

ATTACHMENT G

TRANSPORTATION DEMAND MANAGEMENT STRATEGIES IN LA VMT CALCULATOR

Introduction

This document provides an overview of the Transportation Demand Management (TDM) strategies included in the City of Los Angeles Department of Transportation Vehicle Miles Traveled (VMT) Calculator. The VMT Calculator is a tool designed to measure whether a development project exceeds the VMT thresholds of the City of Los Angeles, based on the MXD methodology¹ validated for City of Los Angeles conditions as documented in the City of Los Angeles VMT Calculator Documentation (Fehr & Peers, October 2017) and the potential VMT reductions available from certain types of project site modifications, programming, and operational changes collectively known as *TDM strategies*.

The effectiveness of each of the 23 TDM strategies included in the VMT Calculator is based primarily on research documented in the 2010 California Air Pollution Control Officers Association (CAPCOA) publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA, 2010). CAPCOA offers methodology based on preferred literature, along with methodology based on alternative literature, for each strategy. The strategies used in the VMT Calculator follow CAPCOA guidance by either directly applying the CAPCOA methodology, applying the alternative literature methodology, or adjusting the methodology offered by CAPCOA to account for local needs and departmental goals. Where more recent research (since 2010) or local empirical data are available, those methods have been used in place of the methodology outlined by CAPCOA. The methodology is specified for each strategy in the pages that follow.

The TDM strategies are individually described in this document, with individual levels of effectiveness identified. However, to ensure the effectiveness of TDM strategies is not overstated, the VMT reductions in the VMT Calculator are both *dampened* and *capped*.

Dampening: Within each type of trip (home-based work trip starting at the home end, for example), a multiplicative dampening formula is applied. For example, if both Strategy A and Strategy B are applied, the combined effectiveness is not A+B, but rather $1-(1-A)*(1-B)$. This captures the reality that many people who would consider using Strategy B overlap with the potential market for Strategy A, and would choose A or B for each trip, but not both A and B.

Capping: For the full set of strategies selected across all trip types, a place-type limit, or cap, is applied. The place-type is a pre-defined category based on land use characteristics of the location where the project is sited. Four place-types, or travel behavior zones (TBZs), have been developed by the City: Urban, Compact Infill, Suburban Center, and Suburban. Consistent with CAPCOA, for urban locations, the maximum VMT reduction that can be achieved by combining TDM strategies is 75%. For compact infill locations, the maximum is 40%. For suburban center locations, the maximum is 20%, and for suburban locations the maximum is 15%. These maximums are described and substantiated in CAPCOA. A map of the TBZ system is included in Figure 1.

