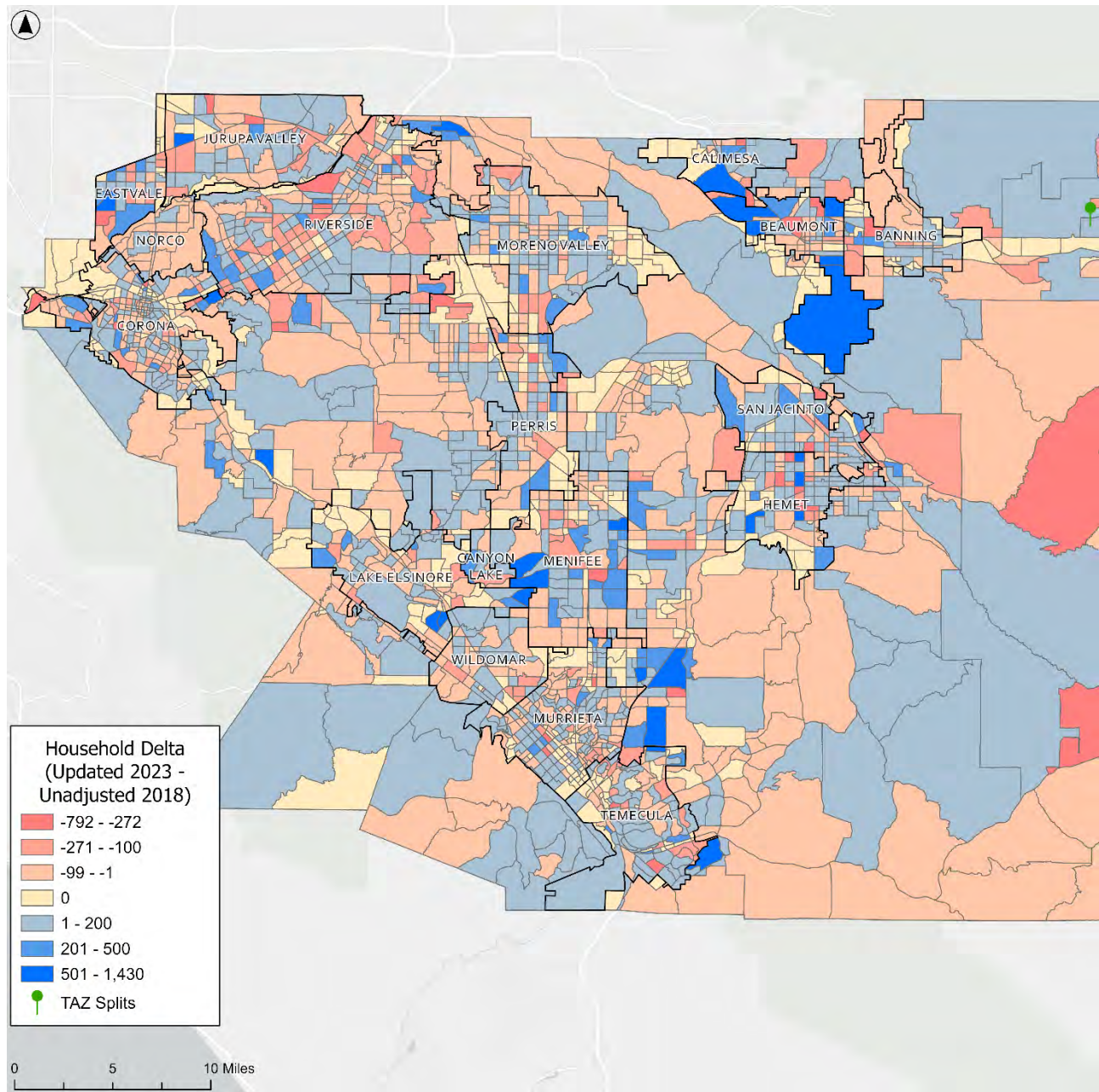


Red highlights indicate the RIVCOM 2018 model estimated more households than the 2023 base year update. Blue highlights indicate the RIVCOM 2018 model estimated less households than the 2023 base year update. The darker colors indicate a larger disparity between the 2023 update and 2018 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Figure 4: Household Comparison of 2018 and 2023 RIVCOM Base Years – Western Riverside County



Red highlights indicate the RIVCOM 2018 model estimated more households than the 2023 base year update. Blue highlights indicate the RIVCOM 2018 model estimated less households than the 2023 base year update. The darker colors indicate a larger disparity between the 2023 update and 2018 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Table 2: Household Comparison of 2018 and 2023 RIVCOM Base Years

	RIVCOM 2018			RIVCOM 2023		
City	Total	Single-Family	Multi-Family	Total	Single-Family	Multi-Family
CVAG						
Blythe	4,591	2,805	1,786	4,310	3,230	1,080
Cathedral City	17,359	10,122	7,237	19,156	14,792	4,364
Coachella	9,623	6,935	2,688	12,352	9,587	2,765
Desert Hot Springs	9,285	5,956	3,329	11,432	8,700	2,732
Indian Wells	2,877	1,775	1,102	2,457	2,182	275
Indio	26,025	17,748	8,277	31,027	25,018	6,009
La Quinta	15,343	12,259	3,084	15,733	13,841	1,892
Palm Desert	23,110	10,051	13,059	24,145	18,644	5,501
Palm Springs	24,011	8,829	15,182	24,296	14,238	10,058
Rancho Mirage	9,189	4,835	4,354	8,686	7,700	986
Unincorporated CVAG	26,486	14,874	11,612	25,658	22,514	3,144
CVAG - Total	167,899	96,189	71,710	179,252	140,446	38,806
WRCOG						
Banning	10,897	7,619	3,278	11,494	10,515	979
Beaumont	14,220	11,704	2,516	17,065	16,061	1,004
Calimesa	3,670	2,451	1,219	3,877	3,781	96
Canyon Lake	3,877	3,419	458	4,090	3,775	315
Corona	46,950	31,539	15,411	48,083	35,792	12,291
Eastvale	16,262	13,964	2,298	17,824	17,077	747
Hemet	29,924	15,546	14,378	32,099	26,666	5,433
Jurupa Valley	26,973	20,708	6,265	27,132	23,930	3,202
Lake Elsinore	16,863	11,947	4,916	20,416	17,677	2,739
Menifee	30,462	24,433	6,029	35,034	33,243	1,791
Moreno Valley	52,687	39,428	13,259	54,808	44,904	9,904
Murrieta	34,745	25,493	9,252	35,452	29,342	6,110
Norco	7,096	6,449	647	6,776	6,541	235
Perris	17,200	13,453	3,747	19,386	17,157	2,229
Riverside	94,269	59,478	34,791	92,368	66,109	26,259
San Jacinto	14,039	9,405	4,634	14,915	13,659	1,256
Temecula	33,621	25,481	8,140	35,423	28,740	6,683
Wildomar	10,951	7,181	3,770	10,622	9,656	966
Unincorporated WRCOG	89,945	67,776	22,169	96,108	91,840	4,268
WRCOG - Total	554,651	397,474	157,177	582,972	496,465	86,507
Riverside County						
Riverside County	722,550	493,663	228,887	762,224	636,911	125,313

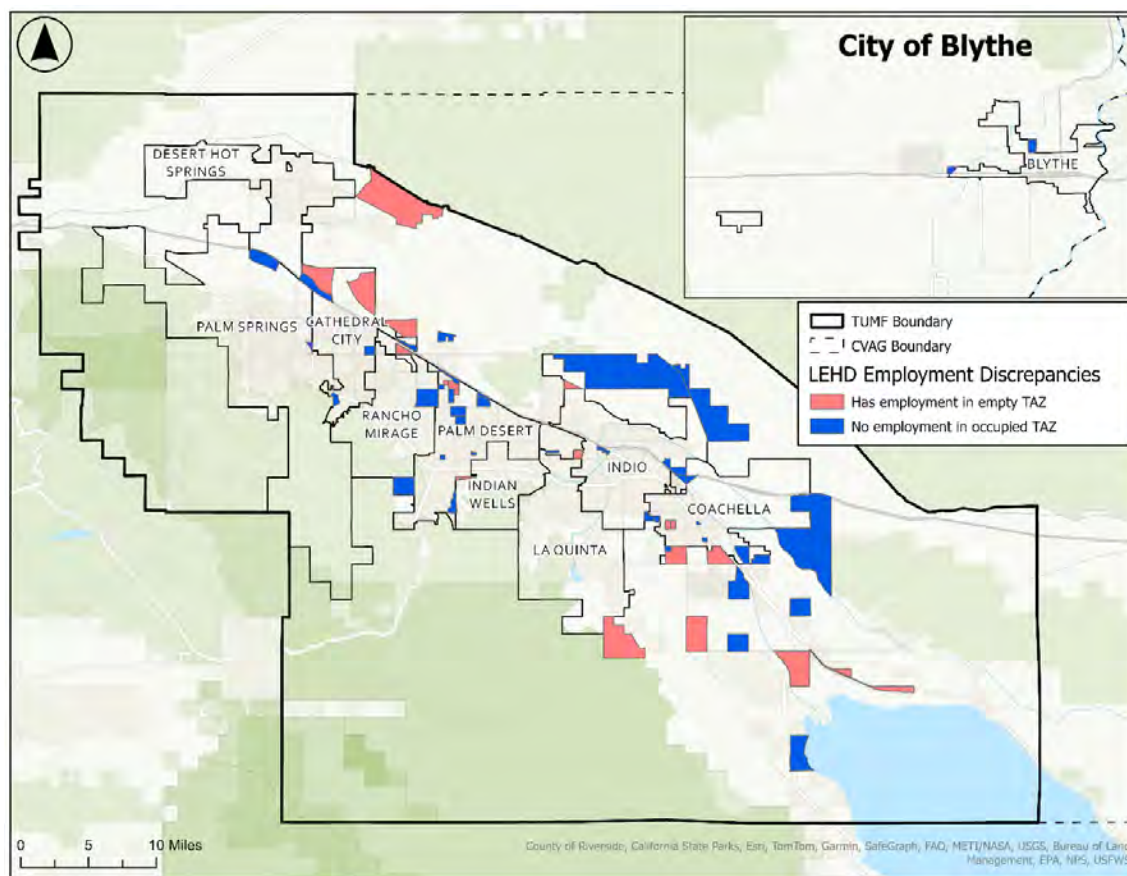
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Employment

To update the employment data, three data sources were considered: Longitudinal Employer-Household Dynamics⁵ (LEHD), Replica⁶, and permit data from CVAG's TUMF program. The data sources were cross checked with assessor data, zoning classifications, and aeriels. When mapped over 2023 Google Earth⁷ and Nearmap⁸ aeriels, LEHD data showed employment in locations known to have no businesses and appeared to conflict with assessor data and zoning data from the local jurisdictions (**Figure 5**). Replica data exhibited similar problems and showed large decreases or increases in some TAZs when compared to RIVCOM model base year data (**Figure 6**).

Figure 5: Discrepancies between 2018 RIVCOM and 2022 Longitudinal Employer-Household Dynamics Data



⁵ U.S. Census Bureau, "OnTheMap," Riverside County *Work Area Profile Analysis* (2022)

⁶ Replica Places, Spring 2024.

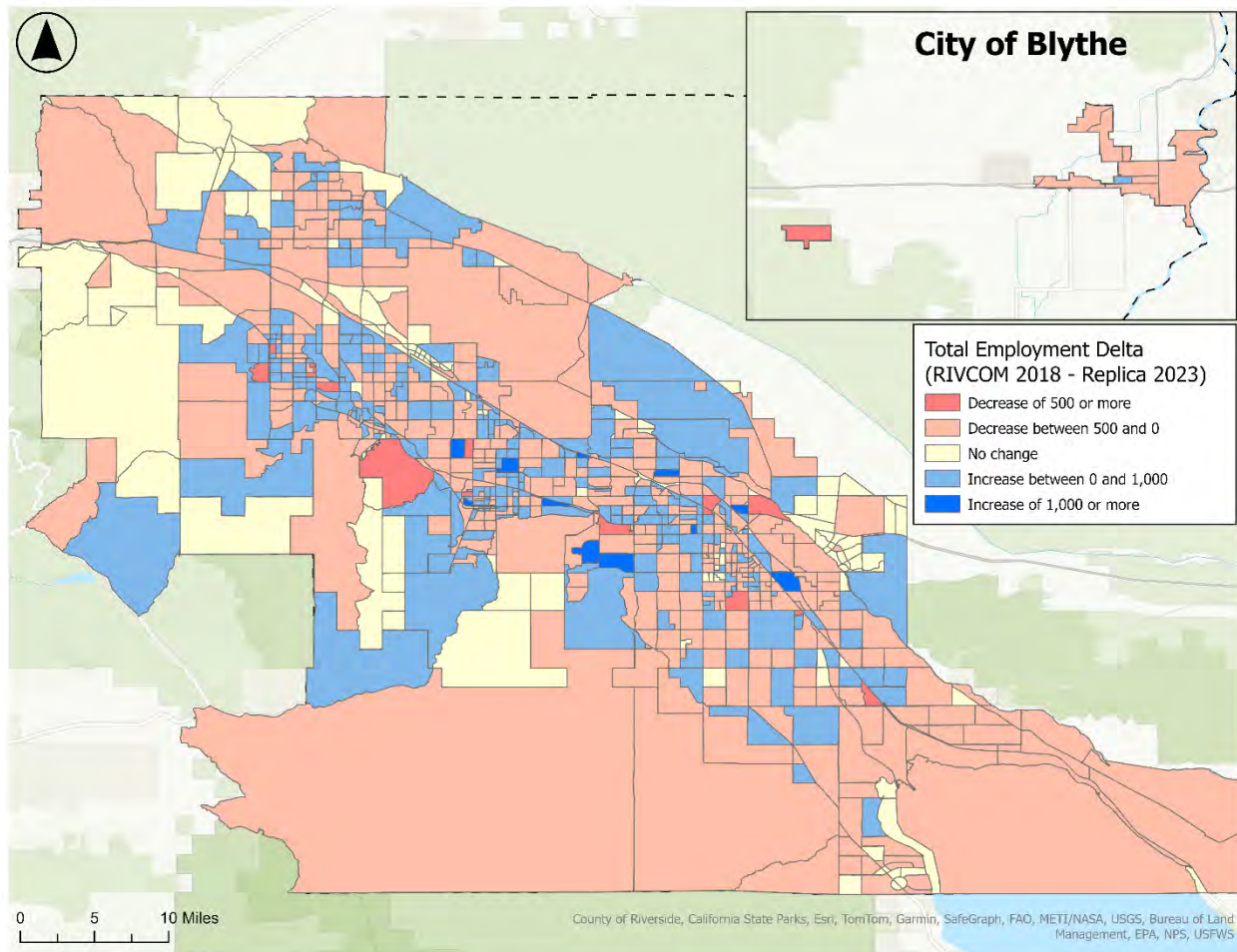
⁷ Google Earth. Satellite imagery of Riverside County, CA. Google, 2023.

⁸ Nearmap. Aerial imagery of Coachella Valley, California. Nearmap, 2023. Web.

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Figure 6: Difference between 2018 RIVCOM Employees and 2023 Replica Employees



Ultimately it was decided to use the data from the TUMF program in combination with the RIVCOM base year model, as this would provide the most locally accurate data available. The TUMF data was provided by both CVAG and WRCOG at a parcel level that included building size in square feet for each permitted facility. Since the RIVCOM model uses employment as its input for non-residential land uses, the square footage for each permitted facility was converted into number of employees by using an average of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition rates, as shown in **Table 3** below. The rates shown in the table below are averages for each *Trip Generation Manual* family of land use classifications to mirror the non-residential land use categories that exist in the RIVCOM model. For example, all ITE codes in the 100 - industrial land uses - family of classifications were averaged to obtain one rate. While this may over- or underrepresent certain permitted land uses, the resulting differences as compared to calculating each permitted project individually are negligibly small. Golf and nursing/congregate care facilities do not have detailed enough information on employment trips. Therefore, both employment categories relied on alternative sources (i.e. California health and safety requirements and industry standards) to determine employment trips. It should be noted that a

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handful of entries in the TUMF permit data did not include APNs or addresses, so the employees for these projects were distributed proportionately across the TAZs in the jurisdiction where the project was constructed to ensure the trips related to these entries were loaded onto the transportation network.

Table 3: Rates for Employees per Square Foot

Employment Category	Rate	Units	Source
Fuel-Gas	0.62	Employee/Fuel Station	ITE
Golf	Varies	-	Industry Newsletters
Hotel	0.34	Employee/Room	ITE
Industrial - General	1.52	Employee/K.S.F.	ITE
Industrial - Warehouse	0.56	Employee/K.S.F.	ITE
Office	3.27	Employee/K.S.F.	ITE
Retail	2.56	Employee/K.S.F.	ITE
Service	5.43	Employee/K.S.F.	ITE
Nursing/ Congregate Care	0.11	Employee/Room	Health & Safety Requirement ¹

¹Congregate living health facilities standards based on California Health & Safety Code, section 1267.13

The full list of TUMF employment data was consolidated to include projects that were determined to be constructed and operational by the end of 2023. Based on satellite imagery and available business data, permits with TUMF payments in 2023 or later were excluded from the base year employment data. To account for longer construction schedules, all “large” (exceeding 100 employees) proposed projects went through a similar validation process, regardless of the permit year. This process ensured that the model best represents 2023 conditions for model validation purposes.

Employment data from the South Coast Air Quality Management District (SCAQMD) was used to confirm employment totals in the CVAG region as part of the land use validation process. To address air pollution caused by mobile sources, SCAQMD records employment for employers with 250 or more employees. SCAQMD provided recorded employment data for 23 employers in the CVAG region for 2023. Employment data for these locations was compared to the updated base year model employment for their respective TAZs. Where the model estimated lower employment than SCAQMD, the SCAQMD data was used to update the total in their respective categories. Where the model estimated higher employment than SCAQMD, the model data remained the same.

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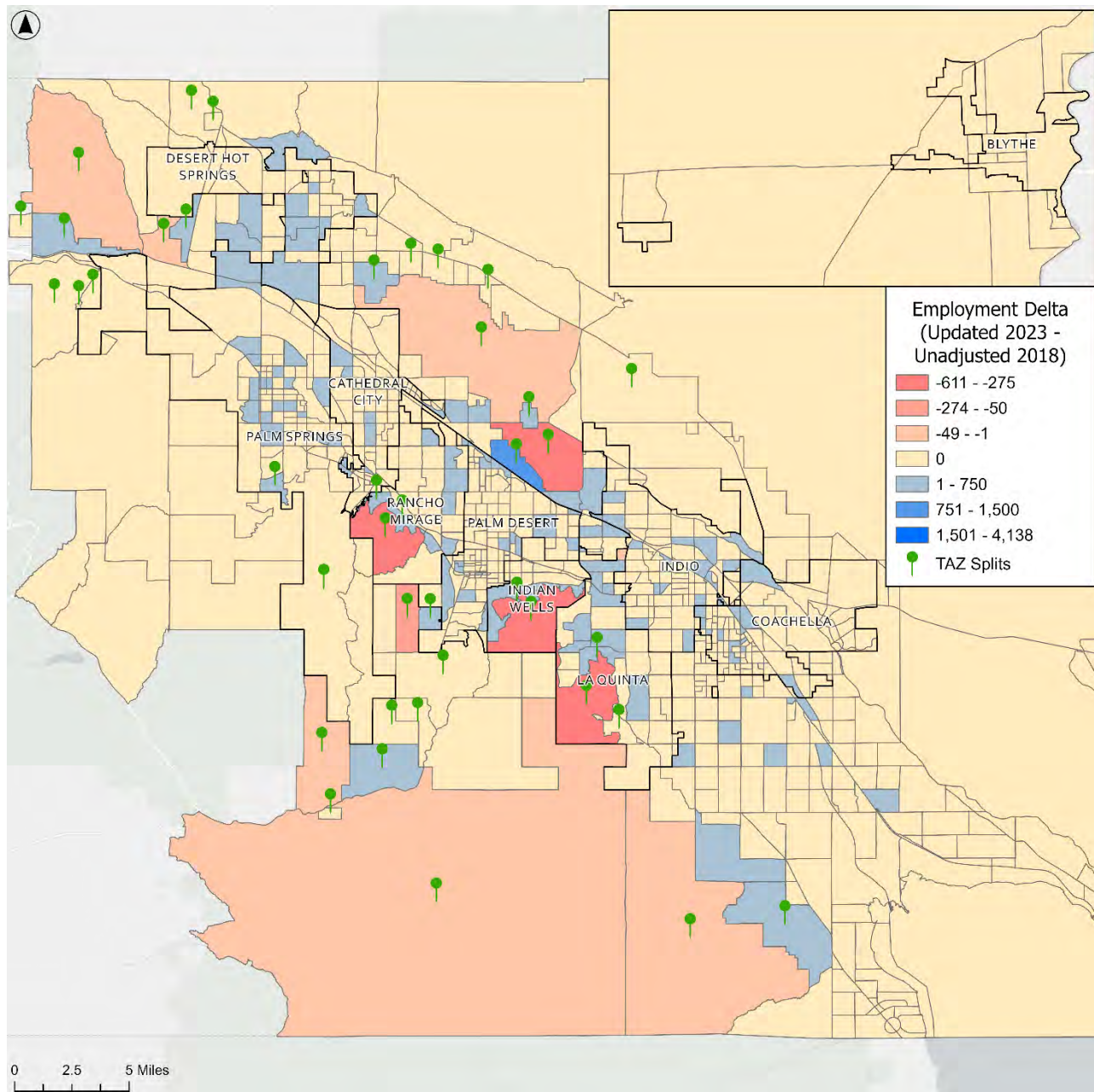


Figure 7, Figure 8, and Table 4 compare the base year employment total to the updated 2023 base year data. Differences in employment are a direct result of growth from 2018 to 2023. Red highlights indicate a decrease in employment from the base model year, while blue highlights indicate an increase in employment. As shown in **Figure 7**, decreases in employment occur throughout the CVAG region at the TAZ level due to reallocation of employment and TAZ splits. However, overall employment totals increase at the jurisdictional level between 2018 and 2023 as shown in **Table 4**. Major decreases in employment at the TAZ level are primarily due to reallocation of employment during the process of splitting TAZs. Minor decreases are due to reallocation during validation process. **Figure 8** depicts minor decreases in employment throughout the remaining TAZs in unincorporated Riverside County. **Table 4** summarizes the employment differences between the original 2018 base year and the new 2023 base year for agencies throughout Riverside County, including the unincorporated portions, the CVAG region, and Riverside County as a whole. As shown in **Table 4**, the employment in the CVAG region grew by almost 6,100 jobs between 2018 and 2023, accounting for over 11-percent of the employment growth in Riverside County.

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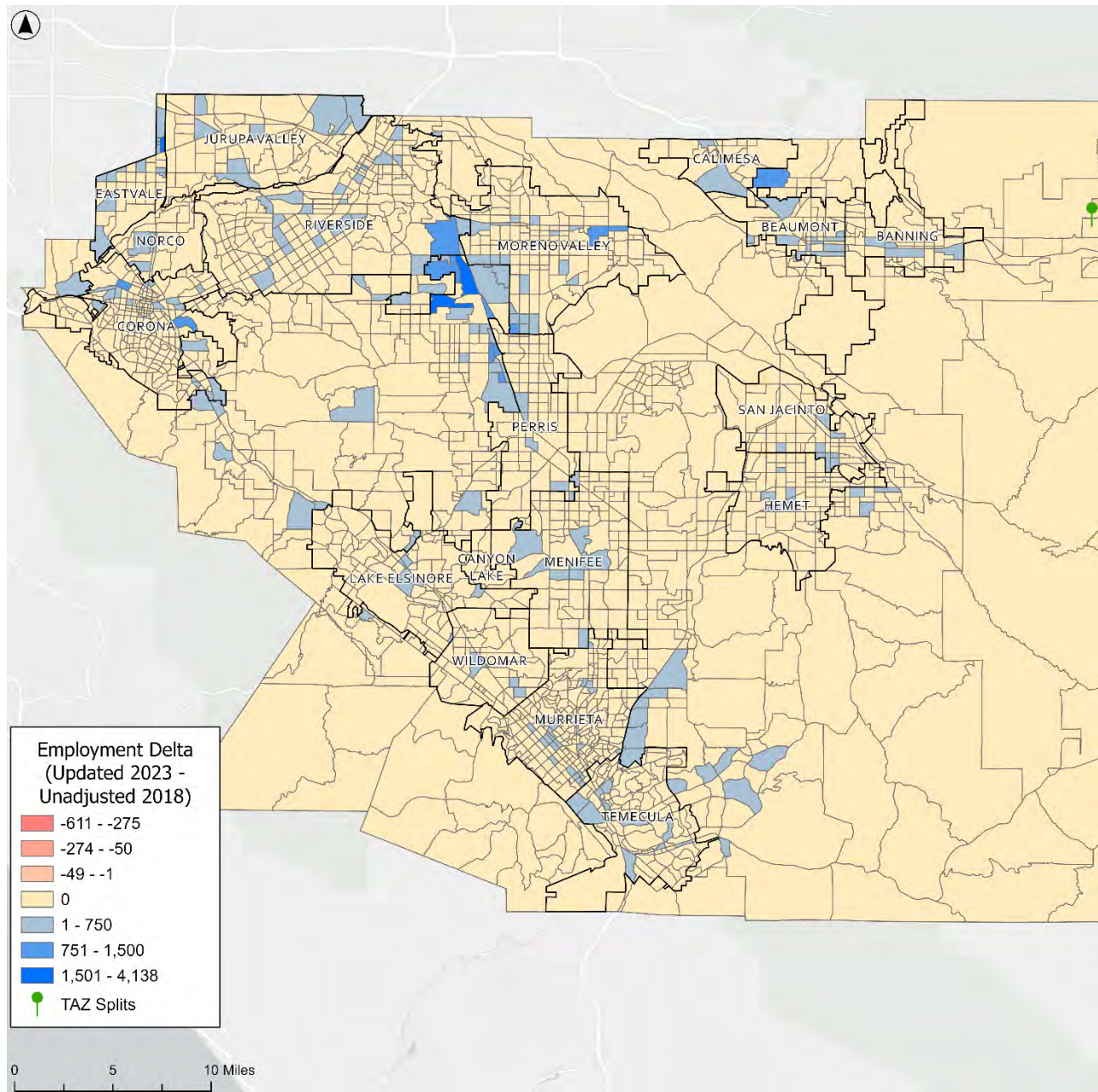
Figure 7: Employment Comparison of 2018 and 2023 RIVCOM Base Years – CVAG



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Figure 8: Employment Comparison of 2018 and 2023 RIVCOM Base Years – Western Riverside County



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Table 4: Employment Comparison of 2018 and 2023 RIVCOM Base Years

City	RIVCOM 2018 Employment Total	RIVCOM 2023 Employment Total	2018 to 2023 Growth
CVAG			
Blythe	3,792	3,792	0
Cathedral City	12,094	12,264	170
Coachella	8,613	8,982	369
Desert Hot Springs	3,675	5,023	1,348
Indian Wells	5,030	5,036	6
Indio	26,475	27,202	727
La Quinta	16,661	16,885	224
Palm Desert	44,077	44,480	403
Palm Springs	32,252	32,881	629
Rancho Mirage	16,037	16,358	321
Unincorporated CVAG	20,849	22,748	1,899
CVAG - Total	189,555	195,651	6,096
WRCOG			
Banning	7,292	8,038	746
Beaumont	8,992	11,266	2,274
Calimesa	3,281	3,524	243
Canyon Lake	1,845	1,845	0
Corona	78,846	81,747	2,901
Eastvale	6,867	11,875	5,008
Hemet	21,772	22,029	257
Jurupa Valley	27,636	29,300	1,664
Lake Elsinore	14,067	14,615	548
Menifee	13,773	14,789	1,016
Moreno Valley	43,140	49,418	6,278
Murrieta	32,207	34,072	1,865
Norco	15,009	16,173	1,164
Perris	17,465	17,745	280
Riverside	150,086	154,065	3,979
San Jacinto	6,694	6,932	238
Temecula	56,422	57,734	1,312
Wildomar	6,921	7,293	372
Unincorporated WRCOG	57,987	76,594	18,607
WRCOG - Total	570,302	619,054	48,752
Riverside County			
Riverside County	759,857	814,705	54,848

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Enrollment

RIVCOM 4.0.1 enrollment inputs are categorized into three fields, kindergarten through 8th grade, 9th through 12th grade, and college/university enrollment. Enrollment data was pulled from two data sources, National Center for Educational Statistics (NCES) school navigator and the California Department of Education (CDE) cumulative enrollment data during the 2022-2023 school year. The NCES data was primarily used to provide the location of the schools, while the kindergarten through 12th grade enrollment data was sourced from the CDE. NCES 22-23 enrollment data was only used where CDE lacked data.

The CDE and NCES school locator does not provide enrollment data for nonpublic sectarian schools, so enrollment totals from the 2018 model were used in conjunction with the updated enrollment data. TAZs with non-zero enrollment in the 2018 model and zero enrollment in the updated estimates were flagged for potential gaps in the CDE and NCES data. The 2018 enrollment was only added to the updated 2023 base year after the school location was confirmed with aerial imagery. Enrollment data for colleges in Riverside County is not as accessible as K-12 enrollment data. For this reason, college enrollment was held constant between 2018 and 2023.

Table 5 provides a comparison between the 2023 and 2018 enrollment totals. Increases in enrollment totals can be explained by a few reasons: (1) increased number of students as population increases, (2) growth in enrollment caused by the addition of a new school between 2018 and 2023, and (3) underestimate of enrollment from the 2018 model. Decreases in enrollment can be attributed to overestimates of enrollment in the 2018 mode.

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Table 5: Enrollment Comparison of 2018 and 2023 RIVCOM Base Years

City	RIVCOM 2018			RIVCOM 2023		
	K - 8 th Grade	9 th – 12 th Grade	College Enrollment	K - 8 th Grade	9 th – 12 th Grade	College Enrollment
CVAG						
Blythe	2,117	977	0	2,103	1,030	0
Cathedral City	6,065	1,999	430	5,800	1,844	430
Coachella	5,657	2,873	0	5,018	3,053	0
Desert Hot Springs	4,576	1,750	0	4,597	1,886	0
Indian Wells	779	0	0	622	0	0
Indio	11,627	5,601	0	10,935	4,557	0
La Quinta	3,337	1,986	0	2,716	3,079	0
Palm Desert	5,375	1,986	11,885	4,637	2,155	11,885
Palm Springs	3,833	1,886	0	3,853	2,149	0
Rancho Mirage	677	69	0	576	1,634	0
Unincorporated CVAG	8,724	4,480	4,309	10,005	3,719	4,309
CVAG - Total	52,767	23,607	16,624	50,862	25,106	16,624
WRCOG						
Banning	3,119	1,314	0	2,960	1,424	0
Beaumont	7,070	2,863	0	6,708	3,104	0
Calimesa	1,021	86	0	969	93	0
Canyon Lake	0	0	0	0	0	0
Corona	20,814	10,688	0	19,747	11,586	0
Eastvale	9,059	4,187	0	8,596	4,539	0
Hemet	9,816	4,353	0	10,158	4,719	0
Jurupa Valley	16,613	5,952	0	15,762	6,453	0
Lake Elsinore	9,595	4,510	0	9,106	4,889	0
Menifee	12,756	6,503	0	12,102	7,048	0
Moreno Valley	28,573	13,088	10,571	27,112	14,188	10,076
Murrieta	15,914	9,014	0	15,101	9,770	0
Norco	2,832	2,809	10,958	2,688	3,045	10,445
Perris	10,575	4,617	0	10,035	5,005	0
Riverside	41,817	22,783	60,279	39,676	24,696	57,455
San Jacinto	8,222	3,193	16,760	7,803	3,462	15,975
Temecula	19,707	10,941	83	19,253	11,860	79
Wildomar	4,394	2,230	0	4,170	2,418	0
Unincorporated WRCOG	36,398	6,795	0	34,536	7,363	0
WRCOG - Total	258,295	115,926	98,651	246,482	125,662	94,030
Riverside County						
Riverside County	311,062	139,533	115,275	297,344	150,768	110,654



Validation Procedure

After updating the RIVCOM base year from 2018 to 2023, a static validation process was completed to ensure the traffic patterns were representative of 2023 conditions. The validation process was consistent with the process used for validating the 2018 RIVCOM model base year. Static validation involves comparing model assignment outputs, generally roadway segment volumes, to measured data not used for updating the model. The goal of the validation was to ensure that the network within Riverside County performed as well as or better than it did prior to the adjustments. Using a combination of annual average daily traffic (AADT) volumes from Streetlight and the Caltrans Performance Measurements System (PeMS), the same link locations within Riverside County that were used for the static validation process of the 2018 RIVCOM model were compared with volumes from the updated 2023 base year. Count sources used in the 2023 update validation differed from those used in the RIVCOM 2018 validation. The 2018 validation utilized weekday count data provided by cities from varying months not falling on or near holidays. As the 2018 RIVCOM validation included 626 validation locations throughout Riverside County, and given that San Bernadino County socioeconomic data was not updated from the 2018 version of the model, 131 of the 626 locations were excluded from the validation process as model volumes at these locations would not represent 2023 conditions. Additionally, as travel demand models are not effective at representing local roads or facilities with low volumes given their structure and level of detail, 68 additional count locations with an AADT of 5,000 or less were removed from the 2023 validation process.

PeMS data was used for all freeway segment count locations while data from Streetlight was used for the remaining count locations. Every PeMS detector has a *Percent Data Used* indicator, which is the percentage of actual sensor data (from loop detectors or other sources) that were available and used to generate traffic performance metrics for a specific time period and location. Consistent with Caltrans guidance and to reduce uncertainty, only data from freeway stations with a *Percent Data Used* of 85% or greater was used in the validation process for the 2023 base year. However, PeMS data was used regardless of the *Percent Data Used* metric if at least one of the following conditions was met:

- 1) Count location does not exist in the Streetlight model network
- 2) Count location is a high occupancy vehicle (HOV) or high occupancy toll (HOT) lane
- 3) PeMS volumes result in a lower percentage change than Streetlight when compared to the base year 2018 RIVCOM model validation observed counts

The static model validation process was completed using similar statistical criteria from the base year 2018 RIVCOM model validation process. The base year 2018 RIVCOM model static validation process compared the observed counts to the modeled volumes using the following three criteria:

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- Maximum percent root means square error (%RMSE) for all links
- Correlation coefficient between model volumes
- Percent of links within Caltrans maximum allowable deviation⁹

Table 6 summarizes the validation results in Riverside County for the previous 2018 RIVCOM model compared to the updated 2023 RIVCOM model. Although the *Correlation Coefficient* performed marginally worse than the 2018 base year, the 2023 base year validation results are within industry-accepted ranges and within 1% of the 2018 RIVCOM validation results. Both the 2018 and 2023 base years do not meet the threshold for the *Percent of Links within Caltrans Maximum Deviation*, but the margin of error was slightly higher for the small-volume links. Although different data sources were used for the 2023 validation process, the model still performs similarly. This indicates the 2023 validation process is as robust as the 2018 validation and shows the model is validating consistently after socio-economic updates were provided. The limitations of regional travel demand models cause small-volume links to have a higher margin of error when compared to links with higher volumes. **Table 7** shows the validation statistics by link volume groups, excluding the small volume links, or links with less than 5,000 AADT. 71.8% of links between 25,000 and 49,999 AADT were within Caltrans allowable deviation while 80.0% of links with more than 50,000 AADT were within the Caltrans deviation. However, roadways with less than 25,000 AADT performed roughly the same as the 2018 base year model showing that the modifications made to the model result in the model performing consistent with the 2018 model.

Table 8 and **Table 9** show validation statistics by facility type, and city group, respectively. The 2023 base year model performs the same or better than the 2018 model about 64% of the time (23 of the 36 results), when comparing the individual metrics. As shown in **Table 8**, freeway, principal arterials, and minor arterials performed roughly the same as the 2018 base year model in all three validation criteria. Major collectors performed better in the 2023 update with a 4% improvement in *Percent Root Mean Square*, a 4% improvement in *Percent of Links within Caltrans Maximum Deviation*, and a 4% increase in the *Correlation Coefficient*. HOV lanes performed worse under the 2023 update. This decline in performance may be caused by unreliable PeMS data as no other data source was available to provide HOV link volumes. As shown in **Table 9**, Beaumont-Banning, San Jacinto-Hemet, and Temecula-Lake Elsinore performed the same or better than the 2018 validation in all three criteria. Coachella-Palm Springs, Unincorporated Riverside County, and Corona-Riverside performed roughly the same in all criteria, but Moreno Valley-Perris performed slightly worse when compared to the previous 2018 results.

⁹ This metric differs from the RIVCOM 2018 validation. RIVCOM 2018 validation used "Percent of Links within Allowable Deviation" based on the NCHRP Report 255

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Given that a full model calibration process was beyond the scope of work for the project, it is recommended to include analyzing screenlines and collecting updated count data for use in the calibration and validation process during the next model update.

Travel demand models strive to represent overall travel patterns as accurately as possible. If the model behaves consistently and aligns with the larger travel patterns, the acceptable margin of error for small-volume links is deemed reasonable for practical purposes in transportation planning and analysis. Consistent with the previous 2018 validation methodology, the updated 2023 model passes the *Percent Root Mean Square* and *Correlation Coefficient* thresholds by 14.7% and 0.080, respectively. Although the updated 2023 model does not meet the *Percent of links within Caltrans maximum allowable deviation* threshold, it does perform consistently with the validated 2018 model after performing updates to the socio-economic data. For these reasons, the 2023 base year update for the RIVCOM model is determined to be valid.

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Table 6: Overall Daily Static Model Validation for 2018 and 2023 Base Year Model

Criteria	RIVCOM 2018	RIVCOM 2023	Threshold
% RMSE	25.7%	25.3%	Below 40%
Correlation Coefficient	0.962	0.960	At least 0.88
Percent of Links within Caltrans Maximum Deviation	66.7%	66.5%	At least 75%
Number of Links	427	427	-

Table 7: Daily Static Model Validation for 2018 and 2023 Base Year Model by Volume Group

By Volume Group	Number of Links	Mean Count	Mean Volume	%RMSE	%Links w/in Caltrans Deviation	Correlation Coefficient
RIVCOM 2018						
<5,000	-	-	-	-	-	-
5,000-24,999	313	14,244	14,817	36.81%	63.9%	0.68
25,000-49,999	62	32,138	32,978	23.36%	72.6%	0.65
50,000-99,999	46	70,734	68,974	13.21%	76.1%	0.82
≥100,000	6	125,285	125,197	8.90%	83.3%	0.96
Total	427	24,488	24,839	25.66%	66.7%	0.96
RIVCOM 2023						
<5,000	-	-	-	-	-	-
5,000-24,999	290	14,414	14,960	35.69%	62.8%	0.69
25,000-49,999	85	32,363	31,054	24.24%	71.8%	0.58
50,000-99,999	45	68,686	70,053	12.34%	80.0%	0.79
≥100,000	7	119,064	125,135	12.67%	71.4%	0.95
Total	427	25,422	25,776	25.35%	66.5%	0.96

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Table 8: Daily Static Model Validation for 2018 and 2023 Base Year Model by Facility Type

By Facility Type	Number of Links	Mean Count	Mean Volume	%RMSE	%Links w/in Caltrans Deviation	Correlation Coefficient
RIVCOM 2018						
Freeways	60	65,659	66,724	14.23%	71.7%	0.96
HOV	21	17,347	18,144	24.45%	76.2%	0.65
Principal Arterial	120	21,802	23,777	30.20%	65.8%	0.86
Minor Arterial	151	17,240	16,538	31.69%	63.6%	0.83
Major Collector	73	12,437	11,625	36.74%	68.5%	0.80
RIVCOM 2023						
Freeways	60	64,771	67,995	14.69%	66.7%	0.96
HOV	21	16,810	18,707	30.91%	61.9%	0.40
Principal Arterial	120	24,501	24,793	28.69%	67.5%	0.82
Minor Arterial	151	17,598	17,349	30.46%	63.6%	0.85
Major Collector	73	13,664	12,527	32.35%	72.6%	0.83

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Table 9: Daily Static Model Validation for 2018 and 2023 Base Year Model by City Group

By City Group	Number of Links	Mean Count	Mean Volume	%RMSE	%Links w/in Caltrans Deviation	Correlation Coefficient
RIVCOM 2018						
Beaumont-Banning	15	21,571	17,280	34.30%	53.3%	0.95
Coachella-Palm Springs	113	15,424	17,427	34.19%	64.6%	0.82
Corona-Riverside	140	29,052	29,914	24.47%	65.7%	0.96
Moreno Valley-Perris	37	19,391	19,186	24.86%	75.7%	0.95
San Jacinto-Hemet	7	18,674	18,717	21.97%	85.7%	0.79
Temecula-Lake Elsinore	74	26,557	23,598	22.87%	67.6%	0.96
Unincorporated Riverside County	41	36,808	39,094	19.52%	68.3%	0.99
RIVCOM 2023						
Beaumont-Banning	15	20,155	18,342	23.26%	66.7%	0.97
Coachella-Palm Springs	113	21,488	18,254	27.93%	60.2%	0.84
Corona-Riverside	140	27,088	30,363	27.75%	63.6%	0.97
Moreno Valley-Perris	37	18,528	20,371	28.92%	64.9%	0.95
San Jacinto-Hemet	7	20,321	20,049	12.32%	100.0%	0.91
Temecula-Lake Elsinore	74	25,732	25,124	18.50%	82.4%	0.96
Unincorporated Riverside County	41	39,035	40,599	20.54%	61.0%	0.99



Horizon Year Updates

Following the update of the RIVCOM baseline year to 2023, the horizon year was revised to reflect updated land use and growth assumptions provided by CVAG member agencies. Two scenarios were developed in the horizon year update (1) an unconstrained 2045 horizon year and (2) a constrained 2050 horizon year.

The unconstrained 2045 horizon year relies on CVAG member agency comments for growth assumptions and does not limit the expected growth. The constrained 2050 scenario was developed to be consistent with the parallel RIVCOM update being conducted by WRCOG which will match the horizon year with the demographic projections in the SCAG 2024 RTP/SCS. Household, employment, and enrollment growth were limited to the control totals provided by the WRCOG, however the geographic distribution of growth was informed by input from agency staff. The following terms are used throughout this chapter:

- (1) Control totals: targeted values set for household, employment, and enrollment data aggregated at the agency level.
- (2) Unadjusted 2045 model: refers to the 2045 horizon year scenario obtained directly from RIVCOM 4.0.1 prior to any modifications.
- (3) Unconstrained 2045 model: refers to the updated 2045 scenario that incorporates land use growth reflecting current planning efforts.
- (4) Constrained 2050 model: refers to the updated 2050 scenario that is constrained to the WRCOG/SCAG demographic projection control totals.

As mentioned under the base year updates methodology, updates discussed in the following sections are inputs for the region-wide socio-economic data for the RIVCOM population synthesizer.

Households

Unconstrained 2045 Horizon Year

Before making any revisions to the 2045 horizon year land use assumptions, the net change (delta) between the updated 2023 base year and the unadjusted 2045 horizon year was calculated for both households and employment. This delta was calculated to cross check that the extensive updates to the 2023 base year did not result in oddities such as declines in households or extreme growth. Comparisons between the updated 2023 base year and the unadjusted 2045 horizon year helped determine the methodology required to update to the 2045 horizon year.

It was anticipated that given the reallocation of households to the 2023 base year there would be discrepancies in growth between the former RIVCOM TAZ growth allocations and the updated RIVCOM allocations. Prior to any adjustments, the delta between 2023 and unadjusted 2045 for

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households in each of CVAG's member agencies was compared to the delta from the unadjusted base year of 2018 to determine if any reallocations to the 2045 assumptions would be needed. **Table 10** below summarizes the results of this comparison.

Table 10: Household Growth between 2018 and 2045 compared to Updated RIVCOM Year 2023

	Delta between 2018 Unadjusted and 2045 Unadjusted			Delta between 2023 Updated and 2045 Unadjusted		
	Total	SFDU	MFDU	Total	SFDU	MFDU
Blythe	2,207	368	1,839	2,488	-57	2,545
Cathedral City	10,792	7,582	3,210	8,995	2,912	6,083
Coachella	29,393	15,200	14,193	26,664	12,548	14,116
Desert Hot Springs	15,002	7,794	7,208	12,855	5,050	7,805
Indian Wells	643	719	-76	1,063	312	751
Indio	17,218	10,100	7,118	12,216	2,830	9,386
La Quinta	4,178	1,935	2,243	3,788	353	3,435
Palm Desert	9,312	1,356	7,956	8,277	-7,237	15,514
Palm Springs	8,055	3,070	4,985	7,770	-2,339	10,109
Rancho Mirage	4,607	3,948	659	5,110	1083	4,027
Unincorporated CVAG¹	18,478	12,774	5,704	19,306	5,134	14,172

To address discrepancies in growth and updated land use and to reflect current planning efforts, outreach was conducted with each CVAG member agency to solicit guidance on anticipated growth at the TAZ level. Growth was added to the updated 2023 base year to arrive at the projected 2045 household totals based on the input received from local agencies. In addition, opportunity site locations were obtained from housing elements of each CVAG member agency to supplement the outreach effort. Due to legislative changes, the housing elements for the 6th cycle Regional Housing Needs Assessment (RHNA) (2021-2029) include more information on locations of planned growth than previous RHNA cycles required. In the absence of specific guidance from the member agencies, the housing elements were utilized and an agency's growth total was held to the jurisdiction level control totals from the unadjusted 2045 horizon year. When a housing element did not specify locations for growth or where housing element allocations fell short of the control totals for 2045, household growth was allocated to TAZs based on historical growth patterns using a proportional distribution approach to match control totals. **Table 11** provides each jurisdiction's projected 2045 household growth and total broken down into single- and multi-family units.

The eastern portion of the City of Coachella (located within city bounds and north of I-10) is currently undeveloped, but specific plans indicate a large increase in households and employment within this area. To best represent the expected growth in Coachella Valley, specific plans within the eastern section of the City of Coachella were used to determine model growth instead of the

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methods previously described above. The following specific plans were examined as a part of this effort: La Entrada, KPC Coachella, Vista Del Agua, Brandenburg Butters, Coachella Vineyards, and Eagle Falls. Each specific plan was compared to the unadjusted 2045 model to confirm the households were already accounted for. At the time of the model update, no finalized environmental impact report for the KPC specific plan had been adopted by Coachella, so it was excluded from the growth projections for the City. The KPC specific plan includes substantial growth and should be included in future updates if approved.

Table 11: CVAG Unconstrained Horizon Year (2045) Household Growth and Totals

	Unconstrained 2045 Household Total			2045 Unconstrained & 2023 Updated Delta		
	Total	SFDU	MFDU	Total	SFDU	MFDU
Blythe	6,798	3891	2,907	2,488	661	1,827
Cathedral City	26,940	18,558	8,382	7,784	3,766	4,018
Coachella	39,019	21,897	17,122	26,667	12,310	14,357
Desert Hot Springs	24,284	13,749	10,535	12,852	5,049	7,803
Indian Wells	2928	2264	664	471	82	389
Indio	46,331	33,344	12,987	15,304	8,326	6,978
La Quinta	22,173	18,113	4,060	6,440	4272	2,168
Palm Desert	35,535	20,814	14,721	11,390	2,170	9,220
Palm Springs	31,416	16,577	14,839	7,120	2,339	4,781
Rancho Mirage	14,062	8,499	5563	5,376	799	4,577
Unincorporated CVAG¹	41,148	26,988	14,160	15,490	4,474	11,016

For the remaining TAZs outside of the CVAG region, household growth was based on the jurisdictional level control totals from the unadjusted 2045 horizon year. Similar to the initial results in the CVAG region, the reallocation of households in the 2023 base year resulted in discrepancies in growth in the western areas of Riverside County. To account for the discrepancies, household growth was allocated to TAZs using a proportional distribution approach based on historical growth patterns between the unadjusted 2018 and 2045 model years. The updated 2045 horizon year household estimates are summarized in **Table 12**.

Figure 9 and **Figure 10** illustrate the growth in households between the updated 2023 and 2045 model years. Red highlights indicate a decrease in households in the future year compared to the base year, while blue highlights indicate an increase. Within the CVAG region, no TAZs have a decrease in households between the base year and horizon year. Given the availability of data and scope of work, households allocated at the TAZ level for the updated horizon year in agencies outside of the CVAG region relied on the historic growth patterns between the unadjusted 2018 and 2045 model years to update the horizon year. Therefore, for the few TAZs projected to have negative growth in the updated 2045 horizon year, this is due to the negative growth carried over from the unadjusted model.

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Figure 11 and **Figure 12** illustrate the difference in the unconstrained and unadjusted 2045 horizon year. Red highlights indicate the unadjusted scenario projected higher households than the unconstrained scenario, while blue highlights indicate the unconstrained scenario projecting more households than the unadjusted scenario. Differences between the unconstrained and unadjusted scenarios are expected given the change in methodology and data sources used to develop the horizon year. Significant differences between the unconstrained and unadjusted horizon year (both increases and decreases) can be seen in Coachella and the unincorporated Coachella Valley TAZs. The differences show the reassignment of growth using updated specific plans and agency comments.

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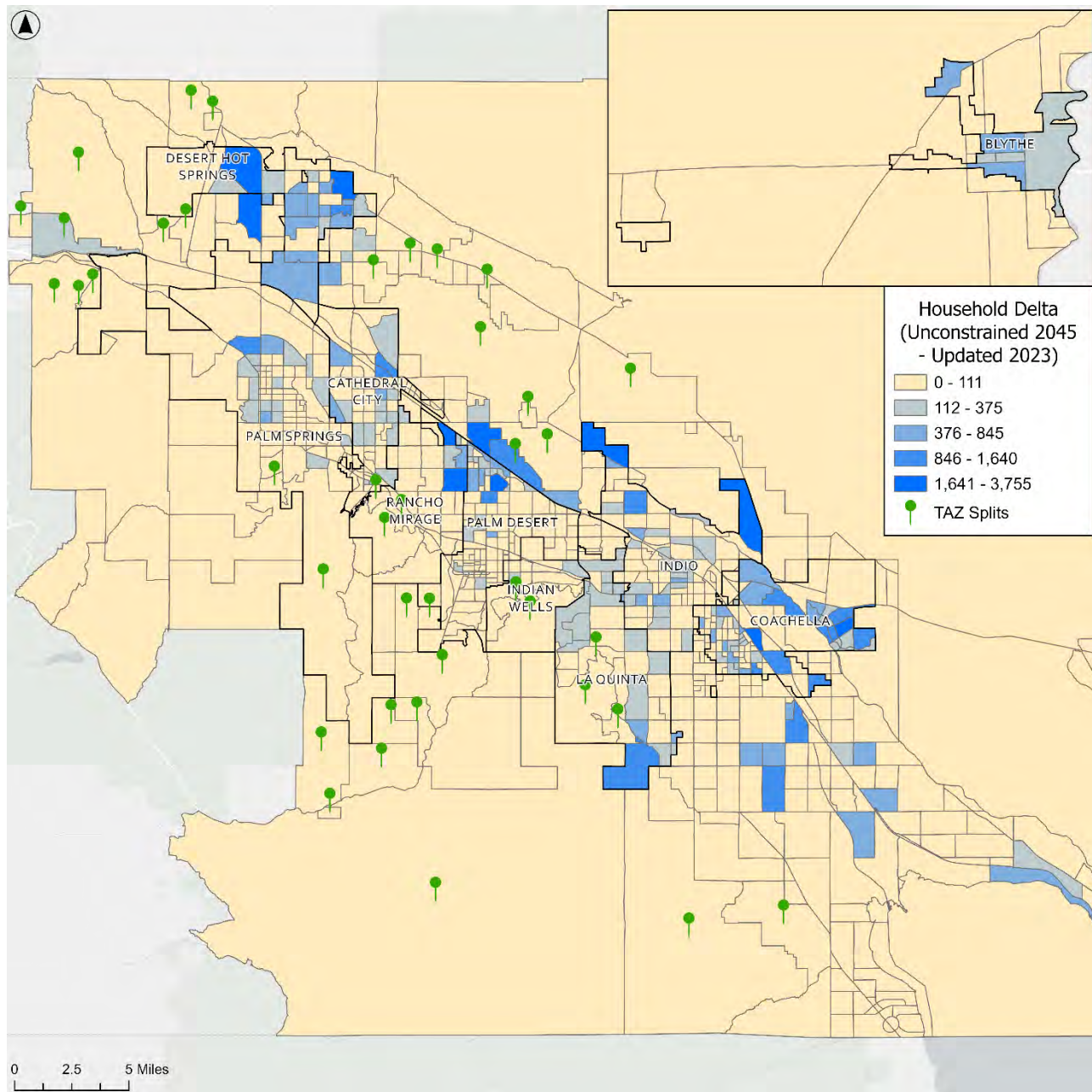
Table 12: Unadjusted and Unconstrained Horizon Year (2045) Household Totals for Riverside County

	Unadjusted RIVCOM 2045			Unconstrained RIVCOM 2045		
City	Total	Single-Family	Multi-Family	Total	Single-Family	Multi-Family
CVAG						
Blythe	6,798	3,173	3,625	6,798	3,891	2,907
Cathedral City	28,151	17,704	10,447	26,940	18,558	8,382
Coachella	39,016	22,135	16,881	39,019	21,897	17,122
Desert Hot Springs	24,287	13,750	10,537	24,284	13,749	10,535
Indian Wells	3,520	2,494	1,026	2,928	2,264	664
Indio	43,243	27,848	15,395	46,331	33,344	12,987
La Quinta	19,521	14,194	5,327	22,173	18,113	4,060
Palm Desert	32,422	11,407	21,015	35,535	20,814	14,721
Palm Springs	32,066	11,899	20,167	31,416	16,577	14,839
Rancho Mirage	13,796	8,783	5,013	14,062	8,499	5,563
Unincorporated CVAG	44,964	27,648	17,316	41,148	26,988	14,160
CVAG - Total	287,784	161,035	126,749	290,634	184,694	105,940
WRCOG						
Banning	15,975	10,286	5,689	15,975	13,559	2,416
Beaumont	24,433	19,884	4,549	24,434	22,490	1,944
Calimesa	11,640	9,407	2,233	11,641	9,709	1,932
Canyon Lake	4,244	3,893	351	4,243	3,904	339
Corona	52,699	33,669	19,030	52,703	37,598	15,105
Eastvale	20,596	15,955	4,641	20,597	18,498	2,099
Hemet	50,428	26,757	23,671	50,427	37,290	13,137
Jurupa Valley	31,821	23,046	8,775	31,822	26,931	4,891
Lake Elsinore	38,267	23,478	14,789	38,269	29,110	9,159
Menifee	49,682	41,017	8,665	49,685	44,520	5,165
Moreno Valley	76,043	47,684	28,359	76,042	60,100	15,942
Murrieta	42,028	31,219	10,809	42,034	34,522	7,512
Norco	7,279	6,593	686	7,278	6,898	380
Perris	37,317	26,406	10,911	37,316	28,695	8,621
Riverside	116,367	76,655	39,712	116,360	80,979	35,381
San Jacinto	24,783	14,621	10,162	24,784	20,165	4,619
Temecula	48,993	32,071	16,922	48,993	37,669	11,324
Wildomar	19,415	14,795	4,620	19,415	15,860	3,555
Unincorporated WRCOG	140,524	107,584	32,940	143,873	130,459	13,414
WRCOG - Total	812,534	565,020	247,514	815,891	658,956	156,935
Riverside County						
Riverside County	1,100,318	726,055	374,263	1,106,525	843,650	262,875

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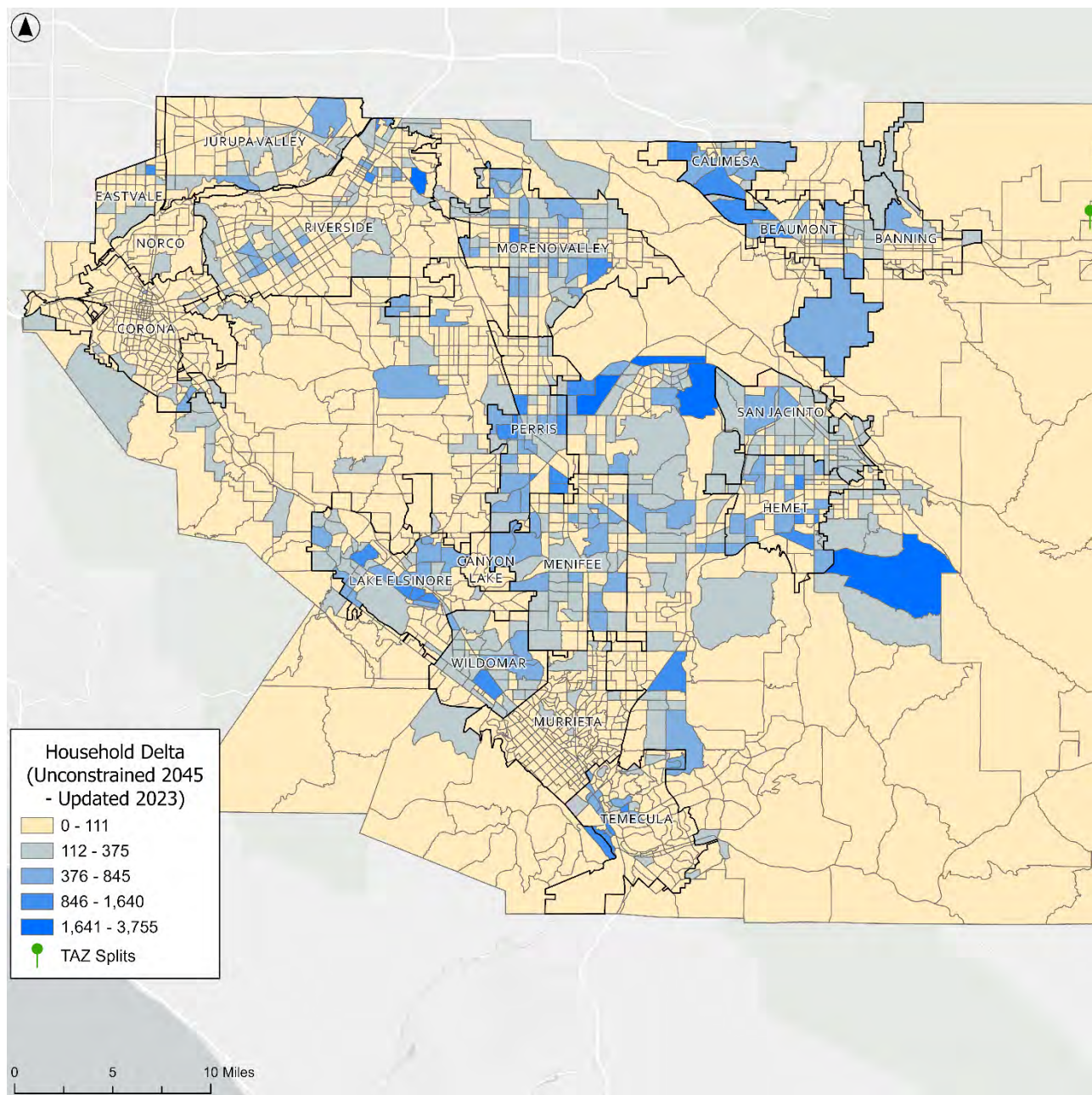
Figure 9: Household Growth between 2023 and 2045 – CVAG



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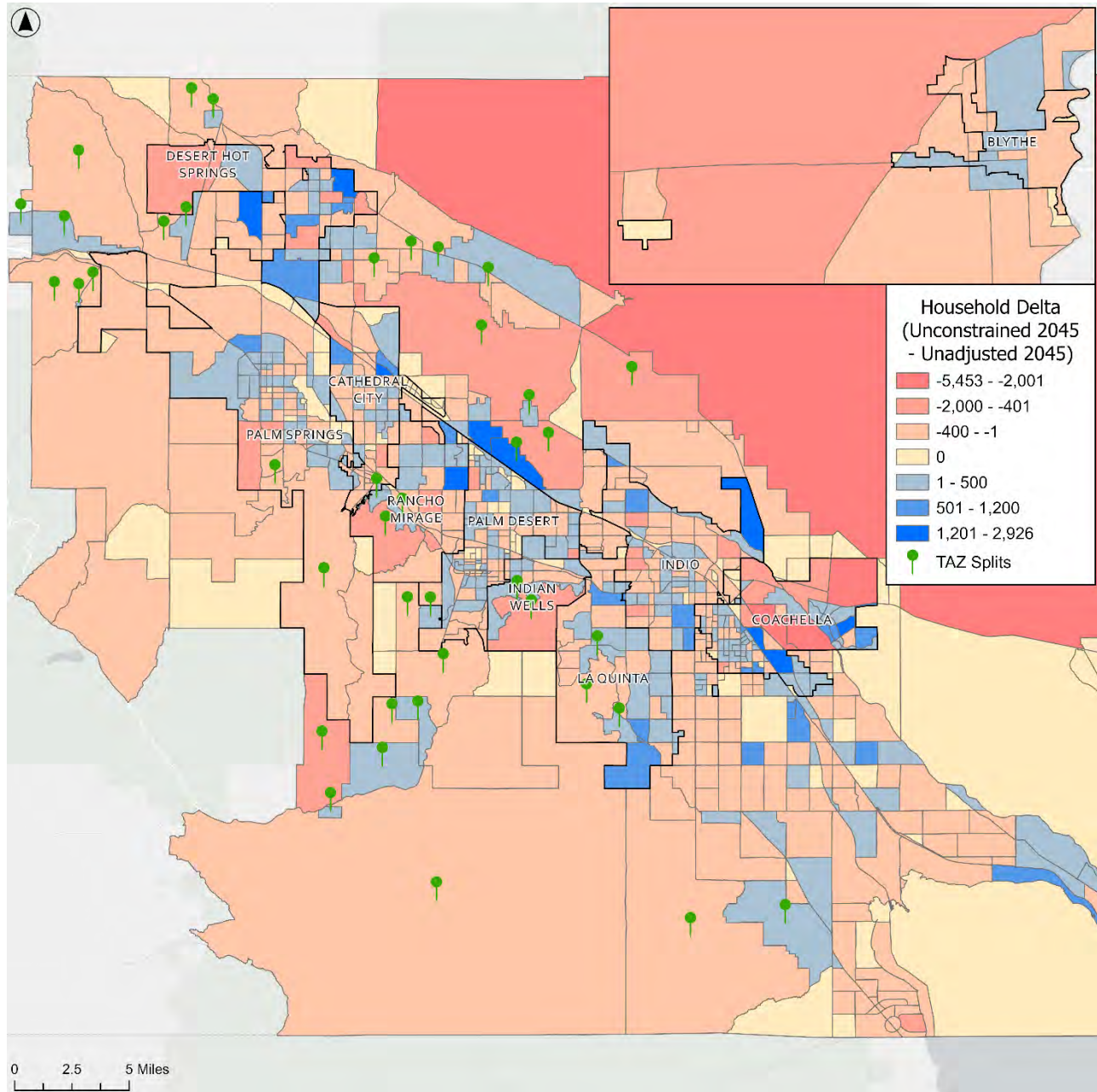
Figure 10: Household Growth between 2023 and 2045 – Western Riverside County



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Figure 11: Household Comparison between 2045 Unconstrained and Unadjusted – CVAG

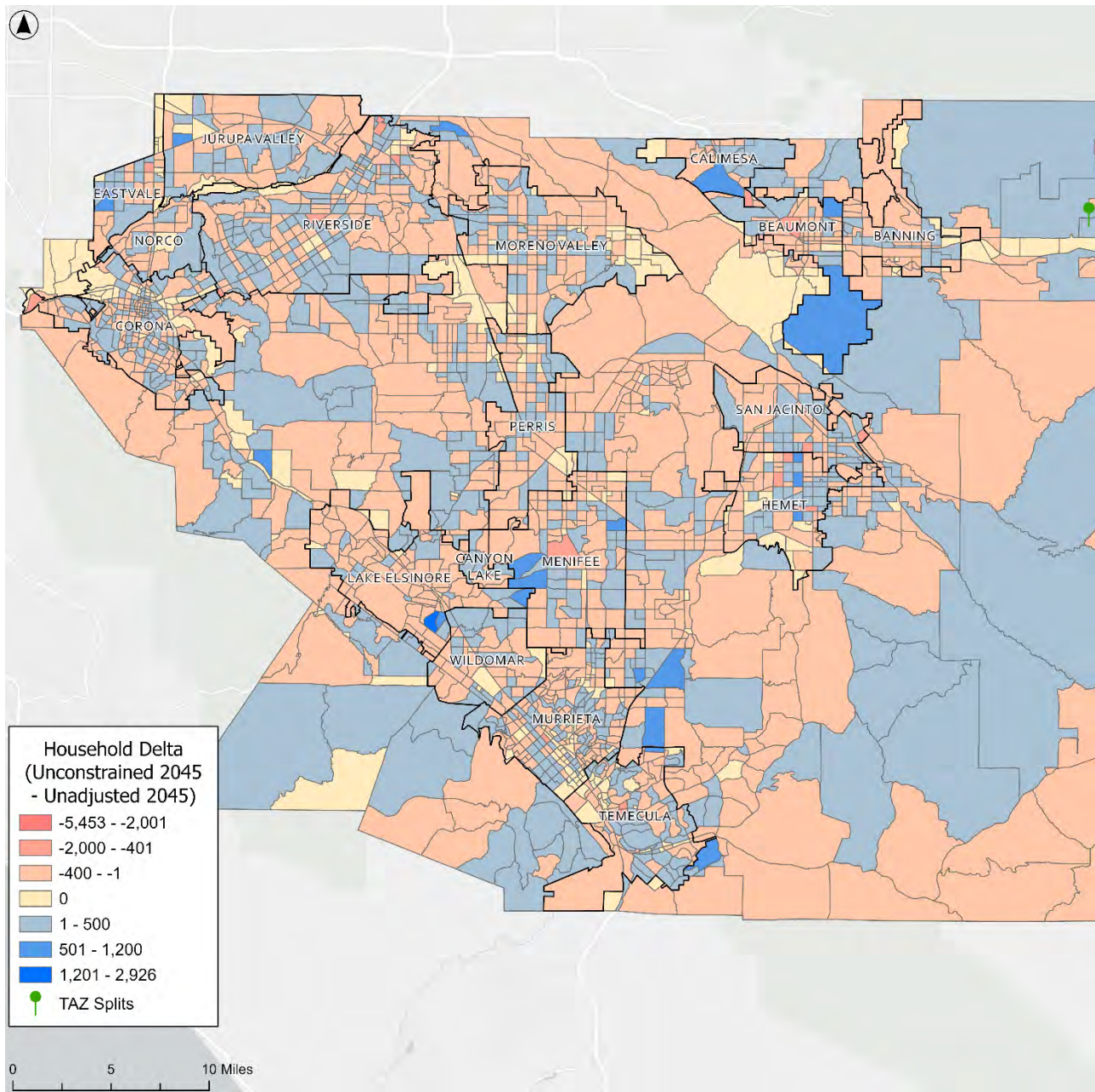


Red highlights indicate the RIVCOM 2045 unadjusted model estimated more households than the 2045 unconstrained model. Blue highlights indicate the RIVCOM 2045 unadjusted estimated less households than the 2045 unconstrained model. The darker colors indicate a larger disparity between the unconstrained and unadjusted models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Figure 12: Household Comparison between 2045 Unconstrained and Unadjusted – Western Riverside County



Red highlights indicate the RIVCOM 2045 unadjusted model estimated more households than the 2045 unconstrained model. Blue highlights indicate the RIVCOM 2045 unadjusted estimated less households than the 2045 unconstrained model. The darker colors indicate a larger disparity between the unconstrained and unadjusted models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Constrained 2050 Horizon Year

The following section describes the edits made to the unconstrained 2045 household totals to develop the constrained 2050 scenario.

