


# Regional VMT

## *Mitigation Program Study*

**FINAL**

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Fresno Council of Governments

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# Regional VMT

*Mitigation Program Study*

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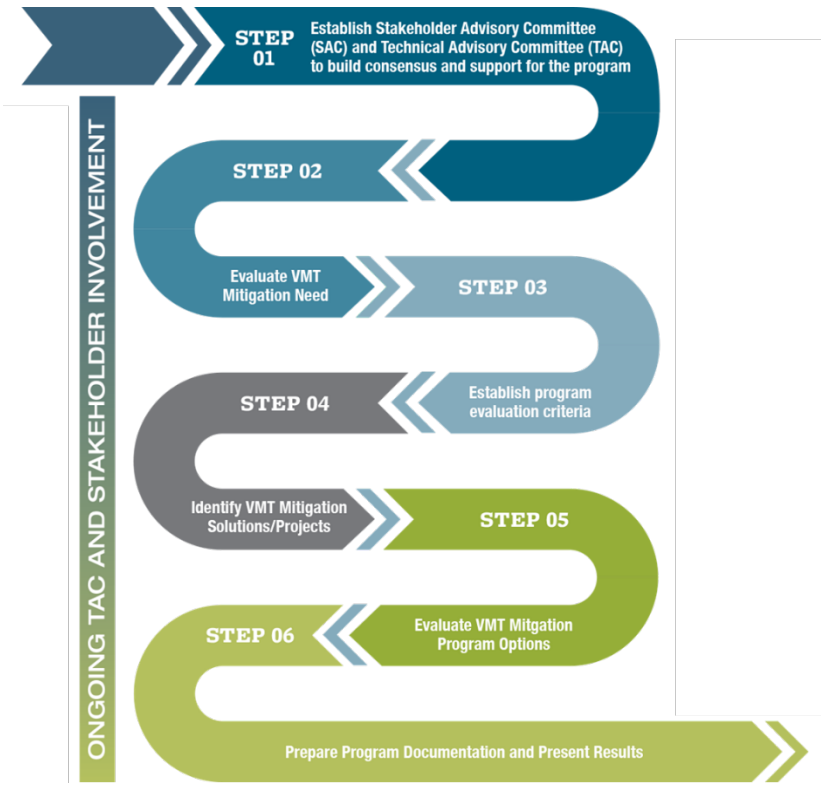
## Executive Summary

This study evaluates Vehicle Miles Traveled (VMT) mitigation programs to meet the California Environmental Quality Act (CEQA) transportation mitigation needs for the 16 jurisdictions that comprise Fresno COG. As discussed in the ***Background*** section, existing solutions that often rely heavily on existing transportation demand management (TDM) options are inadequate to fully mitigate many of the planned land use and transportation projects within the Fresno region. This study considers whether a programmatic approach, primarily through fee assessments to pay for VMT-reducing projects, is a feasible solution to address transportation related CEQA mitigation needs within the Fresno region.

To determine feasibility and evaluate program options, this study sought to answer the following questions:

- What is the ***state of the practice for VMT mitigation programs***?
- What is the magnitude of ***need for VMT mitigation*** within the Fresno region?
- What are the ***program options*** available to be considered to meet this need?
- What are the appropriate ***evaluation criteria to select a VMT mitigation program***?
- What types of ***VMT-reducing mitigation projects*** should be considered with a program?
- What are the ***challenges to implementing a program***?
- How can ***equity concerns be addressed within the program***?
- Which program has the potential to ***best meet the needs of the Fresno region***?

**Exhibit ES-1** – Study Process



## Study Oversight

To guide the study, a Technical Advisory Committee (TAC) and Stakeholder Advisory Committee (SAC) were assembled to provide oversight and input during the study. The TAC comprised primarily subject matter experts, while the Stakeholder Advisory Committee was represented by Fresno COG member jurisdictions, community-based organizations (CBOs), and developers, including those who have expertise in affordable housing. The TAC and SAC were presented with the same material and were afforded the same opportunities to participate during the study.

## VMT Mitigation Approaches

If a project needs to mitigate its VMT impact, there are several different options available to the project applicant. **Exhibit ES-2** below provides project examples that will reduce VMT in the Fresno region. Currently, due to the cost and complexity of implementing many types of individual projects, the primary way of mitigating a VMT impact is using select transportation demand management (TDM) measures.

Fresno COG's VMT policy includes two TDM measures that can be used to mitigate a project's VMT impacts: a vanpool program (only applicable for office building projects) and a carpool program. These options are site-specific and are not part of a regional program. In addition, these TDM options require the project to provide ongoing monitoring to measure mitigation effectiveness and report it to the jurisdiction where the project is located. As a part of a fee-based VMT mitigation program, several new mitigation options could be included to allow projects more flexibility in mitigating their VMT impacts, as summarized in **Exhibit ES-2**.

**Exhibit ES-2** – VMT Mitigation Project Types

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| Example Projects | | Types of Projects |
|---|---|---|
| | Pedestrian | Adding sidewalks or filling in sidewalk gaps |
| | Bike | New lane miles of Class I – Class IV bike lanes, filling in gaps in bike infrastructure, or bike share |
| | Transit | New transit lines, extension of existing service, or adding new service types such as BRT |
| | Road Diet | Reducing capacity and providing non-auto infrastructure such as protected bike lanes or bus pull outs |
| | ITS/ TSM | Providing parking wayfinding, optimizing signal systems, providing trip planning services |
| | Mobility Hub | Provide infrastructure to link multiple types of transportation modes |
| | Affordable Housing | Providing affordable housing in dense areas, transit-oriented development, or other affordable housing supportive needs |
| | Vanpool/Carpool | Implement regionwide vanpool and carpool programs or expand existing programs |
| | Park-and-Ride | Construct park-and-ride lots to increase trip occupancy |

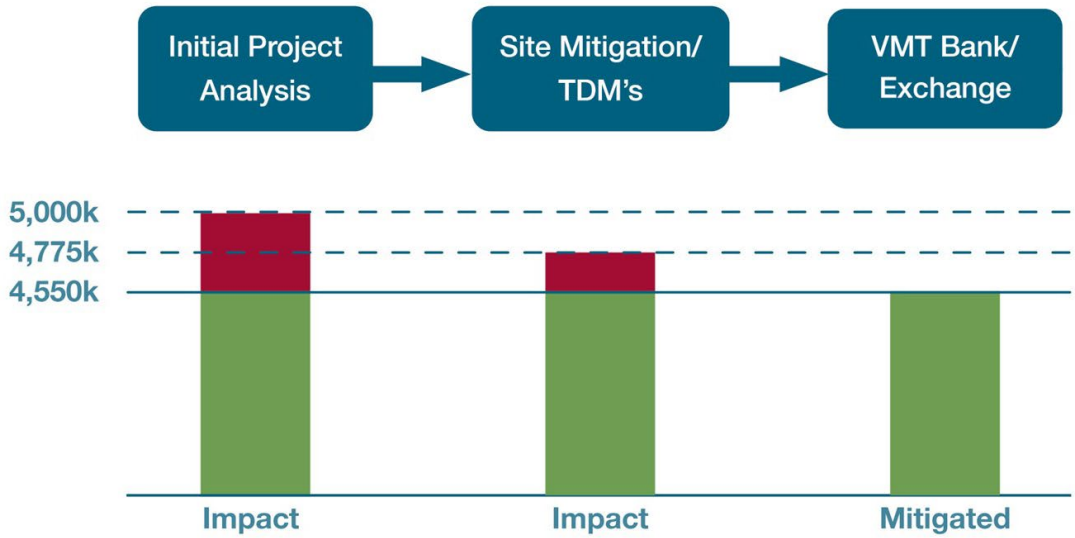
To expand the opportunities and choices for VMT mitigation, regional VMT mitigation programs, such as the one being contemplated by this study, are being considered for implementation throughout California. Regional VMT mitigation programs have the potential to implement larger VMT-reducing projects that can have a bigger overall impact in reducing regional VMT. Since many of the projects included in these programs can cost millions of dollars, it would unlikely that many project applicants would have a need for so much VMT mitigation or be able to feasibly fund these projects on their own. However, with a program such as those being contemplated by this study, several project applicants can pool their money together to fund large VMT-reducing projects.

## VMT Mitigation Programs

This study focused on several different programmatic approaches to VMT mitigation, including VMT banking, VMT exchanges, and VMT mitigation impact fee programs. **Exhibit ES-3** provides a graphical representation of how a project would go about mitigating its transportation impact in an area where a VMT fee program, such as a VMT bank, exists. Even where a VMT fee program exists, an applicant project is still encouraged to use TDM and other project-specific measures to reduce VMT impacts prior to relying on a VMT bank or similar strategy to mitigate any remaining VMT impact, as shown in **Exhibit ES-3**.

The example project in **Exhibit ES-3** below shows that a project is 450 VMT above its threshold (5,000 VMT – 4,550 VMT = 450 VMT). The project uses various TDM measures to reduce its VMT by 225 (5,000 – 4,775 = 225) and then pays into the fee program to reduce the final 225 VMT (450 – 225 = 225).

**Exhibit ES-3** – Application of a VMT Mitigation Program



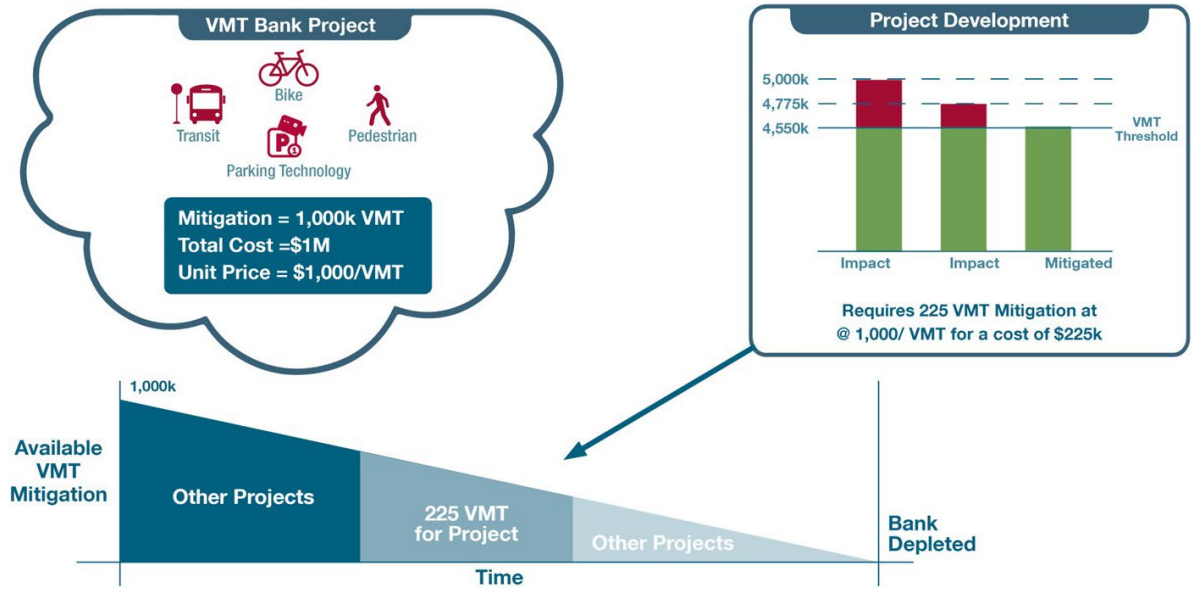

Although ***VMT mitigation programs*** can take multiple forms, the three most common program types, and the primary focus of this study included:

***VMT Bank*** – As shown in **Exhibit ES-4**, the following steps are followed for establishing a VMT mitigation bank:

1. Identify VMT-reducing projects, such as bike, pedestrian, and transit projects.
2. Evaluate projects to determine how much VMT they reduce.
3. Add all VMT that is mitigated by all projects together. In this example the total VMT reduced is 1,000.
4. The cost for each project is also summed. In this example the total cost of all projects that reduce VMT is $1 million.
5. The cost per VMT reduced is calculated by dividing the total cost of all the projects by the total VMT reduced. In this example, the cost to mitigate 1 VMT is $1,000.

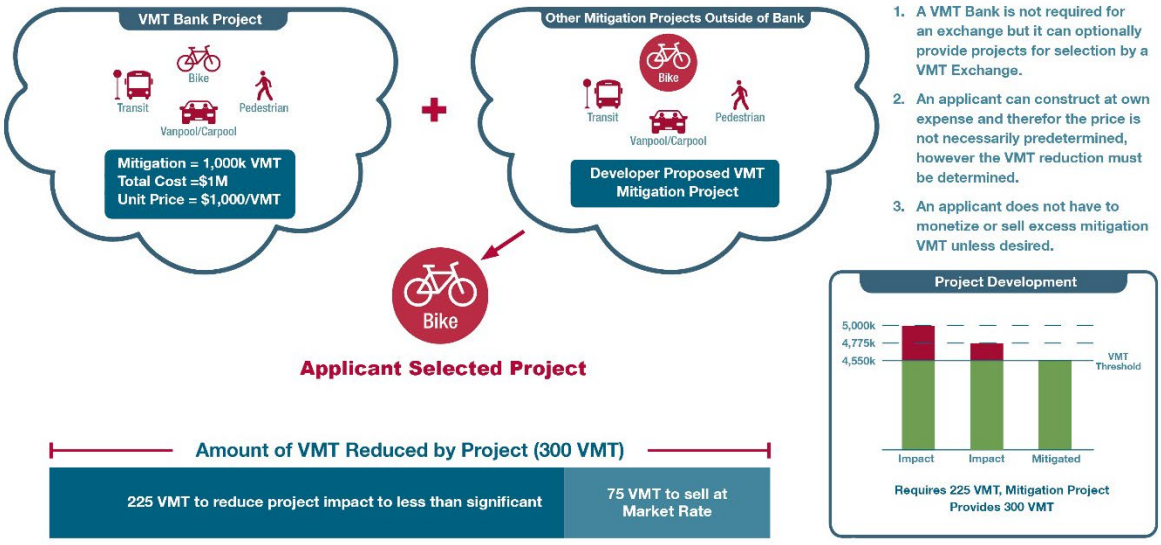
Once the cost per VMT is determined and the VMT bank is implemented, a project can mitigate its VMT impact by paying into the bank. As shown in **Exhibit ES-4** below, the example project needs to reduce 225 VMT to achieve the threshold. Therefore, the total cost for the project would be $225,000 based on multiplying the cost of each VMT reduced, $1,000, by the total VMT needing to be reduced, 225. Note that once the available VMT is used up by development projects purchasing VMT from the VMT bank, the VMT bank would need to be replenished with new mitigation projects.

**Exhibit ES-4** – VMT Banking Example




***VMT Exchange*** – VMT exchanges operate like VMT banks, except that under a typical VMT exchange, applicants may identify a single project from an existing list or program of VMT-reducing projects or may instead identify their own VMT-reducing project for implementation. Under a VMT exchange, it is not necessary to monetize the selected VMT-reducing project unless the project applicant wishes to make excess VMT mitigation available to others for purchase. As shown in **Exhibit ES-5** below, an applicant constructs a bike project that reduces regional VMT by 300. However, the applicant only needs 225 VMT to reduce the VMT impact to the VMT threshold. Therefore, the applicant has 75 VMT that can be sold to others at a market rate.

**Exhibit ES-5** – VMT Exchange Example

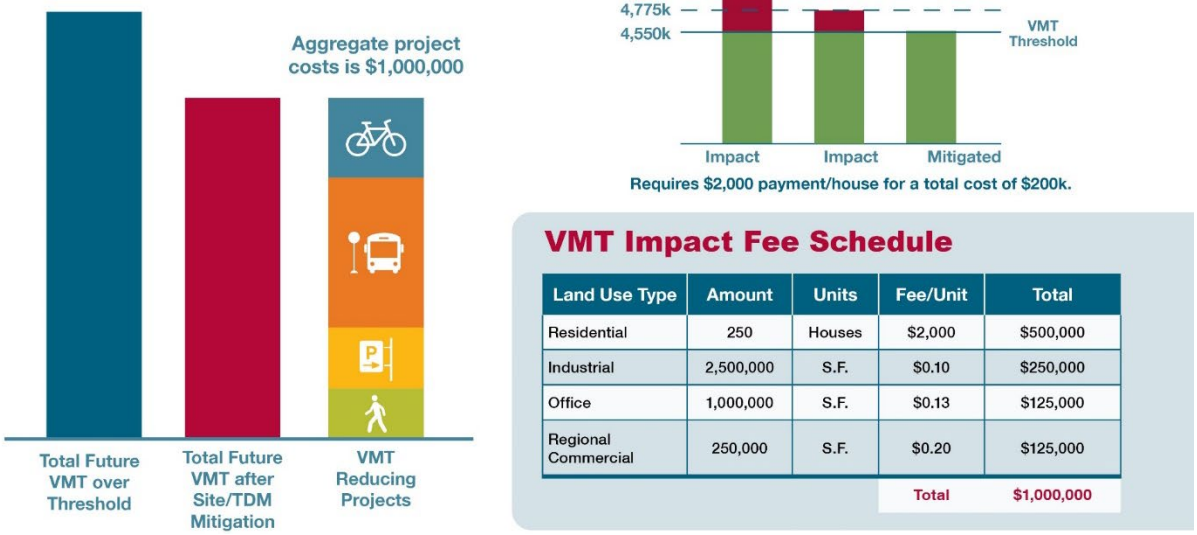


***VMT Impact Fee –*** Instead of a VMT bank, Fresno COG's VMT fee program could be structured similarly to existing development fee programs. A new development project would be required to pay a fee to offset its VMT impact based on the total number of dwelling units planned or the total size of any buildings, in square-feet, planned to be constructed. A VMT impact fee program would function similarly to existing development fee programs, except it would only include projects that reduce VMT.

As shown in **Exhibit ES-6** below, fees would be determined based on how much VMT would be generated by planned developments over the next 10-20 years with a focus on offsetting the amount of VMT that would need to be mitigated. Like the VMT bank, fees are determined by dividing the total VMT reduced by the total cost of the VMT-reducing projects. However, unlike a VMT bank, this is done for each land use category rather than collectively.

The fee for each land use type is determined by first quantifying the VMT that needs to be mitigated for each land use, calculating the share of the total VMT requiring mitigation, multiplying that percent share by the total cost of the VMT-reducing projects, and then dividing the land-use specific cost by the growth for each land use (either dwelling units or square-feet). For example, in **Exhibit ES-6**, the residential land use accounts for 50% of all future VMT needing to be mitigated and the total cost of all VMT-reducing projects is $1 million, then the residential land use would have a total mitigation cost of $500,000 (50% of $1 million). If the total number of houses expected to be constructed in the future is 250, then the fee would be calculated by dividing $500,000 by 250, resulting in a fee of $2,000 per home.

