



# Regional VMT

*Mitigation Program Study*



## APPENDIX A – LITERATURE REVIEW



# FRESNOCOG REGIONAL VMT MITIGATION PROGRAM STUDY

TASK 2: Literature Review

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## Chapter 1: Introduction

Senate Bill (SB) 743 reformed the transportation impacts review process under California Environmental Quality Act (CEQA) to align with greenhouse emissions reduction goals. As a result, Vehicle Miles Traveled (VMT) became the key metric to measure transportation impacts and estimate mitigation effects. The California Air Pollution Control Officers Association (CAPCOA) *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, which is an updated version of the VMT and GHG mitigation guide released previously in 2010, was released in January 2022. CAPCOA's Handbook is one of the primary sources for estimating mitigation effects in California. Although this resource is invaluable, it is still challenged by the limitations of the prior 2010 version given that it provides solutions that work best in highly urbanized areas, with TDM applications in suburban and rural contexts often having limited or questionable efficacy. TDMs can also be challenging from the standpoint of mitigation monitoring and are often unpopular with project applicants because they may need to be managed and paid for in perpetuity. These limitations have led jurisdictions to increasingly consider other programmatic approaches to VMT mitigation. In response, policymakers started considering new designs such as "banks" and "exchanges". This effort will take a look at example programmatic approaches in practice, assess the legal and non-legal considerations that can identify a direction for jurisdictions, provide a framework, and create solutions and key takeaways.

## Chapter 2: Fee-based VMT Mitigation

Programmatic approaches that rely on collectively funding projects appear to hold great promise for VMT mitigation as they can allow a project to obtain an amount of mitigation precisely commensurate with their impact. In addition, these programmatic approaches allow developers to make a single payment, avoid the complexity of ongoing TDM management and do not require mitigation monitoring by the project applicant. Programmatic approaches can also provide a public benefit in terms of funding transportation improvements that would not otherwise be constructed, resulting in potential improvements to congestion, GHG emissions, increased transportation choices, and additional opportunities for active transportation and related health benefits.

This study focuses on programmatic approaches to VMT mitigation including VMT Banking, VMT Exchanges, and VMT Mitigation Impact Fee Programs. The following is an introduction to the basic framework of each of these Fee-Based VMT Mitigation Programs:

**VMT Banking** – Under a VMT Banking framework, multiple VMT reducing projects are grouped and their associated VMT reductions are monetized in the form of credits. These credits are then purchased for the purposes of mitigating VMT in excess of determined impact thresholds. The underlying projects may be either regionally or locally beneficial to the area in which the project is located.

**VMT Exchanges** – VMT Exchanges are similar to VMT Banking with the exception that they deal with a single VMT-reducing project that can be established by the project applicant, other entity, or potentially be selected from a VMT Banking list. As this approach eliminates the need to convert a group of projects into equivalent VMT reducing credits, its administration could potentially be simplified, and funding can be directed at a single preferred mitigation solution which may be of greater benefit to the project than alternatively funding a VMT Bank.

**VMT Mitigation Impact Fee Programs** – Some jurisdictions have also considered the creation or conversion of an existing Transportation Impact Mitigation (TIM) Fee Program to serve the purpose of VMT mitigation. This, however, can be complicated for most jurisdictions given that, to not be counterproductive in terms of VMT mitigation, all capacity-enhancing projects would need to be purged from the TIM Fee Program. Simply, a TIM Fee Program cannot have roadway widening projects and be VMT mitigating at the same time. While a full conversion to VMT mitigation projects is feasible in some urban locations, most jurisdictions still desire to have some level of roadway widening/capacity enhancement within their programs for the purpose of facilitating travel and reducing congestion, even if the approach may be conflicting with SB 743 given that most capacity-enhancing projects result in induced demand and increased VMT. An important difference between a VMT Mitigation Impact Fee Program and a Banking/Exchange program is that every project would participate in it, not just those projects that require VMT mitigation under SB 743.

The next chapter will introduce some of the example programs across the state: Actual programs, quasi programs, and wetland banks.

## Chapter 3: Example Programs

This chapter will talk about some of the examples in the region to compare how different jurisdictions approached VMT mitigation under SB743 over the years. The chapter will consider examples as follows:

Actual programs are fully implemented fee-based mitigation programs within a jurisdiction

Quasi programs are programs focusing on one aspect of VMT mitigation

Wetland Banks are privately/publicly owned lands where bank sponsors are allowed to transfer credits to permit developers to compensate for environmental impacts in exchange for permanent protection and monitoring of the wetlands

### ACTUAL PROGRAMS

#### City of San Diego - Active Transportation In-Lieu Fee Program

The City proposed<sup>1</sup> implementing a program for the purpose of complying with SB 743. The intent of this program was to reduce Citywide VMT to address impacts of development related to noise, air pollution, and greenhouse gas emissions, and to promote public health and enjoyment, by investing in active transportation infrastructure and measures that will result in reductions to Citywide VMT.

Under the program, the city has identified four (4) zones, as follows:

Mobility Zone 1 – reflects the Downtown Community Planning Area boundary

Mobility Zone 2 – includes any parcel that falls wholly, or partially, within the State's identified Transit Priority Areas (TPAs)

Mobility Zone 3 – reflects any Community Planning Area boundary with a VMT efficiency that is 85% or less of the regional average for either VMT per capita or VMT per employee

Mobility Zone 4 – represents an area that is not located within Mobility Zones 1, 2, or 3; Mobility. Zone 4 generally reflects the non-urban areas of the City

Under the Program, all development located in Mobility Zone 4 would be required to pay an Active Transportation In-Lieu Fee instead of funding the cost of VMT-generated mitigation measures. In addition, development projects in Mobility Zone 4 would not be required to provide on-site TDM amenities. Funds collected from the Program would be used to pay for transportation and VMT-reducing multimodal infrastructure projects within Mobility Zones 1, 2, and 3, thereby reducing Citywide VMT impacts.

The regulations required that all development located in Mobility Zones 2 and 3 provide on-site Transportation Demand Management (TDM) amenities that reduce VMT. TDM amenities could

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<sup>1</sup> 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](https://www.sandiego.gov/sites/default/files/8_active_transportation_in_lieu_fee_cost_impact_analysis.pdf), accessed on April 11th, 2022



include a variety of pedestrian improvements, bicycle supportive amenities, transit improvements, or other multi-modal enhancements.

<i>The city is divided into four different zones</i>
<i>Developments in non-urban areas would pay an Active Transportation In-Lieu Fee</i>
<i>Developments in urban areas would provide on-site Transportation Demand Management (TDM) amenities that reduce VMT.</i>

**City of San Jose - Transportation Analysis Policy**

Effective by March 29, 2018<sup>2</sup>, the Transportation Analysis policy replaced the Transportation Impact Policy to align with SB 743.

In case a project was unable to fully mitigate VMT impact(s) and thus resulted in significant and unavoidable VMT transportation impact(s), the project must also construct or fund multimodal transportation improvement(s), called Transportation System Improvement(s) that would improve system efficiency and/or safety, enhance non-auto travel modes, and promote the citywide reduction of VMT.

The value of Transportation System Improvements is that a project applicant must construct, or fund improvements based on the amount of VMT impacts the Project is unable to mitigate.

Commercial/Industrial: \$3,200 per Vehicle Mile Traveled not mitigated  
 Residential \$2,300 per Vehicle Mile Traveled not mitigated

<i>Applicants must construct or fund citywide multimodal transportation improvement(s) if a project was unable to fully mitigate VMT impact(s)</i>
<i>Improvements would not necessarily reduce or avoid the significance of VMT impacts that cannot be mitigated</i>
<i>An improvement would be one of the overriding benefits to the community</i>

**Contra Costa Transportation Authority (CCTA)**

A grant of \$400,000<sup>3</sup> has been awarded to the Contra Costa Transportation Authority (CCTA) to build a VMT Mitigation Framework. One aspect of the study will look into allowing developers and transportation agencies whose projects contribute to VMT increases to offset emissions by paying

<sup>2</sup> City of San Jose Council Policy, *Transportation Analysis Policy*, [636691896044230000 \(sanjoseca.gov\)](https://www.sanjoseca.gov/636691896044230000), accessed on April 11th,2022

<sup>3</sup> Contra Costa Transportation Authority, *Press Release*, [https://ccta.net/wp-content/uploads/2021/10/CCTA\\_SustainableGrantAward\\_FINAL.pdf](https://ccta.net/wp-content/uploads/2021/10/CCTA_SustainableGrantAward_FINAL.pdf), accessed on April 11th,2022

into a "VMT Mitigation Program," thanks to funding from the California Department of Transportation Sustainable Planning Grant.

By April 20, 2021, the Revised Implementation Guide requires each jurisdiction to create or maintain a development mitigation scheme to guarantee that new growth pays its fair share of the costs associated with that expansion. In accordance with the Countywide Comprehensive Transportation Plan, this program will include both a local program to reduce impacts on local streets and other facilities and a regional program to fund regional and subregional transportation improvements. Fees, exactions, assessments, or other mitigation measures shall be established by the regional development mitigation program to pay regional or subregional transportation upgrades required to mitigate the impacts of planned or predicted development.

<i>The program is funded by the California Department of Transportation Sustainable Planning Grant</i>
<i>Each jurisdiction is required to create a development mitigation scheme</i>
<i>The program includes both a local and a regional program</i>

**Tahoe Regional Planning Agency – Mobility Mitigation Fee (MMF) program**

As of April 2021<sup>4</sup>, the Tahoe Regional Planning Agency (TRPA) introduced the Mobility Mitigation Fee program basing the fee on average daily VMT instead of the average daily trip ends. VMT mitigating projects are drawn from the 2020 RTP constrained project list. MMF may charge as high as \$218.00 per VMT depending on the development. This program is different from its equivalents in the region as it strictly charges a VMT mitigation fee. These fees are strictly for mitigating project impacts on transportation, not for revenue-generating to offset the vehicular impacts of a project. The updated process requires all projects to mitigate their transportation impacts through MMF and do more at the project level if generated VMT is significant. The new process charges a fee only if it generates a net increase in VMT. The process encourages projects located in low-VMT areas, VMT-reducing strategies such as mitigation that can be reflected in lower MMF fees. TRPA’s Mitigation fund release policy states that collected funds can only be used for VMT mitigating transportation projects.

<i>Fee based on VMT instead of daily trip ends and dependent on type of project</i>
<i>Fees are strictly for mitigating project impacts on transportation, not for revenue-generating to offset the vehicular impacts of a project</i>
<i>The new process charges a fee only if project generates a net increase in VMT</i>

**City of Salinas**

The City of Salinas developed a VMT mitigation bank based solely on bicycle infrastructure projects. As a part of developing the bank, several key citywide bicycle projects were costed and the VMT reductions associated with them were calculated. Only projects that can be constructed in the next

<sup>4</sup> 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 April 11th,2022

ten years were included in the program. This then developed a small program with a cost per VMT reduced that developers can use to reduce their project’s VMT impact that can be use as part of a VMT banking approach to VMT mitigation. An important aspect of this program is that additional projects can be added to the bank to increase the supply of VMT for mitigation purposes. The City of Salinas is one of the first cities in California to undertake the development of a VMT Banking program.

<i>VMT Bank comprised only of bicycle infrastructure projects</i>
<i>Developer pays one time to mitigate amount of total VMT project that is over threshold</i>
<i>VMT Bank can be refilled by new projects if additional VMT is needed</i>

**City of Watsonville**

The City of Watsonville developed a VMT mitigation bank based on bicycle and pedestrian infrastructure projects. As a part of developing the bank, the proposed projects were taken from existing documents such as the bicycle master plan, then they were costed, and the VMT reductions associated with their construction were calculated. Only projects that can be constructed in the next ten years were included in the program. This then developed a small program with a cost per VMT reduced that developers can use to reduce their project’s VMT impact that can be use as part of a VMT banking approach to VMT mitigation. An important aspect of this program is that additional projects can be added to the bank to increase the supply of VMT for mitigation purposes.

<i>VMT Bank comprised of bicycle and pedestrian infrastructure projects</i>
<i>Developer pays one time to mitigate amount of total VMT project that is over threshold</i>
<i>VMT Bank can be refilled by new projects if additional VMT is needed</i>

**City of Tracy**

The City of Tracy developed a VMT mitigation bank based on bicycle and pedestrian infrastructure projects, as well as a mobility hub project. The mobility hub links several different modes of travel together at a transit station to make commuting by transit easier and reduce the number of drive along automobile trips. As a part of developing the bank, the proposed projects were taken from existing documents such as the transportation master plan (TMP), then the projects were costed, and the VMT reductions associated with their construction were calculated. Only projects that can be constructed in the next ten years were included in the program. This then developed a small program with a cost per VMT reduced that developers can use to reduce their project’s VMT impact that can be use as part of a VMT banking approach to VMT mitigation. An important aspect of this program is that additional projects can be added to the bank to increase the supply of VMT for mitigation purposes.

<i>VMT Bank comprised of bicycle, pedestrian, and mobility hub projects</i>
<i>Developer pays one time to mitigate amount of total VMT project is over threshold</i>
<i>VMT Bank can be refilled by new projects if additional VMT is needed</i>

**QUASI PROGRAMS**

**San Francisco Transportation Demand Management Program**

The San Francisco Transportation Demand Management Program, which "seeks to promote sustainable travel modes by requiring new development projects to incorporate design features, incentives, and tools that support transit, ride-sharing, walking, and bicycle riding," was one potential example of VMT exchange. As shown in **Figure 1**, each project was given several points based on its land-use category, size, and parking requirements by program staff. The project developers must then choose applicable demand-management measures (primarily on-site) totaling an equal number of points from a city-prepared menu of options and develop a plan to put the measures in place. Each point corresponds to a 1% reduction in VMT<sup>5</sup>.

Category	Measure	Points	Land Use Category			
			A	B	C	D
ACTIVE-1	Improve Walking Conditions: Option A; or	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Improve Walking Conditions: Option B; or	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Improve Walking Conditions: Option C; or	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Improve Walking Conditions: Option D	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACTIVE-2	Bicycle Parking: Option A; or	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bicycle Parking: Option B; or	2 ●●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bicycle Parking: Option C; or	3 ●●●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bicycle Parking: Option D	4 ●●●●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACTIVE-3	Showers and Lockers	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ACTIVE-4	Bike Share Membership: Location A; or	1 ●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bike Share Membership: Location B	2 ●●	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1 San Francisco Transportation Demand Management Menu of Options

*An early example of VMT Exchange*

*Each project was given several points based on its land-use category, size, and parking requirements*

*Project developers choose applicable measures totaling the points from this menu and develop a plan*

**San Francisco Transportation Sustainability Fee (TSF)**

San Francisco Transportation Sustainability Fee required developers of qualifying projects to pay approximately \$8 per square foot of residential development and \$18 per square foot of commercial development into a fund. Millions of dollars generated from this program were funneled to transit improvements such as adding more MUNI services, expanding the fleet, and improving services as well as transit stops, and streets. A thorough nexus study was conducted to explore legality, justified

<sup>5</sup> City and County of San Francisco Planning Commission, *Standards for the Transportation Demand Management Program* (2016), See <http://www.sftdmtool.org/>, accessed on April 11th, 2022

fees and other aspects, and potential projects. A well-designed analysis of transportation demand and adjusted fees and measures was enough to set the ground to satisfy core CEQA requirements<sup>6</sup>.

<i>San Francisco Transportation Sustainability Fee required developers of qualifying projects to pay development commercial development into a fund</i>
<i>Fees were funneled to transit improvements such as MUNI services expanding fleets, and improving services</i>
<i>A well-designed analysis of transportation demand and adjusted fees and measures was enough to set the ground to satisfy core CEQA requirements</i>

**City of Pasadena Complete Streets Program**

The City of Pasadena<sup>7</sup> had organized its Complete Streets Program to implement innovative approaches to reduce VMT. Thresholds that require analysis and potential mitigation for any significant impacts were included for both VMT and LOS, along with other metrics. The guidelines set the significance threshold for VMT at 22.6 additional trips per capita (residential population plus jobs) and require LOS to be held at D.

This also helped solve a potential CEQA-CMP compliance conflict by evaluating LOS and VMT at the same level. Agencies must consider all aspects of legal issues. It is possible that a project that reduces VMT may not improve LOS at the same level. Another possible solution would be to designate areas as infill opportunity zones that would qualify for designation and be exempt from the LOS requirements under the CMP.<sup>8</sup>

<i>Complete Streets Program was organized to implement innovative approaches to reduce VMT</i>
<i>Thresholds included both VMT and LOS, along with other metrics</i>
<i>This helped solve a potential CEQA-CMP compliance conflict by evaluating LOS and VMT at the same level</i>

**City of Los Angeles Coastal Transportation Corridor Specific Plan, West LA Transportation Improvement and Mitigation Specific Plan**

As the earliest application of mitigation fee programs, these area-wide-specific plans included lists of transportation improvements such as transit, bicycle, pedestrian, roadway, intelligent transportation system (TS), and trip reduction programs to be funded by the impact fees collected from new development. At the time, the Transportation Impact Assessment fee program was also updated to include a VMT-based nexus plan, revisions to the fees, exemptions, in-lieu credits, affordable housing

<sup>6</sup> Robert D. Spencer, San Francisco Municipal Transportation Agency, *San Francisco Transportation Sustainability Fee* (TSF) Nexus Study (2015).

<sup>7</sup> City of Pasadena Department of Transportation, *Mobility Element* (2015). <https://ww5.cityofpasadena.net/transportation/complete-streets/development-review/pasadena-transportation-management-association/>, accessed on April 11th,2022

<sup>8</sup> See Cal. Gov't Code § 65088.4.

credits; and new transit-oriented development credit. Other proposed changes include administrative amendments and minor revisions that are consistent with SB 743<sup>9</sup>

<i>The earliest application of VMT Mitigation programs</i>
<i>Area-specific plans included lists of transportation improvements to be funded by the impact fees</i>
<i>The transportation Impact assessment program included VMT-based nexus plans, in-lieu credits, and new transit-oriented development credit</i>

**Los Angeles Metro Transit Pass Study**

Metro is the Los Angeles County mobility provider. One of the programs they offer is a transit pass subsidy, and based on the Fehr & Peers<sup>10</sup> study, and it may qualify as a VMT mitigation exchange.

Metro offers some students and employees free transit by allowing anyone to 'sponsor' a particular school or employer. LA Metro considered a program as an SB 743 VMT mitigation exchange where developers could purchase these passes and could use the Metro performance data to estimate the VMT reduction per pass. However, this process is still experimental.

<i>LA Metro transit passes could be sponsored by anyone</i>
<i>LA Metro considered a program as an SB 743 VMT mitigation exchange where developers could purchase these passes</i>
<i>This may have qualified as a VMT exchange</i>

**Metropolitan Transportation Commission (MTC) Bay Area Express Lanes Strategic Plan**

The Metropolitan Transportation Commission (MTC) is exploring<sup>11</sup> a simplified VMT bank or exchange options as on-site mitigation may not be feasible for all projects. It is considered that a VMT exchange can reinforce existing multi-county efforts focusing on corridor-planning within the express lane corridor. Through VMT exchange, implementing agencies could offset any VMT impacts of the express lanes. On the other hand, VMT banks allow developers to fund off-site mitigation projects. A simplified VMT bank, an improved Impact fee that is used to fund demonstrated VMT mitigation projects, could fund current mitigation such as a regional express bus service.

However, implementing agencies should consider scenarios where the toll revenue drops, and mitigation funds are needed to operate and maintain highways. In that sense, how and where these banks are used remains an important challenge for agencies.

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<sup>9</sup> 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.

<sup>10</sup> Fehr & Peers, *VMT Mitigation Through Fees, Banks, and Exchanges*, April 2020

<sup>11</sup> Metropolitan Transportation Commission, *Bay Area Express Lanes Strategic Plan*, [https://mtc.ca.gov/sites/default/files/Bay\\_Area\\_Express\\_Lanes\\_Strategic\\_Plan\\_Appendices.pdf](https://mtc.ca.gov/sites/default/files/Bay_Area_Express_Lanes_Strategic_Plan_Appendices.pdf), accessed on April 11th, 2022

<i>MTC is exploring a simplified VMT bank or exchange options for Bay Area express lanes</i>
<i>VMT exchange can reinforce existing multi-county efforts focusing on corridor planning within the express lane corridor</i>
<i>Implementing agencies could offset any VMT impacts of the express lanes</i>

**WETLAND BANKS**

Wetland banks have been in practice for years now. A wetland (mitigation) bank is “privately or publicly owned land managed for its natural resource values. In exchange for permanently protecting, managing, and monitoring the land, the bank sponsor is allowed to sell or transfer habitat credits to permits who need to satisfy legal requirements and compensate for the environmental impacts of developmental projects”<sup>12</sup>.

Although there may be a variety of technical and legal differences, they can be potential models for VMT mitigation strategies. These models typically include a process through which the impacts of various transportation projects are estimated. Mitigation (Wetlands) banking credits are established to compensate for unavoidable wetland losses. One of the differences with VMT banks is the use of mitigation banks. This must occur in advance of development when the mitigation is not possible at the site or would not be as beneficial. Here are some examples sponsored by Caltrans<sup>13</sup>:

**State Road (SR) 149 Freshwater Marsh (1990):** Caltrans mitigated impacts of SR 149 widening project. Initial mitigation funding was provided by local funds for cash flow that is later reimbursed by Caltrans.

**Beach Lake Mitigation Bank (1991):** Beach Lake Mitigation Bank compensated for losses to wetland resources from future Caltrans projects in 14 counties. As of 2014, 43 projects in total had been debited from the bank to mitigate the impacts.

**Elkhorn Slough Early Mitigation Partnership (2009):** It was a collaborative pilot program to preserve the Elkhorn Slough watershed. Program developed funding strategies and conservation agreements for the watershed. Caltrans sponsored the partnership to set up advance mitigation for four transportation projects.

<i>Collaboration with local/regional partners facilitates state-level (Caltrans) efforts to develop advanced mitigation.</i>
<i>The timeline for bank development could be different from agency to agency</i>
<i>Sometimes smaller agencies can have the flexibility to achieve advance mitigation, since they may have less restricted processes compared to Caltrans.</i>

<sup>12</sup> California Department of Fish and Wildlife, [Conservation and Mitigation Banking \(ca.gov\)](http://www.california.gov/conservation/mitigation-banking), accessed on April 11th,2022

<sup>13</sup> Sciarra, G., Bjorkman,J., Lederman,J., Thorne, J.H., Schlotterbeck, M., Wachs, M., *Setting the Stage for Statewide Advance Mitigation in California*, UC Davis, Institute of Transportation Studies, 2015.

## Chapter 4: Legal Considerations

There are a few potential legal considerations that need to be considered to create a VMT mitigation bank, exchange, or impact fee program such as CEQA, associated court decisions, California's Mitigation Fee Act, associated Assembly Bills (AB), the Congestion Management Program, and other Senate Bills (SB). Any agency or authority designing or operating a bank would need to consider those mentioned above to minimize any risk of litigation. This section will discuss these considerations in further detail.

