



# INFRASTRUCTURE

## INTRODUCTION AND VISION FOR THE FUTURE

Orange residents, businesses and visitors rely on public infrastructure to carry out their daily duties. Population growth and new development continues to increase demand for infrastructure services. The Infrastructure Element includes guidelines and policies that address this demand for the community's existing and future needs for public utilities and infrastructure. Infrastructure services discussed in this Element include water, sewer, and storm drain systems, and solid waste services. The Element also addresses "dry" utilities such as natural gas, electrical, telephone, data, and cable television services. Further, the Element discusses lifeline infrastructures, which connect Orange to outside services during an emergency.

Availability of infrastructure determines growth patterns, density, and intensity of land use. Roadways are a critical part of the City's infrastructure system, providing for the movement of goods and services that support the local economy. The City maintains the local roadway system and supports efforts of the County, the California Department of Transportation (Caltrans), and the Transportation Corridor Agencies (TCA) to maintain regional roadways serving the City. The Circulation & Mobility Element provides policies and plans for future maintenance and enhancement of the roadway circulation system. Infrastructure also provides water and roadways that support emergency fire, police, and medical response. The Public Safety Element provides policies and plans addressing these topics.

Water, and access to water, has always been integral to the development of Orange. It is not by accident that the City is located at the intersection of the Santa Ana River and Santiago Creek. The City was incorporated in 1888 and the water system was privately owned until 1904, when it was purchased by the City. At that time, the domestic water supply came exclusively from wells or canals leading from the Santa Ana River. The water was used to irrigate the surrounding citrus groves and various agricultural crops.

After World War II, growing residential, commercial, and industrial development forced the City to look elsewhere for an adequate water supply. In 1951, the City joined with five other water agencies to form the Municipal Water District of Orange County (MWDOC), which led to annexation to the Metropolitan Water District of Southern California (Metropolitan). The first pipeline of imported water was activated in 1954.

The City's Water Division, a part of the Department of Public Works (DPW), is responsible for providing clean, safe water to the City of Orange and for designing and constructing the system that supplies City residents and businesses with water. The City is a member agency of MWDOC, which in turn is a member agency of Metropolitan. This entitles the City to



receive water from available Metropolitan sources. The City has a number of service connection agreements with MWDOC whereby MWDOC will deliver water to the City as it receives water from Metropolitan in the amount requested by the City, subject to Metropolitan water availability.

To meet its infrastructure needs, the Water Division collaborates with other jurisdictions, agencies, and service providers, including MWDOC, Metropolitan, Orange County Water District, Irvine Ranch Water District, Golden State Water Company, Serrano Water District, and East Orange County Water District. Water delivery requires a large number of sources and substantial coordination between agencies. The Lower Santa Ana River groundwater basin provides the main source of water for Orange, and is maintained by the Orange County Water District.

The Infrastructure Element also addresses wastewater systems. Cities throughout Orange County, including the City of Orange, rely on the Orange County Sanitation District (OCSD) for the regional collection and treatment of domestic, commercial, and industrial sewage. Although OCSD operates a comprehensive regional system of collection mains and treatment plants, individual cities are responsible for installing and maintaining local collection facilities.

The City also collaborates with other agencies in the development and maintenance of infrastructure facilities, including working with the Public Works Department of the County of Orange to maintain the Santa Ana River, Santiago Creek, and other flood control facilities not owned by the City.

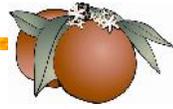
The City’s DPW collaborates with private contractors for some services, such as the collection of solid waste, recyclable, and green waste materials and the disposal of household hazardous waste. “Dry” utilities, such as natural gas, telephone and data services, electricity, and cable television are serviced by contracted private agencies, including Southern California Edison Company, Southern California Gas Company, AT&T, Time Warner Cable and Cox Communications Orange County.

Orange’s ***Vision for the Future***, described in the General Plan Introduction, recognizes the City’s infrastructure as a key component, and includes the following objectives:

- Orange recognizes the importance of managing development in a manner that ensures adequate and timely public services and infrastructure and limits impacts on the natural environment.
- We will continue to protect our critical watersheds, such as Santiago Creek, and other significant natural and open space resources.

