

4 Definition of Terms

The definitions presented in this chapter are intended for use in the *Trip Generation Manual* (TGM).

The terms are grouped as follows:

- Trip Types
- Setting/Location
- Time Periods
- Independent Variables
- Data Page Terms

Trip Types

TGM includes trip rates for each mode (vehicle, walk, bicycle, transit, truck), as well as person trips. The definitions for each are provided below.

Bicycle Trip—An inbound or outbound person trip where the longest segment between origin and destination is traveled by a bicycle or any pedal-powered vehicle.

Person Trip—A trip made by an individual person using any mode of travel from an origin to a destination. Each person counts as one trip, regardless of vehicle occupancy. For example, three people leaving a site in one vehicle generate three person trips.

Personal Passenger Vehicle—Includes (1) any automobile, van, SUV, motorcycle, moped, or light truck driven by a private individual for personal use; (2) taxis, paratransit, and vanpools (including airport shuttles); and (3) pick-up trucks not being used for commercial purposes.

Transit Trip—An inbound or outbound person trip that crosses the site cordon line in a transit vehicle or where the greatest distance traveled is by transit vehicle. Transit modes include bus, heavy rail (metro, subway, rapid transit), light rail (streetcar, tramway, trolley), commuter rail (regional rail), monorail, ferry boat, trolleybus, cable car, automated guideway transit (personal rapid transit), aerial tramway, and inclined plane. Taxis, paratransit vehicles, and vanpools are considered personal passenger vehicles, not transit.

Trip or Trip End—A single or one-direction person or vehicle movement with an origin or destination inside a study site. Each trip has two trip ends (entering and exiting). Each trip end is a part of a trip. For site trip generation analysis, the focus is typically on trips entering and exiting a single site.

Truck Trip—The movement of a commercial cargo transport vehicle across a site cordon line. This includes off-site parked vehicles that load or unload cargo bound to or from the study site. Commercial cargo is typically transported in either medium-duty or heavy-duty trucks. A service vehicle entering or exiting a site is not considered a truck trip.

Vehicle Trip—The movement of a personal passenger vehicle or truck that transports a person across the site cordon line. “Vehicle trip” refers to the number of vehicles entering or exiting a site. For example, if a

person parks off-site and walks to an office building, the trip is considered an entering vehicle trip for the office building. However, if a person travels by transit and walks the final distance, the trip is counted as a transit trip, not a vehicle trip.

Walk Trip—An inbound or outbound person trip where the greatest distance traveled is on foot or via any type of assistive device (e.g., wheelchair, scooter, skates, or skateboard).

Walk+Bike+Transit Trip—An inbound or outbound person trip made by walking, bicycling, or transit.

Setting/Location

Center City Core—The downtown area of a major metropolitan region, typically the focal point of a regional light- or heavy-rail transit system. This area is characterized by multi-storied buildings, diverse land uses, an extensive pedestrian sidewalk network, and shared/priced parking both on-street and in structured garages or surface lots. It is generally an employment destination and includes an adjacent commercial core.

Dense Multi-Use Urban—A fully (or nearly fully) developed area with diverse and interacting complementary land uses; good pedestrian connectivity; and convenient and frequent transit. It may be a well-developed urban area outside a major metropolitan downtown or a mid-sized urban area downtown. Common land uses include office, retail, residential, entertainment, hotel, and other commercial uses. The residential uses are typically multifamily or single-family on lots no larger than one-fourth acre. Buildings often have minimal setbacks from the sidewalk. Vehicles remain the primary mode of travel, but the area also supports walking, biking, and transit. Parking is provided on and off-street. The complementary land uses in dense multi-urban areas provide the opportunity for short trips within the area, made convenient by walking, biking, or transit. Significant transit access, such as rail or bus, supports high transit mode share.

