

Memorandum

Date: March 22, 2024
To: Nick Liccardo and Trin Campos, Caltrans District 3
From: Dave Stanek and Ronald T. Milam, Fehr & Peers
Subject: **03-3H900: I-80/US 50 Corridor Improvements – Final VMT Mitigation Estimates**

SA22-0177

This attachment to the VMT Mitigation Plan Executive Summary serves as a technical memorandum and documents the expected vehicle miles of travel (VMT) reduction from the proposed mitigation strategies developed for the I-80/US 50 Corridor Improvements project. Caltrans District 3 analyzed multiple managed lanes alternatives to improve travel time reliability and accommodate travel demand growth in this corridor. Some of the alternatives have the potential to induce VMT, which constitutes a potentially significant impact under the California Environmental Quality Act (CEQA). The selected project alternative is to add High Occupancy Toll (HOT) 3+ lanes to I-80 and US 50 in Yolo and Sacramento Counties with a median connector ramp (Direct Connector) at the I-80/US 50 interchange.

The VMT Mitigation Memo Attachment to the Draft Environmental Impact Report (DEIR), dated November 16, 2023, presented the induced VMT subject to mitigation and reviewed potential mitigation measures to reduce VMT. The memo concluded by recommending a subset of mitigation measures to proceed with VMT reduction estimation. This memorandum has been revised from the original version based on comments received on the DEIR and discussions with partner agencies on the scope and feasibility of the proposed mitigation measures.

Induced VMT

Based on a review of the supporting research behind the National Center for Sustainable Transportation (NCST) Induced Travel Calculator¹, we have summarized the following components of total induced VMT.

- Changes in commercial driving – 19 to 29%
- Changes in individual or household driving – 9 to 39%

¹ Duranton, G., & M. A. Turner (2011). The Fundamental Law of Road Congestion: Evidence from US Cities. *American Economic Review*, 101(6), 2616-2652. Retrieved from <https://www.aeaweb.org/articles?id=10.1257/aer.101.6.2616>.



- Changes in population (includes population growth and migration) – 5 to 21%
- Diversion of traffic – 0 to 10%

For the I-80/US 50 Corridor Improvements project alternatives, the commercial driving should be excluded producing an induced automobile VMT elasticity of approximately 0.71.² This change was accepted by Caltrans headquarters (HQ) staff as documented in the December 28, 2022, memorandum from Eric Sundquist to Erin Damm, with the basis for the VMT calculation guidance coming from the CAPCOA Handbook.

For this project, there is evidence that the value of up to 10 percent for diversion of traffic could also be excluded. A traffic study for the Mace Boulevard corridor in Davis measured eastbound travel times during the PM peak period for routes staying on eastbound I-80 and those diverting off I-80 via Tremont Road to the south and Covell Boulevard and Road 29 to the north. These longer diversion routes had shorter travel times than staying on I-80. Therefore, reducing travel time on I-80 would likely reduce VMT as drivers would return to using the shorter route. However, no reduction in induced VMT due to diversion of traffic was made.

Table 1 presents the induced annual VMT for the project alternatives. The total annual induced VMT uses an elasticity of 1.0 from the NCST Induced Travel Calculator (see attachment at end of document). With commercial driving excluded, the automobile daily induced VMT has an elasticity of 0.71. This reduces the annual induced VMT from around 149 million to about 106 million for most alternatives, and about 110³ million for others, including for Alternative 12, Add HOT 3+ with Median Ramps, which is the project's selected alternative. The induced VMT for the transit lane alternatives is unknown since the calculator does not apply to these alternatives. However, the Durant and Turner paper cited above and used in developing the calculator concludes, "*We find no evidence that the provision of public transportation affects VKT.*" This means that the construction of a transit only lane plus expanded transit service would not reduce regional VMT. It is possible that some induced VMT would occur from transit vehicles shifting out of general purpose (GP) lanes and into the transit only lane and thereby freeing up capacity for more automobile demand.

² The high end of the range for each component adds up to the 1.0 elasticity used in the NCST calculator so the accounting adjustments for automobile only VMT use the high end of the range.

