UNIVERSITY OF CALIFORNIA

Sustainable Transportation Terms: A Glossary

A Research Report from the University of California Institute of Transportation Studies

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16. Abstract

One of the challenges in developing a consensus around the goal of sustainable transportation is a lack of consensus around the terms used to define and describe sustainable transportation. The goal in this project was to assemble a list of relevant terms and provide clear and simple definitions. Because it is not uncommon to find multiple terms used to refer to the same concept, the report also aims to differentiate the preferred terms from less preferred terms and terms that should not be used for various reasons. Terms were identified based on a review of documents from transportation agencies, websites and publications from transportation organizations, and papers published by the academic community, and refined the list in consultation with Ellen Greenberg, Deputy Director of Sustainability at the California Department of Transportation (Caltrans). Terms are grouped into categories based on purpose, mode, destinations, community type, and others. The intent of this work is to create a useful resource for those working to advance sustainable transportation

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DISCLAIMER

Sustainable Transportation Terms: A Glossary

UNIVERSITY OF CALIFORNIA INSTITUTE OF TRANSPORTATION STUDIES

September 2017

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EXECUTIVE SUMMARY

One of the challenges in developing a consensus around the goal of sustainable transportation is a lack of consensus around the terms used to define and describe sustainable transportation. Our goal in this project was to assemble a list of relevant terms and provide clear and simple definitions. Because it is not uncommon to find multiple terms used to refer to the same concept, we also aimed to differentiate the preferred terms from less preferred terms and terms that should not be used for various reasons. We identified the following terms based on a review of documents from transportation agencies, websites and publications from transportation organizations, and papers published by the academic community, and refined the list in consultation with Ellen Greenberg, Deputy Director of Sustainability at the California Department of Transportation (Caltrans). Primary sources for the definitions are provided in footnotes, and more detail on the sources reviewed is included in Appendix A.

Although these definitions are by no means definitive, and others might disagree with our choices, this glossary may prove a useful resource for those working to advance sustainable transportation. Terms are grouped in the following categories:

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- Traveling purpose
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- Ability to get to destinations and moving without hindrance
- Facilities that accommodate multiple travel modes
- Terms related to communities burdened by poor public health, quality of life, economic opportunities, or mobility
- Convenience to transit options
- Terms related to vehicle volume and capacity
- Vehicles and people colliding through direct impact
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Introduction

One of the challenges in developing a consensus around the goal of sustainable transportation is a lack of consensus around the terms used to define and describe sustainable transportation. Our goal in this project was to assemble a list of relevant terms and provide clear and simple definitions. Because it is not uncommon to find multiple terms used to refer to the same concept, we also aimed to differentiate the preferred terms from less preferred terms and terms that should not be used for various reasons. We identified the following terms based on a review of documents from transportation agencies, websites and publications from transportation organizations, and papers published by the academic community, and refined the list in consultation with Ellen Greenberg, Deputy Director of Sustainability at the California Department of Transportation (Caltrans). Primary sources for the definitions are provided in footnotes, and more detail on the sources reviewed is included in Appendix A.

Although these definitions are by no means definitive, and others might disagree with our choices, this glossary may prove a useful resource for those working to advance sustainable transportation.

The T Words

Transportation: Means of conveyance or travel from one place to another. Conveyance of passengers or freight.[1]

Less preferred: transport (British usage for "transportation")

Travel: The action of going from one location to the other, from origin to destination.

Traffic: The vehicles, pedestrians, ships, or planes moving through an area or along a route.[2]

Transit: See below.

Traveling purpose

Discretionary travel: Travel that is not required to obtain resources that sustain life (work, health, safety, etc.). This includes trips for leisure purposes as well as those generated by the choice of longer routes, farther destinations, greater motor vehicle usage, and more frequent trips than necessary for non-discretionary travel.

Less preferred: non-essential travel, recreational travel.

[1] Merriam-Webster
[2] Merriam-Webster

Non-discretionary travel: The travel necessary to obtain resources that sustain life (work, health, safety, etc.), assuming the use of shortest distance, fewest trips, and maximizing active transportation.

Less preferred: purposeful travel, necessary travel, utility travel, productive travel, sustaining travel, obligatory travel, essential travel.

Utilitarian travel: Traveling (usually walking or bicycling) for transportation rather than as sport or leisure activity.

Travel Modes

Travel mode: The means by which travel is done. Common travel modes for people include passenger car (driving alone or shared ride), public transit (bus, subway, or train), walking, and bicycling. Common travel modes for freight include land (road, rail, and pipelines), maritime, and air transportation.

Multi-modal travel: Travel using more than one travel mode.

Mode share: The percentage of travelers or trips using a particular transportation mode for a specified place at a specific time. For example, the mode share for public transit in City A in 2017 is 5%. In freight transportation, mode share may be measured in mass.

Mode split: The overall distribution of travel modes used in a specified place at a specified time. For example, the mode split for City A in 2017 is 70% drive alone, 20% bike, and 10% walk.

Less preferred: modal split

Transit: Public or private transportation service that moves passengers in mass and usually has fixed routes, stops, and fares. Operates within cities or regions rather than between cities or regions.

Public transit: Transit services owned and operated by state, regional, or local public agencies.

Private transit: Transit services owned and operated by private entities, such as privately-owned shuttles.

Mass transit: Large-scale public transportation with high carrying capacity, such as buses, subways, and trains.

Less preferred: public transportation
Do not use: active transit

Bicycling, bicyclists: The activity / the person riding a bicycle or tricycle, including Type 1 and 2 e-bikes (defined as bikes with maximum motor-assisted speed of 20 mph), cargo bikes, recumbent bikes, or other variations. Motorized scooters or mopeds are not considered bicycles. [3]

Less preferred: cycling, cyclist, biking, bike rider

Pedestrian: Persons walking, skateboarding, using a wheelchair or other mobility device, or any other form of human-powered transportation other than a bicycle. Motorized wheelchair users are also considered pedestrians. The term "walking" may be used to imply all pedestrian activities, as many of these modes primarily travel on sidewalks and other walking facilities. [4]

Active transportation: Human-powered transportation, such as biking and walking, that enhances public health and helps to reduce greenhouse gas emissions associated with transportation.[5,6] Public transit is sometimes considered an active mode because many riders walk or bicycle to and/or from the bus stop or train station.

Less preferred: human-powered transportation, non-motorized transportation
Do not use: alternative transportation, active transit

Active travel: The action of going from one location to the other using active transportation.

Low-impact transportation: Transportation modes that have less environmental impact than single occupancy vehicles with internal combustion engines, including active transportation, transit, and electric vehicles. [7]

Do not use: alternative transportation

Motor vehicle: A road vehicle propelled by an engine or motor (internal combustion engine, or electric motor, or some combination of the two) and used for the transportation of passengers, property, or freight.

Passenger vehicle: A motor vehicle with at least four wheels, used for the transport of passengers.[8,9]

Zero-emission vehicles (ZEV): Vehicles that may be driven with zero tail-pipe emissions. These include hydrogen fuel cell electric vehicles (FCEVs), pure battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs).[10]

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[3] California State Bicycle and Pedestrian Plan, page 5
[4] California State Bicycle and Pedestrian Plan, page 5
[5] California State Bicycle and Pedestrian Plan, page 5
[6] Caltrans Director's Policy Number DP-03-R2. Safety and Health.
[7] http://www.lowimpact.org/lowimpact-topic/0-sustainable-transport-intro/
[8] http://oica.net/wp-content/uploads/stats-definition1.pdf
[9] https://www.dmv.ca.gov/portal/dmv/detail/online/fee_calc/vehdef
[10] https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf

Single-occupancy vehicle (SOV): A passenger vehicle whose only occupant is the driver.
High-occupancy vehicle (HOV): A passenger vehicle with a driver and one or more passengers. This includes carpools, vanpools, and transit buses.

Rideshare: When a driver, or a passenger, shares an open seat(s) in a vehicle with one or more passengers that have similar travel paths and schedules. Traditional forms of ridesharing include carpooling and vanpooling and current use includes sharing space in a ridesourced vehicle (see ridesourcing).

