Appendix 2-1 Existing Conditions Reports

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Biological Resources

Existing Conditions Report

June 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Introduction

For much of the City, biological resources are associated with landscaping, vacant parcels, and parks. For the rural-suburban periphery however, the City has habitat that must be considered if development is proposed. This difference between the urban City core and the rural-suburban edge is important in the consideration of the Conservation Element Update, and future compliance with the California Environmental Quality Act (CEQA).

Key Findings

Provided below are the key findings from this report:

- Conservation areas within the City protect sensitive habitats such as alluvial fan sage scrub, sycamore alluvial woodland, California walnut woodland, and freshwater marsh, providing important habitat and corridors for wildlife, ecosystem services, and recreational resources for the public. As growth and development occur in the city, preservation should remain a priority for sensitive land resources that have significant native vegetation and/or habitat value.
- Several protected plant and animal species are known to occur within the General Plan Area (See Appendix A). Substantial efforts should be made to avoid impacts to these species and their habitats. If impacts to these species or their habitats are unavoidable, professional analysis should be conducted early in the planning process to reduce and mitigate these impacts to the extent possible.
- Urban landscaping such as street trees, public spaces, and parks, can provide important habitat for migratory birds, raptors, and songbirds, as well as enhance the aesthetic of the City. Native species should be incorporated into landscaping whenever possible and consistent with community willdfire protection guidelines.
- Regional connectivity between habitats is essential to the wellbeing of local wildlife. The northern periphery of the City plays an important role in connecting two expansive areas of the Angeles and San Bernardino National Forests. This mountanous area and its associated foothills include corridors, drainages, and open areas attractive to wildlife. Design of future development in the northern portion of the City should consider the regional flow of wildlife and incorporate design measures compliant with current research on wildlife movement.
- The undeveloped Day Creek utililty and flood control open space corridor is likely to facilitate wildlife movement from the mountains to the north of the City through the southern end of the City and may provide at a minimum a throughfare for wildlife but it could provide additional resources.

Project Setting

The General Plan Area is within the U.S. Geological Survey's (USGS's) Mount Baldy, Cucamonga Peak, Devore, Ontario, and Guasti 7.5-minute quadrangles. The City is within and adjacent to the foothills of the eastern end of the San Gabriel Mountains and west of the San Bernardino Mountains (See Figure 1). The City's Sphere of Influence (SOI) directly abuts the San Bernardino National Forest. The topography of the City slopes downward from the foothills in the north into the Santa Ana Watershed. Elevations in the City typically range from 1,018 to 1,600 feet above mean sea level (msl), with the northern edge of the City's SOI at approximately 5,200 feet above msl. North of the SOI, elevations increase to Cucamonga Peak, Bighorn Peak, Ontario Peak, Sugarloaf Peak, and Mount Baldy.

Numerous streams in the Santa Ana Watershed drain from the north into the General Plan Area. The western edge of the General Plan Area runs along Cucamonga Creek. Other creeks flowing through the City include Deer Creek, Day Creek, and Etiwanda Creek (See Figure 2).

Figure 1. Regional Vicinity Map

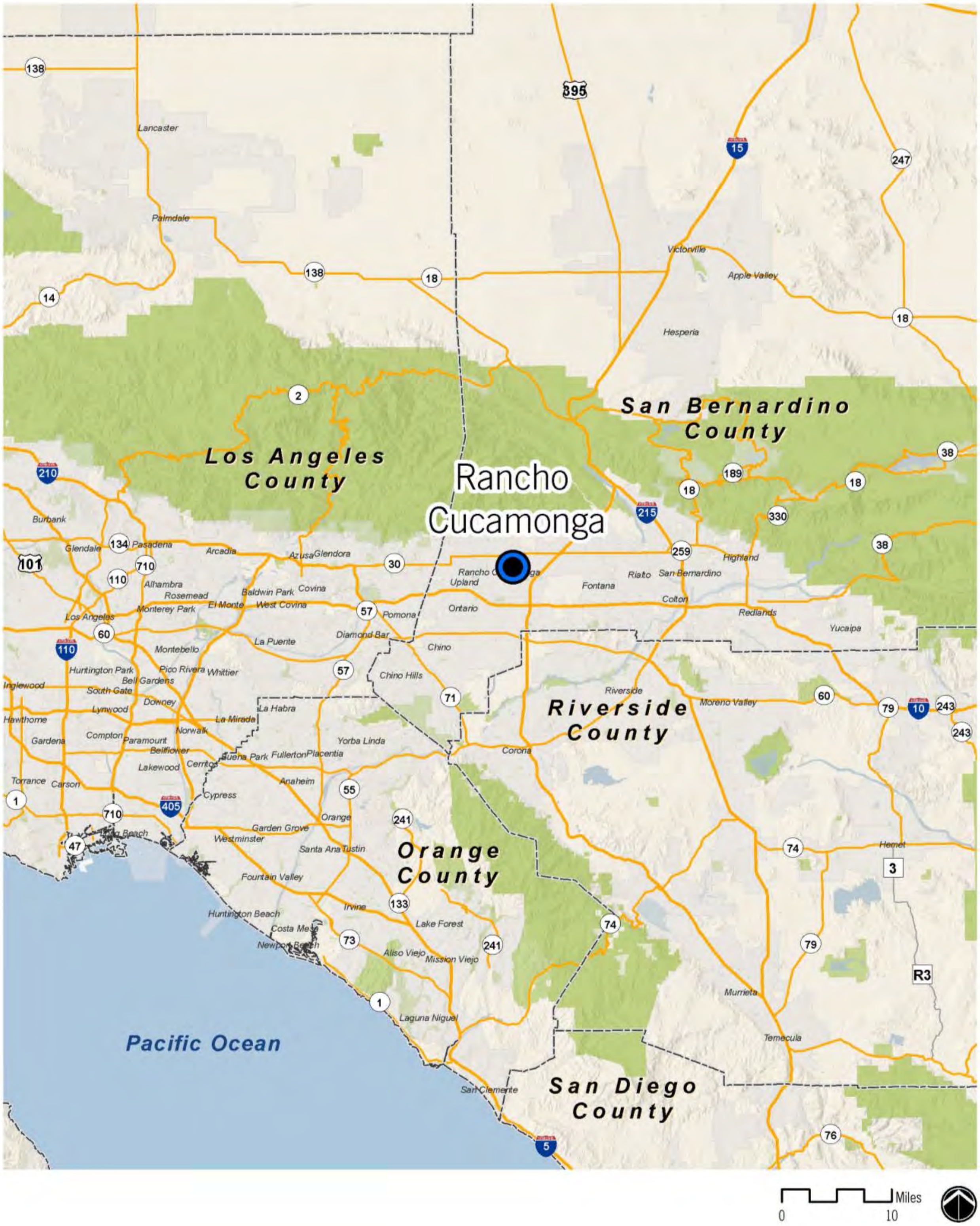
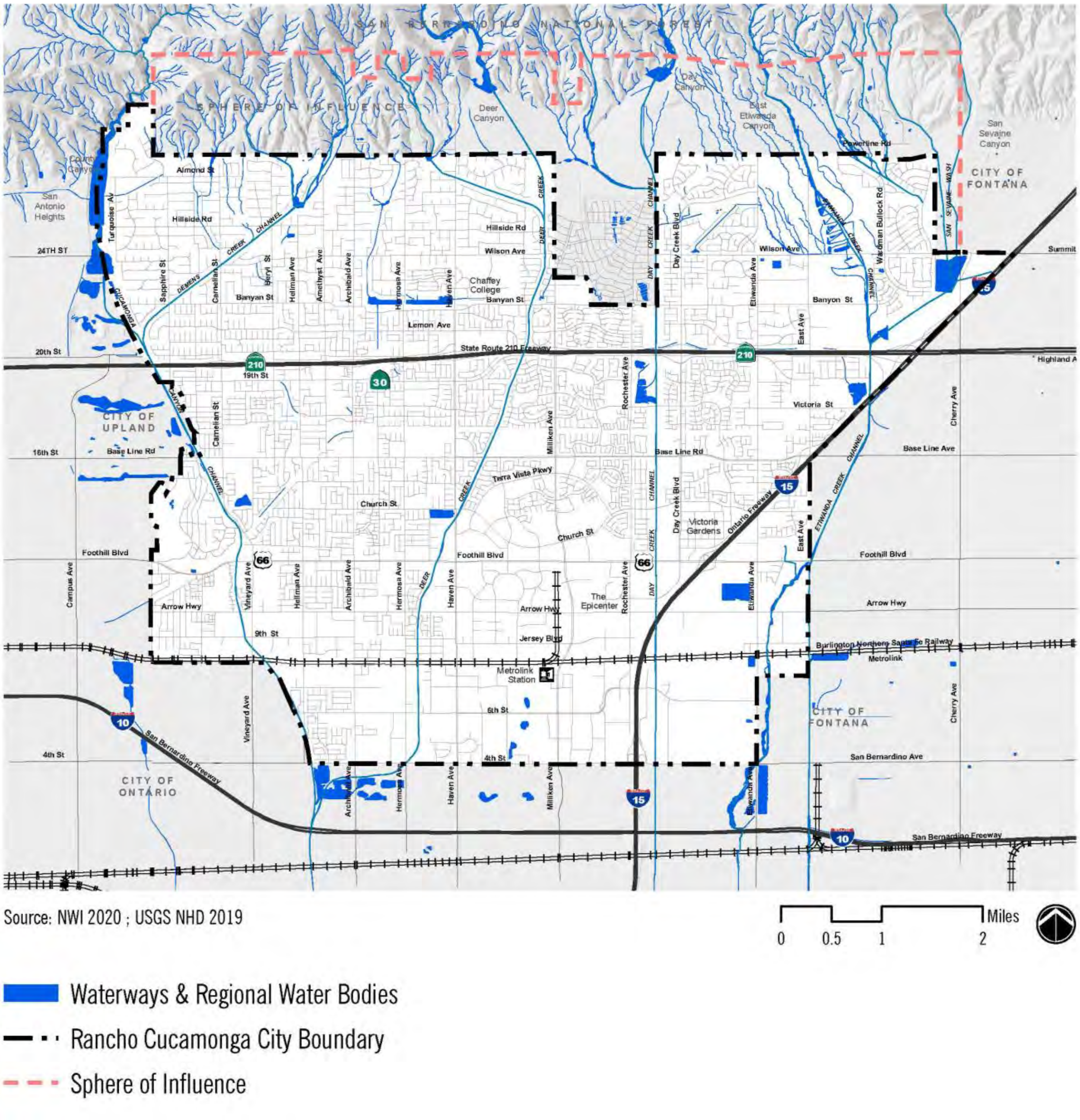


Figure 2. Drainage Map



Source: NWI 2020 ; USGS NHD 2019

Waterways & Regional Water Bodies

Rancho Cucamonga City Boundary

Sphere of Influence

Conservation Areas

As illustrated in Figures 3, four conservation areas with the General Plan area have already been protected from development by the recordation of conservation deed restrictions, some further protected by the preparation and adoption of conservation management plans. These include:

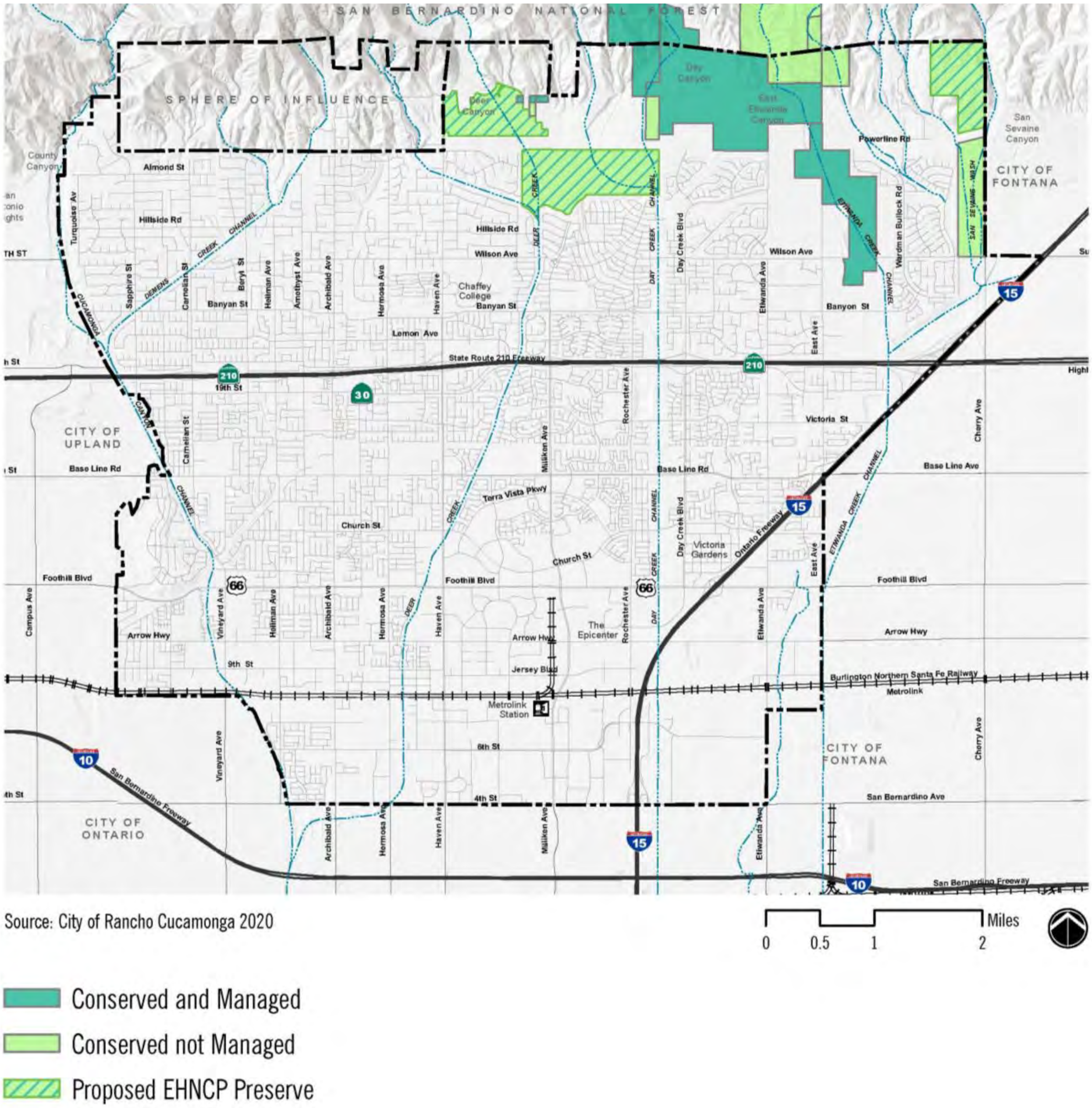
- 760-acre North Etiwanda Preserve
- 137-acre San Sevaine Spreading Grounds
- 880-acre U.S. Forest Service Conservation Area
- 35-acre conservation area purchased as mitigation and set aside through a conservation easement to the San Bernardino County CSA 70 (10/2003)

These conservations areas protect habitats such as alluvial fan sage scrub, sycamore alluvial woodland, California walnut woodland, and freshwater marsh, providing important habitat and corridors for wildlife, ecosystem services, and recreational resources for the public. In total, these areas encompass approximately 1,812 acres of habitat within the General Plan Area and will remain critical to the survival of sensitive species and wildlife occupying these habitats.

As part of the Etiwanda Heights Neighborhood & Conservation Plan (EHNCP), three new conservation areas are proposed, as identified in Figure 3. The intent of this EHNCP is to create a regulatory and management framework for securing, expanding, linking, and managing these areas, and systematically transforming the front country from an area of threatened habitat and rural open space with a few islands of partial conservation, to an area of permanently conserved, well-managed habitat with a few small islands of rural living in harmony with nature. As growth and development occur in the City it will be essential that preservation remains a priority for sensitive land resources that have significant native vegetation and/or habitat value.

Vegetation types within the General Plan Area and the City's SOI include: California sycamore woodland, coast live oak woodland, coast live oak – California sycamore woodland, red will thicket, chaparral, mixed sage scrub, scale broom scrub, alluvial wash, mulefat thickets, grassland, annual brome grassland, ruderal, ornamental, orchard – agriculture, disturbed channel, developed/ornamental, open water.

Figure 3. Conservation Areas Map



Source: City of Rancho Cucamonga 2020

Vegetation Types and Other Areas

The City has several habitat types described below, and shown on Figure 4.

Riparian

Riparian vegetation occurs occurs along the canyon bottoms in the northern portion of the General Plan Area, typically in the City's SOI. This vegetation type includes California sycamore woodland, coast live oak woodland, coast live oak – California sycamore woodland, and red willow thicket.

California sycamore woodland is dominated by western sycamore (*Platanus racemosa*). Scattered sycamores occur downstream in the various drainages and are included in the alluvial wash vegetation type. Cucamonga, Deer, Day, and Etiwanda Creeks were previously documented as containing southern sycamore-alder riparian woodland with a variety of species such as white alder (*Alnus rhombifolia*) and canyon live oak (*Quercus chrysolepis*).

Coast live oak woodland is dominated by coast live oak (*Quercus agrifolia*).

Coast live oak – California sycamore woodland is co-dominated by coast live oak and western sycamore. The understory of this vegetation includes toyon (*Heteromeles arbutifolia*), red willow (*Salix laevigata*), and mulefat (*Baccharis salicifolia*).

Red willow thicket occurs in some canyon bottoms and isolated patches and is dominated by red willow. Other species present in these areas include mulefat, with some California buckwheat (*Eriogonum fasciculatum*) and California sagebrush (*Artemisia californica*). There is patch of willows at the western edge of the City which extends along the edge of Cucamonga Creek, with mulefat, cattails (*Typha* sp.), and scattered laurel sumac (*Malosma laurina*) also in the area. Another small patch occurs near the northeastern corner of the City's SOI between Henderson and Morse canyons. Rushes (*Juncus sp.*), deergrass (*Muhlenbergia rigens*), western ragweed (*Ambrosia psilostachya*), and nightshade (*Solanum sp.*) are also present in this area.

Above: A partially vegetated wash with riparian vegetation within the General Plan Area.

Chaparral

Chaparral occurs in scattered patches in the City's SOI. These areas contain shrubs that are larger than those of the mixed sage scrub that surrounds this vegetation type. Chaparral species previously identified in the General Plan Area include manzanita (*Arctostaphylos sp.*), Nuttall's scrub oak (*Quercus dumosa*), ceanothus (*Ceanothus sp.*), holly-leaved cherry (*Prunus ilicifolia*), and Our Lord's candle (*Yucca whipplei*).

Above: An example of chaparral vegetation within the General Plan Area.

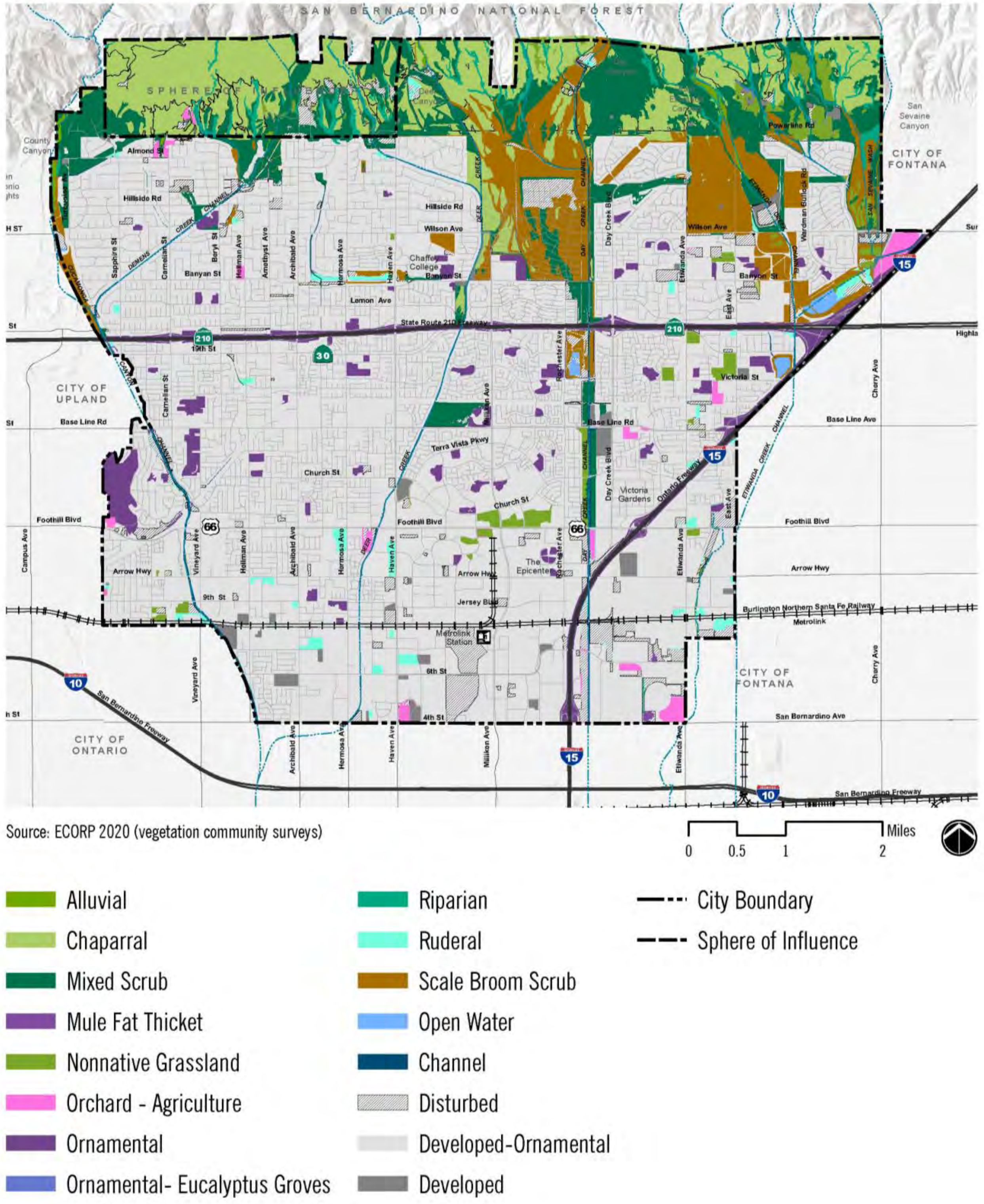
Mixed Scrub

Mixed scrub occurs throughout the foothills of the General Plan Area. Outside the alluvial areas, the majority of the City's SOI contain this vegetation type. Remnant patches of mixed scrub also occur within the City boundary. The dominant species in this vegetation type are California sagebrush, California buckwheat, deerweed (*Lotus scoparius*), white sage (*Salvia apiana*), black sage (*Salvia mellifera*), and thick-leaf yerba santa (*Eriodictyon crassifolium*). The shrub density, species composition, and species percent coverage varies by patch. Other species present, but not dominant, in these areas include telegraph weed (*Heterotheca grandiflora*), California aster (*Lessingia filaginifolia*), and brittlebush (*Encelia farinosa*). The amount of non-native vegetation also varies by patch.

Some areas contain virtually no non-native species while other areas, particularly isolated patches, contain a large portion of species such as black mustard (*Brassica nigra*), tocalote (*Centaurea melitensis*), common horehound (*Marrubium vulgare*), and bromes (*Bromus spp.*).

Above: An example of mixed scrub vegetation within the General Plan Area.