³The induced VMT of 133 million reported in the Draft EIR was the result of a calculation error. Early in the analysis, the annual VMT estimate from the NCST Induced Travel Calculator was converted to daily VMT using a factor of 300 based on older Performance Measurement System (PeMS) volume data that showed that the average mid-week daily volume was higher than the average volume for all days of the year. PeMS data from 2023 for I-80 in the project area was found to have a conversion factor close to 365. So, the daily VMT was later converted back to annual VMT using this higher value. The corrected value of 110 million removes the artificial increase based on the difference in the daily to annual conversion factors (300 vs. 365).



Table 1: Induced Annual VMT

Scenario	Added Lane Miles	Annual Induced VMT	
		Total	Auto-only
Alternative 1 (No Build)	0	0	0
Alternative 2 (Add HOV)	28.4	148,600,000	105,506,000
Alternative 3 (Add HOT2+) ¹	28.4	148,600,000	105,506,000
Alternative 4 (Add HOT3+) ¹	28.4	148,600,000	105,506,000
Alternative 5 (Add Toll) ¹	28.4	148,600,000	105,506,000
Alternative 6 (Add Transit)	28.4	n/a	n/a
Alternative 7 (Convert HOV)	0.7	3,700,000	2,627,000
Alternative 8 (Add HOV with Median Ramps)	29.6	154,800,000	109,908,000
Alternative 9 (Add HOV without Enterprise Crossing)	28.4	148,600,000	105,506,000
Alternative 10 (Add GP)	28.4	148,600,000	105,506,000
Alternative 11 (Add HOT2+ with Median Ramps)	29.6	154,800,000	109,908,000
Alternative 12 (Add HOT3+ with Median Ramps)	29.6	154,800,000	109,908,000
Alternative 13 (Add Toll with Median Ramps)	29.6	154,800,000	109,908,000
Alternative 14 (Add Transit with Median Ramps)	29.6	n/a	n/a
Alternative 15 (Convert HOV with Median Ramps)	1.9	9,900,000	7,029,000

Note: Long-term induced VMT estimated with an elasticity of 1.0 using NCST Induced Travel Calculator based on 2019 VMT in the four-county MSA (El Dorado, Placer, Sacramento, and Yolo). Auto-only VMT estimated using an elasticity of 0.71.

The project contains two Active Transportation Project (ATP) elements in the scope of work. The first will improve the pavement surface to both entry points of the bicycle/pedestrian path on the Yolo Causeway and install a separated bike path at County Road 32A from the levee to follow the County Road 32A off-ramp alignment and eliminate a local street crossing. The enhancement of the existing connection may encourage additional bicycle and pedestrian trips. However, VMT reduction has been found only for new bicycle and pedestrian connections, not for simply enhancing existing connections. The second component is the establishment of a mobility hub at the I-80/Enterprise Boulevard interchange that will provide 300 parking spaces, electric scooter and bicycle parking, and a transit transfer station. However, these features alone would not reduce the cost of convenience of walking, bicycling, or riding transit such that people would shift away from driving. In addition, Yolobus currently serves the existing park and ride lot on the north side of the interchange, so no new transit service would be provided. Since no documented evidence exists for the VMT effect of these project components, no reduction in the induced VMT was applied.



Mitigation Measures

The following mitigation measures were selected for further analysis to forecast potential VMT reduction.

- Microtransit
- Expand Sidewalks
- Expand Putah Creek Trail for Davis Promenade
- Voluntary Trip Reduction Program
- Subsidize Monthly Transit Passes
- Expand Yolobus Route 42
- Truxel Road Bridge
- Green Line LRT Extension – Township 9 to Airport
- Downtown Riverfront Streetcar
- Expand Unitrans
- Reduce Transit Fares
- Increase Parking Costs
- Housing Construction or Subsidies for Infill Areas
- Causeway Connection Route 138
- Expand Capitol Corridor

The VMT reduction with the first six measures were calculated using the TDM+ tool, which is one of the tools available on the Caltrans SB 743 Implementation Resources website. The next six strategies were evaluated using the SACSIM regional travel demand model. Changes in housing location were estimated using average travel by neighborhoods. The three estimation methods are described below. In addition, the information below includes more detail about each strategy that was necessary for quantification purposes. VMT reduction estimates for the final two strategies were prepared by others.

