03 | EXISTING CONDITIONS

HISTORY OF COACHELLA

Coachella is a desert community of approximately 40,000 people located at the eastern end of the Coachella Valley, in Riverside County, California. The City was founded in 1876 and later incorporated in 1946. Before the settlement of the Coachella Valley by Europeans, the Valley was home to the Agua Caliente band of Cahuilla Indians. The Cahuilla Indians are the first known human inhabitants of the Coachella Valley. The Cahuilla were hunters and gatherers, generally divided into three groups based on their geographic setting: the Pass Cahuilla of the Beaumont/Banning area; the Mountain Cahuilla of the San Jacinto and Santa Rosa Mountains; and the Desert Cahuilla from the Coachella Valley, as far south as the Salton Sea. Varying clan groups of the Desert Cahuilla had many villages throughout the Coachella Valley. Planted crops, as well as hunting and gathering, was identified as the primary way of life for the Cahuilla. Before European contact, population for the Cahuillas ranged from 3,600 to as high as 10,000. Due to European diseases, such as smallpox, the Cahuilla population was decimated during the 19th century. The first official United States land survey in Southern California in the mid-1850's noted eight Indian villages or Indian rancherias within, or just outside, the present boundaries of Coachella, presumably occupied by the Desert Cahuilla people.

Figure 3-1: Coachella circa 1949.

A number of roads and trails were observed crisscrossing the planning area, connecting the villages and rancherias to one another. Two of these roads and trails, both traversing through the planning area in a northwest-southeast direction, appear to have been the main thoroughfare for traffic in the vicinity. One road passed through the planning area in the southwestern corner while the other was recorded along the Whitewater River/**Coachella Valley Stormwater Channel** bed, running directly through the

center of the planning area. These two main roads were considered to be two branches of the ancient Cocomaricopa Trail.

With the discovery of gold in California in 1848, the first wave of non-Native American immigrants began arriving in California. In 1862, this ancient Cocomaricopa Trail was "rediscovered" by William David Bradshaw, and soon became known as Bradshaw Trail as he transformed the route into Riverside County's first road. A stagecoach was put into service adjacent to this trail as gold miners and settlers began arriving in the Valley via the Trail.

In 1866, development of the Southern Pacific Coachella Valley railroad brought waves settlers to the Coachella Valley, and a series of new communities sprang up along the tracks. Once the Southern Pacific Railroad route connecting the desert and Los Angeles was completed in 1877, the Valley's population began to expand more rapidly. By the early 20th century, Euroamerican settlements had replaced the Indian villages and rancherias to become the prevailing cultural landscape in the area.

In the 1920s and 1930s, U.S. Highways 99 and 60-70 were completed, further facilitating travel, migration and economic growth in the Valley's primary economic sectors for tourism and agriculture. Palm Springs and neighboring cities became a major destination for Hollywood celebrities and other vacationers during the years before World War II. The Valley's population continued to grow during the war as troops from nearby training centers came to Palm Springs and other cities looking for relaxation and entertainment.

The highways, combined with major irrigation projects that brought water from the Colorado River, have supported a prosperous agricultural sector. By the 1940s, the planning area showed significant growth in population and agriculture. The cities of Coachella and Indio, and the unincorporated areas of Mecca and Thermal became known for niche crops such as dates, grapes, lemons, oranges, avocados, figs, persimmons and even mangos. The fast-growing date palm industry in the Coachella Valley had become the main agricultural staple in the region. Since the late 1940s, the Coachella Canal has served as the main water supply for residents of the Coachella Valley.

The completion of the Coachella Canal had a dramatic impact on the growth of the Coachella Valley, taking place in the western portion of the City south of the Coachella Canal, while the eastern portion, north of the canal, essentially remained untouched by civilization.

DEMOGRAPHICS AND ECONOMIC CONDITIONS

POPULATION AND POPULATION GROWTH

While Coachella has been a small town since its inception, its population has grown very quickly. Between 2005 and 2010, the City's population increased by nearly one-third, jumping from 30,879 to 40,704 in only five years. And, the City's population is expected to continue to grow at a high rate for the foreseeable future. The Southern California Association of Governments 2012 Regional Transportation Plan estimates that Coachella could grow to 70,200 by 2020 and 128,700 by 2035. This is a massive amount of growth that the City must be prepared to accommodate.

HOUSING UNITS

In 2010, 40,704 people lived in the City of Coachella's 8,998 occupied housing units. On average, 4.51 persons were living within each occupied housing unit. As compared to the statewide (2.96) and countywide averages (3.2), Coachella had more persons living within each occupied unit. Further, the average number living in mobile homes was 5.8 persons in 2007.[1]

Table 3-1: Housing Occupancy[2]

HOUSING OCCUPANCY	OCCUPIED UNITS	% OF OCCUPIED UNITS	POPULATION	PERSONS PER OCCUPIED UNIT
OWNER-OCCUPIED	5,586	62.1	25,519	4.57
RENTER-OCCUPIED	3,412	37.9	15,127	4.43

In Coachella, 62.1% of the housing units were owner-occupied and 37.9% were renter-occupied in 2010, and 21.7% of homes are in multi-family structures. As compared to California as a whole, this was a higher proportion of owner-occupied units (56%) and lower proportion of renters (44%). Riverside County had 67% owner-occupied units and 33% renter-occupied units.

HOUSING TENURE

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JOBS-HOUSING BALANCE

The jobs-housing ratio is a basic tool to measure whether the number of jobs and housing units within a community are roughly equivalent. In Coachella, the jobs-housing ratio was 0.65 (5,831 jobs ÷ 8,998 housing units) in 2010. The recommended standard for jobs-housing unit ratios is based on the assumption the average number of workers per household is approximately 1.5. As such, the Coachella jobs-housing ratio is significantly lower than the recommended standard, indicating the area is job-poor, requiring many of workers to travel outside the jurisdiction to find employment.

NUMBER AND TYPE OF JOBS

In 2010, there were 5,831 jobs in Coachella, 11% below the 2007 total of 6,593. The total included salary and wage jobs held by business owners and self-employed individuals. For particular sectors,

[1] A 2007 Poder Popular report.
[2] U.S. Census Bureau (2011). 2010 Census Summary File 1— California).

total manufacturing jobs numbered 208, construction accounted for 245, retail trade jobs numbered 867 and professional and management accounted for 555 jobs.[3]

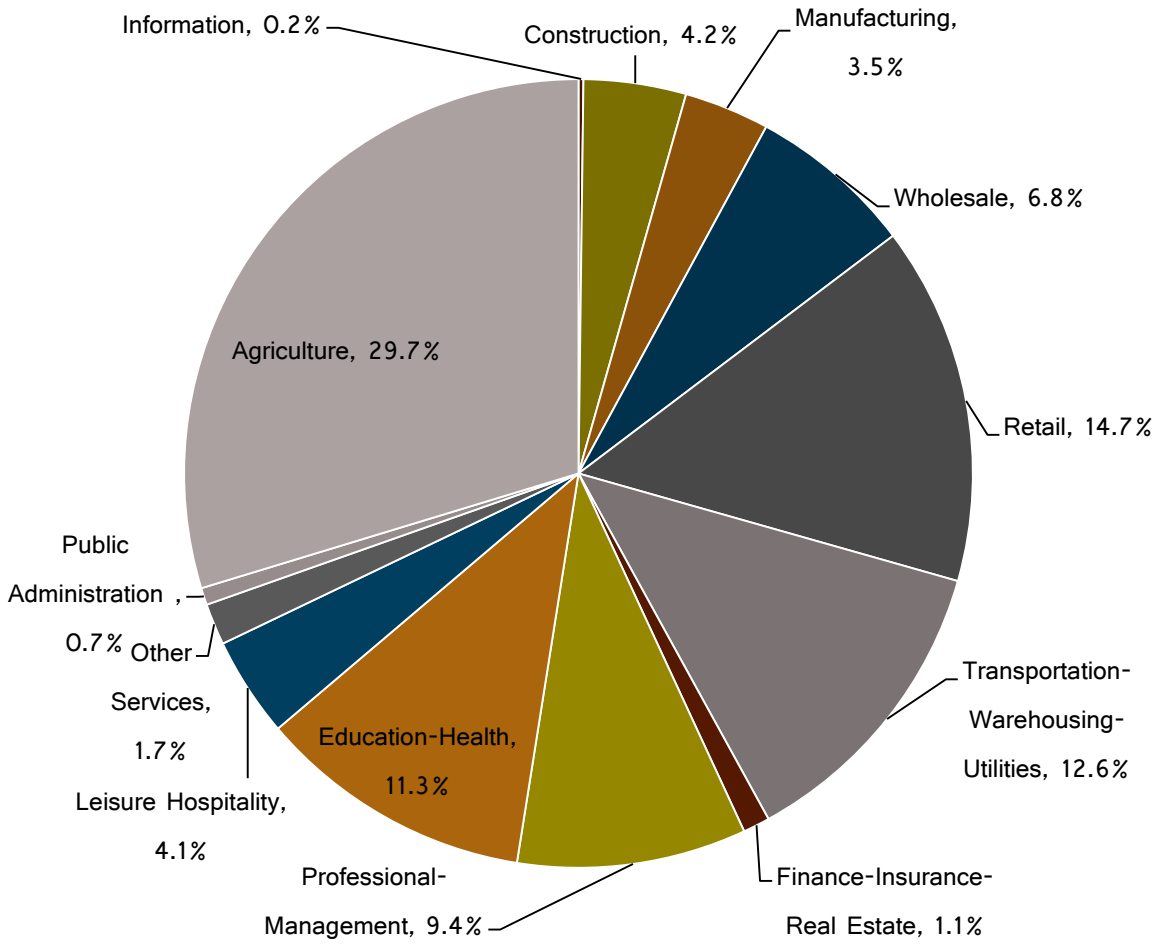


Figure 3-2: Jobs by Sector in 2010[4]

UNEMPLOYMENT RATE

In March 2012, the unemployment rate in Coachella was higher than neighboring communities and county and statewide averages. The California Employment Development Department reported the unemployment rate in Coachella was 20%, higher than the California unemployment rate (11%) and the Riverside County rate (12.7%). Table 3-2 shows the unemployment for cities in the Coachella Valley, Riverside County and statewide in March 2012. Between 2006 (before the recession) and 2012, the

[3] Southern California Association of Governments, (2011). Profile of the City of Coachella. Available at http://www.scag.ca.gov/resources/pdfs/2011LP/Riverside/Coachella.pdf.
[4] Southern California Association of Governments, (2011). Profile of the City of Coachella. Available at http://www.scag.ca.gov/resources/pdfs/2011LP/Riverside/Coachella.pdf.

unemployment rate in Coachella rose 169%, increasing from 8% to 20%. Similarly in Riverside County over the same period, the unemployment rate increased 169%, from 5% to 12.7%.[5]

Table 3-2: Unemployment Rates in March 2012[6]

REGION	UNEMPLOYMENT RATE MARCH 2012
COACHELLA	20.0%
INDIO	13.8%
PALM DESERT	7.6%
RIVERSIDE COUNTY	12.7%
CALIFORNIA	11.0%

POVERTY RATES

According to the American Community Estimates (2008-2010), approximately 24% of the households in the City had income below the Federal poverty level during the last 12 months. This was significantly higher than the countywide (13%) and statewide (14%) averages. Further, 28% of the households earned incomes less than $25,000 per year and 51% of households earned less than $50,000 per year.

SENATE BILL 244

Senate Bill 244 (SB 244) requires procedural steps to be taken that ensure the identification, consideration, and protection of disadvantaged communities to be included in the general plans. Disadvantaged community settlements occur where a majority of residents have less income and higher density living have also been found to have insufficient infrastructure. According to SB 244 sufficient infrastructure in community developments includes sidewalks, safe drinking water, and adequate waste processing. Lack of these basic necessities negatively impact residents' health, safety, and quality of life as well as generate inequities in the larger economic market. Additionally, continuous lack of infrastructure investments increases the equality gap and further impairs the quality of life of residents living in disadvantaged communities. These disadvantages not only create hardship for residents, but can weaken the social and economic health of the City, Sphere of Influence, and region where disadvantaged communities are present.

In response to adjust reduce inequalities and protect disadvantaged communities form such hardship, SB 244 has set in place criteria to identify the location of disadvantaged communities, and assess gaps in infrastructure. Through local governments and local agency formation commissions (LAFCos), establishment criteria are used to site communities, and work with counties and cities to comply with SB244.

[5] Bureau of Labor Statistics. (2012). Local Area Unemployment Statistics. Available at http://data.bls.gov/cgi-bin/dsrv.
[6] California Employment Development Department (2012). Labor Market Information. Available at http://www.labormarketinfo.edd.ca.gov/.

