VEHICLE MILES TRAVELED ANALYSIS

SINGH DEVELOPMENT PROJECT

CITY OF HANFORD

KINGS COUNTY, CALIFORNIA

This Vehicle Miles Traveled Analysis has been prepared under the supervision of
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LSA

February 2025

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February 2025

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1.0 EXECUTIVE SUMMARY

The proposed Singh Development Project will be a mixed-use development including 926 single-family homes, 218 apartments, , one elementary school with 600 students, 12,500 square feet (sf) of retail, a 11,000 sf sit-down restaurant, a 10,500 sf food court with outdoor seating, a 6,000 sf restaurant with drive-through window, and a gasoline station with 12 vehicle fueling positions and a 5,000 sf convenience store. It is to be noted that the commercial uses are tentative and conceptual, but are estimated to remain at approximately 45,000 sf cumulatively. Additionally, the project will include passive use/open space areas within the community including playgrounds for children and areas for families to gather and socialize.

The trip generation for the proposed project was developed using rates from the ITE *Trip Generation Manual* (11th Edition). The project is anticipated to generate 15,282 net daily trips..

The City has recently adopted the *City of Hanford VMT Thresholds and Implementation Guidelines* (VMT Guidelines), dated November 2022. Based on the guidelines, the project being a mixed-use project, individual land use components were analyzed separately for purposes of the VMT analysis. The project VMT analysis has been conducted based on the current project description. The retail/ commercial component of the project could be screened out using the 55,000 sf screening criteria for retail projects. Similarly, the elementary school component of the project could be screened out. However, the residential component of the project doesn't meet any of the screening criteria identified in the VMT Guidelines. The VMT Guidelines further recommends that for projects/components of a project that could not be screened out using the project screening criteria, a detailed VMT analysis should be conducted using the methodology and significant threshold criteria identified in the guidelines.

Based on the VMT analysis, the residential component of the project's VMT per capita is forecast to be 14.2 percent higher than the regional threshold. Therefore, it will have a significant transportation impact under California Environmental Quality Act (CEQA). As such, the project is required to identify mitigation measures that will offset the project's VMT impact. To offset the project's VMT impact, appropriate mitigation measures related to Travel Demand Management (TDM) measures and any other mitigation measure have been identified. TDM measures and strategies aim to promote overall mobility with the goal of reducing the number of single-occupancy vehicle trips and reducing greenhouse gas emissions. Implementation of the mitigation measures identified in this analysis may potentially result in a reduction of the project's residential VMT by approximately 7.61 percent. Therefore, given the project's residential component requiring 14.2 percent VMT reduction, which is significantly higher than achievable using feasible mitigation measures, as well as the uncertainty of the effectiveness/lack of localized substantial evidence of the VMT reduction measures, the project will have a significant and unavoidable VMT impact under CEQA.

2.0 VEHICLE MILES TRAVELED ANALYSIS

2.1 BACKGROUND

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on Vehicle Miles Traveled (VMT) generated by the project.

The City has adopted the *City of Hanford VMT Thresholds and Implementation Guidelines* (VMT Guidelines) in November 2022. Therefore, the project VMT analysis was conducted using the methodology and significant threshold criteria identified in the guidelines. As previously mentioned, the project includes residential, educational (elementary school), and retail/commercial land uses. As per the guidelines, mixed-use projects should be evaluated separately for each component of the project. Therefore, each project component was analyzed separately.

2.2 METHODOLOGY

2.2.1 Project VMT Screening Analysis

The VMT guidelines include multiple screening criteria for small land use projects or project components to be screened out of a detailed VMT analysis.