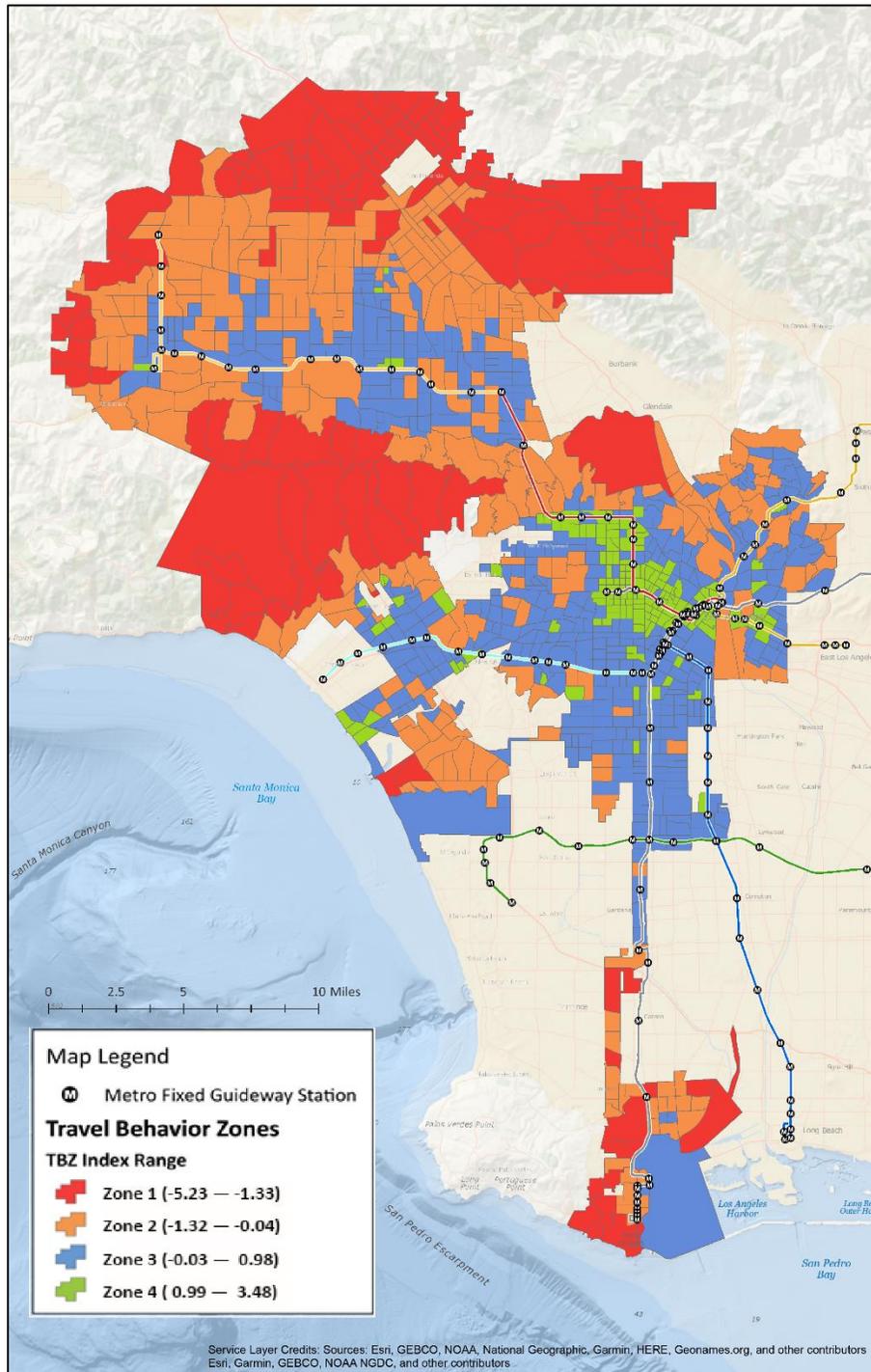
¹ The MXD methodology was originally developed by the U.S. Environmental Protection Agency to better estimate trip generation in urban areas considering a number of factors including the relative numbers of residents and jobs, the density of development, the connectivity for walking or driving among different activities, the availability of transit, the number of convenient trip destinations within the immediate area, vehicle ownership, and household size.

Transportation Demand Management Strategies in LA VMT Calculator

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In the pages that follow, the inputs required by the project applicant are highlighted in yellow. The other formula components are either coefficients identified in the research and documented in CAPCOA or predefined quantities based on the location of the project.

FIGURE 1 TRAVEL BEHAVIOR ZONES



Parking

1. Reduce Parking Supply
2. Unbundle Parking
3. Parking Cash-Out
4. Price Workplace Parking
5. Residential Area Parking Permits

Transit

1. Reduce Transit Headways
2. Implement Neighborhood Shuttle
3. Transit Subsidies

Education & Encouragement

1. Voluntary Travel Behavior Change Program
2. Promotions & Marketing

Commute Trip Reductions

1. Required Commute Trip Reduction Program
2. Alternative Work Schedules and Telecommute Program
3. Employer Sponsored Vanpool or Shuttle
4. Ride Share Program

Shared Mobility

1. Car Share
2. Bike Share
3. School Carpool Program

Bicycle Infrastructure

1. Implement/Improve On-Street Bicycle Facility
2. Include Bike Parking per LAMC
3. Include Secure Bike Parking and Showers per LAMC