City and counties are also required to follow procedures to identify island, fringe, or disadvantaged communities, assess infrastructure needs of each community, and outline potential funding mechanisms to address infrastructure improvements in these communities. These requirements are to be included in the land use element of a general plan update, in conjunction with adoption of the city's housing element.

DISADVANTAGED COMMUNITIES

According to SB 244 a disadvantaged community meets the following criteria:

1) Housing contains 10 or more dwelling units in close proximity to one another;
2) Community is either within a city SOI, is an island within a city boundary, or is geographically isolated and has existed for more than 50 years; and
3) The median household income is 80 percent or less than the statewide median household income.

Within the City of Coachella and its Sphere of Influence, there are five communities that are considered to be disadvantaged communities under SB 244: Shady Lane, Cocopah, Thermal, Fillmore, and Vista Santa Rosa. Following are brief descriptions of these communities. Figure 3-3, shows there location within the Planning Area. Table 3-3 shows the infrastructure needs in each of the five disadvantaged communities in Coachella

1. ***Shady Lane.*** This community has water and sewer available nearby on 54th street. Water wells in this area have a high mineral content, and there is no stormwater management infrastructure in the Shady Lane community. Additionally, this neighborhood is so dense that septic is no longer viable and it needs to be connected to the wastewater treatment system.

2. ***Cocopah.*** The nearest water and sewer facilities are between one and two miles away from the community. The water quality is adequate and is supplied through private wells. Septic capacity and quality is considered adequate, as the community is low in density, and low in overall wastewater demand. In addition, there are current plans for water and sewer infrastructure improvements upon development of the La Entrada Specific Plan.

3. ***Thermal.*** Thermal does not have storm drain facilities. This area is included in the Coachella Valley Water District and receives water and wastewater sewer through the district.

4. ***Fillmore Street.*** This community has adequate well and septic facilities due to low density and low treatment demand. Like the rest of the City, there are no stormwater facilities in the area.

5. ***Vista Santa Rosa.*** Water wells in this community are depleted. There is also no sewer or storm drain infrastructure. However, septic treatment is adequate.

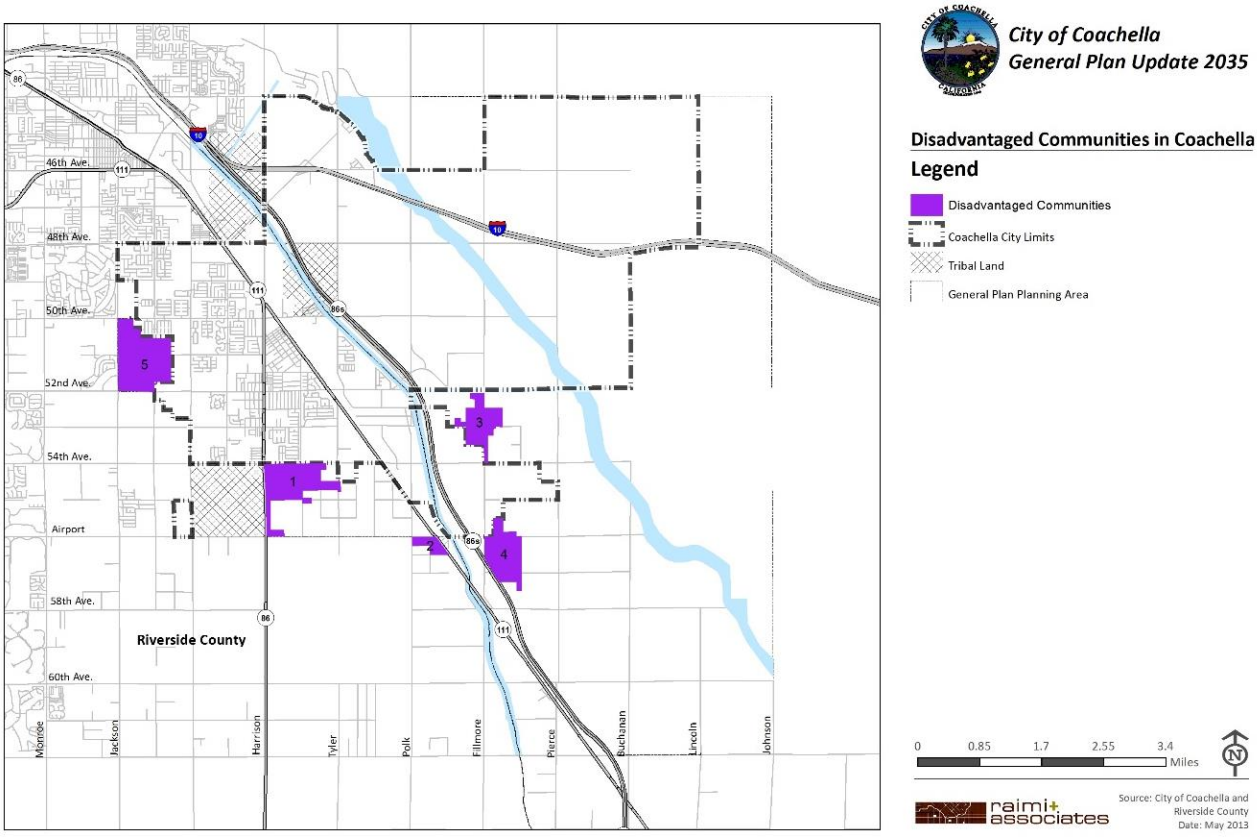


Figure 3-3: Location of the five disadvantaged communities in Coachella

Table 3-3: Disadvantaged Communities Infrastructure Needs Analysis

NEIGHBORHOODS	WATER	SEWER	STORMWATER	FIRE
SHADY LANE	Y	Y	Y	N
COCOPAH	N	N	Y	N
THERMAL	N	N	Y	N
FILLMORE	N	N	Y	N
VISTA SANTA ROSA	Y	N	N	N

FINANCING INFRASTRUCTURE

Financial investments in infrastructure improvements will supply disadvantaged communities with a better environment to improve the health and safety of each community. There are several strategies to fund the necessary improvements that would be applicable to these communities. These include:

Development impact fees. The City is able impose development impact fees for projects that could affect disadvantaged communities or for projects that would also require infrastructure to be extended near or past a disadvantaged community. The City has done so in previous project developments, and is able incorporate such fees into the City's development review and permitting process. These additional fees would be allocated to support the planning, building and implementation of infrastructure

to meet necessary service levels in disadvantaged communities. The City can use these funds now, as well as continue to collect funding to support maintenance, or future additions to meet adequate levels of service.

Master plan implementation. It is common practice for cities to actively prepare and adopt infrastructure and utilities master plans, or similar plan types. These plans have the potential to allocate City funds towards building and maintaining necessary infrastructure improvements in identified disadvantaged communities. Potential plans, including a water master plan, a wastewater master plan, and a stormwater management plan, provide frameworks for infrastructure improvements throughout the City, including in disadvantaged communities. Within each plan, proposed funding opportunities and allocation strategies would be included to support infrastructure improvements. Once plans are adopted by the City, the approval of funding allocation and plan implementation can begin working towards closing the infrastructure service gaps in disadvantaged communities. This General Plan includes policies for the creation, maintenance, and implementation of such master plans needed to address the infrastructure needs of these five disadvantaged communities.

General Fund. The City can allocate infrastructure investments as a part of annual budget expenditures and allocate a certain amount or percentage of spending towards improvements in disadvantaged communities and typically occurs through the City's Capital Improvements Program. City decision makers and City officials can allocate funding, or community members could also recommend and propose part of the City's general fund go towards updating infrastructure to an adequate level of service. This may ultimately benefit the economic viability of the City, and have a secondary benefit of adding revenue back into the general fund.

Loans, grants, and program funds. There is potential for periodic grant opportunities and government loans, to fund the necessary infrastructure improvements. Potential funding opportunities could also come from Proposition 84 and the Water Authority and Sanitary District Enterprise Funds. Application of such funding opportunities can be done with partnerships between the City and various utilities companies, the Coachella Valley Water District, or any other interested party.

Development funded improvements. Some disadvantaged communities are in unincorporated areas, and in areas where development is happening at a slower pace. As development continues, the City may consider annexing this land, and could require that development in identified disadvantaged communities fund infrastructure improvements necessary to meet sufficient levels of service. During the permitting and development projects must have necessary infrastructure plans for meet adequate levels of service for the project as well as additional investments into infrastructure that will support the project's surrounding community.

LAND USE AND COMMUNITY FORM

At the time this plan was prepared, 18,530 acres of the City was developed. The City's Planning Area of 45,300 acres is only partially developed, with nearly 27,000 acres undeveloped. Of that undeveloped land, approximately 10 percent of it has been entitled for future development. Most of the City's houses are modest, varying greatly in vintage. However, many of the City's neighborhoods suffer

from an incomplete transportation network, unfinished subdivisions, poor access and limited parks and neighborhood serving uses. The City's urban fabric is in need of repair.

MIX OF LAND USES

The land uses within Coachella's various neighborhoods and commercial areas include residential housing, public spaces (parks and streets), industrial activity and commercial activities, such as restaurants, retail stores, offices, and services. Some areas within the City's commercial areas have a mix of uses, including commercial and industrial on the same parcel, or on neighboring parcels. Table 3-5 identifies the total distribution of existing land uses in Coachella as of 2008.

Table 3-4: Land Use Designations

LAND USE CLASSIFICATION	ACRES	% OF TOTAL AREA	% OF TOTAL AREA EXCLUDING AGRICULTURE AND VACANT LAND
AGRICULTURE	11,174	33%	-
COMMERCIAL AND SERVICES	138	0.4%	3%
EDUCATION	98	0.3%	2%
FACILITIES	54	0.2%	1%
GENERAL OFFICE	101	0.3%	2%
INDUSTRIAL	892	3%	18%
MIXED COMMERCIAL AND INDUSTRIAL	5	0.01%	0%
MULTI-FAMILY RESIDENTIAL	55	0.2%	1%
OPEN SPACE AND PARKS	109	0.3%	2%
OTHER RESIDENTIAL	277	1%	6%
SINGLE FAMILY RESIDENTIAL	1,007	3%	20%
TRANSPORTATION, COMMUNICATIONS, + UTILITIES	1,889	6%	38%
UNDER CONSTRUCTION	300	1%	6%
VACANT	18,224	53%	-
GRAND TOTAL	**34,322**	**100%**	**100%**

Agricultural land comprises approximately 33% of the area. Transportation, communications and utilities comprised 6% of the land area, and both single family residential and industrial land account for 3% of the land area. All other uses comprised 2% of the land area. By excluding agriculture and vacant lands, transportation, communications and utilities comprised 38% of the land area, single family residential

represented 20% of the land area, and industrial land accounted for 18% of the land area. All other uses comprised 24% of the land area.

POPULATION DENSITY

According to the 2010 Census, the population density of Coachella was 2.20 persons per acre for the entire city[7]. The population density was about four times higher than the county and six times higher than the state. Compared to other cities, however, Coachella's population density was lower than Palm Desert (2.82), Indio (4.07) and Riverside (5.58). However, when looking at population density for only the developed areas of the city (west of SR86), the result is much different; Coachella's developed areas have a density of 6.71 persons per acre. Although Coachella's residential development patterns are similar to the rest of the region, some neighborhoods have smaller lots and household size in Coachella is much larger than other geographic areas.

Population is not uniformally distributed in Coachella, ranging from zero on the eastern and southern sides of Coachella to more than 30 people per acre. Figure 3-4 shows the population density within the Coachella city limits and General Plan Planning Area.

