Chapter 7: Mobility Element

I. Introduction

The California Complete Streets Act of 2008 requires the General Plan to demonstrate how the County will provide for the routine accommodation of all users of a road or street, including pedestrians, bicyclists, users of public transit, motorists, children, seniors, and the disabled. The Mobility Element addresses this requirement with policies and programs that consider all modes of travel, with the goal of making streets safer, accessible and more convenient to walk, ride a bicycle, or take transit.

The Mobility Element provides an overview of the transportation infrastructure and strategies for developing an efficient and multimodal transportation network. The Element assesses the challenges and constraints of the Los Angeles County transportation system, and offers policy guidance to reach the County's long-term mobility goals. Two sub-elements—the Highway Plan and Bicycle Master Plan—supplement the Mobility Element. These plans establish policies for the roadway and bikeway systems in the unincorporated areas, which are coordinated with the networks in the 88 cities in Los Angeles County. The General Plan also establishes a program to prepare community pedestrian plans, with guidelines and standards to promote walkability and connectivity throughout the unincorporated areas.

II. Background

Los Angeles County has one of the largest transportation systems in the world. Despite continuing efforts to increase transportation services and build transportation infrastructure, transportation systems are heavily burdened by the demands of a growing population and a diversity of activities. Transportation is also one of the biggest contributors of noise, and greenhouse gases and other air pollutants.

Regulatory Framework

Local agencies responsible for transportation services in Los Angeles County coordinate their activities to comply with the goals and policies of Southern California Association of Governments (SCAG) and Los Angeles County Metropolitan Transportation Authority (Metro). SCAG is the federally designated regional transportation planning agency responsible for preparing the Regional Transportation Plan (RTP) and the Sustainable Communities Strategy (SCS). Metro is the county-level transportation planning agency responsible for the preparation of the Long Range Transportation Plan (LRTP). The County, the 88 cities in Los Angeles County, and other transportation agencies engage in transportation planning activities by participating in the development and implementation of the RTP and LRTP.

The County participates in establishing policies, promoting specific projects, and funding the strategies in the RTP and the LRTP. Each Los Angeles County Supervisor is a member of the Metro Board of Directors, and two members of the Board of Supervisors serve on SCAG's Regional Council, and on the Southern California Regional Rail Authority (Metrolink) Board of Directors.

Metro is also the Congestion Management Agency for Los Angeles County and is responsible for implementing the Congestion Management Program (CMP). Metro is currently exploring the development of a countywide congestion mitigation fee program to improve transportation roadways including state facilities. This program, adopted locally by individual jurisdictions, would impose a fee

on new development that would be collected and spent locally on transportation projects that would help to ease regional congestion. For more information, please visit Metro's web site at http://www.metro.net/projects/congestion_mgmt_pgm/.

Transportation Systems in Los Angeles County

Public Transit

Los Angeles County is served by a large public transit system that includes rail systems and various bus service options, such as transitways and bus rapid transit systems. Figure 7.1 depicts the major public transit systems in Los Angeles County.

Figure 7.1: Major Public Transit Systems Map

Rail

Metro operates the Metro rail system, which is exclusively within Los Angeles County. The Metro rail system consists of the following lines: Red, Purple, Blue, Green, Gold and Expo. The hub of the system is in Downtown Los Angeles at Union Station. The Metro lines that primarily serve the unincorporated areas include the Metro Blue, Green and Gold Lines. The Metro Blue Line stations that serve the unincorporated areas include: Slauson, Florence, Firestone, Willowbrook and Del Amo. The Aviation/LAX, Vermont, Hawthorne, and Rosa Parks stations along the Metro Green Line also serve the unincorporated areas. The Gold Line has five stations that serve the unincorporated areas: Indiana, Maravilla, East LA Civic Center, Atlantic and Sierra Madre Villa.

Two additional rail service operators that provide services in Los Angeles County are Metrolink and Amtrak. The Southern California Regional Rail Authority (SCRRA) operates the 416-mile Metrolink commuter rail system, which has its hub in Downtown Los Angeles at Union Station and extends to Ventura, San Bernardino, Riverside, Orange, and San Diego counties, and serves some of the unincorporated areas. There is one Metrolink station located in the unincorporated community of Acton, on the Antelope Valley Line. Amtrak provides interstate service from points around the country to Union Station, as well as regional service between major cities throughout California.

Bus

With many regional and municipal operators providing bus services, buses provide the majority of public transit service in Los Angeles County. Examples of these operators include Torrance Transit, Foothill Transit, Santa Clarita Transit, and the Antelope Valley Transit Authority. According to Metro's 2009 Long Range Transportation Plan, the transit providers in Los Angeles County collectively operate 4,000 buses and serve 1.6 million bus riders daily.

The Metro bus system is the largest in Los Angeles County. Metro operates the Metro Rapid Bus service, which runs on select surface street corridors with fewer stops and electronic signal switching devices to expedite traffic flow, and the Metro Express Bus service, which are express bus routes for a portion of the route and then local or limited routes in other areas. Metro also operates two bus rapid transitways: the Orange Line and Silver Line. The Metro Orange Line operates on a dedicated bus lane in the San Fernando Valley and also includes a separated bike path that runs along part of the route. The Metro Silver Line operates between Downtown Los Angeles and the Artesia Transit Center.

Furthermore, the Los Angeles County Department of Public Works (DPW) operates fixed route shuttle services in the following unincorporated areas: Willowbrook and King Medical Center Shuttle

services in Willowbrook; Athens Shuttle service in West Athens-Westmont; Lennox Shuttle service in Lennox; Florence-Firestone/Walnut Park Shuttle service in Florence-Firestone and Walnut Park; El Sol Shuttle service in East Los Angeles; Sunshine Shuttle service in South Whittier; Avocado Heights/Bassett/West Valinda Shuttle service in Avocado Heights, Bassett and West Valinda; East Valinda Shuttle service in East Valinda; Edmund D. Edelman's Children's Court Shuttle service in East Los Angeles; Los Nietos Shuttle service in Los Nietos; and Acton/Agua Dulce Shuttle service in Acton and Agua Dulce. For detailed information on these shuttle services, please visit http://www.lagobus.info. For data on monthly average boardings for the County shuttles, please refer to Appendix D.

