



San José VMT Evaluation Tool: User Guide

**Prepared for:
City of San José**

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1. Introduction

This User Guide provides an overview of how and when to use the City of San José's VMT evaluation tool. Detailed information about the tool's structure and approach to estimating VMT reductions can be found in the Technical Background Document included as an appendix to the guide.

1.1. Goal and Purpose of the Tool

The San José VMT Evaluation Tool is an Excel-based tool that evaluates whether proposed land use projects in the City of San José would generate VMT impacts. The starting point for each land use Project is the per capita and per employee VMT for the half-mile radius surrounding the Project site, as calculated using the City's travel demand model and adjusted to the parcel level. This initial VMT estimate is compared to impact thresholds as outlined in San José's VMT impacts policy (City Council Transportation Analysis Policy 5-1).

Projects that would trigger a VMT impact can evaluate a variety of strategies to reduce those impacts. The strategies and VMT reductions applied in the tool are derived from research literature and case studies. This tool does not estimate impacts for retail land uses; refer to the City's Policy and Transportation Analysis Handbook for more detail on retail VMT.

1.2. Intended Users

This user guide is intended for developers and their consultants to estimate the per capita and per employee VMT associated with proposed development projects. City of San José staff may also use the tool to estimate likely VMT effects of proposed development projects and associated infrastructure investments.

1.3. Types of Projects Appropriate for the Tool

The tool estimates per worker and per capita VMT for the following types of development:

- Residential uses.
- Employment uses (not including retail employment).
- The residential and employment components of mixed use projects.

The tool is not intended to estimate per user VMT for Projects where the most VMT is generated by customers and visitors, such as retail, restaurant, and hotel uses.



1.4. Assumptions and Caveats

This tool is only to be used for proposed developments in the City of San José; it is not to be used for developments outside of San José.

The tool relies on a parcel lookup using current Assessor’s Parcel Numbers (APN) as defined by the Santa Clara County Office of the Assessor. Users should ensure that the parcel numbers they enter are current by confirming them on the County’s parcel lookup website (www.sccassessor.org).

The tool does not yet estimate potential increases to per capita or per worker VMT that could result from project attributes, such as development that restricts pedestrian access, reduces land use diversity, or reduces density within a neighborhood.

1.5. Acronym Dictionary

The following table spells out acronyms and defines specialized terms used in the tool.

Table: Terms Used

Location	Term/ Acronym	Definition
Main		
Project Input	APN	Assessor’s Parcel Number
Land Use Type	DU	Dwelling Unit
	MFI	Median Family Income
	KSF	1000 square feet
VMT Reduction Strategies-Tier 1	BMR	Below Market Rate: a designation for affordable housing offered at rents or purchase prices below current market prices
VMT Reduction Strategies-Tier 2	Class I Bikeway	Shared-use paths: completely separate right-of-way for the exclusive use of bicycles and pedestrians
	Class II Bikeway	Bicycle lanes: for bicyclists generally adjacent to the outer vehicle travel lanes.
	Class III Bikeway	Bicycle routes: designated by signs or pavement markings for shared use with motor vehicles, but have no separated bicycle right-of-way or lane striping. Bike routes serve either to: a) provide a connection to other bicycle facilities where dedicated facilities are infeasible, or b) designate preferred routes through high-demand corridors
	Class IV Bikeway	Cycle tracks or “separated” bikeways: a right-of-way designated exclusively for bicycle travel within a roadway and are protected from vehicle traffic by physical barriers, including, but not limited to, grade separation, flexible posts, and inflexible vertical barriers such as raised curbs or parked cars.



Table: Terms Used

Location	Term/ Acronym	Definition
VMT Reduction Strategies-Tier 3	ITE	Institute of Transportation Engineers
	RPP	Residential Parking Permits
VMT Reduction Strategies-Tier 4	CTR	Commute Trip Reduction
Flowchart		
Flowchart	GUI	Graphical User Interface
Tier 1		
PC_001	SFHH	Single Family Household
PC_001	MFHH	Multi-Family Household
PC_001	RESCARE/RA	Residential Acres
PC_002	AGEMP	Agricultural Employment
PC_002	MANEMP	Manufacturing Employment
PC_002	WHOEMP	Wholesale Employment
PC_002	HHPOP	Household Population
PC_002	RETEMP	Retail Employment
PC_002	SEREMP	Service Employment
PC_002	OTHEMP	Other Employment
PC_002	INDEMP	Industrial Employment
PC_004	TEMP	Total Employment
PC_004	CIACRE	Commercial Acres
Tier 2		
MI_001	CHTS	California Household Travel Survey
MI_001	CSJ	City of San José
Tier 4		
TP_012	HB	Home-Based
TP_016	CAPCOA	California Air Pollution Control Officers Association

Source: California Department of Transportation (Caltrans) *Highway Design Manual*, 2017; Fehr & Peers 2018.