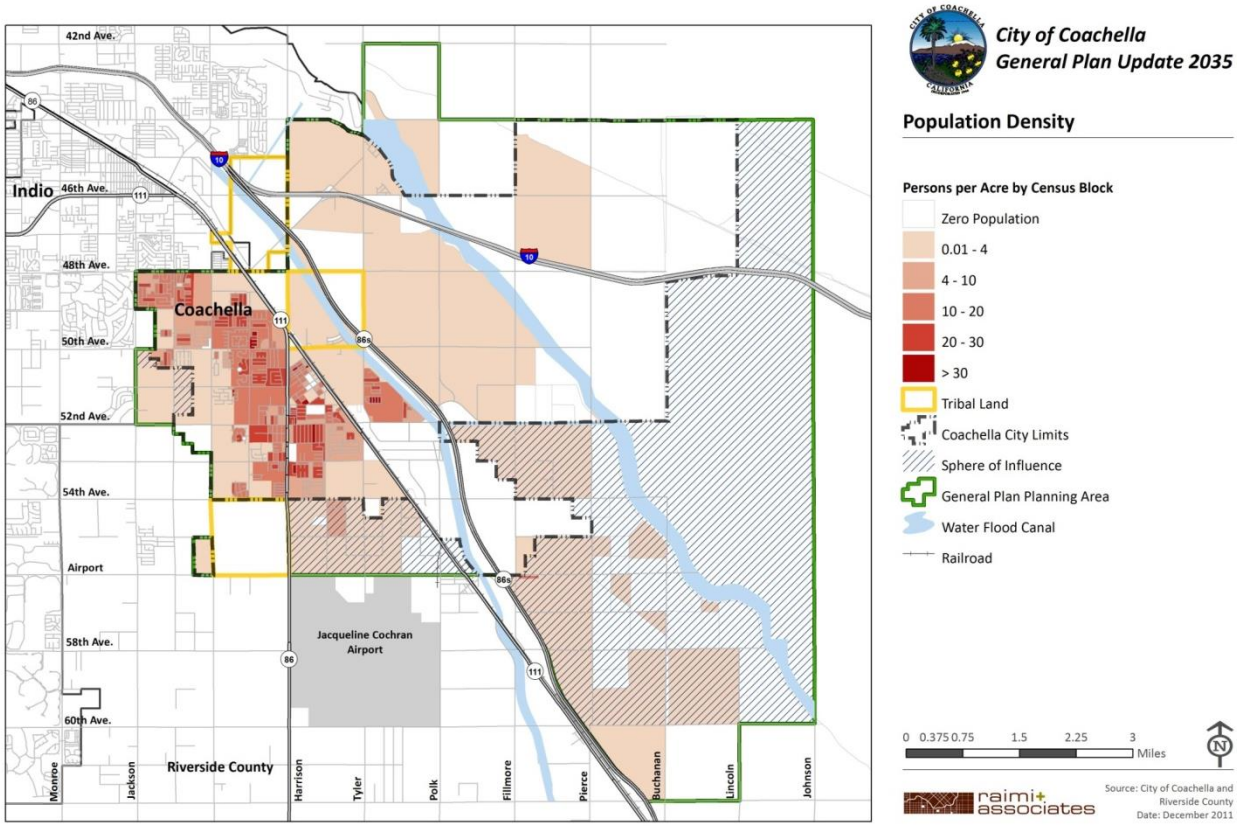


Figure 3-4: Population Density - Persons per Acre

[7] U.S. Census Bureau (2011). 2010 Census Summary File 1— California).

STREETSCAPE QUALITY AND PEDESTRIAN NETWORK

The layout and quality of the streetscape varies significantly by neighborhood and City region. In some older residential communities, sidewalks are separated from roadways by landscaped parkways, often incorporating grass and shade trees. In the newer residential areas, sidewalks are typically adjacent to the curb and gutter while landscaping is minimal. There are examples of utility poles and street lights embedded directly into the sidewalk in these areas, creating obstructions and potential hazards in low-light conditions.

Sidewalks are generally continuous in the residential neighborhoods, though there are occasionally gaps in connectivity between neighborhoods. In more newly developed areas of the City, residential tracts may have sidewalks within the community and on the major roads immediately adjacent but sidewalks may not extend all the way to the next development, creating an island effect. This is often due to the fact developers were required to widen roads and provide sidewalks for the street sections directly abutting their sites, but were not required to implement improvements beyond those boundaries. If neighborhoods are not built proximate to one another, gaps in the pedestrian network are observed.

Older neighborhoods tend to feature better connectivity between blocks, but lack a continuous style or layout. Walkway widths, setback from roadway, landscaping and disabled person's access all vary. In general, the pedestrian network in these older neighborhoods could be considered safer and more walkable. The main component missing is favorable destinations; houses, schools and parks are connected and within walking distance but food service and commercial developments are still focused outside of these residential areas, requiring residents to either walk in a less pedestrian-friendly environment or use another form of transportation. Outside of residential and commercial core areas, sidewalks are not common.

Crosswalks are common at intersections of higher volume streets throughout the City. They are less common at intersections of residential streets and collectors/arterials. In some of the newer areas in the northern part of the City there may be as much as a half-mile between safe pedestrian crossing locations at major arterials, limiting access between the residential developments by foot. In the central residential area of the City, pedestrian connectivity between the neighborhood blocks is better, with more mid-block crossing. Many of these crosswalks also feature higher visibility marking, such as ladder painting. Crosswalks are also much more prevalent in the vicinity of parks and schools. One area of concern is SR86S, where there are few intersections, and little to no pedestrian right of way. This essentially isolates pedestrians east of the highway from the rest of the City.

Despite the incomplete pedestrian facilities, field investigations indicate walking is a common form of transportation for residents in the older neighborhoods, particularly in the southern half of the City. Residents were observed walking alone, in couples, in groups and with children. Pedestrians were observed carrying food and other groceries. In the newer residential developments, less walking was observed, which may correspond with higher auto ownership, less pedestrian-oriented design or both.

BLOCK SIZE

Block size varies in Coachella, primarily by age. Older residential neighborhoods and commercial areas, such as the downtown core, feature smaller blocks laid out in a traditional grid pattern. The average distance between intersections in the downtown core and surrounding neighborhoods is 300 to 400 feet. Even in residential areas, where rows are used in place of a square grid pattern, the road system is uniform and the intersection distance doesn't typically exceed 400 feet. A commonly used measure for walkable neighborhoods is an intersection distance of 500 feet. The triangle formed by Grapefruit

Blvd, Harrison Street and 52nd Avenue could be considered "walkable" as it has access to services, homes, outdoor areas and commercial zones all within a half-mile distance. As you move farther away from downtown, block sizes increase and cul-de-sacs become more common.

Newer residential developments usually feature an internal road network that is isolated from the arterial roadways providing access to the site except for occasional entries and exits mid-block. These roads rarely form a connected grid pattern, and as a result, travel distances between homes is increased, and access to the major roadways is often limited to one or two points for the entire development. The resulting intersection spacing can exceed 1200 feet. This configuration is commonly known as a "superblock", where arterial roads surround an independent residential neighborhood. However, in these areas pedestrian connectivity outside the neighborhood is lacking. Walls along property lines prevent access to connector roads and arterials from homes directly adjacent to the roads, and pedestrian paths are not common.

Recent commercial developments are typically built on large lots and feature a big, central parking lot serving all businesses, creating large blocks. In the rural and industrial areas, blocks can grow very large, having no internal circulation between the avenues, with a half-mile between intersections.

TRANSPORTATION

Coachella's transportation network consists of freeways, arterial roadways and local streets. State Routes (SR) 86, 86S and Grapefruit Boulevard (SR111) provide connectivity to neighboring cities, as does an established transit (bus) service. The safe and efficient movement of goods and vehicles is a key element in Coachella's future social and economic well-being.

Coachella's roadway system includes regional freeways, major arterials and local streets. Two major functions of roadways are to serve through traffic and provide access to adjacent property, and different roadways prioritize these functions differently. For instance, arterials generally prioritize the movement of traffic over access to individual adjacent properties, while local streets emphasize access to private properties over through traffic. Roadways are also the backbone of the bicycle and pedestrian network.

Collectively, the average daily trips of the City's aggregate land uses can be measured by VMT, or vehicle miles traveled. In 2008, Coachella generated 245 million VMT; in 2010, 308 million.

Walking and bicycling are environmentally friendly modes of transportation that enhance personal and social well-being. In addition to transportation, these modes of travel provide health and economic benefits. Walking and bicycling are recognized as integral components of Coachella's transportation system. Safe, convenient, attractive and well-designed pedestrian and bicycle facilities are essential if these modes are to be properly accommodated and encouraged. Well-designed pedestrian and bicycle facilities are safe, attractive, convenient and easy to use. Inadequate facilities discourage users and unnecessary facilities waste money and resources.

The bicycle system in Coachella primarily consists of shared bicycle and motor vehicle facilities. There few dedicated bicycle facilities in Coachella and the City is actively working to expand the network of bicycle lanes and bicycle paths.

TRANSIT SERVICES AND FACILITIES

Public transportation in Coachella is operated by SunLine Transit Agency, which enables commuters to travel within the City and adjacent cities with minimal transfers. Currently, SunLine operates buses on two routes within the City including Routes 90 and 91. **Route 90** operates seven days a week and connects also Coachella to Indio. Service frequency is 35 minutes weekdays and weekends. **Route 91** operates seven days a week and connects Coachella to Indio, Thermal, Oasis and Mecca. Weekday service frequency is 60 minutes and weekend service frequency is 80 minutes.

Ridership data indicates that each of these lines accommodates 700 trips per day during the week. Approximately 24% of ridership for Route 91 originates or terminates in Coachella. Route 90 provides a similar number of trips as Route 91, but operates almost entirely within Coachella. This could be taken as an indicator that transit ridership within the City is higher than in surrounding cities or towns. Ridership during the week is significantly higher than the weekend, which indicates transit may be the primary method of work commuting for many residents. Line 90 sees a high volume of ridership commuting west into Indio in the morning and returning in the evening. From this information, we can infer transit is an important element of the commute within the Coachella Valley as it facilitates travel between Coachella and adjacent cities.

CITYWIDE MODAL SPLIT

The City's land use patterns and topography play an important role in the way residents travel in and around the City. Coachella residents have access to several modes of travel such as walking, bicycling and public transit. However, the automobile is the primary means of travel within the City.

The 2005-2009 American Community Survey (ACS) was analyzed to determine mode split for the City of Coachella, Riverside County, California and the United States. Table 3- provides a comparison between the City, county, state and national level for these commute characteristics.

As is clear from the Table 3-5, a majority of Coachella residents choose to drive rather than using other modes of transportation. Coachella residents carpool more frequently than the county, state and national average, which is likely indicative of less access to vehicles than elsewhere in the Southern California region. Public transit utilization is lower than County, though our ridership information indicates that it is an important travel mode. Average commute time to work is 21.0 minutes in Coachella, according to the 2005-2009 American Community Survey data.

Table 3-5: Modal Transportation Shift[8]

COMMUTE MODE CHOICE	COACHELLA CITY	RIVERSIDE COUNTY	CALIFORNIA	UNITED STATES
SINGLE OCCUPANT AUTO	72.8%	75.3%	73.1%	76.1%
CARPOOL	21.2%	15.3%	12.3%	10.6%
PUBLIC TRANSIT	0.9%	1.4%	5.0%	4.8%
BICYCLING/WALKING	1.6%	1.9%	2.8%	2.9%
OTHER MEANS	1.2%	1.2%	2.2%	1.7%
WORK AT HOME	2.2%	4.9%	4.7%	3.9%

[8] 2005-2009 American Community Survey.

HEALTH AND HEALTH CARE

HEALTH CARE FACILITIES

Regional hospital and emergency services are generally good based on a national perspective. Tenet Health Care owns JFK Memorial Hospital, the main regional provider, capturing 62% market share. The other regional hospital providers are Eisenhower Medical Center (14% share of the market) and Desert Regional Medical Center (11% share of the market).

Along with major health care providers, there are also several clinics and family care centers that serve Coachella. Clinicas de Salud del Pueblo, Santa Rosa Del Valle Clinic and Clinica Medica Del Valle are located within the City.

Despite the availability of regional hospitals and local clinics, there are significant transportation issues for Coachella residents. This prevents some residents from accessing services that are available in Indio, such as the primary care clinic and WIC clinic, as well as other locations outside of Coachella[9]. Several SunLine transit routes do provide access to medical facilities, but service is infrequent and often requires the passenger to transfer to another line. For example, SunLine Routes 80 and 81 provide access to John F Kennedy Memorial Hospital, but these buses only run once an hour, fifteen hours per day.

To support the full health-care demand of Coachella, it would need approximately 42 additional physicians: 12 adult primary care physicians, four pediatricians, 16 medical specialists, and 10 surgical specialists. Most of these specialists were located near JFK Memorial Hospital, Eisenhower Medical Center, or Desert Regional Medical Center.[10]

ASTHMA HOSPITALIZATIONS

Asthma affects adults and children in Riverside County, particularly children living in relative poverty. Asthma is triggered by a number of factors, including smog, dust, pollen, smoke and cockroaches. In Riverside County, approximately 14% of the children up to 17-years-old have been diagnosed with asthma and many children suffer from asthma that result in trips to the ER or hospitalization.[11] In Eastern Riverside County, asthma was cited as the one of the top 10 reasons for emergency department visits for children 5 to 14 years old.[12]

CLIMATE AND AIR QUALITY

The climate of the Salton Sea Air Basin where the City is located, is typical of a desert regime, with large daily and seasonal fluctuations in temperature and relatively high annual average temperatures. Temperatures frequently exceed 100 degrees Fahrenheit (°F) for the summer months. During winter, temperatures can drop to near freezing (and below freezing at higher elevations). Throughout the year, average daily relative humidity and average rainfall are low. Daily temperature fluctuations and seasonal

[9] Medical Development Specialists LLC. (2011). Healthcare Needs Assessment.
[10] Medical Development Specialists LLC. (2011). Healthcare Needs Assessment.
[11] Meconis KD. Childhood Asthma in Riverside County, 2009. (2011) Riverside, CA: Riverside County Department of Public Health, Epidemiology and Program Evaluation.
[12] Health Assessment Resource Center, (2010). Eastern Riverside County Community Health Monitor.

variations are generally extreme. Clear skies with rapid heating and cooling of desert soils create high temperatures by day and quick cooling by night. Daily temperatures range from the mid-40s to low 70 degrees during winter, and from low 70s to mid-100s during summer. The average annual rainfall is about 3 inches, and the average annual air temperature is about 72.

