
Circulation Element

Introduction

The circulation element is not simply a transportation plan, but rather a strategy addressing infrastructure needs for the circulation of people, goods, energy, water, sewage, storm drainage, and communications. By [statute](#), the circulation element must correlate directly with the [land use](#) element, but also has direct relationships with other elements. The provisions of a circulation element affect a community’s physical, social, and [economic](#) environment, as well as its [health](#). The passage of SB 1000 in 2016 requires local governments to address [environmental justice](#) considerations related to circulation—such as access to transportation systems, air quality related to transportation, delivery routes and transit options for nutritional food access, and promotion of physical activity—upon the next revision of two or more elements in their general plan after January 1, 2018.

Government Code Section 65302 (b)

- (1) A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan.
- (2) (A) Commencing January 1, 2011, upon any substantive revision of the circulation element, the legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan.
- (B) For purposes of this paragraph, “users of streets, roads, and highways” mean bicyclists, children, persons with disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors.

Transportation systems are essential to any city or county and its economy, and can be designed to enhance opportunity and improve equity. However, the implementation and maintenance of infrastructure and resources is costly, impacts the environment, and affects human health. Transportation planning in California is rapidly changing, driven by a number of key factors:

- An increasing focus on access to destinations (connectivity) rather than just mobility, and transportation solutions involving proximity that better accomplish livability and environmental goals
- Constrained local government budgets
- A mismatch of anticipated revenue and future maintenance obligations under current policies
- An increasing focus on greenhouse gas emissions reduction and an ongoing focus on air quality

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- An increasing recognition that we cannot “build our way out of congestion,” in part because new capacity encourages more driving, but that congestion can be addressed with roadway pricing measures
- An increasing recognition of the transportation network’s effect on land use, and in turn the effect of more disperse land use on the environment and human health
- Demographic and social trends creating increased demand for infill and walkable neighborhoods
- Emerging transportation solutions such as carshare, rideshare, and bikeshare services, which can reduce automobile dependence
- Enhanced technology and information such as Nextbus and Intelligent Transportation Systems (ITS) making navigation of multiple transportation systems more simple and convenient and in some cases influencing transportation choices.
- Introduction of emerging technologies such as partially or fully autonomous vehicles with potential to sharply increase VMT and alter land use scenarios

Further, recent legislation has driven change in the way local governments approach transportation and the types of solutions available:

- The Complete Streets Act
- Global Warming Solutions Act (AB 32)
- SB 32
- The Sustainable Communities and Climate Protection Act (SB 375) and the completion of Sustainable Communities Strategies
- CEQA Streamlining for infill projects (SB 226)
- Shift in CEQA transportation metric away from LOS to VMT (SB 743)

Many California communities are substantially revising their circulation elements to respond to and take advantage of this new legislation.

CORRELATIONS AMONG ELEMENTS

	Land Use	Housing	Conservation	Open Space	Noise	Safety	EJ
Circulation	IN STATUTE	RELATED	RELATED	RELATED	IN STATUTE	RELATED	RELATED

■ Identified in statute ■ Closely related to statutory requirements

Completeness Checklist

Local agency staff can use the following checklist to help ensure that the draft circulation element addresses all required issues. Please note that use of this checklist is purely advisory, and only contains issues that are legally required in [Government Code section 65302\(b\)](#). Circulation elements may address additional issues at the discretion of the local government. Because general plan formats may vary, this checklist suggests identifying where the particular government code provision is satisfied

Statutory Citation	Brief Description of Requirement
Gov. Code, § 65302(b)(1)	Existing and proposed major thoroughfares
Gov. Code, § 65302(b)(1)	Existing and proposed transportation routes
Gov. Code, § 65302(b)(2)	• Public transportation
Gov. Code, § 65302(b)(2)	• Bicycle
Gov. Code, § 65302(b)(2)	• Pedestrian
Gov. Code, § 65302(b)(2)	• Automobile
Gov. Code, § 65302(b)(2)	• Commercial goods
Gov. Code, § 65302(b)(1)	Existing and proposed terminals
Gov. Code, § 65302(b)(1)	Military airports and ports
Gov. Code, § 65302(b)(1)	Other local public utilities and facilities
Gov. Code, § 65302(b)(2)	Needs of children, persons with disabilities, and seniors?
Gov. Code, § 65302(b)(1); Fed. of Hillside & Canyon Assns. v. City of Los Angeles (2004) 126 Cal. App. 4th 1180, 1196	Identified funding for infrastructure identified in circulation element?
Gov. Code, § 65302(b)(1)	Circulation element is correlated with the land use element?

Required Contents

The circulation element must, consistent with Government Code Section [65302 \(b\)](#), include the location and extent of existing and proposed

- Major thoroughfares
- Transportation routes
- Terminals
- Military airports and ports
- Public utilities and facilities

Statutory Requirements

The [Government Code](#) requires that any revision of circulation elements after Jan 1, 2011 must plan for a “balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan.” Users are defined in statute as “bicyclists, children, persons with

disabilities, motorists, movers of commercial goods, pedestrians, users of public transportation, and seniors.” For more information on integrating complete streets concepts to help address these requirements, see OPR’s [“Complete Streets and the Circulation Element.”](#)

The circulation element must identify funding for capital, operations, and maintenance of planned additions to the network, additions that would be triggered by policies in the element, and the existing network.

