The Planning Commissioner Handbook

Chapter 9

Transportation

INSTITUTE FOR LOCAL GOVERNMENT℠

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Government Role in Managing Transportation Systems

Transportation and circulation systems are important to the local economy and quality of life. A capable transportation system helps ensure adequate employment and mobility. The extent to which the planning commission can tackle transportation issues varies among communities. Some communities have transportation commissions that are separate from the planning commission, and most metropolitan areas also have regional transportation authorities that take the lead on regional transportation planning. Nonetheless, it's important for planning commissioners to understand many aspects of the transportation system as they affect community planning.

Transportation planning and governance occurs at many different government levels: federal, state, regional and local. The federal government dictates transportation safety and air quality requirements and provides transportation funding to the lower levels of government. The state, regional and local transportation agencies fund, plan, construct, operate and maintain different transportation infrastructure.[1]

Levels

Federal

The U.S. Department of Transportation (DOT) is the main federal agency that carries out the U.S. Congress's funding directives and transportation policies. The U.S. DOT is made up of nine administrations, each specializing in a particular mode or aspect of transportation, such as highways, transit, railroads, aviation and maritime. The Congestion Mitigation and Air Quality Improvement (CMAQ) Program, managed by U.S. DOT, distributes funding to states for transportation projects that reduce traffic congestion and improve air quality to meet national air quality standards.[2]

State

The California Legislature determines the state's transportation expenditure priorities and establishes the state's revenue resources. The state also distributes certain federal and state funds to regional and local transportation agencies. Some major transportation state agencies include California Department of Transportation (Caltrans), the High-Speed Rail Authority and the California Transportation Commission. The California Transportation Commission approves and oversees transportation projects proposed by Caltrans. Caltrans owns and operates all state-designated highways and has authority to make its own decisions regarding these facilities with only limited local input.

Regional

California has two types of regional transportation planning bodies: 1) Metropolitan Planning Organizations (MPOs) for urbanized areas with a population over 50,000 and 2) Regional Transportation Planning Agencies (RTPAs) which oversee rural areas of the state. MPOs prepare Regional Transportation Plans (RTPs), which prescribe the urbanized area's long-term transportation needs and priorities and specific transportation projects for the federally funded Transportation Improvement Program (TIP). As part of Senate Bill 375, RTPs also include Sustainable Communities Strategies (SCSs), which strive to

1 Legislative Analyst's Office, 2021, August 18, California's Transportation System, https://lao.ca.gov/Publications/Report/3860.
2 U.S. Department of Transportation, 2021, August 18, Federal Programs Directory: CMAQ Improvement Program, https://www.transportation.gov/sustainability/climate/federal-programs-directory-congestion-mitigation-and-air-quality-cmaq.

achieve greenhouse gas emissions reduction targets set by the California Air Resources Board (CARB).[3] SCSs contain strategies to integrate transportation, housing and land use decisions to meet CARB's climate goals. RTPAs perform similar activities as MPOs but for rural areas.

The "self-help counties," which include most of the state's most urbanized counties, have passed county-wide sales tax measures that generate funds for transportation projects. These are typically administered by a specialized body created to oversee these funds, usually referred to as a "transportation authority" or "transportation commission." Funds from these sales tax measures, as well as funds from the state and federal governments, often flow through these regional agencies to local governments.

Congestion Management Agencies (CMAs) coordinate transportation planning, land use and air quality measures through reducing traffic congestion and decreasing reliance on motor vehicle use at a county level.[4] CMAs create and update long-range Countywide Transportation Plans (CTPs), which contain transportation investment priorities for the next 20 to 30 years.

In many of California's regions and subregions, CMA functions are undertaken by MPOs, RTPAs and/or transportation agencies overseeing transportation sales tax funds. Note that some regions have a single entity that handles all transportation planning, while others have several agencies the work together to provide planning. Check with your own agency to understand who is responsible for regional transportation planning and how your jurisdiction is represented.

Local

Local governments, typically at the county and city level, manage and maintain local streets and roads in their jurisdictions. Local transportation policies and objectives are prescribed in the jurisdiction's general plan circulation element and/or active transportation plans such as bicycle, pedestrian, and/or safe routes to school plans.