### Court Decisions

The Court has been clear on land-use regulations stating that any regulation must “substantially advance legitimate state interests”. This translates to including the establishment of an “essential nexus” between the mitigation fee and government interest<sup>14</sup>. Furthermore, the doctrine requires those fees to be “rough[ly] proportional” to the adverse impacts of a project<sup>15</sup>. This can also translate to the fact that mitigation must be appropriately sized to offset the actual impact. Under an approach where the VMT reductions are determined in terms of “vehicle miles” or similar units, an amount of mitigation commensurate with the impact can be purchased. As long as these fees are justified to further a legitimate purpose with an essential nexus to government interest and roughly proportional to the adverse impacts, they may be permissible. To summarize, implementing agencies need to comply with two court decisions:

Essential Nexus: There must be an essential nexus between the mitigation fee and the government interest

Roughly Proportionality: Mitigation must be approximately sized to offset the actual impact

### The California Environmental Quality Act (CEQA)

SB 743 directly amends CEQA to require an updated analysis of transportation impacts. Reducing greenhouse gas emissions through means such as VMT, it is undeniable that mitigating VMT is a justified purpose for the state's interest. CEQA requires that feasible mitigation be applied to projects that result in a significant impact. The impact is defined as the changes to the baseline environment caused by the project. Lead Agencies or authorities can choose their thresholds to determine the significance of the impact.

CEQA Statute (CA Public Resources Code 21000-21189)

CEQA Guidelines (CA Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387)

### Mitigation Fee Act (AB 1600)

Legislation that was passed as AB 1600 by the California Legislature is now codified as California Government Code Sections (GC §) 66000 through 66008 (“Mitigation Fee Act”). The Main purpose of

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<sup>14</sup> See *Nollan*, 483 U.S. at 837.

<sup>15</sup> *Dolan v. City of Tigard*, 512 U.S. 374, 391, 1994



the mitigation fee act is to “address concerns over the fact that local agencies are imposing fees for purposes unrelated to development projects”<sup>16</sup>.

§66000 (d) – The bank or the recipient of the fund should constitute a public facility. While it is defined broadly, mitigation measures such as public transit infrastructures or subsidies can be defined as a public facility

§ 66001(a) A reasonable relationship between the development fee, its use, and the need for the mitigation measure should be identified. Mitigation projects such as contributions to transit services should meet legal requirements as long as the relationship is properly documented.

§66005 identifies a course for a fee reduction regarding new infill or transit-oriented housing developments. If development is a one-half mile from a transit station and meets basic requirements – generates lower auto trips–, that development is entitled to a fee reduction. However, based on a study by the Institute of Transportation Studies, U.C. Berkeley<sup>3</sup> this component may be subject to debate as SB 743 exempts all transit priority areas from analysis of transportation impacts. Any entity should pay attention to this detail.

### **Congestion Management Program (CMP)**

The current Congestion Management Program in California requires urban areas to develop and adopt a program to enforce the Level of Service (LOS) of E or promote alternative methods if below LOS E. However, SB 743 identifies VMT as the new measure of effectiveness for CEQA considerations, which creates a conflict with the existing CMP. VMT mitigation banks or exchanges may be funding or permit a VMT reducing project that does not necessarily improve LOS.

Until the CMP is updated to comply with SB 743, a simple solution would be to consider, for instance having transportation impact analysis thresholds for both LOS and VMT on the same geographical scale

### **Senate Bill 375 (SB 375)**

Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008) requires MPOs to create and implement Sustainable Communities Strategies (SCS) and that adopted RTP components integrate land use, housing, and transportation planning strategies to meet regional greenhouse gas emission reduction goals set by California.

While it is unlikely that SCSs will conflict with SB 743, it is crucial for lead agencies to review the applicable Sustainable Communities Strategies (SCS) for any potential conflicts.

SB375 can provide useful considerations to design and operate VMT banks or exchanges.

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<sup>16</sup> 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.

**Assembly Bill 602 (AB 602)**

AB 602 (Grayson)<sup>17</sup> 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. AB 602 would require impact fees to be proportional to the size of a new home so that smaller individual homes pay smaller fees. But prior to the adoption of the fee, an impact fee nexus study should be adopted that identifies the existing level of service for each public facility, proposed a new level of service, and should include an explanation of why the new level of service is needed.

This bill would require that a local agency that calculates fees proportionately to the square footage of the proposed units be deemed to have used a valid method to establish a reasonable relationship between the fee charged and the burden posed by the development. Bill went into effect on January 1, 2022.

While for new VMT bank programs there is no existing level of service for VMT offsets, and VMT banking rates are not calculated based on service levels or standards, there might not be any conflicts with AB 602. However, lead agencies should review and consider AB 602 for potential conflicts with their programs.

**California Fish & Game Code**

While research shows there are no specific statutes for VMT exchanges and banks, U.C. Berkeley<sup>18</sup> used conservation programs as a proxy established under the California Fish & Game Code to develop a list of requirements associated with existing statutes as shown in **Table 1**. 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*

Requirement	Statutory Ref.
An explanation of the VMT mitigation purpose and need for the bank or exchange.	Fish & game code § 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.	§ 1852(c)(2)
The public transit and VMT reduction opportunities are currently located within the bank or exchange area.	§ 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.	§ 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.	§ 1852(c)(5)-(6)

<sup>17</sup>California Legislative Information, AB 602 Development Fees: Impact fee nexus study, [https://leginfo.ca.gov/faces/billTextClient.xhtml?bill\\_id=202120220AB602](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB602), accessed on April 11<sup>th</sup>, 2022

<sup>18</sup> 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.

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.	§ 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.	§ 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.	§ 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.	§ 1852(c)(10)-(11)

**LEGAL CHALLENGES**

SB 743 has completely changed how jurisdictions analyze transportation impacts under CEQA. In 2018, the Governor's Office of Planning and Research (OPR) released technical recommendations regarding SB 743. However, there are still legal and practical scenarios falling through the cracks as shown in the two cases described below.

**Case 1: Petitioners vs County of San Diego**

VMT banks and exchanges are presenting unique solutions to VMT mitigation. However, they also bring quite a few legal challenges with them in terms of implementation. One of these challenges is the use of carbon offsets. Recently, the County of San Diego was challenged over the use of carbon offsets to achieve Greenhouse Gas (GHG) reduction goals in the County's climate action plan<sup>19</sup>. The court petition states that revised CAP(Cap-and-Trade Program) and 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 also 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. This could be an obstacle to creating VMT banks or exchange programs.

**Case 2: Petitioners vs Governor's Office of Planning and Research (OPR), California Natural Resources Agency, Office of Administrative Law**

In 2019, the Governor's Office of Planning and Research, California Natural resources Agency, Office of Law were challenged by the Two Hundred, an unincorporated association of civil leaders and additional individuals. Petitioners challenged five new regulations, one regulatory appendix, and two underground regulations. Essentially, petitioners argued that new plans increase new home costs, which pushes too many families of color far behind in their ability to access homeownership. It also mandates a VMT mileage quote for each driver, a quote which will arguably raise commute costs of

<sup>19</sup> Superior Court of the State of California, *Court Petition*, <https://www.biologicaldiversity.org/programs/urban/pdfs/San-Diego-CAP-Petition-for-Writ-of-Mandate.pdf>, accessed on April 11<sup>th</sup>, 2022

lower and moderate-income workers who commute from outlying affordable home communities<sup>20</sup>. If successful, as the case is still on-going, this could affect the legality of VMT policy setting.

## Chapter 5: Non-legal Considerations

Research shows that there are other important considerations to take into account such as equity, structure, etc. This chapter will shed light on these considerations to establish a basis for fee-based VMT programs.

### TARGETED STRUCTURE

A Fee-Based VMT Mitigation Program should only be imposed when a project can't sufficiently or cost-effectively mitigate its transportation impact. Unlike a typical TIM Fee Program under which nearly every development project may be required to pay into it, VMT Fee-Based Mitigation Programs are anticipated to only collect money from projects that cannot effectively mitigate their significant impacts on their own. As a result, forecasting revenue may be more difficult given the need to predict a project location and timing, its land-use characteristics, and whether it will require mitigation.

### VERIFICATION AND ADDITIONALITY

Agencies need to consider both verifications of VMT reductions and additionality (i.e., the requirement that reductions would not have occurred absent funding from the bank) for projects before approving participation in the banking regime. This consideration applies both from the perspective that VMT reductions are not accounted for in the VMT estimating technique and that this is truly new mitigation (not just shifting money around). For specific proposed reductions, the agency or the developer must demonstrate that reductions would not have occurred under the current plan but under this new project.

If not, the developer should generate further reductions

If yes, the developer has the claim to mitigate its impact

Prioritization for the additionality could be a smooth path. Projects such as transit pass subsidies can be cleared first since additionality is the clearest.

For verification, agencies could try to exercise in-house or create a smaller body to handle verifications at the regional level. In that case, agencies should consider:

Increasing their computational powers, and modeling capacities.

The need for ongoing monitoring of any potential discrepancies between the forecasts

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<sup>20</sup> Superior Court of the State of California, *Court Petition*, [200-v-OPR-Complaint-12-18.pdf \(thetwohundred.org\)](#), accessed on April 11<sup>th</sup>, 2022

If agencies cannot verify in-house, they can have third-party off-set verifiers<sup>21</sup> could be a possibility to avoid concerns about self-verification such as improper influence, and undermined public trust.

## **GEOGRAPHY**

Limiting the impact area to offset in the jurisdiction or project boundary is arbitrary. VMT by nature might not be local, while locally administered programs are limited in their jurisdictions. In addition to that, developers might choose a particular type of mitigation beyond the minimum required for good publicity.

Some experts argue that VMT is a regional phenomenon and that is how it should be addressed in terms of VMT mitigation options. There could be a transparent exchange between local and regional approaches to VMT. Local programs which generate reductions could be used to offset regional level VMT generating projects. It should also be noted that regional demand management practices can cause some local VMT mitigation exchanges to be overlooked even though they can accomplish significant reductions at a much lower cost.

Agencies argue that larger infrastructure investments are not considered attractive options for off-site mitigation, whereas in practice they choose roadway improvements. Mitigation banks or exchanges could also include measures to ensure that developers or agencies first exhaust their on-site VMT mitigation options before authorizing their participation in the program unless they direct those measures to disadvantaged communities.

## **LINKAGE BETWEEN GOVERNMENTS**

The linkage between local and regional governments and agencies must be strengthened to create linkages between VMT impact nexus, project and plan-level funding streams, and administrative/implementation pathways. The continual development of the VMT body of knowledge through grants could also be managed at the state level.

In addition, transportation experts note that VMT estimation is still challenging, and error bars are still very large. Some agencies are using more than one tool since local experts don't have confidence in the existing tools to estimate VMT. Developing robust VMT estimation and evaluation tools should be prioritized and deployed to local governments.

## **EQUITY**

Some programs, when not vetted, may lead to equity issues – where mitigation is provided in an area already suffering from VMT when the source is in a distant suburb. In another scenario, while off-site mitigation is considered, an existing community adjacent to the development could expect an immediate mitigation effort since they are the ones being impacted. Off-site mitigation that safeguards equity does not necessarily alleviate that community's concerns.

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<sup>21</sup> 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.

Disadvantaged communities that are compact, low-income, and have good access to transit produce the lowest amount of VMT. However, results show that access to transit does not necessarily result in mode-shift. Any access to transit should be reinforced and supported with urban design features. A study argues<sup>22</sup> that VMT-efficient areas need to be identified since they have the biggest opportunities for VMT mitigation. If a development site is in a VMT-inefficient area, it might be too late to harness the best opportunities for mitigation in that region. These arguments align with some of the current practices as equity is a foundational aspect of VMT mitigation. The Bay Area's Metropolitan Transportation Commission (MTC) has developed Community-Based Transportation Plans (CBTPs) that help identify specific project sites. San Diego's "Climate Equity Index" is another tool that is used to address historical inequities suffered by communities of color. It is argued that racial equity is much more challenging to address than geographical equity.

Programs need to be carefully vetted to avoid the potential for disproportionate impacts on low-income and minority communities. Benefits of Fee-Based VMT Mitigation Programs should also be distributed equitably.

## UNINTENDED CONSEQUENCES

Given the relative newness of these programmatic approaches, the potential for unintended consequences exists. Care needs to be given to avoiding program designs that disincentivize good public policy or that don't find an appropriate balance between efficient VMT mitigation in terms of return on investment and community values. It's not easy to navigate between financial cost, political cost, and feasibility. Having an exchange program would lay the ground for the long-term market to track performances of different mitigation options and streamline fees at a regional scale.

Agencies should also be diligent in their VMT mitigation duration. If a roadway capacity investment is tied to LOS, the duration would last until additional traffic depreciates the LOS to what it was before the investment was implemented. If the mitigation is a program such as a transportation management organization, the duration could last in perpetuity, which would be very expensive. Neal Peacock's paper provides examples of annual reporting mechanisms that demonstrate that transportation impact fees are being collected in sufficient volumes, year to year, to effectively fund Tier 1 projects<sup>23</sup>. Research shows that the nexus methodologies between impacts and improvements and the successful use of these fee programs as mitigation under CEQA as discussed above vary by region.

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<sup>22</sup> Alexander, S.E., Alfonzo, M., Lee, K., Safeguarding Equity in Off-Site Vehicle Miles Traveled (VMT) Mitigation in California, 2021. <https://transweb.sjsu.edu/sites/default/files/2027-Alexander-Equity-Off-Site-VMT-Mitigation.pdf>

<sup>23</sup> Neil Peacock, *The Potential for Regional Transportation Impact Mitigation Fee Programs and Mitigation Banks to Help Streamline the Implementation of SB 743*, March 2017

## OTHER CHALLENGES

### Projects approved prior to SB743:

The question arises for those projects<sup>24</sup> that rely on existing environmental documents, but where LOS analysis was used to approve the project. As a result, some lead agencies are taking the position that previously relied-on litigation measures are not feasible or enforceable. OPR has guided when projects can rely on a prior environmental document that analyzed traffic impacts under LOS rather than VMT finding that “an agency may use its discretion to determine that a VMT analysis is not required for later-prepared documents. However, it is argued that VMT impacts are not new information and were known at the time. It can be argued that agencies were aware of VMT but did not choose to study and share those impacts. So far, courts have not yet had a chance to weigh on CEQA issues in this context of the project’s reliance on prior environmental documents that use a LOS analysis. To avoid any challenges, VMT bank and exchange programs should rely on new environmental reports. If not possible, demonstrating that the project falls below VMT thresholds or reviewing applied development policies to show findings that they would substantially mitigate the impact could be solutions.

### Slow Down on Home Building:

Adopting SB 743, and its guidance on VMT mitigation arguably slowed down the amount of residential development and construction, especially the larger developments<sup>25</sup>. For instance, Clovis County Council is moving forward with an all-encompassing Environmental Impact Report (EIR) to take some of the law’s uncertainty out of the equation so that not every project is subject to an EIR<sup>26</sup>. Developers will be asked to fund an umbrella EIR, but questions arise about whether the city was helping developers make profits by paying for an umbrella EIR.

In addition, developers might be discouraged from building housing across the state if large mitigation fees are used to support public transportation projects. Another aspect of the problem is that retail development typically requires attracting customers who would drive to the shops. In the absence of truly exceptional transit service and service riders, mitigation efforts to reduce driving, say to a regional shopping center, would be counterproductive to the goals of the development.

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<sup>24</sup> Grid Legal, [VMT Impacts: Can Prior CEQA Documents Be Relied on That Did Not Study VMT Impacts?](https://www.gridlegal.com/post/vmt-impacts-prior-ceqa-documents), accessed on April 19<sup>th</sup>, 2022.

<sup>25</sup> GVWire, *State’s VMT Law Driving Builders Away, Making Homes More Expensive*, Say Valley Lawmakers, <https://gvwire.com/2021/03/02/states-vmt-law-driving-builders-away-making-homes-more-expensive-say-valley-lawmakers/>, accessed on April 11<sup>th</sup>, 2022.

<sup>26</sup> GVWire, *With State VMT Law Limiting Home Building, Clovis Takes Action*, <https://gvwire.com/2021/04/07/states-vehicle-miles-traveled-law-is-limiting-home-building-city-of-clovis-takes-bold-action/>, accessed on April 11<sup>th</sup>, 2022.

### Charging Developers a VMT Tax

San Diego Association of Governments (SANDAG)<sup>27</sup> is considering taxing developers based on vehicle miles traveled by their tenants (an additional \$10,000 - \$22,000 per mile traveled). As the revenue from gas tax shrinks due to electric and hybrid vehicles becoming more common, this could allow collecting revenue to achieve state and regional goals. A VMT tax would also encourage residential developments to be built close to job and activity centers. During the housing crisis, anything that increases the cost of housing could have adverse effects on the market and the public eye.

A similar proposal faced opposition in other regions of the country. A proposal circulated to replace the 18.4 cents per gallon tax with a VMT tax in Washington D.C. was not successful<sup>28</sup>. Proponents in California state that the state's gas tax could be replaced by a "miles drive fee" of \$0.05, even though the elimination of the gas tax is not guaranteed. However, opponents claim that this proposal penalizes low-income and working families who drive long distances to work. In addition, the VMT tax could singularly equate to or exceed the construction cost of a new home through its lifespan, which could go as high as \$640,000 if the project is not close to a transit station.

## Chapter 6: Key Takeaways

This chapter summarizes the key takeaways and detailed considerations for implementing agencies to successfully design and create fee-based VMT mitigation programs. **Table 2** provides a comparison table for VMT Exchange and VMT Banking discussing pros and cons of each program. **Figure 2** outlines a workflow diagram for agencies to consider for designing and creating a fee-based VMT mitigation program.

- Agencies need to verify VMT reductions and additionality for projects before approving participation in the banking regime
  - Any agency implementing a bank or exchange must demonstrate both a reasonable substantive relationship and financial proportionality between the proposed development and the fee or condition placed on it
- Agencies should also be diligent in their VMT mitigation duration as nexus between improvements and successful use of fees vary region by region
  - Bank arrangements that receive and pools funds from multiple projects should account for the delay between payment and deployment of funds as it measures the cost of VMT mitigation and negotiates with developers
  - All models should also determine a comprehensive framework for the prioritization of individual mitigation projects, in order to ensure that reductions are achieved as quickly and efficiently as possible

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<sup>27</sup>StreetBlog Cal, *San Diego County Ponders a VMT Tax, with a Twist*, [San Diego County Ponders a VMT Tax, with a Twist – Streetsblog California](#), accessed on April 11<sup>th</sup>, 2022.

<sup>28</sup>Powering California, *ANALYSIS: Vehicle Miles Traveled Tax (VMT)*, <https://poweringcalifornia.com/analysis-vehicle-miles-traveled-vmt-tax/>, accessed on April 11<sup>th</sup>, 2022.



- A VMT exchange might be simpler for developers, but it could also limit the usefulness of funds from smaller developments and be less politically agreeable to local communities
  - Offer more certainty for developers regarding the kinds and costs of appropriate mitigations needed to address cumulative VMT impacts
- New plans and programs might increase new home costs, which can push disadvantaged communities further behind in their ability to access homeownership
  - Significant equity issues may also arise if disadvantaged communities host developments but not beneficial mitigation projects
  - Any lead agency will need to include rigorous backstops to ensure that disadvantaged communities are not negatively impacted by—and ideally can benefit from—the ability of developers to move mitigation off-site
- Implementing agencies should consider requiring or providing incentives for developers or lead agencies to demonstrate that on-site mitigation is not feasible before being permitted to undertake off-site measures
- VMT Banks and Exchanges comprehensively address VMT impacts across jurisdictional boundaries

**FRAMEWORK PROS AND CONS**

Programmatic approaches studied throughout this effort hold great promise for VMT mitigation as they can allow a project to obtain an amount of mitigation precisely commensurate with their impact. However, these programmatic approaches have a number of advantages and disadvantages in terms of implementation, legal considerations, etc. Weighing up pros and cons can speed up the decision-making process for implementing agencies as well as improving the understanding of the concepts.