Paratransit

Paratransit is an alternative mode of flexible transportation that does not follow fixed routes or schedules. Demand-responsive paratransit contractors are used to meet the needs of seniors and mobility-impaired individuals living in the unincorporated areas.

The Whittier paratransit service operating in the unincorporated communities of North Whittier, West Whittier–Los Nietos and South Whittier–Sunshine Acres has, on average, the highest number of monthly boardings at 3,207. Unincorporated East Los Angeles has the second highest demand with 2,049 boardings on average per month. For detailed information on the County's paratransit services, please visit http://www.lagobus.info. For additional data on average monthly boardings, please refer to Appendix D.

Bikeways

The State Vehicle Code allows roadways to be used by bicyclists. Therefore, the entirety of surfaced roadways, excluding freeways, may be used by the bicycling public even though they are not all identified as bikeways. However, the lack of public awareness and the safety concerns associated with road sharing create a need for bikeways with a grade separation, lane delineation, or designated trail/path construction for bicycle users.

Bicycle Master Plan

The Los Angeles County Bicycle Master Plan, adopted in March 2012, provides policy guidance for building a comprehensive bicycle network throughout the unincorporated areas. The Bicycle Master Plan identifies bikeways and transportation systems that are available for use by bicyclists, such as roadways with bike lanes or designated bike routes, and dedicated off-road bike paths, such as bike paths along the flood protection channels. The purpose of the Bicycle Master Plan is to: 1) guide the development of infrastructure, policies and programs that improve the bicycling environment; 2) depict the general location of planned bikeway routes; and 3) provide for a system of bikeways that is consistent with the General Plan.

The Bicycle Master Plan maps depict bikeways along roadways in the unincorporated areas and along rivers, creeks, and flood protection facilities countywide. These bikeways may be used for both recreational use and commuter travel.

The Bicycle Master Plan also includes data on collisions involving bicyclists and motor vehicles in the unincorporated areas between the years 2004 and 2009. In total, there were 1,369 collisions, including 25 fatalities. One of the goals of the Bicycle Master Plan is to reduce the number of collisions by making bicycling more safe through the implementation of education programs and network improvements. For more detailed data on collisions in the unincorporated areas, please refer to Appendix D. To view the Bicycle Master Plan, including policies, programs, and the mapped

bicycle network, please visit DPW's Bicycle Master Plan web site at http://dpw.lacounty.gov/go/bikeplan.

Pedestrian Networks

The diversity of communities in Los Angeles County creates distinct conditions, opportunities and challenges for pedestrians. There are a number of trails and paths that are available for use by pedestrians, such as sidewalks, hiking trails, over and under passes, and skywalks. Together, these systems constitute a network for accommodating pedestrian travel.

Community Pedestrian Plans

The County is committed to improving the environment to allow for increased alternative transportation uses. The General Plan includes a program to prepare community pedestrian plans for the unincorporated areas that will set standards for sidewalks, street crossings, sidewalk continuity, street connectivity, and topography. The community pedestrian plans will emphasize the connectivity of pedestrian paths to and from public transportation, major employment centers, shopping centers, and government buildings.

For more information on community pedestrian plans, please refer to Program M-2, Community Pedestrian Plans in Chapter 16: General Plan Implementation Programs.

Freeway, Highway, and Local Road Networks

The highway network is comprised of the State Highway System, which consists of 915 freeway and highway miles, and includes U.S. Interstate freeways and state-maintained freeways and highways, High Occupancy Vehicle (HOV) lanes, and county and city highways. The California Department of Transportation (Caltrans) is the state agency responsible for the maintenance of freeways and highways. Caltrans estimates that on average there are more than 100 million vehicle miles traveled per day in Los Angeles County via the State Highway System. Figure 7.2 is a map of State Highways and Freeways System that serves Los Angeles County.

Figure 7.2: Highways and Freeways Map

The County is responsible for the design, construction, operation, maintenance, and repair of roads in the unincorporated areas, as well as in a number of local jurisdictions that contract with the County for these services. DPW maintains over 3,100 miles of major roads and local streets in the unincorporated areas and over 1,700 miles in 22 cities.

Highway Plan

The Los Angeles County Highway Plan provides policy guidance for building a comprehensive highway network throughout the unincorporated areas. The Highway Plan provides a highway system that is consistent with and supportive of the goals and policies outlined in the Land Use Element. More specifically, the Highway Plan maintains right-of-way corridors to ensure space for future facility improvements to accommodate alternative modes. This is important in urbanized areas, which often have limited room for expansion, but are in need of additional facilities and improvements, such as bike lanes, sidewalks, and bus service. This is also important in rural areas to accommodate trails and landscaping, which encourage active transportation, provide shade, and reduce runoff from pollutants.

The purpose of the Highway Plan is to: 1) depict the general location of planned highway routes; 2) provide a means for protecting highway rights-of-way within the unincorporated areas; 3) establish a

plan and process for coordinating highway policies with neighboring cities and counties; and 4) provide for a system of highways that is consistent with the General Plan.

The Los Angeles County Interdepartmental Engineering Committee (IEC), which is comprised of the Director of Planning, the Road Commissioner, and the County Engineer, is charged with maintaining the Highway Plan.

Figure 7.3 shows the Highway Plan, which includes locations of existing and proposed major arterial highways. Although the County has no jurisdiction over roads in the 88 cities, or the freeways and other state routes maintained by Caltrans, these roadways are included in the map for reference and visual continuity. The Highway Plan roadway classifications and descriptions are provided in Table 7.1.