VMT Estimation Using TDM+

Table 2 presents the VMT reduction estimates using TDM+. The mitigation measures were estimated for three areas: the City of Davis, the City of West Sacramento, and Yolo County, which includes all cities and rural areas in the county. The base VMT used in the calculations below was forecasted using the SACSIM model for the 2040 Alternative 2 scenario.



Table 2: Estimated Annual VMT Reduction using TDM+

Mitigation Measure	Davis ¹	West Sacramento	Yolo County ²
Microtransit ³	2,007,500	2,482,000	6,241,500
Expand Sidewalks ⁴	2,591,500	2,774,000	13,578,000
Expand Putah Creek Trail for Davis Promenade	1,375,000	-	-
Voluntary Trip Reduction Program ⁵	5,402,000	10,256,500	24,674,000
Subsidize Monthly Transit Passes ³	1,788,500	2,226,500	5,621,000
Expand Yolobus Route 42 ⁴	1,168,000	1,460,000	3,650,000

- Notes:
1. Includes the entire UC Davis campus in both Yolo and Solano Counties
 2. Includes Davis, West Sacramento, and the entire UC Davis campus in both Yolo and Solano Counties
 3. Reduction applied to origin-destination passenger vehicle VMT for all trips in the affected area.
 4. Reduction applied to boundary passenger vehicle VMT for all trips in the affected area.
 5. Reduction applied to origin-destination passenger vehicle VMT for home-based work trips in the affected area. Assumed to apply to the 80% of workers who would become eligible to participate.

The Microtransit mitigation measure would expand transit service by 25 percent to add flexible route buses with more frequent service and/or longer service hours. The additional transit service is expected to be provided by Yolobus and would occur over a larger area than is typical for microtransit. Based on the *Handbook for Analyzing Greenhouse Gas Emission Reduction, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (California Air Pollution Control Officers Association (CAPCOA), 2021) strategy T-25, a 25 percent increase in transit service mileage or hours could result in up to a 0.29 percent reduction in passenger vehicle VMT within the area affected by the expanded transit service. The research associated with this reduction was based on conventional fixed-route bus or passenger rail service so expanding the application of this strategy to microtransit may not be directly transferrable. If evidence becomes available that conventional transit service would produce higher VMT reductions, the mitigation funding could be directed for that purpose. Further, this calculation presumes new riders substitute transit for driving without providing quantified evidence of this actual effect. As noted above, Duranton and Turner did not find that expanding transit would reduce VMT. This may be due to the study’s reliance on large metropolitan statistical areas (MSAs) so it does not necessarily refute the CAPCOA reduction being applied in much small localized areas or corridors. The VMT reduction is anticipated to occur from residents, workers, and visitors to the area using the new service as a substitute for driving. Therefore, the VMT reduction was derived by calculating the VMT being generated by trips that start or end within the new service area.

The Expand Sidewalks mitigation measure would increase sidewalk coverage by 10 percent. Further investigation is needed to confirm that the sidewalk network can be increased by 10 percent by determining actual sidewalk coverage. CAPCOA strategy T-18 estimates a 10 percent increase in sidewalks will result in a 0.5 percent reduction in passenger vehicle VMT within the affected area. This strategy only applies to trips contained within the affected area since the strategy acts to replace or avoid short-distance auto trips with walking trips. This strategy was rejected since no local agencies identified specific projects to construct sidewalks.