**Table 2** below provides a summary of the pros and cons:

*Table 2 Framework pros and cons<sup>29</sup>*

Program Type	Pros	Cons
Mitigation Exchange	<ul style="list-style-type: none"> <li>• Limited complexity</li> <li>• Reduced nexus obligation</li> <li>• Expands mitigation to include costs for programs, operations, and maintenance</li> <li>• Allows for regional scale mitigation projects</li> <li>• Allows for mitigation projects to be in other jurisdictions</li> </ul>	<ul style="list-style-type: none"> <li>• Requires “additionality”</li> <li>• Potential for mismatch between mitigation need and mitigation projects</li> <li>• Increases mitigation costs for developers because it increases feasible mitigation options</li> <li>• Unknown timeframe for mitigation life</li> </ul>

<sup>29</sup> Fehr & Peers, *VMT Mitigation Through Fees, Banks, and Exchanges*, April 2020

	<ul style="list-style-type: none"> <li>Increases potential VMT reduction compared to project site mitigation only</li> </ul>	<ul style="list-style-type: none"> <li>Effectiveness depends on scale of the program</li> </ul>
Mitigation Bank	<ul style="list-style-type: none"> <li>Add certainty to development cost</li> <li>Allows for regional scale projects</li> <li>Allows for mitigation projects to be in other jurisdictions</li> <li>Allows regional or state transfers</li> <li>Expands mitigation options to include costs for programs, operations, and maintenance</li> <li>Increases potential VMT reduction compared to project site mitigation only</li> </ul>	<ul style="list-style-type: none"> <li>Requires “additionality”</li> <li>Time consuming and expensive to develop, and maintain</li> <li>Requires strong nexus</li> <li>Political difficulty distributing mitigation dollars/projects</li> <li>Increases mitigation costs for developers because it increases feasible mitigation options</li> <li>Unknown timeframe for mitigation life</li> <li>Effectiveness depends on scale of the program</li> </ul>

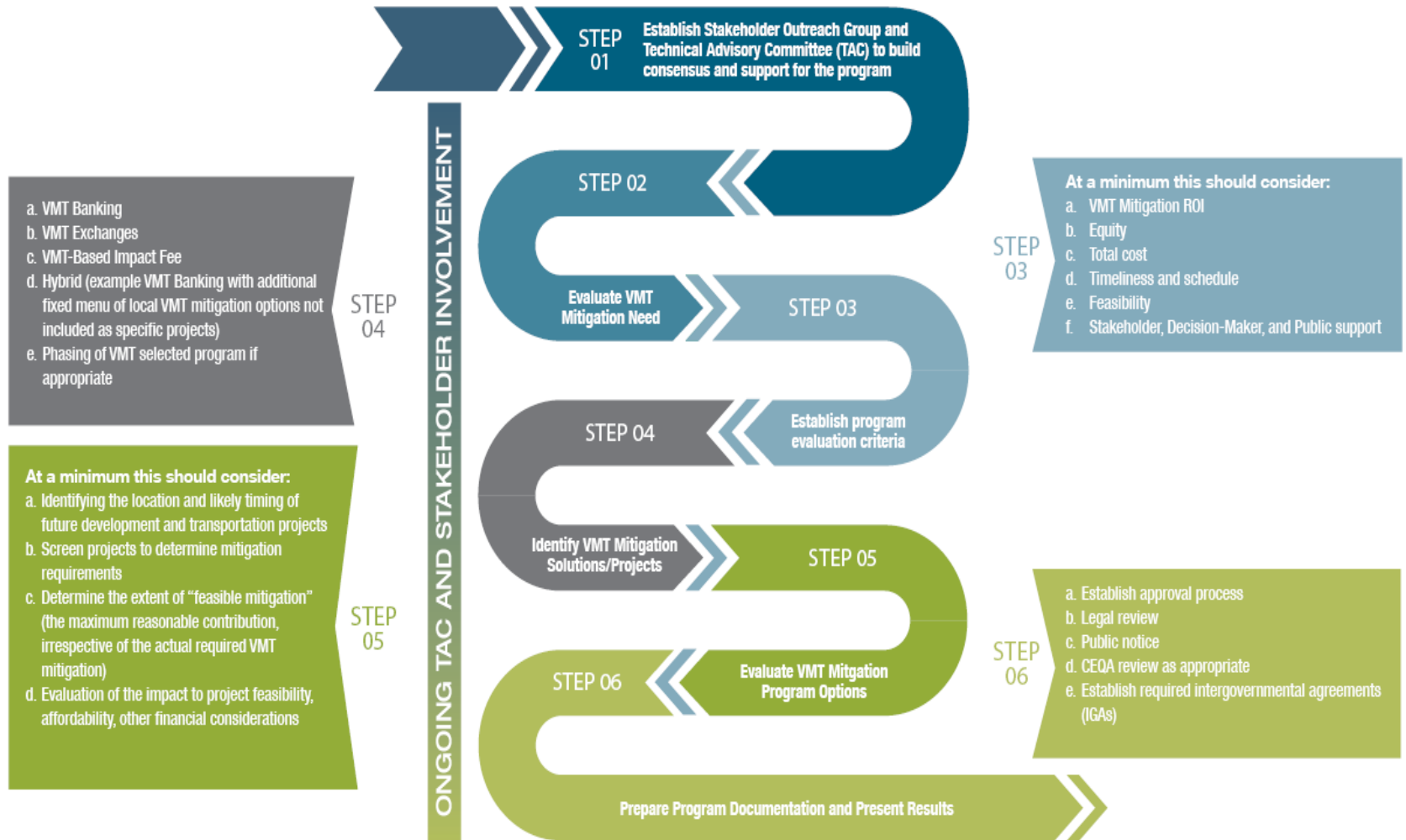


Figure 2 Workflow Diagram



# Regional VMT

*Mitigation Program Study*



## APPENDIX B – MODELING APPROACH

## **Fresno COG Vehicle Miles Traveled (VMT) Mitigation**

The Fresno COG VMT mitigation program involves quantifying the potential VMT reduction for different types of future development and infrastructure and policy projects to better understand which types of projects will provide the highest VMT reductions. Our approach to quantifying the potential VMT reduction is to apply the Fresno COG activity-based model (ABM) for each project of interest and compare the future baseline with the future build model runs to produce the VMT reduction associated with the project. There are some project types that require additional effort to adapt the model, and these are identified with a level of effort needed to enhance the model. There is a summary that includes our recommendation for each project type, including any discussion of additional effort needed for this project. In a few cases, additional information on future enhancements is provided but if the level of effort is significant, we assume that this would not be included for this project.

### ***Project Types***

- Pedestrian Infrastructure Projects
- Bicycle Infrastructure Projects
- Transit Operational Projects
- Mobility Hubs e.g. SANDAG
- Land use Projects e.g. affordable housing, TOD
- Travel Demand Management Projects e.g. carpool and vanpool programs, telecommuting, parking fees/incentives

### ***Approach to Evaluating VMT Reduction***

As mentioned above, our approach to evaluating VMT reduction is to first identify whether the Fresno ABM is appropriate for a particular project type and if not, what other options are available to evaluate VMT reduction. In some cases, a small effort can provide the needed enhancements to allow the Fresno ABM to be applied for VMT reductions. In other cases, the level of effort is significant and not considered appropriate for this study but may be useful for future enhancements of the ABM.

### ***Pedestrian Infrastructure Projects***

Currently, the Fresno ABM includes walk times based on the distance of the shortest path. Pedestrian infrastructure projects are not represented by type and would not be able to produce VMT reductions using the current ABM, but future updates to this model could include designations of pedestrian facility types to weight pedestrian travel times similar to those used for bicycle travel times. The Fresno ABM includes a walk assignment based on shortest distance to produce pedestrian volumes, and this can also be updated to include weights for pedestrian facility types. An off-model approach might be a better option for pedestrian projects.

## Bicycle Infrastructure Projects

The ABM has advanced features to evaluate bicycle infrastructure projects. Bicycle facilities are identified as one of six types:

- Bike path
- Bike lane
- Bike route
- Separated bike lane
- Separated highway crossing
- Unpaved multipurpose trail

These bicycle facilities are weighted to represent the added value to bicyclists who use these facilities. These weights are included as less time per mile for better bicycle facilities and more time per mile for no bicycle facilities. In the Fresno ABM, the weight for no bike facility is 6 minutes per mile, a bike route is 4.9 minutes per mile, a bike lane is 3.1 minutes per mile and a bike trail is 2 minutes per mile.

The Fresno ABM includes a mode choice model and subsequent bicycle assignment that assigns bike trips to the best path using a generalized cost based on bike facility type. We expect that the output of bike trips, combined with the highway assignments, will allow a direct evaluation of the impacts of VMT reduction from bicycle infrastructure projects. Although the bike assignment is part of the Fresno ABM, we do expect it will be needed for this study.

## Transit Operational or Capital Projects

The Fresno ABM can evaluate VMT reduction impacts due to transit operational or capital projects. Any significant transit improvements that improve transit in-vehicle time, walk access and egress times, transfer walk and wait times, initial wait times, or reduce fares can be represented in the transit network and will produce reductions in VMT. Zone-based fares represent the actual fare structure for the Fresno County Regional Transit Authority (FCRTA) bus services and dwell times are included at every stop to better represent transit schedules.

Transit projects can include operational projects (adding or shifting existing buses to existing routes or changing transit fares) and capital projects (adding new buses to new routes). During the development of the Fresno ABM, RSG conducted sensitivity tests for a change in transit fare and a new transit service and these model runs could provide additional reports on VMT reductions to provide insights for future consideration of transit projects to reduce VMT. The Fresno ABM will be used as is to predict changes in VMT due to a transit capital or operational project by running the future baseline and future build models.

## Mobility Hubs

Mobility hubs are communities with a high concentration of people, destinations, and travel choices. They offer on-demand travel options and supporting infrastructure that enhance

connections to high-quality transit options. San Diego Association of Governments (SANDAG) has developed mobility hubs for their regional plan based on total employment for current and future conditions, weighted population density (excluding vacant and undevelopable land), proximity to activity centers (airports, government centers, hospitals, hotels, major attractors (such as amusement parks, sports arenas, and music venues), military installations, shopping centers and universities/colleges. Once the full set of 30 mobility hubs were developed, SANDAG developed composite propensity scores using the above data to prioritize the Census Block Groups with composite scores higher than 29. Mobility hubs aim to reduce VMT through multimodal access to services and amenities.

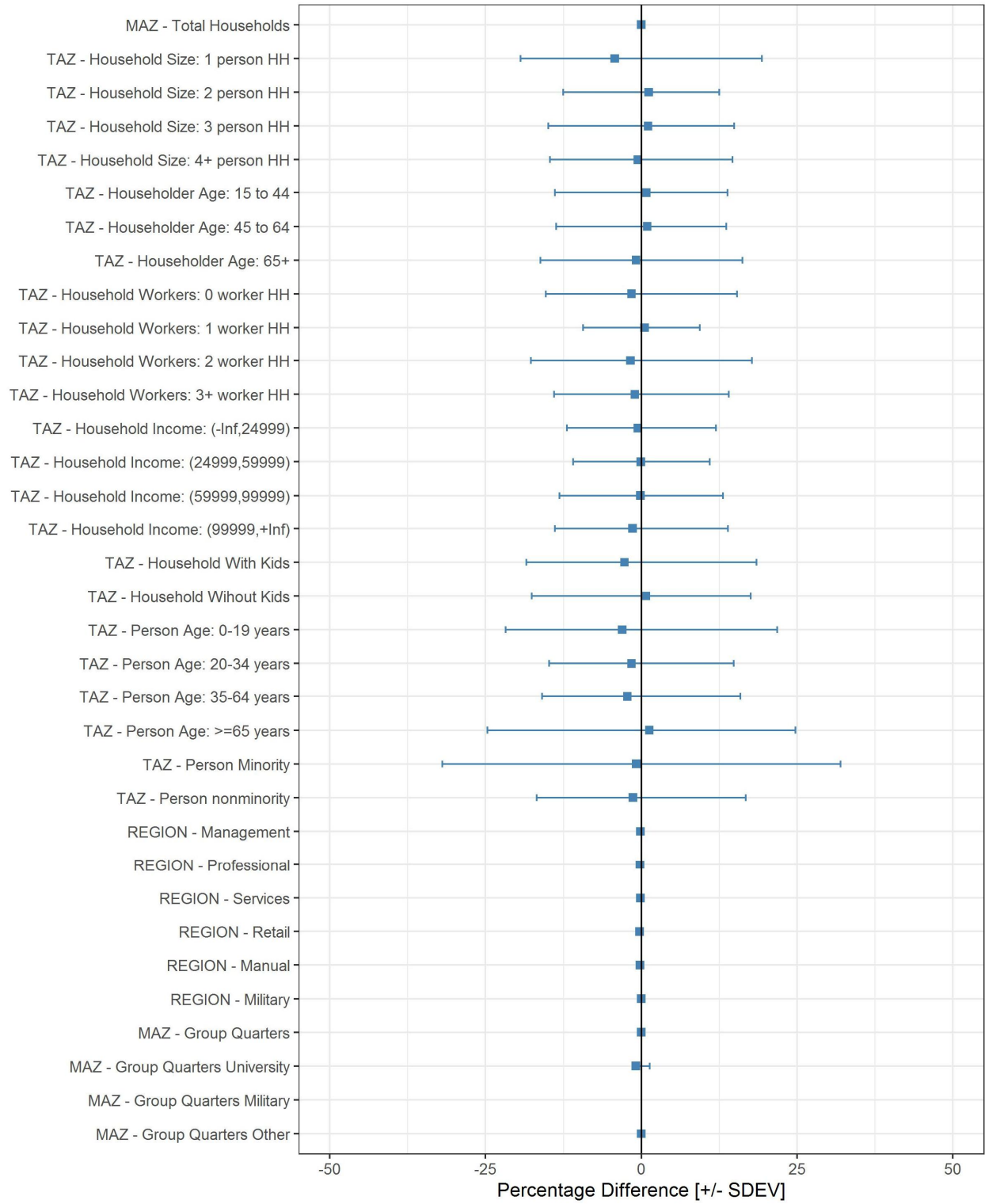
The Fresno ABM can currently be used to produce VMT reduction for transportation projects in mobility hubs in the region. Mobility projects within the mobility hub are expected to provide more VMT reduction than mobility projects outside these hubs. The impact of a mobility hub on VMT reduction can be assessed by comparing a similar transportation project within a mobility hub to the same project outside the mobility hub. These results identify the importance of shared services and amenities within a smaller community. While the Fresno ABM has the capability to evaluate mobility hubs, the effort to identify these mobility hubs for Fresno County is significant.

### Land use Projects

Land use projects are represented in the Fresno ABM by adjusting the inputs to the synthesized population and employment data. New employment centers or developments should be modeled by adding employment from the region into the new development as model inputs and reporting the change in VMT from moving this employment. Transit oriented development can be evaluated in a similar fashion, with additional employment around transit stations.

Housing projects can be modeled in the Fresno ABM by adding new households with expected characteristics to the population synthesizer. This process is known as “repop” and is an extension to PopulationSim for this purpose. Affordable housing can also be included in this analysis by identifying the characteristics of households who will reside in these affordable housing units. These housing projects would require a small amount of additional level of effort to implement fully. The current Fresno ABM can represent additional households and produce changes in VMT from these additional households by expanding the household and person controls for the population synthesis (see Figure 1). We recommend adding the repop feature to the population synthesizer if housing projects are considered as a VMT reduction strategy.

**FIGURE 1. FRESNO POPULATION SYNTHESIS CONTROLS VALIDATION**





## Travel Demand Management Projects

Recently, FresnoCOG staff worked with LSA to assess the range of VMT reduction percentages associated with TDM measures. These included carpool and vanpool programs and affordable housing. Carpool and vanpool programs were evaluated with local data available from FresnoCOG and % change in VMT from carpools and vanpools were estimated from the following modeled data:

- Auto (non-pooled) mode share
- Car/Vanpool mode share
- Length of average auto commute trip
- Length of average car/vanpool
- Average car/vanpool occupancy (carpools were assumed to have 2 occupants)

LSA estimated VMT reductions for affordable housing projects using the “Income, Location Efficiency, and MT: Affordable Housing as a Climate Strategy” by Gregory L. Newman and Peter M. Haas. This research used the California Households Travel Survey data to produce VMT reductions for affordable housing for households with low-income, very low-income, and extremely low-income in rural, suburban, and urban areas. These percent reductions in VMT vary from 7.9% for low-income households in rural areas to 32.5% for extremely low-income households in urban areas.

There are three other TDM programs that can be evaluated with the Fresno ABM: telecommuting, transit pass ownership, and parking fees or incentives:

- **Telecommuting** is represented in the Fresno ABM by a work-from-home model identifying workers who work at home full-time. DaySim also has a telecommuting model component that can be added to the Fresno ABM to predict the demand for telecommuting when a worker works at home occasionally rather than full-time. We recommend applying the current Fresno ABM with assumptions about telecommuting that are implemented with the current work-from-home model since the additional component for part-time telecommuting is a small share of the telecommuting market.
- **Transit pass ownership** is currently predicted in the Fresno ABM as a function of income, employment status, land use and parking supply around the workplace. If the parking cost model indicates that a worker has to pay for parking, then the worker is more likely to own a transit pass.
- **Parking fees or incentives** are currently represented in the Fresno ABM by the number of parking spaces and the daily parking cost. Parking fees or incentives can be applied by raising or lowering these parking costs and/or to increase or reduce parking supply.

TDM programs can be effective to mitigate VMT if there are enough participants on a voluntary basis or if they are implemented on a mandatory basis.

## ***Summary***

The Fresno ABM is a useful tool for quantifying the VMT reduction expected as a result of land use, infrastructure, and policy strategies. That said, the Fresno ABM is not the best tool for all strategies, so each strategy or improvement is considered separately to determine if the Fresno ABM is the preferred tool for estimating VMT reduction. RSG recommends that the following project types produce VMT reduction by applying the Fresno ABM and interpreting the results in the highway assignments:

- Bicycle Infrastructure Projects
- Transit Operation or Capital Projects
- Land Use Projects
- Travel Demand Management Projects (Selected)

Mobility hubs and pedestrian infrastructure projects would require enhancements to the Fresno ABM and the inputs to these models. The work required for mobility hubs would fall largely on local stakeholders to develop and may take more time than this project schedule allows. We are still considering an off-model approach to pedestrian infrastructure projects.



# Regional VMT

*Mitigation Program Study*



## APPENDIX C – VMT MITIGATION PROJECT EVALUATION GUIDE

# FRESNO VMT MITIGATION PROJECT MODELING

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**Report Title:**

Fresno VMT Mitigation Project Modeling

**Report Prepared by:**

RSG

**Report Prepared for:**

Fresno Council of Governments

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## 1.0 INTRODUCTION

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The FresnoCOG VMT mitigation program requires quantifying the potential VMT reduction for different types of future development, infrastructure, and policy projects to better understand which types of projects will provide the highest VMT reductions. For this project, the technical approach was to quantify the potential VMT reduction by applying the Fresno COG activity-based model (ABM) for selected projects of interest and comparing the future baseline with the future build (project) model runs to produce the estimated VMT reduction associated with each project.

### 1.1 FRESNO TRAVEL MODEL

The quantification of project VMT was conducted using the FresnoCOG activity-based travel model. The ABM is run in two sequential steps: input processing and the Fresno model:

- The first step, input processing, processes the model network and creates inputs required by the second step, the Fresno model, which performs network skimming, demand generation, and assignment in three feedback loops.
- After the networks are prepared in required format, the second step, Fresno Model, runs three feedback loops. Each feedback loop starts with generating highway and transit skims to use in demand models.

A set of demand models produce demand for two travel markets in the Fresno County region: resident travel and truck travel. The resident travel demand is generated by DaySim, whereas the truck demand is produced by the truck model, which was retained from the Valleywide Model Improvement Program Version 2 (VMIP2) model. The two sets of travel demand, along with the external demand (auto and truck) generated in the first step, input processing, are combined into four time-period specific highway demand matrices with each having OD demand by multiple highway classes based on vehicle type and value of time. Similarly, the transit demand from DaySim is also prepared into four time period specific transit demand matrices with each having multiple transit assignment classes based on transit sub-mode and access mode. The non-motorized (bike and walk) demand also come from the DaySim model and the corresponding matrices are for daily demand. After the demand matrices are constructed, two highway assignments are run: peak (AM) and off-peak (MD). Note that transit and non-motorized assignments are run only once, in the final assignment step after the feedback loops. The link flows from the two highway assignments then inform new link travel times for the next feedback loop.

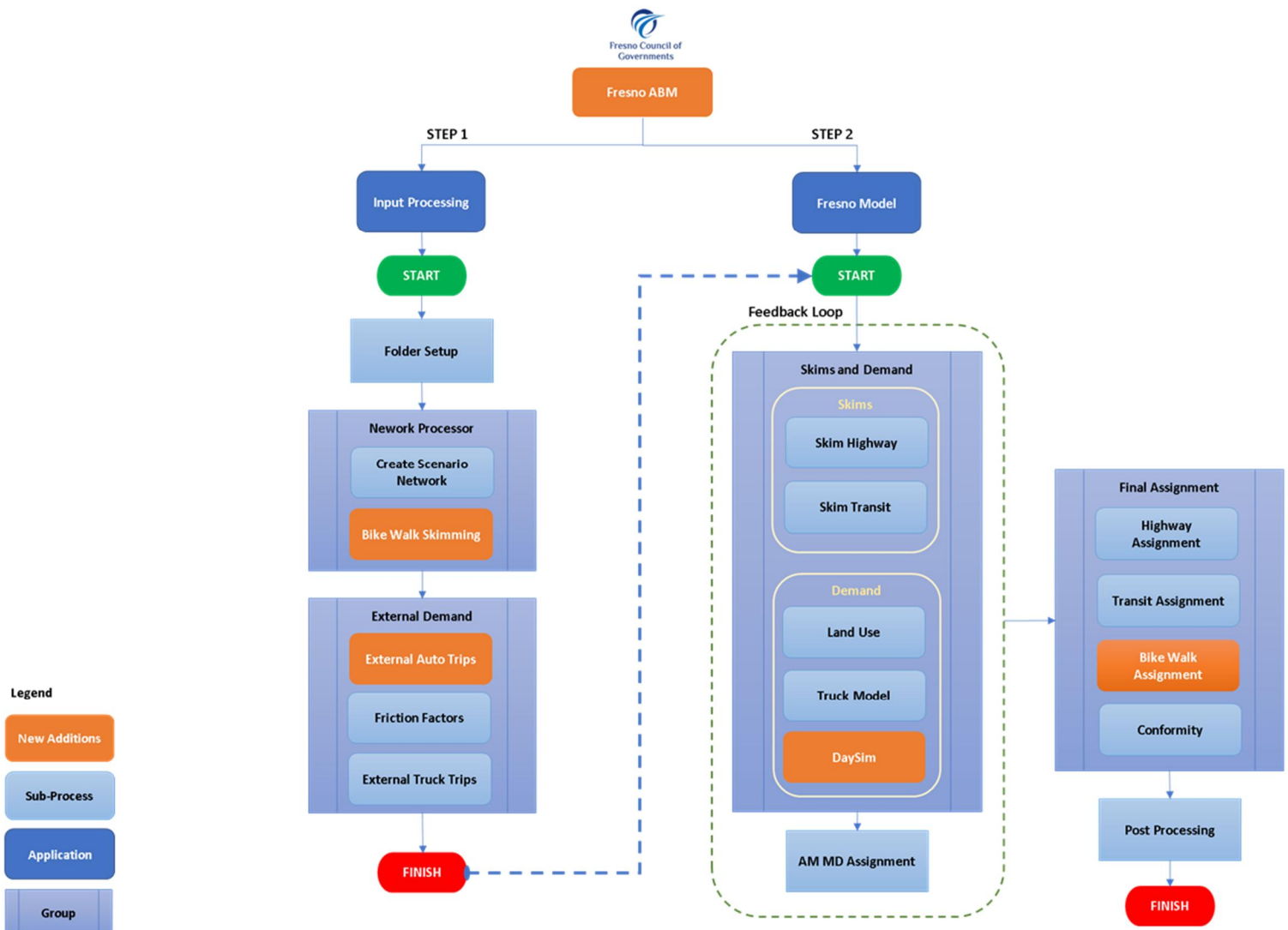
After the model system runs three feedback loops of skimming, demand, and assignment, a final assignment step runs assignment for all network systems (highway, transit, and non-motorized). The final highway assignment is run for four time periods





(AM, MD, PM, and EV) and the transit assignment (also skimming) is performed for peak and off-peak periods. The non-motorized assignments are run for daily demand. After the network assignments, the last step of the model system summarizes the assignment results and produces files/reports to use for analysis. Figure 1 presents structure of the Fresno activity-based model (ABM) system showing the relationship among different sub-model components.

**FIGURE 1: FRESNO ACTIVITY-BASED MODEL (ABM) SYSTEM**



The model can represent a variety of different project types and travel modes, including non-motorized (walk and bike) projects and transit. The ABM has advanced features to evaluate bicycle infrastructure projects. Bicycle facilities are identified as one of six types:



- Bike path (Class I)
- Bike lane (Class II)
- Bike route (Class III)
- Separated bike lane (Class IV)
- Separated highway crossing
- Unpaved multipurpose trail

These bicycle facilities are weighted to represent the added value to bicyclists who use these facilities. These weights are included as less time per mile for better bicycle facilities and more time per mile for no bicycle facilities. In the Fresno ABM, the weight for no bike facility is 6 minutes per mile, a bike route is 4.9 minutes per mile, a bike lane is 3.1 minutes per mile and a bike path and separate bike lane is 2 minutes per mile. The Fresno ABM includes a mode choice model and subsequent bicycle assignment that assigns bike trips to the best path using a generalized cost based on bike facility type. The output of bike trips, combined with the highway assignments, allows a direct evaluation of the impacts of VMT reduction from bicycle infrastructure projects.