Figure 7.3: Highway Plan Policy Map

Table 7.1: Highway Plan Roadway Classifications

Classification	**Description**
Major Highway	This classification includes urban and rural highways that are of countywide significance and are, or are projected to be, the most highly traveled routes. These roads generally require four or more lanes of moving traffic, channelized medians and, to the extent possible, access control and limits on intersecting streets. In urban areas, the typical right-of-way width for these highways is 100 feet. Alternative major highway sections may be established by the County to accommodate features such as raised medians, bicycle facilities, and wider parkways with varying right-of-way widths. In rural areas, major highways are intended to maintain a rural appearance (without curb, gutter, and/or sidewalk) to reflect the rural character of various communities throughout Los Angeles County. The typical right-of-way width of a rural major highway is 108 feet. Additional right-of-way may be required to accommodate other transportation uses. In addition, beyond the ultimate road right-of-way, there may be a need for additional dedications for trail purposes, to accommodate equestrian and other non-vehicular uses.
Secondary Highway	This classification includes urban and rural routes that serve or are planned to serve an areawide or countywide function, but are less heavily traveled than major highways. Secondary highways also frequently act as oversized collector roads that feed the countywide system. In this capacity, the routes serve to remove heavy traffic from local streets, especially in residential areas. Access control, especially to residential property and minor streets, is desirable along these roads. In urban areas, secondary highways generally have four lanes of vehicular traffic on 80 feet of right-of-way. However, configuration and width may vary with traffic demand and existing conditions. In a few cases, routes that carry major highway levels of traffic are classified as secondary highways because it is impractical to widen them to major highway standards. Alternative secondary highway sections may be established by the County to accommodate features such as raised medians, bicycle facilities, and wider parkways with varying right-of-way widths. In rural areas, certain connector highways to and between rural communities are also classified as secondary highways. These highways are intended to maintain a rural appearance (without curb, gutter, and/or sidewalk) to reflect the rural character of various communities throughout Los Angeles County. The typical right-of-way

	width of rural secondary highways is 86 feet. Additional right-of-way may be required to accommodate other transportation uses. In addition, beyond the ultimate road right-of-way, there may be a need for additional dedications for trail purposes, to accommodate equestrian and other non-vehicular uses.
Limited Secondary Highway	This classification includes urban and rural routes that provide access to low-density areas. In urban areas, limited secondary highways generally feature lower traffic volumes and multimodal transportation facilities. The typical right-of-way width of these highways generally ranges between 64-80 feet. Alternative secondary highway sections may be established by the County to accommodate features such as raised medians, bicycle facilities, and wider parkways with varying right-of-way widths. In rural areas, limited secondary highways are generally located in rural communities and remote foothill, mountain and canyon areas. These highways are intended to maintain a rural appearance (without curb, gutter, and/or sidewalk) to reflect the rural character of various communities throughout Los Angeles County. The typical right-of-way width of rural limited secondary highways is 64 feet. Additional right-of-way width may be required to accommodate left-turn pockets and passing lanes may be provided when required for traffic safety. The right-of-way may be increased for additional improvements where traffic or drainage conditions warrant. In addition, beyond the ultimate road right-of-way, there may be a need for additional dedications for trail purposes, to accommodate equestrian and other non-vehicular uses.
Parkway	This classification includes urban and rural routes that have park-like features either within or adjacent to the roadway. The right-of-way width required varies as necessary to incorporate these features, typically with a minimum of 80 feet. Roadway improvements vary depending on the composition and volume of traffic carried.
Expressway	This classification includes urban and rural controlled-access highways connecting communities. Expressways can generally accommodate six to ten traffic lanes and are intended for thru-traffic, featuring full or partial control of access. The right-of-way required varies as necessary to incorporate these features, but is typically 180 feet in width. Roadway improvements vary depending upon the composition and volume of traffic carried.

Level of Service

DPW uses level of service (LOS) to assess the congestion of roadways in the transportation system. Based on a roadway's volume-to-capacity ratio (the number of vehicles currently using the roadway compared to the ideal maximum number of vehicles that can efficiently use the roadway), a letter designation is assigned that represents the traffic flow conditions, or LOS. Letter designations "A" through "F" represent progressively declining traffic flow conditions. LOS designations indicate whether the roadways are operating in excess of their intended capacity. Acceptable LOS is determined on a case by case basis, but generally, Level D is the desired minimum LOS. In some instances, LOS below D will be deemed acceptable in order to further other General Plan goals and policies, such as those that protect environmentally sensitive areas, promote active transportation, and encourage infill development, particularly within the Transit Oriented Districts. For the freeway system, DPW will work closely with Caltrans to identify potential significant traffic impacts and traffic mitigations to alleviate traffic congestion within the unincorporated areas.

Table 7.2 provides the definitions for LOS A-F, which are based on the definitions in the Transportation Research Board's Highway Capacity Manual.

Table 7.2: Level of Service Definitions

LOS	Type of Flow	Description
A	Free flow	Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
B	Stable flow	The ability to maneuver within the traffic stream is only slightly restricted and control delay at intersections is no significant. The travel speed is between 67% and 85% of the base free-flow speed.
C	Stable flow	The ability to maneuver and change lanes at midsegment locations may be more restricted than at LOS B. Longer queues at intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Approaching unstable flow	Small increases in flow may cause substantial increases in delay and decreases in travel speed. The travel speed is between 40% and 50% of the base free-flow speed.
E	Unstable flow	Significant delay is commonly experienced. The travel speed is between 30% and 40% of the base free-flow speed.
F	Forced flow	Congestion is likely occurring at intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed.

Although DPW utilizes the above described LOS criteria for assessing the performance of, and determining impacts to, roadways, DPW is currently working on the development of a multimodal transportation planning function. This effort will ensure that transportation facilities are planned, designed, and maintained to provide safe and efficient mobility for all users. Please refer to Program M-4, Multimodal Transportation Planning Function in Chapter 16: General Plan Implementation Program, for more details.