The Expand Putah Creek Trail mitigation measure would improve the existing Putah Creek Trail between the Union Pacific Railroad tunnel and Old Davis Road at Hutchison Drive in Davis. Although this measure was not discussed in the DEIR, it has been added based on feedback and outreach with UC Davis and the City of Davis. The current trail serves bicycle and pedestrian traffic from the Olive Drive area and south Davis. With the planned Promenade development (also known as the Nishi property), demand for this path would increase. The existing path is too narrow to serve bicycles and pedestrians simultaneously. The mitigation measure would widen the existing path or provide a widened alternate path to serve this demand. As noted previously, CAPCOA strategy T-19-A is typically for new facilities. The Putah Creek Trail location is unique because of its high demand levels that will be exacerbated by planned growth. By widening the path, a bottleneck to bicycle and pedestrian movements through this popular route will be reduced such that higher use is expected. The effect would be similar to the provision of a new Class I path. The VMT reduction applies only to short-distance trips in the immediate area affected by the path expansion; therefore, no reduction was calculated for West Sacramento or Yolo County.

The Voluntary Trip Reduction Program mitigation measure would expand the current program provided by Yolo Commute, the Yolo County transportation management association, to apply for all residents and workers. To apply the VMT reduction calculations for CAPCOA strategy T-5, the program must include program marketing (T-4) and "services, infrastructure, and incentives for alternative modes such as ridesharing (T-7), discounted transit (T-8), bicycling (T-9), vanpool (T-10), and guaranteed ride home." An estimated 20 percent of workers are currently eligible. This measure would expand the program to cover the other 80 percent. CAPCOA strategy T-5 estimates a 4 percent reduction in home-based work trips when employees in a study area participate in the voluntary trip reduction program. Since transit pass reductions are included in this measure, the VMT reduction for the separate measures to subsidize transit passes or reduce transit fares cannot be included in the final plan as separate measures.

The next measure would reduce the cost of monthly passes by 50 percent on the Capitol Corridor and YoloBus transit services for Yolo County residents. CAPCOA strategy T-29 estimates a 0.26 percent reduction in passenger vehicle VMT within the area affected by the reduced cost of monthly transit passes. The VMT reduction is anticipated to occur from residents and workers in the area using transit as a substitute to driving due to the reduced cost. Therefore, the VMT reduction was derived by calculating the VMT being generated by trips that start or end within the area. Since the Voluntary Trip Reduction Program and Capitol Corridor Expansion measures already include transit pass subsidies (or the potential for transit pass subsidies in the case of Capitol Corridor) and was selected for the final mitigation plan, this measure is not included in the final plan.

YoloBus Route 42 provides 30-minute service during the morning and evening peak periods and hourly service outside the peak periods for Woodland, Sacramento International Airport, Downtown Sacramento, and Davis via clockwise and counterclockwise routes (Routes 42A and 42B). The mitigation measure would increase service to 30-minute headways during the entire day. Based on CAPCO strategy T-26, the proposed 38 percent increase in service frequency and a 50 percent level of implementation would result in a 0.17 percent reduction in related vehicle trips. The VMT reduction is anticipated to occur from residents, workers, and visitors to the area using the expanded service as a substitute to driving.



Therefore, the VMT reduction was derived by calculating the VMT being generated by trips that start or end within the service area.

VMT Estimation Using SACSIM

The following mitigation measures were evaluated using SACSIM.

- Truxel Road Bridge – Construct a two-lane multimodal bridge at the American River from Garden Highway to Sequoia Pacific Boulevard
- Green Line LRT Extension: Township 9 to Airport – Extend the Green Line LRT from Township 9 Boulevard to the Sacramento International Airport
- Downtown Riverfront Streetcar – Construct and operate the proposed Downtown Riverfront Streetcar system from midtown Sacramento to West Sacramento City Hall and along Broadway
- Causeway Connection Route 138 – Provide 20-minute headways during the AM and PM peak periods and 60-minute headways during midday/off-peak periods for Route 138
- Expand Unitrans – Increase frequency from 30 to 15 minutes during the AM and PM peak periods
- Reduce Transit Fares – Reduce fare by 50 percent for Yolobus
- Increase Parking Costs – Double parking costs for UC Davis and downtown Sacramento

To estimate the passenger vehicle VMT reductions, the analysis started with the 2040 SACSIM model that was used to prepare the travel demand forecasts and other performance measures for the project's Alternative 2, which would add a HOV lane on from I-80 at Richards Boulevard in Davis to US 50 at I-5 in Sacramento and on I-80 from US 50 in West Sacramento to West El Camino Avenue in Sacramento. This version of the model included some of the proposed mitigation measures or different versions of the mitigation measures as planned projects. Therefore, different model versions were created that added or removed the mitigation measure, as appropriate, to measure the effect to VMT.