The Fresno ABM can also evaluate VMT reduction impacts due to transit operations or capital projects. Any significant transit improvements that improve transit in-vehicle time, walk access and egress times, transfer walk and wait times, initial wait times, or reduce fares can be represented in the transit network and will produce changes in VMT. Zone-based fares represent the actual fare structure for the Fresno County Regional Transit Authority (FCRTA) bus services and dwell times are included at every stop to better represent transit schedules. Transit projects can include operational projects (adding or shifting existing buses to existing routes or changing transit fares) and capital projects (adding new buses to new routes).

## **1.2 MODELED PROJECTS**

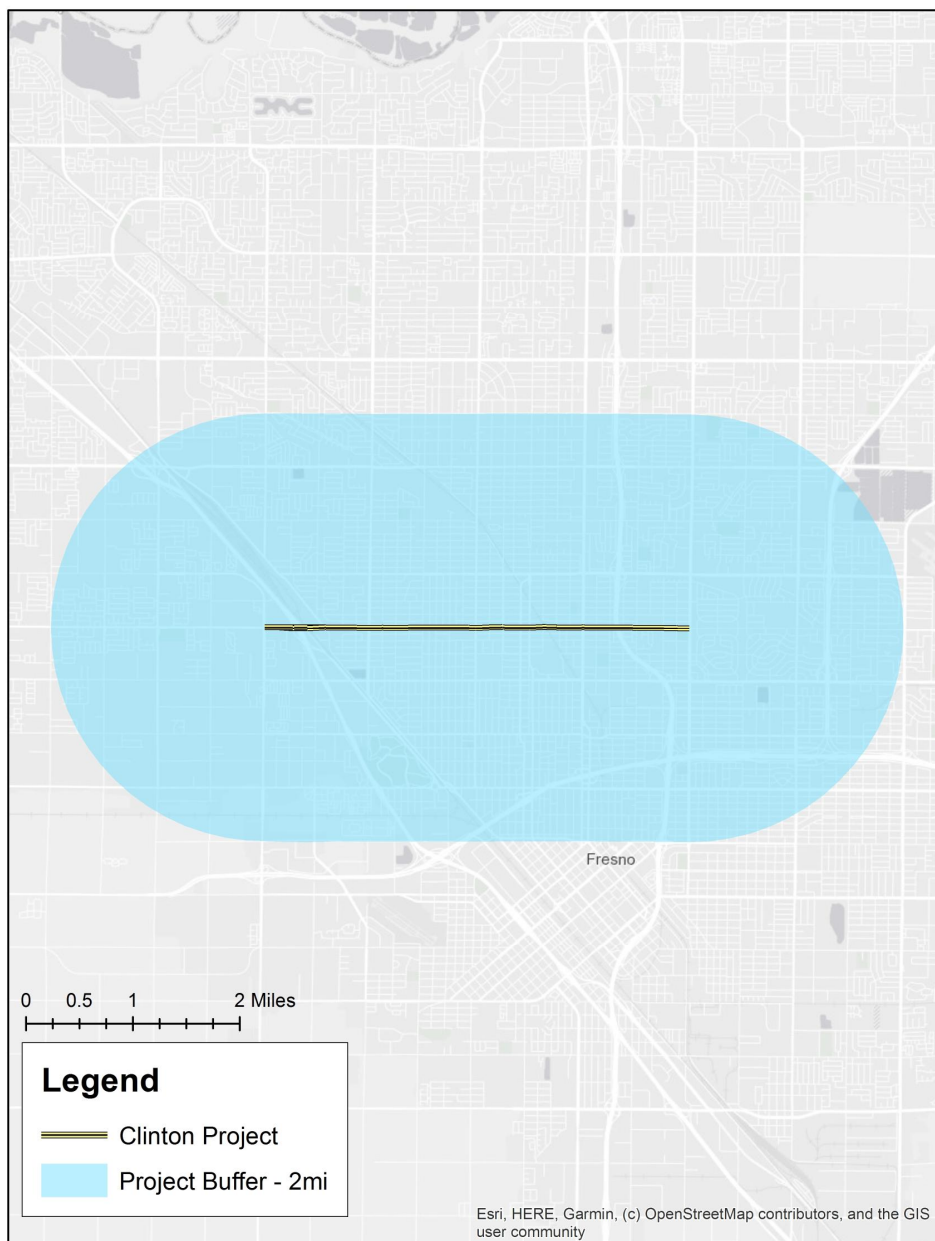
In order to better understand potential VMT mitigation options in Fresno County, the project team considered a variety of different projects to be modeled, which included transit, bike/ped, capacity projects, affordable housing, land use, and transportation demand management. Each of these project types was analyzed using an initial screening process that estimated that expected VMT impact in relation to the project cost. The projects described below were selected to be modeled based upon the expected cost effectiveness for reducing VMT, as well as considerations related to the capability of the model to represent the transportation project.



### **Clinton Bike Lane**

The Clinton Ave Bike project consists of a road diet coupled with the construction of class IV bike lanes from Marks to First in north Fresno. The project is 4 miles long and includes a reduction of vehicles lanes from 2 to 1 in each direction. The estimated project cost is \$1,210,000. Figure 2 shows the Clinton project with a 2-mile corridor buffer.

**FIGURE 2: CLINTON BIKE PROJECT**

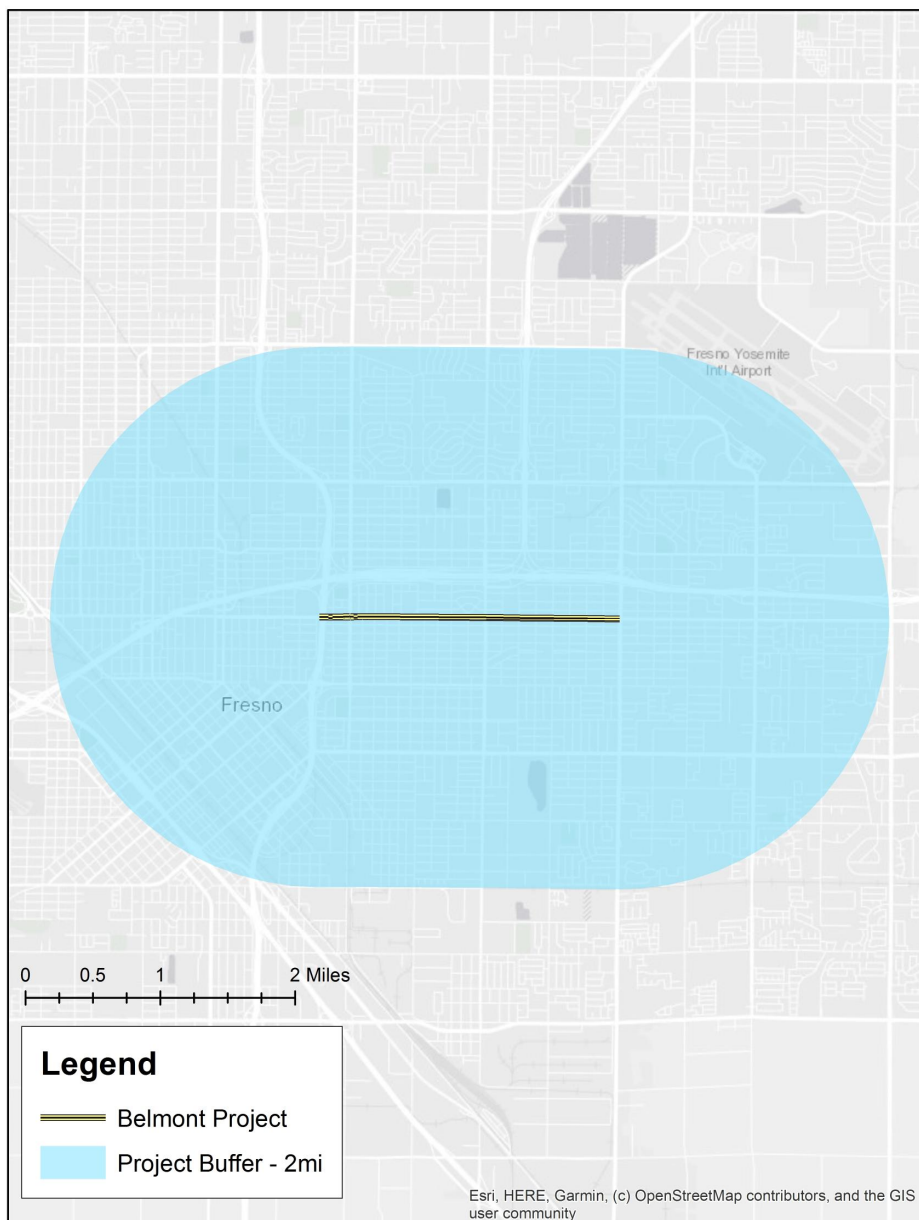




### **Belmont Bike Lane**

The Belmont bike project is a 2-mile road diet and bike/pedestrian project north-east of downtown Fresno. The project consists of a reduction in travel lanes from 4 to 2, construction of class II bike lanes, and pedestrian bulb-outs. The estimated project cost is \$605,000. Figure 3 shows the Belmont bike project with a 2-mile corridor buffer.

**FIGURE 3: BELMONT BIKE PROJECT**

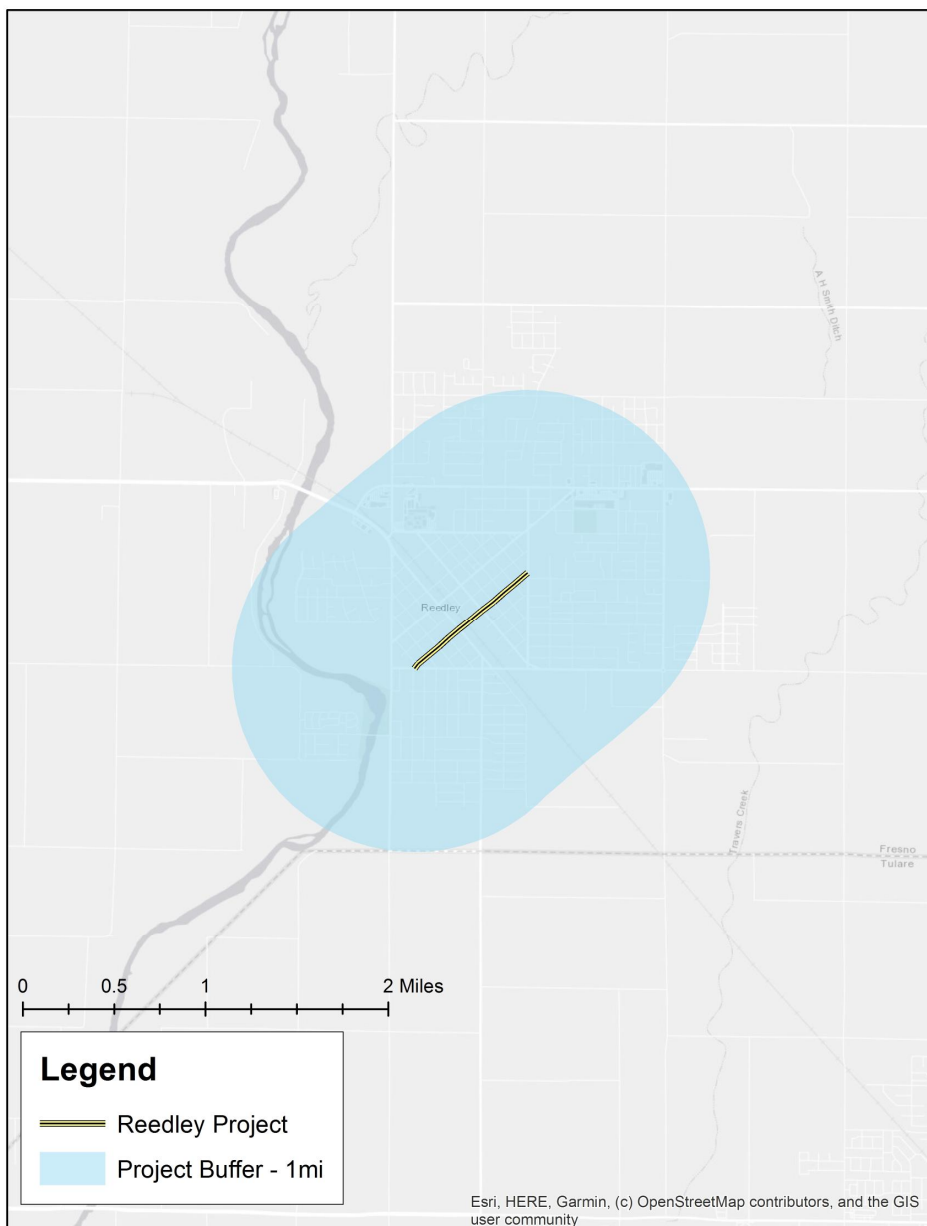




### **Reedley Bike Lane**

The Reedley bike project consists of 0.8 miles of new class II bike lanes in downtown Reedley. The estimated project cost is \$100,000. Figure 4 shows the Reedley bike project with a 1mi corridor buffer.

**FIGURE 4: REEDLEY BIKE PROJECT**

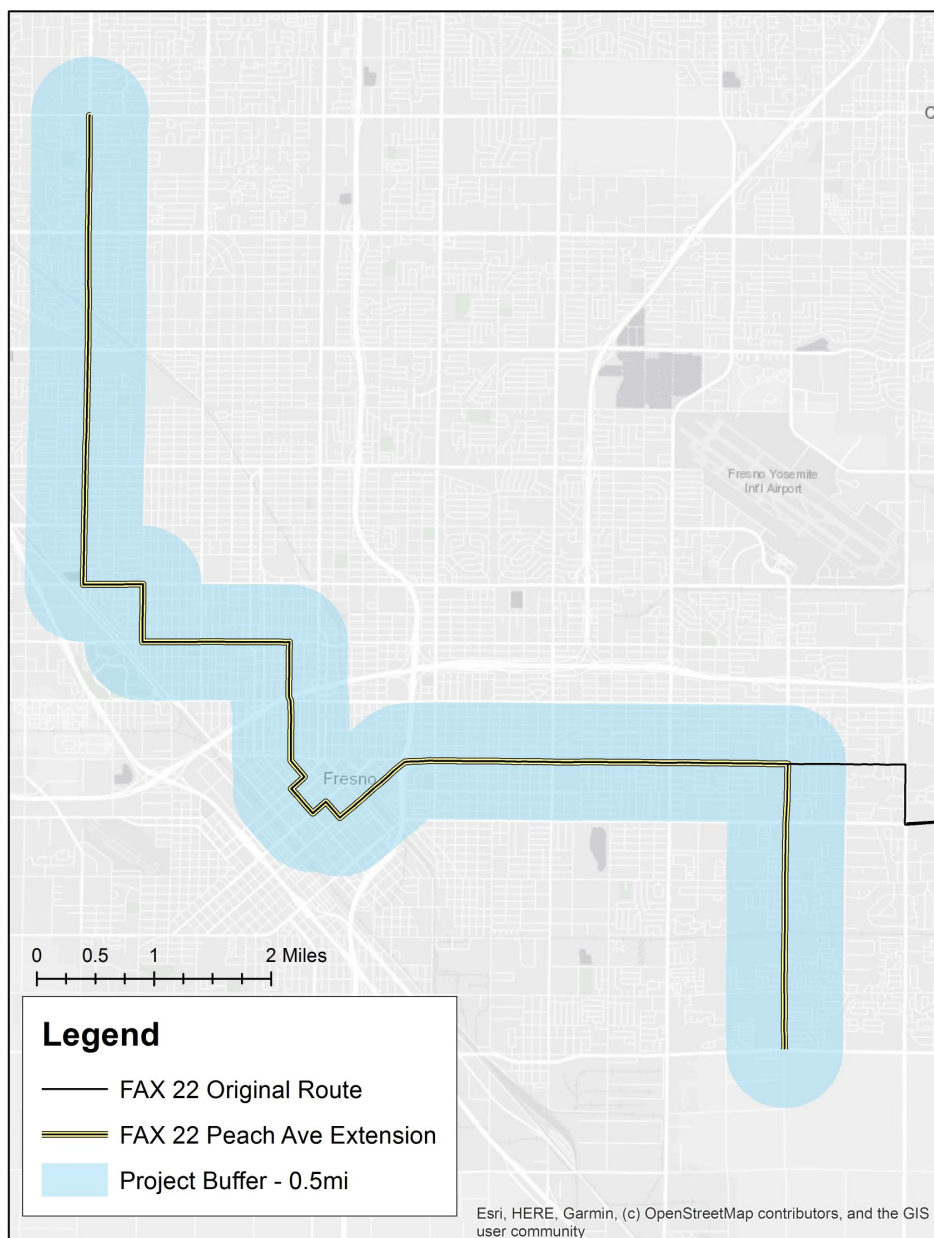




## ***Peach Transit Service Expansion***

The Peach project is a transit operations project that goes north-south through downtown Fresno. The project consists of a minor route modification at the southern end of the existing FAX 22 transit route. The result of the route alteration is a net increase in 0.75 total miles of service. The existing route service and headways are not expected to change. The estimated project cost is \$1,500,000. Figure 5 shows the Peach transit service expansion with a 0.5mi corridor buffer.

**FIGURE 5: PEACH TRANSIT SERVICE EXPANSION**





## ***Shaw Avenue Express Transit***

The Shaw project is a transit operations project that implements express transit service on Shaw Ave, which is an arterial route north of Fresno. The project decreases headways from 15 to 10 minutes over a 14 mile stretch of roadway. The estimated project cost is \$25,000,000. Figure 6 shows the Shaw Ave Express transit service with a 0.5 mi corridor buffer.

**FIGURE 6: SHAW AVE EXPRESS TRANSIT**





## 2.0 MODELING METHODOLOGY

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The modelling approach for each scenario is to modify the necessary inputs to represent the project and perform a complete model run with the modified inputs. Vehicle miles traveled for each scenario is reported based on the network location of links within the selected project buffer. Only resident VMT is reported to isolate the impacts of the scenarios on mode choice. Resident VMT is calculated from the assigned network by multiplying the daily passenger volumes by the link distance in miles (truck and external volumes are not included). Only roadway links are included in the analysis; no zone connectors are included. Only links which intersect the project buffer are used and the total VMT in the buffer is the sum of VMT across all these links. For the bike projects, the bike miles traveled is similarly reported on links that intersect the project buffer. Bike miles traveled is calculated by multiplying the daily bike volumes by the link distance in miles. The change in VMT is evaluated based on the difference of VMT in the buffer distance between the 2029 build and 2029 no-build scenarios.

The project team discussed and agreed on appropriate buffers for the different kinds of projects. Transit projects are evaluated in a half-mile buffer which is consistent with how far a typical pedestrian is willing to walk to transit. Bike projects are evaluated in a 2-mile buffer which is consistent with an average bike trip distance. The Reedley bike project is evaluated in a 1-mile buffer because a larger buffer would exceed the model boundary and as a smaller bike project this was considered appropriate.

### 2.1 MODELING SPECIFICATIONS

To eliminate model 'noise', the shadow pricing procedure was disabled for each scenario run. The no-build scenario was run once fully with shadow pricing enabled and those shadow pricing outputs were used as the inputs for the scenario runs. Shadow pricing is a feedback loop that creates consistency between work location choices and employment centers. Running more or less iterations or running with different inputs can cause model noise due to resident work location shifts. For small infrastructure projects such as those being modeled here, it is reasonable to expect minimal changes in destination choices and particularly work location choice. The evaluation of each scenario was therefore better determined by disabling the shadow price procedure. The updated FresnoABM catalog file includes a binary flag to enable and disable shadow pricing. If an older version is being used, the shadow pricing loop can be manually disabled by setting the execution order to zero. The shadow pricing inputs being used in lieu of running the shadow pricing procedure should be pasted in the folder: "Scenarios\{Scenario Name}\11\_DaySim\working".

#### **Bicycle Projects**

The bicycle projects were coded directly in the model network by updating the "BIKE\_IMP\_FACTY" field to the appropriate facility type and setting the





“BIKE\_IMP\_PRJYR” to a year that occurs before the current scenario year. It is important to note that if the “BIKE\_IMP\_PRJYR” (project year of bike facility improvement) is coded after the current model scenario year, the bike facility will not be included in the network even if it is coded in the ‘BIKE\_FACTY’ field. To avoid this, make sure that the “BIKE\_IMP\_PRJYR” is set to a year that occurs before the current scenario year, and the project is coded in the “BIKE\_IMP\_FACTY” field. Alternatively, the “BIKE\_IMP\_PRJYR” can be set to zero and the project in the ‘BIKE\_FACTY’ field will be included in all scenario years.

When a lane reduction was included in the project the link ‘BASE\_LANES’ field was adjusted accordingly.

## **Transit Projects**

To input transit projects into the model, they can be coded directly in the transit line file. The re-route to the Peach Transit project was made by adding each highway node along the new route and adding stops at the major intersections along the way either where bus stops already existed or where it was inferred they should exist. For the Shaw Transit project, the headway of the FAX 09 route was decreased from 15 to 10 minutes.



## 3.0 PROJECT-LEVEL VMT REDUCTIONS

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This section presents the results of the project-level VMT reductions, which are based upon outputs from the Fresno activity-based travel model. There are a variety of ways to summarize model outputs and the nuances of each method may produce slightly different results. For example, VMT can be reported at the regional scale, on the actual roadway network where a project exists, or within a pre-defined geographic buffer around the project. At a regional scale, when modeling a singular, relatively small project it is difficult to discern the impact of the project by itself because there exists inherent model variability (“noise”) within a regional travel model. When looking solely at the project, the results are overly narrow and do not necessarily account for travel behavior impacts beyond the direct project vicinity.

RSG recommends evaluating a project with a geographic buffer to capture immediate impacts surrounding the project. It is important to define a buffer that minimizes the amount of regional variability that is captured but still accounts for actual project impacts that occur within adjacent neighborhoods and land uses beyond the narrow project area. The project team discussed all of these considerations and concluded that the most accurate way to report VMT results was using a relatively small buffer area around the project (1/2 – 2 miles, depending on the project).

### 3.1 BIKE PROJECTS

There are three bike projects that were evaluated based on VMT reductions in Fresno: the Clinton Bike Lane, the Belmont Bike Lane, and the Reedley Bike Lane. The Clinton and Belmont Bike Lane projects included road lane reductions as well as bike lanes. The Reedley Bike Lane project did not include any road lane reductions.

#### Clinton Bike Lane

Using a 2-mile buffer as the area of analysis, the Clinton bike lane project produced a net increase of five thousand (+5,549) vehicle miles traveled (VMT) as shown in Table 1. Although bike projects in general are expected to decrease VMT, this project highlights an important observation that if bike projects reduce the number of vehicle lanes, in some situations this may cause vehicle rerouting to longer routes that actually increase the total number of miles driven. For the Clinton bike lane, the project is located on a heavily trafficked corridor with few land use attractors; it is mostly used to get to and from other locations, rather than as a destination area. Therefore, while there was some increase in the number of bicycle trips (Table 2), those were overshadowed by the number of travelers that continued to use an automobile and simply took a different – longer – route. While VMT on the actual corridor decreased – as is expected when the number of lanes are reduced – VMT on adjacent roadways increased due to rerouting. Figure 7 shows the change in daily volumes on links around the project corridor where this behavior can be seen.