The screening thresholds and their applicability to the project site are as follows:

- **Transit Priority Area Screening:** The project location was compared against the Transit Priority Area from the City of Hanford VMT Screening Tool. Since the project is not located within any Transit Priority Area, this screening criteria does not apply for the project.
- **Local-serving Retail:** Based on the VMT Guidelines, retail projects with a combined area of less than 55,000 sf could be classified as local-serving and could be screened out from a detailed VMT analysis. As summarized in Chapter 1 of this report, the retail component of the project is approximately 45,000 sf, which is less than 55,000 sf. Therefore, the retail component of the project could be screened out using this criterion and a detailed VMT analysis will not be required for this project component.
- **Redevelopment Project:** The project site is currently vacant. Therefore, this criterion is not applicable for the project.
- **Affordable Housing Project:** The residential component of the project proposes market rate single-family and multifamily residential development. Therefore, this criterion is not applicable for the residential component of project.
- **Average Daily Trip Threshold:** As summarized in Chapter 1.0, the project is estimated to generate approximately 15,282 daily trips. Therefore, the project could not be screened using the daily trip threshold criteria, which is 500 daily trips for projects requiring a General Plan Amendment (GPA), and 1,000 daily trips for projects not requiring a GPA.
- **Institutional/Government and Public Service Project:** The project land uses could not be classified as Institutional/government and public service land uses, including police stations,

fire stations, government offices, utilities, public libraries, community centers, and refuse stations. Therefore, this criterion is not applicable for the project.

- **Specific Land Use Screening:** As included in the VMT Guidelines, local parks, daycare centers, student housing projects on or adjacent to a college campus, local serving gas stations, banks, and K–12 public schools could be screened out from detailed VMT analysis. As such, the elementary school component, as well as the park/open space component of the project could be screened out using this criterion and a detailed VMT analysis will not be required.
- **Low VMT Area Screening:** The project site was evaluated using City of Hanford VMT Screening Tool to determine if the project is located within a low VMT area. Per the VMT Screening Tool, the project comprises of Kings County Association of Governments (KCAG) Travel Demand Model's traffic analysis zone (TAZ) # 651 and 652. This site is currently vacant, with these TAZs having nominal existing household or employments. As such, there's no sufficient data available to determine whether these TAZs are expected to have a low VMT profile. Therefore, the project could not be screened out using this criterion.

As noted above, the retail and the school components of the project is screened out using the screening criteria and no further VMT analysis would be required for these components. However, the residential component of the project doesn't meet any of the screening criteria identified in the guidelines. Therefore, a detailed VMT analysis was conducted to evaluate the VMT impact of the residential component.

2.2.2 VMT Metrics and Thresholds

The VMT Guidelines provide guidance regarding VMT analysis based on land use types. It recommends use of VMT per capita metric to evaluate residential land uses.

The VMT Guidelines also established Kings County as the region and 13 percent below existing as the threshold for comparison of VMT metrics. Therefore, if the project VMT per capita exceeds 87 percent of Kings County baseline average VMT per capita, the project would have a significant VMT impact. For projects that require a detailed VMT analysis, the VMT Guidelines recommend use of KCAG model to conduct the VMT analysis. Therefore, KCAG model was used for the VMT evaluation of the project. Numerical values for the VMT metric threshold have been obtained from Table E: Significance Thresholds for VMT Analysis of the VMT Guidelines.

2.2.3 Project Traffic Analysis Zone Update

To calculate the project VMT, the first step was to update the traffic analysis zones (TAZs) in the model that include the project area. The project should be isolated in the travel model to estimate project VMT. The KCAG model includes ability to split or add new TAZs. Therefore, four separate TAZs were added to the model to incorporate the project's single-family, multifamily, school, and retail land uses. Single-family and multifamily residential uses have been separated into two TAZs because they have different household characteristics such as household size and household income. Typically, single-family residential developments have a higher household size, higher auto ownership, and higher income compared to multifamily developments. Creating new TAZs for the project help isolate project VMT and determine project specific, and project land use specific VMT impact.

KCAG model is a socioeconomic data-based model. Therefore, in addition to the number of households, the model requires other household characteristics such as household income and household size as inputs to the socioeconomic database. The household attributes such as size and income determine the number of trips and their trip lengths. For example, based on ITE *Trip Generation Manual*, (11th edition), a single-family dwelling unit will have 9.4 daily trips, whereas a multifamily unit will have 6.7 daily trips in average. Generally, higher household sizes contribute to higher number of trips and similarly higher income households have more and longer trips. The trip rates in the travel model are disaggregated by different household attributes which are based on regional household travel survey, and census data. These household variables for the project dwelling units were obtained from similar TAZs within the City. Appropriate socioeconomic data for each of the residential land uses were included in the model prior to conducting the VMT analysis model run.