Relationship with Regional Planning

California courts have recognized that general plans must reflect the regional context. Circulation elements must, therefore, account for both regional transportation plans and, in some cases, congestion management plans.

Regional Transportation Plans

Metropolitan planning organizations and regional transportation planning agencies prepare regional transportation plans in cooperation with Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Caltrans, the Air Resources Board, the Department of Housing and Community Development and other stakeholders, including system users. The purpose of the regional transportation plan is to establish regional goals, identify present and future transportation needs, deficiencies and constraints, analyze potential solutions, estimate available funding, and propose investments. In most regions in California, the regional transportation plan includes a sustainable communities strategy that aligns transportation investments with a land use pattern designed to reduce regional greenhouse gas emissions. In order to be eligible for federal and state funding, transportation projects must be consistent with the adopted regional transportation plan, including an applicable sustainable communities strategy.

Regional transportation plans are required to reflect certain population growth and distribution assumptions contained in local general plans. As a practical matter, circulation elements should also reflect the adopted regional transportation plan to ensure access to transportation funds. If adopting a circulation element that is not consistent with the regional transportation plan, that inconsistency and its impact on regional greenhouse gas reductions also should be discussed in the environmental analysis under the California Environmental Quality Act. (See, e.g., [CEQA Guidelines § 15125\(d\)](#).)

Correlation with the Land Use Element

Requirement Description:

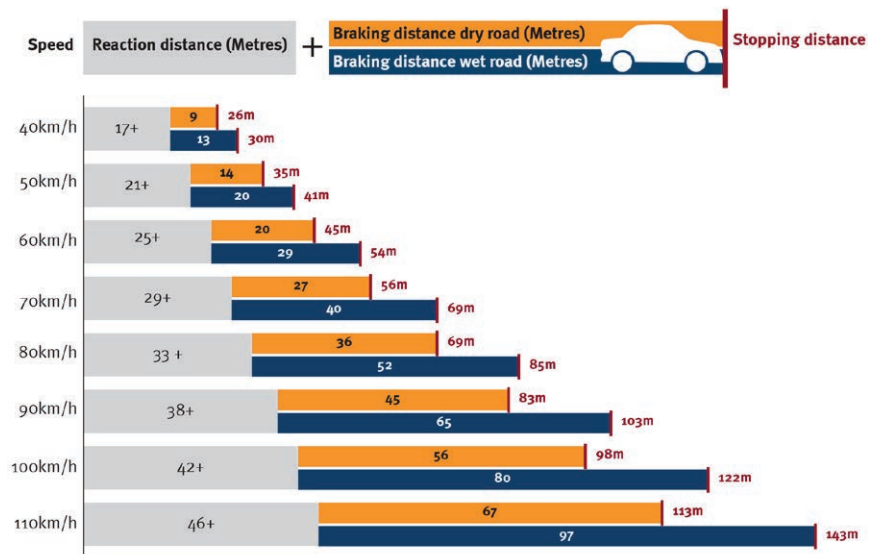
Creating connected, accessible, and complete systems of circulation networks and ensuring access to opportunities within a community and region requires coordination between land use and circulation planning. Due in part to the connection between transportation funding and greenhouse gas reduction established in [SB 375](#), vehicle miles traveled (VMT) is an increasingly important metric of impact in the circulation element. Because the circulation element is required to correlate with the land use element, it should account for the features of the particular community. For example, the circulation element can demonstrate

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connectivity between residential uses, services and employment centers. Lack of transportation options from identified disadvantaged communities to essential destinations, such as grocery stores, may be improved through circulation (e.g. working with transit provider to increase transit frequency) or land use (e.g. new commercial development). Mapping transportation options as part of the general plan process may help identify gaps to address. The **land use** and circulation elements are useful places to plan for equitable access for all community members. Pedestrian and bicycle routes in the circulation element

should connect residential areas identified in the **land use** element with jobs centers, parks, schools, and other destination centers. Truck routes should be directed away from noise- and emissions-sensitive residents and designated instead to serve areas designed for commercial and industrial uses in the **land use** element. The design speed of a roadway should equal its target speed (in other words, a street should be designed to accommodate intended auto speeds, not faster speeds).

Figure 4: How long a stop takes based on speed (driving an average family car)



Source: <https://www.qld.gov.au/transport/safety/road-safety/driving-safely/stopping-distances>

Regional Transportation Plans, SB 375, and Sustainable Community Strategies

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) supports the State’s climate action goals to reduce greenhouse gas (GHG) emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

Under the Sustainable Communities Act, ARB sets regional targets for GHG emissions reductions from passenger vehicle use. In 2010, ARB established these targets for 2020 and 2035 for each region covered by one of the State’s metropolitan planning organizations (MPO). ARB will periodically review and update the targets, as needed.