Figure 4. Vegetation Types Map



Source: ECORP 2020 (vegetation community surveys)

Scale Broom Scrub

Scale broom scrub occurs in the alluvial fans of the major creeks that drain the surrounding foothills. Remnant patches of this vegetation type are also present within areas of development. The supportive soil type is sandy with a large number of cobbles and boulders. Scale broom (*Lepidospartum squamatum*) is diagnostically present at greater than one percent coverage in this vegetation type. In addition to scale broom, this vegetation type is co-dominated by a variety of species including California buckwheat, Our Lord's candle, and mountain mahogany (*Cercocarpus betuloides*). The amount of scale broom varies. Other species observed throughout this vegetation type include mulefat, deerweed, white sage, laurel sumac, and western sunflower (*Helianthus annuus*). Individual western sycamore trees are scattered in this vegetation type.

Some portions of this vegetation type are disturbed. While the northern portions of the alluvial fan are densely vegetated, other areas contain less cover and more non-native species such as black mustard and tocalote.

Above: An example of scale broom scrub within the General Plan Area.

Alluvial

Alluvial consists of the stream courses of the various creeks in the General Plan Area. These areas are either unvegetated or contain alluvial fan sage scrub species at a lower density than that vegetation type. Flowing water is present in some washes. The supportive soil type of alluvial washes is sandy with numerous cobbles and boulders.

Mulefat Thickets

Mulefat thickets occur in remnant patches in the General Plan Area. These areas are dominated by dense areas of mulefat.

Nonnative Grassland

Nonnative grasslands occur throughout the General Plan Area with densities varying by parcel. This vegetation type includes annual brome grasslands, which are dominated by *Bromus* spp., as well as a mix of native and non-native grasses and forbs such as needlegrass (*Nassella sp.*), bromes, and black mustard. These areas contain few scattered shrubs.

Above: An example of nonnative grassland vegetation within the General Plan Area.

Ruderal

Ruderal vegetation is mapped throughout the General Plan Area. These areas contain a variety of weedy species such as black mustard, Russian thistle (*Salsola tragus*), and tocalote. Some scattered scrub species occur in some ruderal areas. The density of ruderal species varies by parcel.

Ornamental

Ornamental vegetation occurs throughout the General Plan Area. This includes recreational areas (e.g., golf courses, parks, sports fields) and landscaping adjacent to the major freeways. Turf grass is a large component of the landscaping associated with the recreational areas. These areas also contain non-native trees such as gum (*eucalyptus spp.*), pine (*Pinus spp.*), or Peruvian pepper (*Schinus molle*). The vegetation adjacent to the freeways contains sage scrub species in some areas, with additional plantings of non-native species like wattle (*Acacia sp.*), Peruvian pepper, and hottentot fig (*Carpobrotus edulis*).

Ornamental – Eucalyptus Groves

Ornamental – eucalyptus groves occur in patches in the northern portion of the City's SOI near Henderson and Morse canyons. The areas contain non-native gum (*eucalyptus spp.*).

Orchard – Agriculture

Orchard – agriculture occurs in isolated patches throughout the General Plan Area. Most of these areas are fallow grape vineyards. These areas contain a large amount of non-native species such as black mustard. This vegetation category also includes strawberry fields, citrus groves, and a tree farm.

Disturbed

Disturbed areas occur throughout the General Plan Area. They consist of exposed soil with little or no vegetation. Some of these areas have been subject to grading or other earth disturbance measures.

Above: An example of disturbed vegetation within the General Plan Area.

Channel

Channels occur throughout the General Plan Area. These are concrete lined and trapezoidal or vertical walled. Open water occurs in some channels while others are dry. The amount of open water present in these channels was too small to be mapped as a separate mapping unit.

Developed/Ornamental

The majority of the General Plan Area is mapped as developed/ornamental. These areas consist of commercial, industrial, and residential structures and associated landscaping. Paved roads are also included in this mapping unit. Vegetation in these areas is varied and dominated by non-native, ornamental species including Peruvian pepper, pine, gum, flowering plum (*Prunus cerasifera*), and African fountain grass (*Pennisetum setaceum*).

Open Water

Open water occurs in various natural and constructed catch basins in the General Plan Area, which gather water flowing from the mountains to the north of the City. Golf course water features were also included in this mapping unit. Any open channels which may provide corridors that encourage the movement of wildlife are also included in this classification.

Above: An example of open water in the form of a catch basin within the General Plan Area. Riparian vegetation is present in the forefront of the photo.

Wildlife Movement

Wildlife corridors are linear landscape elements that provide for wildlife species movement and dispersal between two or more habitats. Wildlife corridors contribute to population viability by assuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local displacement or ecological catastrophes (e.g., fires). Wildlife corridors could be bound by development or areas unsuitable for wildlife, but could contain enough food, cover, and/or water to facilitate wildlife movement between habitat patches and prevent isolation of populations. Travel routes are landscape features (i.e., ridgelines, drainages, canyons, or riparian areas) that are used by wildlife to gain access to essential resources. Areas adjoining two habitats are also often referred to as habitat linkages.

A statewide interagency workshop was conducted in 2000 to delineate habitat linkages critical for preserving the State's biodiversity. The San Gabriel-San Bernardino Linkage was one of 15 landscape linkages identified as crucial to maintaining ecological and evolutionary processes among large blocks of protected habitat within the South Coast Ecoregion. This linkage occurs at the San Gabriel and San Bernardino Mountains divide, which includes the mountains and foothills north of and within the General Plan Area (See Figure 5). The different elevations and transition from scrub and woodland in the south to the Mojave Desert in the north result in a diversity of natural communities.

The final Linkage Design, as shown in Figure 5, *Wildlife Movement Linkages Map*, covers approximately 129,901 acres and has three roughly parallel routes to accommodate diverse species and ecosystem functions. The central branch is relatively short and largely in public ownership, but the northern and southern branches are roughly 24 miles long and include substantial private lands (Penrod et al. 2004).

The northern branch provides a high desert connection dominated by chaparral communities, with patches of desert scrub, juniper and Joshua tree woodlands, grassland, and riparian habitats. The central branch links a series of higher elevation forest and shrubland habitats. The southern branch encompasses coastal and alluvial fan scrub habitats and includes portions of Cucamonga, Deer, Day, Etiwanda, Morse, and San Sevaine Creeks. Natural vegetation makes up most of the Linkage Design, but urban and agricultural development covers approximately 1.8 percent of the area. As of 2004, approximately 66 percent of the Linkage Design had some level of conservation protection.

The majority of the General Plan Area is developed. These areas have little natural open space and therefore provide few wildlife movement corridors. Existing corridors include creeks and open drainage canals, which connect wildlife between the mountains to the north. Scattered open space areas, such as golf courses, parks, and vacant lots are additional resources areas. The City should maintain these resource areas by encouraging the protection, enhancement, and proliferation of native landscaping, especially near existing corridors. Additionally, any new culverts thought to be of value for wildlife movement should be designed with bridged undercrossings, or, if a bridge is not possible, use a 12-foot by 12-foot box culvert or bigger for larger animals.

The northern part of the General Plan Area has large, contiguous open space areas and areas already designated for preservation in perpetuity. Development within existing open space and undeveloped areas in this region of the Plan Area could result in habitat fragmentation and constrain wildlife movement that has regional significance. With careful planning and design, the City can mitigate these impacts to wildlife movement by incorporating design measures that allow wildlife to disperse between large patches of remaining habitat. Wildlife corridor studies may need to be required for any proposed land use conversions in these areas and some general principles of evaluation and design should be implemented, such as:

- Monitoring the use of corridors by target wildlife species
- Approve corridor designs that allow for adaptive management;
- Incorporating wildlife corridor designs into development;
- Maintaining as much natural open space as possible in designated corridor areas.
- Develop strict lighting restrictions for the houses adjacent to the corridor to prevent light pollution into the corridor. This includes directing lights downward and inward toward the home.

In 2019, the City adopted the Etiwanda Heights Neighborhood and Conservation Plan, the location of which abuts the aforementioned open space areas. In conjunction with the plan, the City proposes to annex 4,400 acres of unincorporated San Bernardino County in the foothills of the San Gabriel Mountains, between the northerly city limits and the San Bernardino National Forest. The upper 3,200 acres lie north of the existing foothill community, and the lower 1,200-acre area is surrounded on three sides by existing housing tracts. The City's intent is to conserve the natural and rural character, recreational and habitat resources, and visual qualities of that area for future generations.

It is important to note that these large open space areas may not serve as wildlife corridors where there are few or no man-made or naturally occurring physical constraints to wildlife movement. Instead, these open spaces are large enough to maintain viable populations of species and to provide a variety of travel routes (e.g., canyons, ridgelines, trails, riverbeds, and others). Wildlife may use these "local" routes while searching for food, water, shelter, and mates and will not need to cross into other large open space areas.

Special Status Species

Several special status plant and animal species occur in the General Plan Area that could be affected by future development. Generally the presence of a listed species, and in some instances the habitat suitable for a listed species, is sufficient to require additional biological anlalysis. If biological analysis is needed, then the scientific study must follow protocol acceptable to the applicable regulatory agency (or agencies, depending if the species is listed by the state and/or federal government) for the results to be considered adequate. Often the protocol requires investigation during different season(s) for particular species, or possibly over several seasons. Because of the potential to significantly affect the schedule for project consideration, developers are encouraged to conduct biological analyses prior to planning development and submit the results of the analysis along with the development application.

A full list of species and their protected statuses is included in Appendix A. Federally endangered species known to occur within the General Plan Area and information regarding their status, general habitat, and habitat mitigation ratio(s) are listed in the table below. Images of these species are shown below.

© 2010 Benjamin
Ambrosia pumila
(San Diego
ambrosia)

© 2009 Thomas
Astragalus brauntonii
(Braunton's milk-
vetch)

© 2013 Steven
Eriastrum densifolium ssp. sanctorum
(Santa Ana River
Woollystar)

© 2009 Thomas
Berberis nevinii
(Nevin's Barberry)

© 2012 Anuja Parikh and Nathan
Dodecahema leptoceras
(slender-horned spineflower)

© 2006 Andrea B.
Rhaphiomidas terminatus abdominalis

© 2018 William Flaxington
Rana muscosa
(southern mountain yellow-legged
frog)

© 2004 Chris Brown
Anaxyrus californicus
(Arroyo toad)

© 2010 Patrick Martin
Gymnogyps californianus
(California condor)

© 2015 Benjamin Smith
Vireo bellii pusillus
(least Bell's vireo)

Dave Menke, USFWS
Empidonax traillii extimus
(southwestern willow

Art Davenport
Dipodomys merriami parvus
(San Bernardino kangaroo rat)

B. "Moose" Peterson
Dipodomys stephensi
(Stephen's kangaroo rat)

Table 1. General Habitat and Habitat Mitigation Ratios of Federally Endangered Species Known to Occur within the General Plan Area

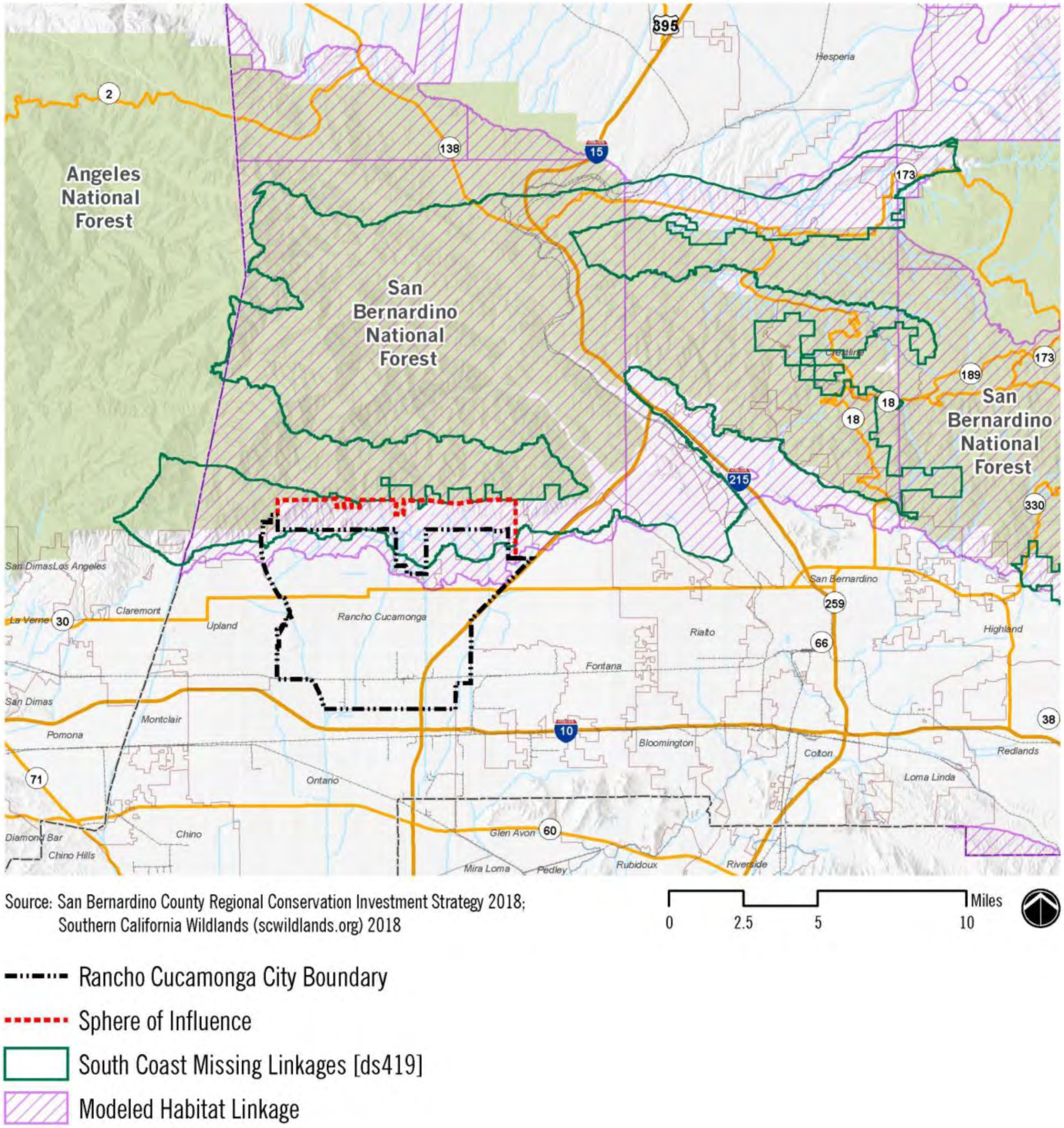
Scientific Name (Common Name)	Description	Habitat Description	Vegetation Community(ies)	Mitigation Ratio of Habitat(s)
Plants				
Ambrosia pumila (San Diego ambrosia)	Perennial herb with an erect stem. Generally few-branched, densely short-hairy	Chaparral, coastal scrub, valley and foothill grassland, and vernal pools. Sandy loam or Clay, Disturbed areas, Alkaline areas.	Chaparral	0.5:1-1:1
			Grassland	None
			Mixed Scrub	1:1-3:1
			Scale Broom Scrub	1:1-3:1
			Disturbed	None
Astragalus brauntonii (Braunton's milk-vetch)	Perennial herb with coarse, white hairs that are dense, tangled, some longer, spreading	Chaparral, coastal scrub, and valley and foothill grassland habitats. Often found in recently burned or disturbed areas. Usually in sandstone soil with carbonate layers.	Chaparral	0.5:1-1:1
			Grassland	None
			Mixed Scrub	1:1-3:1
			Scale Broom Scrub	1:1-3:1
			Disturbed	None
Berberis nevinii (Nevin's barberry)	Erect shrub, maximum height of four meters. Dense foliage of dark green to bluish-green with spiny-toothed, spear-shaped leaflets	Chaparral, cismontane woodland, coastal scrub, and riparian woodland in sandy or gravelly soils.	Chaparral	0.5:1-1:1
			Scale Broom Scrub	1:1-3:1
			Mixed Scrub	1:1-3:1
			Riparian	2:1
Dodecahema leptoceras (slender-horned spineflower)	Small annual plant forming a patch of spreading basal leaves measuring a few centimeters in diameter	Chaparral, cismontane woodland, and alluvial fan coastal scrub in sandy soils.	Chaparral	0.5:1-1:1
			Scale Broom Scrub	1:1-3:1
			Mixed Scrub	1:1-3:1
			Alluvial	1:1
Eriastrum densifolium ssp. Sanctorum (Santa Ana River woollystar)	Perennial herb with light grey-green stems and leaves with bright blue funnel-shaped flowers	Chaparral and alluvial fan coastal scrub in sandy or gravelly soils	Chaparral	0.5:1-1:1
			Alluvial	1:1
Invertebrates				
Rhaphiomidas terminatus abdominalis (Delhi Sands flower-loving fly)	Approximately 1-inch long flying insect, orange-brown in color with dark brown oval spots	Dune habitat, with fine sandy Delhi soils.	Alluvial	1:1

Scientific Name (Common Name)	Description	Habitat Description	Vegetation Community(ies)	Mitigation Ratio of Habitat(s)
Amphibians				
Anaxyrus californicus (Arroyo toad)	Plump and stocky toad with dry, uniformly warty skin. Adults are 1.75 - 3.2 inches from snout to vent	Sandy banks of rivers, arroyos, and streams with shallow sandy pools. Also found in riparian woodlands or uplands adjacent to arroyos.	Alluvial (or adjacent)	1:1
			Riparian (or adjacent)	2:1
Rana muscosa (southern mountain yellow-legged frog)	A medium-sized frog with a slim waist, long legs, smooth skin and webbing on the hind feet	Ponds, streams, lakes, and isolated pools in southern Sierra Nevada Mountains and rocky streams within narrow canyons and the chaparral belt in Southern California mountains	Riparian	2:1
			Chaparral	0.5:1-1:1
Birds				
Empidonax traillii extimus (southwestern willow flycatcher)	Small perching bird, < 15 cm long from bill to tail. Brownish-olive upper body, whitish throat, pale olive breast, a pale-yellow belly, and two light wing bars.	Riparian woodlands particularly with willow thickets. Nests in densest areas of shrubs and trees with low-density canopies.	Riparian	2:1
Gymnogyps californianus (California condor)	Large bird with long, broad wings and long “fingers”. Adults are black with striking white patches under the wings.	Nests in cliff faces.	Cliff faces	N/A
Vireo bellii pusillus (least Bell’s vireo)	11.5-12.5 centimeters long. Short rounded wings and short, straight bills with a faint white eye ring. Feathers are mostly gray above and pale below.	Riparian woodlands and willow-cottonwood forests particularly with streamside thickets and dense brush.	Riparian	2:1
Mammals				
Dipodomys merriami parvus (San Bernardino kangaroo rat)	Approx. 9 in. in length including tail. Faintly yellowish tinted fur with an over-wash of dusky brown above and white underparts. Long tail with a white side stripe wider than the dark stripes and a dusky tufted tip. Dark	Alluvial sage scrub, flood plains, washes, and upland areas adjacent to desert habitat.	Alluvial	1:1
			Mixed Scrub	1:1-3:1
			Chaparral	0.5:1-1:1
			Scale Broom Scrub	1:1-3:1

Scientific Name (Common Name)	Description	Habitat Description	Vegetation Community(ies)	Mitigation Ratio of Habitat(s)
	line on either side of the nose.			
Dipodomys stephensi (Stephen's kangaroo rat)	Approx. 12 in. in length including tail. Tail often twice as long as body. Light brown fur which becomes lighter on the ventral surface and legs.	Annual grasslands, coastal sage scrub with sparsely spaced vegetation, loose friable soils, and flat or slightly rolling terrain.	Grassland	None
			Mixed Scrub	1:1-3:1
			Alluvial	1:1

Sources:
[1] United States Fish and Wildlife Service (USFWS). 2020 Environmental Conservation Online System (ECOS) Species Profiles. [*https://ecos.fws.gov/ecp/*](https://ecos.fws.gov/ecp/)
[2] California Department of Fish and Wildlife (CDFW). 2018 RareFind 5 California Department of Fish and Wildlife Natural Diversity Database (CNDDB) Version Commercial Version. Sacramento, CA: California Department of Fish and Game, Biogeographic Data Branch.
[3] Jepson Flora Project. 2020. Jepson eFlora, [*https://ucjeps.berkeley.edu/eflora/*](https://ucjeps.berkeley.edu/eflora/)*.*
[4] Baldwin, B. G., G. H. Goldman, et al. 2012 The Jepson Manual; Vascular Plants of California, Second Edition. Berkeley, CA, University of California Press.
[5] Calflora. 2018 Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [web application]. 2018. Berkeley, California: The Calflora Database [a non-profit organization]. Available: [*http://www.calflora.org/*](http://www.calflora.org/)
[6] [CNPS] California Native Plant Society. 2020 California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website [*http://www.rareplants.cnps.org*](http://www.rareplants.cnps.org)

Figure 5. Wildlife Movement Linkages Map



Source: San Bernardino County Regional Conservation Investment Strategy 2018;
Southern California Wildlands (scwildlands.org) 2018

Relevant Documents and Regulations

A myriad of federal, state, and local regulations designed to protect biological resources apply to land within the City. Most of the regulations are independent of the CEQA process. This means that the regulations apply to the property even if there is no discretionary permit that would 'trigger' an environmental analysis for the overall project. For example, wetlands are protected by both federal and state regulations, so a permit is needed from either federal and/or state agencies before a wetland can be altered. The permit to alter the wetland requires environmental analysis, even if the project is exempt from CEQA. The issuance and monitoring of a federal or state permit is overseen by one of several resource agencies. These can include the U.S. Army Corps of Engineers, U.S. Fish and Wildlife, and California Department of Fish and Wildlife. A summary of federal and state regulations is included as Appendix B to this report.

Policies and Regulations

Development allowed within the General Plan Area may be subject to one or more of the following policies and regulations:

Federal

Federal Endangered Species Act

Clean Water Act/River and Harbors Act

Executive Order 11990

Migratory Bird Treaty Act

Bald and Golden Eagle Protection Act

State

California Endangered Species Act

Porter-Cologne Act

California Fish and Game Code

County Policies and Regulations

County regulations would likely apply in the areas next to the City prior to annexation and would need to be considered if a project would affect the adjacent land, or as part of the annexation process. The County of San Bernardino Code of Ordinances (Title 8, Division 8, Chapter 88.01: Plant Protection and Management) provides regulations and guidelines for managing plant resources in the unincorporated areas of the County on property or combinations of property under private or public ownership. A Tree or Plant Removal Permit is required for the removal of regulated trees and plants. Regulated trees and plants are found in Section 88.01.070(b) (Regulated Trees) and Section 88.01.080(b) (Regulated Riparian Plants).

Riparian plants are regulated in riparian areas found on private land within unincorporated areas of the County and on public land owned by the County, unless exempt. Section 88.01.080(b) applies to the removal of vegetation within 200 feet of the bank of a stream or in an area indicated as a protected riparian area on an overlay map or Specific Plan.

Local Policies and Regulations

The City's Tree Preservation Ordinance in the Municipal Code (Title 17, Development Code- Chapter 17.80) provides regulations to protect trees, considered to be a community resource, from indiscriminate cutting or removal. Provisions within the chapter are specifically intended to protect and expand the eucalyptus windrows. A permit is required for the removal, relocation, replacement, or destruction of a Heritage TreeCommunity Wildfire Protection Plan

As part of this effort the City will update the Wildfire Protection Plan. The plan may call for fuel management and the creation of breaks in the fire area, all of which have the potential to affect wildlife habitat and movement corridors. Additionally, it contains measures such as consciously excluding certain brush and tree species most likely to create fuel for wildfires. While the details of the wildfire protection plan are more appropriately discussed in the Hazards Element, the potential biological impacts will need to be addressed in the Conservation Element and the General Plan EIR.