It should be noted that though the school and retail component of the project were screened out, two separate TAZs were created in the model to include these land uses. Inclusion of retail and school components will appropriately reflect the internal capture within the project. That is because, presence of retail in proximity of residential uses will help reduce the overall VMT of the project. The elementary school and retail land uses were converted to model socioeconomic data including school enrollment and employment categories using land use conversion factors for inclusion in the model. The land use to employee conversion factors were developed using ITE *Trip Generation Manual*, 11th edition. The ITE trip generation manual includes trip generation rates for different land use categories by different units such as square footage, number of units, and/or number of employees. Employee/square footage rate was determined for these uses by dividing the daily trip rate per 1,000 sf by daily trip rate per employee. This ratio was used to estimate number of employees per square feet for the retail use which in turn was used to estimate total project retail employees. Model run was conducted for this updated model after incorporating the project land uses as described above. The outputs from this updated model run were utilized to estimate project specific VMT metrics. No project specific roadway network modifications were conducted for the model runs.

2.3 VMT ANALYSIS

Table 2-A shows the result of the VMT analysis for the residential component of the project. As shown in Table 2-A, VMT per capita for residential component of the project is 14.2 percent higher than the regional threshold. As such, based on the VMT analysis, the residential component will have a significant VMT impact.

Detailed VMT calculation for the project is included in Appendix A.

2.4 VMT REDUCTION MEASURES – PROJECT DESIGN FEATURES AND MITIGATION MEASURES

When a significant CEQA impact is identified, the project must identify feasible mitigation measures to avoid or substantially reduce that impact. These measures can also be incorporated as a part of project design, local plans, policies, or regulations. Project design features that encourage mode shift from automobiles to transit or non-motorized modes can therefore help reduce project VMT. Typically, VMT reduction and benefits from these project design features are not accounted in the

project VMT calculations conducted using the regional travel demand model. Therefore, VMT reduction credit may be accounted for these design features like VMT mitigation measures to help reduce the project's VMT impact.

2.4.1 Limitation of Travel Demand Models Runs

Though travel models provide a detailed VMT estimate based on the regional and project trip patterns, they have limited ability to refine project VMT based on project design features or internal circulation patterns for mixed-use projects or specific plans. As such, project design including project site plan, internal street connectivity, adjacency of complementary land uses, availability of active transportation facilities and transit facilities among other project design features help reduce VMT further by reducing vehicle dependency and encouraging use of alternative transportation modes.

Therefore, the project VMT was further refined to account for the effect of project design features. The project design features were obtained from the project applicant.

Table F of the City's VMT Guidelines provides a list of mitigation measures/project design features that would be appropriate/feasible for implementation within the City. These measures were generally shortlisted from the *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, dated November 2024 (CAPCOA Green Book). The CAPCOA Green Book identifies several measures/design features that can reduce vehicular VMT based on empirical research data. The CAPCOA Green Book identifies types of environments (urban/suburban/rural) within the state where each measure will be applicable or appropriate to implement. As such, given that the City of Hanford is the largest major urban center within Kings County, VMT reduction methodologies and factors, that are appropriate for urban/suburban areas were reviewed to determine what measure may be applicable for this project. The CAPCOA Green Book also includes methodologies to estimate VMT reductions due to each of the measures/features. As such, using VMT reduction methodologies from the CAPCOA Green Book within the City would be appropriate as long as those measures are quantified using data that are applicable to the City. The methodologies from CAPCOA Green Book were tailored to reflect City of Hanford conditions where applicable and data for City of Hanford was available.

The following section offers project design features and mitigation measures that may potentially decrease the project VMT impact. Potential VMT reductions have been estimated using CAPCOA methodologies tailored to City of Hanford where applicable. However, given the uncertainty of the potential reduction in VMT as per the CAPCOA measures, the estimates provided in this analysis may not be achievable. Therefore, as a conservative approach, the VMT impact of the project has been considered significant and unavoidable.