Each of California’s MPOs must prepare a “sustainable communities strategy” (SCS) as an integral part of its regional transportation plan (RTP). The SCS contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets. Once adopted by the MPO, the RTP/SCS guides the transportation policies and investments for the region.

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Special attention should be paid to ensure that all transportation facilities are designed to be [safe](#), accessible, and connected for all users. Simply putting a sidewalk or a bike lane on one street, for example, without a complete system that connects residents and destinations, may not address the needs of a community. Using context sensitive, flexible designs can help increase access for all users while improving overall conditions or addressing common issues such as storm-water runoff, air quality, and bicyclist and pedestrian safety. For additional information on the design of complete streets, see [NACTO Street Design Guidelines](#) and [Caltrans Complete Street Guidelines](#).

As noted above, the circulation element and the land use element must correlate. One of the most recent appellate court cases addressing the correlation requirement explained:

[T]he internal consistency and correlation requirements do not require a city or county to limit population growth or provide traffic management measures to ensure that its transportation infrastructure can accommodate future population growth. The Planning and Zoning Law (Gov. Code, § 65000 et seq.) does not require a city or county to avoid adverse impacts on transportation. Rather, the city has broad discretion to weigh and balance competing interests in formulating development policies.... (*Federation of Hillside & Canyon Assns. v. City of Los Angeles* (2004) 126 Cal. App. 4th 1180, 1196.)

In characterizing the correlation requirement, the same court explained that “the circulation element of a general plan must provide meaningful proposals to address changes reflected in the land use element, and the land use element must provide meaningful proposals to reflect changes reflected in the circulation element” (Ibid). A proposal is “meaningful” if the element identifies reasonably reliable funding sources (Id. at 1196-1197). An element that identifies proposals with no reasonable expectation of implementation (i.e., funding) is not meaningful, and therefore would not satisfy the statutory correlation requirement (Id.; see also *Concerned Citizens of Calaveras County v. Board of Supervisors* (1985) 166 Cal. App. 3d 90, 103).

Proposals should address not just capital costs, but also costs associated with operations and maintenance. Because the circulation element addresses both transportation and local public utilities, the statutory correlation requirement applies to utilities infrastructure as well.

Appropriate fiscal analyses should be prepared to support the conclusion that the circulation element is capable of supporting the land uses planned in the land use element. Certain transportation funds are tied to consistency with regional sustainable communities strategies, so consistency with regional plans should be part of this analysis.

[Tools](#) are available to allow comparison of total infrastructure costs and benefits across several build-out scenarios. These [tools](#) enable communities to make decisions regarding land use patterns with long-term infrastructure costs and benefits in mind. More information on these tools and how to use them is available [here](#).

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Examine potential policies for local implementation of SCS	Modal split rates, transportation emissions data, transit access maps
Identify gaps in network connectivity	Transit maps, bicycle and pedestrian infrastructure maps, major destinations, and residential centers

Major Thoroughfares

Requirement Description:

Consideration must be given in the general plan to the development and improvement of major thoroughfares, including future acquisitions and dedications, based on proposed land use patterns and projected demand. Cities and counties should consider the location and design of major thoroughfares in new developments, as well as street patterns (curvilinear, grid, modified grid, etc.), multi-modal use and safety, coordination with other infrastructure such as utilities, and relationships between destinations and transportation systems. Relationships between intended users of streets, including freight trucks, transit, automobiles, bicyclists, and pedestrians, should be considered. Design standards for local streets (including, but not limited to, width, block size, speed, and accommodation of parking and bicycle and pedestrian traffic) may also be included in the circulation element. Information on safety elements of design is available in [Appendix B](#). Providing charging stations and alternative fuel stations can facilitate use of zero emissions vehicles, reducing air pollutants and greenhouse gas emissions.

Transportation Routes

Requirement Description:

The transportation system consists of means to transmit vehicles and people (e.g. roads, sidewalks), docks to station vehicles at their destination (e.g. parking lots, ports), and the vehicles themselves (e.g. busses, bicycles, cars). In developing a general plan, a jurisdiction should consider its overall objectives, and develop policies for each of these three components that support those objectives.

Local governments should coordinate transportation routes with larger regional route plans, such as regional or state freight plans, regional transportation plans, and regional transit corridors. Consideration of multiple modes as part of a transportation system, combined with data on projected needs and uses, and local [land use](#) data, may help prioritize routes based on community needs. For example, a county may designate a freight corridor to run parallel to existing regional transit lines, utilizing the same infrastructure where possible, and directing both away from sensitive land uses such as schools.

Roads

Requirement Description:

The underlying goal of transportation is to provide connectivity (also called “accessibility” or “access to destinations”). Connectivity is provided by mobility (increased speed) and proximity (reduced distance). The transportation system has traditionally been evaluated primarily through a mobility lens, measuring speed (e.g. via delay metrics like Level of Service). In addition, the primary focus of mobility has been on Automobile Level of Service (LOS), a localized (intersection or roadway segment) measure of auto-mobility. The [Complete Streets Act of 2008](#), as well as recent changes in CEQA and congestion management law, highlight a need for circulation elements to have a broader focus that includes other modes.