General Urban/Suburban—A predominantly vehicle-oriented area where most person trips are made by personal or commercial vehicle. These areas may be fully developed (or nearly so) at low to medium density and typically contain a mix of residential and commercial land uses. Commercial uses are often located at intersections or along corridors and surrounded by parking. These corridors are often situated near low-density, almost entirely residential development. Most commercial buildings are located behind the parking area or surrounded by parking. The mixing of land uses is only in terms of their proximity, not in terms of function. A retail land use may focus on serving a regional clientele whereas a service land use may target motorists or pass-by vehicle trips. Although the land uses are geographically close, a lack of pedestrian, bicycling, and transit infrastructure discourages non-vehicle travel.

Rural—An agricultural or undeveloped area with scattered parcels and very low population density.

Time Periods

Friday—A continuous 24-hour period during a Friday.

Friday, Peak Hour of Generator—The one-hour period with the highest volume of vehicle or person trips entering and exiting a site on a Friday. This peak may occur during either the AM or PM.

Friday, Peak Hour of Adjacent Street Traffic—The one-hour period during the morning or evening commuter peak periods when combined site-generated vehicle traffic and adjacent street traffic is the highest on a Friday. If adjacent street traffic volumes are unknown, the peak hour of the adjacent street is assumed to be the one hour when the highest hourly vehicle trips are generated by the site during the

commuter peak periods between 7:00 and 9:00 a.m. or 4:00 and 6:00 p.m. Recent studies have indicated that peak periods can be longer in heavily populated areas.

Saturday—A continuous 24-hour period during a Saturday.

Saturday, Midday Peak Hour of Generator—The one-hour period between 11:00 a.m. and 1:00 p.m. on Saturday with the highest volume of vehicle or person trips entering and exiting a site.

Saturday, Peak Hour of Generator—The hour with the highest volume of vehicle or person trips entering and exiting a site on a Saturday. This peak may occur during either the AM or PM.

Sunday—A continuous 24-hour period during a Sunday.

Sunday, Peak Hour of Generator—The hour with the highest volume of vehicle or person trips entering and exiting a site on a Sunday. This peak may occur during either the AM or PM.

Weekday—A continuous 24-hour period typically based on data collected Monday through Friday. The period can span two days.

Weekday, Peak Hour of Adjacent Street Traffic—The one-hour period during weekday morning or evening commuter peak periods when combined site-generated and adjacent street traffic is the highest (typically based on data collected Monday through Friday). If adjacent street traffic volumes are unknown, the peak hour of the adjacent street is assumed to be the one hour when the highest hourly vehicle trips are generated by the site during the weekday commuter peak periods between 7:00 and 9:00 a.m. or 4:00 and 6:00 p.m. Recent studies have indicated that peak periods can be longer in heavily populated areas.

Weekday, Peak Hour of Generator—The one-hour period with the highest volume of vehicle trips or person trips entering and exiting the site during the AM or PM on a weekday (typically based on data collected Monday through Friday). It may or may not coincide with the peak hour of the adjacent street traffic.

Independent Variables

Acre—A unit of measurement equal to 43,560 square feet. In TGM, this refers to the total gross area of a development site. Because submitted site acreage may not always distinguish between total and developed acres, caution is advised. When submitting data, analysts should specify both total acreage and the percentage of developed acreage.

AM/PM Peak Hour Traffic on Adjacent Street—The highest hourly volumes of traffic on the adjacent streets during the AM and PM commuter peak periods, respectively (**see Peak Hour of Adjacent Street Traffic under Time Periods**). This value includes all traffic on abutting streets with direct access to the development site. If the site is served by a service road, the adjacent street includes any roadway that provides access to the service road, even if not directly contiguous to the site. Traffic on roadways without direct access to the site is excluded.

Annual Enplanements—The total number of passengers whose commercial airline flight originates at the airport under study within a given year.

Attendee—A person present on a given occasion, during a given event, or at a given place.

Bed—A designated sleeping place for a group quarters resident or medical facility patient.

Bedroom—A designated room for sleeping that contains one or more beds.

Bowling Lane—A single lane available for bowling.

Cage—A designated location for a person to hit baseballs or softballs within a contained area.