2.4.2 Project Design Features

Evaluation of VMT reductions should be evaluated using state-of-the-practice methodologies recognizing that many of the VMT mitigation strategies/project design features are dependent on resident performance over time. As indicated before, VMT reduction that can be achieved by the project design features have been estimated using Table F of the City's VMT Guidelines, which was developed using the CAPCOA Green Book. The methodologies and factors used to estimate VMT reduction have been modified to be applicable to City of Hanford, wherever possible. Following is a

detailed description of project design features and the corresponding potential reduction that could be achieved with implementation of these measures.

Provide Electric Vehicle (EV) Parking and EV Charging Infrastructure: Accessible EV parking and provision of charging for electric vehicles in the multifamily and retail areas of the project can possibly encourage the use of EVs. Designating EV parking with charging stations at favorable locations (e.g. near main entrances or major access points) can raise awareness about using EV to reduce GHG emissions. The latest California Green Building Standards (CALGreen), California Building Code, requires provision of infrastructure to accommodate electric vehicle chargers for new land use developments. Additional electric charging stations, in addition to CALGreen requirements, can be considered as a GHG/VMT mitigation measure according to CAPCOA. While CALGreen requirements will be met for the single family, retail, and school uses of the project, additional EV chargers (in addition to CALGreen requirements) are proposed for the multifamily use of the project to reduce project VMT impacts.

CALGreen code requires multifamily projects to provide EV charging stations for 5 percent of the total project parking with an additional 35% that would be EV capable and EV ready. While it is understood that provision of electric charging stations might not reduce VMT, it will reduce GHG which can be considered equivalent to reduction in VMT. CAPCOA Green Book transportation measure "**T-14. Provide Electric Vehicle Charging Infrastructure**" was used to quantify VMT reduction due to additional EV chargers proposed for the multifamily part of the project. Number of additional electric chargers required to achieve maximum GHG reduction and therefore VMT reduction, were estimated using methodology identified in CAPCOA. Project specific information such as project multifamily trip generation and carbon intensity factor for the local electricity provider (from CAPCOA appendix table E-4.3) were used to estimate VMT reduction that can be achieved. A maximum of 11.9 percent VMT reduction can be achieved by provision of 11 additional (in addition to CALGreen requirements) EV chargers. The 11.9 percentage reduction of VMT is only applicable to multifamily VMT and therefore this reduction was applied for the VMT generated by multifamily dwelling units of the project. As such, application of this VMT reduction may reduce the overall project residential VMT per capita by 1.2 percent. However, given the uncertainty of the effectiveness/lack of localized substantial evidence of the above listed VMT reduction measure, no VMT reduction was assumed for this project design feature as a conservative approach.

Pedestrian Infrastructure: The project proposes to provide pedestrian improvements/sidewalks both internal to the project site and along the project frontage. Provision of sidewalk/pedestrian improvements encourage people to walk to various uses inside the project such as retail, school, and parks, instead of driving and thus reduces VMT. The Project would include a 10 feet concrete bike/pedestrian trailway around the 2.25 mile collector loop road. This would be used by the residents for accessing different land uses of the project. This trailway will be integrated with the external pedestrian and bike facilities around the project, connecting the residents with the surrounding neighborhood for easy access without vehicular dependency and enhancing the neighborhood's active transportation network. As such, such an integrated active transportation network is estimated to reduce car dependency, at least for the non-commuting trips, like for recreational and other non-work purposes trips within the neighborhood and for destinations within walking/biking distance. CAPCOA transportation measure "**T-18. Provide Pedestrian Network**

Improvement" was used to estimate the VMT reduction due to project related enhancements in pedestrian access and connectivity. The CAPCOA methodology requires existing sidewalk length in the project surroundings in addition to the length of sidewalk being provided by the project. In order to estimate the existing sidewalk length, a survey was conducted along the proposed project frontage. Based on the survey, it was determined that currently the project surroundings has minimal sidewalk coverage and therefore approximately 1 mile of sidewalk was assumed for calculation purposes. The project proposes to add approximately another 21 miles of sidewalk/pedestrian access in the entire project area, including along the project frontage and internal street systems. Therefore, this mitigation measure may reduce the project's VMT by approximately 6.4 percent which is the maximum reduction that can be achieved by this measure. However, given the uncertainty of the effectiveness/lack of localized substantial evidence of the effectiveness of this project design feature, no VMT reduction has been accounted.

