FRESNO


# Fresno General Plan Update

## Resource Conservation and Resilience

PRELIMINARY
WORKSHOP
DISCUSSION
DRAFT

Development and Resource
Management Department

City of
FRESNO

January 2013

# 7
# Resource Conservation and Resilience

## Preliminary Workshop Discussion Draft of the City of Fresno General Plan Update

The Resource Conservation and Resilience chapter is one of the many Elements noted below that when combined will ultimately comprise the Draft Fresno General Plan Update, anticipated to be released as a comprehensive document for public review and formal comments in March - April 2013.

- Urban Form, Land Use, and Design Element
- Mobility & Transportation Element
- Parks, Open Space and Schools Element
- Healthy Communities Element
- Historic and Cultural Resources Element
- Resource Conservation and Resilience Element
- Public Utilities Element
- Noise and Safety Element
- Economic Development and Fiscal Sustainability Element
- Implementation Element
- Housing Element[1]

This version of the Resource Conservation and Resilience Element is a **Preliminary Workshop Discussion Draft of the City of Fresno General Plan Update,** intended for introduction to the public, with a request for public review and comments to be received via emails, letters, and oral presentations as part of a series of workshops with the Fresno Planning Commission and other community engagement meetings scheduled through February - March of 2013.

The Resource Conservation and Resilience Element establishes policies for the conservation of natural resources in Fresno. The Element addresses air resources including air quality and greenhouse gas emissions; water resources including groundwater and waterways; energy resources; and land resources including farmland and mineral resources. Biological resources such as native plant communities and wildlife habitats are addressed in Chapter 5: Parks, Open Space, and Schools.

[1] The City has already updated and approved the Housing Element as required by State law. Although not currently scheduled for preliminary workshop review, the Housing Element will be addressed in the Draft Fresno General Plan Update and the current version is available for public review. Technical amendments to the Housing Element needed for General Plan consistency will be addressed in the Draft Fresno General Plan Update as appropriate. The Housing Element's goals, objectives, policies and programs will be included in the General Plan, with any proposed technical amendments clearly indicated

Resiliency, in terms of city planning, refers to creating infrastructure and policies to ensure that the residents, businesses, and government of a city can withstand temporary and permanent disruptions in resources and everyday ways of life. A resilient city is not dependent on certain sources of energy, is able to adapt to shifts in weather patterns, has a plan to respond to emergencies such as earthquakes and floods, and has secured a long-term source of food and water. These ideas are developed in this Element in relation to resource conservation concepts; details on infrastructure planning are in the Public Utilities and Services Element and the Transportation and Mobility Element, while emergency preparedness is addressed in the Noise and Safety Element.

## RELATIONSHIP TO GENERAL PLAN GOALS

This Element provides objectives and policies that support a wide range of General Plan goals, in particular the following:[2]

3. Emphasize conservation, successful adaptation to climate and changing resource conditions, and performance effectiveness in the use of energy, water, land, buildings, natural resources, and fiscal resources required for the long-term sustainability of Fresno.
4. Emphasize achieving healthy air quality and reduced greenhouse gas emissions.
5. Support agriculture as an integral industry and sustainable food production system.

   *Emphasize the economic and cultural role of Fresno as a center of agriculture and food production systems by conserving farmland through a focus on developing vacant and underutilized land within the established Sphere of Influence of the City, limiting any further urban boundary expansion, and developing urban agriculture within the city and designated growth areas.*

12. Resolve existing public infrastructure and service deficiencies, make full use of existing infrastructure, and invest in improvements to increase competitiveness and promote economic growth.

    *Emphasize the fair and necessary costs of maintaining sustainable water, sewer, streets, and other public infrastructure and service systems in rates, fees, financing and public investments to implement the General Plan. Adequately address accumulated deferred maintenance, aging infrastructure, risks to service continuity, desired standards of service to meet quality-of-life goals, and required infrastructure to support growth, economic competitiveness and business development.*

13. Emphasize the City as a role model for growth management planning, regional cooperation, collaborative planning, efficient processing and permit streamlining, public-private partnerships and shared financing, sustainable urban development policies, environmental quality, and a strong economy, and work with other jurisdictions and institutions to further these values throughout the region.

    *Positively influence the same attributes in other jurisdictions of the San Joaquin Valley –and thus the potential for regional sustainability - and improve the standing and credibility of the City to pursue appropriate State, LAFCO, and other regional policies that would curb sprawl and prevent new unincorporated community development which compete with and threaten the success of sustainable policies and development practices in Fresno.*

[2] The commentary in italics following certain goals is not part of the goal itself, but is instead advisory and informational language intended to further discussion, clarify the goal, and help guide the objectives of the General Plan.

16. Protect and improve public health and safety.
17. Recognize, respect, and plan for Fresno's cultural, social, and ethnic diversity, and foster an informed and engaged citizenry.

    *Emphasize shared community values and genuine engagement with and across different neighborhoods, communities, institutions, businesses and sectors to solve difficult problems and achieve shared goals for the success of Fresno and all its residents.*

## FRESNO GREEN – THE CITY OF FRESNO'S STRATEGY FOR ACHIEVING SUSTAINABILITY

In 2008, the Fresno Green Strategies were presented to the then-mayor and City Council. Though not presented for approval, the then-mayor and City Council accepted the strategies as the City's first attempt to articulate a direction for achieving a sustainable future for the city of Fresno through green conservation efforts including those that could be made by the City. These strategies address a wide range of issues organized around five "visions" for Fresno and its future growth areas—these are New City Beautiful, Sierra View 2025, Solar Valley, Green Enterprise and Economic Development, and City as Good Steward. The City has won an award from the U.S. Environmental Protection Agency (EPA) for these strategies. Most of the objectives and programs that support these strategies have been implemented or are in the process of execution, and the majority are embedded throughout the General Plan in the implementing policies of this Element and many others. Key ideas from these visions follow.

### New City Beautiful


The New City Beautiful vision showcases good urban design, with priority given to public health, open spaces, public art, historic preservation, urban forests and the protection of natural habitats. The main initiatives are:

1. Develop and implement compact, transit- and pedestrian-oriented development principles and green building standards.
2. Build municipal buildings to a green building rating system and adopt green technology for the retrofit of existing City buildings.
3. Plan new residential areas and retrofit existing neighborhoods to be within one half mile of public parks, school playgrounds and/or recreational open space.
4. Plant and maintain trees in order to achieve shading of at least 50 percent of all hardscaped parking and pedestrian surfaces.
5. Protect critical habitat corridors and key habitat characteristics from unsuitable development.
6. Reduce the use of disposable toxic or non-renewable products through environmentally preferred purchasing policies.


## Sierra View 2025

The Sierra View 2025 initiatives focus on making the Sierra Nevada mountain range clearly visible to all Valley residents by 2025 thus improving public health with cleaner air, enhanced public transportation and increased opportunities for walking and cycling:

7. Implement enhanced public transit and traffic light synchronization programs to reduce commute time.
8. Reduce City fleets' air pollutant emissions and City greenhouse gas emissions.
9. Reduce the number of commute trips by single occupancy vehicles.
10. Meet federal clean air standards.


## Solar Valley

Fresno will become a leader in renewable energy use by maximizing new renewable sources. With its abundant sunshine, the opportunity exists to improve air quality, reduce dependence on foreign energy, and provide attractive new jobs by harnessing solar power. Three initiatives work toward this goal:

11. Increase use of renewable energy to meet 50 percent of annual electrical consumption for City operations.
12. Reduce the city's peak electrical load by 10 percent through energy efficiency and conservation measures and shifting the timing of energy demands.
13. Reduce citywide greenhouse gas emissions to meet requirements of State AB 32.


## Green Enterprises and Economic Development

These initatives set the stage for Fresno to become the Valley center for innovative business enterprises with a focus on the "triple bottom line" of providing environmental, economic and social benefits:

14. Position Fresno as a regional center for green enterprises.
15. Create environmentally beneficial jobs in low-income neighborhoods.
16. Promote and support locally grown and organic foods.


## City as Good Steward

The City as Good Steward vision puts forth Fresno as a city that leads by example in greening up its facilities and practices, embracing a zero waste initiative, providing appropriate staff resources, and collaborating with other municipalities and agencies to develop regionally-based green programs. Seven initiatives comprise the program for this vision:

17. Achieve 75 percent diversion of solid waste that otherwise would go to landfills by 2012 and zero waste to landfills by 2025.
18. Develop and implement an Integrated Pest Management program.
19. Protect integrity of Fresno's primary drinking water sources through an update of the General Plan.
20. Develop and implement environmentally responsible policies and practices.
21. Market the Fresno Green Strategies (New City Beautiful, Sierra View 2025, Solar Valley, Green Enterprises and Economic Development, and City as a Good Steward) throughout the community.
22. Incorporate sustainable policies into the General Plan.
23. Measure successes of Fresno Green Strategies and present a periodic report to the Council, which could be integrated into the General Plan annual report.

## RELATION BETWEEN URBAN FORM AND RESOURCE CONSERVATION

Making efficient use of public infrastructure and reducing the financial resources devoted to energy use will save money for residents, businesses, and the City government. By strategically regulating urban form elements through this General Plan, such as development types, intensity, building massing and orientation, landscaping size and type, and the mix of land uses, the city can produce significant energy and water savings.

The General Plan also needs to prevent an overextension of its developable area. Low-density residential development on the urban fringe is expensive to serve with both physical infrastructure (roads, water, and sewer) and public services (fire and police). Meanwhile Fresno has vacant and undervalued parcels located in its urban core for which infrastructure and services are already provided. Ensuring that the cost of doing business goes down and scarce financial resources are used efficiently is a key strategy of this General Plan. Also, the amount of land available to the city for future growth is ultimately finite. Further expansion of Fresno's Sphere of Influence is blocked in certain directions by the County line and the City of Clovis, is contingent on County plans, and may consume valuable farmland.

Continued growth outwards creates transportation and air quality issues as well. The continued siting of major retail and commercial uses, as well as jobs, at Fresno's urban fringe is lengthening travel times and increasing traffic levels (and air pollution) disproportionately faster than the rate of population growth, due to inefficient location selection.

Given the restrictions on and impacts of increasing Fresno's land area, the General Plan logically promotes the highest and best use of land within Fresno's current City Limits, phasing of growth into county areas of the Sphere of Influence, and avoids de-investment of developed land. Furthermore, certain patterns of land development can increase costs to the City in excess of related

*The photos above depict some infill development projects built in the Downtown in the first decade of the 21st Century. In the upper photo is the Chukchansi Baseball Park (background) and the United Security Bank building (foreground), in the middle photo is the Iron Bird Lofts, and in the lower photo is the Fresno Federal Courthouse.*

revenues and essentially reduce fiscal resources; the General Plan seeks to discourage this type of development and, at the least, ensure that all development covers its fair share of public costs.

## OBJECTIVE

RC-1 Make efficient use of existing and future public infrastructure.

## IMPLEMENTING POLICIES

RC-1-a **Setting Service Standards**. Consider setting service delivery standards at existing levels, or formulate and commit the City to an investment program that will meet an improved standard of service.

RC-1-b **Capital Improvement Program.** Prepare and consider adoption of a long-term Capital Improvement Program (CIP) that describes City-sponsored capital projects related to General Plan implementation.

*Commentary*[3]*: The CIP will define what development areas or projects it would enable, include funding sources covering the complete cost of the projects as well as intended phasing, and be updated annually and comprehensively reviewed every five years so that it accurately reflects the City's priorities, community needs, fiscal realities, and State mandates. It also will include an analysis of how improvements implement the General Plan and how they reflect the City's commitment to "environmental justice" and fair share issues relative to individual neighborhood needs.*

RC-1-c **Prioritize Revenues.** Place a priority on improving property tax and sales tax revenues by supporting, streamlining, and providing incentives for projects that create the largest impacts on property values and the city's retail base.

*Commentary: These incentives could include giving priority to redevelopment of vacant and underutilized land over the conversion of active farmland to urban uses.*

RC-1-d **Coordinate Construction.** Coordinate construction with other public and private agencies, particularly with respect to streets, sewerage, water, gas, electric, irrigation improvements, and flood control facilities to seek the greatest public benefit and efficiencies at the least public cost.



[3] The commentary in italics following certain policies is not part of the policy itself, but is instead advisory and informational language intended to further discuss and clarify the policy to help guide the understanding and relevancy of the General Plan.

## OBJECTIVE

RC-2 Promote land uses that conserve resources.

## IMPLEMENTING POLICIES

RC-2-a **Land Use Link to Transportation**. Promote mixed-use, higher density infill development and support land use patterns that make more efficient use of the transportation system. Likewise, plan future transportation investments in areas of higher-intensity development.

RC-2-b **Infrastructure for Mixed-Use and Infill.** Promote investment in the public infrastructure needed to allow mixed-use and denser infill development to occur in targeted locations, such as expanded water and wastewater conveyance systems, complete streetscapes, parks and open space amenities, and trails.

## OBJECTIVE

RC-3 Actively engage, listen to, educate, and enlist the support of the community on the need and strategies for resource conservation.

## IMPLEMENTING POLICIES

RC-3-a **Public Tracking of Resource Consumption.** As funding is available, City will provide written materials and information on the City's website tracking public and private rates of resource consumption in Fresno, and the related fiscal and environmental costs, to be updated frequently. Work with utilities and the San Joaquin Valley Air Pollution Control District to determine and publish such information.

