



CIRCULATION & MOBILITY

INTRODUCTION AND VISION FOR THE FUTURE

Orange's circulation system has been influenced by a variety of historical factors, including the presence of the Santa Fe Railroad, the vision of Alfred B. Chapman and William T. Glassell, the agricultural history of the area, and alternative transportation modes including a historic streetcar system.

In 1887, the Santa Fe Railroad came to Orange and built a station four blocks west of the Plaza. The coming of the railroad set off a real estate boom that brought hundreds of settlers to the area. The railroad also influenced the City's early economic success by providing a means to transport goods, especially citrus, to the entire country. Today, the railroad tracks continue to serve freight trains and provide a critical link to the region via the Metrolink heavy rail transit system.

In the 1870s, Alfred B. Chapman and William T. Glassell subdivided their land into residential and small farm lots centered on a roundabout known today as Plaza Park. Plaza Park was dedicated in 1886 and established the City's two main streets – Chapman Avenue and Glassell Street – as well as the compact street grid of Old Towne Orange. The street grid and railroad system were supported historically by a streetcar system that connected the small towns and settlements that make up the City today.

Over time, the small farms on the outer edges of Orange's core district began to disappear. Two factors influenced this change: the demand for housing after World War II and the appearance of "Quick Decline" disease that destroyed the local citrus industry. As each farm was developed independently, the grid system expanded outward and commercial corridors were established. Orange's roadways began to take on a more suburban pattern of collectors, connectors, and arterials. As development reached the eastern portion of the City, the grid gave way to curvilinear street patterns.

The historic roadways and railways that form the basis for the current circulation network have been complemented over the years by the development of a streetcar system, a transit service, an emerging and continually expanding bicycle trail and route network, and routes for equestrian use in the eastern portion of the City. The City will continue to be served by these multiple modes of transportation and other emerging mobility technologies.



Orange's ***Vision for the Future***, described in the General Plan Introduction, recognizes that the circulation system is a key component of the quality of life in the City. Accordingly, the vision includes the following objectives:

- Residential areas will be connected to commercial, recreational, and open space areas, as well as educational and cultural facilities via a balanced, multi-modal circulation network that accommodates vehicles, pedestrians, cyclists, hikers, and equestrians. This network will create additional opportunities for walking and biking, enhancing safety and well-being for neighborhoods and businesses.
- The City will work to define neighborhoods through the use of open space areas and a trail system that provides a source of aesthetic beauty and recreational opportunities. These open space areas support a healthy and active community.
- We will develop a connected multi-modal network for traveling from one end of town to the other that provides the option for residents from different neighborhoods to access parks, open spaces, and scenic areas by vehicle, transit, foot, bicycle or, where appropriate, horse.

Purpose of the Circulation & Mobility Element

California's General Plan Guidelines mandate that the Circulation & Mobility Element fulfill the following objectives:

- Show a direct relationship to the Land Use Element to ensure that any changes to land use as stated by the Land Use Element and growth occur with adequate circulation and transportation facilities in mind.
- Address relevant issues including the adequacy of "major thoroughfares, transportation routes, terminals, other local public utilities and facilities." The goal of the Circulation & Mobility Element is to identify circulation problems related to these facilities in the early stages and resolve them in local goals and policies without costly delays.

Other relevant issues discussed in the Circulation & Mobility Element include those that address streets, highways, public transit routes, railroads, bicycle and pedestrian routes, recreational trails, paratransit, parking, transportation system management, and air pollution. The hierarchy of streets within the residential areas helps to frame the urban form. Connections between neighborhoods can be achieved by a comprehensive network of sidewalks and trails. Also, the commercial corridors can be enhanced with adequate street capacity, public transit, and pedestrian-friendly environments.

The state also recommends that the Circulation & Mobility Element address coordination efforts among the local, regional, and state transportation plans to better resolve circulation issues. Since many transportation concerns are regional, addressing them requires intergovernmental and regional transportation management plans and policy implementation. These partnerships ensure the most efficient use of funding, infrastructure, and other resources. The state also recommends the "preservation of transportation corridors for future system improvements."



The Circulation & Mobility Element prioritizes the issues and opportunities that exist within Orange's transit network. It is directly responsive to proposed changes in land use and anticipates the impacts of those changes. This Element also seeks to reassure residents and businesses that the City recognizes the link between transportation and land uses, and provides a means to mitigate the impacts of growth.

Another goal of the Circulation & Mobility Element is to increase transportation options and provide increased access to the circulation system for all residents of Orange. This goal includes improved rail and bus transit connections and frequency, implementation of a *Bikeway Master Plan*, and completion of a trails system. Transforming many of Orange's historically auto-oriented commercial corridors, such as Katella Avenue, Main Street, and portions of La Veta Avenue, Chapman Avenue, and Glassell Street into more pedestrian-friendly mixed-use environments is an overarching goal. Where possible, the development of equestrian trails is also encouraged.

One of the main functions of the Circulation & Mobility Element is to guide and direct enhancement of the current circulation system for existing and future developments. Thus, circulation provisions correlate with the Land Use Element to avoid unchecked growth and unnecessary congestion.

Another key objective of the Element is to work toward a future circulation network that provides meaningful alternatives for getting around the community by less auto-dependent means. The City's topography, street and sidewalk system, transit and trail framework, and land use relationships provide an excellent foundation for pursuit of this objective.

The Circulation & Mobility Element does not simply determine automobile routes. It also guides the movement of people and goods, directly affecting Orange's physical, social, and economic environment. Since circulation permits accessibility to places and social amenities, it can either improve or cause deterioration in quality of life. Circulation efficiency also plays a major role in progress and development of the City's economy.

Scope and Content of the Circulation & Mobility Element

The Circulation & Mobility Element comprises three sections:

- (1) Introduction;
- (2) Issues, Goals, and Policies; and
- (3) The Circulation & Mobility Plan.

The first section introduces the contents of the Circulation & Mobility Element. The second section presents issues, goals, and policies for improving circulation. The third section includes the Circulation & Mobility Plan, which designates locations and standards for roadways and non-motorized circulation facilities, and states the community's desired level of transportation service.

Implementation measures designed to promote achievement of the goals and policies are provided in an Appendix to the General Plan.



Relationship to other General Plan Elements

California planning law requires that the Circulation & Mobility Element correlate and maintain consistency with the other General Plan elements. The Circulation & Mobility Element relates most closely to the Land Use, Natural Resources, Noise, Economic Development, Housing, and Urban Design Elements.

The Circulation & Mobility Element is linked to the Land Use Element because the General Plan land use designations identified in the Land Use Element serve as a basis for the allocation of vehicle trips and establishment of capacity levels for circulation planning. The Land Use Element also provides land use designations that accommodate mixed commercial and residential development, which encourage shorter trips and improve the efficiency of the transportation network. The Circulation & Mobility Plan is established to define and provide for adequate levels of service and facilities to support future land uses. This Element recommends roadway and intersection improvements that may require land acquisition. Location of public transportation facilities will also influence pedestrian activity and transit-oriented development, and the physical size of streets will affect urban land uses and the physical appearance of the City.

The Natural Resources Element identifies regional air quality objectives and provides appropriate mitigation efforts that affect the Circulation & Mobility Element. Improving access, encouraging alternative modes of travel, and maintaining air quality and conservation standards are common objectives of the Natural Resources and the Circulation & Mobility Elements.

The Noise Element addresses future noise levels associated with roadways, rail, and other transportation facilities. Future volumes of traffic on the circulation system are directly related to future noise levels and mitigation strategies.

The Economic Development Element identifies desirable economic conditions and land uses that enhance and promote business activity, employment growth, and economic stability. The goals and policies of the Circulation & Mobility Element will determine road capacity in Orange, which will impact the type and location of uses, and parking and access considerations associated with future uses. Both elements share a common objective of planning for future transportation infrastructure needs. Maintaining roadways, bikeways and bus and rail transit facilities is critical to the success of both current and future businesses in Orange.

The Urban Design Element is a framework for shaping the future form and character of Orange. The quality of Orange's physical environment contributes to its identity, attracts new residents, and sets the stage for economic activity. The Urban Design Element builds on the foundation of Orange's already strong sense of place to preserve and strengthen the streetscape environment of commercial corridors and landmarks within the city. The Urban Design Element and Circulation & Mobility Element share a common objective to reinvent City streets as more functional and walkable public places.



ISSUES, GOALS, AND POLICIES

The goals, policies, and implementation programs of the Circulation & Mobility Element seek to achieve a better balance between vehicular, pedestrian, and bicycle travel, and to provide a wide range of viable transportation options to Orange residents. The following six issues are addressed: (1) enhancing the local circulation system; (2) maintaining the regional circulation system; (3) maintaining a viable public transportation network; (4) creating a comprehensive system of sidewalks, trails, and bikeways; (5) providing adequate parking facilities; and (6) improving circulation system aesthetics and safety.

Local Circulation System

The local roadway system serves the community's primary needs for mobility and access, and consists of a hierarchy of City streets to meet those needs. The City's original street system was established as a grid pattern long before a Master Plan of Arterial Highways (MPAH) was adopted. The Old Towne area and many postwar neighborhoods were designed in a classic grid configuration, while in newer parts of the City, physical features such as the Santa Ana River, Santiago Creek, hilly terrain, freeways and the presence of the City of Villa Park have resulted in a system without a definitive pattern. Some major roads do not connect the eastern and western portions of the City and consequently do not provide effective through circulation. A well-designed roadway system will provide convenient access to activities in Orange.

GOAL 1.0: Provide a safe, efficient, and comprehensive circulation system that serves local needs, meets forecasted demands, and sustains quality of life in neighborhoods.

Policy 1.1: Plan, build, and maintain an integrated, hierarchical, and multi-modal system of roadways, pedestrian walkways, and bicycle paths throughout the City.

Policy 1.2: Identify key intersections and streets with historical or projected traffic congestion problems and apply creative traffic management measures to improve overall circulation.

Policy 1.3: Consider various methods to increase safety on City arterials and neighborhood streets, including landscaping, provision of bike/transit lanes, and consideration of traffic calming on neighborhood streets in accordance with the City's Neighborhood Residential Traffic Management Program.