Bicycle Infrastructure/Improvements: The project proposes to construct a total of 2.5 miles of bike lanes along project frontage. Similar to pedestrian facilities, these bicycle design features included in the project can encourage increase active transportation mode share in the area. The CAPCOA manual was utilized to estimate the reduction of project VMT due to proposed bicycle improvements. Specifically, CAPCOA transportation measure "T-19A: Construct or Improve Bike Facility" was deemed applicable to estimate the VMT reduction due to project bicycle features. According to the measure, providing bicycle infrastructure helps to improve biking conditions within an area. This encourages a mode shift on the roadway parallel to the bicycle facility from vehicles to bicycles, displacing VMT and thus reducing GHG emissions. Based on CAPCOA estimates, the project bicycle design features have a potential to reduce up to 0.01 percent of the project VMT. However, as previously stated, given a lack of empirical data in context for the City, no VMT reduction was accounted for this project feature.

Traffic Calming Measure: This measure would encourage walking and bicycling instead of using a vehicle through the implementation of pedestrian and bicycle safety and traffic calming measures. Traffic calming would reduce motor vehicle speeds through features such as marked crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, count-down signal timers, curb extensions, speed tables, raised crosswalks, on-street parking, planter strips with street trees, chicanes/chokers, and similar improvements. At the intersections between vehicular street network and the trail loop, the project proposes to include enhanced crossing that would be designed to easily identify the pedestrian/bike crossings for conflict free and safe maneuver. Block walls along the collector loop, adjacent to these trails have been specifically designed with pedestrian pathway connections to allow residents within the Project have easy access to these trails for walking, biking, and socializing with the community. As such, the project proposes to develop a safe and integrated active transportation network using bike and pedestrian trails that will cater to the residents' recreational requirements and thus help reduce such trips to distant locations. This measure is also in the 2021 CAPCOA guidance as **Measure T-35**. Although the 2010 guidance notes a potential decrease in VMT of up to one percent, the 2021 guidance includes traffic calming as a supporting, non-quantified measure. While implementation of this measure may potentially help in some reduction in project VMT, due to lack of substantial evidence no VMT reduction has been attributed to this project design feature.

Table 2-B provides methodology, assumptions, and parameters used in the estimation/calculation of VMT reduction for the project along with the potential amount of VMT reduction that can be achieved.

In conclusion, VMT mitigation measures/project design features and strategies aim to promote overall mobility with the goal of reducing VMT and reducing greenhouse gas emissions. As indicated previously, the above project design features and VMT mitigation measures have potential to reduce project's VMT by approximately 7.61 percent. The above listed VMT reduction measures demonstrate the project's best faith effort in reducing the project's VMT impact. However, given the uncertainty of the effectiveness of the above listed VMT reduction measures, no VMT reduction was assumed for these project design features/mitigation as a conservative approach. Therefore, the project will have a significant transportation impact under CEQA. If implemented, these measures and strategies may need to be monitored for their usage and effectiveness.

2.4 LIST OF CHAPTER 2.0 FIGURES AND TABLES

- Table 2-A: Regional Threshold and Project VMT per capita
- Table 2-B: Calculated VMT Reduction with Project Mitigation

Table 2-A: Regional Threshold and Project VMT per Capita

Threshold[1]	Project (Residential Componenet)	Difference	Percentage Difference
8.99	10.27	1.28	14.2%

Source: KCAG Model.
The Kings County VMT per capita was obtained from City of Hanford VMT Guidelines, (November 2022).
VMT = vehicle miles traveled