2. Using the VMT Evaluation Tool

This section provides an introduction to using the VMT impact tool.

2.1 How to Install and Run the Tool

The user should download a copy of the tool to their local network or computer and open it using Excel 2010, 2013, or 2016 (32 bit). Enable macro plug-ins when the tool opens.

The tool interface is optimized for a zoom level of 100%; setting the zoom level higher or lower may prevent the tool interface from displaying properly.

2.1.1 System Requirements

The tool has been developed and tested on the following systems:

- Operating system: Windows 7, 10
- Excel version: Excel 2010, 2013, 2016 (32 bit, not 64 bit)

2.2 User Inputs

Per capita and per employee VMT reductions from the Project's starting point are calculated based on user inputs of Project characteristics and proposed VMT reduction strategies.

2.2.1 Getting Started

Starting on the Main tab, the user begins by entering the [Project's parcel number](#) and a project description under the "Project Information" and "Land Use Type" headers. The project description should include:

- Gross square footage for retail, office, and industrial uses included in the Project.
- The number of single family and/or multi-family dwelling units at included in the Project (multi-family units include apartments, condominiums, and townhouses).
- Information about dedicated affordable housing included in the Project.
- Project acreage.
- Project automobile and bicycle parking supply.

For questions about how specific land uses align with the land use categories in the tool, contact City of San José staff.



The FAQ tab provides basic instructions for using the tool. The tab includes links to City of San José's web pages on relevant policy and guidance for [finding parcel numbers](#). The City's online guidance for finding parcel numbers links to an interactive parcel lookup website maintained by the Santa Clara County Surveyor's office. To ensure that they are entering a current parcel number, the user should look up the parcel number using the County's parcel database.

2.2.2 Selecting Strategies

2.2.2.1 Strategy Types

The tool allows the user to select from four tiers of VMT reduction strategies. Each tier includes strategies that target VMT in similar ways.

- **Tier 1: Project Characteristics:** Land use characteristics, such as density, mix of uses, and housing affordability, that reduce VMT by increasing access to amenities (relative to the average development in the same neighborhood) or by attracting residents who generate lower VMT than the average household. Tier 1 strategies are automatically completed using data entered by the user under the "Project Information" and "Land Use Type" headers.
- **Tier 2: Multimodal Infrastructure:** Developer-funded or developer-built improvements to the surrounding transportation network that encourage the use of biking, walking, and transit instead of driving.
- **Tier 3: Parking:** Strategies that reduce auto parking supply, making driving less attractive, and provide high-quality bicycle parking, making biking more attractive.
- **Tier 4: Transportation Demand Management (TDM) Programs:** Programmatic strategies that reduce VMT by providing incentives to driving alone, such as ride sharing programs, transit subsidies, and shuttle services. These strategies would be implemented on an ongoing basis once the Project is occupied.

2.2.2.2 How to Select Strategies

The user selects strategies by clicking on the check box in the upper left corner of each strategy's title box. Relevant information about the strategy is entered in the input window to the right of the title box. Note, Tier 1 strategies are automatically completed using data entered by the user under the "Project Information" and "Land Use Type" headers.

Clicking on the question mark in the upper right corner of the title box opens a popup window that provides more information about each strategy. The popup window includes:



- **Description:** A description of the strategy, including information about whether it applies only to residential or employment land uses and whether coordination with the City is required to implement the strategy.
- **Overlap:** A list of strategies that affect travel behavior in similar ways to the selected strategy and that therefore cannot be selected for the same project.
- **Source:** A reference to the study or studies used as a primary reference for the VMT reduction included in the tool.

Strategies whose **titles are shown in red** require additional coordination with the City of San José, VTA, or other public agencies to implement. Strategy categories/tiers may include more strategies than can be shown onscreen at once. Users can click the buttons labeled “Prior Page” and “Next Page” and the bottom of each Tier window to see other strategies in the same Tier.

More information about how each strategy is calculated can be found in the Tier 1, Tier 2, Tier 3, and Tier 4 spreadsheet tabs. Note that the per-strategy reductions shown in these tabs are interim reductions; the total effectiveness is capped as described in Section 2.3.3, below, and the Technical Background Document.