Aviation Network

There are 15 public-use airports located in Los Angeles County and one military airport located on San Clemente Island, as shown in Figure 7.4. The majority of passenger air transportation is serviced through Los Angeles International Airport (LAX), Burbank Airport, and the Long Beach Airport. Table 7.3 is a list of the airports and owners.

Figure 7.4: Airports/Airfields Map

Table 7.3: Los Angeles County Airports/Airfields

Airport/Airfield	Location	Owner
Agua Dulce Airport	Agua Dulce	Private

Burbank (Bob Hope) Airport	City of Burbank	Airport Authority
Brackett Field Airport	City of La Verne	Los Angeles County
Catalina Island Airport	Santa Catalina Island	Private
Compton/Woodley Airport	City of Compton	Los Angeles County
El Monte Airport	City of El Monte	Los Angeles County
Frederick Sherman Field	San Clemente Island	U.S. Navy
General William J. Fox Airfield	City of Lancaster	Los Angeles County
Jack Northrop Field Airport (Hawthorne Municipal Airport)	City of Hawthorne	City of Hawthorne
Long Beach Municipal Airport (Daugherty Field Airport)	City of Long Beach	City of Long Beach
Los Angeles International Airport (LAX)	City of Los Angeles	City of Los Angeles (LAWA)
Santa Monica Municipal Airport	City of Santa Monica	City of Santa Monica
Palmdale Regional Airport	City of Palmdale	City of Los Angeles (LAWA)
Van Nuys Airport	City of Los Angeles, Van Nuys	City of Los Angeles (LAWA)
Whiteman Airport	City of Los Angeles, Pacoima	Los Angeles County
Torrance Municipal Airport-Zamperini Field	City of Torrance	City of Torrance

Freight Rail Network

Los Angeles County has an extensive rail network that is focused on the efficient and safe movement of goods throughout the region. An effective goods movement system requires the elimination of at-grade crossings, and the creation and operation of rail networks, such as the Alameda Corridor.

The Alameda Corridor is a 20-mile rail cargo corridor, with a 10-mile below-grade trench between the ports of Los Angeles and Long Beach and the central Los Angeles freight yard transfer stations. The Alameda Corridor has been instrumental in efficiently transporting goods from the ports to inland transfer stations. The Alameda Corridor East Project, which is an extension of the Alameda Corridor Project, covers the area from central Los Angeles eastward 35 miles through the San Gabriel Valley, past Pomona and onward to the transcontinental rail network. The $910 million endeavor of mobility and safety improvements includes signalization upgrades, roadway widening, and 20 grade separations.

Figure 7.5 shows the freight and passenger rail lines that run throughout Los Angeles County.

Figure 7.5: Freight and Passenger Rail Lines Map

Interstate, Highways, and Local Roads

The six-county SCAG region has about 53,400 road miles traversing incorporated and unincorporated areas, 1,630 miles of which are interstate and freeway type. Sections of Interstate-710, Interstate-605, State Route-60, and State Route-91 carry the highest volumes of truck traffic in the region, averaging over 25,000 trucks per day in 2008. Other major components of the regional highway network also serve significant numbers of trucks, including Interstate-5, Interstate-10, Interstate-15, and Interstate-210, with some sections carrying over 20,000 trucks per day. These roads carry a mix of local, domestic trade, and international cargoes. The arterial roadway system also plays a critical role, providing "last mile" connections to the ports, manufacturing facilities, intermodal terminals, warehouses, and distribution centers.

Supportive Facilities

Harbors

The ports of Los Angeles and Long Beach are key links in the global economy and can handle a variety of cargo, including containers, bulk products, and automobiles. Combined, they are one of the largest and most efficient international shipping ports in the country, and the fifth busiest container port in the world. According to SCAG, the ports handled just under 120 million metric tons of cargo imports and exports, valued at $336 billion in 2010. The ports also serve as a significant tourism driver, as the largest cruise ship terminal on the West Coast, serving over a million passengers per year.

Parking

A limited number of public parking lots are maintained in the unincorporated areas by a variety of agencies, including Caltrans, Metro, the Los Angeles County Departments of Beaches and Harbors, and DPW. Metrolink and Caltrans maintain park-and-ride lots adjacent to commuter rail stops. The County owns and operates the following four park-and-ride lots: Studio City (Ventura Boulevard); Pomona (Fairplex); San Dimas (Via Verde); and Acton (Acton/Vincent Grade Metrolink Station).

The County regulates on-street parking in certain high-traffic areas through restricted parking zones enforced by the Sheriff's Department and California Highway Patrol. In addition, the Los Angeles County Department of Regional Planning regulates parking for new developments by requiring an adequate number of spaces to meet anticipated demand.

Terminals

Terminal facilities provide multiple uses, from park-and-ride lots for daily commuter vehicles to the heavily used freight terminals that serve the ports. Fierce competition among West Coast cities for international trade business has led to the planning and construction of an efficient terminal network. The most notable terminal facilities are the intermodal terminal networks located in and around the ports of Los Angeles and Long Beach, the goods transfer stations located near Downtown Los Angeles, and several freight and trucking facilities in the City of Industry.

III. Issues

1. Providing Streets That Accommodate All Users

Historically, transportation planning and street design have focused on the efficient movement of automobiles and not on the travel needs of pedestrians, equestrians, and bicyclists. In order to

create more welcoming places to walk, ride and bicycle, as well as to take transit, more emphasis needs to be placed on these other viable modes of transportation. Furthermore, transportation corridor designs should accommodate all users, including children, seniors, and the disabled.

Aesthetics and function are also important considerations when creating comfortable places to walk, bicycle, and take transit. This can include landscaping, street furniture, and amenities, such as benches and shelters at transit stops.

In a jurisdiction as diverse as the unincorporated areas, the approach to complete streets must be flexible and street designs must be context-sensitive. For example, complete streets in rural areas, such as the Antelope Valley, could look and feel very different from complete streets in urban communities, such as Willowbrook and Florence-Firestone.