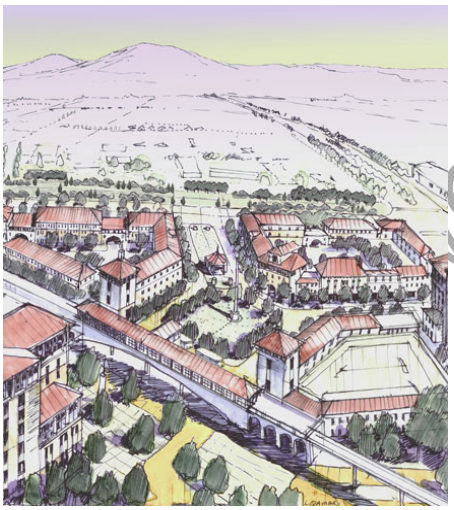
RC-3-b **Community Outreach and Joint Solution Making.** City will hold an ongoing education and listening session series with the public to inform them of public and private rates of resource consumption, costs, impacts, and projected future constraints. Actively work with the public to develop and champion realistic, effective solutions at the local, regional, and state levels. Partner with utilities and the Air Quality District to provide information, answer questions, and suggest solutions.

## AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Fresno is located in the center of the San Joaquin Valley Air Basin. The Basin's air quality is among the worst in the nation, and routinely exceeds national and state air quality health standards for ozone and particulates. This poor air quality seriously impacts the daily health of area residents, in terms of high levels of asthma, sinus infections, and cardiovascular disease, and can be an impediment for potential corporate investors who have to determine whether their employees should be exposed to increased health risks. This poor air quality is caused by natural geographic and climatic conditions and local/regional development, transportation and land use practices.

Fresno's air quality management programs are administered by the San Joaquin Valley Air Pollution Control District (SJVAPCD), which covers eight counties from the San Joaquin County in the north to Kern County in the south. Within this region the SJVAPCD is responsible for ensuring compliance with federal air quality standards, but cannot regulate all the pollution sources. The SJVAPCD enforces clean air regulations and also uses incentives which are paid for by the collected fees. Its regulations include dust reduction during construction and stationary source requirements. Incentives include programs to replace or retrofit certain vehicle and engine types (trucks, lawn mowers, and school buses) and the Burn Cleaner Program (wood stove change out). The SJVAPCD only has authority to regulate stationary sources for air pollution and has voluntary incentive programs to help reduce mobile source emissions. This lack of authority to regulate mobile source emissions has restricted the SJVAPCD's ability to reduce emissions in the Valley and to achieve compliance time lines for federal air quality standards.

As a practical matter, any efforts to directly and indirectly reduce mobile source emissions and thereby improve air quality fall to the City and its transportation and land use policies. For instance, over 81 percent of the region's summer ozone pollution comes from mobile vehicle sources, but Fresno residents are highly dependent on automobiles and trucks for day-to-day operations due to low-density development patterns. Reducing ozone pollution is therefore highly contingent on reducing the number of vehicles miles traveled in the city. The City can accomplish this reduction by planning for and providing feasible and convenient alternative travel facilities and modes that emit fewer pollutants per person and by ensuring that trip generators (such as homes) and destinations (shops and businesses) are closer to one another to allow for shorter trips. There are two main strategies to do so: higher-density infill and mixed-use development and transit-oriented development (TOD).



*Illustrative drawing of a high-density mixed-use transit-oriented development*

Higher-density infill and mixed-use development encourages people to drive less since the urban environment is less spread out. Infill occurs when new buildings are placed on vacant or underdeveloped land surrounded by developed land, rather than on never-developed land at the periphery of a city. Infill uses pre-existing public road and utility infrastructure, but may require site cleanup and may tax the existing utility infrastructure to the point that existing distribution piping may need to be upgraded.

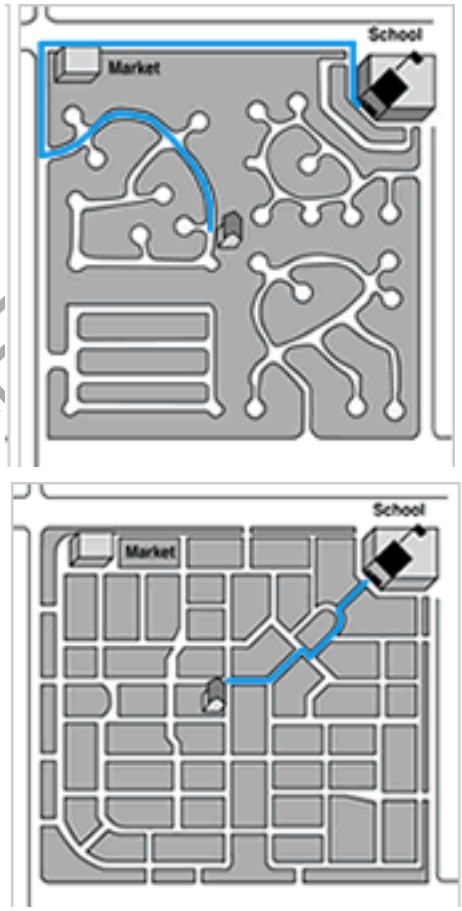
TOD is land development that maximizes access to public transit options. It attempts to discourage driving by facilitating walking through a compact pattern

of development and being located near good transit options such as train lines. Most TOD proposals emphasize rail transit, but it can work in bus rapid transit corridors.

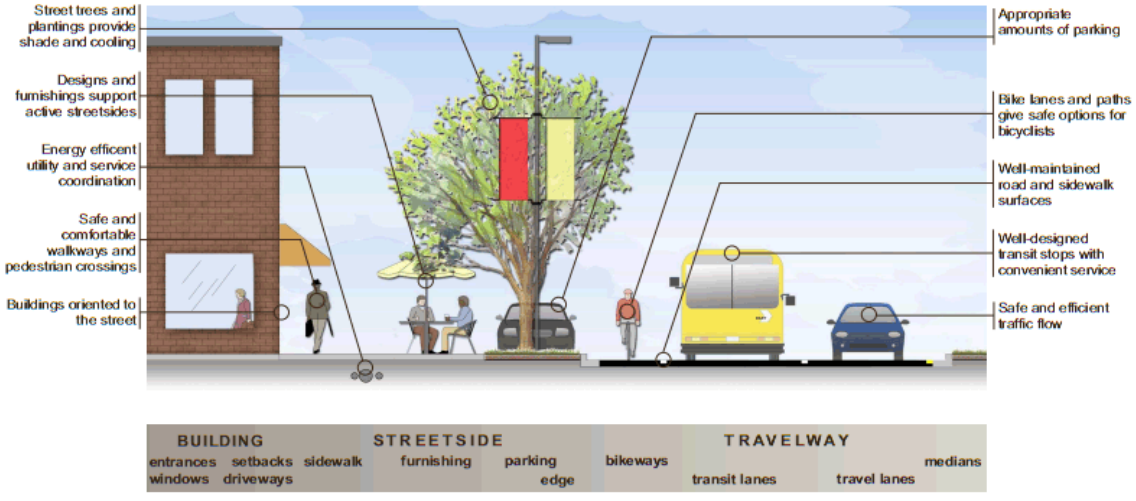
Street networks can also affect air quality based on the length of trips they require. More distance travelled and more time on the road is likely to coincide with more criteria pollutants released into the air. For example, in the two diagrams on the side of this page, the one on the top shows that traveling from the school to the house requires a longer trip because streets are disconnected and curvy, while the grid system in the bottom diagram allows a shorter trip.

The term "Complete Streets" means that streets are designed so all users—pedestrians, bicyclists, motorists and transit riders—of all ages and abilities may safely move along and across them. Since 2011, the Complete Streets Act has required California cities to account for the needs of all roadway users when updating their General Plans. There is no single design for a complete street, but components include sidewalks, curb extensions, accessible pedestrian signals, roundabouts, bike lanes, comfortable and/or accessible public transportation stops, and pedestrian-scaled lighting. Complete Street policies often have the effect of encouraging walking and use of public transit through safer travel and infrastructure, thereby negating automobile traffic congestion and improving air quality. The Mobility and Transportation Element addresses street patterns and complete street systems as well.

The availability of transit service to users is another critical method by which infrastructure can affect regional air quality. Public transit often reduces air pollution since its users could be using a car for private transport instead. Finally, the City can encourage the use of hybrid, electric, and alternative fuel vehicles through policies and infrastructure, such as providing electric and CNG (compressed natural gas) fueling stations and preferential parking spots, and using these vehicles for the City fleet.




*Transportation and Growth Management*
*Oregon Guide for Reducing Street Widths*




*Example of some components of a "Complete Street" taken from Dallas Complete Streets*

The land use objectives and policies of this General Plan are designed to decrease the generation of air pollution through the reduction of vehicle miles traveled by promoting infill development, encouraging a proximate mix of land

The term "complete neighborhood" refers to a neighborhood where one has safe and convenient access to the goods and services needed in daily life. This includes a variety of housing options, grocery stores and other commercial services, quality public schools, public open spaces and recreational facilities, affordable active transportation options and civic amenities. An important element of a complete neighborhood is that it is built at a walkable and bikeable human scale, and meets the needs of people of all ages and abilities.

*Fresno's BRT system is a new form of public transportation that improves speed, reliability, and identity of bus transit through special kinds of stops, buses, traffic signal priority, queue jump lanes and level boarding.*

uses including "complete neighborhoods", requiring more compact development in growth areas, and tying land uses and densities/intensities to existing and probable transit routes.

The General Plan also encourages modes of travel beyond the private automobile through its circulation policies designed to expand and connect the city's existing sidewalk and bike route network, consider multiple modes in transportation mitigation and level of service measurement, and consider context in roadway design. Other transportation measures that are part of City strategy and that have been determined to reduce air pollution include:

- Investing in bus rapid transit, express bus, limited stop bus and high frequency bus routes on principal transit corridors, transit corridors, and transit routes as determined feasible by appropriate transportation infrastructure studies.
- Identifying and pursuing measures that enhance the City's ability to obtain or use land for on-site bus turning and parking areas and construct attendant employee and passenger facilities.

## GREENHOUSE GASES EMISSIONS

Gases that trap heat in the Earth's atmosphere are called greenhouse gases (GHGs). These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that enters Earth's atmosphere from space is absorbed by the Earth's surface. The other part of it is reflected off the Earth and radiated back toward space, but GHGs absorb some of this radiation. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. Without natural GHGs, the Earth's surface would be about 61°F cooler.[4] This phenomenon is known as the greenhouse effect. However, many scientists[5] have determined that emissions from human activities—such as electricity generation, vehicle emissions, and even farming and forestry practices—have elevated the concentration of GHGs in the atmosphere beyond naturally-occurring concentrations, contributing to the larger process of global climate change.

### Climate Change

Climate change refers to a change in the average climate of the earth that may be measured by wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the distant past, such as during previous ice ages. The rate of temperature change has typically been incremental, with warming and cooling occurring over the course of thousands



4 California Climate Action Team, April 2006.

5 The world's leading climate scientists, the Intergovernmental Panel on Climate Change (IPCC), have reached consensus that global climate change is "very likely" caused by humans, and that hotter temperatures and rising sea levels will continue for centuries no matter how much humans control their future emissions.

of years. In the past 10,000 years the earth has experienced incremental warming as glaciers retreated across the globe. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years, roughly coinciding with the global industrial revolution.

Climate change in California is expected to result in the following impacts:*

- **Increased average temperature.** Climate change is expected to lead to an increase in average outdoor air temperature, with greater increases expected in summer than in winter months.
- **Negative health impacts.** Increased temperatures also pose a risk to human health when coupled with high concentrations of ground-level ozone and other air pollutants, which are correlated with increased rates of asthma and other pulmonary diseases.
- **Increased electricity demand.** Higher temperatures and heat waves will impact peak electricity demand in California, resulting in increased demand for air conditioning and refrigeration, especially in the Central Valley.
- **Decreased electricity supply.** Decreased water availability for hydropower generation (due to less Sierra snowpack and consequently lower reservoir levels) and decreased transmission efficiencies will increase the risk of brown-outs and black-outs.
- **Increased flood risk.** Climate change is anticipated to cause a 20 to 30 percent increase in precipitation in the spring and fall in California. More frequent and heavier precipitation events cause flooding and mudslides, which would incur considerable costs in damages to property, infrastructure and even human life.
- **Decreased summer water supply.** With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow. This will decrease the Sierras' capacity as a natural water tower, resulting in decreased water availability for agricultural irrigation, hydroelectric generation and the general needs of a growing population in dry seasons.
- **Increased drought and wildfires.** Drought conditions are likely to increase, causing decreased water supply and quality, food production impacts, and increased risks of waterborne disease. Drought conditions also result in increased frequency, intensity, and duration of wildfires, especially in conifer-dominant ecosystems in the Sierra Nevada. Regardless of where fires occur in the State, prevailing winds and valley geography causes the smoke to drift into the San Joaquin Valley and impair air quality.
- **Agricultural impacts.** Changing temperature conditions and natural cycles, increased drought conditions, changes in pests and pollinators, and a longer growing season will alter the thriving locally adapted agriculture.
- **Declines in native animal and plant populations.** Many species will be unable to adapt to changes or move to new areas quick enough to survive. As the ecosystem unravels native species will be lost while invasive species will increase.

*Source: California Natural Resources Agency, *California Climate Adaptation Strategy*, 2009 and ClimateWise, *Integrated Strategies for a vibrant and Sustainable Fresno County, 2011*.

