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JOB NO: 14845-04 VMT

CHI HIGHLAND EAST VEHICLE MILES TRAVELED (VMT) ANALYSIS

Urban Crossroads, Inc. is pleased to provide the following Vehicle Miles Traveled (VMT) Analysis for the CHI Highland East (**Project**), which is located north of 3rd Street, south of 5th Street and east of Central Avenue, in the City of Highland.

PROJECT OVERVIEW

The Project consists of a 243,323 square foot industrial warehouse building. A preliminary site plan for the Project is shown in Attachment A.

BACKGROUND

Changes to California Environmental Quality Act (CEQA) Guidelines were adopted in December 2018, which require all lead agencies to adopt VMT as a replacement for automobile delay-based level of service (LOS) as the measure for identifying transportation impacts for land use projects. This statewide mandate went into effect July 1, 2020, consistent with Senate Bill 743 (SB 743). To comply with SB 743, the San Bernardino County Transportation Authority (SBCTA) released the SBCTA Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment (SBCTA Guidelines) (1) that address VMT analysis requirements. At the time of this analysis, the City of Highland has yet to formally adopt VMT guidelines, however, based on consultation with City planning and engineering staff, the City has directed that on an interim basis the SBCTA Guidelines should be utilized for purposes of VMT screening steps.

VMT SCREENING

The SBCTA Guidelines provide information on appropriate screening thresholds that can be used to identify when a proposed land use project is anticipated to result in a less than significant impact without the need to conduct a more detailed project level assessment. The SBCTA Guidelines state that a project may have a less than significant impact and screen out of requiring a project level VMT analysis if it meets at least one of the VMT screening steps. To aid in the VMT screening process the SBCTA VMT Screening Tool (**Screening Tool**) was used. The SBCTA's adopted VMT screening steps are

described in Table 1 along with a determination of each screening step's applicability to the Project.

TABLE 1: SCREENING FOR LAND USE PROJECTS EXEMPT FROM VMT ANALYSIS

Screening Steps	Description	Result
1. Transit Priority (TPA) Screening	Projects located within a TPA (i.e., within a half mile of an existing major transit stop or an existing stop along a high-quality transit corridor) are presumed to have less than significant impact on VMT.	Does not meet.
2. Low VMT Area Screening	Projects located within a low VMT generating zone that can reasonably be expected to generate VMT per resident, per worker, or per service population that is similar to the existing land uses in the low VMT area are presumed to have a less than significant VMT impact.	Does not meet.
3. Project Type Screening	Local-Serving Retail under 50,000 square feet, Local Essential Services, and projects generating less than 110 daily vehicle trips are presumed to have a less than significant impact on VMT.	Does not meet.

The Project is not located in a TPA or Low VMT area. In addition, the Project is not local serving and is anticipated to generate an additional 123 net new daily trips consistent with the Trip Generation Assessment prepared for the Project (Urban Crossroads, 2022). Therefore, as noted in the SBCTA Guidelines, projects not screened through the above steps are required to complete a VMT analysis using the San Bernardino Traffic Analysis Model (**SBTAM**) to determine if they have a significant VMT impact.

VMT ANALYSIS

VMT MODELING

SBCTA Guidelines identify SBTAM as the appropriate tool for conducting VMT analysis for land use projects in San Bernardino County. SBTAM is a useful tool to estimate VMT as it considers interactions between different land uses based on socio-economic data such as population, households, and employment. The SBTAM model assumes datasets consistent with the 2016 Southern California Association of Governments (SCAG) Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS). SBTAM is also consistent with the model used to develop the SBCTA's VMT impact thresholds identified in their Guidelines.

VMT METRIC AND SIGNIFICANCE THRESHOLD

Based on consultation with City Staff, an employment generating single use project in the City of Highland shall use the VMT metric home-based work (HBW) VMT per employee, which measures all home-based attraction trips (employment) to/from their ultimate destination unless that destination is outside the model boundary area. Using the metric VMT per employee, the City has chosen to utilize the following impact thresholds:

1. The baseline project generated VMT per employee exceeds the City of Highland General Plan Buildout VMT per employee, or
2. The cumulative project generated VMT per employee exceeds the City of Highland General Plan Buildout VMT per employee.

Based on VMT data previously published by the SBCTA for each of its member agencies and the San Bernardino County region, VMT per employee in the City of Highland for General Plan Buildout conditions is **15.57 VMT per employee**.

LAND USE CONVERSION

In order to estimate project generated VMT, standard land use information such as building square footage must first be converted into a SBTAM compatible dataset. The SBTAM model utilizes socio-economic data (SED) (e.g., population, households, employment, etc.) instead of land use information to estimate vehicle trips. The Project's building square footage was converted into employment for input into SBTAM using employment density factors derived by the Southern California Association of Governments (SCAG) Employment Density Study (October 2001) (2). Table 2 presents the estimated number of Project employees by land use type used to populate the SBTAM model for the proposed Project.