3 California Air Resources Board, 2021, August 19, What are Sustainable Communities Strategies?, https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/what-are-sustainable-communities-strategies

4 ChangeLab Solutions, 2021, August 19, Getting Involved in Transportation Planning, https://www.changelabsolutions.org/sites/default/files/Health_Transport_Factsheet_FINAL_20110713_%28rebrand_20130409%29.pdf.

Transportation Modes

One of the most basic concepts in transportation is that of different “modes,” which refers to the form of transportation, such as cars and trucks (collectively referred to as “vehicles” bikes, walking and transit (which is a collective term that covers buses, rail, ferries and other shared systems). Planners will often refer to a facility that accommodates more than one mode of transportation as “multi-modal.” Since some modes (such as bicycling, walking and transit) generally have lower environmental impacts than others (such as vehicles), encouraging “non-vehicular mode choice” is often a primary goal of transportation planning.

Trip Generation

To plan for future transportation needs there needs to be an estimate of transportation demand. Trip generation is usually based on engineering studies such as produced by the Institute of Traffic Engineers Trip Generation Manual (ITE) that provides a range of trip estimates by land use type. Some regions have prepared their own trip generation estimates so be sure to check with your agency to understand the source of the trip generation estimates. The trip generation figures are often expressed in terms of peak hours which can be different for each project.

Streets, Roads and Vehicular Travel

Street Types

The U.S. Department of Transportation's Federal Highway Administration (FHWA) classifies urban and rural streets by a hierarchy of three functions. Each of the three street types have designated design standards, including allowable lane widths, shoulder widths, curve radii, etc. These street types are:

- **Arterial.** With higher speeds, increased widths and significantly greater vehicle capacity, arterial streets are the largest type of surface street, and typically serve to convey vehicles across communities, as well as to larger, limited-access state or interstate highways. Arterial streets frequently feature widely spaced intersections and relatively few pedestrian crossings. Single-family residential uses are less common along arterial streets, which are instead usually dominated by commercial, office, industrial and multi-family residential land uses.
- **Collector.** Collector streets tend to be moderately-sized, with somewhat higher vehicle speeds and volumes of traffic. As their name would suggest, collector streets collect traffic from local streets and direct it toward larger arterials. Collector streets are most likely to feature a variety of land uses, including single- or multi-family residential, institutional, recreational, or even low-intensity commercial, office or industrial uses.
- **Local.** Local streets tend to be the smallest street type, with narrow widths, low speeds and limited traffic volumes. Such streets are most often flanked by low- to medium-intensity residential uses or, in some cases open space, recreational or institutional land uses, such as parks and schools. Local streets are usually intended as the first leg in vehicle trips originating from homes and as the final leg of the return trip. Though local streets may at times intersect with larger arterial streets, local streets most often interface with collector streets.

Each agency develops their own list of street types that are generally variations of the above that can include both public and private ownership. These standards are usually in the general plan and engineering development standards for the agency.

Vehicle Miles Traveled (VMT)

Under Senate Bill 743, passed in 2013, the most important way that vehicular travel is measured and mitigated is through assessment of vehicle miles traveled (VMT). VMT measures the total amount of driving in a community and provides a holistic lens through which to view the roadway transportation system's impact on the climate, environment, human health and access to economic and social opportunity.[5] Communities and projects that generate relatively low VMT allow people to make short trips and travel by modes of transportation other than cars, such as biking, walking and transit, thereby producing societal benefits such as improving air quality from auto emissions and making more efficient use of the land.

Today, much of planning focuses on creating communities and projects that can minimize VMT. This occurs by approving projects in centralized locations, increasing residential and employment densities, developing projects with a mixture of uses and creating transportation facilities that support non-vehicular modes.

5 Governor's Office of Planning and Research, 2021, August 5, SB 743 Frequently Asked Questions, https://opr.ca.gov/ceqa/updates/sb-743/faq.html.