**Exhibit ES-6** – VMT Impact Fee Example




**VMT Impact Fee Schedule**

| Land Use Type | Amount | Units | Fee/Unit | Total |
|---|---|---|---|---|
| Residential | 250 | Houses | $2,000 | $500,000 |
| Industrial | 2,500,000 | S.F. | $0.10 | $250,000 |
| Office | 1,000,000 | S.F. | $0.13 | $125,000 |
| Regional Commercial | 250,000 | S.F. | $0.20 | $125,000 |
| | | | Total | $1,000,000 |

Unique to a VMT impact fee framework, but consistent with other impact fee programs, it may be beneficial to divide a region into multiple benefit areas to provide fees based on how efficient a benefit zone is with respect to the overall VMT performance. This could incentivize projects to locate in VMT-

efficient areas in the region. As shown in **Exhibit ES-7** below, the areas that combine to form Zone 1 all fall below the regional VMT threshold for both residential and non-residential uses and this results in no fees being administered for projects in that zone. Alternatively, Zone 2 has the worst VMT performance and contains the highest fees charged for the region.

**Exhibit ES-7** – VMT Impact Fee Program with Multiple Benefit Areas


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

Several variations of these programs were also considered during the study-- including ***hybrid VMT mitigation programs*** under which a jurisdiction can mix and match entire programs or elements of VMT banks, VMT exchanges, and VMT impact fee programs.

## Mitigation Projects

As shown in **Exhibit ES-2**, a variety of ***mitigation project*** types can be considered to be included within a regional VMT mitigation program, including:

***Active Transportation*** – Providing additional lane miles of bike lanes (Class 1 – Class IV) or sidewalks, including those close network gaps, to allow users to more safely and reliably access destinations to which they might otherwise drive. These projects can also be linked to existing transit infrastructure to help solve existing last-mile issues and further incentivize a mode shift away from driving.

***Transit*** – Providing additional buses (increasing frequencies and/or reducing headways), extending existing routes, providing new routes, or providing new express or bus rapid transit (BRT) service are all projects with the goal of providing a reliable transit service that can compete with driving. Combining transit projects with improvements to the active transportation networks and/or increasing parking costs can further incentivize a mode shift towards transit and away from driving.

***Mobility Hubs*** – A mobility hub provides infrastructure that links several different modes of travel, often including additional features such as dedicated rideshare drop-off and pick-up location, secure bike storage, electric vehicle chargers, all centralized around a transit stop. Mobility hubs can provide a good return on investment by connecting different travel modes to reduce VMT, improving the overall transportation network to serve different travel needs.

***Land Use*** – Providing funding for land use projects that lower regional VMT by moving residents closer to desired destinations or alternate modes of transportation can be an effective way to reduce regional VMT. In particular, land use projects such as affordable housing and transit-oriented development are promising mitigation measures to reduce VMT.

***Transportation Demand Measures (TDM)*** – Many development projects use TDM mitigations for their VMT impacts. Common TDMs include: guaranteed ride home, telecommuting, carpooling and vanpooling programs, and increasing parking costs. Although, these programs are typically considered measures to address employment-based VMT impacts, other applicant project types (residential, transportation, etc.) can pay into an existing program that helps offset their VMT impacts.

***Reduced Demand*** – Road diets, lane restrictions, and traffic calming are all projects that can be considered in isolation but are more commonly partnered with other types of projects such as bike/ped or transit projects. Reduced demand projects disincentivize driving by increasing travel time, albeit with the benefit of making the roadway safer and more attractive to non-motorized users. Potential VMT increases are a concern, however. These projects reduce capacity, so users might respond to this reduction by changing paths and rerouting trips, which could lead to more VMT than their usual routes. This may offset any realized gains related to mode shift, so existing traffic routes need to be carefully considered during any analysis.

## Mitigation Project Evaluation

Fresno COG coordinated with its member jurisdictions to establish a list of candidate VMT-reducing projects to evaluate the feasibility of including them in a fee-based VMT mitigation program. Eleven total projects were evaluated including four active transportation projects, three transit projects, one land use/affordable housing project, and two TDM projects. Based on this evaluation the following was determined:

- Active transportation projects were evaluated using Fresno COG's travel demand model. Two of the four projects evaluated increased VMT within the 2-mile buffer of the projects. The remaining two projects resulted in a mitigation cost per VMT reduced that varied between $302 and $3,596.
- Transit projects were also evaluated using Fresno COG's travel demand model. One of the four projects evaluated increased VMT within the half-mile buffer of the projects. The remaining three projects resulted in a cost per VMT reduced that varied between $2,193 and $38,226.
- The affordable housing project was evaluated based on a case study of an actual affordable housing project proposed in the Fresno region and then using Fresno COG's VMT estimation tool to determine the total VMT reduced by multiplying the difference between the project's average VMT per capita and the regional threshold by the total population of the project. A total VMT reduction of 764 VMT was determined which would, voiding any other funding source, result in a $49,749 cost per VMT.
- A vanpool program was evaluated by determining the unit cost per VMT reduced if a vanpool program was implemented within the Fresno region based on existing vanpools operated by CalVans. It was determined that the total cost per VMT reduced would be $723 over a 20-year lifespan.
- A carpool program was evaluated by determining the feasibility of providing monetary incentives to drivers of a carpool to increase participation in the program. It was determined that the cost

per VMT reduced was $3,042 for a carpool with 1 passenger or $1,014 for a carpool with 3 passengers over a 20-year lifespan.

Note that the costs presented are representative of the improvements being solely funded through the regional VMT mitigation program. As demonstrated by this analysis, there are significant variations in the cost of mitigation that is not inclusive to just project type. This is consistent with the findings of other recent VMT mitigation studies from throughout the state. As a result of this analysis, it is understood that a feasible program will likely require additional funding sources if the cost per VMT is to result in a financially feasible mitigation.

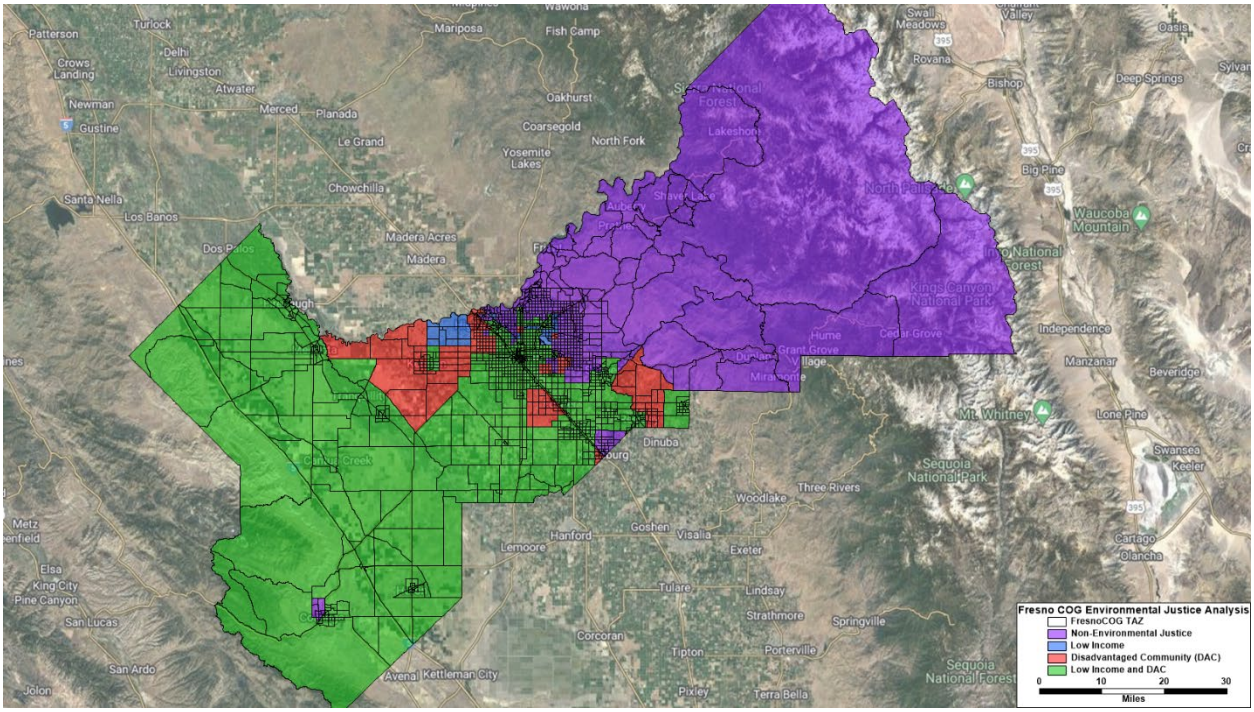
Additional funding can be appropriately considered for mitigation projects so long as the requirements of ***additionality*** are met. Caltrans defines additionality as, "a critical step in asserting such mitigation is to assure that the investment provides additional resources that otherwise would not have been provided or providing the additional resources substantially earlier than they otherwise would have been available." Based on this and other guidance provide by Caltrans a VMT mitigation program could claim the entirety of a project's VMT mitigation if the funding provided meets the requirements of additionality and if there are no other claimants to the VMT mitigation.

## Equity and Mitigation

Unlike Level of Service (LOS) which determines specific impacts in the vicinity of a new development, VMT considers the entirety of a trip and looks at impacts regionally. When a development project is constructed, its VMT impact can be mitigated by a VMT-reducing project anywhere in the region because its impact is not necessarily tied to a specific location. Equity concerns are raised where new development and transportation projects are concentrated in a few communities while their corresponding VMT mitigation projects are implemented elsewhere in the region. Some communities could bear the impact of new development and transportation facilities without seeing the benefits of VMT-reducing projects funded by a VMT bank or similar.

To determine whether the fee-based VMT mitigation program would be equitable, an environmental justice analysis was completed to determine whether the impact of new development and the VMT mitigation projects would likely occur equitably across the region. Specifically, the analysis evaluated whether VMT impacts would be concentrated in low-income and/or disadvantaged communities and where it would be most likely that mitigation projects would be implemented. Disadvantaged communities are designated by the California Environmental Protection Agencies (CalEPA) per Senate Bill 535 (SB 535). Low-income communities and households are defined as the census tracts and households, respectively, that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development's (HCD) Revised 2021 State Income Limits per Assembly Bill 1550 (AB 1550). **Exhibit ES-8** below identifies the areas in Fresno County that are low-income communities (blue), disadvantaged communities (red), both low-income and disadvantaged communities (green), or neither (purple). VMT mitigation should be concentrated in areas where it would be most effective, e.g., areas with the densest population; **Exhibit ES-8** suggests that the majority of VMT mitigation projects would likely occur in environmental justice communities (non-purple areas).

**Exhibit ES-8** – Fresno Environmental Justice Communities




The categorization shown above was combined with an analysis completed to determine future VMT mitigation needs for both residential and employment uses, as shown in **Exhibit ES-9** and **Exhibit ES-10** below. The beige areas in ES-9 and ES-10 are non-environmental justice communities while the others are low income, disadvantaged, or both. The height of the area indicates the estimated amount of VMT needed in the future based on how closely the area is to the region's VMT threshold multiplied by the total residential (dwelling unit) or employment (jobs) growth. **Exhibit ES-9** and **Exhibit ES-10** show that VMT is spread relatively consistently throughout the region and therefore the implementation of a fee-based VMT mitigation program would support an equitable outcome as VMT impacts would not be concentrated in environmental justice communities and VMT mitigation would not be concentrated in non-environmental justice communities.

**Exhibit ES-9** – 20-year Vehicle Miles Traveled Need (Residential)

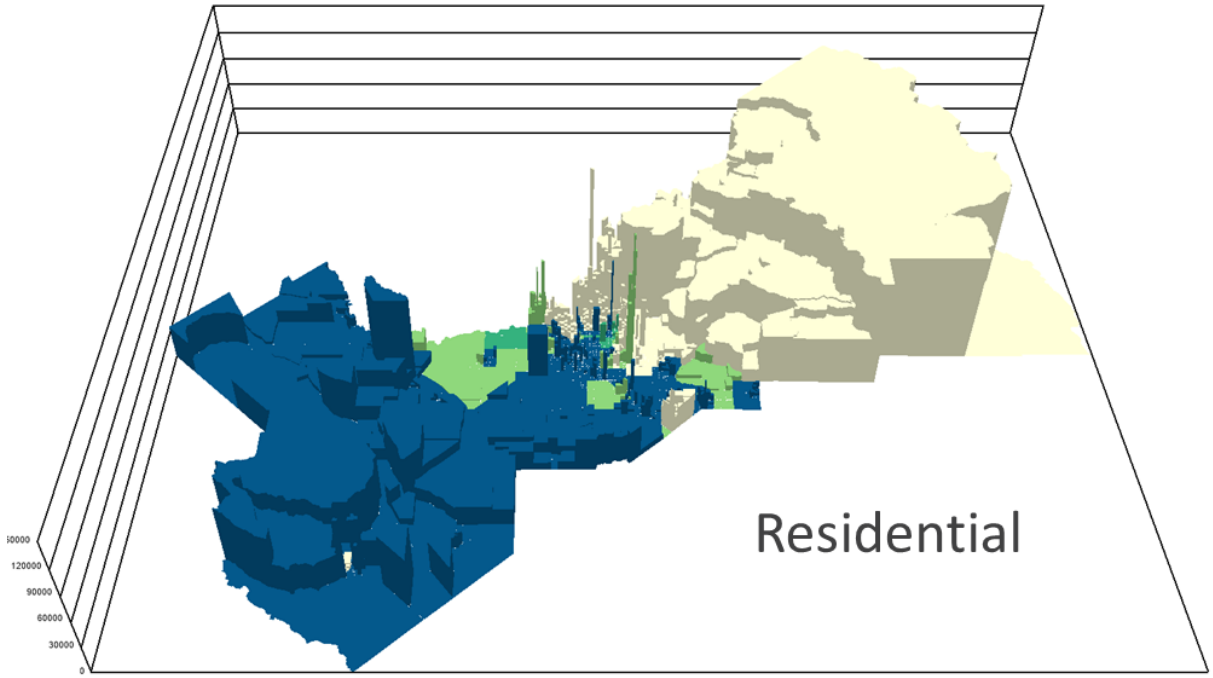



**Exhibit ES-10** – 20-year Vehicle Miles Traveled Need (Employment)

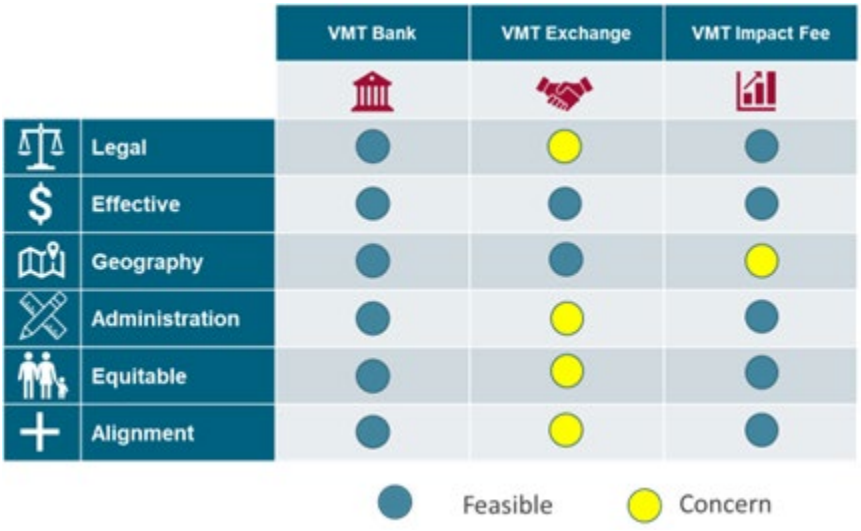

## Program Evaluation

As part of this study, mitigation program options were evaluated in terms of their potential to meet the identified needs of the region. The following are considerations and questions that guided the evaluation of the feasibility of the fee-based VMT mitigation program framework for Fresno COG:

***Legal*** – Does the fee-based VMT mitigation program meet CEQA and statutory requirements, including additionality?
***Effective*** – Does the fee-based VMT mitigation program result in a long-term financially feasible mitigation program?
***Geography*** – Can the fee-based VMT mitigation program scale to meet the region's needs?
***Administration*** – Does the fee-based VMT mitigation program fund oversight and management of the program and maintain analysis and technical requirements for administering the program?
***Equitable*** – Does the fee-based VMT mitigation program avoid disproportionate impacts to disadvantaged and/or low-income communities? Does the program encourage an equitable benefit distribution throughout the region?
***Alignment*** – Does the fee-based VMT mitigation program support good design of projects and align with community values and existing plans?

**Exhibit ES-11** below provides a summary of how each type of fee-based VMT mitigation program was evaluated against the above considerations. Yellow dots indicate a "concern" that the complexity of a specific program element or that the lack of practical experience with it may represent a challenge to its implementation. As it is believed that all the program types are ultimately implementable, these designations should simply be thought of as areas of consideration that which will require additional study and evaluation prior to their respective programs being considered for implementation. As shown in **Exhibit ES-11**, only VMT Bank frameworks would address all considerations identified.

**Exhibit ES-11** – Regional VMT Mitigation Program Evaluation




In addition to the above, one of the important considerations that must be addressed when considering CEQA transportation mitigation is the requirement of ***additionality***. Additionality requires that mitigation be an action that would not have happened otherwise. Simply put, a project applicant must either introduce a new mitigation solution or materially advance a future mitigation solution for it to serve as the basis for offsetting their significant transportation impact. Recently, Caltrans has provided important clarification on its interpretation of additionality, which allows applicants to claim the totality of VMT

mitigation from a VMT-reducing project even if they are not the sole source of funding, assuming no one else has a claim to that mitigation. Under this interpretation, a greater range of VMT-reducing project solutions are possible because funding sources outside of a VMT mitigation program can be used to sufficiently improve per unit VMT pricing helping improve feasibility. Along with additionality, there are ***other legal and administrative considerations***, depending on the program format, that will need to be considered when instituting a VMT mitigation program.

Another important consideration incorporated into the evaluation of a fee-based VMT mitigation program was the concept of ***unintended consequences***. Unintended consequences related to the implementation of a fee program that could include a variety of outcomes including significant changes to development or transportation costs, changes in development patterns, or changes to the priority of infrastructure project implementation. Another important consideration was that implementing a VMT mitigation program should not discourage good project design or contradict community values.

## Study Outcome

After completing the project analyses, outreach, framework evaluations, and reviewing all considerations, it was determined that ***a fee-based VMT mitigation program is a feasible option for the Fresno COG region***. In addition, it was determined that VMT banking would be the most appropriate initial program framework for implementation in the Fresno region. A variation of VMT banking, called VMT banking plus, that allows for a project applicant to select a project to implement from a predetermined list was also identified as being favorable. In part these programs were identified as being the most appropriate given that they are more easily understood by the public and decision-makers and would also be the most flexible in terms of accommodating VMT mitigation programs that may be locally implemented, such as the one currently being considered by the City of Fresno.