By identifying and addressing underlying vulnerabilities due to climate change in this General Plan, the City can increase the resilience of both the community and the resources it depends on not only to climate change, but also to other changes such as population growth and water scarcity.

## RESPONDING TO CLIMATE CHANGE LEGISLATION

The City will need to continue to comply with applicable State of California climate change legislation as well as take into consideration settlements by the Governor's Office of Planning and Research Technical Advisories and Attorney General with other jurisdictions related to the California Environmental Quality Act (CEQA), greenhouse gas (GHG) emissions and general plan updates. By proactively addressing these climate change issues and requirements through the Fresno General Plan Update, the City has the opportunity to provide streamlined application processes for conforming local development.

The issue of climate change is closely related to other resource issues and opportunities, particularly air quality and water supply. The State's greenhouse gas legislation (AB 32 – California Global Warming Solutions Act of 2006 and SB 375 – Sustainable Communities and Climate Protection Act of 2008) and the amended CEQA and CEQA Guidelines require local governments to define the extent of greenhouse gas production and identify ways to substantially reduce greenhouse gases in the future in order to minimize a potentially significant environmental impact. Of particular importance to the General Plan Update is SB 375's requirement that all regional transportation planning organizations (locally, the Council of Fresno County Governments) develop a Sustainable Community Strategy (SCS) designed to coordinate regional transportation plans with land use intensities and densities in order to reduce future GHG emissions. For instance, Fresno County has a State-mandated target of reducing its greenhouse gases from automobile and light trucks (primarily $NO_x$ – nitrogen oxide) by five percent by 2020 and ten percent by 2035.

SB 375 provides financial and regulatory incentives to achieve the target GHG reductions, including streamlined environmental review for projects that conform to an adopted SCS. If the General Plan includes policies to reduce vehicle miles traveled by increasing land development densities so that more trips (such as to jobs, schools, and personal services) can be accommodated by shorter drives, transit, walking, or biking, then it is likely that such policies would be consistent with an adopted SCS. Since the Council of Fresno County Governments will not come out with its SCS until 2014, the precise implications for the City will not be known until this time. Local adherence to SB 375 and the regional SCS is not mandatory; however, the hope is that local governments will be motivated to align their land use planning with the SCS because they will have participated in its development, and doing so will allow them to capitalize on the new CEQA streamlining opportunities discussed below.

Senate Bill 97 (Chapter 185, Statutes of 2007) amended the California Environmental Quality Act statute to establish how GHG emissions and the effects of GHG emissions are appropriately analyzed under CEQA. The amendments stipulate that environmental documents for certain residential and mixed-use projects that are consistent with a General Plan designation, density, SCS or alternative planning strategy need not analyze global warming impacts

resulting from cars and light duty trucks. SB 97 also allows streamlined environmental review for projects in transit corridors that are consistent with an SCS and a city's General Plan.

**CEQA Tiering and Streamlining Analysis of Greenhouse Gas Emissions**

A plan to reduce greenhouse gas emissions is anticipated to be prepared concurrently with this General Plan update and may be included in this update, the Master Environmental Impact Report, or adopted separately. Such a plan will conform to CEQA Guidelines Section 15183.5 and allow the City to streamline environmental review for later projects.

Under CEQA, public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

1. **Plan Elements**. A plan for the reduction of greenhouse gas emissions should:

    A. Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
    B. Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
    C. Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
    D. Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
    E. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;
    F. Be adopted in a public process following environmental review.

2. **Use with Later Activities.** A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable notwithstanding the project's compliance with the specified requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.

## OBJECTIVE

RC-4 In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take necessary actions to achieve and maintain compliance with State and federal air quality standards for criteria pollutants.

*This includes compliance with Government Code Section 65302.1 for the San Joaquin Valley.*

## IMPLEMENTING POLICIES

RC-4-a **Support Regional Efforts.** Support, encourage and lead where appropriate regional, state and federal programs and actions for the improvement of air quality, especially the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) efforts to monitor and control air pollutants from both stationary and mobile sources.

RC-4-b **Reasonably Available Control Measures.** Implement the Reasonably Available Control Measures (RACM) submitted by the SJVAPCD to the Environmental Protection Agency as part of the Ozone Attainment Plan designed to reduce ozone forming emissions from operations and/or services that the City controls.

RC-4-c **Conditions of Approval.** Consider development and incorporation of detailed air quality maintenance considerations, compatible with Federal/State Air Quality Attainment and Maintenance Plans, as conditions of approval for land use plans and development proposals.

RC-4-d **Evaluate Impacts with Models.** Require use of computer models recommended by the SJVAPCD to evaluate the air quality impacts of projects that require environmental review by the City.

RC-4-e **Forward Information.** Forward information regarding proposed General Plan amendments, master plans, area and community plans, development projects, and amendments to development regulations to the SJVAPCD for their review of potential air quality and health impacts.

RC-4-f **Support Employer-Based Efforts.** Support and encourage employer implementation of staggered work hours and employee incentives to use carpools, public transit and other measures to reduce vehicular use and traffic congestion.

RC-4-g **Fleet Actions.** Consider continued control and reduction of air pollution emissions from municipal operations and facilities. More specifically, the City will continue to undertake the following:

- Expand the use of alternative fueled, electric and hybrid vehicles in City fleets.
- Create preventive maintenance schedules that will ensure efficient engine operation.
- Include air conditioning recycling and charging stations in the City vehicle maintenance facilities, to reduce freon gases being released into the atmosphere and electrostatic filtering systems in City maintenance shops, when feasible or when required by health regulations.
- Use satellite corporation yards for decentralized storage and vehicle maintenance.
- Convert City-owned emergency backup generators to natural gas fuels whenever possible, and create an advanced energy storage system.

RC-4-h **FAX Actions.** Continue efforts to improve Fresno Area Express (FAX) bus transit system technical performance, reduce emission levels, and streamline system operations, and implement Bus Rapid Transit (BRT) where supportive land uses are proposed to be implemented.

RC-4-i **Airport Actions.** Support Airport efforts to develop and maintain programs and policies to achieve and maintain air quality standards.

RC-4-j **Methane Capture.** Continue to pursue opportunities to reduce air pollution by using methane gas from the old City landfill and the City's wastewater treatment process.

RC-4-k **All Departments.** Require all City departments to develop and implement operational policies to reduce air pollution.

RC-4-l **Electric Vehicle Charging.** Develop standards to facilitate electric vehicle charging infrastructure in both new and existing public and private buildings, in order to accommodate these vehicles as the technology becomes more widespread.

## OBJECTIVE

RC-5 In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take timely and necessary actions to achieve and maintain reductions in greenhouse gas emissions and all strategies that reduce the causes of climate change in order to limit and prevent the related potential detrimental effects upon public health and welfare of present and future residents of the Fresno community.[6]

## IMPLEMENTING POLICIES

RC-5-a **GHG Evaluation and Mitigation.** Establish and uphold planning criteria and environmental analysis protocols that evaluate potential greenhouse gas (GHG) emissions from public and private projects and provide useful reduction and mitigation strategies through implementation measures including the following:

- Incorporate global climate change analysis and mitigation measures when reviewing private and public projects as required by the Public Resources Code and CEQA Guidelines,
- Use thresholds of significance or applicable alternative analysis strategies, adopted by the SJVAPCD or others. Advise project applicants of greenhouse gas and air pollutant emission significance thresholds, mitigation requirements, and control regulations promulgated by federal, state, regional, and local agencies.
- Consider guidance from the California Attorney General's Office, California Air Pollution Control Officers Association, and other sources in determining appropriate and feasible mitigation measures to be incorporated into land use plans, development projects and City operations to achieve GHG emission reductions.
- Whenever the Office of Planning and Research adopts revisions to the California Environmental Quality Act Guidelines and processes to assess global climate change, adopt any necessary amendments to the Environmental Quality Ordinance of the Fresno Municipal Code (Chapter 12, Article 5).



[6] Climatewise prepared a comprehensive study of climate change in the San Joaquin Valley titled, *"Integrated Strategies for a vibrant and Sustainable Fresno County, 2011."* The final Hearing Draft of the Fresno General Plan Update will include more detailed references in the narrative to include recommendations made in this ClimateWise study for addressing climate change in cities. Depending on what narrative is added some of the policies in this section might be slightly modified.

RC-5-b **Climate Action Plan.** Prepare a Climate Action Plan (CAP) as part of the Master Environmental Impact Report Update to be concurrently approved with the General Plan Update in order to achieve compliance with State mandates, focusing on feasible actions the City can take to minimize the adverse impacts of growth and development on climate change and air quality. The CAP may include, but not be limited to:

- A baseline inventory of all known or reasonably discoverable sources of greenhouse gases (GHGs) that currently exist in the city and sources that existed in 1990.
- A projected inventory of the GHGs that can reasonably be expected to be emitted in the city in the year 2035 in accordance with discretionary land use decisions pursuant to this General Plan update and foreseeable communitywide and municipal operations.
- A target for the reduction of emissions from those identified sources reasonably attributable to the City's discretionary land use decisions and municipal operations, in line with State goals and targets established by the Air Resources Board.
- A list of feasible GHG reduction measures whose purpose shall be to meet the established local reduction target, including energy conservation and "green building" requirements in municipal buildings and private development.
- Re-evaluate municipal and community-wide GHG emissions in the city at five-year intervals (or more frequently if mandated by the State of California) to determine the efficacy of adopted measures and to guide future policy formulation needed to achieve GHG reduction goals.

RC-5-c **Carbon Credits.** Develop a policy for "banking" the emission "carbon credits" generated through City facilities, programs, and policies, and for "trading" or otherwise assigning these "credits" to projects and programs/activities within the city to optimize local and regional benefit from City air pollutant and GHG emission reduction efforts and expenditures.

RC-5-d **GHG Reduction through Design.** Increase efforts to incorporate GHG emission reductions in land use entitlement decisions, facility design, and operational measures subject to City regulation through the following measures and strategies:

- Promote the expansion of incentive-based programs that involve certification of projects for energy and water efficiency and sustainability. These certification programs and scoring systems may include public agency "Green" and sustainable criteria, Energy Star™ certification, CALGreen Tier 1 or Tier 2, Leadership in Energy Efficient Design (LEED™) certification, etc.
- Promote appropriate energy and water conservation standards and facilitate mixed-use projects, new incentives for infill development, and the incorporation of mass transit, bicycle and pedestrian amenities into public and private projects.
- Consider requiring energy and water audits and upgrades for water conservation, energy efficiency, and mass transit, pedestrian and bicycle amenities at the time of renovation, change in use, change in occupancy, and change in ownership for major projects meeting review thresholds specified in an implementing ordinance.
- Incorporate the City's "Guidelines for Ponding Basin/Pond Construction and Management to Control Mosquito Breeding" as conditions of approval on any project which utilizes an on-site stormwater basin, in order to prevent possible increases in vector-borne illnesses that may be associated with global climate change.
- On a periodic basis (at least every five years), evaluate facility maintenance practices for opportunities to reduce GHGs, looking at facility cleaning and painting, parks maintenance, road maintenance, and utility system maintenance.
- Periodically (at least every five years as funds are available) evaluate standards and mitigation strategies for highly vehicle-dependent land uses and facilities such as, but not limited to, drive-through windows and new single-family residential construction, including adoption of anti-idling policies for uses such as delivery trucks, taxis, etc.
- Consider a City procurement policy that sets standards for purchasing low-polluting and climate-friendly goods and services requiring that emission reductions be achieved by vendors and contractors through City contracts and/or giving preference to those who demonstrate implementation of GHG and criteria air pollution emission reductions in their facilities and operations.

RC-5-e **Consider SCS and CAP Impact.** For projects requiring environmental review, ensure that the City's analysis considers the project's impact on the regional Sustainable Community Strategy, the Climate Action Plan, and other City and regional greenhouse gas reduction strategies in affect at the time.

RC-5-f **Ensure Compliance.** Ensure ongoing compliance with requirements for air quality measures incorporated into projects' design, conditions of approval, and mitigation measures, as appropriate.

RC-5-g **Toolkit.** Provide residents and project applicants with a "toolkit" of generally feasible measures that can be used to reduce greenhouse gases and criteria pollutants, including educational materials on energy-efficient and "climate-friendly" products.

## WATER RESOURCES

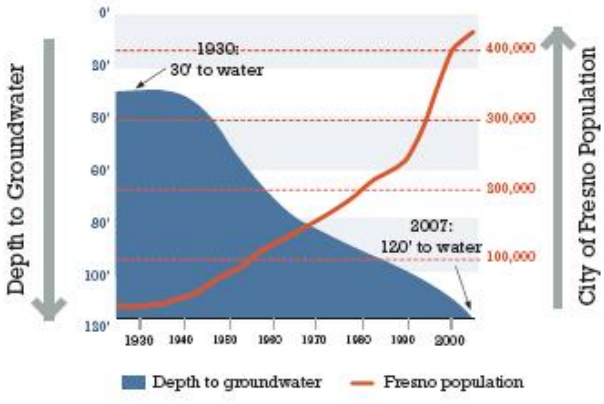
The future population and economic growth of Fresno will be determined in part by the availability of water. Fresno's water supply faces challenges and requires strategic decisions to secure its long-term availability and affordability, in light of several pressures:

- Fresno's water supply currently depends on hundreds of deep wells, which draw on a declining aquifer (See Chapter 6, Public Utilities and Services for more information).
- The City has the opportunity to utilize substantial surface water resources, but these cannot be used until costly new treatment and distribution infrastructure is constructed.
- Fresno has one of the highest per capita water consumption rates in California, more than twice that of Los Angeles. More than 50 percent of water consumption is used for landscaping, rising to 70 percent in summer months.
- The costs of wastewater treatment, both for the City and industrial users, are relatively high.
- Running groundwater pumps and conveyance systems uses a tremendous amount of energy; both the amount and cost of energy are rising in spite of technological innovation and efforts to reduce energy demands related to the city's water supply.