The aforementioned Etiwanda Heights Neighborhood and Conservation Plan is located in an area that is very high in wildfire hazard, with significant fault zones and areas subject to landslides at the foot of the mountains. This plan incorporates specific measures in order to reduce and mitigate these risks, as discussed in the Hazards Element.

Existing General Plan Goals and Policies

A number of policies in the Resource Conservation Element of the General Plan address biological resource issues. These policies were developed and implemented to help reduce impacts to existing biological resources within the City and its SOI. Applicable goals and related policies are identified below in italics. Each policy is followed by an implementation action which identifies the programs and procedures used to put General Plan goals and policies into action.

- **Policy RC-1.1:** *Preserve sensitive land resources that have significant native vegetation and/or habitat value.*
    - ***Implementation Action:*** *Continue to consult with agencies and private organizations that have the land or other resources available to promote open space and habitat preservation and restoration.*
- **Policy RC-8.1:** *Preserve the integrity of riparian habitat areas, creek corridors, Riversidian Alluvial Fan Sage Scrub, bogs, and sensitive wildlife habitat that support biological resources.*
    - ***Implementation Action:*** *Pursue actions that provide appropriate long-term protection of areas within the City's Sphere of Influence that contain sensitive habitat, and which are considered of unique value in enhancing the quality of the local environment.*
- **Policy RC-8.2:** *Consult with San Bernardino County and other agencies to support the preservation of streamside woodland areas along the foothills of the San Gabriel Mountains, including the North Etiwanda Preserve.*
    - ***Implementation Action:*** *Require development proposals that include riparian or water-related communities to prepare a site-specific investigation to define the extent and fragility of the riparian community, determine wetland permit requirements and propose measures to mitigate any impacts on the resources stemming from land disturbance or other site development.*
- **Policy RC-8.3:** *Utilize innovative measures that will allow the expansion of sensitive biological preserve areas (e.g., North Etiwanda Preserve, Day Creek Preserve, and San Sevaine Preserve) and other important habitat areas.*
    - ***Implementation Action:*** *Continue working with the County of San Bernardino, California Department of Fish and Game, and U.S. Fish and Wildlife Service to protect sensitive biological resources within the City's Planning Area through the creation of a system of preserves and open space along the foothills of the San Gabriel Mountains. Continue with the acquisition program or the creation of conservation easements to protect the biological integrity of the alluvial fan sage scrub (AFSS) to create a preserve for use as part of a mitigation land bank.*
- **Policy RC-8.4:** *Acquire and/or protect open space areas that provide strategic wildlife corridors and vital connectivity between habitat areas.*
    - ***Implementation Action:*** *Continue working with the County of San Bernardino, California Department of Fish and Game, and U.S. Fish and Wildlife Service to protect sensitive biological resources within the City's Planning Area through the creation of a system of preserves and open space along the foothills of the San Gabriel Mountains. Continue with the acquisition program or the creation of conservation easements to protect the biological integrity of the alluvial fan sage scrub (AFSS) to create a preserve for use as part of a mitigation land bank.*

- ***Policy LU-8.5:*** *Protect natural resources and sensitive habitat areas and avoid encroachment from new hillside development.*
    - ***Implementation Action:*** *Continue to coordinate the review of hillside development proposals with Federal, State, and regional agencies with purview over natural resources and sensitive habitats.*

Attachment A:

Species Listing

Special Status Wildlife Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area

Species	Status		Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW		
Invertebrates				
Bombus crotchii (crotch bumble bee)	–	Candidate	Reported in San Antonio Canyon, north of Ontario (1931 record); Also reported in San Bernardino, Devore, and Mt. Baldy (1945, 1953, and 1975 record)	–
Callophrys mossii hidakupa (San Gabriel Mountains elfin butterfly)	–	–	Reported near Mt. Baldy (1975 and 1976 recods)	–
Diplectrona californica (California diplectronan caddisfly)	–	–	Reported from Claremont (CDFG 2009)	–
Rhaphiomidas terminatus abdominalis (Delhi Sands flower-loving fly)	FE	–	Reported in Fontana, San Bernardino, and Guasti (CDFG 2009)	–
Fish				
Gila orcuttii (arroyo chub)	–	SSC	Reported from Cattle Canyon Creek and the East Fork of the San Gabriel River (2003 record)	–
Rhinichthys osculus ssp.3 (Santa Ana speckled dace)	–	SSC	Reported near Cajon Creek and Lytle Creek (1996 record)	–
Catostomus santaanae (Santa Ana sucker)	FT	SSC	Reported from Cattle Canyon Creek and the East Fork of the San Gabriel River (2006 record)	Not within final or newly proposed Critical Habitat (USFWS 2020)
Amphibians				
Anaxyrus californicus (Arroyo Toad)	FE	SSC	Reported along Cucamonga Creek (1999 record)	Not within final Critical Habitat (USFWS 2020)

Special Status Wildlife Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area

Species	Status		Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW		
Batrachoseps gabrieli (San Gabriel Mountains slender salamander)	–	–	Reported near Scotland and Lytle Creek (1998 record)	–
Rana boylii (foothill yellow-legged frog)	–	SSC	Reported in the vicinity of Evey, San Antonio, and Thompson Creeks in Claremont (1960 record)	–
Rana muscosa (southern mountain yellow-legged frog)	FE	SE	Historically reported at various locations in Mt. Baldy (1959 record)	Not within final Critical habitat (USFWS 2020)
Spea hammondii (western spadefoot)	–	SSC	Reported 1.5 miles northwest of Claremont (1941 record)	–
Taricha torosa (California newt)	–	SSC	Reported from Live Oak and Cobal Canyons, north of Claremong (1990s records)	–
Reptiles				
Anniella pulchra pulchra (silvery legless lizard)	–	SSC	Reported near Ontario, Fontana, and Claremont (CDFG 2009)	–
Arizona elegans occidentalis (California glossy snake)			Reported in the vicinity of Mira Loma and Azusa; near Devore, Ontario, and Guasti (1946 records)	–
Aspidoscelis tigris stejnegeri (San Diego tiger whiptail) coastal whiptail (Cnemidophorus tigris stejnegari)	–	SSC	Reported in San Antonio Canyon near Mt. Baldy (CDFG 2009)	–
Charina umbratica (southern rubber boa)	–	ST	Reported within Jeffrey pine and black oak forest near Harrison Mountain	–
Phrynosoma blainvillii (Blainville's horned lizard)	–	SSC	Reported near Devore, Ontario, Cucamonga Peak, Guasti, and San Bernardino (CDFG 2009)	–
Thamnophis hammondii (two-striped garter snake)			Reported near Cucamonga Creek and near La Verne (2001 and 2010 records)	–

Special Status Wildlife Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area				
Species	Status		Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW		
Birds				
Agelaius tricolor (tricolored blackbird)	–	ST, SSC	Reported from the San Bernardino Flood Control Basin (2014 record)	–
Aimophila ruficeps canescens (southern California rufous-crowned sparrow)	–	WL	Reported in Upland (2001 record)	–
Amphispiza belli belli (Bell's sage sparrow)	–	WL	Reported north of Lytle Creek Wash near Devore (1997 record)	–
Aquila chrysaetos (golden eagle)	–	WL, FP	Potentially present	–
Athene cunicularia (burrowing owl)	–	SSC[c]	Observed in multiple locations in the Rancho Cucamonga and Ontario (1992-2013 records)	–
Buteo swainsoni (Swainson's Hawk)	–	ST	Historically reported near Chino (1920 record)	–
Coccyzus americanus occidentalis (western yellow-billed cuckoo)	FT	SE[a]	Historically reported from Chino Creek (1931 record)	–
Cypseloides niger (black swift)	–	SSC[a]	Reported from Wolfskill Falls east of the Plan Area (1986 records)	–
Empidonax traillii extimus (southwestern willow flycatcher)	FE	SE	Potentially Present	Not within final Critical Habitat (USFWS 2020)
Gymnogyps californianus (California condor)	FE	SE	Potentially Present	Not within final Critical Habitat (USFWS 2020)
Laterallus jamaicensis coturniculus (California black rail)	–	ST, FP	Reported near Chino (1931 records)	–
Polioptila californica californica (coastal California gnatcatcher)	FT	SSC	Reported near Lytle Wash and Cajon Wash and multiple locations in the City (1991 records)	Not in final Critical Habitat (USFWS 2020)

Special Status Wildlife Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area

Species	Status		Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW		
Vireo bellii pusillus (least Bell's vireo)	FE	SE	Reported along Cable Creek and Sycamore Flat, near Devore (2007 record)	Not in final Critical Habitat (USFWS 2020)
Mammals				
Antrozous pallidus (pallid bat)	–	SSC	Historically reported from Ontario (1951 record)	–
Chaetodipus fallax fallax (northwestern San Diego pocket mouse)	–	SSC	Reported from Cucamonga Creek to Upland (2002 record)	–
Chaetodipus fallax pallidus (pallid San Diego pocket mouse)	–	SSC	Reported west of Devore (1976 record)	–
Dipodomys merriami parvus (San Bernardino kangaroo rat)	FE	SSC	Reported east of Ontario and in Devore (1996 record)	Northeast portion of SOI located in final Critical Habitat (USFWS 2020)
Dipodomys stephensi (Stephen's kangaroo rat)	FE	FT	Reported southeast of Ontario	–
Eumops perotis californicus (western mastiff bat)	–	SSC	Reported in Pomona and Rancho Cucamonga (1925 and 1992 records)	–
Lasiurus cinereus (hoary bat)	–	WL	Historically reported 1.5 miles northwest of Claremont and near San Antonio Canyon (1940 and 1951 records)	–
Lasiurus xanthinus (western yellow bat)	–	SSC^e	Reported in the vicinity of Pomona (CDFG 2009)	–
Lepus californicus bennettii (San Diego black-tailed jackrabbit)	–	SSC	Reported in Fontana (2001 record)	–
Neotoma lepida intermedia (San Diego desert woodrat)	–	SSC	Reported from Cucamonga Creek to Upland (2002)	–
Nyctinomops femorosaccus (pocketed free-tailed bat)	–	SSC	Reported in the vicinity of San Bernardino (1985 record)	–
Nyctinomops macrotis (big free-tailed bat)	–	SSC	Reported from Pomona (1987 record)	–

Special Status Wildlife Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area

Species	Status		Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW		
Perognathus longimembris brevinasus (Los Angeles pocket mouse)	–	SSC	Reported in Guasti and Cucamonga Peak (CDFG 2009)	–

Federal Designation
(USFWS)

FE	Federally listed Endangered
FT	Federally listed Threatened
FC	Federally listed Candidate

State Designation
(CDFW)

SE	State listed Endangered
ST	State listed Threatened
SSC	Species of Special Concern
WL	Watch List
FP	Fully Protected

[a] Designation refers to nesting individuals
[b] Designation refers to wintering individuals
[c] Designation refers to burrow sites; wintering observations not considered special status for Orange County
[d] Designation refers to nesting colony
[e] Designation based on the draft updated mammalian species of special concern report

– Indicates information that is not applicable to the species.

Sources: IPAC Trust Resources List. 2018. http://ecos.fws.gov/ipac/. Accessed on March 26, 2020.

Special Status Plant Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area					
Species	Status			Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW	CRPR		
Acanthoscyphus parishii var. parishii (Parish's oxytheca)	–	–	4.2	Reported in the vicinity of Mt. Baldy and Cucamonga Peak (CNPS 2020)	–
Amaranthus watsonii (Watson's amaranth)	–	–	4.3	Reported in the vicinity of Mt. Baldy (CNPS 2020)	–
Ambrosia monogyra (singlewhorl burrobrush)	–	–	2B.2	Historically reported near Fontana Power Plant near Rialto (1947 and 1961 record); Reported in the vicinity of Devore (CNPS 2020)	–
Ambrosia pumila (San Diego ambrosia)	FE	–	1B.1	Reported near Alberhill, approximately 30 miles from the City (CNPS 2020).	Not in final Critical Habitat (USFWS 2020)
Arctostaphylos glandulosa ssp. gabrielensis (San Gabriel manzanita)	–	–	1B.2	Reported near Mt. Baldy and Cucamonga Peak. Known only from Mill Creek Summit divide in the San Gabriel Mountains (CNPS 2020)	–
Asplenium vespertinum (western spleenwort)	–	–	4.2	Reported near Mt. Baldy and Cucamonga Peak (CNPS 2020)	–
Astragalus bicristatus (crested milk-vetch)	–	–	4.3	Reported in the vicinity of Mt. Baldy (CNPS 2020)	–
Astragalus brauntonii (Braunton's milk-vetch)	FE	–	1B.1	Reported near Azusa, approximately 18 miles from the City (CNPS 2020).	Not in final Critical Habitat (USFWS 2020)
Atriplex coulteri (Coulter's saltbush)	–	–	1B.2	Reported in Chino Creek, south of Ontario (1917 record; CNPS 2020)	–
Berberis nevinii (Nevin's barberry)	FE	SE	1B.1	Reported near Mt. Baldy (1997 record; CNPS 2020)	Not in final Critical Habitat (USFWS 2020)

Special Status Plant Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area					
	Status				
Species	USFWS	CDFW	CRPR	Occurrence Information	Relationship of Plan Area to Critical Habitat
Calochortus catalinae (Catalina mariposa lily)	–	–	4.2	Reported in the vicinity of Ontario and Guasti (CNPS 2020)	–
Calochortus clavatus var. gracilis (slender mariposa lily)	–	–	1B.2	Historically reported at Cobal Canyon (1999 record); Observed in Cattle Canyon (2013 record; CNPS 2020)	–
Calochortus plummerae Plummer's mariposa lily	–	–	4.2	Reported in the vicinity of Mt. Baldy, Cucamonga Peak, and Devore (CNPS 2020)	–
Calystegia felix (lucky morning-glory)	–	–	1B.1	Reported in west Chino (2013 record; CNPS 2020)	–
Centromadia pungens ssp. laevis (smooth tarplant)	–	–	1B.1	Reported near San Bernardino, approximately 17 miles from the City; many historical occurrences may be extirpated (CNPS 2020)	–
Chorizanthe leptotheca (Peninsular spineflower)	–	–	4.2	Reported in the vicinity of Mt. Baldy (CNPS 2020)	–
Chorizanthe parryi var. parryi (Parry's spineflower)	–	–	1B.1	Reported in the City of Rancho Cucamonga and in Devore (1998 record; 1999 record; CNPS 2020)	–
Chorizanthe xanti var. leucotheca (white-bracted spineflower)	–	–	1B.2	Reported in the vicinity of Devore (1979 record; CNPS 2020)	–
Cladium californicum (California sawgrass)	–	–	2B.2	Historically reported in Red Hill, East of Upland (1918 record; CNPS 2020)	–
Claytonia lanceolata var. peirsonii (Peirson's spring beauty)	–	–	3.1	Reported near Bighorn Peak and Timber Mountain in Mt. Baldy (2012 record; CDFG 2009); Known only from the San Gabriel Mountains (CNPS 2020)	–
Deinandra paniculata (paniculate tarplant)	–	–	4.2	Reported in the vicinity of Guasti (CNPS 2020)	–

Special Status Plant Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area					
	Status				Relationship of Plan Area to Critical Habitat
Species	USFWS	CDFW	CRPR	Occurrence Information	
Dodecahema leptoceras (slender-horned spineflower)	FE	SE	1B.1	Historically reported from the vicinity of Upland (1905 record; CDFG 2009)	No Critical Habitat has been published.
Dudleya multicaulis (many-stemmed dudleya)	–	–	1B.2	Historically reported in Marshall Creek near La Verne (1934); Reported in the vicinity of Mt. Baldy (CNPS 2020)	–
Eriastrum densifolium ssp. sanctorum (Santa Ana River woollystar)	FE	SE	1B.1	Historically reported in the vicinity of Devore (1985 record); Reported in Fontana, approximately 9 miles from the City (CNPS 2020)	No Critical Habitat has been published.
Eriogonum microthecum var. johnstonii (Johnston's buckwheat)	–	–	1B.3	Reported near Cucamonga Peak, less than 4 miles north of the SOI (CDFG 2009; CNPS 2020)	–
Eriogonum umbellatum var. minus (alpine sulfur-flowered buckwheat)	–	–	4.3	Reported near Cucamonga Peak (CNPS 2020)	–
Galium angustifolium ssp. gabrielense (San Antonio Canyon bedstraw)	–	–	4.3	Reported in the vicinity of Cucamonga Peak and Mt. Baldy (CNPS 2020)	–
Galium johnstonii (Johnston's bedstraw)	–	–	4.3	Reported near Cucamonga Peak and Devore (CNPS 2020)	–
Heuchera caespitosa (urn-flowered alumroot)	–	–	4.3	Reported near Mt. Baldy and Cucamonga Peak (CNPS 2020)	–
Horkelia cuneata ssp. puberula (mesa horkelia)	–	–	1B.1	Historically reported in Upland and Etiwanda (1917 record; 1925 record); Reported in the vicinity of Cucamonga Peak and Ontario (CNPS 2020)	–
Juglans californica (Southern California black walnut)	–	–	4.2	Reported in Cucamonga Peak, Devore, and Ontario (CNPS 2020)	–

Special Status Plant Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area					
Species	Status			Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW	CRPR		
Juncus duranii (Duran's rush)	–	–	4.3	Reported in Cucamonga Peak (CNPS 2020)	–
Lepechinia fragrans (fragrant pitcher sage)	–	–	4.2	Known in Santa Monica Mountains near Triunfo Pass; threatened in San Gabriel Mountains; Reported near Mt. Baldy and Cucamonga Peak (CNPS 2020)	–
Lepidium virginicum var. robinsonii (Robinson's pepper-grass)	–	–	4.3	Historically reported in the vicinity of Chino and Pomona (1936 record; 1926 record)	–
Lilium humboldtii ssp. ocellatum (ocellated Humboldt lily)	–	–	4.2	Reported in Mt. Baldy, Cucamonga Peak, and Devore (CNPS 2020)	–
Lilium parryi (lemon lily)	–	–	1B.2	Historically reported near San Sevaine Cow Camp in Cucamonga Peak (1993 record; CNPS 2020)	–
Linanthus concinnus (San Gabriel linanthus)	–	–	1B.2	Historically reported from Icehouse Canyon in Cucamonga Peak (2003 record; CNPS 2020)	–
Lycium parishii (Parish's desert-thorn)	–	–	2B.3	Historically reported north of San Bernardino (1885 record; CNPS 2020)	–
Malacothamnus parishii (Parish's bush-mallow)	–	–	1A	Historically reported south of San Bernardino and Redlands (1895 record; CNPS 2020)	–
Monardella australis ssp. jokerstii (Jokerst's monardella)	–	–	1B.1	Known only from the San Gabriel Mountains; Reported west of Day Creek on the south face of Cucamonga Peak (2006 record; CNPS 2020)	–
Monardella macrantha ssp. hallii (Hall's monardella)	–	–	1B.3	Historically reported near Sunset Peak (1991 record; CNPS 2020)	–
Monardella saxicola (rock monardella)	–	–	4.2	Reported near Mt. Baldy and Devore (CNPS 2020)	–

Special Status Plant Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area					
	Status				
Species	USFWS	CDFW	CRPR	Occurrence Information	Relationship of Plan Area to Critical Habitat
Muhlenbergia californica (California muhly)	–	–	4.3	Historically observed from Red Hill, east of Upland (1916 record; CNPS 2020)	–
Muhlenbergia utilis (aparejo grass)	–	–	2B.2	Historically observed in Red Hill near Upland (1916 record)	–
Navarretia prostrata (prostrate vernal pool navarretia)	–	–	1B.1	Historically observed from Red Hill (1917 record; CDFG 2009); Reported in Guasti (CNPS 2020)	–
Opuntia basilaris var. brachyclada (short-joint beavertail)	–	–	1B.2	Reported in Lytle Creek (1995 record; CNPS 2020)	–
Oreonana vestita (woolly mountain-parsley)	–	–	1B.3	Reported in Telegraph Wash near Cucamonga Peak (2006 record; CNPS 2020)	–
Orobanche valida ssp. valida (Rock Creek broomrape)	–	–	1B.2	Reported near Lookout Mountain, north of the SOI (1995 record; CNPS 2020)	–
Phacelia mohavensis (Mojave phacelia)	–	–	4.3	Reported near Cucamonga Peak (CNPS 2020)	–
Phacelia stellaris (Brand's star phacelia)	–	–	1B.1	Reported in Rancho Cucamonga in Guasti (2003 record; CNPS 2020)	–
Pseudognaphalium leucocephalum (white rabbit-tobacco)	–	–	2B.2	Reported in Guasti and 2 miles northeast of La Verne in Ontario (CNPS 2020)	–
Quercus durata var. gabrielensis (San Gabriel oak)	–	–	4.2	Known from the San Gabriel Mountains; Reported near Mount Baldy (CNPS 2020)	–
Sagittaria sanfordii (Sanford's arrowhead)	–	–	1B.2	Reported near Cucamonga Peak (2009 record; CNPS 2020)	–
Senecio astephanus (San Gabriel ragwort)	–	–	4.3	Reported in Mt. Baldy and Devore (CNPS 2020)	–
Sidalcea neomexicana (salt spring checkerbloom)	–	–	2B.2	Historically reported from Claremont (1909 record); Presumed extirpated or uknown in Ontario (CNPS 2020)	–

Special Status Plant Species Known to Occur in the Vicinity of the Rancho Cucamonga Proposed General Plan Update Study Area

Species	Status			Occurrence Information	Relationship of Plan Area to Critical Habitat
	USFWS	CDFW	CRPR		
Sidotheca caryophylloides (chickweed oxytheca)	–	–	4.3	Reported near Mt. Baldy (CNPS 2020)	–
Streptanthus bernardinus (Laguna Mountains jewelflower)	–	–	4.3	Reported in Lytle Creek, northeast of Cucamonga Peak and near Devore (1991 record; CNPS 2020).	–
Symphyotrichum defoliatum (San Bernardino aster)	–	–	1B.2	Historically observed in Red Hill and Chino (1916 record; CDFG 2009); Reported in Fontana (CNPS 2020)	–
Symphyotrichum greatae (Greata's aster)	–	–	1B.3	Historically reported from San Antonio Canyon in Mt. Baldy (1917 record; CDFG 2009; CNPS 2020)	–
Thysanocarpus rigidus (rigid fringepod)	–	–	1B.2	Historically reported in Claremont (1923); Reported in Mt. Baldy (CNPS 2020)	–
Viola pinetorum ssp. grisea (grey-leaved violet)	–	–	1B.2	Reported between Bighorn Peak and Ontario Peak (2014 record; CNPS 2020)	–

Federal Designations (USFWS)		State Designations (CDFW)	
FE	Federally listed Endangered	SE	State listed Endangered

California Native Plant Society (CNPS) Designations

List 1A	*Plants Presumed Extinct in California*
List 1B	*Plants Rare, Threatened, or Endangered in California and Elsewhere*
List 2	*Plants Rare, Threatened, or Endangered in California But More Common Elsewhere*
List 3	*Plants About Which We Need More Information – A Review List*
List 4	*Plants of Limited Distribution – A Watch List*

California Native Plant Society (CNPS) Threat Code Extensions

None	*Plants lacking any threat information*
.1	*Seriously threatened in California (high degree/immediacy of threat)*
.2	*Fairly threatened in California (moderate degree/immediacy of threat)*
.3	*Not very threatened in California (low degree/immediacy of threat or no current threats known)*

– *Indicates information that is not applicable to the species.*

Sources: California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 26 March 2020].