Less preferred: shared ride/shared-ride, on-demand transportation services, on-demand ride services, ride-hailing, jitney, shared taxi, micro-transit, non-single-occupancy vehicle travel (non-SOV travel), transportation network company (TNC), mobility service provider.

Ridesourcing: A rideshare service that connects passengers to drivers, typically through a digital application and typically for a fee. Drivers and companies work for-profit and typically offer rides that are not incidental to their own trips.

Less preferred: ride hailing, e-hailing, dynamic ridesharing, real-time ridesharing, instant ridesharing, ad-hoc ridesharing, on-demand ridesharing, on-demand transportation services, transportation network services (TNCs), dynamic carpooling.

Ridesplitting: Ridesharing in a ridesourced vehicle when two or more passengers have similar travel paths, i.e. sharing a taxi.

Less preferred: shared ride/shared-ride (see rideshare), shared taxi

Shared mobility: When a transportation mode, such as an automobile or bicycle, is used by more than one person either for moving a person or personal goods. Mode-usage typically occurs at the same time, but may also refer to sequential use, i.e. a leasing a shared bicycle. Although it can reduce miles traveled per person, it may or may not be efficient in terms of mode used or emissions per person.

This includes: public transit options, carsharing; personal vehicle sharing (peer-to-peer carsharing and fractional ownership); car-pooling; van-pooling; ride-splitting, bikesharing; scooter sharing; shuttle services; microtransit; ridesharing; e-Hail (taxis); shuttle services; neighborhood jitneys; ridesourcing; transportation network companies; ride-hailing; paratransit; and more. It can also include courier network services or flexible goods delivery, which provide for-hire delivery services using an online application or platform (such as a website or smartphone app) to connect couriers using their personal vehicles, bicycles, or scooters with freight (e.g., packages, food), and commercial delivery vehicles providing flexible goods movement.

Less preferred: shared-use mobility.

Transportation Network Company (TNC): A ridesourcing company, see *ridesourcing*. (California Public Utilities Commission) “TNCs provide prearranged transportation services for

compensation using an online-enabled application or platform (such as smart phone apps) to connect drivers using their personal vehicles with passengers."[11]

Vehicle sharing: Provides short-term, on-demand access to a transportation mode without sole, direct ownership, thus reducing the overall number of vehicles including automobiles, bicycles, and scooters. Examples include car sharing/carsharing/car-sharing, bike sharing/bikesharing/bike-sharing, scooter sharing.

Do not use: rideshare/shared ride/shared-ride (see rideshare)

Ability to get to destinations and moving without hindrance

Mobility: The potential for movement, the ability to get from one place to another, an ability to move around. In general, faster speeds and more ease of movement lead to higher mobility. [12]

Accessibility, destination accessibility: The ease with which people can reach destinations such as jobs, shopping, and leisure-time activities. [13] Accessibility is higher when residences and potential destinations are within close proximity of each other, and the transportation connections between residences and destinations are direct as well as safe, comfortable, and attractive.[14]

Distinguish from: accessibility (in reference to ADA standards): facilities designed to accommodate people with disabilities in pedestrian planning and facility design.

Do not use: universal accessibility[15], transportation accessibility. These are terms associated with ADA standards.

Multimodal access: A system that meets the needs of bicyclists, pedestrians, transit users, passenger vehicles, and other motor vehicle users. A system providing multimodal access integrates different transportation modes to allow co-existence and easy switching between modes. [16]

Transit accessibility: This term is ambiguous. In the context of transportation planning, transit accessibility means the ability to travel from an origin point to potential destinations by transit. In the ADA standards context, it refers to a transit facility' ability to accommodate people with disabilities.

[11] http://www.cpuc.ca.gov/tncinfo/
[12] Access to Destination. Chapter 7 Planning for Accessibility in Theory and in Practice. Susan Handy. 2005.
[13] Litman, Tod (2017). Accessibility for Transportation Planning. http://www.vtpi.org/access.pdf
[14] California Air Resources Board, 2013. Policy Brief on the Impacts of Regional Accessibility Based on a Review of the Empirical Literature. https://arb.ca.gov/cc/sb375/policies/regaccess/regional_accessibility_brief120313.pdf
[15] http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SMF_PI_4-25-12.pdf
[16] California State Bicycle and Pedestrian Plan, page 45.

Connectivity: The density of connections in road and other networks, or more specifically, the directness of the link from one point to another along the network. At higher levels of connectivity, travel distances are shorter and route options more numerous, allowing more direct travel between destinations.[17,18]

Multimodal connectivity: The ease with which people can switch between modes on the same trip. For example, pedestrian and bicycling access to transit stops and stations.

Walkability: The overall walking conditions in an area; how friendly an area is to walking. [19] Walkability is affected by the presence and quality of walkways (see below), as well as the surrounding environment, including the design of buildings and their location relative to the sidewalk as well as vegetation such as landscaping and street trees. Good destination accessibility (see above) and good connectivity (see above) contribute to walkability.

Facilities that accommodate multiple travel modes

Complete Streets: Complete Streets principles state that all people, regardless of age, ability, income, race, or ethnicity, should have safe, comfortable, and convenient access to community destinations and public places—whether walking, driving, bicycling, or taking public transit.[20] Complete Streets planning recognizes that roadways often serve diverse functions including through travel, recreational walking, socializing, vending, and nearby living.[21]

Do not use: pedestrian amenities, transit amenities

Shared-use facility: A facility, typically a paved path, adjacent to the roadway or separate from the roadway that is designated for non-motorized use. In general, this includes pedestrians and bicyclists, but some shared-use facilities are also designated for rollerbladers, skateboarders, and equestrians.[22]

Less preferred: mixed-use path, multi-use path, greenway[23]

Do not use: amenities, non-motorized facility

Pedestrian walkway: A facility that is designated for pedestrian use. This may include sidewalk, paved paths, pedestrian-only market streets, boardwalks, etc.

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[17] https://www.arb.ca.gov/cc/sb375/policies/connectivity/network_connectivity_brief.pdf
[18] Victoria Transport Policy Institute, 2017. Roadway Connectivity. http://www.vtpi.org/tdm/tdm116.htm
[19] Victoria Transport Policy Institute, 2017. Walkability Improvements. http://www.vtpi.org/tdm/tdm92.htm
[20] NHTSA. A primer for Highway Safety Professionals. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf, page 2.
[21] Victoria Transport Policy Institute, 2017. Complete Streets. http://www.vtpi.org/tdm/tdm133.htm
[22] NHTSA. A primer for Highway Safety Professionals. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf, page 96.
[23] NHTSA. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf

Bicycle facility: A facility, typically a lane or paved path, that is designated for bicycling use. This may include Class I bike paths, Class II Bike Lanes, Class III Bike Routes, Class IV Separated Bikeways, as well as other bike trails.

Less preferred: bikeway

Bicycle boulevard: A street with low motorized traffic volumes and speeds, designated and designed to give priority to bicycle travel. Bicycle boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.[24]

Low-stress bicycle network: A bicycle network that serves bicyclists of all ages and abilities by offering separated lanes and paths, signed routes along low-traffic roads, as well as safe and comfortable ways to cross streets with higher levels of traffic.[25, 26]

Bicycling highway: A bicycle facility designed to allow safe bicycling at higher speeds, for longer distances, typically separated from vehicular traffic.

Terms related to communities burdened by poor public health, quality of life, economic opportunities, or mobility

Disadvantaged community: (CalEPA) Spatially designated areas, identified by CalEPA, based on geographic, socio-economic, public health, and environmental hazard criteria using the California Communities Environmental Health Screening Tool ("CalEnviroScreen"[27]). Senate Bill (SB) 535 (De León, Chapter 830, Statutes of 2012) directs State and local agencies to make investments that improve California's disadvantaged communities. It also directs the California Environmental Protection Agency (CalEPA) to identify disadvantaged communities for the purposes of Greenhouse Gas Reduction Fund (GGRF) programs based on geographic, socio-economic, public health, and environmental hazard criteria.[28]

Environmental justice: (USDOT) Environmental Justice (EJ) at the Federal Highway Administration (FHWA) means identifying and addressing disproportionately high and adverse effects of the agency's programs, policies, and activities on minority populations and low-income populations to achieve an equitable distribution of benefits and burdens. [29]

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[24] NACTO. Urban Bikeway Design Guide. http://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/

[25] Mekuria, Maaza C., Peter G. Furth, and Hilary Nixon. (2012). Low-stress bicycling and network connectivity.