Upon review of existing policies, many local governments may find that existing automobile LOS standards are not sustainable or even desirable. For example, a high automobile LOS may be too expensive to maintain, may be unsafe for non-auto users, and may force different uses to be spread so far apart that travel becomes inconvenient.

Ideally, going forward, the circulation element of the general plan will include a discussion of the transportation system designed using metrics that capture connectivity (the fundamental purpose of transportation) rather than mobility (just one facet of connectivity). Examples of such measures include number of jobs accessible within 30 minutes, number of retail destinations reachable in a ten-minute walk, and number of hospitals accessible by a 45-minute transit ride. Even where metrics like Level of Service are still used, local governments should consider the following ways to account for limitations:

- Use Level of Service during the planning process to size roadways, but not as a measure of individual project impacts.
- Level of Service should be balanced with other metrics when used, rather than triggering decisions by itself. Other metrics are needed to measure the efficacy, comfort and safety of other transportation modes, and to measure the proximity benefits conferred by infill development. It is important to estimate the cost of achieving any Level of Service threshold, in order to determine whether that threshold is fiscally feasible, and to identify, where possible, funding for long-term maintenance costs associated with building to any Level of Service thresholds.
- Set Level of Service thresholds in consideration of the tradeoffs between mobility and other goals. Accommodating automobile traffic has direct tradeoffs with greenhouse gas emissions, other emissions that affect air quality, pedestrian collision risk, and active mode share and the resulting public health benefits. It also leads to sparser land development patterns, creating indirect tradeoffs with consumption of agricultural land and sensitive habitat, energy use, water use, and water runoff affecting water quality and flood risk. A general plan should consider these tradeoffs when recommending a Level of Service objective.

Planning for safe transportation systems has often used LOS to attempt to streamline automobile flow, accommodating driver error in an effort to reduce crash rates. This method of planning for safety may not most effectively increase safety or protect all users of the system. Rather, proactive roadway design, reduced speeds, and reduction of overall VMT may be more effective. For more information on analyzing transportation safety impacts, see [Appendix B](#).

Transit

Requirement Description:

As more of the population chooses alternatives to driving, roadway capacity becomes filled, and California strives to reduce VMT and GHG emissions, transit availability becomes increasingly important. There are many important considerations for transit in general plans. Policies, such as increasing density around transit corridors and increased transit infrastructure, can promote and prioritize high quality transit, aligned with housing and economic development policies, which in turn increases efficiency of the overall transportation system. Promotion of equitable access to transit, through the analysis of available data to make decisions, can help ensure all community members have access to core destinations, such as employment centers, schools, and retail, and contribute to fulfillment of [environmental justice](#) requirements. Transit providers should be involved in general plan processes, ensuring their alignment with community priorities.

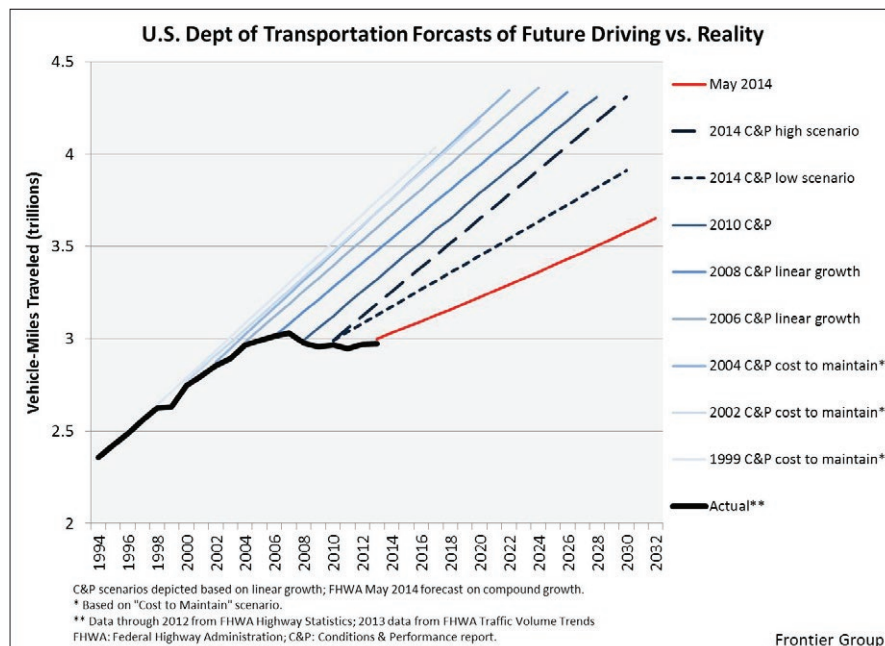
Well-planned transit infrastructure can improve access to opportunity by making job centers, housing, schools, and other major destinations accessible to a high numbers of residents. Providing infrastructure at transit stops for convenience and safety, such as proper lighting,

covered shelter, and safe crossings; implementing transit priority on streets and bridges, such as priority lanes, signals, and other types of infrastructure; and utilizing technology to communicate transit patterns in real time can help speed transit vehicles, shorten travel times, promote safety, and attract additional passengers.