The weather of the area is governed by large-scale warming and sinking of air in the semi-permanent subtropical high-pressure center over the Pacific Ocean. The high-pressure ridge blocks most mid-latitude storms, except in the winter when the high-pressure ridge is weakest and farthest south. The coastal mountains prevent the intrusion of the cool, damp air found in California's coastal regions.

The flat terrain and strong temperature differentials created by intense heating and cooling patterns produce moderate winds and deep thermal circulation systems. As a result, the general dispersion of local air pollution is greater than in the coastal basins where polluted inversion layers may remain for long periods of time.

Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: Ozone (O_3), Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Sulfur Dioxide (SO_2), Respirable Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$) and lead. These standards were established to protect sensitive receptors with a margin of safety from the impact of adverse health due to exposure to air pollution. The California standards are more stringent than the federal standards and, in the case of PM_{10} and SO_2, much more stringent. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide and vinyl chloride.

Air quality of a region is considered to be in attained by the National Ambient Air Quality Standards (NAAQS) if the measured ambient air pollutant levels are not exceeded more than once per year, except for O_3, PM_{10}, $PM_{2.5}$ and those based on annual averages or arithmetic mean. The NAAQS for O_3, $PM_{10,}$ and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Air Resources Board (CARB) is the state agency responsible for setting the California Ambient Air Quality Standards (CAAQS). Air quality of a region is considered to be attained by the CAAQS if the measured ambient air pollutant levels for O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive three-year period.

The US EPA designates air basins as being in "attainment" or "nonattainment" for each of the seven criteria pollutants. Nonattainment air basins are ranked (marginal, moderate, serious, severe, or extreme) according to the degree of the threshold violation. The stringency of emission control measures adopted by a state or air district depends on the severity of the air quality within the specific air basin. The status of the Riverside County portion of the Salton Sea air basin with respect to attainment with the NAAQS is summarized in Table 3-6.

Table 3-6: National Ambient Air Quality Standard Designations Status

POLLUTANT	DESIGNATION/CLASSIFICATION
OZONE (O_3)[a]	Nonattainment/Severe-15
NITROGEN DIOXIDE (NO_2)	Attainment/Unclassified
CARBON MONOXIDE (CO)	Attainment/Unclassified
SULFUR DIOXIDE (SO_2)	Attainment/Unclassified
RESPIRABLE PARTICULATE MATTER (PM_{10})	Nonattainment/Serious
FINE PARTICULATE MATTER ($PM_{2.5}$)	Attainment/Unclassified
LEAD (Pb)	Attainment

For PM_{10}, the Riverside County portion of the basin was required to meet the national standard by 2001; however, elevated annual PM_{10} levels from 1999 through 2001 prompted the SCAQMD to adopt the *2002* and *2003 Coachella Valley PM_{10} State Implementation Plan* (CVSIP), both of which demonstrated attainment of the federal PM_{10} NAAQS by 2006.[13] In 2006, the US EPA repealed the annual PM_{10} standard[14] due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution. The revocation of the annual PM_{10} standard became effective December 17, 2006.[15] Over the past five years, annual average PM_{10} concentrations have met the levels of the revoked standard and peak 24-hour average PM_{10} concentrations have not exceeded the current federal standard; thus, the Riverside County portion of the basin is currently eligible for redesignation as attainment.[16] However, a formal request for redesignation has not been submitted to the US EPA. Therefore, the region remains nonattainment for the federal PM_{10} standard.

CARB supervises and supports the regulatory activities of local air quality districts as well as monitors air quality itself. CARB will designate an area as nonattainment for a pollutant if monitoring data show that a California Ambient Air Quality Standard (CAAQS) for a particular pollutant was violated at least once during the previous three years. In addition to the criteria pollutants, CAAQS have been established for visibility-reducing particulates, hydrogen sulfide, and sulfates.

CARB establishes policy and statewide standards and administers the state's mobile source emissions control program. In addition, CARB oversees air quality programs established by state statute.

CARB makes area designations for 10 criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, sulfates, lead, hydrogen sulfide, and visibility-reducing particles. The status of the Riverside County portion of the basin with respect to attainment for the CAAQS is summarized in Table 3-7.

[13] South Coast Air Quality Management District, *Final 2003 Coachella Valley PM10 State Implementation Plan*, http://www.aqmd.gov/aqmp/PM10PLans.htm, (2003).

[14] US Environmental Protection Agency, 40 CFR Part 50, "*National Primary and Secondary Ambient Air Quality Standards,*" http://www.epa.gov/air/criteria.html. 2010.

[15] Ibid.

[16] South Coast Air Quality Management District, 2007 Air Quality Management Plan, (2007) 8-1.

Table 3-7: California Ambient Air Quality Standards Status

POLLUTANT	DESIGNATION/CLASSIFICATION
OZONE (O_3)	NONATTAINMENT
NITROGEN DIOXIDE (NO_2)	ATTAINMENT
CARBON MONOXIDE (CO)	ATTAINMENT
SULFUR DIOXIDE (SO_2)	ATTAINMENT
RESPIRABLE PARTICULATE MATTER (PM_{10})	NONATTAINMENT
FINE PARTICULATE MATTER ($PM_{2.5}$)	UNCLASSIFIED
LEAD (PB)[2]	ATTAINMENT
SULFATES (SO_4)	ATTAINMENT
HYDROGEN SULFIDE (H_2S)	UNCLASSIFIED
VINYL CHLORIDE[2]	UNCLASSIFIED
VISIBILITY-REDUCING PARTICLES	UNCLASSIFIED

CLIMATE CHANGE

During the last several decades, an overwhelming body of scientific evidence has demonstrated that human activity is altering the Earth's climate by increasing the concentration of greenhouse gases in the atmosphere. Climate change poses significant risks for, and may already be affecting, human and natural systems, including coastal infrastructure, human health, energy sources, agriculture and freshwater resources.[17] Human activities, such as the use of fossil fuels, industrial processes, and land use changes, have increased the amount of greenhouse gases in the atmosphere, intensified the greenhouse effect, and caused changes to the climate. Since the Industrial Revolution, greenhouse gas concentrations have risen 40% in the Earth's atmosphere and are at a level unequaled during the last 800,000 years. Higher concentrations of greenhouse gases trap additional energy in the atmosphere, resulting in more rapid warming. During the last century, the global average temperature rose 1.4°F with significant variation across the planet.[18] In California, average temperatures rose 2.1°F between 1915 and 2000.

From 2005 to 2010, greenhouse gas emissions in Coachella rose. Metered electricity and natural gas use, vehicle fuel consumption, and water use all increased. Between 2005 and 2010, greenhouse gas emissions increased from 312,628 metric tons of carbon dioxide equivalent ($MTCO_2e$) to 349,032 $MTCO_2e$, a 12% increase in emissions. Greenhouse gas emissions from the transportation sector accounted for 180,078 $MTCO_2e$, or 51% of all community emissions. Emissions per person in Coachella were 8.7 $MTCO_2e$ in 2010. 2010 per capita emissions were down from the 2005 emissions of 10.5 $MTCO_2e$ per person. Similar to person emissions, per service population emissions fell from 8.5 $MTCO_2e$ in 2005 to 7.6 $MTCO_2e$ in 2010.[19]

[17] National Research Council, 2010. Advancing the Science of Climate Change. Washington, DC: The National Academies Press.
[18] Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson (eds.), 2009. Global Climate Change Impacts in the United States.
[19] Service population is defined as population (residents) plus employment (jobs).

Table 3-8: Community Greenhouse Gas Emissions (2005-2010)

COMMUNITY-WIDE GREENHOUSE GAS EMISSIONS	2005	2010
AGRICULTURE	N/A	8,844
COMMERCIAL, INDUSTRIAL, & PUBLIC	78,128	72,294
LIGHTING INFRASTRUCTURE	492	730
RESIDENTIAL	51,662	65,357
SOLID WASTE	15,747	10,960
TRANSPORTATION	152,528	180,078
WATER	11,960	17,693
TOTAL EMISSIONS	312,628	355,956
POPULATION, EMPLOYMENT, AND PER CAPITA AND PER SERVICE AREA EMISSIONS		
POPULATION	29,754	40,704
EMPLOYMENT	7,213	5,831
SERVICE AREA POPULATION (POP + EMP)	36,967	46,535
EMISSIONS PER CAPITA ($MTCO_2E$/POP)	10.5	8.7
EMISSIONS PER SERVICE POPULATION ($MTCO_2E$/SP)	8.5	7.6

1 Activity data includes a range of information, including annual metered electricity use, fuel consumption by type, solid waste production, and vehicle miles travelled. Emissions factors are used to convert activity data into greenhouse gas emissions quantities.

2 The water sector uses both electricity and natural gas to collect, convey, treat, and deliver water to users, and then it uses additional energy to collect, treat, and dispose of the resulting wastewater. This embedded energy yields both direct and indirect greenhouse gas emissions.

3 Totals may be slightly off due to rounding.

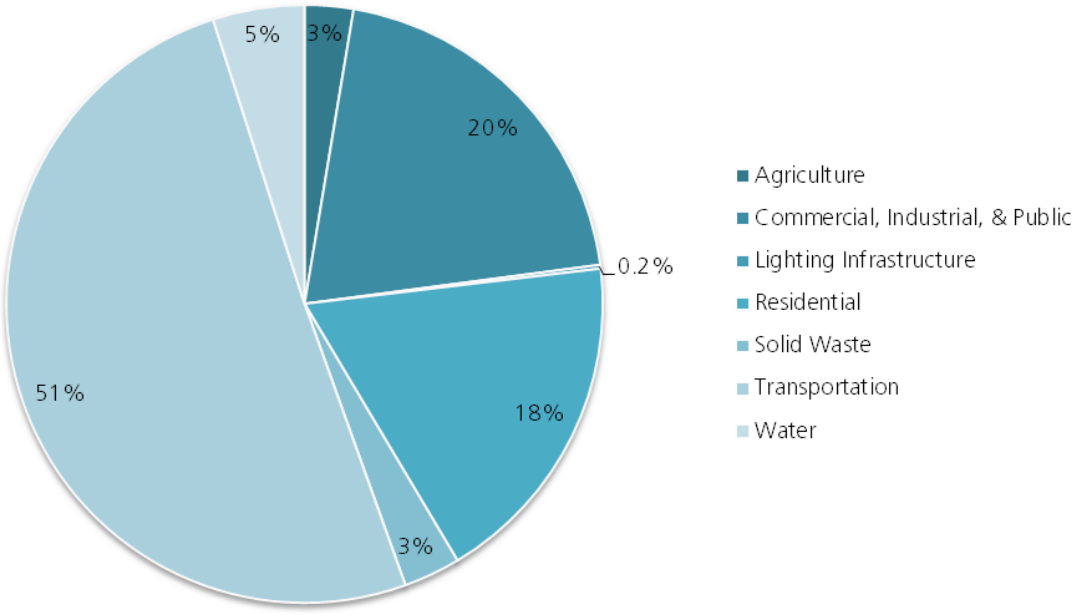


Figure 3-5: Community Emissions Summary by Sector in 2010

AGRICULTURE

California is the leading agriculture-producing state in the nation, and Riverside County is the leading agriculture-producing county in Southern California. In 2002, Riverside County sold $1,008,273,000 in agricultural products. Of that total, $268,873,000 was from sale of fruits, nuts and berries. These are the primary types of crops grown in Coachella.[20,21]

As part of Riverside County, the City of Coachella's agricultural lands are a key aspect of the county and City's character. Preservation of agriculture is considered integral to the City's future. As shown by Figure 3-, agricultural land is one of the predominant land uses within Coachella, covering approximately 40 percent (21,840 acres) of the City's planning area. Approximately 17 percent (3,800 acres) of the total agricultural land within the planning area is located within the City's incorporated area. Most of the agricultural land is located in the unincorporated areas (18,040 acres) (Coachella, 1998). The City of Coachella contained 3,405 acres of land with existing agricultural operations in 2011.