Neighborhood Infrastructure

1. Traffic Calming Improvements
2. Pedestrian Network Improvements

Parking

1. Reduce Parking Supply

This strategy changes the on-site parking supply to provide less than the amount of vehicle parking required by direct application of the Los Angeles Municipal Code (LAMC) without consideration of parking reduction mechanisms permitted in the code. Permitted reductions in parking supply could utilize parking reduction mechanisms such as TOC, Density Bonus, Bike Parking ordinance, or locating in an Enterprise Zone or Specific Plan area. Reductions in parking supply could also include reductions in parking requirements due to variances sought by a project. This strategy is appropriate for use in all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 12.5%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = \left[\frac{\text{Base City Code parking requirement} - \text{Actual parking provision}}{\text{Base City Code parking requirement}} \right] \times 0.5$$

Inputs:

- Base city code parking requirements – enter the number of spaces required by direct application of the LA Municipal Code without consideration of parking reduction mechanisms permitted in the code..
- Actual parking provision – enter the number of spaces that the project will be providing.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy PDT-1. CAPCOA Strategy PDT-1 has been adjusted to reflect a change in parking provision compared to the City Code requirements, rather than the ITE Parking requirements as specified in CAPCOA.

Parking

2. Unbundle Parking

This strategy unbundles the parking costs from the property costs, requiring those who wish to purchase parking spaces to do so at an additional cost from the property cost. The strategy assumes the parking cost is set by the project applicant, between \$25 and \$220 per month, and paid by the vehicle owners/drivers. This strategy is appropriate for residential developments in all land-use contexts, and applies to home-based trip types. This strategy is appropriate only where residential parking permit zones are in place for residential neighborhoods adjacent to the project or where street parking is metered, on-street parking supply is regulated by parking management strategies approved by LADOT, or heavily utilized as demonstrated through a parking analysis

The maximum available VMT reduction from this strategy is 26% of residential-based VMT, if implemented with residential permit parking and priced on-street parking to limit spillover.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (-0.4) \times [(\text{Monthly parking cost}) \times (12/\$4,000)]$$

Inputs:

- Monthly parking cost – enter the monthly dollar amount cost of each parking space, between \$25 and \$220. If amount of each parking space cost to vehicle owners/drivers is greater than \$220, maximum reduction will be calculated.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy PDT-2.

Parking

3. Parking Cash-Out

This strategy requires employers to offer employees the opportunity to “cash-out” the monthly value of their currently-free or subsidized parking space. The project applicant determines an employee’s eligibility to participate. This strategy is appropriate for all land-use contexts and all types of development that have employment, and applies only to attraction-end trips originating at home and terminating at work. The strategy depends on parking that is unbundled from the commercial lease.

The maximum available VMT reduction from this strategy is 7.7% of commute VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent reduction in commute VMT associated with project setting}) \times (\text{Percent of employees eligible})$$

Inputs:

- Percent of employees eligible – enter the percent of employees on-site that will be eligible to participate in the parking cash-out program. Eligibility is determined by the project applicant. Some employees may be excluded based on their job category or employment status, such as part-time employees or interns.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-15.

4. Price Workplace Parking

This strategy implements workplace parking pricing for employees at employment locations. This strategy is appropriate for all land-use contexts and all types of development that include employment, and applies only to attraction-end trips originating at home and terminating at work. This strategy is appropriate only where residential parking permit zones are in place for residential neighborhoods adjacent to the project or where street parking is metered, on-street parking supply is regulated by parking management strategies approved by LADOT, or heavily utilized as demonstrated through a parking analysis.

The maximum available VMT reduction from this strategy is 19.7% of commute VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent reduction in commute VMT associated with daily parking charge}) \times (\text{Percent of employees subject to charge})$$

Inputs:

- Daily parking charge – enter the closest dollar amount of the daily parking cost (\$1, \$2, \$3, or \$6). If necessary, convert monthly costs to daily costs by dividing by 22 work days per month.
- Percent of employees subject to charge – enter the percent of employees on-site that will be subject to priced parking.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-14.

5. Residential Area Parking Permits

This strategy involves the implementation of residential permit parking zones for long-term use of on-street parking in residential areas. This strategy is often implemented to curb “spillover effect” that could be caused by parking pricing strategies implemented in adjacent commercial or employment locations. This strategy is appropriate for all land-use contexts and all types of development that have residential units, and applies only to production-end trips originating at home and terminating at work or other locations. This strategy is appropriate only for large developments with internal blocks within the project footprint.