Other findings and recommendations that have resulted from the study include:

- Equity is an important consideration that will need to be incorporated into both the final design of the selected VMT mitigation program and the projects selected to support it. Based on the analysis completed as part of this study, implementation of a fee-based VMT mitigation program could support an equitable outcome, as VMT impacts would not be concentrated in environmental justice communities and VMT mitigation would not be concentrated in non-environmental justice communities.
- There is a need to be selective about which VMT-reducing projects are included in a fee-based VMT mitigation program to ensure that the VMT mitigation program financially and feasibly mitigate. This evaluation should consider whether other funding sources are available to a project and whether it can meet the requirements of additionality.
- Implementing a regional VMT mitigation program provides a new feasible mitigation option that project applicants will be required to use if a VMT impact is determined for their project and that they cannot mitigate though other means.
- Developing a project list for a fee-based VMT mitigation program will be an iterative process to determine the best solution. It is essential for the success and defensibility of VMT mitigation program that accurate methods consistent with analysis best practices be used to maintain

rigorous outcomes. It is recommended that the analysis and framework established and documented during this study be the foundation of future analysis.

- The nexus between the need for the program and the impact of the mitigation must be documented during the final project design.
- The success of the program will require decision-maker, agency, and community support as well as from those that will participate in the resultant VMT mitigation program. It will be important to consider a broad range of perspectives during the final design of the selected VMT mitigation program and during project selection.
- Implementing a fee-based VMT mitigation program adds a new fee and may further increase the cost of housing and other development and increase the cost of any capacity enhancing projects. However, in the absence of a solution for increased VMT mitigation solution demands, significant uncertainty will remain for many projects, including those that align with other plans and programs, continuing to impede their ability to progress.

# Regional VMT

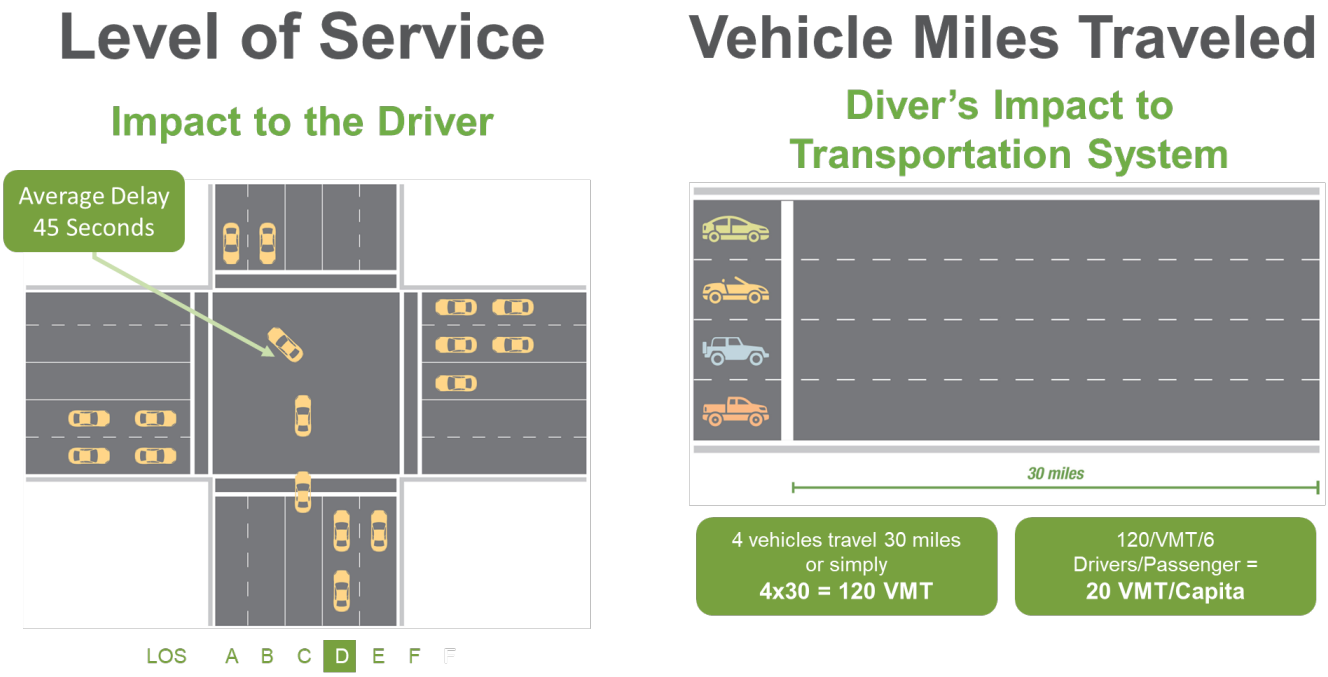
*Mitigation Program Study*

## Background

SB 743 was a bill passed by the California legislature that changes how an environmental review is conducted for proposed projects. Proposed projects can be both land use projects, like a housing development, or a transportation project, like widening a road. Vehicle delay at an intersection or along a roadway is no longer considered an environmental impact. Instead, the focus is on the amount of vehicle miles traveled (VMT) produced by a project.

Prior to the implementation of SB 743, transportation impacts were determined based on delay and the concept of Level of Service (LOS). LOS has been in use in the transportation industry since the first Highway Capacity Manual (HCM) was released in 1950. In total, seven editions of the HCM have been released and LOS has guided transportation-decision-making in all seven editions. However, the use of LOS has been directly linked to numerous less desirable outcomes including urban sprawl, negative impacts to active transportation such as bicycles and pedestrians, and negative impacts to transit. These negative impacts result because LOS is a metric that is primarily used to improve travel for vehicles, oftentimes at the expense of other modes of travel. In addition, the cost to address LOS is cheaper the further away the impact is from the urban core making greenfield development more cost effective when compared to infill development. SB 743 looks to reverse these trends by measuring VMT, which is more representative of how vehicles impact the overall transportation system. **Exhibit 1** provides a summary of the differences between LOS and VMT.

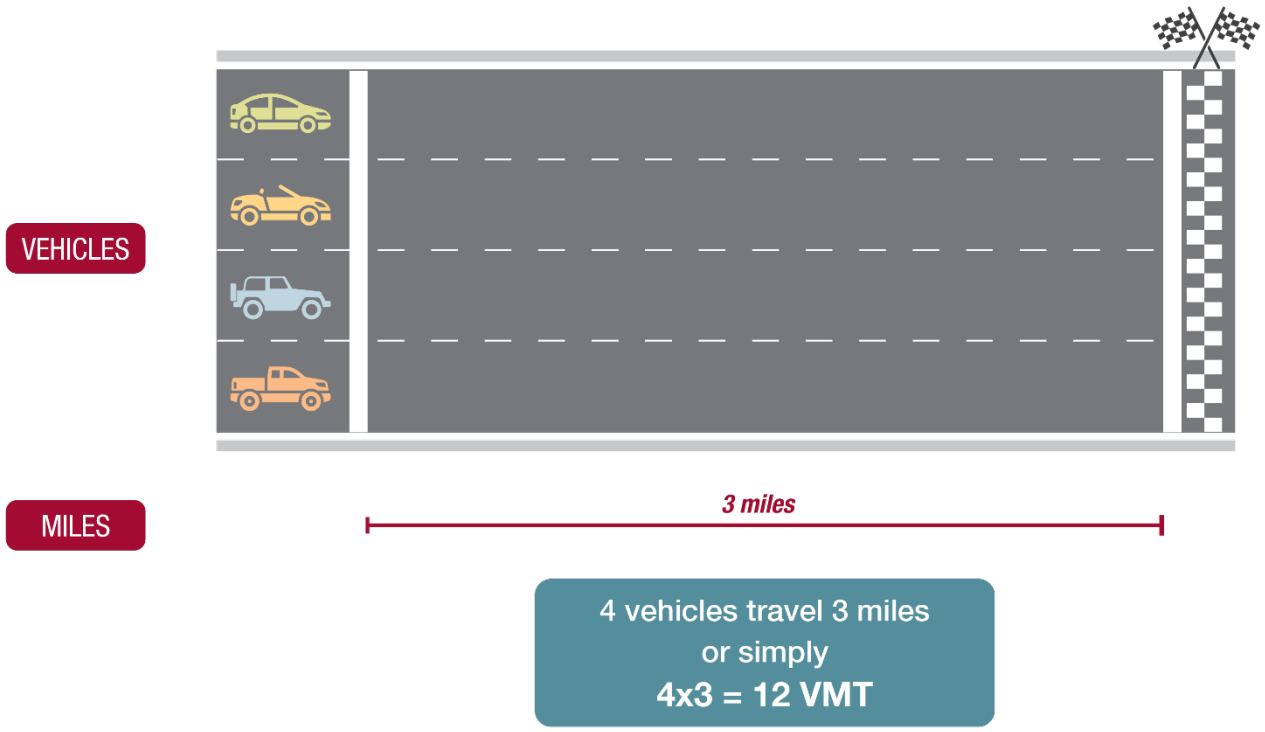
**Exhibit 1** – Level of Service vs. Vehicle Miles Traveled




Vehicle miles traveled are calculated exactly as the term sounds, the number of miles traveled by each vehicle in a system summed. As shown in **Exhibit 2** below, four vehicles each traveling 3 miles means that

each individual vehicle would have 3 VMT. When combined, all four vehicles account for a total of 12 VMT.

**Exhibit 2** – How to Calculate Vehicle Miles Traveled



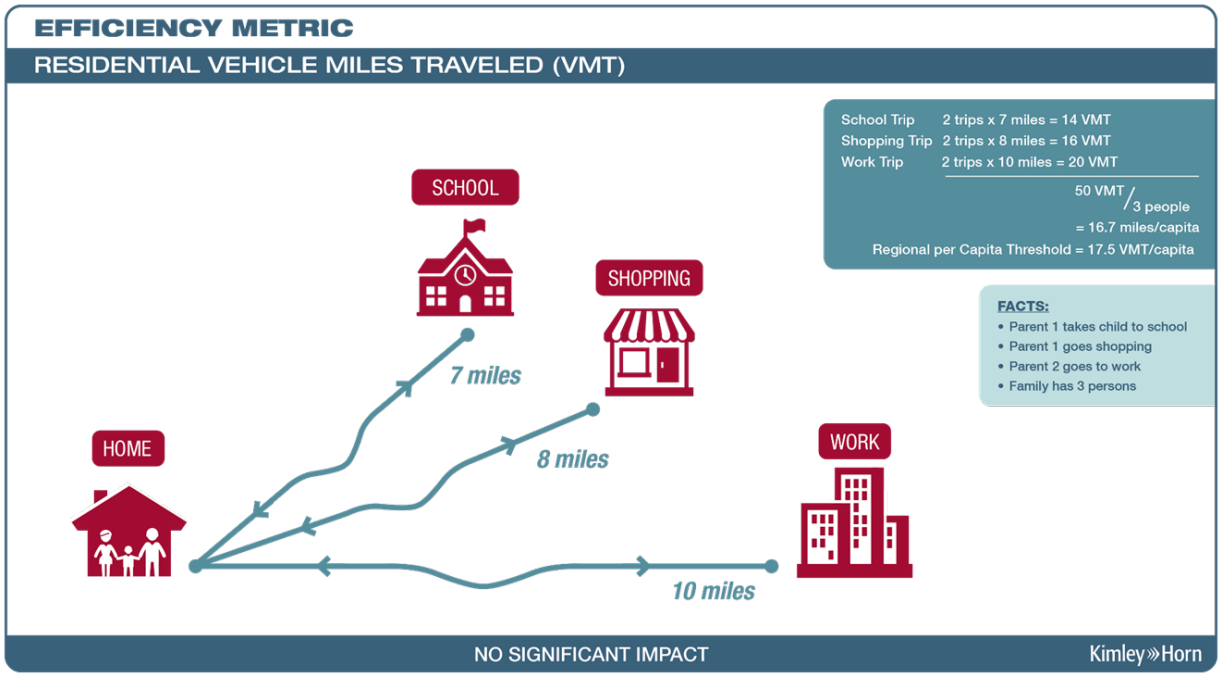

The change from LOS to VMT is meant to encourage more development in denser urban areas, where VMT tends to be lower. The use of VMT as the basis of analysis has also resulted in a lack of feasible and cost-effective mitigation solutions for projects in suburban and rural areas as many mitigations used to previously address LOS considerations are either ineffective or counterproductive to reducing VMT. Not surprisingly, the change from LOS to VMT has resulted in many jurisdictions seeing markedly different outcomes in CEQA-related transportation analysis and resulted in the need for new and different mitigation solutions.

When determining if a project results in a significant transportation impact, the project must be compared to a threshold of significance that is determined by the jurisdiction it is constructed in. Two types of thresholds exist: efficiency thresholds, such as VMT per capita for residential projects or VMT per employee for office projects, and net change thresholds. Residential and office projects can vary in size so using an efficiency metric allows the projects to be easily compared to a threshold. Based on prior analysis, Fresno COG has established a recommended threshold of 13-percent below the Countywide average for both residential and office and similar projects. Retail and similar customer serving projects often do not create new trips, so it is more appropriate to consider how proximity to the ultimate destination and transportation options affect the outcome in terms of a net change in VMT.

**Exhibit 3** summarizes how a residential project is evaluated using VMT. Each household has every trip measured, both to and from a location, to determine the total VMT. The graphic below shows how trips

to the child's school is 7 miles each way (14 miles total), the trip to work is 10 miles each way (20 miles total), and the trip to the store is 8 miles each way (16 miles total). When adding the total length of all trips together, the household has 50 daily VMT.

**Exhibit 3** – Vehicle Miles Traveled Residential Project Example




To determine whether the project results in an environmental impact, the project's VMT per capita must be compared to the regional threshold. In the example shown in **Exhibit 3**, the household contains 3 people, so the VMT per capita is determined by dividing the household's total VMT (50) by the household size (3) resulting in a household VMT per capita of 16.7. If the regional threshold is 17.5 VMT per capita, the project would not result in an impact as it is more efficient (less than) the threshold.

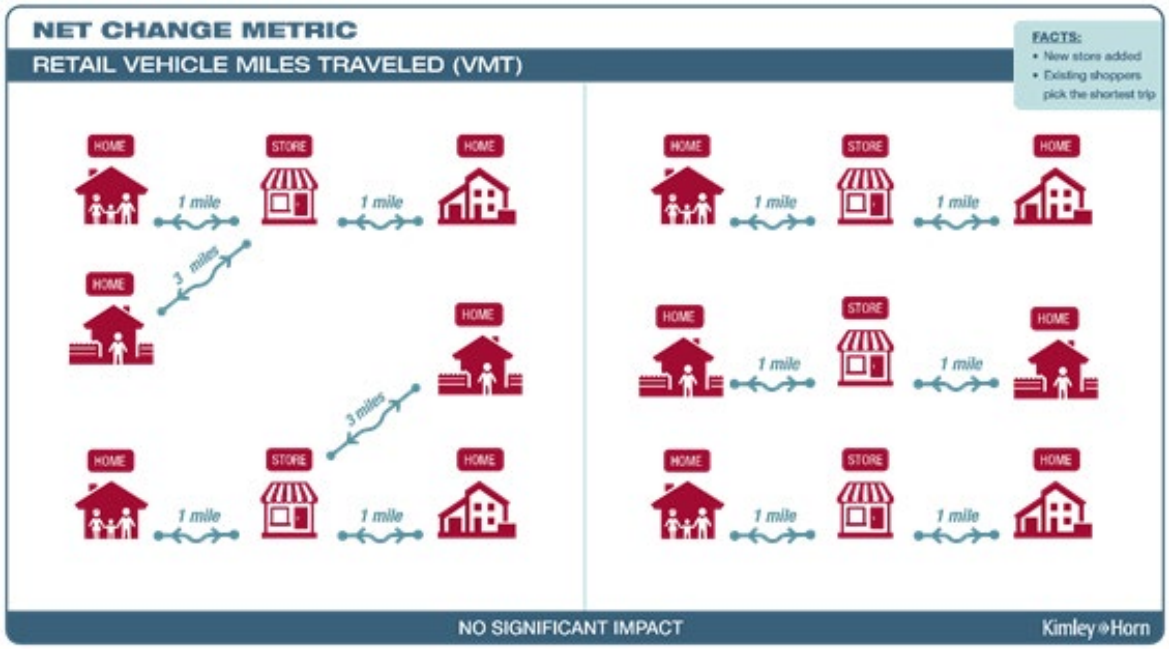
Most trips generated by retail projects are related to customers who have a pre-existing need such as grocery shopping. These trips already exist on a network, so the impact of a new retail store is the change in length of those trips rather than the length of the newly generated trips. Therefore, a net change metric is used to see how regional VMT changes as a result of introducing a new retail store into the region.

There is a distinction between regional retail (e.g., Lowes or Target) and local-serving retail (e.g., coffee shops, fast food restaurants, or gas stations) when it comes to evaluating VMT. Local-serving retail primarily serves preexisting needs (i.e., it does not generate new trips because it meets existing demand). Because of this, local-serving retail uses can be presumed to reduce trip lengths when a new store is proposed. Essentially, the assumption is that someone will travel to a newly constructed, local-serving store because of its proximity compared to a comparable store currently fulfilling an existing need located further away. This results in a trip on the roadway network becoming shorter, rather than adding a new trip to the roadway network, which would result in an impact on the overall transportation system.

Conversely, residential and office land uses often drive new trips, given that they introduce new participants to the transportation system.

**Exhibit 4** visually demonstrates the basis for this finding. As shown, introducing a new retail store often has the effect of redistributing existing customer trips in a manner that reduces average trip lengths, thereby resulting in a VMT reduction (i.e., trip segments that were 3 miles before the new retail store are reduced to 1 mile with the addition of the new retail store).

**Exhibit 4** – Effect of Local-Serving Retail on Regional Vehicle Miles Traveled




Additional documentation on Fresno COG's recommend VMT policy, including thresholds by land use, can be found on Fresno COG's VMT Analysis Guide website: [https://www.fresnocog.org/project/vmt-analysis/](https://www.fresnocog.org/project/vmt-analysis/)

## VMT Mitigation Approaches

If a project needs to mitigate its VMT impact, there are several different options available to the project applicant. **Exhibit 5** below provides project examples that will reduce VMT in the Fresno region. Currently, due to the cost and complexity of implementing many types of individual projects, the primary way of mitigating a VMT impact is using select transportation demand management (TDM) measures.

Fresno COG's VMT policy includes two TDM measures that can be used to mitigate a project's VMT impacts: a vanpool program (when using FresnoCOG's VMT Analysis Tool vanpools are only applicable for office building projects, but overall can be used to mitigate VMT for other land uses outside of the tool) and a carpool program. These options are site-specific and are not part of a regional program. In addition, these TDM options require the project to provide on-going monitoring to measure mitigation effectiveness and report it to the jurisdiction where the project is located. As a part of the fee-based VMT

mitigation program, several new mitigation options could be included to allow projects more flexibility in mitigating their VMT impacts, as summarized in **Exhibit 5**.