Attachment B:
Regulatory Summary

Relevant Policies and Regulations

Federal

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (FESA) protects plants and animals that the government has listed as "Endangered" or "Threatened". A Federally listed species is protected from unauthorized "take", which is defined in the FESA as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or attempt to engage in any such conduct". All persons are presently prohibited from taking a Federally listed species unless and until: (1) the appropriate Section 10(a) permit has been issued by the U.S. Fish and Wildlife Service (USFWS) or (2) an Incidental Take Statement is obtained as a result of formal consultation between a Federal Agency and the USFWS pursuant to Section 7 of the FESA and the implementing regulations that pertain to it (50 *Code of Federal Regulations* [CFR] 402). "Person" is defined in the FESA as an individual, corporation, partnership, trust, association, or any private entity; any officer, employee, agent, department or instrument of the Federal government; any State, Municipality, or political subdivision of the State; or any other entity subject to the jurisdiction of the United States.

Clean Water Act/River and Harbors Act

The U.S. Army Corps of Engineers (USACE) Regulatory Branch regulates activities that discharge dredged or fill materials into "Waters of the U.S."1 under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. This permitting authority applies to all "Waters of the U.S." where the material has the effect of: (1) replacing any portion of "Waters of the U.S." with dry land or (2) changing the bottom elevation of any portion of "Waters of the U.S.".

Section 401 of the CWA provides the Regional Water Quality Control Board (RWQCB) with the authority to regulate, through a Water Quality Certification, any proposed Federally permitted activity that may affect water quality. Among such activities are discharges of dredged or fill material permitted by the USACE pursuant to Section 404 of the CWA. Section 401 requires the RWQCB to provide "certification that there is reasonable assurance that an activity which may result in the discharge to 'waters of the U.S.' will not violate water quality standards". Water Quality Certification must be based on a finding that the proposed discharge would comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the nine Regional Boards' Basin Plans.

Development allowed within any identified jurisdictional areas in the proposed 2020 General Plan Area (which includes the City of Rancho Cucamonga and its related SOI) may be subject to requirements under Sections 401 and 404 of the CWA. This includes filling; stockpiling; converting to a storm drain; modifying an existing storm drain or channel; creating a channel; stabilizing a bank; modifying road or utility transmission line crossings; or completing other modifications of an existing drainage, stream, or wetland. Also, both permanent and temporary impacts to jurisdictional resources are regulated activities that require permit authorization from these agencies.

Executive Order 11990

Executive Order 11990 directs Federal agencies (1) to minimize the destruction, loss, or degradation of wetlands and (2) to preserve and enhance the natural and beneficial values of wetlands in carrying out the agencies' responsibilities. Each agency shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction and (2) that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use. In making this finding, the head of the agency may take into account economic, environmental, and other pertinent factors.

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[1] "Waters of the U.S." include navigable coastal and inland waters, lakes, rivers, and streams and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce

Migratory Bird Treaty Act

Pursuant to the Migratory Bird Treaty Act of 1918, Federal law prohibits the taking of migratory birds, their nests, or their eggs (16 United States Code [USC], Section 703), except as allowed by permit pursuant to 50 CFR 21. The statute makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts*, nests, or eggs of such a bird except under the terms of a valid Federal permit.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act provides for the protection of the bald eagle (Haliaeetus leucocephalus) and the golden eagle (Aquila chrysaetos) by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act and strengthened other enforcement measures. A 1978 amendment authorized the Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations.

State

California Endangered Species Act

Pursuant to the California Endangered Species Act and Section 2081 of the California Fish and Game Code, an Incidental Take Permit from the California Department of Fish and Game (CDFG) is required for projects that could result in the take of a State-listed Threatened or Endangered species. Under the California Endangered Species Act, “take” is defined as an activity that would directly or indirectly kill an individual of a species. If a species is listed by the Federal and State governments as Threatened or Endangered, a consistency finding in accordance with Section 2080.1 of the CESA is issued when a project is deemed consistent with an existing USFWS Biological Opinion (BO), pursuant to Section 7 of the FESA.

Porter-Cologne Act

The Porter-Cologne Act provides the State with very broad authority to regulate “Waters of the State”.[2] Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a “Report of Waste Discharge” when there is no Federal nexus, such as under Section 404(b)(1) of the Clean Water Act. Although “waste” is partially defined as any waste substance associated with human habitation, the RWQCB interprets this to include fill discharge into water bodies.

California Fish and Game Code

“Waters of the State”

Sections 1600–1616 of the California Fish and Game Code protect “Waters of the State”. Activities of State and local agencies, as well as public utilities that are project proponents, are regulated by the CDFG under Section 1602 of the code; this section regulates any work that would (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. For project activities (described above) that may affect stream channels and/or riparian vegetation regulated under Sections 1600 through 1603, CDFG authorization is required in the form of a Streambed Alteration Agreement.

Birds of Prey and Migratory Birds

Sections 3503 and 3503.5 of the California Fish and Game Code makes it unlawful to take, possess, or destroy the nests and eggs of birds of prey.

Section 3513 of the California Fish and Game Code prohibits taking and possession of any migratory nongame bird, as designated in the Migratory Bird Treaty Act.

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[2] The Porter-Cologne Act defines "Waters of the State" as "any surface water or groundwater, including saline waters, within the boundaries of the state" (this includes the rivers, streams, or lakes protected by Sections 1600-1616 of the *California Fish and Game* Code).

CDFG Review

As a trustee agency, the CDFG has jurisdiction over certain resources held in trust for the people of California. Trustee agencies are generally required to be notified of CEQA documents relevant to their jurisdiction, whether or not these agencies have actual permitting authority or approval power over aspects of the underlying project (14 California Code of Regulations [CCR] Section 15386). The CDFG, as a trustee agency, must be notified of CEQA documents regarding projects involving wildlife of the State as well as Rare and Endangered native plants,[3] wildlife areas, and ecological reserves. As a trustee agency the CDFG cannot approve or disapprove a project; however, lead and responsible agencies are required to consult with them. The CDFG, as the trustee agency for wildlife resources, shall provide the requisite biological expertise to review and comment upon environmental documents and impacts arising from buildout of the proposed General Plan Update Study Area and shall make recommendations regarding those resources held in trust for the people of California (California Fish and Game Code, Section 1802).

County

The County of San Bernardino Code of Ordinances (Title 8, Division 8, Chapter 88.01: Plant Protection and Management) provides regulations and guidelines for managing plant resources in the unincorporated areas of the County on property or combinations of property under private or public ownership. A Tree or Plant Removal Permit is required for the removal of regulated trees and plants. Regulated trees and plants are identified in Section 88.01.070(b) (Regulated Trees) and Section 88.01.080(b) (Regulated Riparian Plants).

Trees protected by Section 88.01.070(b) include (1) any living, native tree with a 6-inch or greater stem diameter or 19 inches in circumference measured 4.5 feet above natural grade level and (2) 3 or more palm trees in linear plantings which are 50 feet or greater in length within established windrows[4] or parkway plantings.

Riparian plants are regulated in riparian areas located on private land within unincorporated areas of the County and on public land owned by the County, unless exempt. Section 88.01.080(b) applies to the removal of vegetation within 200 feet of the bank of a stream[5] or in an area indicated as a protected riparian area on an overlay map or Specific Plan.

Local

The City's Tree Preservation Ordinance in the Municipal Code (Title 19, Environmental Protection - Chapter 19.08) states that eucalyptus, palm, oak, sycamore, pine, and other trees growing within the City are a natural aesthetic resource and are worthy of protection. A permit is required for the removal, relocation, or destruction of a Heritage Tree.[6]

Community Mobility

Existing Conditions Report

May 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Summary

The purpose of assessing existing conditions is to help the City of Rancho Cucamonga develop a General Plan update (PlanRC) strategy to encourage an integrated, multimodal transportation system that meets the needs of Rancho Cucamonga. This chapter reviews several aspects of transportation mobility, including regulatory setting, travel characteristics, streets and roadways along with their functional classifications, pedestrian facilities, bicycle facilities, transit services and facilities, goods movement, parking, and the future trends of transportation.

Key Findings

Key findings of the assessment are noted below. Additional detail and information can be found later in this chapter.

- Existing regional rail connections are east-west, but there is an opportunity to create a regional transit hub within the Inland Empire by creating a north-south regional transit connection that will connect Rancho Cucamonga to Ontario, Eastvale, Corona, and other jurisdictions. Collaboration among regional transportation agencies and surrounding cities including Rancho Cucamonga will be needed to pursue this. The collaboration may include buy-in from regional transit agencies and creation of a joint powers authority to reach the common goal of increased regional rail connections. In addition, the City should identify and evaluate the roadway connections to nearby communities as another opportunity for improving regional networks.
- State regulations such as Assembly Bill 1358 (California Complete Streets Act) and Senate Bill 743 (SB 743) are affecting the desired functionality of City streets and the analysis of transportation impacts.
    - The California Complete Streets Act requires a circulation element to plan for all modes of transportation, including walking, biking, car travel, and transit, for users of all ages and abilities. The City adopted a complete streets ordinance in 2012 to ultimately provide for the safe, convenient, and comfortable experience of all travelers. The City should update the complete streets ordinance to provide access for users of all abilities and mode choice.
    - SB 743 aims to manage congestion management with the promotion of infill development, active transportation for improved public health, and the reduction of greenhouse gas emissions. This will be achieved by shifting from using auto delay (LOS) as the primary metric to using vehicle miles traveled (VMT) to evaluate transportation impacts of land development for CEQA purposes. LOS may still be used for roadway planning purposes and for evaluating CEQA impacts of specific roadway projects.
- Current roadway classifications prioritize automobile circulation because the roadway hierarchy is based on the vehicular capacity, type and frequency of vehicular access that is allowed (e.g., intersection spacing, driveway locations). However, these same streets also need to serve bicyclists, pedestrians, and transit users. In some cases, for example, it is more important to prioritize walking or biking over vehicle capacity because of the character of the street (i.e., a downtown shopping district with on-street parking), adjacent land uses (i.e., parks, schools, or mixed-use developments), or to create connectivity between adjacent, complementary uses. Use of a new system such as a street typology that addresses the overall context of a roadway and the adjacent land uses is one way to provide a more balanced planning approach across travel modes.

Alternatively, a layered network approach can be employed to identify those streets where active modes and/or transit should be prioritized, and other streets where vehicle capacity is more important (but where other modes could still be considered). Identifying the modal priority for regional roadway connections could also be investigated in light of the General Plan update.

- Collisions involving bicycles and pedestrians had higher rates of fatal and severe injuries compared to collisions involving motor vehicles across the City. Safety should be a major priority for street treatments, especially when planning future activity centers where high pedestrian activity is anticipated. The City may also consider making a greater commitment to “safety first” by prioritizing safety of all users.

- From electric vehicles and ridesharing to autonomous vehicles, innovation in the transportation sector is already changing the way we get around. These developments and innovations have the potential to make travel safer, more convenient, and more environmentally sustainable. The General Plan Update will need to anticipate how these changes could affect the design of streets and consider new curbside management strategies as travel behavior and vehicle ownership patterns evolve.

- Due to a mismatch in local jobs and skill levels of residents, only 15% of Rancho Cucamonga residents work in the City and 85% commute to other locations. Their travel patterns indicate that the majority of residents travel west and east to jobs in other cities in Los Angeles and San Bernardino Counties, respectively. The General Plan update should identify incentives to increase the number of local jobs for higher skill levels in the City and increase commute trip internalization.

- Despite having a generally good sidewalk network, key sidewalk gaps exist in the City. Some parts of the City have sidewalk gaps as a result of design choice. For example, the gaps in the older neighborhoods of northern Alta Loma reflect the intention to preserve a rural character, and the areas along Base Line and Carnelian Street were developed under County standards. Closing sidewalk gaps should be prioritized in the southwest part of the City where there is a higher density of pedestrian-related collisions and future development potential. Overall, sidewalks may still be desirable in all areas, especially on routes to school.

- There is limited roadway connectivity between the north and south part of the City across SR-210 and a lack of east-west connectivity to the north of SR-210. The Mobility Element should focus on connectivity to the north area, especially to assist in emergency access.

- The City offers a well-connected grid of arterial streets, many of which have existing and planned bicycle facilities. However, many of these streets are also truck routes and facilitate high travel speeds; both of which decrease bicycle comfort. The City should review the on-street bicycle network to separate the truck routes from bicycle facilities or to provide alternative bicycle routes.

- The robust network of existing City trails is a great community asset and there is an opportunity to connect bicycle facilities throughout the City using drainage channels and utility corridors. The General Plan update should identify these opportunities and coordinate with appropriate agencies to ensure their implementation.

Community Mobility

This chapter provides an assessment of existing transportation regulations, infrastructure conditions, services, and system performance in the City of Rancho Cucamonga. The information provided in this chapter establishes a consistent baseline that frames the City's transportation conditions in the larger regional context of San Bernardino County and Inland Empire Cities.

Introduction

This chapter discusses the existing transportation infrastructure in the City and the Sphere of Influence, including roadways, bicycle and pedestrian facilities, and transit. It also describes truck routes and traffic distribution patterns throughout the City. Rancho Cucamonga's transportation system not only serves the everyday mobility needs of its residents, but also affects regional travel patterns associated with its growing employers and goods movement industry. Consequently, the General Plan Update will evaluate transportation conditions in Rancho Cucamonga at both a local and regional scale in this changing context.

This report will subsequently be used as a basis for facilitating community input on planning issues, priorities, and visions for the future; preparing alternative land use and transportation planning scenarios; formulating policies and implementation actions for the General Plan; and creating the environmental setting portion of the Environmental Impact Report for the General Plan.

Transportation System and Context

The City of Rancho Cucamonga has convenient access to both local and regional transportation facilities, including freeways, arterial roadways, a commuter rail connection, and convenient proximity to the Ontario International Airport. Three major freeways serve the City: Interstates 10 and 15 and State Route 210. Interstate 10 (I-10) runs just south of the City limits with several interchanges at major arterials. Interstate 15 (I-15) runs along the eastern edge of the City, and State Route 210 (SR-210) runs thorough the northern part of the City. To the east of Rancho Cucamonga lies the City of Fontana, to the south is the City of Ontario, and to the west is the City of Upland. This section discusses the existing transportation system, focusing on commute trends and the current regulatory framework shaping transportation in the City of Rancho Cucamonga.

Key Transportation Agencies

City of Rancho Cucamonga

The City of Rancho Cucamonga is responsible for planning, constructing, and maintaining local public transportation facilities, including all City streets, City-operated traffic signals, sidewalks, and bicycle facilities. These local services are funded primarily by gas-tax revenue, Measure I revenue, and developer fees. The City has jurisdiction over all

City streets and traffic signals except for those operated by Caltrans (noted below) or shared with adjacent jurisdictions.

San Bernardino County Transportation Authority (SBCTA)

San Bernardino County Transportation Authority (SBCTA), formerly San Bernardino Association of Governments (SANBAG), is the joint powers authority that oversees regional transportation planning comprising all the cities in San Bernardino County. SBCTA oversees the countywide multimodal transportation system with delivering freeway construction projects, regional road improvements, transit and rail improvements, grade separations, call boxes and ridesharing programs, congestion relief, as well as long-term planning efforts.

Southern California Association of Governments (SCAG)

The regional transportation planning agency and Metropolitan Planning Organization (MPO) for the Southern California region is SCAG. SCAG develops long-range regional transportation plans (RTPs) including the Sustainable Communities Strategy (SCS) and growth forecast components. SCAG also develops the regional transportation improvement programs (RTIP).

Caltrans

Caltrans has authority over the State highway system, including mainline facilities, interchanges, and arterial State routes. Caltrans approves the planning and design of improvements for all State-controlled transportation facilities. Caltrans facilities in or serving Rancho Cucamonga include I-10, 1-15, SR-210 Freeways and the associated interchanges.

Transit Operators

OmniTrans

OmniTrans operates local and express bus service as well as bus rapid transit service in Rancho Cucamonga. OmniTrans also operates the shuttle service and paratransit service in the City.

Metrolink

Metrolink is the commuter rail system in Southern California that connects Rancho Cucamonga with destinations in Los Angeles County, San Bernardino County, and Riverside County.

System Monitoring

The City is working towards the goal of installing Advanced Traffic Management System (ATMS) that allows staff to monitor traffic at strategic locations throughout the City. Phase 1 of the ATMS is currently in design and is expected to begin construction in late 2020. The system allows for the transportation system to work more effectively and efficiently by providing the ability to adjust critical traffic signals from the City’s Traffic Management Center (TMC). These tools will allow the City of Rancho Cucamonga to better monitor and address congestion issues.

Regulatory Setting

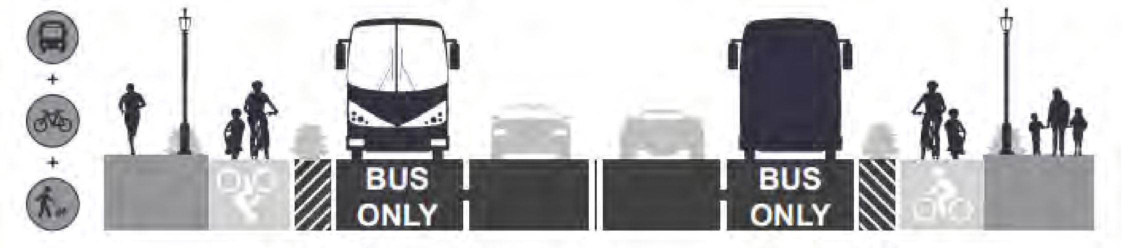
The regulatory framework is meant to inform decision makers about the regulatory agencies and policies that affect transportation in the City of Rancho Cucamonga. This enables decision makers to execute informed decisions about planning improvements to transportation systems.

State Regulations

Assembly Bill 1358 (California Complete Streets Act)

Assembly Bill 1358 (AB 1358) or the California Complete Streets Act, was signed into law on September 30, 2008. Since January 1, 2011, AB 1358 has required circulation element updates to address the transportation system from a multimodal perspective. The Act states that streets, roads, and highways must "meet the needs of all users in a manner suitable to the rural, suburban, or urban context of the General Plan." The Act requires a circulation element to plan for all modes of transportation where appropriate, including walking, biking, car travel, and transit. In addition, the Act requires circulation elements to consider the multiple users of the transportation system, including children, adults, seniors, and the disabled.

Rancho Cucamonga adopted its Complete Streets Ordinance in 2012 to implement the goals of providing complete streets in the City from the 2010 General Plan[1].



Conceptual Street Cross-Section of a Complete Street. Source: Fehr & Peers

Assembly Bill 32 (Global Warming Solutions Act)

Assembly Bill 32 (AB 32) or the Global Warming Solutions Act was signed into law on September 27, 2006. AB 32 established a comprehensive program to reduce greenhouse gas emissions to combat climate change. This bill requires the California Air Resources Board (CARB) to develop regulations that reduce greenhouse gas emissions to 1990 levels by 2020. On January 1, 2012, the greenhouse gas rules and market mechanisms, adopted by CARB, took effect and became legally enforceable. The reduction goal for 2020 is to reduce greenhouse gas emissions by 25% of the current rate in order to meet 1990's level, and a reduction of 80% of current rates by 2050. The AB 32 Scoping Plan contains the main strategies California will use to reduce the greenhouse gases. The scoping plan has a range of greenhouse gas reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms, and an AB 32 program implementation regulation for funding. In 2016, the Legislature passed SB 32, which codifies a 2030 GHG emissions reduction target of 40% below 1990 levels.

CARB recognizes cities as "essential partners" in reducing greenhouse gas emissions. The Air Resources Board has developed a Local Government Toolkit with guidance for GHG reduction strategies such as improving transit, developing bicycle/pedestrian infrastructure, increasing city fleet vehicle efficiency, and other strategies.

The City of Rancho Cucamonga is currently striving to comply with AB 32 and implement greenhouse gas reduction strategies into the City's General Plan by adopting the Complete Streets Ordinance in 2012 and publishing Sustainable Community Action Plan in 2018. SBCTA is also undertaking several initiatives including transit

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[1] https://smartgrowthamerica.org/app/legacy/documents/cs/policy/cs-ca-ranchocucamonga-ordinance.pdf

investments, technology-enabled multimodal action plan, Transit-Oriented Development (TOD) planning, countywide active transportation investment, etc. which intends to comply with the statewide reduction targets.

Senate Bill 375 (Sustainable Communities and Climate Protection Act)

Senate Bill 375 (SB 375) or the Sustainable Communities and Climate Protection Act, provides incentives for cities and developers to bring housing and jobs closer together and to improve public transit. The goal is to reduce the number and length of automobile commuting trips, helping to meet the statewide targets for reducing greenhouse gas emissions set by AB 32.

SB 375 requires each MPO to add a broader vision for growth to its transportation plan - called a Sustainable Communities Strategy (SCS). The SCS must lay out a plan to meet the region's transportation, housing, economic, and environmental needs in a way that enables the area to lower greenhouse gas emissions. The SCS should integrate transportation, land-use, and housing policies to plan for achievement of the emissions target for each region. The SCAG Regional Transportation Plan (RTP) and SCS were adopted in 2016.

For consistency with the regional planning objectives of the SCS, consideration of ways to achieve the following is needed as part of the General Plan Update process:

- Support transit-oriented development;
- Support mixed-use development, which improves community walkability;
- Improve jobs-to-housing ratio;
- Promote land use patterns that encourage the use of alternatives to single-occupant automobile use;
- Apply Transportation System Management (TSM) and Complete Streets practices to arterials to maximize efficiency;
- Improve modes through enhanced service, frequency, convenience, and choices; and
- Enhance Transportation Demand Management (TDM) practices to reduce barriers to alternative travel modes and attract commuters away from single-occupant vehicle travel.

Senate Bill 743 (SB 743)

Senate Bill 743 (SB 743) was signed into law on September 27, 2013 and has the potential to fundamentally change the traditional transportation impact analyses conducted as part of the CEQA process. According to this bill, traffic impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area will not be considered significant. Also, residential, mixed-use, and employment center projects meeting specific criteria would be exempt from CEQA. Furthermore, for the CEQA process, this bill eliminates measures such as auto delay, level of service (LOS), and other vehicle-based measures of capacity in many parts of California. Instead, other measurements such as vehicle miles traveled (VMT) are to be utilized to measure impacts.

The purpose of SB 743 is to balance the needs of congestion management, infill development, public health, greenhouse gas reductions, and other goals. The Office of Planning and Research released the *Technical Advisory on Evaluating Transportation Impacts in CEQA*[2] in December 2018. Rancho Cucamonga is currently leading the countywide effort to develop the SB 743 implementation study, a guiding document for VMT analysis methodology, thresholds, and mitigation strategies for transportation impact evaluation for SBCTA agencies.

To comply, the City of Rancho Cucamonga is leading the process in San Bernardino County to develop guidelines and significance criteria consistent with SB 743 by July 1, 2020. This process includes adoption of thresholds of

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[2] *Technical Advisory on Evaluating Transportation Impacts in CEQA*, 2018. http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

significance and identification of a VMT analysis methodology. These choices will be documented in the updated traffic impact study guidelines but will be revisited during the PlanRC process.

