










Metric	Model Types Used to Produce Metric(1)	Definition	Example
Total VMT	ABM, TOUR, TRIP	All vehicle-trips (i.e., passenger and commercial vehicles) assigned on the network within a specific geographic boundary (i.e., model-wide, region-wide, city-wide). Vehicle volume on each link is multiplied by link distance.	
Total VMT generated by a project	ABM, TOUR, TRIP	All vehicle-trips are traced to the zone or zones of study. This includes internal to internal (II), internal to external (IX), and external to internal (XI) trips. May use final assignment origin-destination (OD) trip tables or production (P) and attraction (A) estimates multiplied by distance skims. When the model has multiple assignment periods, OD trip tables and congested skims from each period should be used.	

<p>Total VMT per service population</p>	<p>ABM, TOUR, TRIP</p>	<ul style="list-style-type: none"> • Same method as above (Total VMT generated by a project) to estimate VMT and then divide by the population and employment of the zone or zones of study. If the model generates vehicle trips from other sources such as students and visitors, then include those variables in the service population. Note that employment is often used as the independent variable for total vehicle trip generation associated with non-residential land uses. This means that vehicle trips made by people other than the employees are accounted for in the trip rate including visitors, customers, vendors, custodians, and delivery companies. For this reason, it is often difficult to draw conclusions about VMT patterns and use of the metric should be limited to analysis scenarios comparing full model runs typically focused on changes at the sub-regional, city, county, or regional scale. • Some trip-based models may not use population and employment as trip generation variables. Instead, they will rely on land uses. A 'correspondence' between the model land use input variables and population and employment rates is required for these types of models. 	
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<p>Residential VMT per resident</p>	<p>ABM, TOUR</p>	<ul style="list-style-type: none"> • All automobile (i.e., passenger cars and light-duty trucks) vehicle-trips are traced back to the residence of the trip-maker, even non-home-based trips. • Not applicable for trip-based models since non-home-based (NHB) trips aren't tied to the households making them. • Can be calculated either by averaging the daily VMT of all residents or by calculating total VMT, counting total residents, and dividing. • Allocation of responsibility within a jurisdiction (e.g., cities within a county) is straight-forward, since each trip is attached to a resident and each resident has a single home location. • Requires household size determination, which can be subject to debate for different housing types (i.e., single-family, multi-family, and age-qualified housing products). • Commercial vehicle trips are not included. • A related metric is residential VMT per household – denominator is the total number of households instead of the total number of residents. The benefit of this metric form is that it doesn't require an estimate of household size. 	
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<p>Home-Based VMT per resident</p>	<p>ABM, TOUR, TRIP</p>	<ul style="list-style-type: none"> • All home-based automobile vehicle trips are traced back to the residence of the trip-maker; non-home-based trips are excluded. • Similar to Total VMT per service population. 	
<p>Total VMT per employee</p>	<p>ABM, TOUR</p>	<ul style="list-style-type: none"> • All automobile vehicle-trips made by employed persons are traced back to the workplace of the trip-maker, even trips that aren't part of the work tour (i.e., all trips from home to work location and the return to home). • Allocation of responsibility within a jurisdiction is straight-forward, since each trip is attached to a worker. But if some workers have multiple work locations then deciding which to count may be an issue. • Commercial vehicle trips are not included. 	
<p>Total VMT per land use unit (e.g., KSF)</p>	<p>TRIP</p>	<ul style="list-style-type: none"> • All vehicle trips are traced to the zone or zones of study. This includes internal to internal (II), internal to external (IX), and external to internal (XI) trips. Use trip estimates or trip tables multiplied by distance skims similar to total VMT generated by a project. 	

<p>Work Tour VMT per employee</p>	<p>ABM, TOUR</p>	<ul style="list-style-type: none"> • All automobile trips which are part of home-work tours or work-based tours are counted. • Allocation of responsibility within a jurisdiction is straight-forward, since each tour or half-tour should be attached to a specific workplace. • Commercial vehicle trips are not included. 	
<p>Home-Based Work (HBW) VMT per employee</p>	<p>ABM, TOUR, TRIP</p>	<ul style="list-style-type: none"> • All automobile trips between home and work are counted. (A variant might also count work-based other trips.) • Allocation of responsibility within a jurisdiction should be straight-forward except for work-based other trips from one work location to another; even in this case it should be possible to decide which to count. • Commercial vehicle trips are not included. 	

NOTES:

(1) ABM = Activity-Based Model, TOUR = Tour-Based Model, TRIP = Trip-Based Model