Coordinating transit stops, stations, and routes with bicycle and pedestrian infrastructure can help create first and last mile connections, promoting reduced VMT for short trips and potentially increasing transit ridership for a greater range of residents.

Developers and employers can also incentivize transit ridership, and general plan policies can promote such programs through general visions and goals or through specific transit zones in the plan.

Figure 5: People are choosing to drive less and less, at rates higher than expected



Source: Frontier Group <http://www.uspirg.org/resources/usp/us-dept-transportation-forecasts-future-driving-vs-reality>

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Assessment of potential needs for new transit routes	Maps highlighting residential centers, commercial centers, employment opportunities, schools, and recreation areas
Identifying potential targets areas for policies incentivizing transit use	Major employment centers, existing and planned transit routes, residential areas with demographic information

Active Transportation: Bicycle and Pedestrian Networks

Requirement Description:

The **Active Transportation Program**, enacted via Senate Bill 99 in 2013, funds pedestrian, bicycle, and **Safe Routes to School programs (SRTS)**. This program ensures that at least 25% of investments benefit disadvantaged communities. Increasing safe, connected bicycle and pedestrian networks in a city or county improves health, economic mobility, GHG emissions, and increases accessibility for numerous populations. Ensuring that infrastructure is safe for residents from ages 8 to 80, if possible, captures the needs of recreational riders, ADA users, bicycle and pedestrian commuters, and all people in between. The **Complete Streets Act (2008)** requires cities and counties to plan for the development of multimodal transportation networks in the circulation element

of their general plan. [Caltrans](#) and [NACTO](#) offer guidelines on complete streets implementation. The [Sustainable Communities and Climate Protection Act of 2008 \(SB 375\)](#), promotes regional coordination of transportation and land use planning, including support of active transportation. Prioritizing more forms of active transport policies in general plans will strengthen potential for regional transportation plans to meet GHG reduction targets established pursuant to SB 375.

Safe Routes to Schools (SRTS)

Less than 15% of children living within a 2 mile radius of a school walk or bike to school, and over half are driven in vehicles. Recognizing the implications of these statistics for childhood health, worsening air quality, and congestion around schools, the Safe Routes to School program established in one jurisdiction in 1997 quickly became a model to promote safe, accessible routes to schools nationwide. With federal funding through the Transportation Alternatives Program, state funding, and programming across the US, SRTS promotes infrastructure, design, policy, and education to promote active transportation for children and parents. Many jurisdictions have incorporated SRTS into their circulation and land use elements, and the [national partnership](#) offers numerous [resources](#) and examples to help communities implement safe routes to school.

Bicycle and pedestrian networks should be complete systems for transportation, including coordination with [land use](#) plans, [housing](#), and transit systems. Bicycle and pedestrian networks should connect residents to employment centers, community centers, schools, commercial districts, and transit stops. Active transportation can be used to fill the gap in transit systems- the first and last mile between transit stops and destinations. Promoting [infill](#) and TODs may create additional opportunities for active transportation by decreasing the distance between origins and destinations.

Circulation elements should promote equitable distribution of active transportation networks that link residents to key destinations, and ensure equitable allocation of infrastructure investments and maintenance. Where feasible given right of way restrictions, cost, and other limitations, protected or buffered bikeway should be prioritized to reduce injuries and promote biking. Paths and facilities, both on and off road, should include user amenities such as shade trees, benches, and drinking fountains. Complete [Streets policies](#) should be integrated into [bicycle and pedestrian](#) policies as well. Some jurisdictions have separate bicycle and pedestrian plans, which should correspond and align with the general plan.

Terminals

Requirement Description:

Airports, seaports, bus and train stations, and other terminals play an important role in a region's transportation, social, and economic makeup. As such, the circulation element should include these facilities in its transportation discussion, and include operators in the general plan process. Often, terminals bring a specific set of land use issues that may need to be addressed as future growth occurs in existing [infill](#) areas. These issues include pollution, noise, traffic, and public safety. The location, type, and height of development in areas surrounding airports, should be considered in the context of the local Airport Land Use Plan. Airport Land Use Plans must coordinate with general plans' [land use elements](#), but should be considered in relation to circulation and [safety](#) as well. Some actions to consider in the circulation element include:

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- Assess the adequacy of navigable waterways and port and harbor facilities, including the need for expansion and improvements.
 - Project future demand based on new or expanded economic activities and recreational trends
 - Assess the adequacy of and safety hazards associated with existing aviation facilities and the need for expansion and improvements.
 - Limit potential noise and safety hazards posed by port activities to surrounding land uses
 - Mitigate aviation-related hazards posed to and by aircraft
 - Make access to and from aviation facilities available by all modes of transportation

Military Airports and Ports

Requirement Description:

The Department of Defense (DOD) has a significant presence in the State of California, using 10% of the State's land. Consequently, military ports and airports impose demands on local circulation infrastructure that should be factored into the overall analysis of local circulation planning in a general plan. Furthermore, changes to circulation patterns and routes may affect military operations. For example, development along formerly rural roads can significantly increase urban traffic and limit the use of routes for military transport purposes. Such changes can impede military operations, especially for units that commute to conduct training operations. On the other hand, improvements to circulation routes, such as ports, can contribute to operations. Additional information on military specific development can be found in the [California Advisory Handbook for Community and Military Compatibility Planning](#).