Policy 1.4: Prohibit on-street parking where possible to reduce bicycle/automobile conflicts in appropriate target areas as recommended by the *Bikeways Master Plan*.

Policy 1.5: Address possible safety and noise effects of increased rail activity on grade crossings throughout the City.

Policy 1.6: Maintain and repair roadways and sidewalks as necessary to improve circulation and safety.

Policy 1.7: Consolidate driveways along roadways that provide access to commercial uses to minimize side street interruption and promote smooth traffic flows.



On-street parking is prohibited on commercial access streets to provide adequate curb-to-curb width for travel lanes.

Regional Circulation System

Mobility in Orange is directly related to the regional transportation network, as the City lies at the confluence of several regional freeways: the Santa Ana Freeway (Interstate 5), Orange Freeway (State Route [SR] 57), Garden Grove Freeway (SR-22), Costa Mesa Freeway (SR-55), Riverside Freeway (SR-91) and Eastern Transportation Corridor (SR-241). In addition to the freeways, other connections to the region include the commuter rail system known as Metrolink, a freight and goods rail transport system, and a regional bikeways system with connections to the Santa Ana River and other locations. Orange is also connected to the region via the Orange County Transportation Authority (OCTA) bus system. City infrastructure must accommodate regional through traffic originating in other communities in addition to providing local residents access to the regional network.

GOAL 2.0: Provide an effective regional transportation network.

- Policy 2.1: Ensure consistency with the County MPAH in order to qualify for funding programs.
- Policy 2.2: Coordinate with adjacent cities to plan and develop major east/west and north/south arterials and rapid transit to connect the City with the cities of Anaheim, Tustin, Santa Ana, Garden Grove, and Villa Park, as well as developing areas within the City's sphere of influence.
- Policy 2.3: Cooperate with and support local and regional agencies' efforts to improve regional arterials and transit in order to address increasing traffic congestion.
- Policy 2.4: Coordinate land use planning with anticipated future development of roadways and other transportation facility improvements as well as the expansion of commuter rail and bus service.
- Policy 2.5: Ensure that transportation facilities and improvements do not degrade the quality of Orange's commercial and residential areas.
- Policy 2.6: Encourage the use of regional rail, transit, bicycling, carpools, and vanpools for work trips to relieve traffic congestion.
- Policy 2.7: Continue to support the use of rail corridors within the City for the movement of freight and goods, and work with rail operators to minimize associated traffic delays.

Public Transportation

Public transportation is a crucial component of a comprehensive circulation system. In addition to reducing air pollution and traffic congestion, a successful public transit system provides an alternative mode of travel for those with limited mobility, residents who may not have access to a car, and persons who choose not to drive.

GOAL 3.0: Connect centers within the City to each other and to the region through efficient and accessible public transportation.



- Policy 3.1: Work with OCTA and other agencies to assess City public transportation needs and to ensure delivery of services when and where they are needed.
- Policy 3.2: Enhance and encourage provision of convenient and attractive transit amenities and streetscapes to encourage use of public transportation (e.g., benches, trash cans, shelters, and lighting).
- Policy 3.3: Require incorporation of transit-oriented design features within major commercial and employment areas as well as in medium density residential and mixed-use development areas.

Sidewalks, Trails, and Bikeways

In addition to offering recreational and public health benefits, non-vehicular modes of transportation offer commuting options. Also, the mixed-use environments advocated by Land Use Element policies will encourage increased pedestrian activity on City sidewalks for both business and pleasure. An effective pedestrian, bicycle, and equestrian network must be safe and accessible, and must connect key activity centers within the City with each other and with the regional trail system. A comprehensive network of on-street bicycle lanes, off-street bicycle paths, sidewalks, and trails should be developed and maintained to increase the safety and utility of the system, with a particular focus on the City's sidewalk deficient industrial areas

GOAL 4.0: Provide efficient and accessible modes of pedestrian, bicycle, and equestrian transportation and improved facilities and amenities.

- Policy 4.1: Create a comprehensive bicycle network that is integrated with other transportation systems by establishing complementary on-street and off-street facilities as identified in the *City of Orange Bikeways Master Plan* and *OCTA Commuter Bikeways Strategic Plan*, including Santiago Creek, the Santa Ana River, and the Tustin Branch Trail.
- Policy 4.2: Install racks and safe storage facilities at parking areas for City facilities, as appropriate, and encourage incorporation of such facilities within privately-developed projects.
- Policy 4.3: Improve citywide awareness of automobile and bicycle safety.
- Policy 4.4: Encourage use of the bikeway system by providing adequate signage, trail markings, and other amenities.
- Policy 4.5: Ensure that pedestrian sidewalks, trails, and bikeways are safe environments through the use of crime prevention-oriented trail design features, lighting where appropriate, pedestrian and bicycle safety improvements at at-grade rail crossings, access for emergency vehicles, and links to the roadway signal system.
- Policy 4.6: Explore opportunities to convert abandoned rail corridors into segments of the City's bikeway and pedestrian trail system.
- Policy 4.7: Provide ADA accessible sidewalks and pedestrian amenities throughout the City.



Policy 4.8: Expand and maintain an equestrian trail network and provide for appropriate staging areas and infrastructure.

Parking Facilities

A shortage of parking can cause circulation problems and could lead to a reduction or loss of business activity. Old Towne Orange has been identified as an area of particular concern. As the City develops, providing adequate parking adjacent to other activity centers is increasingly important.

GOAL 5.0: Provide adequate parking to meet the needs of activity centers throughout the City.

Policy 5.1: Provide adequate parking to protect and support the economic vitality and diversity of Old Towne.

Policy 5.2: Plan for and design parking facilities throughout the City that are adequate to meet demand, but also consider land use-parking efficiencies, and the surrounding natural and built environment.

Policy 5.3: Encourage adjacent businesses to consolidate parking facilities and access points.

Policy 5.4: Encourage well-designed structured parking in commercial areas where such features would be economically feasible, safe, and visually integrated with existing development.

Circulation System Aesthetics

Streets that have been made or modified to include visual and pedestrian amenities can improve the overall look and feel of City streets, as well as enhancing functionality for all users. As major commercial corridors are beautified and changed to include a pleasant pedestrian environment, this will have positive effects on the feelings of safety and security for pedestrians, bicyclists, and motorists.

GOAL 6.0: Provide roadway corridors that are aesthetically pleasing and contribute to a feeling of safety, security, and comfort for motorists, bicyclists, and pedestrians.

Policy 6.1: Supply adequate, clear, and correctly placed signage to direct both motorists and non-motorists toward destinations and away from hazards.

Policy 6.2: Provide clear indicators in the right-of-way for where pedestrians and bicyclists are encouraged to walk, bike, or cross safely. These may include special paving, line stripes, and crosswalks.

Policy 6.3: Provide lighting, landscaping, street trees, and other appropriately scaled streetscape features that accommodate all users on commercial corridors. Where appropriate, lighting should be scaled for autos as well as pedestrians.



CIRCULATION & MOBILITY PLAN

The objective of the Circulation & Mobility Plan is to document existing transportation facilities in the planning area used for the movement of people and goods. The Element addresses the desired future condition of these facilities, and their relationship to future land uses identified in the Land Use Element. The Plan describes the circulation system, including the arterial network and intersections, the public transit system, bicycle paths, recreation facilities, parking, and railroad operations. The City's circulation network includes an extensive system of roadways, bus transit service, commuter rail, and freight rail.

Local Circulation System

A well-designed local arterial roadway system that connects to a well-developed regional circulation system provides safe and convenient access to employment, housing, recreation, and commercial areas in Orange. City arterial roadways located on the western side of SR-55 generally follow north-south and east-west orientations. On the eastern side of the freeway, arterials are characterized by curvilinear streets due to undulating geographical surroundings. Key north-south arterials include Tustin Street, Glassell Street, Main Street, and The City Drive. Key east-west arterials include Chapman Avenue, Katella Avenue, Taft Avenue, and parts of La Veta Avenue. These arterial roadways are in turn supported by a network of collector and local streets that provide access to homes and businesses throughout the City.

Roadway Classification System

The City's roadway network is distinguished by a hierarchical classification system that differentiates roads by size, function, and approximate daily capacity based upon Level of Service D (LOS D). LOS is a qualitative measure that characterizes traffic congestion on a scale of A to F with LOS A representing a free-flow condition and LOS F representing extreme congestion. LOS standards can apply to either intersections or links (a section of street between two intersections). Generally speaking, LOS represents the ability of a roadway or an intersection to accommodate traffic.

In the City, intersections are used as actual control points. City roadways consist of both divided and undivided roadways. Divided roadways generally contain a physical barrier or buffer, such as a raised median or a continuous two-way left turn lane, between each direction of travel. Divided roadways remove vehicles making a left turn from the travel lanes so as not to impede through traffic and constrict roadway capacity. Undivided roadways do not contain a buffer between each direction of travel, and therefore left-turning traffic can impede through traffic. Undivided roadways may provide turn movement pockets at intersections. The six categories of roadways in Orange are summarized in Table CM-1. Proposed cross-sections for each type of roadway are shown in Figure CM-1.

The City's policy is to use a link capacity standard of LOS D. The following paragraphs represent link capacities of each roadway type at LOS D.



Classification	Facility Type	Characteristics
Smart Street	Smart Street	4-8 lane divided, with possible signal coordination, intersection capacity improvements and/or grade separations
Principal Arterial	8 Lane Divided	Primarily serves through traffic with limited local access
Major Arterial	6 Lane Divided	Serves mostly through traffic with some local access allowed
Primary Arterial	4 Lane Divided	Serves through and local traffic
Secondary Arterial	4 Lane Undivided	Serves through and local traffic
Collector Street	2 Lane	Serves mostly local traffic

Smart Streets are typically four- to eight-lane roadways with enhanced capacity and smoother traffic flow than standard arterial streets. These streets have enhanced features such as traffic signal synchronization, bus bays, intersection improvements, and the addition of travel lanes by removing on-street parking and consolidating driveways. The traffic carrying capacities of Smart Streets can range from 60,000 to 79,000 vehicles per day, depending on the number of lanes, degree of access control, peak period loading, and the configurations of major intersections.