**Exhibit 5** – VMT Mitigation Project Types

| Example Projects | | Types of Projects |
|---|---|---|
| | Pedestrian | Adding sidewalks or filling in sidewalk gaps |
| | Bike | New lane miles of Class I – Class IV bike lanes, filling in gaps in bike infrastructure, or bike share |
| | Transit | New transit lines, extension of existing service, or adding new service types such as BRT |
| | Road Diet | Reducing capacity and providing non-auto infrastructure such as protected bike lanes or bus pull outs |
| | ITS/ TSM | Providing parking wayfinding, optimizing signal systems, providing trip planning services |
| | Mobility Hub | Provide infrastructure to link multiple types of transportation modes |
| | Affordable Housing | Providing affordable housing in dense areas, transit-oriented development, or other affordable housing supportive needs |
| | Vanpool/Carpool | Implement regionwide vanpool and carpool programs or expand existing programs |
| | Park-and-Ride | Construct park-and-ride lots to increase trip occupancy |

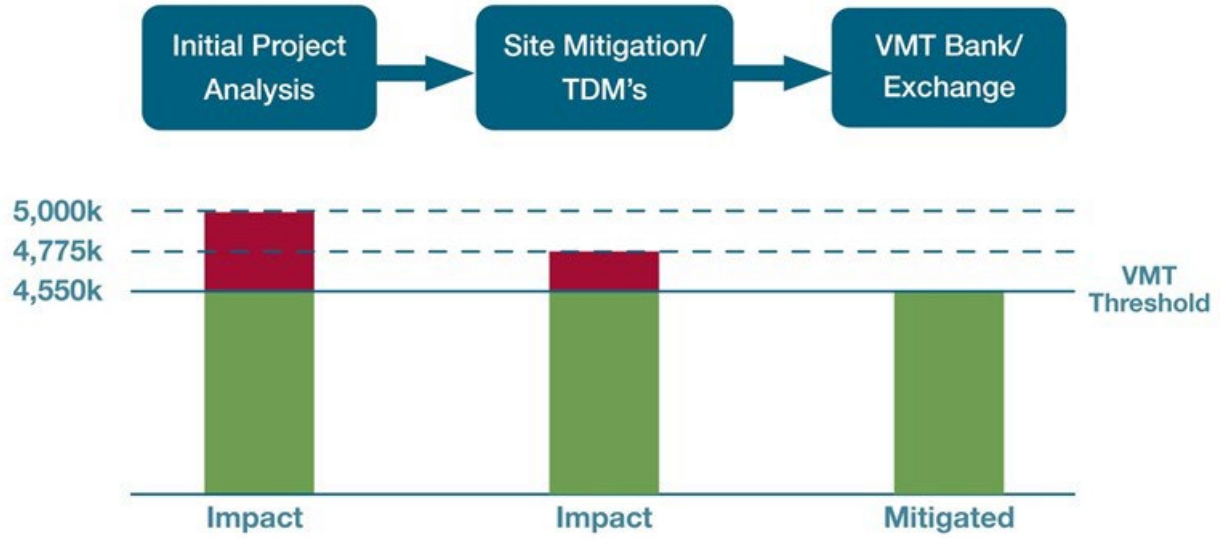
To expand the opportunities and choices for VMT mitigation, regional VMT mitigation programs, such as the one being contemplated by this study, are being considered for implementation throughout California. Regional VMT mitigation programs have the potential to implement larger VMT-reducing projects that can have a bigger overall impact in reducing regional VMT. Since many of the projects included in these programs can cost millions of dollars, it would be unlikely that many project applicants would have a need for so much VMT mitigation or be able to feasibly fund these projects on their own. However, with a program such as those being contemplated by this study several project applicants can pool their money together to fund large VMT-reducing projects.

## Fee-Based VMT Mitigation Program Framework Options

This study focused on several different programmatic approaches to VMT mitigation, including VMT banking, VMT exchanges, and VMT mitigation impact fee programs. **Exhibit 6** provides a graphical representation of how a project would go about mitigating its transportation impact in an area where a VMT fee program, such as a VMT bank, exists. Even where a VMT fee program exists, an applicant project is still encouraged to use TDM measures and other project specific measures to reduce their VMT impact with the VMT bank or similar strategy used to mitigate any remaining VMT impact, as shown in **Exhibit 6**.

The example project in **Exhibit 6** below shows that a project is 450 VMT above its threshold (5,000 VMT – 4,550 VMT = 450 VMT). The project uses various TDM measures to reduce its VMT by 225 (5,000 – 4,775 = 225) and then pays into the fee program to reduce the final 225 VMT (450 – 225 = 225).

**Exhibit 6** – Application of a VMT Mitigation Program



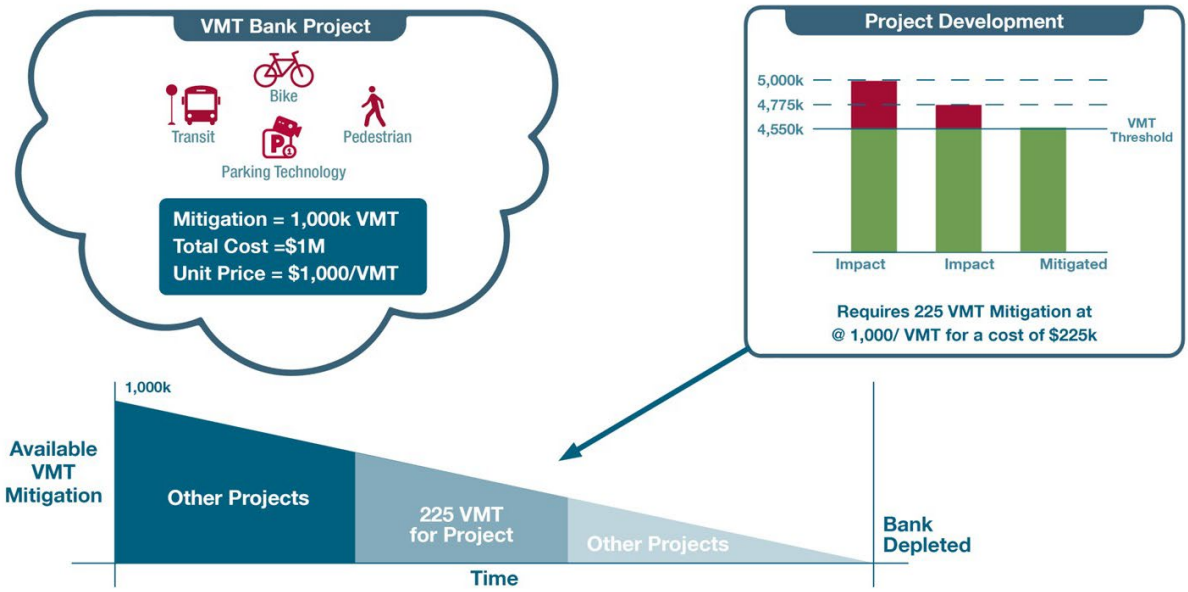

Although ***VMT mitigation programs*** can take multiple forms, the three most common program types, and the primary focus of this study included:

***VMT Bank*** – As shown in **Exhibit 7**, the following steps are followed for establishing a VMT mitigation bank:

1. Identify VMT-reducing projects such as bike, pedestrian, and transit projects are identified.
2. Evaluate projects to determine how much VMT they reduce.
3. Add all VMT that is mitigated by all projects together. In this example the total VMT reduced is 1,000.
4. The cost for each project is also summed. In this example the total cost of all projects that reduce VMT is $1 million.
5. The cost per VMT reduced is calculated by dividing the total cost of all the projects by the total VMT reduced. In this example, the cost to mitigate 1 VMT is $1,000.

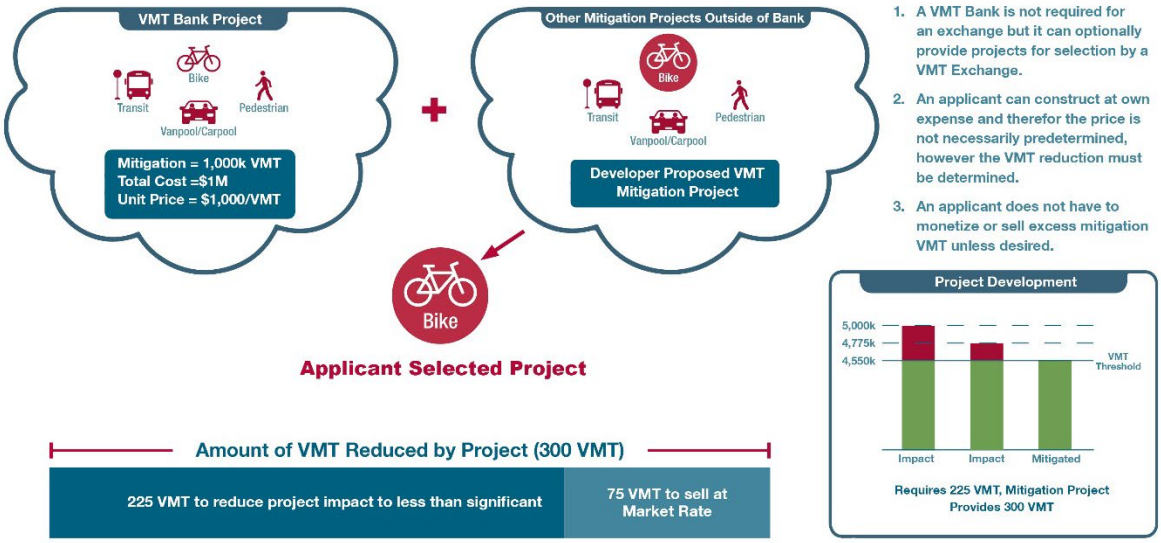
Once the cost per VMT is determined and the VMT bank is implemented, a project can mitigate its VMT impact by paying into the bank. As shown in **Exhibit 7** below, the example project needs to reduce 225 VMT to achieve the threshold. Therefore, the total cost for the project would be $225,000 by multiplying the cost of each VMT reduced, $1,000, by the total VMT needing to be reduced, 225. Note that once the available VMT is used up by development projects purchasing VMT from the VMT bank, the VMT bank would need to be replenished with new VMT mitigation projects.

**Exhibit 7** – VMT Banking Example




***VMT Exchange*** – VMT exchanges operate like VMT banks, except that an applicant may identify a single project from an existing list or program of VMT-reducing projects or may instead identify their own VMT-reducing project for implementation. Under a VMT Exchange, it is not necessary to monetize the selected VMT-reducing project unless the project applicant wishes to make excess VMT mitigation available to others for purchase. As shown in **Exhibit 8** below, an applicant constructs a bike project that reduces regional VMT by 300. However, the applicant only needs 225 VMT to reduce their VMT impact to the VMT threshold. Therefore, the applicant has 75 VMT that can be sold to others at a market rate.

**Exhibit 8** – VMT Exchange Example

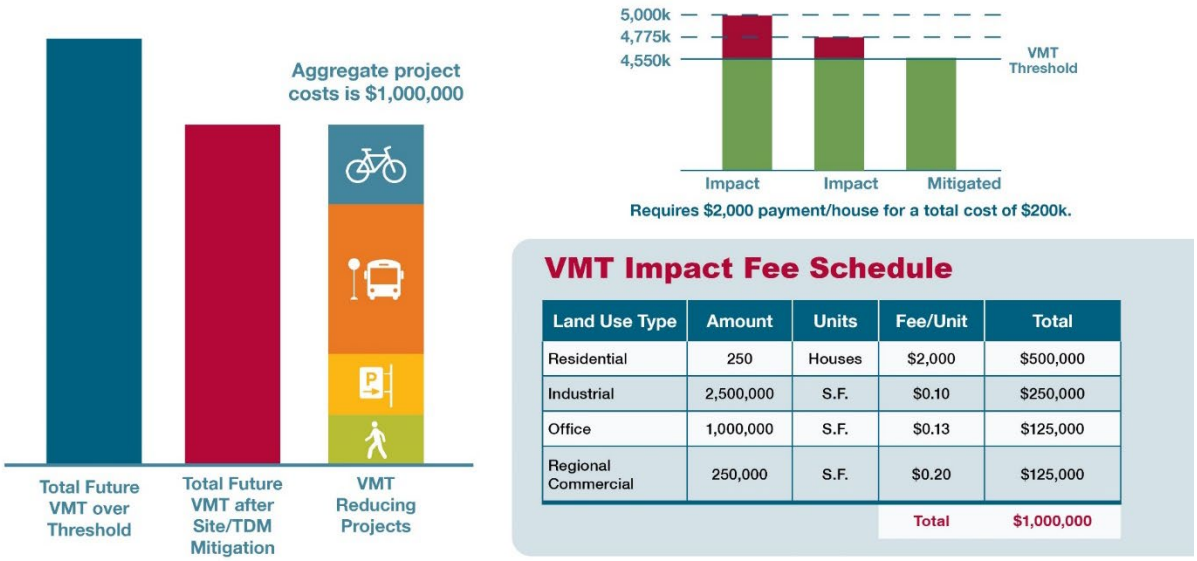


***VMT Impact Fee –*** Instead of a VMT bank, Fresno COG's VMT fee program could be structured similarly to existing development fee programs. A new development project would be required to pay a fee to offset its VMT impact based on the total number of dwelling units planned or the total size of any buildings planned in square-feet planned to be constructed. A VMT impact fee program would function similarly to an existing development fee programs except it would only include projects that reduce VMT.

As shown in **Exhibit 9** below, the fees would be based on how much VMT would be generated by planned developments over the next 10-20 years with a focus on offsetting the amount of VMT that would need to be mitigated. Like the VMT bank, the fees are determined by dividing the total VMT reduced by the total cost of the VMT-reducing projects. However, unlike a VMT bank, this is done for each land use category rather than collectively.

The fee for each land use type is determined by first quantifying the amount of VMT that needs to be mitigated for each land use, calculating the share of the total VMT needing to be mitigated, multiplying that percent share by the total cost of the VMT-reducing projects, and then dividing the land-use specific cost by the growth for each land use (either dwelling units or square-feet). For example, in **Exhibit 9**, the residential land use accounts for 50% of all future VMT needing to be mitigated and the total cost of all VMT-reducing projects is $1 million, then the residential land use would have a total mitigation cost of $500,000 (50% of $1 million). If the total number of houses expected to be constructed in the future is 250, then the fee would be calculated by dividing $500,000 by 250, resulting in a fee of $2,000 per home.

**Exhibit 9** – VMT Impact Fee Example




**VMT Impact Fee Schedule**

| Land Use Type | Amount | Units | Fee/Unit | Total |
|---|---|---|---|---|
| Residential | 250 | Houses | $2,000 | $500,000 |
| Industrial | 2,500,000 | S.F. | $0.10 | $250,000 |
| Office | 1,000,000 | S.F. | $0.13 | $125,000 |
| Regional Commercial | 250,000 | S.F. | $0.20 | $125,000 |
| | | | Total | $1,000,000 |

Unique among fee-based VMT mitigation program frameworks, but consistent with other impact fee programs such as trip-based transportation impact fee programs, it may become beneficial to divide a region into multiple benefit areas to provide fees based on how efficient a benefit zone is with respect to the overall VMT performance. This could incentivize projects to locate in VMT-efficient areas in the region. As shown in **Exhibit 10** below, the areas that combine to form Zone 1 all fall below the regional VMT threshold for both residential and non-residential uses and this results in no fees being administered for

projects in that zone. Alternatively, Zone 2 has the worst VMT performance and contains the highest fees charged for the region.

**Exhibit 10** – VMT Impact Fee Program with Multiple Benefit Areas


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

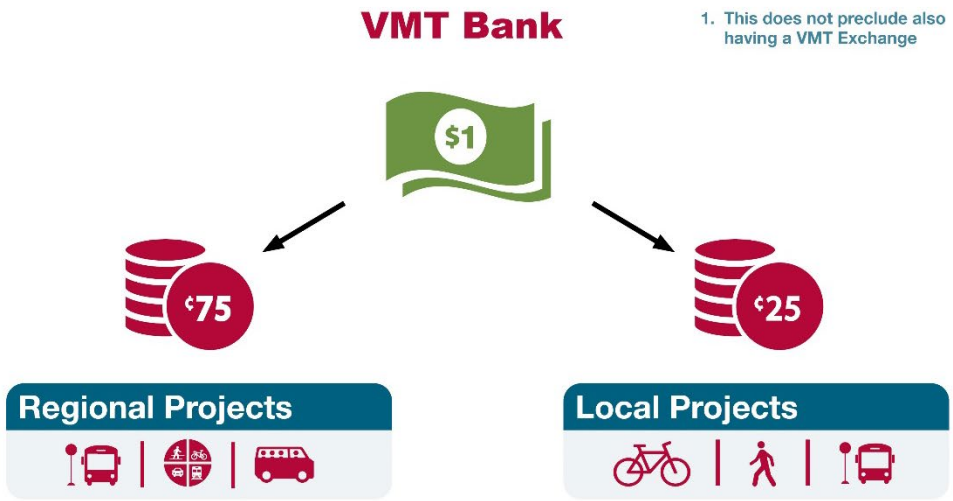
## Fee-based VMT Mitigation Program Variations

In addition to the three primary types of fee-based VMT mitigation program frameworks, there are several other variations that were considered throughout the project, including:

***Micro (Localized) VMT Banking*** – Sometimes, rather than implementing a single regional fee-based VMT mitigation program using one of the frameworks described above, it can be beneficial to implement multiple VMT banking programs that cover smaller areas or stay within a single jurisdiction. Under this approach, smaller, manageable groups of projects could be funded and implemented simultaneously. This may address some equity concerns because mitigation projects would occur in the same location as the development projects causing the VMT impacts. Alternatively, a micro VMT bank could be integrated into a regional VMT bank or VMT exchange.

***Hybrid VMT Mitigation Programs*** – Under a hybrid approach, jurisdictions can mix and match banking, exchanges, impact fee programs, and/or micro VMT banking programs. As noted previously with micro VMT banks, combining a regional banking solution with a micro VMT banking program works best. As shown in **Exhibit 11**, every dollar that is brought in for VMT mitigation would be spread regionally and locally by a predetermined value, so VMT mitigation payments can take advantage of the efficiency of regional projects while still supporting the local community in which they are located. This hybrid approach also helps to address equity concerns by funding VMT-reducing projects in the community in which the development project with a VMT impact is located.