Campsite—A location used for overnight outdoor stays. Campsite includes all campsites within a campground. **Occupied Campsite** is a related independent variable.

Car Wash Tunnel—An enclosed series of stationary car wash components that can process a single row of motor vehicles, typically with the aid of a conveyor system.

Courts—Indoor or outdoor facilities specifically designed for tennis or pickleball.

Daily Customer—A person who visits a building to conduct personal business at any time during a single day.

Daily Trail User—A person who visits a park and walks along a designated trail at any time during a single day.

Drive-In Lane—An individual lane at a banking facility used for financial transactions. Includes lanes used solely for Automated Teller Machine (ATM) transactions.

Drive-Through Lane—A lane at a restaurant that enables motorists to pick-up food or beverages without leaving their vehicles. A single pick-up window fed by dual order lanes is considered a single drive-through lane.

Dwelling Unit—A residential location such as a house, apartment, condominium, townhouse, mobile home, or manufactured home where people may live.

Employee—A full-time, part-time, or per diem/contract worker. The number of employees refers to the total number of persons employed at a facility, not just those in attendance at the hour or day the data are collected.

Family Members—The total number of individuals identified as members of a specific place of worship.

Member is a related term.

Field—Any outdoor area that is constructed, equipped, and/or marked for outdoor recreational activities.

Food Cart—A mobile kitchen used to prepare and sell cooked food to customers.

Gaming Position—An individual seat at which a person may engage in a gaming activity, such as at a slot machine.

Gross Floor Area (GFA)—The total area of all levels of a building, expressed in square feet. It includes cellars, basements, mezzanines, penthouses, corridors, lobbies, stores, and offices located within the principal outside faces of exterior walls, but excludes architectural setbacks or projections. All areas with a floor surface and a minimum clear standing headroom of 6 feet 6 inches are included, regardless of use. With the exception of buildings containing enclosed malls or atriums, GFA is equivalent to gross leasable area and gross rentable area. If a ground-level area, or part thereof, within the principal outside faces of the exterior walls is unenclosed, this floor area is still considered part of the overall GFA. However, unroofed areas and unenclosed roofed-over spaces—except those contained within the principal outside faces of

exterior walls—should be excluded from GFA calculations. For **warehouse-related land uses** (154, 155, 156 and 157), an alternate definition of mezzanine is applied and therefore has a different definition of GFA. For these land uses, mezzanine floor area is NOT included in the reported GFA. Each applicable land use description page provides additional discussion on this topic. For the purpose of trip generation calculation, the floor area of all parking garages within the building should be excluded in the GFA. The majority of land uses in the *Trip Generation Manual* use GFA as an independent variable.

Gross Leasable Area (GLA)—The total floor area designed for tenant occupancy and exclusive use, expressed in square feet. It includes any basements, mezzanines, or upper floors and is measured from the centerline of joint partitions and from outside faces of exterior walls. For the purpose of trip generation calculation, the floor area of all parking garages should be excluded from the building's GLA. GLA represents the space for which tenants pay rent and that generates income for the property owner. Leased spaces not in productive use are not considered occupied. In the retail industry, GLA is widely adopted as the standard measurement for statistical comparison. Accordingly, GLA is used in the *Trip Generation Manual* for shopping centers. For specialty retail centers, strip centers, discount stores, and freestanding retail facilities, GLA typically equals GFA.

Hole—A single combination of a tee, fairway, and green on a golf course.

Lift—A mechanism used to transport skiers uphill on a ski slope, typically consisting of seats or benches attached to an overhead cable.

Member—An individual who belongs to a group or organization. Family Member is a related term.

Member Family—A family that belongs to a group or organization.

Movie Screen—A room within a movie theater that contains seating and the equipment necessary to present of a movie.

Municipal Population—A count of all persons having their primary residence within a given municipality.

Net Rentable Area—The total square footage of all storage units in a self-storage facility.

Occupied Campsite—(See **Campsite**.)

Occupied Parking Space—(See **Parking Space**.)