[26] NHTSA. A primer for Highway Safety Professionals. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf, page 95.

[27] http://calepa.ca.gov/EnvJustice/GHGInvest/

[28] https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/communityinvestments.htm

[29] https://www.fhwa.dot.gov/environment/environmental_justice/

Transportation equity: Both the benefits and burdens created by transportation projects, policies, and plans are distributed fairly across the population. No segments of the population, particularly low-income and/or minority groups, are unduly burdened by a lack of access to adequate transportation or by the negative effects of proximity to transportation infrastructure.

Less preferred: social equity

Underserved community: (USDOT) Low income and minority households, low income and minority populations, groups with protected non-discrimination status, and limited-English-proficient populations. [30]

Convenience to transit options

Location efficiency: Sites within a city or region that are within close proximity to destinations and have good access to transit, thereby reducing dependence on driving.

Priority development area: Locally designated areas within existing communities where increased housing or commercial growth will support the day-to-day needs of residents and workers in a pedestrian-friendly environment served by transit.

Transit oriented: Sites within an easy walk of transit stops that are developed with a relatively high density of residences and/or employment and include a variety of services for residents and/or workers.

Terms related to vehicle volume and capacity

Capacity: The maximum number of vehicles that can pass a point on a roadway during a specified time period (usually one hour) under prevailing roadway, traffic and control conditions, usually measured as vehicles per lane per hour.

Induced demand: A potential long-term effect of added highway capacity if it leads to faster population and/or employment growth in the region. This term should not be used to refer to increases in travel directly resulting from decreases in travel costs (see induced travel).

Induced travel: When an increase in the capacity of a roadway reduces the cost of travel, in terms of travel time and/or monetary expense, encouraging more travel on that roadway. In this case, the added capacity enables travelers to satisfy more of their demand; their latent demand becomes realized demand.

[30] 23 CFR Section 450.104 and executive Orders: 12898 and 13166

Latent demand: The travel that people want to do but choose not to do or cannot do owing to the high time and/or monetary cost or other constraints. This is also called unrealized demand.

Traffic congestion: The condition of having a high ratio of volume to capacity, resulting in vehicle speeds lower than roadway design. It is typically measured with the concepts of level of service and vehicle delay, where delay is calculated relative to the free-flow travel time for that segment of roadway, i.e. the travel time without any congestion.

Volume: The number of vehicles passing a given point in a specified period of time, usually measured as vehicles per lane per hour. This is also called realized demand.

Vehicles and people colliding through direct impact

Crash: A collision resulting in an injury or property damage.

Do not use: accident (infers that there is no fault)

Transportation terms relating to conserving environmental resources

Green: A descriptive modifier that indicates energy minimization, resource reduction, and/or pollution prevention.

Low-carbon transportation: (ARB) Transportation that "reduces greenhouse gas (GHG) emissions, criteria pollutants, and air toxics."[31]

Low-impact: This adjective indicates energy minimization, resource reduction, and/or pollution prevention

Less preferred: efficient/efficiency.

Sustainability: the ability to reduce and/or minimize energy requirements, resource inputs/impacts, and pollution, reflecting the goals of equity, ecological integrity, and human welfare, regardless of time or location, thus meeting the needs of current generations while not limiting the resources of future generations.

Sustainable mobility: Meets present generation mobility needs without compromising the future generation's ability to meet their own mobility needs.

Less preferred: smart mobility.

[31] https://www.arb.ca.gov/msprog/aqip/aqip.htm

Appendix A: Detail on Sources for Definitions

This appendix includes supporting documentation and primary sources for the definitions that were presented above. It includes term definitions that were considered, borrowed, or modified to be included in the sustainable transportation glossary. It also includes term usage when there may not have been specific and relevant definitions from which to draw upon.

The T Words

Traveling purpose

Discretionary travel/Non-discretionary travel: These two definitions developed through the following sources:

> *Caltrans Technical Report:* "These models examine trips classified as non-home-based, for which the attraction/activity type was identified. These activities are divided into work, discretionary, and obligatory trips."[32]
>
> *Handy, et. al:* "As noted, the distinction between driving by choice and driving by necessity is not entirely clear. One way to clarify this distinction is to ask, in what ways are people driving more than they really need to, thereby generating what might be called "excess" driving? As a starting point, excess driving is defined here as driving beyond that required for household maintenance given choices about residential location, job location, and activity participation. The required level of driving can be defined more specifically as the minimum number of trips using the shortest routes to the closest destinations possible and using modes other than the car as often as possible. **Excess driving** is then defined as driving above and beyond the required level and can be generated by the choice of longer routes, farther destinations, greater use of the car, and more frequent trips than the minimum required. (Handy, 2005)
>
> *Caltrans Smart Mobility Plan 2010:* ***Productive travel*** is travel essential to the State and regional economy, including interregional and international commerce (ports, freight movements and deliveries if consolidated), commute trips, tourist travel, a portion of government travel (e.g. to maintain infrastructure and the peace, military travel) and a portion of the travel related to the business of business (such as strategic resource activities including bio/solar/wind energy areas, agriculture, lumber, oil, mining, logistics) and ***Sustaining travel***: Essential household travel for all purposes (work,

[32] http://www.dot.ca.gov/newtech/researchreports/reports/2012/improved_ca_land_use-transportation_planning_tools_final_report.pdf, Appendix D, pg 43.

school, shopping etc) that occurs even in areas with the best land use place making and transit and TDM programs.[33]

Utilitarian Travel:

Wikipedia: "Utility cycling encompasses any cycling done simply as a means of transport rather than as a sport or leisure activity. It is the original and most common type of cycling in the world."

Traffic Solutions: "On top of work trips, utilitarian trips include round-trips when the purpose of the trip is to go to a particular place where you might have otherwise driven alone. Here are some examples of utilitarian trips: a round-trip to a restaurant, to the grocery store, to the beach to take a walk or run, to the gym to work-out over lunch, to school, or to a trailhead to go for a hike. If you make any of these trips without a car, you can earn a point for the day."[34]

Other terms considered: "purposeful travel", "necessary travel", "utility travel", "productive travel", "decision utility", "sustaining travel", "obligatory travel", "essential travel", "non-essential travel", and "recreational travel".

Travel Modes

Mode share:

Wikipedia: "the percentage of travelers using a particular type of transportation or number of trips using said type.[1] In freight transportation, this may be measured in mass."

Victoria Transport Policy Institute: "the portion of trips by different modes."[35]

Bicycling, bicyclists:

California Bike & Ped Plan: "a bicyclist is any person riding a bicycle or tricycle, including Class I and II e-bikes, cargo bikes, recumbent bikes, bikes with trailers, handcycles, or other variations. Motorized scooters or mopeds are not considered bicycles."[36]

Pedestrian:

[33] http://www.dot.ca.gov/hq/tpp/offices/ocp/documents/smf_files/SMF_handbook_062210.pdf, Appendix A
[34] http://www.trafficsolutions.info/cc-FAQ.htm#What_is_a_utilitarian_trip
[35] http://www.vtpi.org/landtravel.pdf, page 6
[36] California State Bicycle and Pedestrian Plan, page 5

California Bike & Ped Plan: "A pedestrian is any person walking, skateboarding, using a wheelchair or other mobility device, or any other form of human-powered transportation other than a bicycle. Motorized wheelchair users are also considered pedestrians. All pedestrians are implied when this Plan uses "walking," as many of these modes primarily travel on sidewalks and other walking facilities. "[37]

Active Transportation:

California Bike & Ped Plan: "all pedestrians and bicyclists (as defined in the Plan) are included in active transportation." [38]

Caltrans: "A consolidated set of programs that enhances public health, encourages increasing the number of walking and bicycling trips, increases safety and mobility for non-motorized users, and reduces both vehicle miles traveled and greenhouse gas emissions."[39]

Low-impact transportation:

Low Impact.org: "A transport system that uses less fossil fuel, which would involve a combination of:

- most importantly – moving from private to public transport
- reducing the overall amount of travel
- fuel efficiency, and
- alternative fuels (including muscle power)"[40]

Wikipedia: "Sustainable Transport" refers to the broad subject of transport that is sustainable in the senses of social, environmental and climate impacts… Components for evaluating sustainability include the particular vehicles used for road, water or air transport; the source of energy; and the infrastructure used to accommodate the transport (roads, railways, airways, waterways, canals and terminals)… Transport operations and logistics as well as transit-oriented development are also involved in evaluation."