Principal Arterials are typically eight-lane divided roadways with medians or continuous two-way left turn lanes. They can accommodate up to 67,500 vehicles on an average weekday at LOS D conditions, depending on the degree of access control, peak period traffic loadings, and lane configurations at major intersections. Principal arterials prohibit on-street, curbside parking, and connect directly to freeways.

Major Arterials are six-lane divided roadways with medians or continuous two-way left turn lanes. They can accommodate up to 50,700 vehicles on an average weekday at LOS D conditions, depending on the degree of access control, peak period traffic loadings, and lane configurations at major intersections. Major arterials facilitate traffic circulation within Orange, and also prohibit on-street, curbside parking.

Primary Arterials are four-lane divided roadways with medians or continuous two-way left turn lanes. They can accommodate up to 33,750 vehicles on an average weekday at LOS D conditions, depending on the degree of access control and peak period loadings. Primary Arterials provide for easy circulation in the City, and allow for limited on-street, curbside parking.

Secondary Arterials are four-lane undivided roadways without medians. They can accommodate up to 21,600 vehicles on an average weekday at LOS D conditions, depending on the degree of access control and peak period loadings. Secondary arterials allow for on-street, curbside parking.

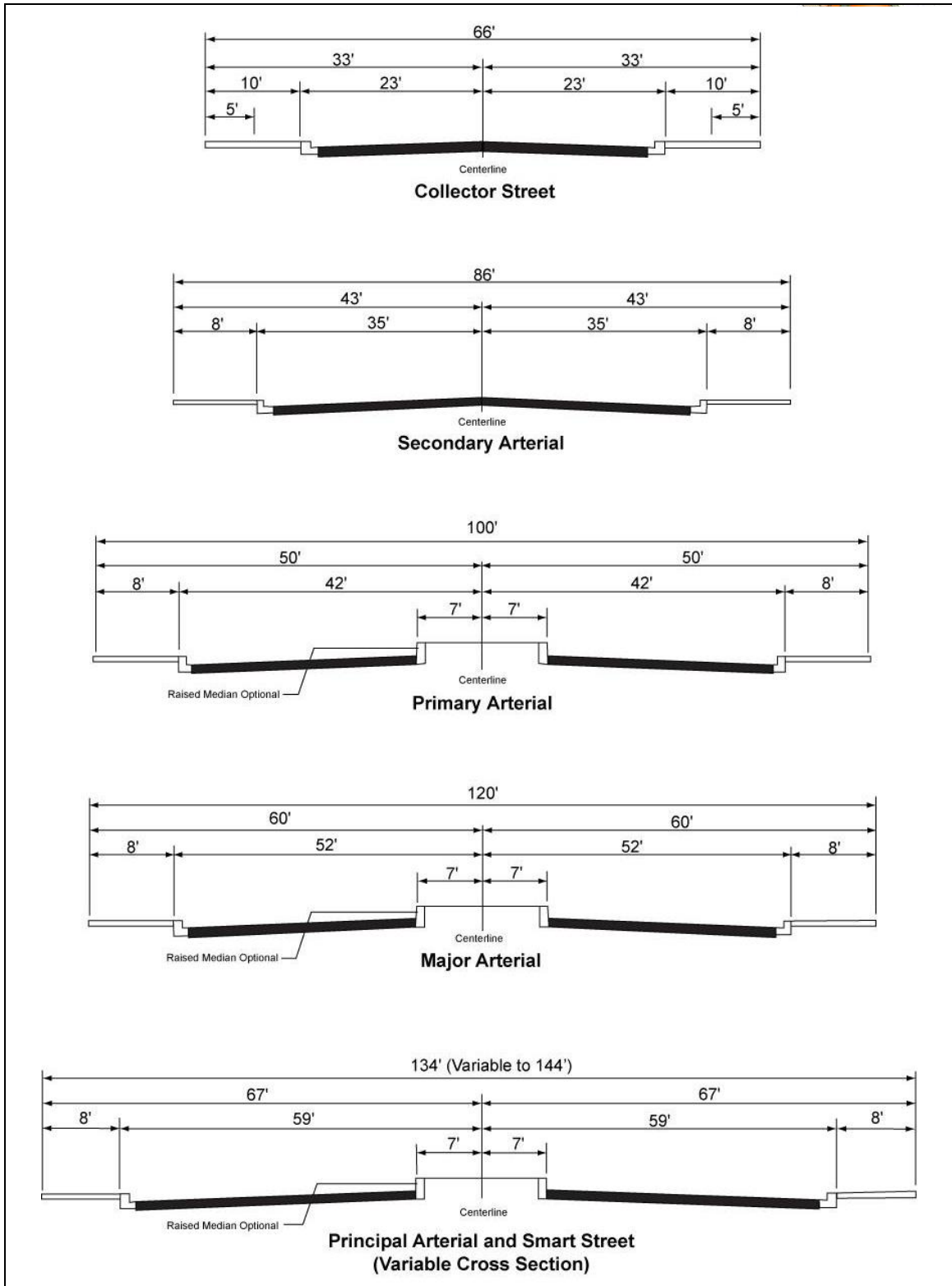


Figure CM-1
Roadway Cross Sections



Collector Streets are typically two-lane roadways without medians that gather and distribute traffic to higher-capacity arterials. They can accommodate up to 10,800 vehicles per average weekday at LOS D conditions, depending on the degree of access control and peak period traffic loadings. Centerline striping is typically not provided on collector streets, and on-street parking is allowed. There are several types of two-lane streets in the City, including divided, undivided, residential, and collector streets. Each type serves a slightly different purpose and may have different capacity thresholds based on various factors.

Performance Criteria

Evaluating the ability of the circulation system to serve residents and businesses in Orange requires establishing performance criteria. Performance criteria have a policy component that establishes a desired LOS, and a technical component that specifies how traffic forecast data can be used to measure criteria achievement.

The LOS definition for intersections is based on a volume-to-capacity (V/C) ratio and provides a more quantitative description of traffic conditions. Table CM-2 presents LOS based on traffic volumes and the design capacity of intersections.

Table CM-2 Level of Service Definitions for Intersections		
Level of Service	Volume-to-Capacity Ratio	Description
A	0.00-0.60	Free Flow/Insignificant Delays: No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	0.61-0.70	Stable Operation/Minimal Delays: An occasional approach phase is fully utilized. Many drivers feel somewhat restricted within platoons of vehicles.
C	0.71-0.80	Stable Operation/Acceptable Delays: Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	0.81-0.90	Approaching Unstable/Tolerable Delays: Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	0.91-1.00	Unstable Operation/Significant Delays: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	N/A	Forced Flow/Excessive Delays: Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: Highway Capacity Manual, Transportation Research Board, Special Report No. 209, Washington DC, 2000.

Although roadway capacity is generally a function of peak hour intersection performance and the corresponding peak hour volumes, daily arterial segment capacities (link capacities) also provide a measure of the overall LOS of the arterial system. Generally, traffic impact mitigation focuses on peak hour intersection performance, since system performance is typically a function of intersection performance. The City’s policy is to use a link capacity standard of LOS D. Table CM-3 presents arterial daily capacities at LOS D and LOS E.



**Table CM-3
Arterial Daily Capacity Threshold Assumptions**

Street Type	Daily Capacity	
	LOS D	LOS E
Smart Street – 6- to 8-lane divided	71,100	79,000
Principal – 8-lane divided	67,500	75,000
Major – 6-lane divided	50,700	56,300
Primary – 4-lane divided	33,750	37,500
Secondary – 4-lane undivided	21,600	24,000
Collector – 2-lane undivided	10,800	12,000

Source: City of Orange General Plan Update Traffic Report, 2008.

Various LOS policy standards have been established to evaluate observed traffic conditions, future development plans, and circulation system modifications. At the local level, the City of Orange has established LOS D as the lowest acceptable level of service for both roadway segments and peak-hour signalized intersection movements. At the regional planning level, Orange County’s Congestion Management Plan (CMP) specifies LOS E as the operating standard for roadways and intersections on the CMP highway system. The CMP Highway System consists of the Orange County smart street network plus the state highway system. Thus, the SR-55 northbound and southbound ramps at Katella Avenue are CMP intersections within the City’s jurisdiction. The City does not have an adopted LOS standard for unsignalized intersections. Performance of unsignalized intersections is evaluated on a case-by-case basis.

In addition to the LOS standards for roadways and intersections, the California Environmental Quality Act (CEQA) Guidelines (Section 15064.3), require “vehicle miles traveled” (VMT), to measure transportation impacts on the community. VMT refers to the amount and distance of automobile travel attributable to a project.

For purposes of compliance with CEQA, a significant impact would occur if the baseline and/or cumulative project-generated VMT per service population (population plus employment) exceeds the anticipated City of Orange General Plan Buildout VMT per service population. One vehicle traveling one mile would generate one VMT. Additionally, the project’s effect on VMT would be considered significant if it resulted in the baseline and/or cumulative link-level boundary citywide VMT per service population increases under the plus project condition compared to the no project condition. Link-level boundary VMT is calculated by summing all weekday VMT on a roadway network within the City boundary and includes all trips including trips that pass through the City’s roadway network but do not start and end with in City.

These thresholds are designed to reduce the number of miles traveled by automobiles, and are implemented within the City of Orange *Traffic Impact Analysis Guidelines*.



In order to maximize the efficiency of its circulation system, the City will look at where physical improvements to the circulation infrastructure can be made to expand capacity and increase traffic flow. To maximize efficiency of the road system, the City will support traffic signal coordination and spacing, and will also discourage on-street parking along arterials. In addition, the City will explore ways to reduce the demand for vehicular transportation, specifically through the provision and maintenance of bike lanes, bikeways, and trails, and will also encourage additional regional transit services and support facilities. The City's Transportation Demand Management (TDM) ordinance (Chapter 10.83 of the Municipal Code) further specifies a variety of techniques available to employers with 100 or more employees to advance the goals of efficiently utilizing the existing and planned transportation system and reducing vehicle emissions.