The maximum available VMT reduction from this strategy is 0.25%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction based on a categorical association of annual permit price with percent VMT reduction.

Inputs:

- Annual permit price – enter the closest dollar value of the annual price for the residential permit (\$100 or \$200).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy PDT-4. In order to disaggregate the effects of this strategy from other parking strategies, the tool uses the alternative literature available for CAPCOA Strategy PDT-4 rather than the bundled approach described in the report.

Transit

1. Reduce Transit Headways

This strategy makes transit service more appealing by reducing headways and thereby reducing overall transit trip time, encouraging riders to switch from auto to transit use. This strategy assumes transit is already present in the project area, and requires close coordination with the transit service operator in the area to demonstrate the service improvements are viable. The project applicant would typically be required to financially support the operation of additional service and demonstrate commitment and partnership with the transit service provider with formal documentation. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 2.5%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent reduction in headway}) \times (\text{Elasticity of transit ridership based on project setting}) \times (\text{Existing transit modeshare}) \times (\text{Level of implementation}) \times (0.67 \text{ Adjustment factor from transit ridership increase to VMT})$$

Inputs:

- Percent reduction in headway – enter the percent reduction in peak-period headways (for example, if the headways are reduced from 30 minutes to 15 minutes, enter 50%), not to exceed 80%.
- Existing transit mode share – enter the percent mode share for transit in the project area, based on US Census' American Communities Survey commute mode share information for the city, or more granular if possible (e.g., census tract level), not to exceed 17%.
- Level of implementation – enter the percentage of lines within the project area that will be improved (>= 50% or < 50%).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TST-4.

2. Implement Neighborhood Shuttle

This strategy involves the implementation of a project-operated or project-sponsored neighborhood shuttle, serving residents, employees, and visitors of the project site. This strategy is most appropriate for application to very large project sites, or for smaller projects participating in a neighborhood shuttle in conjunction with other projects in the vicinity. Shuttle service should not simply mirror existing service, but provide new opportunities for access, either through differences in route or in cost to the rider. Shuttle service should provide new connections to job/activity centers and transit. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 13.4%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent shift in modeshare of trips based on degree of implementation}) \times (\text{Percent employees, residents \& visitors eligible}) \times (0.67 \text{ Adjustment factor from shuttle ridership increase to VMT})$$

Inputs:

- Degree of implementation – enter high (all day service; headways less than 15 minutes), medium (all day service; headways 15 minutes or more), or low (peak hours only; headways 15 minutes or more).
- Percent employees, residents, and visitors eligible – enter the percent of all individuals who may access the project that are eligible to utilize the shuttle (for example, if the shuttle serves only residents on a mixed-use site with retail employment, divide the anticipated population of residents into the anticipated population of residents + employees + visitors to determine the percent).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-11. CAPCOA Strategy TRT-11 has been adjusted in the tool to allow for the implementation of a shuttle in any type of development, open to all residents, employees, and visitors of the site, rather than its application in CAPCOA as a purely commute-based strategy for work trips only.

Transit

3. Transit Subsidies

This strategy involves the subsidization of transit fare for residents and employees of the project site. The subsidy must be proactively offered to each dwelling unit and/or employee at least once annually for a minimum of five years. This strategy assumes transit service is already present in the project area. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

In Los Angeles, many transit fare products are available that can pay for individual trips, unlimited trips on a single transit operator's system, or unlimited trips on multiple transit operators' systems. Unlimited passes are available on a daily, weekly, and monthly basis, and can provide a per-trip discount if the rider exceeds a certain number of trips within the given time period. In addition, Metro offers several annual pass programs, such as the B-TAP program for businesses, which offer steep discounts but require a high minimum threshold of participation amongst all employees. In the future, new pass options may become available and fare structures may change.

Given this level of variation across all transit operators in Los Angeles, subsidy levels are measured in dollars rather than percent of fares. At the low end, a single trip on LADOT's DASH system costs \$0.35 per ride if the rider pays with a TAP card. At the high end, some LADOT Commuter Express routes cost \$4.25 per ride if the route crosses several distance-based zones. The base fare on the Metro system is \$1.75 for a single trip. Metro's monthly pass costs \$100/month for unlimited rides.