### WATER SOURCES

Fresno relies on two sources for its water: groundwater and surface water. With its dry climate and low annual rainfall (11 inches), Fresno is dependent on the Sierra snowpack, two rivers, and a groundwater basin to support the current city.

Fresno's primary source of water is groundwater that is located within the Kings Subbasin groundwater aquifer (see Figure RC-1). The City of Fresno's Water Division currently uses approximately 272 wells to pump about 146 million gallons of water per day (mgd) from the aquifer which equates to about 138,200 acre feet per year. Since the 1940s, Fresno has taken out more water from the aquifer than has naturally and intentionally seeped back in thus creating an

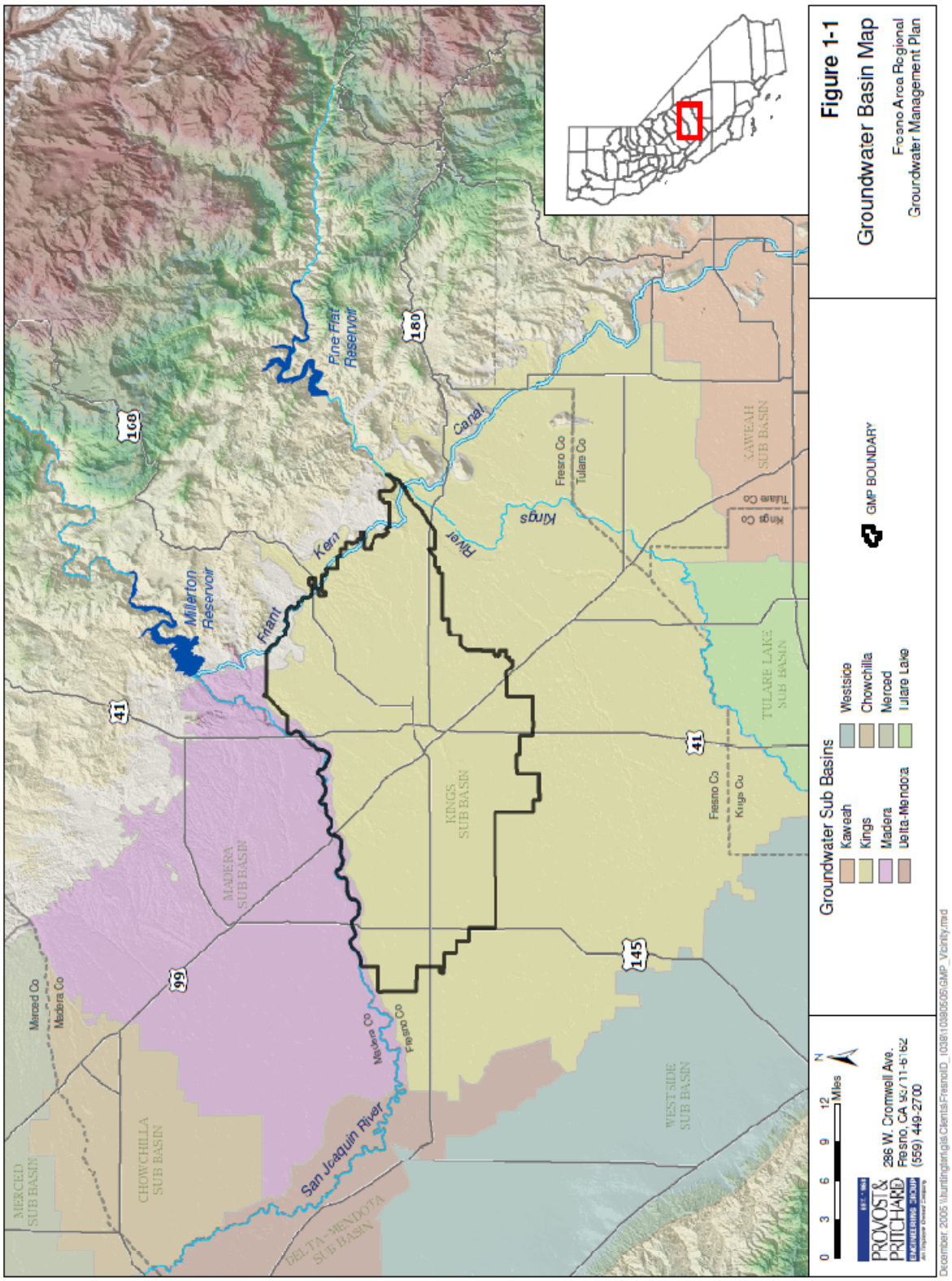



**Population Growth vs. Depth to Groundwater**

*As our population has grown, the demand on our groundwater supplies has increased.*

*Source: Fresno DPU, 2008*

**Figure RC-1:**
**Kings Subbasin Groundwater Aquifer and Watershed**



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overdraft on the system, resulting in a declining water table (over 100 feet in the past 70 years). This increase in the depth to the water table has contributed to water quality problems, deeper well construction, and additional energy costs (due to additional pumping required) and treatment costs. The City spends $20 million on electricity annually. Fifty-six percent, or $11.2 million, of this is spent on water and wastewater services. It costs the City $9 million just for electricity to run groundwater pumps and conveyance. As the groundwater level decreases the City is forced to drill deeper wells resulting in increased power costs to lift the deeper water from the aquifer. The groundwater level will continue to decline, possibly at a higher rate as the population in the basin increases. Other jurisdictions access the Kings Subbasin groundwater aquifer, and so the rate of drawdown is not solely under the control of the City. Fresno is the biggest user of the aquifer, however, and thus has a large degree of influence on its condition, and is in a position to lead regional standards of groundwater usage and recharge.

Fresno does have other sources of water available from the San Joaquin River to the north and the Kings River to the southeast. Snow melt from the Sierras makes its way to Millerton Lake, where it is stored behind Friant Dam and released to the San Joaquin River, and to Pine Flat Reservoir, where it is stored behind Pine Flat Dam and released to the Kings River. Fresno's access to this natural surface water has been established through contracts with the United States Bureau of Reclamation (USBR) for the San Joaquin River and the Fresno Irrigation District (FID) for the Kings River. The FID contract is renewed annually and the USBR contract is permanent. Between both sources, 168,600 acre feet (af) of surface water was available to Fresno in 2009. The City diverted 79,000 af for use within the city and allowed the remaining 89,600 af to be used by California State University and local farmers for irrigation purposes.[7] This practice is termed in-lieu recharge, whereby groundwater pumping is offset by the use of surplus surface water, thereby leaving groundwater in storage for later use. Another advantage to this practice is that the irrigated surface water seeps through the soil to replenish the aquifer.

*Surface Water Treatment Facility*

The City's Surface Water Treatment Facility (SWTF) opened in 2004. By 2009, it helped to offset demand for groundwater by 12 percent. Because of the depth of the groundwater table in Fresno, it costs less to treat water at a surface water treatment facility than it does to pump water from the aquifer. The City's Urban Water Management Plan and the Metro Plan provide recommendations to increase surface water treatment capacity with phased infrastructure improvements that could shift the burden away from groundwater and potentially allow water levels in the aquifer to balance. This would also allow the City to make use of available surface water that is not being used within the city.

If the City continues to use primarily groundwater and does not increase surface water treatment and recycled water supply capacity, the groundwater table will decrease at an increasingly higher rate as Fresno grows and the population increases. According to modeling done for Phase 2 of the Metro Plan, continuing to operate "status quo" will cause the groundwater table to decline an additional 85 feet below 2005 conditions by 2025. Under these conditions,

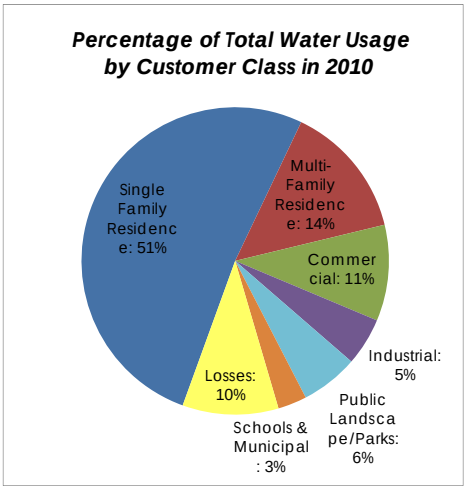
If Fresno continues to operate at "status quo" for drinking water supply and treatment, 26 percent of the City's wells would be non-operational by 2025. Another 13 percent would be at risk.

7 An acre-foot is enough water to cover an acre of land with one foot of water. It equates to about 326,000 gallons of water.

26 percent of the City's wells (69 wells) would have groundwater levels below the current pump bowl intake elevations and would not be operational, and another 13 percent of the wells (36 wells) would have groundwater levels of 15 feet or less above the pump bowl elevations, which may result in inadequate water coverage over the top of the pump bowl.

## EXISTING PLANS AND INITIATIVES

The City of Fresno's future depends on being able to provide a sustainable supply of potable water to the community. The City has adopted long-range capital and strategic programs through its Metropolitan Water Resource Management Plan, Recycled Water Master Plan, and Wastewater Master Plan. The City has also adopted the State's 2010 CalGreen Building Code, Water Efficient Landscape Ordinance, and Graywater Standards, which combine for a 10 to 20 percent reduction in water use in most new construction.




### 2008 Urban Water Management Plan (UWMP)

The City's UWMP sets water management goals and strategies to supply water to Fresno's population through 2030. These goals and strategies include reducing the consumption of gallons per capita per day (GPCD) from 300 to 243 by 2020 as mandated by the State and balancing the City's groundwater operations by 2025. To accomplish these targets will require ongoing and new conservation measures; the maximization of available surface water supplies for direct treatment and use, and intentional groundwater recharge; and the incorporation of tertiary-treated recycled water into the future water supply portfolio to meet non-potable demands in new development areas and existing parts of the city. Implementation of the City's future water supply plan will result in a significant shift and increase in diversity in the City's water supply mix, which will enhance overall water supply reliability.

### Water Conservation Efforts

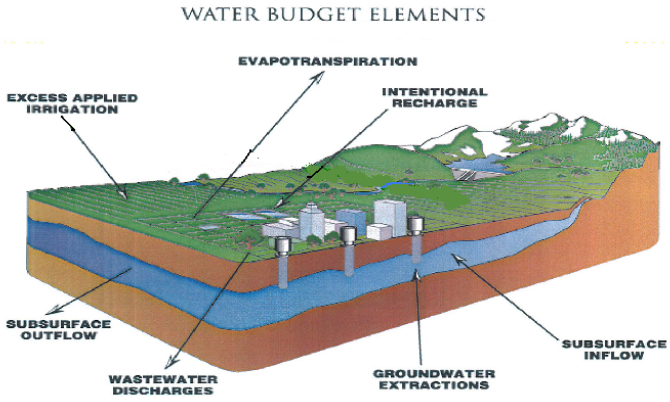
The city depends on reduced consumption due to conservation as a part of its future water supply. Educating the public to reduce usage also directly affects water delivery costs. Power and treatment costs increase as the City pumps more water, so higher water use would mean higher water and sewer rates. Many of the City's water conservation measures are in accordance with the City's United States Bureau of Reclamation (USBR) contract for 60,000 acre feet of surface water. One of the contract conditions is that the City is to follow USBR Best Management Practices, which were used to create the City's comprehensive Water Conservation Program.

Some aspects of the Program include watering restrictions in the form of a required winter and summer watering schedule; customer education on the need to conserve water and how to do so; free residential plumbing retrofits such as low flow shower heads and aerators; system water audits, leak detection and repair; metering for all new connections and retrofits of existing connections; rebate programs for high efficiency clothes washing machines, ultra-low flush or high efficiency toilets, and urinal replacement; public information outreach programs; and water waste prohibition through watering regulations and

enforcement. Demonstration gardens and drip irrigation demonstration plots have been installed as resources to provide examples to customers.

## Groundwater Recharge

An important process in a sustainable groundwater management plan is groundwater recharge. One source is the natural subsurface inflow recharge, which occurs when water flows from areas where the water table is higher to areas where it is lower. The Water Division has estimated that the average rate of subsurface inflow to the aquifer is 21,100 acre feet/year (af/yr). The aquifer is also recharged naturally by rainfall, unlined canals and rivers, as well as irrigation water seeping through the soil at an average estimated rate of 32,500 af/yr. Natural recharge can be impeded somewhat by human activities including pavement and buildings. These activities can result in enhanced surface runoff and reduction in recharge.