Table 2-B: Calculated VMT Reduction with Project Mitigation

Mitigation Measure (Number corresponds to the 2024 CAPCOA Handbook)	Formula	Comments	Calculated Reduction in VMT (%)
Parking or Road Pricing/ Management (Maximum Reduction 35%)			
T-14: Provide Electric Vehicle Charging Infrastructure	A= [B * D * (F−E) * (G−(H * I * K * L))] / (-C * J), Where B= Number of chargers installed at site, C= Total vehicles accessing the site per day, D= Average number of PHEVs served per day per charger installed (2) , E= Percent of PHEV miles in electric mode without measure (46), F= Percent of PHEV miles in electric mode with measure (80), G= Average emission factor of PHEV in gasoline mode (205.1), H= Energy efficiency of PHEV in electric mode (0.327), I= Carbon intensity of local electricity provider, J= Average emission factor of non-electric vehicles accessing the site (307.5), and K= conversion from lb to g (454), and L= Conversion from kWh to MWh (0.001)	The project proposes to provide an additional (in addition to CALGreen requirement) 11 electric charging stations for the multifamily portion of the project. Provision of electric chargers at multifamily will reduce 11.9 percent of GHG/VMT. 11.9 percent of multifamily VMT is approximately equal to 1.2 percent of total project residential VMT as shown in the appendix calculations.	1.2% (Reduction not applied)
Neighborhood Design (Maximum Reduction 10%)			
T-18: Provide Pedestrian Network Improvement	A = ((C/B)-1) * D, Where B = Existing sidewalk length in study area, C = Sidewalk length in study area with measure, and D = Elasticity of household VMT with respect to the ratio of sidewalks-to-streets (-0.05 constant)	Based on the survey, the project study area includes approximately 1 mile of of sidewalk. The project proposes to add approximately another 21.0 miles of sidewalk/pedestrian access.	6.4% (Reduction not applied)
T-19-A: Construct or Improve Bike Facility	A = (B*(F/I)*(C+D)*E*G)/H, Where B = Percent of plan/community VMT on parallel roadway, C = Active transportation adjustment factor, D = Credits for key destinations near project, E = Growth factor adjustment for facility type, F = Annual days of use of new facility, G = Existing regional average one-way bicycle trip length, H = Existing regional average one-way vehicle trip length, and I = Days per year (365)	Variables C, D, E, F, G, and H were obtained from appropriate tables listed in CAPCOA handbook. It was assumed that 20% of VMT on the parallel roadway is from the community. A = (0.2*(320/365)*(0.0029+0.000)*1*2.2)/11.7 A = (0.2*0.88*0.0034*1*2.2)/11.7 A = 0.01%	0.01% (Reduction not applied)

Potential VMT Reduction from All Subsectors[1]	7.61% (Reduction not applied)
Total VMT Reduction Required	14.2%

Source: Handbook for Analyzing Greenhouse Gas Emission Reduction, Assessing Climate Vulnerabilities, and Advancing Health and Equity, California Air Pollution Control Officers Association (CAPCOA), November 2024.

[1] Per CAPCOA total VMT reduction for multiple strategies within same subsector is calculated using the equation: 1-(1-A)*(1-B)*(1-C)... where A, B, C are equal to individual mitigation strategy reduction percentages.

APPENDIX A:

VMT CALCULATIONS

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VMT Analysis - Singh Project Hanford

Table 1 - VMT per Capita Calculations

2015	Project Single Family	Project Multifamily	Total Project Residential	Threshold
Households (a)	926	218	1,144	
Population (b)	2,784	568	3,352	
Homebased (HB) VMT ('c)	30,845	3,585	34,430	
HB VMT per capita (d = c/b)	11.08	6.31	10.27	8.99

Source: KCAG Model

The Kings County VMT per capita threshold was obtained from City of Hanford VMT Guidelines, (November 2022).

VMT = vehicle miles traveled

Table 2 - VMT Reduction due to Electrical Chargers at Multifamily Dwelling Units

2015	Project Multifamily
Homebased (HB) VMT (a)	3,585
Percent VMT reduction due to additional electric chargers (b)	11.9%
VMT reduction ('c)	427
HB VMT after reduction (d = c-a)	3,158

2015	Project Residential
Total Homebased (HB) VMT (a)	34,430
VMT reduction due to EV chargers at Multifamily DUs (b)	427
Percent VMT reduction for entire project residential (c=b/a)	**1.2%**