Coachella's multiple field crops result in year-round harvesting. Some examples include mature date palm groves, citrus groves and vineyards, which are considered of high value from both their annual

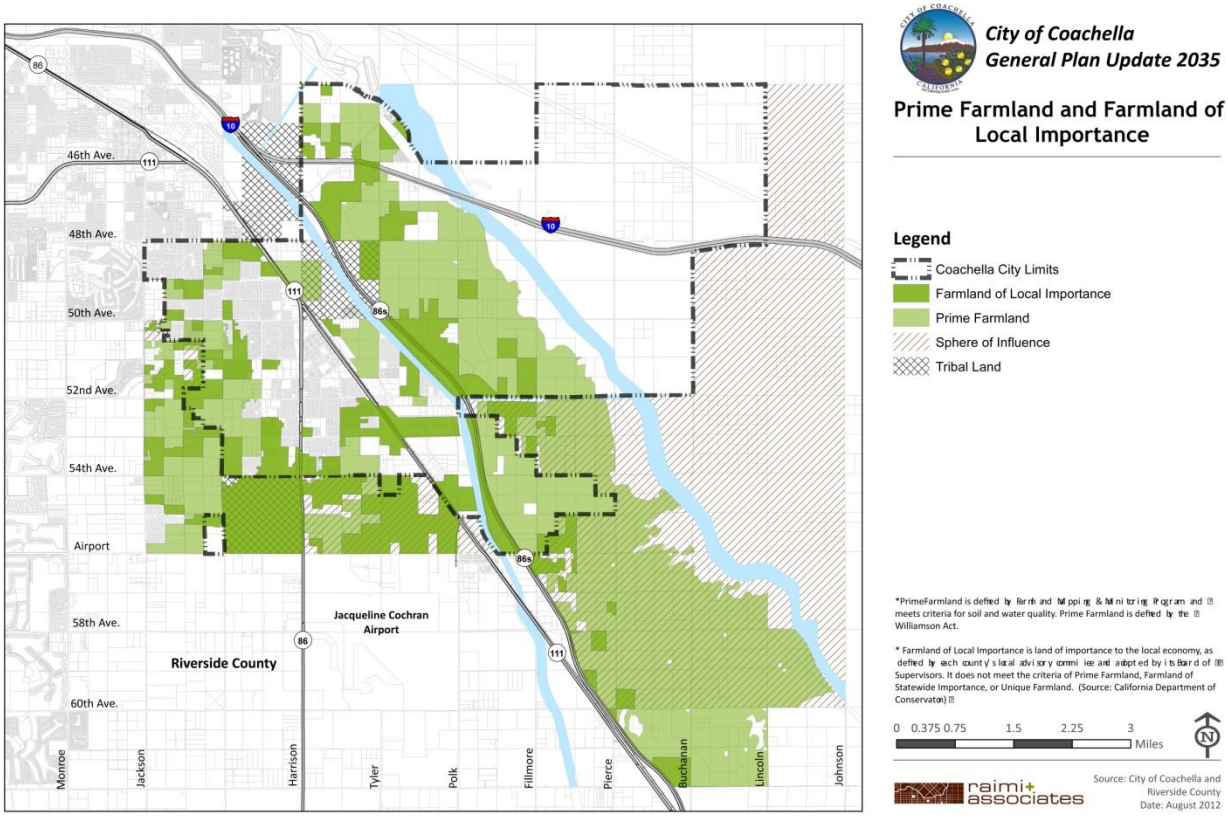


Figure 3-6: Prime Farmland and Farmland of Local Importance

[20] United States Department of Agriculture, Census of Agriculture, http://www.agcensus.usda.gov/Publications/2002/County_Profiles/California/index.asp, Accessed September 22, 2008.
[21] City of Coachella. City of Coachella General Plan 2020, 1998.

sales and revenues and from an open space and aesthetic perspective. However, Coachella has experienced a significant loss in farmland that continues as urbanization spreads.

WATER RESOURCES

Water resources within the City and the surrounding area have historically been at the center of all activity public and private, economic and domestic. Agricultural-based industry began early in the 20th century and continues today. In those early days, artesian water was plentiful and tapping into those natural reserves was as easy as drilling a private well on one's own property. With the draw on resources thanks to increased population and the growth of agriculture, water resources began to diminish, eventually to the point that natural flowing artesian wells stopped producing. In 1918, the Coachella Water District was formed in order to protect remaining water resources through management and replenishment. Additional information on regional geology can be found in Appendix B, Safety Element Technical Background Report.

Even with managed water resources, groundwater levels continued to fall as population and agricultural operations expanded to meet market demands for agricultural products. Not until 1949, when Colorado River water was introduced into the Valley via the Coachella Canal, did groundwater levels begin to stabilize. Overdraft of local groundwater began again in the 1980s as scale and population overtook the holding capacity of the water tables and the carrying capacity of the Coachella Canal. In 2009, the pilot Dike 4 recharge facility was replaced by the Thomas E. Levy Groundwater Replenishment Facility. Since 2009, average groundwater levels in 200 wells that CVWD monitors in the East Whitewater River Subbasin Area of Benefit, which includes the City of Coachella, have increased 26 feet. Artesian conditions have also returned to a large portion of this area of benefit.

The local groundwater basin encompasses most of the Coachella Valley from the San Gorgonio Pass to the Salton Sea and has been subdivided by the Department of Water Resources (DWR) and U.S. Geological Survey into four interrelated water-bearing sub-basins which are delineated by fault barriers that restrict the lateral movement of groundwater. Specifically, the planning area lies within the Whitewater River (or Indio) sub-basin that encompasses approximately 400 square miles and extends one mile west of the intersection of State Highway 111 and Interstate 10 to the Salton Sea. Coachella is located within the Thermal Subarea of the Whitewater Sub-basin and it is noteworthy the lower valley basins, including the Coachella area, are overlain by a layer of clay which blocks the flow of surface water to and from the aquifer. The City uses approximately 5.32 million gallons of water per day (mgd) for all nonagricultural uses including residential, commercial and industrial development. This accounts for only four % of total water usage within the planning area and the existing water supply is adequate to serve existing and future residents.

Within the Coachella Valley, groundwater replenishment through direct precipitation is negligible due to the small amount of annual precipitation. Percolation of water from stream flows, which originate in the adjacent mountain areas, serves as the largest natural source of groundwater replenishment in the Lower Coachella Valley. These stream flows develop from rain and snowmelt and are transported to the Lower Coachella Valley, including the project area, primarily by the Whitewater River/**Coachella Valley**

Stormwater Channel and surrounding canyons. In addition to these naturally occurring drainages, percolation from the Coachella serves as another source of groundwater replenishment. Additional information on Seismic Hazards can be found in Appendix B, Safety Element Technical Background Report.

WATER QUALITY

The source of potable water for the City of Coachella is the Coachella Valley Groundwater Basin. The City's groundwater supplies are chlorinated before to distribution. Other treatment processes are not necessary to meet the State's primary drinking water standards. Furthermore, well water is routinely monitored to ensure continued compliance with applicable standards.

According to the EPA Safe Drinking Water Information, Coachella has had five monitoring and reporting violations in the last 10 years, since 2000. Although having any violations is a concern, this is in fact a good record, as the EPA indicates that in 2005, the last fiscal year for which the EPA has complete data, 24% of all water purveyors had a reporting/monitoring violation, 6.1% reported a MCL violation, and 1.5% reported a treatment technique violation. During the same period, the Coachella Valley Water District has had no health violations, or monitoring and reporting violations.

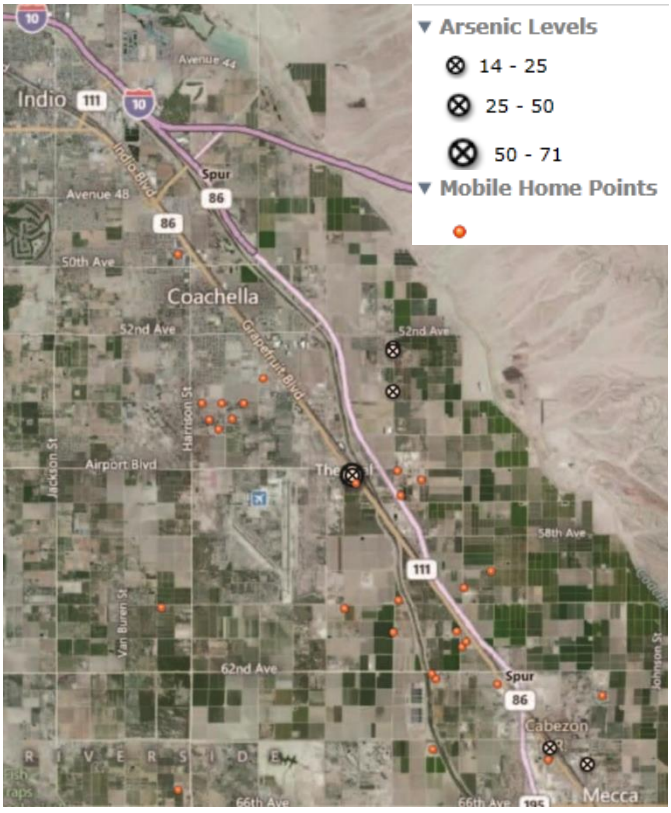


Figure 3-7: Coachella Valley Arsenic Levels Map

Groundwater, recently extracted east of the Coachella Valley Storm Channel, reported elevated levels of fluoride. A high level of arsenic in the water supply is an area concern for residents of the Coachella Valley, as well. The EPA set the arsenic standard for drinking water at 10 parts per billion, and several areas in the Coachella Valley exceed that standard. Figure 3-7: Coachella Valley Arsenic Levels Map shows arsenic levels that exceed the EPA standard around the City of Coachella. Some of the mobile home parks in the vicinity are near or at areas with unsafe levels of arsenic. Concentrations of naturally occurring arsenic have been detected in several wells in the Coachella Valley at levels above the state-adopted Maximum Contaminant Level (MCL) of 10 µg/L. As a result, the Coachella Valley Water District has built and is operating facilities that reduce, via an ion-exchange process, the amount of arsenic present in those municipal water wells that exceed the MCL.

Leaking underground storage tanks (LUSTs) are an additional source groundwater contamination, leaking gasoline compounds and solvents. The State Water Resources Control Board (SWRCB) is the lead regulatory agency in the development of regulations and policy for underground storage tanks. The SWRCB, in cooperation with the Office of Emergency Services, maintains an inventory of LUSTs in a statewide database called GeoTracker. The database lists 37 reported LUST cases in the Coachella area. Of these, 30 sites have been remediated and closed, leaving seven cases still open. Because of the relatively shallow ground water table in several parts of the Coachella area, 15 of the reported leaks

reportedly had an impact on groundwater in aquifers used for drinking purposes, and another 11 impacted aquifers not used for drinking-water purposes.

Perchlorates are substances that are persistent in the environment and that can pose a health hazard, especially to infants and women. Perchlorate in relatively small amounts was detected in the early 2000s in water samples from a few wells in the Coachella Valley, including one in La Quinta, one in Palm Springs, and at least three in the Torres Martinez Indian Reservation. In February and March 2007, the U.S. Geological Survey, in cooperation with the State Water Resources Control Board, sampled 35 wells in the Coachella Valley Study Unit as part of the Groundwater Ambient Monitoring and Assessment (GAMA) Program. Of 35 wells sampled, 12 (34%) were found to contain perchlorate, although in most wells, the concentration of perchlorate was less than 1 µg/L. Only two of the water wells sampled had concentrations above the public health goal of 6.0 µg/L; one in La Quinta (9.0 µg/L), and one southwest of Mecca (6.1 µg/L) (Goldrath et al., 2009).

Other quality issues of special interest in the Coachella Valley that are being monitored, and where necessary, remediated for, include salinity (in the form of high Total Dissolved Solids), chromium-6 (hexavalent chromium), and solvents with carcinogenic properties.

Hexavalent chromium has been detected in hundreds of wells in the Coachella Valley at levels below the 50 µg/L for total chromium established by California in 1977. California's drinking water maximum contaminant level of 10 µg/L became effective July 1, 2014. Groundwater supplied for drinking water throughout many areas of the Coachella Valley, including the City of Coachella, contains naturally-occurring levels of hexavalent chromium above this new standard.

Nitrate and nitrite are nitrogen-oxygen combinations that occur in several organic and inorganic compounds. Nitrates are used extensively in fertilizers and are thus found in agricultural areas and landscaped areas where fertilizers are used extensively. Other sources of nitrates include leaks from septic tanks and leaching fields, along with erosion of natural deposits. Drinking water with high concentrations of nitrates can pose serious health hazards, especially to infants. Nitrate at concentrations above the maximum contaminant level of 10 parts per million (ppm or mg/L) as nitrogen, and 45 ppm as nitrate, has been detected in some wells in the Cove Communities area.