Public Utilities and Facilities

Requirement Description:

In addition to transportation routes, the circulation element must identify the location and necessity of public utilities and facilities. Relevant utilities include water, sewers, storm-water systems, telecommunications and broadband, electric vehicle charging stations, electricity, and natural gas lines. These facilities relate directly to the land uses planned in the [land use element](#), consequently, the circulation element should consider not just “right sizing” such infrastructure to serve only that growth that is actually planned in the land use element, but also placing infrastructure in areas that maximize efficiency and minimize impacts to the community. California courts have noted that plans for infrastructure should follow determinations regarding desired growth that reflect resource constraints and other broader considerations. (See, e.g., *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 949-950.)

“Dig once” policies can help ensure efficiencies and reduce costs among circulation infrastructure. The underlying premise of a “dig once” policy is to coordinate conduit construction with unrelated civil works projects, such as digging up the roads and sewer construction, to create a usable infrastructure for future network deployment/provisioning. [Dig once policies](#) are flexible and may

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come in many forms. The goal and emphasis should be on impacting the rights of way as few times as possible by inviting multiple parties to lay their infrastructure together. While not always feasible, coordinating between circulation infrastructure agencies may help reduce costs and impacts on the local community. In identifying existing infrastructure and planning for future needs, local governments should work closely with any relevant service providers, including water districts, utilities and others.

Infrastructure needs of Disadvantaged Unincorporated Communities

In 2011, local governments were required to plan for infrastructure needs of disadvantaged unincorporated communities through [Senate Bill 244](#). The bill requires the [land use element](#) to analyze needs for infrastructure in these communities. To ensure consistency, the circulation and land use elements' policies and programs should be coordinated. For additional information on planning for disadvantaged unincorporated communities, see the Land Use Element chapter of the GPG and [Senate Bill 244: Land Use, General Plans, and Disadvantaged Communities Technical Advisory](#).

Broadband

Both state and federal governments are implementing various funding programs that serve the goal of expanding broadband access to unserved and underserved areas. Within California, the [California Public Utilities Commission \(CPUC\)](#) manages the [California Advanced Services Fund \(CASF\)](#), which invests hundreds of millions of dollars annually in broadband deployment. The state also created the [California Emerging Technology Fund \(CETF\)](#), which was designed to be a public-purpose venture capital fund.

Dig once policies can substantially reduce costs for providing broadband service to communities. A new provider can run fiber through leased conduit space at a fraction of the costs, incentivizing more private actors to deploy or reducing costs to the city if self-provisioning broadband services. For example, if conduit construction was promoted along ongoing civil work projects, fiber deployment costs drop by \$30,000- \$100,000 per mile. On average, 60 to 90 percent of network deployment costs come from civil works as opposed to equipment and maintenance.

SAMPLE OF OPR-RECOMMENDED DATA FOR CONSIDERATION IN ANALYSIS OF THIS ELEMENT

Intent of Analysis	Recommended Data
Understanding transportation choices and multi-modal needs	Percentage of pedestrians and bicyclists commuting to work and other trips (National Household Travel Survey , California Household Travel Survey , American Community Survey)
Identifying necessary safety improvements	Number or % of injuries and fatalities (Transportation Injury Mapping System)
Analysis of existing and needed active transportation networks	Transit stops and centers, existing and planned bicycle routes, pedestrian facilities, destination centers

Other Considerations

Transportation and Climate Change

Transportation is a significant source of greenhouse gases. In California, transportation is the largest source of emissions: according to the California Air Resources Board, about 37% of the state’s GHG emissions come just from vehicle tailpipe emissions,ⁱ as compared to 28% nationally.ⁱⁱ Considering life-cycle emissions (extraction, fuel refining, fuel transport, roadway construction, etc.) in addition to tail pipe emissions, transportation is the source of over half of California GHG emissions. An update to the circulation element presents an opportunity to integrate measures for reducing vehicle travel that are critical to meeting our State’s GHG reduction goals.

Strategies to reduce transportation-related GHG emissions fall into three general categories: vehicle efficiency, switching to low-carbon fuels, and reduction of vehicle miles traveled. General plans’ most important policy levers focus on VMT reduction, by setting out low-VMT land use patterns and specifying transportation network characteristics and travel demand management strategies. Further, general plans can help jurisdictions become “ZEV-ready”, e.g. by specifying provision of alternative fuel fueling and charging stations.

Parking

Many general plans set forth the goal of providing their communities with “adequate parking.” Historically, this has meant directing new land use projects to exceed the full demand for free parking. This has resulted in a substantial subsidy to automobile users of roughly \$20-40 Billion per year in California.ⁱⁱⁱ Free parking is a community choice, but should be recognized as one that entails costs and leads to additional vehicle travel, which in turn can impact community goals for livability, mode shift, environmental protection, emissions reduction, and fiscal benefits.