Roadway Capacity and Congestion

Beyond looking at VMT, you may also discuss roadway and vehicular transportation issues in terms roadway capacity and traffic congestion. Community members often desire to minimize congestion on their streets, and the traffic impact of a new development is often measured in terms of trip generation figures and impact on congestion. A "trip" is a one-way commute between a production point (such as a home) and an attraction location (such as work). For example, the transportation impact of a commercial site might be expressed in terms of the trips to and from the site made by workers, customers, visitors and employees traveling for business and personal reasons. This figure can be further broken down into number of persons driving alone, riding as passenger (ridesharing), using public transit, riding bicycles and walking.

The capacity of a main or ancillary road to absorb additional vehicle trips that would be generated by a project depends on the number of lanes it contains. Mechanisms like left-turn lanes, wide shoulders, signals, stop signs and other traffic management tools also affect road capacity. The general roadway capacity standards are set by each agency.

Traffic Level of Service (LOS) Standards

Traffic engineers can measure the quality of traffic flow in terms of level of service (LOS) standards that considers the capacity of a roadway versus the volume of traffic it is carrying. Other standards are expressed as total vehicle delay or the average "floating car" speed. Measurement of vehicle delay is more focused on accommodating the auto driver, as increased vehicle delay can cause driver discomfort/frustration and extended travel time to a destination. LOS standards are applied to intersection capacity and operating characteristics.

The ideal LOS standards for a community are often set in the circulation element of the general plan. Typical language may read, "all intersections will operate at level of service D or better except those within one-quarter mile of a freeway off-ramp, which may operate at level of service E." Mitigation actions—like street widening, bicycle paths, increased mass transit options or traffic signals—can then be added to increase capacity (for various transportation demand management strategies) or manage demand.

LOS standards can be confusing because of the letter system by which they are expressed. School students generally seek to earn only As and Bs, so it can be tempting to assume that only LOS A and B (or perhaps C) are acceptable. In fact, LOS D is quite acceptable in most cases, and LOS E or even F might be acceptable in some parts of a community. As a planning commissioner, you should work with your staff and other commissioners to decide what Level of Service is appropriate in each part of your community.

Table 1. LOS Roadway and Intersection Operation Conditions

LOS	Roadway Operation	Intersection Operation
A	Free flow conditions, minimal traffic volumes given the available approach, stable roadway capacity.	Light to moderate traffic queues, little additional delay.
B	Stable flow conditions, vehicle maneuverability restricted to some extent.	Same as above.
C	Traffic flows smoothly, but vehicle maneuverability is restricted. Ability to recover from momentary conflicts without undue delay.	Moderately heavy traffic on approach, longer but stable queues, moderate but acceptable delay.
D	Traffic generally flows smoothly; however, occasional momentary congestion occurs.	Heavy traffic on approach, long unstable queues, some excessive delays.

LOS	Roadway Operation	Intersection Operation
E	Traffic flows under congested conditions; the maximum volume that the road can handle.	Heavily congested traffic conditions, excessive delays.
F	Traffic flows sporadically; stop and go conditions usually due to upstream bottleneck.	Demand exceeds capacity.

While LOS can be an effective method of sizing roadways, its ineffective in measuring actual efficiency because it only looks at vehicles and not occupancy of the vehicles. This means that a car with three people in it is treated the same as a car with a single occupant resulting in a larger roadway than might otherwise be necessary. Roadways, and especially their maintenance, are expensive. By reducing the need to widen roadways communities can save money, use their existing resources more efficiently, and encourage people to use other modes of transportation.

Complete Streets

Transportation policies often focus on the automobile, but planning commissioners also need to consider public transit, rail, bicycles and walking as important to the mobility mix. In 2008, the Complete Streets Act (AB 1358), was signed into law, which required government agencies to include "complete streets" concepts that address the safety and mobility of all users when updating the circulation element of their General Plans. Complete streets relate to the creation of a multi-modal road and transportation system that supports a variety of transportation types for the benefit of all road and transportation system users, which includes bicyclists, pedestrians, transit riders, motorists, movers of commercial goods, children, people with disabilities and seniors.

In response, many communities have adopted complete streets policies, which require the integration of complete streets design into transportation projects. Complete streets improvements include sidewalks, bike lanes, pedestrian crossings and signals, narrower travel lanes, dedicated bus lanes, bus islands and shelters and more. Local governments also create and adopt complete streets Plans that contain policies, recommendations and designs for these types of improvements, typically for a transportation corridor within the jurisdiction.