Household growth was reduced for agencies where the unconstrained 2045 scenario exceeded the WRCOG/SCAG 2050 control totals were reduced provided there were no existing entitlements, specific plans, or agency comments supporting the additional growth. When reductions were still required following the initial pass, reduced occupancy rates were applied to the TAZs until the agency controls were met.

For agencies where the unconstrained 2045 scenario was lower than the WRCOG/SCAG 2050 control totals, vacant residential zoned parcels were used to accommodate the remaining growth. Growth assigned to vacant residential parcels was removed or reduced to prevent double counting projects already accounted for in permit data, specific plans, or agency comments.

Once the preliminary 2050 household results were completed, additional outreach was conducted with each CVAG member agency to confirm the 2050 growth estimates were consistent with anticipated growth areas. Additional adjustments were made to reflect input received at those meetings. **Table 13** provides each jurisdiction's projected 2050 household growth and total broken down into single- and multi-family units.

Figure 13 and **Figure 14** illustrate household growth between the updated 2023 and constrained 2050 model years. Red highlights indicate a decrease in households in the future year compared to the base year, while blue highlights indicate an increase.

Figure 15 and **Figure 16** illustrate the difference in the unconstrained 2045 scenario and the constrained 2050 scenario. Red highlights indicate the unconstrained 2045 scenario projected higher households than the constrained 2050 scenario, while blue highlights indicate the constrained 2050 scenario is projecting more households than the unconstrained 2045 scenario. Differences between the unconstrained 2045 and constrained 2050 scenarios are expected given the change in methodology to update the unconstrained 2045 horizon year to the 2050 scenario. Many of these differences result from the reassignment of growth applied when constraining the 2050 horizon year to city control totals. Large decreases generally occur in TAZs whose projected growth was limited to remain within their control total. Conversely, large increases occur where the control total required more household growth than the unconstrained scenario had estimated, prompting additional growth to be allocated to those TAZs.

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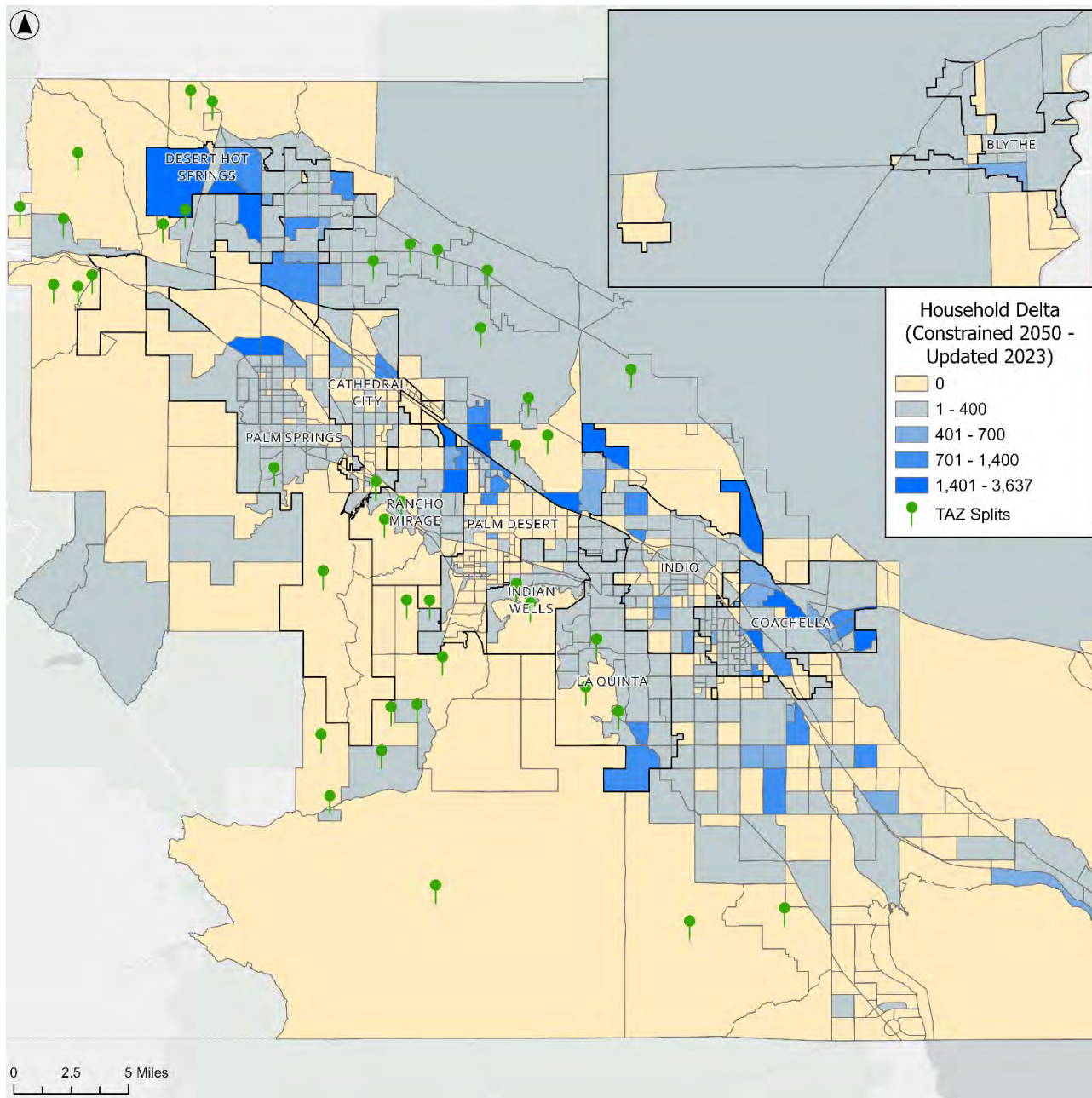
Table 13: Unconstrained 2045 and Constrained 2050 Horizon Year Household Totals for Riverside County

	Unconstrained RIVCOM 2045			Constrained RIVCOM 2050		
City	Total	Single-Family	Multi-Family	Total	Single-Family	Multi-Family
CVAG						
Blythe	6,798	3,891	2,907	5,998	3,852	2,146
Cathedral City	26,940	18,558	8,382	23,998	17,297	6,701
Coachella	39,019	21,897	17,122	32,695	18,523	14,172
Desert Hot Springs	24,284	13,749	10,535	23,680	18,317	5,363
Indian Wells	2,928	2,264	664	3,337	2,754	583
Indio	46,331	33,344	12,987	47,371	33,541	13,830
La Quinta	22,173	18,113	4,060	20,089	16,890	3,199
Palm Desert	35,535	20,814	14,721	30,012	20,426	9,586
Palm Springs	31,416	16,577	14,839	30,706	18,172	12,534
Rancho Mirage	14,062	8,499	5,563	14,802	9,707	5,095
Unincorporated CVAG	41,148	26,988	14,160	45,867	30,279	15,588
CVAG - Total	290,634	184,694	105,940	278,555	189,758	88,797
WRCOG						
Banning	15,975	13,559	2,416	13,221	11,599	1,622
Beaumont	24,434	22,490	1,944	23,656	21,204	2,452
Calimesa	11,641	9,709	1,932	5,581	5,218	363
Canyon Lake	4,243	3,904	339	4,541	4,127	414
Corona	52,703	37,598	15,105	52,064	38,118	13,946
Eastvale	20,597	18,498	2,099	19,485	17,806	1,679
Hemet	50,427	37,290	13,137	50,076	39,366	10,710
Jurupa Valley	31,822	26,931	4,891	36,018	30,229	5,789
Lake Elsinore	38,269	29,110	9,159	27,480	21,897	5,583
Menifee	49,685	44,520	5,165	48,604	44,726	3,878
Moreno Valley	76,042	60,100	15,942	76,268	58,780	17,488
Murrieta	42,034	34,522	7,512	39,766	32,198	7,568
Norco	7,278	6,898	380	7,986	7,618	368
Perris	37,316	28,695	8,621	34,404	27,016	7,388
Riverside	116,360	80,979	35,381	128,438	90,231	38,207
San Jacinto	24,784	20,165	4,619	24,176	19,414	4,762
Temecula	48,993	37,669	11,324	42,377	33,343	9,034
Wildomar	19,415	15,860	3,555	17,377	14,371	3,006
Unincorporated WRCOG	143,873	130,459	13,414	121,625	108,911	12,714
WRCOG - Total	815,891	658,956	156,935	773,143	626,172	146,971
Riverside County						
Riverside County	1,106,525	843,650	262,875	1,051,698	815,930	235,768

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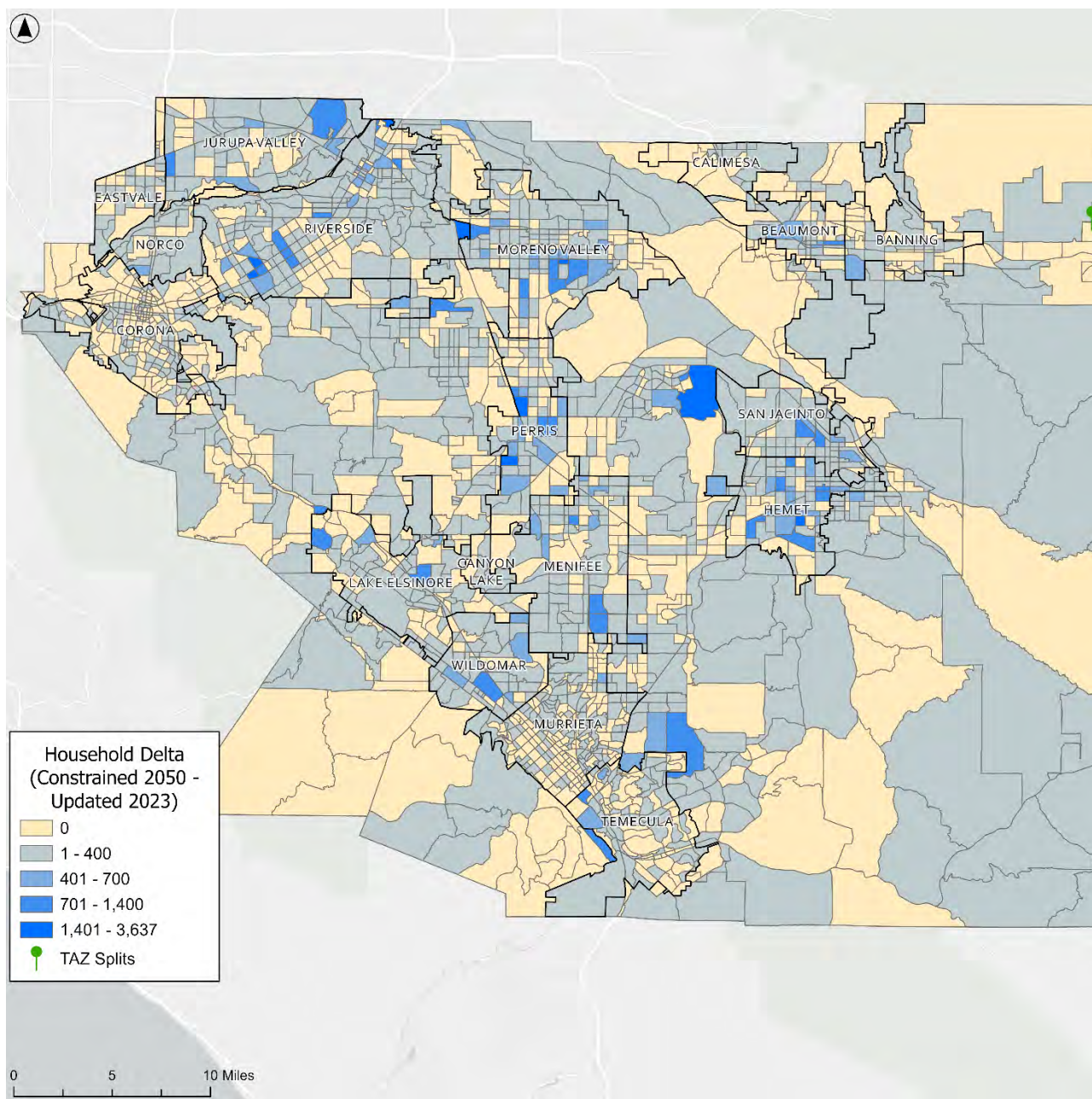
Figure 13: Household Growth between 2023 and Constrained 2050 – CVAG



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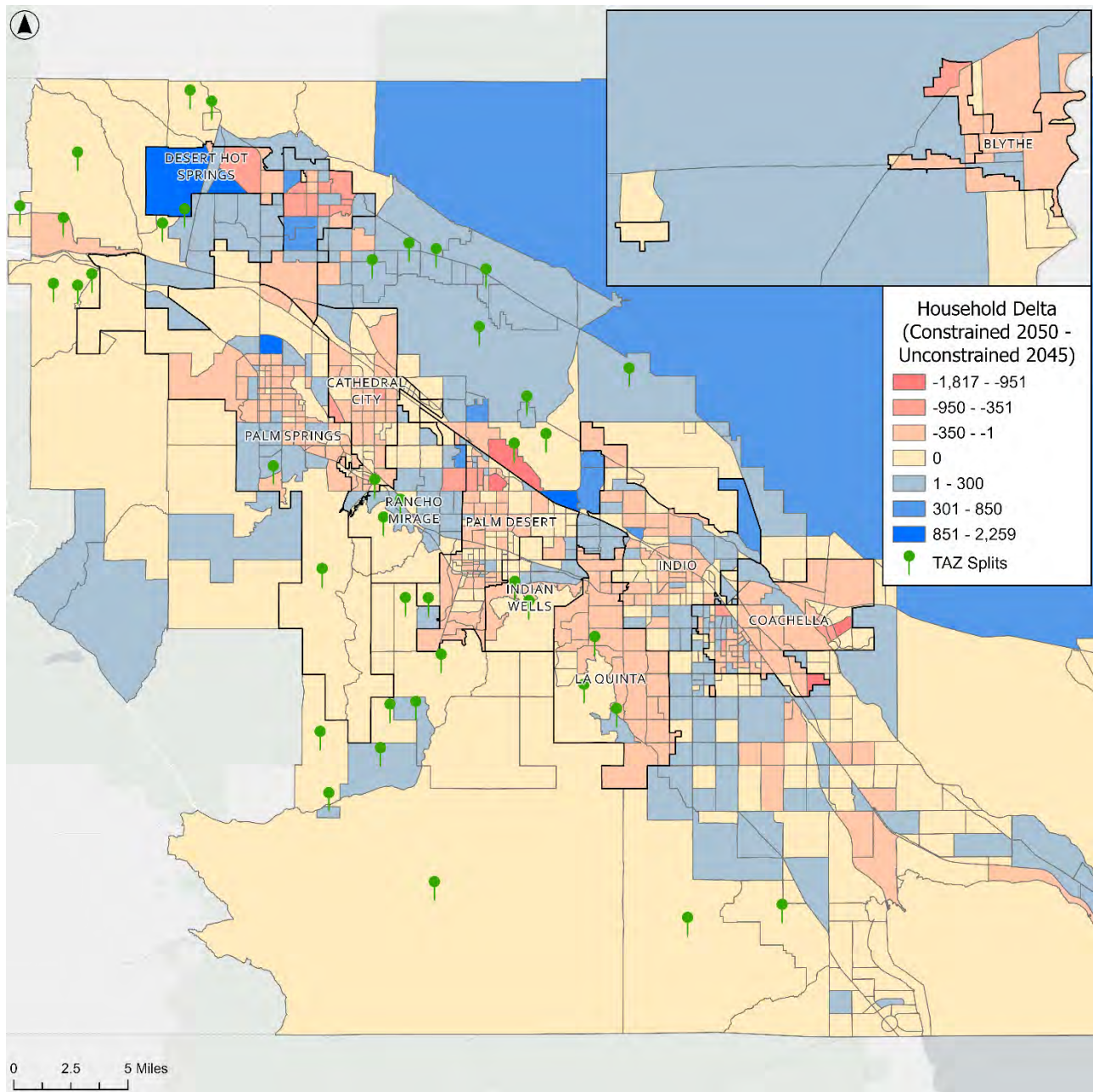
Figure 14: Household Growth between 2023 and Constrained 2050 – Western Riverside County



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Figure 15: Household Comparison between Constrained 2050 and Unconstrained 2045 – CVAG

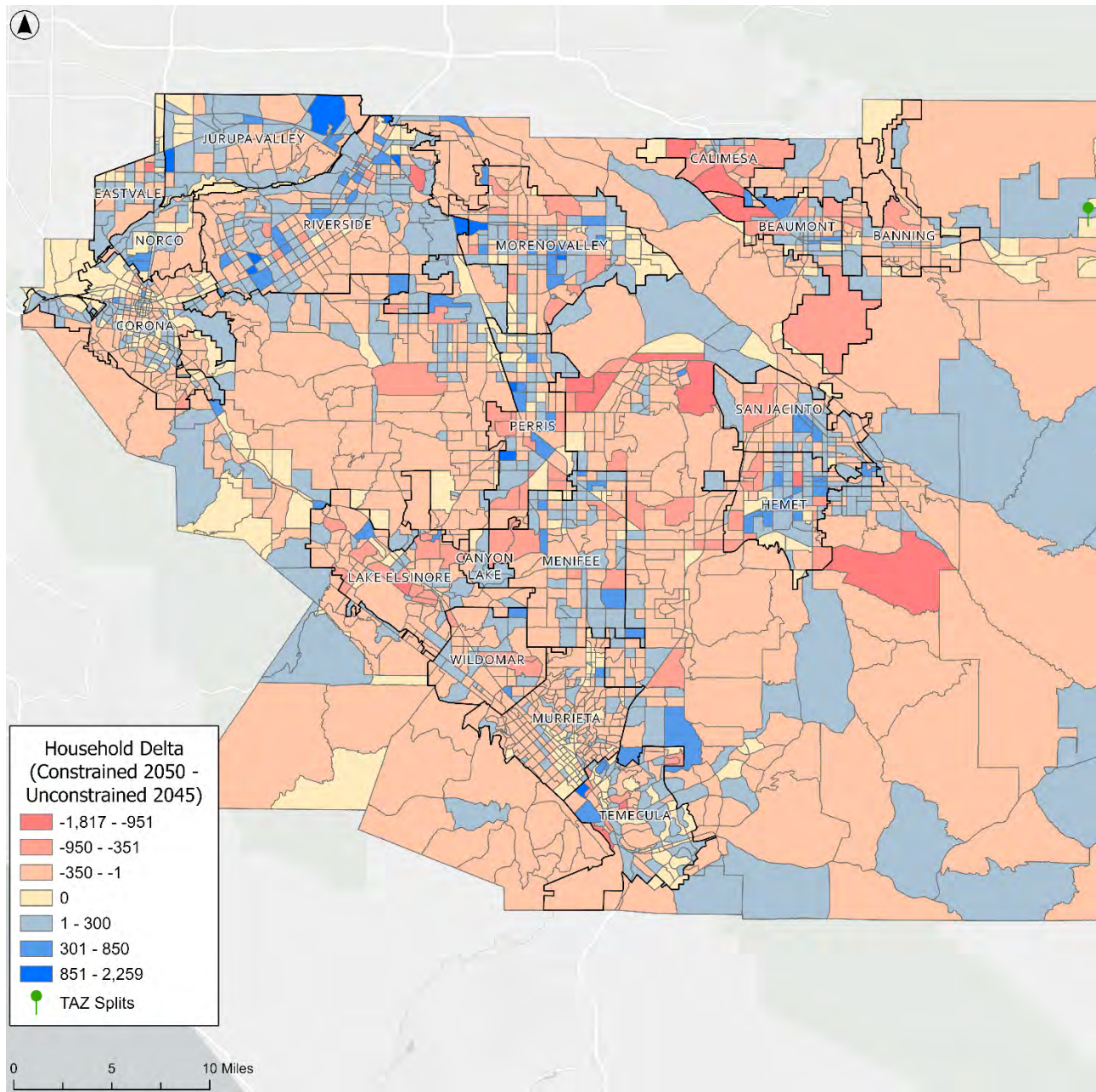


Red highlights indicate the RIVCOM 2045 unconstrained model estimated more households than the 2050 constrained model. Blue highlights indicate the RIVCOM 2045 unconstrained model estimated less households than the 2050 constrained model. The darker colors indicate a larger disparity between the constrained and unconstrained models. TAZ splits indicate a TAZ has been altered from RIVCOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Figure 16: Household Comparison between Constrained 2050 and Unconstrained 2045 – Western Riverside County



Red highlights indicate the RIVCOM 2045 unconstrained model estimated more households than the 2050 constrained model. Blue highlights indicate the RIVCOM 2045 unconstrained model estimated less households than the 2050 constrained model. The darker colors indicate a larger disparity between the constrained and unconstrained models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting

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Employment

The horizon year employment data was updated using two primary data sources - member agency comments and TUMF permit data - to reflect the anticipated growth in the RIVCOM model. The following data sources were utilized in the development of the updated horizon year employment totals:

Member Agency Comments: After conducting outreach, several CVAG member agencies provided specific guidance on anticipated employment growth, leading to targeted adjustments in their respective employment allocations. Comments from CVAG member agencies were also used to replace the unadjusted 2045 employment totals where applicable. Each agency was instructed to provide an estimated growth in square footage or employees from 2023 to 2045 to help inform the employment totals in the unconstrained 2045 employment. Unless specified otherwise, the unadjusted model growth was applied to TAZs where agencies did not provide specific input.

TUMF Permit Data: CVAG TUMF data included permits deemed not constructed and operational by the end of 2023, specifically defined as permits issued from the start of 2024 through March 2025. Following the same approach detailed in the base year update, the permit data was converted into employees using the ratios summarized in **Table 3**.

Employment Additions: Comparisons between the horizon year employment totals and the updated 2023 base year employment totals showed some decreases due to the addition of employment to 2023 in TAZs where previously there had been no or low employment forecasted for the future year. To correct this, the employment growth, or delta, that was added to 2018 to develop the 2023 base year was also added to the future year. This adjustment corrected for new employment that may not have been considered when the model was originally developed. Although minor decreases in employment is not unrealistic, large employment decreases were not considered reasonable.

Unconstrained 2045 Horizon Year

A comparison of employment growth between 2018 and unadjusted 2045 and between 2023 and unadjusted 2045 indicated that overall 2045 employment projections remained reasonable. However, some minor decreases in specific industries were observed. To better reflect anticipated economic trends and incorporate information from all data sources reviewed, targeted adjustments to 2045 land use growth trends at the TAZ level were made using the following assumptions:

Acceptable Sector Decreases: Modest employment decreases in agriculture, construction, retail, FIRE (finance, insurance, and real estate), professional, education, arts/entertainment, public administration, and service sectors were deemed acceptable and consistent with regional and statewide trends as indicated by statewide job reports and conversations with local agency staff. These changes were not adjusted further.

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Targeted Sector Corrections: Decreases in the manufacturing, wholesale, transportation, and information sectors were not considered appropriate given the expected long-term growth in these industries. In the absence of agency guidance, when decreases were observed, employment was set to be equal to 2023 levels. This ensured alignment with broader economic expectations in the absence of localized forecasts.

As noted above, the employment assumptions for 2045 within the CVAG region were informed by member agency comments and TUMF permit data at the TAZ level. In TAZs where specific agency input was not provided, the unadjusted model growth was used to represent growth between 2023 and 2045. Subsequently, a review of the growth between the unconstrained 2045 and the updated 2023 base year employment revealed significant decreases in several employment sectors. Decreases were found to be caused by one of two reasons:

- (1) employment added to the unadjusted 2018 data to develop the 2023 base year exceeded the growth that was previously forecasted in the model for 2045; and/or
- (2) the unadjusted model growth from 2018 to 2045 previously projected a decrease in employment.

To address declines due to unforeseen growth from the previous model, employment growth from 2018 to 2023 was added to the horizon year of 2045 only for TAZs that would have otherwise shown a significant decline in employment. This ensured that growth occurring between 2018 and 2023 was not artificially lost by the horizon year simply because the growth was not forecasted during the development of the previous model. To prevent overestimating employment growth at the jurisdictional level, employment growth was equivalently removed from other TAZs such that the overall growth for each jurisdiction remained consistent for 2045. When determining if employment growth needed to be equivalently adjusted down, all 13 RIVCOM employment categories were first grouped into 4 categories (industrial, retail/service, office, and educational). Aggregating the 13 categories into 4 generalized categories allows for an accounting of the potential differences in employment category assignment assumed when distributing the employment. For example, a TAZ could have been assigned 200 employees under the "Retail" category as part of the 2018 to 2023 additions. However, the previous model development could have assumed the 2018 to 2045 growth as 100 employees in "Retail" and the remaining 100 in the "ArtEnt" (arts and entertainment) category showing an overall equivalent growth in employment, but a decrease in the "Retail" employment category. Thus, aggregating the 13 categories into the 4 generalized categories ensures that employment was not overestimated for 2045.

To address reason (2) above, negative employment growth was proportionally reduced to zero when aggregated at the agency level. Removing negative employment growth only occurred for the targeted sectors (manufacturing, wholesale, transportation, and information) that were deemed to be inconsistent with current market trends. Negative employment growth could still exist at the TAZ level to account for businesses moving locations but not when aggregated at the agency level to ensure that the larger employment growth assumptions matched market trends.

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Before finalizing the employment assumptions for 2045, the updated 2045 totals were held equal to the unadjusted 2045 model totals for jurisdictions outside of the CVAG region, as well as for CVAG member agencies that had no changes for employment growth assumptions. This was done to align the overall model growth with the expected growth seen in the unadjusted RIVCOM 4.0.1 model. Agencies that did provide input on employment growth may have higher projected employment than the unadjusted 2045 model due to the requested additions combined with corrections made to account for negative growth inconsistent with market trends. In some cases, TUMF permit data also demonstrated growth that was not accounted for in the unadjusted 2045 future year.

As shown in **Table 14**, the 2045 employment totals of ten cities (Banning, Blythe, Calimesa, Canyon Lake, Hemet, Indian Wells, Lake Elsinore, Murrieta, Perris, and Temecula) experience minimal changes (less than 50 employees) between the unadjusted and unconstrained horizon year. Five agencies (Beaumont, La Quinta, Menifee, Norco, and San Jacinto) saw an increase of no more than 1,000 employees compared to the unadjusted horizon year. Fourteen agencies (Cathedral City, Coachella, Corona, Desert Hot Springs, Eastvale, Indio, Jurupa Valley, Moreno Valley, Palm Desert, Palm Springs, Rancho Mirage, Riverside, Wildomar, and unincorporated Riverside County) increased by more than 1,000 employees when compared to the unadjusted horizon year. The increased employment totals are considered acceptable due to the reasons described above. It is recommended that the next model update provide a similar level of review of employment growth projections for areas outside the Coachella Valley.

Figure 17 and **Figure 18** compare the 2045 horizon year employment totals to the updated 2023 year for the CVAG and WRCOG regions. Red highlights indicate a decrease in employment from the base model year, while blue highlights indicate an increase in employment. All red highlighted TAZs experience a decrease in total employment from 2023 for two reasons: (1) these TAZs experienced minor negative growth from the unadjusted model growth and the declines in the employment sectors were considered acceptable or (2) there were direct comments from the member agency to expect a decrease in employment.

Figure 19 and **Figure 20** illustrate the difference between the unconstrained and unadjusted 2045 horizon year. Red highlights indicate the unadjusted scenario projected higher employment than the unconstrained scenario, while blue highlights indicate the unconstrained scenario projecting more employment than the unadjusted scenario. Differences between the unconstrained and unadjusted scenarios are expected given the change in methodology and data sources used to develop the horizon year. Significant differences between the unconstrained and unadjusted horizon year in Coachella Valley are caused by the reassignment of employment from TAZ splits and agency comments. Refer to **Appendix C** for industry level comparisons.

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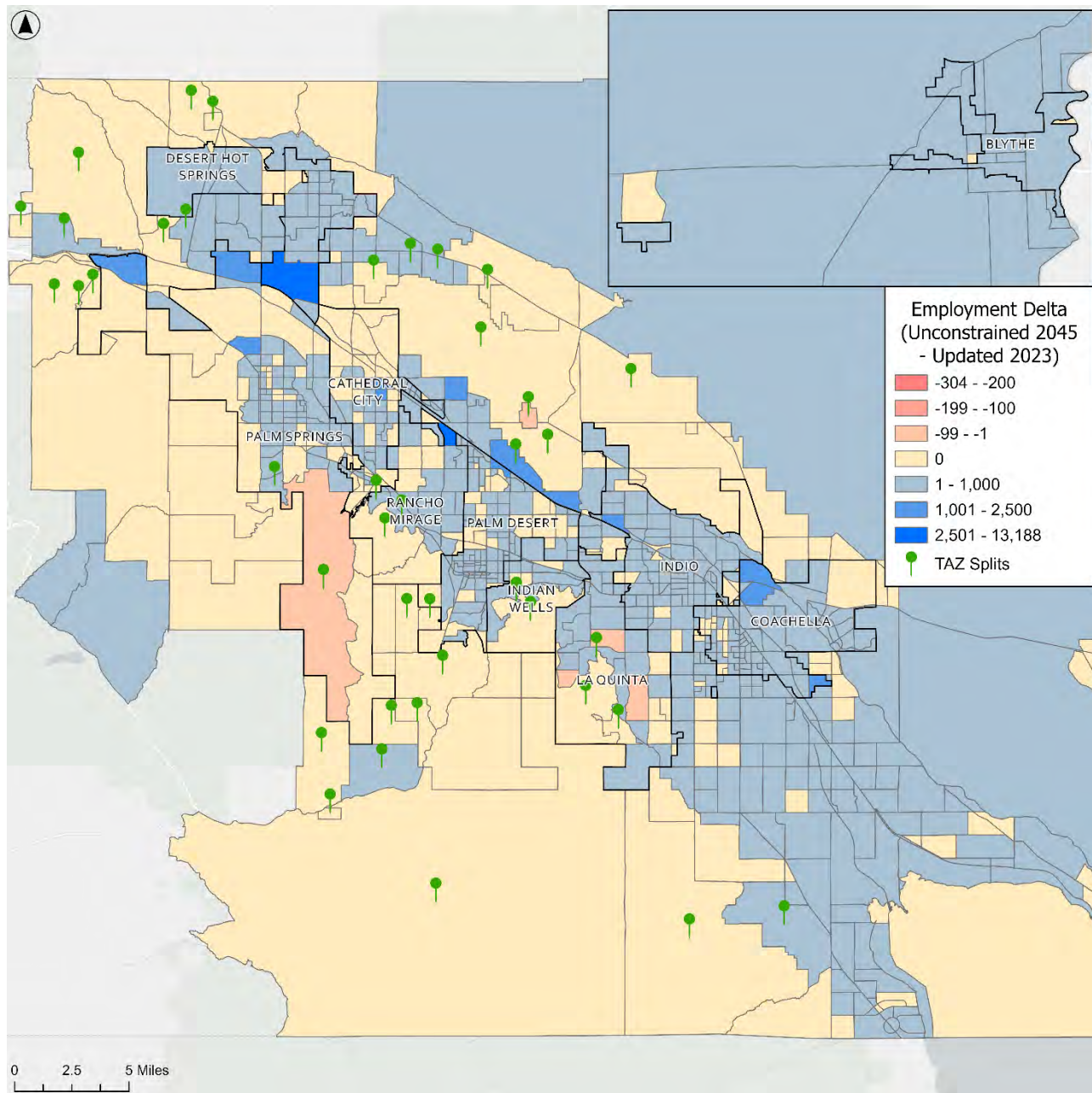
Table 14: Unadjusted and Unconstrained Horizon Year (2045) Employment Totals for Riverside County

City	Unadjusted 2045 Total Employment	Unconstrained 2045 Total Employment	Unconstrained - Unadjusted 2045 Delta
CVAG			
Blythe	4,703	4,729	26
Cathedral City	17,788	22,178	4,390
Coachella	23,977	29,753	5,776
Desert Hot Springs	8,228	11,707	3,479
Indian Wells	6,672	6,722	50
Indio	39,103	40,293	1,190
La Quinta	18,720	19,002	282
Palm Desert	55,128	56,787	1,659
Palm Springs	41,701	45,900	4,199
Rancho Mirage	20,611	30,379	9,768
Unincorporated CVAG	33,152	38,981	5,829
CVAG - Total	269,783	306,431	36,648
WRCOG			
Banning	11,505	11,455	-50
Beaumont	15,761	17,107	1,346
Calimesa	9,589	9,620	31
Canyon Lake	2,319	2,319	0
Corona	91,334	92,441	1,107
Eastvale	18,457	21,125	2,668
Hemet	39,993	40,006	13
Jurupa Valley	31,890	33,957	2,067
Lake Elsinore	23,385	23,384	-1
Menifee	28,243	28,120	-123
Moreno Valley	65,138	71,117	5,979
Murrieta	50,439	50,423	-16
Norco	22,128	22,216	88
Perris	34,275	34,267	-8
Riverside	191,799	195,967	4,168
San Jacinto	13,390	13,886	496
Temecula	76,124	76,126	2
Wildomar	11,213	12,294	1,081
Unincorporated WRCOG	109,260	120,254	10,994
WRCOG - Total	846,242	876,084	29,842
Riverside County			
Riverside County	1,116,025	1,182,515	66,490

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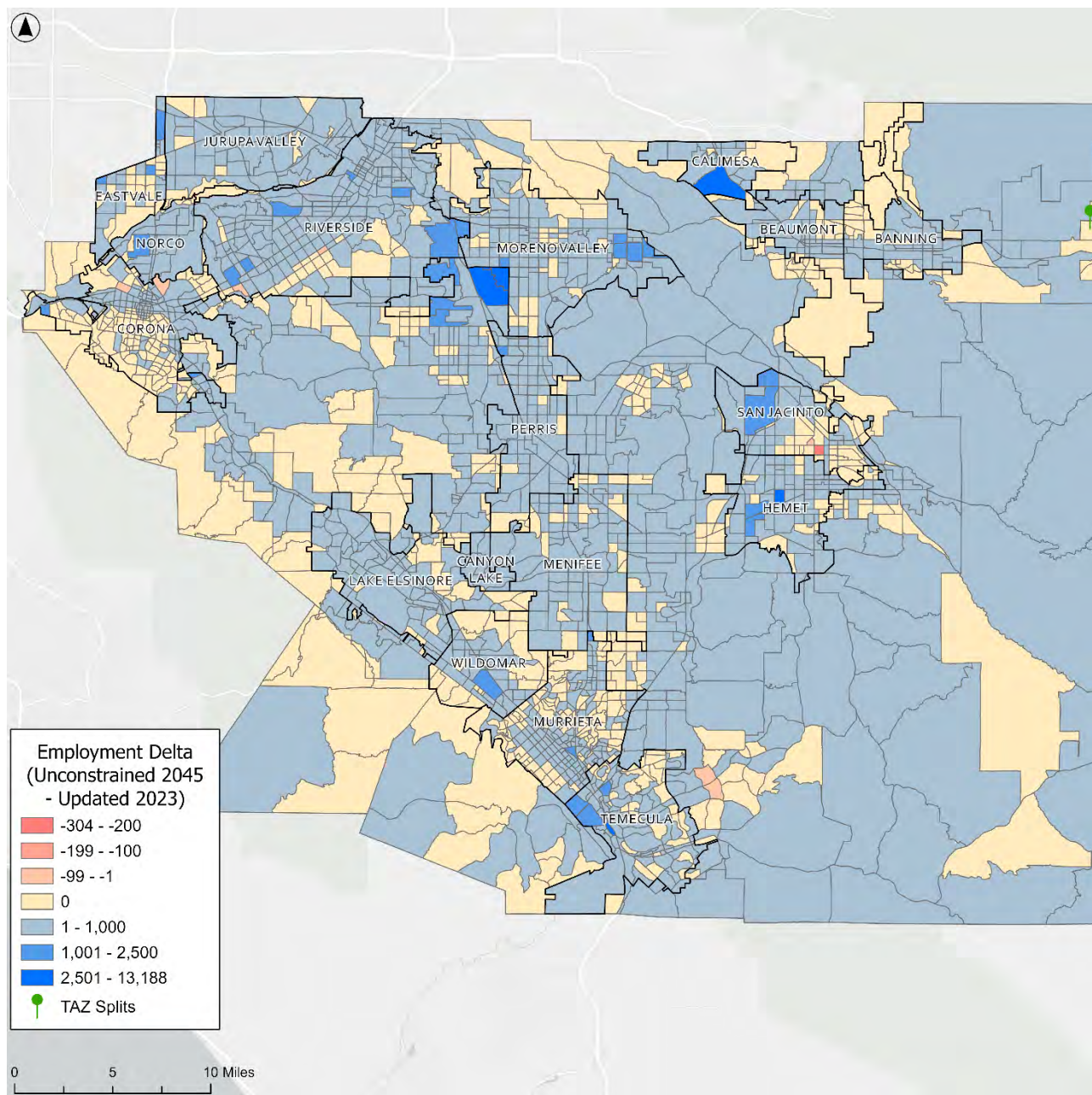
Figure 17: Employment Growth between 2023 and 2045 – CVAG



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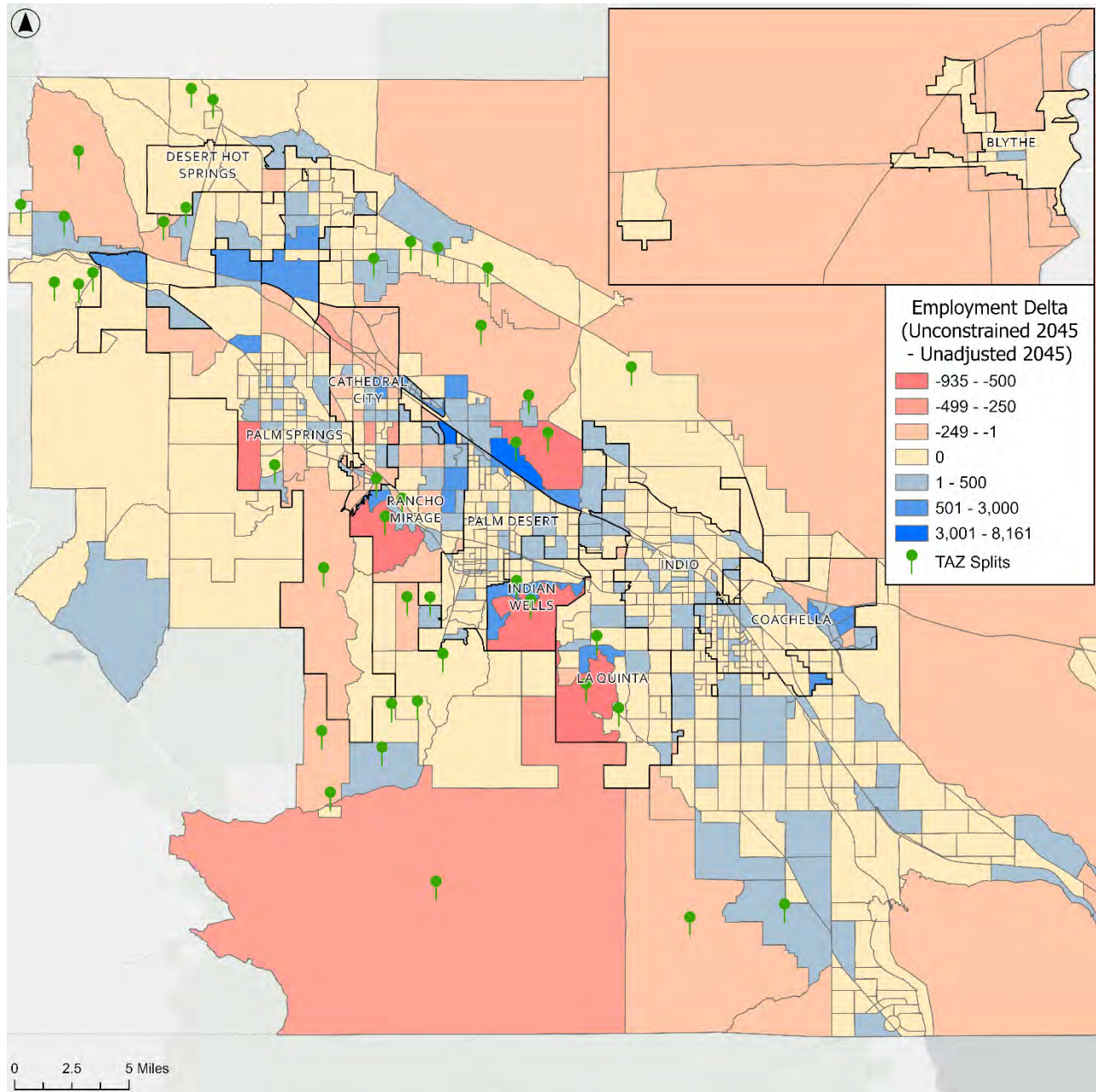
Figure 18: Employment Growth between 2023 and 2045 – Western Riverside County



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Figure 19: Employment Comparison between 2045 Unconstrained and Unadjusted – CVAG

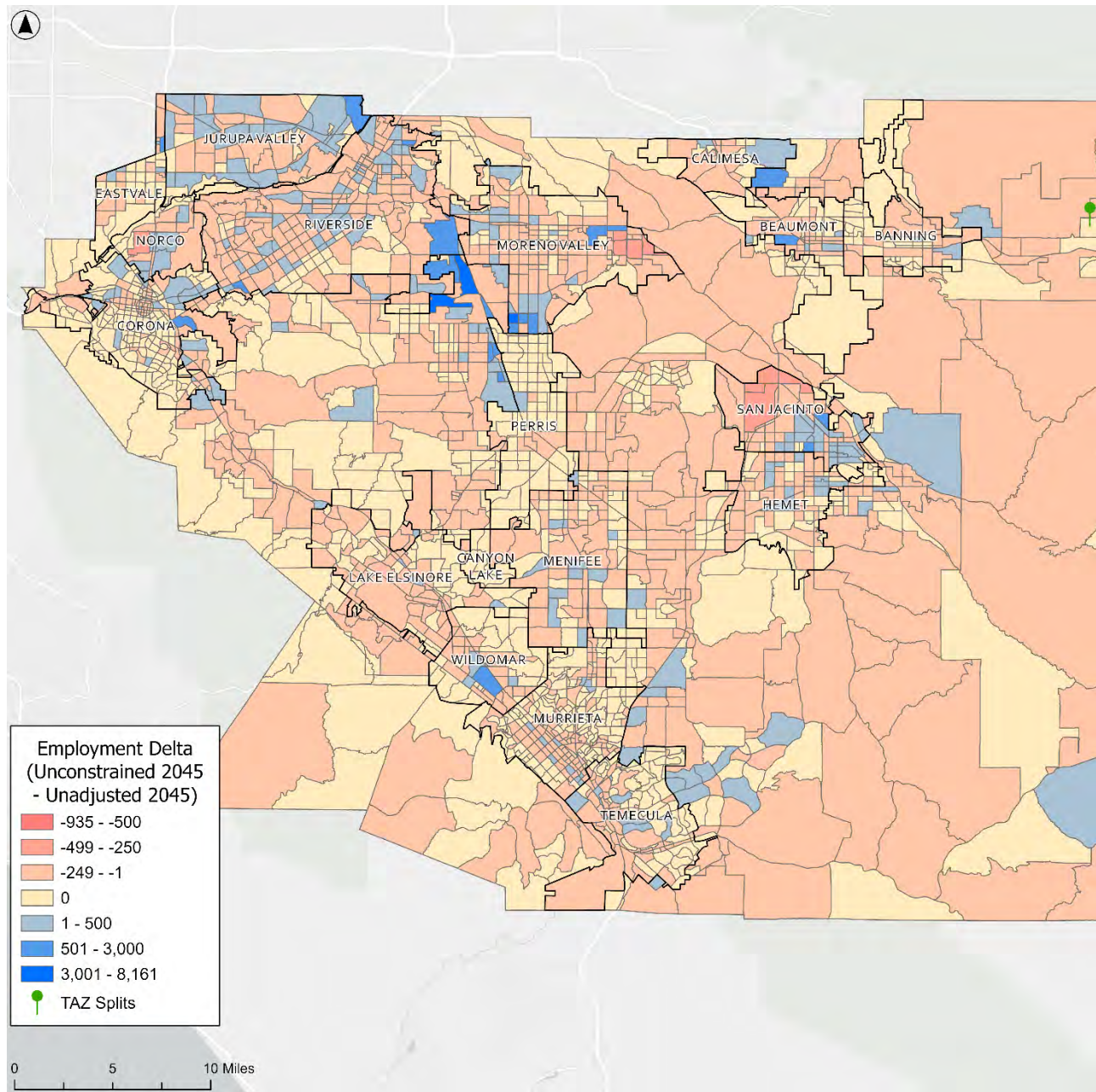


Red highlights indicate the RIVCOM 2045 unadjusted model estimated more employment than the 2045 unconstrained model. Blue highlights indicate the RIVCOM 2045 unadjusted estimated less employment than the 2045 unconstrained model. The darker colors indicate a larger disparity between the unconstrained and unadjusted models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Figure 20: Employment Comparison between 2045 Unconstrained and Unadjusted – Western Riverside County



Red highlights indicate the RIVCOM 2045 unadjusted model estimated more employment than the 2045 unconstrained model. Blue highlights indicate the RIVCOM 2045 unadjusted estimated less employment than the 2045 unconstrained model. The darker colors indicate a larger disparity between the unconstrained and unadjusted models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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Constrained 2050 Horizon Year

Using a similar approach to the unconstrained 2045 scenario, employment growth for the horizon year began with an inventory of planned and permitted projects, compiled through member agency outreach, TUMF permit data, and specific plans. Where reported employment was missing or fell short of the control total after incorporating available data sources, the remaining growth was supplemented using WRCOG/SCAG 2050 growth estimates. To stay consistent with the industry level forecasts, no adjustments were made to the targeted sectors. At the TAZ level, negative growth within each industry category was adjusted where the decline exceeded the base year total. This process was implemented to remove negative employment totals at the industry level while maintaining consistency with the WRCOG/SCAG 2050 forecast. It is recommended that the next model update provides a similar level of review of employment growth projections for areas outside the Coachella Valley.

As shown in **Table 15**, the employment totals of eight of the eleven CVAG agencies (Cathedral City, Coachella, Desert Hot Springs, Indio, Palm Desert, Palm Springs, Rancho Mirage, and Unincorporated Riverside County - CVAG) have forecasted less growth in the constrained 2050 scenario than the unconstrained 2045 scenario. The remaining three agencies (Blythe, Indian Wells, and La Quinta) show a higher forecasted growth in the constrained 2050 scenario compared to the 2045 unconstrained. The CVAG region overall results in 28,364 less employees under the constrained 2050 scenario. The employment totals of seven of the nineteen WRCOG agencies (Beaumont, Calimesa, Lake Elsinore, Perris, Temecula, Wildomar, and Unincorporated Riverside County - WRCOG) have forecasted less growth in the constrained 2050 scenario than the unconstrained 2045 scenario. The remaining twelve agencies (Banning, Canyon Lake, Corona, Eastvale, Hemet, Jurupa Valley, Menifee, Moreno Valley, Murrieta, Norco, Riverside, and San Jacinto) show a higher forecasted growth in the constrained 2050 scenario compared to the 2045 unconstrained. The WRCOG region overall results in 35,863 more employees under the constrained 2050 scenario. The county overall results in 7,499 more employment under the constrained 2050 scenario.

Figure 21 and **Figure 22** compare the constrained 2050 horizon year employment totals to the updated 2023 year for the CVAG and WRCOG regions. Red highlights indicate a decrease in employment from the base year, while blue highlights indicate an increase. All red highlighted TAZs experience a decrease in total employment from 2023 for two reasons: (1) these TAZs experienced negative growth from the WRCOG model growth and the declines in the employment sectors were considered acceptable to remain consistent with the industry level forecasts or (2) there were direct comments from the member agency to expect a decrease in employment.

Figure 23 and **Figure 24** illustrate the difference between the constrained 2050 and unconstrained 2045 horizon year. Red highlights indicate the unconstrained 2045 scenario projected higher employment than the constrained 2050 scenario, while blue highlights indicate the constrained 2050 scenario projecting more employment than the unconstrained 2045 scenario. Differences between the constrained 2050 and unconstrained 2045 scenarios are expected given the change in methodology and data sources used to develop the horizon year. Significant differences between the constrained 2050 and unconstrained 2045 horizon year in

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Coachella Valley are caused by the reassignment of employment when constraining the horizon year to regional control totals. Large decreases generally occur where a TAZ's projected growth was limited to keep employment within its control total. Conversely, large increases occur where the control total required more employment growth than the unconstrained scenario had estimated, prompting additional growth to be allocated to the TAZ. Refer to **Appendix C** for industry level comparisons.