Motor vehicle:

Wikipedia: "A **motor vehicle** is a self-propelled road vehicle and off-road vehicle, commonly wheeled, that does not operate on rails, such as trains or trams and used for the transportation of passengers, or passengers and property. The vehicle propulsion is provided by an engine or motor, usually by an internal combustion engine, or an electric

[37] California State Bicycle and Pedestrian Plan, page 5
[38] California State Bicycle and Pedestrian Plan, page 5
[39] Caltrans Director's Policy Number DP-03-R2. Safety and Health.
[40] http://www.lowimpact.org/lowimpact-topic/0-sustainable-transport-intro/

motor, or some combination of the two, such as hybrid electric vehicles and plug-in hybrids."

Passenger vehicle:

OICA: "Passenger cars are motor vehicles with at least four wheels, used for the transport of passengers, and comprising no more than eight seats in addition to the driver's seat."[41]

California DMV: "An "automobile" is a passenger vehicle that does not transport persons for hire. This includes station wagons, sedans, vans, and sport utility vehicles. Vehicle Code Section 465."[42]

Zero-Emission Vehicles (ZEV):

Office of Governor Edmund G. Brown Jr.: "ZEV technologies include hydrogen fuel cell electric vehicles (FCEVs) and plug-in electric vehicles (PEVs), which include both pure battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs)." [43]

Rideshare:

US DOT: "Ridesharing involves adding passengers to a private trip in which driver and passengers share a destination. Such an arrangement provides additional transportation options for riders while allowing drivers to fill otherwise empty seats in their vehicles. Traditional forms of ridesharing include carpooling and vanpooling. This term is sometimes used to refer to ridesourcing. [TCRP Research Report 188]"[44] (National Academies of Sciences, Engineering, and Medicine, 2016)

US DOT planning glossary: "A form of transportation, other than public transit, in which more than one person shares the use of the vehicle, such as a van or car, to make a trip. Also known as "carpooling" or "vanpooling." (APTA1)"[45]

Shared-use Mobility Center: "Traditional ridesharing includes carpooling (grouping of travelers into a privately owned vehicle, typically for commuting), vanpooling (sharing of a ride in a van by commuters traveling to/from a job center) and real-time ridesharing services (matching of drivers and passengers based on destination, through a mobile app before the trip starts and through which the passenger pays a share of the trip cost). Ridesharing essentially focuses on the issue of filling empty seats in vehicles, which helps better realize vehicle occupancy potential and reduces the number of

[41] http://oica.net/wp-content/uploads/stats-definition1.pdf
[42] https://www.dmv.ca.gov/portal/dmv/detail/online/fee_calc/vehdef
[43] https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf
[44] https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions
[45] https://www.fhwa.dot.gov/planning/glossary/search_result.cfm

vehicles on the roadway. As such, ridesharing can be a powerful tool to address problems of congestion, emissions and fossil fuel dependency."[46]

Related: Shared-ride: (Phrase includes carpooling)

> *Virginia Code:* "shared ride taxi system" means a transportation system which employs taxicab-type vehicles or other motor vehicles which can carry no more than six passengers, and which attempts to arrange for use of such vehicles by more than one passenger per trip.[47]
>
> *Wisconsin DOT:* "'Shared-ride taxi service' means a service in which riders with similar points of origin and destination group together to share the cost of a taxi trip. The service is a door-to-door, demand responsive, and advanced reservation service that is made available to the general public. The scheduled service is normally seven days a week with specific daily hours outlined in the solicitation. The system is subsidized with state and federal transit operating funds. The service is available to the disabled with the provider responsible for assisting the disabled passenger into and out of the accessible taxi vehicle."[48]
>
> Phrase used in *Pennsylvania* as reference to paratransit transportation services. This book uses paratransit to mean "alongside-of" transit and further describes the term to encompass what is defined here as shared mobility.[49]

Ridesourcing:

> *DRISI, Lee Provost, 2016:* "Urban ridesharing companies –ridesourcing- otherwise called TNC's – the transportation network companies -such as Uber or Lyft- are replacing part of the taxicab's and other shared modes of travel by use of a smartphone to summon their services (referred to as on-demand services). … Transportation experts have called these services "ridesourcing" to clarify that drivers do not share a destination with their passengers… [50]
>
> *Rayle, et. al, 2014:* "By leveraging advances in technology, ride service companies such as Uber, Lyft, and their competitors—also known as "Transportation Network Companies" (TNCs) or, more colloquially, "ridesharing"—promise to increase reliability

[46] http://sharedusemobilitycenter.org/what-is-shared-mobility/
[47] http://law.justia.com/codes/virginia/2006/toc1502000/15.2-949.html
[48] http://wisconsindot.gov/Documents/doing-bus/local-gov/astnce-pgms/transit/procurement/srt.pdf
[49] http://www.aging.pa.gov/aging-services/transportation/Pages/default.aspx
[50] http://www.dot.ca.gov/newtech/researchreports/preliminary_investigations/docs/new_shared_mobility_preliminary_investigation.pdf

and reduce wait times of point-to-point transportation. We refer to these services as 'ridesourcing.' (Rayle, et. al, 2014)"[51]

US DOT: Use of online platforms to connect passengers with drivers and automate reservations, payments, and customer feedback. Riders can choose from a variety of service classes, including drivers who use personal, non-commercial, vehicles; traditional taxicabs dispatched via the providers' apps, and premium services with professional livery drivers and vehicles. Ridesourcing has become one of the most ubiquitous forms of shared mobility. [TCRP Research Report 188][52] (National Academies of Sciences, Engineering, and Medicine. 2016)

Rayle, et al, 2015: "…dynamically matches supply and demand by allowing travelers to request car rides in real-time from potential suppliers using a smartphone application. Distinct from ridesharing, ridesourcing drivers operate for-profit and typically provide rides not incidental to their own trips."[53] (Rayle, et al, 2015)

Greenblatt and Shaheen: "Ridesourcing services (also known as transportation network companies or TNCs) provide prearranged and on-demand transportation services for compensation, connecting drivers of personal vehicles with passengers."[54] (Greenblatt and Shaheen, 2015)

Ridesplitting:

Shaheen, et. al: Ridesplitting involves splitting a ridesourcing/TNC--providedride with someone else taking a similar route. Lyft and Uber match riders with similar origins and destinations together, and they split the ride and the cost. (Shaheed, et. al, 2015)[55]

Shared mobility:

Shaheen, et. al: "Shared mobility -the shared use of a vehicle, bicycle, or other mode – is an innovative transportation strategy that enables users to gain short-term access to transportation modes on an "as-needed" basis. It includes carsharing; personal vehicle sharing (peer-to-peer carsharing and fractional ownership); carpooling; bikesharing; scooter sharing; shuttle services; microtransit; ridesharing; e-Hail (taxis); and ridesourcing/transportation network companies (TNCs) (also known as ride-hailing). It can also include courier network services (CNS) or flexible goods delivery, which provide for-hire delivery services using an online application or platform (such as a website or