Implementing SB 743

An Analysis of Vehicle Miles Traveled Banking and Exchange Frameworks

October 2018

Ethan N. Elkind, Ted Lamm, and Eric Prather

SB 743 Implementation Framework Example. Source: Fehr & Peers

Regional Regulations

San Bernardino County Congestion Management Program (CMP)

The passage of Proposition 111 in June 1990 established a process for each metropolitan county in California, including San Bernardino County within which the City of Rancho Cucamonga is located, to prepare a Congestion Management Plan[3] (CMP). Updated by SBCTA in 2016, the CMP is an effort to align land use, transportation, and air quality management efforts in order to promote reasonable growth management programs that effectively use statewide transportation funds, while ensuring that new development pays its fair share of needed transportation improvements.

The focus of the CMP is the development and coordination of a multimodal transportation system across jurisdictional boundaries, incorporating the goals from SCAG RTP/SCS. Per the Level of Service target of “E” adopted by SBCTA, when a CMP segment falls to “F,” a deficiency plan must be prepared by the local agency where the deficiency is located. The plan must contain mitigation measures, including Transportation Demand Management (TDM) strategies and transit alternatives, and a schedule of mitigating the deficiency. It is the responsibility of local agencies to consider the traffic impacts on the CMP when reviewing and approving development proposals.

It should be noted that SB 743 provides the option for local agencies to opt out of the CMP individually due to the outdated regulatory nature of CMP. This may be something the City could consider in the future to reduce the regulatory requirement and the cost of annual monitoring of intersections. For reference, the following facilities are designated CMP facilities in or serving the City: I-10, I-15, SR-210, 19th Street, Base Line Road, Foothill Boulevard, Arrow Route, 4th Street, Archibald Avenue, Haven Avenue, and Milliken Avenue.

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[3] *San Bernardino County Congestion Management Program*, 2016. https://www.gosbcta.com/wp-content/uploads/2019/10/2016-Congestion-Management-Plan-.pdf

Regional Transportation Plan (RTP)

The Regional Transportation Plan (RTP) is prepared by SCAG for the six-county SCAG region. This long-range transportation plan (approximately 20-year horizon) projects population and employment growth and defines the vision and overall goals for the regional multimodal transportation system. The RTP identifies future transportation infrastructure needs and defines planned multimodal transportation improvements, including freeways, high-occupancy vehicle facilities, bus and rail transit, freight movement, and aviation. This plan therefore sets the framework for the regional transportation infrastructure system that serves Rancho Cucamonga.

Caltrans VMT-Focused Transportation Impact Study Guide (TISG)

The Caltrans VMT-Focused Transportation Impact Study Guide[4] (TISG) provides a starting point and a consistent basis on which Caltrans evaluates traffic impacts to state highway facilities. Still in draft format, the guide provides information on when a traffic impact study is needed based on VMT, the scope of a traffic impact study (i.e. the boundaries of the traffic study and the analysis scenarios), the required data for a traffic impact study, analysis methodologies for various types of state facilities, and guidelines for mitigating impacts. A future update will include basis for requesting transportation impact analysis that is not based on VMT.

Measure I 2010-2040 Strategic Plan

First approved in 1989 and extended in 2004 by the voters, Measure I is the half-cent sales tax collected throughout San Bernardino County for transportation improvements. Administered by SBCTA, the Measure I 2010-2040 Strategic Plan[5] is the official guide for the allocation and administration of the combination of local transportation sales tax, State and Federal transportation revenues, and private fair-share contributions to regional transportation facilities to fund delivery of the Measure I 2010-2040 transportation programs. The strategic plan identifies funding categories, allocations, and planned transportation improvement projects in the County for freeways, major and local arterials, bus and rail transit, and traffic management systems. For the fiscal years 2018-19 through 2022-23, Rancho Cucamonga has identified improvements worth approximately $19 million in funding for pavement rehabilitation projects, citywide Americans with Disabilities Act (ADA) corrective measures, signal and striping maintenance, etc. These improvements are planned to be funded through the Measure I Local Streets Program. It is to be noted that the five-year Capital Improvement Program (CIP) is over programmed to allow use of this funding source if additional funding is available during the five-year planning period. For a detailed list of the projects, see Appendix A.

San Bernardino County Long-Range Transit Plan

SBCTA updates its Long-Range Transit Plan[6] (LRTP) to address transit needs for an approximate 25-year horizon. The LRTP prioritizes goals and projects for transit growth. With the passage of SB 375 by the State legislature in 2008, the LRTP has been modified to more closely tie land use and transportation planning strategies. The LRTP addresses countywide travel challenges and creates a system aimed to increase the role of transit in future travel choices. The LRTP anticipates that a premium transit service, such as rapid buses and rail modes, will offer solutions to future travel demands by providing competitive travel times and increased reliability, mobility, and accessibility. Premium

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[4] *Caltrans Draft VMT-Focused Transportation Impact Study Guide*, 2020. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-02-26-transmittal-and-draft-vmt-focused-tisg.pdf

[5] https://www.gosbcta.com/wp-content/uploads/2019/09/2018-2023CIPSummaryReport.pdf

[6] *San Bernardino County Long Range Transit Plan, 2010.* https://www.gosbcta.com/wp-content/uploads/2019/10/San-Bernardino-County-Long-Range-Transit-Plan.pdf

transit will reduce dependence on cars, encourage community revitalization, and encourage more balanced transit-oriented land use development.

SBCTA Non-Motorized Transportation Plan

SBCTA published its Non-Motorized Transportation Plan[7] (NMTP) in 2011 and revised in 2018, with the vision of creating a safe, interconnected cycling and walking system in the County. Supplemented by local jurisdiction inventory data, the plan provides both regional and city-level recommendations, and the jurisdictions are responsible for the implementation of the plan.

SBCTA Development Mitigation Nexus Study

The SBCTA Development Mitigation Nexus Study[8] identifies the fair share contributions from new development for regional transportation improvements (e.g., freeway interchanges, railroad grade separations, and regional arterial highways). The Nexus Study is updated biennially or as requested by SBCTA Board of Directors and in close coordination with local jurisdictions.

City Projects of Significance

Etiwanda Heights Neighborhood & Conservation Plan (EHNCP)

Adopted in October 2019, the Etiwanda Heights Neighborhood & Conservation Plan (EHNCP) is a Specific Plan that provides the vision and pre-zoning for conservation of the foothills and a neighborhood area in 4,393 acres of unincorporated land (the Planning Area) located to the north and northeast of the City's current boundary. In January 2020, the City submitted an application to the San Bernardino County Local Agency Formation Commission (LAFCO) for approval of the annexation of this planning area. As an undeveloped and rural area, the Planning Area currently has very little roadway network. The Specific Plan provides strategies for connected roadway network, opportunities for active transportation, and enabling existing and future residents to conduct some of their daily errands on foot, on horseback, by bike or a short drive within the neighborhood.

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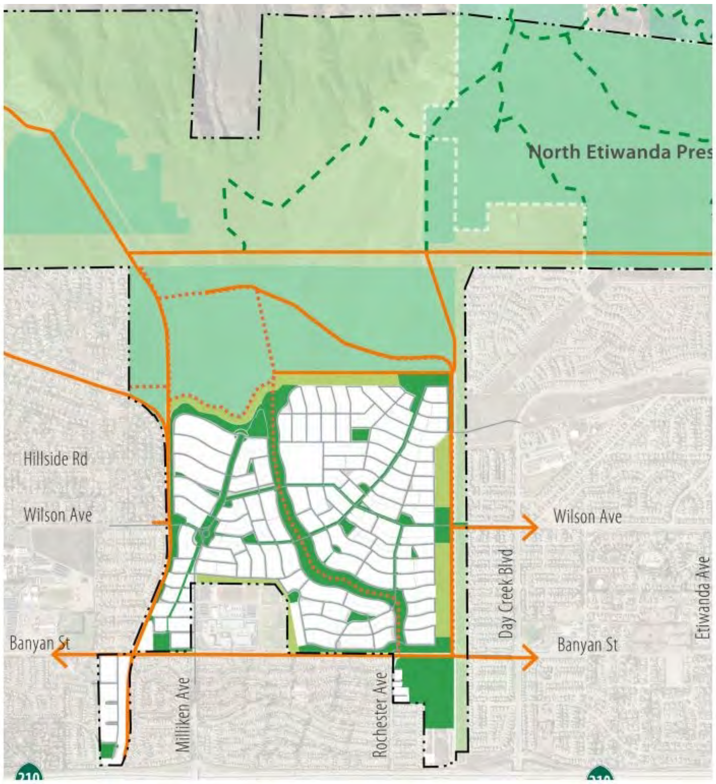
[7] *SBCTA Non-Motorized Transportation Plan.* https://www.gosbcta.com/wp-content/uploads/2019/10/Non-Motorized-Transportation-Plan-.pdf

[8] *SBCTA Development Mitigation Nexus Study, 2018.* https://www.gosbcta.com/wp-content/uploads/2019/09/CMP-AppendixG-2018.pdf



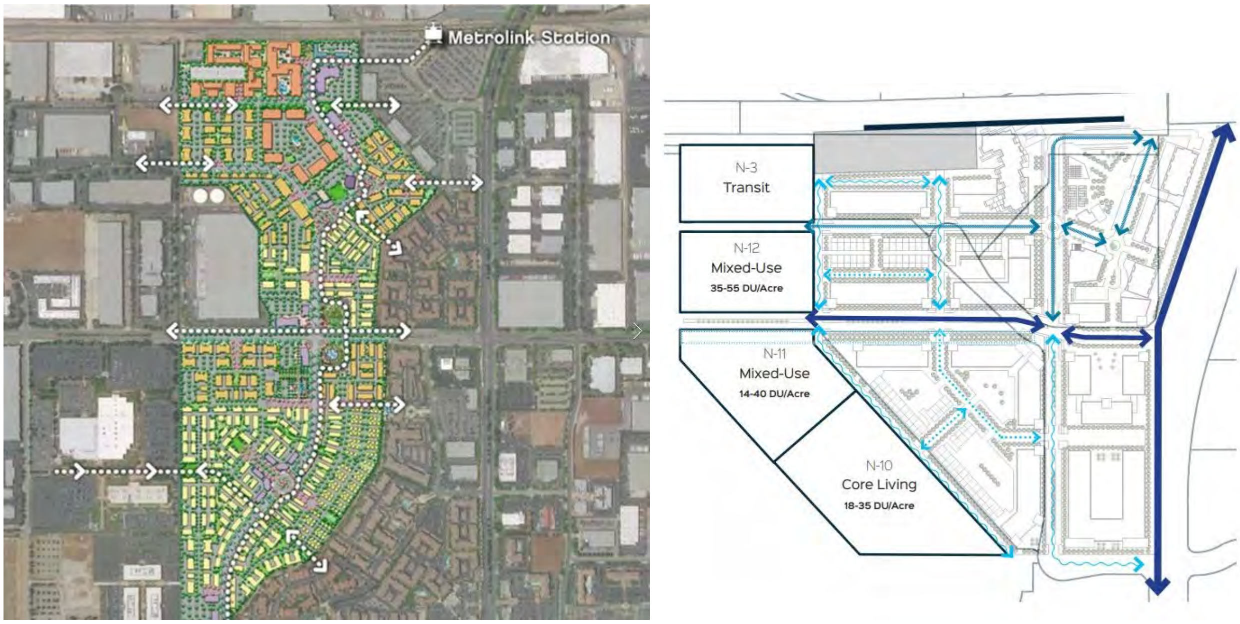
Etiwanda Heights Neighborhood and Conservation Plan (EHNCP) (conceptual). Source: City of Rancho Cucamonga (2016)

The Resort (Empire Lakes) Specific Plan, Planning Area 1

The Empire Lakes Specific Plan was amended in 2016 to allow for the development of a mixed-use project located on a former privately owned and operated golf course in close proximity to the Rancho Cucamonga Metrolink station and a variety of employment centers. The 160-acre Plan provides a setting for residential, commercial, and recreational activity in a connected, intimate, personal pedestrian-oriented community. The plan provides for up to 220,000-square-feet of non-residential development with up to 3,450 dwelling units consisting of a mix of apartments, multi-family and single-family homes. Multimodal circulation is provided on the Resort Parkway (previously referred to as “The Vine” in the amended Specific Plan), a spine road with buffered bike lanes, and a 16-foot wide pedestrian zone on each side.

Empire Yards Transit-Oriented Development Plan

In 2016, the City and SBCTA partnered with a proposed developer to design and implement a transit-oriented development (TOD) in the parking lot areas at the Rancho Cucamonga Metrolink Station. Currently called Empire Yards, the project concept is a multimodal transit village with mixed-use development that will attract Metrolink commuters and serve the broader community. There are opportunities to improve access between Empire Lakes and Empire Yards that will serve complementary land uses in the area.



Left Figure: Empire Lakes Specific Plan, Planning Area 1 (conceptual). Source: City of Rancho Cucamonga (2016); Right Figure: Empire Yards TOD Development Plan (conceptual). Source: City of Rancho Cucamonga (2017)

Travel Characteristics

Housing-Employment Dynamics

Based on 2017 American Community Survey (ACS) and the 2017 Longitudinal Employer-Household Dynamics (LEHD) Origin Destination Employment Statics, about 15% of Rancho Cucamonga's working population lives and works in the City of Rancho Cucamonga, while the other 85% lives in the City but is employed outside of the City (Figure 3.1). As such, there is an opportunity to address the heavy outbound commute flows by focusing on policies that grow the number of people who both work and live in Rancho Cucamonga. The City should pursue options for shortening commute distances and expanding efforts that increase environmentally sustainable transportation options for commute. The City, through the Rancho Cucamonga Municipal Utility, should also leverage roadway improvements to build fiber infrastructure that provides high speed internet access and facilitates telecommute for both employers and residents in a post COVID-19 world.

There are approximately 82,000 total jobs and approximately 56,000 total households in Rancho Cucamonga.[9] The City's jobs to employed residents ratio is 1.08; indicating that the City largely maintains a balance between employed residents and employees within the City. However, the fact that only 15% of people both live and work in the City indicates that the local jobs do not match the skill levels or salary expectations of residents. In other words, although

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[9] *U.S. Census Bureau. 2017. OnTheMap Application. Longitudinal-Employer Household Dynamics Program.*

the City has a jobs/worker balance, there is a clear jobs/worker mismatch where most residents do not work in the City.

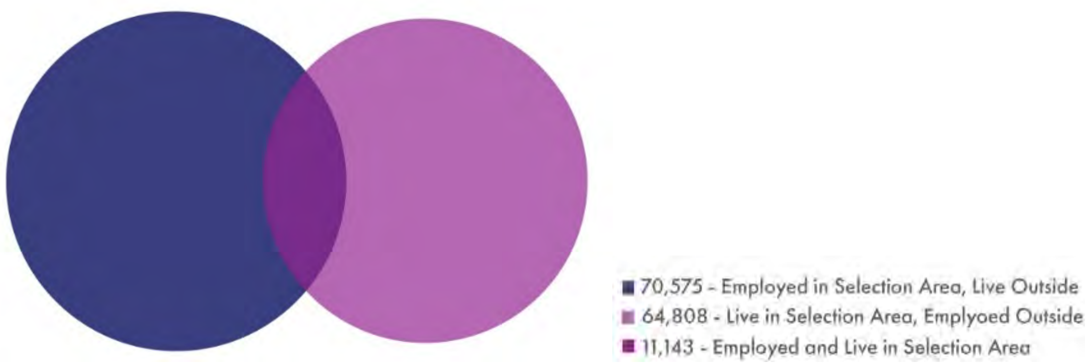
Table 3.1 shows the top workplace destinations of Rancho Cucamonga residents. About 15% of residents work in the City. The other top workplace cities are Ontario (9%), Los Angeles (8%), Upland (3%), Fontana (3%), and San Bernardino (4%); indicating a commute directionality towards the west.

Table 3.1. Top Workplace Destinations of Rancho Cucamonga Residents (2017)

City	Share*
Rancho Cucamonga, CA	15%
Ontario, CA	9%
Los Angeles, CA	8%
Upland, CA	4%
Fontana, CA	4%
San Bernardino, CA	4%
Pomona, CA	3%
Riverside, CA	3%
All Other Locations	50%

Source: U.S. Census Bureau. 2017. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/

Figure 3.1. Inflow and Outflow of Job Counts (2017)



Source: Fehr & Peers (2020); U.S. Census Bureau. 2017. OnTheMap Application. http://onthemap.ces.census.gov/

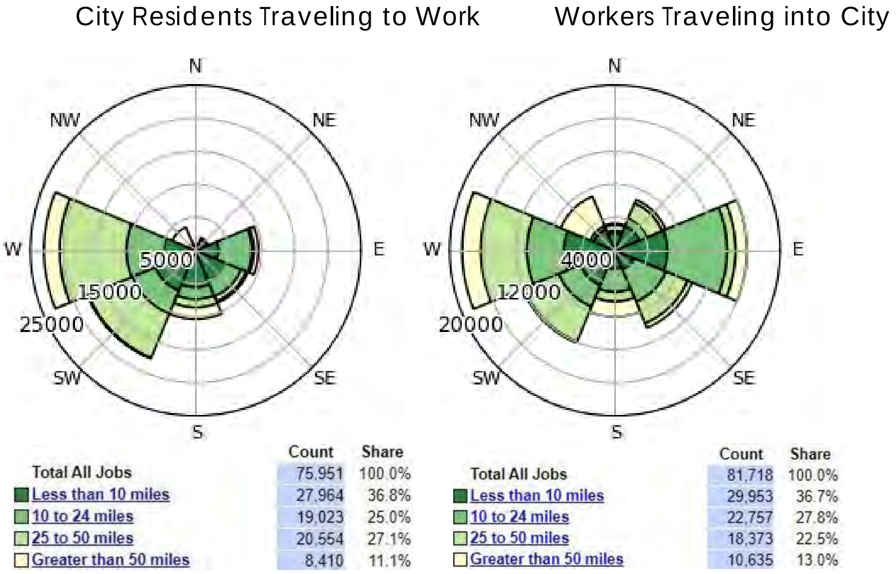
Commute Distances and Patterns

Commute patterns for employed residents are as follows:

- 37% of residents travel less than 10 miles to reach their employment.
- 25% of residents travel between 10 and 24 miles to reach their employment.
- 38% of residents travel 25 miles or more to reach their employment.

63% of Rancho Cucamonga residents travel more than 10 miles to reach their places of employment. The small share of residents traveling less than 10 miles to reach their employment supports the previous conclusions that the city has a relatively small number of people who live and work in Rancho Cucamonga. Figure 3.2 shows that most residents travel west for work, and most workers living outside the city travel from the west and east to work in Rancho Cucamonga.

Figure 3.2. Commute Distance and Direction (2017)



	Count	Share
Total All Jobs	75,951	100.0%
🟩 Less than 10 miles	27,964	36.8%
🟩 10 to 24 miles	19,023	25.0%
🟩 25 to 50 miles	20,554	27.1%
☐ Greater than 50 miles	8,410	11.1%

	Count	Share
Total All Jobs	81,718	100.0%
🟩 Less than 10 miles	29,953	36.7%
🟩 10 to 24 miles	22,757	27.8%
🟩 25 to 50 miles	18,373	22.5%
☐ Greater than 50 miles	10,635	13.0%

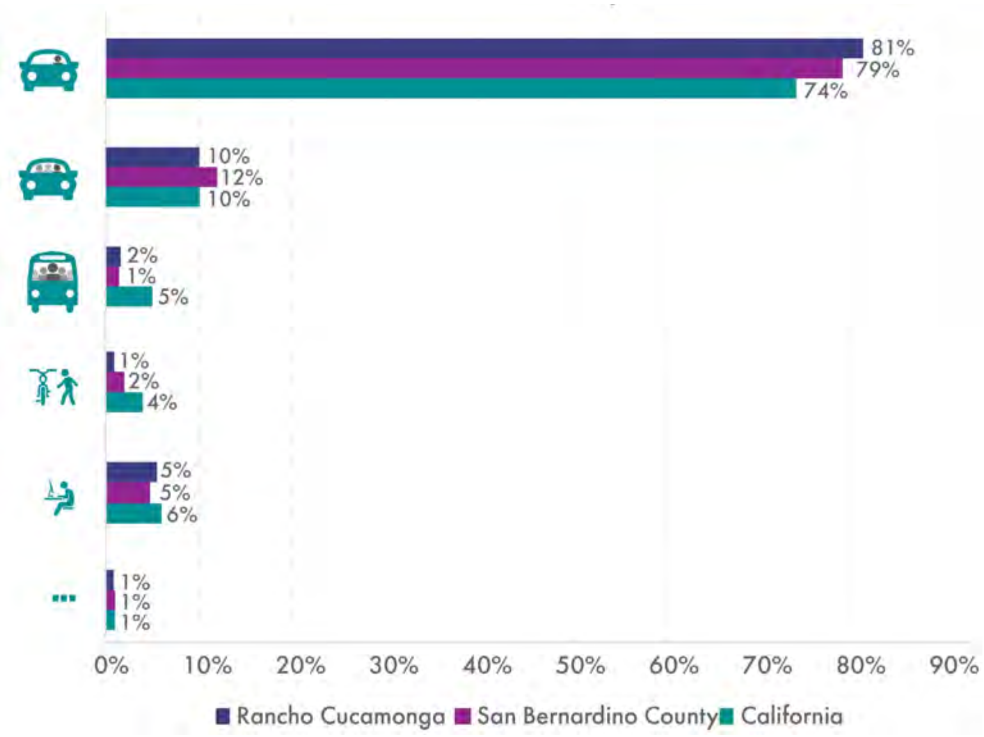
Source: U.S. Census Bureau. 2017. OnTheMap Application. http://onthemap.ces.census.gov/

Commuter Modal Split

Transportation modes for commute for the City of Rancho Cucamonga, San Bernardino County, and California are presented in Figure 3.3. The primary mode of travel for all three geographic areas is the automobile, which includes solo drivers and carpools. Automobile trips (both single occupancy vehicle and carpool) make up about 90% of total travel for both the City of Rancho Cucamonga and San Bernardino County, which is higher than the California average of 84%.

Bicycling and walking are less common in Rancho Cucamonga (1% of the total) when compared to the county (2%) and state (4%). Given the rectilinear grid patterns of streets, there are opportunities to increase the share of trips made by bicycle. The City's public transit modal share (2%) is slightly higher than the County (1%) but substantially lower than the California average (5%). Working at home and other modes (e.g., taxi, motorcycle) comprise the remaining categories.