SACSIM simulates person-level travel demand, with travel patterns for each person in the model computed in a randomized order. The random variation creates potential "noise" in the simulation of travel and VMT. Therefore, to minimize the effect of random noise and better understand the potential VMT reduction for each mitigation measure, the SACSIM model was run with three different random number seeds, with the reported VMT results using the average of the three runs³.

Table 3 reports the potential VMT reduction from the SACSIM model runs.

³ Performing additional multiple model runs as noted above may help to minimize some of these output issues and improve confidence in the forecasts. It is also possible that other refinements to the model may be necessary to improve sensitivity especially under future conditions when the level of congestion may be severe enough to warrant a more sensitive dynamic traffic assignment (DTA) model. For this project, the use of DTA is not applicable nor available or consistent with SACOG's static modeling tool, which was used for the analysis.



Table 3: Estimated Annual VMT Reduction using SACSIM

Mitigation Measure	Annual VMT Reduction
Truxel Road Bridge	3,686,500
Green Line LRT Extension: Township 9 to Airport	7,190,500
Downtown Riverfront Streetcar ¹	4,270,500
Causeway Connection Route 138	5,893,000
Expand Unitrans	1,168,000
Reduce Transit Fares ²	3,723,000
Increase Parking Costs	64,094,000

Notes: 1. This estimate is for the two-line streetcar system, not the starter line that is currently being studied and designed.
 2. The VMT reduction may not apply if the monthly transit pass subsidy strategy in Table 2 above is also implemented. The strategies offer different methods for reducing transit costs but may end up targeting similar people that could dampen the reported effectiveness.

The following model limitations are important to note when considering these results.

- Model runs from earlier analysis years (2027 and 2035) during mitigation testing revealed potential increases in VMT due to the addition of the Truxel Road Bridge.
- A review of the model outputs showed unexpected changes on the freeway HOV lanes far from the project area (for example, US 50 in Rancho Cordova and SR 99 in Elk Grove).
- Model runs for expansion of service for YoloBus Route 42 showed a VMT increase rather than a reduction. (As a result, the VMT reduction for this mitigation measure was estimated using TDM+).
- The range in the VMT estimates for the three model runs was larger than the estimated VMT reduction for all mitigation measures except for increasing parking costs.

The mitigation measures for Truxel Road Bridge, Green Line LRT Extension, Downtown Riverfront Streetcar, and Increase Parking Costs were analyzed but rejected during the DEIR process. Reasons for rejecting these measures include infeasibility due to, being within the responsibility and/or jurisdiction of another public agency, unreasonably high cost-to-VMT reduction ratio, or already being included in SACOG’S MTP/SCS and not qualifying under Caltrans’ additionality definition⁴. Specific justifications for rejecting each measure can be found in the VMT Mitigation Plan Executive Summary that is also attached to the Final EIR (FEIR).

⁴ <https://dot.ca.gov/~/-/media/dot-media/programs/esta/documents/21-01-vmt-bulletin-mitigation-funding-status-additionality-a11y.pdf>



VTM Estimation for Increasing Capitol Corridor Service

Separate from the above analyses, the Capitol Corridor Joint Powers Authority (CCJPA) estimated the VMT reduction provided by increasing Capitol Corridor regional train service with three new round trips between Sacramento and Martinez. The estimated combined ridership for the three round trips (6 trains) is 712 passengers per day. The VMT reduction per rider value of 48.5 was estimated using an average trip length of 68.4 miles, an average vehicle occupancy of 1.2 passengers, and a value of 85 percent having the option to use a vehicle. This mitigation measure is included in the final plan.