**Purpose of the Infrastructure Element**

Although the State does not require preparation of an Infrastructure Element, the City places high importance on its ability to meet infrastructure demands. The Infrastructure Element identifies and assesses existing and future needs of the City’s growing population and of future proposed development within Orange. The intent of the Infrastructure Element is to consider the various infrastructure resources provided by public agencies and private



purveyors, and to provide guidelines for current and future development to best utilize and improve infrastructure.

## **Scope and Content of the Infrastructure Element**

The Infrastructure Element is comprised of three sections:

- 1) Introduction;
- 2) Issues, Goals, and Policies; and
- 3) Infrastructure Plan.

The Issues, Goals, and Policies section provides guidance for the City to address current and future infrastructure needs of the community. The goals express general and broad statements describing the community's desires regarding infrastructure. The policies provide guidelines for local agencies to provide efficient, affordable, and adequate infrastructure to serve Orange. The Plan explains how the goals and policies will be achieved and implemented.

## **Relationship to Other General Plan Elements**

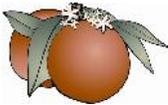
Proposed infrastructure goals, policies and plans must be consistent with all other elements of the General Plan. The issues addressed in the Infrastructure Element relate most closely to the contents of the Land Use, Growth Management, and Housing Elements.

The Land Use Element directs the location of current and future development that relies on available infrastructure. Furthermore, the Land Use Element establishes standards for use intensity, population density, and types of land uses that influence the design, layout, and funding sources for infrastructure.

The Growth Management Element contains policies to ensure that growth is accompanied by needed capital facilities to properly address infrastructure needs concurrently with development. Growth Management Element policies ensure that new growth is managed in a way that does not overwhelm current infrastructure, or diminish the level and quality of services provided to current residents. The growth patterns and level of growth included in the Growth Management Element must be consistent with those of the Infrastructure Element. Similarly, the Housing Element relies on available infrastructure to guide new housing to suitable sites.

## **ISSUES, GOALS, AND POLICIES**

The goals and policies of the Infrastructure Element address five key issues: (1) maintenance of the City's aging water, sewer, and storm drain infrastructure in the face of increased growth pressures; (2) provision of high-quality solid waste collection services and encouragement of recycling; (3) maintenance of right-of-way areas; (4) provision of adequate electricity, natural gas, telephone and data services, and other "dry" utilities; and (5) protection of lifeline infrastructure systems that meet the public health and safety needs of the City.



### Water, Sewer, and Storm Drain Systems

Protection and proper management of the storm drain infrastructure system is essential to prevent pollution of rivers, lakes, and the ocean by contaminants from urban runoff. A detailed discussion of water resource issues is provided in the Natural Resources Element. Infrastructure (including sewer, storm drain, and water lines, and solid waste collection and disposal services) must be sufficient to accommodate the present and future needs of the community. As infrastructure ages, or growth outpaces capacity, isolated failures represent a real problem. One of the most critical issues facing the City is how to improve and maintain infrastructure to protect water quality and supplies, ensuring that residents fully enjoy the health, economic, and social benefits that sound infrastructure systems provide.

**GOAL 1.0: Ensure water, sewer, and storm drain systems that meet the needs of residents and businesses.**

- Policy 1.1: Provide sufficient levels of water, sewer, and storm drain service throughout the community.
- Policy 1.2: Correct known deficiencies in the City’s sewer, storm drain, and water systems and work toward environmentally sustainable systems.
- Policy 1.3: Promote water conservation programs aimed at reducing demands.
- Policy 1.4: Explore environmentally efficient infrastructure improvements such as the use of reclaimed water, maximizing percolation, and similar technologies.
- Policy 1.5: Investigate and carry out cost-effective methods to reduce storm water infiltration into the sewer system.
- Policy 1.6: Require that new developments fund fair-share costs associated with City provision of water, sewer, and storm drain service and are consistent with City and service provider plans to complete needed improvements and funding capacity for such improvements.

### Solid Waste

Nearly everything we do leaves behind some kind of waste. Households create ordinary garbage, industrial and manufacturing processes create solid and hazardous waste, and construction activities create large chunks of debris and inorganic materials.

Orange contracts with a private sector provider to collect solid waste, green waste, and recyclables. By actively recycling, reducing, and reusing waste, residents and businesses reduce the need for new landfills and incinerators, prevent the emission of many greenhouse gases and water pollutants, supply valuable raw materials to industry, and conserve land and natural resources.