City Master Plan of Streets and Highways

Land Use Element policy will allow land use changes and intensification to occur in specific focus areas within the City. The City's Master Plan of Streets and Highways displayed in Figure CM-2 has been developed in close coordination with land use policy to ensure that traffic generated by new development will not compromise the City's goal to ensure that intersections and roadway segments operate efficiently. The map identifies components of the City's roadway circulation system. The map also indicates where augmented roads are needed, and pinpoints locations for enhanced intersections, including the future Meats Avenue interchange at SR-55. Although most of Orange is already built out, most remaining developable land is located in the eastern part of the City. New development in east Orange will require construction of new roads to provide circulation and traffic flow to residents and businesses. Land Use Element policies enabling reuse and redevelopment within established portions of the City, particularly within the focus areas, may also necessitate roadway widening and intersection enhancements. The City will continue to collect funds for necessary circulation system capital improvements through a program that sets up a fee structure for all new development and redevelopment projects. This program will require developers to pay their fair share for transportation system improvements required by new projects. The City will use the annual seven-year Capital Improvement Program (CIP) process to prioritize, fund, and complete improvements required to achieve build-out of the proposed roadway system identified in Figure CM-2.

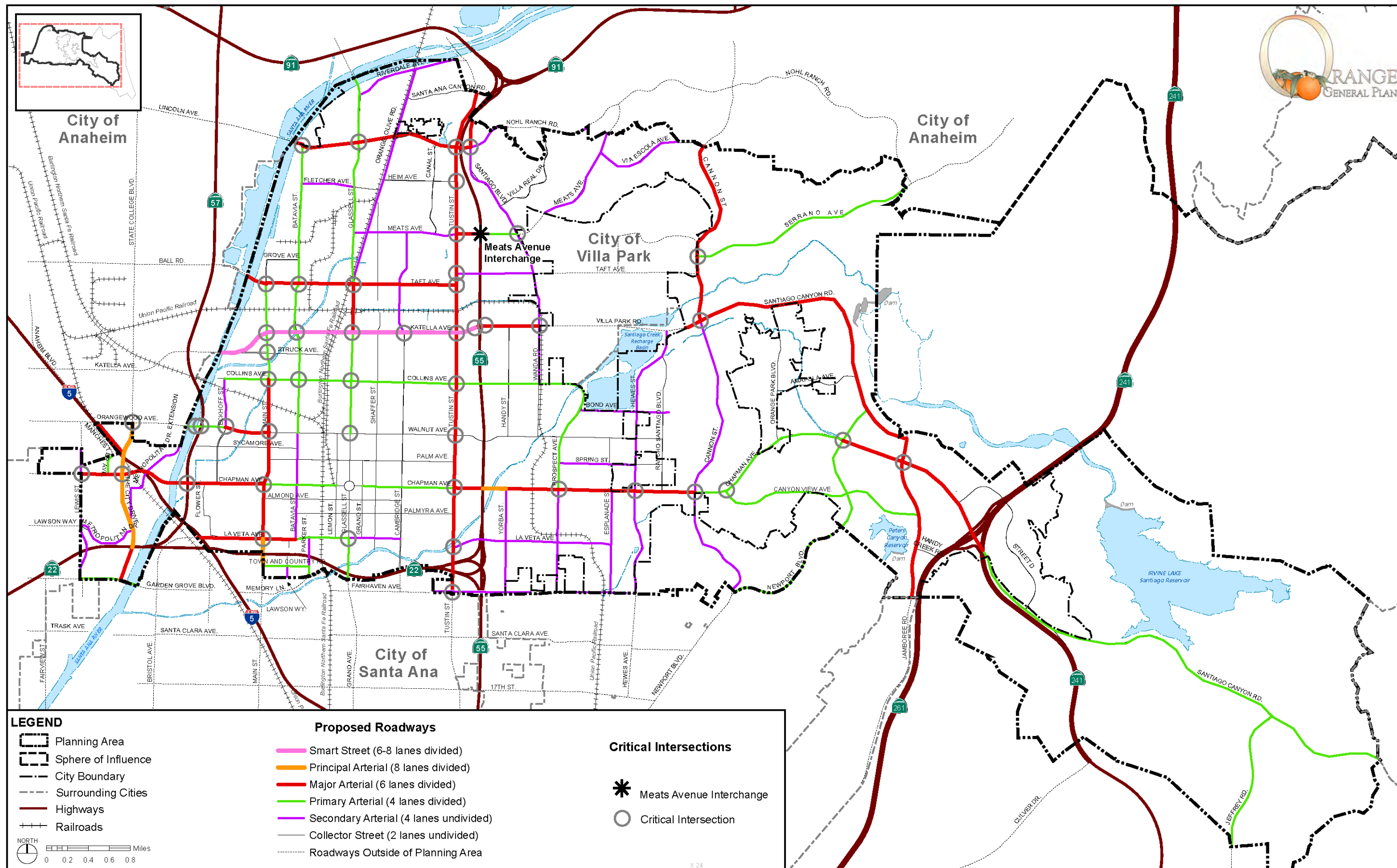
Roadway Widening

Roadway widening in specific locations will be necessary to obtain new travel lanes. Additional travel lanes may be acquired either by obtaining additional rights-of-way as necessary or by constructing new lanes within existing rights-of-way. Parking restrictions may be applied to allow additional lanes to be provided within existing rights-of-way.


















Old Towne Street Network

The Old Towne street network is a clear example of Orange’s grid street pattern. Parallel roadways have been established in both the north-south and east-west direction to distribute traffic evenly. The Plaza area at Glassell Street and Chapman Avenue is a unique feature that creates discontinuous traffic flows along these two primary roadways. However, no plans have been made to modify the National Register-listed Historic Plaza to increase its traffic carrying capacity.



LEGEND

	Planning Area		Smart Street (6-8 lanes divided)		Meats Avenue Interchange
	Sphere of Influence		Principal Arterial (8 lanes divided)		Critical Intersection
	City Boundary		Major Arterial (6 lanes divided)		
	Surrounding Cities		Primary Arterial (4 lanes divided)		
	Highways		Secondary Arterial (4 lanes undivided)		
	Railroads		Collector Street (2 lanes undivided)		
			Roadways Outside of Planning Area		

Proposed Roadways

Critical Intersections

0 0.2 0.4 0.6 0.8 Miles

Figure CM-2 City Master Plan of Streets and Highways

GPA 2014-0001 (12/8/15)
GPA 2010-0001 (8/10/10)

(This Page Left Intentionally Blank)



In light of these conditions, parallel roadways such as Almond Avenue, Palmyra Avenue, Lemon Street, Olive Street, Shaffer Street, Grand Street, Palm Avenue, and Maple Street will continue to serve as local collectors around The Plaza.

Metropolitan Drive Extension

Extending Metropolitan Drive behind the University of California, Irvine (UCI) Medical Center will help facilitate the movement of north-south traffic near The Block at Orange shopping area, improve access to Interstate 5 (I-5), and relieve congestion on The City Drive. Metropolitan Drive will be extended from The City Drive/State College Boulevard to the Metropolitan Drive/Rampart Street connection.

Critical Intersection Program

Intersections serve as traffic control points for the circulation system, regulating the flow of vehicles along City streets and sometimes limiting the capacity of the system. In the long term, system capacity and efficiency can both be increased if intersections are designed to handle future anticipated traffic volumes. Typically, the design of the roadways forming an intersection dictates the intersection configuration. Department of Public Works standards indicate that a left-turn pocket may or may not be provided, depending on traffic volumes through the intersection. However, one pocket may not be adequate to handle vehicles during peak hours. Traffic may back up into a through travel lane, resulting in congestion at the intersection and at other locations along the roadway.

One way of providing additional intersection capacity at critical locations is through the use of special intersection configurations known as “critical intersections.” Critical intersections deviate from typical City design standards by increasing the number of lanes at an intersection beyond what typically would be required. By increasing capacity at the intersection, the circulation link increases overall system capacity.

The Master Plan of Streets and Highways (Figure CM-2) identifies the locations of critical intersections within Orange. A list of these intersections and diagrams depicting their geometries are on file in the Public Works Department.

Regional Roadway System

The City’s local circulation network is connected to an efficient regional circulation system. Figure CM-2 shows the freeways that traverse the Orange planning area. The Santa Ana Freeway (I-5) provides interstate and regional access to the City. In addition, SR-57, SR-55, and SR-22 all provide connections to the City from northern Orange County and neighboring Los Angeles County, San Diego County, Riverside County, and San Bernardino County. SR-91 and SR-241 provide additional, more limited freeway access. SR-241 is a toll facility controlled by the Transportation Corridor Agency (TCA).

I-5 is a northwest-southeast freeway that passes through the southwest corner of the City, and provides direct access to Los Angeles County to the north and San Diego County to the south. I-5 has two interchanges within Orange—one located at its junction with SR-57 and SR-22 (commonly known as the Orange Crush) and the other at State College Boulevard/The



City Drive. The junction at the Orange Crush currently has the most severe congestion, which directly affects the roadway system in the City. With projected future growth in Orange and in the region, traffic flow at this junction is expected to worsen. The City will continue to work with and support the efforts of local and regional agencies to mitigate the increased traffic congestion in this area.

SR-91 is an east-west freeway that provides access to key arterial facilities in Orange, including interchanges at Tustin Street and Glassell Street. SR-91 also provides regional access through interchanges with SR-55 and SR-57 and SR-241.

SR-22 is an east-west freeway that crosses through the southern portion of the City. Five SR-22 interchanges are located in the City, at Tustin Street, Glassell Street, Main Street/La Veta Avenue, Bristol Street, and The City Drive.

SR-55 is a north-south freeway that passes through the center of Orange, and provides access to the coastal communities of Orange County. SR-55 has four interchanges in Orange, located at Lincoln Avenue, Katella Avenue, Chapman Avenue, and SR-22. An additional future interchange at Meats Avenue is contemplated within this General Plan.

SR-57 is a north-south freeway that originates at the junction of I-5 and SR-22 and extends to San Dimas in Los Angeles County. It provides access for the eastern parts of Los Angeles County, and central and northern parts of Orange County. SR-57 has three interchanges in Orange, at Chapman Avenue, Orangewood Avenue, and the junctions of I-5 and SR-22.