2.2.3 Place Types

VMT reduction strategies are typically more effective in dense areas with highly diverse land uses and access to high-quality transit. Where evidence is available, the effectiveness of specific strategies reflects the proposed project’s local context. The combined effectiveness of strategies evaluated by the tool are also capped to reflect local context. In both instances, the project’s local context is defined by its place type.

Each parcel in San José is assigned a place type based on its Census geography, as evaluated in the California Air Resources Board’s report, “Quantifying the Effect of Local Government Actions on VMT” (Deborah Salon, 2014). The five place types found within San José are defined as follows:

- **Central City Urban:** Very high density, excellent accessibility, high public transit access, low single-family homes, older high value housing stock.
- **Urban High Transit:** High density, good accessibility, high public transit access, low single-family homes, middle-aged and older housing stock.
- **Urban Low Transit:** Good accessibility, low vacancy, middle-aged housing stock.
- **Suburb with Multifamily Housing:** Average on most indicators, low single-family homes, and relatively lower housing values.
- **Suburb with Single-Family Homes:** Low density and accessibility, low vacancy, high newer single-family homes, and relatively higher housing values.



2.3 Tool Outputs

The tool's results (outputs) are shown dynamically in the Main tab and in a printable format in the Report tab. To understand how the tool results could affect VMT impacts associated with the Project, refer to the City's VMT impact policy. Users should communicate with City staff if Project VMT remains above the impact threshold after modeling likely VMT reduction strategies.

2.3.1 Viewing Results

The rightmost column on the Main tab shows the Project's performance against the VMT impact threshold determined by the City of San José's VMT Impact Policy. Existing per-capita and per-employee VMT for the half-mile radius around the parcel provide the starting point for VMT reductions calculated by the tool.

As the user selects strategies, the combined VMT reduction resulting from the strategies selected is shown in the bar chart to the right of the list of strategies. Impact thresholds and maximum possible reductions are shown as horizontal lines. Separate reductions are shown for per-capita and per-employee VMT. Employment impacts will show up for any land use with employment regardless of the size of the employment size. If land uses with employment (including retail and industrial) or residential are exempt from analysis due to size and/or location, the user can ignore the impact result.

The Report tab provides a printable summary of the tool's analysis results. The tool thresholds are shown in a bar chart and listed under the chart.



CITY OF SAN JOSE VEHICLE MILES TRAVELED EVALUATION TOOL SUMMARY REPORT

PROJECT:

Name: (no project name entered)	Tool Version: 2/29/2019
Location: (no project location entered)	Date: 2/28/2019
Parcel: 26435066 Parcel Type: Urban High Transit	
Proposed Parking Spaces Vehicles: 200 Bicycles: 20	

LAND USE:

Residential:	Percent of All Residential Units
Single Family 50 DU	Extremely Low Income (≤ 30% MFI) 0 % Affordable
Multi Family 20 DU	Very Low Income (> 30% MFI, ≤ 50% MFI) 0 % Affordable
Subtotal 70 DU	Low Income (> 50% MFI, ≤ 80% MFI) 0 % Affordable
Office: 100 KSF	
Retail: 100 KSF	
Industrial: 0 KSF	

VMT REDUCTION STRATEGIES

Tier 1 - Project Characteristics

Increase Residential Density	
Existing Density (DU/Residential Acres in half-mile buffer)	8
With Project Density (DU/Residential Acres in half-mile buffer)	9
Increase Development Diversity	
Existing Activity Mix Index	0.46
With Project Activity Mix Index	0.50
Integrate Affordable and Below Market Rate	
Extremely Low Income BMR units	0 %
Very Low Income BMR units	0 %
Low Income BMR units	0 %
Increase Employment Density	
Existing Density (Jobs/Commercial Acres in half-mile buffer)	32
With Project Density (Jobs/Commercial Acres in half-mile buffer)	39

Tier 2 - Multimodal Infrastructure

Traffic Calming Measures <i>(In Coordination with SJ)</i>	
Are improvements provided beyond the development frontage?	Yes

Tier 3 - Parking

End of Trip Bike Facilities	
Bicycle Parking Spaces Provided by Project	20 spaces
Project Provides Additional End-of-Trip Facilities Beyond Parking?	Yes