2. Creating a Multimodal Transportation System

Single occupant vehicle use is associated with the highest level of land consumption among all transportation modes, and generates the highest level of environmental impacts. Estimates from the American Community Survey suggest that 74 percent of residents in the unincorporated areas drive alone to work, compared with 13 percent that carpool and 6 percent that use public transportation. The percentages for walking and bicycling are even lower, at less than 2 percent each. To encourage alternative modes and discourage single occupant vehicle use, the County can facilitate an interconnected, multimodal network of streets, equestrian trails, alleys, paths, greenways, and waterways where people can choose to walk, bicycle, ride, take transit or drive. The key to achieving a functional and sustainable multimodal transportation system is to provide efficient connections between different modes. For example, bicyclists can conveniently travel to farther destinations if they have the option to board the transit system with their bicycles. Multimodal options, such as bicycling and walking are cost-effective, energy efficient and healthy alternatives to driving. Additionally, creating bike-friendly and walkable communities is a critical component in meeting the County's greenhouse gas emission and energy reduction goals, while enhancing vibrant, livable communities.

Mobility management is an important component of a multimodal transportation system. Highway congestion results in major social costs, and long travel times and congestion increase energy and oil usage, exacerbate automobile emissions, and diminish the region's quality of life. In addition, long delays and congestion negatively impact the region's economy. According to SCAG, by failing to address congestion in the region, jobs have been lost–-every 10 percent decrease in congestion can bring an employment increase of about 132,000 jobs.

Mobility management is an important strategy for improving congestion and reducing VMTs. Mobility management strategies are designed to be used alone, or in concert with other policies to have a cumulative effect on the efficiency of the transportation system. Such strategies include the use of technologies in the development of transportation facilities and infrastructure, such as liquid and compressed natural gas, and hydrogen gas stations, Intelligent Transportation Systems (ITS), and electric car plug-in ports. Mobility management also refers to transportation demand management (TDM), which includes strategies that change travel behavior and discourage the single occupant driver, such as offering employer-based transit passes or increasing transit availability; regional carpooling programs; and parking management. One of the most effective TDM strategies is arguably congestion pricing.

Achieving a multimodal transportation system will require a greater investment in transit, pedestrian, and bicycle infrastructure. New proposals, such as tolling major freeways, double-decking highways, and/or raising the gas tax, all have varying levels of political and popular support. However, paying for transportation infrastructure will remain a critical planning issue. To plan efficient, functional and

cost-effective transportation networks, including public transit, roadways, and alternative transportation, the County should leverage investment with the planning, financing and management of other jurisdictions' transportation efforts. The County must work with transportation planning agencies on infrastructure, capital improvements and programming in areas where the General Plan focuses growth.

3. Connecting Transportation and Land Use Planning

For any transportation system to be effective, healthy and sustainable, all aspects–streets, freeways, public transit, highways, sidewalks, bicycle facilities, and freight movement–must be coordinated with land use planning. Land use and mobility are inherently linked. For example, sprawling single use development encourages driving. In another example, denser, communities with a mix of land uses that encourage transit use, walking, and bicycling are healthier and sustainable.

Land use planning and urban design are important factors in developing transit use and multimodal transportation options. Historically, streets have been designed to move the maximum amount of automobile traffic. Congested roadways and high on-street parking demand create insufficient space to accommodate bike lanes. In addition, a frequent complaint of bicyclists is the absence of adequate facilities to secure bicycles at public and private buildings or facilities. Many of the commercial corridors in mature urbanized areas are underutilized and in need of redevelopment. Strengthening mixed land uses and promoting compact development in these areas, in concert with design standards for rights-of-way, can help encourage walking and bicycling for shorter trips, as well as make transit more accessible. This is certainly true in the first-last mile connection to transit, which is the portion of a transit trip between a transit stop and one's final destination. At its April 2014 meeting, the Metro Board approved the First Last Mile Strategic Plan and Planning Guidelines, which aims to "better coordinate infrastructure investments in station areas to extend the reach of transit, with the ultimate goal of increasing ridership." The First Last Mile Strategic Plan details an extensive toolbox of pedestrian and cycling facilities that would make it safer and more convenient for riders to walk and bike to and from a transit stop. The strategies and tools identified in this Strategic Plan should be considered and utilized by the County, when feasible, during future planning efforts within the Transit Oriented Districts. The First Last Mile Strategic Plan is available online at: http://media.metro.net/docs/sustainability_path_design_guidelines.pdf. Finally, an important consideration in rural areas is to ensure that land uses account for equestrian uses, including the development of feeder trails and regional trails, to address equestrian mobility issues.

Because of the nature and financing of regional transportation networks, transportation planning is fragmented among many jurisdictions, agencies and County departments. Effective inter-jurisdictional collaboration, and public-private partnerships are essential to creating an efficient and multimodal transportation network.

4.Safe and Efficient Movement of Goods

The safe and efficient movement of goods is an important mobility issue that significantly impacts the economy. Goods movement has been negatively impacted by inefficient transportation networks. The ports, airports, rail lines and intermodal transit terminals have existing capacity constraints that undermine the efficiency and productivity of the goods movement system. In addition, the existing roadway and rail networks are reaching capacity. As a result, the system is susceptible to disruptions, which causes delays that reduce the quality of services and increase costs to consumers. Furthermore, the roadways and rail networks that accommodate the movement of goods are shared by motorists and passengers, which raises additional concerns over efficiency and safety.

The ports of Long Beach and Los Angeles are heavily investing in infrastructure to handle a projected doubling of container volumes. However, the ports have also been identified as one of the largest sources of air pollution in the region. In addition, terminal operations and supporting infrastructure are consumptive land uses, and are often characterized as having heavily polluting activities. The ports have created a Clean Air Action Plan in conjunction with the U.S. Environmental Protection Agency, the California Air Resources Board, and the South Coast Air Quality Management District to reduce emissions related to port operations.