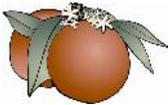


- GOAL 2.0:** Reduce the amount of waste material entering regional landfills with an efficient and innovative waste management program.
- Policy 2.1: Provide sufficient levels of solid waste service throughout the community.
- Policy 2.2: Expand outreach and education regarding recycling opportunities to all City customers.
- Policy 2.3: Develop programs that encourage residents to donate or recycle surplus furniture, old electronics, clothing, and other household items rather than disposing of such materials in landfills.
- Policy 2.4: Expand outreach and education to all City customers regarding residential collection of household hazardous wastes including paint containers, electronics, household chemicals, motor oils, and pesticides.

### **Public Rights-of-Way**

Maintaining safe, clean rights-of-way is important for promoting circulation and the public health and safety of Orange's residents. Through the DPW, the City provides street sweeping, tree trimming, graffiti removal, and installation and maintenance of street lights on public rights-of-way. The DPW also provides maintenance of and repair services for all public rights-of-way, including roadways, sidewalks, alleys, and other public property within Orange.

- GOAL 3.0:** Ensure adequate maintenance of public rights-of-way to enhance public safety and improve circulation.
- Policy 3.1: Continue to maintain and repair sidewalks and pavement surfaces on public rights-of-way.
- Policy 3.2: Provide sufficient levels of street sweeping, landscaping, graffiti abatement, shopping cart and bulk item removal from streets, sidewalks alleys, and other public rights-of-way.
- Policy 3.3: Continue to design, install, and maintain signals, signage, street lights, and traffic control devices within rights-of-way.
- Policy 3.4: Investigate the feasibility of using energy-efficient street lights to conserve energy.
- Policy 3.5: Preserve and improve existing on-street bike paths within rights-of-way.
- Policy 3.6: Require that new developments fund fair-share costs associated with City provision of right-of-way maintenance services and are consistent with City and service provider plans to complete needed improvements and funding capacity for such improvements.



**Dry Utilities**

Dry utility services, such as electricity, natural gas, telephone and data services, and cable television both meet basic needs and enhance quality of life for Orange residents. These services are provided by independent entities that set their own service standards and facility improvement strategies. Demand for services and ability to serve new developments are generally determined on a case-by-case basis. The City works with service providers to ensure that City goals and service expectations are met for both current and future development.

**GOAL 4.0: Ensure adequate provision of electricity, natural gas, telephone and data services and cable television.**

Policy 4.1: Continue to work with dry utility service providers to ensure that the community’s current and future needs are met.

Policy 4.2: Continue to require utilities to be placed underground for new development.

Policy 4.3: Promote the use of new and emerging communication technologies.

Policy 4.4: Encourage integrated and cost-effective design and technology features within new development to minimize demands on dry utility networks.

**Lifeline Infrastructure**

Lifeline infrastructures, such as electric, water, gas, and telecommunications utilities and transportation systems, connect Orange to outside services during an emergency. Maintaining and protecting the City’s lifeline infrastructure systems against damage from disasters is essential to ensuring the public health and safety of residents. Loss of electric, water, gas, and telecommunications services and transportation systems can not only severely impair police and fire agencies’ efforts to respond to emergencies, it can also displace residents and economically impact businesses. The City works with regional agencies and utility service providers to ensure the system of lifeline infrastructures is maintained and retrofitted against disaster and against deterioration from increasing demands and long-term use.

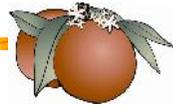
**GOAL 5.0: Ensure lifeline infrastructure systems that meet the City’s public health and safety needs.**

Policy 5.1: Continue to work with regional and federal agencies to ensure that infrastructure for transportation systems, water, gas, electricity, and telecommunications meet regional emergency preparedness standards.

Policy 5.2: Work with utility service providers to create resiliency performance standards for water, gas, electricity, and telecommunications infrastructure.

Policy 5.3: Identify engineering vulnerabilities in lifeline utilities exposed to human-caused and natural hazards, including seismic activity, wildland fire, and flooding.