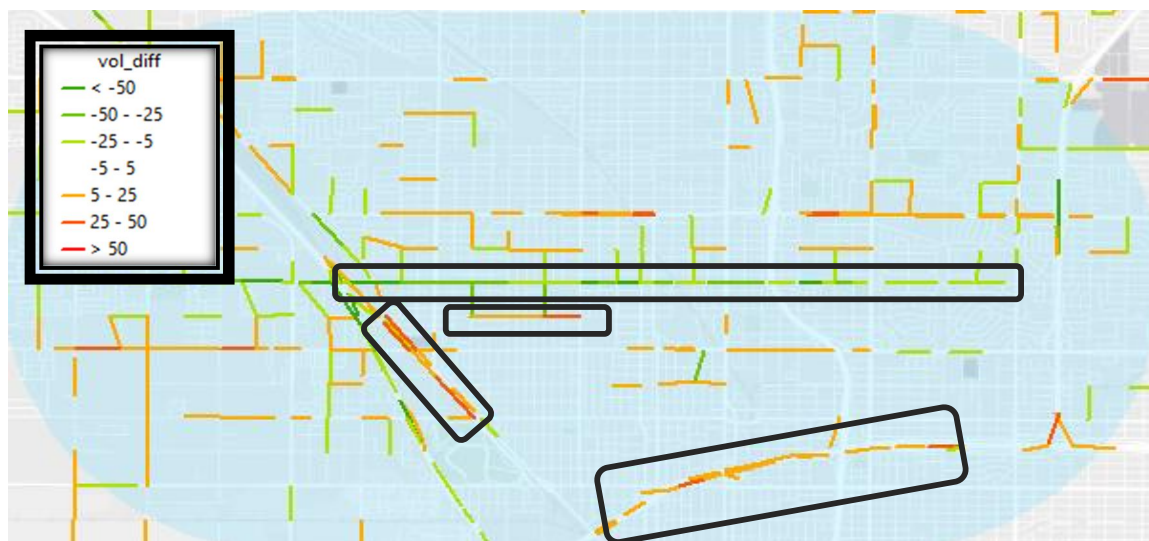
**TABLE 1: CLINTON BIKE PROJECT VMT**

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	PERCENT DIFFERENCE
2-mile Project Buffer	2,538,169	2,543,718	5,549	0.22%
Outside Buffer	13,423,737	13,445,366	21,629	0.16%
Regionwide	15,961,906	15,989,084	27,178	0.17%

**TABLE 2: CLINTON BIKE PROJECT TRIP MODE**

MODE	BASE TRIPS	BUILD TRIPS	DIFFERENCE
Drive Alone	1,553,147	1,553,307	160
Shared Ride 2	887,651	887,183	-468
Shared Ride 3+	947,478	946,941	-537
Transit	29,712	29,598	-112
Bike	40,553	40,791	238
Walk	397,010	397,192	182
School Bus	65,123	65,007	-116
Total	3,920,674	3,920,019	-655

**FIGURE 7: CLINTON BIKE PROJECT CHANGE IN DAILY VEHICLE VOLUMES**



### Belmont Bike Lane

Using a 2-mile project buffer, the Belmont bike lane produced a net decrease of two thousand (-2,003) VMT as shown in Table 3. Although this project also included lane



reductions, the project did not produce significant vehicle rerouting, which sometimes may lead to increased VMT. Potential rerouting did not occur because this project is located in an area closer to downtown, with more destinations; in order for travelers to reach these destinations they select other modes when vehicle lanes are reduced. Figure 8 shows the daily change in volumes around the project corridor where it can be seen that no significant re-routing is happening on parallel facilities.

Table 4 shows the bike miles traveled in the project buffer and in the region where it can

REPORTING AREA	BASE BMT	BUILD BMT	DIFFERENCE	PERCENT DIFFERENCE
BMT 2 mi Prj Buffer	23,757	23,899	142	0.60%
BMT Outside Prj	88,028	89,063	1,035	1.18%
BMT Region	111,785	112,963	1,178	1.05%

also be seen that more miles are travelled by bike when the Belmont bike project is implemented.

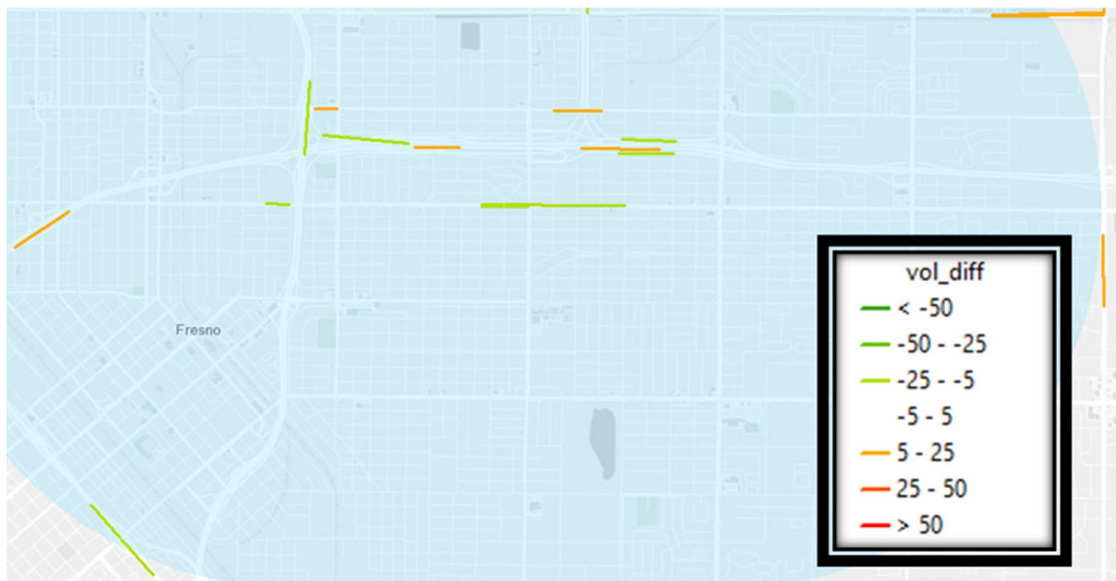
**TABLE 3: BELMONT BIKE PROJECT VMT**

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	PERCENT DIFFERENCE
2mi Project Buffer	2,081,684	2,079,681	-2,003	-0.10%
Outside Buffer	13,880,222	13,890,175	9,953	0.07%
Regionwide	15,961,906	15,969,856	7,950	0.05%



**FIGURE 8: BELMONT BIKE PROJECT DAILY VEHICLE VOLUME CHANGE**

The Reedley bike project resulted in a small (-23) decrease in VMT within a 1-mile buffer of the project as shown in Table 5. The Class II bike lane is a relatively short and simple addition of bicycle infrastructure in a relatively lowly populated area of Fresno County, so the resulting minor decrease in VMT is expected.



**TABLE 4: BELMONT BIKE PROJECT BIKE MILES TRAVELLED**

REPORTING AREA	BASE BMT	BUILD BMT	DIFFERENCE	PERCENT DIFFERENCE
BMT 2 mi Prj Buffer	23,757	23,899	142	0.60%
BMT Outside Prj	88,028	89,063	1,035	1.18%
BMT Region	111,785	112,963	1,178	1.05%

### Reedley Bike Lane

Table 6 shows the bike miles traveled where there is actually a small decrease in BMT in the project buffer. This is due to the fact that the Reedley project introduced a new



bike facility which was not included in the no-build. By adding this facility, more direct routes between origins and destinations in Reedley became available, allowing more bike trips to travel shorter distances.

**TABLE 5: REEDLEY BIKE PROJECT VMT**

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	PERCENT DIFFERENCE
1mi Project Buffer	109,546	109,522	-23	-0.02%
Outside Buffer	15,852,360	15,852,636	275	0.00%
Regionwide	15,961,906	15,962,158	252	0.00%

**TABLE 6: REEDLEY BIKE PROJECT BIKE MILES TRAVELLED**

REPORTING AREA	BASE BMT	BUILD BMT	DIFFERENCE	PERCENT DIFFERENCE
1 mi Project Buffer	735	725	(10)	-1.38%
Outside Buffer	111,050	111,625	576	0.52%
Regionwide	111,785	112,350	565	0.51%

**TABLE 7: REEDLEY BIKE PROJECT TRIP MODE**

MODE	BASE TRIPS	BUILD TRIPS	DIFFERENCE
Drive Alone	1,553,147	1,553,251	104
Shared Ride 2	887,651	887,584	-67
Shared Ride 3+	947,478	947,508	30
Transit	29,712	29,557	-155
Bike	40,553	40,627	74
Walk	397,010	396,774	-236



School Bus	65,123	65,138	15
Total	3,920,674	3,920,439	-235

### 3.2 TRANSIT PROJECTS

There were two transit projects evaluated for VMT reductions: Peach Transit Service Expansion and Shaw Avenue Express Transit. The Peach Transit Service Expansion includes a minor route modification at the southern end, with no change in operations. The Shaw Avenue Express Transit is a reduction in headways, with no change in the route.

#### Peach Transit Service Expansion

Table 8 shows the VMT for the Peach transit project. This transit line expansion results in a small decrease in VMT within a ½ mile buffer of route (-684 miles). While a larger decrease in VMT is shown outside the project buffer, this decrease is less certain due to regional model noise.

**TABLE 8: PEACH TRANSIT PROJECT VMT**

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	PERCENT DIFFERENCE
0.5 mi Project Buffer	1,042,516	1,041,832	(684)	-0.07%
Outside Buffer	14,919,390	14,916,224	(3,165)	-0.02%
Regionwide	15,961,906	15,958,057	(3,849)	-0.02%

Table 9 shows the boardings on the project route (FAX 22) and all other routes. The boardings on FAX 22 decrease slightly (-11) but boardings system-wide increase (47). The east end of the FAX 22 route was re-routed, which did not directly improve the FAX 22 line. However, the re-routing had a positive effect on connections to other routes, as evidenced by an increase in boardings on all routes.

**TABLE 9: PEACH TRANSIT PROJECT BOARDINGS**

TRANSIT LINE	BASE BOARDINGS	BUILD BOARDINGS	DIFFERENCE	PERCENT DIFFERENCE
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FAX 22	2,555	2,545	(11)	-0.42%
Other Routes	50,013	50,070	58	0.12%
Total	52,568	52,615	47	0.09%

## Shaw Avenue Express Transit

Table 9 shows the VMT for the Shaw transit project. The reduced headway on the FAX 09 results in a small decrease in VMT within a ½ mile of the route (-654 miles driven). A VMT increase outside the project area is a result of model variability.

**TABLE 10: SHAW TRANSIT PROJECT VMT**

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	PERCENT DIFFERENCE
0.5 mi Project Buffer	1,604,357	1,603,703	(654)	-0.04%
Outside Buffer	14,357,549	14,360,409	2,860	0.02%
Regionwide	15,961,906	15,964,112	2,206	0.01%

Table 11 shows the boardings for the improved transit line (FAX 09) and all other routes. There was a significant increase in the number of people boarding the FAX 09 buses (13.61%) due to decreasing the headway (time between consecutive buses) on the FAX 09 route. It is possible that some of these additional boardings came from people who previously used other routes but switched to the FAX 09 route because it became a better option due to the shorter headway. This is supported by the fact that there was a decrease in boardings on all other routes (215 boardings). Despite this decrease, the total number of boardings on the transit system as a whole still increased by 487 boardings.

**TABLE 11: SHAW TRANSIT PROJECT BOARDINGS**

TRANSIT LINE	BASE BOARDINGS	BUILD BOARDINGS	DIFFERENCE	PERCENT DIFFERENCE
FAX 09	5,160	5,862	702	13.61%
Other Routes	47,409	47,193	(215)	-0.45%
Total	52,568	53,055	487	0.93%





## APPENDIX – MODELING SUMMARY

TABLE 12. PROJECT SUMMARIES FOR VMT AND COST

PROJECT	DESCRIPTION	LOCATION	LENGTH (MILES)	VMT IMPACT	SCOPE OF ANALYSIS	NOTE	COST	COST PER VMT
Clinton Bike Lane	Clinton Avenue Road Diet & Class IV Bicycle Facilities. Vehicle lane reduced from 2 to 1 lanes over 4 miles	North of downtown Fresno	4	5,549	2 mile buffer	Rerouting of traffic causes net increase in VMT within 2-mile buffer.	\$ 1,210,000	N/A
Belmont Bike Lane	Modify Belmont Ave from 4 lanes to 2 lanes with bike lanes and pedestrian bulb-outs. Vehicle lane reduced from 2 to 1.	North-east of downtown Fresno	2	-2,003	2 mile buffer	No signs of vehicle rerouting (VMT increases) because of surrounding built environment – more destinations	\$ 605,000	\$ 302.05



and closer to  
downtown.

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Reedley Bike Lane	Bike lanes in downtown Reedley (painting only)	Downtown Reedley	0.08	-23	1 mile buffer	\$ 100,000	\$ 4,347.83
Peach Transit Service Expansion	Add service on Peach Ave, south of Kings Canyon. Route largely remains the same with small southern route alternation at the end of the route.	North-south route that goes through downtown Fresno.	0.75	-684	1/2 mile buffer	\$ 1,500,000	\$ 2,192.98
Shaw Avenue Express Transit	Implement express transit service on Shaw Avenue transit corridor. Decrease headways from 15 to 10 minutes	North Fresno	14	-654	1/2 mile buffer	\$ 25,000,000	\$ 38,226.30

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## ADDITIONAL PROJECTS MODELED BY FRESNO COG FOR VMT MITIGATION STUDY

The following projects were modeled for the year 2029. One additional transit project was modeled as the Veterans Blvd expansion seemed to attract no riders at all on that transit line (please see page 9). Since the trip attractions along the line are very minimal to none, maybe people are not taking the trips along that route. As an alternative, I have modeled the Clovis Avenue Expansion project. This project seemed to be practically feasible and an attractive route as there are a lot of trip attractions like businesses along this route. Further, the low-income residents live around this corridor and are inclined towards the transit option compared to the people living north of Shaw Avenue.

Project ID	Project Description	Project Type	Project Cost	Buffer	EST. O2T YEAR
FRE501487	Blackstone - Hedges to Friant:6 LD to 6 LD with bike lanes	Bike & Ped	\$7,980,000	1 mile	2037
FRE504203	Convert Maple from a 4 LU facility to 3 LD with bicycle facilities	Bike & Ped	\$755,000	2 miles	2035
FRE503944	Implement service along Clovis Avenue from Jensen Avenue to Shaw Avenue	Transit	\$4,000,000	0.5 mile	2030
FRE503930	Implement service along Veteran's Blvd to Grantland Ave.	Transit	\$2,500,000	0.5 mile	2035



## 2. Maple Road Diet

The Maple Road diet project consists of reducing four lanes undivided Maple Road into 3 lanes divided road along with addition of Class II bike lanes, between Belmont and Church Avenue. The project is 2.5 miles long. The estimated project cost is \$755,000. Figure 2 shows the Maple Road diet project with a 2-mile corridor buffer.

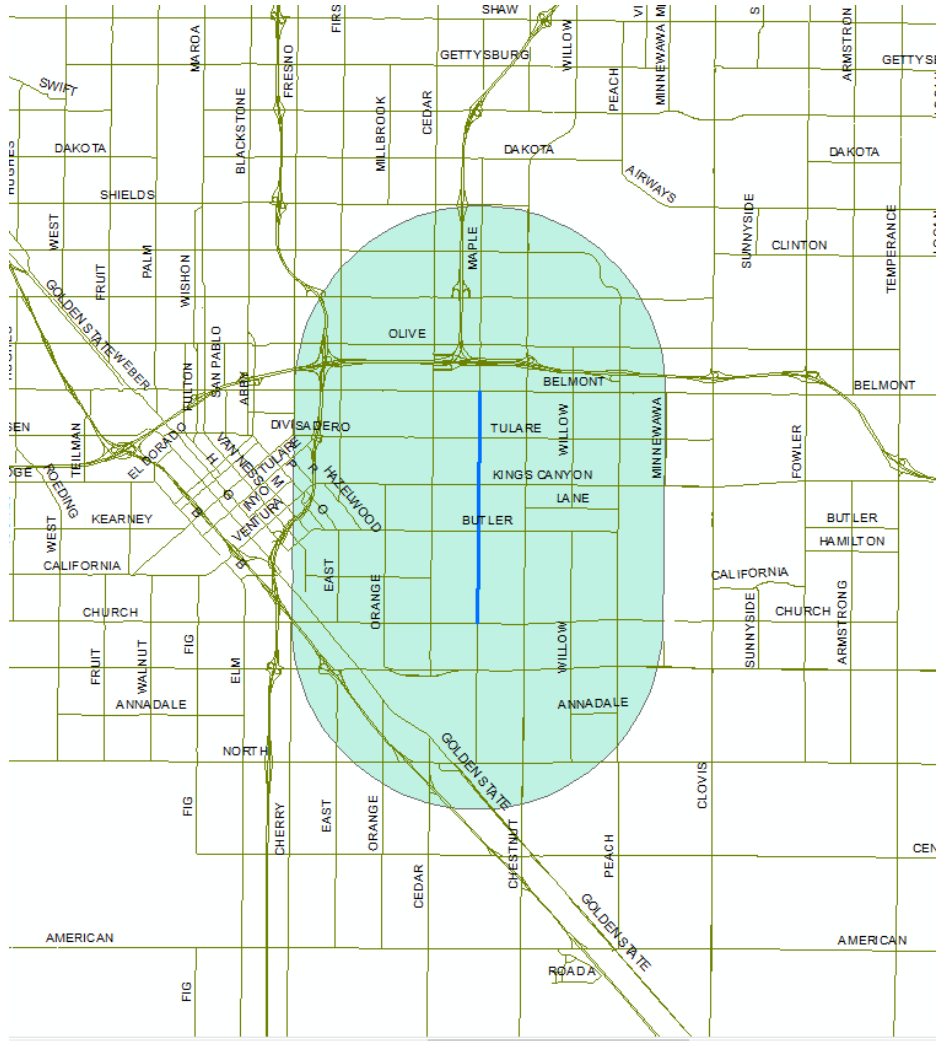


FIGURE 2: MAPLE ROAD DIET PROJECT

**3. Clovis Avenue Transit Service Expansion**

The Clovis Avenue transit service expansion consists of adding a new north-south FAX transit service on Clovis Avenue between Jensen and Shaw Avenue. The project is 7 miles long. The headways for peak and off-peak time are expected to be 30 minutes. The estimated project cost is \$4,000,000. Figure 1 Figure 3 shows the Clovis Ave transit service line with a 1/2-mile corridor buffer.

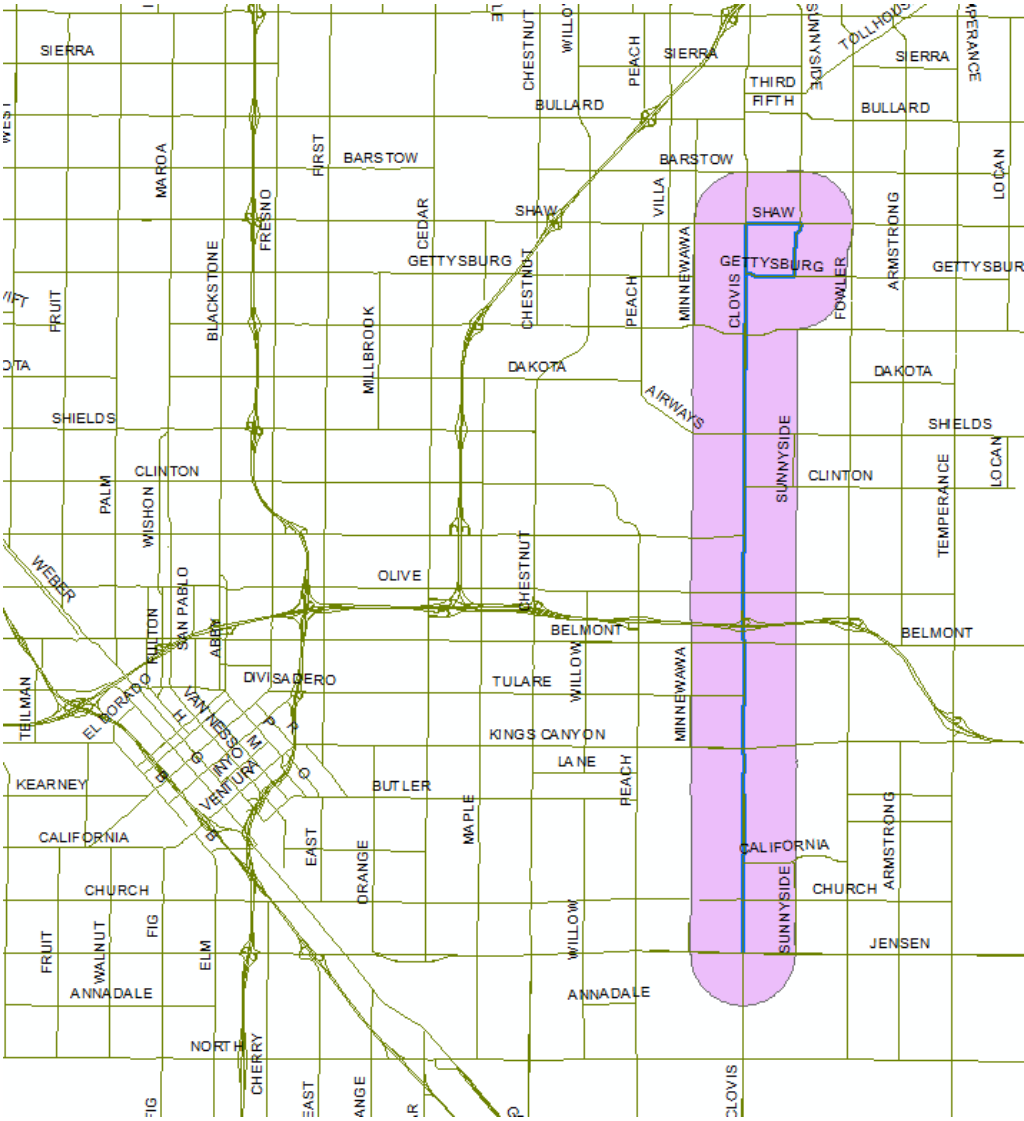


FIGURE 3: CLOVIS AVENUE TRANSIT EXPANSION

#### 4. Veteran's Blvd Transit Service Expansion

The Veterans Blvd. transit service expansion consists of adding a new FAX transit service on veterans Blvd. between Herndon and Grantland avenue. The project is approximately 5.5 miles long. The headways for peak and off-peak time are expected to be 30 minutes. The estimated project cost is \$2,500,000. Figure 1 Figure 4 shows the Veterans Blvd. transit service expansion with a 1/2-mile corridor buffer.