If the additional service does not prove feasible, the authority has suggested that a buy-down program to reduce monthly fares could be used instead to increase ridership on existing trains to a level similar to providing the additional service.

VTM Estimation for Housing Construction or Subsidies for Infill Areas

Affordable housing construction, especially if it occurs in areas well served by transit, can contribute to lower future VMT growth in an area. This type of housing may also produce more immediate VMT reductions if a program is designed to relocate people from high to low VMT generating areas. This mitigation measure focuses on reducing the housing cost differential between highly accessible neighborhoods, where a low VMT lifestyle is easier to establish and maintain and low-accessibility areas on the fringe of a region where daily activities generate more VMT. To be fully effective, this program would need to shift or accelerate housing development in the low VMT area versus creating new housing demand. If the new housing just satisfies existing demand in the low VMT area, the demand for housing on the fringe may not be affected. As a result, less VMT substitution would occur. A final requirement for this mitigation measure is evidence that the financial contribution from Caltrans is essential for the project to be implemented and the amount of the contribution was substantial enough to justify taking credit for the associated VMT reduction.

Fehr & Peers has developed a web tool that provides estimates of VMT per capita for census block groups in California (<https://www.fehrandpeers.com/project/find-my-vmt/>). The VMT data was derived from a custom application of the mobile source data collected in 2019 by StreetLight Data. **Tables 4, 5, and 6** below compare the average home-based VMT per resident (per capita) for a neighborhood in well-served transit areas with several outlying areas in Sacramento, Davis, and West Sacramento. The tables also provide average household size for these block groups from the 2020 census.

The downtown Sacramento census block group in **Table 4** is bounded by J Street, 16th Street, N Street, and 7th Street. The governor recently announced that three state office buildings in this area would be converted to approximately 400 housing units (*Sacramento Bee*, January 31, 2023). The average home-based VMT in this neighborhood is 15.2 daily VMT per capita. The three sample neighborhoods in North Natomas, Elk Grove, and North Highlands have an average of 22.1 daily VMT per capita, and an average household size of 3.28. On average, relocating a household from these suburban areas would result in a reduction of $(22.1 - 15.2 =) 6.9$ daily VMT per capita. For an average suburban household, this is a reduction of $(6.9 \times 3.28 =) 22.6$ daily VMT per household. If 400 housing units were constructed in downtown Sacramento instead of an outlying area, the regional daily VMT would be reduced by



approximately $(400 \times 22.6 =) 9,040$. This may be a high estimate of the VMT reduction since the households that choose to relocate downtown may have a lower-than-average household size.

Table 4: VMT per Capita by Census Block Group - Sacramento

Census Block Group	Home-based Daily VMT per Capita	Household Size
Downtown Sacramento (060670011033)	15.2	1.25
North Natomas Community Park (060670071062)	23.2	3.11
Elk Grove Commons (060670096323)	21.8	3.36
Watt Avenue & Antelope Road (060670074172)	21.3	3.37

Source: The census block group number is listed in parentheses. Average VMT per capita as reported by VMT+, <https://www.fehrandpeers.com/project/find-my-vmt/>. Average household size is from Census 2020: DEC Redistricting Data (PL 94-171).

The Promenade (Nishi property) in Davis is bounded by I-80, the Union Pacific railroad, and Putah Creek. The proposed development would include up to 700 housing units for students at the adjacent UC Davis campus. As shown in **Table 5**, the Promenade is in a census block group with an average home-based daily VMT per capita of 10.1. The three sample neighborhoods in Davis with similar student housing populations have an average of 12.1 daily VMT per capita, and an average household size of 2.46. On average, locating a student household at the Promenade instead of one of the other areas would result in a reduction of $(12.1 - 10.1 =) 2.0$ daily VMT per capita. For an average household, this is a reduction of $(2.0 \times 2.46 =) 4.9$ daily VMT per household. If 700 housing units were constructed in the Promenade instead of the other areas, the regional daily VMT would be reduced by approximately $(700 \times 4.9 =) 3,430$.