The maximum available VMT reduction from this strategy is 20%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent employees \& residents eligible}) \times (\text{Percent reduction in trips associated with daily transit subsidy amount})$$

Inputs:

- Percent employees & residents eligible – enter the percent of all individuals who may access the project that are eligible to receive transit subsidies (for example, if the project only offers transit subsidies to office employees on a mixed-use site with residential units, divide the anticipated population of eligible office employees into the anticipated population of residents + employees to determine the percent).
- Daily transit subsidy amount – enter the closest dollar amount of daily transit fare subsidy per passenger (\$0.75, \$1.49, \$2.98, or \$5.96); select the highest value if unlimited-ride passes are provided.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-4. CAPCOA Strategy TRT-4 has been adjusted in the tool to allow for transit subsidies to be offered to both employees and residents of a project site, rather than its application in CAPCOA as a purely commute-based strategy for work trips only.

Education & Encouragement

1. Voluntary Travel Behavior Change Program

This strategy involves the development of a travel behavior change program that targets individual attitudes, goals, and travel behaviors, educating participants on the impacts of their travel choices and the opportunities to alter their habits. Unlike the Promotions & Marketing strategy below, which uses only passive educational tools such as posters, websites, and travel information displays, these programs often include two-way mass communication campaigns and travel feedback programs that actively engage participants as they make their travel choices in real time. This program also relies on a coordinator to manage the program and administer the tools, which may be analog (submit paper forms) or digital (online logging system, push notifications from an app, etc.). This strategy does not include any monitoring or reporting at the level of the development, but may encourage individual tracking and reporting of trips for incentives. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 8%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (8\%) \times (\text{Percent employees \& residents participating}) \times (\text{Adjustment factor based on project setting})$$

Inputs:

- Percent employees & residents participating – enter the percent of all individuals who will be targeted to participate in the program (for example, if the program targets only office employees on a mixed-use site with residential units, divide the anticipated population of eligible office employees into the anticipated population of residents + employees to determine the percent).

The application and effectiveness of this strategy is based on research and methodology documented in the 2013 policy brief by Steven Spears, Marlon Boarnet, and Susan Handy, *Policy Brief on the Impacts of Voluntary Travel Behavior Change Programs Based on a Review of the Empirical Literature*.

Education & Encouragement

2. Promotions & Marketing

This strategy involves the use of marketing and promotional tools to educate and inform travelers about site-specific transportation options and the effects of their travel choices. Unlike the Voluntary Travel Behavior Change Program, which involves active two-way communication between the transportation management coordinator and the participating traveler, this strategy does not include two-way communication tools or tools that would encourage an individual to consider a different mode at the time the trip is taken (such as an app or a daily email). Rather, this strategy includes passive educational and promotional materials, such as posters, info boards, or a website with information that a traveler could choose to read at their own leisure. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 4%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (4\%) \times (\text{Percent employees \& residents eligible})$$

Inputs:

- Percent employees & residents eligible – enter the percent of all individuals who will be targeted by the promotions and marketing (for example, if the program targets only office employees on a mixed-use site with residential units, divide the anticipated population of eligible office employees into the anticipated population of residents + employees to determine the percent).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-7. CAPCOA Strategy TRT-7 has been adjusted in the tool to allow for promotions and marketing efforts to be targeted to both employees and residents of a project site, rather than its application in CAPCOA as a purely commute-based strategy for work trips only. The tool disallows the use of this strategy if the Voluntary Travel Behavior Change Program is selected, because the activities described in this strategy are duplicative.

Commute Trip Reductions

1. Required Commute Trip Reduction Program

This strategy involves the development of an employee-focused travel behavior change program that targets individual attitudes, goals, and travel behaviors, educating participants on the impacts of their travel choices and the opportunities to alter their habits. The program typically includes elements such as a coordinated ride-sharing or carpooling program, vanpool program, alternative work schedule program, preferential carpool parking, guaranteed ride home service, and a program coordinator. The program requires the development of metrics to evaluate success, program monitoring, and regular reporting. This strategy is appropriate for all land-use contexts and all types of development that have employment, and applies only to attraction-end trips originating at home and terminating at work.