The 2012–2035 RTP/SCS describes a goods movement system with initiatives and projects totaling nearly $50 billion through 2035 for SCAG's six-county region, including Los Angeles County. Key regional initiatives include a comprehensive system of zero- and/or near-zero-emission freight corridors, alleviation of major bottlenecks, a rail package totaling approximately $12 billion, and an environmental strategy to address emissions through both near term initiatives and a long term action plan for technology advancement. The comprehensive system of zero- and/or near-zero-emission freight corridors includes Interstate-710. The rail package includes main line capacity enhancements, on-dock and near-dock rail facility improvements, and 71 grade separations. In addition, critical projects to facilitate access to the ports (e.g., improvements to the Gerald Desmond Bridge), and to alleviate congestion at critical border crossings, are underway.

Regional Clean Freight Corridor System

In past RTPs, SCAG has envisioned a system of truck-only lanes extending from the ports to Downtown Los Angeles along Interstate-710, connecting to an east-west segment, and finally reaching Interstate-15 in San Bernardino County. Such a system would address the growing truck traffic on core highways throughout the region and serve key goods movement industries in a manner that mitigates impacts on communities and the environment.

East-West Freight Corridor

The 2012–2035 RTP/SCS identifies a corridor concept that connects to the north end of the I-710 freight corridor and roughly parallel the Union Pacific Railroad Los Angeles Subdivision before finally following a route adjacent to SR-60 just east of SR-57. The potential use of two non-roadway routes provides an opportunity to move the facility away from neighborhoods and closer to the industrial activities that it would serve. Utilizing a right-of-way of approximately 100 feet, the bi-directional corridor would be restricted to truck traffic and have limited ingress/egress points. The East-West Freight Corridor would be a catalyst for the use of zero-and/or near-emission truck technologies, improving air quality for communities near the corridor and throughout the region.

Bottleneck Relief

The 2012 RTP/SCS allocates an estimated $5 billion toward goods movement bottleneck relief strategies. Examples of bottleneck relief strategies include ramp metering, extension of merging lanes, ramp and interchange improvements, capacity improvements, and auxiliary lane additions. Additional project concepts will continue to be refined through SCAG's Comprehensive Regional Goods Movement Plan and Implementation Strategy.

Truck Corridors and Localized Arterials

While SCAG's effort is regional in scope, Metro is working to identify a County-Wide Strategic Truck Arterial Network (CSTAN) for Los Angeles County. The CSTAN will be informed by collection of data including truck counts on arterials, existing truck routes, connectivity to goods movement facilities, the location of bottlenecks, identification of land uses along truck routes and where they overlap with active transportation areas. The information is expected to guide funding priorities for projects such

as roadway widening, road repair and intersection improvements while minimizing potential conflicts between trucks and active transportation facilities.

While truck route studies have been performed at the council of government level, Metro is coordinating a countywide effort in recognition that truck routes frequently traverse subregions. As a key stakeholder and steward of public rights-of-way in the unincorporated areas, DPW serves as a technical advisor to the CSTAN program.

Air Travel and Cargo

SCAG expects air travel in the region to continue to grow. LAX, for instance, is the sixth busiest airport in the world and third busiest in the United States, offering more than 565 daily flights to 81 domestic cities and more than 1,000 weekly nonstop flights to 66 international destinations on more than 75 air carriers. It ranks 13th in the world in the amount of air cargo tonnage handled. In 2010, LAX served more than 59 million passengers, processed more than 1.9 million tons of air cargo valued at nearly $84 billion, and handled 575,835 aircraft operations (landings and takeoffs).

A $4.11 billion capital improvement program is underway at LAX, generating nearly 40,000 local jobs. The program's centerpiece is the $1.5-billion Bradley West Project with new gates for the latest-generation aircraft; new concourses and seating areas; new retail and food and beverage offerings; and expanded areas for more efficient security screening, immigration and customs processing. There also are several major airfield and facility projects, including a new Central Utility Plant, new taxiways and taxi lanes, and multi-million-dollar renovations--undertaken by both Los Angeles World Airports (LAWA) and the airlines--to other terminals.

5. Impacts of Transportation on Natural and Community Resources

Transportation systems, goods movement activities, and automobile use directly affect quality of life. This includes traffic congestion, truck intrusion into neighborhoods, safety, land use incompatibility, poor air quality and related health impacts, restricted mobility and delay at rail crossings, noise and vibration impacts, and visual impacts. Significant short- and long-term air quality impacts directly result from goods movement activities, such as emissions from ocean ships, diesel trucks, as well as increased auto-emissions, which in turn contributes to climate change.

The expansion and operation of transportation systems, which invariably affect biological resources and water quality, can be mitigated to lessen the negative impacts on resources. One key ecological issue is the effect of increased runoff from paved surfaces, which increases sediment movement, destroys aquatic habitat, and redistributes road-source pollutants. A second crucial ecological issue is potential negative impacts of human transportation systems on biological resources. Human transit is often responsible for transporting non-native species to ecosystems that do not have any natural defenses against the new threats. At the same time, transit infrastructure creates physical barriers across wildlife habitats and corridors that can reduce the mobility of local species, contribute toward mortality, and threaten genetic diversity. As discussed in the Public Services and Facilities Element, the majority of stormwater runoff is discharged directly into the Pacific Ocean. The General Plan provides policies that support transportation systems that treat and infiltrate stormwater runoff to mitigate the environmental impacts of the runoff.