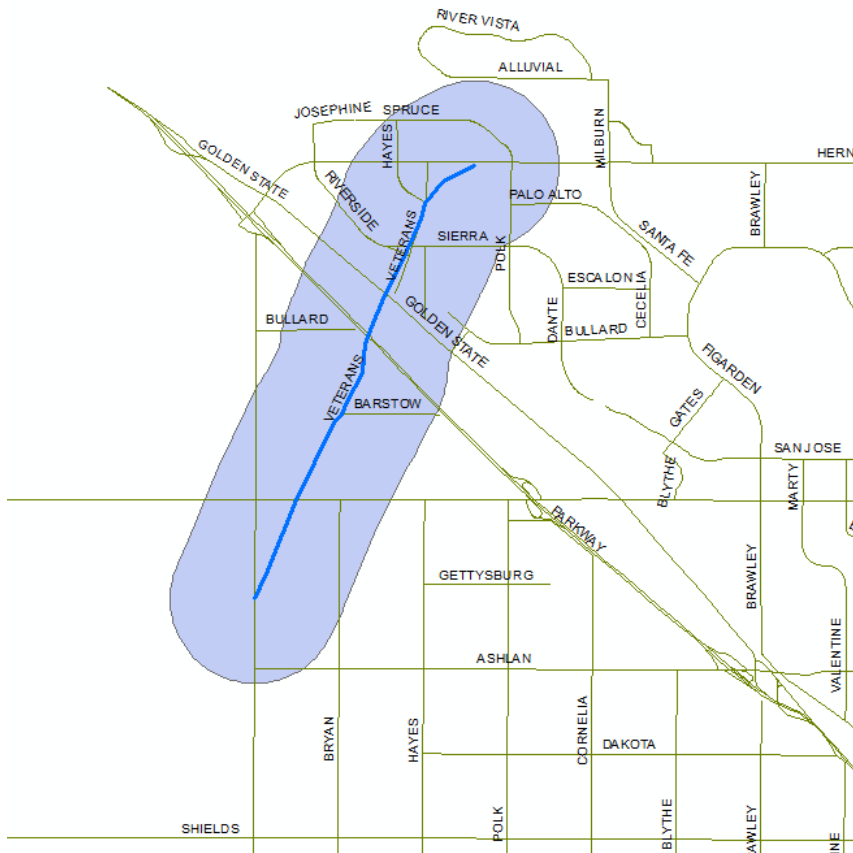


FIGURE 4: VETERANS BLVD SERVICE EXPANSION

## PROJECT-LEVEL VMT REDUCTIONS

### 1. Blackstone Bike Project

#### Blackstone Bike Project VMT

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	%DIFFERENCE
1-mile Project Buffer	2,077,205	2,074,986	-2219	-0.11%
Outside Buffer	13,986,396	13,987,949	1553	0.01%
Regionwide	16,063,601	16,062,935	(666)	-0.004%

#### Blackstone Bike Project BMT

REPORTING AREA	BASE BMT	BUILD BMT	DIFFERENCE	%DIFFERENCE
1-mile Project Buffer	17,001	18,557	1556	9.15%
Outside Buffer	61,744	61,315	-429	-0.69%
Regionwide	78,745	79,872	1,127	1.43%

#### Regional Trip Mode Distribution

MODE	BASE TRIPS	BUILD TRIPS	DIFFERENCE
Drive Alone	1,552,193	1,551,492	-701
Shared Ride 2	887,603	887,437	-166
Shared Ride 3+	946,838	946,691	-147
Transit	33,730	33,643	-87
<b>Bike</b>	<b>40,538</b>	<b>41,068</b>	<b>530</b>
Walk	397,681	397,264	-417
School Bus	65,315	65,324	9
Total	3,923,898	3,922,920	-978



## 2. Maple Road Diet Project

One thing to notice here is the BMT is same between base and build conditions. This is because the bike facility was already coded in this section for the base 2029 scenario. The only change was the reduction of lane (from 4 to 3 lanes).

### Maple Road Diet Project VMT

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	%DIFFERENCE
2-mile Project Buffer	1,727,774	1,728,063	289	0.02%
Outside Buffer	14,335,827	14,341,640	5,813	0.04%
Regionwide	16,063,601	16,069,703	6,102	0.04%

### Maple Road Diet Project BMT

REPORTING AREA	BASE BMT	BUILD BMT	DIFFERENCE	%DIFFERENCE
2-mile Project Buffer	10,585	10,585	0	0.00%
Outside Buffer	68,160	68,160	0	0.00%
Regionwide	78,745	78,745	-	0.00%

### Project Trip Mode

MODE	BASE TRIPS	BUILD TRIPS	DIFFERENCE
Drive Alone	1,552,193	1,551,696	-497
Shared Ride 2	887,603	887,559	-44
Shared Ride 3+	946,838	946,989	151
Transit	33,730	33,704	-26
Bike	40,538	40,658	120
Walk	397,681	397,342	-339
School Bus	65,315	65,345	30
Total	3,923,898	3,923,293	-605

### 3. Clovis Ave Transit

Open to traffic date for this service is 2030 so we can model it in our 2029 scenario. Please note that the regional resident VMT is little different in transit cases than the above two scenarios. This is because of some modifications made in the network, to match the ground reality around Veterans boulevard avenue.

The VMT within the half mile buffer is almost the same between base and build scenarios. However, the VMT outside the buffer is significantly down because of the better connectivity with existing nearby routes. There is a significant increase in the transit boardings in the newly added transit line, "FAX\_Clovis\_Ave" along with some increment seen in other routes.

#### Clovis Ave Transit Project VMT

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	%DIFFERENCE
0.5-mile Project Buffer	497,353	497,413	60	0.01%
Outside Buffer	15,568,968	15,564,958	-4010	-0.026%
Regionwide	16,066,321	16,062,371	-3950	-0.025%

#### Clovis Ave Transit Project Ridership

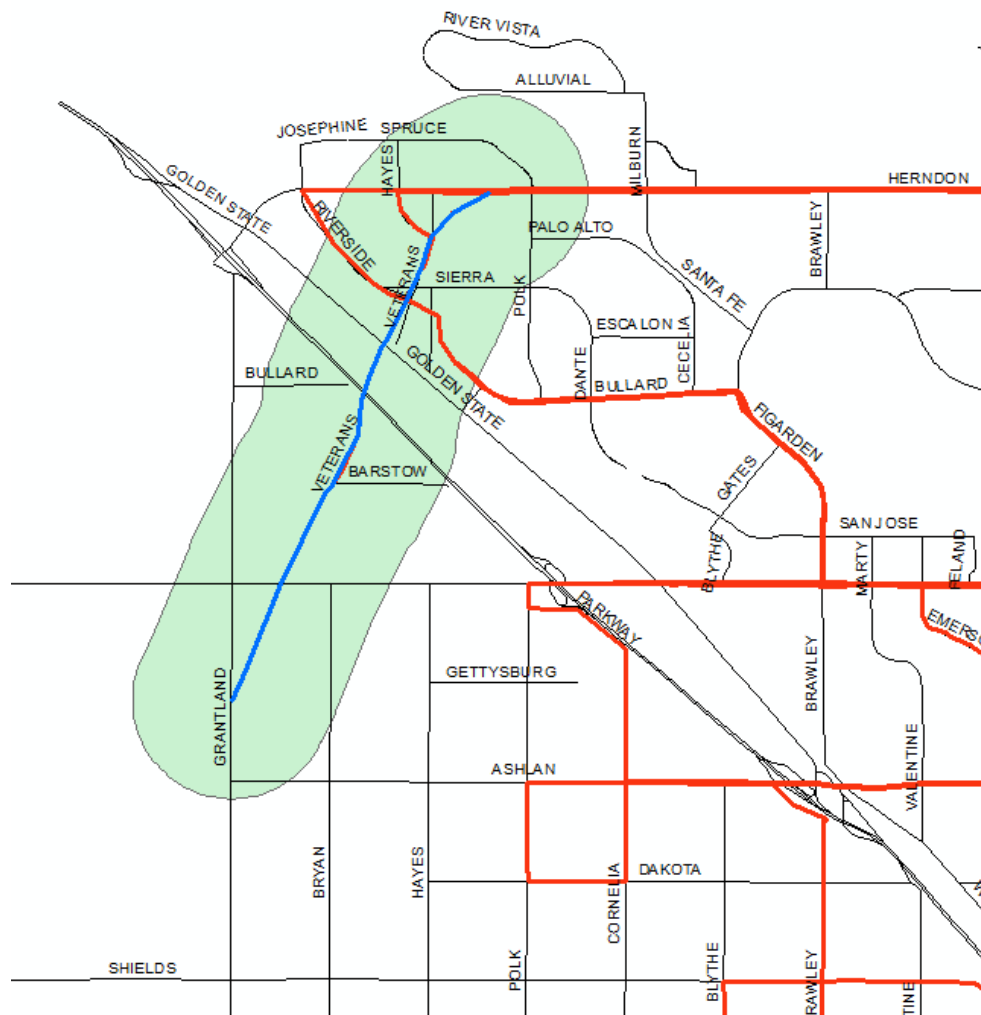
TRANSIT LINE	BASE BOARDINGS	BUILD BOARDINGS	DIFFERENCE	%DIFFERENCE
FAX_Clovis_Ave	0	1,062	1,062	NA
Other Routes	54,508	54,767	259	0.48%
Total	54,508	55,829	1,321	2.42%

#### Project Trip Mode

MODE	BASE TRIPS	BUILD TRIPS	DIFFERENCE
Drive Alone	1,552,726	1,551,801	-925
Shared Ride 2	887,418	887,303	-115
Shared Ride 3+	946,466	946,717	251
Transit	30,425	30,959	534
Bike	40,672	40,584	-88
Walk	397,607	397,646	39
School Bus	65,356	65,382	26
Total	3,920,670	3,920,391	-279

#### 4. Veteran's Blvd Transit

As expected, the VMT within the half mile buffer as well as outside the buffer decreased in the build scenario compared to the base scenario. Although the transit ridership increased slightly in the new transit line as well as the other routes, the magnitude of the increment is not significant. This is caused by the already existing transit routes in a closed periphery. Please see the screenshot of the project area below. While the blue line inside the buffer shows the new Veterans transit line, the thicker red lines are the existing routes which are kind of intersected and partly overlaps with the new transit line. Since the attractions along Veterans Blvd are very minimal to none, maybe people are not taking many trips along that route. However, network connectivity improved because of this project.



Veterans Blvd Transit Project VMT

REPORTING AREA	BASE VMT	BUILD VMT	DIFFERENCE	%DIFFERENCE
0.5-mile Project Buffer	177,677	177,472	-205	-0.12%
Outside Buffer	15,888,644	15,888,212	-432	-0.003%
Regionwide	16,066,321	16,065,684	-637	-0.004%

Veterans Blvd Transit Project Ridership

TRANSIT LINE	BASE BOARDINGS	BUILD BOARDINGS	DIFFERENCE	%DIFFERENCE
Veterans_Blvd	0	35	35	NA
Other Routes	54,508	54,611	103	0.19%
Total	54,508	54,646	138	0.25%

Project Trip Mode

MODE	BASE TRIPS	BUILD TRIPS	DIFFERENCE
Drive Alone	1,552,726	1,552,863	137
Shared Ride 2	887,418	887,364	-54
Shared Ride 3+	946,466	946,127	-339
Transit	30,425	30,443	18
Bike	40,672	40,753	81
Walk	397,607	397,342	-265
School Bus	65,356	65,406	50
Total	3,920,670	3,920,298	-372



# Regional VMT

*Mitigation Program Study*



## APPENDIX D – SAC AND TAC MEETING MINUTES



Fresno COG Regional VMT Mitigation Program  
Stakeholders Advisory Committee Meeting #1  
May 19, 2022

**Presenters**

Kristine Cai – Fresno COG  
Braden Duran – Fresno COG  
Mike Schmitt – Kimley-Horn  
Chris Gregerson – Kimley-Horn

**Attendees**

Mohammad Khorsand – Fresno County  
Christopher Xiong - Caltrans D6  
Mike Prandini - BIAFM  
Carolina Ilic - Fresno Area Express (FAX)  
John Rowland - Peters Engineering Group  
Erin Haagenson – Fresno County  
Brian Spaunhurst - County of Fresno  
Santosh Bhattarai - Fresno COG  
Pankaj Joshi - Fresno COG  
Michael Osborn - City of Mendota  
Mohammad Alimi - Fresno County  
Jill Gormley - City of Fresno  
Janelle Del Campo - FCRTA  
Sophia Pagoulatos – City of Fresno  
Meg Prince - Fresno COG  
Jesus Orozco - City of Kerman  
Rodney Horton - City of Reedley  
Shichen Fan - Fresno COG  
Sean Smith - City of Clovis  
David Brletic – City of Sanger  
Bonique Emerson - Precision Civil Engineering  
Jerry Jones - City of Kerman  
Eric VonBerg - Rincon  
Rob Terry - City of Selma  
Karl Schoettler - Collins & Schoettler  
Gloria Hensley - Fresno County

**Meeting Summary**

*Background*

The meeting began with Fresno COG and Kimley-Horn staff introducing the project team followed by a discussion on the background on the project. This background discussion primarily focused on the fact that while VMT threshold and policy implementation has been successfully implemented by many agencies throughout the state, developing feasible mitigation solutions for projects with significant transportation impacts has remained a challenge. This is especially true for rural areas around the state

which often lack a reliable transit system and have less housing and job density compared to more urban areas within California.

**As described, the purpose of this project is to determine the feasibility of implementing a fee-based VMT mitigation program for the Fresno Region.** Note that the study has not predetermined that a program will be implemented.

Currently Fresno COG has developed VMT thresholds for the region, has VMT screening maps to help identify areas in Fresno County that fall below the thresholds for residential and non-residential land uses, and has developed a VMT estimation tool to help project applicants estimate the VMT for a project developed in the County. During the discussion, a representative of the City of Fresno also provided an update on their SB 743 efforts. This included the fact that the city has set their own thresholds and are working on developing their own VMT mitigation program. The City of Fresno has also developed an urban design calculator that can be used by developers or those completing an EIR to evaluate the implications to VMT of their design choices. As part of the VMT mitigation program under development, the city shared that they are also working on a VMT fee-based mitigation solution. The fee program is currently planned to be implemented in the fall of 2022.

### *Presentation*

Once the background and the purpose of the project was relayed to the Stakeholder Advisory Committee (SAC), the main presentation was undertaken. The presentation began by giving an overview of what is being asked of the members of SAC. The project team is primarily asking members of the SAC to attend four total meetings, including the kickoff meeting, provide direction on the project's methodology and analysis, review work products, and to ultimately participate in determining the appropriateness and feasibility of the resultant program for the Fresno Region.

The presentation included an overview of SB 743 and the history behind SB 743 for those attending the call who do not deal with SB 743 or VMT analyses on a day-to-day basis. This included the following:

- SB 743 is a law that went into effect as of July 2020 that replaces Level of Service (LOS) analyses with VMT analyses for the purpose of determining CEQA transportation impacts.
- The objectives of SB 743 include trying to reverse the negative trends that have resulted from development sprawl, improve sustainability, and reduce Greenhouse Gas (GHG) emissions.
- SB 743 goals can be primarily achieved by encouraging denser infill development, reducing single occupancy vehicle trips, and implementing policies that incentivize alternative modes of travel, including mass transit and active transportation.

The State of California provided guidance on setting VMT analysis policy and thresholds, most recently in December 2018. This guidance recommends that when performing VMT analyses for projects with multiple land uses, those land uses should be analyzed separately. This is due to the fact that different land use types have different travel characteristics associated with them. For example, a residential neighborhood will produce trips that not only travel to offices, but also to schools, shopping, restaurants, and entertainment while an office building will primarily attract trips from a residential area but may cast a wider net of trip origin locations than those trips being produced by the residential areas.

In terms of the history of SB 743, the following was highlighted:

- In September 2013, Darrel Steinberg (current Sacramento mayor, formerly of the California Senate) leads SB 743 passage

- In August 2014, the California Office of Planning and Research (OPR) releases the preliminary discussion draft of SB 743 guidelines
- In December 2014, Pasadena becomes the first City to adopt VMT for CEQA analysis
- In January 2016, OPR publishes revised SB 743 guidelines
- In March 2016, San Francisco becomes the next City to adopt VMT analysis guidelines
- In December 2018, OPR publishes the final guidelines
- In November 2019, the City of Sacramento is sued by the Citizens for Positive Growth & Preservation over SB 743 implementation
- In May 2020, Caltrans publishes an updated Transportation Impact Study Guide including references to VMT
- In July 2020, SB 743 implementation is required of all California jurisdictions
- In August 2020, Fresno COG provided a SB 743 training workshop
- In September 2020, Caltrans publishes their Transportation Analysis Framework outlining how they will review traffic studies moving forward
- In January 2020, Fresno COG's SB 743 Regional Guidelines are released
- In March 2021, Fresno COG releases their VMT analysis tool
- In June 2021, Caltrans and OPR kick off a multi-year SB 743 working group
- In September 2021, San Diego County rescinds its Transportation Study Guide outlining their methodology for performing VMT analyses
- In January 2022, CAPCOA releases an updated version of their Travel Demand Measures/GHG Reduction Measures Handbook. This document provides updated research and guidance on many measures that can be used to mitigate VMT impacts, though most measures are suited for urban and suburban contexts.

Following the SB 743 overview and history, CEQA and VMT mitigation was discussed. In terms of VMT mitigation for projects, the mitigation must be effective and enforceable. In this context, effective means that the mitigation would avoid or reduce a project's significant impact while enforceable means the mitigation is included in a condition of approval, an agreement between the jurisdiction and the project's owner, or the mitigation is incorporated into a plan, policy, regulation, or design. Many mitigations require ongoing monitoring to demonstrate that the VMT reduction implemented by the project applicant is effective. An example of a mitigation that requires monitoring is implementing a ridesharing or carpooling program by an employer. The monitoring program should answer the who, what, where, when, why, and how questions and provide a reporting mechanism so the jurisdiction can ensure that the stated VMT reductions are happening.

Often the best way to avoid the need for VMT mitigation is to carefully consider project elements during design, including such considerations as planning for a mixed use development or providing uses such as infill retail options. To date, in terms of VMT mitigation measures, the most common types have been Transportation Demand Measures (TDMs). Examples of common TDMs include Vanpools, guaranteed ride home programs, flexible work schedules, providing transit passes, or incentive programs to encourage alternative modes of travel from single occupancy vehicles. More recently, VMT banking and exchanges have become options for mitigating. These programs provide a way for development or transportation projects to pay into either a single or group of VMT mitigating projects for the purposes of addressing identified significant transportation impacts. This funding strategy can enable VMT reducing projects to be undertaken that generally are not able to be funded by any one development or transportation project. An additional benefit of this approach for a project applicant is that it does not require on-going mitigation monitoring to be carried out by the applicant.



As part of the presentation, the following major categories of fee-based VMT mitigation programs was presented:

- VMT Bank – Under a VMT Banking framework, multiple VMT reducing projects are grouped together and their associated VMT reductions are monetized in the form of credits. These credits are then purchased for the purposes of mitigating VMT in excess of a determined impact threshold. The underlying projects may be either regionally or locally beneficial to the area in which the project is located.
- VMT Exchange – VMT Exchanges are similar to VMT Banking with the exception that they deal with a single VMT-reducing project that can be established by the project applicant, other entity, or potentially be selected from a VMT Banking list. As this approach eliminates the need to convert a group of projects into equivalent VMT reducing credits, its administration could potentially be simplified and funding can be directed at a single preferred mitigation solution which may be of greater benefit to the project than alternatively funding many projects through a VMT Bank.
- VMT Mitigation Impact Fee Program – Some jurisdictions have also considered the creation or conversion of an existing Transportation Impact Mitigation (TIM) Fee Program to serve the purpose of promoting VMT reducing projects. This, however, can be complicated for most jurisdictions given that, to not be counterproductive in terms of VMT mitigation, all capacity-enhancing projects would need to be purged from the TIM Fee Program. Simply, a TIM Fee program cannot have roadway widening projects and be VMT mitigating at the same time. While a full conversion to VMT mitigation projects is feasible in some urban locations, most jurisdictions still desire to have some level of roadway widening/capacity enhancement within their programs for the purpose of facilitating travel and reducing congestion, even if the approach may be conflicting with SB 743 given that most capacity-enhancing projects result in induced demand and increased VMT. An important difference with a VMT Mitigation Impact Fee Program and a Banking/Exchange program is that every project would participate in it, not just those projects that require VMT mitigation under SB 743.

An overview of the induced demand phenomenon was also provided to explain why capacity-enhancing projects cannot be included in a VMT Mitigation Impact Fee Program and why many capacity-enhancing transportation projects will result in a significant transportation impact. Simply put, when additional capacity is provided on a roadway, while there may be a short-term gain in reducing delay on the roadway, in the long term it will encourage additional trips amongst existing users to be made, thus increasing VMT overall. These new trips are generated for a variety of reasons, some examples provided included; drivers who were using an alternative mode previously, but now are driving (e.g., driving instead of taking transit) or drivers who now choose to make a trip that previously they had forgone (e.g., someone going shopping or picking up dinner that was previously staying home for dinner). Specifically, for transportation projects in which capacity is increased, induced demand often results in a significant transportation impact. It was noted that for induced demand effected projects, feasible mitigation is still required by CEQA. In the future, transportation projects such as freeway widening may include a transit component to offset the increased VMT or the project applicant might seek to buy VMT banking credits to fund regional VMT reducing projects to mitigate their transportation project. The effects of induced demand on transportation programs are still being determined, although it is already clear that there will be significant changes to many transportation programs as a result.

A high-level overview of the legal requirements for VMT Banks, including the fact that VMT Banks must meet the requirements of both the Mitigation Fee Act (AB 1600) and CEQA, were presented. As

discussed, A VMT Bank will require more than showing a nexus and rough proportionality. The nexus will need to demonstrate the balance between the mitigation and the VMT impact while the proportionality will need to form the basis for calculating the mitigation cost. Fee-based VMT mitigation programs must also be able to show additionality and that their mitigation can be implemented in a reasonable time frame. The additionality requirement means that the mitigation cannot be funded elsewhere and while no hard and fast rule is provided for a reasonable time frame, a starting point of less than 10-years is likely reasonable. Both of these issues will be investigated as part of this study.

A fee-based VMT mitigation program requires CEQA clearance, but it may be cleared with CEQA exemptions, although this has not yet been tested. There are many parallels to fee-based VMT mitigation programs and GHG mitigation programs and wetland mitigation programs. Case law for GHG CEQA projects provides guidance on the features needed to pass legal muster.