PARKS

Parks and open-space facilities are important resources for maintaining and improving health. In 2012, Coachella maintained approximately 47 acres of parkland spread across seven different parks. The City categorized each park by its size and role within the community.

Table 3-9 describes each municipal park in Coachella. Along with existing parks, Coachella is currently in the process of developing Rancho Las Flores Park, which will add an additional 29 acres of community parkland to the City's inventory.

Table 3-9: Coachella Parks

PARK NAME	TYPE OF PARK	ACRES
BAGDOUMA PARK	Community Park	34
RANCHO LAS FLORES PARK*	Community Park	12
DATELAND PARK	Neighborhood Park	5
DE ORO PARK	Neighborhood Park	4
SIERRA VISTA PARK	Neighborhood Park	2
VETERANS MEMORIAL PARK	Neighborhood Park	1.5
SHADY LANE PARK	Neighborhood Park	1
YA' WE' VICHEM PARK	Pocket Park	0.6
AVE 53 TOT LOT	Pocket Park	0.21

Phase 1 of Rancho Las Flores Park is complete, with future phases planned for future expansion.

PARK ACCESS

Creating new places for physical activity or improving their accessibility can increase the proportion of residents who exercise three times a week by 25 percent. People who live within walking distance (quarter-mile) of a park are 25 percent more likely to meet the minimum weekly exercise recommendation of 30 minutes three times a week. In 2010, approximately 67% of Coachella's residents lived within a half-mile of a community, a neighborhood park or one quarter-mile of a pocket park. Figure 3-8 shows the park service area for municipal parks.

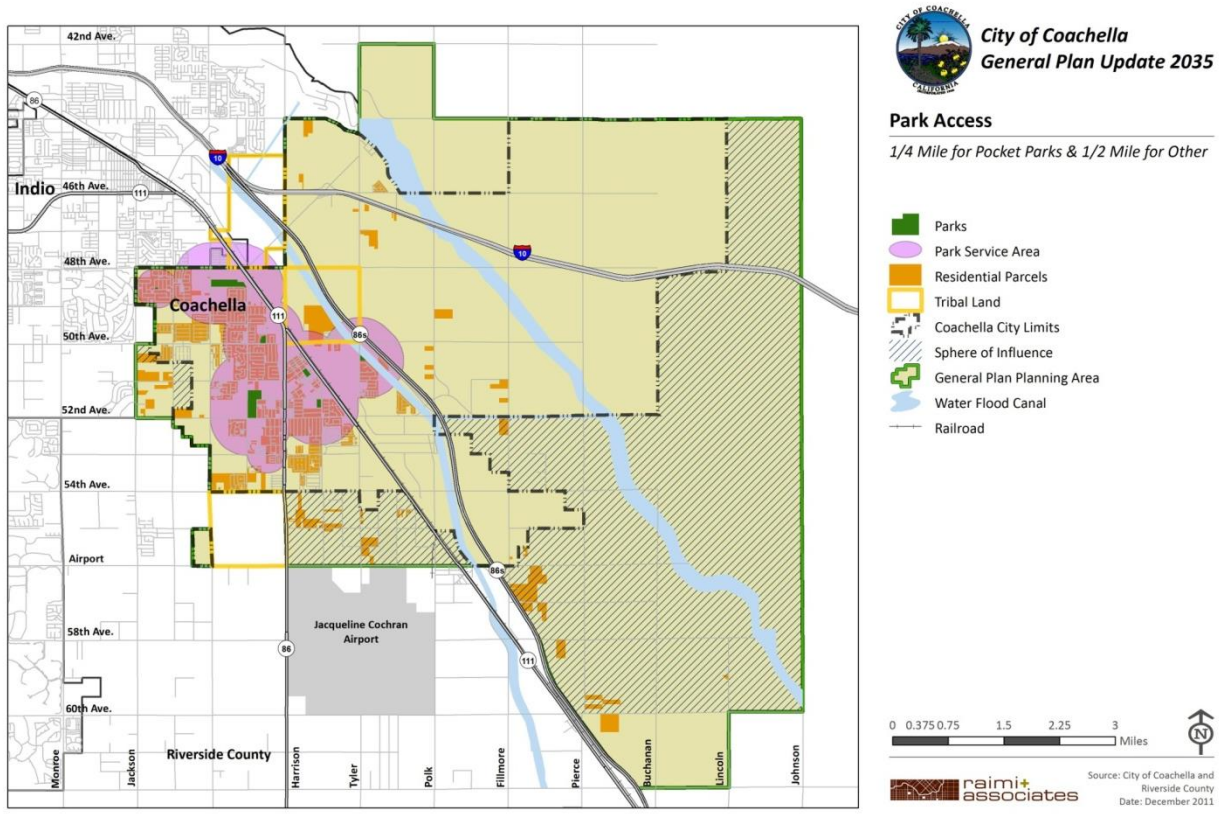


Figure 3-8: Park Service Area

While seemingly a high proportion of residents are near parks, these calculations do not consider barriers that would limit access to Coachella's parks by non-motorized means such as walking and biking. These impediments include crossing highways SR86S and SR111, the water flood canal, streets with posted speed limits above 40 miles per hour, and also include neighborhoods that lack sidewalks or bicycle facilities. Thus, the percentage of residents who can safely walk to a park is lower than what is shown above.

REGIONAL GEOLOGY

The Coachella General Plan area is highly diverse physically and geologically, the result of both the youthful seismic setting of the surrounding region, and the effects of climate. Coachella is located within the eastern portion of the Coachella Valley, defined as a low and relatively flat desert basin bounded by mountainous terrain. The City is located south of the Little San Bernardino Mountains, southeast of the San Gorgonio Pass, east of the San Jacinto and Santa Rosa Mountains, north of the Salton Sea at 68 feet below sea level. Interstate 10 runs the length of the Coachella Valley, connecting the City of Coachella with nearby cities and the Southern California region. Coachella (including its SOI and planning area) is located in a portion of Coachella Valley that ranges in elevation from 1,000 feet in the Mecca Hills to the east, to approximately 160 feet below sea level south of Thermal. However, the majority of the City (including its SOI and planning area) is relatively flat, gently sloping from northwest

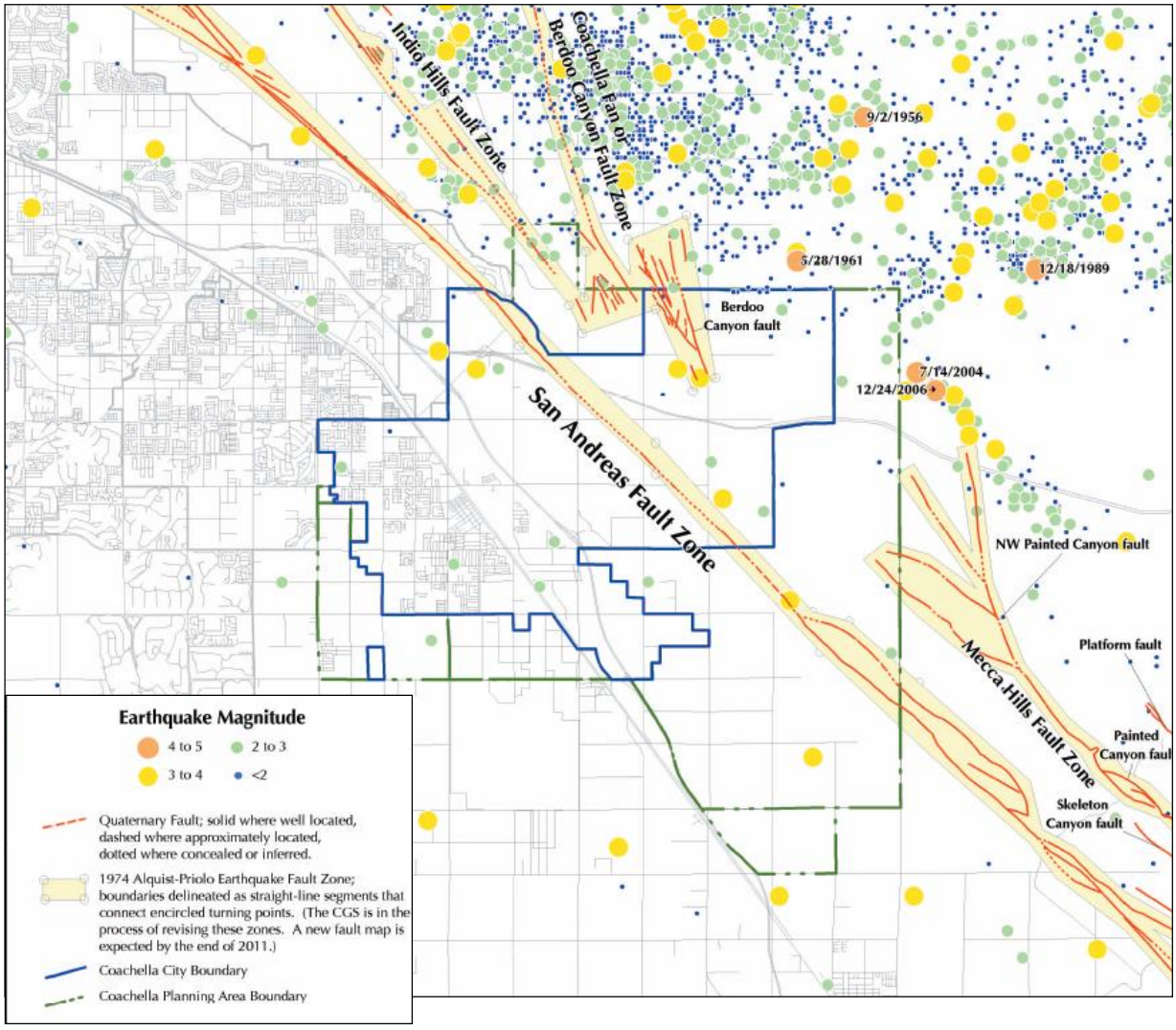
to southeast. Additional information on soils can be found in Appendix B, Safety Element Technical Background Report.

The area is bisected by the Whitewater River/**Coachella Valley Stormwater Channel** and the Coachella Canal, both of which traverse generally northwest to southeast. Major geographic features in the region include the Santa Rosa Mountains to the southwest of the planning area; the Mecca Hills to the south of the City area; and the Indio Hills to the north of the City (including its SOI and planning area). The surrounding mountains range from 3,000 to 9,000 feet, with peaks ranging to over 11,000 feet (San Gorgonio peak). The overall valley gradient is from northwest to the Salton Sea with a current surface of approximately 220-feet below mean sea level. The Coachella Valley is surrounded by the Santa Rosa Mountains (Toro Peak, 8,715 feet) approximately five miles southwest. The north and northeast portion of the valley is defined by the Little San Bernardino Mountains (up to 5,267 feet) approximately two miles to the northeast. There are several natural rock outcroppings in the hillside areas of the east that provide a native desert appearance as viewed from the Valley floor. The northeastern portion of the Study Area contains the alluvial that forms the base of the Joshua Tree National Monument and the San Bernardino Mountains to the north (outside of the Study Area).

SEISMIC HAZARDS

Geologically speaking, the valley portion of Coachella lies at the eastern edge of a broad structural basin known as the Salton Trough (also called the Salton Sink or the Coachella Valley). Over the last million years or so, the Salton Trough has been tectonically subsiding, and filling with sediments eroded from adjacent mountain ranges. The eastern boundary of the basin is formed by the San Andreas fault, a wide zone of multiple fault strands that trends northwesterly through the middle of the General Plan area. The rise of hills in the eastern part of Coachella, as well as mountains to the east and north, are a direct result of movement along the San Andreas fault zone.

Because the San Andreas fault passes through the area, the hazards of primary surface fault rupture and strong ground shaking are very high. For instance, the Coachella segment of the San Andreas fault is thought capable of generating a maximum magnitude 7.2 earthquake. Because this segment has not ruptured since about 1680, scientists estimate there is a high probability it will break in a significant earthquake within the next 30 years. If the entire Southern segment (a much larger section of the fault zone that includes the Coachella segment) ruptured, an earthquake of magnitude 8.0 is conceivable. Although the probability of this earthquake occurring is lower, it is not considered unrealistic and the impact to the Coachella region would be considerably more severe. Furthermore, Coachella is located near several other regional active faults – such as the San Jacinto – that have the potential to cause strong ground shaking in the area. The nearby segments of the San Jacinto fault zone could generate at least a magnitude 6.6 earthquake.