**Exhibit 11** – VMT Bank with Regional and Local Split




## Literature Review and State of the Practice

The first task completed as a part of this project was the literature review and evaluation of the state of the practice. This effort reviewed relevant existing programmatic approaches and assessed the legal and non-legal considerations that can influence program development. The findings are summarized four subsections below: Framework Pros and Cons, Fee-Based VMT Mitigation Program Legal Considerations, Mitigation Fee Act (AB 1600), and State of the Practice.

The documents reviewed for the Fresno region include member jurisdictions' impact fee guidelines, Fresno County SB 743 Implementation Regional Guidelines, screening criteria and thresholds, as well as other relevant documents including climate action plans, bicycle and pedestrian master plans, transit plans, and transportation demand management ordinances produced by jurisdictions within Fresno County, including Fresno COG and Fresno County were reviewed. In addition, the best practices involving CEQA mitigation methods supporting the goals of SB 743 of select agencies throughout California were reviewed.

Other resources and documents that were reviewed as a part of this effort included new analysis methodologies from industry experts and relevant professional organizations (ITE, ITS, APA, CAPCOA, OPR, CARB, etc.) for providing multimodal solutions to mitigate VMT impacts. The complete literature review can be found in **Appendix A**. Following are some of the key relevant findings that were identified during these efforts that helped shape this study:

- Agencies need to verify VMT reductions and additionality for projects before including them in a VMT mitigation program.
- Any agency implementing a VMT 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 be diligent in their evaluation of VMT mitigation duration as the nexus between improvements and the successful use of fees can vary 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.
- Agencies should also determine a comprehensive framework for the prioritization of individual mitigation projects to ensure that VMT mitigation is achieved in a timely and efficient manner.
- 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. VMT exchanges can also offer more control 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 arise if disadvantaged communities host developments but not beneficial mitigation projects. Lead agencies 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 can comprehensively address VMT impacts across jurisdictional boundaries

## Framework Pros and Cons

Programmatic approaches studied throughout the literature hold great promise for VMT mitigation, but also have a number of advantages and disadvantages in terms of implementation, legal considerations, etc. Weighing the pros and cons can speed up the decision-making process for implementing agencies as well as improving the understanding of the concepts.

**Table 1** below provides a summary of the pros and cons for each VMT mitigation program framework:

**Table 1** – Framework Pros and Cons

| Program Type | Pros | Cons |
|---|---|---|
| Mitigation Exchange | • Limited complexity<br>• Reduced nexus obligation<br>• Expands mitigation to include costs for programs, operations, and maintenance<br>• Allows for regional scale mitigation projects | • Requires “additionality”<br>• Potential for mismatch between mitigation need and mitigation projects<br>• Increases mitigation costs for developers because it increases feasible mitigation options |

| | | |
|---|---|---|
| | • Allows for mitigation projects to be in other jurisdictions<br>• Increases potential VMT reduction compared to project site mitigation only | • Unknown timeframe for mitigation life<br>• Effectiveness depends on scale of the program |
| Mitigation Bank | • Add certainty to development cost<br>• Allows for regional scale projects<br>• Allows for mitigation projects to be in other jurisdictions<br>• Allows regional or state transfers<br>• Expands mitigation options to include costs for programs, operations, and maintenance<br>• Increases potential VMT reduction compared to project site mitigation only | • Requires "additionality"<br>• Time consuming and expensive to develop, and maintain<br>• Requires strong nexus<br>• Political difficulty distributing mitigation dollars/projects<br>• Increases mitigation costs for developers because it increases feasible mitigation options<br>• Unknown timeframe for mitigation life<br>• Effectiveness depends on scale of the program |

## Fee-Based VMT Mitigation Program Legal Considerations

The following is a summary of the legal requirements related to fee-based VMT mitigation programs:

- A fee-based VMT mitigation program may include VMT-reducing projects that require CEQA clearance, but the program itself does not need to be environmentally cleared. CEQA clearance may be achieved once a VMT-reducing project is funded, but before construction or implementation is undertaken. In addition, many VMT-reducing projects may have CEQA exemptions (e.g., active transportation projects already included in a master plan that included CEQA evaluation).
- There are many parallels between fee-based VMT mitigation programs and GHG mitigation programs. CEQA case law provides guidance on the features needed to pass legal muster.

## Mitigation Fee Act (AB 1600)

The following summarizes key considerations included in the Mitigation Fee Act as they apply to non-voluntary fee-based VMT mitigation programs:

- The elements included in the Mitigation Fee Act apply to non-voluntary fee-based VMT mitigation programs
  - Developers pay fees in lieu of building infrastructure
  - Many existing programs allow for direct construction of infrastructure with credit against fees owed

- Key change compared to existing fee-based mitigation programs is the currency, from trips to VMT
- Bank, exchange, or other is not necessarily a dichotomy
- Any fee program will continue to require nexus and proportionality
- Nexus will need to demonstrate a balance between mitigation and impact
- Proportionality needs to form the basis for calculating the mitigation cost
- Each jurisdiction should be mindful of the unintended consequences of implementing a fee-based VMT mitigation program such as a reduction in overall housing growth if the program is too restrictive

### State of the Practice

**Exhibit 12** provides a high-level summary of the current state of the practice in California on fee-based VMT reduction/mitigation programs. As shown, there are relatively few active fee-based VMT reduction/mitigation programs active in the state. Some of the programs included **Exhibit 12** are not specifically focused on meeting CEQA VMT Mitigation needs (they instead are focused on general VMT reductions), however they are still important models that show how specific elements programs being considered by the study could function.

**Exhibit 12** – Fee-based VMT Mitigation Program State of the Practice

| *Agency* | *Program* |
|---|---|
| LA DOT | Pilot testing a program based on new student transit passes. |
| SCBTA | Pilot VMT Mitigation Bank focused on earn VMT reduction credits by making choices to reduce their travel. |
| CCTA | Pilot a hybrid exchange/in-lieu fee program targeted toward implementing the Mobility On Demand (MOD) app. |
| Fresno COG | The study is anticipated to recommend the establishment of a VMT Bank assuming Policy Board approval. |
| San Diego | Impact fee program that includes mobility zones – VMT priced at $1,400/unit |
| San Jose | Includes VMT fees within TDM Program |
| ***Micro Banks*** | • Funding for previously identified active transportation projects<br>• Relatively small programs |
| Watsonville | |
| Tracy | |
| Salinas | |
| Hollister | |

## Establishing Mitigation Need

The locations of future development, the quantity of development, and the resulting extent of mitigation need is invaluable input to determine whether a regional VMT mitigation program is necessary and to understand its potential scale. To accomplish this, a dataset was developed using information contained within Fresno COG's current travel demand model along with information from Fresno COG's existing

VMT program to estimate the amount of VMT that different Fresno County communities may require to be mitigated and the resulting potential revenue that a fee-based VMT mitigation program could generate. This data helped evaluate the overall feasibility of program alternatives as well as establish the scale of projects that might be included in the various program formats. This dataset is also important for understanding the magnitude of costs that individual projects may need to pay to fully mitigate their VMT impacts and to what extent these costs may need guide policy considerations related to the definition of "feasible mitigation" under CEQA.

Using Fresno COG's travel demand model and previous VMT work with establishing thresholds, the total potential VMT to be mitigated was determined by calculating the difference between the VMT per capita and VMT per employee for each Traffic Analysis Zone (TAZ) that was over the established thresholds. The difference was then multiplied by the population and total employees for each TAZ to develop a total VMT per TAZ to be mitigated, which then allowed for a countywide total to be calculated. **Table 2**, **Exhibit 13**, and **Exhibit 14** show the VMT amount that will need to be mitigated through 2035 numerically and spatially, based on current land use development assumptions. As shown in **Table 2**, it is anticipated that 39,163 households and 15,500 jobs will be constructed or created between 2019 and 2035 in locations above the relevant VMT threshold. This results in a total VMT need of 366,004 VMT for residential land uses and 433,197 for employment land uses.

**Table 2** – Land Use Growth and VMT to Mitigate, 2019 to 2035

| Community Type | Future Vehicle Miles Traveled (VMT) to Mitigate | |
|---|---|---|
| | Residential | Employment |
| Anticipated Growth (Households/Jobs) | 39,163 | 15,500 |
| Total VMT Need (2019 - 2035) | 366,004 | 433,197 |
| **Total VMT per Year** | **22,875** | **27,075** |
| ***Potential Revenue per Year (Assumes $1,000/VMT)*** | ***$22,875,260*** | ***$27,074,816*** |

**Table 2** also displays the highest potential revenue per year generated by a fee-based VMT mitigation program operating in the Fresno region assuming a cost of $1,000 per VMT reduced. Note that this assumes development will occur at the maximum possible rate per year assumed in the exact same locations as projected by Fresno COG. The need to mitigate VMT, changes in the economy, and many other factors will reduce the potential income achieved by implementing a fee-based VMT mitigation program.

**Exhibit 13** – Residential VMT Mitigation Need by TAZ

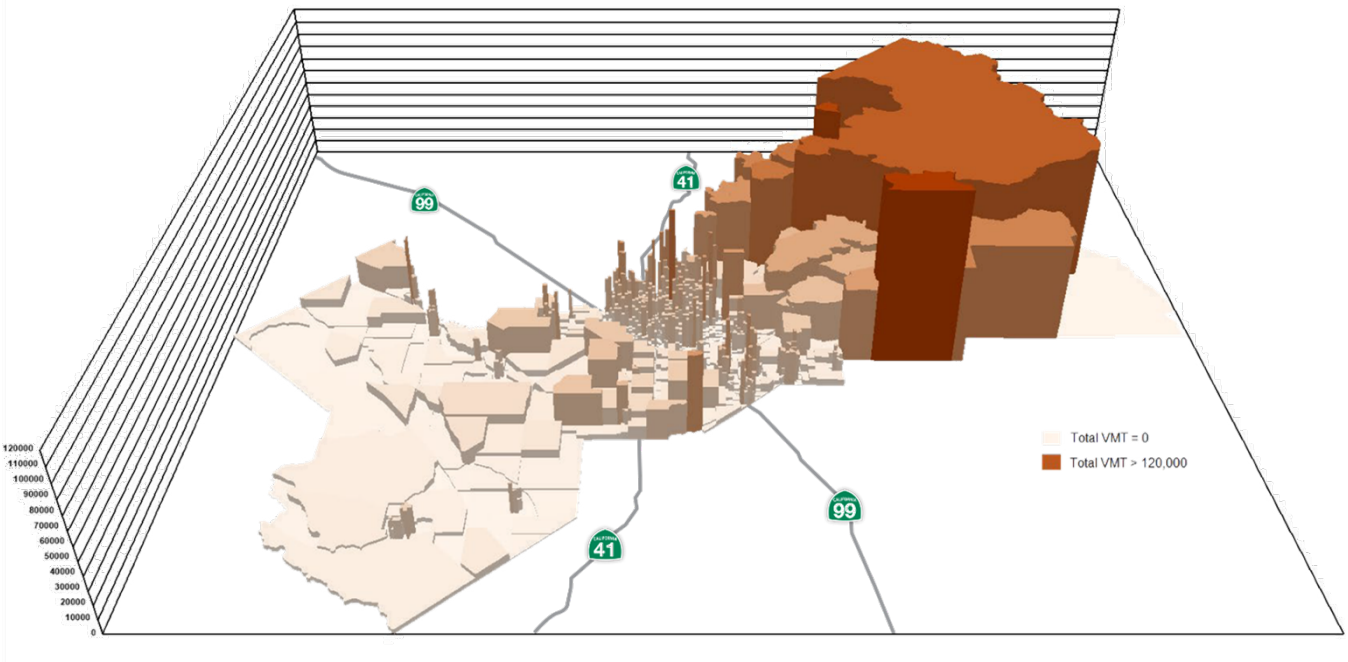
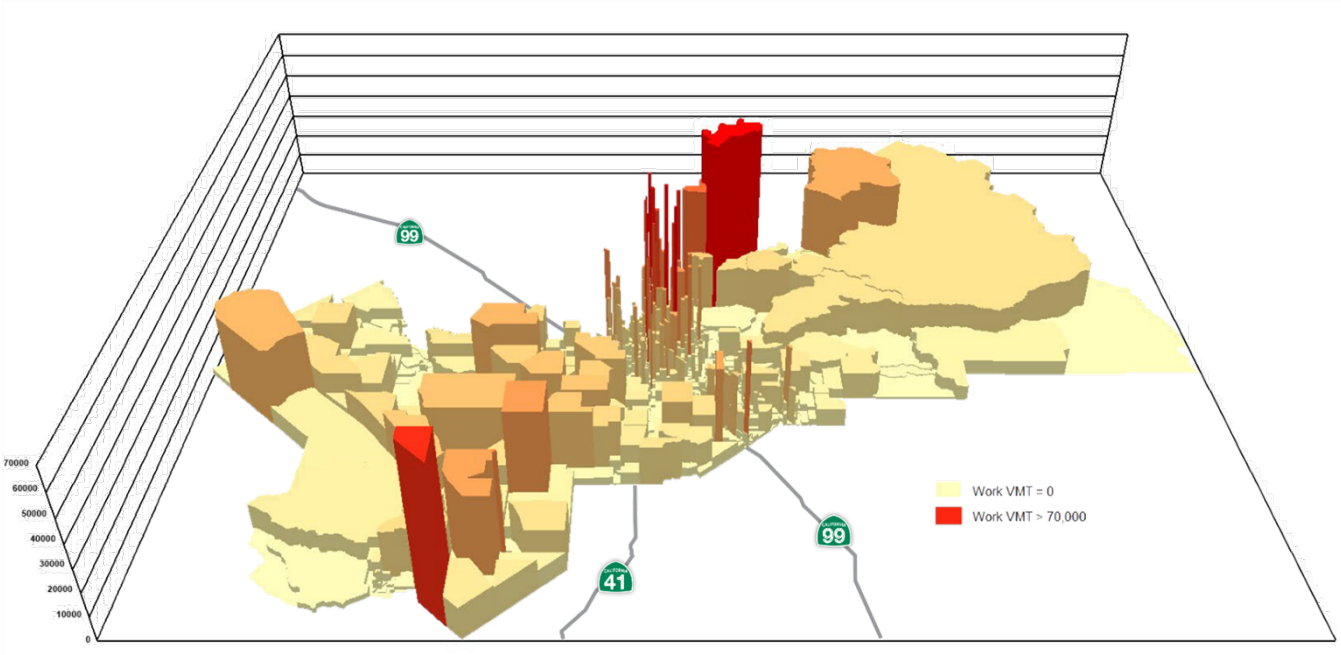



**Exhibit 14** – Employment VMT Mitigation Need by TAZ



## Identifying and Evaluating Candidate Projects

In parallel with evaluating the need and options for a fee-based VMT mitigation program, the study also considered the specific type of mitigation solutions that could be provided. The first step was to identify the categories of projects that would be reviewed prior to identifying individual projects for evaluation. The project types considered fell into two broad categories, transportation infrastructure projects and non-infrastructure projects. Non-infrastructure projects were stratified further into land use and transportation demand management projects. **Exhibit 15** below summarizes the project categories and provides project examples that were considered:

**Exhibit 15** – VMT Mitigation Project Types

| Example Projects | | Types of Projects |
|---|---|---|
| | Pedestrian | Adding sidewalks or filling in sidewalk gaps |
| | Bike | New lane miles of Class I – Class IV bike lanes, filling in gaps in bike infrastructure, or bike share |
| | Transit | New transit lines, extension of existing service, or adding new service types such as BRT |
| | Road Diet | Reducing capacity and providing non-auto infrastructure such as protected bike lanes or bus pull outs |
| | ITS/ TSM | Providing parking wayfinding, optimizing signal systems, providing trip planning services |
| | Mobility Hub | Provide infrastructure to link multiple types of transportation modes |
| | Affordable Housing | Providing affordable housing in dense areas, transit-oriented development, or other affordable housing supportive needs |
| | Vanpool/Carpool | Implement regionwide vanpool and carpool programs or expand existing programs |
| | Park-and-Ride | Construct park-and-ride lots to increase trip occupancy |

### Transportation Infrastructure Project Evaluation

As a reminder, only projects that meet the requirements of ***additionality*** can be considered for inclusion in the fee-based VMT mitigation program. A methodology was developed to further screen and evaluate transportation projects that could potentially be implemented as VMT mitigation. A separate methodology was developed for land use projects and is described later in this report. The following is the methodology developed for candidate transportation projects:

- Step 1 – Screen for Candidate Mitigation Projects
- Step 2 – Evaluate Mitigation Project's Performance (project analysis)
- Step 2A – Set Project Benefit Area (buffer)
- Step 2B – Monetize Mitigation Project
- Step 3 – Implementation

A screening process was developed for candidate mitigation projects to narrow down the list of potential projects to evaluate. This process combined the project's cost and distance with a target cost per VMT to calculate the number of trips, both overall and per mile, to identify projects that should be further reviewed to determine if they should be evaluated. Once a group of projects were identified, the following considerations were used to help identify projects that should be evaluated further using the travel demand model to determine their overall VMT reduction:

1. High trip rate - Improvements with higher usage (i.e., High bike ridership)
2. Located in a denser area - Existing land uses patterns in proximity are favorable
3. Shorter trip lengths - Shorter trips tend to favor active transportation and transit usage
4. Financial need - Project has financial need sufficient to meet additionality requirements. Note that this can also be accomplished by advancing a project sooner
5. Project feasibility - Other than financial issues it is likely to be constructed

**Exhibit 16** provides an example of how the screening process was applied for bicycle projects. As shown in **Exhibit 16**, each project was listed with its ID, title, a description of the project, the estimated cost, and the project's total distance. The Replica big data platform was used to determine the average distance traveled for bicycle and pedestrian trips in both the County of Fresno and the City of Fresno. A target cost per VMT, $1,000/VMT, was determined based on the result of the literature review and review of existing/proposed fee-based VMT mitigation programs. Note that the actual fee of a resultant program could be more or less, but that this value needs to be of sufficient order of magnitude to facilitate analysis. Using the target cost, project cost, average trip distance, and project distance, the number of trips needed to meet the target cost for the project and per mile along the project, were calculated. These values were subsequently used to quickly sort the VMT-reducing potential of various projects both in terms of estimated usage and the effective cost/VMT so that projects could be screened for further analysis.