Traffic Calming

The objective of traffic calming measures is to reduce the speed of automobile travel to provide a safer and more pleasant environment for pedestrians and bicyclists. Traffic calming improvements change the roadway such that most drivers naturally slow down. Some examples of traffic calming measures are:

- Vertical deflections like speed humps, speed tables and raised intersections
- Horizontal diversions like chicanes and curb extensions
- Roadway narrowing where there is a reduction in the width or number of vehicular lanes to provide space for other improvements like bike lanes or parking[6]

6 U.S. Department of Transportation, 2021, August 5, Traffic Calming to Slow Vehicle Speeds, https://www.transportation.gov/mission/health/Traffic-Calming-to-Slow-Vehicle-Speeds.

Freight

Planning commissioners should balance the importance of freight (e.g., delivery trucks) to the local and regional economy with freight's negative externalities that can impact communities.[7] These negative externalities include noise, congestion and air pollution. Freight planning should consider whether existing or future truck routes pass through residential, pedestrian-heavy commercial and environmentally sensitive areas. For example, it may not be beneficial for a truck route to be located along a vibrant, slow-moving retail corridor with heavy pedestrian traffic. Planning for freight in commercial or industrial areas should accommodate for curbside deliveries through designated loading areas so that trucks do not block other traffic on the roadway.

7 American Planning Association, 2021, August 4, APA Policy Guide on Freight. https://www.planning.org/policy/guides/adopted/freight/.

Parking

The need for parking is one of the most pronounced effects of our society's reliance on the automobile as our primary mode of transportation. Not only do we need places to drive our cars, we also need places to park them. The land dedicated to parking can take up a large percentage of a development area, thereby reducing land available for buildings, open space and other amenities. To the extent that we can lessen reliance on the automobile and provide for mixed use developments that are in use for most of the day and night, we also lessen the need for parking, thereby increasing the land supply available for other uses. Moreover, parking can be very expensive, so lessening parking demand can save money.

Parking facilities—and the policies that direct their development—have a significant bearing on the accessibility and the attractiveness of an area. The amount, location and pricing of parking influences both business development and individual transportation decisions. Since parking is an essential element of an automobile trip, parking programs can either improve or impede automobile accessibility, ridesharing participation and transit usage. It's important to provide adequate parking to serve the uses in the area, but not so much that the abundance of parking discourages use of other transportation methods.

On-street Parking and Curb Management

On our public streets, curbside lanes are traditionally used for on-street parking, which can be regulated or unregulated. Parking regulations can require parking time limits and/or payment via the use of meters, pay boxes or parking permits.

Increasingly, curbside lanes are also being used for other uses, such as drop-off and loading of ride-hailing users and goods, transit, bike share, parklets and green infrastructure. As competition between public and private interests increases, it is important for local agencies to encourage curb management practices that balance the needs of pedestrians, cyclists, transit, cars, local businesses and the environment. Emerging technologies in transportation and the increase of e-commerce delivery trucks are already changing how curbs are used. Ride-hailing services, bike share stations and autonomous vehicles can compete with parking and transit uses if not designed or priced correctly. In response, some jurisdictions are experimenting with "flex zones" or "flexible curbs," which allow for different types of uses to be located in place of on-street vehicle parking, in some cases only at designated times.

Off-street Parking and Parking Standards

Local governments generally regulate off-street parking through regulations that govern the number of parking spaces required for each type of development, based on the concept of "parking demand," which is a function of the number of automobiles that will be attracted to a site and the length of time they remain there during the day. Factors like parking fees, quality of available transit and general parking availability will influence the overall parking demand associated with a given use.

Parking requirements for new projects are usually formulated for specific uses and incorporated into the development or zoning code and design standards. For example, apartments might require 1.5 spaces per unit and a shopping center might require one space per every 100 square feet. Some uses may have exemptions from parking standards based on special use permits (for example, a convalescent hospital may have a lower requirement than a regular hospital because of the nature of its clients).