The maximum available VMT reduction from this strategy is 21% of commute VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (21\%) \times (\text{Percent of employees eligible})$$

Inputs:

- Percent employees & residents eligible – enter the percent of all individuals who will be eligible to participate in the program (for example, if the program targets only office employees on a mixed-use site with both office and retail employment, divide the anticipated population of eligible office employees into the anticipated population of office employees + retail employees to determine the percent).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-2. The tool disallows the use of all other Commute Trip Reduction strategies if this strategy is selected, because the activities described in this strategy are duplicative.

Commute Trip Reductions

2. Alternative Work Schedules and Telecommuting Program

This strategy encourages employees to work alternative schedules or telecommute, including staggered start times, flexible schedules, or compressed work weeks. This strategy is appropriate for all land-use contexts and all types of development that have employment, and applies only to attraction-end trips originating at home and terminating at work.

The maximum available VMT reduction from this strategy is 5.5% of commute VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction based on a categorical association of schedule type and employee participation with percent VMT reduction.
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Inputs:

- Schedule type – enter the type of alternative work schedule program that will be offered (9-day/80-hour work week, 4-day/40-hour workweek, or 1.5 days per week of telecommuting).
- Percentage of employees participating – enter the closest percentage of employees that are anticipated to participate in an alternative work schedule (1%, 3%, 5%, 10%, or 25%).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-6. The tool disallows the use of this strategy if either the Voluntary Travel Behavior Change Program or Required Commute Trip Reduction Program is selected, because the activities described in this strategy are duplicative.

3. Employer-Sponsored Vanpool or Shuttle

This strategy involves the implementation of an employer-sponsored employee vanpool or shuttle connecting employees to the project site. Vanpool or shuttle service should not simply mirror existing service, but provide new opportunities for access, through differences in route directness or by providing a lower cost or free option to the rider. This strategy is appropriate for all land-use contexts and all types of development that have employment, and applies only to attraction-end trips originating at home and terminating at work.

The maximum available VMT reduction from this strategy is 13.4% of commute VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent shift in vanpool/shuttle mode share of commute trips based on degree of implementation and employer size}) \times (\text{Percent employees eligible}) \times (0.67 \text{ Adjustment factor from vanpool/shuttle mode share to VMT})$$

Inputs:

- Degree of implementation – enter high (>30 vans), medium (10-30 vans), or low (<10 vans).
- Employer size – enter large (>500 employees), medium (100-500 employees), or low (<100 employees).
- Percent employees eligible – enter the percent of all employees that are eligible to utilize the vanpool (for example, if the vanpools only serve office employees on a mixed-use site with both office and retail employment, divide the anticipated population of eligible office employees into the anticipated population of office employees + retail employees to determine the percent).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-11. The tool disallows the use of this strategy if either the Neighborhood Shuttle or Required Commute Trip Reduction Program is selected, because the activities described in this strategy are duplicative.

Commute Trip Reductions

4. Ride-Share Program

This strategy increases vehicle occupancy by providing ride-share matching services, designating preferred parking for ride-share participants, designing adequate passenger loading/unloading and waiting areas for ride-share vehicles, and providing a website or message board to connect riders and coordinate rides. This strategy is appropriate for all land-use contexts and all types of development that have employment, and applies only to attraction-end trips originating at home and terminating at work.

The maximum available VMT reduction from this strategy is 15% of commute VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent reduction commute VMT associated with project setting}) \times (\text{Percent employees eligible})$$

Inputs:

- Percent employees eligible – enter the percent of all employees that are eligible to utilize the ride-share program (for example, if the ride-share program is only offered to office employees on a mixed-use site with both office and retail employment, divide the anticipated population of eligible office employees into the anticipated population of office employees + retail employees to determine the percent).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-3. The tool disallows the use of this strategy if either the Voluntary Travel Behavior Change Program or Required Commute Trip Reduction Program is selected, because the activities described in this strategy are duplicative. This strategy does not include ride-sharing services such as Lyft, Uber, or other transportation network companies (TNCs).