The Eastern Transportation Corridor (SR-241) is a north-south toll facility located in the eastern portion of the planning area. This facility provides direct access to east Orange. SR-241 has three toll lanes in each direction and provides regional access through an interchange at Santiago Canyon Road.

Consistency with County Master Plan of Arterial Highways

Maintaining consistency with the County's Master Plan of Arterial Highways (MPAH) is required in order to ensure that the City's circulation system develops in a manner that promotes regional mobility. At a practical level, consistency is also required in order for the City to receive transportation funding under Measure M. Orange's Master Plan of Streets and Highways (Figure CM-2) is generally consistent with the MPAH.

While the City's Master Plan of Streets and Highways has been consistent with the County MPAH to maintain funding eligibility, both the City of Orange and OCTA have the goal of a realistic and implementable MPAH. In keeping with this spirit, in 2010 as a follow up to adoption of this General Plan, the City worked with OCTA on amendments to the MPAH and Master Plan of Streets and Highways that downgraded the long-standing classification of Chapman Avenue and Glassell Street from 4-lane Primary Arterials to 2-lane Collector Streets, and removed the Critical Intersection classification of the Plaza. A remaining desire of the City is to work with OCTA to downgrade La Veta Avenue between Glassell Street and Cambridge Street from a Secondary Arterial to a Collector Street to reflect physical constraints related to historic buildings and features in the Old Towne National Register Historic District.



To initiate the MPAH amendment process, a local agency must submit a written request to OCTA describing the amendment requested and provide documentation to support the basis for the request. A copy of the request must be submitted concurrently to the City Managers of adjoining cities. For the facilities under consideration, this would require a letter to be forwarded to the City of Santa Ana.

Once the initial request is forwarded to OCTA, a conference between the City of Orange, OCTA, and potential affected jurisdictions is held to determine whether mutual agreement exists for the MPAH amendment. If mutual agreement exists, then Orange is expected to proceed with adopting this revision to the Circulation & Mobility Element. Upon adoption, the City of Orange would submit the Circulation & Mobility Element to OCTA and request OCTA Board approval of the Orange County MPAH amendment.

Public Transportation

Effective regional transportation strategies are required to successfully implement City and County plans for accommodating future growth. Such strategies must link the City of Orange with other regional employment and commercial centers, as well as airports and other transportation hubs, and should fully integrate alternatives to the automobile. Alternative modes of transportation, including public transportation, bicycling, and walking, are important components of a comprehensive circulation system. These modes of transportation also help reduce air pollution and road congestion.

Public transportation plays a key role in future land use development and mobility. As the roadway system reaches capacity, alternative modes of transportation provide additional capacity as well as an enhanced degree of mobility for residents, workers, and visitors. Existing services are expected to continue while enhancements, many of them currently in the planning stages, will increase the viability of alternative modes of travel. The integration into the circulation system of alternative modes of transportation, such as bus, rail, bicycle, and pedestrian, is essential to maximizing mobility opportunities for residents, workers, and visitors.

Bus Service

OCTA provides public bus service for the City of Orange. In addition, the Riverside Transit Agency (RTA) provides long-distance service between The Village at Orange and the Downtown Terminal in Riverside. Table CM-4 identifies local bus routes that connect various activity centers in Orange to each other and to the region.

Table CM-5 shows the different community, station link, and inter- or intra-County routes that serve Orange. Community routes are express bus routes that provide faster connections to activity centers within and outside Orange County. Station link shuttles provide services between the Orange Transportation Center (OTC) and Orange. Both community and station link routes operate only at peak commuter times.

In addition to the fixed-route service, OCTA also offers several types of specialized community transportation services, such as standard service (curb-to-curb service), door-to-door service, subscription service, and same-day taxi service. Some of these services cater to senior citizens and people with disabilities residing in the City.



OCTA has forecast bus ridership to increase by approximately 75 percent by 2030. Some of this ridership increase will be the result of enhanced services, including express bus routes and introduction of bus rapid transit service. Much of the increase will be driven by increased arterial and freeway congestion levels in conjunction with improved local bus service. OCTA is planning to introduce bus rapid transit (BRT) services by 2011 on the Bristol Street-State College Boulevard, Harbor Boulevard, and Westminster Avenue corridors. This service would include planned BRT stops in Orange on State College Boulevard south of Orangewood Avenue and on The City Drive south of Chapman Avenue. With the projected success of this service, which is comparable to the Los Angeles Metro Rapid service, it is likely that BRT will be implemented on other key corridors. Corridors that have been considered for potential future application include Katella Avenue.

Convenient, accessible, frequent, and easy-to-use public transit is a cornerstone element of the proposed land use plan. Planned mixed-use residential and commercial areas and intensified commercial and professional office corridors must be coupled with increases in transit service. Orange’s land use plan features mixed-use districts that strategically concentrate population density near alternative transit facilities, such as the OTC in Old Towne, transit hubs at The Block at Orange and South Main Street, and the future Anaheim Regional Transportation Intermodal Center station in Anaheim near the City’s western boundary at Katella Avenue.

Route #	Route Type	Route Service	Service Corridors	Key Orange Activity Centers Served
24	Local	Fullerton–Orange	Malvern Ave. / Chapman Ave. / Tustin St..	The Village at Orange Lincoln Park and Ride
42	Local	Orange–Seal Beach	Lincoln Ave. / Los Alamitos Blvd. / Seal Beach Blvd.	The Village at Orange Lincoln Park and Ride
46	Local	Los Alamitos–Orange	Ball Rd. / Taft Ave.	The Village at Orange Lincoln Park and Ride
47	Local	Brea–Newport Beach	Brea Blvd. / Anaheim Blvd. / Fairview St.	Theo Lacy Jail Orangewood Children's Home UCI Medical Center The Block at Orange
50	Local	Long Beach–Orange	Katella Ave.	The Village at Orange Lincoln Park and Ride
53	Local	Brea–Irvine	Main St.	Batavia Industrial Parks Children's Hospital – CHOC St. Joseph's Hospital OCTA Offices
54	Local	Garden Grove–Orange	Chapman Ave.	Orange Civic Center Orange Transportation Center The Plaza UCI Medical Center The Block at Orange Rancho Santiago Community College



Table CM-4 Local Bus Routes				
Route #	Route Type	Route Service	Service Corridors	Key Orange Activity Centers Served
56	Local	Garden Grove–Orange	Garden Grove Blvd.	Orange Transportation Center OCTA Offices Children's Hospital–CHOC St. Joseph's Hospital
57	Local	Brea–Newport Beach	State College Blvd. / Bristol St.	The Block at Orange UCI Medical Center Theo Lacy Jail Orangewood Children's Home
59	Local	Brea–Irvine	Kraemer Blvd. / Glassell St. / Grand Ave. / Von Karman Ave.	Orange Transportation Center Chapman University Orange Plaza
71	Local	Yorba Linda–Balboa	Tustin St. / Red Hill Ave. / Newport Blvd.	The Village at Orange Lincoln Park and Ride

Source: Orange County Transportation Authority, 2006

Table CM-5 Community, Station Link, Intra- and Inter-County Bus Routes				
Route #	Route Type	Route Service	Service Corridors	Key Orange Activity Centers Served
131	Community	Yorba Linda–Orange	Lakeview Ave./ Riverdale Ave. / Tustin St.	The Village at Orange Lincoln Park and Ride
147	Community	Brea–Santa Ana	Raiit St. / Greenville St. / Fairview St.	UCI Medical Center The Block at Orange OCTA Offices St. Joseph's Hospital Children's Hospital – CHOC
167	Community	Anaheim–Irvine	Santiago Blvd. / Hewes St. / Bryan Ave.	The Village at Orange Lincoln Park and Ride
453	Station Link	Orange Transportation Center –St. Joseph's Hospital	Chapman Ave. / Main St. / La Veta Ave.	Orange Transportation Center Children's Hospital–CHOC St. Joseph's Hospital OCTA Offices
454	Station Link	Orange Transportation Center –The Block at Orange	Chapman Ave. / Metropolitan Dr.	Orange Transportation Center UCI Medical Center The Block at Orange Bergen Brunswig Nexus



Table CM-5 Community, Station Link, Intra- and Inter-County Bus Routes				
Route #	Route Type	Route Service	Service Corridors	Key Orange Activity Centers Served
213	Intra County	Brea-Irvine Express	SR-55	Lincoln Park and Ride The Village at Orange
757	Inter County	Diamond Bar -Santa Ana Express	SR-57	UCI Medical Center The Block at Orange
RTA 149	Inter County	Riverside-Orange (Operated by RTA)	SR-91	The Village at Orange Downtown Riverside

Source: Orange County Transportation Authority and Riverside Transit Agency, 2006.

The City recognizes that ridership of both the bus and rail transit systems will increase, and has designed a land use plan that both enables and accommodates increased transit use. A large part of the City’s role in accommodating additional transit use includes providing convenient and attractive transit amenities and streetscape features that improve user comfort and perception of safety, thus encouraging transit use. Transit-oriented Development (TOD) design features will be encouraged in major commercial and employment areas within the City, such as the Town and Country Road corridor, South Main Street, Katella Avenue, Uptown Orange, and Old Towne. Such TOD features may consist of streetscape measures such as bus turn-outs, benches, trash receptacles, shelters from wind and rain, and lighting. TOD features may also be more fundamental to the permitted uses and design within projects, such as incorporating child care centers, convenience stores, or personal services within the retail component of mixed-use projects, or near professional office concentrations. These and other measures help to make the transit system more accessible to a wide range of people.

The City will continue to work with OCTA to pursue expanded community circulators, such as the current Station Link service, that will connect people to rail transit, employment centers, residential areas, and commercial corridors. Additional options, such as jitney services that function as group taxis, will also be explored.

The City will also continue to support OCTA initiatives and services that promote the mobility of Orange’s senior, disabled, and youth populations. To accommodate the needs of these groups, the City will continue to work with OCTA to offer para-transit services, and will seek ways to improve mobility for Orange youth through transit.