Table 5: VMT per Capita by Census Block Group - Davis

Census Block Group	Home-based Daily VMT per Capita	Household Size
Olive Drive (061130106024)	10.1	2.56
Downtown Davis (061130107014)	10.6	2.04
West Manor Park (061130105132)	14.3	2.73
Sycamore Lane North (061130105103)	10.1	2.54
F Street North (061130107012)	13.6	2.11

Source: The census block group number is listed in parentheses. Average VMT per capita as reported by VMT+, <https://www.fehrandpeers.com/project/find-my-vmt/>. Average household size is from Census 2020: DEC Redistricting Data (PL 94-171).

The VMT reduction could be higher or lower depending on the following factors.



- The relative percentage of students in each census block group since students have lower VMT on average than other populations
- The actual location of alternative housing for students

The VMT reduction could be higher if student housing would otherwise occur in neighboring jurisdictions due to the housing supply constraints in Davis. Without the Promenade project some students may have to reside outside of Davis in the nearby communities of Woodland, Winters, Dixon, and West Sacramento. Average citywide daily VMT per household in these communities ranges from 22.6 to 33.4.

The Downtown Davis Specific Plan area is generally bounded by the Union Pacific railroad, 1st, A, and 5th Streets and includes the G Street corridor from 5th to 8th Streets. The approved plan calls for up to 1,000 additional housing units in the specific plan area. As shown in **Table 5**, the downtown Davis census block group has an average home-based daily VMT per capita of 10.6. The new housing units would likely attract students like the nearby Promenade project. The three sample neighborhoods in Davis with similar student housing populations have an average of 12.1 daily VMT per capita, and an average household size of 2.04. On average, locating a student household in downtown Davis instead of one of the other areas would result in a reduction of $(12.1 - 10.6 =) 1.5$ daily VMT per capita. For an average household, this is a reduction of $(1.5 \times 2.46 =) 3.7$ daily VMT per household. If 1,000 housing units were constructed in downtown Davis instead of the other areas, the regional daily VMT would be reduced by approximately $(1,000 \times 3.7 =) 3,700$. This estimate could vary due to the factors noted above especially if housing would otherwise occur outside of Davis. The total daily VMT reduction could increase closer to 50,000 if housing locates in communities such as Woodland or Dixon.

The Bridge District Specific Plan area is bounded by the Sacramento River, Tower Bridge Gateway, US 50, South River Road, and 15th Street. The approved plan calls for up to 4,442 additional housing units in the specific plan area. As shown in **Table 6**, is the Bridge District census block group has an average home-based daily VMT per capita of 19.8. The three sample neighborhoods from the Southport area of West Sacramento have an average of 25.0 daily VMT per capita, and an average household size of 2.77. On average, relocating a household from these suburban areas would result in a reduction of $(25.0 - 19.8 =) 5.2$ daily VMT per capita. For an average suburban household, this is a reduction of $(5.2 \times 2.77 =) 14.4$ daily VMT per household. If 4,442 housing units were constructed in Bridge District instead of an outlying area of West Sacramento, the regional daily VMT would be reduced by approximately $(4,442 \times 5.2 =) 23,100$. Like the estimates above, the VMT reduction may vary depending on the alternative housing location and factors such as household size. Households that choose to relocate downtown may have a lower-than-average household size.



Table 6: VMT per Capita by Census Block Group – West Sacramento

Census Block Group	Home-based Daily VMT per Capita	Household Size
Bridge District (061130102011)	19.8	2.27
Bridgeway Island Park (061130103104)	27.3	2.83
Village Parkway South (061130103141)	24.4	2.91
Southport Gateway (061130103131)	23.3	2.58

Source: The census block group number is listed in parentheses. Average VMT per capita as reported by VMT+, <https://www.fehrandpeers.com/project/find-my-vmt/>. Average household size is from Census 2020: DEC Redistricting Data (PL 94-171).