IV. Goals and Policies

Goal M 1: Street designs that incorporate the needs of all users.	
Topic	**Policy**
Complete Streets	Policy M 1.1: Provide for the accommodation of all users, including pedestrians, motorists, bicyclists, equestrians, users of public transit, seniors, children, and persons with disabilities when requiring or planning for new, or retrofitting existing, transportation corridors/networks whenever appropriate and feasible.
	Policy M 1.2: Ensure that streets are safe for sensitive users, such as seniors and children.
	Policy M 1.3: Utilize industry standard rating systems to assess sustainability and effectiveness of street systems for all users.
Goal M 2: Interconnected and safe bicycle- and pedestrian-friendly streets, sidewalks, paths and trails that promote active transportation and transit use.	
Topic	**Policy**
Active Transportation Design	Policy M 2.1: Provide transportation corridors/networks that accommodate pedestrians, equestrians and bicyclists, and reduce motor vehicle accidents through a context-sensitive process that addresses the unique characteristics of urban, suburban, and rural communities whenever appropriate and feasible.
	Policy M 2.2: Accommodate pedestrians and bicyclists, and reduce motor vehicle accidents by implementing the following street designs, whenever appropriate and feasible: • Lane width reductions to 10 or 11 feet in low speed environments with a low volume of heavy vehicles. • Wider lanes may still be required for lanes adjacent to the curb, and where buses and trucks are expected. • Low-speed designs. • Access management practices developed through a community-driven process. • Back in angle parking at locations that have available roadway width and bike lanes, where appropriate.

	Policy M 2.3: Accommodate pedestrians and bicyclists, and reduce motor vehicle accidents by implementing the following intersection designs, whenever appropriate and feasible: • Right angle intersections that reduce intersection skew. • Smaller corner radii to reduce crossing distances and slow turning vehicles. • Traffic calming measures, such as bulb-outs, sharrows, medians, roundabouts, and narrowing or reducing the number of lanes (road diets) on streets. • Crossings at all legs of an intersection. • Shorter crossing distances for pedestrians. • Right-turn channelization islands. Sharper angles of slip lanes may also be utilized. • Signal progression at speeds that support the target speed of the corridor. • Pedestrian push buttons when pedestrian signals are not automatically recalled. • Walk interval on recall for short crossings. • Left-turn phasing. • Prohibit right turn on red. • Signs to remind drivers to yield to pedestrians.

	Policy M 2.4: Ensure a comfortable walking environment for pedestrians by implementing the following, whenever appropriate and feasible: • Designs that limit dead-end streets and dead-end sidewalks. • Adequate lighting on pedestrian paths, particularly around building entrances and exits, and transit stops. • Designs for curb ramps, which are pedestrian friendly and compliant with the American Disability Act (ADA). • Perpendicular curb ramps at locations where it is feasible. • Pedestrian walking speed based on the latest standard for signal timing. Slower speeds should be used when appropriate (i.e., near senior housing, rehabilitation centers, etc.) • Approved devices to extend the pedestrian clearance times at signalized intersections. • Accessible Pedestrian Signals (APS) at signalized intersections. • Pedestrian crossings at signalized intersections without double or triple left or right turn lanes. • Pedestrian signal heads, countdown pedestrian heads, pedestrian phasing and leading pedestrian intervals at signalized intersections. • Exclusive pedestrian phases (pedestrian scrambles) where turning volume conflicts with very high pedestrian volumes. • Advance stop lines at signalized intersections. • Pedestrian Hybrid Beacons. • Medians or crossing islands to divide long crossings. • High visibility crosswalks. • Pedestrian signage. • Advanced yield lines for uncontrolled crosswalks. • Rectangular Rapid Flashing Beacon or other similar approved technology at locations of high pedestrian traffic. • Safe and convenient crossing locations at transit stations and transit stops located at safe intersections.

	Policy M 2.5: Ensure a comfortable bicycling environment by implementing the following, whenever appropriate and feasible: • Bicycle signal heads at intersections. • Bicycle signal detection at all signalized intersections. • Wayfinding signage. • Road diet techniques, such as lane narrowing, lane removal, and parking removal/restriction. • Appropriate lighting on all bikeways, including those in rural areas. • Designs, or other similar features, such as: shoulder bikeways, cycle tracks, contra flow bike lanes, shared use paths, buffered bike lanes, raised bike lanes, and bicycle boulevards.
	Policy M 2.6: Encourage the implementation of future designs concepts that promote active transportation, whenever available and feasible.
	Policy M 2.7: Require sidewalks, trails and bikeways to accommodate the existing and projected volume of pedestrian, equestrian and bicycle activity, considering both the paved width and the unobstructed width available for walking.
	Policy M 2.8: Connect trails and pedestrian and bicycle paths to schools, public transportation, major employment centers, shopping centers, government buildings, residential neighborhoods, and other destinations.
	Policy M 2.9: Encourage the planting of trees along streets and other forms of landscaping to enliven streetscapes by blending natural features with built features.
	Policy M 2.10: Encourage the provision of amenities, such as benches, shelters, secure bicycle storage, and street furniture, and comfortable, safe waiting areas near transit stops.
	Policy M 2.11: In urban and suburban areas, promote the continuity of streets and sidewalks through design features, such as limiting mid-block curb cuts, encouraging access through side streets or alleys, and promoting shorter block lengths.
Goal M 3: Streets that incorporate innovative designs.	
Topic	**Policy**
Innovative Street Design	Policy M 3.1: Facilitate safe roadway designs that protect users, preserve state and federal funding, and provide reasonable protection from liability.
	Policy M 3.2: Consider innovative designs when part of an accepted standard, or when properly vetted through an appropriate engineering/design review, in compliance with all state and federal laws.