The City of Orange will continue to cooperate with OCTA and other regional providers to establish new bus routes and stops, and to provide transit amenities. New subdivision plans will be reviewed by OCTA to assess impacts on bus services, and to examine the need to provide bus stops or bays. Orange will also work with OCTA to maintain and, if needed, expand successful transfer stations in Old Towne, the Village at Orange, and The Block at Orange.

Rail Transit

Many current passenger and commuter fixed-rail transit options in the City will be expanded in the future, offering significant alternatives to automobile transit for many individuals who



commute to or from the City for housing or employment. Rail transit now has a proven track record in Orange, and Metrolink seeks to expand rail services in support of land use transformations near current and future rail stations.

Metrolink

Metrolink operates seven commuter rail lines in Southern California, two of which pass through Orange. The Orange County Line offers direct connections to Union Station in Los Angeles to the north and to Oceanside to the south. The Inland Empire–Orange County Line provides direct connections to Riverside/San Bernardino to the east and San Juan Capistrano to the south. Roughly 30 Metrolink trains pass through the City on a daily basis. The Metrolink station in Orange is located three blocks from The Plaza at the OTC, close to a variety of stores and civic uses in Old Towne. Amtrak and Metrolink operate a cooperative program called “Rail-2-Rail”, which allows all Metrolink monthly pass holders to use Amtrak within the limits specified on the pass.

Another much-anticipated rail service improvement is intra-county rail service along the County’s core transit corridor. This service, which will be provided by Metrolink on behalf of OCTA, is an attempt to provide intra-county trips with a high degree of reliability. This 30-minute service is planned to operate between the Irvine Transportation Center (and possibly Laguna Niguel) and the Fullerton Transportation Center throughout the day to supplement Metrolink’s peak period commuter service.

The City recognizes that plans to increase daily service on the current Metrolink lines, improvements to the OTC, and future expansion of Metrolink services to new destinations would be beneficial to Orange by providing multi-modal transportation options for people living and working in the community, thus reducing auto dependence for business and leisure purposes.

Anaheim Regional Transportation Intermodal Center

The Platinum Triangle, which borders Angel Stadium in the City of Anaheim, proposes a variety of high-density multiple-family high-rise housing, office space, and commercial uses. The Anaheim Regional Transportation Intermodal Center (ARTIC) is located adjacent to the proposed development, between Angel Stadium and the Honda Center. ARTIC will be a major regional transportation center similar in scale to Union Station in Los Angeles and Ontario International Airport in Ontario. The intermodal center will be a stopping point for Amtrak, Metrolink, buses, and future high-speed rail systems that connect to Ontario Airport, Las Vegas, and the Bay Area.



The City of Orange will coordinate with the City of Anaheim, OCTA, and others to ensure that the City is able to take full advantage of the regional mobility benefits offered by ARTIC. Potential benefits offered to the City by ARTIC include:



- BRT service along Katella Avenue;
- a dynamic mixed-use commercial and residential center at the westernmost end of Katella Avenue; and
- bicycle and pedestrian connections to the Santa Ana River.

California High Speed Rail Corridor

The California High-Speed Rail Authority was established as a state agency in 1996 to direct the planning, design, construction, and operation of a future high-speed train system extending from Sacramento, San Francisco, and Oakland in the north to Los Angeles and San Diego in the south. This high-speed train is proposed to stop at ARTIC. OCTA estimates that by 2025, the California High Speed Rail Corridor will serve between 150,000 and 230,000 passengers each week.

Magnetic Levitation Train

A magnetic levitation train is being planned that would connect Anaheim to Ontario, Victorville, Barstow, Primm, and Las Vegas. The California-Nevada Super Speed Train (SST) will use Magnetic Levitation Systems (Maglev), a type of transportation technology that uses electric power and non-contact electromagnetic levitation to sustain speeds in excess of 300 mph.

The trip from ARTIC to Las Vegas on the California-Nevada SST will take about 90 minutes, with an estimated 40.4 million annual riders. A key future benefit offered by the Maglev train is a high-speed connection to Ontario International Airport, which is planned to grow substantially and to expand international service in coming decades. The City will support efforts of the California High-Speed Rail Authority, OCTA, and Southern California Association of Governments to construct these important rail corridors, and will cooperate with all parties involved in any future studies conducted to examine the noise and other impacts associated with the corridors within Orange.

Sidewalks, Trails and Bikeways

Walking and biking contribute to a healthy community, and play increasingly significant roles as alternatives to the automobile. The City recognizes this by providing and maintaining sidewalks, trails, and bikeways to support pedestrians and cyclists.

Pedestrian Facilities

In addition to providing basic transportation routes, sidewalks and pathways offer the opportunity to create appealing public spaces that reflect community pride and invite people to walk. Proposed mixed-use areas and reinvigorated commercial areas throughout the City will provide new and reinvented spaces for people to walk and shop. Walkability and access are essential components of a circulation system that easily and specifically accommodates pedestrians. Features that contribute to walkability include wide sidewalks, safe street crossings, design elements that encourage cautious driving, and a pleasant and safe walking environment. Sidewalks, walkways, well-designed pedestrian crossings, pathways, and pedestrian short-cuts allow people to get from one destination point to another with ease.



Dedicated pedestrian paths can provide access between residential and activity areas, especially if streets do not connect. Access strategies for school children, seniors, and people with disabilities should also be incorporated into street and sidewalk plans. The City supports proactive integration of pedestrian improvements and amenities within the circulation system to improve walkability.

The City will create and implement a pedestrian-oriented streetscape master plan addressing key commercial corridors, including Tustin Street, Chapman Avenue, Main Street, Lincoln Avenue, and Katella Avenue. The master plan will address all functional aspects of the pedestrian environment. It will identify pedestrian links that need improvement and strengthening, determine new pedestrian links to underserved areas, ensure adequate sidewalk widths to accommodate lighting and street trees, develop sidewalks in the industrial area that create links between bus stops, encourage safe routes to schools and recreation facilities, and minimize barriers to pedestrian and bicycle access.

Recreational Trails and Bikeways

A comprehensive network of recreational trails and bikeways greatly benefits Orange residents and visitors by providing popular modes of transportation for recreation. In addition to recreation activities, the City also supports walking and bicycling as viable commute alternatives to the automobile. The City's plan for recreational trails and bikeways is shown in Figure CM-3.

The plan includes trails maintained by the County and private homeowners associations, and is consistent with the OCTA *Commuter Bikeways Strategic Plan*. It is also consistent with the County's major riding and hiking trails and off-road paved bikeways. As described in the ***Vision for the Future***, the plan will enable the City to connect parks to activity centers and residential areas using a combination of recreational trails and bikeways that truly allows people to travel from place to place within the City without needing an automobile.

Recreational Trails

As shown in Figure CM-3, over 70 miles of existing recreational trails are located within the City, connecting a large number of neighborhoods and community parks. In addition, 104 miles of proposed future trails are planned throughout Orange on land currently utilized for a variety of purposes, including flood control, railroad rights-of-way, and roadways.

The City will use the annual seven-year Capital Improvement Program (CIP) process to prioritize, fund, and build proposed trail segments identified in Figure CM-3. These trails have been and will continue to be constructed and administered through cooperative efforts of the City, County, developers, and private homeowner associations.

Desired cross-sections for recreational trails are identified in Figure CM-4. The City may require construction of portions of proposed trails identified in Figure CM-3 as a condition of development approval for projects located adjacent to the proposed trail alignments. Funding for recreational trails and associated restoration projects comes from a variety of federal, state, and regional sources. Priority for funding of trail improvements will be given to projects that complete loops within the system, provide missing links for regional and local



trail systems, or serve as destination links to schools, parks, retail businesses, or regional trails.

Priorities for the recreational trail system include:

- trail connections to the Santiago Oaks Regional Park extension west of Cannon Street, consisting of a connection between Calle Grande and Cannon Street, and the Jamestown trail from the Orange Park Acres equestrian arena to Cannon Street;
- trail connection from Serrano Avenue near Fred Barrera Park to Santiago Oaks Regional Park;
- Mabury Ranch Trail connection from the proposed Cerro Villa Park to the Santiago Oaks Regional Park;
- Serrano Avenue connection near Cannon Street; and
- Additional trail connection into Santiago Oaks Regional Park from Orange Park Acres.