Figure 3.3. Mode Share for Commute Trips (2017)

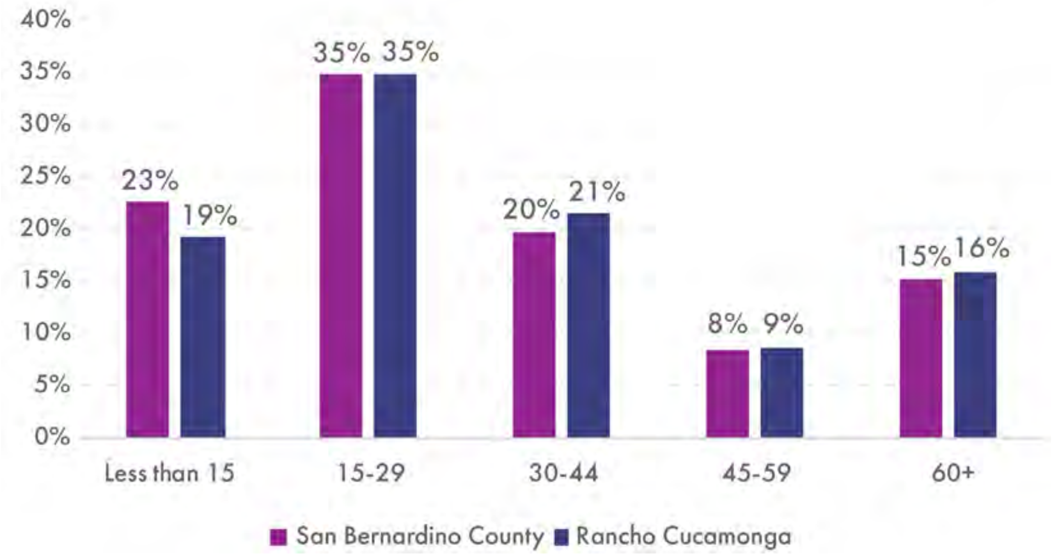


Source: Fehr & Peers (2020); U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Commute Lengths

Figure 3.4 displays the distribution of travel time to work by the percentage of working populations of the City of Rancho Cucamonga and San Bernardino County. The travel time distribution of Rancho Cucamonga residents is generally similar to that of San Bernardino County residents, although the share of Rancho Cucamonga residents that travel more than 30 minutes to work is 3% higher than the corresponding share of San Bernardino County residents.

Figure 3.4. Travel Time to Work in Rancho Cucamonga and San Bernardino County (2013-2017)



Source: Fehr & Peers (2020); U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

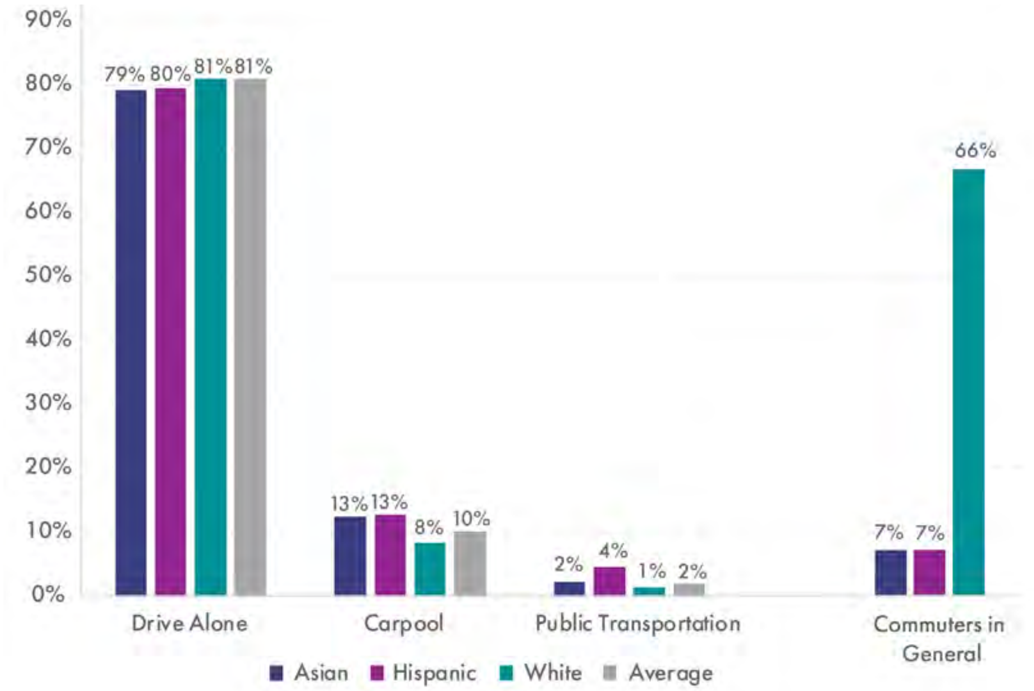
Socioeconomic Factors

Journey to Work Mode by Race and Income

Commute patterns tend to vary between white and nonwhite residents of Rancho Cucamonga, as shown in Figure 3.5. Residents across different races have the similar percentage of driving alone, but a higher percentage of nonwhite residents carpool or ride transit.

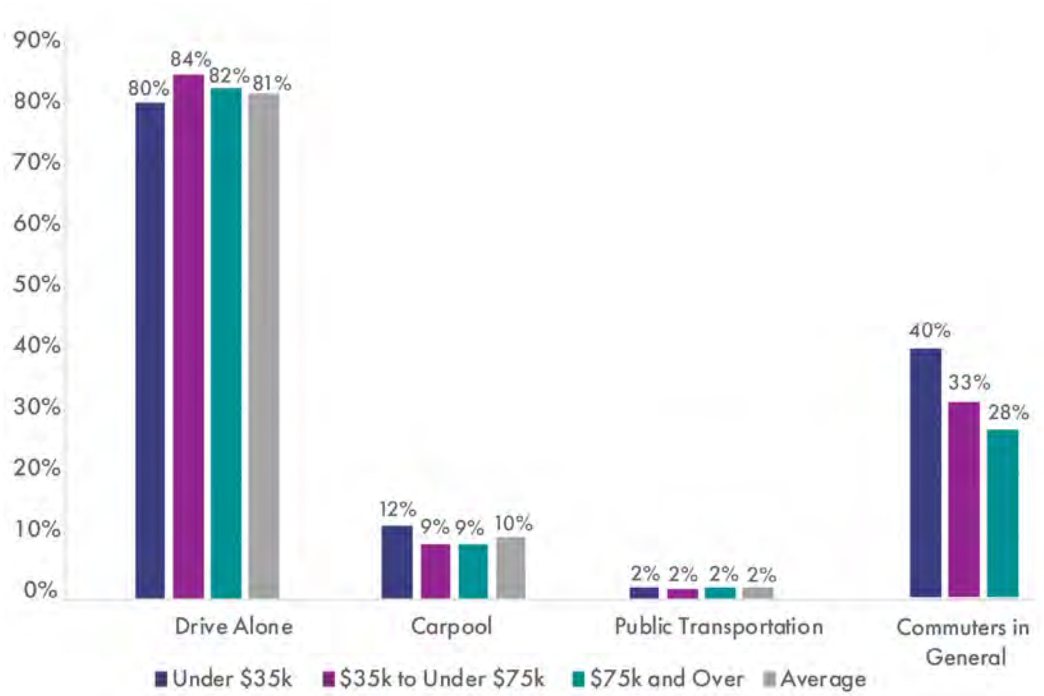
Commuting patterns are relatively comparable across incomes, as shown in Figure 3.6. Moderate income households tend to drive alone slightly more than lower or higher income households, while lower income households tend to carpool more. Transit ridership is the same across all incomes. One possible explanation for this pattern is that some of the highest paying jobs in downtown Los Angeles are more accessible via transit (particularly Metrolink) whereas lower paying jobs are accessed by fixed-route bus service within the City.

Figure 3.5. Journey to Work Mode Percent by Races/Ethnicities (2014-2018)



Source: Fehr & Peers (2020); U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates

Figure 3.6. Journey to Work Mode Percent by Income Level (2014-2018)



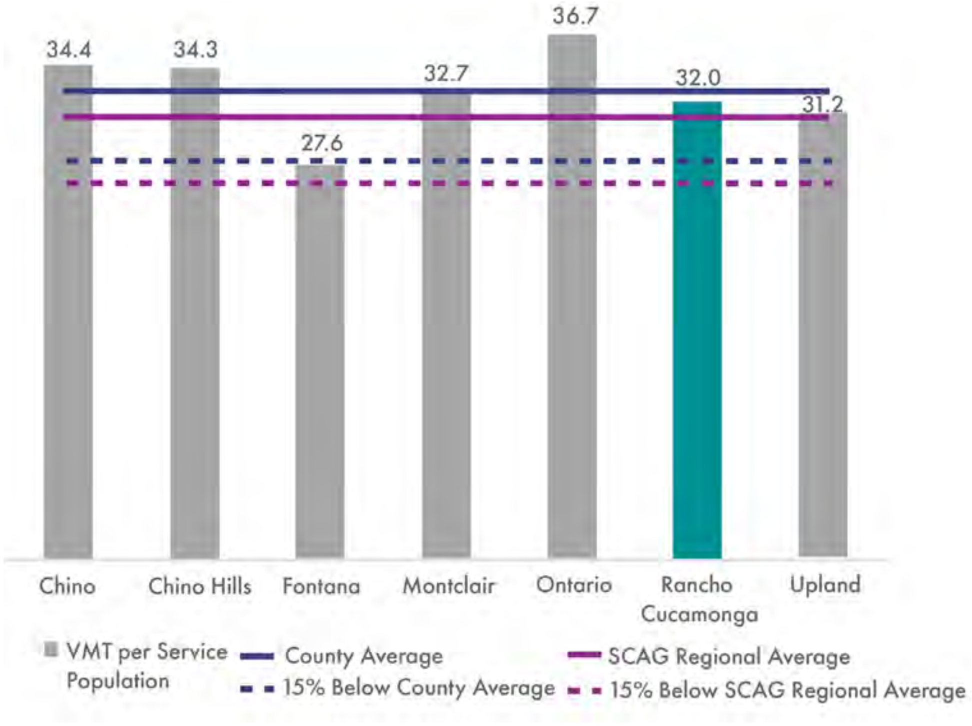
Source: Fehr & Peers (2020); U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates

Vehicle Miles Traveled (VMT)

Vehicle miles traveled (VMT) measures the number of miles traveled during a specified time within a specific region. Cities with more accessibility to key destinations and job centers in a region tend to generate less VMT on a per service population (service population is resident population plus employment) or per household basis compared to locations further away from job centers. After adjusting for commute distances, other things being equal, VMT can also be a good proxy to evaluate whether residents use local services or travel farther for those services.

Rancho Cucamonga VMT per service population is almost the same as the average of the County and in the middle among the neighboring cities in west San Bernardino County, as shown in Figure 3.7. Service population is the sum of the residents and workers in the jurisdiction. Fontana, located just east of the City, has significantly lower VMT per service population; indicating that Rancho Cucamonga could improve its travel efficiency in this area.

Figure 3.7. VMT Per Service Population Comparison in the Neighboring Cities (2018)



Source: Fehr & Peers (2020); Origin-Destination (OD) VMT per Service Population Base Year (2018) SBTAM Model

Existing Street System

This section discusses the existing street system, including discussion of roadway and pavement classifications and conditions. Networks for pedestrians, bicycles, and transit are discussed along with parking and safety information that will inform General Plan Update discussions concerning traffic and circulation.

Roadway System

Regional Highways

Interstate 10

I-10 is located approximately 0.7 miles south of the City limit and provides east-west connectivity to surrounding metropolitan areas. The major interchanges on I-10 that serve the City are provided via major north/south arterials including Vineyard Avenue, Archibald Avenue, Haven Avenue, Milliken Avenue, and Etiwanda Avenue.

Interstate 15

I-15 extends through the southeastern area of the City and along its northeastern City limit with key arterial interchanges at Beech Avenue, Base Line Road, Foothill Boulevard, and 4th Street.

State Route 210

State Route 210 (SR-210) runs through the northern portion of the City, with interchanges located at Carnelian Street, Archibald Avenue, Haven Avenue, Milliken Avenue, and Day Creek Boulevard.

Local Circulation

Roadway Hierarchy

The 2010 Rancho Cucamonga General Plan outlines a roadway hierarchy with three types of facilities: Primary Travel Corridors, Secondary Travel Corridors and Tertiary Travel Corridors (Figure 3.8 and Table 3.2). These roadway types are used as a general description to understand the movement of people and vehicles, and to identify connections to the transit and bicycle networks.

Roadway Classifications

Functional classifications of roadway networks categorize streets by purpose, location, and typical land uses to which they provide access. The functional classification system is often considered an automobile-centric method of planning and does not typically consider travel characteristics and multimodal priorities; consequently, this classification is becoming less common in California cities. Because streets oftentimes have multiple functions, defining street “typologies” beyond the existing functional roadway classifications could better support a multimodal transportation network, assist in implementing complete streets, and generally match the context of the land use environment.

In Rancho Cucamonga, the local street system is organized into a hierarchy of eight roadway types according to the Circulation Plan from 2010 Rancho Cucamonga General Plan. These nine types are Local Streets, Collector Streets, Modified Collector Streets with Median, Secondary Streets, Modified Secondary Streets with Median, Major Arterials, Modified Major Arterials with Median, Major Divided Arterials, and Major Divided Highways, as shown in Figure 3.9.

The current roadway classifications Rancho Cucamonga uses are typical throughout the state, but the current structure focuses only on vehicle travel. The Complete Streets Act (AB 1358) requires that California communities consider all modes of travel when planning the transportation system. To comply with the requirements and intent of the Act, the General Plan update should include a revision of roadway classifications to better meet the needs of all users and abilities and address the land use context of each street.

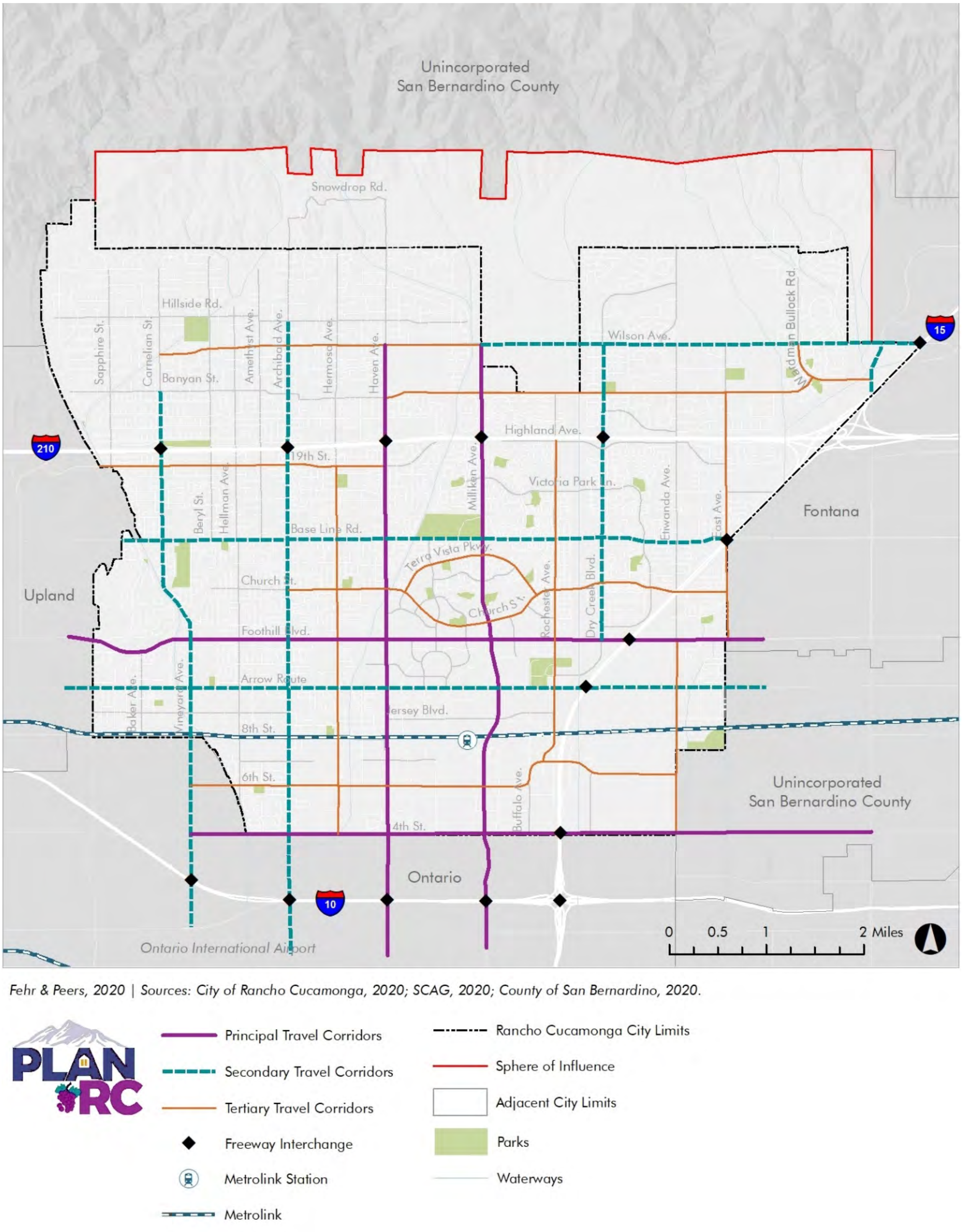
The City may review a reclassification and reprioritization of travel modes on roadways to better support complete streets that serve users of all ages, abilities, and mode choice. This is known as a layered network approach, which recognizes that not all streets can provide the best service for all travel mode types. A narrow street with multiple crossings may be great for walking but may not serve automobiles because of competing interests. By explicitly prioritizing a travel mode for each roadway type, the City of Rancho Cucamonga can focus on providing a network of preferred streets by mode, limiting the overlap between non-compatible modes.

Table 3.2. General Roadway Hierarchy Types (2010)

Type	Description	Features	Streets
Principal Travel Corridors	Traverses the City and extends beyond the City limits to connect to freeways and adjacent communities.	Total Lanes: 6 ADT: 30,000-40,000	▪ Foothill Boulevard ▪ 4th Street ▪ Haven Avenue ▪ Milliken Avenue
Secondary Travel Corridors	Extends across the entire City and in most cases, connects with freeways and extends to other communities.	Total Lanes: 4-6 ADT: 20,000-30,000	▪ Base Line Road ▪ Arrow Highway ▪ Carnelian Street/Vineyard Avenue ▪ Archibald Avenue ▪ Day Creek Boulevard
Tertiary Travel Corridors	Supports and provides access to the primary and secondary corridors. Are more locally oriented and locally traveled.	Total Lanes: 2-4 ADT: 10,000-15,000	▪ Wilson Avenue ▪ Church Street ▪ Banyan Street ▪ 6th Street ▪ 19th Streets ▪ Hermosa Avenue ▪ Rochester Avenue ▪ Etiwanda Avenue ▪ East Avenue

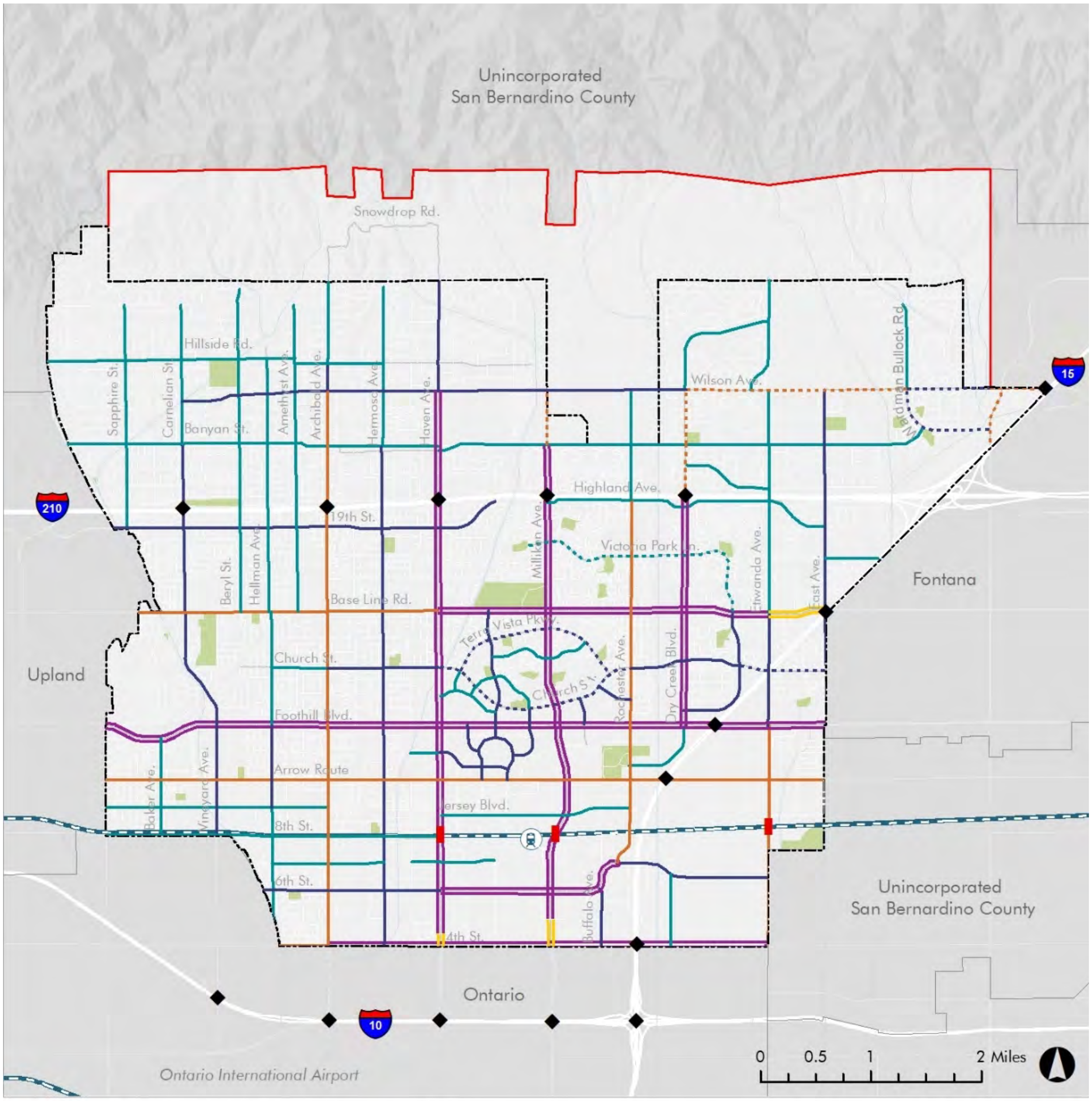
Source: 2010 Rancho Cucamonga General Plan

Figure 3.8. General Roadway Hierarchy (2020)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020.

Figure 3.9. Roadway Classifications (2019)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019.

Roadway Design Standards

The City has adopted roadway design standards for each of the roadway classifications identified in the 2010 General Plan. The 2010 General Plan requires roadway and intersection monitoring to be included in the traffic impact studies for proposed projects. Additional analyses may be needed to determine whether the proposed roadway improvements may exceed the standard cross sections at specific intersections. Site-specific access studies may be deemed necessary by the City Traffic Engineer to determine the feasibility of proposed access locations.

However, with the adoption of EHNCP, there have been recent modifications to the typical roadway cross sections and roadway classifications to better address the community values. With the PlanRC effort, typical roadway cross sections will likely not be included within the General Plan update. However, it may be more appropriate to include them in the City Standard Drawings such that they can be updated to reflect innovative street designs and respond to changing technologies as they evolve.

Private Streets

The 2010 General Plan allows for the construction of private streets under limited conditions, subject to approval by the Planning Commission. Private streets may be desirable in new developments where they would enhance neighborhood identification, provide access control, and include special design concepts. The Plan recommends constructing private streets to public street standards, but owners of the private streets are responsible for ensuring emergency access and maintenance of the streets. Different funding mechanisms such as localized tax through Community Facilities District or funding of private improvements through Homeowners Associations should be explored in order to reduce maintenance burden on the City.

However, private streets are often obstacles to overall street connectivity and are not recommended in an urban context. The City should encourage street grid connectivity instead of cul-de-sac private streets that limit connectivity and distribution of traffic.

Overall, it is recommended that the General Plan update focus on developing a complete streets network that is sensitive to the envisioned land use context. This should include prioritizing modes of travel and focusing on providing the best access and service for that priority mode. It is also recommended that roadway cross sections in the City Standard Drawings be incorporated into the development code to promote new, innovative street treatments.