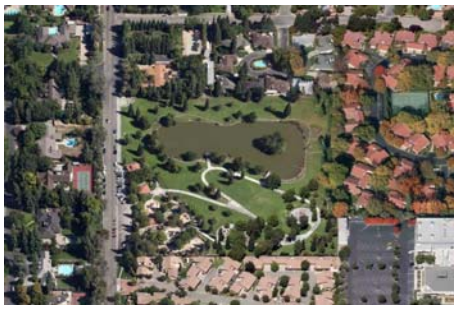

To capture surface water runoff, also known as storm water, the Fresno Metropolitan Flood Control District (FMFCD) has developed an urban drainage design concept which collects, detains and retains surface water runoff for intentional groundwater recharge in ponding basins dispersed throughout the city. FMFCD estimates they collect more than 95 percent of Fresno's urban runoff though the percentage that actually gets recharged and the part that is discharged to FID canals and the San Joaquin River is unknown. The FMFCD also partners with the Fresno Irrigation District (FID) and the City in a cooperative groundwater recharge program. This program provides for dry season (generally March through October) delivery of City contract imported surface water from the San Joaquin and Kings Rivers into many of the FMFCD's local ponding basins and the City-owned Leaky Acres recharge basin. Intentional recharge can vary due to a number of factors, which could include pond availability, water delivery season, pond maintenance, or length of wet season.

Intentional recharge in Fresno has averaged 48,500 af/yr over the since 1990. In 2009, intentional recharge was 54,600 af for a total groundwater recharge of 108,200 af. Groundwater pumpage was 138,200 af, however, creating a 30,000 af overdraft on the aquifer. This overdraft is not sustainable.

The City also recharges treated wastewater into the ground at the Fresno/Clovis Regional Water Reclamation Facility (RWRF). Around 55,000 af is percolated for recharge into the aquifer, with 30,000 af subsequently pumped out by the FID in exchange for 13,800 af of fresh surface water from the Kings River.

## Stormwater Best Management Practices

*Retention Basin off Barstow Avenue also provides an excellent buffer from noise generators such as streets and freeways*



*Retention Basin at Oso De Oro Park acts as dual-use ponding basin and open space park*

The FMFCD captures approximately 100 percent of the stormwater runoff from new development and approximately 95 percent of the stormwater runoff from existing development. Capturing the runoff allows for groundwater recharge and also protects surface water quality by not allowing urban runoff, which often contains contaminants from roadways and lawns, to flow into natural creeks, rivers, and irrigation ditches. The runoff is collected in retention basins (also known as ponding basins), allowing for filtration through the soil. On average, retention basins remove 50 to 80 percent of stormwater pollutants. Additional sediment and ground water studies show that the majority of stormwater pollutant are absorbed to the top 4cm of soil and do not exceed background levels beyond 16cm. The same studies did not detect any stormwater pollutants in ground water tested beneath a retention basin serving an industrial catchment.

The FMFCD's storm water quality management program includes specific pollution prevention and control practices for urban drainage system planning, design, construction, and maintenance. The program also includes public education to prevent storm water pollution; commercial, industrial, and new development storm water quality control practices; monitoring to assess storm water impacts on receiving water and to evaluate the effectiveness of best management practices; and development and implementation of ordinances to effect and enforce storm water quality controls.

## Water Conservation

Fresno's average total per capita water consumption is 300 gallons per capita per day (gpcd) as measured from 1990 to 2009, making Fresno one of the highest water consuming cities in California. In 2009, it improved to 275 gpcd as a result of stepped up water conservation efforts, though a decline in the economy may have played a role. By comparison Clovis averages 247 gpcd, Los Angeles is 150, Phoenix is 184, and Tucson is 110.

The California Water Conservation Act of 2009 requires a statewide 20 percent reduction in urban water usage by 2020. The methodology chosen by a jurisdiction must be documented in their 2010 Urban Water Management Plan (UWMP). Fresno's recommended interim 2015 target is 282 gpcd, and the final recommended 2020 target is 251. A further reduction to 243 gpcd by 2020 established by the Metro Plan Update would help to balance the groundwater table by 2025.

To meet the consumption reduction target of 243 gpcd by 2020 will require a combination of conservation measures, including among other possible actions: Best Management Practices, incentives, appliance rebates, outreach programs and education, fixture swap, and water meters for all residences by 2013. In the

future, the City may develop a tiered water rate structure to further encourage water conservation.

The biggest opportunities for water conservation are related to the reduction of outdoor water uses, particularly landscape and turf irrigation, by all customers. Several potential measures related to outdoor water use reduction are discussed in the 2011 Metropolitan Water Resources Management Plan and include rebates for xeriscape (drought-tolerant) landscaping for new homes, programmable irrigation, weather-based irrigation control, and turf replacement.

*Xeriscape landscaping in front yard of Fresno residence*

## Recycled Water Use

Water recycling is using treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing a ground water basin (referred to as ground water recharge). Water recycling offers resource and financial savings, as potable water does not need to be used for non-drinking purposes. Wastewater treatment can be tailored to meet the water quality requirements of a planned reuse. Recycled water for landscape irrigation requires less treatment than recycled water for drinking water.

Wastewater generated from homes, businesses, and industry in the city is conveyed to the Fresno/Clovis Regional Water Reclamation Facility (RWRF). The RWRF is operated by the City of Fresno and has the capacity to treat 80 million gallons a day (mgd) of wastewater. On an average day, the RWRF receives 68 million gallons of wastewater. The RWRF recycles nearly every component of influent wastewater (water, solids, and natural gas). The city releases up to 65,100 af of recycled water per year.

- 10,000 af/yr is sent directly to irrigate non-food agricultural land downstream
- 55,100 af/yr is directed to 1,660 acres of ponds for percolation into the aquifer.
- 30,000 af/yr is then pumped from the aquifer into Fresno Irrigation District (FID) canals for reuse downstream from Fresno to nearby farmers for unrestricted irrigation use. In exchange for this recycled water, FID provides Fresno with 13,800 af of Kings River surface water.

*Fresno-Clovis Regional Wastewater Reclamation Facility*

The City does not presently have the infrastructure to route recycled water from the RWRF to existing or new development. The retrofit of existing residential uses is considered economically infeasible and impractical to implement. The use of recycled water should focus on new and existing large green spaces, industrial uses and new development. However, the development of a gray water policy for the residential reuse of wastewater for household gardening and landscape irrigation on site may be feasible.

The City also operates a satellite facility in North Fresno called the Wastewater Reclamation Facilities (WRF) Satellite Plant. It was built to serve the Copper River development and golf course. In 2010, the plant was capable of irrigating

the golf course at about 750 af/yr and future total capacity will ultimately reach about 1,000 af/yr when the surrounding development builds out.

## KEY OPPORTUNITIES

With strategic thinking and investments Fresno could have a sustainable water supply system that, in turn, could create a competitive economic advantage. Below are some considerations that should be noted with regards to the City's efforts to have a sustainable water supply system and though not General Plan policy of themselves many are supported by General Plan policies that follow.

- The geologic structure of the aquifer underneath Fresno is capable of recharging to levels sufficient to support the city during drought periods if the proper infrastructure were in place.
- Conversion to conjunctive use of surface and ground water could reduce energy usage for water delivery purposes by 18 to 20 percent. The reduction in power demand for pumping water would be a reduction in both the total demand and, more significantly, during peak usage periods (a reduction in both production and grid capacity demand). This reduction could also reduce the city's carbon footprint, potentially eliminating the equivalent of 670,000 gallons of gasoline or one year of electricity for 745 homes.
- Fresno has developed a Property Assessed Clean Energy (PACE) district that can finance water efficiency and energy efficiency upgrades for property owners.
- If properly managed, with the correct infrastructure, and with the true cost of water reflected in the Fresno rate structure, Fresno could have a sustainable water supply.
- Fresno has the water resources available to balance the groundwater aquifer and create storage for dry years. This can be accomplished by implementing the Fresno Urban Water Management Plan and the Metropolitan Water Resource Management Plan. These plans call for increased surface water treatment facility capacity, increased intentional recharge, a local groundwater banking program, use of recycle water for non-potable water demands and aggressive water conservation measures.
- Available recycled water and untreated surface water can be used by industrial facilities for cooling systems and other uses without having to meet the drinking water standards for the rest of the city. This water supply could be distributed directly to future industrial facilities or parks to encourage new businesses to relocate to Fresno.
- Changing the practice of lining canals with concrete will allow for natural recharge.
- Outdoor water demand can be significantly reduced through climate-appropriate landscape design and more efficient irrigation technology, while indoor water demand can be reduced by efficient fixtures and appliances.

- Citywide, infrastructure costs and water demand can be minimized through efficient land use. Compact and infill development generally requires significantly less pipe and lower water per capita demand equating to significant per capita cost savings as compared to low density developments.

  *Qualifier: Where infill development substantially increases density, or increases the building height, due to both the age and size of the distribution system, the distribution system may require upgrading to avoid negative impacts from suction created by booster pumps, or to provide adequate flows and pressures for increased demands.*

In addition to those discussed below, the Public Utilities and Services Element contains additional objectives and policies on water supply, water quality, and reclaimed water.

## OBJECTIVE

RC-6 Ensure that Fresno has a reliable, long-range source of drinkable water.

## IMPLEMENTING POLICIES

RC-6-a **Regional Efforts.** Support cooperative, multi-agency regional water resource planning efforts and activities on developing and implementing the Upper Kings Basin Integrated Regional Water Management Plan.

RC-6-b **Execute Water Plans.** Encourage adoption and implementation of ordinances, standards, and policies to achieve the goals of the Urban Water Management, Groundwater Management, and Fresno Metropolitan Water Resources Management plans to ensure a sustainable supply of water.

RC-6-c **Land Use and Development Compliance.** Ensure that land use and development projects adhere to the requirements of the Metropolitan Water Resource Management Plan and the mitigation measures of its Environmental Impact Report.

RC-6-d **Recycled Water.** Encourage implementation of a Recycled Water Master Plan.

*Commentary: This plan will expand the City's wastewater recycling program by developing treatment, delivery, and users.*

RC-6-e **Protect Aquifer.** Oppose as appropriate urban development in unincorporated areas that are not served by a wastewater treatment/management system that is capable of preventing the buildup of compounds that would degrade the aquifer.

RC-6-f **Regulate Sewage Disposal Facilities.** Oppose as appropriate the development of new sewage disposal facilities either within the planning area or upgradient (north and east) of the planning area, unless the treatment facilities produce effluent that:

- Will not degrade the aquifer in the long term;
- Will not introduce contaminants into surface water that would negatively affect its potential economic use for drinking water;
- Will not deleteriously affect downstream agricultural and urban uses; and
- Will not degrade sensitive riparian habitat.

RC-6-g **Protect Recharge Areas.** Continue to protect areas of beneficial natural groundwater recharge by preventing uses that can contaminate soil or groundwater.

RC-6-h **Conditions of Approval.** Update the Development Code concurrently with the General Plan Update to include standards and authority for imposing conditions of approval for development projects to ensure long-term maintenance of adequate clean water resources. Require findings that adequate water supply must exist prior to any discretionary project approval.

RC-6-i **Natural Recharge.** Encourage removal of concrete from existing canals and changing the practice of lining new and existing canals with concrete to allow for natural recharge.

## OBJECTIVE

RC-7 Promote water conservation through standards, incentives and capital investments.

## IMPLEMENTING POLICIES

RC-7-a **Water Conservation Program and Target.** Maintain a comprehensive conservation program as appropriate that reduces per capita water usage in the city's water service area to 243 gallons per day (gpd) per capita (20 percent of the current consumption rate) by 2020, by adopting conservations standards and implementing a program of incentives, design and operation standards, and user fees.

*Commentary: Actions could include:*

- *Encourage and support programs that result in decreased water demand such as landscaping standards that require drought-tolerant plants and controls on watering systems.*

- *Implement "best management practices" as necessary to maintain the city's surface water entitlements.*
- *Adopt and implement policies for development of artificial lakes.*
- *Work cooperatively toward effective uniform water conservation measures that would apply throughout the planning area.*
- *Expand efforts to educate the public about water supply issues and water conservation techniques.*
- *Strongly consider pursuit of an average water consumption target of 150 gpd per capita (50 percent of current rate) by 2035. The current State average water consumption is 192 gpd per capita; Los Angeles consumes 150 gpd per capita.*

RC-7-b **Water Pricing and Metering.** Consider developing a tiered water cost structure for both residential and commercial users that will properly price water based on its true cost, require all new development to be metered for water use, and charge all customers the true, full cost of their water supply, including acquisition, initial treatment, conveyance, and wastewater treatment, as well as operations, and maintenance, and remediation costs.

RC-7-c **Best Practices for Conservation.** Consider requiring all City facilities and all new private development to follow U.S. Bureau of Reclamation Best Management Practices for water conservation.

RC-7-d **Update Standards for New Development.** Continue to refine water saving and conservation standards for new development.

RC-7-e **Retrofit City Facilities, and Consider Incentives Programs for to Encourage Retrofitting of Other Existing Public and Private Residential and Non-Residential Facilities and Sites.** Consider reducing water use in municipal buildings and City operations by developing a schedule and budget for the retrofit of existing municipal buildings with water conservation features, such as auto shut-off faucets and water saving irrigation systems. Consider a comprehensive incentive program for other existing public and private residential and non-residential buildings and irrigation systems.

RC-7-f **Enforce and Update Conservation Program.** Consistently enforce and enact the City's approved Water Conservation Program, and periodically update restrictions on water uses, such as lawn and landscape watering and the filling of fountains and swimming pools, and penalties for violations.

RC-7-g **Educate on State Requirements.** Educate the residents and businesses of Fresno on the requirements of the California Water Conservation Act of 2009.