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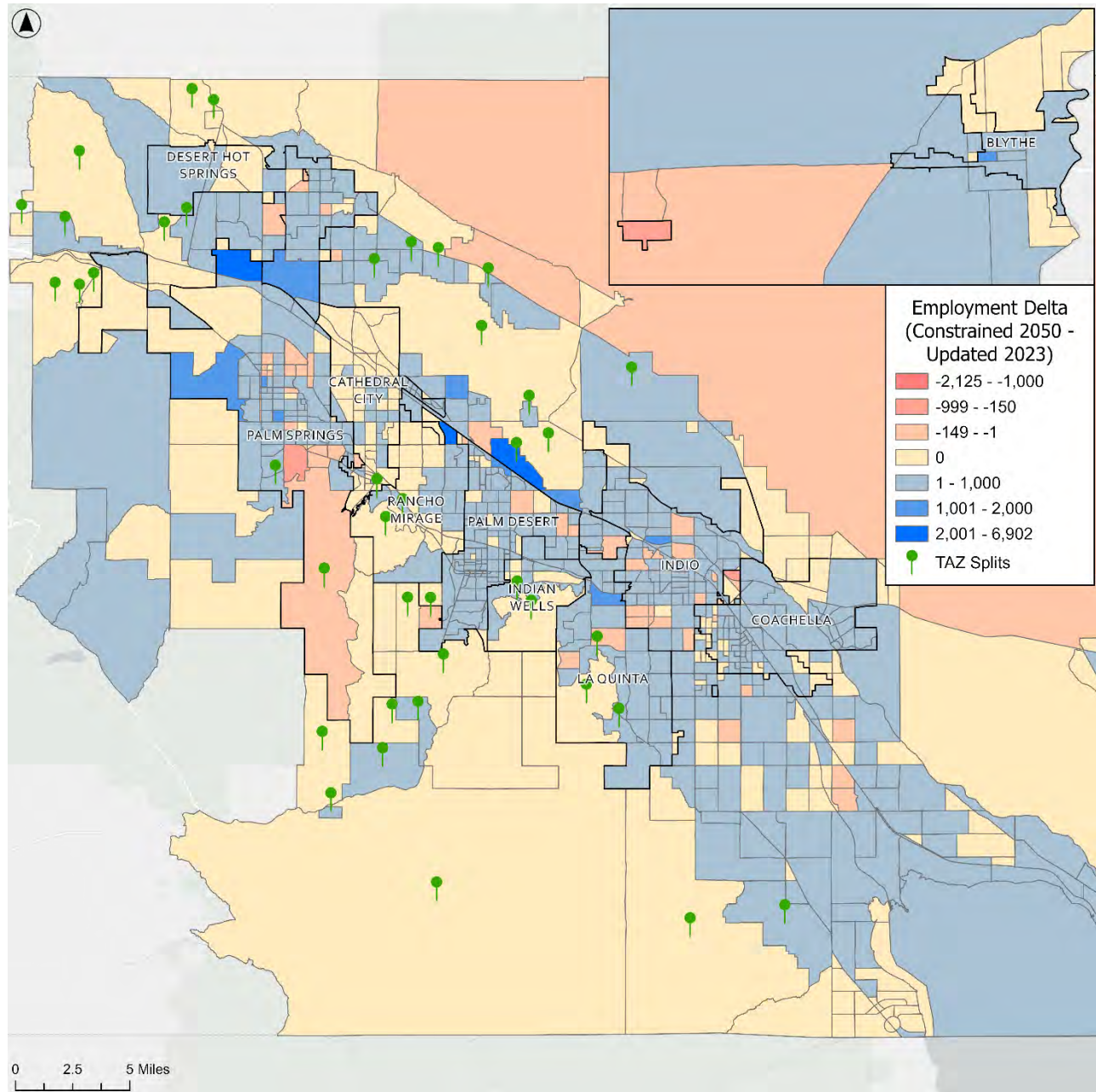
Table 15: Unconstrained 2045 and Constrained 2050 Horizon Year Employment Totals for Riverside County

City	Unconstrained 2045 Total Employment	Constrained 2050 Total Employment	Constrained 2050 - Unconstrained 2045 Delta
CVAG			
Blythe	4,729	6,607	1,878
Cathedral City	22,178	17,991	-4,187
Coachella	29,753	20,917	-8,836
Desert Hot Springs	11,707	6,826	-4,881
Indian Wells	6,722	6,981	259
Indio	40,293	39,055	-1,238
La Quinta	19,002	22,016	3,014
Palm Desert	56,787	56,392	-395
Palm Springs	45,900	44,796	-1,104
Rancho Mirage	30,379	24,620	-5,759
Unincorporated CVAG	38,981	31,866	-7,115
CVAG - Total	306,431	278,067	-28,364
WRCOG			
Banning	11,455	13,127	1,672
Beaumont	17,107	15,633	-1,474
Calimesa	9,620	4,554	-5,066
Canyon Lake	2,319	3,385	1,066
Corona	92,441	98,257	5,816
Eastvale	21,125	26,967	5,842
Hemet	40,006	49,475	9,469
Jurupa Valley	33,957	36,146	2,189
Lake Elsinore	23,384	21,952	-1,432
Menifee	28,120	29,853	1,733
Moreno Valley	71,117	87,330	16,213
Murrieta	50,423	58,591	8,168
Norco	22,216	22,220	4
Perris	34,267	32,192	-2,075
Riverside	195,967	203,193	7,226
San Jacinto	13,886	15,030	1,144
Temecula	76,126	75,583	-543
Wildomar	12,294	10,861	-1,433
Unincorporated WRCOG	120,254	107,598	-12,656
WRCOG - Total	876,084	911,947	35,863
Riverside County			
Riverside County	1,182,515	1,190,014	7,499

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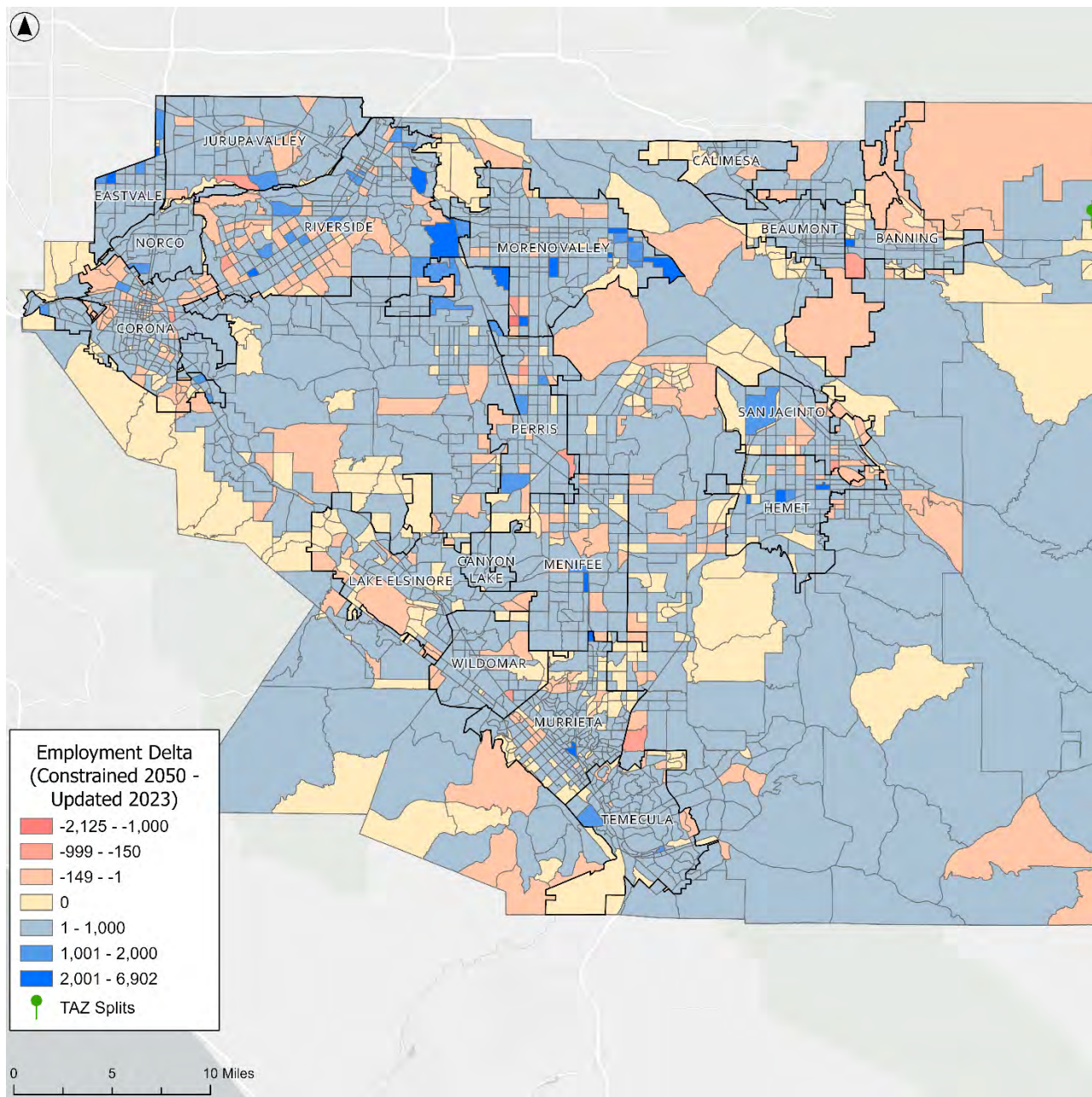
Figure 21: Employment Growth between 2023 and Constrained 2050 – CVAG



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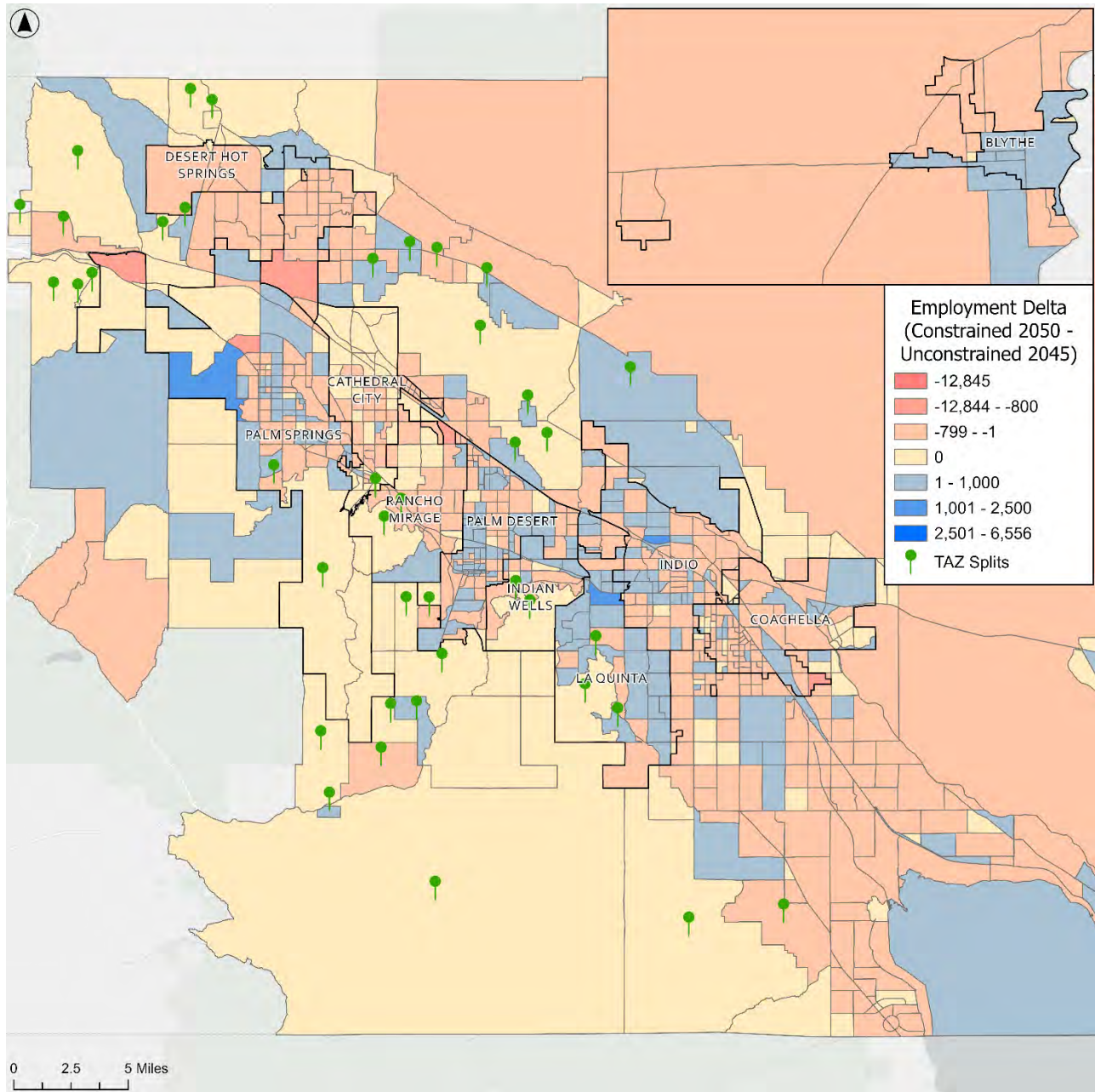
Figure 22: Employment Growth between 2023 and Constrained 2050 – Western Riverside County



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**Figure 23: Employment Comparison between Constrained 2050 and Unconstrained 2045
– CVAG**

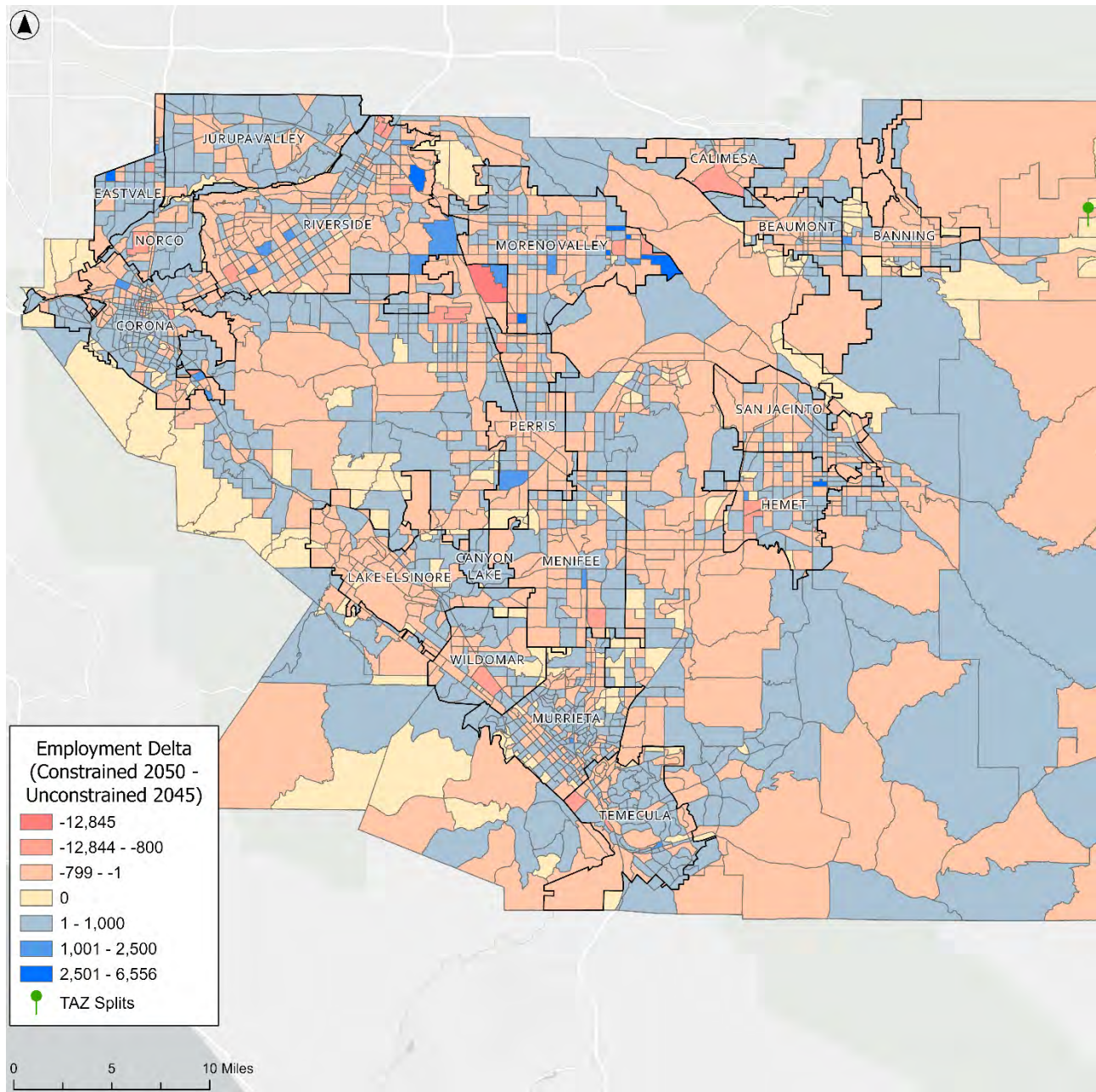


Red highlights indicate the RIVCOM 2045 unconstrained model estimated more employment than the 2050 constrained model. Blue highlights indicate the RIVCOM 2045 unconstrained estimated less employment than the 2050 constrained model. The darker colors indicate a larger disparity between the constrained and unconstrained models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.

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**Figure 24: Employment Comparison between Constrained 2050 and Unconstrained 2045
– Western Riverside County**



Red highlights indicate the RIVCOM 2045 unconstrained model estimated more employment than the 2050 constrained model. Blue highlights indicate the RIVCOM 2045 unconstrained estimated less employment than the 2050 constrained model. The darker colors indicate a larger disparity between the constrained and unconstrained models. TAZ splits indicate a TAZ has been altered from RICVOM 4.0.1 model. The "TAZ Split" icon identifies new TAZs and edited TAZs as an outcome of splitting.



Enrollment

It was anticipated that given the reallocation and adjustment of kindergarten through 12th grade enrollment to the 2023 base year there would be discrepancies in growth between the various horizon year data sources and the updated base year. Unlike employment and household growth, enrollment data was not collected from CVAG member agencies. Therefore, the enrollment growth relies on the difference between the unadjusted horizon year, WRCOG/SED 2050 forecasts and the updated base year. Due to the lack of available college enrollment growth data, the unadjusted 2045 totals and WRCOG/SCAG 2050 forecast were used for their respective horizon year models.

Unconstrained 2045 Horizon Year

Given the limited data sources for enrollment forecast, the unconstrained 2045 horizon year relies on the growth between the unadjusted 2018 base year and unadjusted 2045 horizon year. To account for the discrepancies between the update 2023 base year and the unadjusted model growth, the following conditions were assumed:

- 1) 2023 enrollment stays constant if the unadjusted 2018 model starts at a non-zero enrollment and decreases to zero in the horizon year; and
- 2) 2023 enrollments stays constant if the unadjusted model does assume no enrollment in both the 2018 base and 2045 horizon year.

Table 16 provides a comparison between the unadjusted and unconstrained 2045 horizon year model. The updated model does estimate more enrollment between kindergarten and 12th grade when compared to the unadjusted 2045 model. Although the updated model (2045 - 2023) experiences more enrollment growth than the unadjusted model (2045 - 2018), this increase is considered appropriate given the correction of base year data.

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Table 16: Enrollment Comparison of Unconstrained and Unadjusted 2045 Horizon Year

City	Unconstrained RIVCOM 2045			Constrained RIVCOM 2050		
	K - 8 th Grade	9 th – 12 th Grade	College Enrollment	K - 8 th Grade	9 th – 12 th Grade	College Enrollment
CVAG						
Blythe	2,539	1,396	0	2,433	1,218	0
Cathedral City	7,300	2,514	446	5,302	2,061	242
Coachella	8,053	4,430	0	4,943	2,963	0
Desert Hot Springs	5,216	2,430	0	4,001	1,805	0
Indian Wells	622	0	0	681	0	0
Indio	13,312	6,032	0	10,165	5,775	0
La Quinta	3,047	3,261	0	2,917	2,048	0
Palm Desert	5,132	2,174	12,319	4,695	2,047	6,676
Palm Springs	4,519	2,606	0	3,349	1,945	0
Rancho Mirage	669	1,663	0	592	1,784	0
Unincorporated CVAG	14,436	4,905	4,466	7,631	2,910	3,374
CVAG - Total	64,845	31,411	17,231	46,709	24,556	10,292
WRCOG						
Banning	3,676	1,796	0	3,109	1,457	0
Beaumont	8,436	4,039	0	7,048	3,173	0
Calimesa	1,119	125	0	1,017	95	0
Canyon Lake	0	0	0	0	0	0
Corona	22,186	13,652	0	18,220	10,243	0
Eastvale	9,825	5,475	0	7,931	4,013	0
Hemet	11,885	5,949	0	10,670	4,825	0
Jurupa Valley	17,691	7,837	0	14,543	5,705	0
Lake Elsinore	11,989	5,864	0	8,549	4,852	0
Menifee	13,503	8,246	0	11,367	6,998	0
Moreno Valley	31,044	17,071	10,462	25,012	12,544	8,132
Murrieta	14,274	12,044	0	14,184	9,699	0
Norco	3,004	3,650	10,845	2,480	2,691	8,429
Perris	11,462	6,039	0	9,398	4,923	0
Riverside	45,557	30,464	59,657	36,604	21,835	46,369
San Jacinto	8,802	4,329	16,588	8,196	3,539	13,513
Temecula	20,410	14,462	82	18,082	11,776	697
Wildomar	4,843	2,827	0	3,917	2,401	0
Unincorporated WRCOG	40,426	9,342	0	32,416	6,852	0
WRCOG - Total	280,132	153,211	97,634	232,743	117,621	77,140
Riverside County						
Riverside County	344,977	184,622	114,865	279,452	142,177	87,432



Constrained 2050 Horizon Year

As discussed in previous sections, the 2050 estimates provided by WRCOG were used as the source for the control totals for the constrained 2050 model. The WRCOG/SCAG 2050 forecast shows a substantial decrease in projected enrollment: kindergarten through 12th grade and college enrollment are expected to decrease. **Table 18** provides a comparison between the unconstrained 2045 and constrained 2050 horizon year model. CVAG experiences a lower enrollment forecast by 18,136 in kindergarten through 8th, 6,855 in 9th through 12th, and 6,939 in college. Following this same trend, the remainder of Riverside County experiences lower enrollment forecasts by 47,389 in kindergarten through 8th, 35,590 in 9th through 12th, and 20,494 in college.

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Table 17: Enrollment Comparison of Constrained 2050 and Unconstrained 2045 Horizon Year

City	RIVCOM Unconstrained 2045			RIVCOM Constrained 2050		
	K - 8 th Grade	9 th – 12 th Grade	College Enrollment	K - 8 th Grade	9 th – 12 th Grade	College Enrollment
CVAG						
Blythe	1,708	1,343	0	2,433	1,218	0
Cathedral City	7,559	2,796	446	5,302	2,061	242
Coachella	8,565	4,250	0	4,943	2,963	0
Desert Hot Springs	5,174	2,294	0	4,001	1,805	0
Indian Wells	779	0	0	681	0	0
Indio	15,723	5,895	0	10,165	5,775	0
La Quinta	3,091	3,297	0	2,917	2,048	0
Palm Desert	5,298	2,158	12,319	4,695	2,047	6,676
Palm Springs	4,798	2,343	0	3,349	1,945	0
Rancho Mirage	770	1,663	0	592	1,784	0
Unincorporated CVAG	15,199	4,107	4,466	7,631	2,910	3,374
CVAG - Total	68,664	30,146	17,231	46,709	24,556	10,292
Outside CVAG						
Banning	3,935	1,796	0	3,109	1,457	0
Beaumont	10,184	4,102	0	7,048	3,173	0
Calimesa	2,284	118	0	1,017	95	0
Canyon Lake	0	0	0	0	0	0
Corona	23,568	12,465	0	18,220	10,243	0
Eastvale	11,426	5,123	0	7,931	4,013	0
Hemet	13,255	5,739	0	10,670	4,825	0
Jurupa Valley	17,844	7,185	0	14,543	5,705	0
Lake Elsinore	13,344	5,784	0	8,549	4,852	0
Menifee	16,719	7,880	0	11,367	6,998	0
Moreno Valley	35,711	16,049	10,957	25,012	12,544	8,132
Murrieta	15,301	9,594	0	14,184	9,699	0
Norco	3,814	3,653	11,358	2,480	2,691	8,429
Perris	14,137	7,868	0	9,398	4,923	0
Riverside	48,120	27,958	62,481	36,604	21,835	46,369
San Jacinto	10,686	4,380	17,373	8,196	3,539	13,513
Temecula	21,043	13,082	86	18,082	11,776	697
Wildomar	5,114	2,639	0	3,917	2,401	0
Unincorporated WRCOG	45,193	10,564	0	32,416	6,852	0
WRCOG - Total	311,678	145,979	102,255	232,743	117,621	77,140
Riverside County						
Riverside County	380,342	176,125	119,486	279,452	142,177	87,432



Comparison of Results to Other Data

A reasonableness check of the updated 2023, unconstrained 2045, and constrained 2050 household and employment totals was completed. This check included a comparison of the base year totals, horizon year totals, and growth from the updated model to the previous RIVCOM 4.0.1 model, SCAG's activity-based model (ABM), and California's Department of Finance's (DOF) estimates. A comparison of the base year, 2045 horizon year, 2050 horizon year, and growth is shown in **Table 18**, **Table 19**, **Table 20**, and **Table 21** respectively. Household totals in the tables below compare household totals before the inclusion of group quarters.

Table 18: Base Year Model Comparison

	Updated 2023 RIVCOM	2018 RIVCOM	2019 SCAG ABM	ACS 5-Year 2023	2023 California DOF ¹
	CVAG				
Population	502,237	468,262	459,321	464,211	-
Households	179,252 ²	167,916 ²	170,400	179,956	-
Employment	195,651	189,555	208,652	-	-
K-12 Enrollment	75,968	76,374	75,326	-	-
	Riverside County				
Population	2,500,152	2,358,439	2,385,377	2,449,909	2,545,852
Households	762,224 ²	722,562 ²	744,440	762,234	779,188
Employment	814,705	759,857	847,058	-	-
K-12 Enrollment	448,112	450,595	447,783	-	419,992 ³

¹2023 is an estimation using 2020 and 2025 California Department of Finance projections

²Household totals exclude group quarters

³Total enrollment reflects California Department of Finance 2024 - 2025 public school estimate

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Table 19: 2045 Horizon Year Model Comparison

	Updated 2045 RIVCOM	Unadjusted 2045 RIVCOM	2045 SCAG ABM ¹	2045 California DOF ²
	CVAG			
Population	747,315	742,570	644,702	-
Households	290,634 ²	287,785 ²	263,957	-
Employment	306,431	269,783	269,956	-
K-12 Enrollment	96,256	98,201	71,928	-
	Riverside County			
Population	3,488,483	3,424,454	2,893,176	2,779,925
Households	1,106,525 ²	1,101,773 ²	1,011,135	871,433
Employment	1,182,515	1,116,025	1,130,692	-
K-12 Enrollment	529,599	529,359	426,904	375,063 ⁴

¹ SCAG ABM has base year of 2024 and horizon year of 2050; 2045 is estimated using interpolation; ² 2045 households are estimated using ratio between population and households from the DOF 2030 projection (3.14); ³ Household totals exclude group quarters; ⁴ Total enrollment reflects California Department of Finance 2044 - 2045 public school estimate

Table 20: 2050 Horizon Year Model Comparison

	Updated 2045 RIVCOM	Unadjusted 2045 RIVCOM
	CVAG	
Population	686,681	680,352
Households	278,555 ¹	281,949
Employment	278,067	281,745
K-12 Enrollment	71,265	71,274
	Riverside County	
Population	3,167,226	2,990,830
Households	1,051,698 ¹	1,062,423
Employment	1,190,014	1,185,237
K-12 Enrollment	421,629	422,889

¹ Household totals exclude group quarters

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Table 21: Yearly Growth Rate Comparison

	Unconstrained 2045 - 2023 RIVCOM	Constrained 2050 - 2023 RIVCOM	Unadjusted 2045 - 2018 RIVCOM	2050-2024 SCAG ABM	2045 - 2020 California DOF ¹
	CVAG				
Population	2.22%	1.36%	2.17%	1.78%	-
Households	2.82%	2.05%	2.64%	2.42%	-
Employment	2.57%	1.56%	1.57%	1.30%	-
K-12 Enrollment	1.21%	-0.23%	1.06%	-0.20%	-
	Riverside County				
Population	1.80%	0.99%	1.67%	0.94%	0.50%
Households	2.05%	1.41%	1.94%	1.58%	0.67%
Employment	2.05%	1.71%	1.74%	1.48%	-
K-12 Enrollment	0.83%	-0.22%	0.65%	-0.21%	-0.43%

¹ 2045 households are estimated using ratio between population and households from the DOF 2030 projection (3.14).

As shown in **Table 18**, base year household and employment increases are expected from the unadjusted 2018 RIVCOM model. Compared to the RIVCOM 2018 base year CVAG region, the updated 2023 model data estimate lower enrollment (-406) and higher households (+11,336), employment (+6,096), and population (+33,975). At the county level, the updated 2023 model estimates also show growth in population (+141,713), households (+39,662), employment (+54,848), and lower enrollment (-2,483). Using the ACS as the control total results in the CVAG region showing an decrease in households but a increase in population in the 2023 base year. When compared to the 2023 ACS, the updated 2023 model data estimates a higher population (+38,026) and lower households (-704) for the CVAG region. At the county level, the updated 2023 model estimates show higher population (+50,243) and lower households (-10). Compared to SCAG 2019 ABM, the updated 2023 model data estimates lower employment (-13,001), and higher enrollment (+642), higher households (+8,852) and population (+42,916) for the CVAG region. At the county level, the updated 2023 model estimates higher population (+114,775), higher households (+17,784), lower employment (-32,353), and higher enrollment (+329) compared to the SCAG 2019 ABM estimates. The California DOF does not provide population, household, employment, and enrollment numbers at a level granular enough for the CVAG region, so only the County level estimates were compared. Compared to the interpolated 2023 California DOF estimates, the updated 2023 model data estimates lower population (-45,700), lower households (-16,964), and higher enrollment (+28,120). It should be noted that the California DOF enrollment estimate only includes public schools.

As shown in

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Table 19, the updated 2045 model data estimates higher population (+4,745), higher households (+2,849), higher employment (+36,648), and lower enrollment (-1,945) for the CVAG region when compared to the unadjusted 2045 horizon year. At the county level, the updated 2045 model estimates higher population (+64,029), higher households (+4,742), higher employment (+66,490), and higher enrollment (+240). Compared to interpolated SCAG 2045 ABM, the updated 2045 model data estimates higher population (+102,613), higher households (+26,677), higher employment (+36,475), and higher enrollment (+24,328) for the CVAG region. At the county level, the updated 2045 model estimates higher population (+595,307), higher households (+95,390), higher employment (+51,823), and higher enrollment (+102,695). Compared to the interpolated 2045 California DOF estimates, the county level updated 2045 model data estimates higher population (+708,558), households (+235,092), and enrollment (+154,536).

Table 20 shows the difference between the SCAG 2050 ABM and the constrained 2050 model data. The comparisons show the RIVCOM constrained 2050 scenario having higher population (+6,329), lower households (-3,394), lower employment (-3,678), and lower enrollment (-9) for the CVAG region. At the county level, the constrained 2050 model estimates higher population (+176,396), lower households (-10,725), higher employment (+4,777), and lower enrollment (-1,260).

As shown in **Table 21**, the unconstrained model experiences a consistently higher yearly growth rate compared to all other sources. For the CVAG region, the growth rates are within the same magnitude of SCAG and RIVCOM. Compared to the unadjusted RIVCOM model, the unconstrained model yearly growth rate estimates higher population growth (+0.05%), household growth (+0.18%), employment (+1.01%), and enrollment (+0.16%) for the CVAG region. At the county level, the unconstrained model estimates higher population growth (+0.12%), higher household growth (+0.11%), higher employment growth (+0.32%), and higher enrollment growth (+0.18%). Compared to SCAG ABM, the unconstrained model data estimates higher population growth (+0.67%), higher household growth (+0.71%), higher employment growth (+1.44%), and higher enrollment growth (+1.39%) for the CVAG region. At the county level, the unconstrained model estimates higher population growth (+0.98%), higher household growth (+0.68%), higher employment growth (+0.76%), and higher enrollment growth (+1.01%). Compared to the California DOF estimates, the county level unconstrained model estimates higher population growth (+1.30%), household growth (+1.38%), and enrollment growth (+1.26%).

When comparing the constrained 2050 RIVCOM model and the unconstrained 2045 scenario, the constrained model yearly growth rate estimates lower population growth (-0.86%), household growth (-0.77%), employment (-1.01%), and enrollment (-1.44%) for the CVAG region. At the county level, the constrained model estimates lower population growth (-0.81%), lower household growth (-0.65%), lower employment growth (-0.35%), and lower enrollment growth (-1.05%). Compared to SCAG ABM, the constrained model data estimates lower population growth (-0.19%), lower household growth (-0.06%), higher employment growth (+0.43%), and lower enrollment growth (-0.06%) for the CVAG region. At the county level, the constrained model estimates higher population growth (+0.17%), higher household growth (+0.03%), higher employment growth (+0.42%), and lower enrollment growth (-0.04%).

The variance in growth between the unconstrained 2045 scenario, constrained 2050 scenarios, and other data sources is likely due to differences in data source, the timing of updates to the projections, and the methodologies used. The California DOF projections are benchmarked to decennial census data whereas

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the updated RIVCOM model is using American Community Survey data and specific input from CVAG member agencies. Both the unconstrained and unadjusted RIVCOM models used jurisdictional level input for the horizon year that considers plans for land use changes, whereas the California DOF projections only consider past trends.

Time and scope constraints limit the ability to do a comparative adjustment between the unadjusted and unconstrained horizon year. For example, employee shifts between categories is not one-to-one, so updates to the horizon year lacked the accuracy needed to adjust for excess employment. The growth experienced by the unadjusted RIVCOM model (2018 to 2045) is less than the growth expected by the updated model (2023 to 2045). This can be explained by the following reasons:

- 1) CVAG member agency comments and specific plans provide more detail into the estimated growth potential for the CVAG region than previous model developments.
- 2) Negative growth was zeroed out for the specific employment sectors as described above.
- 3) The remaining difference in growth assumptions is a result of the agency input received. The expected growth from the updated model for the CVAG region is 110,780 total employment, while the CVAG region experienced a 80,228 employment growth in the unadjusted model. This increase is due to the expected increases in employment provided by CVAG member agencies.

Although the horizon year totals and growth estimates for the unconstrained 2045 and constrained 2050 model vary from the sources reviewed, the updated model estimates are comparable to the other sources and this variance can be expected with differing data sources and methodologies. Additionally, the updated model is using direct input from jurisdictional staff and includes a major update to the base year. Therefore, the model estimates for the base year and horizon year are considered acceptable.



Next Steps

Looking ahead, several opportunities could help strengthen the RIVCOM model and continue improving the reliability of VMT estimates for the Coachella Valley and Riverside County. These recommendations are provided with the understanding that a travel demand model is a constantly evolving tool and that RIVCOM covers a large area and population. However, any updates to one area of the model help improve performance and reliability for all agencies.

It is highly recommended that WRCOG and CVAG work together to continue updating land use assumptions, particularly for the future year. While there were multiple points of communication with all CVAG member agencies regarding land use assumptions, not all agencies were able to review the data – the City of Blythe did not provide input – and some agencies did a high level review that would benefit from a deeper dive into the land use assumptions. Some agencies may have included more optimistic growth assumptions than state or regional demographic forecasts and these areas may warrant additional conversations to align projected growth with larger regional trends. Additionally, none of the cities or jurisdictions outside the CVAG area were contacted as it was outside the scope of the project. However, improvements to land use across the County benefit all agencies within the County as a more accurate model also provides more accurate information on countywide VMT and inter-regional roadway facilities. Additionally, while a highly detailed review of the base year inputs was conducted for the CVAG region aeriels and development permits were not reviewed at the same level of detail for western Riverside County.

It would also be beneficial to collect new traffic count data. New counts would provide a more current foundation for evaluating model performance and would enhance future calibration efforts. Count locations would ideally be identified in partnership between WRCOG and CVAG to reflect local priorities and areas experiencing notable growth or change.

Refinements to the calibration process could also offer value in a future update. Areas that may warrant further review include trip length distributions, mode share assumptions, and origin–destination patterns, particularly where supplemental datasets such as StreetLight and Replica can provide additional insight. Additional checks—such as reviewing screenline performance, validating trip generation rates across land-use types, and further adjusting traffic analysis zones—could further support improvements in model behavior. Any future calibration work should continue to be closely coordinated with WRCOG to maintain consistency across the regional modeling system.

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Appendix A – Riverside County Model Input Maps



Exhibit A.1: Household Comparison of 2018 and Updated 2023 RIVCOM Base Years – Riverside County

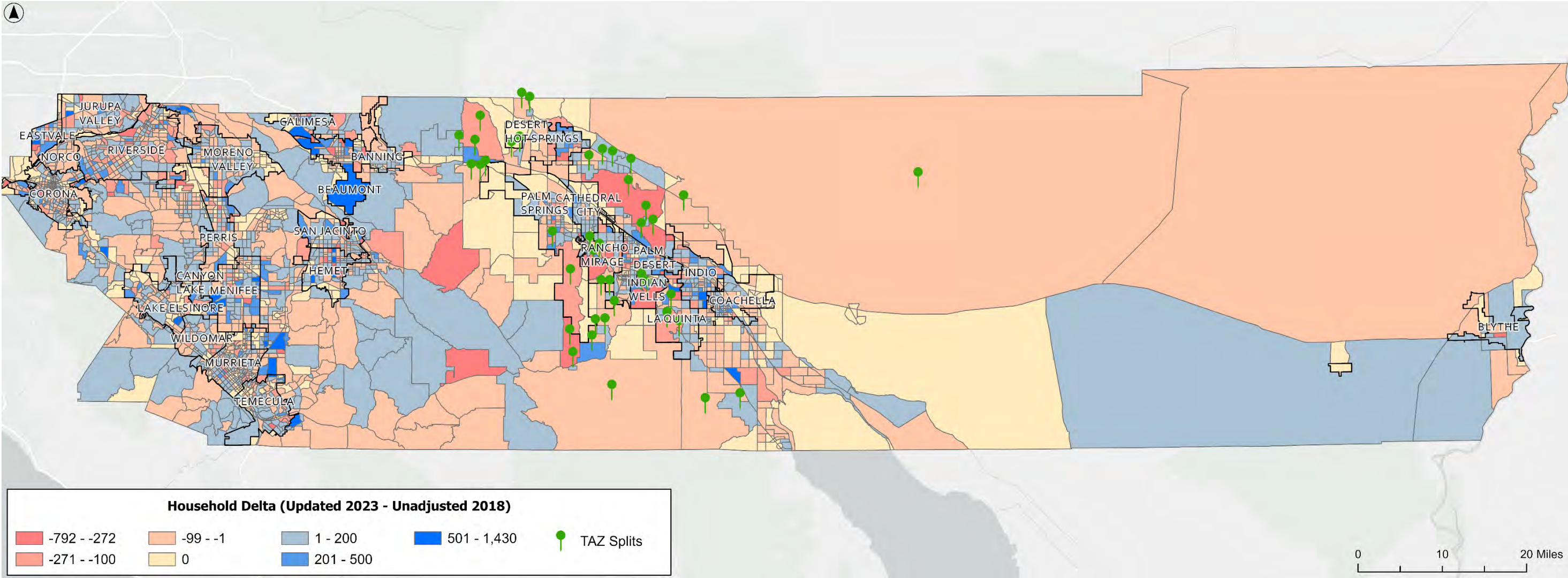




Exhibit A.2: Employment Comparison of 2018 and Updated 2023 RIVCOM Base Years – Riverside County

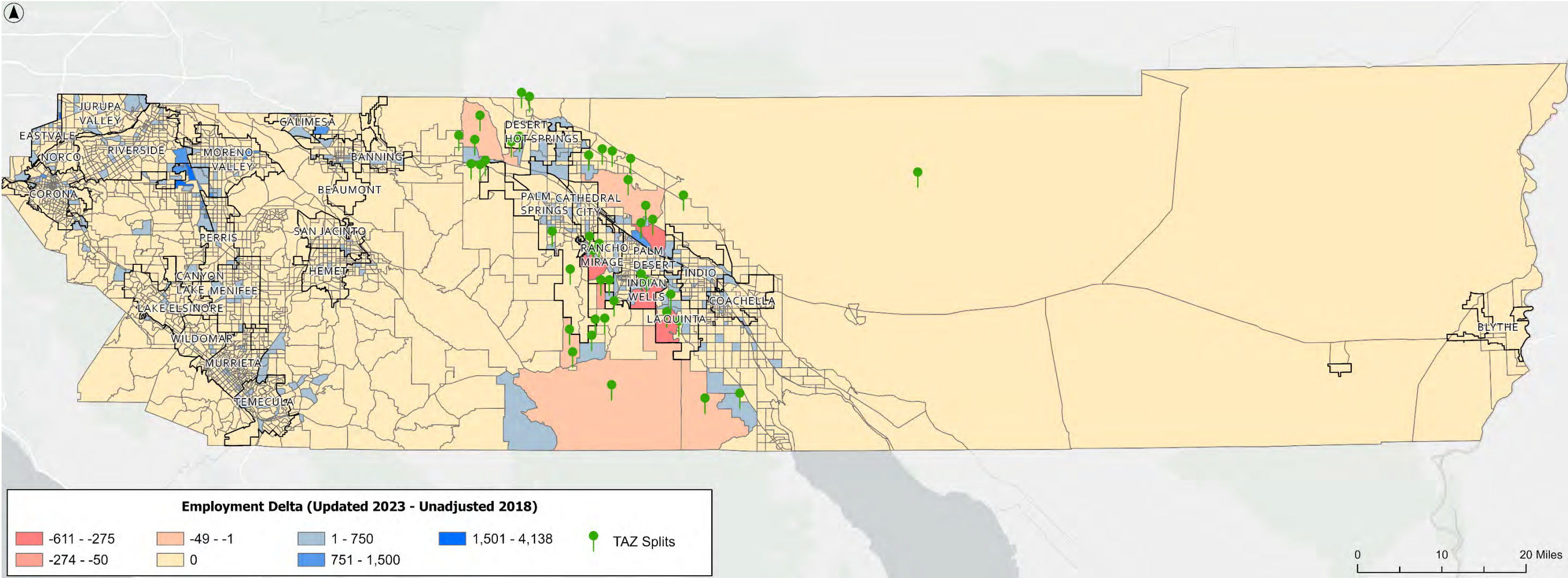




Exhibit A.3: Household Growth between Updated 2023 and Unconstrained 2045 – Riverside County

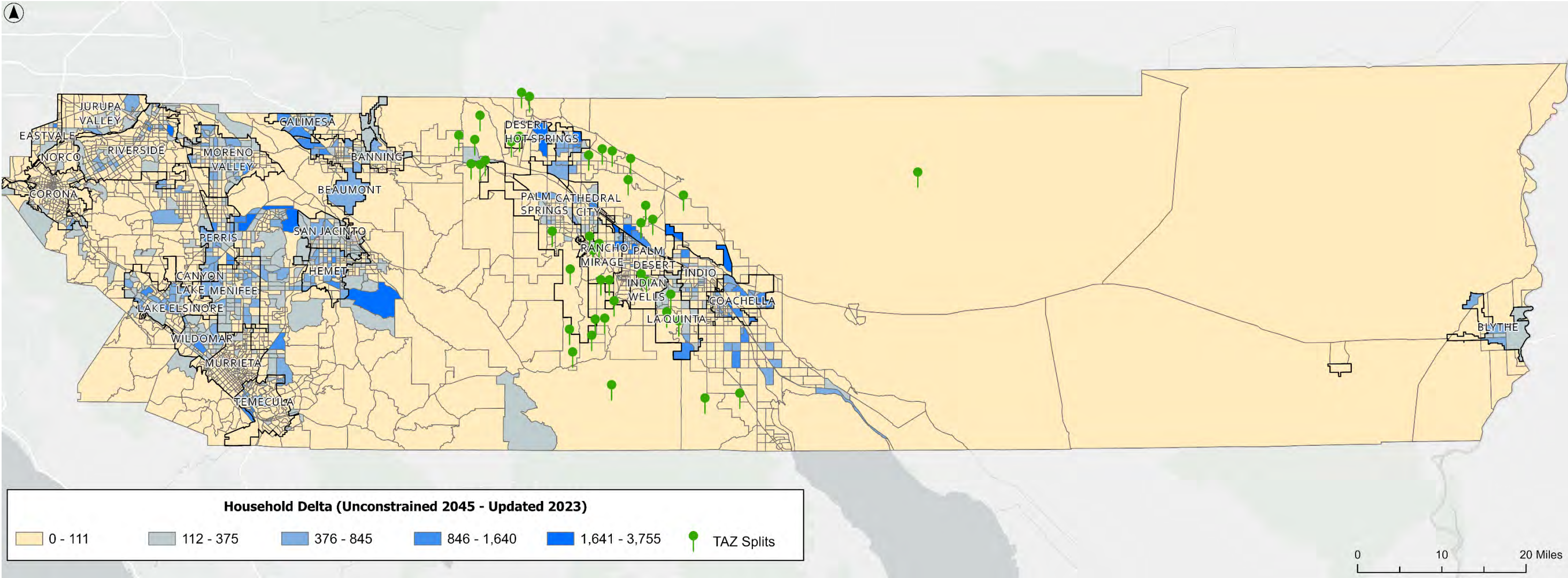




Exhibit A.4: Employment Growth between Updated 2023 and Unconstrained 2045 – Riverside County

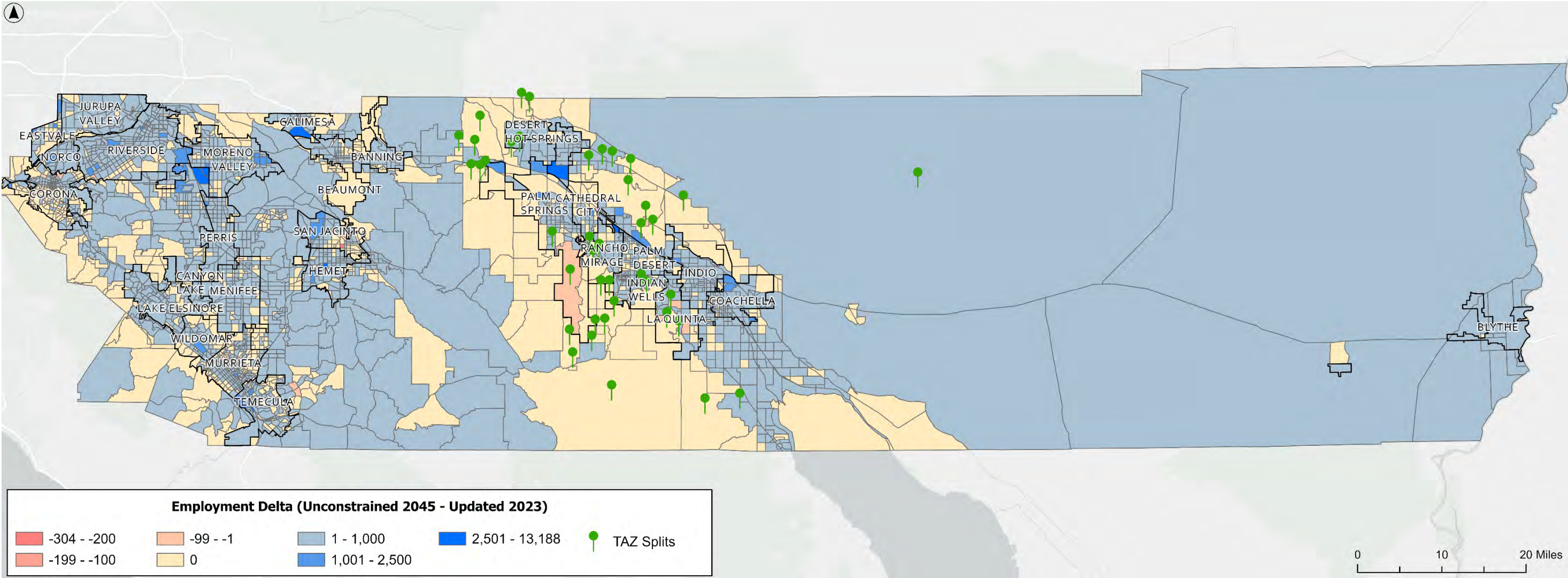




Exhibit A.5: Household Comparison of 2045 Unadjusted and 2045 Unconstrained – Riverside County

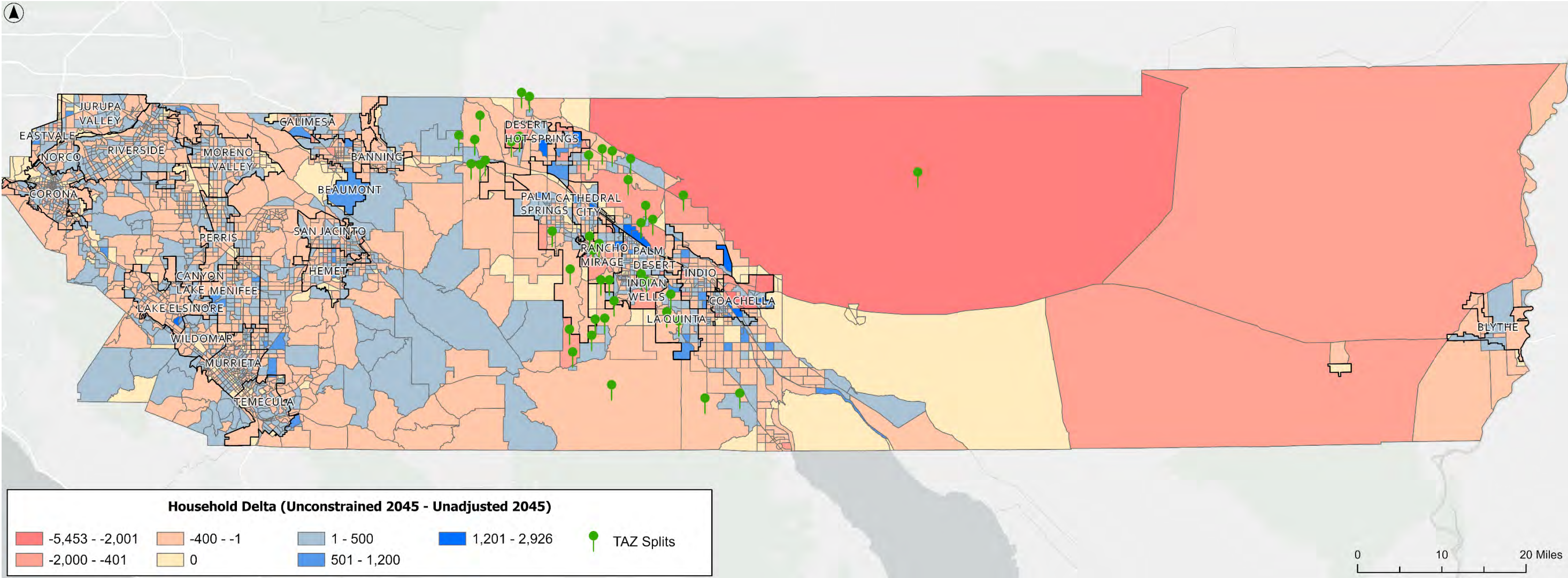




Exhibit A.6: Employment Comparison of 2045 Unadjusted and 2045 Unconstrained – Riverside County

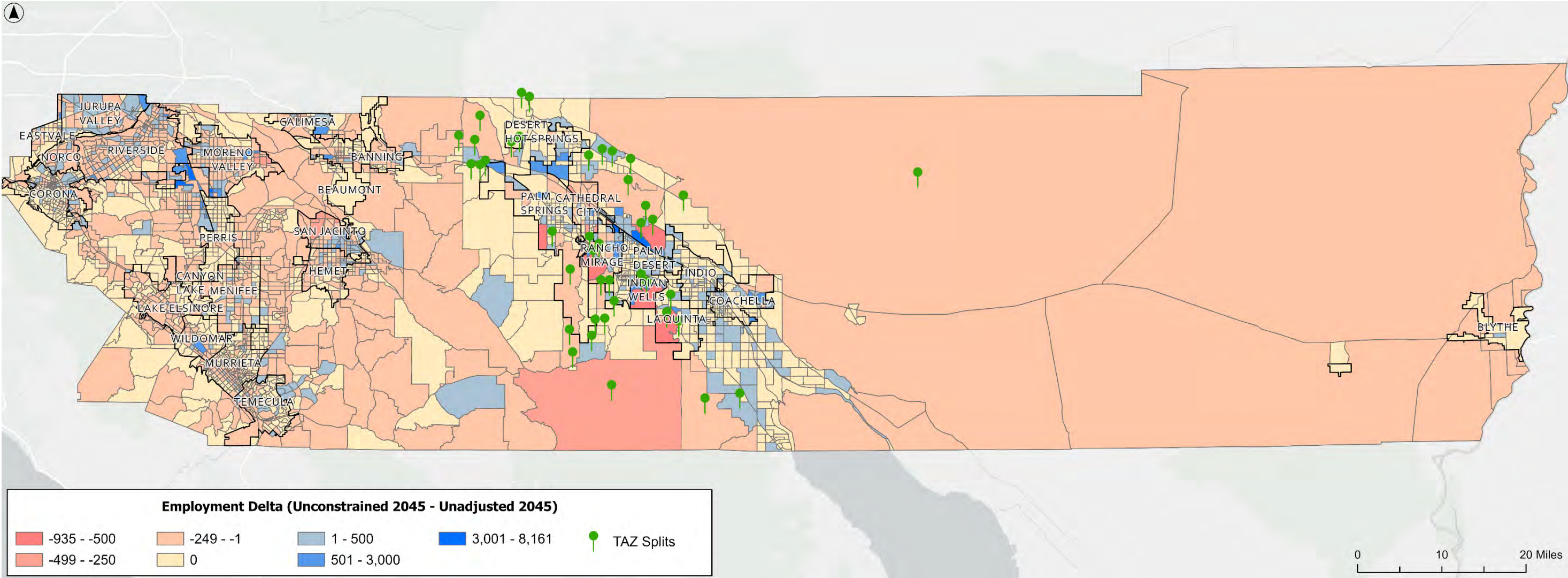




Exhibit A.7: Household Comparison of Updated 2023 and 2050 Constrained – Riverside County

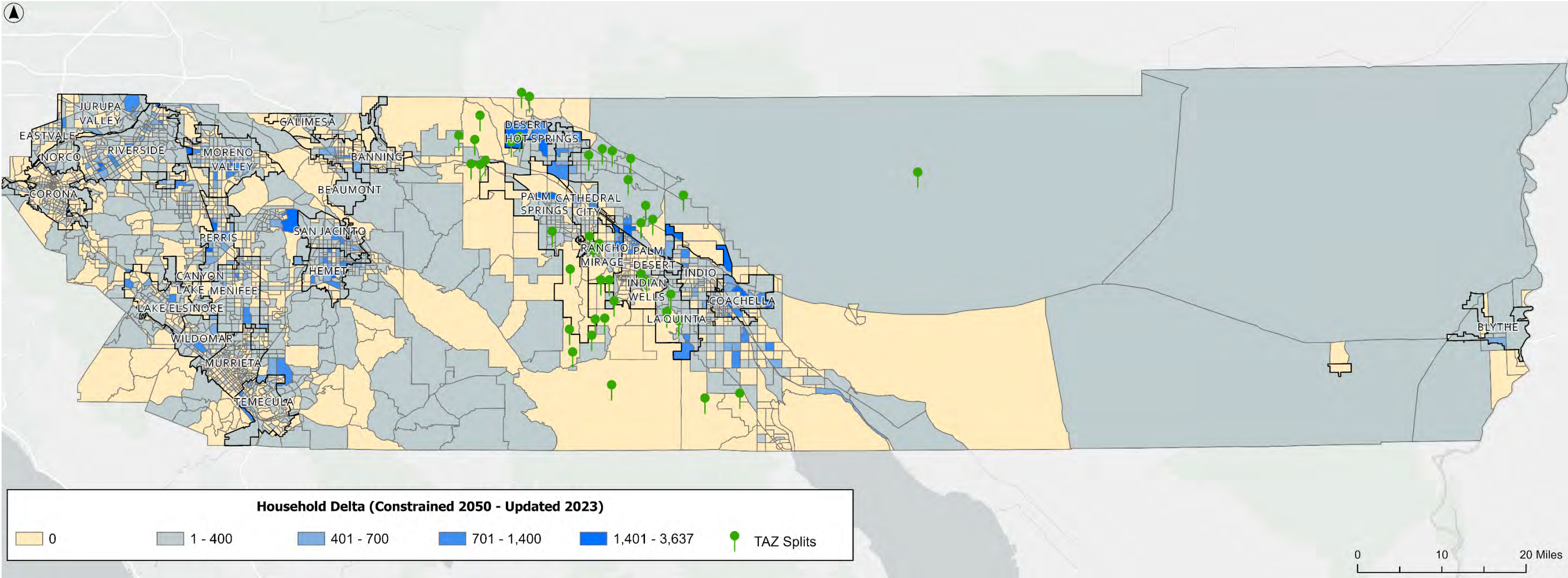




Exhibit A.8: Employment Comparison of Updated 2023 and 2050 Constrained – Riverside County

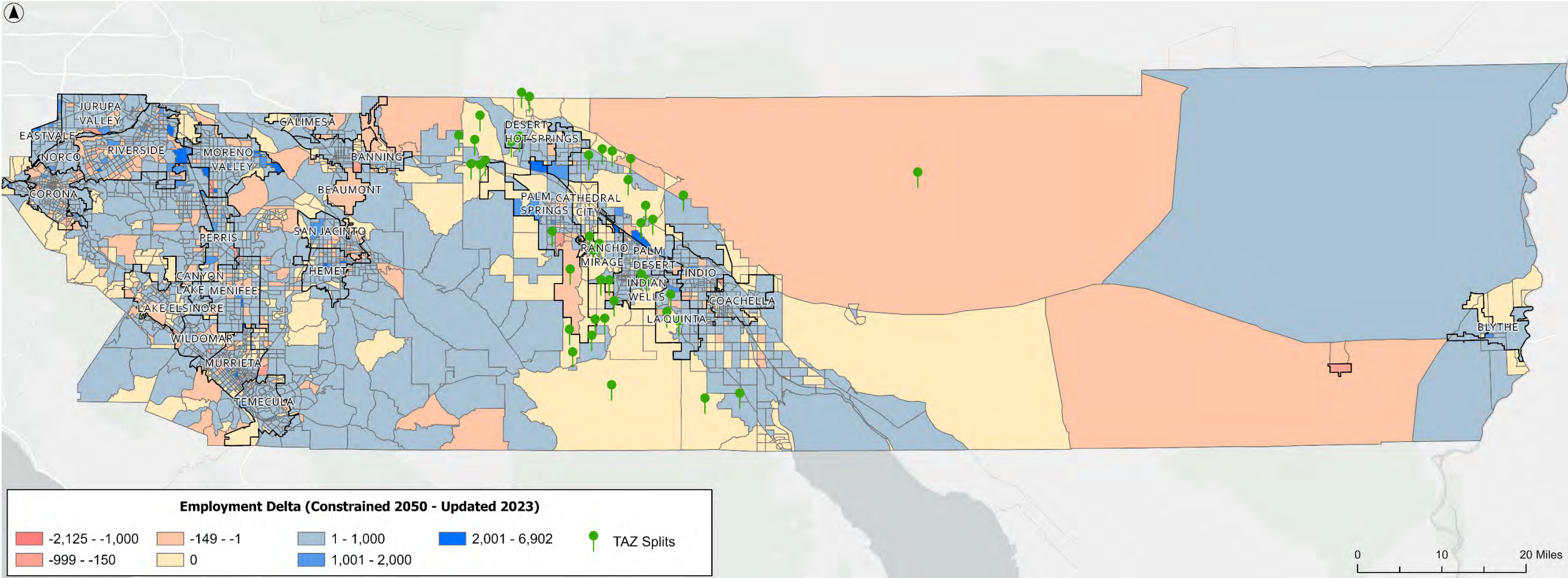




Exhibit A.9: Household Comparison of Unconstrained 2045 and 2050 Constrained – Riverside County

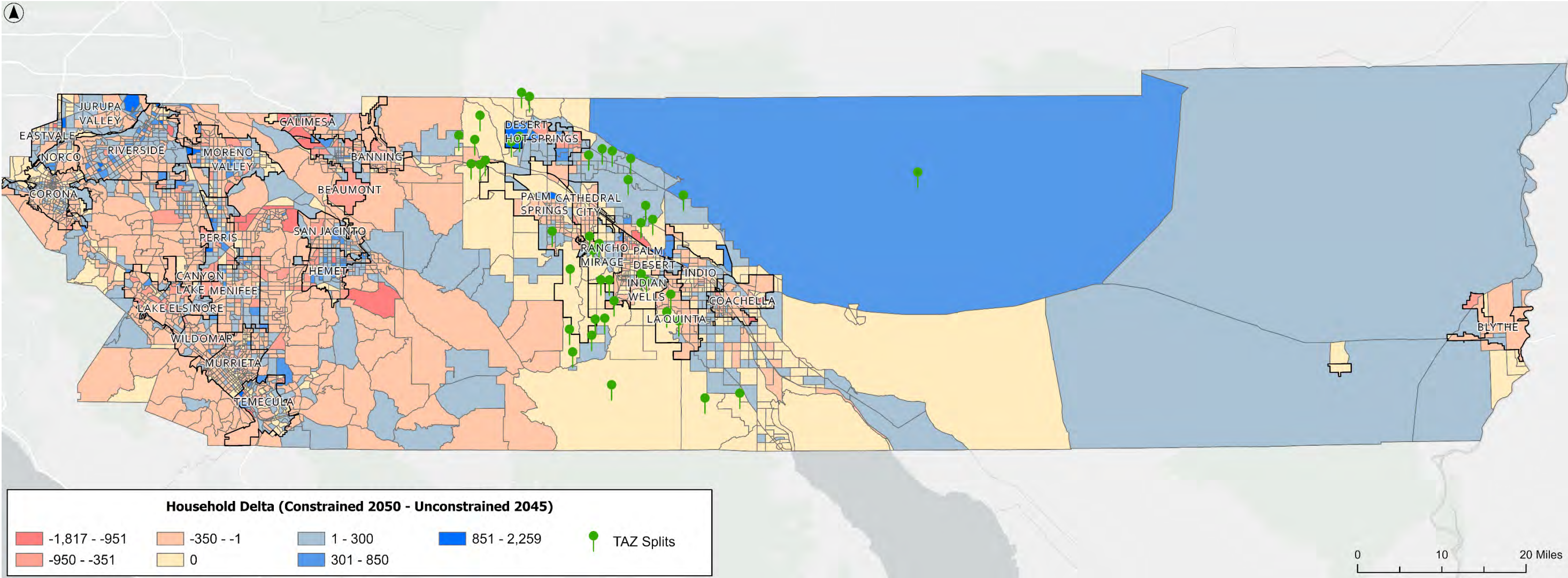
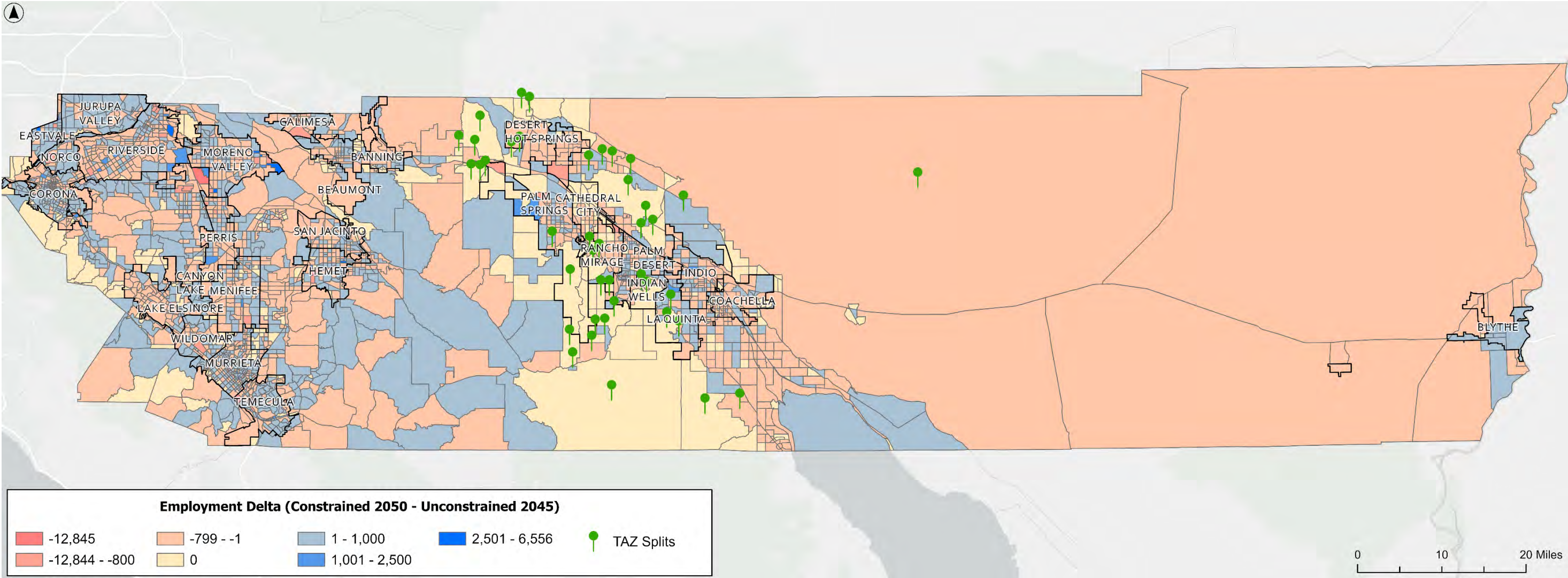




Exhibit A.10: Employment Comparison of Unconstrained 2045 and 2050 Constrained – Riverside County



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Appendix B – Evaluation of Data for Screening Maps



MEMORANDUM

To: Peter Satin, Conservation Program Manager, CVAG

From: **Michael Schmitt, AICP CTP, PTP, RSP2^B and Anais Schenk, AICP**
Kimley-Horn and Associates, Inc.