Shared Mobility

1. Car-Share

This strategy involves implementation of car-sharing to allow people to have on-demand access to a vehicle, as-needed. This may include providing membership to an existing program located within ¼ mile, contracting with a third-party vendor to extend membership-based service to an area, or implementing a project-specific fleet that supports the residents and employees on-site. Car-share can serve as a supportive strategy that enhances other TDM strategies including unbundled parking. Car-share implementation should meet the following conditions:

- Memberships are proactively offered to residents/employees annually for the life of the project.
- Car-share vendor provides vehicle insurance and vehicle maintenance.
- Vehicles are located on-site; can be accessed by those on-site and by those off-site.
- Vehicles are unstaffed and self-service; available 24 hours a day.
- Vehicles are available for reservation hourly or in smaller intervals.

This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 0.7%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\% \text{ reduction in car-share member annual VMT that corresponds to project setting, below}) \times (20 \text{ car-share members per shared car}) / (\text{Deployment level based on project setting})$$

Inputs:

- Project setting – enter urban + comprehensive transit, suburban + commuter rail, or all other settings.
 - Urban + comprehensive transit corresponds to a 50% reduction in member VMT
 - Suburban + commuter rail corresponds to a 75% reduction in member VMT
 - All other settings corresponds to a 37% reduction in member VMT

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-9, and empirical analysis conducted by Fehr & Peers.

Shared Mobility

2. Bike Share

This strategy involves implementation of bike share to allow people to have on-demand access to a bicycle, as-needed. In order to apply this strategy, the project must either:

1. be located less than 500 feet away from an existing bike share station;
2. install a publicly-accessible bike share station on-site (for a minimum of 10 bicycles) within 0.25 miles of an existing or planned bike share station meeting all LADOT Bike Share siting guidelines.
3. offer all building occupants bike share membership passes within a bike share service area (defined as 0.25 miles from an existing or planned bike share station).

This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 0.25%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction = 0.25% reduction if the project is within 500 feet of an existing bike share station, or if the project implements a publicly-accessible bike share station for a minimum of 10 bicycles within 0.25 miles of an existing or planned bike share station or offers all building occupants bike share membership passes within a bike share service area

Inputs:

- Presence of bike share – enter Yes or No.

The application and effectiveness of this strategy is based on empirical data collected from the Downtown Los Angeles bike share pilot and research documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-12.

Shared Mobility

3. School Carpool Program

This strategy involves implementation of a school carpool program to encourage ride-sharing for students. This strategy requires a staff person or volunteers tasked with implementing the program and matching parents to other families that could pool. This strategy is appropriate for residential land uses in all land-use contexts, and applies only to school trips.

The maximum available VMT reduction from this strategy is 15.8% of school VMT, or 0.9% of overall VMT, given the share of overall VMT that is comprised by school VMT.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

$$\text{VMT Reduction} = (\text{Percent of families that participate}) \times (45\% \text{ Adjustment to convert daily school VMT to annual school VMT}) \times (0.059 \text{ Adjustment to convert project-level trips to school trips only})$$

Inputs:

- Percent of families that participate – enter anticipated level of participation: high (75%-100% of all students + active school pool coordinator), medium (50%-75% of all students), or low (<50% of all students).

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-10, and local adjustment.

Bicycle Infrastructure

1. Implement/Improve On-Street Bicycle Facility

This strategy involves implementing or providing funding for improvements to corridors and crossings for bike networks identified within the City's Mobility Plan 2035 within a one-half mile buffer area of the project boundary, to support safe and comfortable bicycle travel. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 0.625%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction = 0.625% reduction if the project implements or provides funding for improvements to corridors and crossings for bike networks identified within the City's Mobility Plan 2035 within a one-half mile buffer area of the project boundary

Inputs:

- Implements/improves on-street bicycle facility – enter Yes or No.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy LUT-8. In order to disaggregate the effects of this strategy from other bicycle-supportive strategies, the tool uses the alternative literature available for CAPCOA Strategy LUT-8 rather than the bundled approach described in the report.

2. Include Bike Parking Per LAMC

This strategy involves implementation of short and long-term bicycle parking to support safe and comfortable bicycle travel by providing parking facilities at destinations. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types.