RC-7-h **Landscape Water Conservation Standards**. Refine landscape water conservation standards that will apply to new development installed landscapes, building on the State Model Water Efficient Landscape Ordinance and other state regulations. Actions can include:

- Evaluate and apply, as appropriate, augmented xeriscape, "water-wise," and "green gardening" practices to be implemented in public and private landscaping design and maintenance.
- Facilitate implementation of the State's Water Efficient Landscape Ordinance by developing alternative compliance measures that are easy to understand and observe.

RC-7-i **PACE Financing.** Consider developing a residential Property Assessed Clean Energy (PACE) district that can finance water efficiency and energy efficiency upgrades for property owners.

## ENERGY RESOURCES

Pacific Gas and Electric (PG&E) provides almost all the energy for the City of Fresno. The cost of energy services provided by PG&E is among the highest in the state. Meanwhile, the city has abundant solar resources that could be expanded to reduce dependence on costly purchased electricity, but this will take time and financial resources to implement. Green building practices can be one of the main energy savings strategies encouraged, or required, as Fresno continues to develop. How the City can develop an energy-efficient infrastructure and reduce dependence on the energy grid is a prominent issue for the General Plan update.

Examining the long-term sustainability of these energy networks reveals several challenges. The PG&E electrical grid was established decades ago and no new major transmission lines are planned. Demand for electricity in Fresno has increased 5.4 percent since 2005, placing increased load on a finite capacity grid system. The PG&E natural gas pipeline system was established decades ago and has had limited upgrade. Natural gas usage in Fresno has increased 9.2 percent since 2005, adding increased load on the system.

Newer development in Fresno uses energy at higher rates than older land uses, despite having newer, more efficient technology available. Single family homes consume 98 percent of the electricity used in the residential sector based on current data from PG&E. The data also shows that the average single family home consumes 40 percent more electricity than a multi-family home. According to data from PG&E, the highest amount of residential energy usage in Fresno appears to be in the newer, more affluent areas on the north, west, and southeast edges of Fresno. Many of these homes were built after State energy codes were first enacted in 1978. The higher rates of energy use in new residential development may be because those that can afford it are willing to pay more for comfort; that the homes are larger in square footage, volume and/or number of stories than older homes and therefore require more energy to heat and cool; more of these homes may have swimming pools (which have high energy usage for pumps and heaters); and/or the mechanical systems used in the summer for the highest energy usage areas (such as condensing units) may require more energy to run than those system used in the lower usage areas (such as evaporative coolers, more commonly known as swamp coolers).

Cost data from the recent retrofits done in Fresno shows the average investment necessary to achieve a 28- to 30-percent reduction in energy usage on a typical Fresno home is about $25,000. Taking the 76,000 homeowners that have a need and multiplying that by the average cost per retrofit, equates to $1.9 billion in economic activity potential in Fresno, if fully developed. When combined with the estimated $103 million in annual energy savings through a fully deployed and subscribed existing-home retrofit program, the economic potential of comprehensively reducing energy consumption in Fresno is staggering.

Any serious efforts to reduce energy consumption at the community level should incorporate a mix of strategies that include, but are not limited to those below. These strategies are not General Plan policies of themselves though

many are supported by General Plan policies that follow or can be found in other Elements.

- New development standards and zoning that encourages small-lot single family and multi-family residential development instead of larger-lot single-family homes.
- New building design standards and incentives that encourage renewable energy systems and on-site power generation equipment deployment for both residential and commercial property with an emphasis on solar power, combined heat and power systems, and possibly low-speed wind technology.
- Comprehensive programs to drive energy efficiency retrofit of existing structures such as PACE financing districts or other financing programs from private lenders, incentives from the utilities and government sources, and trusted third-party information on the proper measures to install.
- Long-term and on-going education of homeowners and businesses as to the value of energy efficiency and the need to upgrade existing structures on the regular basis as technology improves and the structures age.

The City of the Fresno has been active since the mid-1990s in taking steps to invest and deploy renewable energy technology and improve the energy efficiency of City-owned facilities and the community at large. Notable actions include:

- Adopting the 2010 California Energy Code;
- Developing a comprehensive free residential energy efficiency survey program;
- Implementing the Fresno Energy Watch Program as part of the Fresno Small Business Energy Makeover;
- Using renewable biogas to produce electric power at the Clovis/Fresno Regional Waste Water Treatment Facility (RWTF);
- Installing solar panels at City-owned facilities for an expected savings of $4 million over 30 years and the airport, which is expected to save the airport about $13 million dollars over the next 20 years; and
- Requiring installation of solar energy systems in construction of any new City-owned buildings containing at least 7,500 square feet, and a mandate to use a green building rating system standard for all new municipal buildings over 10,000 square feet.

PG&E also has numerous energy efficiency programs operating in the Fresno area. Many of these programs are focused on low-income homeowners, such as the Energy Partners program and Middle Income Direct Install (MIDI) program. Other programs are focused on local businesses, such as the Direct Install program of the Fresno Energy Watch, the Air-Care Plus program, and numerous others.

The Fresno County Equal Opportunities Commission (FCEOC) administers the federally-funded weatherization programs focused on low income homeowners in Fresno. These programs are designed to work in collaboration with utility funded programs operated by PG&E. There are several areas of overlap with these programs.

*Photovoltaic cells atop parking shelter supplying electricity to adjacent City of Fresno Convention Center Parking Structure*

Private organizations, businesses and individuals are also taking important steps locally. Fresno has the third highest deployment level for solar power among cities in California with 1,056 sites that total 12 MW of power generation capacity and of these sites 1,018 are residential and 38 are commercial, industrial, or institutional. The level of investment in solar power in Fresno has seen a rapid increase since 2006 with over 532 systems installed in 2010 compared with only two systems installed in 2006. In July 2009, Environment California ranked Fresno third in the state for number of kilowatts its solar projects produce and fifth for projects on roofs with Clovis close behind at seventh.

Solar Installation at California State University, Fresno: The Fresno State project, a partnership with the Chevron Energy Solutions division of Chevron, provides the first sheltered parking on campus, protecting nearly 700 vehicles from the elements. The 3,872 photovoltaic cells atop the parking shelters generate 20 percent of Fresno State's electricity demand. The $11.9 million project—the largest of its kind on a university campus—was completed in fall 2007.

## KEY POLICY OPPORTUNITIES

The City can help encourage households to conserve electricity, and should consider how to change current trends of higher energy use in newer development in order to conserve resources for future growth. Fresno also has a large potential for solar power and can continue investing in solar energy for public facilities.

### Alternative Energy

Current viable alternative energy sources for buildings and transportation in Fresno include solar photovoltaic electricity, solar thermal electricity, solar thermal heating, low-speed wind generated electricity, hydroelectricity, natural gas for vehicles, electricity for vehicles, and bio-methane generated electricity. Alternatives such as bio-diesel fuel, ethanol fuel, biomass combustion electric power plants, nuclear power plants, and conventional wind generators face numerous obstacles to being viable alternatives for the area. Regulatory and structural barriers can block or hamper installation of solar and wind power production, however.

### Efficient Outdoor Lighting Standards

Excessive outdoor lighting can have a number of harmful consequences. It is recommended that building owners use outdoor lighting fixtures that are shielded to reduce glare and light pollution. Owners who shield and direct light to where it is needed can decrease the energy used to obtain the desired level of illumination. LEDs are an energy-efficient way to provide outdoor light. Some

LED-based lighting solutions are solar powered, eliminating the need for batteries and special light fixtures.

### Energy Star

To earn the ENERGY STAR, a home must meet strict guidelines for energy efficiency set by the U.S. Environmental Protection Agency (EPA), making them 20 to 30 percent more efficient than standard homes. Homes achieve this level of performance through a combination of energy-efficient improvements including insulation systems, high–performance windows, efficient heating and cooling equipment, and qualified lighting and appliances.

There are 4,441 Energy Star qualified homes built to date in Fresno which is equivalent to eliminating 124 vehicles from the roadway, or saving 749,000 lbs. of coal or planting 205 acres of trees or saving the environment 1.5 million pounds of $CO_2$. There are no builders or developers in Fresno who have made a commitment to building all of their homes to ENERGY STAR performance guidelines, however.

### Community Choice Aggregation (Energy Purchasing)

Community Choice Aggregation (CCA) is an energy procurement model that allows local governments to pool, or aggregate, the electric load of their residents, businesses and institutions in order to purchase electricity on their behalf. The reasons to pursue CCA vary by community, but chief among them are lower electricity costs, cleaner energy supply, greenhouse gas reduction benefits and the development of local generation assets to boost economic development in the region. However, CCA also may impose additional costs on local customers if renewable energy project costs exceed estimates and economies of scale are not realized. A decision on whether to support the CCA may require substantial technical and financial feasibility studies, which are outside the scope of this General Plan update.

### Revolving City Energy Fund

The City can implement municipal energy efficiency retrofits that will save the City money each year. A revolving energy fund would enable investment of yearly savings on energy bills into future energy efficiency programs.

#### OBJECTIVE

RC-8 Reduce the consumption of non-renewable energy resources by requiring and encouraging conservation measures and the use of alternative energy sources.

#### IMPLEMENTING POLICIES

RC-8-a **Existing Standards and Programs.** Continue existing beneficial energy conservation programs in the community and the City's facilities and operations, adhering to the California Energy Code in all new construction and major renovations;

RC-8-b **Energy Reduction Targets.** Consider setting a 25 year target to reduce per capita residential electricity use purchased off the private grid to a maximum of 1,800 kWh per year and reduce non-residential electricity use to a maximum of 2,694 kWh per year per capita by developing and implementing incentives, design and operation standards, promoting alternative energy sources, and fees.

*Commentary: The target should represent a 28- and 30-percent reduction respectively in the 2010 rate of consumption.*

RC-8-c **Energy Conservation in New Development.** Consider establishing standards and regulations, supported by guidelines and administrative review procedures to achieve the energy conservation target in RC-8-a.

- Update current energy-efficient planning and construction guidelines to reflect General Plan targets for energy conservation.
- Consider a requirement that all discretionary development projects include a description of energy consumption and conservation features that are, or feasibly could be, incorporated into these projects.
- Review the energy efficiency of all proposed siting, building orientation, structural design, and landscaping of a development project in relation to the Plan's conservation targets.
- Update the Development Code to be consistent with the Solar Rights and Solar Shade Acts of 1978, regarding solar access.
- Update the Development Code to ensure that, at the interface of commercial or industrial and residential land uses, or the interface of multi-family with single-family residential land uses, height restrictions and/or setbacks provide solar access to structures on both sides of the boundary.
- Make available updated information on California Energy Code and other energy conservation guidelines and measures to all City staff involved in development review and the City's construction industry.

RC-8-d **Incentives.** Consider providing incentives to residential developers who commit to building all of their homes to ENERGY STAR performance guidelines.

RC-8-e **PACE Financing.** Consider developing a residential Property Assessed Clean Energy (PACE) financing program, to be administered by private parties, to fund residential energy efficiency retrofits.

RC-8-f **Energy Use Disclosure.** Promote compliance with State law mandating disclosure of a building's energy data and rating of the previous year to prospective buyers and lessees of the entire building or lenders financing the entire building.

RC-8-g **City Heating and Cooling.** Reduce energy use at City facilities by updating heating and cooling equipment and installing "smart lighting" where feasible and economically viable.

RC-8-h **Revolving Energy Fund.** Consider creating a City Energy Fund which uses first year savings and rebates from completed City-owned energy efficiency projects to provide resources for additional energy projects. Dedicate this revolving fund to the sole use of energy efficiency projects that will pay back into the fund.

RC-8-i **Solar Assistance.** Identify and publicize information about financial mechanisms for private solar installations and provide over-the-counter permitting for solar installations meeting specified standards, which may include maximum size (in kV) of units that can be so approved.

RC-8-j **Renewable Target.** Consider adopting and implementing a program to increase the use of renewable energy to meet a given percentage of the city's peak electrical load within a given time frame.

RC-8-k **Alternative Fuel Network.** Support the development of a network of integrated charging and alternate fuel station for both public and private vehicles. If feasible, open up municipal stations to the public as part of network development.

RC-8-l **Energy Efficiency Education.** Consider providing long-term and on-going education of homeowners and businesses as to the value of energy efficiency and the need to upgrade existing structures on the regular basis as technology improves and structures age.

## FARMLAND, URBAN AGRICULTURE, AND FOOD SYSTEM RESOURCES

Central California is one of the world's premier growing regions, with Fresno at its heart. The Valley is a mature agricultural area, with a well-defined pattern of farming activities. Much of the arable land is devoted to relatively stable crops such as orchards and vineyards and other commercial crops.

The conversion of farmland to urban uses is not the only threat to agriculture. When "leapfrog" development (development that is not contiguous to the existing urbanized area) occurs in the midst of agriculture uses, optimal crop production is precluded due to urban/agriculture conflicts. It is common for farmland to suffer disruptions and economic losses while urban uses suffer negative effects such as farm-generated dust, noise and odors. Another problem exists with premature disinvestment of farmland where future growth is anticipated but development may not occur for several years. Farmland may be purchased or held for its possible urban development value, rather than continue in agriculture production.

Farmland within planned urban areas in the County, such as Fresno's Sphere of Influence (SOI), is not classified or considered as long-term strategic farmland, since it is assumed that it will be urbanized at some point. Long-term farmland conservation is likely best achieved by maintaining development within the current SOI and protecting viable farmland outside the SOI from further encroachment.