Date: March 13, 2025

Subject: Evaluation of Big Data Resources for VMT within CVAG

To assess a possible update to VMT thresholds and guidelines for the Coachella Valley Association of Governments (CVAG) member agencies, Kimley-Horn analyzed various data sources, including Replica and Streetlight. This big data review aimed to compare alternatives to the RIVCOM model and explore their policy implications for CVAG's member agencies. This memo documents the methodology for extracting this data.

Replica Data Review

Replica provides travel and demographic data akin to a travel demand model, such as RIVCOM, with various trip attributes, including trip mode, purpose, distance, origin, and destination. The dataset spans multiple years (2019–2024) and incorporates various data sources, including cell phone mobility data. For this VMT analysis, the 2022 dataset was selected to align with 2022 population and employment estimates from Census data, ensuring consistency in comparisons.

Population and employment data are key components of this VMT analysis. Population estimates at the Traffic Analysis Zone (TAZ) level were extracted for Riverside County using tools available within the Replica platform. However, employment data is not directly provided within the platform. To address this, work location coordinates (latitude and longitude) were extracted for all individuals whose designated work locations fall within Riverside County. This data was then spatially joined at the TAZ level, aggregating the total number of workers in each zone.

To account for remote work patterns, two distinct datasets were created:

- Including Work-From-Home (WFH): This dataset includes individuals whose recorded work locations match their home locations, as identified by Replica.
- Excluding Work-From-Home (WFH): This dataset considers only those with distinct work locations separate from their home locations. This dataset was used for analysis, as individuals working from home do not contribute to total Vehicle Miles Traveled (VMT).

For VMT calculations, vehicle trips were analyzed by trip purpose, mode, and distance for trips originating and terminating within Riverside County. This data was compiled at the RIVCOM TAZ

level using Replica's big data platform. Additionally, population and employment estimates from the Census Bureau's American Community Survey (ACS) for 2022 were compiled for comparison and validation of Replica data. VMT per Capita and VMT per Employee were then calculated for the entire county at the TAZ level using available trip, population, and employment data.

To assess VMT within the Coachella Valley Association of Governments (CVAG) area, Replica model results were compared against RIVCOM model results using two threshold approaches:

- **Countywide Average:** Applied the Countywide VMT per Capita and VMT per Employee as a threshold across all CVAG jurisdictions.
- **Jurisdiction-Specific Thresholds:** Used VMT thresholds adopted by individual jurisdictions where available. Some jurisdictions refer to County or OPR recommendations instead of setting unique thresholds.

This analysis aims to evaluate VMT mitigation needs under existing and future conditions using different available travel models.

Streetlight Data Review

Streetlight provides travel and demographic data with various trip attributes. The dataset spans multiple years and comes from two main vehicle data sources: connected vehicle data and location-based services (LBS+) data. For this analysis, LBS+ data was used because it is the only source that includes trip purpose information.

Streetlight offers multiple analysis types, each with specific filters and parameters. To calculate VMT at a zonal level, the recommended methods are the Origin-Destination analysis for zones or the Zone Analysis. Both methods were used in this study to explore all available options.

For consistency, the 2022 dataset was selected to match population and employment estimates from Census data. Additionally, daily trip data was used instead of hourly or peak-period data to align with VMT policies.

ORIGIN DESTINATION ANALYSIS

The TAZs from the RIVCOM 4.0.1 were used as the geographic basis for the origin destination analysis. The CVAG area consists of 875 TAZs, but Streetlight has a limit of 500 zones for zonal-based origin-destination data. To capture all origin-destination pairs, the TAZs were divided into two sets—northern and southern—and four separate data runs were conducted:

- Northern TAZ Origins and Northern TAZ Destinations
- Northern TAZ Origins and Southern TAZ Destinations
- Southern TAZ Origins and Southern TAZ Destinations
- Southern TAZ Origins and Northern TAZ Destinations

These runs produced two output files: one containing trip length data and another containing traffic volume and trip purpose data, categorized as Home-Based Work, Home-Based Other, and Non-

Home-Based trips. To calculate VMT, trip length and volumes by purpose were merged using a unique identifier.

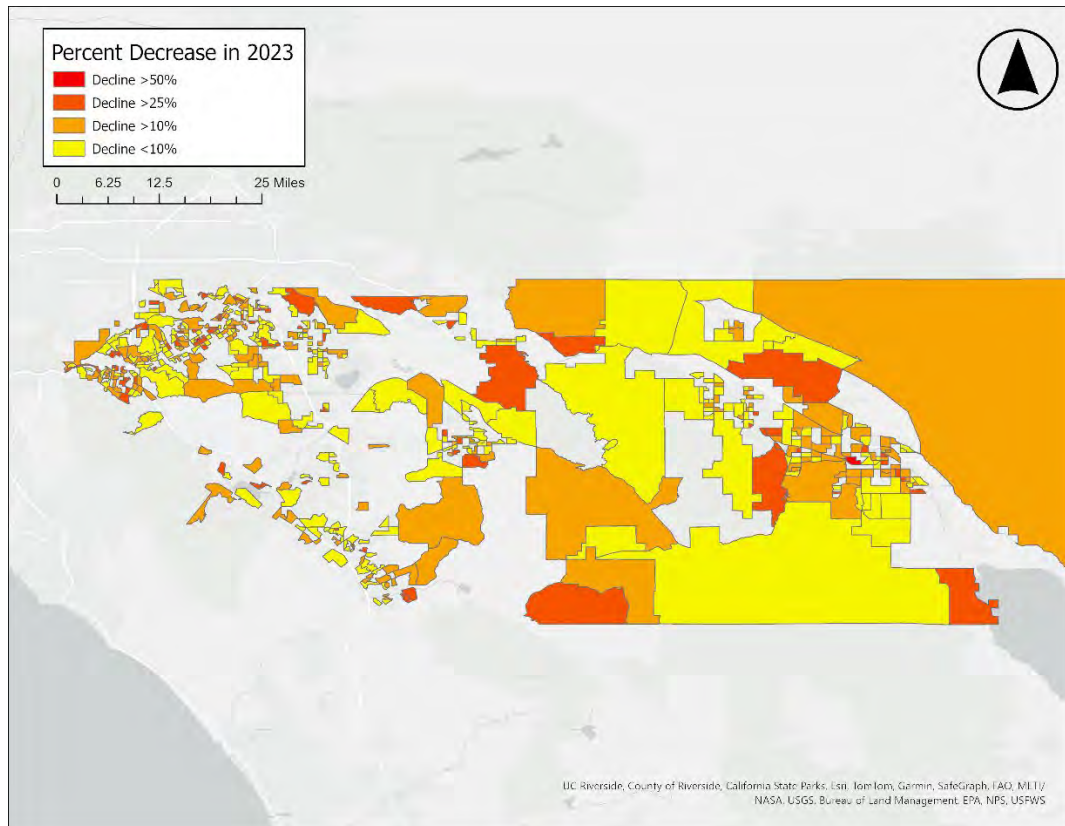
VMT for residents was determined by multiplying the average trip length by the total volumes for all home-based trip purposes. Employee VMT was calculated by reversing the origin-destination table for Home-Based Work trips.

For VMT CEQA threshold analysis, countywide average VMT per capita and per employee is required. However, the countywide data presented inconsistencies. The average trip length for trips within the county was about 7 miles, while trips entering the county averaged 31 miles, and trips leaving the county averaged 30 miles. These figures differ significantly from the previous analysis using RIVCOM model data, which estimated a countywide average of 15.2 miles per capita and 14.2 miles per employee. Even when averaging all trip origins and destinations, the result was 22.6 miles—still much higher than RIVCOM model outputs.

A key difference is that RIVCOM's base year is 2018, whereas the Streetlight analysis was conducted for spring 2022. A possible explanation is a COVID-related shift: an influx of residents who worked remotely during the pandemic may have returned to office-based work by 2022. However, as shown in **Table 1** and **Figure 1**, American Community Survey data from 2018 to 2023 indicates a gradual decline in housing units across many areas of the community.

Table 1: Housing Unit Change from 2018 – 2023, American Community Source

Area	2018		2023		Change	
	Population	Housing Units	Population	Housing Units	Population	Housing Units
CVAG	448,667	247,376	449,428	237,242	761	- 10,134
TUMF	425,834	237,776	425,507	228,446	327	- 9,330

Figure 1: Percent Decrease in Housing Units from 2018-2023 in Riverside County

ZONE ANALYSIS

A Streetlight zone analysis was conducted for the CVAG area for spring 2022. This analysis provides trip volume, trip length, and trip purpose data. However, it comes with two key limitations: a maximum of 100 polygons per run and a polygon size restriction of 4 square kilometers. To work within these constraints, the CVAG area was divided into 10 sets of hexagonal polygons, each smaller than 4 square kilometers.

Despite this approach, the analysis returned sparse results, with data gaps in many urbanized areas of the Coachella Valley. This is likely due to Streetlight's requirements for anonymity and sample size. In low-density areas, restricting polygon size to 4 square kilometers may have led to sample sizes below Streetlight's reporting threshold. **Figure 2** and **Figure 3** illustrate where data was available for residents and workers, respectively.

After reviewing the results with Streetlight's technical support team, they waived the polygon size restriction for the zone analysis method, allowing us to run the analysis using TAZs instead. While

this improved coverage, the data still only covered a small portion of the 875 TAZs that make up the Coachella Valley and Blythe, as shown in **Table 2**.

Figure 2: Streetlight Zone Analysis Results for Residents

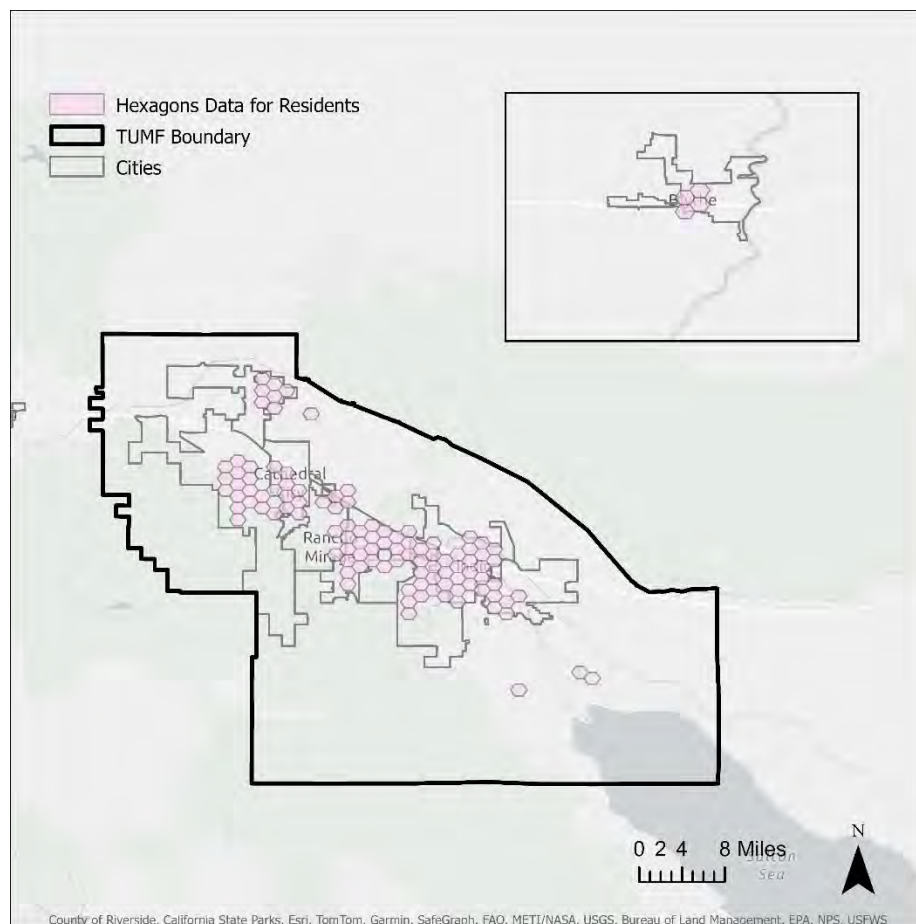


Figure 3: Streetlight Zone Analysis Results for Workers

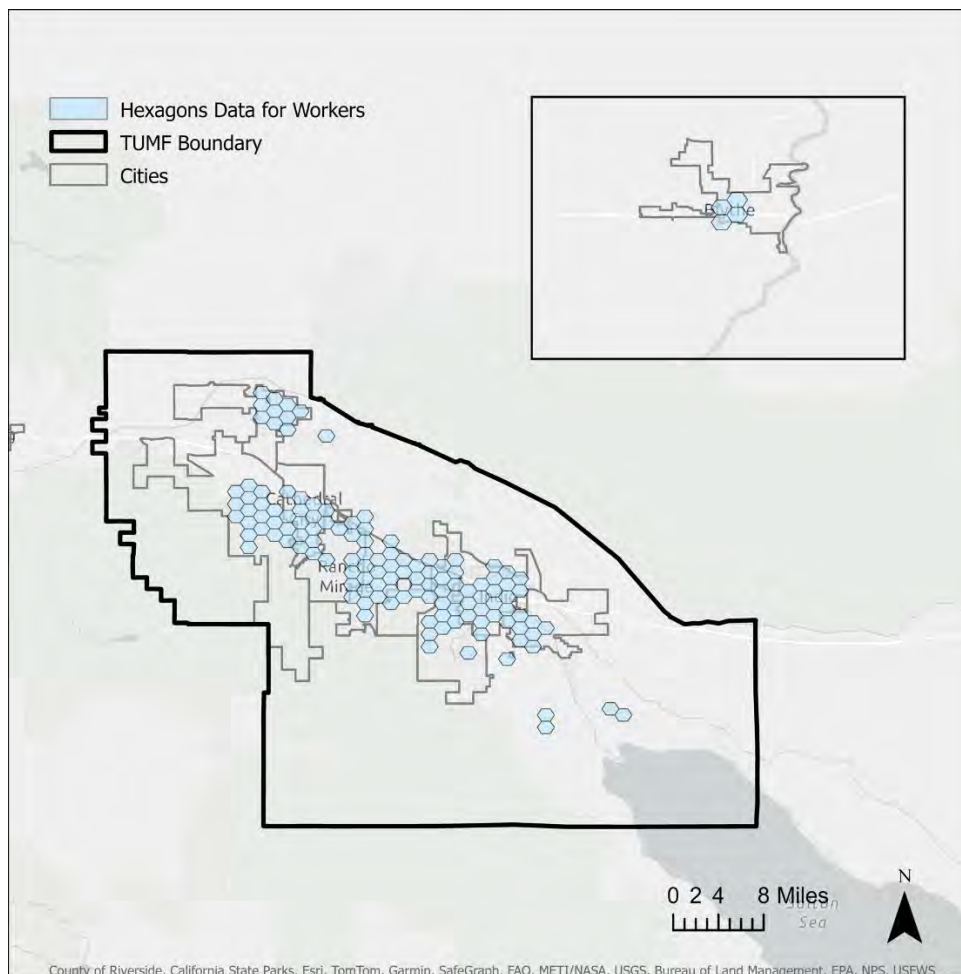


Table 2: Results of Zone Analysis Run with TAZs

	Day Type	Count of TAZs with Data	Percent of Total TAZs
Residents	All Days	313	36%
	Weekday	279	31%
Workers	All Days	418	48%
	Weekday	407	47%

Summary

After evaluating the available resources and the limitations of both datasets, we decided not to proceed with using Streetlight. While no final decision had been made at the time of this memo regarding Replica as a potential alternative to the RIVCOM model, it was concluded that Streetlight would not be a viable option.

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Appendix C – Industry Level Employment Summary



The tables presented below provide comparisons for CVAG (Coachella Valley Association of Governments) agencies at an industry level. For the purpose of these tables, the “Unincorporated CVAG” includes all unincorporated county TAZs located within the CVAG jurisdictional boundary.

Table 22: 2045 Unadjusted - 2018 Unadjusted Employment Growth – CVAG

	Total Emp	Agriculture	Construction	Manufacture	Wholesale	Retail	Transportation	Information	FIRE	Professional	Educational	ArtEnt	OthService	PubAdmin
Blythe	911	0	107	15	0	25	136	0	13	72	450	69	16	8
Cathedral City	5,694	0	491	134	1	747	700	12	220	760	1,118	1,043	415	53
Coachella	15,364	-332	1,004	131	480	1,227	482	33	427	2,465	6,759	2,440	202	46
Desert Hot Springs	4,553	-59	515	50	68	363	400	19	156	296	1,941	590	199	15
Indian Wells	1,642	0	6	0	-10	116	2	-8	56	294	636	512	5	33
Indio	12,628	0	931	90	23	872	571	94	307	2,271	4,996	1,511	563	399
La Quinta	2,059	-48	136	-13	-4	-19	182	71	1	175	926	497	50	105
Palm Desert	11,051	0	776	173	-2	1,170	768	0	324	1,412	3,581	1,875	593	381
Palm Springs	9,449	0	839	191	-5	782	1,023	9	287	1,242	3,539	1,311	152	79
Rancho Mirage	4,932	0	154	-43	-1	224	82	11	117	725	2,588	864	136	75
Unincorporated CVAG	11,945	112	3,028	62	89	242	2,602	-26	79	553	2,996	1,312	483	413

Table 23: 2045 Unadjusted 2045 - 2023 Updated Employment Growth – CVAG

	Total Emp	Agriculture	Construction	Manufacture	Wholesale	Retail	Transportation	Information	FIRE	Professional	Educational	ArtEnt	OthService	PubAdmin
Blythe	911	0	107	15	0	25	136	0	13	72	450	69	16	8
Cathedral City	5,524	0	438	134	1	717	680	10	216	747	1,113	1,017	398	53
Coachella	14,995	-332	991	111	368	1,214	346	33	425	2,403	6,759	2,431	200	46
Desert Hot Springs	3,205	-59	303	-92	-23	327	-183	-2	135	153	1,941	552	188	-35
Indian Wells	1,636	0	6	0	-10	116	2	-9	54	291	636	512	5	33
Indio	11,901	0	918	89	21	653	570	89	283	2,203	4,996	1,213	479	387
La Quinta	1,835	-48	110	-18	-4	-26	177	70	-18	163	932	374	48	75
Palm Desert	10,648	0	706	155	-13	1,109	709	-3	288	1,373	3,581	1,789	586	368
Palm Springs	8,820	0	830	78	-73	758	923	0	220	1,136	3,539	1,199	138	72
Rancho Mirage	4,611	0	154	-43	-1	202	82	-64	68	635	2,588	782	136	72
Unincorporated CVAG	10,046	112	1,898	56	26	189	2,469	-27	63	367	2,996	1,058	443	396



Table 24: 2045 Unconstrained 2045 - 2023 Updated Employment Growth – CVAG

	Total Emp	Agriculture	Construction	Manufacture	Wholesale	Retail	Transportation	Information	FIRE	Professional	Educational	ArtEnt	OthService	PubAdmin
Blythe	937	0	107	15	0	36	136	0	13	72	450	80	20	8
Cathedral City	9,914	0	1,392	602	645	1,219	2,143	0	94	665	799	1,518	837	0
Coachella	20,771	-332	1,003	113	371	2,595	360	63	741	3,615	6,452	5,342	393	55
Desert Hot Springs	6,684	-59	1,417	563	92	356	1,284	10	134	302	1,833	563	174	15
Indian Wells	1,686	0	2	0	0	116	2	0	55	304	636	488	50	33
Indio	13,091	0	1,062	130	78	818	765	94	350	2,452	5,030	1,372	553	387
La Quinta	2,117	-48	106	-18	-4	158	150	70	-21	139	889	515	106	75
Palm Desert	12,307	0	783	395	1	1,433	709	0	334	1,432	3,581	2,549	711	379
Palm Springs	13,019	0	1,650	1,347	559	1,081	1,970	6	173	892	3,319	1,615	337	70
Rancho Mirage	14,381	0	155	0	1	2,449	91	18	619	3,536	2,253	714	4,518	27
Unincorporated CVAG	15,873	68	3,032	425	-29	1,879	3,199	-27	99	1,281	2,909	1,679	982	376

Table 25: 2050 Constrained 2050 - 2023 Updated Employment Growth – CVAG

	Total Emp	Agriculture	Construction	Manufacture	Wholesale	Retail	Transportation	Information	FIRE	Professional	Educational	ArtEnt	OthService	PubAdmin
Blythe	2,815	33	2	-8	51	-56	162	-349	-7	26	775	92	28	2,066
Cathedral City	5,727	0	926	417	453	731	1,457	0	4	254	98	901	485	1
Coachella	11,935	78	240	308	2,008	1,801	806	2	151	1,576	957	3,111	888	9
Desert Hot Springs	1,803	1	-11	358	349	5	983	1	-1	64	36	21	-5	2
Indian Wells	1,945	0	4	0	12	1	0	1	263	36	106	910	605	7
Indio	11,853	57	708	434	335	379	203	26	-303	496	3,808	1,983	340	3,387
La Quinta	5,131	7	-277	59	39	-136	203	-3	140	484	2,739	1,055	529	292
Palm Desert	11,912	20	224	91	247	668	59	72	36	1,358	5,904	1,154	1,106	973
Palm Springs	11,915	5	-341	-245	771	-503	3,240	-28	162	-88	5,344	2,915	499	184
Rancho Mirage	8,262	0	37	14	1	1,540	7	159	482	2,407	338	2,831	441	5
Unincorporated CVAG	15,873	68	3,032	425	-29	1,879	3,199	-27	99	1,281	2,909	1,679	982	376



Table 26: 2045 Unconstrained Employment Totals – CVAG

	Total Emp	Agriculture	Construction	Manufacture	Wholesale	Retail	Transportation	Information	FIRE	Professional	Educational	ArtEnt	OthService	PubAdmin
Blythe	4,729	382	176	41	64	516	509	385	90	143	1,388	574	172	289
Cathedral City	22,178	0	2,749	826	742	3,722	3,299	81	481	1,648	2,609	3,714	1,786	521
Coachella	29,753	1,158	1,337	532	2,180	3,818	1,104	94	1,180	4,062	7,540	6,134	547	67
Desert Hot Springs	11,707	34	2,075	707	213	834	2,149	68	272	618	2,776	1,483	375	103
Indian Wells	6,722	12	123	12	72	261	252	66	495	823	1,237	2,934	355	80
Indio	40,293	519	3,066	1,017	423	3,793	2,044	212	1,360	5,407	11,299	4,517	1,541	5,095
La Quinta	19,002	58	1,530	59	31	2,725	697	289	874	1,564	3,902	5,731	1,163	379
Palm Desert	56,787	178	4,248	1,042	378	7,759	2,516	354	2,427	9,969	12,077	11,806	2,618	1,415
Palm Springs	45,900	67	3,642	2,376	961	4,543	4,784	663	1,439	3,860	12,502	9,339	1,378	346
Rancho Mirage	30,739	0	539	131	32	4,083	297	180	1,163	4,527	9,604	4,708	5,264	211
Unincorporated CVAG	38,621	2,439	7,304	710	572	3,236	5,272	505	574	3,376	5,952	5,845	1,511	1,325

Table 27: 2050 Constrained Employment Totals – CVAG

	Total Emp	Agriculture	Construction	Manufacture	Wholesale	Retail	Transportation	Information	FIRE	Professional	Educational	ArtEnt	OthService	PubAdmin
Blythe	6,607	415	71	18	115	424	535	36	70	97	1,713	586	180	2,347
Cathedral City	17,991	0	2,283	641	550	3,234	2,613	81	391	1,237	1,908	3,097	1,434	522
Coachella	20,917	1,568	574	727	3,817	3,024	1,550	33	590	2,023	2,045	3,903	1,042	21
Desert Hot Springs	6,826	94	647	502	470	483	1,848	59	137	380	979	941	196	90
Indian Wells	6,981	12	125	12	84	146	250	67	703	555	707	3,356	910	54
Indio	39,055	576	2,712	1,321	680	3,354	1,482	144	707	3,451	10,077	5,128	1,328	8,095
La Quinta	22,016	113	1,147	136	74	2,431	750	216	1,035	1,909	5,752	6,271	1,586	596
Palm Desert	56,392	198	3,689	738	624	6,994	1,866	426	2,129	9,895	14,400	10,411	3,013	2,009
Palm Springs	44,796	72	1,651	784	1,173	2,959	6,054	629	1,428	2,880	14,527	10,639	1,540	460
Rancho Mirage	24,620	0	421	145	32	3,174	213	321	1,026	3,398	7,689	6,825	1,187	189
Unincorporated CVAG	31,866	2,453	5,363	427	994	1,985	3,267	414	390	2,946	3,677	4,760	3,527	1,663

Appendix B: Member Agency Program Inventory



CVAG



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Member Agency Program Inventory

Blythe

Blythe, located in the Palo Verde Valley along the Colorado River near the Arizona border, is a rural city in Riverside County known for its agricultural heritage and role as a transportation gateway between California and Arizona. Positioned along Interstate 10, Blythe provides a critical connection for freight, travelers, and commerce, making it a key stop for cross-state travel. With its location near the Colorado River, Blythe is also a hub for outdoor recreation, including boating, fishing, and camping, contributing to its appeal as a tourist destination.



Planning for VMT Reductions

The Blythe General Plan outlines a strategic vision for revitalizing Blythe as a transportation and economic hub in Riverside County. It emphasizes infrastructure improvements, sustainable development, and economic growth while addressing transportation challenges and opportunities. The plan highlights Blythe's role as a gateway city along Interstate 10, connecting California and Arizona, and focuses on leveraging its strategic location to attract investment and tourism.

The General Plan outlines objectives and policies aimed at reducing trip frequency and vehicle miles traveled. This includes a Transportation System Management policy designed to decrease peak-period trips by 10% through collaboration with the local business community. Additionally, the plan establishes an objective to lower energy consumption by minimizing the use of single-occupancy vehicles and overall vehicle miles traveled.

VMT Policy

The City of Blythe currently uses the County of Riverside's *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled* (2020) to review projects under CEQA for impacts due to VMT.

Municipal Code

Blythe does not currently have a municipal code that allows for parking reductions, transportation demand management programs, or reductions to trip generation assumptions.

Cathedral City

Cathedral City is the second-largest city in the Coachella Valley and serves as a key residential and commercial hub. The City offers a mix of suburban neighborhoods, shopping centers, and recreational facilities, including golf courses, parks, and hiking trails. Cathedral City is also home to several annual events with large audiences.



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Positioned along both Highway 111 and I-10, it provides easy access to nearby cities like Palm Springs and Rancho Mirage, making it an integral part of the valley's growth and development.

Planning for VMT Reductions

The Cathedral City General Plan, adopted in July 2021, integrates transportation, land use, housing, and environmental sustainability to create a safe, efficient, and multimodal transportation system. The plan promotes the development of alternative transportation modes (pedestrians, bicycles, low-speed electric vehicles, and public transit), pedestrian-oriented retail and activity centers, multi-use trails, and complete streets designs. Air quality and climate stability goals are addressed through policies that encourage mixed-use and compact development patterns, transit-oriented projects, and ridesharing services.

The General Plan includes a policy to promote land use patterns and strategies, such as mixed-use development and a balanced distribution of employment and housing, to encourage pedestrian and other non-motorized transportation while minimizing vehicle miles traveled. Additionally, the plan outlines an action to implement a transportation demand management ordinance, which has already been adopted. To further support the goal of enhancing multimodal travel, and reduce reliance on automobile trips, the plan incorporates multiple active transportation policies to promote alternative modes of transportation.

Active Transportation Plan

The Cathedral City Active Transportation Plan (ATP), adopted in February 2023, outlines strategies to improve mobility, safety, and connectivity for pedestrians, cyclists, and transit users. The ATP provides a plan for constructing pedestrian and bicycle infrastructure to close identified gaps in the active transportation network. The ATP also outlines strategies to serve disadvantaged communities and vulnerable road users like children and seniors.

Wayfinding plays a central role in Cathedral City's ATP and the plan leverages transit services provided by SunLine Transit Agency and connections to regional trails like CV Link in an attempt to increase active transportation trips. Implementation of the ATP is structured in phases that include cost estimates and funding strategies, including eligibility for state and federal grants.

VMT Policy

Cathedral City currently uses the County of Riverside's *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled* (2020) to review projects under CEQA for impacts due to VMT.

Municipal Code

Cathedral City's municipal code section 9.58.060 allows for Joint Use Parking, which permits property owners or lessees to share parking facilities if their operating hours differ, such as one being a daytime use and the other a nighttime or weekend use. Up to 50-percent of required parking spaces can be shared through a conditional use permit (CUP), provided certain conditions are met. These include proximity within 300 feet, safe pedestrian access, clear visibility or signage, and minimal conflict in operating hours. Additionally, a legal agreement must be approved by the city attorney and recorded to ensure compliance and address any future changes in use that might affect parking availability.

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The Cathedral City Transportation Demand Management Code, Chapter 9.102, establishes regulations to reduce vehicle trips and VMT. It applies to new developments and change-of-use projects with 100 or more employees. Developers are required to submit a Trip Reduction Plan prepared by qualified professionals to achieve a 10-percent reduction in trips. Developers are also required to include provisions for transit facilities, bicycle facilities, and rideshare facilities, which can be used to meet the 10-percent trip reduction. The ordinance also allows for flexibility for developers to include additional trip reduction strategies such as housing subsidies and regional transit funding in their Trip Reduction Plan to meet transportation goals while supporting sustainability and accessibility.

The TDM Code requires developers to submit plans for review, with approvals granted within 90 days. Approved plans are subject to annual reviews to ensure compliance, and any updates must be submitted if standards are not being met. Violations can result in permit denials, stop-work orders, or legal actions to enforce compliance. Appeals can be filed if disputes arise over compliance decisions. Overall, this ordinance ensures Cathedral City promotes sustainable growth, traffic congestion relief, and environmental responsibility through strategic transportation planning.

Coachella

Coachella is a rapidly growing city known for its rich cultural heritage, agricultural roots, and vibrant community. Coachella serves as a key economic and transportation hub in the eastern valley. The City is well-connected by Highway 111 and Interstate 10, providing access to regional and interstate transportation networks. The City is also a gateway to regional attractions, including agriculture, festivals, and natural landmarks, making it a center for tourism and commerce.

With ongoing infrastructure improvements and a focus on sustainable growth, Coachella continues to expand as a vital part of the region's transportation and economic network.



Planning for VMT Reductions

The Coachella General Plan, adopted in April 2015, aims to develop the community through updated urban design, climate adaptation, zoning policies, and transportation policies. The Coachella General Plan prioritizes a balanced transportation system by promoting compact, transit-oriented development, complete streets, and extensive walking and biking networks. It also includes several goals and policies to reduce vehicle trips, build a multimodal network, and implement transportation demand management policies.

Active Transportation Plan

The *Coachella Valley ATP* (2020) focuses on connectivity, safety, and accessibility. It builds upon previous transportation plans and includes updates to active transportation infrastructure such as bike lanes, sidewalks, and pedestrian crossings to promote active transportation and reduce reliance on automobiles. The plan addresses the needs of disadvantaged communities by prioritizing investments in areas with limited transportation options. The ATP also integrates with regional active transportation networks, such as CV Link, to create multi-modal pathways across the Coachella Valley. Implementation

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strategies include funding sources, phased project timelines, and community engagement programs to encourage walking and biking while improving safety, especially near schools.

VMT Policy

The City's *Local Guidelines for Implementing the California Environmental Quality Act (2020)* does not provide thresholds of significance for VMT. Coachella currently uses the County of Riverside's *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled (2020)* to review projects under CEQA for transportation impacts.

Municipal Code

Coachella's parking code allows for reduced parking in the Sixth Street commercial core area for commercial businesses located within 500-feet of a public parking lot. Residential parking requirements are lower than average, requiring only one space per unit. There are also provisions for shared parking if a parking study is prepared and approved by the City.

Coachella's Transportation Demand Management Code, Chapter 12.4, requires a TDM plan for employers with 100 or more employees to be prepared by a qualified professional and demonstrate a 10-percent reduction in vehicle trips. Developers are also required to include provisions for transit facilities, bicycle facilities and rideshare facilities, which can be used to meet the 10-percent reduction. Similar to Cathedral City, there is flexibility to include housing subsidies and other measures that reduce trips in a developer's TDM plan. The City does not require an additional operational plan if the employer is already required to submit one to the SCAQMD.

Desert Hot Springs

Desert Hot Springs is a scenic desert city renowned for its natural hot mineral springs and spa resorts.

Positioned between Interstate 10 and Highway 62, the City serves as a key gateway to the High Desert and Joshua Tree National Park, offering convenient access to regional and interstate transportation routes. Desert

Hot Springs is experiencing steady growth while maintaining a focus on sustainability and infrastructure improvements. Its proximity to major highways and transit services makes it an important part of the Coachella Valley's transportation network, supporting economic development and regional connectivity.



Planning for VMT Reductions

The Desert Hot Springs General Plan, adopted in April 2015, focuses on creating an inclusive, sustainable, and safe transportation framework through land use and mobility strategies. The General Plan emphasizes the development of a safe multimodal transportation network through adaptive street designs, traffic calming measures, and enhanced pedestrian and cyclist infrastructure. Efforts to reduce VMT are supported by integrating sustainable transportation and land use strategies, such as higher-density development along major corridors, active transportation facilities, and revitalization of underutilized infill areas near existing infrastructure and transit. The plan prioritizes transit expansion, improved bus service, and enhanced facilities to support public transportation use.

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VMT Policy

Desert Hot Springs currently uses the County of Riverside's *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled* (2020) to review projects under CEQA for impacts due to VMT.

Municipal Code

Similar to Cathedral City, Desert Hot Springs allows for joint use parking where the operating hours of the uses do not overlap. Businesses can reduce parking requirements up to 50-percent.

Desert Hot Spring's Transportation Demand Management Code, Chapter 10.56, is similar to other cities' TDM requirements in the Coachella Valley with applicability to employers with over 100 employees and consistency requirements with the SCAQMD requirements. (See Cathedral City and Coachella)

Indian Wells

Indian Wells is a resort city known for its luxury golf courses, world-class resorts, and the Indian Wells Tennis Garden, which hosts the annual BNP Paribas Open, one of the largest professional tennis tournaments in the world. Situated along Highway 111 and near Interstate 10, the City offers convenient access to regional transportation routes, making it a key destination for tourism and events.



Planning for VMT Reductions

The Indian Wells November 2024 Draft General Plan outlines creating a safe, efficient, and sustainable roadway network for all users. The General Plan seeks to promote biking, walking, and public transit through infrastructure improvements, connectivity enhancements, and campaigns encouraging sustainable travel. Environmental and noise-reduction goals encourage alternative travel options and low-emission vehicles, aligning with broader sustainability and livability efforts.

VMT Policy

Indian Wells does not have an adopted VMT policy and has most recently used LCI's *Technical Advisory on Evaluating Transportation Impacts In CEQA* (2018) for evaluation of the General Plan.

Municipal Code

Indian Wells does not have any allowances for shared parking. Similar to other cities in the SCAQMD area, the City has requirements for TDM programs. Chapter 16.50 of the City's municipal code outlines requirements that are consistent with other cities and the SCAQMD requirements. (See Cathedral City and Coachella)

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Indio

Indio is the region's largest City and a major cultural, economic, and transportation hub. It hosts world-renowned events such as the Coachella Valley Music and Arts Festival and the Stagecoach Festival, attracting visitors from around the globe. Indio is strategically positioned along Interstate 10 and Highway 111, providing vital connections for regional and interstate travel.

Planning for VMT Reductions

The City of Indio's General Plan 2040, adopted in September 2019, outlines a vision to create more walkable, healthier, and sustainable neighborhoods and centers. Key goals include revitalizing the historic Highway 111 and 99 corridors, transforming a declining shopping mall into a pedestrian-oriented "Midtown District," and connecting this area to a rejuvenated downtown Indio. The plan emphasizes the development of mixed-use, pedestrian-friendly, and transit-ready areas to enhance community life.

VMT Policy

The City of Indio currently uses the County of Riverside's *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled* (2020) to review projects under CEQA for impacts due to VMT.

Municipal Code

City of Indio's unified development code (UDC) requires unbundled parking for multi-family and attached single-family developments. The UDC also includes a parking maximum of 150-percent of the required parking. A number of parking reductions are available for developers to take advantage of, with a maximum reduction of 30-percent of the required parking. The parking reductions available include reductions for proximity to transit, the provision of carpool/vanpool spaces or motorcycle spaces, on-street parking availability, car-sharing programs, and shared parking. The UDC also contains requirements for bicycle parking. The City's municipal code requires a TDM program for employers with over 100 employees similar to other cities in the SCAQMD. (See Cathedral City and Coachella)

La Quinta

La Quinta is a vibrant City known for its resort lifestyle, golf courses, and cultural attractions. It is home to the renowned La Quinta Resort & Club and hosts the American Express PGA Golf Tournament at the PGA West golf course. The City is well-connected by Highway 111 and Washington Street, providing easy access to regional transportation networks and nearby cities.



Planning for VMT Reductions

The City of La Quinta 2035 General Plan, adopted in February 2013, includes a vision for a neighborhood-oriented community with a healthy, vibrant, and heritage-minded approach to planning. The plan focuses on smart land use, efficient transportation, diverse housing options, and the conservation of open spaces. The City also has adopted a Greenhouse Gas (GHG) Reduction Plan that

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includes a community reduction measure to reduce VMT by 15-percent from existing conditions through increased bicycle and walking activity.

VMT Policy

The City of La Quinta has adopted their own VMT thresholds of significance in June 2020 which generally follow the *Technical Advisory on Evaluating Transportation Impacts In CEQA* (2018). Project screening criteria follow the recommendations in the technical advisory including screening for local serving uses, projects within transit priority areas, and low VMT generating areas. A proposed project is required to be analyzed under four scenarios: baseline conditions, baseline plus project conditions, cumulative conditions, and cumulative plus project conditions. The City's VMT thresholds are as follows:

- Residential: VMT that exceeds either 15% below the Citywide per resident VMT, or 15% below regional VMT per resident, whichever is more stringent.
- General Employment (including offices and R&D): VMT that exceeds 15% below the existing regional VMT per employee.
- Industrial: VMT that exceeds existing regional VMT per employee.
- Retail: A net increase in the total regional VMT.
- Public/Quasi Public: Most relevant threshold to be used at the discretion of the Public Works Director.
- Mixed Use, Area Plans, Changes of Use, or Additions: Each land use component of the project to be analyzed separately according to the relevant threshold.
- General Plan Amendments: An increase in citywide VMT.
- Transportation Projects: A net increase in VMT that exceeds the levels within SCAG's RTP/SCS.

Additionally, a project would result in a significant VMT impact if either the baseline or cumulative project-generated VMT per service population exceeds the City's baseline VMT per service population. A project's impact on VMT is also considered significant if the baseline or cumulative link-level boundary VMT per service population increased under the plus project condition compared to no-project condition.

Municipal Code

La Quinta's code section 9.150.060 allows for shared parking with a plan using the Urban Land Institute's methodology. The code incentivizes shared parking with an increase of 5-percent in the allowable floor-to-area ratio (FAR). Similar to other cities in the SCAQMD, the City has a transportation demand management plan requirement for employers with over 100 employees with allowances for creative TDM measures. (See Cathedral City and Coachella) However, unlike other cities' TDM plan requirements, which use a 10-percent trip reduction, La Quinta's code uses an average vehicle occupancy rate of 1.3 as the performance metric for the TDM plans.

Palm Desert

Palm Desert is a dynamic city known for its shopping, dining, and recreational opportunities. It serves as a regional hub for



PALM DESERT
CALIFORNIA

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commerce, education, and arts, featuring attractions such as El Paseo, often called the "Rodeo Drive of the Desert," and the Living Desert Zoo and Gardens. Strategically situated along Highway 111 and near Interstate 10, Palm Desert offers excellent regional connectivity.

Planning for VMT Reductions

The City of Palm Desert General Plan, adopted in November 2016, envisions transforming the community into a more walkable, sustainable, and vibrant city. Key aspects of this vision include developing mixed-use city centers along Highway 111, El Paseo, and San Pablo Avenue, fostering pedestrian-friendly environments, and promoting sustainable development practices. The plan also emphasizes the importance of community engagement, environmental stewardship, and economic vitality to enhance the quality of life for residents and visitors alike. The General Plan includes policies aimed at reducing VMT by emphasizing the development of mixed-use city centers along major corridors.

Active Transportation

While the City does not have an active transportation plan, there are several programs in Palm Desert that collectively comprise a robust set of active transportation projects. The Walk & Roll program is a three-phase program prompted by the *Bike and Pedestrian Gap Analysis Study* (2022) which assessed and identified gaps in the bicycle and pedestrian network, as well as recommended prioritized bike and pedestrian infrastructure improvements. The first phase of the Walk & Roll program was to install sharrows-- lane markings for Class III bicycle routes -- on various roadways. The second phase includes the installation of Class II buffered and unbuffered bike lanes along various roadways. The third phase will focus on pedestrian walkways.

PD Link is a program to develop local connections to the CV Link corridor. The goal of PD Link is to provide access to the CV Link and central Palm Desert destinations for bicycles and low-speed electric vehicles, including golf carts. The City's 2016 General Plan envisions a multimodal transportation system that includes walking, bicycling, public transit, automobiles, and golf carts. The PD Link project will identify and construct priority corridors and routes to connect to the CV Link. Other corridors may be considered in the future if funding becomes available.

The Haystack Traffic Calming program is aimed at enhancing pedestrian safety and reducing traffic speeds along Haystack Road. The program includes traffic signal improvements to modernize the equipment, as well as adding new crosswalks and pedestrian push buttons. In addition, Haystack Road will undergo sealcoating, and lane widths will be narrowed to encourage slower traffic. Buffered, painted bike lanes will be added on both sides of the roadway to create a safer environment for cyclists while also contributing to the overall traffic calming effect.

VMT Policy

The City of Palm Desert currently uses the County of Riverside's *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled* (2020) to review projects under CEQA for impacts due to VMT.

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Municipal Code

Palm Desert provides minimum bicycle parking standards and allows for joint use parking with a reduction of no more than 50-percent of the required parking spaces. Similar to other cities in the SCAQMD, Palm Desert has TDM requirements for employers with over 100 employees (see Cathedral City and Coachella). The City also uses the performance metric of average vehicle ridership of 1.3, similar to La Quinta. The City's requirements for on-site development are slightly different than other cities. In addition to transit facilities, the City requires the construction of bicycle, rideshare, and golf cart facilities.

Palm Springs

Palm Springs is a world-renowned resort city celebrated for its mid-century modern architecture, luxury resorts, proximity to Joshua Tree National Park, and cultural events such as the Palm Springs International Film Festival. Positioned along Highway 111 and Interstate 10, the City serves as a major transportation hub with access to Palm Springs International Airport.



Planning for VMT Reductions

The City of Palm Springs General Plan, adopted in 2007, envisions a future that blends its rich cultural heritage with sustainable growth and modern amenities. The plan emphasizes creating vibrant, walkable neighborhoods, enhancing economic opportunities, and preserving the City's unique architectural and natural landscapes. Key objectives include promoting mixed-use developments, improving transportation infrastructure to support alternative modes of travel, and implementing environmental stewardship practices. Through these initiatives, Palm Springs aims to foster a thriving, inclusive community that offers a high quality of life for residents and an inviting destination for visitors. The General Plan contains policies aimed at reducing VMT through land use strategies and shifts away from automobile trips and towards alternate modes of travel.

Active Transportation Plan

Palm Springs does not have its own Active Transportation Plan; however, it does have a Pedestrian Master Plan which aims to create safer streets, develop new walking routes, and improve public health by promoting active transportation. It provides a roadmap for addressing pedestrian infrastructure gaps, prioritizing projects, and securing funding for improvements. A key element of the plan was community engagement, which involved walk audits, surveys, and virtual meetings to gather public input and assess needs. The plan prioritizes projects based on criteria such as safety, connectivity, and proximity to schools, parks, and transit. Recommendations focus on adding sidewalks, crosswalks, traffic calming measures, and pedestrian signals to enhance safety and convenience. Specific corridors and intersections are identified for upgrades, along with conceptual designs for high-priority areas. The plan also highlights Safe Routes to School (SR2S) initiatives to improve pedestrian access near educational facilities. The implementation strategy outlines funding opportunities, including grants and transportation programs, to support construction and maintenance. By integrating pedestrian infrastructure into larger transportation projects, the plan aims to make Palm Springs more walkable, sustainable, and connected while promoting public health and safety.

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VMT Policy

The City of Palm Springs adopted their own VMT thresholds of significance in June 2020, which generally follow the *Technical Advisory on Evaluating Transportation Impacts In CEQA* (2018). Project screening criteria follow the recommendations in the advisory, including screening for local serving uses, projects within transit priority areas, and low VMT generating areas. A proposed project is required to be analyzed under four scenarios: baseline conditions, baseline plus project conditions, cumulative conditions, and cumulative plus project conditions. Thresholds are distinguished between project generated VMT and the project's effect on VMT.

A project would result in a significant project-generated VMT impact if either of the following conditions are satisfied:

1. The baseline project-generated VMT per service population exceeds the City of Palm Springs General Plan Buildout VMT per service population, or
2. The cumulative project-generated VMT per service population exceeds the City of Palm Springs General Plan Buildout VMT per service population.

The project's effect on VMT would also be considered significant if it resulted in either of the following conditions to be satisfied:

1. The project causes the baseline link-level boundary VMT per service population within the City boundary to increase under the plus project condition compared to the no project condition, or
2. The project causes the cumulative link-level boundary VMT per service population within the City boundary to increase under the plus project condition compared to the no project condition.

Municipal Code

Palm Springs allows joint use parking similar to other cities in Coachella Valley employees (see Cathedral City and Coachella). The TDM code uses the metric of ten-percent reduction in vehicle trips and includes site development requirements for bicycle and rideshare facilities in addition to transit facility requirements.

Rancho Mirage

Rancho Mirage is a city renowned for its luxury resorts, championship golf courses, and world-class amenities. Positioned along Highway 111 and Interstate 10, Rancho Mirage offers convenient access to regional and interstate transportation networks. Rancho Mirage is home to notable landmarks such as the Annenberg Estate at Sunnylands, a historic retreat for world leaders, and the Agua Caliente Casino Resort & Spa, a premier entertainment destination.





Planning for VMT Reductions

The City of Rancho Mirage's General Plan, adopted in 2017, outlines a vision to maintain and enhance the community's high quality of life while accommodating thoughtful growth and development. The plan emphasizes preserving the City's unique desert environment, promoting sustainable land uses, and ensuring that new developments complement the existing character of the community. Key objectives of the City's General Plan include fostering economic vitality, providing diverse housing options, enhancing transportation infrastructure, and maintaining open spaces for recreation and conservation.

Active Transportation Plan

The Active Transportation Guidelines and Best Practices for the City of Rancho Mirage outlines strategies to improve pedestrian and bicycle infrastructure, enhance safety, and promote sustainable transportation options. The plan evaluates existing conditions, identifying gaps in sidewalks, bike lanes, and crosswalks, and proposes improvements to better connect neighborhoods, schools, commercial areas, and transit stops. It highlights the challenges to addressing the identified gaps such as barriers created by major roads and limited pedestrian crossings over the Whitewater Channel.

The document provides design standards for Class I, II, and III bikeways, pedestrian facilities, and intersection treatments to improve visibility and safety. Recommendations include installing pavement markings, painted bike lanes, wayfinding signage, and traffic-calming measures to create a safer and more accessible environment for cyclists and pedestrians. It also addresses high-priority areas, such as Highway 111, and future development impacts, emphasizing the need for multimodal connections in new developments.

The document also considers regional projects like the CV Link, identifying opportunities and challenges for integrating it into the City's transportation network while addressing community concerns. It outlines funding sources at federal, state, and local levels to support implementation, including grants from programs like the Active Transportation Program (ATP) and Caltrans Transportation Planning Grants.

VMT Policy

Rancho Mirage has adopted and subsequently updated their own thresholds of significance which generally follows the *Technical Advisory on Evaluating Transportation Impacts In CEQA* (2018). Project screening criteria follow the recommendations in the advisory including screening for small projects, local serving retail, local essential services, projects near high quality transit, affordable housing, redevelopment projects, and map-based low VMT screening. A proposed project is required to be analyzed under four scenarios: baseline conditions, baseline plus project conditions, cumulative conditions, and cumulative plus project conditions. Ranch Mirage's VMT thresholds are as follows:

- Residential: VMT that exceeds either 15% below the citywide per resident VMT, or 15% below regional VMT per resident
- Office: VMT that exceeds 15% below the existing regional VMT per employee
- Retail: A net increase in the total regional VMT
- Public/Quasi Public: Most relevant threshold to be used at the discretion of the Public Works Director

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- Mixed Use, Area Plans, Changes of Use, or Additions: Each land use component of the project to be analyzed separately according to the relevant threshold
- General Plan Amendments: A net increase in citywide VMT
- Transportation Projects: A net increase in VMT that exceeds SCAG's RTP/SCS

Municipal Code

Rancho Mirage allows shared parking using a methodology specified in Section 17.26.050 of the municipal code, with additional reductions available for mixed-use developments and rideshare programs. The City also specifies bicycle parking requirements for newly constructed developments. Rancho Mirage's TDM code has a lower employment requirement and includes additional requirements of an employer's TDM plan compared to other cities in the valley. The TDM code applies employers with more than 50 employees and specifies requirements for employers to identify a TDM coordinator, submit baseline and annual reporting, and includes the option for the formation of transportation management associations.

Riverside County

The unincorporated areas of Riverside County within the Coachella Valley encompass a mix of rural communities, agricultural lands, and desert landscapes, offering a unique blend of open spaces and growing residential developments. These areas, including Thermal, Mecca, Oasis, and North Shore, are vital to the region's agricultural economy, producing crops such as dates, citrus, and vegetables. Positioned along Highway 111, State Route 86, and near Interstate 10, these communities have access to key transportation corridors that connect them to urban centers and markets.



Planning for VMT Reductions

The County of Riverside's General Plan, adopted in October 2003, promotes the development of diverse, well-connected communities that reduce dependence on single-occupancy vehicles and encourage alternative transportation modes such as public transit, biking, and walking. Strategic land use planning focuses on creating mixed-use developments and transit-oriented communities that enhance accessibility and reduce VMT. Transportation policies aim to integrate efficient roadway networks with public transit systems to ensure seamless mobility across the county, while minimizing environmental impacts. The General Plan also emphasizes the importance of safe, accessible streets and infrastructure that support both economic vitality and environmental stewardship. By aligning land use and transportation strategies, the plan seeks to foster vibrant, sustainable communities with a high quality of life for all residents.

VMT Policy

In December 2020, the County of Riverside adopted the *Transportation Analysis Guidelines for Level of Service and Vehicle Miles Traveled*. The guidelines generally follow the *Technical Advisory on Evaluating Transportation Impacts In CEQA* (2018). Small project screening applies to projects with low

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trip generation per existing CEQA exemptions or based on the County's Greenhouse Gas Emissions Screening Tables. Small project screening using the GHG Screening Tables includes a 3,000 Metric Tons of Carbon Dioxide Equivalent (MTCO₂e) per year screening level threshold. The County's VMT thresholds are as follows:

- Residential: VMT that exceeds the existing countywide per resident VMT.
- Office: VMT that exceeds the existing countywide per employee VMT.
- Retail: A net increase in the total regional VMT, using the county as the regional basis or other area as determined by the Transportation Department.
- Other Employment: VMT that exceeds the existing countywide per employee VMT for similar land uses.
- Other Customer: A net increase in the total regional VMT, using the county as the regional basis or other area as determined by the Transportation Department.
- Transportation Projects: A net increase in regional VMT.

The County has developed a sketch planning tool based on the RIVCOM model that is available for use to determine impacts. Mitigation options for projects that cannot be screened include project-specific mitigation through transportation demand management or related strategies as approved by the County.

Municipal Code

Riverside County allows for parking reductions due to TDM measures that intentionally reduce parking demand such as shared parking, the provision of bicycle parking, ridesharing, and other such measures. The code also includes minimum bicycle parking standards and facilities. Chapter 10.36 of Riverside County's code outlines the TDM program as voluntary. A developer must provide a traffic impact analysis that includes a TDM plan if they are participating in the TDM program.

Tribes

The Coachella Valley is home to four federally recognized tribes—the Agua Caliente Band of Cahuilla Indians, the Cabazon Band of Cahuilla Indians, the Torres Martinez Desert Cahuilla Indians, and the Twenty-nine Palms Band of Mission Indians. Tribal communities in the Coachella Valley face long-standing transportation challenges rooted in historical and systemic barriers. Many reservations were established in remote, undesirable areas with limited access to water, flat land, and essential resources. This placement not only restricted community growth but also isolated tribes from one another, especially those connected by political, kinship, and ceremonial ties, such as the Cahuilla communities.



Today, these historical decisions continue to affect transportation and development for tribes. Major freeways like I-10 and the Union Pacific Railroad (UPRR) provide access to reservation cores but also

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physically divide communities. Expanding beyond these cores to develop housing or transportation infrastructure is difficult, particularly for tribes with large, non-contiguous, or checkerboard land bases. Tribes such as Cabazon and Torres Martinez face additional resource and funding constraints, limiting their ability to pursue development projects.

Although recent grants offer some support, they are often insufficient to cover entire projects and may come with complications, such as requirements to waive sovereign immunity. It is important to note that transportation challenges are not unique to Tribal lands; the Coachella Valley as a whole is underserved. Even some incorporated cities lack modern sewer systems, and many public roads remain unpaved. Federal land preservation limits development in surrounding areas, concentrating growth along the I-10 corridor. Additionally, the rise of large-scale solar projects in the region does not typically include associated public infrastructure improvements.