Once the VMT mitigation overview was completed, the work plan for this project was introduced. Fresno COG, Kimley-Horn, and RSG are collaborating to deliver this project by completing the following major tasks:

- Task 1 – Convene a Stakeholder Advisory Committee (SAC), the purpose of this meeting
- Task 2 – Complete a literature review of VMT mitigation programs and SB 743
- Task 3 – Convene a Technical Advisory Committee (TAC)
- Task 4 – Develop a VMT Mitigation Framework
  - Task 4A – Estimation of Mitigation need
  - Task 4B – Develop Evaluation Criteria
  - Task 4C – Identify VMT Framework Options
- Task 5 – Evaluate and Recommend a VMT Mitigation Framework
- Task 6 – Develop and Publish a Draft Report
- Task 7 – Present project report to Committees and Policy Board for acceptance

The result of the project will not be a VMT Bank or VMT Exchange, but a recommendation of which to pursue and an evaluation of the recommended program including which types of projects to include, the amount of VMT that the program could reduce, and whether to split the program into smaller sub-programs to be implemented by the local jurisdictions within Fresno County. Candidate program evaluation will include evaluation of the following:

- The anticipated VMT mitigation return on investment (ROI)
- Equity
- Total cost
- Timeliness and schedule
- Feasibility
- Stakeholder, decision-maker, and public support

When identifying the fee-based VMT mitigation program to be recommended for implementation, the following items will be considered:

- Identifying the location and likely timing of future development and transportation projects already programmed.
- Screening potential development and transportation projects to determine mitigation requirements.

- Determining the extent of “feasible mitigation” which is the maximum reasonable contribution to a fee-based VMT mitigation program, irrespective of the actual required VMT mitigation required to mitigate a significant transportation impact.
- Evaluating the impact to project feasibility, affordability, and other financial considerations.

As a part of documenting the recommended fee- based VMT mitigation program and the analysis results, the following items will be addressed:

- Establishing an approval process
- Legal reviews
- Public notices
- CEQA review as appropriate
- Establishing required intergovernmental agreements (IGAs)

Several lessons were learned from implementing VMT Mitigation Banks/Exchanges in the cities of Tracy, Watsonville and Salinas. They include the following:

- Be selective about projects, they need to have a good ROI because otherwise the cost per VMT will become so high that no project applicant will be able to effectively fully mitigate their impact and the program may struggle to be successful.
- Understand that implementing a fee-based VMT mitigation program provides project applicants with an additional feasible mitigation option.
- A fee-based VM mitigation program may need address setting a limit on what is determined to be “feasible” in terms of maximum feasible VMT reduction requirement.
- When evaluating a potential fee-based VMT mitigation program, an iterative process will need to be undertaken to test projects to be included in the program and the program itself will should be tested with real or hypothetical projects. This will help to understand the total mitigation a typical development or transportation project may have to purchase within a proposed fee-based VMT mitigation program.
- Ensure there is a robust and thorough documentation of the nexus between the mitigation program and the impacts that are mitigated by the program
- Consider project applicants’ perspectives as their support is helpful to ensuring that a fee-based VMT mitigation program will be successful.
- Equity should be considered to ensure that there is an even distribution of benefits and impacts resulting from a fee-based VMT mitigation program among all populations within a jurisdiction.
- Understand that implementing a fee-based VMT mitigation program adds a new fee that more than likely will be passed on to the customer. Housing costs are already a major issue in California and when evaluating the VMT mitigation program options, this should be taken into consideration.
- It is important to quantify the market and timing need for VMT mitigation within the region so that the program is responsive to forecasted need.
- Understand that there may be unintended consequences resulting from the implementation of a fee-based VMT mitigation program and think through possible outcomes not directly related to the program.

A summary of the literature review that has been completed by the project team to date was provided. These major themes presented included:

- Agencies need to verify VMT reductions through analytical methods and prove the additionality of projects included in a fee-based VMT mitigation program.
- Agencies need to address VMT mitigation timeliness as part of program development.

- A VMT exchange could limit the usefulness of funds from smaller developments.
- Implementing new plans and programs such as the fee-based VMT mitigation program might increase end-user costs.
- Attention needs to be given to impacts to disadvantaged communities in terms of equity considerations and distribution of benefits and any impacts of the program.
- On-site mitigation should be undertaken first before project applicants consider paying into a fee-based VMT mitigation program.
- VMT Banks and Exchanges are believed to be able to comprehensively address VMT impacts as long as the above considerations are addressed and good guidance is established.

The project schedule was reviewed and as described is expected to last through the beginning of 2023 bring the total duration of the project to approximately one year. It is expected that the SAC will meet again at the beginning of August, end of September, and beginning of November in 2022. In addition, the following take-aways were provided for the SAC members at the conclusion of the presentation:

- Good project design can avoid the need for mitigation.
- CEQA requires feasible mitigation.
- Travel Demand Measure (TDM) research is lagging and estimating VMT reductions is complicated,
- TDM mitigation monitoring can cause administrative headaches.
- VMT impact fees, banking, exchanges, and hybrids are being considered.
- VMT banking requires nexus and rough proportionality.
- VMT banking can reduce TIFs and provide needed mitigation.
- Roadway project mitigation may be a good fit for VMT Banking or Exchanges.

At the conclusion of the presentation, a period of question and answer followed. The following is an overview of the questions asked and the answers provided:

- An attendee asked a question whether there will be a call for potential projects from agencies and what types of projects will be requested?
  - Answer: yes, but each project will need to be evaluated for potential inclusion in the program as all projects will require a feasible ROI.
  - The timeliness of the project also needs to be considered because it cannot be planned to be constructed beyond ~10 years. It was also noted that the question of timeliness will be addressed as part of the study.
- A question was asked about the gap between a project being constructed and the mitigation being constructed given the timing of funding a potential program?
  - The answer included a discussion on the wetlands mitigation program run by the state that can be used as an example for this exact situation where a mitigation is constructed later once it is fully funded even if a project has already been completed.
  - The timeliness of a project was also discussed as it pertains to CEQA. There is no hard and fast timeline provided by CEQA, only a requirement that the timing be “reasonable.” So therefore, it doesn’t have to happen on day 1 of the project, but also can’t be 20 years later.
- A question was asked in regards to whether there were certain criteria for a project to be added to the mitigation program?
  - It was noted that as part of the study, a comprehensive set of criteria would be developed in cooperation with the SAC.
  - It was further clarified that the study will develop guidelines on adding projects to the mitigation program, but it may not include strict quantitative requirements.

- A question was asked in regards to whether a project can be in the RTP, a jurisdiction's CIP, or other programs and also be added to the VMT mitigation program?
  - The answer centered on additionality, where in it is understood that a project can not be already adequately funded and then be added to a fee-based VMT mitigation program. Other points included:
    - Tier 2 of an RTP, not included in a CIP, are good places to look for candidate projects.
    - There is also some uncertainty about the amount of funding that is tied to a project that applies to additionality. E.g. can a project be in Tier 1 of an RTP, but not be full funded and then added to the mitigation program with its identified funding being reallocated? Or could the provision of immediate funding that substantially moves a project's schedule up be a different option?
- A question was asked in regards to how a mitigation program be affected if a City adopts a 15% VMT reduction threshold while the County or another jurisdiction uses a 13% reduction threshold?
  - The mitigation program shouldn't be affected, but we want to be sensitive to the project's location and avoid unintended financial incentives driving where a project may seek to locate.
  - A follow up question was asked about whether every City has to be involved in the mitigation program even if they don't have an adopted VMT threshold?
    - If a City does not have an adopted threshold, it would be reasonable to assume they could default to the State's 15% threshold below the average for per/capita and per/employee types of thresholds (residential and office for example).
    - However, a City is not required to be involved in the VMT mitigation program and joining the fee-based VMT mitigation program is voluntary.
- A question was asked in regards to the projects within the short-range transit plan, but that are not included in the FTIP - can they be included in a fee-based VMT mitigation program?
  - Yes, these projects can be included because they are not included in the FTIP so they are not funded projects.
- A question was asked in regards to what if very few cities choose to participate in a fee-based VMT mitigation program, could it still be successful?
  - The answer/response was that the fewer jurisdictions that choose to participate, the less successful the program would likely be given that it could create funding gaps and potential financial incentives that may drive unintended consequences.
- A comment was made by Eric Vonberg, that CEQA documentation about bridging the gap between 13% thresholds and 15% thresholds is available and that agencies can contact him for further information.
- A question was asked in regards to how the implementation of a fee-based VMT mitigation program could affect the housing crisis?
  - This was noted as a good point because as with any fee program, the costs may be passed on to the end user (the homeowner in this example) - so the study does need to carefully consider this.
  - However, the point was also made that developers don't like uncertainty and that a fee-based VMT mitigation program may help them address CEQA uncertainties given they can potentially eliminate significant impacts at a known cost.
- A question was asked in regards to whether a fee-based VMT mitigation program could operate like a fee program rather than a VMT Bank and whether projects would have to pay fees even if they were below the VMT threshold?

- The answer was that if a VMT-based impact fee program was chosen then it would operate like a more traditional impact fee program where everyone participates. Depending on how it is designed, the program could have limited potential to address development and transportation CEQA impacts, although the specific program design would drive this determination.
- A question was asked in regards to how many jurisdictions chose 13% reduction as the VMT threshold instead of 15% and whether a jurisdiction could change to 13% from a 15% threshold.
  - The answer stated noted that substantial evidence has to be provided to use thresholds that are lower than 15% and Fresno COG staff indicated this evidence was provided
  - Other jurisdictions in the state have also adopted thresholds that are lower than 15%, but some are more questionable than others.
  - It was also reiterated that substantial evidence has been developed for the 13% goal used by several jurisdictions in the Fresno region.
- A question was asked in regards to whether projects that do not have enough funding in a city's developer's impact fee (DIF) program could they be included in the VMT mitigation program
  - The answer is likely yes but the focus would need to be on the funding source and whether it could be reallocated or not so that the additionality requirement is still able to be met.
- The final question was in two parts. 1) Can all jurisdictions participate regardless of their adopted thresholds? 2) Is a certain percentage of the mitigation program spent on local projects vs regional projects?
  - Yes, all jurisdictions can participate regardless of their adopted thresholds.
  - As a part of completing the study, there is a need to determine what is feasible in terms of funding local vs regional projects. As a part of the SAC meetings, we are soliciting guidance on this very question as there is no predetermined outcome for the study.

**Fresno COG Regional VMT Mitigation Program Study**  
**Technical Advisory Committee Meeting #1**  
July 7, 2022

**Attendees**

Kristine Cai – Fresno COG  
Braden Duran – Fresno COG  
Kai Han – Fresno COG  
Shichen Fan – Fresno COG  
Mike Schmitt – Kimley-Horn  
Reid Haefer - RSG  
Matt Kelly – CCTA  
Tony Petros – LSA  
Mike Aronson – Kittelson  
Anais Schenk – Santa Cruz County  
Jim Damkowitch - DKS  
Chris Kuzak – Caltrans

**Background and Presentation**

The meeting began with Fresno COG and Kimley-Horn introducing the project team members before providing background on the project. The background primarily centered around the fact that while VMT threshold and policy implementation has been largely concluded around the state, developing mitigation options for projects is still relatively difficult. This is especially true for rural areas around the state without a reliable transit system and less housing and job density compared to the more urban areas within California. This project will determine the feasibility of implementing a regional VMT mitigation program for the Fresno Region. This would potentially provide project applicants with the ability to write a check to help fund projects that reduce VMT in the region rather than developing VMT mitigations on a project-by-project basis.

Once the background on the purpose of the project was relayed to the group, the main presentation was provided. A detailed overview of the presentation is provided in **Appendix A**.

The following sections highlight the interactive discussions between TAC participants, the focus of the meeting, on the following subjects:

- State of VMT mitigation programs in California
- Methodology discussion on quantifying the need, identifying creative candidate projects, and testing for feasibility/evaluating projects
- Policy discussion on additionality, mitigation timeliness, and unintended consequences

## Discussion Item #1 – The State of VMT Mitigation Programs in California

Through discussion with the TAC, the following agencies were identified as either planning to undertake a study, having a study ongoing, or identified as having a program under development but the status is unknown, or completed.

Agency	VMT Mitigation Program Format	Status
Fresno COG	TBD	Ongoing, completion in 2023
CCTA	TBD	Ongoing, end date TBD
City of Fresno	Impact Fee	Ongoing, end date TBD
Santa Cruz County and incorporated Cities	TBD	Beginning September 2022
City of San Diego	N/A	Status unknown, KH will contact the city to find out more
City of Watsonville	VMT Bank	Pending implementation
City of Tracy	VMT Bank	Pending implementation
City of Salinas	VMT Bank	Pending implementation
City of Los Angeles	Impact Fee	Completed, understood to be implemented as part of Westside Mobility Plan
City of Fremont TBD	TBD	Ongoing, end date TBD
VTA	TBD	Grant awarded; RFP date unknown
SloCOG	TBD	Grant awarded; RFP to be released in 2022
C/CAG	TBD	Grant awarded; RFP date unknown
Town of Los Gatos	Impact Fee	Ongoing, end dated anticipated in 2022

The discussion surrounding the status of the programs included some of the initial experiences with program development, including:

- Identifying mitigation projects with a feasible return on investment (ROI) has been problematic for many programs under development. This is particularly true when considering more conventional options such as transit and active transportation options. There is growing concern that in some locations the cost of conventional options may make VMT mitigation programs difficult to implement.
- There is growing interest in considering mitigation projects that are less conventional, including affordable housing implementation, other land use options including transit-oriented development (TOD), transportation development measures (TDM), mobility hubs, and micro-mobility options.
- There is growing interest in considering mitigation projects that are already under development or programmed with the idea that either expediting their development or solidifying funding needs could be a basis for their inclusion in a VMT mitigation program.
- Based on TAC member experiences, many programs are using an iterative process given the complexity of development. Many programs seem to be undertaking efforts to evaluate potential



mitigation projects to be included in the program as the first step towards viability rather than focusing on the program format initially.

- Depending on the program format, there may be legal requirements that need to be met, including requirements under both the Mitigation Fee Act and CEQA. If nexus is required, it will need to demonstrate the balance between the mitigation and the VMT impact while the proportionality will need to form the basis for calculating the mitigation cost. VMT reduction projects must also be able to show additionality and be implemented in a reasonable time frame.

## **Discussion Item #2 – Methodology discussion on quantifying the need, identifying creative candidate projects, and testing for feasibility/evaluating projects**

This discussion built on discussion #1, and included the following:

- The TAC was asked to weigh in on the approach undertaken to evaluate the total mitigation requirements for a potential Fresno COG program (described during the presentation). TAC members indicated that they had not considered the total need during the development of programs they had been involved with to date and did not have any direct feedback and that it was not felt that this may be a pressing concern for many of the programs that were involved in.
- As discussed, in the prior section, there is growing interest in exploring less conventional options, this included the following:
  - Affordable housing – mitigation credit would be the delta between the established threshold and the estimated VMT/capita for the affordable housing project. Some initial experience has shown that these types of projects are, like more conventional choices, price sensitive
  - Other land use options, including Transit Oriented Development – mitigation credit would be the delta between the established threshold and the estimated VMT/capita or VMT/employment. There was discussion about the use of VMT mitigation for funding incentives and or more direct payments to facilitate implementation of TOD or similar.
  - Transportation demand measures – mitigation credit would be commensurate with the VMT reduction achieved. Concern was voiced over these measures given that many may require funding in perpetuity.
  - Mobility hubs – given that mobility hubs can represent a range of conditions and mode interactions, it was recognized that they are challenging to evaluate. Under ideal conditions mobility hubs could create new ridership for existing modes without having to participate in the higher cost elements of implementation (track installation as an example). However, it was recognized that the additional ridership/users or additional shortening of trips that might occur with multiple modes is a complex matter. There were mixed feelings on whether mobility hubs may ultimately prove to be particularly effective in the contest of VMT mitigation programs.
  - Micro-mobility options – In the context of mobility hubs or similar, last-mile options may be an effective solution to facilitate the use of VMT-reducing modes. At least one TAC member indicated they are actively considering as an option.
- A key area of interest is identifying opportunities that have partial funding and that “would not happen if it were not for” the additional funding brought in by a VMT mitigation program. It is recognized that these opportunities may have better ROIs than other “from scratch” projects that may not already be in existing transportation programs because they are less effective. Simply, there was the observation that many of the best VMT mitigation projects are probably already in existing transportation programs and focusing on less desirable projects may only result in less productive (lower ROI) mitigation projects being put forth for consideration.

- It was reminded by participants that operating costs are not allowed under AB 1600 (Mitigation Fee Act) and as such, depending on the VMT mitigation program selected, this could be problematic for some mitigation projects that might be considered.
- The idea of advancing project schedules and taking the VMT reducing credit for the time that they were constructed prior to when they might otherwise be constructed was suggested as a viable strategy. An example of this could be to advance a VMT reducing Regional Transportation Plan (RTP) project from its opening year, taking VMT reducing credit for the construction year through the original opening year in terms of VMT mitigation.

## Discussion Item #3 – Policy discussion on additionality, mitigation timeliness, and unintended consequences

This discussion built on discussions #1 and #2, and included the following:

- Additionality is a complex subject that most participants did not seem to feel there is consensus on. There was general agreement with the idea that it can be summed up as an action that “would not have happen if it were not for” and that a mitigation project’s VMT reduction cannot directly be taken credit for if it is already fully funded. However, beyond these two themes there seems to be range of opinions on additionality and its implications for VMT Mitigation Programs.
- There was discussion that most TAC participants had migrated from an understanding that additionality required that new completely unfunded mitigation projects be developed to the idea that existing projects that are not fully funded and shovel ready may be candidates depending on their circumstances.
- The following court case regarding GHG and additionality was cited as being relevant: [Golden Door Properties v. Superior Court of San Diego County .pdf \(ceqaportal.org\)](#)
- It was indicated that Caltrans also has additional guidance on their website pertaining to additionality.
- There does not appear to be consensus on a reasonable time frame for how soon a project must be constructed to be considered VMT mitigation when included in a VMT mitigation program. Habitat mitigation was raised as having similar characteristics in that it was designed, funded, and implemented in a similar fashion and some reasonable amount of time therefore does pass between it being included as mitigation for a project and it being implemented.
- A VMT mitigation program may require CEQA clearance, although it may be cleared with CEQA exemptions, though this has not yet been tested. There are many parallels to VMT mitigation programs from GHG mitigation programs and wetland mitigation programs. Case law for GHG CEQA projects may provide guidance on the features needed to pass legal muster (depending on program design).
- The idea of design life addressing issues related to the perpetuity of some expenses was raised. In essence, the point was made that instead of thinking in terms that project may have no end date, its mitigation could be considered for only the time frame it is funded. Simply put, the VMT reductions would end if the project ended due to it not being further funded in the future.
- It is understood that as with any new program implementation that there may be unintended consequences, and as such, care needs to be taken in vetting program options. Some initial conversations around this included the identification of the following:
  - On important consideration is understanding that implementing a VMT Mitigation program provides project applicants with a feasible mitigation option that therefore must be considered under CEQA.

- Equity was raised as an important concern that must be considered to ensure that there is an even distribution of benefits for a VMT mitigation program.
- Even though a VMT mitigation project does not need to be located near the site it is mitigating, this still may be a concern given the potential desire to have benefits within the community that is affected by the VMT increase.
- It is understood that implementing a VMT mitigation program may add a new fee that may be passed on to the end-user. Housing costs are already a large issue in California and when evaluating the VMT mitigation program options, this should be taken into consideration.

## Appendix A – Presentation Overview

The presentation began by giving an overview of what is being asked of the attendees of the meeting regarding their involvement in the Technical Advisory Committee (TAC). The project team is primarily asking members of the TAC to attend up to four total meetings, including this kickoff meeting, provide direction on the project's methodology and analysis, and review work products.

Once the introduction was completed, the work plan and schedule for this project was provided. Fresno COG, Kimley-Horn, and RSG are collaborating to deliver the project and the work plan includes:

- Task 1 – Convene a Stakeholder Advisory Committee (SAC), the purpose of this meeting
- Task 2 – Complete a literature review of VMT mitigation programs and SB 743
- Task 3 – Convene a Technical Advisory Committee (TAC)
- Task 4 – Develop a VMT Mitigation Framework
  - Task 4A – Estimation of Mitigation need
  - Task 4B – Develop Evaluation Criteria
  - Task 4C – Identify VMT Framework Options
- Task 5 – Evaluate and Recommend a VMT Mitigation Framework
- Task 6 – Develop and Publish a Draft Report
- Task 7 – Present project report to Committees and Policy Board for acceptance

A summary of the literature review was provided where the themes of the documents reviewed were outlined. These themes included:

- Agencies need to verify VMT reductions through analytical methods and prove the additionality of projects included in the VMT mitigation program
- Agencies need to address VMT mitigation duration as part of program development
- A VMT exchange could limit the usefulness of funds from smaller developments
- Implementing new plans and programs such as the VMT mitigation program might increase end-user costs such as more costly housing
- Attention needs to be given to impacts to disadvantaged communities in terms of equity considerations and distribution of benefits of the program
- On-site mitigation should be undertaken first before project applicants consider paying into the VMT mitigation program
- VMT Banks and Exchanges can comprehensively address VMT impacts as long as the above considerations are addressed, and guidance is followed

The result of the project is not necessarily a VMT Bank or VMT Exchange, but a recommendation of which to pursue and an evaluation of the recommended program, including which projects to include, the amount of VMT that the program would reduce, and whether to split the program into smaller sub-programs to be implemented by the local jurisdictions within Fresno County. For the recommended program, the following, at a minimum, will also be evaluated:

- The VMT mitigation return on investment (ROI)
- Equity
- Total cost
- Timeliness and schedule
- Feasibility
- Stakeholder, Decision-Maker, and public support

When identifying the VMT mitigation program to be recommended for implementation, the following items will be considered:

- Identifying the location and likely timing of future development and transportation projects already programmed
- Screening projects to determine mitigation requirements
- Determining the extent of “feasible mitigation” which is the maximum reasonable contribution to the VMT mitigation program, irrespective of the actual required VMT mitigation
- Evaluating the impact to project feasibility, affordability, and other financial considerations

As a part of documenting the recommended VMT mitigation program and the analysis results, the following items will be included:

- Establishing an approval process
- Legal review
- Public notice
- CEQA review as appropriate
- Establish required intergovernmental agreements (IGAs)

To date, Fresno COG has developed VMT thresholds for the region, has VMT screening maps to help display areas in Fresno County that fall below the thresholds for residential and non-residential land uses, and has developed a VMT estimation tool used to help project applicants and the general public to estimate the VMT impact of a project developed in the County.