[51] https://pdfs.semanticscholar.org/a8dc/54bf9f113702fd2a1b437f78b9b04fa7123d.pdf
[52] https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions
[53] https://www.researchgate.net/profile/Susan_Shaheen/publication/284077119_Just_A_Better_Taxi_A_Survey-Based_Comparison_of_Taxis_Transit_and_Ridesourcing_Services_in_San_Francisco/links/56c7bf7e08ae5488f0d2e73e.pdf
[54] https://www.researchgate.net/profile/Susan_Shaheen/publication/282545128_Automated_Vehicles_On-Demand_Mobility_and_Environmental_Impacts/links/56aea99008ae28588c61e54f.pdf
[55] http://innovativemobility.org/wp-content/uploads/2015/11/SharedMobility_WhitePaper_FINAL.pdf

smartphone app) to connect couriers using their personal vehicles, bicycles, or scooters with freight (e.g., packages, food)." (Shaheen, et. al, 2015)[56]

DRISI, Lee Provost, 2016: "…Shared mobility is broadly defined as the use of a shared vehicle for transportation by the public." "…comprises transportation services that are shared among users, including traditional public transit; taxis and limos; bikesharing; carsharing (round-trip, one-way, and personal vehicle sharing); ridesharing (car-pooling, van-pooling); ride-sourcing; scooter sharing; shuttle services; neighborhood jitneys; and commercial delivery vehicles providing flexible goods movement." [57]

Shaheen, et. al., TSRC: "Shared mobility – the shared use of a vehicle, bicycle, or other mode – is an innovative transportation strategy that enables users to gain short-term access to transportation modes on an "as-needed" basis. The term shared mobility includes various forms of carsharing, bikesharing, ridesharing (carpooling and vanpooling), and on-demand ride services. It can also include alternative transit services, such as paratransit, shuttles, and private transit services, called microtransit, which can supplement fixed-route bus and rail services. With many new options for mobility emerging, so have the smartphone "apps" that aggregate these options and optimize routes for travelers. In addition to innovative travel modes, new ways of transporting and delivering goods have emerged. These "courier network services" have the potential to change the nature of the package and food delivery industry. Shared mobility has had a transformative impact on many global cities by enhancing transportation accessibility, while simultaneously reducing driving and personal vehicle ownership." See also the authors' following diagram. (Shaeen, et. al, 2015)[58]

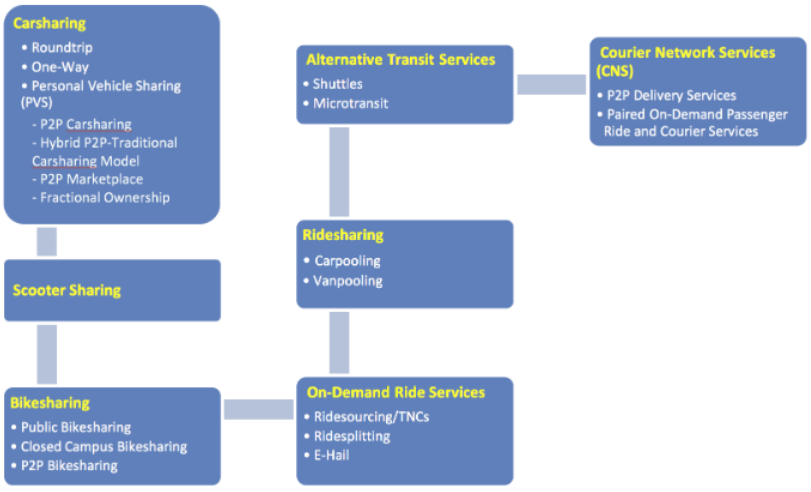

Figure 1: Key Areas of Shared Mobility

[56] https://www.transit.dot.gov/regulations-and-guidance/shared-mobility-definitions

[57] http://www.dot.ca.gov/newtech/researchreports/preliminary_investigations/docs/new_shared_mobility_preliminary_investigation.pdf

[58] http://innovativemobility.org/wp-content/uploads/2015/11/SharedMobility_WhitePaper_FINAL.pdf

Related definitions:

> *Caltrans CTP 2040:* "Shared-use mobility is transportation services shared among users such as public transit (buses and trains) bikesharing, carsharing, ridesharing (vanpools and carpools), and regional/local shuttle services. The economic and social benefits of shared-use mobility can help reduce VMT and emissions as well as car ownership rates and household transportation costs. Shared mobility can also provide better linkages trough multi-modal connections and technologies to encourage greater use of transit and help improve users' health by encouraging biking, walking and other forms of active transportation. …Joint use mobility such as carpooling can maximize the person throughput of corridors." [59]
>
> *Shared-use Mobility Center:* "Shared-use mobility is a term used to describe transportation services that are shared among users, including public transit; taxis and limos; bikesharing; carsharing (round-trip, one-way, and personal vehicle sharing); ridesharing (car-pooling, van-pooling); ridesourcing/ride-splitting; scooter sharing; shuttle services; neighborhood jitneys; and commercial delivery vehicles providing flexible goods movement." (site goes on to use the term "shared mobility") [60]

Transportation Network Company (TNC):

> *CA Public Utilities Commission (Rulemaking 12-12-011):* TNCs "provide prearranged transportation services for compensation using an online-enabled application or platform (such as smart phone apps) to connect drivers using their personal vehicles with passengers."[61]
>
> *Wikipedia:* "A transportation network company (TNC) connects (Sometimes known as Mobility Service Providers or MSPs), via websites and mobile apps, pairing passengers with drivers who provide such passengers with transportation on the driver's non-commercial vehicle."[62]
>
> *Caltrans:* "These companies provide prearranged transportation services for compensation using an online-enabled application or platform to connect passengers with drivers using a personal vehicle. Lyft and Uber are examples of transportation network companies."[63]

[59] http://www.dot.ca.gov/hq/tpp/californiatransportationplan2040/Documents/CTPFAQ.pdf
[60] http://sharedusemobilitycenter.org/what-is-shared-mobility/
[61] http://www.cpuc.ca.gov/tncinfo/
[62] https://en.wikipedia.org/wiki/Transportation_network_company
[63] http://www.dot.ca.gov/hq/asc/travel/ch11/15other.htm

CA.gov: "provide prearranged transportation services for compensation using an online-enabled application or platform (such as smart phone apps) to connect drivers using their personal vehicles with passengers."[64]

Vehicle sharing:

Carsharing:

TCRP: service that provides members with access to an automobile for intervals of less than a day. Major carsharing business models include traditional or round-trip, which requires users to borrow and return vehicles at the same location; one-way or free-floating, which allows users to pick up a vehicle at one location and drop it off at another; and peer-to-peer (p2p), which allows car owners to earn money at times when they are not using their vehicles by making them available for rental to other carshare members. (National Academies of Sciences, Engineering, and Medicine, 2016)

Greenblat and Shaheen: Carsharing is short-term access to a shared automobile. (Greenblatt, et. al, 2015)[65]

Shaheen, et. al: Private vehicles for use without ownership. "reduces the number of vehicles on the road, VMT, GHG emissions, and transportation costs for individuals. (Shaheen, et. al, 2015)"

Bikesharing

TCRP: Short-term bike rental, usually for individual periods of an hour or less over the course of a membership. (Periods can range from a single ride, to several days, to an annual membership.) Information technology (IT)-enabled public bikesharing provides real-time information about the location and demand for bikes at docking stations throughout a community. (National Academies of Sciences, Engineering, and Medicine. 2016)

Martin, et. al: Bikesharing systems provide shared bicycles for use by the general public. Often, bikesharing systems consist of a network of docking stations that position bicycles throughout a metropolitan region for public access. However, bikesharing systems have also evolved into dockless models, which permit bicycles to be dropped off in more flexible regions or zones. Generally, most bikesharing systems permit one-way trips by allowing bicycles to be checked out

[64] http://www.cpuc.ca.gov/tncinfo/

[65] https://www.researchgate.net/profile/Susan_Shaheen/publication/282545128_Automated_Vehicles_On-Demand_Mobility_and_Environmental_Impacts/links/56aea99008ae28588c61e54f.pdf

of one docking station and then returned to another in the system. (Martin, et. al, 2016) [66]

Shaheen,et. al: allows users to access bicycles on an as-needed basis from a network of stations, which are typically concentrated in urban areas. Bikesharing stations are usually unattended and accessible at all hours, granting an on-demand mobility option. (Shaheen, et. al, 2015)[67]