- Policy 5.4: Incorporate disaster mitigation strategies into the City's infrastructure master plans for retrofitting water, gas, electricity, telecommunications utilities, and transportation infrastructure.
- Policy 5.5: Review and limit the location and intensity of development and placement of lifeline infrastructure in identified earthquake fault zones.

## **INFRASTRUCTURE PLAN**

The Infrastructure Plan documents current infrastructure conditions in the City, and assesses the projected future capacity of the infrastructure system. This includes the water systems, wastewater systems, storm drain systems, public rights-of-way, such dry utilities as electricity, gas service, and telephone and cable facilities, and lifeline infrastructure.

### **Water, Sewer and Storm Drain Systems**

Orange's water, sewer, storm drain and solid waste management systems represent the City's hidden support network. Managing infrastructure can be a challenge because these services are often taken for granted. They are "forgotten" services in the sense that in Orange, when we turn on the faucet, direct our downspouts and yard drains away from the house, or place garbage out at the curb, it seems that clean water simply appears, rainwater drains, and garbage is taken away. These systems must be maintained to ensure that our infrastructure systems will not fail and public facilities will be available when we need them.

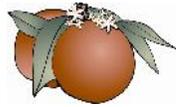
The City's role and preferred future strategies for providing these services are outlined in infrastructure master plan documents prepared by the City and updated on an ongoing basis. These master plans provide detailed descriptions of each infrastructure system and prioritize future system improvements in response to projected future growth.

The General Plan defers to the City's infrastructure master plans to establish service standards, prioritize future system improvements, and secure financing for needed improvements. Goals and policies of this Element focus on broad strategies to guide future infrastructure development. Each of the master plans will be updated in future years to be consistent with the policies and growth projections established in this General Plan.

#### **Water Systems**

The City's water supply comes from several sources: local groundwater basins, Northern California waters via the State Water Project, the Colorado River, local watersheds, reclamation, and water reuse projects. The City is a member agency of MWDOC, and MWDOC is a member agency of Metropolitan. Metropolitan supplies imported water to six Southern California counties, including Orange County. As a Metropolitan member, MWDOC represents the interests of its 29 member-agencies at the Metropolitan Water District of Southern California.

The City of Orange is also a member of the Orange County Water District (OCWD). OCWD's primary responsibility is managing the vast groundwater basin under north and central Orange County. The Orange County Groundwater Basin is the main source of water supply



for the City. The City obtains approximately 64 to 75 percent of its water from City-owned wells. The City purchases approximately 25 to 36 percent from Metropolitan through the MWDOC. In addition, the City purchases approximately 3 to 5 percent from the Serrano Water District. The OCWD, along with MWDOC and Metropolitan, carry out long-term water management planning, and provide public awareness, education, and water conservation activities on behalf of their member agencies. The following four water districts serve the City of Orange:

- Irvine Ranch Water District
- Golden State Water Company
- Serrano Water District
- East Orange County Water District (EOCWD)

Figure INF-1 shows the location of each District’s service area within Orange’s planning area.

The Orange County Groundwater Basin is actively managed by OCWD and has a history of supporting between 64 percent and 75 percent of the City’s water demand. The basin’s management plan allows for drawdown during dry periods and for replenishment during normal or wet periods. The City does not anticipate current, short-term, or long term supply deficiencies in its ability to pump groundwater into the water system. The greatest challenge for water supply in the near future will be to meet the water needs of a growing population, particularly with projected population growth in not only the focus areas identified in the Land Use Element, but also in east Orange.

The City of Orange completed an Urban Water Management Plan Update in 2010. In order to improve the reliability and efficiency of the ground water producing facilities and ultimately the water supply system, the City plans to replace older wells with more efficient wells. The new wells will provide the City with increased pumping capacity, though the amount of water produced from the wells will continue to be regulated by the Basin Production Percentage as set by OCWD in April of each year. The City will continue to analyze storage capacity needs and add additional storage as recommended in the Water Master Plan. The City will continue to implement the Water Master Plan and the Urban Water Management Plan and will update each Plan on an ongoing basis throughout the planning horizon of this General Plan.

In Orange, runoff from local rainfall is the main source of recharge for the smaller basins, and accounts for some of the recharge of the groundwater basin. The amount of runoff recharge can only be estimated because it is highly variable. Most of the recharge of the basin is from Santa Ana River flows percolated instream or diverted to off-stream spreading basins operated by OCWD. OCWD will continue to develop new replenishment methods and supplies, as well as improve recharge capacity and implement basin protection programs to meet the projected demand from the basin during both normal and drought periods.