**Exhibit 16** – VMT-reducing Candidate Active Transportation Project Screening Example

| PROJECT ID | PROJECT TITLE | PROJECT DESCRIPTION | EST TOTAL PROJECT COST | Project distance (miles) | Trips to Meet Target Cost/VMT | Trips/Mi to Meet Target Cost/VMT |
|---|---|---|---|---|---|---|
| FRE500938 | Fowler Avenue Class II Bike Lane Nees to Shepherd | Signage and striping | $79,000 | 0.83 | 34 | 41 |
| FRE501475 | 13th Street Class II | Install Bike lanes | $100,000 | 0.83 | 43 | 52 |
| FRE500940 | Palm Avenue Class II Bike Lane (Fig Garden County Island) Ashlan to Dakota | Striping and signage | $316,000 | 1.51 | 137 | 91 |
| FRE501559 | AUBERRY-INTERNATIONAL TO COPPER: BIKE LANE | BIKE LANE | $111,000 | 0.5 | 48 | 96 |
| FRE500955 | Maple Avenue Class II Bike Lanes University to Shields | Signage and striping | $198,000 | 0.88 | 86 | 98 |
| FRE501634 | 8th St from F St to I St - Class II | Install Bike lanes | $86,000 | 0.35 | 37 | 106 |
| FRE504203 | Maple Road Diet, Church to Belmont | Convert Maple from a 4 LU facility to 3 LD with bicycle facilities | $755,000 | 2.5 | 302 | 121 |
| FRE504191 | Clinton Avenue Road Diet & Class IV Bicycle Facilities - Marks to First | Modify Clinton from 4LU to 2L w/TWLTL AND Class IV Facilities | $1,210,000 | 4 | 484 | 121 |

| Distance/Percent/Cost | Metric |
|---|---|
| 2.3 | Fresno County Bike Dist |
| 0.46 | Fresno County Ped Dist |
| 2.5 | City of Fresno Bike Dist |
| 0.42 | City of Fresno Ped Dist |
| 67% | Bike Share |
| 33% | Ped Share |
| $1,000 | Target Cost/VMT |

Shorter Trip Lengths

Project Location

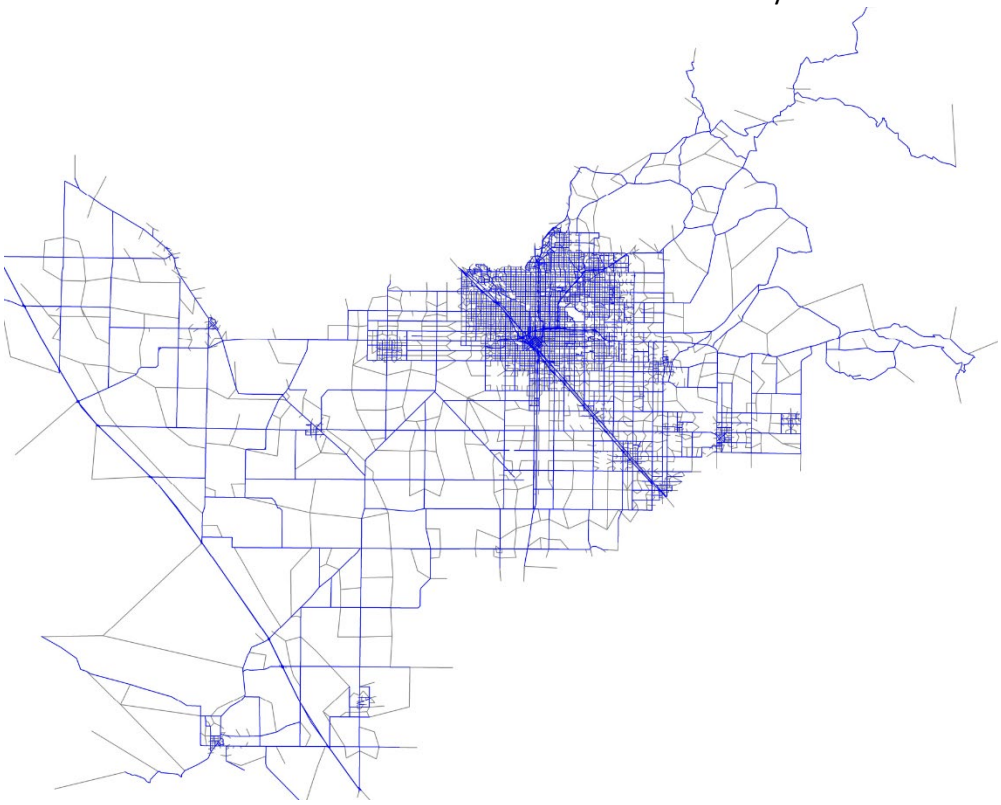
Financial Need

High Trip Rate

The screening process was completed for both active transportation projects and transit projects as these types of projects could be evaluated using the travel demand model. This resulted in the initial selection of two bicycle projects and two transit projects for further detailed analysis during Step 2.

To evaluate the active transportation and transit projects, Fresno COG's travel demand model was used. In order to evaluate the effect that a particular project has on localized and regional VMT reductions, the future baseline model run results were compared with the future build model run results to produce the VMT reduction associated with the VMT-reducing project. The full approach to modeling VMT-reducing projects using Fresno COG's travel demand model is provided as **Appendix B**. In addition, a guide is provided to document the process by which a VMT-reducing project can be evaluated using Fresno COG's travel demand model as **Appendix C**. This guide provides a step-by-step approach to modeling active transportation and transit projects, provides project examples, and a summary of the results of analyzing these examples. **Exhibit 17** provides a visual representation of the roadway network in Fresno COG's travel demand model.

**Exhibit 17** – Fresno COG Travel Demand Model Roadway Network



Due to some level of inherent randomness in Fresno COG's travel demand model, small changes in the model network cannot be accurately captured by the regional VMT, hence a buffering system was introduced to better capture the expected localized effect on VMT. It was decided that transit projects would be evaluated using a half-mile buffer as this would be consistent with how far a typical pedestrian is willing to walk to transit. Bicycle infrastructure projects would be evaluated using a 2-mile buffer, which would be consistent with the distance of an average bike trip.

## Active Transportation Project Examples

Five active transportation projects were evaluated to determine their feasibility for inclusion in a fee-based VMT mitigation program. The Clinton Avenue Bike Lane & Road Diet Project would reduce a four-mile stretch of Clinton Avenue from four lanes to two lanes and add Class IV bicycle facilities on both sides of the roadway. The Belmont Avenue Bike Lane & Road Diet Project would reduce a two-mile stretch of Belmont Avenue from four lanes to two lanes and add Class II bike lanes along both directions of travel. The Reedley Bike Lanes Project installs Class II bike lanes along a 0.83-mile stretch of 13th Street. The Blackstone Bike Lane Project adds Class II bike lanes along a 6.4 mile stretch of Blackstone Avenue. Finally, the Maple Road Diet Project consists of reducing a 2.5 mile stretch of Maple Road from four lanes to two lanes with the addition of Class II bike lanes along each direction.

The estimated cost of the Clinton Avenue Bike Lane & Road Diet Project is $1.21 million, the estimated cost of the Belmont Avenue Bike Lane & Road Diet Project is $605,000, the estimated cost of the Reedley Bike Lanes Project is $100,000, the estimated cost of the Blackstone Bike Lane Project is $7,980,000, and the estimated cost of the Maple Road Diet Project is $755,000.

**Table 3** – Summary of Active Transportation Project Evaluation

| Project | Base VMT | Build VMT | Difference | Cost | $/VMT Reduced |
|---|---|---|---|---|---|
| **Clinton Ave** | 2,538,169 | 2,543,718 | 5,549 | $1,210,000 | N/A (Increase) |
| **Belmont Ave** | 2,081,684 | 2,079,681 | -2,003 | $605,000 | $302 |
| **Reedley Bike Lanes** | 109,546 | 109,522 | -23 | $100,000 | $4,348 |
| **Blackstone Bike Lane** | 2,077,205 | 2,074,986 | -2,219 | $7,980,000 | $3,596 |
| **Maple Road Diet** | 1,727,774 | 1,728,063 | 289 | $755,000 | N/A (Increase) |

As noted previously, to better isolate the effects of the project, the change in VMT was calculated only for roadways within two miles of the project, the average length of a bike trip. **Table 3** above summarizes the change in VMT for the active transportation projects. As shown in **Table 3**, the Clinton Avenue and Maple Road Diet projects increase VMT inside the buffer, the Belmont Avenue Project reduces VMT inside the buffer by 2,003 VMT, the Reedley Bike Lanes Project reduces VMT within the buffer by 23 VMT, and the Blackstone Bike Lane Project reduces VMT within the buffer by 2,219 VMT. It is likely that the increase in VMT attributed to the Clinton Avenue and Maple Road Diet projects is due to the redistribution of traffic. The redistribution could cause increased trip lengths due to the reduction in capacity along the roadways associated with the road diet portion of the projects. However, the low cost of the Belmont Avenue Project, combined with the higher reduction in VMT, results in a low unit cost per VMT reduced at $302/VMT reduced while the Reedley Bike Lanes Project and Blackstone Bike Lane Project result in a higher unit cost per VMT at $4,348/VMT and $3,596/VMT respectively.

## Transit Project Examples

The Peach Avenue Service Expansion Project would increase the length of FAX Route 22 by approximately 0.75 miles of service along Peach Avenue without any alterations in existing service or headways. The Shaw Avenue Express Transit Project would implement an express transit service along Shaw Avenue, which would decrease headways from 15 to 10 minutes over a 14-mile stretch of roadway. The Clovis Avenue Transit Service Expansion Project consists of adding transit service along a 7-mile stretch of Clovis

Avenue between Jensen Avenue and Shaw Avenue. The Veterans Boulevard Transit Service Expansion Project consists of adding transit service on a 5.5-mile stretch of Veterans Boulevard between Herndon Avenue and Grantland Avenue.

The estimated cost of the Peach Avenue Service Expansion Project is $1.5 million, the estimated cost of the Shaw Avenue Express Transit Service Project is $25 million, which includes the cost of purchasing additional buses, the estimated cost of the Clovis Avenue Transit Service Expansion Project is $4,000,000, and the estimated cost of the Veterans Boulevard Transit Service Expansion Project is $2,500,000.

**Table 4** – Summary of Transit Project Evaluation

| Project | Base VMT | Build VMT | Difference | Cost | $/VMT Reduced |
|---|---|---|---|---|---|
| **Peach Ave** | 1,042,516 | 1,041,832 | -684 | $1,500,000 | $2,193/VMT |
| **Shaw Ave** | 1,604,357 | 1,603,703 | -654 | $25,000,000 | $38,226/VMT |
| **Clovis Ave Transit** | 497,353 | 497,413 | 60 | $4,000,000 | N/A (Increase) |
| **Veterans Blvd Transit** | 177,677 | 177,472 | -205 | $2,500,000 | $12,195 |

As noted previously, to better isolate the effects of the project, the change in VMT was calculated only for roadways within a half-mile of the project, the average walking distance to access transit service. **Table 4** above summarizes the change in VMT for the Peach Avenue and Shaw Avenue transit projects. As shown in **Table 4**, all projects except for the Clovis Avenue Transit Service Expansion Project would reduce VMT within the analysis buffer. However, due to limited reduction in VMT within the buffer, the unit cost per VMT is calculated to be between $2,193/VMT and $38,226/VMT.

## Non-Infrastructure Projects

The following methodology was developed for candidate land use projects:

- Step 1 – Screen for Candidate Mitigation Projects
- Step 2 – Evaluate Mitigation Project's Performance
- Step 2A – Monetize Mitigation Project (Optional)
- Step 3 – Implementation

A screening process was also developed for candidate land use mitigation projects based on several criteria including the socioeconomic details of an area, the existing VMT efficiency of an area, the availability of mobility options apart from vehicular travel, and the feasibility of constructing the project. The screening considerations used to develop the screening criteria are listed below:

1. Socioeconomic criteria - Low income correlates to low vehicular trip generation (i.e., affordable housing)
2. Low trip rate - Land uses with abnormally low trip generation (i.e., transit oriented development)
3. Located in a low VMT area - Existing land uses patterns in proximity are favorable to reducing trips.
4. Availability of alternate transportation options - Transportation options can lead to lower vehicular use.
5. Financial need - Project has financial need sufficient to meet ***additionality*** requirements.
6. Project feasibility - Other than financial issues it is likely to be constructed.

To evaluate an example affordable housing project, the project team identified an actual affordable housing project proposed in the Fresno region. The multifamily residential project is proposed to include 88 units, have a total cost of $38 million ($431,000 per unit), and it has a funding gap of $2.2 million (the remaining funding has been identified).

For evaluation purposes, it was assumed that the average occupancy of Fresno County would apply to this project, 3.1 people per household, which results in a total project population of 273 people. As summarized in **Table 5** below, using Fresno COG's VMT estimation tool and based on the location of the project, it would have a VMT per capita that is 2.8 VMT/capita less than Fresno's regional threshold of 14.3 VMT per capita. When multiplied by the total population identified previously, this would result in an overall VMT reduction of 764 VMT associated with the project. Assuming only the remaining cost factors into the cost of each VMT reduced, this would result in a unit cost per VMT reduced $2,880.

**Table 5** – Summary of Affordable Housing Project Evaluation

| Dwelling Units | People (3.1/HH) | VMT/Capita Threshold | VMT/Capita Project | VMT/Capita Delta | Total VMT Difference | $/VMT Reduced |
|---|---|---|---|---|---|---|
| 88 | 273 | 14.3 | 11.5 | 2.8 | 764 | $2,880/VMT |

## Transportation Demand Management (TDM) Projects

Two examples of candidate TDM projects include carpools and vanpools. A vanpool is a group of up to 15 people who lease a van for the purpose of commuting to and from work together and live at least 20 miles from their workplace. A carpool is a system administered and funded solely or in combination with an employer and/or a public agency that matches employees living in close proximity or along a similar commute route to ride together to and from their workplace.

The Fresno region currently has several TDM strategies in place including:

- Measure C's Carpool Incentive Program, which provides commuter incentives for sharing rides to work or school
- Measure C's Commuter and Agricultural Worker Vanpool Subsidy programs, which provide funding to new and existing commuter vanpools
- CalVans, a joint powers public transportation agency comprising local transportation planning agencies that operate a multi-county vanpool program
- Fresno COG's Valleyrides.com, which is a website and carpool mobile application that offers commuters free ride matching and serves as the database for Measure C's Carpool and Vanpool Programs
- Flex-time work schedules to reduce peak congestion

As noted above, CalVans provides vanpool services to farmworkers and commuters in rural counties including Fresno County. In 2015/16, vans out of Fresno County traveled 2.6 million miles with 528,510 passengers and passenger miles reached 28.8 million. Therefore, as a part of this project, the project team met with CalVans to discuss the possibility of program expansion within the Fresno region. CalVans staff stated that with additional funding, the ridership within the Fresno region would increase and provided

the project team with recent data on the number of vans in operation, the occupancy of each van, the annual mileage, and the reimbursement cost per mile.

An evaluation of two types of transportation demand management (TDM) projects was undertaken to determine their feasibility for being included in a future Fee-based VMT Mitigation Program.

### Vanpool

Implementing a vanpool program or providing CalVans with additional funding to expand its operations within Fresno County, was determined to be a realistic project to include in Fresno COG's fee-based VMT mitigation program. Therefore, an exercise was undertaken to determine the unit cost per VMT reduced if a vanpool program was implemented within the Fresno region based on existing vanpools operated by CalVans.

Using the information provided by CalVans for existing vanpools operating out of Fresno County, the following evaluation was undertaken:

- Number of riders: 7
- Monthly VMT reduced: 1,395 VMT/person
- Total monthly VMT reduced: 1,395 * 6 passengers = 8,370 VMT reduced
    - This assumes that all vanpool participants would have driven separately absent the vanpool, but the driver of the vanpool's VMT remains the same
- Number of workdays per month: 21
- Total daily VMT reduced: 8,370 / 21 = 399 VMT per day reduced
- Monthly cost to operate vanpool: $1,202
    - This excludes $600 in miscellaneous credits provided to the vanpool participants
- Total cost for a 20-year lifespan (design life of comparable infrastructure projects): $288,480
- Total cost per VMT reduced: $723

### Carpool

While a carpool program already exists within the Fresno region, similar to the vanpool example, the inclusion of a carpool program within a fee-based VMT mitigation program would be based on the expansion of the existing program or implementing a new type of carpool program. In this example, we evaluate the feasibility of providing monetary incentives to drivers of a carpool to increase participation in the program. The following evaluation was undertaken to determine the feasibility of the "Free Ride Idea"

- IRS standard reimbursement for personal car miles driven as a business expense is $0.585/mile
- Average annual commute days per year: 260
- Average one-way commute distance for Fresno County residents: 11.66 miles
    - Based on the Replica big data platform
- Average round trip commute cost per day: 11.66 miles * 2 * $0.585/mile: $13.64
- Average annual round trip commute distance: 11.66 miles * 2 * 260 days: 6,063 miles
- Average annual round trip commute cost: 6,063 miles * $0.585/mile = $3,547
- Total commute cost for a 20-year lifespan (design life of comparable infrastructure projects): $70,940
- Total cost per VMT reduced: $3,042 for 1 passenger or $1,014 for 3 passengers

## Additionality

Caltrans defines additionality as, "a critical step in asserting such mitigation is to assure that the investment provides additional resources that otherwise would not have been provided or providing the additional resources substantially earlier than they otherwise would have been available." Put simply, additionality means that a mitigation can only be claimed by one person or project to avoid the benefits of a mitigation being claimed by multiple future projects.

Proportionality has generally been understood as the requirement that the use of a mitigation must be proportional to the investment in implementing that mitigation. For example, if a bike lane project reduces VMT by 100, but is funded by a mix of sources and a fee-based VMT mitigation bank contributes 40% of the overall cost, then the fee-based VMT mitigation bank would only be able to claim a VMT reduction of 40 VMT.

The concept of proportionality is of particular importance when it comes to the inclusion of affordable housing projects within a fee-based VMT mitigation bank. In Caltrans' SB 743 program mitigation playbook (playbook), it states that, "compact housing can reduce VMT compared to housing that is lower density. Affordable housing produces less VMT compared to market-rate housing. To the extent a project contributes to such housing, it can take credit for the VMT reduction compared to business as usual. Compared to other options, denser, more affordable housing is a powerful VMT-reduction tool. If a project contributes half of the backing (funding, land, infrastructure, etc.) needed to deliver the housing units that reduce VMT by 10,000 miles/day, it could claim 5,000 miles/day as VMT reduction." However, this poses many problems as affordable housing projects are difficult to construct and generally require multiple funding sources to be constructed. If proportionality is taken as Caltrans defines it in the playbook, affordable housing projects would likely result in a unit cost per VMT that is too high to be included in a fee-based VMT mitigation program.