US DOT, NHTSA: Bike share is a service in which bicycles are made available for shared use to individuals on a very short-term basis. Bike share schemes typically allow people to borrow a bike from one location and return it at another "station." Many bike share systems offer subscriptions that make the first 30–45 minutes of use very inexpensive, encouraging their use as transportation. This allows each bike to serve several users per day. (Brookshire, et. al, 2016)[68]

Other terms considered in this section: "on-demand transportation", "non-SOV", "on-demand ride", "mobility service provider", "shared-ride", "ride-hailing", "high capacity transit"

Ability to get to destinations and moving without hindrance

Mobility:

Handy (2005): "Mobility has been defined as the potential for movement, the ability to get from one place to another, an ability to move around… Mobility is related to the impedance component of accessibility, in other words, how difficult it is to reach a destination." [69]

Victoria Transport Policy Institute: ""Mobility" refers to the movement of people and goods. This recognizes both automobile and transit modes, but still assumes that movement is an end in itself, rather than a means to an end."[70]

Accessibility, destination accessibility:

Hansen (1959): "Accessibility is defined as the potential of opportunities for interaction. Accessibility is a measurement of the spatial distribution of activities about a point, adjusted for the ability and the desire of people or firms to overcome spatial separation." [71]

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[66] http://www.dot.ca.gov/newtech/researchreports/reports/2016/CA16-2635_FinalReport.pdf
[67] http://innovativemobility.org/wp-content/uploads/2015/11/SharedMobility_WhitePaper_FINAL.pdf
[68] (US DOT, NHTSA) http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf
[69] Access to Destination. Chapter 7 Planning for Accessibility in Theory and in Practice. Susan Handy. 2005.
[70] http://www.vtpi.org/measure.pdf, page 4
[71] Hansen, W.G. (1959). How Accessibility Shapes Land Use. Journal of the American Planning Institute, 25, 73-76.

Victoria Transport Policy Institute: "Accessibility refers to the ability to reach desired goods, services, and activities, which is the ultimate goal of most transport activity"[72]
Handy (1993): "Accessibility, as generally defined, consists of two parts: a transportation element or resistance factor and an activity element or motivation factor. The transportation element reflects the ease of travel between points in space as determined by the character and quality of service provided by the transportation system and as measured by travel distance, time, or cost. The spatial element reflects the distribution of activities, such as residences, employment, stores, offices, and so on. This distribution is characterized by both the amount and location of different types of activities."[73]

California Air Resources Board (2013): "There are three ways to increase regional accessibility: put more potential destinations within close proximity of existing residences, put more residents within close proximity of existing destinations, and improve the transportation connections between residences and destinations."[74]

Multimodal access:

California Bike & Ped Plan: "Ensuring multimodal access requires integrating bicycle and pedestrian needs into the planning and design of all transportation systems, including rail and transit systems and services and the delivery of freight."[75]

Connectivity:

Handy, Tal, Circella (2014): "Network connectivity describes the quality of the connections that link each of the points in a community with one another. The structure of the street network, defined in terms of the patterns of streets and intersections, determines the directness of these connections, which often differ by mode (Handy, et al. 2003). From the transportation standpoint, network connectivity is defined with respect to the directness of connections to potential destinations."[76]

Victoria Transport Policy Institute: "*Connectivity* refers to the density of connections in path or road networks, and the directness of links. A well-connected network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a
more Accessible and Resilient system that reflects Complete Streets principles.

[72] Litman, Tod (2017). Accessibility for Transportation Planning. http://www.vtpi.org/access.pdf
[73] Handy, S. (1993). Regional versus local accessibility: Implications for nonwork travel. University of California Transportation Center.
[74] California Air Resources Board, 2013. Policy Brief on the Impacts of Regional Accessibility Based on a Review of the Empirical Literature. https://arb.ca.gov/cc/sb375/policies/regaccess/regional_accessibility_brief120313.pdf
[75] California State Bicycle and Pedestrian Plan, page 45.
[76] https://www.arb.ca.gov/cc/sb375/policies/connectivity/network_connectivity_brief.pdf

Connectivity can apply both internally (streets within that area) and externally (connections with arterials and other neighborhoods)." [77]

Walkability:

Victoria Transport Policy Institute: "Walkability reflects overall walking conditions in an area (Evaluating NMT). Walkability takes into account the quality of pedestrian facilities, roadway conditions, land use patterns, community support, security and comfort for walking. Walkability can be evaluated at various scales. At a site scale, walkability is affected by the quality of pathways, building accessways and related facilities. At a street or neighborhood level, it is affected by the existence of sidewalks and crosswalks, and roadway conditions (road widths, traffic volumes and speeds). At the community level it is also affected by land use Accessibility, such as the relative location of common destinations and the quality of connections between them."[78]

Facilities that accommodate multiple travel modes

Complete Streets:

NHTSA: "The Complete Streets approach starts with a policy commitment to design and operate roads that provide safe access for all users—pedestrians, bicyclists, transit riders, and motorists—and is intended to lead to roadway designs that provide for the needs of all roadway users."[79]

Victoria Transport Policy Institute: "Complete Streets refers to roadway design and operating practices intended to safely accommodate diverse users and activities including pedestrians, cyclists, motorists, public transport users, people with disabilities, plus adjacent businesses and residents. Complete Streets planning recognizes that roadways often serve diverse functions including through travel, recreational walking, socializing, vending, and nearby living, which must be considered and balanced in roadway design and management."[80]

Shared-use facility:

NHTSA: "A facility, typically a paved path, adjacent to the roadway or separate from the roadway that is designated for nonmotorized use. In general, this includes pedestrians

[77] Victoria Transport Policy Institute, 2017. Roadway Connectivity. http://www.vtpi.org/tdm/tdm116.htm
[78] Victoria Transport Policy Institute, 2017. Walkability Improvements. http://www.vtpi.org/tdm/tdm92.htm
[79] NHTSA. A primer for Highway Safety Professionals. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf, page 2.
[80] Victoria Transport Policy Institute, 2017. Complete Streets. http://www.vtpi.org/tdm/tdm133.htm

and bicyclists, but some shared-use facilities are also designated for rollerbladers, skateboarders, and equestrians." [81]

Bicycle boulevard:

NACTO: "Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets." [82]

Low-stress bicycle network:

NHTSA: "A bicycle network that attracts bicyclists of all ages and abilities by offering separated lanes and paths, as well as signed routes along low-volume roads." [83]

Mekuria, Maaza C., Peter G. Furth, and Hilary Nixon. (2012): "its most fundamental attribute should be low-stress connectivity, that is, providing routes between people's origins and destinations that do not require cyclists to use links that exceed their tolerance for traffic stress, and that do not involve an undue level of detour." [84]

Terms related to communities burdened by poor public health, quality of life, economic opportunities, or mobility

Environmental Justice:

2015 MPO RTP Review Report: Environmental Justice–is the fair treatment and meaningful involvement of all people with respect to the development, implementation, and enforcement of laws, regulations, and policies.[85]

Transportation Equity:

Victoria Transport Policy Institute/Oxford Lit review: refers to both the vertical (between different levels of social or income classes) and the horizontal (between all people in a similar classes) distribution of impacts (benefits and costs), from provision and

[81] NHTSA. A primer for Highway Safety Professionals. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf, page 96.
[82] NACTO. Urban Bikeway Design Guide. http://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/
[83] NHTSA. A primer for Highway Safety Professionals. http://www.ssti.us/wp/wp-content/uploads/2016/05/812258-Peds_Bike_Primer.pdf, page 95.
[84] Mekuria, Maaza C., Peter G. Furth, and Hilary Nixon. (2012). Low-stress bicycling and network connectivity.
[85] http://www.dot.ca.gov/hq/tpp/offices/orip/rtp/index_files/RTPReviewReportlastedit428.pdf

experience of transportation facilities and whether that distribution is considered fair and appropriate. [86, 87]