	Policy M 3.3: Complete the following studies prior to the implementation of innovative design concepts: • An analysis of the current and future context of the community and neighborhood in which they are proposed; • A balanced assessment of the needs of all users and travel modes (i.e., pedestrian, bicycle, transit, vehicular, and equestrian, where appropriate); • A technical assessment of the operational and safety characteristics for each mode; and • A consistency check with transportation network plans, including the Highway Plan, Bicycle Master Plan, and Community Pedestrian Plans.
	Policy M 3.4: Support legislation that minimizes or eliminates liability associated with the implementation of innovative street designs that accommodate all users.
Goal M 4: An efficient multimodal transportation system that serves the needs of all residents.	
Topic	**Policy**
Transit Efficiency, Multimodal Transportation	Policy M 4.1: Expand transportation options that reduce automobile dependence.
	Policy M 4.2: Expand shuttle services to connect major transit centers to community points of interest.
	Policy M 4.3: Maintain transit services within the unincorporated areas that are affordable, timely, cost-effective, and responsive to growth patterns and community input.
	Policy M 4.4: Ensure expanded mobility and increase transit access for underserved transit users, such as seniors, students, low income households, and persons with disabilities.
	Policy M 4.5: Encourage continuous, direct routes through a connected system of streets, with small blocks and minimal dead ends (cul-de-sacs), as feasible.
	Policy M 4.6: Support alternatives to LOS standards that account for a multimodal transportation system.
	Policy M 4.7: Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.
	Policy M 4.8: Provide and maintain appropriate signage for streets, roads and transit.
	Policy M 4.9: Ensure the participation of all potentially affected communities in the transportation planning and decision-making process.
	Policy M 4.10: Support the linkage of regional and community-level transportation systems, including multimodal networks.
	Policy M 4.11: Improve the efficiency of the public transportation system with bus lanes, signal prioritization, and connections to the larger regional transportation network.

	Policy M 4.12: Work with adjacent jurisdictions to ensure connectivity and the creation of an integrated regional network.
	Policy M 4.13: Coordinate with adjacent jurisdictions in the review of land development projects near jurisdictional borders to ensure appropriate roadway transitions and multimodal connectivity.
	Policy M 4.14: Coordinate with Caltrans on mobility and land use decisions that may affect state transportation facilities.
Travel Demand Management	Policy M 4.15: Reduce vehicle trips through the use of mobility management practices, such as the reduction of parking requirements, employer/institution based transit passes, regional carpooling programs, and telecommuting.
	Policy M 4.16: Promote mobility management practices, including incentives to change transit behavior and using technologies, to reduce VMTs.
Goal M 5: Land use planning and transportation management that facilitates the use of transit.	
Topic	**Policy**
Land Use and Transportation	Policy M 5.1: Facilitate transit-oriented land uses and pedestrian-oriented design, particularly in the first-last mile connections to transit, to encourage transit ridership.
	Policy M 5.2: Implement parking strategies that facilitate transit use and reduce automobile dependence.
	Policy M 5.3: Maintain transportation right-of-way corridors for future transportation uses, including bikeways, or new passenger rail or bus services.
Transportation Funding	Policy M 5.4: Support and pursue funding for the construction, maintenance and improvement of roadway, public transit, and equestrian, pedestrian and bicycle transportation systems.
	Policy M 5.5: Encourage financing programs, such as congestion pricing, bonding, increasing parking costs, fair share programs for each community, to implement local and state transportation systems and facilities.
Goal M 6: The safe and efficient movement of goods.	
Topic	**Policy**
Goods Movement	Policy M 6.1: Maximize aviation and port system efficiencies for the movement of people, goods and services.
	Policy M 6.2: Support the modernization of aviation systems, including LAX.
	Policy M 6.3: Designate official truck routes to minimize the impacts of truck traffic on residential neighborhoods and other sensitive land uses.
	Policy M 6.4: Minimize noise and other impacts of goods movement, truck traffic, deliveries, and staging in residential and mixed-use neighborhoods.

	Policy M 6.5: Support infrastructure improvements and the use of emerging technologies that facilitate the clearance, timely movement, and security of trade.
	Policy M 6.6: Preserve property for planned roadway and railroad rights-of-way, marine and air terminals, and other needed transportation facilities.
Goal M 7: Transportation networks that minimizes negative impacts to the environment and communities.	
Topic	**Policy**
Environmentally Sensitive Transportation Design	Policy M 7.1: Minimize roadway runoff through the use of permeable surface materials, and other low impact designs, wherever feasible.
	Policy M 7.2: Encourage the creation of wildlife underpasses and overpasses, fencing, signage, and other measures to minimize impacts to wildlife at junctures where transit infrastructure passes through or across sensitive habitats.
	Policy M 7.3: Encourage the use of sustainable transportation facilities and infrastructure technologies, such as liquid and compressed natural gas, and hydrogen gas stations, ITS, and electric car plug-in ports.
	Policy M 7.4: Where the creation of new or the retrofit of roadways or other transportation systems is necessary in areas with sensitive habitats, particularly SEAs, use best practice design to encourage species passage and minimize genetic diversity losses.
Rural Streets	Policy M 7.5: In rural areas, require rural highway and street standards that minimize the width of paving and the placement of curbs, gutters, sidewalks, street lighting, and traffic signals, except where necessary for public safety.

V. Mobility Element Implementation Programs

- Parking Ordinance
- Community Pedestrian Plans
- Safe Routes to School Program
- Multimodal Transportation Planning Function

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Model Design Manual for Living Streets

The Model Design Manual for Living Streets is a valuable resource for local jurisdictions looking to create streets that are safe and comfortable for all users and all modes. It outlines various design features that not only accommodate

cars, but also pedestrians, bicyclists, and transit riders. Street design features that help to create vibrant and attractive streets are also outlined in the manual.

The manual was funded by the Department of Health and Human Services through the Los Angeles County Department of Public Health and the UCLA Luskin Center for Innovation.

For more information please visit: http://www.modelstreetdesignmanual.com/

Green Streets

Green streets is a sustainable stormwater management and landscaping strategy that utilizes a combination of increased permeable surfaces and planted areas, soil filtration, vegetative bio-retention and underground stormwater retention basins to maximize groundwater recharge. Green streets not only improve water quality and drainage, but also improve mobility and promote complete streets through traffic calming. They also enhance the pedestrian experience through sustainable landscaping, such as bio-swales, street trees, rain gardens, and planters.