The circulation element of a general plan provides a jurisdiction the opportunity to evaluate various tradeoffs, including the costs and benefits of parking, in conjunction with other planning goals. Tradeoffs a jurisdiction might consider include:

- Parking demand may change over time due to numerous factors including adjacent land uses, densifying urban development, transit and active transportation infrastructure, and emerging vehicle technologies such as automated vehicles
- Ready parking availability can induce increased vehicle miles traveled (VMT), leading to increased traffic and greenhouse gas emissions.
- Parking requires land that might be occupied by other land use, which may provide greater benefit (including fiscal benefit).
- Parking areas paved with standard asphalt can exacerbate impacts on water quality and runoff control.
- Free parking subsidizes drivers at the expense of transit users, pedestrians, and cyclists.

Many jurisdictions are already confronting parking tradeoffs and addressing these issues by managing parking demand and parking supply.

Managing Demand for Parking

- Support alternative transportation. Travelers by non-auto modes do not require automobile parking. Quality bicycle, pedestrian, and transit access facilities and services (See e.g. [City of Berkeley](#)), and development proximate to those facilities, reduce motor vehicle mode share and therefore parking demand. Adequate, convenient, and secure bicycle parking, including around transit stations, facilitates cycling and increases cycling mode share.
- Convert parking to [parklets](#), which increase public space and can improve neighborhood vibrancy.
- When providing on-street parking, design it in a manner that calms traffic and enhances bicycle and pedestrian safety and comfort. This may include [reverse angle parking](#) and [parking-protected bicycle lanes](#).
- Attach a cost to parking. Construction and maintenance of parking is costly. Jurisdictions may wish to consider the benefits of optimizing parking prices to reflect the equilibrium between supply and demand, to help improve traffic flow, or to reduce VMT and GHGs. (See e.g. [City of San Diego](#); [City of Sacramento](#)) Further, fees collected can be reinvested in a number of ways, including neighborhood benefits districts, that can increase neighborhood vibrancy.

Increased bicycle and pedestrian infrastructure, including shade, pathways, and safety features, help promote activity



Image by Urban Advantage, Cunningham Quill | Architects

Managing Supply of Parking

- Remove minimum parking requirements. Parking restrictions, such as residential parking permit programs, can be implemented to prevent spillover parking. Parking provision can be left to the market, pricing can be deployed, or parking maxima can be provided.
- Set parking maxima. Especially in TOD or mixed-use development areas, establishing maximum parking requirements instead of minimum requirements will mean that space is available for other uses (See e.g. [Sacramento County](#); [City of San Jose](#)).
- Manage the use of existing spaces rather than provide additional parking. Prioritize spaces based on location (e.g. proximity to employment centers) and intended use (e.g. short- or long-term). Implement shared parking or establish parking benefit districts. (See e.g. [Sacramento County](#)) Optimizing use of existing parking will help make efficient use of land within the jurisdiction's boundaries.

Traffic Control Around Schools

High volumes of pedestrian traffic, vulnerable users, and other factors create increased need for safety around schools. Considerations in roadway design should take in to account the specific needs of the population, including bicycle and pedestrian access, transit and drop off needs, and safety around crosswalks, intersections, and roundabouts. [The Safe Routes to Schools National Partnership](#), with support from CalTrans' [Safe Routes to School program](#), provides [guidance](#) and resources for improving traffic control around schools, including signage, pavement markings, signals, and other infrastructure. For additional guidance on traffic control specifically around schools, see the [CalTrans Manual on Uniform Traffic Control Devices](#), including [Section 3c](#) on roundabout markings and [Part 7](#) for traffic control around schools.

Addressing Tradeoffs and Maximizing Co-benefits in Circulation

The transportation network should be designed to accommodate multiple competing interests, as well as to maximize co-benefits. Potential areas for co-benefits, such as safer streets through slower traffic, greater economic activity through improved walkability, and increased positive health outcomes through improved active transportation, should be considered in making decisions around transportation.

The circulation element should address the tradeoffs between various interests rather than listing desirable but mutually exclusive outcomes. The following are some of tradeoffs that a circulation element might address. Some of these tradeoffs will involve agencies distinct from the city or county, such as some transit systems, highlighting the importance of coordination between stakeholders involved in circulation planning and implementation.

- Roadway motor vehicle throughput and speed v. impacts on community along roadway
- Roadway motor vehicle throughput and speed v. capacity for other modes

Aligning circulation and land use improves access and creates economic opportunities



Image by Urban Advantage, Clarion

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- Roadway design speed and risk to pedestrians and cyclists
 - Breadth of coverage of transit system v. cost
 - Provision of bicycle facilities v. provision of additional motor vehicle capacity
 - Transit priority measures (e.g. signal priority and queue jump lanes) v. automobile capacity
 - Accommodation of potential emergency vehicle turning movements v. design for pedestrian safety
 - Accommodation of freight vehicles v. pedestrian safety
 - Automobile throughput and speed v. traffic calming measures such as narrower travel lanes, roundabouts, raised medians, speed tables, small curb radii, etc.)