NCST: "An equitable transportation system would ensure that the benefits and burdens created by transportation projects, policies, and plans are shared fairly such that no groups would be unduly burdened by a lack of access to adequate transportation nor by the negative effects of proximity to transportation infrastructure. (Karner, Rowangould, & London, 2016)"[88]

The Caltrans Transportation Equity Branch: "promotes the involvement of disadvantaged and underrepresented communities, and Native American tribal governments in the planning for transportation projects. Transportation Equity has a clear focus on transportation and community development issues to prevent or mitigate disproportionate, negative impacts that are traditionally experienced in disadvantaged and underrepresented communities."[89]

Transform: movement to redefine transportation in terms of access, health, justice, and sustainability[90]

The Transportation Equity Act of the 21st Century (TEA-21): "In allocating funds, the Secretary shall ensure equity of distribution among a diversity of populations and geographic regions."[91]

The plans must:

1. support the economic vitality of the metropolitan planning area, especially by enabling global competitiveness, productivity and efficiency;
2. increase the safety and security of the transportation system for motorized and non-motorized users ;
3. increase the accessibility and mobility options available to people and for freight;
4. protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns (altered by SAFETEA-LU);
5. enhance the integration and connectivity of the transportation system across and between modes of transport, for people and freight;
6. promote efficient system management and operation; and
7. emphasize the efficient preservation of existing transportation systems.

[86] http://www.vtpi.org/equity.pdf
[87] http://www.tsu.ox.ac.uk/pubs/1055-markovich-lucas.pdf
[88] https://ncst.ucdavis.edu/wp-content/uploads/2016/12/NCST_EquityWhitePaper-FINAL.pdf
[89] http://www.dot.ca.gov/hq/tpp/offices/orip/transportation_equity.html
[90] http://www.transformca.org/california
[91] https://www.fhwa.dot.gov/tea21/factsheets/consol.pdf

Ca Transportation Plan 2025: "Transportation equity means having an affordable, accessible transportation system that serves all Californians. Transit equity addresses the needs of traditionally under-served groups, including rural, low-income, disabled, minority, and senior populations. Transportation is a key component in addressing unemployment, equal opportunity goals, and ensuring equal access to education, employment, health care, and other essential services. The burden of poor transit alternatives falls most heavily on Californians who cannot easily use or afford automobile travel."[92]

Related:

Ca Bik-Ped Plan, 2017 Draft: "Equity is addressed in this Plan consistent with the California Transportation Plan 2040 and the Smart Mobility Framework, with a focus on providing mobility for people who are economically, socially, or physically disadvantaged in order to support their full participation in society. Social Equity strategies seek to support disadvantaged communities, people of color, and those who rely on walking, bicycling, and transit by designing and managing an active transportation system that equitably distributes its benefits and burdens. …works to narrow gaps, overcome inequities, and improve overall outcomes by considering the distribution of positive and negative impacts of investments."[93]

2015 MPO RTP Review Report: "Social equity means ensuring that all people are treated fairly and are given equal opportunity to participate in the planning and decision-making process, with an emphasis on ensuring that traditionally disadvantaged groups are not left behind."[94]

Other terms considered: "social equity", "underrepresented community", "historically underserved", "equitable distribution" [95]

Convenience to transit options

Location efficiency:

SGC: "Location efficiency" –refers to the comprehensive environmental, health, and community impacts of a facility's location, including its effect on users' transportation options and related greenhouse gas (GHG) emissions…. An efficient location generates fewer vehicle miles of travel, reduces a user's commute burden, promotes a healthy and attractive workplace environment, and can help attract and retain current and future

[92] http://www.dot.ca.gov/hq/tpp/offices/osp/ctp_historic_files/CTPwsDiscussion.pdf
[93] http://www.cabikepedplan.org/files/managed/Document/194/CSBPP%20DRAFT%202017-02-07_website.pdf
[94] http://www.dot.ca.gov/hq/tpp/offices/orip/rtp/index_files/RTPReviewReportlastedit428.pdf
[95] http://www.dot.ca.gov/hq/tpp/offices/ocp/Smart_Mobility_Framework_Factsheet.pdf

generations of younger State employees who statistically prefer less auto-reliant environments.[96]

Smart Mobility 2010: Location efficiency – Integrates transportation and land use in order to achieve high levels of non-motorized travel and transit use, reduced vehicle trip making, and shorter average trip length while providing a high level of accessibility and "Location-efficient community design elements contribute to the development pattern and transportation system at the neighborhood and district scale that combine to support convenience, non-motorized travel, and efficient vehicle trips."

Related:
Location-Efficient Community Design[97] (Note: was in 2010 Smart Mobility plan)
Location-Efficient Regional Accessibility [98](Note: was in 2010 Smart Mobility plan)

Priority development area:

ABAG: areas where new development will support the day-to-day needs of residents and workers in a pedestrian-friendly environment served by transit.[99]

MTC: areas within existing communities that local city or county governments have identified and approved for future growth.[100]

Alameda County: infill sites where greater density could be accommodated near transit stops. An area must be in an existing community, near transit service and planned for more housing[101]

Transit oriented:

CNT: location near transit options that increases location efficiency (a rich mix of housing, jobs, shopping, and recreation choices.[102]

FTA: "TOD focuses growth around transit stations to promote ridership, affordable housing near transit, revitalized downtown centers and neighborhoods, and encourage local economic development."[103]

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[96] http://sgc.ca.gov/resource%20files/120606-ITEM11LocationEfficiency.pdf
[97] http://www.dot.ca.gov/hq/tpp/offices/ocp/documents/smf_files/SMF_handbook_062210.pdf
[98] http://www.dot.ca.gov/hq/tpp/offices/ocp/documents/smf_files/SMF_handbook_062210.pdf
[99] http://mtc.ca.gov/sites/default/files/0-Introduction.pdf
[100] http://mtc.ca.gov/our-work/plans-projects/focused-growth-livable-communities/priority-development-areas
[101] http://www.alamedactc.org/files/managed/Document/10698/AlamedaCounty_PDA_IGS_Final_March_2013.pdf
[102] http://locationefficiency.cnt.org/transit-oriented-development/

2002 CA DOT TOD study: "…located within an easy walk of a major transit stop, generally with a mix of residential, employment and shopping opportunities designed for pedestrians without excluding the auto.[104]

Papa and Bertolini (2015): "the degree of correlation between the railway network connectivity and the distribution of densities in the whole urban area"[105]

Other terms considered: "location proximity"

Terms related to vehicle volume and capacity

Capacity:

Caltrans glossary: The maximum number of vehicles or persons that can pass a point on a roadway during a specified time period (usually one hour) under prevailing roadway, traffic and control conditions. [106]

Caltrans, on freeways: Recurrent congestion is defined as a condition lasting for 15 minutes or longer where travel demand exceeds freeway design capacity. "Non-recurrent" congestion is defined as backups caused by special circumstances, such as accidents, stalled vehicles, sporting events, etc. Studies show that non-recurrent delay can be equal or greater than recurrent delay.[107]

US DOT: A transportation facility's ability to accommodate a moving stream of people or vehicles in a given time period.[108]

Related terms:

Level of Service: (USDOT planning glossary): 1) A qualitative assessment of a road's operating conditions. For local government comprehensive planning purposes, level of service means an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service indicates the capacity per unit of demand for each public

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[103] https://www.transit.dot.gov/funding/grants/transit-oriented-development-planning-pilot
[104] http://www.dot.ca.gov/hq/MassTrans/Docs-Pdfs/TOD-Study-Final-Rpt.pdf
[105] http://s3.amazonaws.com/academia.edu.documents/38979841/1-s2.0-S096669231500126X-main.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1496119033&Signature=48XvdlcPkZVfOq2de1beEHdKbbs%3D&response-content-disposition=inline%3B%20filename%3DAccessibility_and_Transit-Oriented_Devel.pdf
[106] http://www.dot.ca.gov/dist05/planning/glossary.pdf
[107] http://www.dot.ca.gov/hq/paffairs/faq/faq77.htm
[108] https://www.fhwa.dot.gov/planning/glossary/search_result.cfm

facility. 2) This term refers to a standard measurement used by transportation officials which reflects the relative ease of traffic flow on a scale of A to F, with free-flow being rated LOS-A and congested conditions rated as LOS-F.[109]