Several lessons have emerged from the limited experience implementing VMT Mitigation Banks/Exchanges in California already, and they include the following:

- Be selective about projects, they need to have a good ROI because otherwise the cost per VMT will become so high that no project applicant will want to use it and the program may not be successful
- Understand that implementing a VMT Mitigation program provides project applicants with an additional feasible mitigation option, but ensure project applicants will want to be use the program to help mitigate their impact by setting a limit on what is determined to be “feasible” in terms of maximum feasible VMT reduced
- Ensure that when evaluating a potential program, an iterative process is undertaken to constantly test projects to be included in the program and the program itself is tested with development projects that have already been approved. This will help to determine the total mitigation the development project may have paid if the program were in effect when the development project was going through the approval process
- Ensure there is a robust and thorough documentation of the nexus between the mitigation program and the impacts that are mitigated by the program
- Consider project applicants’ perspective as they are required to ensure the VMT mitigation program is a success
- Equity must be considered to ensure that there is an even distribution of benefits of the VMT mitigation program among all populations within a jurisdiction
- Understand that implementing the program adds a new fee that more than likely will be passed on to the customer. Housing cost is already a large issue in California and when evaluating the VMT mitigation program options, this should be taken into consideration
- Quantify the market and timing need of each project included in the VMT mitigation program
- Understand that there may be unintended consequences of implementing the VMT mitigation program and think through possible outcomes not directly related to the program

In addition, the following take-aways were discussed at the conclusion of the presentation:

- Good project design can avoid mitigation
- CEQA requires feasible mitigation
- Travel Demand Measures (TDM) research is lagging and estimating VMT reductions is complicated
- TDM mitigation can cause administrative headaches
- VMT impact fees, banking, exchanges, and hybrids are being considered
- VMT banking requires Nexus and Rough Proportionality
- VMT banking can reduce TIFs and provide needed mitigation
- Roadway project mitigation may be a good fit for VMT Banking/Exchanges

## Fresno COG Regional VMT Mitigation Program Study Stakeholders Advisory Committee Meeting #2 November 16, 2022

### Presenters:

Kristine Cai – Fresno COG

Mike Schmitt – Kimley-Horn

Chris Gregerson – Kimley-Horn

- Fresno COG and Kimley-Horn provided introductions
- The powerpoint presentation was given that covered the following topics:
  - The project's purpose
  - What fee based VMT programs are, how they work, and what types of fee based VMT programs have been developed
  - The types of VMT mitigation options that could be funded by the fee based VMT program
    - Transit, road diet, active transportation, affordable housing, transit oriented development, vanpools, and carpools
  - The transportation methodology for evaluating potential projects (each covered in detail)
    - Screening for candidate projects
    - Evaluating the project's performance
    - Setting a project benefit area
    - Monetizing the project (optional)
    - Implementation
  - Evaluation results of potential transportation projects including their potential monetization
    - Two transit projects (Peach Ave Extension and Shaw Ave Express Bus)
    - Two Roadway/Active Transportation projects (Clinton Bike Lane & Road Diet and Belmont Bike Lane & Road Diet)
  - The land use methodology for evaluating potential projects (each covered in detail)
    - Screening for candidate projects
    - Evaluating the project's performance
    - Monetizing the project (optional)
    - Implementation
  - Evaluation results of potential land use projects including their potential monetization
    - The Link affordable housing project evaluated as an example
  - The vanpool/carpool methodology for evaluating potential projects (each covered in detail)
    - Evaluate the project's performance
    - Monetize mitigation project
    - Implementation
  - Evaluation results of potential vanpool/carpool projects including their potential monetization
    - Vanpool/CalVans example provided
    - Carpool (free ride) example provided
  - Additionality discussed
  - Takeaways provided include:
    - Project selection will be key

- Many projects will be difficult to include if they have to be 100% paid for
- Additionality definition/limits will be key to defining flexibility
- Affordable housing can likely work as a subsidy
- Initial bike projects show some opportunities, however off model may be required
- Transit provides great benefits, but cost is high
- Road diets are complicated and project dependent
- Vanpool and Carpool funding show promise, particularly as a subsidy
- The schedule was reviewed
  - Currently behind original schedule, but confident project can conclude in early 2023
- The question and answer portion provided the following questions and answers:
  - A copy of the powerpoint was requested to be distributed to the SAC members
    - A copy of the presentation will be emailed with the associated notes
  - It was noted that the City of Clovis is in favor of some benefits to be seen in Clovis if an impact occurs in Clovis. This could include closing a funding gap for a project
    - The City did say it was in favor of a regional program however
    - The City also noted that developers want the program to be simple
  - Fresno COG noted that the project team is reviewing RTP projects submitted by the member agencies as the list for evaluating/screening candidate projects
  - It was noted that the next meeting will likely occur in late January
  - A question was asked about how a fee would be determined and whether it would be based on the total cost of all projects or if it would be project specific
    - A cost per VMT reduced will be determined based on the total cost of all projects divided by the total VMT reduced by all projects. Candidate projects are reviewed to ensure projects with lower costs for VMT reduced are included in the program to ensure the program is successful
  - The City of Fresno asked if the VMT mitigation program they are developing would compete with Fresno COG or if the programs would be integrated
    - Once Fresno COG has determined it's program and set it up, it will work with the City of Fresno to determine how the programs would be integrated
  - The City of Fresno asked about the timing for implementing the program
    - It was noted that this project does not include implementing a program so an exact timeline could not be determined
- Attendees were thanked for their participation and the meeting concluded



## Fresno COG Regional VMT Mitigation Program Study Technical Advisory Committee Meeting #2 November 17, 2022

### Presenters:

Kristine Cai – Fresno COG

Mike Schmitt – Kimley-Horn

Chris Gregerson – Kimley-Horn

- Fresno COG and Kimley-Horn provided introductions
- The powerpoint presentation was given that covered the following topics:
  - The project's purpose
  - What fee based VMT programs are, how they work, and what types of fee based VMT programs have been developed
  - The types of VMT mitigation options that could be funded by the fee based VMT program
    - Transit, road diet, active transportation, affordable housing, transit-oriented development, vanpools, and carpools
  - The transportation methodology for evaluating potential projects (each covered in detail)
    - Screening for candidate projects
    - Evaluating the project's performance
    - Setting a project benefit area
    - Monetizing the project (optional)
    - Implementation
  - Evaluation results of potential transportation projects including their potential monetization
    - Two transit projects (Peach Ave Extension and Shaw Ave Express Bus)
    - Two Roadway/Active Transportation projects (Clinton Bike Lane & Road Diet and Belmont Bike Lane & Road Diet)
  - The land use methodology for evaluating potential projects (each covered in detail)
    - Screening for candidate projects
    - Evaluating the project's performance
    - Monetizing the project (optional)
    - Implementation
  - Evaluation results of potential land use projects including their potential monetization
    - The Link affordable housing project evaluated as an example
  - The vanpool/carpool methodology for evaluating potential projects (each covered in detail)
    - Evaluate the project's performance
    - Monetize mitigation project
    - Implementation
  - Evaluation results of potential vanpool/carpool projects including their potential monetization
    - Vanpool/CalVans example provided
    - Carpool (free ride) example provided
  - Additionality discussed
  - Takeaways provided include:
    - Project selection will be key
    - Many projects will be difficult to include if they have to be 100% paid for

- Additionality definition/limits will be key to defining flexibility
- Affordable housing can likely work as a subsidy
- Initial bike projects show some opportunities, however off model may be required
- Transit provides great benefits, but cost is high
- Road diets are complicated and project dependent
- Vanpool and Carpool funding show promise, particularly as a subsidy
- The schedule was reviewed
  - Currently behind original schedule, but confident project can conclude in early 2023
- The question and answer portion provided the following questions and answers:
  - A copy of the powerpoint was requested to be distributed to the SAC members
    - A copy of the presentation will be emailed with the associated notes
  - CCTA noted that they are seeing similar results in terms of cost for VMT reduced for the various potential types of projects
    - Specifically noted they reviewed affordable housing and came to the same conclusion that it didn't provide a good ROI
      - Asked whether the program could contribute to the City of Fresno's affordable housing program and let them distribute the funds as a mitigation option
    - Also noted that Caltrans is open to projects in RTPs for the additionality question, but the proportionality was still an open question
    - Noted that as long as the project team can prove their methodology, Caltrans has been open to different methodologies for determining VMT reductions for partially funded projects
    - CCTA has looked at proportionality on a project basis (bike/ped take a portion of the VMT reduced if only partially funded by the program, but that affordable housing takes all the VMT reduced if only partially funded by the program)
    - CCTA did not look at TODs because most housing is already TOD
    - CCTA is looking into workforce housing (market rate) as a possible mitigation
  - Kittleson noted that the best results they have seen are with subsidized transit passes
  - It was noted that if a subsidized transit program already exists, could it be expanded with funding from the VMT mitigation program? It could prove to be the most cost effective.
    - It was noted that the City of Clovis already does free transit, so ridership data could be reviewed to determine effectiveness of a free transit pass program
  - A question was asked about the buffer size for determining VMT reductions for bike/ped/transit projects
    - It was noted that due to the travel demand model noise (changes to vehicle paths when no changes affect the trips other than the model is being rerun) whenever an activity-based model is run, such as the one used by Fresno COG, a buffer is needed to eliminate the impact of the noise.
    - It was also noted that the model converged before the maximum number of iterations were reached so that was not the cause of the model noise
    - There was consideration of tightening the tolerance for model convergence
    - The bike/ped buffer was determined to be 2.0 miles to understand the rerouting of trips based on any road diet/bike lane
    - The transit buffer was determined to be 0.5 miles to focus on the switch to transit from vehicle trips rather than any rerouting
- Attendees were thanked for their participation and the meeting concluded

## Fresno COG Regional VMT Mitigation Program Study Stakeholder Advisory Committee Meeting #3 February 21, 2023

### Presenters:

Kristine Cai – Fresno COG

Mike Schmitt – Kimley-Horn

Chris Gregerson – Kimley-Horn

- Fresno COG and Kimley-Horn provided opening statement
- The powerpoint presentation was given that covered the following topics:
  - The purpose of a VMT mitigation fee program and how a mitigation bank/exchange/impact fee work
  - Also discussed regional vs local programs
- A question was asked about how credits would get into a VMT bank if an applicant cannot fully mitigate the project's impact.
  - The answer is that projects are required by CEQA to attempt feasible mitigation even if the impact cannot be fully mitigated. A VMT Bank provides a new feasible mitigation so projects with VMT impacts would need to pay into the bank even if it does not fully mitigate the project. It has yet to be determined what the limit on participation would be in terms of an overall percentage reduction for an individual project
- It was noted by attendees that VMT Exchanges may be easier to administer and might be the lowest cost option
- An attendee noted that it may be difficult to access credits in VMT banks
- When polled, attendees rated a VMT Impact Fee program as their first choice, then VMT Banking & Exchange hybrid, then Banking+
- When polled, attendees rated program/VMT cost as the #1 consideration, but applicant to provide mitigation option was also ranked highly
- When polled, attendees ranked Remaining Cost as the most popular way to calculate the fee
  - The City of Fresno noted that with the Fixed Cost option, the amount collected won't be enough to cover the project costs and it may be difficult to identify other funding sources
- One attendee noted that FCRTA is partnering with the City of Coalinga to pair a VMT reducing project with a development project. The project consists of 81 units of multifamily and the developer is paying for two electric buses for the City. The attendee noted that adding mitigations to the project helps fund the project.
- The City of Sanger is constructing affordable housing with level 2 EV chargers and solar panels constructed over the parking lot. It was noted that we should all consider pre- and post-project for funding and feasibility and can take VMT reducing credits in the beginning stages of the project to help with funding overall
- A question was raised about how operational costs factor into the overall cost of a project when considering it for inclusion in a VMT mitigation prog
  - While projects with only capital costs are easier to calculate, operational costs should be included in the overall cost. While it is recognized that it is complex to determine the useful life for a project, oftentimes we will use a 20-year horizon as the "useful" life of a project, which is consistent with the timeline Caltrans uses for roadway projects. This ensures that all projects are evaluated on an even playing field
- Attendees were thanked for their participation and the meeting concluded

## Fresno COG Regional VMT Mitigation Program Study Technical Advisory Committee Meeting #3 February 15, 2023

### Presenters:

Kristine Cai – Fresno COG

Mike Schmitt – Kimley-Horn

Chris Gregerson – Kimley-Horn

- Fresno COG and Kimley-Horn provided opening statement
- The powerpoint presentation was given that covered the following topics:
  - The purpose of a VMT mitigation fee program and how a mitigation bank/exchange/impact fee work
  - Also discussed regional vs local programs
- A VMT Banking program was most popular among the attendees, but Mike Arensen (Kittelson) talked about the ease of implementing an impact fee program compared to the others
- Attendees noted that Wooclap (website used for presentation surveys) requires a log in and takes some time to register so participation wasn't 100%
- Matt Kelley from CCTA found in their work that VMT exchanges are not the most efficient because developers pick and choose the projects that may not work the best
- Regarding the importance of considerations, the following preferences were given by the attendees:
  - First: A program that is supportive of all SB 743 goals
  - Second: The complexity to administer the program
  - Third: The potential cost to mitigate an impact
- All attendees were supportive of a local component of the program
- Additionality and Proportionality were the next big topics covered
  - It was noted that Caltrans recently updated their opinion regarding proportionality and VMT mitigation, it is posted on the Caltrans website as a "hot topic"
    - The updated position is that as long as there is a "significant" investment (significant is undefined) in a project and no other person or project is claiming the VMT mitigated, 100% of the mitigated VMT can be included in a fee-based VMT mitigation program
    - This is now consistent with other CEQA mitigations for biological and cultural studies
  - Proportionality was put into the Caltrans mitigation play book to avoid individuals or organizations providing minimal investment, but taking full credit
- Kimley-Horn then went through examples on the three methods to calculating the price per VMT
  - A question was asked as to the Fixed Price methodology whether no other project can use the VMT for that project if the total cost is hit
    - Correct, the only focus of the fixed price methodology is price per VMT
- It was noted that there is a sweet spot for a price per VMT for a fee-based VMT mitigation program
  - The sweet spot balances the goals of the program with the ability of the project applicant to participate
- Caltrans' stance is supportive of the "Remaining Cost" calculation methodology
  - Caltrans is not sure about the "fixed cost" methodology because how do you determine the cost you are trying to hit?

- To do this we would look at past and present projects and try to analyze what they would need to pay vs what they can bear
  - This is not currently part of the scope of this project
- Mike Arensen (Kittelson) stated that their approach is to use technical studies to determine the maximum fee to charge and then look at other studies to determine what the market can bear. However, this can put pressure on an agency to fully mitigate the remaining VMT
- Caltrans stated that a complex economic study would be needed to determine the price point for the fixed cost approach
- It was noted that ending at a higher cost may be detrimental to the overall program
- No consensus was found on preferences for the additionality/proportionality topic
- Based on feedback from attendees, the cost per VMT that would be appropriate would be in the low thousands
- Attendees were thanked for their participation and the meeting concluded

## Fresno COG Regional VMT Mitigation Program Study Stakeholder Advisory Committee Meeting #4 June 8, 2023

### Presenters:

Kristine Cai – Fresno COG

Mike Schmitt – Kimley-Horn

Chris Gregerson – Kimley-Horn

- Fresno COG and Kimley-Horn provided opening statement
- The powerpoint presentation was given that covered the following topics:
  - The purpose of the study (revisited)
  - The state of the practice or what existing programs are in development or implemented and what are the details of these programs
  - Evaluation of all projects, their VMT reduction, and potential cost per VMT reduced
  - Program options were revisited which included considerations of program administration, programs and their effect on environmental justice, the program evaluation criteria, and a high level evaluation of each program
  - Findings and next steps
- The purpose of the study was restated as: To determine the feasibility of a Regional VMT Mitigation Program for the Fresno Region.
- The state of the practice included summaries of programs from SCAG/LADOT, SBCTA, CCTA, and SGVCOG
  - SCAG/LADOT is testing a pilot program called U-Pass and will work on further refining the Multi-Agency Mitigation Program Framework
  - SBCTA proposed a pilot VMT mitigation bank in August 2022 that is still under development
    - Initially the program focused on incentivizing individuals by making choices to reduce their travel
    - Additional projects and programs already established under the Inland Empire (IE) Commuter Rideshare Program could be added in the future
  - CCTA released a draft VMT mitigation framework in March 2023. They have expressed interest in establishing a pilot hybrid exchange/in-lieu fee program targeted toward implementing the Mobility On Demand (MOD) app
  - SGVCOG has no publicly available document on progress of the project. Anticipating completion of the project in Fall 2022
- A total of 11 projects were evaluated for their potential VMT reductions. This included 4 bike projects, 4 transit projects, 1 land use project, and 2 TDM projects
  - 2 of the 4 bike projects increased VMT within the study area
  - The remaining 9 projects reduced VMT by 70 to 2,219 VMT
- A survey that was previously emailed to SAC participants was presented and feedback was solicited as initial responses were low
  - <https://www.surveymonkey.com/r/fresnofee>
  - 4 question survey based around feasible fees charged for the program
    1. For a Single-Family Dwelling unit, what is the approximate maximum fee per dwelling unit you believe could be charged and project still maintain financial feasibility?

2. For a Multi-Family Dwelling unit, what is the approximate maximum fee per dwelling unit you believe could be charged and project still maintain financial feasibility?
  3. For a Commercial/Retail development project, what is the approximate maximum fee per sq-ft you believe could be charged and project still maintain financial feasibility?
  4. For a Commercial/Office/Service development project, what is the maximum fee per sq-ft you believe could be charged and project still maintain financial feasibility?
- Administration options for the future program included:
    - Add to existing Regional Transportation Mitigation Fee structure
    - Fresno COG oversee separately as a pilot program
    - A new JPA is created
    - Another agency?
  - Additional considerations for administering the future program included:
    - Annual funding costs
    - Technical ability
    - Legal structure and legal defense
    - Ability to manage updates
    - SCS Benefits
  - Findings included:
    - Program is feasible
    - VMT Banking would be the most appropriate initial program
    - Established methods for evaluating VMT mitigation
  - Next steps included:
    - Prepare and circulate for staff admin draft report for comment
    - Public draft review comment for 30-days comment
    - Finalize draft report and present to board
  - A question was asked by the City of Fresno about whether the project team is counting all development in the County, including the City of Fresno, in the potential VMT to be mitigated
    - Answer is yes so if the City has their own program, the VMT to be mitigated would be reduced
  - A question was asked by the City of Fresno about explaining how the two local/regional banks (in regards to the City's program and the Fresno COG program) wouldn't be in competition
    - Answer was that an applicant would only need to participate in a bank if their project needs mitigation. However, if a fee program were implemented by Fresno COG, every applicant would have to pay a fee based on their location. It would be easier if Fresno COG were to choose a VMT Bank framework to carve out the City of Fresno to eliminate competition rather than an Impact Fee framework
  - A question was asked that if travel demand measures (TDM) were included as mitigation projects in a VMT bank, and these TDM measures require monitoring, does the TDM have to be in the VMT bank forever?
    - The answer was that you would treat the TDMs as a capital project with a 20-30 year useful life so the project would be long term, but not forever
  - A question was asked about whether there were any preliminary results from the survey sent out to attendees
    - Initial findings show that respondents preferred fees on the lower end of the options offered, but that only a handful of responses had been received so far

- Attendees were thanked for their participation and the meeting concluded



## Fresno COG Regional VMT Mitigation Program Study Technical Advisory Committee Meeting #4 June 7, 2023

### Presenters:

Kristine Cai – Fresno COG

Mike Schmitt – Kimley-Horn

Chris Gregerson – Kimley-Horn

- Fresno COG and Kimley-Horn provided opening statement
- The powerpoint presentation was given that covered the following topics:
  - The purpose of the study (revisited)
  - The state of the practice or what existing programs are in development or implemented and what are the details of these programs
  - Evaluation of all projects, their VMT reduction, and potential cost per VMT reduced
  - Program options were revisited which included considerations of program administration, programs and their effect on environmental justice, the program evaluation criteria, and a high level evaluation of each program
  - Findings and next steps
- The purpose of the study was restated as: To determine the feasibility of a Regional VMT Mitigation Program for the Fresno Region.
- The state of the practice included summaries of programs from SCAG/LADOT, SBCTA, CCTA, and SGVCOG
  - SCAG/LADOT is testing a pilot program called U-Pass and will work on further refining the Multi-Agency Mitigation Program Framework
  - SBCTA proposed a pilot VMT mitigation bank in August 2022 that is still under development
    - Initially the program focused on incentivizing individuals by making choices to reduce their travel
    - Additional projects and programs already established under the Inland Empire (IE) Commuter Rideshare Program could be added in the future
  - CCTA released a draft VMT mitigation framework in March 2023. They have expressed interest in establishing a pilot hybrid exchange/in-lieu fee program targeted toward implementing the Mobility On Demand (MOD) app
    - Matt Kelly from CCTA stated that he didn't have anything more recent to add
  - SGVCOG has no publicly available document on progress of the project. Anticipating completion of the project in Fall 2022
- No attendees had updates on any other programs
- A total of 11 projects were evaluated for their potential VMT reductions. This included 4 bike projects, 4 transit projects, 1 land use project, and 2 TDM projects
  - 2 of the 4 bike projects increased VMT within the study area
  - The remaining 9 projects reduced VMT by 70 to 2,219 VMT
- A survey that was previously emailed to SAC participants was presented and feedback was solicited as initial responses were low
  - <https://www.surveymonkey.com/r/fresnofee>
  - Only 5 responses as of meeting time
  - 4 question survey based around feasible fees charged for the program

1. For a Single-Family Dwelling unit, what is the approximate maximum fee per dwelling unit you believe could be charged and project still maintain financial feasibility?
  2. For a Multi-Family Dwelling unit, what is the approximate maximum fee per dwelling unit you believe could be charged and project still maintain financial feasibility?
  3. For a Commercial/Retail development project, what is the approximate maximum fee per sq-ft you believe could be charged and project still maintain financial feasibility?
  4. For a Commercial/Office/Service development project, what is the maximum fee per sq-ft you believe could be charged and project still maintain financial feasibility?
- Administration options for the future program included:
    - Add to existing Regional Transportation Mitigation Fee structure
    - Fresno COG oversee separately as a pilot program
    - A new JPA is created
    - Another agency?
  - No feedback was obtained from the meeting attendees on the administration options
  - Additional considerations for administering the future program included:
    - Annual funding costs
    - Technical ability
    - Legal structure and legal defense
    - Ability to manage updates
    - SCS Benefits
  - Findings included:
    - Program is feasible
    - VMT Banking would be the most appropriate initial program
    - Established methods for evaluating VMT mitigation
  - Next steps included:
    - Prepare and circulate for staff admin draft report for comment
    - Public draft review comment for 30-days comment
    - Finalize draft report and present to board
  - A question was asked by Calgrans regarding background documentation on the project and whether more information can be provided on why a VMT Bank program was preferred over other frameworks
    - The answer indicated that the final report will include additional background information
    - The final report will also include more graphics on how a fee program would work, how the zones would be distributed, etc.
  - An attendee from Kittelson stated that the costs per VMT that were presented are consistent with the costs calculated by others
    - The attendee was asked about whether \$1,000/VMT was a reasonable target. They stated that it seems reasonable, but it's still tough to settle on a specific number
  - An attendee from DKS stated that the challenge is going to be whether the VMT reductions that were calculated and presented will turn out to be real
    - Further, the attendee stated that the baseline needed to be established and that for the carpool/telecommute program, it would need to be determined whether the people are already doing this if they are to be further incentivized

- An attendee from Kittelson stated that they are still not convinced on the advantages of a VMT Bank over a VMT Fee program
  - This attendee requested a better explanation in the final report
- Attendees were thanked for their participation and the meeting concluded