Appendix C: Disadvantaged Communities Definition and Methodology



CVAG



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Abbreviations

AB: Assembly Bill
ACS: American Community Survey
AFFH: Affirmatively Furthering Fair Housing
APP: Areas of Persistent Poverty
CalEPA: California Environmental Protection Agency
CES4: CalEnviroScreen 4.0
CVAG: Coachella Valley Association of Governments
DAC: Disadvantaged Communities
FRPM: Free and Reduced Price Meal
HCD: Department of Housing and Community Development
HUD: Department of Housing and Urban Development
PM 2.5: Particulate Matter 2.5 micrometers or smaller
RCTC: Riverside County Transportation Commission
REAP (2.0): Regional Early Action Planning Grant Program
SB: Senate Bill
SCAG: Southern California Association of Governments
SNAP: Supplemental Nutrition Assistance Program
SS4A: Safe Streets and Roads for All
TAZ: Traffic Analysis Zone
TCAC: Tax Credit Allocation Committee
USDOT: United States Department of Transportation

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Introduction

Disadvantaged communities (DACs) are communities that experience a combination of social, economic, health, and environmental burdens, often resulting from historic disinvestment and systemic inequities. In California, the identification and inclusion of DACs in transportation planning is not only a matter of regulatory compliance, but a critical step toward achieving more equitable and effective outcomes. Statewide policies—including those related to greenhouse gas reduction, vehicle miles traveled (VMT) mitigation, and environmental justice—prioritize equity as a core objective, recognizing that transportation infrastructure plays a significant role in shaping access to opportunity, public health, and community resilience.

The concept of environmental justice and the term "disadvantaged communities" are rooted in the civil rights movement. Studies starting in the 1970's demonstrated that hazardous waste sites and polluting industries were disproportionately located in minority and low-income areas. In the 1980's increasing protests and activism brought national attention to this environmental inequality. Initially, the environmental justice movement primarily focused on the intersection of race and poverty in the context of environmental burdens. However, the movement and the understanding of who constitutes a "disadvantaged community" has expanded over time to include other intersecting factors such as health impacts, reduced access to resources, tribal resources and other factors. Considering a broader range of factors provides a more holistic approach to understanding inequalities and the impacts of transportation policies. In current planning efforts, the term environmental justice is often used to describe the policies addressing equity and disadvantaged communities is used to describe the people who are most vulnerable to policy decisions.

Incorporating equity considerations into planning helps address long-standing disparities in mobility access, safety, and infrastructure quality that disproportionately affect low-income communities and communities of color. Prioritizing DACs in the planning process helps to ensure that transportation investments do not perpetuate inequality or contribute to displacement but instead support inclusive economic growth and climate resilience.

Given the geographic, socioeconomic, and cultural diversity across regions, a one-size-fits-all definition of DACs may not fully capture local conditions. This report documents the process undertaken to develop a locally tailored approach for identifying disadvantaged communities within the Coachella Valley Association of Governments (CVAG) planning area. The methodology integrates state and federal guidance with region-specific indicators to create a comprehensive assessment matrix that reflects the unique challenges and priorities of the Coachella Valley. The goal is to support equitable decision-making by highlighting communities facing the highest levels of disadvantage, thereby ensuring that regional transportation planning efforts are inclusive, responsive, and just.

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Definitions and Considerations

For this project multiple approaches for defining DAC areas were considered: including guidelines from the Regional Early Action Planning Grants program (REAP 2.0¹), the Safe Streets and Roads for All grant program (SS4A²), CalEnviroScreen 4.0 (CES4), California State Senate Bill 535, and Assembly Bill 1550³.

Regional Early Action Planning Grant Program (REAP 2.0)

The Regional Early Action Planning Grant Program (REAP 2.0) provides state funding through the Department of Housing and Community Development (HCD) to support planning initiatives that accelerate housing production, reduce vehicle miles traveled (VMT), and advance equity and climate goals across California. REAP objectives include “Affirmatively Furthering Fair Housing” (AFFH), measured by the impact of housing policy and development on disadvantaged and historically underserved communities. REAP guidelines define disadvantaged and historically underserved communities as those included under the following criteria:

- Areas of concentrated poverty;
- Areas of high segregation, poverty, and low to moderate access to opportunity (using California Tax Credit Allocation Committee/HCD Opportunity Area Maps);
- Communities of concern, disadvantaged communities, and low-income communities pursuant to Senate Bill 535 and Assembly Bill 1550 (using SB 535 disadvantaged Communities Map);
- Areas of high housing cost burdens;
- Areas with high vulnerability of displacement;
- Areas related to Tribal Entities;
- Other areas experiencing disproportionate impacts of California’s Housing and climate crisis.

REAP allows applications to propose alternative definitions to disadvantaged and historically underserved communities in consultation with HCD and the State collaborative partners.

Safe Streets and Roads for All (SS4A)

The Safe Streets and Roads for All program provides federal funding through the US Department of Transportation (USDOT) to regional, local and tribal initiatives aiming to prevent roadway fatalities and serious injuries. A key component of SS4A funding criteria requires using inclusive and representative

¹ Notice of Funding Availability and Final Guidelines – Metropolitan Planning Organization Allocation Regional Early Action Planning Grant (REAP 2.0), California Department of Housing and Community Development, July 26, 2022.

² Identifying Underserved Communities for SS4A Grants, US Department of Transportation, April 1, 2025.

³ Final Designation of Disadvantaged Communities Pursuant to Senate Bill 535, California Environmental Protection Agency, May 2022.

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processes, including equity impact assessments of proposed projects using SS4A funding, with consideration to underserved communities. SS4A provides an Underserved Communities Tool identifying communities for consideration, consistent with the definition of Areas of Persistent Poverty (APP) in the Infrastructure Investment and Jobs Act. This definition includes:

- Any county (or equivalent jurisdiction) in which, during the 30-year period between 1991 and 2021, 20 percent or more of the population continually lived in poverty, as measured by the 1990 decennial Census, 2000 decennial Census, and the most recent annual small area income and poverty estimate of the Bureau of the Census;
- Any Census tract with a poverty rate of not less than 20 percent, as measured by the 5-year data series available from the American Community Survey of the Bureau of the Census for the period of 2014 through 2018;
- Any territory or possession of the United States.

CalEnviroScreen 4.0

California State Senate Bill (SB) 535 (2012) established that money generated by California's cap-and-trade system must allocate a minimum amount of funding to initiatives that support disadvantaged communities, tasking the California Environmental Protection Agency (CalEPA) to identify and designate disadvantaged communities based on geographic, socioeconomic, public health and environmental hazard criteria. Assembly Bill (AB) 1550 (2016) reinforced these requirements, ensuring that minimum quantities of Climate investments must benefit low-income households and disadvantaged communities. CalEPA developed the CalEnviroScreen (CES) mapping tool to identify these communities, incorporating numerous indicators weighing individual census tracts' pollution burden and population characteristics.

Pollution indicators include the prevalence and risk of:

- Ozone
- Airborne PM 2.5
- Diesel particulate matter
- Drinking water contaminants
- Children's lead risk from housing
- Pesticides
- Toxic releases from facilities
- Traffic impacts
- Cleanup sites
- Groundwater threats
- Hazardous waste

Population characteristics consider the prevalence, risk, or deficit of the following factors:

- Asthma
- Cardiovascular disease
- Low birth weight
- Education
- Housing burden (cost of housing relative to income)
- Linguistic isolation
- Poverty
- Unemployment

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The most recent version of CalEnviroScreen 4.0 (CES4) was published in 2022. CalEPA's current definition of disadvantaged communities included under SB 535 include census tracts that meet any of the following criteria:

- Census tracts receiving the highest 25 percent overall scores in CES4; or
- Census tracts lacking overall scores in CES4 due to data gaps but receiving the highest five percent of CES4 cumulative pollution burden scores; or
- Census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CES4; or
- Lands under the control of federally recognized Tribes.

Additional Factors Considered

In addition to the factors required based on programmatic guidelines addressing equity, additional factors were considered to obtain a more holistic view of populations that may be more vulnerable to transportation policy decisions. Using the most recently available, 2023 Five-Year American Community Survey Census datasets, the following additional characteristics were analyzed:

- Prevalence of zero-car households: households without vehicles are dependent on alternative modes and may lose access to critical services, jobs and resources without ongoing investments in transit, rideshare, and active transportation.
- Concentration of disabled populations: households with disabled persons are often fully or at least partially reliant on transit and paratransit services. Understanding the concentrations of populations with this need can help direct or prioritize funding for transit services.
- Concentration of below-market rate housing: affordable housing often generates lower VMT than market rate housing. Understanding where there are concentrations of affordable housing allows agencies to provide resources to communities that will benefit most from those investments.
- Concentration of populations benefiting from assistance programs, including the Supplemental Nutritional Assistance Programs (SNAP) and the Free and Reduced Price Meal (FRPM) under the California Department of Education: populations benefiting from assistance programs are more likely to need and use further public investments in resources that reduce the cost of transportation.

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Methodology

To assess the status of disadvantaged communities in the CVAG region, a standardized methodology was developed to compile and analyze data using different geographies, spatial formats, scales, and measurement methods. The resulting recommendations were developed using the methodology described below.

Spatial Analysis and Geographic Conversion

To adequately analyze communities at a granular level and to maintain consistency with the CVAG Regional VMT Study, all analysis was conducted at the Traffic Analysis Zone (TAZ) level. The indicators and criteria considered are provided at both the Census Tract and School District geographies. To convert these larger geographies to the TAZ level, TAZs were assigned a weighted score for each indicator proportional to the percentage of total land area falling within different geographies. Initially parcels were considered as the method for aggregating data, however not all of the indicators lend themselves to disaggregation using this method, particularly the pollution indicators, assistance programs, and tribal lands, all of which are more accurately reflected by land area. Ultimately land area was chosen as the best overall method of disaggregation for the data.

Mapping of Disadvantaged Communities

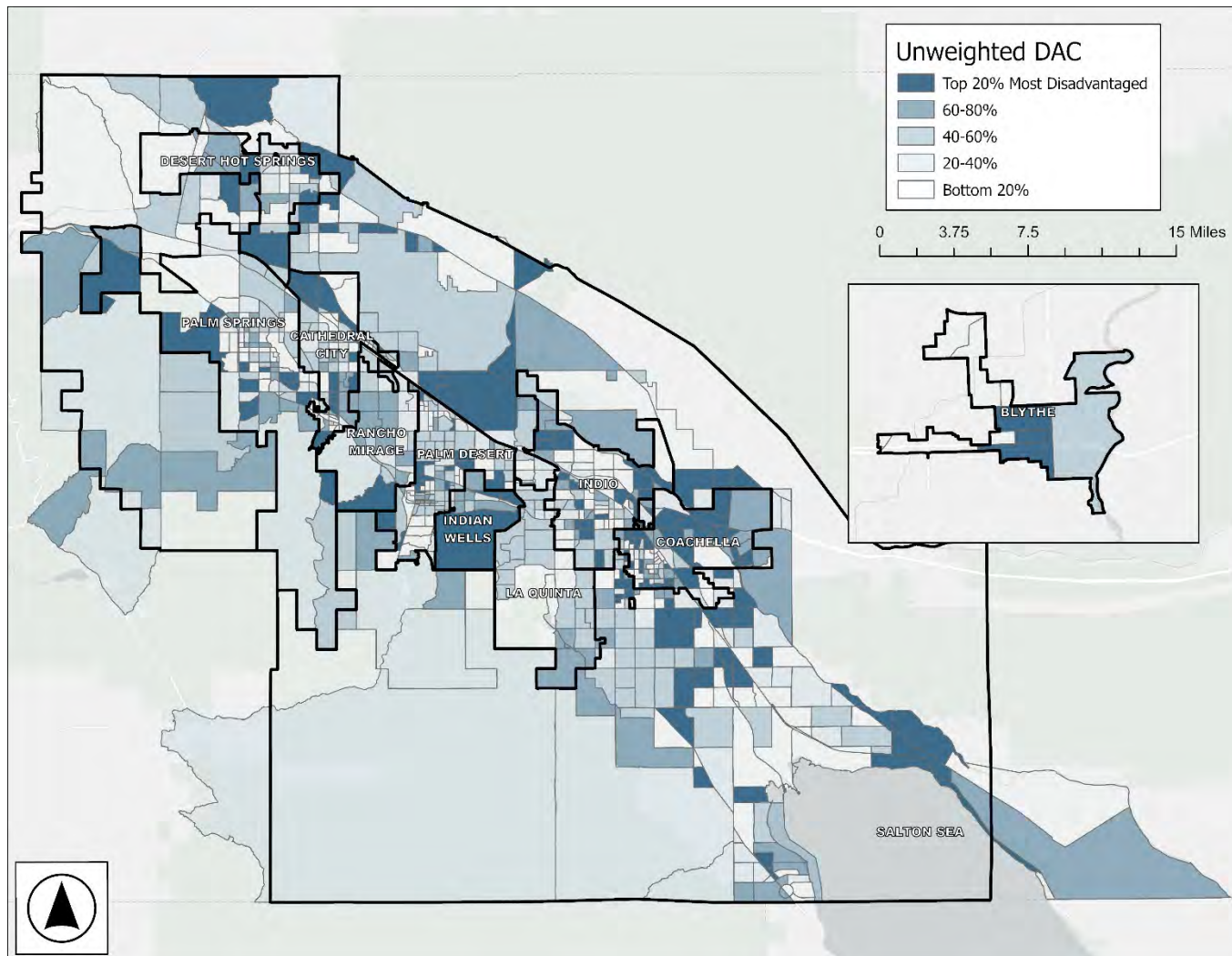
Once TAZs were assigned proportional scores for each indicator, each indicator was scored on a scale of one to five representing quintiles. TAZs within the 80th percentile were assigned a score of five, representing the top 20% of at-risk communities for that indicator. TAZs within the 60th to 80th percentile were given a score of four, and so on. Initially the factors were scored and mapped without any weighting. However, the resulting map showed high results for disadvantaged communities in areas that have very few households and in some cases locations that are known to have high disposable income. **Figure 1** below shows the unweighted results and **Figure 2** below shows the median value of property as reported by Zillow and Redfin. The results show high concentrations of disadvantaged community indicators in communities with high median property values such as Indian Wells, as well as sparsely populated regions directly north of Desert Hot Springs, Palm Desert, Coachella, and Indio. It is expected that urbanized areas in communities with lower median property values would show greater concentration of disadvantaged community indicators, representing ground truth conditions.

The policy approach of environmental justice emphasizes the protection of communities that have been marginalized or overburdened due to historical inequality. Additionally, REAP 2.0 is intended to be a strategic investment towards a more inclusive future by integrating affordable housing and climate goals. Given these policy objectives and the data for defining a disadvantaged community, and to address the apparent imbalance in results, weighting was introduced.

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Figure 1 – Unweighted Disadvantaged Communities Map



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Figure 2 - Typical Home Values in Coachella Valley



Source: Typical home value from Redfin and Zillow, June 2025. San Francisco Chronicle, July 1, 2024, Alejandra Arevalo and Janie Haseman.

Scenarios

Multiple scenarios were tested to identify disadvantaged communities in the CVAG region. For each scenario, a distinct weighting framework was established. This framework assigns varying percent weights to indicators, thereby emphasizing criteria and characteristics specific to CVAG's context and socioeconomic composition. Each scenario's scores were weighted, summed, and assigned a final quintile ranking, as described in **Table 1**.

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Table 1 – Indicator Weighting

Category	Indicator	Alt 1 Weight	Alt 1-A Weight	Alt 1-B Weight	Alt 2 Weight	REAP ⁴
Poverty	2023 Concentration of Poverty	40%	35%	40%	50%	✓
	2018 Concentration of Poverty	--	--	--	--	--
	Areas of Persistent Poverty					--
	Increases in Poverty					--
Housing	Low Income Housing Burden	35%	35%	30%	20%	--
	Below Market Rate Housing					--
	Total Housing Burden	--	--	--	--	--
Assistance Programs	Concentration of SNAP Recipients	15%	20%	15%	15%	--
	Free/Reduced Price Meal	--	--	--	--	--
Tribal Lands	Percent of Tribal Lands	2.5%	2.5%	5%	5%	✓
Other Indicators	Pollution Burden	2.5%	2.5%	2.5%	5%	✓
	Prevalence of Asthma	--	--	--	--	✓
	Prevalence of Cardiovascular Disease	--	--	--	--	✓
	Zero Car Households	2.5%	2.5%	5%	2.5%	--
	Disability	2.5%	2.5%	2.5%	2.5%	--
	Opportunity Maps	--	--	--	--	✓
	Neighborhood Change Maps	--	--	--	--	✓

⁴ The REAP definition did not include any weighting as the guidelines were silent on methodology.

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Aerial Validation Process

During review with CVAG staff, certain areas particularly on the outskirts of the Coachella Valley reflecting high DAC scores were identified as areas of minimal development, non-residential land, or conservation zones. We hypothesize that the data disaggregation process from larger geographies to more granular TAZs using land area caused large TAZs near the outskirts of the CVAG region to show higher scoring results despite much of the land area being unlikely to house residential communities.

To validate the analysis results, TAZs located in conservation zones and regions of no or low development were analyzed with aerial overlays. In general, large TAZs on the periphery of the region were found to contain small communities interspersed within the gaps between conservation zone boundaries or large undeveloped rural parcels. In these cases, scores were not adjusted. In some TAZs, no development or communities were observed. In these cases, scores were reduced to the lowest level, indicating no disadvantaged communities were present.

Future analysis may be aided by refining the geography, dividing large TAZs into smaller geographic areas, providing increased accuracy and granularity for small rural communities near the edge of the CVAG region.

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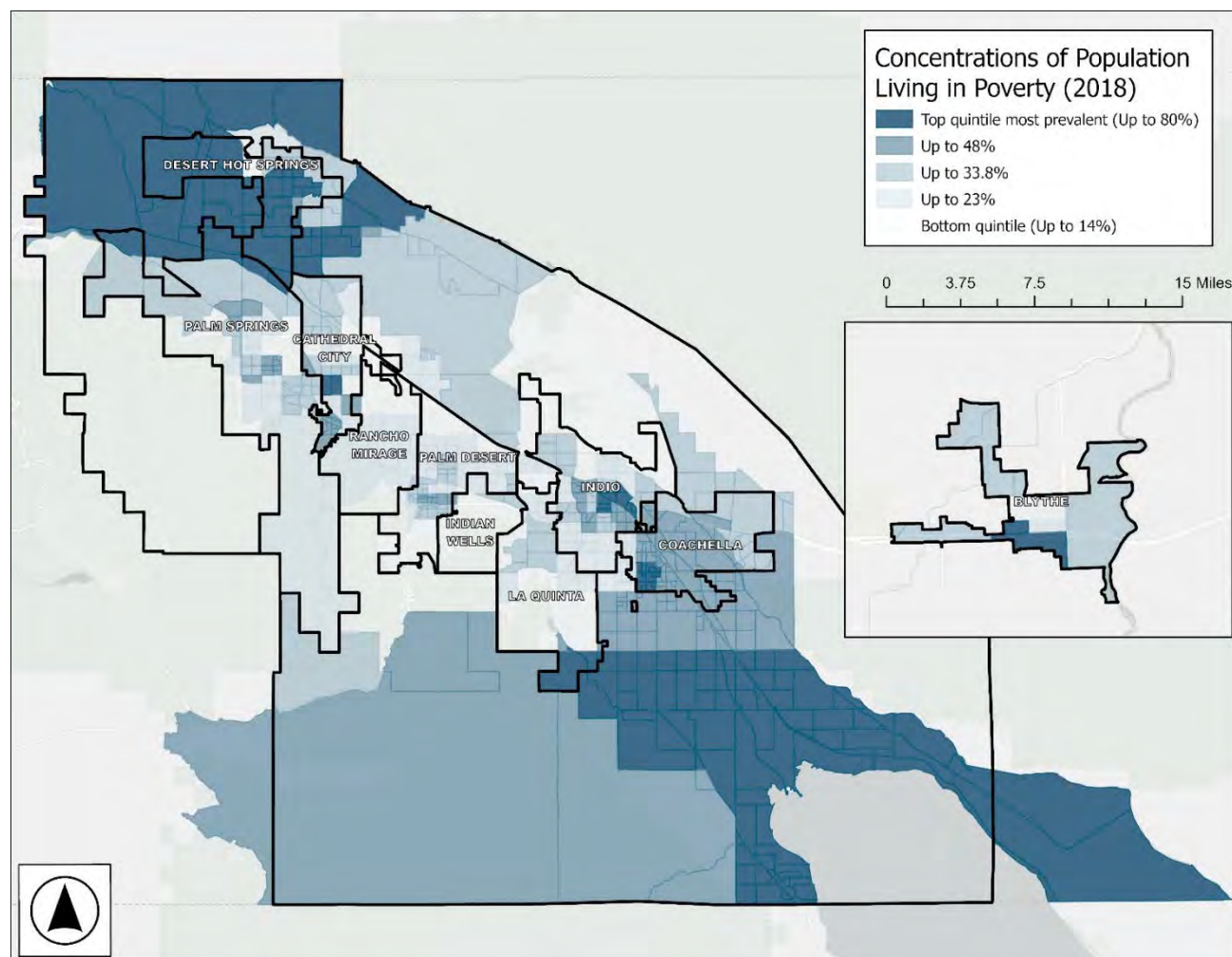


Individual Indicators

The following figures depict each individual indicator considered during the analysis process. Each indicator's source, description of its measurement, and recommendation for its inclusion in the final DAC definition is described below.

Figure 3 shows the concentration of poverty using American Community Survey (ACS) 5-Year estimates from 2014-2018. Concentration of poverty is measured as the percentage of people living under two times the federal poverty line. This indicator was initially provided as it is consistent with REAP Guideline references. However, it was not recommended as a part of the final DAC due to the dated nature of the data. Instead, more recent data was included to measure concentration of poverty.

Figure 3 - Concentration of Poverty (2018)

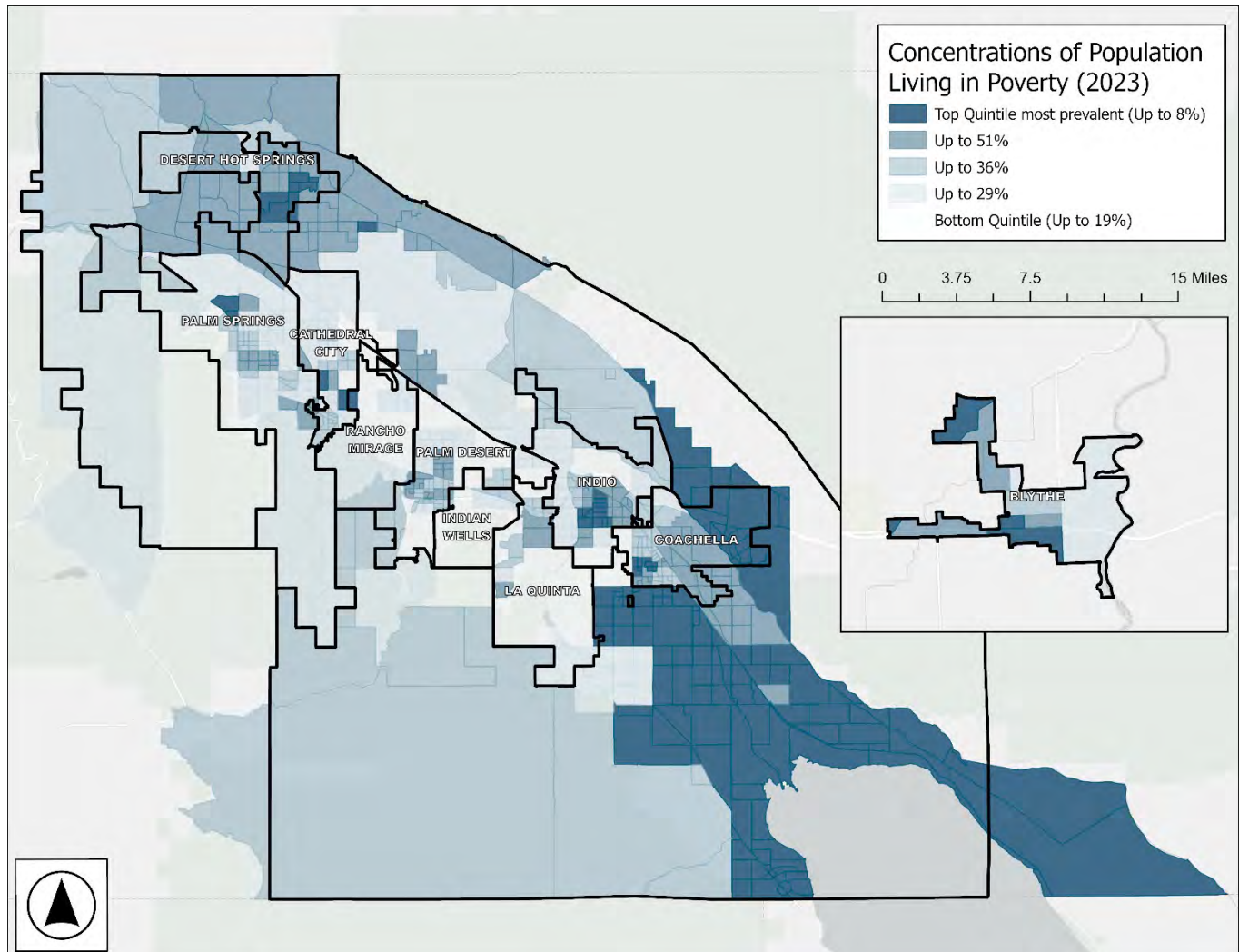


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 4 shows the concentration of poverty using American Community Survey (ACS) 5-Year estimates from 2019-2023. Concentration of poverty is measured as the percentage of people living under two times the federal poverty line. This indicator was recommended as a part of the final DAC to represent REAP criteria “Concentration of Poverty”.

Figure 4 - Concentration of Poverty (2023)

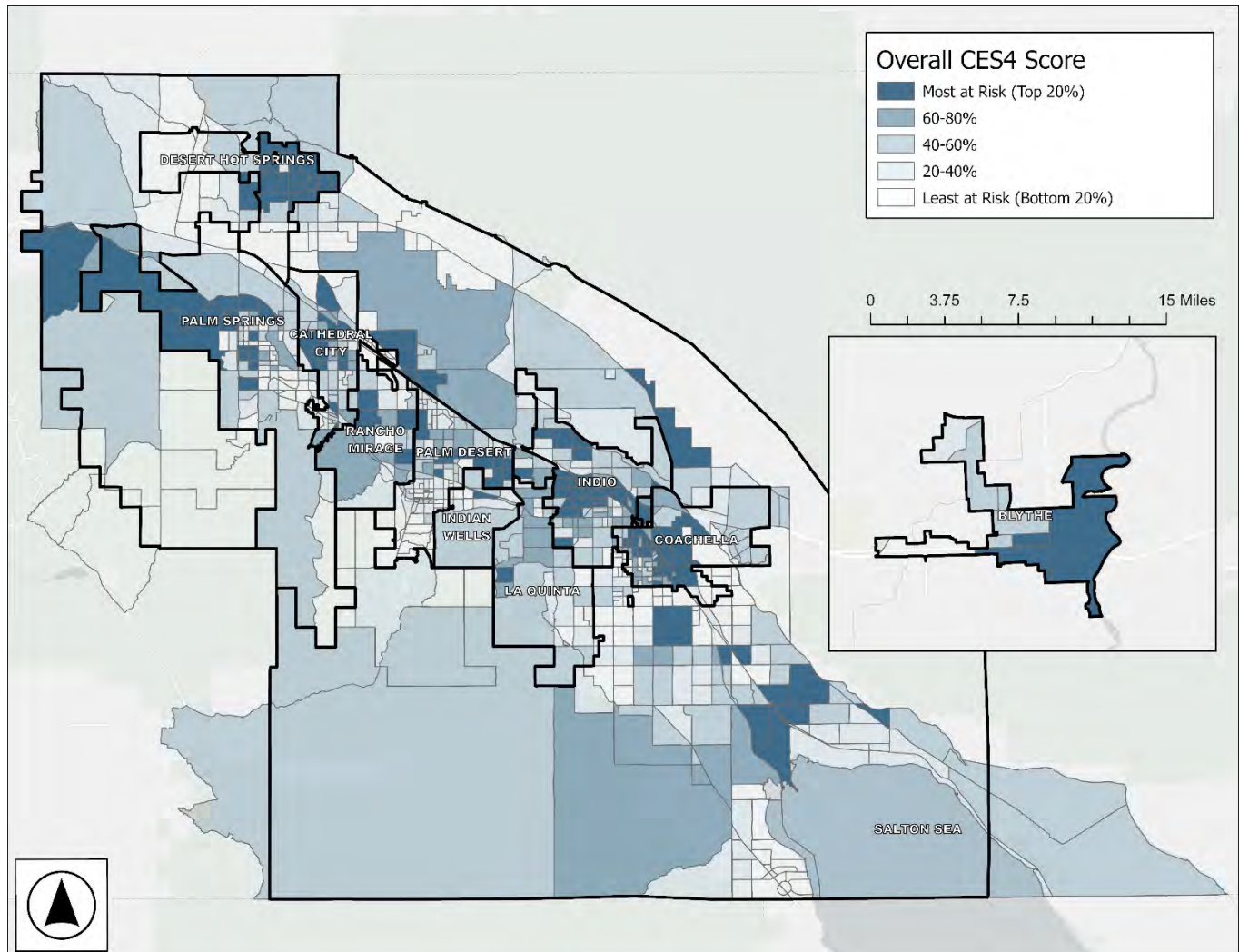


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Figure 5 shows the overall CES4 scores based on the standard indicators included in CalEnviroScreen 4.0 (2021). Overall CES4 ratings were not recommended for the final DAC as the overall score captures communities that are clearly not low income or poverty. However, some of the factors used in CES4 were recommended for continued use in the final definition as discussed below.

Figure 5 - Overall CES4 Scores

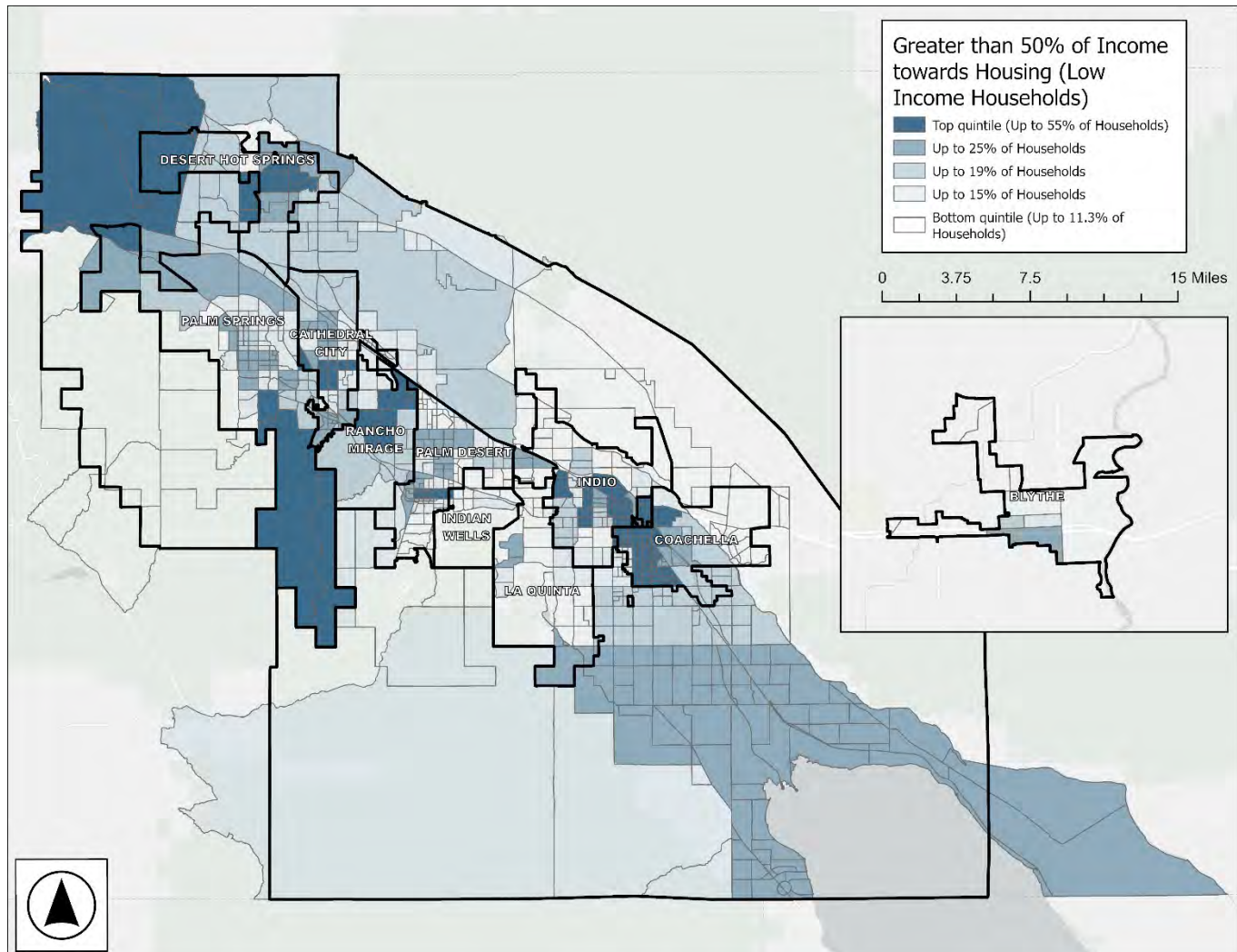


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 6 shows the low-income housing burden, measuring the percentage of low-income households in each TAZ paying greater than or equal to 50% of household income towards housing based on HUD 5-Year estimates between 2013 and 2017. This indicator was recommended for the final DAC definition as it demonstrates the impact of California's high cost housing crisis.

Figure 6 - Low Income Housing Burden

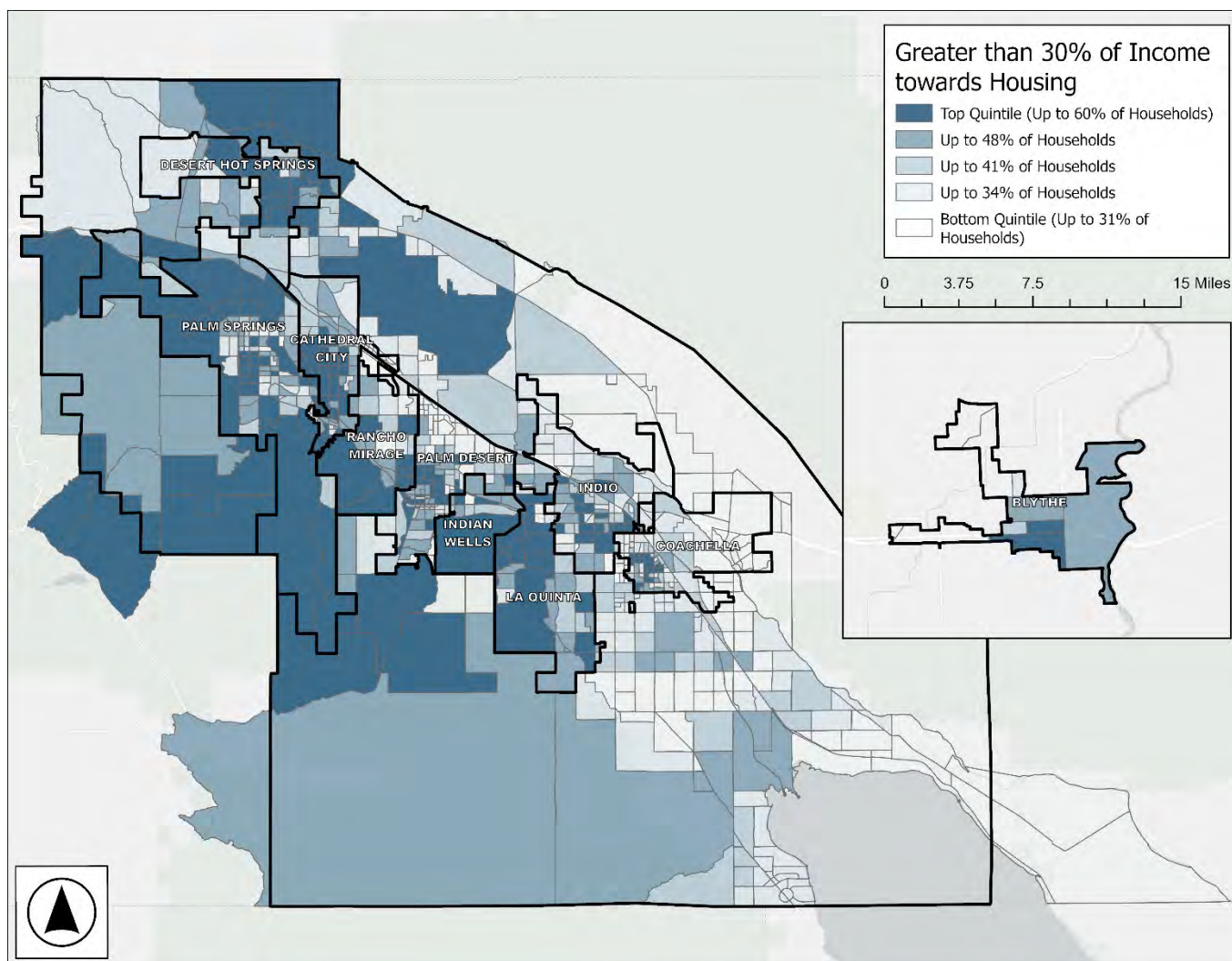


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 7 shows the total housing burden, measuring the percentage of all households in each TAZ paying greater than or equal to 30% of household income towards housing, as measured by ACS 5-Year estimates from 2019-2023. This indicator was not recommended for the final DAC because it does not account for the large retirement-age population in the CVAG region which may be living on a fixed income, but own high value property and assets. Instead, the low-income/asset housing burden indicator was used which accounts for both low income and low assets.

Figure 7 - Total Housing Burden

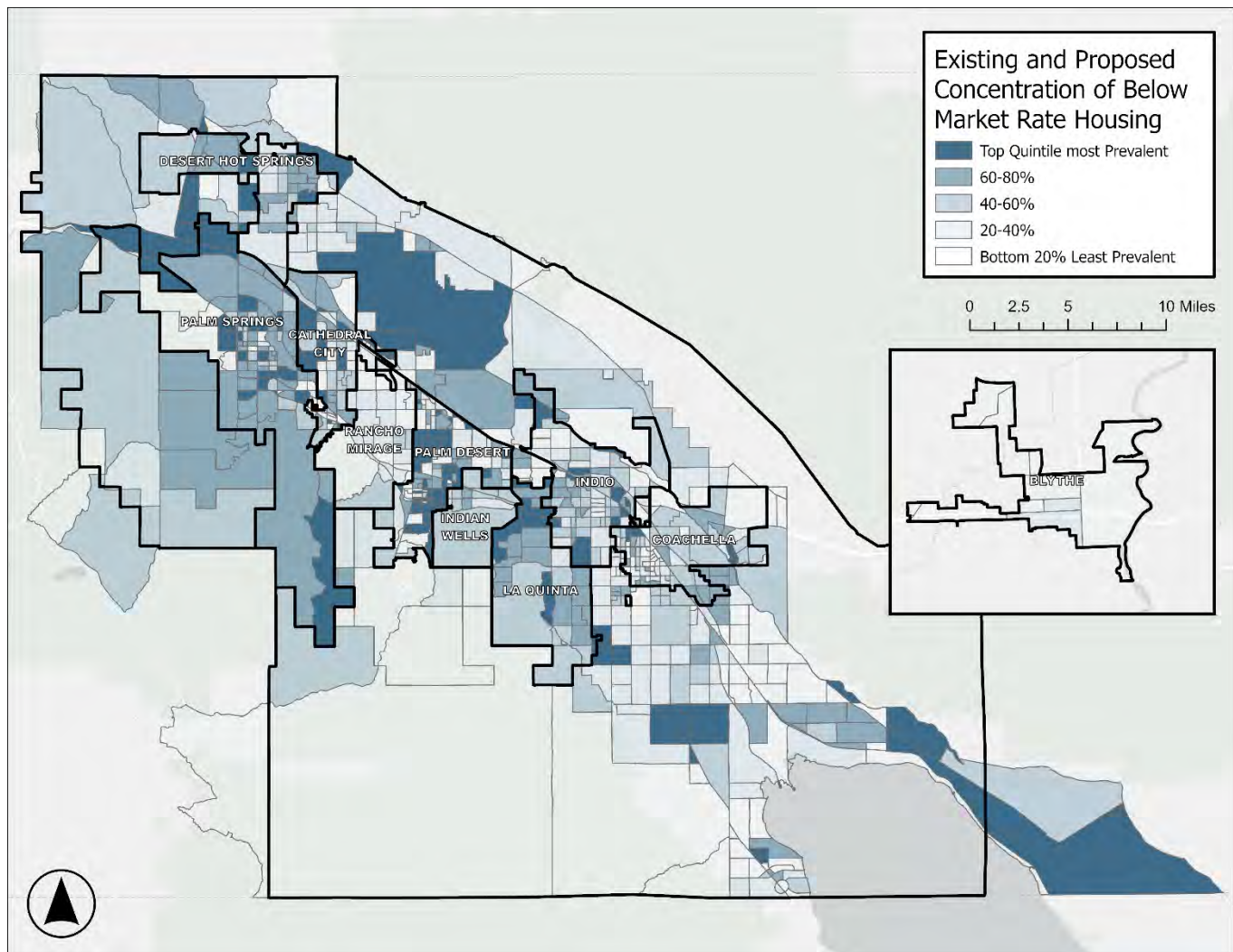


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 8 shows the concentration of below market rate housing, measuring the percent of existing households in TAZs identified as either affordable housing or eligible for low-income housing tax credits as reported by ACS 5-Year estimates from 2019-2023, HUD 2023 datasets, and the Lift to Rise project⁵ as of 2024. This indicator was recommended for the final DAC to represent the prevalence of low-income housing in each TAZ.

Figure 8 - Below-Market Rate Housing



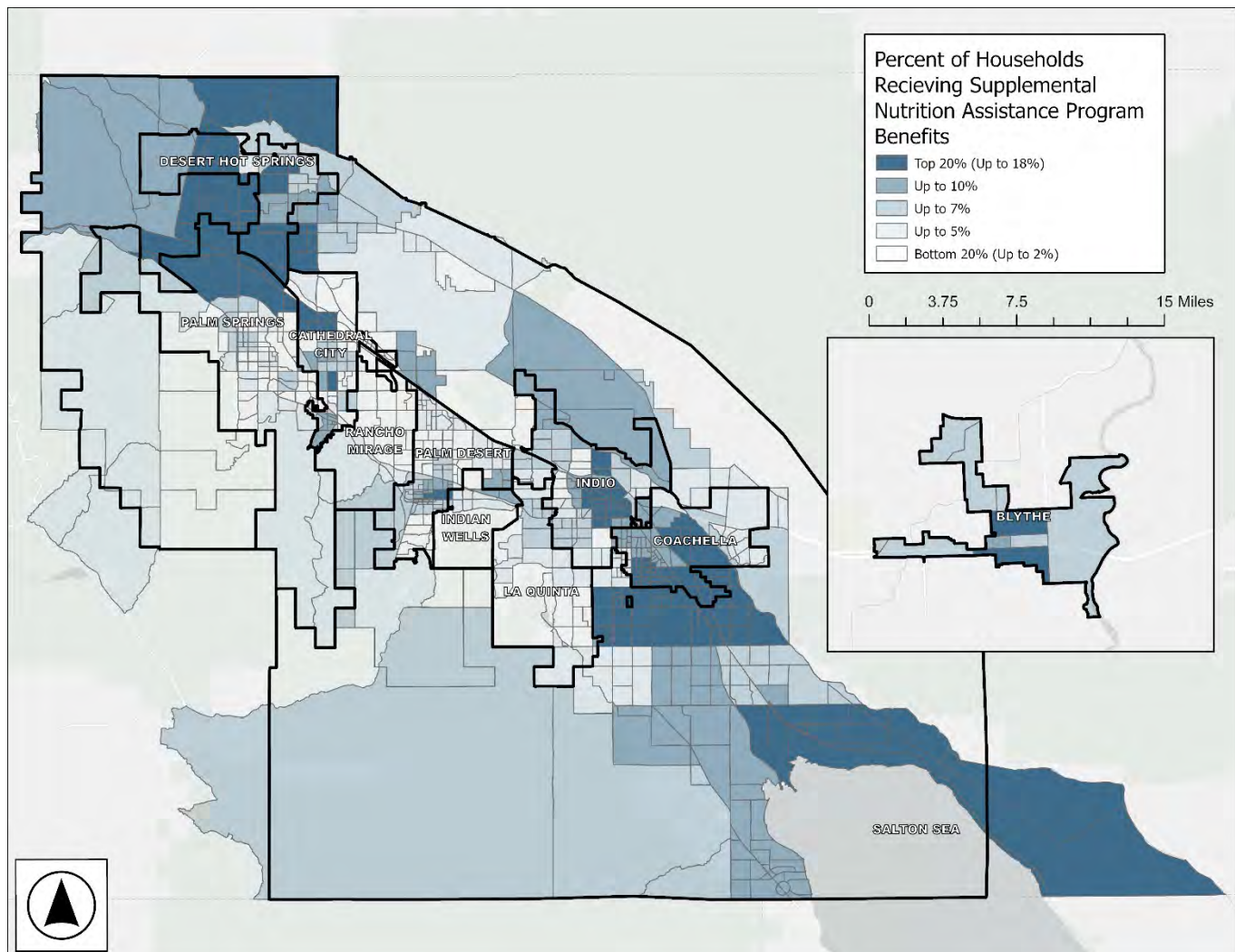
⁵ The Lift to Rise project dataset only applies to development projects located within the Coachella Valley.

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 9 shows the concentration of SNAP recipients, measuring the percentage of households in each TAZ receiving SNAP benefits as reported by ACS 5-Year estimates from 2019-2023. This indicator was recommended for the final DAC to represent the prevalence of assistance programs across the CVAG region.

Figure 9 - Concentration of SNAP Recipients

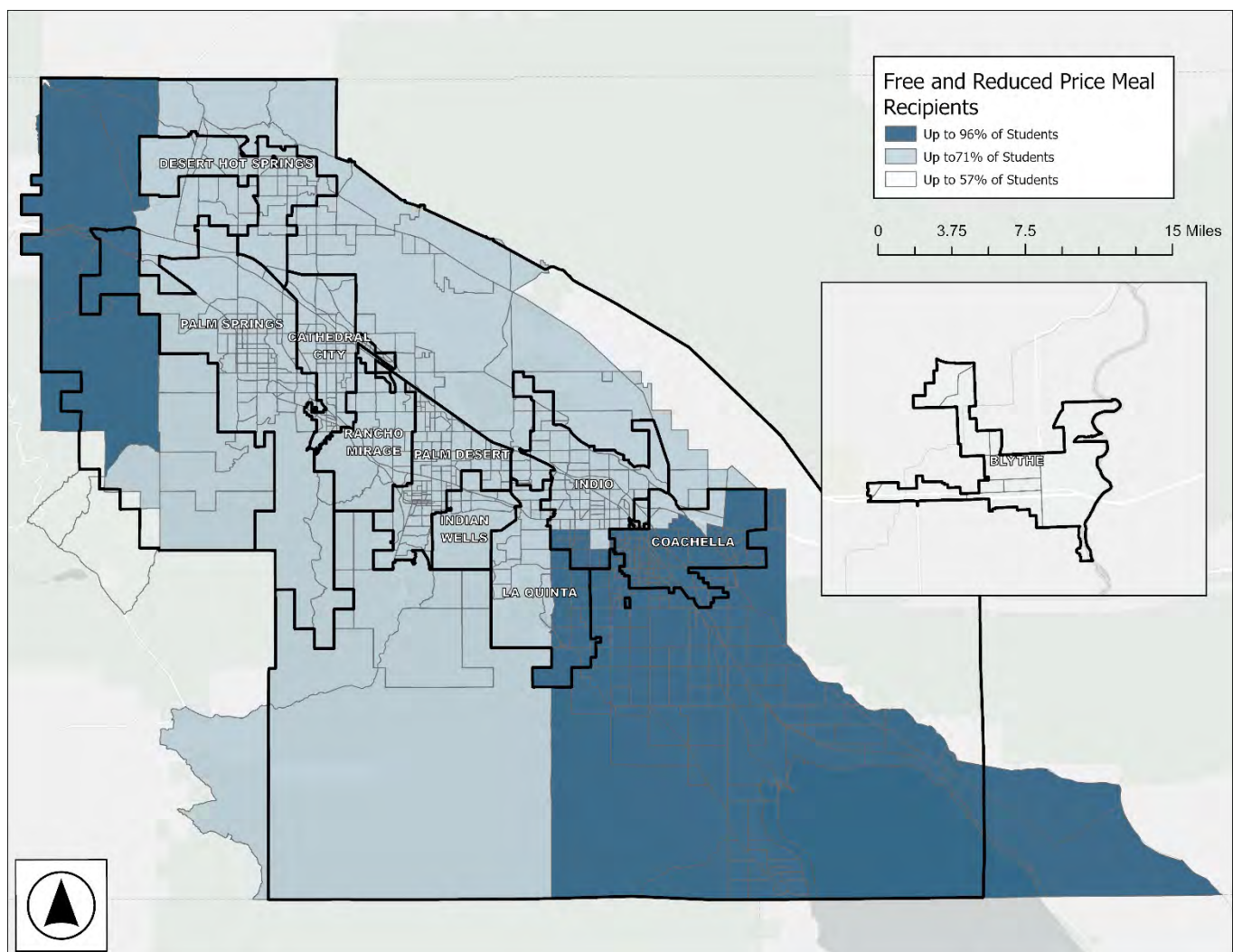


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 10 shows the concentration of free and reduced price meal recipients, measuring the percentage of students in each TAZ eligible for Free and Reduced Price Meals as reported by California DOE for the 2023-2024 school year. This indicator was not recommended for the final DAC as the large geographic scope of school districts did not allow for a successful disaggregation process and distorted the results. Instead, the prevalence of assistance programs was measured more granularly by the concentration of SNAP recipients.

Figure 10 - Concentration of FRPM Eligible Recipients

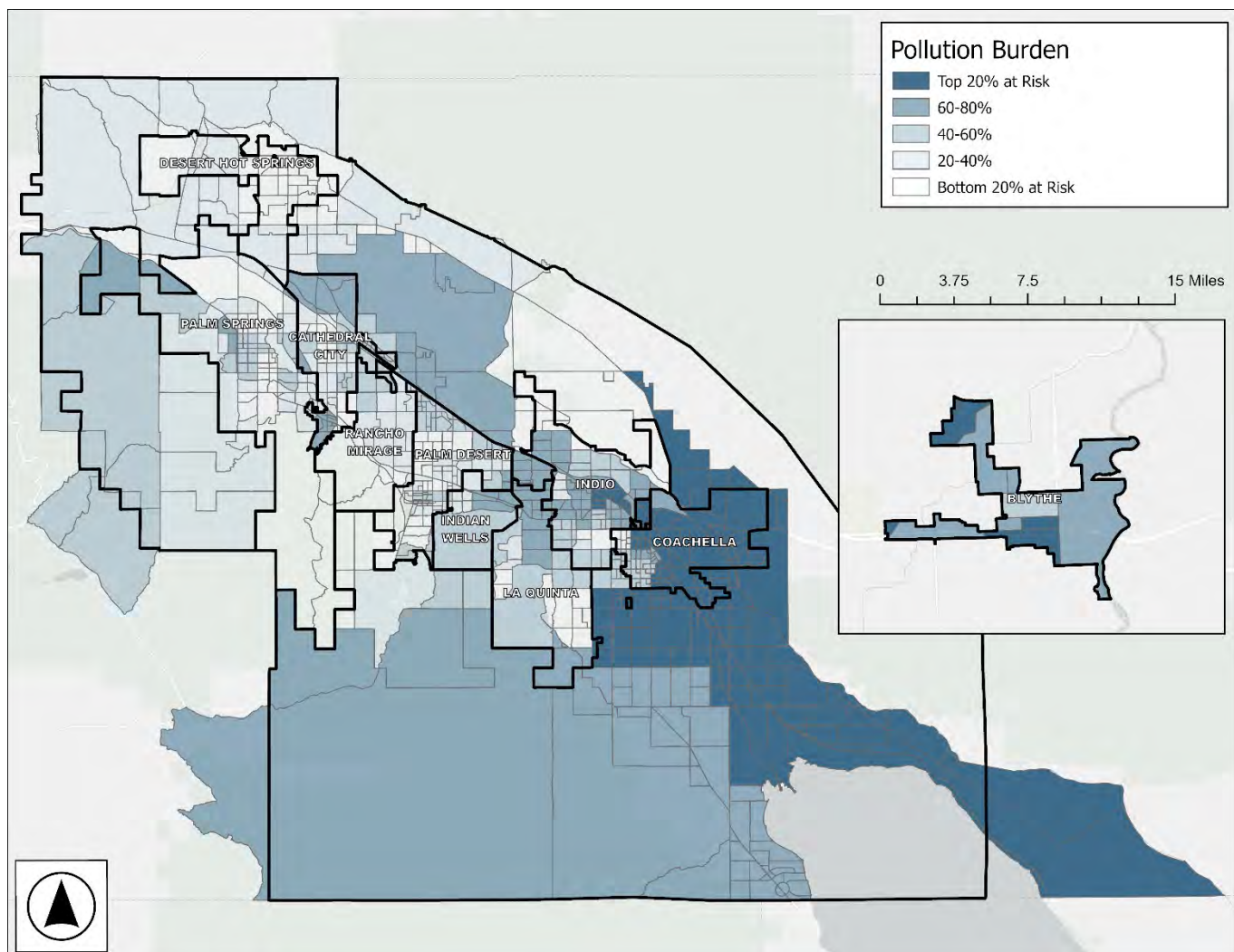


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 11 shows the pollution burden across the CVAG region, measured as the percent of each TAZ located in areas of high impact for pollution hazards as reported by CalEnviroScreen 4.0 (2021), measured by air and water concentrations of ozone, particulate matter, diesel, lead, pesticides, toxic chemicals, groundwater threats, and hazardous waste. Additional considerations include proximity to solid waste facilities, high-traffic density areas, and cleanup sites. This indicator was recommended for the final DAC to account for the disparate impact of the climate crisis in Californian communities satisfying REAP requirements.

Figure 11 - Pollution Burden

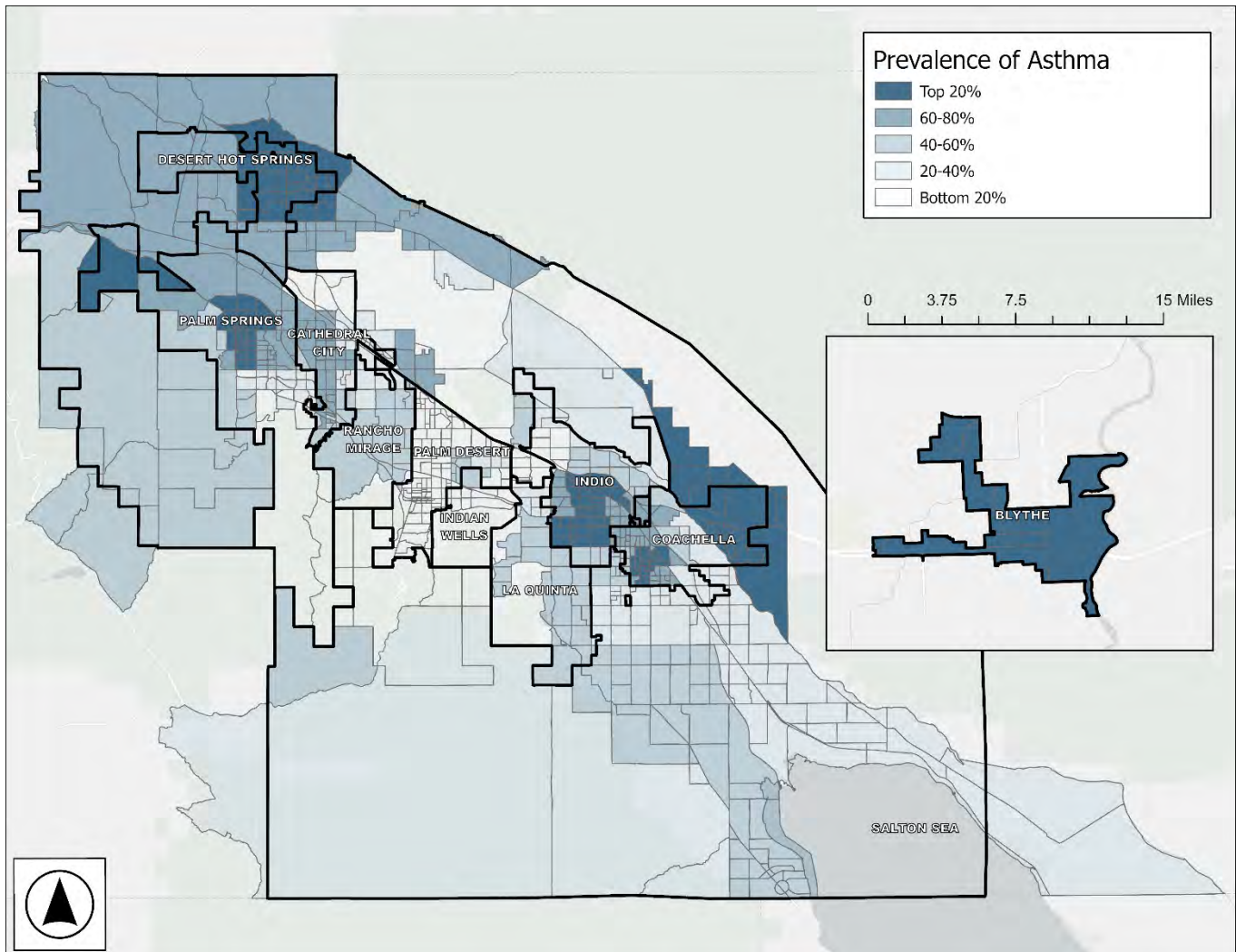


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 12 shows the prevalence of asthma in the CVAG region, measured as the reported cases of asthma within each TAZ as reported by CalEnviroScreen 4.0 (2021). This indicator was not selected for the final DAC due to potential overlap with the overall pollution score reported by CES4 (see Figure 5).