Map prepared by: Earth Consultants International

Figure 3-9: Faults and Historical (1800 - 2011) Seismicity Map

Although an earthquake can be upsetting or terrifying on its own, it is the effect of this shaking on the built environment that can make an earthquake deadly. The interaction between earthquake-induced ground motion and human-made structures is complex; some of the governing factors include the structure's height, construction quality, stiffness, architectural design, condition and age. New advances are reflected in the most recent building codes, thus, newer structures built to these codes are theoretically stronger and more likely to survive an earthquake. However, the main purpose of building codes is to prevent structures from collapsing; significant damage that might cause a structure to be uninhabitable following a large earthquake is possible and permissible. Building codes are also not

retroactive, consequently there are older building types still in existence that do not perform well when shaken.

This is reflected in the HazUS[22] loss estimation analyses conducted for this General Plan Update background investigation, which included two modeled scenarios on the San Andreas fault – one for the Coachella segment earthquake, and one for the larger Southern segment earthquake. For the Coachella segment, the analyses indicate over 24% of the buildings in the Coachella area could be at least moderately damaged[23]. Single-family homes would fare best overall but the models indicate that nearly 86% of residential structures other than single-family homes (that is, multi-family residential buildings, including duplexes, condominiums and apartments) would suffer at least moderate damage, as would nearly half of the industrial, agricultural and commercial structures. About 30% of the school buildings would suffer moderate damage. Higher levels of damage are expected if an earthquake occurs on the entire Southern San Andreas fault, including a significant increase in buildings experiencing extensive or complete damage. Additional information on flood hazards can be found in Appendix B, Safety Element Technical Background Report.

The HazUS analyses predicts that the three hospitals located in the valley north of Coachella (there are no hospitals in the General Plan area) will be less than 20% functional the day an earthquake on the Coachella segment occurs, and completely non-functional immediately after the larger Southern San Andreas earthquake. At the same time, the model predicts hundreds of people in the region will require medical attention. Therefore it is essential that alternate medical providers, both within and outside of Coachella, be identified.

The models indicate the potable water, wastewater and natural gas systems in Coachella will experience moderate damage from the Coachella segment earthquake, and severe damage if an earthquake occurs on the entire Southern San Andreas. In the worse-case scenario, pipelines will have thousands of leaks and breaks, essentially destroying the water distribution system. Coachella households may be without potable water for a minimum of three months, and in some areas, for six months or longer.

Most of the local transportation system is expected to perform relatively well during the Coachella segment earthquake, except where structures, such as Interstate 10, Dillon Road, and the Coachella Canal cross, the fault. Primary displacement along the fault trace and secondary displacement due to ground movement is likely to be high, not only affecting transportation, but also severing or displacing buried utilities. Displacement of the Coachella Canal could result in flooding and loss of water resources. An earthquake on the Southern segment could additionally result in moderate to complete damage to 17 of the 21 bridges in the General Plan area. Damage to roads, bridges, highways and rail lines both north and south of Coachella will also hinder response and recovery activities immediately and for some time after the earthquake.

[22] HazUS (short for Hazards United States) is a methodology developed by the National Institute of Building Sciences with funding from the Federal Emergency Management Agency (FEMA) to make standardized loss estimates at a regional scale resulting from earthquakes, floods, or hurricanes. HazUS addresses nearly all aspects of the built environment and is used in planning for disaster loss mitigation, and emergency preparedness, response and recovery.

[23] [2]The definition of moderate damage varies by building type. For mobile homes, moderate damage means that the structure suffered major movement over its supports, resulting in damage to metal siding and stairs, and requiring resetting of the mobile home on its supports. For precast concrete tilt-up buildings, moderate damage means that most wall surfaces exhibit diagonal cracks; larger cracks in walls with doors or window openings; few shear walls exceeded their yield capacities as indicated by larger diagonal cracks and concrete spalling. Some walls may have visibly pulled away from the roof. Some welded panel connections may have been broken, as indicated by spalled concrete around the connections.

SOILS

Seismic shaking can also cause various types of ground deformation; liquefaction and slope failure are the most destructive of these. When liquefaction occurs, the soils that liquefy lose the ability to support structures; buildings may sink or tilt, with the potential for extensive structural damage. The valley portion of Coachella, west of the Whitewater River/**Coachella Valley Stormwater Channel**, is underlain by soils that could liquefy during an earthquake.

Seismic shaking can cause loose, geologically young deposits to become more tightly packed, resulting in a reduction of the soil column, and differential settlement at the ground surface. Areas at or near the contact between alluvium and bedrock, or at the contact between artificial fill and natural soils, can be susceptible to seismically induced differential settlement. The valley portion of Coachella is underlain by unconsolidated, young alluvial deposits and artificial fill that may be susceptible to this hazard. Deformation may also occur in alluvial-filled drainages within the hills, although the losses associated with this kind of failure are anticipated to be small and geotechnical measures implemented during development of the area can mitigate this hazard. The unconsolidated sediments are also potentially compressible and/or collapsible.

Topographically, the eastern part of Coachella encompasses low rounded hills. The hills of Coachella are currently in a natural state but proposed development is expanding eastward and will eventually reach these areas. Future developments that encroach up to the base, or within the hills, will be exposed to potential slope instability. Most slope damage in the region is likely to occur as a result of earthquake-induced shaking or during periods of exceptional and/or prolonged rainfall. Slope damage in this area typically consists of shallow failures involving the surficial soils, uppermost weathered bedrock and mud or debris flows. Seismically induced slope failures can occur in the moderately steep hills and low mountains in the General Plan area, especially in the Mecca Hills where tectonic deformation and geologically weak clays are present. Grading cuts into these hills could also trigger slope failures and may require remediation during construction. The more gently sloping hills that occupy most of the hillside area are generally more stable, but highly susceptible to erosion. Ridgetop shattering may occur locally in the hills and mountains and near Coachella.

Seiches can occur in bodies of water both near and far from the earthquake epicenter. Given that there are canals, ponds and pools in the Coachella area, seiches as a result of ground shaking can be expected to occur in the region. The amplitude of these waves cannot be predicted but these are typically less than about 0.5 m (1.6 feet). Property owners down-gradient from these bodies of water should be aware of the potential hazard to their property. Given its distance from the ocean, Coachella does not have a tsunami hazard.

Sedimentary units in the Coachella area are a mix of water-transported (alluvial) sand, silt, clay, gravel derived from erosion of the adjacent hills and mountains and very fine-grained ancient lake deposits. Very young, unconsolidated alluvial sediments line the drainage courses. Consequently, the expansion characteristics of the soils are highly variable. Fine-grained soils, such as clays and silts, in the Coachella area are potentially expansive. The sediments in the valley areas are generally corrosive to metallic objects such as pipelines if these come in direct contact with the soils.

The results of studies evaluating the potential for regional subsidence within the Coachella General Plan boundary are unclear. Significant subsidence has been documented in other parts of the valley (Palm Desert, Indian Wells and La Quinta), where the subsidence and associated ground fissuring have been attributed to groundwater withdrawal. Recognizing that significant subsidence in the area could pose a major environmental constraint, several agencies, including the U.S. Geological Survey, the Coachella

Valley Water District and the City of Coachella, are currently devoting resources to the study and mitigation of this potential hazard. Additional information on hazardous materials can be found in Appendix B, Safety Element Technical Background Report.

Unconsolidated sediments in drainage bottoms and the valley floor, as well as the granular semi-consolidated sediments forming the hills, are generally susceptible to erosion. Because much of the runoff travels through the area in natural washes and gullies, and by sheet flow, sedimentation is locally a hazard. Natural erosion processes are often accelerated by man's activities, including the removal of protective vegetation, modification of natural drainage patterns and construction of slopes that may be more susceptible to erosion than the natural slope conditions. Development also reduces the surface area available for infiltration, leading to increased flooding, erosion and downstream sedimentation.

FLOOD HAZARDS

Floods are natural and recurrent events that generally do not pose a hazard when they occur in an undeveloped area; it is only when floods interact with the built environment, typically in the form of structures built on the floodplain, where they obstruct floodwaters, that they become hazardous. Unfortunately, as development in floodplains has increased, the average annual losses due to flooding have also steadily increased.

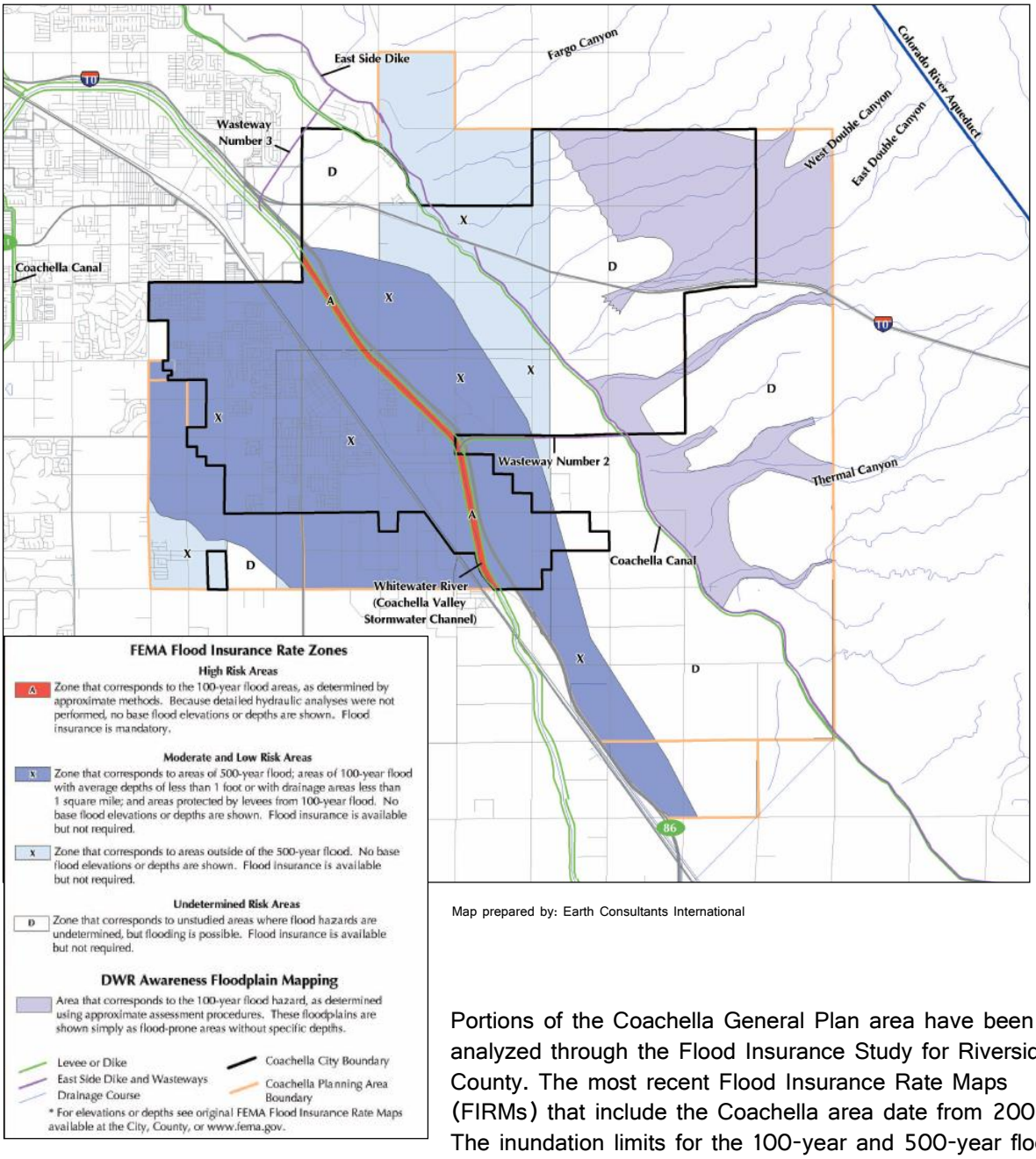
Southern California typically has mild winters and warm, dry summers as a result of a high-pressure area over the eastern Pacific Ocean that deflects storms to the north. However, during the winter months, this high-pressure area can break down, allowing the jet stream to move storms along a more southerly track. If the northern jet stream taps into the sub-tropical jet stream and then veers into southern California, rainfall totals in the region can increase dramatically. El Niño events can also result in increased rainfall in the area and summer monsoons occasionally cause severe weather in July and August. Although Coachella receives on average about three inches of rain a year, actual numbers can vary substantially from year to year.