Parking Space—An individual stall within a parking lot or garage designated for a private motor vehicle. An **Occupied Parking Space** refers to a space currently in use by a parked vehicle.

PM Peak Hour Traffic on Adjacent Street—(See **AM/PM Peak Hour Traffic on Adjacent Street**.)

Resident—A person who resides in the given dwelling unit.

Rink—An enclosed area for skating.

Room—The partitioned section of a building used for lodging, such as in a hotel or motel.

Seat—A designated place where an individual may sit; multiple seats may exist along a bench or pew.

Service Bay—A designated location within an automobile servicing facility where a vehicle can be parked to be inspected and/or repaired.

Servicing Position—A location within a quick-lubrication or other vehicle repair shop where a vehicle can be serviced. For example, if a quick-lubrication vehicle shop has one service bay that can service two vehicles at the same time, the number of servicing positions is two.

Storage Unit—A vault rented for the storage of goods, typically within a self-storage facility. Storage Unit is distinct from a **Unit**, which has a different definition.

Student—A person enrolled in an institution such as a school, college, or day care center, either full-time or part-time. The number of students refers to the total enrollment, not just those present at the time of data collection.

Tee/Driving Position—A designated location from which a golf ball is struck for practice.

Unit—In the context of Land Use Code 255 (Continuing Care Retirement Community), a unit refers to a group of rooms intended for residential dwelling. **Storage Unit** is a similar term with a different definition.

Vehicle Fueling Position—The number of vehicles that can be fueled simultaneously at a service station. For example, a service station with two pumps, each with hoses on both sides, allows four vehicles to fuel at once—therefore, it has four fueling positions.

Vendor—An individual or company offering goods or services for sale.

Wash Stall—A location within either a self-service or automated car wash where a vehicle can be parked to be washed.

Data Page Terms

Average Number of [Independent Variable]—The average value of the independent variable for data presented on the specific data page.

Average Rate (Weighted Average Rate or Average Trip Rate)—The weighted average number of vehicle or person trips entering or exiting a development site per one unit of the independent variable. It is calculated by dividing the total number of trips for all contributing data point sites by the total of all independent variable units across those sites. The weighted average rate is used—rather than the simple average of individual site rates—to account for the variance within the data set. Data sets with a large variance will over-influence the average rate if they are not weighted. Data plots include a dashed line representing the weighted average rate, extending between the lowest and highest observed independent variable values.

Trip Ends, T—The number of vehicle or person trips recorded at a site; shown as the dependent variable on the y-axis of the data plot.

Coefficient of Determination (R^2)—The percent of the variance in the number of trips associated with the variance in the independent variable value. If the R^2 value is 0.75, then 75 percent of the variance in the number of trips is accounted for by the variance in the size of the independent variable. As the R^2 value approaches 1.0 the better the fit; as the R^2 value approaches zero, the worse the fit.

Directional Distribution—The percentage of total trips entering and exiting a site during the indicated time period.

Fitted Curve and Fitted Curve Equation—The result of a single-variable regression analysis between the independent and dependent variables, expressed in an optimal mathematical relationship.

- For a linear relationship: $T = aX + b$.
- For a logarithmic relationship: $\ln(T) = a \ln(X) + b$.

The fitted curve is depicted as a solid line on the data plot, extending between the lowest and highest observed independent variable values.

Independent Variable, X—A physical, measurable, and predictable characteristic describing the study site or baseline site (for example, gross floor area) that directly correlates with the trip generated of a land use. Note: Sometimes referred to as an explanatory variable.

Number of Studies—The total number of individual studies reported on a specific data page.

Range of Rates—The minimum and maximum trip generation rates observed across all reported studies.

Standard Deviation—A measure of data dispersion relative to the calculated average. A lower standard deviation indicates less dispersion and a better fit to the average rate. In TGM, the reported standard deviation is based on the weighted average, not the mean. Standard deviation values are reported only when there are three or more data points.

Study Site—A data point plotted on the graph representing a trip generation study conducted for a specific land use code.