Figure 12 - Prevalence of Asthma



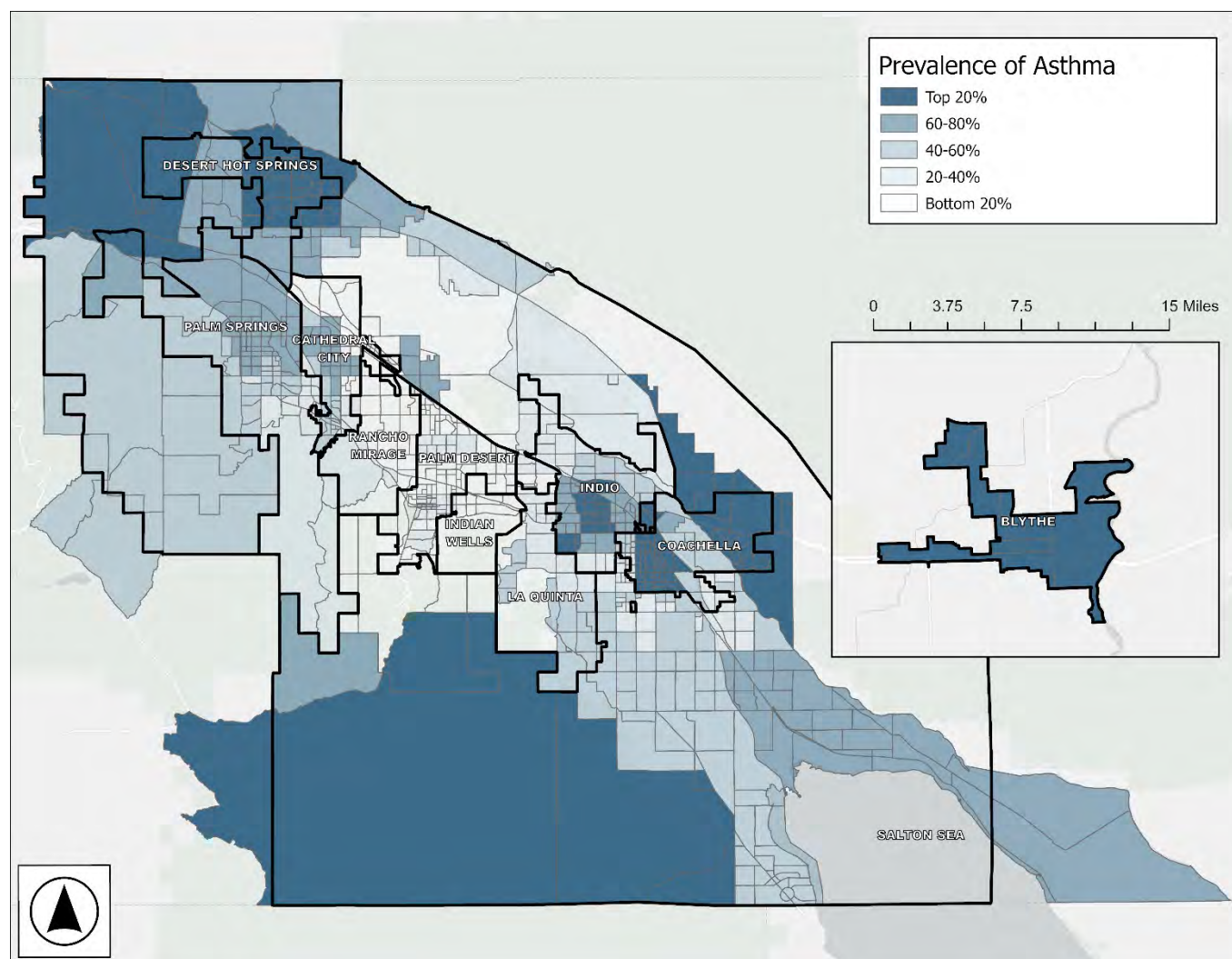
COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



shows the prevalence of cardiovascular disease in the CVGA region, measured as the reported cases of cardiovascular disease within each TAZ as reported by CalEnviroScreen 4.0 (2021). This indicator was not selected for the final DAC due to potential overlap with the overall pollution score reported by CES4 (see Figure 5).

Figure 13 shows the prevalence of cardiovascular disease in the CVGA region, measured as the reported cases of cardiovascular disease within each TAZ as reported by CalEnviroScreen 4.0 (2021). This indicator was not selected for the final DAC due to potential overlap with the overall pollution score reported by CES4 (see Figure 5).

Figure 13 - Prevalence of Cardiovascular Disease

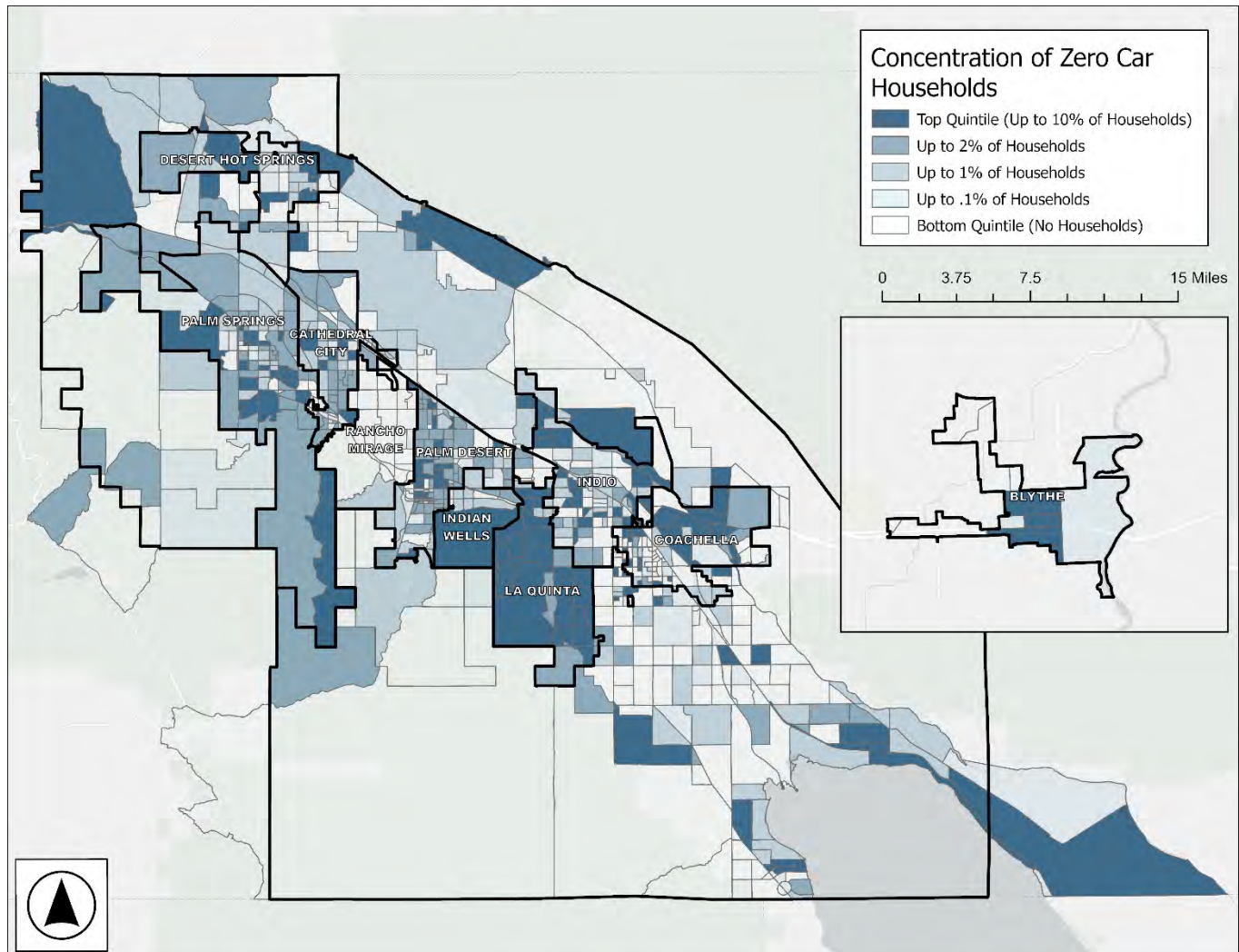


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 14 shows the concentration of zero-car households, measuring the percentage of households in each TAZ without access to a vehicle, as reported by ACS 5-Year estimates from 2019-2023. This indicator was recommended for the final DAC as a measure of household mobility and access to transportation.

Figure 14 - Concentration of Zero-Car Households

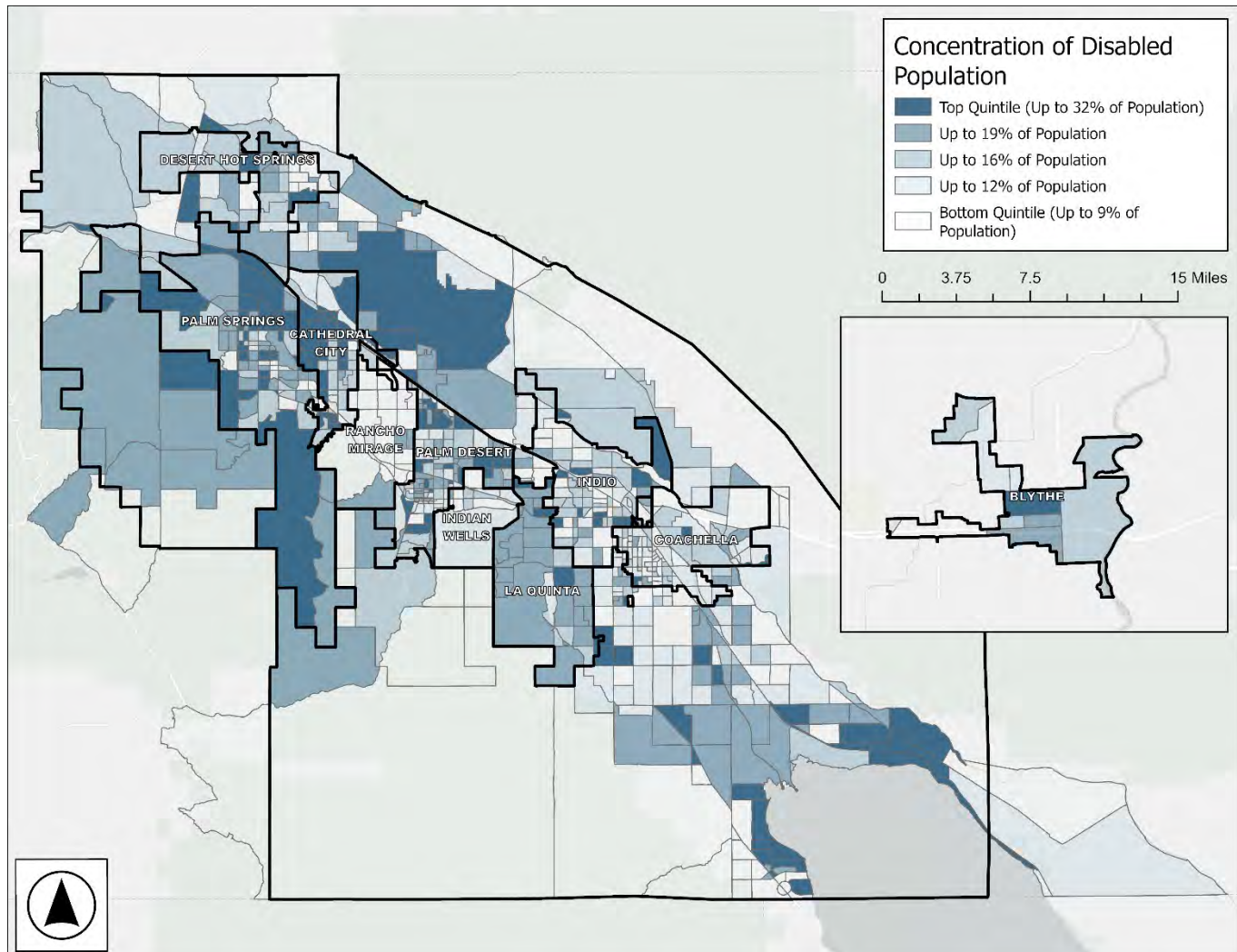


COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 15 shows the concentration of the disabled population in the CVAG region, measuring the percent of the population in each TAZ reporting having a disability as defined by and reported by ACS 5-Year estimates from 2019-2023. This indicator was recommended for the final DAC to account for long-term quality of life, healthcare expenditure, and the correlation to aging populations.

Figure 15 - Concentration of Disabled Population



COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Findings

Through an iterative process—refining indicator disaggregation, validating results against known areas of concern and undevelopable land, and incorporating feedback from CVAG staff—the final indicators for the local area definition were narrowed down to: concentration of poverty, low-income housing burden and below-market rate housing, concentration of SNAP recipients, pollution burden, zero car households, disability, and tribal lands. Using these indicators, a number of local area definition alternatives were explored to evaluate how different weighting schemes could best capture regional equity priorities and reflect the unique socioeconomic and environmental conditions within the CVAG planning area. In parallel, the REAP 2.0 definition—based on state-established criteria such as opportunity mapping, pollution burden, tribal lands, and housing cost burden—was used to ensure consistency with state funding eligibility requirements. The local area definitions were developed to supplement the REAP definition, providing a more tailored lens for local and regional planning efforts. Ultimately, the options were narrowed down to two potential definitions, described further below, that best reflected existing communities of concern.

Local Area Definitions

Local Area Definitions Alternative 1 and Alternative 2 contain distinctions in weighting that reflect different emphasis areas. Alternative 1 places greater emphasis on housing burden than Alternative 2, assigning 35% of the total score to the combination of low-income housing burden and below-market rate housing. Alternative 2 places greater emphasis on poverty. The resulting maps had very minor differences.

Alternative 1 prioritizes local concerns related to housing affordability and displacement, which are especially relevant in jurisdictions grappling with the impacts of the regional housing crisis. It also places a moderate weight on poverty concentration (40%) and SNAP recipient prevalence (15%), capturing both economic hardship and the presence of households reliant on assistance programs.

In contrast, Alternative 2 increases the weight for poverty concentration to 50% and for pollution burden and tribal lands to 5% each, while reducing the housing burden component to 20%. This shift places stronger emphasis on traditional markers of economic disadvantage and environmental justice, consistent with broader federal equity frameworks. The two variants of the local area definition are presented in **Table 2** and presented in **Figure 16** and **Figure 17** below.

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



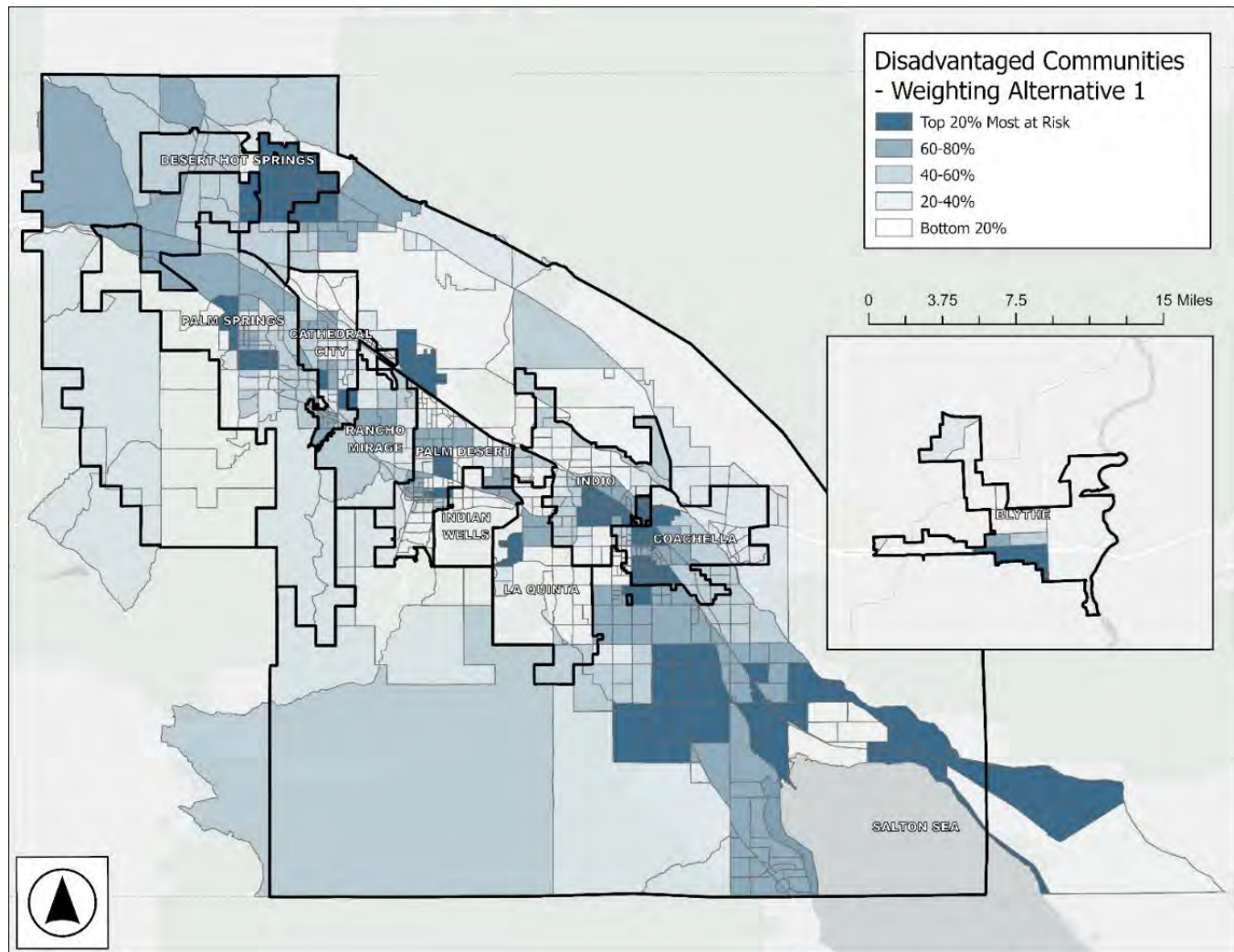
Table 2: Local Area Definition Alternatives

Indicator	Alternative 1 Weight	Alternative 2 Weight
Concentration of Poverty (2023)	40%	50%
Low-Income Housing Burden and Below-Market Rate Housing	35%	20%
Concentration of SNAP Recipients	15%	15%
Pollution Burden	2.5%	5%
Zero-Car Households	2.5%	2.5%
Disability	2.5%	2.5%
Tribal Lands / Percent of Tribal Lands	2.5%	5%

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



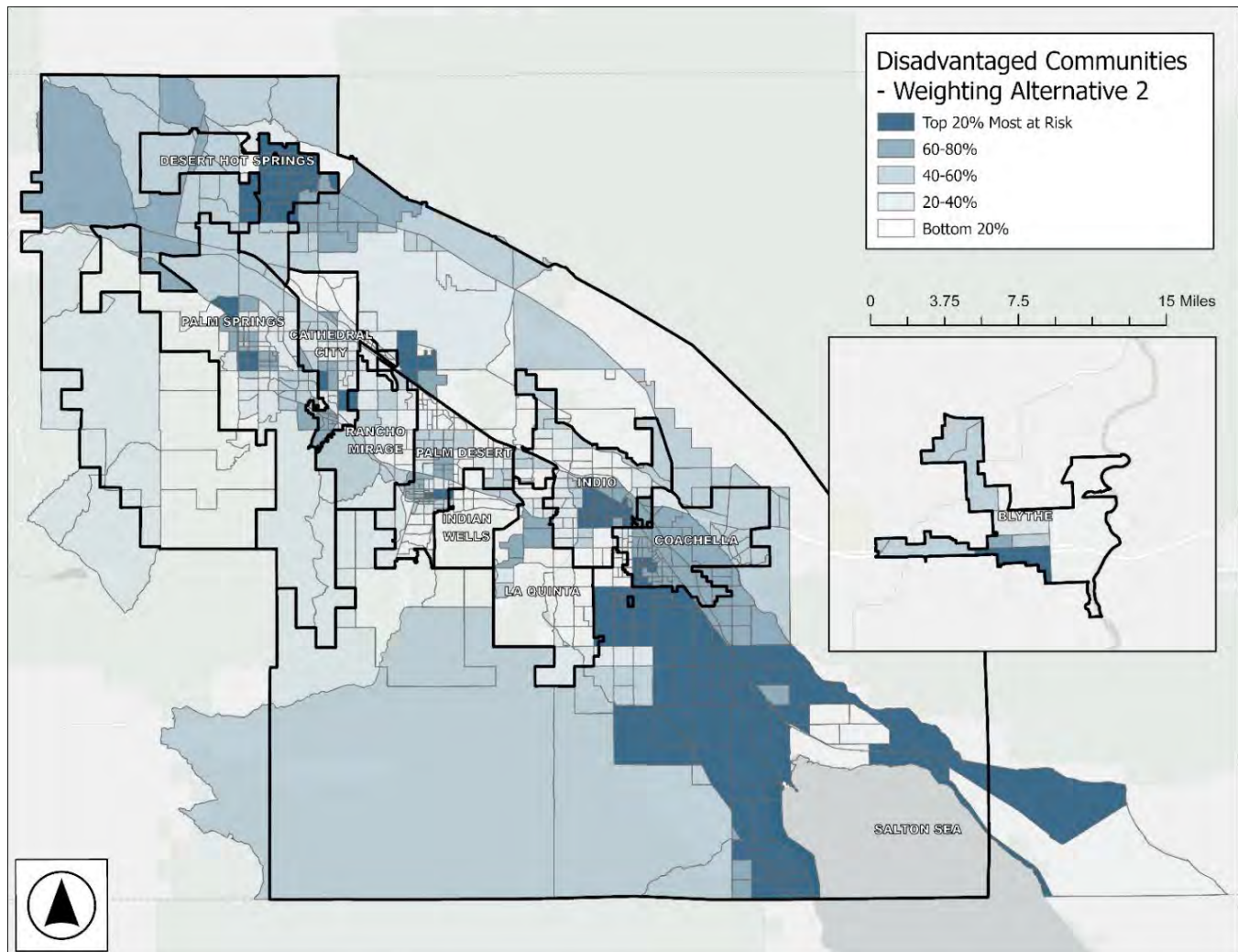
Figure 16 – Alternative 1 Definition



COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 17 – Alternative 2 DAC Definition



REAP 2.0 Disadvantaged Communities Map

The REAP 2.0 definition follows the REAP 2.0 grant guideline requirements without any additional indicators or weighting:

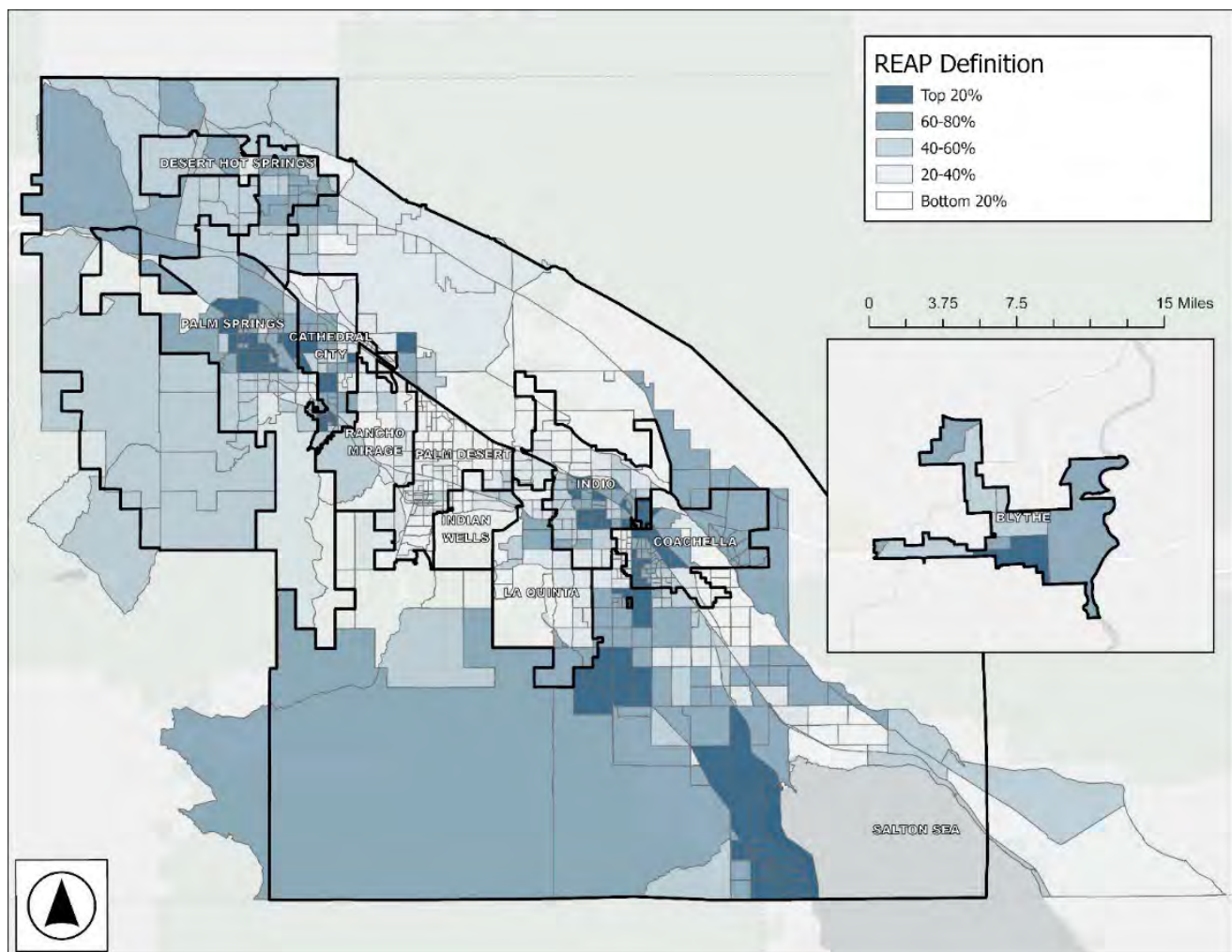
- Concentration of poverty as measured by ACS 5-Year Estimates of Concentration of Poverty (2023)
- Areas of high segregation and poverty and areas of low to moderate access to opportunity as measured by TCAC/HCD Opportunity Maps (2025)
- Areas of high housing cost burdens as measured by the ACS 5-Year Total Housing Burden (2023)

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- Areas of high vulnerability to displacement as measured by TCAC/HCD Neighborhood Change Maps (2022)
- Areas related to tribal entities as measured by Census designated tribal lands (2021)
- Other areas experiencing disproportionate impacts of California's housing and climate crisis as measured by CalEnviroScreen 4.0 Pollution Burden, Asthma, and Cardiovascular Disease Indicators (2021)
- Communities of concern, disadvantaged communities and low-income communities as measured by CalEPA standards established pursuant to SB 535 including previously mentioned ACS 5-Year datasets and CalEnviroScreen 4.0 datasets.

Figure 18 – REAP DAC Definition



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Final Recommendation

Alternative 1 and Alternative 2 for identifying disadvantaged communities contain distinctions in weighting priorities that reflect different planning objectives. Alternative 1 places greater emphasis on housing burden than Alternative 2, assigning 35% of the total score to the combination of low-income housing burden and below-market rate housing. This definition prioritizes local concerns related to housing affordability and displacement, which are especially relevant in jurisdictions grappling with the impacts of the statewide housing crisis. It also places a moderate weight on poverty concentration (40%) and SNAP recipient prevalence (15%), capturing both economic hardship and the presence of households reliant on assistance programs.

In contrast, Alternative 2 increases the weight for poverty concentration to 50% and for pollution burden and tribal lands to 5% each, while reducing the housing burden component to 20%. This shift places stronger emphasis on traditional target communities of environmental justice policies, consistent with broader federal equity frameworks. While still including the same set of indicators, Alternative 2 reflects a more general definition of vulnerability that may align more closely with federal funding criteria.

Ultimately, Alternative 1 is recommended as the preferred local area definition because it aligns with the objectives of REAP to create a more sustainable, resilient, and inclusive future by integrating housing and climate goals. Additionally, Alternative 1 produces results that more intuitively align with areas of known poverty and housing need, particularly in the northern part of the CVAG region. While both alternatives were developed using the same indicators and share a common methodological foundation, their distinct weighting schemes yield slightly different geographic emphases—Alternative 1 highlights more northern communities, whereas Alternative 2 places greater emphasis on the southern portion of the region. The selection of Alternative 1 reflects its stronger alignment with local planning objectives and its responsiveness to documented community needs related to affordability and displacement.

The REAP-based definition will continue to serve as a complementary reference throughout the project. Because it strictly adheres to state-defined criteria, it is especially useful for identifying disadvantaged areas that may qualify for enhanced scoring in state-funded programs, including those related to VMT mitigation. By using both the REAP and local area definitions strategically, CVAG can ensure that its planning processes are both locally responsive and grant-ready, supporting a comprehensive and equitable approach to regional transportation investment.

Appendix D: Co-Benefits Methodology



CVAG



COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



To: Peter Satin
Conservation Program Manager, CVAG

From: Anais Schenk, AICP and Zeke Golf
Kimley-Horn and Associates, Inc

Date: December 11, 2025

Subject: Coachella Valley Regional Vehicle Miles Traveled (VMT) Study Co-Benefits Methodology

This memo outlines the approach used to systematically evaluate and score transportation projects based on their co-benefits to disadvantaged communities, potential for serving high VMT areas, and potential for influencing active transportation mode share. The co-benefits analysis creates transparency for equitable decision making in evaluating and funding projects. This memo documents the approach ensuring a clear and repeatable methodology that can be applied across future evaluations.

Framework and Approach

The approach scored projects across three main categories—Equity, Vehicle Miles Traveled (VMT), and Mode Share—for a total of 100 possible points. All scoring criteria was evaluated at the Traffic Analysis Zone (TAZ) level due to availability of data.

Each category includes specific metrics designed to reflect co-benefits and strategic priorities. Equity included scoring categories based on whether the project was located within a disadvantaged community and whether it was located within a traffic analysis zone with existing or planned affordable housing. Potential for serving high VMT areas was evaluated based on whether the project was in a TAZ that is currently not meeting the jurisdiction's adopted thresholds. Potential for influencing mode share was evaluated by scoring projects higher that are located in TAZs where the population exhibits high drive alone mode share.

Four possible scoring model options were considered, ranging from least complex to most complex:

1. **Binary Unweighted** – Binary scoring without weighting as shown in Table 1.
2. **Binary Weighted** – Binary scoring with weighting based on project objectives as shown in Table 2.
3. **Classified Unweighted** – Scoring classified into categories without weighting as shown in Table 3.
4. **Classified Weighted** – Metrics classified into categories with weighting as shown in Table 4.

These options were tested to determine their impact on project rankings. Results showed minimal differentiation in average scores and scoring spread amongst project types across the four models as shown in Exhibit 1 and Exhibit 2. Therefore, **Option 1, Binary Unweighted** was selected as the preferred approach based on its simplicity, ensuring clarity and ease of application in future evaluations.

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Table 1: Option 1 Binary Unweighted Approach

Category	Metric		Score
Equity	Distance from a DAC TAZ – Top 40%	Within	20
		Not Within	0
	Distance from Affordable Housing – Existing	Within	20
		Not Within	0
	Distance from Affordable Housing – Planned	Within	20
		Not Within	0
Vehicle Miles Traveled (VMT)	VMT Threshold Attainment by Traffic Analysis Zone (TAZ)	TAZ does not screen out	20
		TAZ screens out	0
Mode Share	Drive Alone Mode Share by TAZ	TAZ >80% drive alone mode share	20
		TAZ <80% drive alone mode share	0

Table 2: Option 2 Binary Weighted Approach

Category	Weighting	Metric		Score
Equity	50	Distance from a DAC TAZ – Top 40%	Within	20
			Not Within	0
		Distance from Affordable Housing – Existing	Within	20
			Not Within	0
		Distance from Affordable Housing – Planned	Within	20
			Not Within	0
Vehicle Miles Traveled (VMT)	30	VMT Threshold Attainment by Traffic Analysis Zone (TAZ)	TAZ does not screen out	20
			TAZ screens out	0
Mode Share	20	Drive Alone Mode Share by TAZ	TAZ >80% drive alone mode share	20
			TAZ <80% drive alone mode share	0

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Table 3: Option 3 Classified Unweighted Approach

Category	Metric		Score
Equity	Distance from a DAC TAZ – Top 40%	Within	20
		1/2 mile Proximity	10
		1 mile Proximity	5
		Greater than 1 mile	0
	Distance from Affordable Housing – Existing	Within	20
		Not within	0
	Distance from Affordable Housing – Planned	Within	20
		Not within	0
Vehicle Miles Traveled (VMT)	VMT Threshold Attainment by Traffic Analysis Zone (TAZ)	Project is in TAZ not meeting threshold by more than 15% (Red)	20
		Project is in TAZ not meeting threshold within 15% (Yellow)	10
		Project is in TAZ that meets threshold	0
Mode Share	Drive Alone Mode Share by TAZ	TAZ >80% drive alone mode share	20
		TAZ 60-80% drive alone mode share	10
		TAZ <60% drive alone mode share	0

Table 4: Classified Weighted Approach

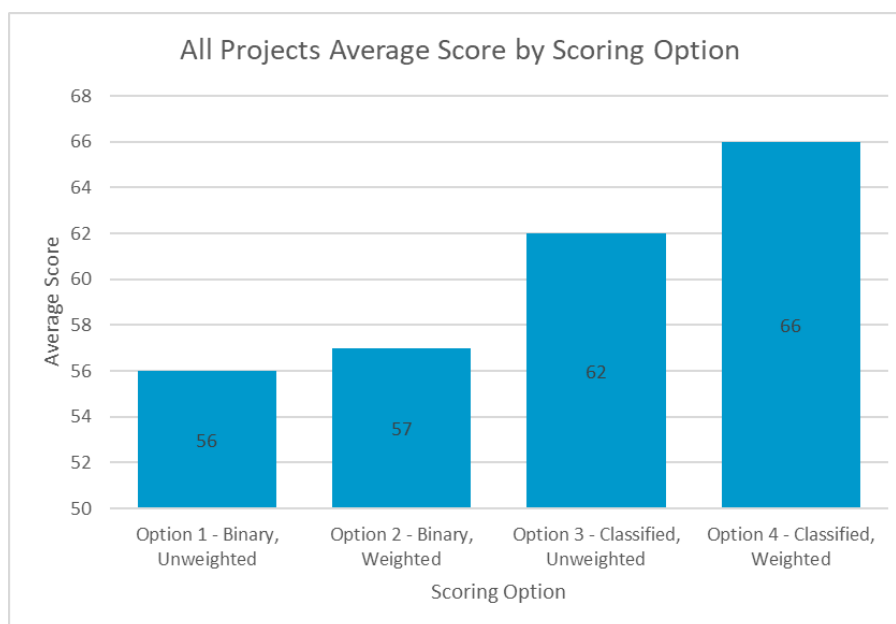
Category	Weighting	Metric		Score
Equity	25	Distance from a DAC TAZ –Top 40%	Within	20
			1/2 mile Proximity	10
			1 mile Proximity	5
			Greater than 1 mile	0
	20	Distance from Affordable Housing – Existing	Within	20
			Not within	0
Vehicle Miles Traveled (VMT)	5	Distance from Affordable Housing – Planned	Within	20
			Not within	0
	30	VMT Threshold Attainment by Traffic Analysis Zone (TAZ)	Project is in TAZ not meeting threshold by more than 15% (Red)	20

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Category	Weighting	Metric	Score	
Mode Share	20	Drive Alone Mode Share by TAZ	Project is in TAZ not meeting threshold within 15% (Yellow)	10
			Project is in TAZ that meets threshold	0
			TAZ >80% drive alone mode share	20
			TAZ 60-80% drive alone mode share	10
			TAZ <60% drive alone mode share	0

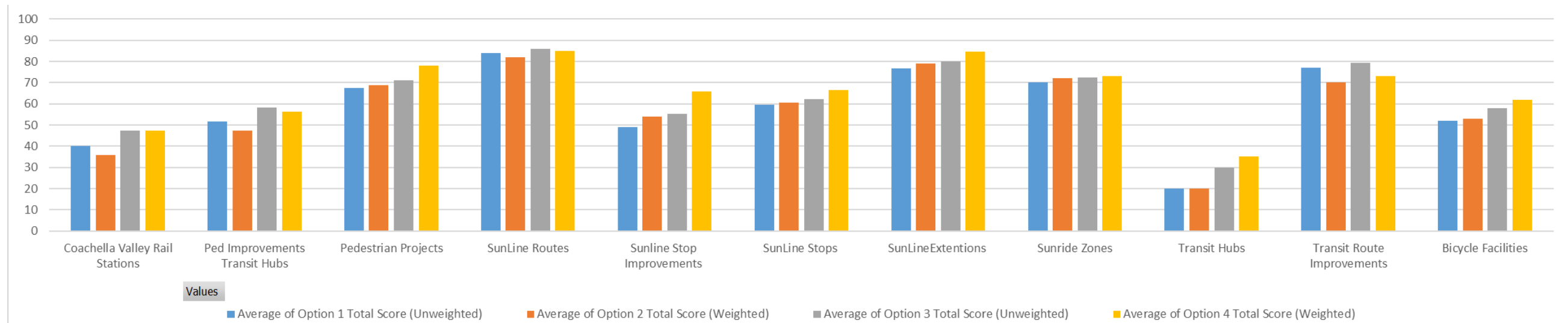
Exhibit 1: Average Score by Option



Note: Values on y-axis start at fifty rather than zero.



Exhibit 2: Average Score by Option and Project Type





Scoring Calculation for Preferred Approach

The scoring process for Option 1 is described below. The other three options used the same metrics but had different scoring and weighting approaches as described above.

Equity metrics account for the largest share of the score (60 points), emphasizing benefits to disadvantaged communities and affordable housing. Projects receive 20 points for each condition met under the selected Binary, Unweighted scoring model:

- Located within a top 20% disadvantaged community (DAC)
- Located within a TAZ with existing affordable housing
- Located within a TAZ with planned affordable housing

If a project meets all three conditions, it earns the full 60 points available for Equity. Top 20% disadvantaged community refers to a community that ranks in the top quantile of communities identified as disadvantaged.¹ Disadvantaged communities are defined by a set of indicators that include economic, social, environmental, and health metrics. Figure 1 shows the Top 20% disadvantaged communities.

Points for VMT were assessed at the TAZ level against each city's VMT threshold. If a project is in a TAZ that is currently not meeting the per capita or per employee VMT threshold, the project receives 20 points. This scoring approach promotes improvements in areas with a greater need for VMT reducing projects.

Mode share was evaluated based on the drive-alone mode share within the project's TAZ.² If the TAZ had a drive-alone mode share greater than 70%, the project earned 20 points. This scoring model promotes improvements in areas with a greater need for mode shift improving projects.

Under the Binary Unweighted model, each metric is scored as full points or zero points. Individual scores from the three categories are aggregated to determine the overall project score out of 100 points:

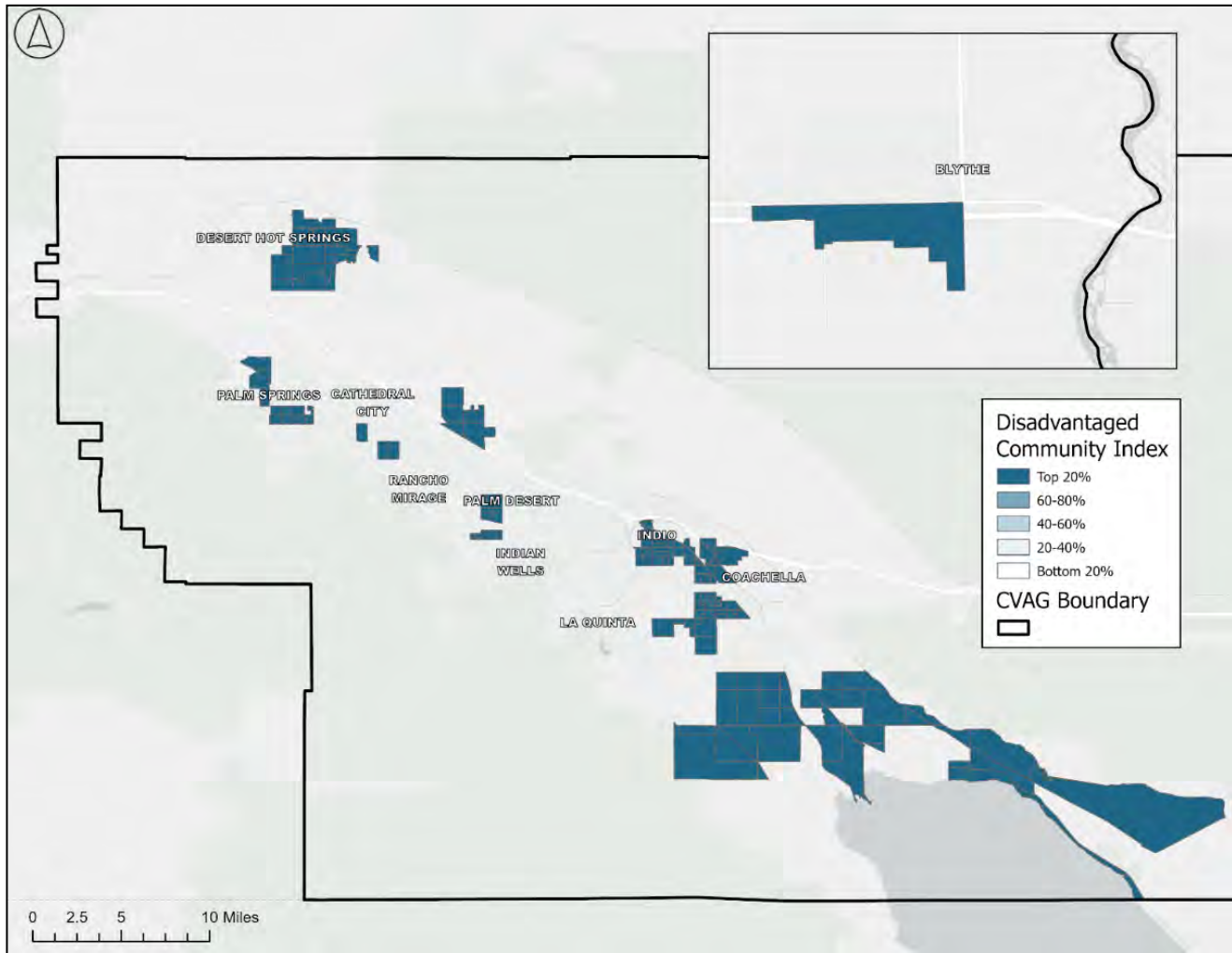
Total Score = Equity Points + VMT Points + Mode Share Points

¹ CVAG, August 2025, *Disadvantaged Communities Definition and Methodology*.

² U.S. Census Bureau, 2019-2023, "Commuting Characteristics," American Community Survey 5-Year Estimates.



Figure 1: Top 20% Disadvantaged Communities



Validation

The scoring process underwent validation and review to ensure accuracy, fairness, and reliability. Results from the four tested scoring models were compared, and differences were found to be minimal, reinforcing confidence in the selected Binary, Unweighted approach. A sensitivity analysis was also conducted to determine whether minor changes in assumptions or thresholds would significantly impact rankings. Findings showed that rankings remained stable and robust.



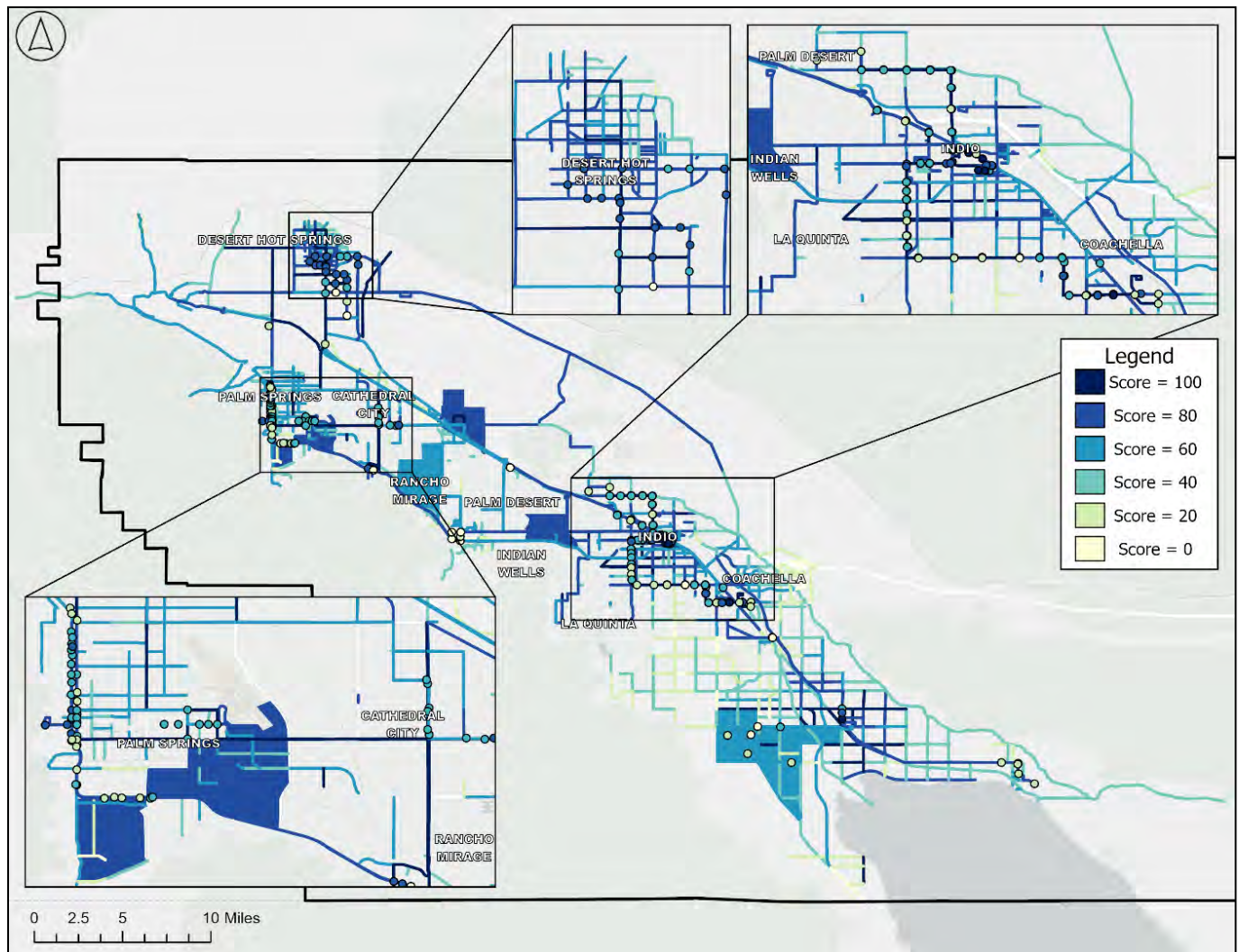
Conclusion

Finally, the Project Team reviewed and approved the final scores and rankings, ensuring alignment with plan and organizational priorities. Figure 2 shows the final project scoring. The average score across all 1,172 projects was 56 with 90 projects receiving the full 100 points and 27 projects receiving the minimum zero points. High scoring project hot spots include Indio, Palm Springs, and Desert Hot Springs, however high scoring projects exist throughout the CVAG region with the exception of Blythe which has no identified projects. The map has also been posted online for viewing at <https://cvaggis.maps.arcgis.com/apps/mapviewer/index.html?webmap=9f158e0605264e1ba20f4a619d50dd83¢er=-116.182646%2C33.743377&scale=577790.554289>

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Figure 2: Co-Benefits Project Scoring



Appendix E: Illustrative Program Profiles



CVAG



COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Illustrative Programs

This appendix profiles a range of programs and initiatives underway throughout California related to VMT mitigation under SB 743. By examining existing mitigation programs, related implementation efforts, and current agency practices, this appendix provides an overview of the different approaches jurisdictions are using to address VMT impacts under CEQA. The examples included illustrate the variety of strategies being employed across the state and provide insights that may help inform future VMT mitigation approaches within the Coachella Valley and other jurisdictions considering similar programs.

Table 1 below includes a list of agencies identified as either planning to undertake a relevant VMT mitigation program feasibility study, having a relevant study ongoing, having a relevant program under development but the status is unknown, or having a program implemented.

Table 1 – Summary of VMT Mitigation Programs in California

Agency	VMT Mitigation Program Type	Current Status	Proposed Pricing
<i>Local Agencies</i>			
City of Escondido	VMT Exchange	Implemented in 2023, with a cost basis varying for each mitigation measure	--
City of Fresno	Hybrid Urban Design Calculator and VMT Bank	Under development	--
City of Hollister	VMT Bank	Under development	--
City of Lancaster	VMT Mitigation Impact Fee Optional Program	Implemented in 2023	\$150/VMT
City of Palmdale	VMT Bank	Implemented in 2024	\$261/VMT
City of Riverside	VMT Bank Pilot	Implemented in 2025	\$94/VMT
City of Salinas	VMT Bank	Under Development	--
City of San Diego	Active Transportation In-Lieu Impact Fee	Implemented in 2020	\$1,400/VMT

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Agency	VMT Mitigation Program Type	Current Status	Proposed Pricing
City of San Jose	Transportation Analysis Policy	Implemented in 2018	\$2,300/VMT for Residential and \$3,200 for Commercial
City of Tracy	VMT Bank	Under Development	--
City of Watsonville	VMT Bank	Implemented March 2023	\$1,524/VMT
City of West Sacramento	TBD	Being evaluated as part of an upcoming study	--
County of Santa Cruz	VMT Bank Pilot	Under Development	\$500-\$1,000/VMT
Town of Los Gatos	Not Determined	Study completed in 2024.	--
<i>Regional Agencies</i>			
Contra Costa Transportation Authority (CCTA)	Hybrid VMT Exchange / In-Lieu Fee Pilot	Study completed in 2023. Pilot program under development.	--
Fresno COG	VMT Bank	Study completed in 2023. An additional study is underway to define remaining program elements required for implementation.	--
Los Angeles County Metropolitan Transportation Authority (Metro)	VMT Bank for Metro Projects on State Highway System	Program adopted by Metro Board in 2024.	Varies
Sacramento Transit Authority (STA)	TBD	Being evaluated as part of an upcoming study	--
San Bernardino County Transportation	VMT Bank	\$2,000,000 in grant funds awarded in 2024 to seed identified mitigation measures.	--

COACHELLA VALLEY REGIONAL VEHICLE MILES TRAVELED (VMT) STUDY



Agency	VMT Mitigation Program Type	Current Status	Proposed Pricing
Authority (SBCTA)			
San Luis Obispo Council of Governments (SLOCOG)	VMT Bank Pilot	Study completed in 2023. An additional study is being considered to define remaining program elements required for implementation.	--
Santa Clara Valley Transportation Authority (VTA)	TBD	Adopted 2025 as an exchange with the option to switch to a bank	--
Stanislaus Council of Governments (StanCOG)	TBD	Being evaluated as part of an upcoming study	--
Tahoe Regional Planning Agency	Mobility Mitigation Fee Program	Implemented April 2021	Up to \$218/VMT based on Development Category
Western Riverside Council of Governments (WRCOG)	VMT Exchange	Adopted 2025	--

VMT Bank Programs

City of Palmdale VMT Mitigation Bankⁱ

The City of Palmdale's VMT mitigation banking program provides a programmatic approach to addressing VMT impacts particularly suited for suburban and rural areas where traditional transportation demand management (TDM) strategies are less effective. The program has established an initial cost of \$261 per daily VMT reduced, enabling developers to purchase credits to mitigate their VMT impacts without requiring direct implementation of mitigation measures. Program highlights and identified benefits include:

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- **Cost and Effectiveness:** The program funds 38 identified measures—37 bicycle/pedestrian improvements and one park-and-ride facility—at a total cost of \$5.91 million. These measures collectively reduce 22,637 daily VMT: 18,860 VMT from bike/ped projects and 3,777 VMT from the park-and-ride facility.
- **Flexibility:** Developers can use TDM measures in conjunction with the bank or rely entirely on bank payments to achieve full mitigation. This flexibility simplifies compliance and reduces barriers for development projects.
- **Efficient Mitigation:** Centralized funding allows for larger, more impactful projects that benefit the community and region.
- **Predictable Costs:** Developers have a clear and consistent cost structure for addressing VMT impacts.
- **Public Infrastructure Improvements:** Projects funded by the bank enhance mobility, sustainability, and connectivity, offering broader public benefits.
- **Scalability:** The program's structure can incorporate additional funding sources, such as grants, to further reduce costs per VMT reduced.

The City of Palmdale's VMT mitigation bank, approved by the Palmdale City Council in 2024, has attracted significant interest from developers, with most available VMT credits expected to be purchased in the first few years of the program's operation. Ongoing discussions within the City focus on ensuring future availability of VMT mitigation, including exploring additional mitigation projects, leveraging external funding, and potential regional partnerships to expand the program's capacity.

Key Takeaways

The Palmdale VMT mitigation bank offers a replicable model for jurisdictions aiming to meet California's SB 743 requirements while balancing development needs with sustainability goals. Its programmatic approach aligns infrastructure funding with regional transportation and environmental priorities, delivering measurable public and private benefits. Key considerations identified as part of its implementation included:

- **Determine Feasibility:** Conduct an evaluation to identify potential mitigation measures, calculate VMT reductions, and establish methodologies for measuring impact.
- **Cost Determination:** Set a cost per VMT reduced that ensures financial feasibility and incentivizes participation.

City of Riverside VMT Mitigation Program

The City of Riverside recently completed a study to evaluate the implementation of a VMT mitigation banking program, aimed at providing feasible mitigation options for development projects within the City. The study concluded that a VMT mitigation bank would be the most appropriate framework for a programmatic VMT mitigation option within the City. The study reviewed 48 potential VMT-reducing measures and proposed three combinations of measures for inclusion in the City's mitigation bank:

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Option A: Includes 16 bicycle-related measures, resulting in the lowest cost per VMT reduced to \$98 per VMT. However, it offers the smallest amount of available VMT credits for purchase. The low cost is attributed to additional funding sources that significantly reduced the program's overall expense.

Option B: Builds on Option A by adding six transit measures. This combination doubles the VMT reduction capacity but increases the cost per VMT reduced to \$1,192 due to the higher expense of transit measures.

Option C: Adds three pedestrian measures to the mix, alongside the bicycle and transit measures in Option B. This provides a broader variety of mitigation options but results in limited additional VMT reductions at a much higher cost, due to the significant expense of pedestrian measures.

A case study evaluation was completed using two previously approved developments to understand how a VMT mitigation program would potentially work within the City. Each of the three combinations of VMT reducing measures were tested (Option A, B, and C) and the total cost to fully mitigate each of the two project's impacts were calculated. The first project tested was a 96-unit residential project while the second project was an expansion of an existing hospital. Option A resulted in a total mitigation cost of just under \$300,000 or approximately \$3,080 per unit for the residential project and a total cost of over \$910,000 for the hospital expansion project. In comparison, Option C resulted in a total cost of almost \$3.9 million for the residential project (over \$40,000 per unit) and a total cost of almost \$12 million for the hospital expansion project. The analysis highlighted the significant cost differences among the options, with Option A being the most affordable and Option C the most expensive.

Based on the findings, the study recommended implementing a voluntary pilot program rather than launching a full-scale initiative. The pilot would be populated with the cost-effective measures from Option A, allowing the City to test the program's feasibility, refine its structure, and manage developer costs effectively.

The City actively engaged the development community throughout the study by:

- Providing regular updates and seeking feedback.
- Conducting a final review meeting with stakeholders to share the study's findings and recommendations.

This proactive approach garnered strong support from developers, which City staff highlighted during committee and council presentations. The pilot program was implemented as of April 2025.

Key Takeaways

This study highlights the critical role of collaboration with the development community and the public in building support for a VMT mitigation program. Such coordination ensures smoother adoption when the program is presented to committees and councils for approval. Additionally, leveraging outside funding sources to subsidize VMT-reducing measures proved effective in significantly lowering the overall cost per VMT.

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City of Salinas

In October 2020, the City of Salinas initiated the development of a VMT mitigation bank specifically focused on bicycle infrastructure projects.ⁱⁱ In creating the bank, the City estimated the cost for several key citywide bicycle projects and calculated the associated VMT reductions. The program includes projects that can be implemented within the next ten years. To facilitate program administration, the cost is calculated on a per-trip basis rather than a per-mitigated VMT basis resulting in program charges of \$204.89 per gross vehicle trip. A project seeking to mitigate its VMT impact must determine the number of vehicle trips to be reduced before calculating the overall mitigation cost. An important aspect of this program is the ability to add additional projects to the bank, thereby increasing the supply of VMT available for mitigation purposes.

Key Takeaways:

- The VMT mitigation bank consists exclusively of bicycle infrastructure projects.
- Developers pay a one-time fee to mitigate the total VMT impact of their project exceeding the threshold.
- The VMT mitigation bank can be replenished by new projects if additional VMT mitigation is necessary.

City of Tracy

In July 2022, the City of Tracy developed a VMT mitigation bank that incorporates bicycle and pedestrian infrastructure projects, as well as a mobility hub project. The mobility hub connects various modes of transportation at a transit station to facilitate commuting by transit and reduce the number of single-occupancy vehicle trips. Similar to the approach taken in the City of Watsonville, proposed VMT reducing projects were selected from existing documents such as the City's transportation master plan (TMP). The projects' associated VMT reductions were calculated, and projects that could be completed within the next ten years were included in the program. The resulting cost for each VMT to be reduced was determined to be \$633.11. This rate does not include any non-fee funding sources, which could potentially decrease the cost per VMT reduction. The VMT bank can be supplemented with additional projects to increase the available VMT supply for mitigation purposes.

Key Takeaways:

- The VMT mitigation bank comprises bicycle, pedestrian, and mobility hub projects.
- Developers make a one-time payment to mitigate the total VMT impact of their project that exceeds the threshold.
- The VMT mitigation bank can be replenished by adding new projects if additional VMT mitigation is necessary.

City of Watsonville

In September 2022, the City of Watsonville developed a VMT mitigation bank centered around bicycle and pedestrian infrastructure projectsⁱⁱⁱ. The proposed VMT reducing projects were selected from existing plans, such as the City's Bicycle Master Plan, and the projects' associated VMT reductions were

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calculated. The program includes projects that can be implemented within the next ten years. This provides developers with a means to reduce their project's VMT impact through a regional VMT banking approach to VMT mitigation.

The calculated cost for each VMT to be reduced was determined to be \$1,524.21. It is important to note that this rate does not consider any non-fee funding sources, such as grants, which could potentially lower the cost per VMT reduction. The VMT mitigation bank can accommodate additional projects to increase the available supply of VMT for mitigation purposes.

Key Takeaways:

- The VMT mitigation bank comprises bicycle, pedestrian, and mobility hub projects.
- Developers make a one-time payment to mitigate the total VMT impact of their project that exceeds the threshold.
- The VMT mitigation bank can be replenished by adding new projects if additional VMT mitigation is necessary.

County of Santa Cruz

In January 2025, the County of Santa Cruz released a Preliminary Final Report recommending a pilot VMT mitigation program structured as a VMT bank. From a broad list of candidate projects, 34 were evaluated for the program based on their feasibility, cost-effectiveness, and equity considerations. These included bicycle infrastructure, transit improvements, affordable housing, mobility hubs, and TDM strategies. The evaluation concluded that a target unit cost of \$500 to \$1,000 per VMT mitigated was appropriate, leading to a two-phase program structure.

The first phase focuses on implementing lower-cost, readily deliverable projects, while the second phase is intended to provide gap funding for higher-cost projects that would not otherwise move forward, such as affordable housing, multimodal hubs, and transit investments. This phased approach balances near-term action with long-term investment in impactful strategies.