Goods Movement

Freight movement is essential for any community to thrive, by allowing the exchange of needed goods and stimulating local and regional economies. Depending upon geography and community characteristics, local governments should plan for goods movement in multiple modes, including air, rail, ship, and truck. A general plan should address transportation improvements that facilitate the timely movement of goods, meet the needs of local business and industry, and support the efficient transfer of goods between truck, rail, and other transportation modes. These interests of goods movement must be balanced with the trade-offs that may include negative impacts to safety, air quality, and noise described in the previous paragraph. Increasing general purpose roadway capacity on a congested roadway may not facilitate freight vehicle travel, due to [induced travel effects](#) (mostly passenger vehicles); freight-only facilities may better accomplish this objective.

While freight moves throughout the state in multiple ways, trucks specifically:

- Emit diesel particulate matter (DPM), which is a localized pollutant that is particularly hazardous to human health
- Generate high noise levels
- Pose special collision hazards because of their size, especially to vulnerable road users, and especially during turning movements, where rear wheels can follow a shortcut-track and collide with pedestrians and cyclists

For these reasons, truck routes should be designed to minimize risk to areas containing concentrations of sensitive receptors and vulnerable road users. Also, goods movement facilities (distribution centers, rail yards, and ports) should be placed in locations that do not bring high levels of truck traffic near residential areas or schools whenever possible. Engaging school boards, goods distributors, and community members to coordinate the [land use element](#) with the circulation element, freight mobility plans, and other relevant efforts may help assess tradeoffs and needs in [locating facilities](#).

[Land use](#) and circulation elements may also be coordinated for freight movement in congested or high traffic corridors, such as by designating specific freight zones, lanes, or management practices, to improve efficiency overall. Policies specific to the needs of a community, depending on factors such as density, proximity to goods movement facilities, and average daily traffic (vehicle and non-vehicle) may help ease safety and congestion issues associated with urban freight movement.

Congestion Management Plans

Each county that includes an urbanized area must establish a congestion management agency to prepare and adopt a congestion management plan ([Gov. Code §65089](#)). The congestion management plan establishes programs for mitigating the traffic impacts of new development, including deficiency programs where congestion is extreme, and monitoring the performance of system roads. The congestion management plan is expected to link land use, transportation, and air quality concerns. At a minimum it must include all state highways and all principal arterial roads. Performance of the congestion management plan is measured through the land use approval process.

As noted above, many jurisdictions have traditionally focused their circulation elements on automobile transportation, planning to certain “level of service” standards. It is important to note, however, that congestion management law does not require general plans to designate level of service standards for every roadway and intersection, only for the “system of highways and roadways designated by the agency,” with special considerations for infill opportunity zones. In fact, there are many reasons that a circulation element should not do so, as noted in this section. Moreover, congestion management plans address far more than just automobile transportation. They must also include an evaluation of the performance of multiple modes of travel and provide a program for travel demand management. Notably, projects identified in a congestion management plan must be consistent with the regional transportation plan, and its sustainable communities strategy, in order to be funded ([Gov. Code § 65082](#)). In updating a circulation element, therefore, a local government must put the congestion management plan in a context that includes reductions in vehicle miles traveled, and provides for multiple users of the transportation system, including transit, bicycles and pedestrian transportation.

OPR Recommended Policies

These policies are an example of recommended policies adopted by varying jurisdictions, to be modified and used as appropriate. A full list of recommended policies can be found [here](#).

Sample Policy	Example of Application	Relationship to Other Elements
[City, county] shall design intersections and public right-of-ways to include adequate and safe access for all users including pedestrians, bicyclists, and motorists of all ages and abilities.	San Pablo	Land use, safety, equitable and resilient communities, economic development
[City, county] shall balance commercial goods movement with the health and quality of life priorities of the community by routing heavy truck traffic away from residential zones and promoting safety at rail crossings.	San Pablo	Land use, safety, air quality, equitable and resilient communities, healthy communities
[City, county] shall limit parking within the public right of way based upon considerations of safety, street width, visibility and access to properties	San Pablo	Land use, healthy communities, safety
[City, county] shall establish travel demand management programs to reduce peak-hour traffic congestion and help reduce regional vehicle miles traveled	San Pablo, Pasadena	Air quality, healthy communities, equitable and resilient communities, economic development, climate change
Incorporate Americans with Disabilities Act (ADA) requirements throughout the [city, county], but especially in high-volume pedestrian areas.	City of El Monte	Healthy communities, economic development, equitable and resilient communities
[City, county] shall create indoor air quality guidelines for residential and commercial units located along higher density corridors and areas where increased intensity of use may result in higher levels of vehicular traffic on adjacent streets. Identify recommendations for mitigation, including design standards and public transportation	City of Richmond	Land use, air quality, equitable and resilient communities
[City, county] shall provide safe routes to school for children and families walking, bicycling, and taking public transportation to schools in the community	City of Santa Cruz	Land use, healthy communities