**Sewer Systems**

The City of Orange owns the local collection systems which feed regional trunk lines owned by OCSD. OCSD is responsible for the treatment of residential, commercial and industrial sewage in Orange. Collected effluent is treated at Reclamation Plant No. 1 in Fountain Valley

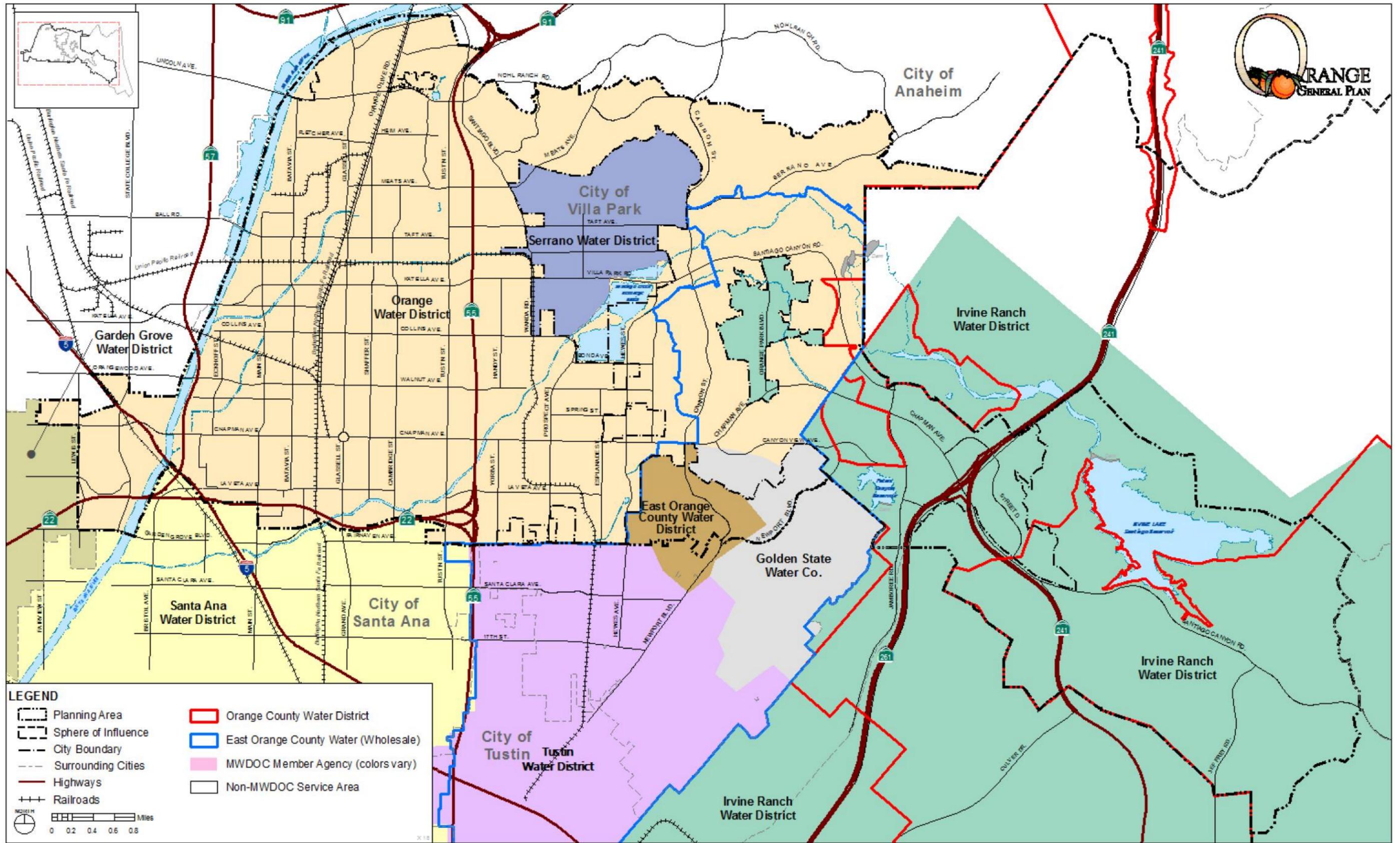
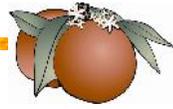


Figure INF-1 Municipal Water District of Orange County Service Areas



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or Treatment Plant No. 2 in Huntington Beach. Though OCSD operates the regional collection mains and treatment plants, the City's DPW is in charge of the daily operation and maintenance of the local sewer collection system owned by the City.