Large minimum parking requirements and freely available parking encourage automobile travel. For this reason, many communities have recently lowered their minimum parking requirements for specific uses. Some communities have also undertaken other efforts to lessen the need for (and the social and environmental impacts of) off-street parking. These

include:

- Eliminating minimum parking requirements, allowing individual developers to provide parking as they see fit.
- Adding maximum parking requirements, which prohibit developers from providing excessive parking and thereby potentially inducing people to drive.
- Decoupling or delinking parking from building projects. In these situations, “free parking” cannot be tied to a project. Instead, users must pay for parking separately from the buildings that they own or rent, which creates a financial incentive for people to find other modes of transportation other than driving.

Planning commissioners should consider the zoning code’s minimum and maximum parking standards specific to a project, which includes the project’s use, density and zoning district. Where feasible, especially in dense areas of development and near transit, planning commissioners should aim to adopt as low of a parking standard as possible to promote the use of other travel modes such as walking, biking and riding transit, and minimize the amount of space on the project site dedicated to parking.

Transportation Demand Management (TDM)

Your community's planning documents may include goals that encourage transportation demand management (TDM) solutions for planning and development issues. Managing transportation demand is about providing travelers, regardless of whether they drive alone, with travel choices, such as work location, route, time of travel and mode. In the broadest sense, demand management is defined as providing travelers with effective choices to improve travel reliability. Implementation of one or more TDM measures can be a condition of development approval for new development projects. Typical examples of TDM measures are listed below.

Table 2. Transportation Demand Management Strategies

Demand Management	Facility Measures	Program Measures
Ridesharing	• Passenger loading zone • Designated carpool/vanpool • Preferential space assignments	• Ridesharing matching service • Flexible work hours • Parking space/parking rate reductions • Van leasing
Transit	• Passenger waiting shelter • Bus turnout • Subsidy to transit district for improved service • Land dedication for bus transfer center or fixed guideway system	• Transit pass sales • Transit pass subsidy for employees/tenants • Flexible work hours
Bicycling	• Secure bicycle lockers or racks • Showers and clothes lockers • Bicycle paths	• Flexible work hours

Transit

Planning commissioners should be aware of the various types of transit and how these transit networks integrate with the built environment. The most common types of mass transit are:

- **Bus.** Public buses are an integral part of local and regional transit networks as they provide connecting trips for residents on the ground to various community destinations. Bus planning includes consideration of bus routes, frequency and reliability. It is also important to ensure that bus amenities such as benches, bus shelters and bike parking are provided at transit hubs and near high density residential areas.
- **Bus rapid transit.** Bus rapid transit (BRT) is a busway system that is designed to provide higher capacity and faster service than the traditional busway system. This is usually achieved by providing higher frequency of buses, larger/longer buses and/or bus-only lanes.
- **Light rail.** Light rail includes lighter weight vehicles, like trams, often traveling at grade levels. They require less infrastructure than heavy rail systems, and often include overhead lines to power the light rail vehicle.
- **Heavy rail.** Heavy rail can include subways, railroad trains and overhead trains. These transit systems require larger infrastructure and right-of-way for its tracks.
- **Ferry.** Ferry systems carry its passengers via a boat across a body of water, like a bay.

Transit Oriented Design

When reviewing development projects located near mass transit, typically called transit oriented development (TOD), you should ensure that the densities for these projects are high enough to support transit ridership. Zoning codes, overlay zones and specific plans typically establish minimum unit density, building types or sizes and/or floor area ratio (FAR). These standards help developers determine the appropriate building size, unit mix and other design features when designing their TOD projects.[8] Establishing minimum densities (and eliminating maximum densities) allow for clustering of uses to create the needed critical mass for a thriving transit hub.

The table below shows the residential densities needed to support different forms of transit for various TOD settings.