Induced travel:

Handy and Boarnet (NCST): "An increase in vehicle miles traveled (VMT) attributable to increases in capacity is called "induced travel."[110] (Handy and Boarnet, 2014)

VTPI: "shifts from other modes, longer trips and new vehicle trips[111] (Litman, 2001)

CA DOT Smart Mobility: "Travel that occurs as a result of a decrease in the generalized cost of travel, including both travel-time and out-of-pocket costs. Induced travel may be a result of changes to one or more of the following traveler choices: new trip generation, longer trips, trips to different destinations, reduced trip consolidation or "chaining," use of different modes, different travel routes, or travel at different times of day. Induced vehicle travel may occur as a result of roadway expansion." [112]

Latent demand:

Caltrans presentation, Patricia L. Mokhtarian, 2004: "Latent Demand is pent-up (dormant) demand for travel, travel that is desired but unrealized because of constraints"[113, 114]

VTPI: "additional peak-period vehicle trips that will occur if congestion is relieved" (Litman, 2001)

Traffic congestion:

Caltrans planning glossary: Defines "congestion" as, reduced speeds of less than 35 miles per hour for longer than 15 minutes.[115]

USDOT: an excess of vehicles on a portion of roadway at a particular time resulting in speeds that are slower—sometimes much slower—than normal or "free flow" speeds.[116]

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[109] https://www.fhwa.dot.gov/planning/glossary/search_result.cfm
[110] https://www.arb.ca.gov/cc/sb375/policies/hwycapacity/highway_capacity_brief.pdf
[111] http://www.vtpi.org/gentraf.pdf
[112] http://www.dot.ca.gov/hq/tpp/offices/ocp/documents/smf_files/SMF_handbook_062210.pdf
[113] *www.dot.ca.gov/researchconn/past.../DrMokhtarian/induced_demand_powerpoint.ppt*
[114] http://www.dot.ca.gov/researchconn/past_speakers/
[115] http://www.dot.ca.gov/dist05/planning/glossary.pdf
[116] https://ops.fhwa.dot.gov/congestion_report/chapter2.htm#content

Affabuzzaman, on measuring traffic congestion (Institute of Transport Studies, Monash University): Traffic congestion "definitions can be broadly categorized into three groups: (i) demand capacity related, (ii) delay-travel time related, and (iii) cost related."[117]

Volume:

Caltrans glossary: The number of vehicles passing a given point during a specified period of time.[118]

Other terms considered: "generated traffic", "capacity utilization"

Vehicles and people colliding through direct impact

Crash:

Washington Post: Accident because it infers that there is nothing could have been done to prevent it. [119]

Transportation terms relating to conserving environmental resources

Sustainability:

Caltrans: "Preserve or enhance California's people, planet, and prosperity to improve the quality of life by meeting the present generation needs without compromising future generation's ability to meet their own needs."[120]

US FHWA: "meets the needs of the present without compromising the ability of future generations to meet their own needs."[121]

CA HSR: "Sustainability is the capacity to endure. Practical application of sustainable thinking recognizes how current decisions affect the capacity of current and future generations to lead healthy and rewarding lives.[122]
Ca DOT 2010 Smart Mobility: "…meeting the needs of the present population without compromising the ability of future generations to meet their own needs. Sustainability

[117] http://atrf.info/papers/2007/2007_Aftabuzzaman.pdf
[118] http://www.dot.ca.gov/dist05/planning/glossary.pdf
[119] https://www.washingtonpost.com/news/wonk/wp/2015/08/24/when-a-car-crash-isnt-an-accident-and-why-the-difference-matters/?utm_term=.c4a594113f2e
[120] http://www.dot.ca.gov/sustainability/
[121] https://www.fhwa.dot.gov/policy/2010cpr/pdfs/part3.pdf
[122] http://www.hsr.ca.gov/docs/programs/green_practices/sustainability/Sustainability_signed_policy.pdf

in the context of the California Transportation Plan and many other policy documents is articulated relative to the 3 Es of equity, environment and economy."[123]

Litman and Burwell: "sustainability ultimately reflects the goals of equity, ecological integrity and human welfare, regardless of time or location."[124]

Sustainable mobility:

Banister: "The sustainable mobility approach requires actions to reduce the need to travel (less trips), to encourage modal shift, to reduce trip lengths and to encourage greater efficiency in the transport system" (Banister, 2008)[125]

CA HSR: "Transportation that does not rely on the use of fossil fuels."[126]

US DOT: "For the Federal Highway Administration (FHWA), a sustainable approach to transportation means decision makers are able to make balanced and efficient choices among environmental, economic, and social values—the triple bottom line of sustainability—that will provide the best benefits to the natural and human environment now and in the future. A sustainable approach includes a wide variety of activities and a diversity of concepts that support the triple bottom line principles. These include efficient use of funding, incentives for construction quality, climate change considerations, and civil rights. Using sustainable approaches in transportation planning, investments, operations, and other phases of transportation project delivery will help decision makers enhance quality of life, and serve current transportation needs without compromising the ability of future generations to meet their needs."[127]

Ramani and Zietsman: "while sustainability may be a common policy goal, transportation planning and policy can also be driven by other goals and priorities. This can include 'traditional' transportation planning paradigms which focus more on basic mobility, to other paradigms that are somewhat related to sustainability, such as livability, resilience, smart growth, public health, and climate adaptation." "For example, sustainable transportation also depends on factors such as land use, economics, and demographics. This makes it difficult for transportation agencies to effect meaningful change on their own, without collaboration with other agencies and sectors (Marsden & May, 2006; Richardson, 2005)." –but, how to balance the three E's – which is a priority? - Issues of definition, measurement, and implementation" *(Ramani and Zietsman, 2016)*

Oswald and McNeil: "Sustainable transportation "allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and

[123] http://www.dot.ca.gov/hq/tpp/offices/ocp/documents/smf_files/SMF_handbook_062210.pdf
[124] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.192.1999&rep=rep1&type=pdf
[125] http://www.sciencedirect.com/science/article/pii/S0967070X07000820
[126] http://www.hsr.ca.gov/docs/programs/green_practices/sustainability/Sustainability_signed_policy.pdf
[127] https://www.transportation.gov/mission/sustainability/sustainable-highways

ecosystem health and with equity within and between generations, it is affordable, operates efficiently, offers choice of transportation mode, supports a vibrant economy, limits emissions and waste within the planet's ability to absorb them, minimizes consumption of nonrenewable resources, reuses and recycles its components, and minimizes the use of land and the production of noise" Centre for Sustainable Transportation 1998. *(Oswald and McNeil, 2010)"*[128]

Black ("Sustainable Transport"): "a system is one that provides transport and mobility with renewable fuels while minimizing emissions detrimental to the local and global environment and preventing needless fatalities, injuries, and congestion." (Black 2010)[129]

Related terms:

A general search shows that "***smart mobility***" means 1. a "brand", 2. related to people in wheelchairs)

(2010) Smart Mobility moves people and freight while enhancing California's economic, environmental and human resources by emphasizing convenient and safe multi-modal travel, speed suitability, accessibility, management of the circulation network, and efficient use of land. …responds to the transportation needs of the State's people and businesses, addresses climate change, advances social equity and environmental Justice, supports economic and community development, and reduces per capita vehicle miles traveled.[130]

Other terms considered: "sustainable transportation", "efficiency", "smart mobility", "sustainable growth", "energy conservation", and "clean economic growth".

[128] http://ascelibrary.org/doi/pdf/10.1061/(ASCE)UP.1943-5444.0000016

[129] https://books.google.com/books?id=ijc9SlvmZDUC&pg=PA3&lpg=PA3&dq=define+sustainability+transportation&source=bl&ots=OHt_Z67acz&sig=AoCXAvgUmztu7CBgG3Nb30mIhYg&hl=en&sa=X&ved=0ahUKEwiHtvzN-oPUAhUlsFQKHcoCDIQQ6AEIeTAP#v=onepage&q=define%20sustainability%20transportation&f=false

[130] http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html

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