To respond to the increased need for sewage treatment in Orange County, OCSD needs to replace aging regional collection and treatment infrastructure and build additional secondary treatment facilities. A portion of the sewage fee charged to developers in the City of Orange will be paid to the OCSD for improvements of regional facilities, which are currently strained by the County's rapidly growing population. A Capital Facilities Capacity Charge, designed to fund improvements in the efficiency and effectiveness of OCSD operations, is applied to cities and developers for new residential, commercial, or industrial development and/or expansion of existing facilities.

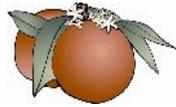
The City of Orange completed a Sewer Master Plan Update in 2003. In order to improve the reliability and efficiency of the sewer system, the City plans to replace older sewer lines. The new lines will maintain, and in some cases increase, the City's sewer line capacity, and provide adequate sewer collection for the future. The City has designated a 100-year life cycle for its sewer pipes, and hopes to replace systems that are nearly 100 years old. The City will continue to implement the Sewer Master Plan and will update the plan on an ongoing basis throughout the planning horizon of this General Plan.

### **Storm Drain Systems**

Important issues to focus on regarding storm drains include ensuring adequate capacity necessary to collect and carry stormwater to avoid flooding, and reducing pollutant loads in stormwater as part of regional efforts to improve water quality in surface waters.

Both the City and the County are responsible for managing the storm drain and flood control facilities in the City. The County of Orange Public Works Department provides for the planning, development, operation and maintenance of major flood control facilities on behalf of the Orange County Flood Control District on a County-wide basis. The City provides drainage for developments and ensures that storm drains properly feed into the regional drainage system. The City is also responsible for the operation and maintenance of stormwater facilities it owns throughout Orange. In addition, the City is served by several existing stormwater facilities that are operated by other jurisdictions. The Santa Ana River, which generally marks the western boundary of the City, is the location of the largest regional facility in Orange County, maintained by the County of Orange Public Works Department. Twelve flood control channels located throughout the City are maintained by the County of Orange Public Works Department on behalf of the Orange County Flood Control District and County of Orange. Within the City, DPW is responsible for developing and implementing the Master Plan of Drainage (MPD) which identifies the City's storm drain facilities and deficiencies.

The City of Orange last completed an update to the MPD in 1997. The biggest challenge facing the storm drain system in the future will occur as hillsides in relatively undeveloped east Orange are developed, causing storm water volumes to increase. As it is, existing development has led to current deficiencies in the drainage system. For this reason, a fair share allocation method has been devised to spread the entire cost of the system across the



future development area. The City will continue to implement the MPD and will update it on an ongoing basis throughout the planning horizon of this General Plan.

## **Solid Waste**

Within the City, solid waste collection is contracted to a private service provider. The City's contractor collects both solid and green waste (grass clippings, tree and shrub clippings), and items for recycling. Most waste is taken to one of the three landfills in Orange County: Olinda Alpha in Brea, the Frank R. Bowerman Landfill in Irvine, and the Prima Deshecha Landfill in San Juan Capistrano. The Orange County Integrated Waste Management Department (IWMD) owns and operates the landfills.

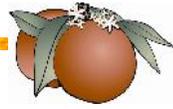
The amount of hazardous household waste has increased in recent years with the widespread use of new technologies. Orange residents are responsible for disposing of hazardous household materials at any of the four Household Hazardous Waste Collection Centers in Orange County. As the definition of household hazardous waste continues to evolve as a result of rapidly changing technology, the City will endeavor to provide convenient opportunities for the proper disposal of such waste.

The City's Solid Waste and Industrial Waste Ordinances regulate where solid and liquid wastes (including hazardous and industrial wastes) may and may not be deposited or discharged. Orange operates a curbside recycling program, and the City encourages residents and businesses to reduce the amount of solid wastes that enter the regional landfills.