Table 3. Transit-Supportive Residential Densities[9]

Transit Type	TOD Settings		
	Urban Downtown (minimum du/acre)	Urban Neighborhood (minimum du/acre)	Suburban Town Center / Commuter Town (minimum du/acre)
Bus	50	25	15
Rail	75	40	30

8 Metro, 2021, August 5, Minimum Densities, https://www.metro.net/projects/tod-toolkit/minimum-densities/.

9 Metropolitan Council, 2021, August 30, Land Use Densities: Rules of Thumb, https://metrocouncil.org/Communities/Services/Livable-Communities-Grants/Transit-Oriented-Development/TOD/Metropolitan-Council-TOD-Guide-Land-Use-Densities.aspx.

The fact that certain minimum densities are needed to support transit also explains why not all existing neighborhoods have extensive transit systems. As shown in the table, the densities in most single-family and rural areas are nowhere near high enough to support even local bus service. As a planning commissioner, it may be important to be able to explain to constituents in lower density areas why convenient transit service cannot easily be made available to them.

Active Transportation

Active transportation, also called non-motorized transportation, is a means of getting around by human energy, generally by walking or biking. Communities sometimes prioritize facilities to support active transportation over those that support automobiles to promote healthier lifestyles for residents and a healthier environment by reducing traffic congestion and greenhouse gas emissions. This can be accomplished by the creation of an active transportation plan and/or a pedestrian and bicycle plan, containing a comprehensive set of strategies to provide more and safer options for biking and walking. These plans often describe the existing conditions for biking and walking, and propose recommendations related to infrastructure, programs and policies.

Pedestrian Facilities

Pedestrian facilities provide comfortable and safe infrastructure for both people who walk and those with disabilities such as people in wheelchairs or have hearing/visual impairments. Pedestrian facilities should be highly visible to nearby motorists and bicyclists and provide adequate space for movement. Pedestrian improvements include:

- **Sidewalks** are provided adjacent to curbs and can be buffered from the roadway with street trees, landscaping, bike racks or other uses. Areas with high pedestrian traffic should provide wider sidewalks to allow for comfortable pedestrian movement and pedestrian amenities like benches, outdoor dining, planters and lighting. A jurisdiction's sidewalk network should avoid any gaps or missing sidewalks and be maintained to repair uneven paving and cracks.
- **Pedestrian crossings** are markings on the ground that provide pedestrians a designated area to cross a roadway and increase visibility for motorists. High visibility crossings have special treatments such as distinct patterns, colored paint or decorative paving. Crossings are located at both intersections and midblock. Midblock crossings can include midblock pedestrian refuge islands, which provide a place to safely wait when crossing multiple lanes of traffic. Crossings can also be in the form of pedestrian overpasses or bridges which provide a separated crossing over a roadway.
- **Pedestrian signals** and lights alert motorists to crossing pedestrians. These signals are located at traffic intersections and midblock. Midblock crossing signals include rapid flashing beacons (RFB) and high intensity activated crosswalk (HAWK) beacons, which flash lights to alert motorists to yield or stop for pedestrians to cross the street.
- **Curb ramps** provide pedestrians access between the sidewalk and street, specifically for people with disabilities such as people who use wheelchairs. It is common for yellow truncated domes to be installed at curb ramps, especially in high traffic areas, to aid people who are visually impaired to sense the beginning or end of a sidewalk.

Bike Facilities

Bicycle facilities are categorized by four classes, which vary in treatment and location relative to a roadway. They offer different levels of separation and protection between bicyclists and motorists. The four classes are typically designated as different colors on bikeway maps and include:

- **Class I facilities** are separated bicycle and pedestrian paths that are not part of a roadway. These facilities are often called trails and are shared by both bicycle and pedestrian traffic. They can be paved with asphalt or be made up of dirt.
- **Class II facilities** are bike lanes painted on a street adjacent to vehicular lanes. To add further protection, these facilities can include a painted buffer and a physical element like flexible posts, planters or bollards to provide a barrier between

bicyclists and vehicle traffic.

- **Class III facilities** or “bike routes” are shared with motor traffic and use signage and/or “sharrow” markings applied to road surface to alert motorists. These bikeways are typically designated on low-volume streets or streets that have limited right-of-way to create a separate bike lane.
- **Class IV facilities**, also known as cycle tracks, are bikeways for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers or on-street parking. Class IV facilities can be designed for one-way or two-way bike traffic.