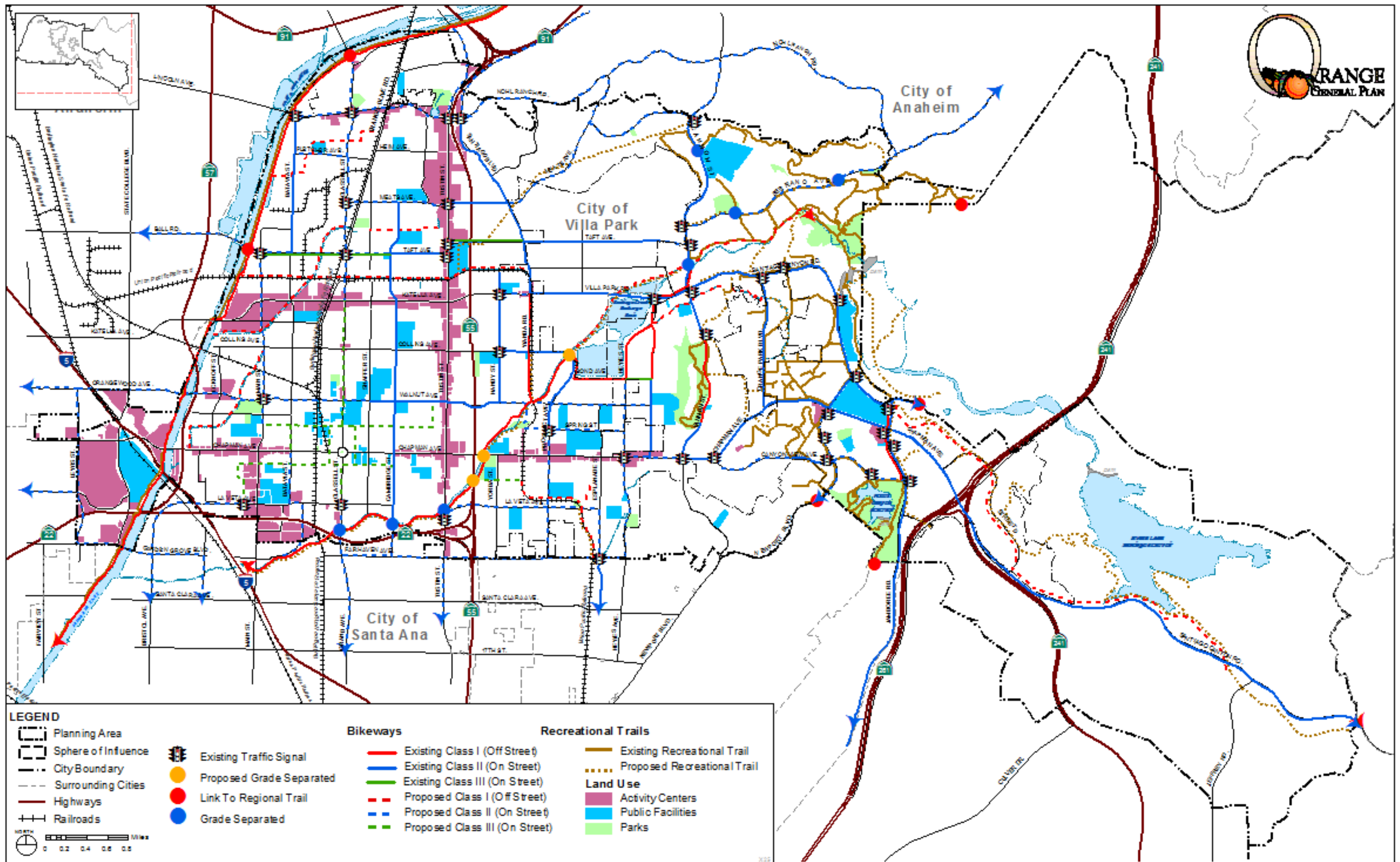
To increase the number of people using non-vehicular means of transportation, the City will encourage putting in place a safe network of crosswalks, grade separations, and walkways to ensure the safety of pedestrians, bicyclists, and equestrians. Where appropriate, traffic calming devices and methods such as median landscaping and provision of bike or transit lanes should be used to slow traffic, improve roadway capacity, and address potential safety issues. The City will continue to work towards improving the overall condition, appearance, and safety of both medians and sidewalks in Orange.

Bikeways

Orange’s relatively mild climate permits bicycle riding year-round, and the growing popularity of bicycling has drawn enthusiasts onto the streets and bike trails throughout the City. The plan for recreational trails and bikeways (Figure CM-3) shows the planned system of bikeways within the City. The *Orange Bikeway Master Plan* has established three classes of bicycle routes that adhere to California Department of Transportation (Caltrans) standards:



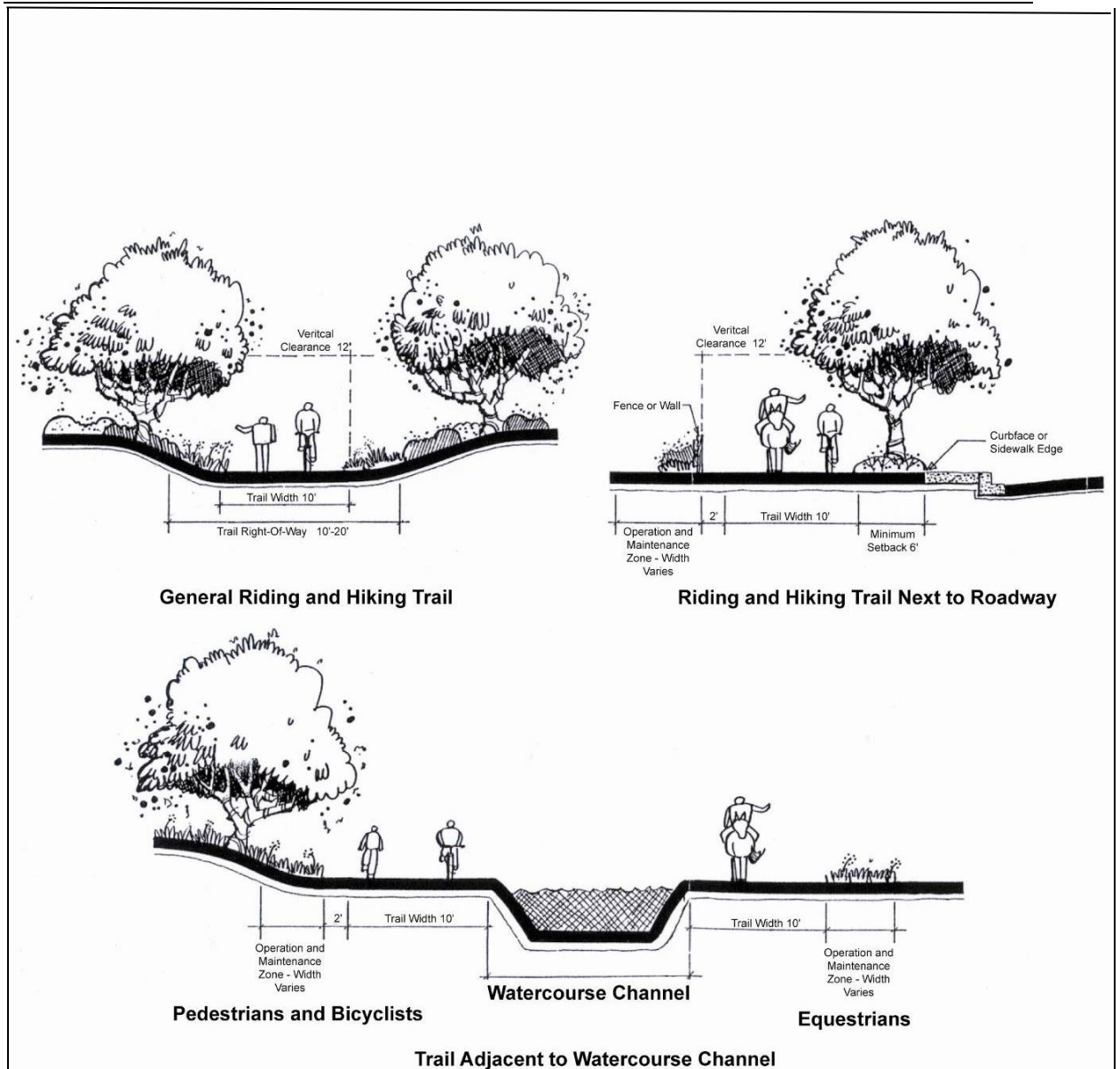
- **Class I** Off-road bike paths are located on vacated rail lines, water corridors, or areas otherwise separated from streets.
- **Class II** On-road bike lanes are located along arterial roadways that are delineated by painted stripes and other features.
- **Class III** On-road bike routes share use with motor vehicle traffic. They provide a route that is signed but not striped.



Source: City of Orange Community Services Department, 2015.

Figure CM-3 Plan for Recreational Trails and Bikeways

(This Page Left Intentionally Blank)

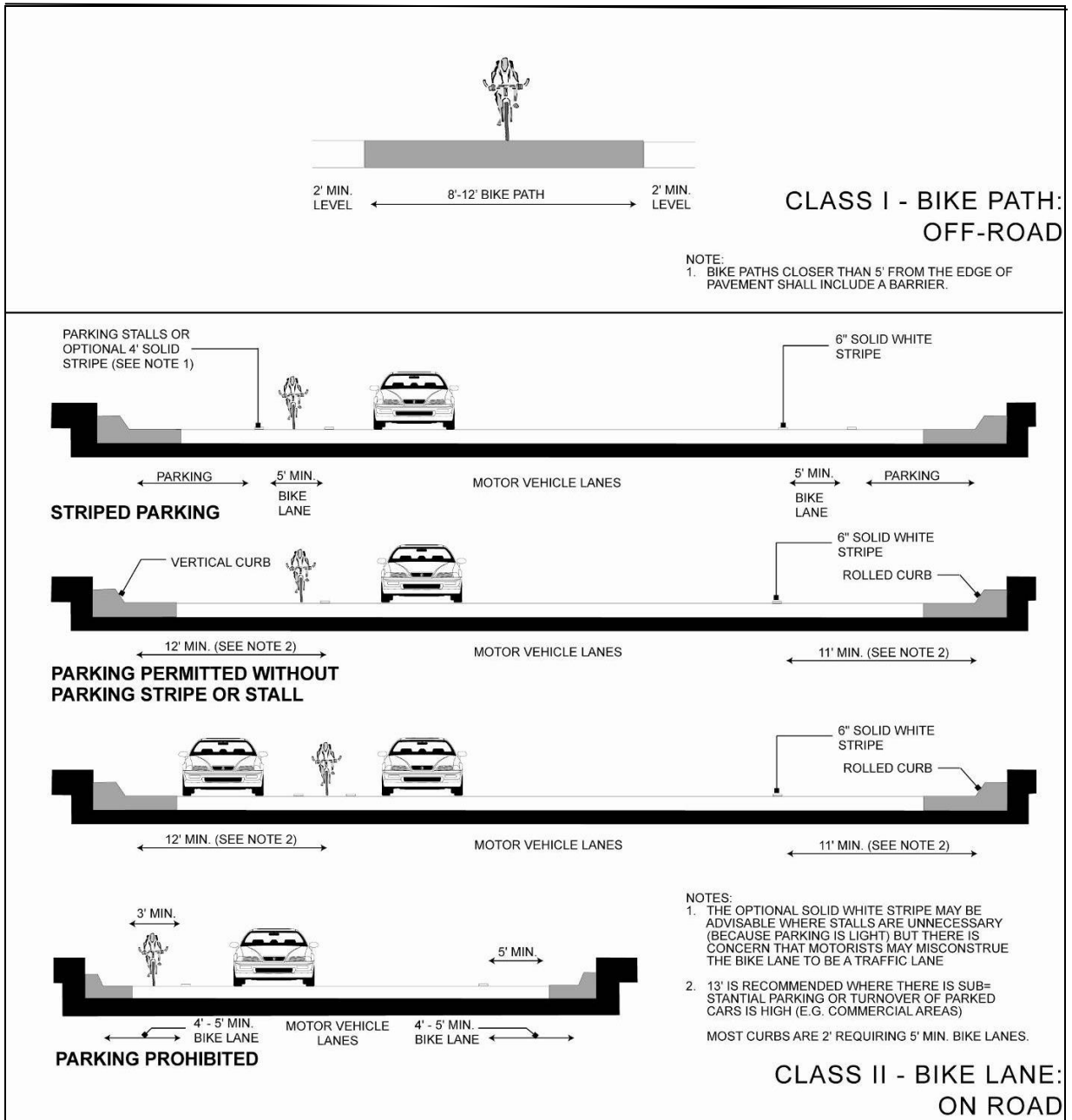


**Figure CM-4
Trail Standards**

Cross-sections for each type of route are shown in Figure CM-5.