Pavement Conditions

The SCAG 2016-2040 RTP/SCS measures the pavement conditions of both local roads and highway systems by county. The condition of the roadway pavement is important to consider for safety and positive driver experience. By tracking the pavement conditions, resources for maintenance funding for existing infrastructure can be allocated based on need. Pavement Condition Index (PCI) is the standard of practice measure of effectiveness used to assess pavement where 100 is the best score and 0 is the worst:

- **Very Good** (86-100 PCI) Pavements with little or no distress.
- **Good** (70-85 PCI) Pavements with some distresses that are predominantly non-load related. The pavement structure is sound and minor oxidation may occur.
- **Fair** (50-69 PCI) Pavements with a significant level of distress, which may be predominantly load-related. The pavement structure is becoming deficient.
- **Poor** (30-49 PCI) Pavements with moderate to severe surface distresses. Extensive weathering, block cracking, and load-related distresses such as alligator cracking and rutting may occur.
- **Very Poor** (0-29 PCI) Pavements with severe weather-related distresses as well as large quantities of load-related distresses. The pavement is nearing the end of its service life.

Table 3.4 summarizes the specific pavement conditions throughout Rancho Cucamonga arterials, collectors and local residential streets. Figure 3.10 shows the PCI for local roadways in SCAG for 2013. San Bernardino County has a score of 71, which is considered adequate (the lowest range of "Good"). As shown, the City's overall weighted PCI for the pavement network in 2018 is 70, which is in the "Good" category and almost same as the County average. The City of Rancho Cucamonga also reported that approximately 69% (by area) of the City's streets are in the "Good" or "Satisfactory" condition categories, 25.7% are in either the "Fair" or "Poor" categories, while 5.3% of the streets fall under the "Very Poor", "Serious" or "Failed" condition.

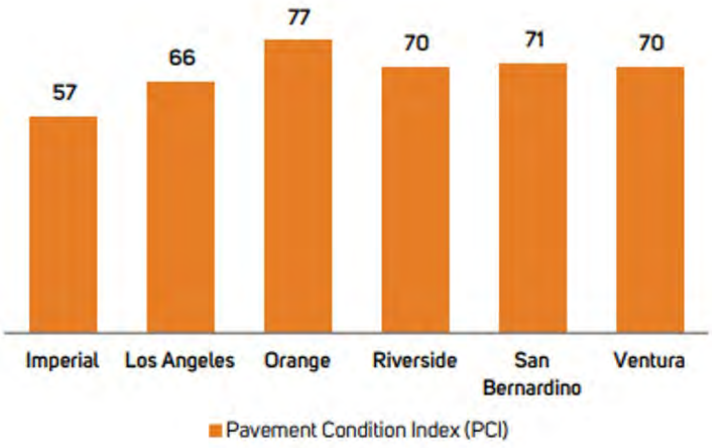
Local roads make up the largest rank class in terms of number of segments, centerline and lane miles, and surface area. Thus, they should be maintained regularly to ensure efficient movement of goods and people.

Table 3.4. Pavement Network Summary (2018)

Functional Class	Centerline Mileage	Lane Miles	Pavement Area (SF)	% Pavement Area	Weighted Average PCI
Arterial	78.3	246.4	20,552,906	20%	76
Secondary	36	137.1	10,450,541	10.2%	77
Collector	51	102.1	11,531,649	11.3%	75
Industrial	16.6	33.1	3,421,217	3.3%	65
Local	316.1	633.5	56,489,263	55.1%	66

Source: City of Rancho Cucamonga, 2018

Figure 3.10. County Pavement Condition Index (2016)



Source: SCAG 2016-2040 RTP/SCS, Appendix Performance Measures

Major Roadway Improvement Projects

According to the SCAG 2016 RTP/SCS approved project list of Federal Transportation Improvement Program (FTIP), several roadway improvements are planned in the City of Rancho Cucamonga, as shown in Table 3.5. The projects are listed by state highway, local highway, and transit.

Table 3.5. Major Improvement Projects (2016)

System	Route Name	From	To	Description	Completion Year
State Highway	I-15	Arrow Route	Foothill Blvd	I-15 at Arrow Route - construct new interchange between Arrow Route and Foothill Blvd	2040
Transit	Ontario Airport Shuttle	Rancho Cucamonga Metrolink Station	Ontario Airport	Direct shuttle bus connection from Rancho Cucamonga Metrolink station to Ontario Airport	2020

(Continued in next page)

System	Route Name	From	To	Description	Completion Year
Local Highway	East Ave	Wilson Ave	North Rim Way (New)	Widen East St from Wilson Ave to North Rim Way (new) from 2 to 4 lanes	2025
	Etiwanda Ave	Existing Terminus	North Rim Way (New)	Widen Etiwanda Ave from existing terminus to north rim way (new) from 0 to 2 lanes	2025
	Victoria Ave	Etiwanda High School	I-15	Widen Victoria Ave from Etiwanda High School to i-15 from 2 to 4 lanes	2025
	Etiwanda Ave	Miller Ave	850’ N/O Miller Ave	Widen Etiwanda Ave from Miller Ave to 850’ n/o Miller Ave, northbound only from 3 to 4 lanes	2025
	6th St	6th St	Cucamonga Creek Channel	Widen 6th St at Cucamonga Creek Channel from 2 to 4 lanes (50% Rancho Cucamonga/50% Ontario)	2025
	Baseline Rd	Etiwanda Ave	Shelby Pl	Widen Baseline Rd from Etiwanda Av to i-15 from 4 to 6 lanes	2025
	East Ave	Chateau Dr	Victoria Ave	Widen East Ave from Chateau Dr to Victoria Ave from 2 to 4 lanes	2025
	Arrow Route	Etiwanda Ditch	Arrow Route @ Etiwanda Ditch	Widen Arrow Route at Etiwanda ditch from 2 to 4 lanes	2025
	Hellman Ave	Cucamonga Creek Channel	Hellman Ave @ Creek Channel	Widen Hellman Ave at Cucamonga Creek Channel (50%rc, 50% Ontario) from 2 to 4 lanes	2025
	Arrow Route	Grove St	Baker St	Widen Arrow Route from Grove St to Baker St from 2 to 4 lanes	2025
	Etiwanda Ave	Banyan	Wilson Ave	Widen Etiwanda Ave from Banyan Rd to Wilson Ave from 2 to 4 lanes	2025
	Church Ave	Archibald Ave	Haven Ave	Widen Church Ave from Archibald Ave to Haven Ave from 2 to 4 lanes	2025
	Foothill Blvd	Archibald Ave	Hermosa Ave	Widen Foothill Blvd from Archibald Ave to Hermosa Ave from 4 to 6 lanes	2025
	Miller Rd	Etiwanda Ave	East St	Widen Miller Rd from Etiwanda Ave to East St from 2 to 4 lanes	2025
	Foothill Blvd	Vineyard Ave	Archibald Ave	Widen Foothill Blvd from Vineyard Ave to Archibald Ave from 4 to 6 lanes	2025
	Etiwanda Ave	6th St	Arrow Route	Widen Etiwanda Ave from 6th St to Arrow Route from 2 to 4 lanes	2025
	Wilson Ave	Milliken Ave	Day Creek Blvd	Widen Wilson Ave from Milliken Ave to Day Creek Blvd from 0 to 4 lanes	2025
	Wilson Ave	Wilson Ave	Day Creek Channel	Construct new 4-lane (2 each direction) Bridge at Wilson and Day Creek Channel	2025
	Etiwanda Ave	Etiwanda Ave	@SCRRA	Construct Grade Separation for Etiwanda Ave @ Southern California Regional Rail Authority tracks with overhead roadway	2025
	Youngs Canyon Rd	San Sevaine	Cherry Ave	Construct new 4-lane divided Youngs Canyon Rd from San Sevaine to Cherry Ave	2026
	Cherry Ave	South Rancho Cucamonga City Limits	Wilson Ave	Widen Cherry Ave from South Rancho Cucamonga City limits to Wilson Ave from 2 to 4 lanes	2021
	Grove Ave	San Bernardino Rd	Foothill Blvd	Widen Grove from San Bernardino Ave to Foothill Blvd from 1 to 2 lanes (East side only)	2025
	Arrow Route	Etiwanda Ave	East City Limits	Widen Arrow Route from Etiwanda to East Rancho Cucamonga City limit from 2 to 4 lanes	2035

Source: SCAG 2016-2040 RTP/SCS, Project List

Near-Term Capital Improvement Program Projects

The City's Capital Improvement Program (CIP) includes both streets and traffic projects that include updates to the vehicle, bicycle, and pedestrian networks. The CIP includes funding for pre-construction activities such as feasibility studies and design, as well as construction funding. The proposed network improvements in Rancho Cucamonga with construction funding in the 2019-2020 CIP include:

General

- Advanced Traffic Management System (ATMS)
- At-grade railroad crossing improvement at 6th Street
- Grade separation on Etiwanda Avenue

Roadway

- Pavement rehabilitation at various locations
- ADA ramp installations at various locations

Transit

- Metrolink station improvements
- Sidewalk Improvements for Bus Stops

Bicycle and Pedestrian

- 6th Street Cycle Track & Milliken Avenue Bike Lane
- 9th Street northside west of Vineyard Avenue-Sidewalk Improvements
- Barrier Replacement at Flood Control Entrance/Exit
- Day Creek Channel Bike Trail
- Milliken Ave Underpass-Sidewalk Expansion
- Pacific Electric Trail drainage improvements
- School crosswalk improvements
- Southeast Corner Foothill Boulevard and Etiwanda Avenue- Sidewalk Survey

Transit

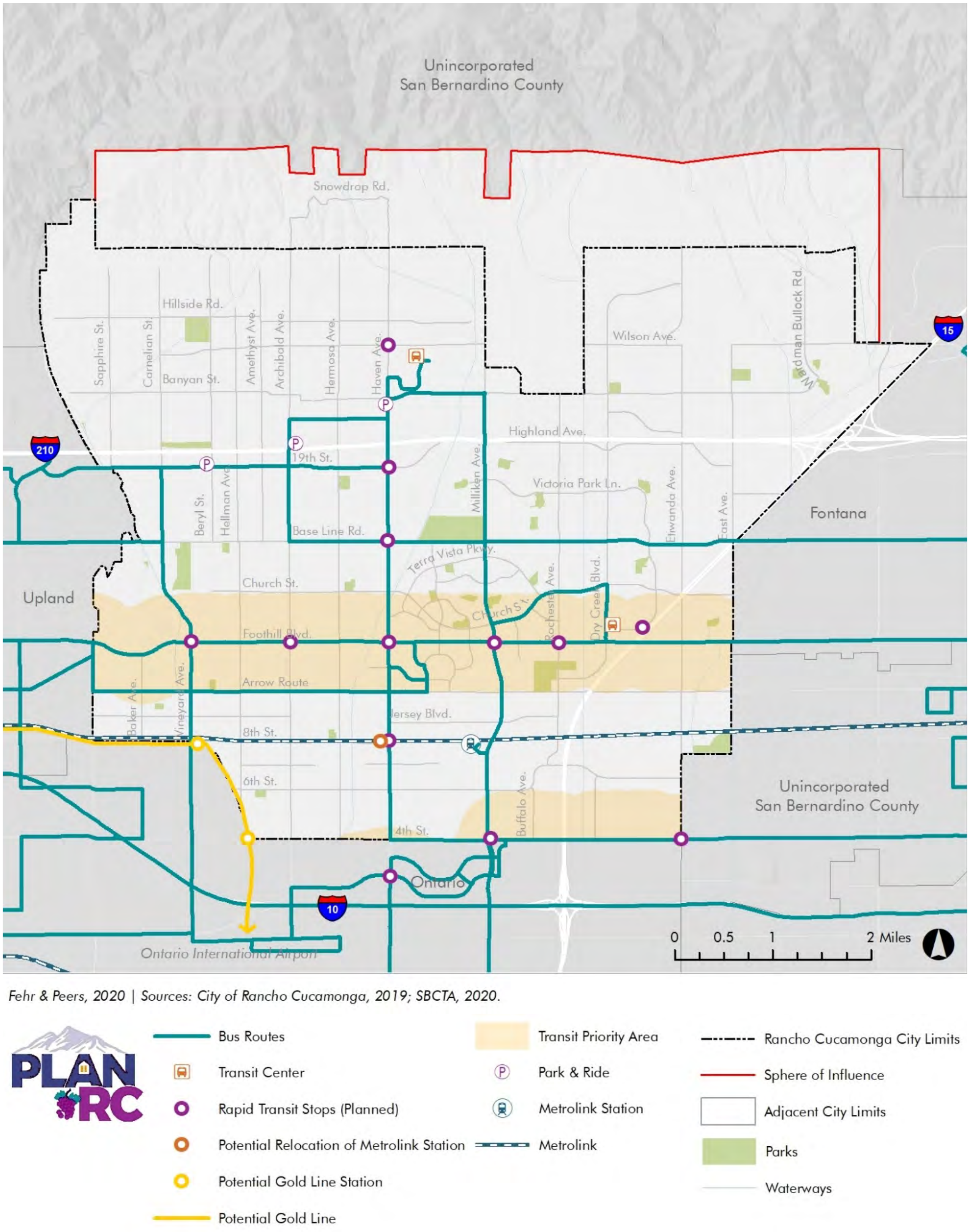
Public transportation is a vital part of the circulation system within Rancho Cucamonga. Transit expands mobility options to citizens who may not be able to afford or physically operate other means of travel, while some choose not to drive. The transit options in Rancho Cucamonga are shown on Figure 3.11. Intercity buses, local buses, and demand-responsive service are provided; all of which help people move. As is the case in many jurisdictions, it is important that Rancho Cucamonga continue to invest in and improve local transit service, since the most frequent users include some of the most vulnerable City residents and workers, such as older adults, persons with disabilities, and students.

Bus Transit

OmniTrans

Majority of the available public transportation is provided by OmniTrans via fixed route bus services. OmniTrans is the public transportation agency in San Bernardino County that provides seven bus routes within the City of Rancho Cucamonga. These routes connect to the Rancho Cucamonga Metrolink Station, Civic Center, Chaffey College, Ontario International Airport, Victoria Gardens, and the surrounding cities of Fontana, Upland, Ontario, Montclair, and Chino.

Figure 3.11. Transit Facilities (2020)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019; SBCTA, 2020.

Major City bus routes include routes 66, 67, 80, 81, 82, 85, and 86. As shown in Figure 3.11, the bus routes run primarily along Haven Avenue, Day Creek Boulevard, Milliken Avenue, Carnelian Street/Vineyard Avenue, Base Line Road, Foothill Boulevard, and Arrow Route, and along parts of Banyan Street, Victoria Park Lane, and 4th Street. Two routes originate in the City at Chaffey College and Civic Center and all other routes start and end beyond the City limits. Route 80 serves the Rancho Cucamonga Metrolink Station. Table 3.6 shows the service frequencies for all routes during peak hours on weekdays.

Table 3.6. Bus Route Service Frequencies (2020)

Route	Peak Hour Frequency
Route 66	15-30 minutes
Route 81	60 minutes
Route 82	60 minutes
Route 85	60 minutes
Route 86	60 minutes

Source: OmniTrans, 2020

Access

OmniTrans also provides a demand-response service called Access, which is a curb-to-curb van service for people unable to independently use the fixed-route service. This service complies with the requirements of the Americans with Disabilities Act (ADA). Reservations must be made in advance, and pick-up and drop-off must be provided within a three-quarter mile range of the existing OmniTrans fixed bus routes and during the same service hours as those routes.

Chaffey College Transit Center. Source: Fehr & Peers (2020)

Planned Bus Transit

The Transit Plan in the 2010 General Plan, shown in Figure 3.11, identified two future major transit corridors – an east-west transit spine along Foothill Boulevard and a north-south transit spine along Haven Avenue. The vision was for Bus Rapid Transit (BRT) to operate along these two corridors, by forming the backbone of bus transit service in the City.

BRT is a rapidly developing form of enhanced bus transit that offers more frequent service, fewer stops, and higher average speeds than traditional bus service. It uses higher-capacity vehicles with low floors and specially designed station platforms for quick boarding. In some areas, busses travel in exclusive lanes for greater mobility through high-demand areas.

SBCTA has initiated the West Valley Connector (WVC) project[10], a 35-mile long BRT route connecting Rancho Cucamonga, Pomona, Montclair, Ontario, and Fontana. The first phase of the project will include the Milliken Alignment, starting from Pomona Regional Transit Center to Victoria Gardens in Rancho Cucamonga. Phase I (Milliken Alignment) is scheduled for operation in 2023. Phase II (Haven Alignment) will connect Ontario International Airport in Ontario to Kaiser Permanente Medical Center in Fontana. Construction of Phase II is scheduled to occur after the completion of Phase I when funding is available.

SBCTA West Valley Connector Project (Phase I and II). Source: SBCTA (2020)

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[10] https://www.gosbcta.com/project/west-valley-connector-brt/

Internal City Local Transit Service

The 2010 General Plan recommended establishing a localized internal circulator transit service to connect neighborhoods to schools, parks, commercial centers, and key destinations such as the Civic Center, Central Park, the Metrolink Station, the Epicenter, and Victoria Gardens. A system such as this would benefit teens, older adults, and others within the City who do not own a car or drive. This local service could be operated by the City or OmniTrans through a joint effort. The feasibility of funding sources for this type of service will be actively explored with OmniTrans. A demand-responsive service with public-private partnership to subsidize TNC, with smaller vehicles and routes along collector and/or local streets, would be an opportunity to build the network until increased ridership justifies the fixed route service. This service would feed into and support regional fixed-route service, significantly enhancing transit access citywide.

The General Plan also identified three possible internal circulator transit service areas, which would provide connections from all neighborhoods to key destinations east, northwest, and southwest. A local transit center in the Terra Vista Town Center was envisioned to provide for transfers among routes. “Microtransit” options can be explored to supplement the existing fixed-route bus service, especially in the areas that are not covered by the half-mile walking radius from the bus stop locations, as shown in Figure 3.12.

Combined with a series of mobility hubs at strategic locations, microtransit service could broaden the transit reach in the City. Microtransit is defined as a privately-operated transit system, which in many cases mirrors the operations of public transit agencies along select routes. Mobility hubs are a key first mile/last mile solution that can provide seamless connections to and between different mobility services.

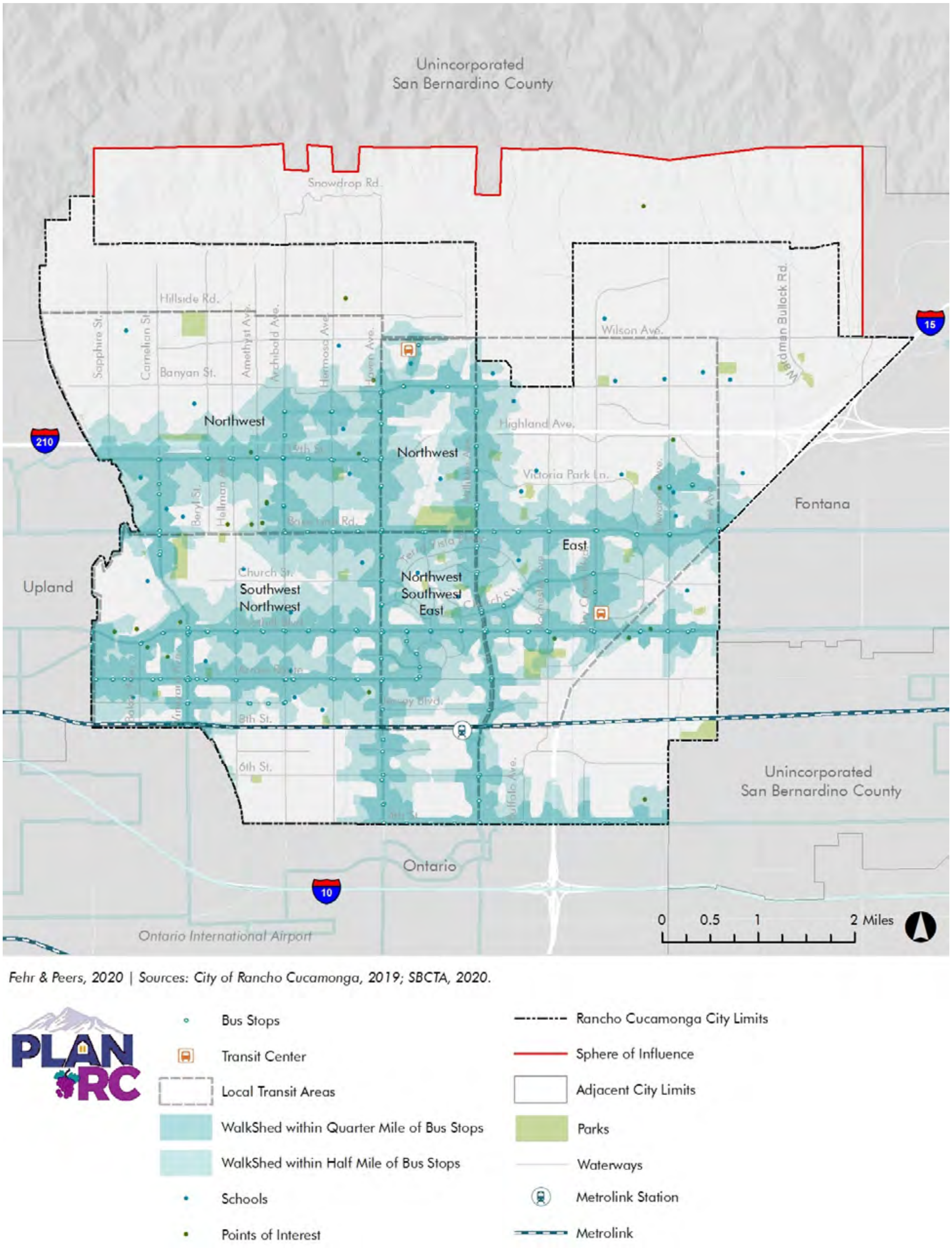
Park-and-Ride Facilities and Parking

The City of Rancho Cucamonga has two park-and-ride facilities located near the SR-210 that are available to commuters. Park-and-ride lots are made possible through partnerships with private property owners, Caltrans, and the SBCTA. Park-and-ride lots are strategically located to serve people who need a place to store their cars while they join a carpool, a vanpool, or use transit. Park and ride lots are valuable resources to the city as they can aid with reducing automobile travel and subsequent emissions, consistent with AB 32.

According to the SCAG 2016 RTP/SCS approved project list, Caltrans has no new park-and-ride facilities planned for the City of Rancho Cucamonga. Currently, no data is available on the composition of the riders who use the park and ride facilities. As part of the General Plan Update, the City of Rancho Cucamonga could designate action items to further study park-and-ride facilities and their uses.

As for parking requirements for individual developments, the City has adopted parking and loading standards by land use, as well as options for shared parking among two or more uses to reduce overall parking supply requirements. Reducing overall parking supplies helps to minimize impervious areas in surface parking lots, and results in more efficient use of land so that portions of parking lots or structures do not sit empty for long periods.