TABLE 2: EMPLOYMENT ESTIMATES

Land Use	Quantity	Conversion Factor	Employees
Warehouse	243,323	1,195 SF per employee	204

VMT ESTIMATION AND COMPARISON TO IMPACT THRESHOLD

As stated previously, VMT per employee is used to evaluate Project VMT. VMT per employee is derived by dividing Project generated HBW VMT by the number of estimated Project employees. HBW VMT is obtained from the SBTAM model using the Production/Attraction (PA) method for calculating VMT, which sums all weekday VMT generated by trips with at least one trip end in the study area (i.e., Project's TAZ). Productions are land use types that generate trips (residences), and attractions are land use types that attract trips (employment). Productions and attractions are converted from person trips to vehicle trips for the purposes of calculating VMT and are then multiplied by the distance skims to calculate VMT. Table 3 presents Project generated PA HBW VMT from the SBTAM model, along with the estimated number of Project employees, and the resulting VMT per employee.

TABLE 3: PROJECT VMT PER EMPLOYEE

	Baseline	Cumulative
HBW VMT	3,391	3,239
Employees	204	204
VMT per Employee	16.62	15.88
City Threshold	15.57	15.57
Percent Above Threshold	+6.74%	+1.99%
Potentially Significant?	Yes	Yes

As shown in Table 3, Project generated VMT per employee is above the City's VMT impact threshold by 6.74% for baseline conditions and 1.99% for cumulative conditions. The Project, at a minimum, will need to reduce its VMT impact for baseline and cumulative conditions by 218

VTM¹ or 6.32%². However, the SBTAM model does adequately account for Project design features that would result in reductions to project generated VMT. When these design features are included in the calculation of VMT per employee, the resulting reduction in VMT falls below the City's impact threshold. The following section provides a discussion of the various design features and the resulting reductions in VMT for each.

PROJECT DESIGN FEATURES

The Project as contemplated includes a number of design features that would result in reductions to commute VMT, which could not be accurately accounted for by the calculations conducted using the SBTAM Model. The level of effectiveness of each Project design feature has therefore been calculated based on the Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (CAPCOA, 2021) (**2021 Handbook**). Since locational context is a contributing factor relevant to the potential effectiveness of the trip reduction characteristics of each design feature, the three locational contexts identified by the 2021 Handbook of suburban, urban, and rural³ were considered and the locational context of the Project was determined to be characteristically suburban.

The following Project design features were evaluated in the context of potential reductions to VMT:

- Commute Trip Reduction Marketing
- Ridesharing Program
- End-of-Trip Facilities (Bicycle)

DESIGN FEATURE 1: COMMUTE TRIP REDUCTION MARKETING

The Project will include a marketing strategy to promote the project site employer's CTR program. Information sharing and marketing promote and educate employees about their travel choices to the employment location beyond driving such as carpooling, taking transit, walking, and biking, thereby reducing VMT. The following features (or similar alternatives) of the marketing strategy are essential for effectiveness.

- Onsite or online commuter information services.
- Employee transportation coordinators.
- Onsite or online transit pass sales.
- Guaranteed ride home service.

¹ $(16.62 \text{ VMT/Employee}_{\text{Project}} \times 208 \text{ Employees}) - (15.57 \text{ VMT/Employee}_{\text{Threshold}} \times 208 \text{ Employees}) = 218 \text{ VMT}$

² $218 \text{ VMT} / 3,457 \text{ VMT} \times 100 = 6.32\%$

³ 2021 Handbook; Page 43

TABLE 6: VMT CALCULATION VARIABLES

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	0-4.0	%	calculated
User Inputs				
B	Percent of employees eligible for program	0-100	%	user input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in employee commute vehicle trips	-4	%	TRB 2010
D	Adjustment from vehicle trips to VMT	1	unitless	assumed

$$A = B \times C \times D$$

$$4\% = 100\% \times -4\% \times 1$$

The Project will provide tenant's employees material and online resources as a means to promote the commute trip reduction program. As calculated for the Project, with proper implementation and 100% of the Project's employees eligible, this design feature is expected to reduce VMT by 4%.

DESIGN FEATURE 2: RIDESHARING PROGRAM

The Project will provide a ridesharing program and establish a permanent transportation management association with funding requirements for employers. Ridesharing encourages carpooled vehicle trips in place of single-occupied vehicle trips, thereby reducing the number of trips and VMT. Ridesharing must be promoted through a multifaceted approach. Examples include the following.

- Designating a certain percentage of desirable parking spaces for ridesharing vehicles.
- Designating adequate passenger loading and unloading and waiting areas for ridesharing vehicles.
- Providing an app or website for coordinating rides.

TABLE 7: VMT CALCULATION VARIABLES

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from project/site employee commute VMT	0-8.0	%	calculated
User Inputs				
B	Percent of employees eligible for program	0-100	%	user input
Constants, Assumptions, and Available Defaults				
C	Percent reduction in employee commute VMT	4	%	SANDAG 2019

$$A = B \times C$$

$$4\% = 100\% \times 4\%$$

The Project as designed, will provide carpool/vanpool/EV parking designated spaces in locations of easy and convenient accessibility to the Project building. As calculated for the Project, with proper implementation and 100% of the Project's employees eligible, the Project is expected to reduce VMT by 4%.