## **Public Rights-of-Way**

The maintenance of public rights-of-way affects circulation, public safety, and pedestrian walkability. Broken sidewalks impede pedestrian mobility and deny access for disabled users. Uneven surface pavement slows vehicular mobility. Untended trees and shrubs can cause branches and tree limbs to fall onto the public right-of-way, potentially causing accidents and impairing nighttime visibility for pedestrians. Future maintenance of right-of-way infrastructure is closely tied to the City's projected mobility needs as discussed in the Circulation & Mobility Element. The City coordinates with the County through the Orange County Transportation Authority (OCTA) to accomplish its circulation and roadway infrastructure maintenance goals, and the City assumes responsibility for maintenance services of public rights-of-way within Orange.

Through DPW, the City maintains all public rights-of-way, including streets, sidewalks, alleys, and on-street bicycle lanes. DPW installs street lights, provides tree trimming and street sweeping services, and responds to graffiti abatement requests. The Street Division maintains and repairs roadways and sidewalks, and performs weekly street sweeping services. The Traffic Engineering Division responds to street light repair requests, in addition to conducting weekly street light checks to identify and repair broken and malfunctioning street lights. DPW also responds to graffiti and tagging removal requests on public property, including public rights-of-way, and on private property adjacent to public rights-of-way. This department is also responsible for providing such landscaping services as tree trimming to prevent and minimize debris and obstacles within rights-of-way. DPW follows the adopted



Street Tree Master Plan that details City-approved species and sets the maintenance schedule and appropriate size of street trees. Through these services, the City will continue to ensure that public rights-of-way are safe, clean, and well maintained to provide improved mobility within Orange.

## **Dry Utilities**

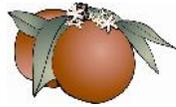
Dry utilities, such as electricity, natural gas, telephone, and cable enhance quality of life for Orange residents. These services are provided by independent entities that set their own service standards and facility improvement strategies. The City works with service providers to ensure that City goals and service expectations are met for both current and future development.

### **Electricity**

Southern California Edison (SCE), an independently owned utility, provides electrical power service to the Orange planning area. SCE distributes electricity purchased through the California Power Exchange, which is the electricity marketplace for about 80 percent of California's electricity customers. The California Independent System Operator coordinates the scheduling and dispatch of electricity bought and sold through the power exchange, which is essentially a statewide grid of electricity generation and distribution.

The rate of electricity consumption, generally referred to as demand or load, is what power grid operators are most concerned with when deciding whether electricity generation and transmission resources are adequate to serve consumers. Peak electricity demand is a measure of the largest electricity usage rate during the day, measured in megawatts. A single megawatt is generally enough power to meet the expected electricity needs of 1,000 typical California homes. Orange's peak demand typically occurs in August between 3 p.m. and 5 p.m. High temperatures during the summer months lead to increased use of air conditioning, which, in combination with industrial loads, commercial lighting, office equipment, and residential refrigeration, compose the major consumers of electricity during the peak demand period. Because electricity is not a storable commodity, the ability of electricity-generating and transmitting resources to provide electricity becomes an issue of the generation rate instead of total amount that may be consumed within a given time period.

Recent summertime energy crises are an indication that peak energy demand will be an important future planning issue, particularly in Southern California. In order to meet future energy needs, SCE has developed several energy-efficiency programs for residential, non-residential, new construction, and low-income subscribers. These include rebate and cash incentive programs for completion of energy-efficiency projects in residences and businesses, providing energy-efficient solutions for new developments as well as programs that aid low-income customers to purchase energy-efficient refrigerators and outdoor lighting. SCE will continue to promote the resourceful use of energy, and in turn, a reduction in electricity bills. The City will fully support these strategies by SCE to encourage energy conservation, including adoption of a green building program. Refer to the Natural Resources Element for policies and discussion concerning green building techniques and other related energy conservation measures.



### **Natural Gas**

California’s gas supply is regionally diverse and includes supplies from both onshore and offshore sources, including the southwestern United States, the Rocky Mountains, and Canada. Gas pipelines serving the Orange planning area include the El Paso Natural Gas Company, Kern River Transmission Company, and Pacific Gas and Electric Company facilities. The Southern California Gas Company (The Gas Company) supplies natural gas to both businesses and residents within the Orange planning area. The Gas Company is a division of Sempra Energy, and is the largest natural gas utility in the nation.