Safe Routes to School

Safe Routes to School (SR2S) is a national program that strives to increase the number of children walking and biking to school through education and incentive programs and infrastructure improvements. SR2S programs and plans can be implemented by various agencies, including local government, school districts and even a school.

Balancing Transportation with Other Issues

Transportation planning is an integral piece to urban development and therefore impacts decisions made about other important issues for planning, including land use, equity, housing provision and economic development. Planning commissioners should always consider how transportation is being planned for when considering other issues, with the goal of providing various sustainable and equitable transportation options.

Land Use

Land use policies are closely related to transportation choice, which influences urban development. For example, policies that encourage infill and mixed-use development over dispersed single-family units often increase reliance on alternative transportation choices, which lowers automobile vehicle miles traveled (VMT), reduces congestion and improves air quality. When evaluating land development projects, you should consider whether these projects promote walkability and smart growth and provide robust transportation amenities. People are more likely to walk, bike or take transit when housing, jobs, retail, parks and other community uses are clustered and located near transit hubs. This also impacts the decision for private car ownership and can decrease the demand for parking.

Housing Affordability

High housing costs, especially for housing near transit, can often force people to live far from work, significantly increasing commute times and costs.[10] Longer commute times can increase greenhouse gas emissions due to more vehicle emissions and decrease productivity. Planning commissioners should work to ensure that affordable housing options are provided near transit and other major transportation access points.

Equity

To increase equity in transportation, transportation should be safe, affordable and accessible to high-need communities, including those of low incomes, seniors, people with disabilities, people of color and others who may not own a private vehicle or have access to public transportation. By providing quality pedestrian, bike and transit amenities in high-need communities, residents can decrease their reliance on a vehicle ownership and use these amenities to travel to work, school and other uses.

Economic Development

Investment in transportation infrastructure can stimulate the economy and increase productivity by creating jobs to not only build the infrastructure, but also connect and move people to office and retail, providing opportunities for employment and spending.

10 California Department of Housing and Community Development, 2021, August 4, Housing and Transportation Costs, https://www.hcd.ca.gov/policy-research/specific-policy-areas/housing-transportation.shtml.

The Future

Transportation systems are evolving, creating more alternatives for travel using single-occupancy automobiles, and thereby increasing capacity, lessening parking demand and minimizing impacts from transportation systems. As a planning commissioner, you might want to consider how these new technologies can be included in your community.

Shared Vehicles / TNCs

Transportation network companies (TNCs) such as Uber and Lyft provide a platform by which multiple individuals can ride in the same automobile, either individually (with one private trip following another) or in a shared format. These services can provide benefits, such as decreasing the demand for car ownership, lessening the need for parking and helping to solve the "last mile" problem of how to get people from a transit stop to their ultimate destinations. However, TNCs can also create impacts within the urban environment, such as increased congestion, particularly if the TNC service is being overly used for single passenger occupancy use rather than ridesharing.

Micromobility

Micromobility refers to lightweight, personal transportation vehicles such as bicycles, e-bikes, and e-scooters that can be publicly accessed on demand. Micromobility vehicles also help complete "first and last mile" trips for transit as their parking areas are typically strategically located near transit hubs. Typically, these vehicles are ridden in bike lanes and have designated docking or parking areas on public sidewalks. Some micromobility services do not have designated parking areas and can create a nuisance and/or hinder public use of the sidewalk.

Autonomous Vehicles

Autonomous vehicles move autonomously, either without a driver or with minimal intervention from a driver, by sensing their surrounding environment with technologies such as cameras, radars and Lidar. Autonomous vehicles include autonomous shuttles, which can provide higher capacity "first and last mile" transportation between mass transit hubs and uses such as office complexes, commercial centers, airports, schools and hospitals. Although there are relatively few examples of working autonomous vehicle systems as of this writing in the early 2020s, it is likely that we will see more and more AV technology in the near future.

Electric Vehicles

Electric vehicles are gaining more acceptance and availability. While they can reduce greenhouse gas emissions and of course may not have traditional emissions from internal combustion engines, there is still a need to plan for an overall reduction in VMT. While electric vehicles reduce emissions, they still take up physical space on roadways and need parking just like other vehicles.