Policies in the Urban Form, Land Use, and Design Element contain the General Plan's policies of preserving farmland beyond the city limits by concentrating new development within and adjacent to already-urbanized land, only extending public utilities to new development that adheres to the General Plan, and not expanding the Sphere of Influence. Additional objectives and policies in this element address the broader planning issues of farmland preservation. See also Chapter 10: Healthy Communities for more information on urban agriculture and expanding access to fresh, healthy foods.

*Orchards in Fresno County*

*"Leapfrog" development in West Fresno*

### OBJECTIVE

RC-9 Preserve agricultural land outside of the area planned for urbanization under this General Plan.

### IMPLEMENTING POLICIES

RC-9-a **Regional Cooperation.** Consider establishing a cooperative research and planning program with the Counties of Fresno and Madera, City of Clovis, and other public agencies to conserve agricultural land resources.

RC-9-b **Land Outside SOI.** Consider opposing lot splits and development proposals in unincorporated areas within or adjacent to the City's planning area when these proposals would do any of the following:

- Make it difficult or infeasible to implement the General Plan;
- Contribute to the premature conversion of agricultural, open space, or grazing lands; or
- Constitute a detriment to the management of resources and/or facilities important to the metropolitan area (such as air quality, water quantity and quality, traffic circulation, and riparian habitat).

RC-9-c **Farmland Enrollment.** Advocate for the enrollment of all prime farmland outside of the Sphere of Influence that is adjacent or near to the SOI limits in agricultural land conservation programs.

*Commentary: Scenic or resource conservation easements also are options for protecting farmland.*

## MINERAL RESOURCES

This section of the Resource Conservation and Resilience Element is intended to assure that cost-effective locally available mineral resources (such as rock, gravel, and sand for concrete aggregate) are protected for future use by the construction industry, and that extraction of these resources is done in a responsible manner that provides for beneficial end uses of surface mining sites, as required by the California Public Resources Code (the Surface Mining and Reclamation Act).

*Sand and gravel mining in Fresno along the San Joaquin River*

Aggregate mineral resources are critical to supporting urban development: all public and private projects utilize this material for roadway paving, structural elements (foundations), and hardscape (sidewalks, curbing, gutters). Because of the demands that will be made on these mineral resources due to Fresno's projected growth, and because the City has land use authority over designated mineral resource areas, the General Plan contains policies relating to mineral resource land and direction for managing mining and post-mining rehabilitation of the land.

Naturally occurring deposits of aggregate minerals must be of sufficient quality to meet engineering material specifications and must be sufficiently concentrated to justify the investment in an extraction and processing site. High-quality aggregate minerals are required for proper formulation of concrete to attain sufficient strength through the curing process. Existing and ancient riverbeds and streambeds are prime areas to look for such high-quality concrete aggregate materials, which consist of sand, gravel, and certain types of rock.

Lower-quality aggregate materials, used for base rock and asphaltic mixtures, also can be recovered from riparian corridors, but may be available in other areas as well. For instance, surface mining for base rock is common on the alluvial fans of the Coast Range along the western edge of the San Joaquin Valley.

Recycling (re-crushing) of concrete extends the available supply of mineral resources but cannot replace mining as a source of these materials. The primary reason for this is that virgin minerals are needed for formulation of concrete. Once minerals undergo the curing reaction once, they are only suited for lower-quality uses such as base rock or asphalt mixtures. Another reason that recycling cannot replace mining is that in a growing area such as Fresno, more new durable structures are created each year than are demolished.

Surface mining operations need to locate in areas where these minerals are sufficiently concentrated–where most of the material excavated consists of the desired materials, and where the mineral deposits can be easily accessed (i.e., there is relatively little "overburden" covering the deposits).

The California Surface Mining and Reclamation Act of 1975 (SMARA) mandates that a "classification/designation" analysis be done to provide information on the availability of mineral resource for construction and growth. The objective is to ensure that raw material will be available when needed—that this raw material will not become inaccessible for mining as the result of inappropriate land use decisions involving mineral resource areas.

The California Department of Conservation (DOC) Division of Mines and Geology periodically maps high-quality concrete aggregate deposits and compiles statistics on the amount of aggregate minerals available, and consumed, within designated Production-Consumption (P-C) Regions of the State. The DOC uses an "MRZ-2" designation for areas that are demonstrated to have regionally significant deposits of high-grade sand and gravel aggregate (i.e., material suitable for making Portland Cement Concrete). Potential, but presently unproven, mineral resource areas are mapped as MRZ-3. Most of the area outside of the San Joaquin and Kings River Resource Areas has an MRZ-3 designation, and may contain economically recoverable mineral resources. However, those resources may not be of the high quality needed to formulate concrete. The City keeps these maps on file for use in development review and decision-making.

## OBJECTIVE

RC-10 Conserve aggregate mineral resources within the Planning Area, as identified by the Division of Mines and Geology, and allow for responsible extraction to meet Fresno's needs.

## IMPLEMENTING POLICIES

RC-10-a **Meet Future Needs.** Consider adopting land use and resource protection regulations that support mining of the high-quality, close-to-market aggregate resources to meet the needs of the Fresno Production-Consumption Region.

RC-10-b **Zoning in San Joaquin Riverbottom.** Maintain zoning consistent with on-going mineral extraction in the San Joaquin Riverbottom that also allows multiple open space uses in conformance with the State law, the City's Surface Mining Ordinance, and conditional use permits requirements.

RC-10-c **Processing-Mining Link.** In the San Joaquin Riverbottom, accommodate only those mineral processing activities associated and co-located with mining operations when such industrial activities will sunset with the mining operation and do not stimulate unplanned growth or conversion of multi-use open space to urban uses.

RC-10-d **Manage MRZ-2 Areas.** Prohibit land uses and development projects that preclude mineral extraction in potential high-quality mineral resource areas designated MRZ-2 by the State.

RC-10-e **Existing Permits.** Honor surface mining permits approved by Fresno County upon annexation, provided that the mining operation is in compliance with the terms of its current permits and State law related to mineral extraction and reclamation. In the event of noncompliance, permit expiration, or permit revocation, the City has the authority to require new permit applications to be processed and to take such measures to ensure compliance as are provided for by law or regulations.

RC-10-f **Cooperate on Uniform Criteria.** Work with Fresno County, Madera County, and the City of Clovis to develop uniform criteria applicable to existing, new, and altered mineral extraction sites in the San Joaquin Riverbottom.

## WASTE REDUCTION

The Public Utilities and Services Element has background information on solid waste collection and disposal and policies related to these systems. This section of the Resource Conservation and Resilience Element contains policies addressing waste reduction.

### OBJECTIVE

RC-11 Strive to reduce the solid waste going to landfills to zero by 2035.

### IMPLEMENTING POLICIES

RC-11-a **Waste Reduction Strategies.** Maintain current targets for recycling and re-use of all types of waste material in the City, and further enhance waste and wastewater management practices to reduce natural resource consumption including consideration of the following measures:

- Continue to require recyclable material collection and storage areas in all residential development.
- Establish recycling collection and storage area standard for commercial and industrial facilities, sizing the recycling areas according to the anticipated types and amounts of recyclable material generated.
- Provide educational materials to residents on how and what to recycle and how to dispose of hazardous waste.
- Provide recycling canisters and collection in public areas where trash cans are also provided.
- Institute a program to evaluate major waste generators and identify recycling opportunities for their facilities and operations.
- Continue to partner with the California Integrated Waste Management Board on waste diversion and recycling programs and the CalMax (California Materials Exchange) program.
- Evaluate the feasibility of a restaurant and institutional food waste segregation and recycling program, to reduce the amount of organic material sent to landfill and minimize the emissions generated by decomposing organic material.
- Evaluate the feasibility of "carbon footprinting" for the City's wastewater treatment facilities, biomass and composting operations, solid waste collection and recycling programs.
- Expand yard waste collection to divert compostable waste from landfills.

- Study the feasibility and cost-benefit analysis of a municipal composting program to collect and compost food and yard waste, including institutional food and yard waste, using the resulting compost matter for City park and median maintenance.

RC-11-b **Zero Waste Strategy.** Create a strategic and operations plan for fulfilling the Council resolution committing the City to a Zero Waste goal.

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# **APPENDIX A** - DEFINITION OF TERMS AND CONCEPTS - FRESNO GENERAL PLAN RESOURCE CONSERVATION AND RESILIENCE ELEMENT

Activity Center: A type of urbanized development that can occur at multiple scales based upon its planned density, intensity, and location. They include a close proximity of buildings with mixed land uses and are typically integrated with and connected by multiple modes of transit including walking, biking and public transit, providing a single destination where people can live, work, and shop. *An umbrella definition for a variety of types of activity centers (should also be defined) such as Regional, Urban, Neighborhood, Suburban, etc. which are characterized based upon the intensity, location, and mix of uses.*

Best Management Practices: will define

Bus Rapid Transit (BRT) and BRT Corridor priority transit routes, pedestrian activities and linkages, "high frequency transit". Will define

City of Fresno or City: Refers to the municipal entity and its functions as a government entity. Use of the term "city" typically refers to the area, population or activities occurring within the Fresno Plan Area.

Citywide: References to "Citywide" are in relation to a characteristic, regulation or other factor that occurs within the incorporated boundaries of the City of Fresno while "citywide" may refer to occurrences within the Fresno Planning Area (FPA).

Citywide Development Code: Refers to the proposed City of Fresno Municipal Code, Chapter 15, Citywide Development Code which is proposed to be the new planning, zoning and development implementing code.

Climatized Plants: will define

Community Plan: A refinement of the general plan for a component geographic area of the general plan. A community plan shall advance the provisions of the general plan to a more precise level of detail and shall contain goals, policies, maps, and standards that implement the recommendations of the general plan. A community plan shall contain those plan elements which are essential to the implementation of the general plan and may contain additional components, including specific plans, which are necessary to the development of the goals, policies, and standards for the community plan area. A community plan shall be adopted, amended, or repealed by resolution of the Council.

Community Facilities District: will define

*Complete Neighborhood and "elements" of, Neighborhood, District, mixed-use urban districts, compact neighborhoods, suburban areas, transit-oriented mixed use corridors, Mixed Use Urban Corridors, activity centers, community centers, neighborhood centers, residential districts, main street, multi-modal corridors and centers, Holistic Neighborhood Planning-"Adopt development regulations that require 'major' new subdivisions be designed as compact pedestrian and transit-oriented communities" (UF-14-1, S-134, s-135)*

Criteria pollutants: will define

Density and Intensity: General description of land use characteristics where Residential Density or Density generally refers to the ratio of residential dwelling units to acre (43,560 square feet) of land which is

calculated by dividing the number of existing or proposed residential dwelling units by the area of the subject property.

Intensity generally refers to the relative magnitude of the use or activity which may occur upon a given property or area of land and is typically reflected by the ratio of building area to land area calculated as floor area ratio (ie the building area divided by the land area). Intensity may also be measured by other characteristics such as the rate at which the uses of a property generate demand for water consumption, demand for wastewater disposal or generates demand for travel such a private vehicle, public transportation, bicycling or walking.

Drought-Resistant Plants: will define

Environmental justice: will be defined

Fresno-Clovis Metropolitan Area (FCMA) and Fresno Metropolitan Area: These terms have been used in the past to refer to one or both of the City of Fresno and the City of Clovis and the immediately surrounding environs the boundaries of which were defined by US Census Tracts. This term was widely used in the past and referred to a geographic area previously defined by the US Census Bureau. The Fresno Metropolitan Area was referred to and the boundary depicted in Exhibit 4 of the Amended and Restated Memorandum of Understanding between the County of Fresno and the City of Fresno January 6, 2003. The area included within the FMA is larger than the SOI and the FPA.

Fresno's City Limits: Refers to the incorporated boundaries of the City of Fresno.

Fresno Production-Consumption Region: will be defined

Fresnans: Refers generally to persons living within the City of Fresno's planning area.

General Plan: Use Municipal Code Definition 12-105-G-6.1: Shall mean an integrated, internally consistent, comprehensive, and long-range set of goals and policies for the general physical development of the city and any land outside the city's boundaries which bears relation to the city's planning. The general plan shall include diagrams which identify the general locations and types of land uses that are consistent with the goals and policies of the plan. The general plan and its recommendations shall address physical, social, economic, environmental, design, and public service delivery system issues that have a bearing on the growth and change of the city. The general plan shall contain the mandatory elements prescribed by State Planning and Zoning Law (Title 7, Division 1, commencing with Section 65000, of the California Government Code), which may be combined where appropriate. The general plan may also include any other elements or address any other subjects which, in the judgment of the Council, are needed for the appropriate physical development of the city.

Goal: A goal is a general direction-setter. It is an ideal future end related to the public health, safety or general welfare. A goal is a general expression of community values and, therefore, may be abstract in nature and is generally not quantifiable or time-dependent.

Objective: An objective is a specified end, condition, or state that is an intermediate step toward attaining a goal. It should be achievable, and preferably measurable.

Policy: A policy is a specific statement that guides decision-making and indicates a commitment of the local legislative body to a particular course of action to accomplish goals and objectives.

Implementation Measure: An implementation measure is an action, procedure, program or technique that carries out general plan policy. (State of CA, GP Guidelines, OPR)

Green building rating system: will be defined

Green Enterprise: will be defined

Green technology: will be defined

Greenways: Greenways is a long, narrow piece of land, where vegetation is encouraged, which is managed for public recreation and slow travel.

Groundwater: will be defined

Graywater: will define

Growth or Urban Growth Area: Urban growth is development of properties over a period of time with uses and improvements which are intensive and urban in character. Urban growth areas are typically specifically defined geographic areas within which urban development may be managed through the application of policies and implementation measures to assure that commensurate urban public facilities and improvements are provided as necessary to accommodate the planned development.