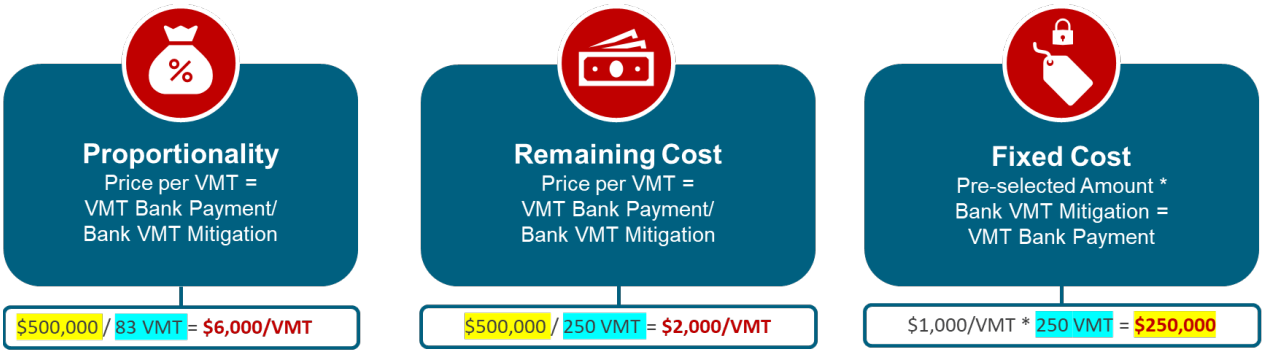
However, Caltrans has recently stated that, "this section of the guidance that suggests a 'proportional' VMT reduction to match the financial contribution toward the denser, more affordable housing warrants further consideration." Further, Caltrans has stated that, "when taking credit for any CEQA mitigation, as long as the mitigation is not deferred, is feasible, is enforceable or meets performance criteria, a project sponsor or lead need not be the sole funding contributor to take credit for the mitigation. This is the case exemplified by in-lieu fee payments, mitigation banks, or similar exchange models whereby the project sponsor or lead does not undertake the mitigation, but instead transacts with another entity to undertake the restoration, preservation, or other mitigation action. Therefore, a project sponsor or lead can take 'credit' for mitigation it purchases as long as the mitigation is enforceable, feasible, not deferred, etc., as noted above, and there is a mechanism in place to prevent 'double counting' of the mitigation 'credit.' With these assurances in place, a transportation project can take the full mitigation credit of a housing development if it could be shown that 'but for' the contribution, the housing project would not have been developed. These conditions and assurances would likely be included in and enforced through a funding agreement."

Therefore, based on the language provided above, affordable housing projects can be included in a fee-based VMT mitigation program even if the program only contributes a portion of funds if the affordable housing project would not be constructed without the funds provided by the program. In addition, even if only a portion of funds are provided, the fee-based VMT mitigation program can take the full credit of

the VMT reduced from the affordable housing project if no other entity takes credit for the mitigation. Caltrans' current position on additionality for affordable housing has been broadly adopted by most practitioners for other project types with understanding that the same requirements apply. Based on this and other guidance provided by Caltrans, it is understood that a VMT mitigation program could claim the entirety of a project's VMT mitigation in so far as the funding provided meets the requirements of additionality and there are no other claimants to the VMT mitigation.

This presents Fresno COG with the option of calculating the unit cost per VMT of a VMT-reducing project in three ways that have been identified as: proportionality, remaining cost, and fixed cost. **Exhibit 18** provides a visual representation of how either the unit cost per VMT or the amount of funding provided by the fee-based VMT mitigation program is calculated using each methodology.

**Exhibit 18** – Calculating Cost per VMT Reduced




| Method | VMT Bank Payment | Other Funding Sources | Total Project Cost | Bank VMT Mitigation | Price per VMT |
|---|---|---|---|---|---|
| Proportionality | $500,000 | $1,000,000 | $1,500,000 | 83 | $6,000 |
| Remaining Cost | $500,000 | $1,000,000 | $1,500,000 | 250 | $2,000 |
| Fixed Cost | $250,000 | $1,250,000 | $1,500,000 | 250 | $1,000 |

Proportionality calculates the unit cost per VMT using Caltrans' original method whereby the fee-based VMT mitigation program can only take credit for the VMT reduced proportionate to the amount of funding provided to the project. Remaining cost calculates the unit cost per VMT using Caltrans' newly recommended method whereby the fee-based VMT mitigation program can take the full credit for the VMT reduced but divide it by the partial funding provided by the fee-based VMT mitigation program assuming that no other entity is claiming the mitigation. Fixed cost is a method developed for consideration during the course of this study that assumes the unit cost per VMT is set for all proposed VMT-reducing projects by the entity administering the program. The total amount of funding needed to be provided by the fee-based VMT mitigation program is calculated by multiplying the unit cost by the total VMT reduced. If this funding is not enough to fully fund the VMT-reducing project, the project's applicant must secure the additional funding before the VMT-reducing project can be incorporated into the overall fee-based VMT mitigation program. This would allow a broad range of VMT-reducing projects to be included in the fee-based VMT mitigation program but may present challenges in justifying the preselected unit cost for VMT and for VMT-reducing projects to secure the additional funding needed to

close the funding gap if the fee-based VMT mitigation program is unable to fully fund the project using this method.

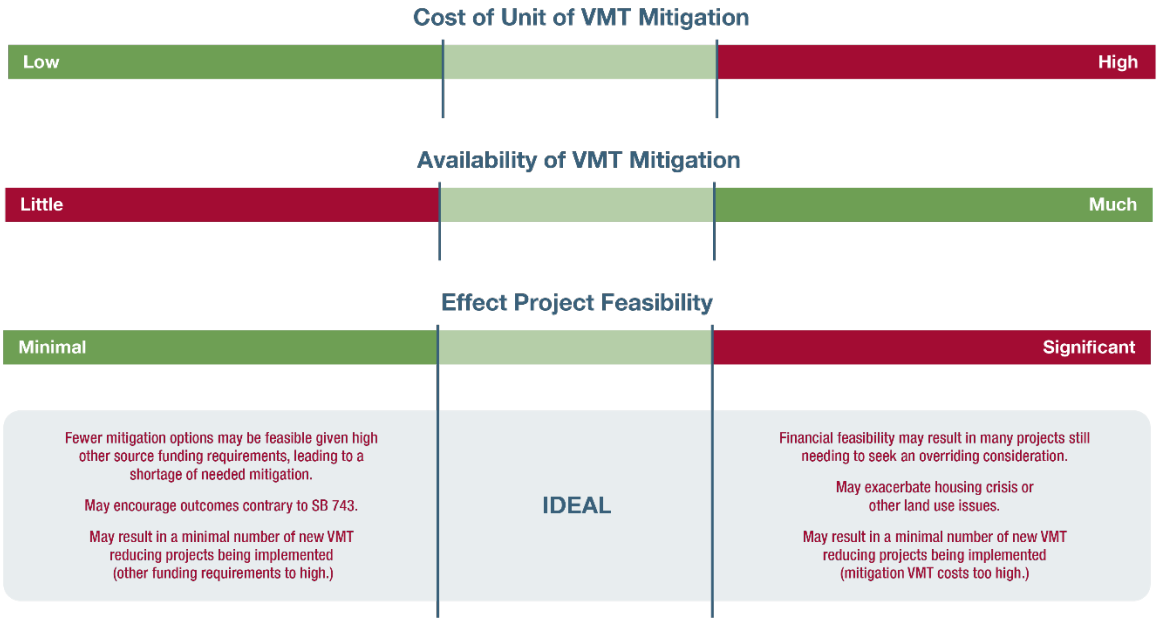
**Exhibit 19** below provides an example of how much funding would be provided by the fee-based VMT mitigation program for four different VMT-reducing project types, the unit cost per VMT for each of the projects, and the overall unit price per VMT sold to project applicants looking to purchase VMT to mitigate their project's VMT impact, based on the additionality method chosen. **Exhibit 19** assumes that all four project types provide an identical amount of VMT reduction (250 VMT) and that costs range from $250,000 to $1.5 million. As shown in **Exhibit 19**, the proportionality method results in the highest unit price per VMT for each project type both individually and collectively and the fixed cost method results in the lowest unit price per VMT for each project type both individually and collectively. The fixed cost method also provides the least amount of funding and for all project types except the bicycle/pedestrian project, the projects would require more than 50% of funding to be identified elsewhere to fully fund the VMT-reducing project.

**Exhibit 19** – Cost per VMT Reduced by Project Type and Additionality Method

| | Mitigation Source | Mitigation | Effective Project Funding | Cost/VMT | VMT Bank Cost |
|---|---|---|---|---|---|
| Proportionality | Affordable Housing | 250 VMT | Fee | $3,750 | $2,250 |
| | Transit | 250 VMT | Fee | $2,250 | |
| | Bike/Ped | 250 VMT | Fee | $750 | |
| | Technology | 250 VMT | Fee | $2,250 | |
| Remaining Cost | Affordable Housing | 250 VMT | Fee / Non-Fee Funding Source | $1,500 | $1,500 |
| | Transit | 250 VMT | Fee | $2,250 | |
| | Bike/Ped | 250 VMT | Fee | $750 | |
| | Technology | 250 VMT | Fee / Non-Fee Funding Source | $1,500 | |
| Fixed Price | Affordable Housing | 250 VMT | Fee / Non-Fee Funding Source | $750 | $750 |
| | Transit | 250 VMT | Fee / Non-Fee Funding Source | $750 | |
| | Bike/Ped | 250 VMT | Fee | $750 | |
| | Technology | 250 VMT | Fee / Non-Fee Funding Source | $750 | |

In addition to determining the additionality method to use when setting up a fee-based VMT mitigation program, several additional factors should be also taken into consideration. These factors include the overall unit cost per VMT reduced, the availability of VMT mitigation, and the effect of project feasibility. Consideration of the effect each factor will have on the overall success of the fee-based VMT mitigation program need to be balanced as they can come into conflict with one another. **Exhibit 20** below provides a summary of the balance needed between the three factors needed for a successful fee-based VMT mitigation program.

**Exhibit 20** – Balance of Factors Needed for Successful Fee-based VMT Mitigation Program




As shown in **Exhibit 20**, an ideal fee-based VMT mitigation program can balance cost, availability, and the program's effect on project feasibility of VMT-reducing projects. Additional considerations include:

- Fewer mitigation options may be feasible given high funding requirements from other sources, which leads to a shortage of needed mitigation
- Low, little, and minimal effect on cost, availability, and feasibility may encourage outcomes contrary to SB 743
- Low, little, and minimal effect on cost, availability, and feasibility may result in a minimal number of new VMT-reducing projects being implemented due to the need for high funding requirements from other sources
- High, much, and significant effect on cost, availability, and feasibility may result in many development projects still needing to seek a finding of overriding considerations
- High, much, and significant effect on cost, availability, and feasibility may exacerbate the need for housing or other land use issues
- High, much, and significant effect on cost, availability, and feasibility may result in a minimal number of new VMT-reducing projects being implemented

## Amount of Funding to Achieve $1,000/VMT Framework Cost

Based on the project evaluations summarized above, and on research completed during the literature review, it was determined that a unit cost of $1,000 per VMT mitigated is a good target that the market can bear. This price point would provide necessary funding to the projects contained within a fee-based mitigation program and would not be so high as to discourage participation in the fee-based mitigation program from project applicants. Therefore, an exercise was undertaken to determine how much external

funding would need to be secured to include each of the active transportation, transit, and TDM projects evaluated and summarized above in Fresno COG's Fee-based VMT Mitigation Program.

### Bike Projects:

- Clinton Avenue Bike Lane and Road Diet: VMT increases with this project, so it should not be included in the program
- Maple Road Diet: VMT increases with this project, so it should not be included in the program
- Blackstone Bike Lane: $5,761,000 of additional funding is needed
    - The project reduces a total of 2,219 VMT
    - At the full project cost of $7,980,000, the current unit cost per VMT reduced is $3,596/VMT reduced
- Belmont Avenue Bike Lane and Road Diet: No additional funding is needed as the unit cost per VMT reduced is already less than $1,000
    - The project reduces a total of 2,003 VMT
    - At the full cost of $605,000, the current unit cost per VMT reduced is $302/VMT reduced

### Transit Projects:

- Clovis Avenue Service Expansion: VMT increases with this project, so it should not be included in the program
- Veteran's Boulevard Service Expansion: $2.295 million of additional funding needed
    - Project reduces a total of 205 VMT
    - At the full cost of $2.5 million, the current unit cost per VMT reduced is $12,195/VMT reduced
- Shaw Avenue Express Service: $24.346 million of additional funding needed
    - Project reduces a total of 654 VMT
    - At the full cost of $25 million, the current unit cost per VMT reduced is $38,226/VMT reduced
- Peach Avenue Transit Line Extension: $816,000 of additional funding needed
    - Project reduces a total of 684 VMT
    - At the full cost of $1.5 million, the current unit cost per VMT reduced is $2,193/VMT reduced

### Transportation Demand Management Projects:

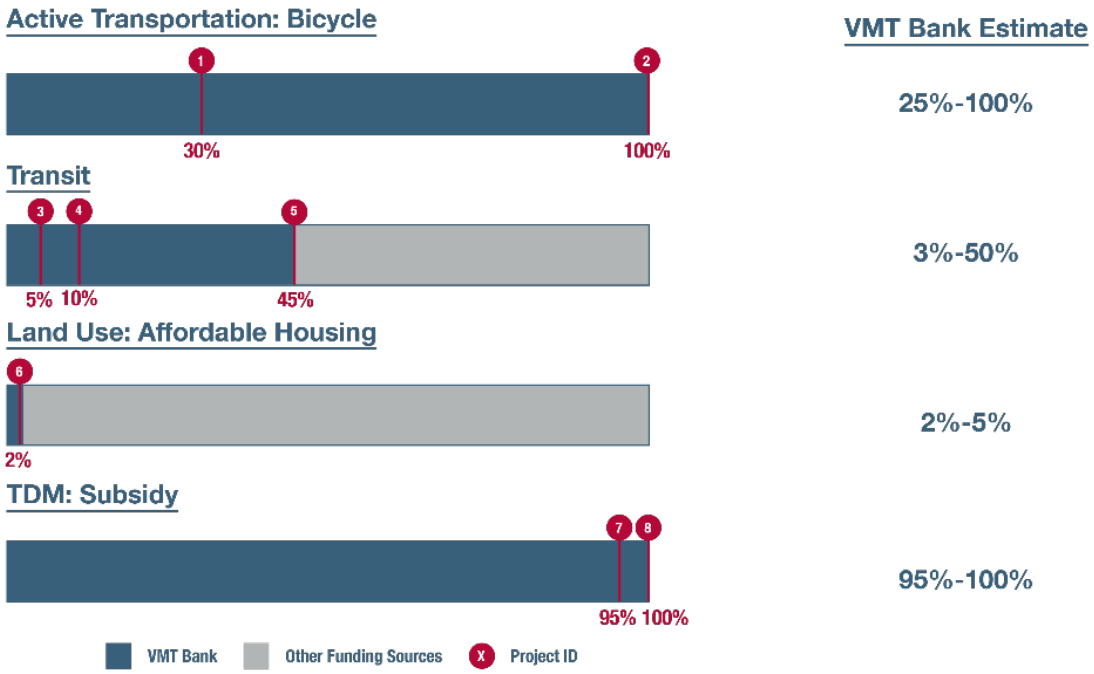
- Vanpool: No additional funding is needed as the unit cost per VMT reduced is already less than $1,000
    - The project reduces a total of 399 VMT
    - At the full cost of $288,480, the current unit cost per VMT reduced is $723/VMT reduced
- Carpool: $980 of additional funding is needed if 3 passengers per carpool are assumed or $56,620 of additional funding is needed if only 1 passenger per carpool is assumed
    - Project reduces a total of 23.32 VMT/passenger
    - At the full cost of $70,940, the current unit cost per VMT reduced is $1,014 for 3 passengers per carpool
    - At the full cost of $70,940, the current unit cost per VMT reduced is $3,042 for 1 passenger per carpool

**Table 6** below provides a summary of all projects analyzed in terms of their cost, VMT reduced, and price per VMT produced. As shown in **Table 6**, three projects resulted in VMT increases in the buffer area while eight projects resulted in VMT reductions. The cost per VMT reduced ranged between $302 and $49,738. In order to obtain funding from statewide sources such as grants, Caltrans requires a 11.47% local funding match. Therefore, as shown in the table below, the cost per VMT was recalculated under the assumption that Fresno COG would only need to collect 11.47% of the total cost and could obtain the remaining funding from other sources. Under this scenario the cost per VMT ranged between $35 and $4,385. One exception was the affordable housing project in which other funding had already been secured and a known amount of funding remaining to construct the project was used in place of the 11.47% match.

**Table 6** – VMT-reducing Project Evaluation Summary

| Project ID | Project Type | Project | Project Cost | VMT Reduced | $/VMT | Match % | Program Match | Fresno $/VMT |
|---|---|---|---|---|---|---|---|---|
| 1 | Bike | Blackstone Bike Lane | $7,980,000 | 2,219 | **$3,596** | 11.47% | $915,306 | **$412** |
| 2 | Bike | Belmont Avenue Bike Lane & Road Diet | $605,000 | 2,003 | **$302** | 11.47% | $69,394 | **$35** |
| 3 | Transit | Shaw Avenue Express Service | $25,000,000 | 654 | **$38,226** | 11.47% | $2,867,500 | **$4,385** |
| 4 | Transit | Veteran's Boulevard Service Expansion | $2,500,000 | 205 | **$12,195** | 11.47% | $286,750 | **$1,399** |
| 5 | Transit | Peach Avenue Line Extension | $1,500,000 | 684 | **$2,193** | 11.47% | $172,050 | **$252** |
| 6 | Land Use | Affordable Housing | $38,000,000 | 764 | **$49,738** | - | $2,200,000 | **$2,880** |
| 7 | TDM | Carpool Program | $70,940 | 70 | **$1,014** | 11.47% | $8,137 | **$116** |
| 8 | TDM | Vanpool Program | $288,480 | 399 | **$723** | 11.47% | $33,089 | **$83** |
| **Projects Tested that Increase Regional VMT** | | | | | | | | |
| - | Bike | Clinton Avenue Bike Lane & Road Diet | $1,210,000 | increase | **N/A** | 11.47% | $138,787 | **N/A** |
| - | Bike | Maple Road Diet | $755,000 | increase | **N/A** | 11.47% | $86,599 | **N/A** |
| - | Transit | Clovis Avenue Service Expansion | $4,000,000 | increase | **N/A** | 11.47% | $458,800 | **N/A** |

**Exhibit 21** – VMT-reducing Project by Revenue Percentage of Total Cost based on $1,000/VMT Reduced

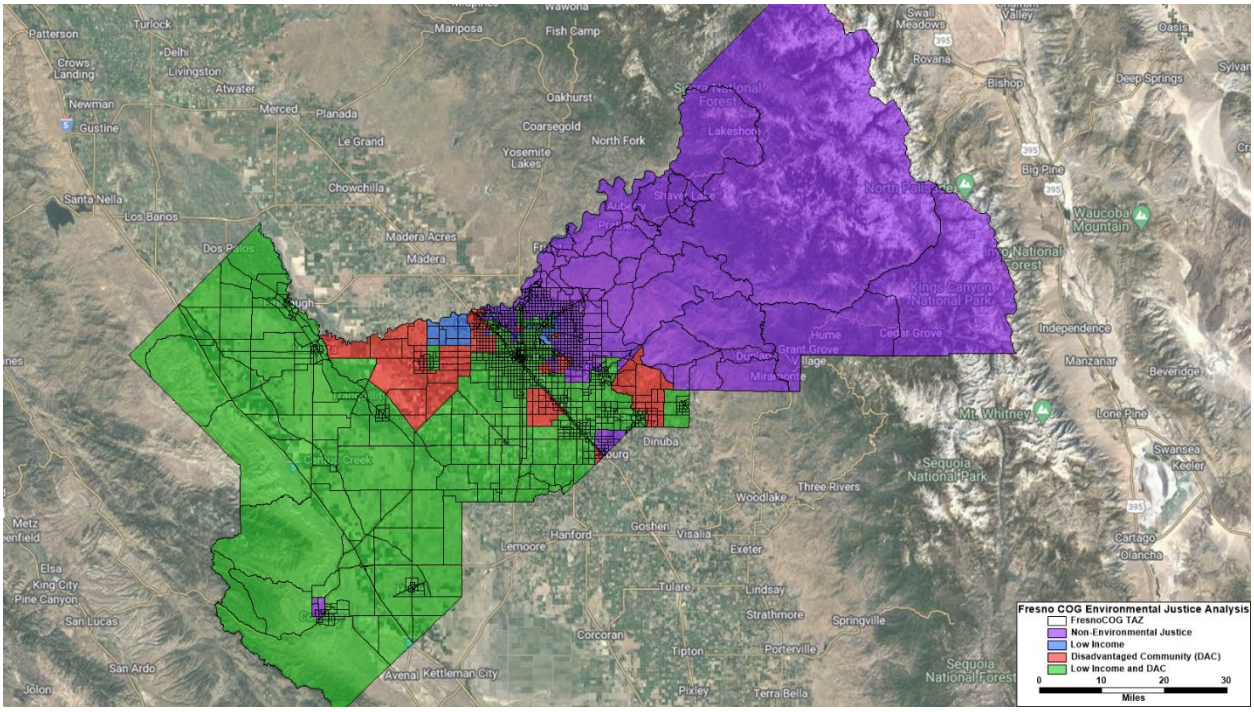



The final test undertaken was a determination of what percentage of the total cost would be covered if the cost per VMT was fixed at $1,000/VMT reduced. **Exhibit 21** above summarizes the results of this test. As shown in **Exhibit 21**, a cost of $1,000 per VMT reduced would cover between 2% and 100% of the project costs. Note that this considers the total cost of all projects, including the affordable housing project, without additional other funding. If only the remaining funding were considered, $1,000/VMT would cover 35% of the remaining $2.2 million needed and further additional funding would need to be identified to construct the project.