DESIGN FEATURE 3: END-OF-TRIP BICYCLE FACILITIES

The Project can install and maintain end-of-trip facilities for employee use. End-of-trip facilities include bike parking and personal lockers. The provision and maintenance of secure bike parking and related facilities encourages commuting by bicycle, thereby reducing VMT. End-of-trip facilities should be installed at a size proportional to the number of commuting bicyclists and regularly maintained.

TABLE 8: VMT CALCULATION VARIABLES

ID	Variable	Value	Unit	Source
A	Percent reduction in GHG emissions from project/site employee commute VMT	0.1-4.4	%	calculated
User Inputs				
	None			
Constants, Assumptions, and Available Defaults				
B	Bike mode adjustment factor	1.78 or 4.86 ¹	unitless	Buehler 2012
C	Existing bicycle trip length for all trips in region	2.2	miles	FHWA 2017a
D	Existing vehicle trip length for all trips in region	11.7	miles	FHWA 2017a
E	Existing bicycle mode share for work trips in region	0.4	%	FHWA 2017b
F	Existing vehicle mode share for work trips in region	95.3	%	FHWA 2017b

¹The bike mode adjustment factor should be provided by the user based on type of bike facility. A study found that commuters with showers, lockers, and bike parking at work are associated with 4.86 times greater likelihood to commute by bicycle when compared to individuals without any bicycle facilities at work. Individuals with bike parking, but no showers and lockers at the workplace, are associated with 1.78 times greater likelihood to cycle to work than those without trip-end facilities.

$$A = \frac{C \times (E - (B \times E))}{D \times F}$$

$$0.1\% = \frac{2.2 \times (0.4\% - (1.78 \times 0.4\%))}{11.7 \times 95.3\%}$$

The Project will include building elements for bicycle trip end facilities (i.e., bicycle parking) for commuters that choose to bicycle as a mode of travel. This will promote an alternative mode choice of commuting for employees. As calculated, the Project will reduce VMT by 0.1%.

TOTAL DESIGN FEATURE VMT REDUCTIONS

The 2021 Handbook states that, effectiveness levels for multiple measures within a subsector may be multiplied to determine a combined effectiveness level. Because the combination of measures and independence of measures are complicated, the 2021 Handbook recommends

that measure reductions within a subsector be multiplied unless the user can provide substantial evidence indicating that emission reductions are independent of one another and that they should therefore be added. Each subsector has a maximum allowable reduction. These were derived by combining the maximum allowable reduction of each individual non-mutually-exclusive measure within the subsector. As all the Project Design features above fall under the Subsector of "Trip Reduction Programs", the 2021 Handbook states that the "Trip Reduction Subsector" has a maximum of reduction of 45%. Therefore, a project cannot exceed the maximum allowable reduction. 2021 Handbook provides the following equation for combining Subsector reductions using the multiplicative dampening method:

$$Reduction_{Subsector} = 1 - [(1 - A) \times (1 - B) \times (1 - C) \dots]$$

Project's VMT reduction are as follows:

$$7.9\% = 1 - [(1 - 4\%) \times (1 - 4\%) \times (1 - 0.1\%)]$$

As outlined through the VMT reduction calculations presented above, with the inclusion of the Project's design features will further reduce VMT by 7.9%, which would bring the Project's VMT per employee to below the City's threshold – in other words, the Project's potential impact to VMT would be less than significant.

PROJECT CUMULATIVE IMPACT ON VMT

The SBCTA Guideline states cumulative no project shall reflect the adopted RTP/SCS; as such, if a project is consistent with the regional RTP/SCS, then the cumulative impacts shall be considered less than significant subject to consideration of other substantial evidence. The Project is consistent with the City's General Plan underlying land use assumptions and was found to have a less than significant impact when considering the Project's VMT reducing design features. Therefore, the Project is also considered to be less than significant under cumulative conditions.

SUMMARY

Based on the results of this analysis the following findings are made:

- The Project was evaluated against screening criteria as outlined in the SBCTA Guidelines. The Project was not found to meet any available screening criteria, and a VMT analysis was performed.
- The Project's VMT analysis using the SBTAM model found the Project to be exceed the City's VMT per employee threshold by 6.74% for baseline conditions and by 1.99% for cumulative conditions. However, with the inclusion of Project design features, the Project reduces its VMT per employee to below the City's threshold.
- The Project is found to have a less than significant impact.

If you have any questions, please contact me directly at aso@urbanxroads.com.

REFERENCES

1. **San Bernardino County Transportation Authority (SBCTA).** *Recommended Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment*. February 2020.
2. **Southern California Association of Governments.** *Employment Density Study*. October 2001.

ATTACHMENT A
PRELIMINARY SITE PLAN