Although the housing components provide significant VMT reduction based on the above calculations, these mitigation measures were rejected during the DEIR process due to the Project’s relatively low financial contribution that was proposed in the DEIR VMT Mitigation Plan Executive Summary (dated October 20, 2023). It is infeasible for the Project to claim full VMT reduction credit when proposing a relatively low financial contribution to housing projects that are estimated in the hundreds-of-millions to billions dollar range to fully construct. This is also referenced in Table 2 of the VMT Mitigation Plan Executive Summary attached to the FEIR.

Summary

Table 7 summarizes the VMT reduction estimated for the analyzed mitigation measures.



Table 7: Estimated Annual VMT Reduction – Analyzed Measures

Mitigation Measure	Method	Annual VMT Reduction ¹
Microtransit in Yolo County	TDM+	6,241,500
Expand Sidewalks in Yolo County	TDM+	13,578,000
Expand Putah Creek Trail for Davis Promenade	TDM+	1,375,000
Voluntary Trip Reduction Program in Yolo County	TDM+	24,674,000
Subsidize Monthly Transit Passes in Yolo County ²	TDM+	5,621,000
Expand Yolobus Route 42 in Yolo County	TDM+	3,650,000
Truxel Road Bridge	SACSIM	3,686,500
Green Line LRT Extension: Township 9 to Airport	SACSIM	7,190,500
Downtown Riverfront Streetcar	SACSIM	4,270,500
Expand Causeway Connection Route 138	SACSIM	5,893,000
Expand Unitrans	SACSIM	1,168,000
Reduce Transit Fares ²	SACSIM	3,723,000
Increase Parking Costs at UC Davis and Downtown Sacramento	SACSIM	64,094,000
400 Housing Units in Downtown Sacramento	VMT+	3,299,600
700 Housing Units at The Promenade in Davis	VMT+	14,644,750
1,000 Housing Units in Downtown Davis	VMT+	18,250,000
4,442 Housing Units at Bridge District in West Sacramento	VMT+	8,431,500
Expand Capitol Corridor between Martinez and Sacramento	*3	12,600,000

- Notes:
1. The non-housing mitigation measures are based on 2040 conditions according to the SACSIM model. The housing mitigation measures are based on 2019 conditions as represented by StreetLight Data applied in the VMT+ tool and 2020 census data.
 2. The voluntary trip reduction program already includes this measure, so the VMT reductions cannot be combined.
 3. Provided by the Capitol Corridor Joint Powers Authority.

Further review by the project team resulted in the removal of several mitigation measures due to concerns about cost effectiveness, additionality criteria, non-inclusion in local agency general plans, and falling within another public agency’s jurisdiction for implementation. As previously mentioned, specific justifications for rejecting each mitigation measure can be found in Table 2 of the VMT Mitigation Plan Executive Summary attached to the FEIR. The remaining feasible mitigation measures are provided below in **Table 8**.



Table 8: Estimated Annual VMT Reduction – Analyzed and Proposed Measures

Mitigation Measure	Annual VMT Reduction ¹
Microtransit in Yolo County	6,241,500
Expand Putah Creek Trail for Davis Promenade	1,375,000
Voluntary Trip Reduction Program in Yolo County ²	24,674,000
Expand Yolobus Route 42	3,650,000
Expand Causeway Connection Route 138	5,893,000
Expand Unitrans	1,168,000
Expand Capitol Corridor between Martinez and Sacramento	12,600,000
Total	55,601,500

Notes: 1. The mitigation measures are based on 2040 conditions according to the SACSIM model. The Capitol Corridor expansion measure estimate provided by the Capitol Corridor Joint Powers Authority.
 2. The voluntary trip reduction program includes monthly transit pass subsidies and reduced transit fares.

The potential total VMT reduction is not sufficient to offset the induced VMT forecasts of around 110 million for the selected project alternative. The mitigation measures would offset about 50 percent of the induced VMT for the selected alternative, Alternative 12, if fully realized. Most of these measures depend on future travel behavior of individuals living and working in the affected area that are subject to change over time. Finally, the potential to offset induced VMT presumes that the SACSIM sensitivity issues noted above do not result in an overestimate of the VMT reduction potential.