## Equity Analysis

In order to determine whether the fee-based VMT mitigation program would be equitable, an environmental justice analysis was completed to determine whether the impact of new development and the mitigation projects to reduce the VMT from new development would occur equitably across the region. Specifically, the analysis was used to determine whether VMT impacts would be concentrated in low-income and disadvantaged communities while the mitigation would occur outside of these communities. **Exhibit 22** below identifies the areas in Fresno County that are low-income communities (blue), disadvantaged communities (red), both low-income and disadvantaged communities (green), or neither (purple). Understanding that VMT mitigation would be concentrated in areas where they would be most effective, i.e., areas with the densest population, **Exhibit 22** shows that the majority of VMT mitigation projects would occur in environmental justice communities (non-purple areas).

**Exhibit 22** – Fresno Environmental Justice Communities




The categorization shown above was combined with an analysis completed to determine the future need for VMT mitigation for both residential and employment uses, as shown in **Exhibit 23** and **Exhibit 24**. The projected future VMT values can also be seen in **Table 7**. The beige areas in **Exhibit 23** and **Exhibit 24** are non-environmental justice communities while the others are low income, disadvantaged, or both. The height of the area indicates the amount of VMT that may be needed in the future based on how closely the area is to the region's VMT threshold multiplied by the total residential (dwelling unit) or employment (jobs) growth. **Exhibit 23** and  show that VMT is spread relatively consistently throughout the region and therefore the implementation of a fee-based VMT mitigation program can be considered equitable as VMT impacts would not be concentrated in environmental justice communities and VMT mitigation would not be concentrated in non-environmental justice communities.

**Exhibit 23** – 20-year Vehicle Miles Traveled Need (Residential)

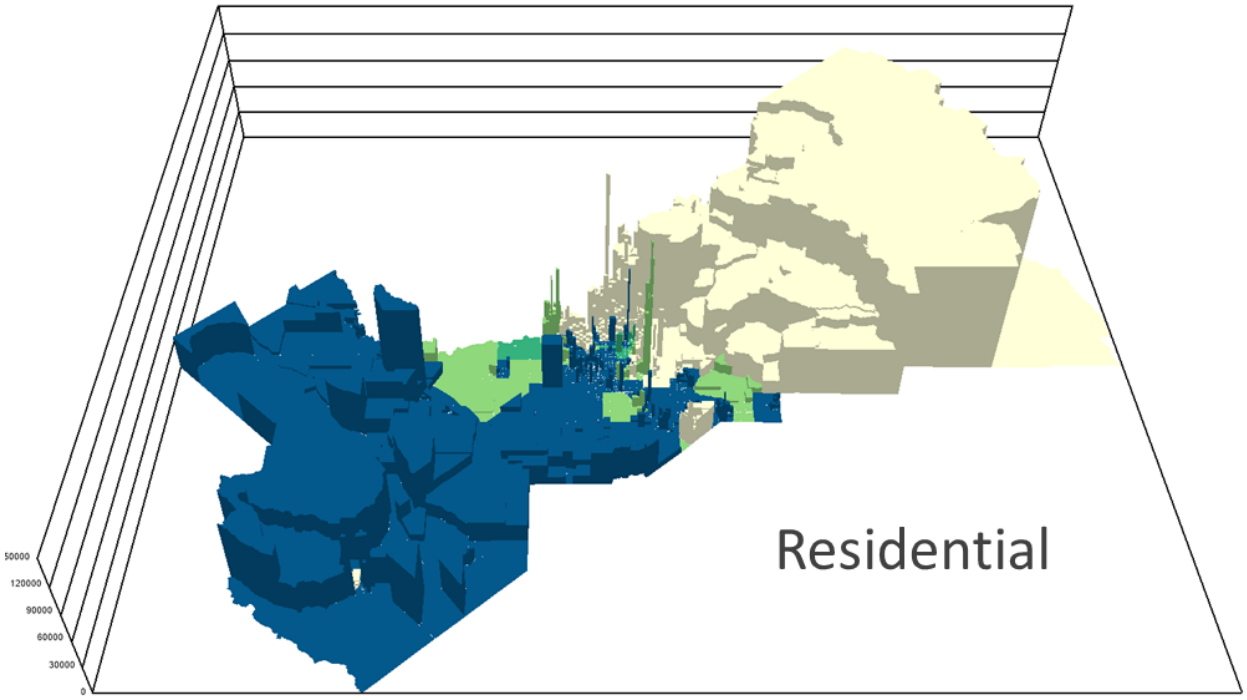



**Exhibit 24** – 20-year Vehicle Miles Traveled Need (Employment)


## VMT Mitigation Need

The VMT mitigation need over the model horizon (2019 – 2035) is summarized in **Table 7** below by environmental justice community to provide a numeric summary of what is displayed in **Exhibit 23** and **Exhibit 24**. As shown in **Table 7**, for residential land uses the VMT mitigation need is 32,366 VMT for environmental justice areas (disadvantaged communities, low income communities, or both) while the non-environmental justice areas have a residential VMT mitigation need of over ten times that at 333,638 VMT. The opposite correlation is shown for employment uses with the environmental justice communities needing over two times the VMT reductions compared to non-environmental justice communities. The VMT need summarized in **Table 7** shows that the environmental justice communities are more densely populated (lower VMT/capita) and that VMT mitigation may be more effective in those communities because mitigation is more effective for non-residential uses and there is a greater mix of residential and employment uses (higher VMT mitigation need for employment uses and denser residential populations).

**Table 7** – VMT Mitigation Need by Environmental Justice Community

| Community Type | Future Vehicle Miles Traveled (VMT) to Mitigate | |
|---|---|---|
| | Residential | Employment |
| Low Income | 313 | 5,099 |
| Disadvantaged Community | 2,957 | 71,691 |
| Low Income & Disadvantaged Community | 29,096 | 224,441 |
| Non Environmental Justice | 333,638 | 131,966 |
| **Total VMT (2019 - 2035)** | **366,004** | **433,197** |

## Program Option Evaluation

Once the candidate projects were evaluated, the framework options for Fresno's fee-based VMT mitigation program were revisited. Specifically, based on feedback received from the Stakeholder Advisory Committee (SAC) and the Technical Advisory Committee (TAC) two additional framework options were developed that combined portions of a VMT bank and VMT exchange into a new option. Details of the five framework options are included in the graphic below and include:

1. VMT Bank
2. VMT Bank Plus (newly developed)
3. VMT Exchange
4. VMT Bank with Exchange (newly developed)
5. VMT Impact Fee

As shown in **Exhibit 25** below, the primary difference between a VMT bank and VMT bank plus framework is that an applicant looking to mitigate their impact can select a predefined project under a VMT bank plus framework, but this would also increase the complexity to administer the program. The difference between a VMT bank plus and a VMT bank with a VMT exchange framework is that an applicant looking to mitigate their impact can provide a VMT-reducing project option for the framework, the potential cost per unit of VMT mitigation may be higher, and there may only be a limited number of predefined VMT-reducing projects within the program.

**Exhibit 25** – Fee-Based VMT Mitigation Program Framework Variations

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

The mitigation program options were subsequently evaluated in terms of their potential to meet the identified needs of the region. The following are considerations and questions that guided the evaluation of the feasibility of the fee-based VMT mitigation program framework for Fresno COG:

***Legal*** – Does the fee-based VMT mitigation program meet CEQA and statutory requirements, including additionality?
***Effective*** – Does the fee-based VMT mitigation program result in a long-term financially feasible mitigation program?
***Geography*** – Can the fee-based VMT mitigation program scale to meet the region's needs?
***Administration*** – Does the fee-based VMT mitigation program fund oversight and management of the program and maintain analysis and technical requirements for administering the program?
***Equitable*** – Does the fee-based VMT mitigation program avoid disproportionate impacts to disadvantaged and/or low-income communities? Does the program encourage an equitable benefit distribution throughout the region?
***Alignment*** – Does the fee-based VMT mitigation program support good design of projects and align with community values and existing plans?

**Exhibit 26** below provides a summary of how each type of fee-based VMT mitigation program was evaluated against the above considerations. Yellow dots indicate a "concern" that the complexity of a specific program element or the lack of practical experience with it may represent a challenge to its implementation. As it is believed that all the program types are ultimately implementable, these designations should simply be thought of as areas of consideration that will require additional study and evaluation prior to their respective programs being considered for implementation. As shown in **Exhibit 26**, only VMT bank frameworks would address all considerations identified.

**Exhibit 26** – Regional VMT Mitigation Program Evaluation

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

● Feasible ● Concern

In addition to the above, one of the important considerations that must be addressed when considering CEQA transportation mitigation is the requirement of ***additionality***. Additionality requires that mitigation be an action that would not have happened otherwise. Simply put, a project applicant must either introduce a new mitigation solution or materially advance a future mitigation solution for it to serve as the basis for offsetting their significant transportation impact. Recently, Caltrans has provided important clarification on its interpretation of additionality which allows for an applicant to claim the totality of VMT

mitigation from a VMT-reducing project even if they are not the sole source of funding assuming no one else has a claim to that mitigation. Under this interpretation, a greater range of VMT-reducing project solutions are possible as funding sources outside of a VMT mitigation program can be used to sufficiently improve their per unit VMT pricing helping to greatly improve feasibility. Along with additionality, there are ***other legal and administrative considerations***, depending on the program format, that will need to be considered during the implementation of a VMT mitigation program.

Another important consideration incorporated into the evaluation of a fee-based VMT mitigation program was the concept of ***unintended consequences***. Unintended consequences related to the implementation of a fee program include: significant changes to development or transportation costs, changes in development patterns, or changes to the priority of infrastructure project implementation. Another important consideration was that the implementation of a VMT mitigation program should not discourage good project design or contradict community values.

## Outreach Summary

As part of evaluating the feasibility of a fee-based VMT mitigation program for the Fresno region, an outreach strategy was developed to solicit input from interested parties within the Fresno region (Fresno COG member agencies, representatives of community-based organizations (CBOs), members of the development community) to form a stakeholder action committee (SAC), as well as a group of technical experts from throughout California to form a technical advisory committee (TAC). The project team met with both committees four times throughout the lifecycle of the project to provide progress updates, as well as to solicit feedback on potential VMT-reducing projects, the type of framework that should be pursued, the format of the framework chosen (regional vs hybrid regional/local), and how the cost per VMT should be determined. Meeting minutes from these meets are provided in **Appendix D**.

Based on the feedback received during the SAC/TAC meetings, it was determined that a VMT impact fee program would be the easiest to implement but was not the preferred framework for the region. The most popular framework was a VMT bank plus framework with a hybrid regional/local option to ensure that VMT-reducing projects were spread throughout the region. In addition, in terms of the cost per VMT reduced, a cost of less than $2,000/VMT (generally assumed to be $1,000/VMT) was the most popular choice to ensure the program can maintain financial feasibility.

As a fee-based VMT mitigation program was only being evaluated and not being fully implemented as a part of this project, no meetings were held that were open to the general public as this will be completed at a future date.

## Program Administration and Other Considerations

### Program Administration

When considering the administration of the program, the structure of the program is the first thing that needs to be determined, especially bearing in mind the City of Fresno's fee-based VMT mitigation program. One structure that should be considered is adding Fresno COG's fee-based VMT mitigation program to the existing regional transportation mitigation fee structure. This could be done using a joint powers authority (JPA) and using existing Fresno COG staff to administer the program. Alternatively,

Fresno COG could separately oversee the fee-based VMT mitigation program as a pilot program to provide more insight before implementing the program fully. Other options include creating a JPA separately or having another agency administer the program. Other considerations for administering the fee-based VMT mitigation program include the annual funding costs that can be passed on to project applicants, the technical ability of staff to evaluate future VMT-reducing projects, the legal structure and legal defense of the program if it is challenged in court, the administering agency's ability to manage updates, and the benefits to Fresno COG's Sustainable Community Strategy (SCS) as an off-model greenhouse gas (GHG) reduction strategy.

### Other Considerations

When considering the SCS benefits, one of the primary considerations is the economics of providing feasible mitigation. If Fresno COG or other MPOs and their member agencies implement a regional VMT mitigation bank or another fee-based VMT mitigation program such as a VMT exchange, a feasible mitigation option will be introduced that did not exist previously. The introduction of a feasible mitigation option will likely necessitate participation by development projects that have CEQA-specific significant impacts where previously they would seek to obtain a finding of "overriding considerations" (i.e., no feasible mitigation exists to fully mitigate the impact so the project is approved without fully mitigating all impacts) if no other remedy to mitigate the VMT impact existed. However, the implementation of a fee-based VMT mitigation program results in more regional changes than solely providing an additional feasible mitigation option for development projects.

Often it is less expensive to construct development projects outside of urban areas than it is to construct those same projects in an infill location. This is primarily due to the use of "overriding considerations" for any VMT impacts identified at suburban and rural locations without feasible mitigations, as well as existing infrastructure and regulatory challenges facing infill sites, including the use of LOS to determine improvement recommendations by local jurisdictions. However, with the introduction of a fee-based VMT mitigation program, a new feasible mitigation for development sites is now required to be pursued and the cost of developing at those sites may be raised as mitigation costs are included in the overall development cost. The net result is to bring the costs of developing in a suburban or rural location more in line with the cost to develop an infill location. The equaling of development costs between infill and suburban and rural locations could result in long-lasting impacts on future development patterns that may bring them more in line with an MPO's SCS. When combined with the number of state, regional, and local incentives to promote affordable and infill development, the implementation of a fee-based VMT mitigation program provides MPOs with an additional tool to achieve their preferred long-range development growth plan and strengthens their overall strategy to achieve the VMT and GHG emission reduction goals set by CARB for each SCS.

One other consideration incorporated into the evaluation of a fee-based VMT mitigation program was the concept of ***unintended consequences***. Unintended consequences related to the implementation of a fee program include housing price increases, a change in development patterns, or changes to the priority of infrastructure project construction. Therefore, one of the ongoing considerations as the program framework was being evaluated was that VMT mitigation projects included in the program should not discourage good design or contradict community values.

## Study Outcome

After completing the project analyses, outreach, framework evaluations, and reviewing all considerations, it was determined that ***a fee-based VMT mitigation program is a feasible option for the Fresno COG region***. In addition, it was determined that VMT banking would be the most appropriate initial program framework for implementation in the Fresno region. A variation of VMT banking, called VMT banking plus that allows for a project applicant to select a project to implement from a predetermined list was also identified as being favorable. In part, these programs were identified as being the most appropriate given that they are more easily understood by the public and decision-makers and would also be the most flexible in terms of accommodating VMT mitigation programs that may be locally implemented, such as the one currently being considered by the City of Fresno.

Other findings and recommendations that have resulted from the study include:

- Equity is an important consideration that will need to be incorporated into both the final design of the selected VMT mitigation program and the projects selected to support it. Based on the analysis completed as part of this study, it is believed that the implementation of a fee-based VMT mitigation program could be supportive of an equitable outcome as VMT impacts would not be concentrated in environmental justice communities and VMT mitigation would not be concentrated in non-environmental justice communities.
- There is a need to be selective about which VMT-reducing projects are included in a fee-based VMT mitigation program to ensure that the VMT mitigation program can provide financially feasible mitigation. This evaluation should consider whether there are other funding sources available to a project and whether it can meet the requirements of additionality.
- Implementing a regional VMT mitigation program provides a new feasible mitigation option that project applicants will be required to use if a VMT impact is determined for their project and that they cannot mitigate though other means.
- Developing a project list for a fee-based VMT mitigation program will be an iterative process to determine the best solution. It is essential for the success and defensibility of VMT mitigation program that accurate methods consistent with analysis best practices be used to maintain rigorous outcomes. Accordingly, it is recommended that the analysis and framework established and documented during this study be the foundation of future analysis.
- The nexus between the need for the program and the impact of the mitigation must be documented during the final project design.
- The success of the program will require decision-maker, agency, and community support as well as from those that will participate in the resultant VMT mitigation program. As such it will be important to consider a broad range of perspectives during the final design of the selected VMT mitigation program and during project selection.
- Implementing a fee-based VMT mitigation program adds a new fee and may further increase the cost of housing and other development and increase the cost of any capacity enhancing projects. However, in the absence of a solution to the need for more VMT mitigation solutions significant uncertainty will remain for many projects, including those that might align with other plans and programs, continuing to impede their ability to progress.