Runoff totals in the area are also controlled by topography. Coachella is located in the lower part of the Whitewater River basin, a regional watershed covering more than 1,000 square miles. The San Jacinto and San Bernardino Mountains capture a significant portion of the precipitation from strong Pacific storms that pass through, such that average rainfall in the San Jacinto Mountains is more than eight times that in the Coachella Valley (25 inches instead of the average three inches in Coachella). The steep mountain slopes and relatively impermeable bedrock means that most of this precipitation becomes runoff that eventually makes it way to the Whitewater River and its tributaries. Consequently, this drainage can convey substantial discharges even if little rain falls on the valleys floors.

There are two distinct flood sources in the Coachella Valley: 1) the Whitewater River and its tributaries upstream from the valley, and 2) the streams entering the valley from the mountain ranges flanking the northeast and southwest sides of the valley. The Whitewater River is the largest drainage course in the area. Collecting runoff from the slopes and canyons of the San Bernardino and San Jacinto Mountains, the river emerges from the mountains near the southern entrance to the San Gorgonio Pass, where it joins and captures the San Gorgonio River, and near Palm Springs, Taquitz Creek.

Although one of the Coachella Valley Water District goals is to safely convey floodwaters from the mountains across the valley to the Salton Sea, rain that falls directly on the valley is the responsibility of the local cities or the county. Currently, there is not a permanent, interconnected flood control system

in the General Plan area, nor does the City or county have a comprehensive master drainage plan. Most stormwater passes through Coachella as surface flow (there are very few underground structures such as storm drains) and existing local structures are not tied to the Coachella Valley Stormwater Channel. As a consequence, the City has periodic local flooding in the downtown area. Streets in the older part of the city have very slow drainage, causing water to pond for days after a storm.



Map prepared by: Earth Consultants International

Figure 3-10: Flood Hazards

Portions of the Coachella General Plan area have been analyzed through the Flood Insurance Study for Riverside County. The most recent Flood Insurance Rate Maps (FIRMs) that include the Coachella area date from 2008. The inundation limits for the 100-year and 500-year floods are shown on these FIRMs; however it is important to note that not all of the General Plan area was evaluated and the flood zones are incomplete in the eastern part of the area. Thus, there are areas outside of the mapped flood zones that could be affected by flooding. It should be noted that FEMA is evaluating

different technical approaches for modeling flood hazards in the vicinity of levees. As a result, the Coachella Valley Water District has put on hold an approved Comprehensive Study of the Stormwater Channel from Indio to the Salton Sea, pending policy changes in FEMA's flood zone mapping. When studies by these agencies are completed, it is likely the FEMA maps covering the Coachella area will be revised. Furthermore, in an attempt to fill in gaps in FEMA's mapping in the state, the California Department of Water Resources has mapped the 100-years flood in portions of the eastern area, using approximate methods. This mapping is broad-based and general, therefore useful only as a starting point by local agencies for mandating more detailed studies when developments are proposed in those areas. Refer to Figure 3-10: Flood Hazards for more information about the extent of flood hazards in the Planning Area.

The City of Coachella and Riverside County have participated as regular members in the National Flood Insurance Program (NFIP) since 1980. Coachella's most current effective FIRM maps are dated August 2008; however maps and flood elevations are amended periodically to reflect changes. Because the City and county are participating members of the NFIP, flood insurance is available to any property owner in the Coachella General Plan area. In fact, to secure financing to buy, build, or improve structures in a Special Flood Hazard Zone, property owners are required to purchase flood insurance. Lending institutions that are federally regulated, or federally insured, must determine if the structure is located in a SFHZ and must provide written notice requiring flood insurance.

Seismically induced **inundation** refers to flooding that occurs when water retention structures, such as dams or levees, fail due to an earthquake. There are no existing dams with the potential to inundate Coachella. However, local flooding resulting from the potential failure of the Coachella Valley Stormwater Channel levees, the Eastside Dike, or the Coachella Canal remains a risk for the people of Coachella. The channel's levee system, or the canal, could be affected by a severe earthquake, with the potential for the foundation soils to fail as a result of lateral spreading. Liquefaction and lateral spreading damaged several levees in the Imperial Valley during earthquakes in 1979 and 1987, and more recently, as a result of the Easter Sunday (Sierra El Mayor-Cucapah) earthquake of 2010. Field reconnaissance of the Imperial Valley canals following the 2010 earthquake showed that there was significant slumping and lateral spreading along the canals, although none of them failed. However, this damage was the result of an earthquake many miles to the south causing shaking-induced lateral spreading. The canals in the General Plan area could be damaged by strong ground shaking, ground deformation and surface fault rupture.

Within the General Plan area, the Coachella Canal is especially vulnerable to primary fault rupture, as its alignment nearly coincides with the trace of the San Andreas fault – a condition considerably more severe than a high-angle fault crossing. The 2008 ShakeOut Scenario by the U.S. Geological Survey estimates that rupture by offset of the canal would likely occur in at least three places, resulting in flooding of valley areas to the southwest. Immediate offset could be on the order of 7.2 to 15.7 feet, with an additional afterslip of 5.9 to 10.8 feet, which is likely to hamper repairs of the damaged canal. In anticipation of a major earthquake, the Coachella Valley Water District has a comprehensive Emergency Response Plan in place that includes the canal system. They have also participated in Shakeout drills that include simulated earthquake damage and practiced response to a break in the canal. There are however, currently no engineering analyses that include potential inundation mapping of the levees and canals in the Coachella area.

Inundation in a smaller scale can also occur if an above-ground water storage tank suffers damage as a result of ground shaking, releasing the water. Flexible joints at the inlet/outlet connections, in addition to bracing and baffling, can help mitigate the damage resulting from water sloshing inside the tank. The City of Coachella has three above-ground water reservoirs in the General Plan area. The newest tank,

located at Well 18, is the only one constructed to current seismic standards. However, all tanks have isolation valves. The only above-ground reservoir in the Coachella General Plan area, owned by the Coachella Valley Water District, is located in their Coachella yard. It is an older tank that has not been retrofitted. The District is evaluating whether to upgrade or demolish the facility. Maintaining the structural integrity of these water tanks during an earthquake is important not only to prevent flooding and provide water to residents but also to fight any fires that may occur as a result of the earthquake.

FIRE HAZARDS

Wildfires are a necessary part of the natural ecosystem in southern California, but they become a hazard when they extend out of control into developed areas, with a loss of property, and sometimes, unfortunately, injuries or deaths. The wildfire risk in the United States has increased in the last few decades with the encroachment of residences and other structures into the wildland environment and the increasingly larger number of people living and playing in wildland areas.

The valley portion of Coachella is located in the Colorado Desert section of the Southeastern Deserts Bioregion, while the hilly, far eastern section of the planning area is a small outlier of the South Coast Bioregion. The Deserts Bioregion is characterized by isolated mountain ranges separated by broad basins blanketed with alluvial fan, dune and playa deposits. In its native state, the Colorado Desert section is characterized by low- to mid-size riparian vegetation, with desert scrub being the predominant vegetation. In Coachella, however, most of the acreage within the Colorado Desert section is no longer in a natural state, as the native cover has been replaced by crops and urban development, or has been altered to varying degrees by road construction, introduction of invasive plant species and other stressors.

In the past 40 years, several different but related fire hazard assessment and classification systems have been developed at the local, state and federal level for the purpose of quantifying the severity of a fire hazard in a given area. The State Responsibility Areas system was developed and implemented by the California Department of Forestry and Fire Protection to rank fire hazards in California as moderate, high or very high based primarily on fuel types. There are no State Responsibility Areas in the Coachella General Plan area. However, there are several sections classified as Federal Responsibility Areas with a moderate fire hazard, and a small section in the far northeastern corner of the planning area is considered to have a high fire hazard. Most of the hillsides in the eastern and northeastern half of Coachella are located within a Local Responsibility Area (LRAs) with a moderate fire hazard. The developed areas in the valley floor do not have a wildfire hazard. Under the California Plan, most of the Coachella planning area east of the Coachella Canal is mapped having a moderate fuel rank and potential fire behavior, with isolated pockets of high fuel rank potential fire behavior.

HAZARDOUS MATERIALS

Hazardous materials are used every day in industrial, commercial, medical and residential applications. The primary concern associated with a hazardous materials release is the short- and/or long-term

effect to the public from exposure to these substances. Compared to other cities in southern California, Coachella has a relatively low number of sites that generate, use or store hazardous materials.

According to the Environmental Protection Agency (EPA), there are no Superfund sites in the Coachella General Plan area. There is one facility in Coachella listed in the most recent Toxics Release Inventory database released to the public on December 2010 with data for the year 2009. This TRI facility is the ARMTEC Defense Products Company, an ordnance and accessories manufacturer. As of May 10, 2011, there were 21 locations in Coachella study area reported as small-quantity generators, and three as large-quantity generators. Two of the small-quantity generators are listed as "conditionally exempt." The Foster-Gardner site, a company that previously manufactured pesticides, is included in the Cortese list. There are no registered transporters of hazardous waste in the City; however, hazardous materials are transported through the City, both by truck and rail. Refer to Figure 3- for an illustration of the location of known sites in the City.3

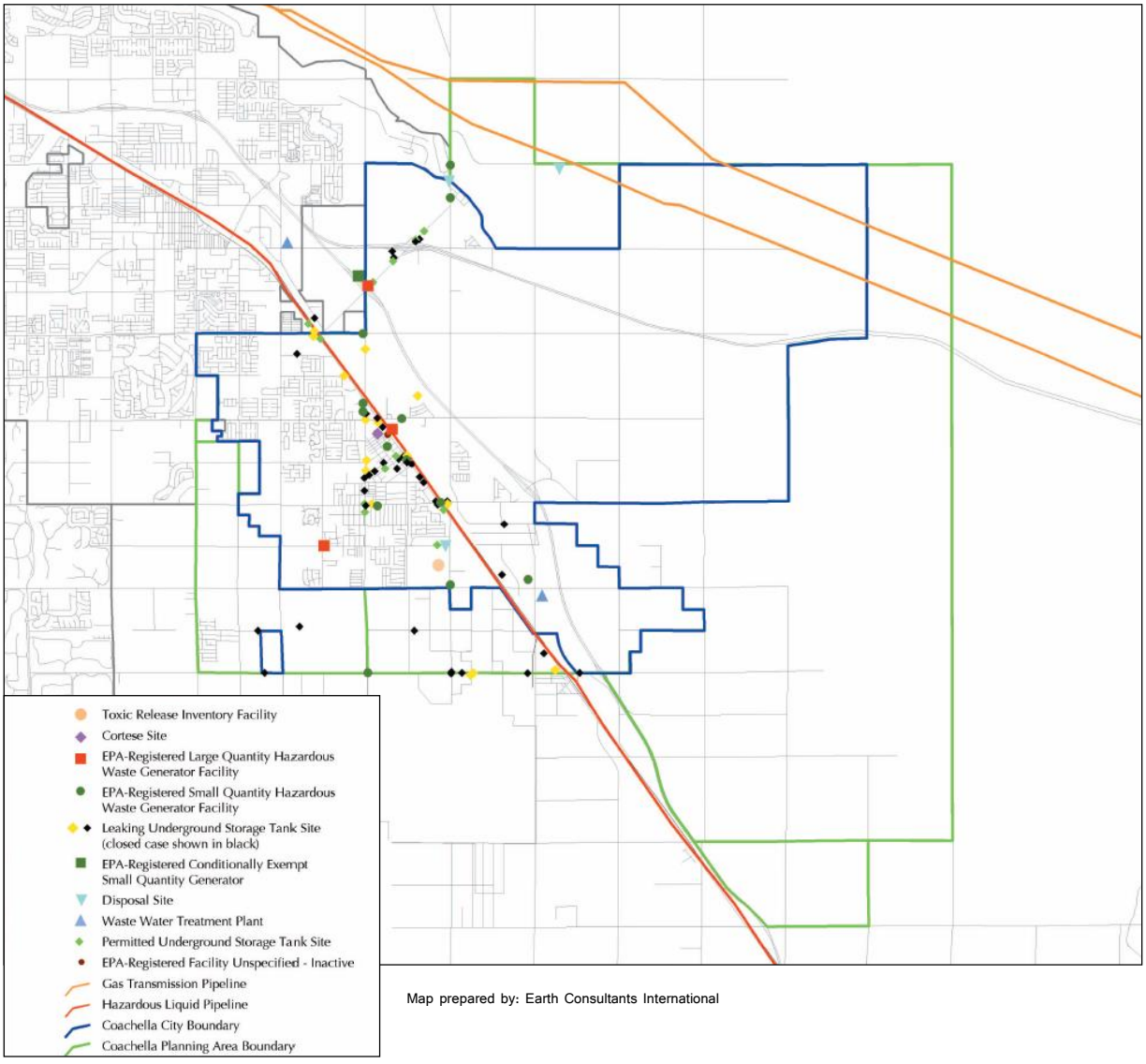


Figure 3-11: Hazardous Materials Sites