The maximum available VMT reduction from this strategy is 0.625%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction = 0.625% reduction if the project provides bike parking at the level specified by City Code, or more
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Inputs:

- Meets or exceeds bike parking requirements as established in the Los Angeles Municipal Code (LAMC) – enter Yes or No.

Projects providing short-term and long-term bicycle parking spaces in accordance with LAMC Section 12.21A.16 qualify for this measure.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy SDT-6. In order to disaggregate the effects of this strategy from other bicycle-supportive strategies, the tool uses the alternative literature available for CAPCOA Strategy SDT-6 rather than the bundled approach described in the report.

3. Include Secure Bike Parking and Showers

This strategy involves implementation of additional end-of-trip bicycle facilities to support safe and comfortable bicycle travel by providing amenities at destinations. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types. This strategy applies to projects that include bicycle parking on-site per LAMC.

The maximum available VMT reduction from this strategy is 0.625%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction = 0.625% reduction if the project provides secure bike parking and showers
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Inputs:

- Provides secure bike parking (e.g., bicycle lockers, bicycle rooms, bicycle cages, or commercially-operated attended bicycle facilities) and showers – enter Yes or No.

Projects providing long-term bicycle parking secured from the general public in accordance with LAMC Section 12.21A.16(d)(2) and showers in accordance with LAMC Section 91.6307 qualify for this measure.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy TRT-5. In order to disaggregate the effects of this strategy from other bicycle-supportive strategies, the tool uses the alternative literature available for CAPCOA Strategy TRT-5 rather than the bundled approach described in the report.

Neighborhood Infrastructure

1. Traffic Calming Improvements

This strategy involves implementation of traffic calming measures throughout and around the perimeter of the project site that encourage people to walk, bike, or take transit within the development and to the development from other locations. Traffic calming at an intersection may include elements such as enhanced crossings, curb extensions, speed tables, raised crosswalks, pedestrian refuge islands, or neighborhood traffic circles. Traffic calming along a street may include elements such as speed tables, speed humps, raised median islands, chicanes, or correcting a substandard sidewalk width. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types. This strategy is appropriate for streets on the perimeter of or near the project site and for large developments with internal blocks within the project footprint.

The maximum available VMT reduction from this strategy is 1%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction based on a categorical association between percent of intersections and percent of streets improved and percent change in VMT.

Inputs:

- Percent of intersections improved – enter the closest percentage (25%, 50%, 75%, or 100%).
- Percent of streets improved – enter the closest percentage (25%, 50%, 75%, or 100%).

To determine the total number of intersections and streets to be included in the denominator, count each street segment either on the project perimeter or within the project footprint as one and count each intersection either at each end of the block(s) on which the project is located or within the project footprint as one. To determine the number of intersections and streets to be included in the numerator, count the number of street segments and the number of intersections with improvements; if improvements are being implemented at locations farther from the project site such that the calculation would yield a percent of street segments or percent of intersections improved greater than 100%, use 100%.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy SDT-2.

2. Pedestrian Network Improvements

This strategy involves implementation of pedestrian network improvements throughout and around the project site that encourage people to walk. This includes internally linking all uses within the project site with pedestrian facilities such as sidewalks, and connecting the project site to the surrounding pedestrian network. It also includes the elimination of barriers such as walls, landscaping, and slopes that impede pedestrian circulation. This strategy is appropriate for all land-use contexts and all types of development, and applies to all trip types. This strategy is appropriate only for developments that have both an internal pedestrian network as well as connections to an off-site pedestrian network, which typically applies to larger projects. Internal pedestrian connections between the project's land uses and its parking supply do not qualify.

The maximum available VMT reduction from this strategy is 2%.

The formula used to calculate the reduction in VMT as a result of this strategy is as follows:

VMT Reduction based on a categorical association between the extent of improvements and percent change in VMT.

Inputs:

- Extent of improvements – enter within project only, or within project site and connecting off-site.

The application and effectiveness of this strategy is based on research and methodology documented in the 2010 California Air Pollution Control Officers Association publication, *Quantifying Greenhouse Gas Mitigation Measures* (CAPCOA), Strategy SDT-1.