As shown in Figure CM-3, several future bike routes are planned within Orange, including the following high-priority projects:

- Completing Class I bike routes along Santiago Creek and the Tustin Branch Trail
- Establishing Class II bike lanes, including:



**Figure CM-5
Bikeway Standards**



- An east/west corridor on Walnut Avenue from the western City limits to Santiago Boulevard
- North/south corridors on Main Street from Taft Street to Palm Street, on Batavia Street from Chapman Avenue to La Veta Avenue, and on Parker Street from La Veta Avenue to the City limits
- Establishing Class III routes along Almond Street, Feldner Street, and Bedford Street

The City has recently completed a paved bike trail along Santiago Creek from Tustin Street to the western City limit that continues on to Main Place Mall and the Discovery Science Center as well as two additional segments to the bike trail, which will extend the Santiago Creek Trail from Tustin Street to Grijalva Park, and also connect Grijalva Park at Santiago Creek to Collins Avenue along the City-owned portion of the Tustin Branch Trail right-of-way between Walnut and Collins Avenues. The Santiago Creek trail is planned to extend through and beyond the City, connecting the regional Santa Ana River Trail to Santiago Oaks Regional Park and wilderness areas east of Orange. The City will continue to work towards designing a comprehensive bike trail system that is highly accessible and safe for those who wish to use it.

The City has proposed Class II and III routes along many north-south and east-west arterials, all of which connect to pedestrian trails and Class I routes. The City responds to the need to provide safe and efficient bike travel by making every effort to provide bikeways separate from the roadway. When bicyclists must share the road with automobiles, the City will work to improve overall safety.

Currently, only one bicycle parking facility is located in Orange, at the OTC (Metrolink station). The City will work to provide greater bike amenities including delineated bike lanes and clear signage along bike trails. The City will also install bicycle racks and safe storage facilities at parking areas for City facilities, as appropriate, and will require privately developed projects to incorporate on-site bicycle facilities in accordance with the City's Zoning Code (Title 17 of the Orange Municipal Code).

Parking Facilities

Although parking is often considered a separate issue from vehicle circulation, it is important to address on-street parking because it has a direct effect on roadway capacity. In order to facilitate improved traffic flow along Orange's major arterials, the City generally plans to



permit on-street parking only on streets classified as Primary or Secondary Arterials or Collector Streets.

Off-street parking deficiencies can reduce business activity, and can cause vehicles to re-circulate on public streets, which increases traffic volumes and congestion by reducing capacity for through traffic. The City's Zoning Code includes parking requirements to ensure that an adequate number of spaces are



provided on-site for most uses. The Code also establishes minimum stall dimensions consistent with current standards for other jurisdictions. These regulations apply to all new developments, and may be applied to current uses that are modified or expanded.

Particular concern has been expressed within the community regarding current and expected future parking shortages in Old Towne. Figure CM-6 identifies the location of existing public parking lots in Old Towne. Most Old Towne parking lots have a maximum time limit of three hours, with or without a permit. However, some parking lots, such as the OTC parking located off Chapman Avenue, have no time limit.

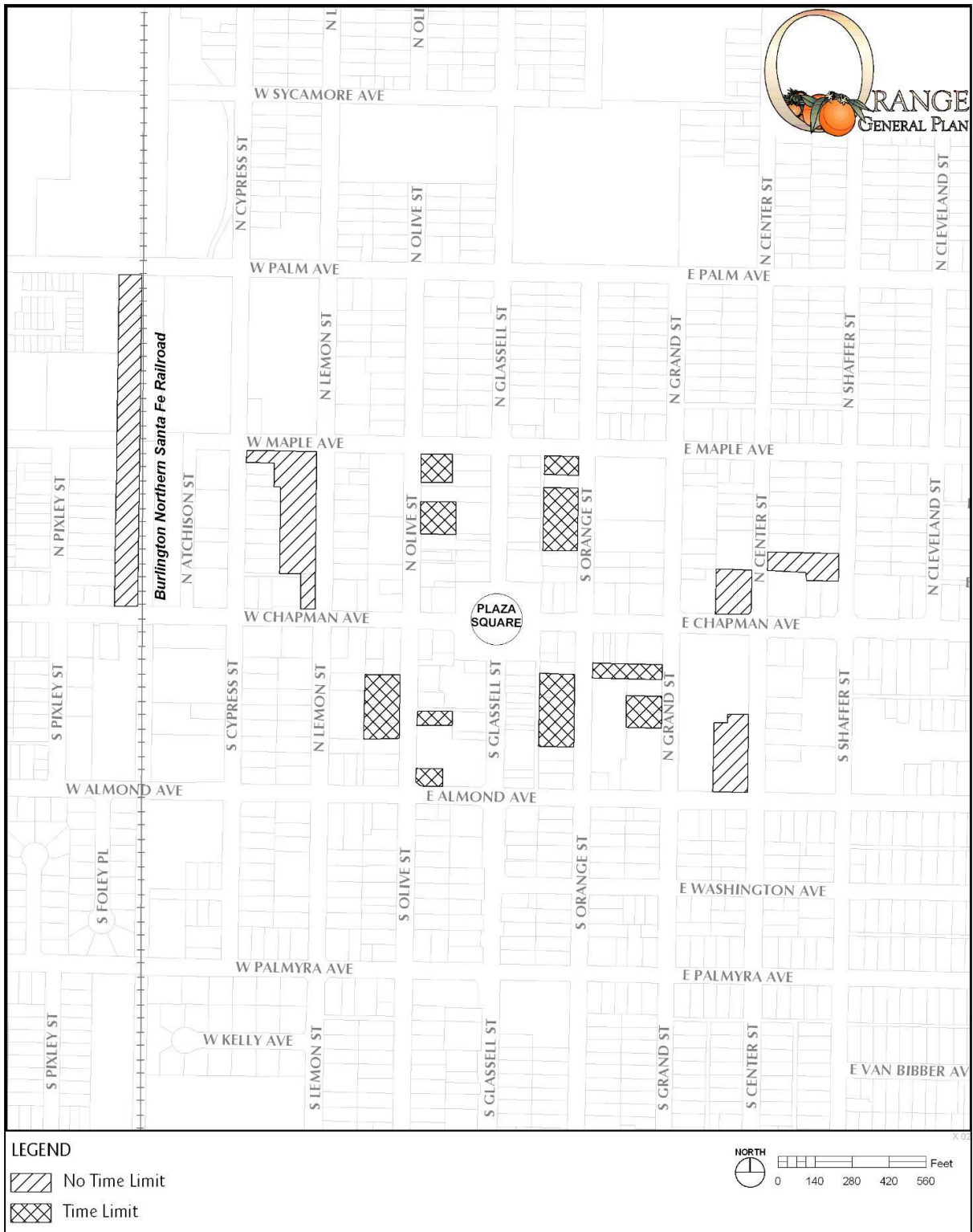
Orange will continue to provide sufficient parking to meet community demands. In Old Towne, the City will study the benefits of creating a parking district and the feasibility of developing underutilized parking lots surrounding The Plaza as public parking facilities. The City may encourage the use of shared parking, consolidated parking facilities, and underground parking or parking structures to provide additional off-street parking to meet future demands in areas throughout the City with higher concentrations of commercial uses.

Circulation System Aesthetics

The City has determined that it is necessary and desirable to improve certain roadways and their rights-of-way to enhance the experience for all users of these corridors. Major commercial corridors have been designated within the Urban Design Element to be improved with pedestrian-scale enhancements. Enhancements could include street trees, sidewalk improvements, lighting, bus shelters, and crosswalks. These improvements not only offer a more aesthetically-pleasing experience for all users in these corridors, they also may offer increased safety and security.

Streetscape improvements offer safety and security to both motorists and non-motorists through increased visual cues, better visibility, and increased activity. Many streetscape enhancements provide not only a comfortable environment for the pedestrian and bicyclist, but also offer drivers visual cues that a non-motorist could be expected in an area. Improvements such as striping, bus shelters, and pedestrian-scaled signage guide the non-motorist towards areas that are most appropriate for their use. These same cues help the motorist to see where the presence of pedestrians and bicyclists is most likely to occur. For example, a well-marked crosswalk guides the pedestrian towards the location in the right-of-way most appropriate for crossing, while also alerting the motorist to slow down and look out for pedestrian traffic.

Visibility offered by pedestrian-scaled lighting benefits non-motorists and motorists alike. Pedestrians and bicyclists are better able to see their way, which increases their feelings of security. Improvements that create a sense of security for pedestrians encourage increased use and activity. This increased activity, in turn, leads to a greater feeling of safety. The City has acknowledged the importance of improving the experience of users on many of its major commercial corridors.



*Note: Possession of City issued parking permit enables holder to exceed specified time limit
 GPA 2010-0001 (8/10/10)

Figure CM-6
Public Parking Lots in Old Towne Orange



CIRCULATION & MOBILITY IMPLEMENTATION

The goals, policies, and plans identified in this Element are implemented through a variety of City plans, ordinances, development requirements, capital improvements, and ongoing collaboration with regional agencies and neighboring jurisdictions. Specific implementation measures for this Element are contained in the General Plan Appendix.