Throughout the process, the County engaged extensively with local jurisdictions and stakeholders. These consultations revealed the need for additional time to develop an administrative framework that reflects each jurisdiction's unique context. By separating implementation into two phases, the County can move forward with priority projects while allowing time to refine the administrative structure to support a regionally coordinated, yet locally responsive, VMT mitigation program.

Key Takeaways

- Early and frequent coordination with local agency staff and decision makers is critical when developing a regional program.
- A phased approach allows for more flexibility for the local agencies to develop a coordinated approach to administration.



Fresno Council of Governments (Fresno COG)

Following the completion of project analyses, outreach, framework evaluations, and a review of key considerations, it was determined that a fee-based VMT mitigation program is a feasible and appropriate option for the Fresno COG region. Among the program structures evaluated, a VMT banking approach emerged as the most suitable framework for initial implementation. A variation known as “VMT Banking Plus,” which allows project applicants to select mitigation projects from a pre-approved list, was also identified as a favorable option. These approaches were preferred because they are easier for the public and decision-makers to understand and offer the flexibility to support locally implemented VMT mitigation efforts.

The study also yielded several findings and recommendations to guide future implementation. Equity emerged as a critical consideration, both in the final design of the program and in the selection of mitigation projects, to ensure that VMT impacts, and mitigation benefits, are not unevenly distributed—particularly across environmental justice communities. The nexus between the need for mitigation and its impact must be clearly documented during the final project design. Broad stakeholder engagement will be essential, including input from decision-makers, agencies, and community members, to ensure a robust and supported program. Additionally, while implementing a fee-based program introduces a new cost that could affect housing and infrastructure development, the absence of a regional solution would continue to create uncertainty and barriers for many projects, even those aligned with local plans.

To ensure financial feasibility and program effectiveness, it will be necessary to be selective about which projects are included in the mitigation portfolio. Each project must demonstrate additionality and, where possible, should not already have access to other funding sources. The development of a project list will require an iterative process informed by best practices and accurate methods. Ultimately, a well-designed regional VMT mitigation program offers a viable pathway to compliance with CEQA and SB 743, providing clear options for project applicants that are unable to fully mitigate VMT impacts on-site.

Key Takeaways

- A hybrid approach to VMT mitigation programs can offer more flexibility to agencies that have a desire to allow project applicants more choices in their mitigation approach.
- The cost of VMT reducing projects varies greatly, which introduces the need for additional sources of funding to make the program economically viable.

Los Angeles County Metropolitan Transportation Authority (Metro)

The LA Metro VMT Mitigation Program is designed to serve as a regional VMT bank for projects on the State Highway System (SHS). The program offers packages of credits where each package includes a set of predetermined VMT-reducing projects. The pilot program includes four mitigation actions that are broken down into these packages: Metro Bus Service Frequency Improvements, Metro Bus-Only Lanes, Metro Joint Development, and Metrolink Service Expansion.

These associated VMT credit values, costs, and “implementation packages”—or minimum units of purchase, are designed to ensure implementation of Mitigation Actions is possible with each purchase of VMT credits. Under this program framework, SHS project managers can purchase credits from the VMT

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Mitigation Program to mitigate the VMT induced by their project without the need to conduct a lengthy VMT analysis for each discrete project.

The program includes recommendations for administration, as well as mitigation monitoring and reporting. The cost of each package varies depending on the projects included. The report provides high level cost estimates for each package, as well as the VMT reductions gained by each package allowing SHS managers to select the most appropriate package to reduce VMT.

Key Takeaways

- Rather than funding individual projects, the bank is structured to sell packages of projects.
- The participant of the bank is the state or the project sponsor for SHS improvements, rather than a typical land use development.

San Bernardino County Transportation Authority (SBCTA)

The San Bernardino County Transportation Authority (SBCTA), in collaboration with the Southern California Association of Governments (SCAG), is pursuing the establishment of a regional CEQA mitigation program to address VMT impacts in San Bernardino County. Initially, the VMT mitigation bank will incorporate a Telework Program under the existing IE Commuter Program as its sole project. This program was identified as the most cost-effective strategy for reducing VMT compared to other mitigation options. Additional projects and programs may be added to the bank in the future based on ongoing evaluations.

Participants in the Telework Program will be required to track their travel patterns. Incentives for participation will include cash rewards, provided measurable VMT reductions are achieved. Participants who fail to reduce VMT will not receive incentives and will become ineligible for future participation. The VMT mitigation bank will issue credits based on the reductions achieved by program participants, with the credits made available for sale. Over time, the cost of VMT reductions and participant incentives may be adjusted based on program outcomes and market dynamics.

To ensure the program remains effective and adaptive, the regional VMT mitigation bank will undergo an annual review. This review will evaluate the program's performance, including VMT reductions achieved, credits available for sale, and the financial structure of the program. Potential changes to the Telework Program, the inclusion of new projects, adjustments to marketing strategies, and alternative mechanisms for trading VMT credits will also be assessed.

The program includes two scenarios, a high and low scenario, which is associated with the amount of annual VMT reduced credits assumed. The program would be initially funded by SBCTA to reimburse participants in the telework program. The program would then be reimbursed once project applicants wanting to mitigate their VMT impacts purchase credits from the program. Both scenarios include a cost per annual VMT reduced of \$0.67, resulting in annual VMT reductions of 1.49 million VMT (Low scenario) and 2.985 million VMT (High scenario). The program was awarded \$2 million in 2024 to fund the High scenario for the VMT Mitigation Bank. The approach that SBCTA has undertaken to fund their VMT mitigation program proactively using the \$2 million in awarded funds helps to address concerns regarding implementation timing.

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Key Takeaways:

- SBCTA is developing a regional VMT mitigation bank using a mode-choice based framework.
- The program initially focuses on teleworking as a regional mitigation measure.

San Luis Obispo Council of Governments (SLOCOG) VMT Mitigation Program^{iv}

SLOCOG's VMT Mitigation Program study aimed to address challenges in mitigating VMT impacts in suburban and rural areas where TDM strategies often fall short. The study identified a VMT mitigation bank as the most effective framework, allowing developers to purchase VMT reduction credits to mitigate impacts exceeding thresholds. Developers could use credits alone or in combination with TDM measures.

From 40 evaluated VMT-reducing measures, 32 were recommended for consideration, with six prioritized for a pilot program. These six measures, costing \$19.3 million, are projected to reduce daily VMT by 16,471 VMT at a cost of \$1,170 per VMT reduced (excluding external funding sources). A follow-on study was also recommended to refine measures and evaluate VMT analysis methodologies before full implementation.

The study included case studies at 10 locations across San Luis Obispo County, covering urban, suburban, and rural contexts. Hypothetical residential (100 units) and office (50,000 sq. ft.) projects revealed mitigation costs ranging from \$500,000 to \$13 million, depending on VMT impacts (12% to 160% above regional thresholds). This variability underscores the importance of local context in determining mitigation needs and costs.

Key Takeaways

The study emphasized the importance of implementing a pilot program as an initial step, particularly when considering the complexities of regional-scale fee-based VMT mitigation banks. A pilot program provides an opportunity to test, refine, and address unforeseen challenges before full-scale implementation.

The study also highlighted a key limitation: fee-based VMT mitigation programs may not always provide financially feasible solutions for all projects needing mitigation. Financial feasibility is influenced by two critical factors:

- Cost of VMT Mitigation Measures: Mitigation costs must be reasonable for developers to encourage participation.
- Project Context: Urban, suburban, and rural areas have differing VMT thresholds and mitigation needs, resulting in significant cost variability.



VMT Exchange Programs

City of Escondido

The City of Escondido's VMT Exchange Program was adopted in 2022 and is a voluntary CEQA mitigation tool that enables developers to offset significant VMT impacts by funding or constructing pre-approved transportation improvement projects. The program emphasizes active transportation and transit-supportive infrastructure, with early action projects focused on building or enhancing sidewalks, bikeways, crosswalks, curb ramps, and bus stops. Each project is assigned a VMT reduction value based on established methodologies, and developers may select from these options to meet their required VMT mitigation. The program ensures "additionality," meaning these mitigation projects are not already funded or planned through other City programs.

The program is structured to allow developers to collaborate with City staff to identify suitable mitigation projects based on proximity to their development and potential to increase walking, biking, or transit use. The selected VMT-reducing project must be completed as a condition of development approval, and its implementation is tracked through the City's Climate Action Plan reporting. Early action project examples include one mile of new sidewalks (303 VMT reduced at ~\$1.05M), new Class I bikeways (107 VMT reduced), and enhanced bus stops (50 VMT reduced per shelter at ~\$10k–\$25k). The VMT reduction from each improvement is based on Escondido-specific calculations and verified assumptions.

Looking forward, the program could expand to include operational programs like a downtown shuttle, City employee trip reduction initiatives, and marketing campaigns for mode shift. These options have higher per-VMT mitigation costs, estimated at \$3,450 per VMT for 30-year marketing or TDM programs and \$4,524 per VMT for annual shuttle operations. These future programs require additional City resources and council approval.

Key takeaways:

- Developers are asked to first select mitigations within a half-mile travel distance of their project with a tiered priority provided for other options if no projects are within that proximity.
- The program provides early action mitigation options with the option to expand to other projects upon City Council approval.

Santa Clara Valley Transportation Authority

The Santa Clara Valley Transportation Authority (VTA) is advancing a regional VMT mitigation program framework that is currently in the evaluation and pre-implementation phase. Released in 2024, the framework outlines a program structure for a VMT exchange model in the short term, with the potential to evolve into a VMT bank as the program matures and a portfolio of mitigation projects is established.

Under the proposed approach, participating jurisdictions within Santa Clara County would opt into the program, enabling projects within those jurisdictions to access a coordinated set of VMT-reducing strategies to mitigate CEQA impacts. The program is designed to provide flexibility to project applicants while maintaining a consistent methodology for quantifying and verifying VMT reductions.

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The initial phase of the program focuses on a targeted set of mitigation strategies that are expected to be both cost-effective and scalable, including:

- Bus speed and reliability improvements
- E-bike incentive and subsidy programs
- Enhanced vanpool and shared mobility programs

These strategies reflect a focus on transportation demand management and operational improvements that can be deployed relatively quickly and generate measurable VMT reductions. Over time, the program may expand to include a broader range of mitigation measures and transition toward a banking structure with pre-quantified VMT credits.

The VTA program emphasizes regional coordination while maintaining local control through an opt-in structure, allowing jurisdictions to participate based on their planning context and development needs.

Key Takeaways

- The VTA program is best characterized as an emerging VMT exchange framework, with potential to transition into a regional VMT bank. This phased approach may help CVAG roll out a program with less complexity before switching to a more complex scaled up program.
- Initial mitigation strategies prioritize cost-effective, scalable TDM and operational improvements. With an initial focus on scalable, lower-cost strategies the administrator can support early program success, before expanding to more complex mitigation investments.
- Jurisdictional opt-in is a key feature, enabling flexible regional participation. An opt-in model may be necessary for CVAG, though allowing every city/county to opt in would create complexity. By allowing sub-regions to participate based on readiness and policy alignment CVAG could create a model that more directly addresses the policy context of the sub-regions that are ready to participate.
- The program reflects a phased implementation approach, allowing refinement of methodologies and governance prior to full deployment.

Western Riverside Council of Governments (WRCOG) VMT Exchange Program

The Western Riverside Council of Governments (WRCOG), in partnership with its member agencies and key regional stakeholders, has developed a voluntary VMT exchange program to provide projects with a mechanism to mitigate VMT impacts. WRCOG will serve as the program administrator, and a program manual was released on May 5, 2025. The program manual establishes the rules and procedures for the operation of the program.

Additional aspects of the program include:

- Agencies agree to join the program by executing an agreement with WRCOG.
- Only agencies which have formally joined the program can submit VMT reducing projects to be included in the program.

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- WRCOG will compile a list of VMT-reducing projects submitted by agencies that have joined the program and then the VMT-reducing projects are available to be purchased to generate VMT credits.
- Once the list has been established, any public entity or private entity can purchase VMT credits by selecting one or more projects from those available on the list.
- WRCOG will collect a 4-percent administrative fee based on the program costs for each project applicant purchasing VMT credits.
- WRCOG will refresh the VMT-reducing project list as appropriate.

Key Takeaways

WRCOG is the only regional agency known to pursue a VMT Exchange framework for their VMT mitigation program.

Impact Fee Programs

City of Lancaster

The City of Lancaster adopted a VMT Mitigation Impact Fee Program in 2023, which allows new residential and nonresidential developments to mitigate their project-specific VMT impacts by making a “fair share” payment to cover the cost of the identified TDM strategies and VMT-reducing projects. The fee applies to new residential and nonresidential development in the City that is subject to a VMT analysis under CEQA and is shown to generate VMT over the City’s established threshold of significance. The developer is able to pay the fee per VMT to reduce the project’s total VMT to a less-than-significant level. Developers are also able to construct specific improvements to reduce their total VMT instead of paying the fee, or can do a combination of both constructing improvements and paying the fee. The fee does not apply to projects that screen out of a VMT analysis, are located in a VMT efficient zone, or have a project-specific VMT study that shows the VMT is less than the City’s threshold. The overall intent of the program is to streamline the SB 743 compliance process for development projects while funding future VMT improvement projects to reduce citywide VMT, thereby reducing the CEQA timeline for the project.

Lancaster completed both a nexus study and an environmental impact report for the adoption of the fee. Based on the nexus study and feedback from the development community, the City adopted a fee of \$150.00 per VMT. Through payment of the fee, developers are able to utilize the Program’s EIR and claim that the project has a less-than-significant transportation impact with mitigation.

Key Takeaways

- In the case of adopting an impact fee that is subject to the Mitigation Fee Act, a nexus study and EIR may be warranted. Whether the program is subject to the Mitigation Fee Act is a question of whether the program is voluntary or not (see more information under Legal Considerations.)



City of San Diego – Active Transportation In-Lieu Fee Program

In 2020, the City of San Diego proposed a program to comply with SB 743.^v The objective of this program was to reduce citywide VMT and address the impacts of development related to noise, air pollution, greenhouse gas emissions, and public health. The program aimed to achieve this by investing in active transportation infrastructure and measures that lead to reduced citywide VMT.

The program designates four zones within the City:

Mobility Zone 1: Represents the Downtown Community Planning Area boundary.

Mobility Zone 2: Includes parcels falling wholly or partially within the State's identified Transit Priority Areas (TPAs).

Mobility Zone 3: Reflects any Community Planning Area boundary with a VMT threshold that is 85% or less of the regional average for VMT per capita or VMT per employee.

Mobility Zone 4: Encompasses non-urban areas of the City not located within Zones 1, 2, or 3.

Under this program, developments located in Mobility Zone 4 are required to pay an active transportation in-lieu fee instead of funding VMT-reducing mitigation measures. These developments are also exempt from providing on-site Transportation Demand Management (TDM) due to their less favorable conditions for walking, biking, transit accessibility, and distance from key destinations. The fees collected from this program are utilized to finance transportation and VMT-reducing multimodal infrastructure projects within Mobility Zones 1, 2, and 3, thereby reducing citywide VMT impacts. Developments in Mobility Zones 2 and 3 are required to implement on-site TDM measures that help reduce VMT. These measures may include pedestrian improvements, bicycle amenities, transit enhancements, or other multi-modal enhancements. The average total cost for regional VMT, normalized across the bike, transit, and pedestrian modes, is estimated at \$1,400.

Key Takeaways:

- The City is divided into different zones.
- Developments in non-urban areas pay an Active Transportation In-Lieu Fee
- Developments in urban areas provide on-site Transportation Demand Management (TDM) amenities to reduce VMT.

Hybrid and Other Programs

City of Fresno

The VMT Reduction Program consists of two key components that can be applied individually or together: an Urban Design Calculator (UDC), which estimates potential VMT reductions based on project design features, and a mitigation fee program—supported by a nexus study—paired with a VMT mitigation bank to fund off-site VMT-reducing projects.

Through this framework, the program will identify appropriate TDM strategies and VMT-reducing investments across Fresno. Fees collected from development projects with significant VMT impacts

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under CEQA would support improvements such as expanded active transportation infrastructure, enhanced multimodal access, and better street connectivity for pedestrians, cyclists, and transit users.

Overall, the program is designed to streamline compliance with SB 743 for developers while enabling the City to fund and implement projects that reduce VMT and support more sustainable, accessible transportation networks. The program is undergoing an EIR, and more information will be available once the City publishes the EIR.

City of San Jose – Transportation Analysis Policy

On March 29, 2018, the City of San Jose adopted a Transportation Analysis Policy^{vi} to align with SB 743. This policy replaced the Transportation Impact Policy and aims to support environmentally friendly transportation projects that align with the City's land use goals and mitigate traffic impacts. The types of transportation projects that meet the screening criteria specified in SB 743 are listed in the City's policy. However, projects that do not meet the screening criteria undergo a quantitative VMT evaluation to assess the project's VMT against the City's significance thresholds. If needed, feasible mitigation measures are included to offset any identified impacts. In cases where full mitigation of an identified VMT impact is not possible, projects are required to fund multimodal transportation improvements, known as Transportation System Improvements. These improvements aim to enhance system efficiency and safety, promote non-auto travel modes, and contribute to the citywide reduction of VMT.

San Jose also uses a VMT "budget" to establish a threshold of significance for transportation projects. The City evaluates transportation projects based on the City's RTP. The San Jose Transportation Analysis Handbook outlines screening criteria that determine whether a CEQA transportation analysis is required for development projects proposed within the City's limits. The criteria are based on the project type, characteristics, and location. If a project meets the screening criteria, a detailed CEQA VMT analysis is not necessary, as it is expected to result in a less-than-significant VMT impact. Projects must demonstrate consistency with the Envision San Jose 2040 General Plan to address cumulative impacts. Consistency with the General Plan is assessed based on factors such as project density, design, and adherence to the plan's goals and policies. If a project is deemed inconsistent, a cumulative impact analysis is required, as outlined in the City's Transportation Analysis Handbook.

San Jose's cost to purchase VMT credits for mitigation purposes are based on the land use proposed and are \$3,200 per VMT for commercial/industrial and \$2,300 per VMT for residential.

Key Takeaways:

- Applicants must either construct or fund citywide multimodal transportation improvements if a project cannot fully mitigate VMT.
- Improvements to the citywide multimodal transportation system may not directly reduce or eliminate the significance of unmitigated VMT impacts.
- The improvements contribute to overall community benefits.

Contra Costa Transportation Authority (CCTA)

The Contra Costa Transportation Authority (CCTA) was awarded a \$400,000 Sustainable Planning Grant by the California Department of Transportation (Caltrans) in 2021 that aimed to support the development of a VMT Mitigation Framework^{vii}. The framework explores the possibility of allowing

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developers and transportation agencies, whose projects contribute to an increase in VMT, to offset their emissions by contributing to a "VMT Mitigation Program."

In March 2023, a draft VMT mitigation framework was released by CCTA. The authority expressed interest in implementing a pilot hybrid exchange/in-lieu fee program focused on the adoption of the Mobility on Demand (MOD) app. The MOD app would serve as a voluntary commute trip reduction program while providing community-based travel information. The app offers VMT monitoring capabilities, enabling the quantification of VMT effects. This would facilitate the direct calculation of the program's cost-effectiveness in reducing VMT. The draft framework estimates a cost of \$0.10 to \$0.35 per VMT reduced over a 10-year period rather than estimating a cost of VMT reduced per day, which is how most other programs calculate the cost of VMT reductions. If the MOD app proves to be effective, the demonstrated VMT reductions and cost data could serve as the foundation for a future fee program.

Key Takeaways:

- The program is funded through the Caltrans Sustainable Planning Grant program.
- CCTA is establishing a pilot hybrid exchange/in-lieu fee program.
- The estimated cost is \$0.10 to \$0.35 per VMT reduced over a 10-year period, rather than estimating a cost of VMT reduced per day, which is how most other programs calculate the cost of VMT reductions.

Tahoe Regional Planning Agency (TRPA) - Mobility Mitigation Fee Program

In April 2021, the Tahoe Regional Planning Agency (TRPA) introduced the Mobility Mitigation Fee (MMF) program, which calculates the fee based on average daily VMT rather than average daily trip ends.^{viii} VMT mitigating projects are selected from TRPA's 2020 RTP constrained project list and the MMF may charge up to \$218 per VMT depending on the type of development. This program differs from others in the region as it exclusively imposes a VMT mitigation fee. The MMF Program is not intended to be a revenue-generating measure to fund roadway improvements but is intended to mitigate a project's VMT impact on the transportation network by funding other RTP projects that reduce regional VMT. The updated process requires all projects to mitigate their transportation impacts through payment in the MMF Program and to address significant VMT at the project level. However, retail/commercial development is only charged a fee if it results in a net increase in VMT. The process encourages projects to be constructed in low-VMT areas and for projects to implement VMT-reducing strategies that further reduce VMT in order to lower a project's total MMF fees. TRPA's mitigation fund release policy specifies that the collected funds can only be used for VMT mitigating transportation projects.

Key Takeaways:

- TRPA's fee program is based on VMT instead of daily trip ends and depends on project type.
- Fees are solely for mitigating project impacts on transportation and not for revenue generation to offset vehicular operational impacts.
- The new process charges a fee only if the project generates a net increase in VMT.



VMT Initiatives

California has implemented various programs to address transportation impacts. These programs aim to promote sustainable travel modes, fund transit improvements, and reduce VMT through innovative approaches.

One example of an early VMT mitigation program is the San Francisco Transportation Demand Management Program^{ix}. This program requires new development projects to incorporate design features, incentives, and tools that support sustainable travel modes. Projects earn points based on their characteristics and choose demand management measures from a menu of options. Each point represents a 1% reduction in VMT. The program effectively combines land-use requirements and demand management measures to mitigate VMT.

Another program that was reviewed was the Transportation Sustainability Fee (TSF)^x implemented in San Francisco. Through TSF, developers of qualifying projects are required to pay fees based on the square footage of their development. The generated funds are used to improve transit services and other non-motorized transportation infrastructure, such as expanding the bus fleet and enhancing transit stops. The TSF program ensures a well-designed analysis of transportation demand and adjusted fees and measures to satisfy core CEQA requirements.

The City of Pasadena has implemented the Complete Streets Program, which focuses on reducing VMT through innovative approaches^{xi}. The program includes thresholds for analyzing and mitigating significant impacts related to VMT and LOS. By evaluating LOS and VMT at the same level, potential conflicts between compliance requirements under CEQA and the CMP can be resolved. The program also allowed for the designation of "infill opportunity zones" exempt from LOS requirements if they were located within a certain distance of major transit stops or high-quality transit corridors^{xii}.

The City of Los Angeles has adopted area-specific plans, such as the West LA Transportation Improvement and Mitigation Specific Plan^{xiii}. These plans include transportation improvements funded by impact fees collected from new development. The plans incorporate a VMT-based nexus, in-lieu credits, and credits for transit-oriented development. Additionally, the Los Angeles Metro Transit Pass Study explores the possibility of using sponsored transit passes as a VMT mitigation exchange, allowing developers to purchase passes to reduce VMT^{xiv}.

The Metropolitan Transportation Commission (MTC) in the Bay Area is exploring a simplified VMT bank or exchange option for express lanes^{xv}. This includes offsetting VMT impacts of the express lanes through a VMT exchange program and considering off-site mitigation projects funded by developers. However, challenges remain in determining how and where these banks should be utilized, particularly in scenarios where toll revenue drops, and mitigation funds are needed for highway operation and maintenance.

ⁱ *Analyzing Vehicle Miles Traveled (VMT) for CEQA Compliance*. City of Palmdale Public Works Department. May 13, 2024.

ⁱⁱ While this VMT Banking program consists of potential projects that could be constructed in the next ten years, some but not all of them are anticipated to be constructed in that timeframe.

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- ⁱⁱⁱ Project level depends on project site and land use types. Chapter 65: Air Quality / Transportation of the TRPA Code of Ordinances details the defined levels
- ^{iv} *Regional Vehicle Miles Traveled (VMT) Mitigation Program Study*. San Luis Obispo Council of Governments (SLOCOG). September 6, 2024.
- ^v See County of San Diego, San Diego Citywide Active Transportation In Lieu Fee Program Estimated Impacts and Cost Savings,
https://www.sandiego.gov/sites/default/files/8_active_transportation_in_lieu_fee_cost_impact_analysis.pdf,
accessed on June 1st, 2023
- ^{vi} See City of San Jose Council Policy, Transportation Analysis Policy, 636691896044230000 (sanjoseca.gov),
accessed on June 1st, 2023
- ^{vii} See Draft Contra Costa VMT Mitigation Program Framework, https://ccta.net/wp-content/uploads/2023/03/CCTA_VMT_Mitigation_Framework_Review_Draft_2023.03-2.pdf, accessed on June 1st, 2023
- ^{viii} See Tahoe Regional Planning Agency, Mobility Mitigation Fee Update, 2021. <https://www.trpa.gov/wp-content/uploads/Ops-Committee-Item-5-Mobility-Mitigation-Fee-Update.pdf>, accessed on June 1st, 2023
- ^{ix} See City and County of San Francisco Planning Commission, Standards for the Transportation Demand Management Program (2016), See <http://www.sftdmtool.org/>, accessed on June 1st, 2023
- ^x See Robert D. Spencer, San Francisco Municipal Transportation Agency, San Francisco Transportation Sustainability Fee (TSF) Nexus Study (2015).
- ^{xi} See City of Pasadena Department of Transportation, Mobility Element (2015).
<https://www5.cityofpasadena.net/transportation/complete-streets/development-review/pasadena-transportation-management-association>, accessed on June 1st, 2023
- ^{xii} See Cal. Gov't Code § 65088.4.
- ^{xiii} See Los Angeles Department of Transportation, Transportation Impact Assessment (TIA) Fee Program Study for Coastal Transportation Corridor Specific Plan and West Los Angeles Transportation Improvement and Mitigation Specific Plans Amendment Project, 2015.
- ^{xiv} See Fehr & Peers, VMT Mitigation Through Fees, Banks, and Exchanges, April 2020
- ^{xv} See Metropolitan Transportation Commission, Bay Area Express Lanes Strategic Plan,
https://mtc.ca.gov/sites/default/files/Bay_Area_Express_Lanes_Strategic_Plan_Appendices.pdf, accessed on June 1st, 2023

Appendix F: Legal Framework



CVAG





Legal Considerations

There are legal considerations that need to be considered before creating a VMT mitigation bank, exchange, or impact fee program, including CEQA and associated court decisions, California's Mitigation Fee Act (AB 1600), associated Assembly Bills (AB) and Senate Bills (SB), as well as regional plans.

Additionality and Verification

Additionality refers to the principle that environmental mitigation efforts—such as offsite VMT mitigation through a bank or exchange—must result in benefits that would not have happened without the mitigation program. Caltrans defines additionality as providing new resources that would not otherwise be available, or delivering them significantly earlier than expected.ⁱ Similarly, the California Air Resources Board states that for offset projects, additional benefits must go beyond what is legally required and must not occur under a typical business-as-usual scenario.

Verification is the process of ensuring that a project's anticipated reductions match the need generated by the development in question. It also refers to the process of ensuring those reductions occur after implementation/construction.

Agencies need to consider questions concerning both “additionality” and verifiable VMT reductions before participating in a VMT mitigation program. These two interrelated considerations are important both from the perspective that VMT reductions are quantifiable and realistic in the VMT estimating technique and that proposed mitigations are truly new mitigation rather than supplanting funding.

To track the additionality in the context of a VMT mitigation program, two basic approaches can be taken in the phases of investment selection and implementation:ⁱⁱ

- **Project-specific (pre-investment):** The lead agency or mitigation program administrator verifies the project's additionality before funding an individual mitigation project using available documented assessments, plans and/or funding resources of the applicable RTP(s).
- **Programmatic (post-investment on a regular programmatic basis):** The mitigation program administrator identifies classes of investment such as “likely to be added” or “unlikely to be added” based on the applicable RTP before selection. To do so, the program administrator conducts a comprehensive review of fund transactions, VMT impacts, mitigation supported investments, and the relationship of the investment cohort to the relevant investment plans (i.e., applicable RTP) and funding sources regularly. The administrator shall verify the additionality of the investments relative to a baseline scenario for the same period.

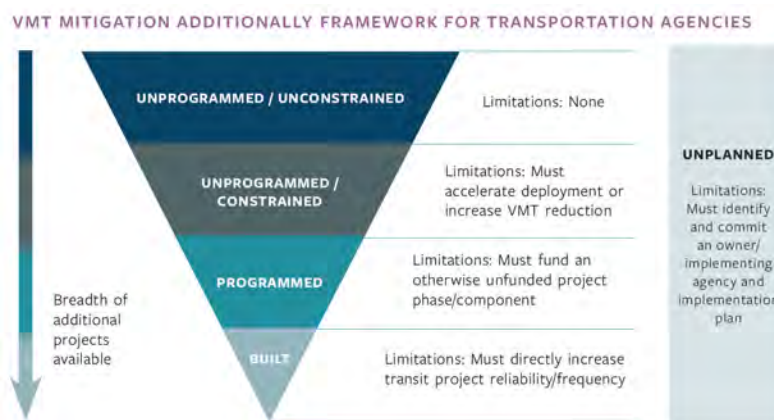
For verification purposes, agencies could try to create a smaller body to handle verifications at the regional level. In that case, agencies will likely need to increase technical capabilities and modeling capacity as there will be a need for monitoring potential discrepancies between VMT reduction forecasts. If agencies cannot conduct verification efforts in-house, they could contract third-party offset verifiers.ⁱⁱⁱ This may have an added benefit of possibly avoiding concerns about self-verification, such as improper influence, that could undermine public trust.

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Exhibit 1 below depicts a conceptual framework for VMT mitigation and additionality assessment for agencies and the existing limitations.^{iv}

Exhibit 1 - Sample VMT Mitigation Additionality Framework



SB 375 and Regional Transportation Plans

A bank or exchange may need to take into account certain transportation planning frameworks that are covered by California law. RTPs are long-term plans created and updated frequently by regional transportation agencies (RTAs) and metropolitan planning organizations (MPOs) incorporating local, regional, state and federal plans and priorities.

SB 375 (Steinberg, 2008) mandates that MPOs develop and implement a Sustainable Communities Strategies (SCS). When combined with RTP components, these strategies integrate land use, housing, and transportation planning to achieve the regional greenhouse gas emission reduction targets set by the State of California. SB 375 promotes robust planning processes that integrate regional and local strategies. However, in terms of implementation, significant gaps have been observed. One of the limitations was the development of adequate incentives for inducing local development choices conducive to RTP goals. Disruptive technologies such as Uber, Lyft, and autonomous vehicles increased vehicle availability, reduced time spent driving, and lowered operating costs in shared platforms, potentially increasing regional VMT absent new regulations. Other challenges include local zoning and permitting practices that constrain housing production and/or make it more expensive. Also, SB 375 states that no aspect of it should be understood to supersede local control of land use decision-making, which makes it hard for MPOs to impose policy directives upon local jurisdictions. There have been concerns about infill strategies, lack of adequate incentives, and support for compact development.

A project in the RTP that is fully funded does not qualify under the additionality requirement for regional VMT mitigation programs. In addition, large scale mitigation investment may overlap with RTPs as they reflect regional transportation investment priorities. VMT mitigation programs should include mechanisms to ensure that additionality requirements are met.



RTIP Programmed Projects

The approved programming document that accompanies the RTP, the Regional Transportation Improvement Program (RTIP), lists funded, partially funded, and unfunded projects and programs. Projects or programs that are fully funded do not offer any new or extra benefits to offset the impact of VMT. These projects are ineligible to be used for VMT mitigation. A partially funded project might be acceptable as mitigation, but this would require a strong justification to show why the project would not have advanced without the mitigation support.

RTP “Constrained” Projects

RTPs typically cover at least 20 years' worth of anticipated funding for the projects and programs listed with construction/implementation also spread out over the 20-year timeline. Consequently, throughout the planning period, many of the projects and programs are shown in projected "phases". A project's VMT impact, especially those adding roadway capacity, may be mitigated in several ways, including by advancing VMT-reducing projects on the RTP project list such as bicycle network or transit improvements. Mitigation is realized by advancing a VMT-reducing project from a later phase to an earlier delivery, ensuring funding certainty, and/or reducing the risk of unanticipated downturns in future funding. Therefore, to be used as VMT mitigation, projects or programs in the financially constrained RTP would need to individually present strong proof of VMT reasonable advancement.

RTP “Unconstrained” Projects

Projects or programs listed in the unconstrained portion of a RTP have no funding programmed or anticipated during the 20-year planning period covered by the RTP. These projects are, in principle, acknowledged as regional needs, but the estimated amount of funds that will likely be available throughout the planning period is insufficient to cover their costs as the funds have been allocated to the projects in the budget-constrained section of the plan. Since the benefits of the projects would be in addition to those that are already committed, funded, or planned for funding, using projects from this component of the RTP accelerates VMT reduction benefits and is therefore acceptable VMT mitigation.

Congestion Management Program

The current Congestion Management Program (CMP) framework in California was originally developed around maintaining roadway performance using LOS standards, typically LOS E, on designated CMP facilities. While subsequent legislative changes reduced many of the mandatory enforcement provisions tied to LOS deficiency plans, CMPs continue to influence regional transportation planning and project evaluation in many urbanized counties.

However, SB 743 shifted the focus of transportation analysis under CEQA from LOS to VMT. This creates an inherent conflict between CMP requirements and SB 743 objectives. For example, a VMT mitigation bank or exchange might fund projects like transit enhancements or infill development incentives—projects that effectively reduce VMT but may do little to improve, or could even worsen, traditional LOS metrics. In addition, projects that increase roadway capacity may improve LOS, but can result in additional regional VMT, requiring mitigation. As a result, jurisdictions face a regulatory tension between compliance with CEQA under SB 743 and maintaining consistency with CMP LOS standards.



Resolving this tension will require careful coordination and potential updates to CMP frameworks to reflect the evolving priorities of the state's transportation and environmental policies.

Impact Fee Legislation

Development Impact Fees were established under Assembly Bill 1600 (AB 1600), also known as the Mitigation Fee Act, codified as Government (Gov.) Code Sections 66000 through 66008 ("Mitigation Fee Act"). The main purpose of the Mitigation Fee Act is to "address concerns over the fact that local agencies are imposing fees for purposes unrelated to development projects."^v

AB 1600 governs the collection of development impact fees by local agencies and requires a clear nexus between the fee imposed and the impacts of the development projects paying the fee. While AB 1600 is relevant to city- or county-level VMT mitigation programs that require project applicants to pay a fee to offset project-specific impacts, it does not apply to voluntary regional VMT mitigation programs. Regional programs are typically voluntary, incentive-based frameworks established through interagency collaboration and are not structured as direct fee-for-service models tied to individual project approvals. As such, they fall outside the statutory requirements of AB 1600, which is designed to regulate mandatory exactions rather than regional planning tools.

AB 602, approved on September 28, 2021, reforms housing impact fees to make them more fair, transparent and streamlined such that smaller, more affordable units are not unfairly penalized with higher costs.^{vi} AB 602 requires impact fee programs to perform an analysis as part of the Nexus study to determine whether it is appropriate to charge fees on residential developments proportional to the size of a new home. Historically impact fee programs charge fees on a per unit basis. This new requirement may result in a program shifting to charge residential fees proportional to the size of a home such that smaller homes pay reduced fees. This association between housing size and the amount of fees charge is based on the number of trips generated by a home, understanding that larger homes tend to support a larger number of people living in them and thus, generate a larger number of trips that impact the roadway network.

AB 602 also requires that when updating an impact fee program, the Nexus study must include an analysis that identifies the existing level of service for each public facility, the proposed new level of service based on the improvements included in the updated impact fee program, and should include an explanation of why the new level of service is needed. This requirement helps support a jurisdiction's transition from funding capacity-increasing projects with the impact fee program towards trip- and VMT-reducing projects such as bicycle network and transit improvements.

AB 516, approved on April 19, 2023, adds new requirements to the annual reporting requirements for impact fee programs, including whether projects previously identified for construction were constructed, and if not constructed, the reasons for the delay in construction must be provided. Reports are also required to include the number of agencies or the people who have received money from mitigation fees. The legislation also provides certain clarifications as to how the agency provides information regarding past reports and provides fee payers with a right to audit.

SB 937, approved on September 19, 2024, changes the timing for collection of impact fees from prior to issuance of a building permit to the date of final inspection or the issuance of a certificate of occupancy,



whichever comes first. Exceptions to the new law are allowed if the public agency uses the impact fees for expenditures previously incurred; or if the agency determines that the fees will be used for improvements to facilities for which an account has been established and funds appropriated. Exceptions also include using the impact fees on facilities for which the agency has adopted a proposed construction schedule or plan prior to the final inspection of the certificate of occupancy. A CIP can be used to meet the requirement of a construction schedule. SB 937 does allow the permitting agency to execute a contract to collect the fees. For residential developments, the new law also specifies that interest may not be applied to fees and allows the collection of fees on a pro-rata or lump sum basis.

AB 3177 and AB 2553, approved on September 22, 2024, and September 19, 2024, respectively, combine to affect how fees are charged for residential developments in proximity to transit stations. AB 2553 updates the definition of a transit station to include a site containing an existing rail or bus rapid transit station, a ferry terminal served by either a bus or rail transit service, the intersection of two or more major bus routes with a frequency of service interval of 20 minutes or less during the morning and afternoon peak commute periods, which is increased from the current 15 minute interval. AB 3177 requires a local agency that is updating an impact fee program to set the fee charged for a housing development to reflect a lower rate of automobile trip generation if the housing development satisfies all of the specified characteristics below:

- The housing development is located within half mile of a transit station as defined by AB 2553,
- The housing development is located within a half mile of convenience retail uses, including a store that sells food, and
- The housing development provides either the minimum number of parking spaces required by the local ordinance, or no more than one onsite parking space for zero- to two-bedroom units, and two onsite parking spaces for three or more-bedroom units, whichever is less.

AB 1244: Transit-Oriented Development Implementation Program

Assembly Bill 1244, introduced to the assembly on February 21, 2025, amended on April 23, 2025, and passed by the assembly on June 2, 2025, proposes a new method for satisfying transportation impact mitigation under the CEQA through financial contributions to a state-administered fund. Specifically, the bill would allow any project applicant in California to meet VMT mitigation requirements by voluntarily paying a per-mile fee—set and updated by the LCI—into the Transit-Oriented Development Implementation Fund. This fund will support the development of affordable, transit-oriented housing, which has been shown to significantly reduce VMT.

Funds contributed through this mechanism would be used by the Department of Housing and Community Development (HCD) to finance housing developments in the same region as the contributing project, with priority given to developments in the same city or county. LCI must confirm the estimated VMT reductions associated with funded projects and post detailed project and impact data online. The bill aims to provide developers with a clear, consistent, and CEQA-compliant option for VMT mitigation, while advancing the state's climate, equity, and housing goals through strategic infill development.



California Fish & Game Code

While research shows there are no specific statutes for VMT exchanges and banks, U.C. Berkeley used conservation programs established under the California Fish & Game Code (FGC) as a proxy to develop a list of requirements associated with existing statutes as shown in **Table 1**.^{vii} The intent is to show that behind VMT exchanges and banks aligning as a VMT mitigation program, is a form of conservation where they are trying to limit environmental impacts and the VMT generated through development.

Table 1 - Sample VMT Mitigation Bank/Exchange Plan

Requirements	Statutory Ref.
An explanation of the VMT mitigation purpose and need for the bank or exchange.	FGC § 1852(c)(1)
The geographic area covered by the bank or exchange and rationale for the selection of the area, together with a description of the existing transportation and development dynamics that provide relevant context for the development of the bank or exchange.	FGC § 1852(c)(2)
The public transit and VMT reduction opportunities are currently located within the bank or exchange area.	FGC § 1852(c)(3)
Important residential and commercial communities and transportation resources within the bank or exchange area, and an explanation of the criteria, data, and methods used to identify those important communities and resources.	FGC § 1852(c)(4)
A summary of historic, current, and projected future transportation stressors and pressures in the bank or exchange area, including economic, population growth, and development trends.	FGC § 1852(c)(5)-(6)
Provisions ensure that the bank or exchange will be in compliance with all applicable state and local legal and other requirements and does not preempt the authority of local agencies to implement infrastructure and urban development in local general plans.	FGC § 1852(c)(7)
VMT mitigation goals and measurable objectives for regional transportation resources and important mitigation elements identified in the plan that address or respond to the identified stressors and pressures on transportation within the bank or exchange area.	FGC § 1852(c)(8)
VMT mitigation projects, including a description of specific projects that, if implemented, could achieve the mitigation goals and objectives, and a description of how the mitigation projects were prioritized and selected about the mitigation goals and objectives.	FGC § 1852(c)(9)
Provisions ensuring that the bank or exchange plan is consistent with and complements any local, regional, or federal transportation or congestion management plan that overlaps with the bank or exchange area, a summary of any such plans, and an explanation of such consistency.	FGC § 1852(c)(10)-(11)



CEQA Considerations

The implementation of a VMT mitigation program raises several CEQA-related considerations. A foundational step for many agencies is establishing their own VMT thresholds of significance, which provides predictability for project applicants and a consistent basis for impact assessment. While agencies may rely on another jurisdiction's adopted thresholds with appropriate justification, having locally adopted thresholds reduces developer uncertainty. Additional considerations include determining the most appropriate type of CEQA documentation, clarifying whether the program itself requires environmental clearance, and defining the level of CEQA evaluation needed for individual mitigation projects. Questions also arise around how to establish limits for feasible mitigation, what constitutes a timely approach to implementing VMT-reducing measures, and the level of documentation and monitoring needed to track mitigation effectiveness. Each of these issues as well as new legislation relating directly to VMT programs is discussed further below.

AB 130 and SB 131

California enacted significant reforms to the CEQA through Assembly Bill 130 (AB 130) and Senate Bill 131 (SB 131), signed into law by Governor Newsom on June 30, 2025. These reforms aim to accelerate housing approvals, reduce litigation risks and CEQA misuse, lower development costs, and support climate and equity goals statewide. The laws took effect immediately, introducing streamlined processes and new exemptions to facilitate development and infrastructure projects while maintaining environmental safeguards.

The new legislation has a number of new streamlining provisions including:

- Exempts qualifying urban infill housing projects up to 20 acres from CEQA review. Eligible projects are subject to criteria such as location, density, and environmental exclusions. (AB 130)
- Provides a “Near-Miss” CEQA streamlining process for projects narrowly missing one criterion under another CEQA exemption and exempts rezoning aligned with certified Housing Elements. (SB 131)
- Introduces 9 new exemptions covering diverse project types including farmworker housing, wildfire reduction, and broadband infrastructure. (SB 131)
- Require timely tribal consultations and impose strict timelines for project approvals and exclude internal drafts and working documents from CEQA administrative records to reduce litigation risk.
- Additional Benefits for Housing Accountability Act (HAA) & Coastal Projects: Reduces appeals and enhances applicant benefits.

AB 130 also creates a statewide mitigation bank administered through use of the Transit-Oriented Development Implementation Fund. Under the state's recently released program guidance, the mitigation bank is intended to be an optional tool, not a replacement for local or regional VMT mitigation programs. Lead agencies will continue to determine whether a project has a significant transportation impact, the amount of mitigation required, and whether to use the state program, a local or regional program, or other mitigation measures. HCD will administer the program by receiving mitigation contributions and investing them through the Transit-Oriented Development program in affordable

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housing and related infrastructure projects, while LCI has developed parallel guidance on pricing, accounting, location-efficient areas, VMT reduction calculations, and contribution verification which will be updated every three years. HCD's investment of mitigation funds will follow statutory geographic priorities, starting with affordable housing or related infrastructure in location-efficient areas within the same MPO or RTPA region as the impacting project, then other eligible projects in the same region, and then location-efficient projects in adjacent regions within a proximity radius established by LCI. Eligible mitigating projects will generally need to meet TOD program requirements, including location-efficiency or related VMT criteria, affordable housing and infrastructure eligibility standards, readiness requirements, and additionality review.

These statewide efforts do not eliminate the need for regional mitigation approaches. Instead, the state program provides an additional pathway for CEQA transportation mitigation, while regional programs can continue to offer more tailored strategies that reflect local development patterns, transit conditions, infrastructure needs, and VMT-reduction opportunities.

CEQA Documentation for a VMT Program

There has been ongoing uncertainty in the industry about whether environmental clearance is required for VMT mitigation programs, given that both the applicant's project and the associated VMT reducing projects must comply with CEQA. This raises the question of whether the VMT mitigation program itself also requires CEQA review.

CEQA Guidelines Section 15002 states: "CEQA applies in situations where a government agency can use its judgment in deciding whether and how to carry out or approve a project." A project subject to such judgmental controls is a "discretionary project". For a fee program, an agency could use its judgment in deciding whether and how to carry out or approve the program, and therefore the fee program would be a discretionary action.

However, VMT mitigation programs are consistent with state law in that they allow regions to implement SB 743, and many have argued that the programs are not a "project" as defined in Section 15378 of the CEQA Guidelines and Public Resources Code Section 21065. This argument is made based on the understanding that the policies and procedures within the program do not constitute a direct or reasonably foreseeable change to the environment. SB 743 itself is effectively administrative in nature and provides guidance to agencies and project applicants for determining a project's impact significance. In addition, a VMT mitigation program contains individual projects that would need to be analyzed under CEQA prior to implementation and therefore the program itself does not constitute a change to the environment.

Additionally, CEQA Guidelines Section 15378(b)(4) provides that: "A project does not include . . . the creation of government funding mechanisms or other government fiscal activities which do not involve any commitment to any specific project which may result in a potentially significant physical impact on the environment." However, CEQA Guidelines Section 15273(b) notes that fees or rate increases to fund capital projects that provide for "expansion of a system" are subject to CEQA. Therefore, the objectives and details of a VMT mitigation program will determine whether the project would be subject to CEQA or could be exempt. For example, if specific improvements are identified, do these improvements result in the expansion of the transportation system that have been previously identified as mitigation measures

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in prior CEQA documents? These transportation system expansion projects have already undergone CEQA review, and no further environmental analysis is required unless (pursuant to CEQA Guidelines Section 15162) there are changes in the description of these planned transportation system projects, changes in circumstances, or new information which indicates that there are new or substantially more severe environmental impacts that could occur upon their implementation.

Unless cleared through prior CEQA documentation, specific improvements would be subject to environmental review at such time as approvals for those projects are considered. Individual VMT reducing projects may or may not be found to be individually exempt from CEQA on the basis of their unique characteristics. That decision can only be made at a later date, when the investment in a specific project is identified.

Feasible Mitigation

Under CEQA, mitigation refers to measures that can be implemented to reduce or eliminate the significant environmental impacts of a project. Key aspects of mitigation under CEQA to be considered during the program's implementation include:

1. Avoid the impact altogether by not taking a certain action or parts of an action.
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectify the impact by repairing, rehabilitating, or restoring the impacted environment.
4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.
5. Compensate for the impact by replacing or providing substitute resources or environments.

CEQA Guidelines Section 21061.1, further clarifies that feasible mitigation measures must be capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.

In *Preserve Wild Santee v. City of Santee*, 210 Cal. App.4th 260, 281 (2012), the court found that "an EIR may not defer the formulation of mitigation measures to a future time, but mitigation measures may specify performance standards which would mitigate the project's significant effects and may be accomplished in more than one specified way." Where it is infeasible for the agency to formulate mitigations in advance, the agency can commit to devising measures that will satisfy specific performance criteria which should be articulated at the time of project approval. VMT mitigation programs are devised to achieve a specific performance criterion – a reduction of VMT to below the lead agency's threshold. Therefore, these programs typically advance the feasibility of mitigation from the perspective of formulating mitigation measures for project development.

Preserve Wild Santee v. City of Santee and other court cases highlight the importance of having a VMT mitigation program established that references specific performance measures and which demonstrates the lead agency's commitment to carrying out the mitigations identified even if the mitigations will not reduce the impact to a less-than-significant level. A VMT mitigation program may meet the requirements of reasonable mitigation if the following conditions are met:

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- **Performance measures:** the VMT mitigation program should identify and substantiate a specific amount of VMT to be reduced over the life of the General Plan to mitigate the potential impacts. VMT reductions can be achieved in more than one specified way, such as from a menu of VMT reducing projects.
- **Commitment:** the lead agency should have an adopted VMT mitigation program in place and require participation in the VMT mitigation program, assuming other mitigation strategies such as on-site mitigation have been explored and are insufficient. A project or a plan that has not yet been adopted is not a commitment to implementation.
- **Authority:** the lead agency must have the authority and ability to implement the mitigation measure included in a VMT mitigation program. This points to a need for a contractual agreement between agencies be in place, such as the formation of a joint powers authority (JPA), which allows a municipality to work with other public agencies to implement improvements that may not be fully within the purview of the lead agency such as transit improvements or multi-jurisdictional projects.

Financial Feasibility

Under CEQA, mitigation is required where it is feasible, meaning it can be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors. In practice, this standard requires lead agencies to balance the obligation to reduce significant environmental impacts with the practical and financial realities of project implementation. Over time, case law has clarified that feasible mitigation must be enforceable, effective, and roughly proportional to a project's impacts. This means that the lead agency must have a clear mechanism and authority to implement and monitor mitigation, the mitigation must demonstrably reduce the identified impact rather than rely on uncertain future actions, and the cost of mitigation must bear a reasonable relationship to the environmental benefit achieved.

These principles are particularly important in the context of VMT, where mitigation often involves off-site investments, such as transit improvements, active transportation infrastructure, or transportation demand management strategies, which can be costly and require coordination across multiple agencies. Unlike traditional on-site mitigation, VMT reduction strategies frequently depend on regional systems and programs, making questions of enforceability, effectiveness, and cost more complex.

CEQA does not require that all impacts be fully mitigated at any cost. Instead, courts have consistently applied a "reasonableness" standard rather than a strict affordability test. The key question is not whether a project applicant can theoretically afford mitigation, but whether the marginal cost of mitigation is justified by the environmental benefit achieved. Courts have affirmed that agencies may reject mitigation as infeasible where costs are disproportionate to the benefit, provided that this conclusion is supported by substantial, project-specific evidence. This evidence does not need to include detailed profit-and-loss analysis; comparative cost and revenue information, operational constraints, and project-specific financial considerations may be sufficient. Courts have also recognized that mitigation may be infeasible where it is technically possible but ineffective, inefficient, or impractical in achieving meaningful environmental outcomes. At the same time, agencies are required to consider existing funding mechanisms and implementation pathways before concluding that mitigation is infeasible, reinforcing the importance of evaluating available tools and programs as part of the CEQA analysis.



In the context of fee-based VMT mitigation programs, economic feasibility plays a central role in determining both the structure of the program and its legal defensibility. Because VMT mitigation measures can have high costs, programs must be designed to ensure that mitigation obligations remain proportional to a project's contribution to VMT and are supported by a clear nexus between the impact and the mitigation funded. This requires establishing a defensible cost framework, identifying mitigation strategies that provide meaningful VMT reduction relative to their cost, and demonstrating that funded improvements will result in measurable impact reduction. At the same time, the existence of a regional mitigation program compels an applicant to consider the program as an option by providing a mechanism to pool resources across multiple projects, fund larger and more effective improvements, and reduce the burden on individual project applicants.

For regions such as the Coachella Valley, where dispersed land use patterns, limited transit infrastructure, and a high reliance on automobile travel can increase the cost of mitigation, these considerations are especially important. A well-structured regional VMT mitigation program can help address these challenges by improving cost efficiency, aligning mitigation with regional priorities, and providing a consistent and implementable pathway for CEQA compliance. Ultimately, the legal durability of such a program will depend less on its specific structure and more on its ability to demonstrate that mitigation is enforceable, effective, and reasonably proportional to the impacts it is intended to address.¹

Deferred Mitigation

Mitigation measures are typically applied either prior to ground disturbance, during ground disturbance/construction, prior to occupancy, or during operation (after occupancy). While standard transportation demand management measures occur prior to occupancy or at occupancy, off site mitigation measures, such as those included in VMT mitigation programs, are likely to occur after occupancy.

CEQA generally prohibits agencies from deferring mitigation measures until after project approval, but allows agencies to do so in limited circumstances where pre-approval formulation of specific measures "is impractical or infeasible" and "the agency (1) commits itself to the mitigation, (2) adopts specific performance standards the mitigation will achieve, and (3) identifies the type(s) of potential action(s) that can feasibly achieve that performance standard and that will be considered, analyzed, and potentially incorporated in the mitigation measure."^{viii} If the mitigation is subject to discretion and is "not guaranteed to occur at any particular time or in any particular manner," or is dependent on a plan that has not been formulated,^{ix} or there are no performance measures committed to,^x then it may be considered to be improperly deferred.

As shown above, while an agency can defer mitigation until after occupation of a project with an identified significant impact, an agency has, "a responsibility to ensure that the final mitigation is effective and is actually implemented." So, while no clear timing deadline is provided, once project applicants begin participating in a VMT mitigation program, the administrator of the program has a legal commitment to constructing or implementing the projects included in the VMT mitigation program.

¹ More detailed information on economic feasibility is provided as Appendix A.



Relevant Court Decisions

SB 743 has completely changed how jurisdictions analyze transportation impacts under CEQA. In 2018, the OPR, now the LCI, released technical recommendations regarding SB 743, which were helpful in evaluating transportation impacts for certain types of projects, such as housing, office and retail development. However, the guidelines do not comprehensively cover every land use scenario and there are still legal and practical scenarios falling through the cracks as shown in the court cases described below. Additional court cases are described in Appendix D: Economic Feasibility of Mitigation.

Golden Door Properties, LLC vs County of San Diego^{xi}

The California Appellate Court rejected San Diego County's plan to mitigate greenhouse gas (GHG) impacts with off-site offsets. The appellate court held that a mitigation measure in the Supplemental Environmental Impact Report (SEIR) that permitted the purchase of carbon offsets from projects outside of the County, including international projects, violated CEQA because the mitigation measure did not require that the offsets meet AB 32 requirements that greenhouse gas emission reductions be additional and that the offsets originating outside California have greenhouse emissions programs equivalent to, or stricter than, California's program. The court petition states that revised CAP (Cap-and-Trade Program) and General Plan Amendment (GPA) Procedures lack standards sufficient to ensure that offsets are real, enforceable, additional, and otherwise consistent with CEQA's mitigation requirements. It also states that these procedures fail to ensure that offset purchases will mitigate GHG emissions because they defer any judgment regarding the adequacy of a particular offset purchase until the issuance of a building permit.

The Two Hundred vs Governor's Office of Planning and Research

In 2019, the Governor's Office of Planning and Research, California Natural Resources Agency, and Office of Law were challenged by the Two Hundred, an unincorporated association of civic leaders and additional individuals. The petitioners argued that the adoption of VMT as the standard for determining transportation impacts under CEQA would increase housing costs and limit homeownership opportunities, particularly for communities of color in suburban areas. They claimed the shift violated CEQA and was racially discriminatory. It is unclear what the status of the case is, however, the results could have substantial implications for VMT mitigation programs.

Sheetz v. El Dorado County

In April 2024, the US Supreme Court issued a unanimous decision in the *Sheetz v. El Dorado County* case which determined that governments that impose impact fees will now be subjected to a standard requiring them to demonstrate the relationship and relative impact of the development on the community. The case stemmed from El Dorado County resident George Sheetz who wanted to build a small, prefabricated home on his residential parcel. To obtain a permit, he had to pay a substantial fee to mitigate local traffic congestion based on the County's Traffic Impact Fee (TIF) program. Relying on *Nollan v. California Coastal Comm'n*, 483 U. S. 825 (1987), and *Dolan v. City of Tigard*, 512 U. S. 374 (1994), Sheetz challenged the fee as an unlawful "exaction" of money under the Takings Clause. The California Court of Appeal rejected that argument because the impact fee was imposed by legislation, and, according to the Court, *Nollan* and *Dolan* apply only to permit conditions imposed on an ad hoc



basis by administrators. The US Supreme Court overturned that decision and stated that takings apply regardless of the method and that the Nollan and Dolan cases, which established the tests for a taking, applied here. The case was remanded back to the California Supreme Court for further consideration.

Upon remand the appellate court analyzed the case under the Nollan- Dolan tests and found that the impact fees met the test of essential nexus and rough proportionality through the documentation found in the County's technical reports and nexus study supporting the fee program. The Court of Appeal's opinion also established a burden-shifting regime, stating that while the County has the initial burden of demonstrating the required degree of rough proportionality between the challenged land-use exaction and the fee, if the County satisfies this initial burden, the burden then shifts to the property owner to demonstrate that the fee is invalid.

Cleveland National Forest Foundation et al. v. County of San Diego

In this case the plaintiffs contested the County of San Diego's VMT screening criteria. The Court of Appeals agreed with the plaintiffs on two issues. The first was regarding the County's definition of infill development. The Court found that the County had not demonstrated that their definition of infill provided substantial evidence as the methods for defining the infill locations did not tie directly back to VMT. Additionally, some of the locations identified as infill locations specifically showed VMT that was greater than the County's adopted thresholds. The Court also found that the definition and use of "small projects" for VMT impact screening was not sufficient as the County did not provide substantial evidence tying the screening metric of 110 daily trips back to local conditions and VMT thresholds.

Olen v City of Newport Beach

The City of Newport Beach prepared an addendum to its existing General Plan EIR, adopted in 2006, to approve a mixed-use development in an area covered by the original EIR analysis. The City determined that the project's impacts would either be the same or not substantially greater than those that were covered by the 2006 General Plan EIR. In this case, the plaintiffs argued that the City should have used VMT instead of LOS to measure the transportation impacts of a land use development project. The Court ruled that the change in CEQA Guidelines, which occurred after the adoption of the environmental documentation for the City's General Plan EIR, did not constitute new information. In other words, the analysis conducted for the specific development was consistent with the former General Plan EIR findings and was sufficient. This case demonstrates that specific projects that are tiering off of older EIRs that used LOS can still be approved under the LOS standards that were in place at the time of adoption of that EIR.

Together, these legal and policy considerations define the parameters within which VMT mitigation programs can be developed and implemented. Building on this framework, the following chapter evaluates how these concepts translate to the Coachella Valley context, including the region's specific VMT reduction opportunities, constraints, and implementation considerations.

ⁱ Eric Sundquist, Caltrans, "VMT Program Bulletin 21- 01: VMT Mitigation Funding Status and Additionality," August 26, 2021.

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ⁱⁱ Berkeley Law – Center for Law, Energy & The Environment, *Implementing SB 743: Design Considerations for Vehicle Miles Traveled Mitigation Bank and Exchange Programs*, August 2022.

ⁱⁱⁱ Elkind, N.E., Lamm, T., Prather, E., *Implementing SB 743 An Analysis of Vehicles Miles Traveled Banking and Exchange Frameworks*, October 2018, U.C. Berkeley.

^{iv} *Ibid.*

^v Elkind, N.E., Lamm, T., Prather, E., *Implementing SB 743 An Analysis of Vehicles Miles Traveled Banking and Exchange Frameworks*, October 2018, U.C. Berkeley.

^{vi} California Legislative Information, AB 602 Development Fees: Impact fee nexus study, https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB602, accessed on April 11th, 2022

^{vii} Cal. Fish & Game Code § 1852

^{viii} *Preserve Wild Santee v. City of Santee*, 210 Cal. App.4th 260, 281 (2012)

^{ix} *Communities for a Better Environment v. City of Richmond*, 184 Cal.App.4th 70, 92 (2010).