Southern California relies on a consistent supply of natural gas to meet residential, business, and industrial energy demand. Natural gas is also needed to produce electricity. Projected population growth in the region is expected to increase demand for natural gas. The Gas Company participates in the California Energy Star® New Homes Program, a performance-based program that provides builders with incentives for developments that use at least 15 percent less energy than standards set forth in the 2001 California Energy Efficiency Standards. The City will continue to support The Gas Company in these and other efforts to improve energy efficiency.

### **Telephone**

The Orange planning area is within the service area of AT&T. AT&T has existing telephone facilities within or adjacent to each of the land use focus areas described in the Land Use Element, and fiber optic lines in Santiago Canyon Road and Jamboree Road to help serve future development in east Orange. The City will continue to work with AT&T and other telephone service providers to ensure high quality telephone and data services are provided to current and future residents.

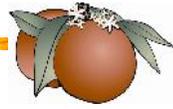
A variety of wireless service providers offer telephone and internet service within the City, and operate an established and growing network of wireless facilities. The City will continue to work with wireless providers to ensure provision of a high quality system while minimizing impacts of wireless facilities on the character of established areas.

### **Cable Services**

The Orange planning area is within the service area of Time Warner Cable and Cox Communications Orange County (Cox). Time Warner is the major cable provider in the City. Cox serves portions of east Orange. Both Time Warner Cable and Cox are full-service providers of telecommunication products, including digital television programming, local and long-distance telephone services, high-speed Internet, and commercial voice and data services. The City will continue to work with Time Warner, Cox, and other service providers to ensure that high quality television and data services are provided to current and future residents.

## **Lifeline Infrastructure**

Roadway systems and water, gas, electrical, and telecommunications services, make up the City’s system of lifeline infrastructure. These utilities provide critical services to the community, and disruption or loss of service can create delays for police and fire agencies in



responding to emergencies, place residents at risk of harm, and hurt the regional economy. Seismic activity, flooding, and wildland fire are particular risks for the City's lifeline infrastructure. Ground shaking, amplification, landslides, and liquefaction from seismic activity can cause water and gas pipes to break, dams to fail, and power lines to come down. Disruption of telephone and radio service impedes communication and dissemination of critical information, and road closures can create delays in providing supplies or services after an emergency. A detailed discussion of the City's risk for natural hazards and plans for emergency response is presented in the Public Safety Element.

As part of its efforts to prevent, mitigate, and plan for hazards, Orange works with regional agencies to prepare infrastructure mitigation plans. In accordance with the Disaster Mitigation Act of 2000, which establishes state and local government infrastructure mitigation planning requirements for federal damage assistance, Orange coordinates with regional public agencies and private utility service providers to prepare hazard mitigation plans and ensure proper maintenance and retrofitting of lifeline infrastructures. The City participates in the Orange County Hazard Mitigation Task Force, which is responsible for preparing a countywide Hazard Mitigation Plan (HMP). The HMP identifies and profiles hazard risks, assesses vulnerabilities in countywide infrastructure, and analyzes development trends to identify future maintenance needs of critical infrastructure and services. The City also works with MWDOC in its planning and implementation of the Regional Water and Wastewater Multi-Hazard Mitigation Plan, which formulates mitigation plans for regional water facilities in the County, including those found within the City.

In addition to preparing for and implementing rapid repair plans to go into effect after an emergency, the City addresses non-emergency threats to lifeline infrastructure. Changes over time can cause vulnerabilities to lifelines. The City of Orange prepares a municipal Emergency Operations Plan in coordination with the City's infrastructure master plans to establish service standards, prioritize future system improvements, and secure financing for needed improvements for infrastructure. DPW provides maintenance and repairs for roadway facilities, sewer and storm drain systems, and water systems including wells, pumps, water lines and reservoirs. Private dry utility service providers are responsible for following state and federal safety guidelines and for maintaining and repairing dry utilities during an emergency. The City will continue to work with regional planning agencies and private utility service providers to ensure that lifeline infrastructure systems meet the highest public health and safety standards for hazard prevention and mitigation.

## **INFRASTRUCTURE 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.