Healthy Communities strategy: will define

Higher-intensity development: will define

Infill or Urban Infill Area: Infill or urban infill areas typically refers to properties and improvements which are largely vacant, underdeveloped or developed with uses and structures which are antiquated or harmful given the site's location and surrounding uses. Infill development typically refers to the reuse or redevelopment of such properties to accommodate activities which are more viable and compatible with the location and surroundings. Infill land is generally surrounded by developed land. Infill generally uses pre-existing public road and utility infrastructure, but may require site cleanup and may tax the existing utility infrastructure to the point that existing distribution piping may need to be upgraded.

Infill opportunity areas and Infill Priority Zone: General or specifically defined geographic areas for which policies and implementation measures are established to promote development or planned land uses.

Integrated Pest Management: will be defined

"Leap frog" development: will define

Lighting and Landscaping District: will define

Low Impact Design: will define

Low-Intensity Agricultural Activities: will define

Master Plan or Master Planning (S45), master public facility plan, Sub-area Master Planning for BRT transit corridors and growth areas designed (designated) by the General Plan to include urban design principles (page 3-21,S126) (page 3-22,S127 & S128 requiring Master Plans and Sub-Area Master Plans), subsequent specific or master plans, (page 3-5, S23, 24)"subsequent specific plans for identified growth areas and certain larger infill areas are subsequent projects", "precise development plan" to be allowed by Development Code (page 3-32). To be defined in glossary.

Sub-area Master Plan: Typically refers to a land use and circulation plan refinement for an area which is 160-acres or less in size and provides for a mix of land use proportionate to those identified by the Fresno General Plan Land Use Diagram and is prepared and adopted as provided by the City of Fresno's Development Code.

Mixed-Use: A development type consisting of a diversity of both residential uses and nonresidential uses, which may include but are not limited to office, retail, public, or entertainment, in a compact urban form with a strong pedestrian orientation.

Vertical Mixed-Use: A development that contains at least one multistory mixed-use building.

Horizontal Mixed-Use: An integrated mixed-use development consisting of adjacent residential and non-residential uses.

Passive Water Storage: will define

Parkway: will define

Planning Area: Referred to as the Fresno Planning Area (FPA) which is the geographic area defined by the boundary depicted in FGP Land Use Element Figure 2. It is consistent with the expanded SOI boundary depicted by the Amended and Restated Memorandum of Understanding between the County of Fresno and the City of Fresno, January 6, 2003 with the addition of the entirety of the Fresno-Clovis Regional Wastewater Reclamation Facility. The FPA includes properties which are within the City of Fresno incorporated boundaries as well as those which are located within the unincorporated area."

Renewable energy: will be defined

Riparian: will define

Solar power: will be defined.

Special Purpose Recreation Facility: will define

Specific Plan: Use Municipal Code Definition 12-105-S-20.1: shall mean a precise plan or redevelopment plan based on, and consistent with, the general plan and the community plan within which it is located, and shall contain precise land use designations, regulations, programs, and legislation that are required for the systematic implementation of the general plan and community plan.

Sphere of Influence (SOI): The City of Fresno's SOI is defined as the geographic area within the boundaries depicted by the Fresno General Plan Land Use Diagram, Figure -, which are consistent with the boundaries as approved by the Fresno Local Agency Formation Commission (LAFCo) as of September 1, 2012. The expanded SOI boundary as identified by the Amended and Restated Memorandum of Understanding between the County of Fresno and the City of Fresno, January 6, 2003 includes the remaining portion of the 2025 Fresno General Plan's North Growth Area which has not been included within the LAFCo approved SOI as of September 1, 2013.

Transit Village, Transit Oriented Development (TOD), TOD Activity Center, TOD Corridor & major TOD corridor, Major Corridor. Will define

Urban and urban area: Areas characteristic of, or constituting a city or more intensively developed community generally comprised of moderate and higher density residential development (i.e. three or more dwelling units per acre although urban areas often include estate sized lots ranging from one to five acres in area) together with office, retail commercial development, industrial, public and institutional uses. The intensity of such uses typically require the provision of public services and infrastructure including water supply system, sewage collection and treatment system, roadways and other improvements for motor vehicle and non-motorized travel, public transit, and police and fire suppression safety services.

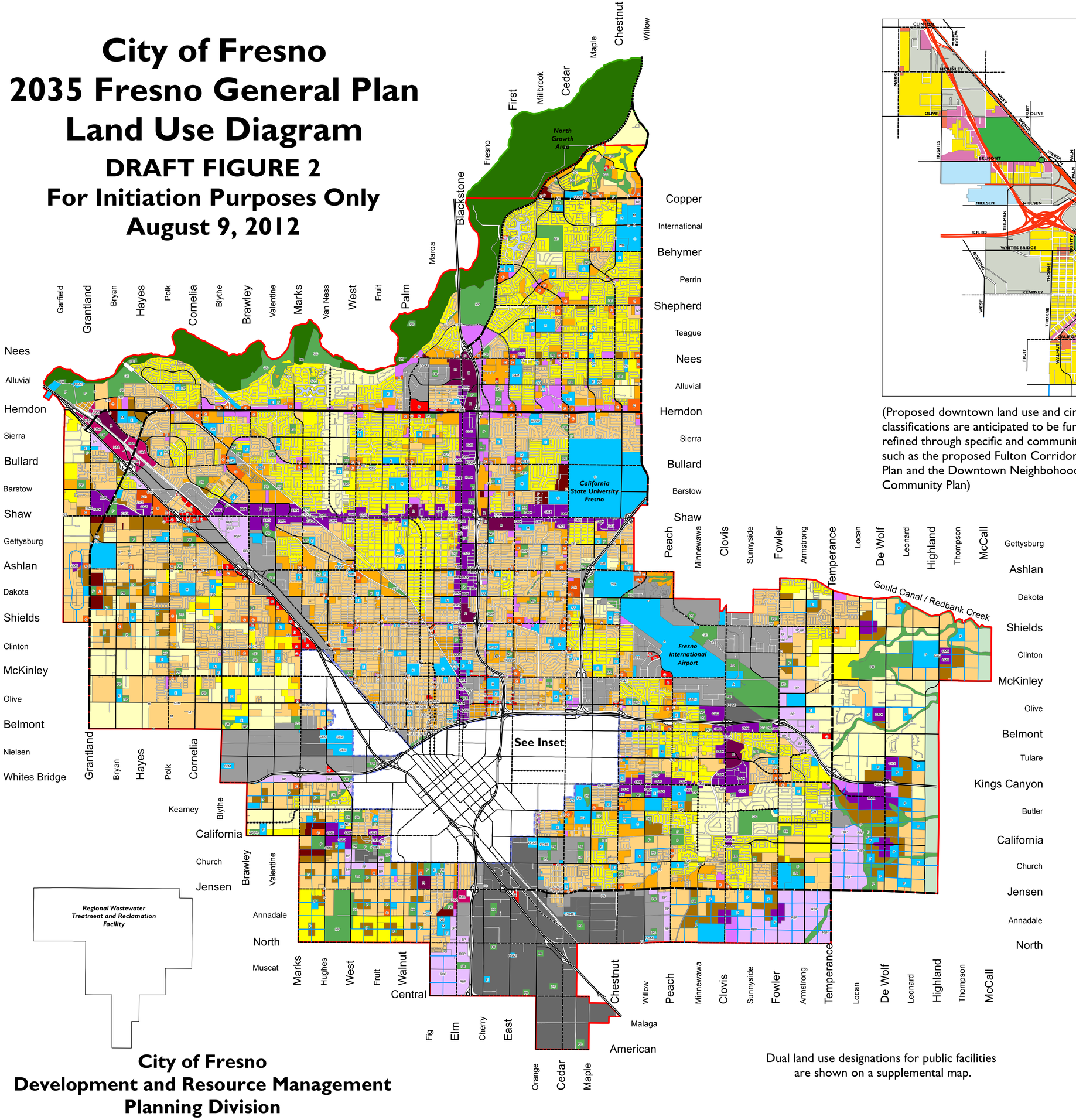
Urban Form or Urban Design: urban form and design is concerned with the location, mass, and design of various urban components and combines elements of urban planning, architecture, and landscape architecture.

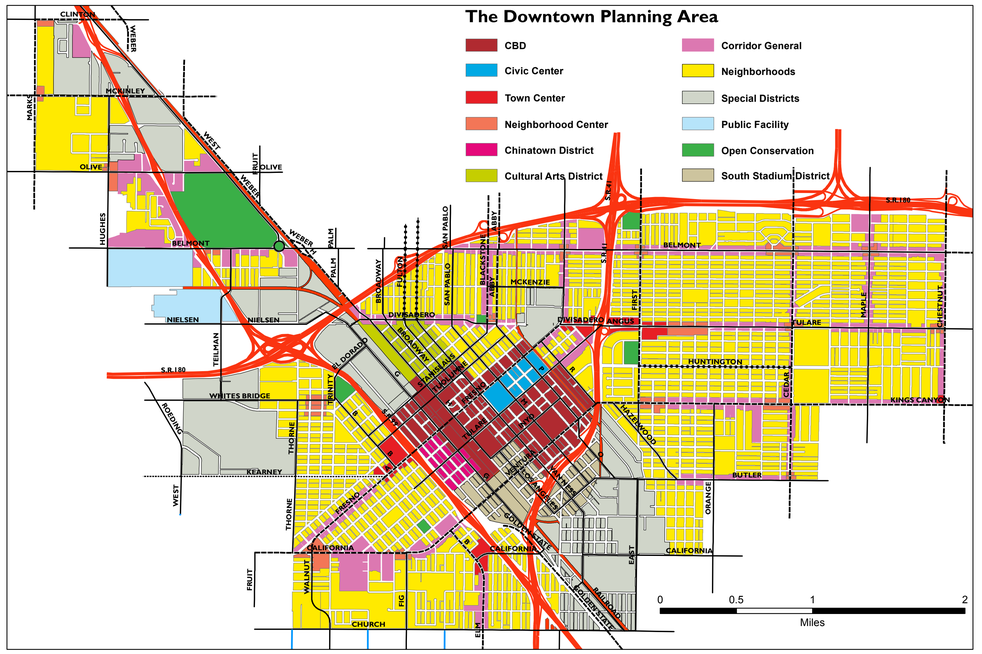
Urban Use, Commercial Use, Residential Use, agri-business or agricultural business uses versus general agricultural use. Will define if necessary but these are typically generic term at a plan level but would be specifically defined in the development code.

Zoning Ordinance and Zoning Regulations: Presently City of Fresno Municipal Code, Chapter 12, Articles 1,2,3, and 4.5 comprise the "Comprehensive Zoning Ordinance" and can be referred to as "Zoning Ordinance of the City of Fresno". The present Zoning Ordinance and many other Articles of Chapter 12 will be repealed and replaced by updated Code provisions. Use of these terms should be in reference to old implementing tools to be replaced.

# **APPENDIX B** - LAND USE DIAGRAM - FRESNO GENERAL PLAN

# City of Fresno
# 2035 Fresno General Plan
# Land Use Diagram
## DRAFT FIGURE 2
## For Initiation Purposes Only
## August 9, 2012




(Proposed downtown land use and circulation classifications are anticipated to be further refined through specific and community plans such as the proposed Fulton Corridor Specific Plan and the Downtown Neighbohoods Community Plan)

## LEGEND

### RESIDENTIAL
- Low Density (1-3 D.U./acre)
- Medium Low Density (3.5-6 D.U./acre)
- Medium Density (5.0-12 D.U./acre)
- Medium High Density (12-16 D.U./acre)
- Urban Neighborhood (16-30 D.U./acre)
- High Density (30-45 D.U./acre)

### COMMERCIAL
- Main Street
- Community
- Recreation
- General
- Highway & Auto
- Regional

### EMPLOYMENT
- Office
- Business Park
- Regional Business Park
- Light Industrial
- Heavy Industrial

### MIXED USE
- Corridor/Center Mixed Use
- Regional Mixed Use
- Neighborhood Mixed Use

### OPEN SPACE
- Clear Zone
- Commercial-Recreational
- Community Park
- Flood Control Project
- Golf Course
- Lake, Pond
- Multi-Use
- Neighborhood Park
- Outdoor Environmental education area
- Open Space
- Park
- Ponding Basin
- Ponding Basin (Park use)
- Regional Park

### PUBLIC FACILITIES
- Public/Quasi-public Facility
- Special School
- Elementary School
- Elementary & Middle School
- Elementary, Middle & High School
- Middle School
- High School
- College
- School with Park
- Airport
- Cemetery
- Church
- Community Activity Center
- Convalescent Hospital
- Fairgrounds
- Fire Station
- Government Offices
- Hospital
- Medical Center
- Neighborhood Center
- PG & E Substation
- Police Dressing Station
- Water Recharge Basin
- Waste Water Treatment Facility

### BUFFER
- Buffer

### BOUNDARIES
- Existing Fresno Sphere of Influence
- Growth Areas
- Downtown Neighborhoods

### Circulation Legend
- Freeway
- Expressway
- Scenic Expressway
- Connector
- Super Arterial
- Arterial
- Scenic Arterial
- Ramp
- Scenic Drive
- Collector
- Scenic Collector

Dual land use designations for public facilities are shown on a supplemental map.

**City of Fresno**
**Development and Resource Management**
**Planning Division**