Tier 4 - TDM Programs

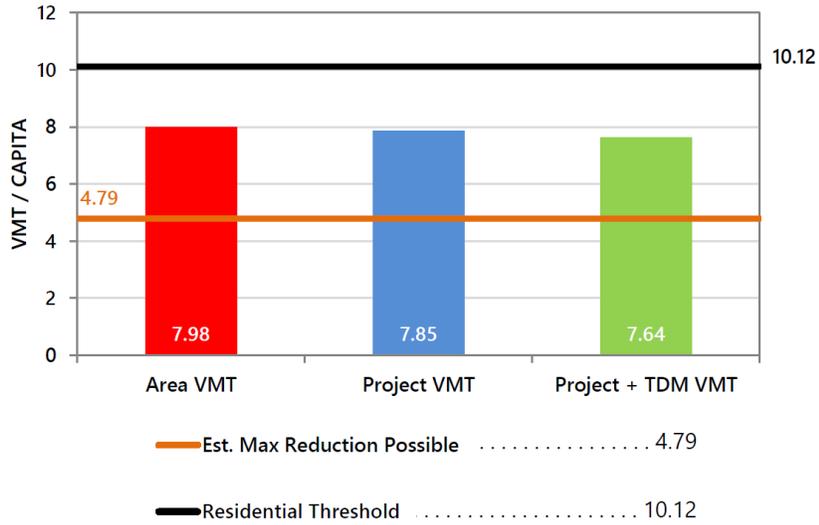
Car Sharing Program <i>(In Coordination with SJ)</i>	
Percent of Eligible Residents/Employees	100 %
Subsidized or Discounted Transit Program	
Percent of Transit Subsidy	100 %



CITY OF SAN JOSE VEHICLE MILES TRAVELED EVALUATION TOOL SUMMARY REPORT

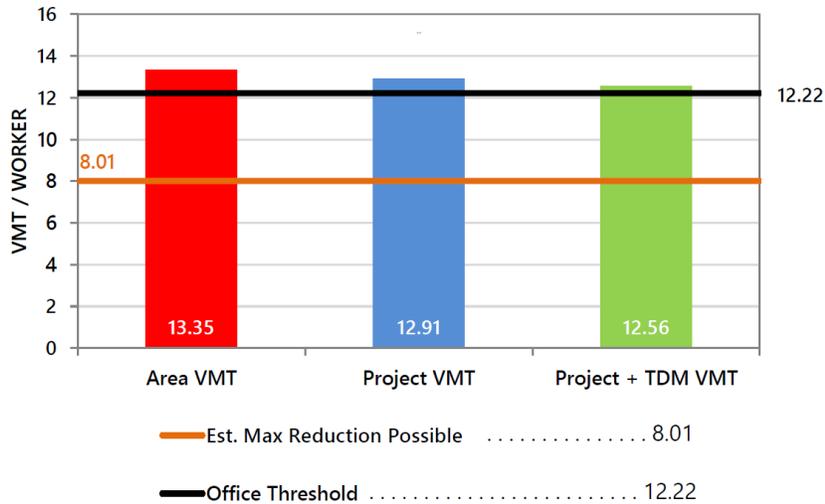
RESIDENTIAL ONLY

The tool estimates that the project would generate per capita VMT below the City's threshold. There are selected strategies that require coordination with the City of San Jose to implement.



EMPLOYMENT ONLY

The tool estimates that the project would generate per non-industrial worker VMT above the City's threshold and per industrial worker VMT below the City's threshold. There are selected strategies that require coordination with the City of San Jose to implement.





2.3.3 Calculation Details

To provide reasonable estimates of VMT reduction effectiveness, maximum VMT reductions are set for the category, cross-category, and global levels. These maxima ensure that 1) strategies that target travel behavior in similar ways are not over-counted and 2) combined reductions are reasonable given a project's context (place type).

Additional detail about how reductions are calculated are provided in the Technical Background Document, included as an appendix to this guide.

2.3.3.1 Individual Strategy Reductions

Individual strategy reductions, details about strategy calculations, and citations for the basis of strategy quantification are shown in the Tier 1, Tier 2, Tier 3, and Tier 4 tabs. The per-strategy reductions shown in these tabs are interim reductions; the total effectiveness is capped as described below.

2.3.3.2 Category-Level Reductions

Calculation details for the combined strategy effectiveness within each tier are provided in the Max_Categories tab. Since multiple measures may affect the same user populations, this approach is used to ensure that reductions are not over-counted. For example, a transit-related measure and a bicycle-related measure may target the same person, but that person cannot switch from driving to both using transit and bicycling.

2.3.3.3 Cross-category maximums

A cross-category maximum is provided for the combination of project characteristics, multimodal infrastructure, and parking strategies per capita (Tier 1, Tier 2 and Tier 3).

2.3.3.4 Global Maximums

A global maximum is provided for the combinations of Tier 1 – 4. Calculation details for the combined effectiveness of strategies across the tiers are provided in the Max_Global_CrossCat tab.