^x *San Joaquin Raptor Rescue Center v. County of Merced*, 147 Cal.App.4th 645, 670 (2007).

^{xi} Court of Appeal, Fourth Appellate District, <https://law.justia.com/cases/california/court-of-appeal/2020/d075328.html>, accessed on October 3rd, 2022

Appendix G: Economic Feasibility of CEQA Mitigation



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Executive Summary

This report examines the legal standards that govern mitigation under the California Environmental Quality Act (CEQA), focusing on how feasibility and economic constraints shape mitigation outcomes for vehicle miles traveled (VMT). CEQA's substantive mandate requires agencies to avoid or reduce significant environmental impacts where feasible mitigation or alternatives exist, and courts have consistently required that feasibility determinations be grounded in substantial evidence in the administrative record. With the shift to VMT as the new metric for determining transportation impacts, many lead agencies have found the costs of mitigation significantly increased and often the lead agency cannot afford to implement solutions that would fully mitigate their project. In the context of the Coachella Valley, which is still a developing region with dispersed land use patterns, limited transit, and significant reliance on the automobile, full mitigation presents an economic challenge as the costs for full mitigation of projects are significant. This has raised the question: when does mitigation become so costly as to become infeasible? The report analyzes the nexus between feasibility and economic factors as well as provides the framework for case law that clarify and inform what constitutes feasible mitigation.

Building from the Laurel Heights (1988) court case and informed by subsequent case law, this report summarizes feasible mitigation through the lens of economic feasibility and through three core criteria.

1. Enforceable and implementable: the lead agency has authority and a realistic mechanism to implement, fund, and monitor mitigation results, including for off-site impacts.
2. Effective and non-speculative: defined actions and performance standards show the mitigation will actually reduce impacts, rather than depending on uncertain future measures.
3. Proportional and reasonable: a clear nexus to the project's impacts, without costs or obligations grossly disproportionate to the benefit.

The governing test is reasonableness, not affordability: agencies may reject mitigation as economically infeasible where supported by contextual, project-specific evidence showing the marginal costs are disproportionate to the environmental benefit. Courts have accepted comparative financial evidence and have also required agencies to consider existing funding mechanisms before concluding infeasibility. Cases such as City of Marina (2006), San Joaquin Raptor Rescue Center (2007), and Cleveland National Forest Foundation (2025) illustrate these requirements and also reinforce that agencies cannot rely on conclusory claims, deferred mitigation without standards, or generalized assumptions in place of localized evidence. Based on this framework, the report identifies best practices for documenting enforceability, effectiveness, proportionality, and economic infeasibility. While the scope of the Regional VMT Study is to examine the feasibility and potential structure of a regional approach to VMT mitigation, the cases and resulting findings also apply to site level mitigation and are therefore also relevant to local agencies mitigating parcel level development.

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Introduction

In California, the California Environmental Quality Act (CEQA) is the chief environmental law that protects the environment from development impacts by allowing public agencies to fully evaluate a project's environmental impacts prior to approving the project. In plain terms, CEQA is California's "look before you leap" law for development and public decisions.

CEQA was signed into law in 1970 by the then-governor of California, Ronald Reagan. The vision for this law was simple: "maintenance of a quality environment for the people of this state now and in the future." CEQA was part of a major environmental movement that also established the U.S. Environmental Protection Agency (U.S. EPA) and federal environmental law, the National Environmental Policy Act (NEPA). CEQA requires local jurisdictions to work with project proponents to evaluate the impacts a project has on the environment, explore alternatives to the project, and implement mitigation measures to offset those impacts. There are several different types of environmental documents that can be prepared pursuant CEQA; however, the most comprehensive type of environmental document is the Environmental Impact Report (EIR). The EIR has been described as "an environmental 'alarm bell'" whose purpose is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return. (*County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.) CEQA encourages on-going public participation in the review of the project, and for instances where certain environmental impacts cannot be overcome, lead agencies must provide justification as to why the project must move forward despite the significant environmental impacts that would occur.

Appendix G of the CEQA Guidelines provides thresholds to determine whether a project would have a significant impact on the physical environment. For transportation projects, the thresholds for analysis ask whether the project would:

- Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?
- Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
- Result in inadequate emergency access?

These thresholds assist decision-makers in determining whether there is a significant impact that can be feasibly mitigated, or if no mitigation would address the impact, whether the lead agency can state overriding considerations that justify the significant impact.

Central to CEQA is the "substantive mandate," which requires public agencies to refrain from approving projects with significant environmental impacts where feasible, effective, and enforceable mitigation or alternatives exist. CEQA Guidelines Section 15364 defines feasible as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." Over the last 50 years, case law has shaped and refined our understanding of mitigation and how it is applied in practice.

In the Coachella Valley, the substantive mandate for mitigation is not an abstract legality. It directly shapes how projects are planned and delivered in a region which is still growing and has a heavy

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reliance on automobile travel. As jurisdictions evaluate projects under CEQA's requirements for transportation impacts, which has shifted from operational metrics to performance-based metrics, specifically vehicle miles traveled, the tension between achieving meaningful environmental reductions and maintaining economic viability becomes especially pronounced. Limited transit options, dispersed land use patterns, and the high cost of effective VMT mitigation strategies mean that agencies must carefully document and justify when mitigation measures are feasible and when they are not. Understanding this balance is critical for local decision-makers, practitioners, and stakeholders, as it informs not only project approvals but also broader regional strategies for sustainable growth, mobility, and environmental stewardship in the Coachella Valley.

This report provides a comprehensive overview of the legal and practical framework governing mitigation under CEQA, with a particular focus on how economic feasibility shapes decision-making. It synthesizes key case law to define what constitutes feasible mitigation, organized around the core principles of enforceability, effectiveness, and proportionality, and explains how courts evaluate these criteria through the lens of substantial evidence. The report also examines the evolving role of economic considerations, including how agencies can justify findings of infeasibility using project-specific financial data and existing funding constraints. In addition, it outlines best practices for documenting and defending mitigation decisions in environmental documents and highlights implications for transportation-related impacts, including VMT and fee-based mitigation programs, providing practitioners with a clear, legally grounded approach to navigating complex CEQA requirements.



Legal Standards Governing CEQA Mitigation Measures

One of the most influential California Supreme Court cases to set precedent and guidance for interpreting CEQA mitigation is *Laurel Heights Improvement Assn. v. Regents of UC* (1988). In this case, the University of California, San Francisco (UCSF) proposed to relocate biomedical research facilities into the Laurel Heights residential neighborhood. Neighborhood groups in this area argued that the EIR prepared and certified for this project evaluated the initial relocation but did not evaluate future expansion of the facilities or provide meaningful evaluation of project alternatives. At the conclusion of this case, the California Supreme Court largely agreed with the neighborhood groups.

In its decision, the Court concluded that agencies cannot “segment” a project to avoid analyzing its full environmental footprint, ultimately concluding that future expansion was reasonably foreseeable. It also clarifies that while CEQA does not require agencies to adopt alternatives, it does require a meaningful analysis of feasible alternatives, considering economic, environmental, legal, social, and technological factors. These five factors now guide our current understanding of feasibility. And finally, although the Court invalidated parts of the EIR, it upheld that the mitigation measures were adequate and were supported by substantial evidence in the administrative record. This ruling helped solidify the modern CEQA standard for mitigation: it must be feasible, enforceable, and effective.

Since *Laurel Heights*, additional criteria established through case law have been added to the legal standard for mitigation. Appendix A provides a summary of this case law. Today, our understanding of feasible mitigation can be summarized into the following criteria:

- **Enforceable and Implementable:** Does the lead agency have the legal authority to require and enforce the mitigation measure? Can the measure realistically be implemented, funded, and monitored, including where it involves off-site or third-party action? Is there substantial evidence demonstrating that any claimed jurisdictional or funding limitation is real and not merely conclusory?
- **Effective and Non-Speculative:** Will the mitigation measure actually reduce the identified environmental impact in a measurable and meaningful way? Are there defined performance standards, clear implementation mechanisms, and supporting evidence in the administrative record? Or does the mitigation depend on uncertain future studies, discretionary approvals, unidentified programs, or speculative third-party actions?
- **Proportional and Reasonable:** Is there a clear nexus between the project’s specific impact and the proposed mitigation? Is the mitigation roughly proportional to the severity and nature of the impact, without imposing obligations that are grossly disproportionate or unrelated to the project’s effects? Does the measure address a defined environmental impact rather than advance a generalized policy objective?

Enforceable and Implementable

In this context, feasibility is not just limited to whether it can physically be implemented. Enforceability in this context is about whether the agency leading the project has the legal authority to require the potential mitigation to be implemented. For example, it may be possible to mitigate a queuing traffic impact from a project by re-timing the traffic signals in an adjacent jurisdiction. However, because the project is not located in that jurisdiction, the lead agency for the project does not have the authority to

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enforce re-timing signals and thus cannot implement the mitigation. Therefore, the measure is not feasible.

City of Marina v. Board of Trustees of CSU (2006) is the foundational case that determined that an agency may reject mitigation as infeasible where it lacks legal authority to implement or fund required measures. In this case, California State University (CSU) certified an EIR for a master plan that would expand CSU Monterey Bay at the former Fort Ord military base. The EIR includes mitigation for impacts on campus but did not include mitigation for off-site infrastructure improvements because CSU concluded that it cannot fund improvements controlled by other agencies, such as roads or public services. The EIR was challenged by local agencies, primarily the City of Marina and the Fort Ord Reuse Authority. While the California Supreme Court ultimately decided that CSU abused its discretion under CEQA by certifying the EIR without adopting or adequately addressing feasible mitigation measures for significant off-site impacts, the case clarified how legal authority limits feasibility. CEQA does not require mitigation beyond an agency's jurisdiction. However, agencies are required to mitigate a project's impact to off-site areas and cannot avoid mitigation simply by asserting that another agency has jurisdiction over the impacted facilities without supporting the claim with substantial evidence. The Court emphasized that enforceability constraints must be real, documented, and evaluated, not assumed or conclusory.

The *City of Marina* case is directly relevant to any regional VMT fee program administered by a regional agency such as CVAG. It establishes that the absence of direct authority over off-site facilities does not eliminate the responsibility to mitigate impacts to those facilities. Because VMT is a measure of travel distance, the impacts associated with increased VMT are not confined to the project site; rather, they are inherently regional in nature, supporting the use of broadly applied off-site mitigation strategies like a regional VMT mitigation fee.

Additionally, the case clarifies that enforceability must be clearly documented. When a lead agency requires a project proponent to contribute to a regional fee program, the enforceability of that mitigation depends on a documented, legally binding mechanism, such as a nexus study, joint powers agreement, or environmental documentation that demonstrates committed funding and defined implementation responsibilities. It is not sufficient to assert that a regional agency "will" implement VMT reduction measures; the administrative record must demonstrate how the measures will be carried out, by whom, and under what legal authority they will be implemented and monitored. In the Coachella Valley, where many VMT mitigation strategies, such as active transportation investments and transit subsidies, are often delivered by agencies other than the lead agency, including SunLine Transit, CVAG, or individual jurisdictions, this jurisdictional clarity is essential to establishing a defensible program structure.

Effective and Non-Speculative

Mitigation must be effective, meaning that the mitigation must actually reduce the identified environmental impact in a meaningful way. If the mitigation relies on uncertain future actions, unidentified programs, or hypothetical funding, then the mitigation is not feasible because it relies on speculative future states. Agencies should ground the analysis in defined actions and measurable outcomes that are documented in the administrative record.

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This requirement is best demonstrated by *San Joaquin Raptor Rescue Center v. County of Merced* (2007). In this case, the County of Merced certified an EIR that allowed for the expansion of an aggregate mining operation which would increase the mine's overall footprint and operational life as well as generate impacts to air quality, water resources, biological resources, traffic, and noise. Environmental groups challenged the EIR on the basis that the project relied on mitigation that was uncertain and deferred, among other issues. The Court of the Appeals determined that the EIR did, in fact, fail to comply with CEQA on this basis. The Court reasoned that CEQA does not allow agencies to approve projects based on mitigation that may or may not occur or that depends on future studies, negotiations, or discretionary approvals. While CEQA allows some deferral of details, the EIR must include specific performance criteria and demonstrate that the mitigation will actually reduce impacts. Additionally, the Court also emphasized the importance of substantial evidence. In *San Joaquin Raptor Rescue Center v. County of Merced*, the County lacked evidence showing that proposed measures would effectively mitigate impacts, particularly because certain proposed mitigations relied on future actions by third parties or undefined programs. CEQA requires that mitigation measures be effective and supported by evidence, not speculative or illusory. Agencies may not rely on mitigation that is speculative, unproven, or lacks evidence showing it would meaningfully reduce the environmental impact.

San Joaquin Raptor directly informs how VMT mitigation measures must be written and documented in a CEQA document. The most common issue in VMT mitigation is improper deferral: a mitigation measure that directs the project proponent to "coordinate with CVAG" or "participate in a future fee program when established" does not satisfy CEQA's requirements. Legally defensible mitigation must identify the specific VMT reduction measures to be funded and quantify the expected reductions using an accepted methodology. CVAG's regional TDM toolbox and off-model quantification tools are designed to allow lead agencies to identify specific mitigation measures and quantify anticipated VMT reductions from active transportation and transit investments using an accepted methodology. If CVAG were to implement a regional fee-based mitigation program, the statutorily-required nexus, inclusive of quantified VMT reductions and cost framework, would meet these requirements for lead agencies participating in the program. Similarly, for parcel-level development projects, the TREDLite tool allows lead agencies to quantify project-level VMT reductions and document mitigation with the level of specificity required under CEQA.

Proportional and Reasonable

Mitigation must also be roughly proportional and reasonable, meaning that the proposed mitigation must bear a fair relationship to the project's impacts and not exceed what is necessary to address the potential impacts. Under CEQA, there must be a nexus between a project and its mitigation. In this context, feasibility also extends to whether the mitigation is designed to address a specific, identified environmental impact created by the project. Even where mitigation would reduce a potentially significant impact, CEQA does not require that an agency adopt measures that impose costs grossly disproportionate to the impact reduction or undermine the project's basic objectives. Reasonableness ensures mitigation remains practicable and defensible, rather than theoretical or aspirational.

In a recent case, *Cleveland National Forest Foundation v. County of San Diego* (2025), the Fourth District Court of Appeal invalidated two Vehicle Miles Traveled (VMT) thresholds of significance adopted by the County of San Diego in its Transportation Study Guide (TSG). These thresholds would have

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allowed certain projects to bypass VMT analysis entirely under CEQA for specific infill projects and small projects that would generate 110 or fewer daily vehicle trips. These thresholds were challenged on the basis that the County of San Diego lacked substantial evidence that these screening criteria would actually result in less-than-significant transportation impacts because the County of San Diego relied on general policy assumptions and statewide guidance, rather than localized, empirical evidence demonstrating VMT insignificance under County of San Diego–specific conditions. The Court of Appeals agreed that the County had violated CEQA. As part of their decision, the Court further affirmed the importance of the nexus of the impact and its mitigation. Mitigation and thresholds cannot be rejected, avoided, or presumed unnecessary based on cost, policy alignment, or generalized assumptions without substantial, localized evidence.

Cleveland National Forest Foundation is the most directly applicable case for VMT threshold adoption in the Coachella Valley. The Court's invalidation of San Diego County's VMT screening thresholds (because they relied on generalized statewide guidance rather than localized evidence) establishes a clear standard: jurisdictions adopting VMT thresholds, screening criteria, or presumptions of less-than-significant impact must support those determinations with data specific to their geography. For CVAG member jurisdictions, the updated RIVCOM 4.0.1 model and the 2023 base year analysis provide the empirical foundation needed to establish defensible local thresholds. When adopting screening metrics, infill development and small project criteria should be clearly tied to applicable CEQA Guidelines exemptions and presumptions, including Sections 15301, 15303, and 15332.



Case Laws Addressing Economic Feasibility

Economic feasibility is one the core considerations of whether CEQA mitigation is feasible. While case law on economic feasibility under CEQA is somewhat limited, four primary cases build the foundation and are further discussed below.

Flanders Foundation v. City of Carmel-by-the-Sea (2012)

In *Flanders Foundation*, the case centered around the City of Carmel-by-the-Sea's proposal to sell the historic Flanders Mansion to avoid the high cost of on-going maintenance and restoration. The Flanders Mansion was listed on the National Register of Historic Places (NRHP) and surrounded by an Environmentally Sensitive Habitat Area (ESHA). An EIR was prepared to analyze and mitigate potential impacts for the sale as any modification, demolition, or sale of historical property by a government agency owner must go through environmental review. In the EIR, the City analyzed four project alternatives, including (1) a no project alternative, where no action would be taken; (2) a residential lease alternative and (3) a public lease alternative, both of which would allow the City to retain ownership of the Flanders Mansion and the flexibility to determine its use; and (4) a sale of the property, with a conservation easement and additional mitigation (referred to as "sale plus"). The EIR found that the lease alternatives would be the environmentally superior alternatives; however, if they were found to be infeasible, the sale plus alternative would be an environmentally superior alternative. Separately, the City also prepared an economic feasibility analysis that ultimately determined that both lease alternatives and the no project alternative were economically infeasible. As such, the City approved the sale plus alternative when it certified the EIR and adopted a statement of overriding considerations.

The EIR for this project was challenged on the basis of two primary concerns. First, the Flanders Foundation argued that the City did not adequately consider environmental impacts related to the Surplus Land Act (SLA), and second, they argued that the City did not adequately respond to public comments that suggested reasonable alternatives to the project, such as selling a smaller parcel of the property. While the Court affirmed, in part, the City's actions in relation to the SLA, it rejected actions related to its response to comments. Regarding the SLA, while this law requires the City to offer the property to other public agencies before selling it to the general public, it does not require the EIR to evaluate all possible purchasers, arguing that it would not be "reasonably foreseeable." Because the sale plus alternative includes the conservation easement and mitigation that would apply to any purchaser of the project, whether a public agency or the general public, the City was not required to evaluate every potential purchaser individually.

The Court also made an important distinction on what economic information needs to be included in the EIR by concluding that an economic feasibility analysis, such as the one created for this project, does not need to be explicitly included in the EIR itself, so long as it is included in the administrative record. And finally, this case established the "economic feasibility test" for alternatives, which is also applicable to mitigation, establishing that it "is not whether [the project proponent] can afford the proposed alternative, but whether the marginal costs of the alternative as compared to the cost of the proposed project are so great that a *reasonably prudent property owner* would not proceed with the [alternative]." (Quoting *Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 600.)

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As the first case that specifically addresses economic feasibility, it sets the foundation for tying it specifically the idea of “reasonableness.” It also establishes that while economic information on feasibility needs to be included in the record, it does not need to be disclosed in the EIR to be compliant with CEQA.

Flanders Foundation establishes the reasonableness standard for economic infeasibility, which is directly applicable when a project proponent argues that required VMT mitigation is too costly. The governing question is not whether the project proponent can afford the mitigation, but whether the marginal cost of the mitigation is disproportionate to the VMT reduction achieved, as judged from the perspective of a reasonably prudent project proponent. For land use projects, this standard applies when mitigation costs exceed the revenue that could reasonably be generated by the project, such that the project would no longer be financially viable and a developer would not proceed. For transportation projects, it applies when mitigation costs substantially increase overall project costs, such that other planned capital improvements may be delayed, reduced in scope, or eliminated due to funding constraints. It may also apply when mitigation obligations create practical implementation challenges that materially hinder the lead agency’s ability to advance the project, such as right-of-way acquisition, utility relocation, or long-term operational funding commitments.

This case also has important implications for the cost basis of a fee-based VMT mitigation program. Establishing a reasonable fee structure is critical in determining whether a project proponent can credibly claim that required VMT mitigation fees are economically infeasible. Again, the key question is not whether the developer can afford the fee, but whether the cost is disproportionate to the VMT reduction achieved. If a regional program includes mitigation measures that are excessively costly or lack supplemental funding sources, the overall fee level may become high enough to discourage participation, undermining both the feasibility and effectiveness of the program.

SPRAWLDEF v. San Francisco Bay Conservation & Development Commission (2014)

Just a couple years after *Flanders Foundation*, another landmark case addressed economic feasibility and further refined its interpretation. In *Sustainability, Parks, Recycling and Wildlife Legal Defense Fund (SPRAWLDEF) v. San Francisco Bay Conservation and Development Commission (BCDC)*, the applicant, Waste Connections, applied to expand the approximately 320-acre Potrero Hills Landfill to add approximately 260 acres and add 35 years to its operational life. Because this landfill is located within the Suisun Marsh, the County of Solano prohibited its modification unless there were no other reasonable alternatives available. Waste Connections provided economic information to the BCDC indicating that an alternative in which the expansion was reduced (adding only 127 acres) was “economically unrealistic.” Waste Connections was able to demonstrate that this 30% reduction in the landfill would reduce revenue by 45% while at the same time only reducing the cost of the project by 10%. Therefore, Waste Connections reasoned that the significant decrease in gross revenue would make the project not financially viable. The project was approved without the reduced-size alternative given the economic infeasibility of the alternative. Litigation of this case came down to whether there was substantial evidence proving that the reduced-size alternative was not economically feasible.

Ultimately, the Court determined that the reduced-size alternative was, in fact, not economically feasible. In doing so, it made a very important finding: explicit net profit and loss data is not required to determine

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whether an alternative is economically viable. It concluded that the economic evidence provided by Waste Connection demonstrated the cost, capacity, and anticipated revenue comparison between the project and alternative and provided enough context for the decision-making body to make an informed decision.

This case directly relates to the concept of proportionality. While the case focuses on alternatives, the same concept can be applied to mitigation. The Court upheld that rejecting alternatives or mitigation based on economic feasibility is not limited to whether the project proponent can afford the alternative or mitigation, but can also consider whether the cost is justified based on the impact reduction from the alternative or mitigation.

SPRAWLDEF is one of the most useful precedents for structuring economic infeasibility arguments where the cost of VMT mitigation would substantially affect a project's budget, particularly in addressing disproportionate costs. The Court upheld a finding of economic infeasibility based on capacity and revenue comparisons without requiring explicit net profit and loss data, establishing a lower evidentiary threshold than practitioners often assume.

For VMT mitigation, this means that a lead agency can justify limiting mitigation costs by presenting a cost-benefit comparison demonstrating that the incremental VMT reduction achieved is minimal relative to the cost imposed. This is especially relevant in the Coachella Valley, where certain mitigation strategies, such as fixed-route transit enhancements, may have high costs per unit of VMT reduced. Where this type of evidence is documented in the administrative record, *SPRAWLDEF* supports a proportionality-based finding of infeasibility, even in the absence of detailed financial modeling.

Living Rivers Council v. State Water Resources Control Board (2017)

Living Rivers Council v. State Water Resources Control Board (State Water Board) further enhances our understanding of proportionality. In this case, proportionality revolves around quantifying the cost of implementing mitigation measures and compares it to the environmental benefit or impact reduction. In *Living Rivers Council*, the Court of Appeal upheld the State Water Board's approval of a programmatic policy to maintain instream flows in northern California. The Living Rivers Council argued that the State Water Board violated CEQA by (1) inadequately analyzing indirect environmental impacts from the new policy and (2) rejecting mitigation measures as infeasible that were not proven to be infeasible.

However, the Court found that the State Water Board properly rejected mitigation based on substantial evidence that proposed mitigation would be impractical, ineffective, or beyond the authority of the State Water Board. Specifically, The State Water Board considered, but rejected, using subterranean stream delineations as mitigation because the mitigation would be resource-intensive and could not be proven to reliably prevent the potential impact. Additionally, the State Water Board lacked the authority over most of the percolating groundwater that was the subject of the mitigation; therefore, the enforcement and coordination of the mitigation would be completely speculative. As such, this case confirms that CEQA does not force public agencies to adopt mitigation that is technically possible but ineffective, inefficient, or directed at speculative impacts. The case further supports findings of infeasibility where a proposed mitigation measure lacks real-world utility or proportionality.

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Living Rivers reinforces the principle of proportionality in a way that is directly relevant to VMT mitigation program design: mitigation that is technically feasible but delivers minimal VMT reduction at a high cost may be rejected as infeasible. This supports the development of fee-based programs in which mitigation strategies are calibrated to the VMT reduction achieved per dollar spent, or their return on investment. In the Coachella Valley, where some TDM measures, such as protected bicycle facilities, have well-documented cost-effectiveness, while others, such as mobility hubs, may have significantly higher costs per unit of VMT reduced, *Living Rivers* provides a legal basis for differentiating mitigation obligations based on performance and efficiency.

Save the Hill Group v. City of Livermore (2022)

Save the Hill Group v. City of Livermore is the most recent case that addresses economic feasibility in CEQA. This case involves City of Livermore's approval of a 44 unit residential development in the Garaventa Hills, an area adjacent to a wetland preserve and home to multiple special status species. It would result in the permanent removal of approximately 32 acres of grasslands with an additional acre being temporarily disturbed for construction of the pedestrian bridge and emergency vehicle access (EVA) road. In this case, the primary CEQA issue revolved around whether the City properly concluded that the "no project" alternative, meaning no development, was infeasible because the project was zoned for residential development and that there was no current proposal for preservation of the property.

The Court held that the City of Livermore had failed to adequately evaluate the "no project" alternative because it did not evaluate the potential to purchase the site or the availability of conservation funding available to the City to finance such purchase. The Court decided that in order to meet CEQA's informational requirements, the EIR was required to determine whether it was illegal or otherwise impossible for the City to acquire and conserve the project site. The Court reasoned that the information that "two funding sources exist for the precise purpose of enabling the City to acquire environmentally sensitive areas such as Garaventa Hills for conservation is just the sort of information CEQA intended to provide those charged with making important, often irreversible, environmental choices on the public's behalf."

While on its face, this case seems to be in contrast with the previous cases discussed where the Courts have decided that public agencies are not required to establish a funding source to address a specific environmental impact for a project, the nuance here is that CEQA does require agencies to explore funding sources that already exist to address the environmental impact. An evaluation of the funding sources and options that are already available to the agency must be included in the environmental review of a project and considered for an alternative or mitigation.

Save the Hill Group has a specific implication for regional fee-based VMT mitigation programs: before an agency concludes that a particular VMT mitigation measure is economically infeasible, it must evaluate whether existing funding mechanisms, including existing or reasonably implementable fee-based mitigation programs, could partially or fully offset the cost of that mitigation, thereby making the mitigation potentially feasible. The agency may still conclude that the mitigation program is not economically feasible to achieve full mitigation, but the lead agency would be compelled to consider such funding sources. For a CVAG regional VMT mitigation program, this standard supports the argument that fee revenues themselves constitute a qualifying funding source because establishment of

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the program creates the mechanism needed to implement mitigation. This also has direct implications for the statewide mitigation program established under AB 130 which will need to be considered as a potential option for mitigation. An agency that rejects VMT mitigation as economically infeasible without considering whether a fee-based program could offset those costs risks the same deficiency identified by the Court in *City of Livermore*.



Best Practices for Public Agencies

Based on the landmark cases identified and discussed above, the following best practices should be used by public agencies when determining CEQA mitigation is economically infeasible.

1. Connect feasibility determinations to the CEQA definition of “feasible”

For environmental documents that reject mitigation based on its feasibility, the analysis should explicitly connect the analysis of the project’s impacts and mitigation to the CEQA guidelines related to feasibility, especially Section 15364, which states that economic factors are part of the CEQA definition of feasibility.

An explanation of infeasibility should be included in the EIR section itself and in a Statement of Overriding Considerations, which would be adopted when certifying the EIR. An explanation in the Transportation Impact Assessment (TIA) prepared for the Project can further strengthen the foundation for finding mitigation infeasible.

2. Rely on substantial, contextual financial evidence

Agencies rejecting mitigation or alternatives based on economic infeasibility should utilize credible cost/revenue comparisons, estimates, and market studies. It is important to explain the proportionality of cost scale relative to the benefit to the project. The strongest financial evidence accepted by the Courts include:

- Percentage of revenue loss compared to cost savings;
- Estimates of operational or long-term maintenance burdens in addition to costs associated with construction; and
- Financial information specific to the project and its location and provides evidence that cost of mitigation is disproportionate relative to the marginal environmental benefits.

As learned in *Living Rivers Council*, mitigation can be rejected when it is inefficient and ineffective, which is applicable to when the mitigation would provide little environmental improvement at a high cost. The EIR section itself does not need to include this evidence but it can strengthen the argument. Including cost information provided by the lead agency or regional planning documents can support this substantial evidence by making it specific to the project’s location.

3. Use the “reasonableness” standard

The most important distinction is between reasonableness and affordability. The environmental document must answer the question of whether a reasonably prudent project proponent would proceed with the mitigation or alternative, not whether the project proponent could theoretically afford to implement the mitigation. CEQA does not require public agencies to push projects to the edge of economic viability or sacrifice the basic project objectives. This is also true of projects that are funded and proposed by public agencies. Just because a jurisdiction may be capable of paying for the mitigation, does not mean it has to if that mitigation would not be proportional to the overall cost to implement.

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4. Document funding and implementation constraints

As learned in *Save the Hill Group*, agencies must consider available funding mechanisms before concluding infeasibility. While the agency does not need to create the funding mechanism in order to mitigate the identified environmental impact, agencies do need to acknowledge applicable existing funding or grant mechanisms that could reduce environmental impacts. Therefore, as a best practice, agencies should confirm whether existing public funding, grants, or conservation programs were evaluated as part of the environmental review and whether they were unavailable, speculative, or legally inaccessible.

5. Include economic feasibility documentation in the record

While the Court confirmed in *Flanders Foundation* that economic analyses do not have to be reproduced in full inside a project's EIR, the findings of economic analyses prepared for the project that may conclude economic infeasibility should be summarized in the EIR or its findings. Detailed economic studies, memos, or consultant analyses should be included in the administrative record. As a best practice, agencies should also explicitly reference and rely on these materials when making CEQA findings, pursuant to CEQA Guidelines Section 15091. When rejecting mitigation or alternative based on infeasibility, agencies need to state what the rejection mitigation/alternative is, the economic constraints involved, why it is infeasible, where the supporting evidence is located in the administrative record.



Applying the Legal Framework to Fee Based VMT Mitigation Programs

Increasingly, public agencies are evaluating the feasibility of mitigating land use development impacts and capacity-increasing transportation infrastructure impacts through fee-based mitigation programs. Under CEQA, transportation impacts are identified when a project would increase vehicle miles traveled (VMT) above a locally established threshold, generate greenhouse gas (GHG) emissions from induced travel above regional thresholds, create impacts to multimodal accessibility, or conflict with a jurisdiction's transportation plan or policies.¹ Mitigation fees, as addressed in this report, function as a form of off-site mitigation for VMT impacts and must meet the legal standard for feasible mitigation.

"Proportional and reasonable" mitigation can take the form of a voluntary fee program that allocates the cost of identified improvements (mitigations) based on a proposed project's incremental contribution to the impact. Accordingly, public agencies must ensure that the administrative record demonstrates a clear nexus between the project's impact and the cost of VMT reduction. Specifically, the administrative record must show that fee-funded mitigations address the same environmental impact identified during CEQA review and that the amount imposed is roughly proportional to the impact attributable to the project.

Economic feasibility plays a critical role in determining whether mitigation measures required under CEQA must be adopted. While CEQA establishes a strong substantive mandate to avoid or reduce significant environmental impacts, feasibility requires lead agencies to exercise informed judgment grounded in substantial evidence.

As demonstrated through decades of case law, courts have consistently affirmed that feasible mitigation cannot be unenforceable, speculative, or ineffective, but has also confirmed that mitigation should not be economically unreasonable. The governing standard is not whether a project proponent can theoretically afford mitigation, but whether the marginal cost of the mitigation, relative to the environmental benefit achieved, is so great that a reasonably prudent person would not proceed. This reasonableness-based approach ensures that mitigation remains practical, defensible, and meaningfully tied to a project's impacts, rather than aspirational or punitive.

The legal framework further makes clear that economic feasibility determinations must be supported by contextual, project-specific evidence. Agencies must document why proposed mitigation would fail to provide proportional environmental benefits, would exceed the agency's legal authority, or would impose disproportionate costs relative to impact reduction.

Recent decisions, particularly those addressing transportation impacts and VMT, underscore the importance of grounding mitigation requirements in localized data and substantial evidence. Courts have rejected reliance on generalized policy assumptions or statewide guidance where they are not supported by project- or jurisdiction-specific analysis. These decisions reaffirm that both physical improvements and fee-based programs must directly address identified impacts and be demonstrably effective.

¹ Though CEQA Guidelines have replaced analysis of LOS with VMT in CEQA documents, some agencies still require non-CEQA analyses of localized LOS impacts.

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For the Coachella Valley, the primary application of this legal framework is the potential development of a regional VMT mitigation program, although the same principles also apply to project-level and site-specific mitigation strategies. The key legal question is whether the program is designed in a manner that satisfies CEQA's requirements for feasible mitigation. As the cases discussed in this report demonstrate, any regional program must be enforceable, effective, non-speculative, and roughly proportional to the project's impacts. This means that, regardless of program structure, the administrative record must clearly identify the legal mechanism authorizing the program, the entity or entities responsible for implementing and monitoring mitigation, the methodology used to quantify VMT reductions, and the evidentiary basis showing that the funded or exchanged mitigation will actually reduce the impact being addressed.

The legal lessons from *City of Marina*, *San Joaquin Raptor*, and *Cleveland National Forest Foundation* are especially important in shaping the structure of a regional program. First, because VMT impacts are inherently regional, off-site mitigation are appropriate, but the program must clearly document how implementation will occur across jurisdictions and agencies. Second, the program cannot rely on improper deferral: whether mitigation is delivered through a bank, exchange, or fee mechanism, the CEQA document must do more than promise that reductions will occur in the future. It must identify the mitigation framework with enough specificity to demonstrate that the measures are real, funded or fundable, and capable of producing measurable reductions. In practicality this means identifying mitigation projects within the program with clear specificity. Third, the program must be grounded in localized evidence and a project-specific nexus. State-wide assumptions, generalized policy goals, or broad assertions of benefit are not enough; the record must show how the mitigation mechanism relates to VMT impacts in the Coachella Valley and how the obligation imposed on a project is proportional to its contribution to that impact.

The economic feasibility cases further refine how such a program should operate. *Flanders Foundation* and *SPRAWLDEF* confirm that the governing standard is reasonableness, not affordability, meaning that a regional program must be structured so that its mitigation obligation is defensible relative to the VMT reduction achieved. *Living Rivers* reinforces that even technically available mitigation may be infeasible if it provides only limited benefit at excessive cost, supporting program designs that consider return on investment. *Save the Hill Group* further indicates that existing funding mechanisms must be considered before mitigation is rejected as infeasible, reinforcing the role of a regional program as a tool that can help make mitigation feasible.

Accordingly, the most important takeaway for any regional VMT mitigation program in the Coachella Valley is that its legal durability will depend less on the way credits are structured (bank, exchange or impact fee) and more on the quality of documentation and administration. The same principles also apply more broadly to project-level mitigation strategies and localized mitigation programs under CEQA. A defensible program, whether a bank, exchange, or impact fee, should be supported by a clear nexus framework, an accepted quantification methodology, identified mitigation strategies, documented implementation authority, monitoring and reporting procedures, and evidence showing that the program delivers VMT reductions in a manner that is proportional and economically reasonable. If those elements are established, a regional program can provide lead agencies with a practical mechanism for addressing VMT impacts under CEQA; if they are absent, the program risks being challenged as speculative, unenforceable, or unsupported by substantial evidence.

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Acronym List

BCDC	San Francisco Bay Conservation and Development Commission
CEQA	California Environmental Quality Act
CSU	California State University
CVAG	Coachella Valley Association of Governments
EIR	Environmental Impact Report
ESHA	Environmentally Sensitive Habitat Area
EVA	Emergency Vehicle Access
GHG	Greenhouse Gas
LOS	Level of Service
MFA	Mitigation Fee Act
MM	Mitigation Measure
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
SLA	Surplus Land Act
TIA	Transportation Impact Assessment
TSG	Transportation Study Guide
U.S. EPA	United States Environmental Protection Agency
UCSF	University of California, San Francisco
VMT	Vehicle Miles Traveled

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Glossary

Administrative Record

The complete body of evidence and documentation considered by a lead agency when preparing, reviewing, and certifying an environmental document under CEQA, including technical studies, public comments, economic analyses, and materials relied upon to support CEQA findings. (*CEQA Guidelines §§ 15088, 15089, 15091; Laurel Heights Improvement Assn. v. Regents of Univ. of Cal. (1988) 47 Cal.3d 376*)

Alternative

A feasible means of attaining most of the basic objectives of a project while avoiding or substantially lessening one or more significant environmental impacts. CEQA requires evaluation of a reasonable range of alternatives, including the no project alternative. (*CEQA Guidelines §§ 15126.6, 15364; Laurel Heights Improvement Assn. v. Regents of Univ. of Cal. (1988) 47 Cal.3d 376*)

Economic Feasibility

A component of feasibility that evaluates whether the marginal cost of a mitigation measure or alternative, relative to the environmental benefit achieved, is so great that a reasonably prudent project proponent would not proceed. Economic feasibility is based on reasonableness, not affordability. (*CEQA Guidelines § 15364; Flanders Foundation v. City of Carmel-by-the-Sea (2012) 202 Cal.App.4th 1093; Uphold Our Heritage v. Town of Woodside (2007) 147 Cal.App.4th 587*)

Emergency Vehicle Access (EVA)

Roadways or access facilities required to maintain emergency response capabilities that may result in environmental impacts subject to CEQA review and mitigation. (*CEQA Guidelines §§ 15064, 15126.4*)

Enforceability

The requirement that mitigation measures must be capable of being implemented, funded, and monitored by the lead agency or through legally binding mechanisms. Mitigation is infeasible where an agency lacks legal authority to ensure implementation. (*CEQA Guidelines §§ 15091, 15126.4; City of Marina v. Board of Trustees of Cal. State Univ. (2006) 39 Cal.4th 341*)

Environmental Impact Report (EIR)

A comprehensive environmental document required under CEQA to evaluate a project's potentially significant environmental impacts, identify feasible mitigation measures and alternatives, and inform public decision-making prior to project approval. (*Pub. Resources Code § 21061; CEQA Guidelines § 15121*)

Environmentally Sensitive Habitat Area (ESHA)

Areas designated by local or regional policy that contain biological resources of special sensitivity, often requiring heightened analysis and mitigation under CEQA. (*CEQA Guidelines §§ 15064, 15125, 15126.4*)

Feasibility

Defined as capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors. Mitigation must be

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feasible to be required under CEQA. (*CEQA Guidelines § 15364; Laurel Heights Improvement Assn. v. Regents of Univ. of Cal. (1988) 47 Cal.3d 376*)

Greenhouse Gas (GHG) Emissions

Emissions that contribute to climate change and may result in significant environmental impacts requiring analysis and mitigation under CEQA. (*CEQA Guidelines §§ 15064.4, 15126.2*)

Lead Agency

The public agency with principal responsibility for carrying out or approving a project and for preparing, certifying, and adopting findings for the CEQA environmental document. (*CEQA Guidelines §§ 15050, 15051*)

Level of Service (LOS)

A qualitative measure of traffic congestion and roadway performance. While LOS is no longer the primary CEQA transportation metric, it may still be evaluated for non-CEQA or operational purposes. (*CEQA Guidelines § 15064.3*)

Mitigation

Measures that avoid, minimize, rectify, reduce, or compensate for significant environmental impacts. Under CEQA, mitigation must be feasible, enforceable, effective, and supported by substantial evidence. (*Pub. Resources Code § 21002.1; CEQA Guidelines §§ 15021, 15126.4; Laurel Heights Improvement Assn. v. Regents of Univ. of Cal. (1988) 47 Cal.3d 376*)

Mitigation Fee

A monetary contribution imposed on a project proponent to fund off-site improvements that mitigate project-related environmental impacts, subject to CEQA feasibility and nexus requirements. (*CEQA Guidelines § 15126.4(a)(4); Gov. Code §§ 66000–66025*)

Mitigation Fee Act (MFA)

State law governing development impact fees, requiring a reasonable relationship between the fee, its use, and the project's impacts. (*Gov. Code §§ 66000–66025*)

Mitigation Measure (MM)

A specific, clearly defined action required to reduce or avoid a significant environmental impact. Mitigation measures must not be speculative and must include performance standards. (*CEQA Guidelines §§ 15126.4, 15091; San Joaquin Raptor Rescue Center v. County of Merced (2007) 149 Cal.App.4th 645*)

No Project Alternative

An alternative that evaluates environmental conditions that would occur if the project were not approved and provides a baseline for comparison of impacts and feasibility. (*CEQA Guidelines § 15126.6(e); Save the Hill Group v. City of Livermore (2022) 76 Cal.App.5th 1092*)

Nexus

The causal relationship between a project's environmental impact and the mitigation measure or fee imposed to address that impact. (*CEQA Guidelines §§ 15064, 15126.4; Cleveland National Forest Foundation v. County of San Diego (2025)*)

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Proportionality

The principle that mitigation measures or fees must be roughly proportional in scale and cost to the environmental impact caused by the project. (*CEQA Guidelines §§ 15126.4, 15364; SPRAWLDEF v. San Francisco Bay Conservation & Development Commission (2014) 226 Cal.App.4th 905*)

Reasonableness

A standard used to evaluate feasibility that focuses on whether a reasonably prudent project proponent would proceed with a mitigation measure or alternative, considering cost, effectiveness, and project objectives. (*CEQA Guidelines § 15364; Flanders Foundation v. City of Carmel-by-the-Sea (2012) 202 Cal.App.4th 1093*)

Statement of Overriding Considerations

A written statement adopted when approving a project with unavoidable significant environmental impacts, explaining why project benefits outweigh those impacts. (*CEQA Guidelines § 15093*)

Substantial Evidence

Enough relevant information and reasonable inferences to support a conclusion, even if other conclusions could also be reached. CEQA findings must be supported by substantial evidence in the record. (*Pub. Resources Code § 21080(e); CEQA Guidelines § 15384*)

Transportation Study Guide (TSG)

A jurisdiction-adopted document establishing methodologies, thresholds, and screening criteria for transportation impact analysis under CEQA. (*CEQA Guidelines § 15064.3; Cleveland National Forest Foundation v. County of San Diego (2025)*)

Vehicle Miles Traveled (VMT)

The total amount of vehicle travel generated by a project and the primary metric for evaluating transportation impacts under CEQA. (*CEQA Guidelines § 15064.3*)

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Attachments

Attachment A Case Law Summary Table

Appendix H: Methodologies for Off Model Estimation of VMT Reducing Projects



CVAG



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MEMORANDUM

To: Peter Satin, Coachella Valley Association of Governments

From: Michael Schmitt, AICP CTP, PTP, RSP2^B, Anais Schenk, AICP, and Atticus Washington, EIT
Kimley-Horn and Associates, Inc.

Date: January 20, 2025

Subject: Methodologies for Off Model Estimation of VMT Reducing Projects

This memorandum documents the methodologies used to estimate and quantify VMT reductions linked to bicycle, pedestrian, and transit projects within the Coachella Valley Association of Governments (CVAG) region. These methodologies were used because the Riverside County Regional Travel Demand Model, or RIVCOM does not allow for modeling the VMT or vehicle trip reductions for bicycle, pedestrian, and transit projects. CAPCOA (2024) was the primary source where applicable measures existed; NCHRP 552 was used for bicycle projects where CAPCOA does not have an equivalent measure; and local data (Replica, NTD, SunLine) was used to calibrate inputs rather than default assumptions. This memo details the data sources, analytical methods, and assumptions used to evaluate how these projects help lessen VMT. The aim of this documentation is to ensure transparency, consistency, and replicability in assessing the impacts of multimodal transportation investments across the Coachella Valley.

Bicycle Projects

Bicycle projects were evaluated using Replica data and National Cooperative Highway Research Program (NCHRP 552) for their ability to reduce VMT. NCHRP 552 is a widely used, peer-reviewed methodology developed specifically for estimating bicycle demand from facility improvements and is recognized by Caltrans and other state DOTs. It was selected because CAPCOA does not include an equivalent bicycle facility measure, and NCHRP 552 is the most widely accepted off-model approach for this purpose. The NCHRP 552 method forecasts bicycle ridership to predict existing and new bicycle trips from bicycle facility improvements. The method identifies population and employment within 0.5, 1.0, and 1.5 miles of the proposed facilities. These buffers are chosen because they represent reasonable distances where people are likely to switch to cycling if a new facility is made available. The existing bicycling rate for the region is used as a baseline with proximity multipliers added to calculate usage of new facilities based on the number of people within buffers to the improvement.

The method also distinguishes between two types of bicyclists that will use the facility: existing cyclists attracted to the new facility and new cyclists that begin biking because of the improvement. The method estimates new users by combining baseline cycling rates, population data, and the facility's expected use.

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Once total ridership is estimated, the average bicyclist trip length is used to estimate the VMT reduction from the new facility. Average bicyclist trip length was calculated from Replica data for the Coachella Valley. The estimated total ridership is multiplied by the average trip length to get the amount of VMT on the new bicycle facility.

Pedestrian Projects

To quantify VMT reduction for pedestrian projects, the California Climate Investments Board methodology was used. This equation estimates the reduction in VMT that results from increased pedestrian use after new pedestrian facilities are built. The method multiplies the following factors to calculate total VMT reduction:

- Number of days per year the facility is used
- Average pedestrian count
- Seasonal adjustment factor
- Growth factor for expected increases in pedestrian use
- Automobile substitution rate representing how many new pedestrians previously drove
- Carpool factor adjusting for shared auto trips
- Trip type factor
- Average walking trip length

Replica data was used to get the average pedestrian counts for facilities in the CVAG region. To convert the daily pedestrian counts to annual counts, a method developed by the National Bicycle and Pedestrian Documentation Project was used. It adjusts pedestrian counts based on factors such as what time the counts were taken, what day of the week the counts were taken, and what month the counts were taken in to estimate average annual VMT reduction from pedestrian facilities. The average daily reduction was determined by conservatively dividing the average annual VMT reductions by 365 days.

The “number of days per year the facility is used” variable is sourced from the National Oceanic and Atmospheric Administration’s (NOAA) *Global Historical Climatology Network* average days per year with precipitation or more than 0.1 inches within Riverside County. This is the same resource used in the California Air Pollution Control Officers Association’s (CAPCOA) 2024 update to the *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*.

Transit Projects

Within the CVAG Region there are various transit-related projects. The following approaches were used to estimate VMT reductions based on the type of transit project.

Extending Transit Network Coverage or Hours

The VMT reduction estimate for extending transit network coverage or service hours utilizes the CAPCOA (2024) T-25 methodology. This methodology compares baseline transit service levels with proposed improvements and applies factors to estimate how many car trips would use transit as a result of the improvements. For consistency, this method is applied to the entire CVAG region rather than solely to the area of proposed improvement. Total transit coverage is calculated by summing all transit

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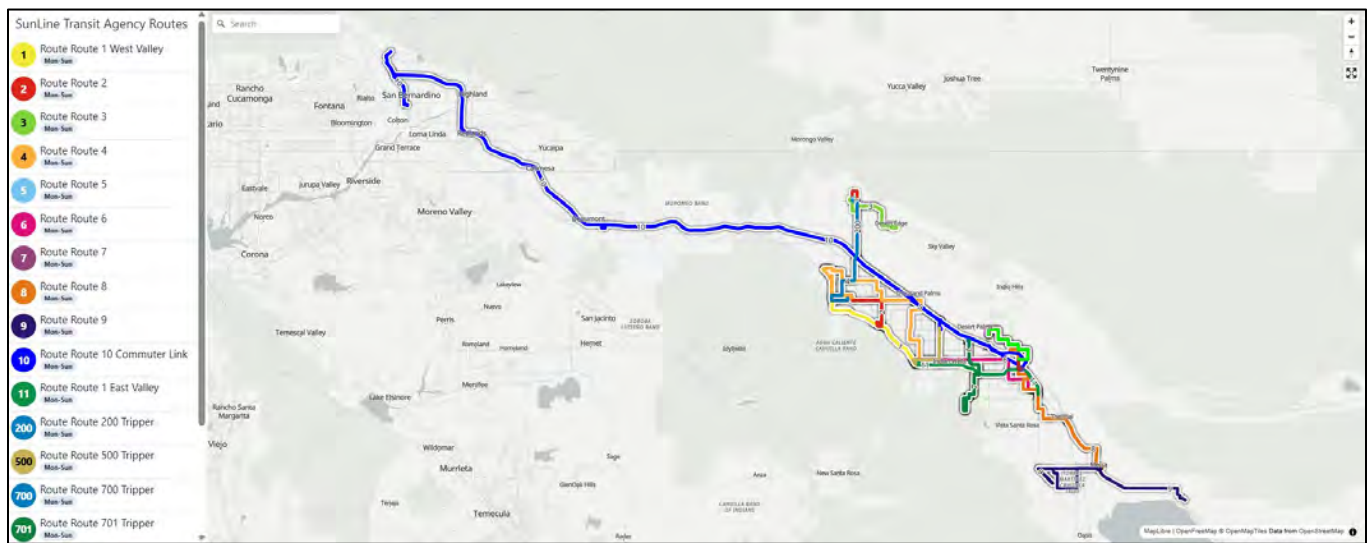


miles in both directions, excluding SunRide mileage. For further details, refer to the CAPCOA methodology.

Increasing Transit Service Frequency

VMT reduction estimates for increased transit service frequency follow CAPCOA (2024) T-26. This method calculates VMT reduction by applying factors that relate the percentage of increase in service frequency to an expected rise in transit usage. This method was applied region wide. The number of routes considered corresponds to those shown on the SunLine Transit “Routes and Schedules” map, including tripper routes, shown in **Figure 1**.

Figure 1: SunLine Transit "Routes and Schedules" Map



Transit Fare Reduction

VMT reduction estimates for fare reduction were estimated using CAPCOA (2024) T-29, *Reduce Transit Fares*. This method calculates VMT reduction by applying factors that relate to the percent increase in transit ridership that is incentivized by reducing transit fare and reducing the cost to the rider. Varying levels of fare reduction and target groups (low-income or elementary school students) are analyzed by changing the user inputs.

Transit Fare Subsidies

Transit fare subsidies differ from fare reduction in the level of implementation. Transit fare reduction is implemented systemwide or in specific zones. Transit fare subsidies are offered through the employer or developer and implemented for eligible employees or residents. VMT reduction for transit fare subsidies were estimated using CAPCOA (2024) T-9, *Implement Subsidized or Discounted Transit Program*. This measure requires input from the user on the subsidy amount, the percent of employees or residents eligible for the subsidy, and the percent of project-generated VMT from employees or residents.

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Provide SunRide Ridesharing Program

VMT reduction estimates for SunLine Transit's SunRide ridesharing program were estimated using CAPCOA (2024) T-8, *Provide Ridesharing Program*. This method calculates VMT reduction by applying a percentage in employee commute VMT for eligible employees. Reduction in employee commute VMT varies based on the place type (urban, suburban, or rural). User input can be changed to adjust for the percentage of employees that are eligible for a rideshare program.

Providing Transit Shelters

The methodology for estimating VMT reductions from transit shelter installations is based on CAPCOA (2024) T-46. Installing transit shelters may result in more ridership because it is anticipated to make waiting for buses safer and more comfortable. The analysis assumes region-wide application and includes with and without real-time information shelter additions. Stop-level data was obtained from SunLine, with boarding data averaged from March 1, 2025, to May 31, 2025. Note that some projects analyzed were sourced from documents that may be outdated by the end of this project, such as the Short Range Transit Plan, and certain stop locations may change due to service changes over time.

Providing Bus Rapid Transit (BRT)

VMT reduction estimates for bus rapid transit projects utilize CAPCOA (2024) T-28 method. This method uses a maximum VMT reduction of 13.8% within the area where bus rapid transit (BRT) is provided. The methodology estimates the degree of service improvement attributable to the BRT project, converts that improvement into an expected mode shift toward transit, and applies the resulting shift to estimate the reduction in vehicle travel. This method was applied to SunLine Routes 1 and 11 with the assumption that new BRT service would be provided using the same alignment. A headway of 15 minutes is assumed for new BRT routes. BRT project ideas were sourced based on conversations and interviews with SunLine Transit staff, but have not undergone full vetting. At the time of this work, SunLine Transit was just beginning a project to update the Short Range Transit Plan.

Coachella Valley Rail Project

The analysis for this project uses the projections and a similar VMT quantification described in the Coachella Valley–San Geronio Pass Rail Corridor Service Program Final Teir 1 Environmental Impact Report. The EIR estimates VMT reduction by modeling how proposed rail alternatives would shift trips from passenger vehicles to transit. To quantify all proposed rail stops, Alternative 1 (as opposed to Alternative 2 and 3), is analyzed. First, the analysis calculates expected boardings and alightings in the opening year (2024). Then, the ratio of trip reductions per passenger is applied to estimate the number of car trips that would be avoided if the rail is built. Next, the average distance from rail stations to the western boundary of the CVAG region along I-10 is used to determine the portion of VMT that can be reduced. Finally, the total VMT reduction is calculated by multiplying the number of two-way auto trips avoided by the average trip length between station pairs, providing a VMT reduction based on the rail project.

Vanpool and SunRide Programs

This approach combines CAPCOA methodology with local data to estimate VMT reductions from vanpool adoption. The CAPCOA measure for employer sponsored vanpools was adapted for the

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SolVans program, which is funded by SunLine and targets commuters and students. While CAPCOA provides default assumptions, inputs were updated using local data. Specifically, the percentage of employees participating is based on National Transit Database (NTD) ridership data rather than the SANDAG study currently used by CAPCO and vanpool occupancy is assumed to be 5 riders, aligning with subsidy requirements, rather than the SANDAG average.

Micro-Transit for School

The methodology provides a way to quantify how new student transit service can shift trips away from private vehicles and reduce VMT. This method estimates VMT reductions from a micro-transit program for students, using concepts from CAPCOA's school bus measure (T-40). It treats micro-transit service like a small capacity bus program and focuses only on school based VMT rather than total regional VMT. This analysis relies on two user inputs, the percentage of students who will begin riding the bus because of the new program and the percentage of students served by the new system. Data for these inputs should be sourced from school districts. However, due to lack of available data for this quantification analysis, these inputs were estimated using the following approach:

- (1) The percentage of new transit riders is determined using the service expansion elasticity (from CAPCOA measure T-25) of a 0.7% increase in transit ridership with a 1% increase in service hours or miles. Assuming the system operates similarly to SunRide, the micro-transit service will operate within eight zones, four hours a day (two hours for AM and PM drop-offs/pick-ups), for 180 school days. A conservative approach of one vehicle per zone was assumed. Using the annual revenue hours as a proxy for annual service hours, the micro-transit service will increase annual service hours by 2.19% or increase annual transit ridership by 1.53%.
- (2) Without data on student home locations for each school, it was assumed that 100% of the student population would be served by the bus system, regardless of whether they ride or not.

Given this program is treated like a school bus program with less capacity, the average student occupancy was reduced to three students per vehicle. Micro-transit vehicles tend to have the same emission factors as light-duty passenger vehicles, so all emission related constants were factored out. It should be noted that this methodology excludes the VMT associated with transit vehicles during touring and deadhead miles. For policy purposes the touring VMT may be necessary to account for, but under SB 743 this VMT is not considered as part of the impact calculation.

Micro-Transit Expansion

This method estimates VMT reduction from micro-transit expansion. A baseline of micro-transit usage was based on current SunRide zones, stops, and ridership. Two improvements for micro-transit were considered, expanding the zones for the current service and allowing inter-zonal travel. For both improvements, baseline ridership and service areas are defined using population and employment data. When providing additional zones SunRide serves, ridership is assumed to increase proportionally to the service population (population + employment) that is being served. The main assumption for this estimate is virtual stops¹ are dense enough, so all employers and residents fall within a quarter mile of

¹ Virtual stops refer to designated pickup and drop-off points within a micro-transit zone that are not marked with physical infrastructure but are accessible via the SunRide app. Unlike fixed bus stops, virtual stops allow riders to

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all added stops. From there an average person miles per user will be developed and then substituted for VMT.

For inter-zonal service, VMT is expected to increase by substituting a trip someone would make walking with a vehicle trip and by creating deadheading miles. VMT reduction for inter-zonal services would rely on added occupancy of shared trips to reduce VMT. Although micro-transit services can help increase accessibility and mobility, an estimate of VMT reduction would be difficult to estimate. Therefore, this VMT project type was not analyzed.

New SunLine Bus Routes

This method estimates the VMT reduced by adding a new route to the region. To estimate the effect new service lines have on VMT, a proximity analysis was conducted to determine the increased ridership because of a new route. The analysis used a combination of service population in SunLine's system area, the average daily trips per person, and average boardings per 100 trips to determine the potential capture market of employees and residents that would shift from a passenger vehicle to transit. A market capture ratio is then applied to the service population located within a quarter mile radius of each added transit stop to determine a projected daily ridership. The decrease in VMT is conservatively assumed to be the increase in passenger miles from the project daily ridership. Passenger miles is determined using the average passenger miles for all bus routes from the 2024 agency profile from NTD (National Transit Database). This methodology relies on the assumption that all new routes and stops will be added in areas not already served by an existing stop.

Transit Hub

The interaction between all modes of transportation (walking, driving, biking, transit, etc.) at a transit hub is complicated to determine without an in depth analysis. For simplicity reasons, this analysis only examined the effect of transit hubs on the local bus routes. Interactions between walking, driving, and biking are important, but require a higher level of modeling. Given that all transit hub projects are proposed along the alignment of the Coachella Valley-San Geronimo Pass rail project, it was assumed all existing SunLine routes must extend their coverage to reach the transit hubs. Therefore, the same methodology used for the *Extending Transit Network Coverage or Hours* is used to quantify the transit hub reduction in VMT.

Summary

This memorandum documents the off-model methodologies used to estimate VMT reductions from bicycle, pedestrian, and transit projects within the CVAG region. Because RIVCOM, the regional travel demand model, does not have the capability to model VMT or vehicle trip reductions from these types of improvements, off-model approaches were required. Methods were selected from the CAPCOA (2024) Handbook for Analyzing Greenhouse Gas Emission Reductions where applicable measures existed, supplemented by NCHRP 552 for bicycle facility analysis where no equivalent CAPCOA measure is available. Local data sources including Replica, SunLine ridership and stop data, and the National

request service anywhere within a defined zone, provided they are within a specified walking distance of the stop location.

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Transit Database were used to calibrate inputs in place of statewide defaults, improving the accuracy of estimates for Coachella Valley conditions.

Bicycle projects were evaluated using NCHRP 552, which estimates ridership uptake and resulting VMT reduction based on population and employment proximity to new facilities. Pedestrian projects were evaluated using the California Climate Investments Board methodology, adjusted for local pedestrian count data from Replica. Transit projects were evaluated using a range of CAPCOA measures depending on the type of improvement, including service coverage and frequency expansion, fare reduction and subsidies, BRT, vanpool, micro-transit, new route additions, and the Coachella Valley–San Geronio Pass Rail project.

All analyses were implemented as spreadsheet-based tools provided to CVAG, allowing assumptions to be updated as new projects are identified or local data improves. This enables CVAG to evaluate future projects for inclusion in the VMT Mitigation Program and calculate updated VMT reduction estimates on an ongoing basis without repeating the underlying methodology development.