Figure 3.12. Transit Walkshed Area (2020)



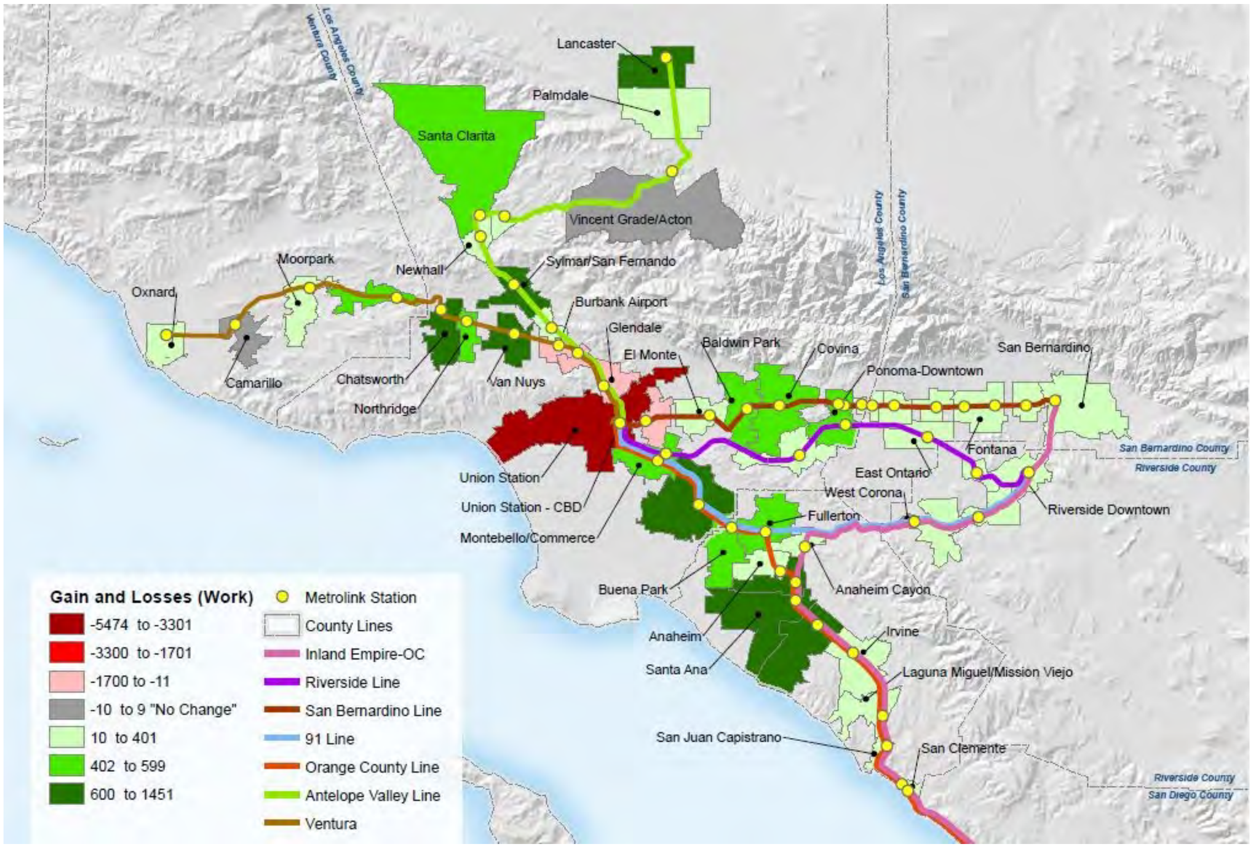
Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019; SBCTA, 2020.

Rail

Metrolink

Metrolink is a commuter rail program operated by the Southern California Regional Rail Authority (SCRRA), providing service from outlying suburban communities to employment centers such as Burbank, Irvine, and downtown Los Angeles. For Rancho Cucamonga, the San Bernardino Line (SBL) train services Metrolink stations in the cities of San Bernardino, Rialto, Fontana, Rancho Cucamonga, Upland, Montclair, Claremont, Pomona, Covina, Baldwin Park, El Monte, and Los Angeles.

The Metrolink 10-Year Strategic Plan[11] (2015-2025) indicates that, through a partnership with Metro, the agency will experiment with lower fares across the board and targeted discounts on shorter distance trips with the goal to increase ridership and revenue. The plan anticipates an increase in regional population and employment in Inland Empire rail lines that includes Rancho Cucamonga.



Net change to work catchment areas served by Metrolink for all purposes (2010-2035). Source: Metrolink (2016)

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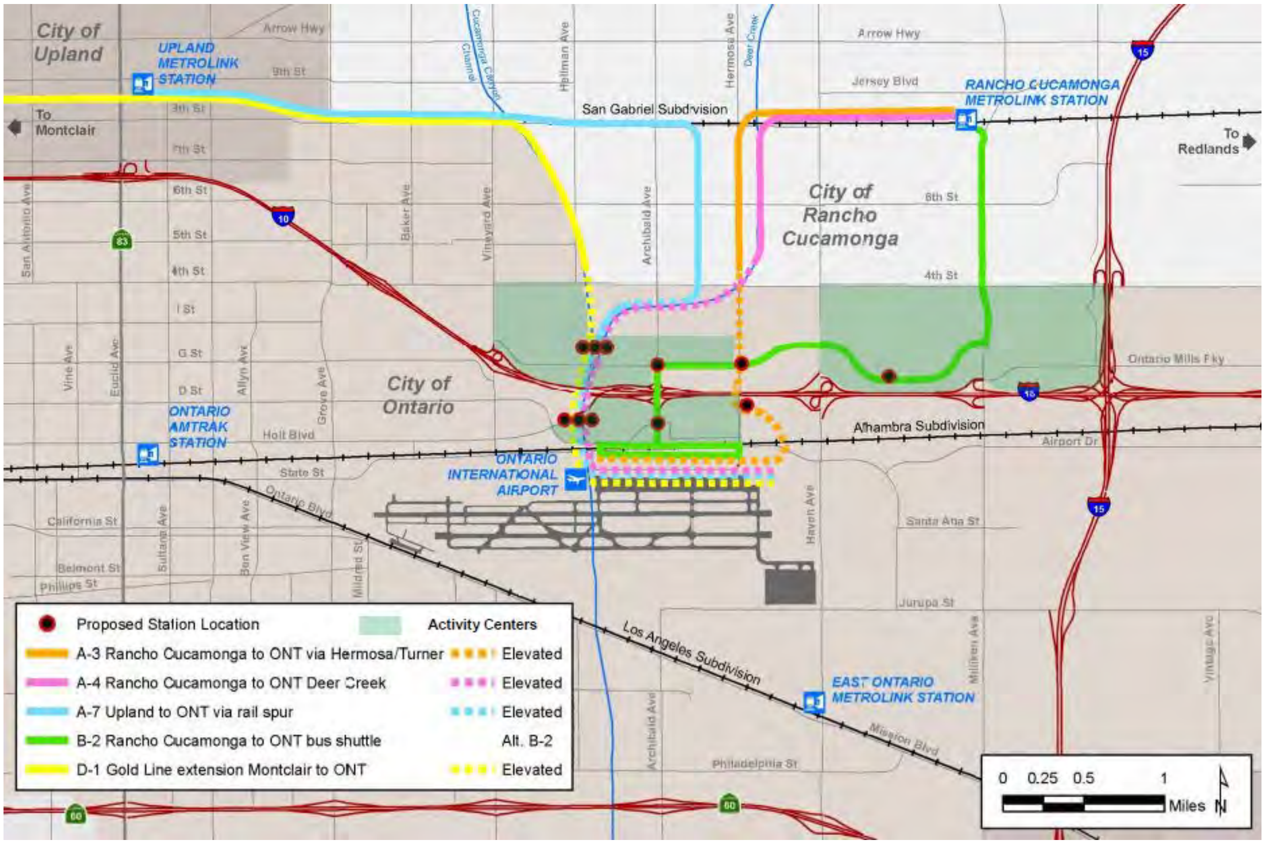
[11] https://metrolinktrains.com/globalassets/about/metrolink_10-year_strategic_plan_2015-2025.pdf

The Ontario Airport Rail Access Study[12], published in 2014, recommended a set of transit alternatives to connect the Ontario International Airport to the City of Rancho Cucamonga. The City Council recently adopted a resolution with preferences for enhanced Metrolink Service to the Ontario International Airport that would utilize the Metrolink Station.



Transit alternatives to the Ontario International Airport (conceptual). Source: Ontario Airport Rail Access Study (2014)

Metro Gold Line

The Metropolitan Transportation Authority of Los Angeles County, or Metro, is responsible for light rail service operations in Los Angeles County, and will extend operations to San Bernardino County with the planned extension of the Gold Line. Plans as of 2020 have the east end of the line terminating in Montclair (with the west end of the line terminating at Los Angeles' Union Station), but ultimate plans include the extension of the Gold Line all the way to Ontario International Airport. This would increase the need to connect Metrolink to the airport to assist in facilitating this connection.

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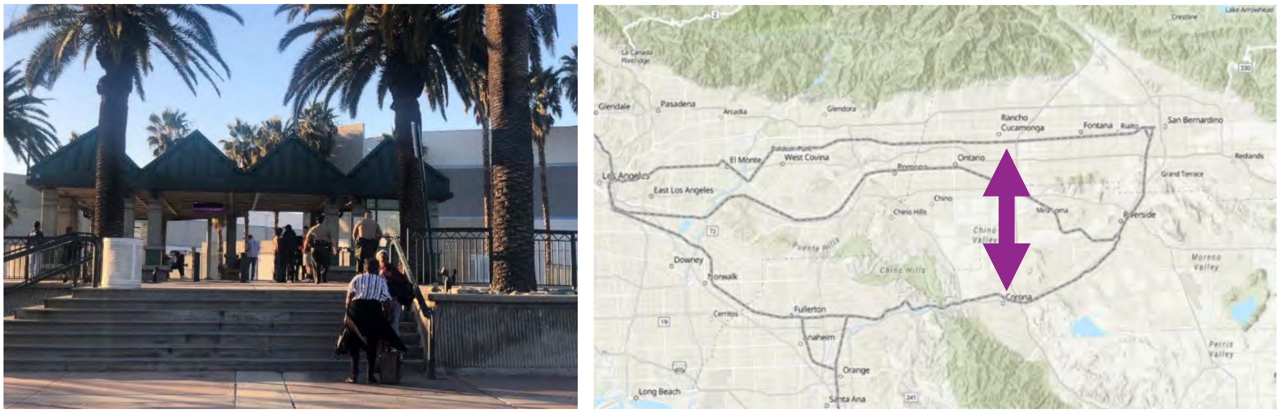
[12] https://www.gosbcta.com/wp-content/uploads/2019/10/Ontario-Airport-Rail-Access-Study-Report.pdf

In conclusion, currently, the regional rail connections are east-west, but there are opportunities to create a regional hub within the Inland Empire by creating north-south connection. Collaboration across county boundaries and funding formulas will be needed to pursue this initiative but could be transformative in creating an inland empire "hub" for activity and urbanism.



Left Figure: Passengers waiting for train at the Metrolink Station in Rancho Cucamonga. Right Figure: Regional North-South Transit Connection. Source: Fehr & Peers (2020)

Bicycle Facilities

Bicycle facilities in Rancho Cucamonga consist of bike lanes, routes, trails, and paths, as well as bike parking. The existing and planned bicycle network in the City is shown in Figure 3.13. On-street bicycle facilities are classified into four categories depending on their design and function as described in the following page.

Although the City has a high network of Class II bikeways, many of these facilities are on high speed, wide roadways that limit rider comfort on the corridors (whereas the bike path system provides a comfortable, low stress biking environment). As such, the General Plan update should consider bicycle comfort and look at increasing the connectivity of low stress facilities through street prioritization (e.g. a layered network approach) or through better connections between activity centers and the Class I trails system.

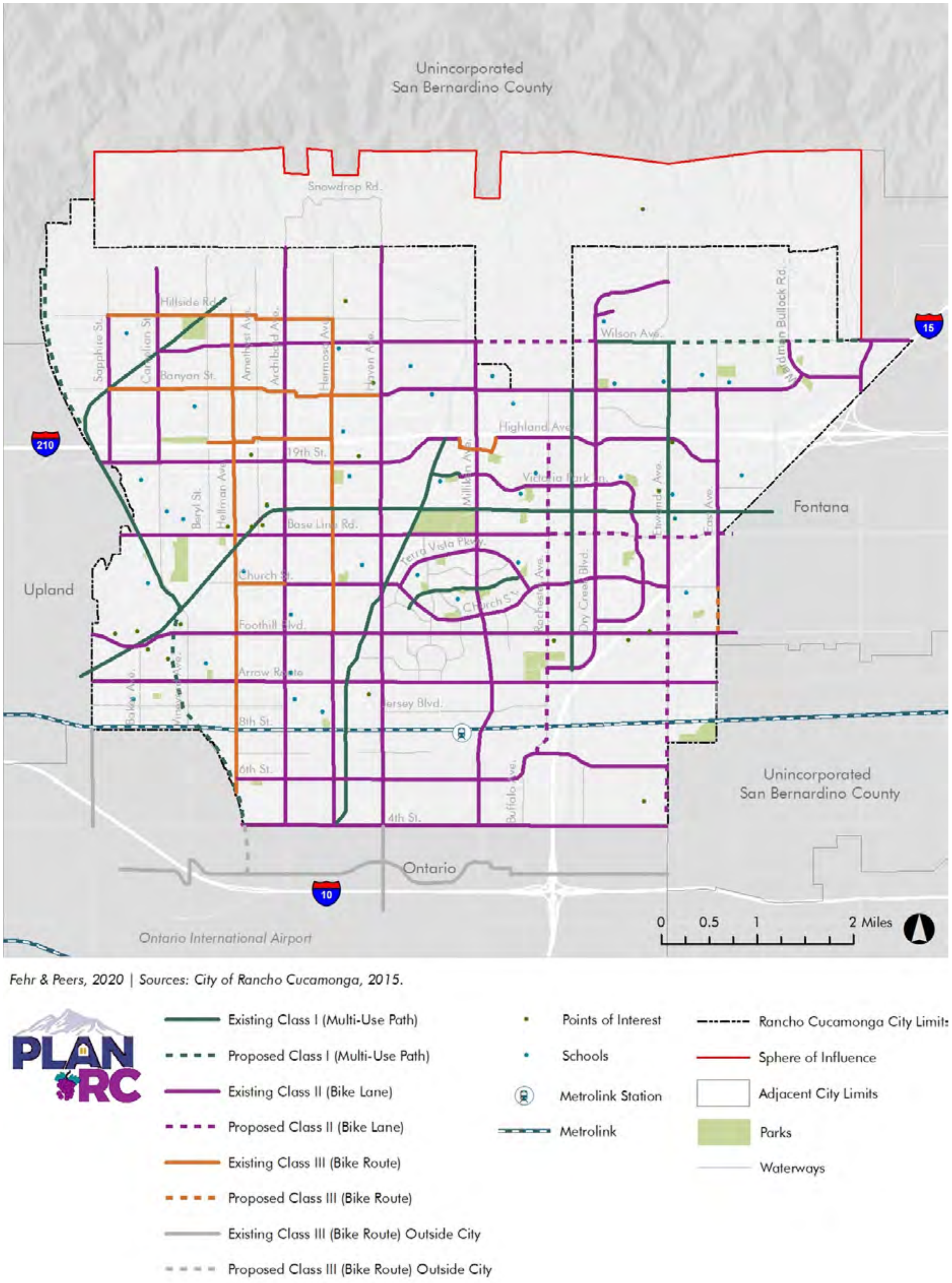
Class I/Bike Path or Trail (34.5 miles):
Provides a completely separated right-of-way for the exclusive use of cyclists and pedestrians with crossflow minimized. Typically, the most desirable for all ages and abilities.
Example: Pacific Electric Trail

Class II/Bike Lane (31.75 miles):
Provides a striped lane for one-way travel on a street, which may include a "buffer" zone consisting of a striped portion of roadway between the bicycle lane and the nearest vehicle travel lane. Typically, suitable for some bicyclists comfortable sharing some space with cars.
Example: Base Line Road

Class III/Bike Street (34.25 miles):
Provides for shared use with motor vehicle traffic to help guide bicyclists between major destinations. Typically, not suitable for most bicyclists except on local residential streets.
Example: Hillside Road

Class IV/Bike Boulevard (0 miles):
Provides a right-of-way designated exclusively for bicycle travel, which is protected from vehicular traffic. Types of separation include, but are not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking. Typically, suitable for most bicyclists.
No examples in Rancho Cucamonga

Figure 3.13. Bicycle Facilities (2015)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2015.

Trails

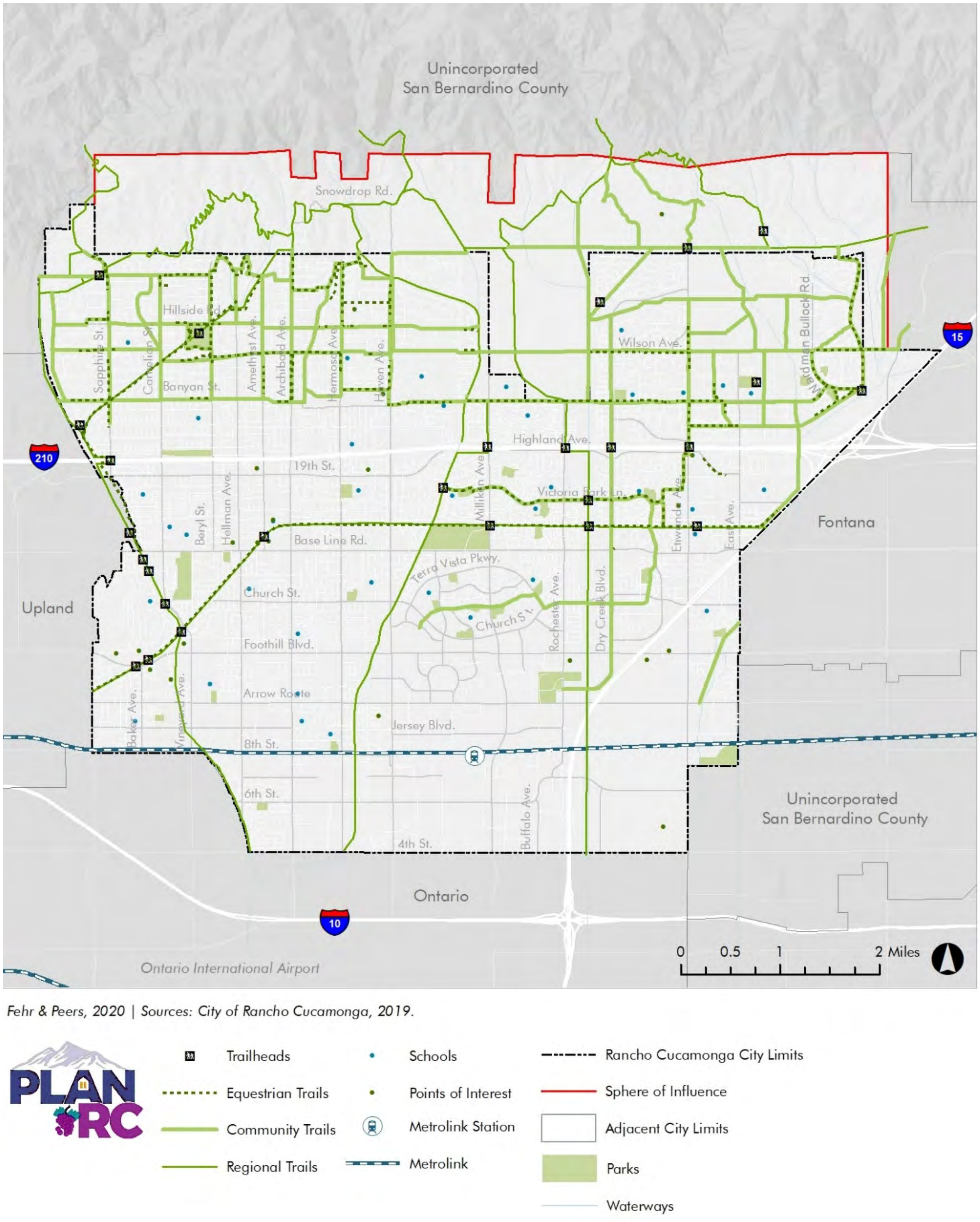
The City adopted its Trails Implementation Plan (TIP) in 1991 that provides design and technical guidance for bicycle routes, and hiking and riding trails (collectively referred to as “multi-purpose trails”). The Trails Advisory Committee, as an advisory body to the Planning Commission and City Council, generally reviews all development applications where trails are required per the TIP and, when necessary, reviews changes to the trails system. A recommended implementation action item would be to update the TIP in light of the General Plan update. The Trail Implementation Plan:

- Provides a more detailed analysis of trail conditions and strategies to address bikeway issues;
- Includes preliminary cost estimates for bikeway construction;
- Identifies funding mechanisms for bikeway implementation;
- Defines the roles of various City departments in the implementation of the bikeway system;
- Addresses horseback riding and hiking trail issues.

The existing multi-purpose trails are great community assets that serve the residents of Rancho Cucamonga for variety of recreational purposes. These trails are mostly in the northern portion of the City (north of SR-210), as shown in Figure 3.14. In addition to maintaining the existing trails, the existing flood channels and utility corridors through the city could also provide multimodal active transportation boulevards.

Equestrian Trail along Archibald Avenue. Source: Fehr & Peers (2020)

Figure 3.14. Trails (2019)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019.

Pedestrian Network

Active modes of transportation provide environmental, economic, and social sustainability to a city and its transportation system while improving public and personal health. Inadequate facilities misuse valuable resources and discourage potential users. Well-designed pedestrian and bicycle facilities are needed to make active transportation safe, accessible, attractive, and comfortable enough to be a desirable alternative to driving. It is important to provide a seamless transportation system for all modes and for all people to improve circulation. The 2010 General Plan focuses on vehicular travel but encourages the proposal of policies and programs that facilitate pedestrian improvements.

Sidewalks and Crosswalks

Pedestrian facilities in Rancho Cucamonga consist of sidewalks and crosswalks. Figure 3.16 identifies all sidewalks in the city. Most residential and commercial developments provide sidewalks on public streets and internal circulation. Areas with no existing sidewalks are mainly located in the northwest, southwest, south and eastern portions of the city. While the sidewalk gaps in the established neighborhoods in the northwest part may be intentional, the gap closures to the southern part are more critical to examine due to the disadvantaged communities located there and the higher density of pedestrian collisions.

Sidewalks vary from wide and meandering curb separated sidewalks to narrow pathways on the side of the road. Sidewalks are sometimes obstructed, incomplete mid-block, or damaged. Crosswalks at signalized intersections are marked and are usually provided for all approaches. Crosswalks at unsignalized intersections are generally not well marked, although crosswalks around schools are always marked at intersections.

Overall, Rancho Cucamonga has 76% of sidewalk coverage in its streets (Figures 3.15 and 3.16). However, it is a community that has largely been designed with auto travel in mind, featuring suburban tract housing, ample parking in most centers, major through streets, and separation of land uses that comprise a notable portion of the city. Although walking may not be a viable form of transportation for errand trips, the ample sidewalk widths in established neighborhoods provide a walking environment that accommodates walking trips for leisure and exercise. The following six factors affect walkability and the pedestrian experience in the city:

Sidewalk Continuity: Communities are more walkable if sidewalks do not end abruptly and are present on the entire segment and both sides of a roadway. This is especially important for mobility-impaired users or those pushing small children in strollers.

Sidewalk Conditions: This refers to the physical condition of sidewalk surfaces. Sidewalks that are broken or cracked can deter walkability and impede mobility; particularly for mobility-impaired users, such as those in wheelchairs, persons using walkers, or strollers.

Shading: People are more inclined to walk in areas where there is shade present, particularly in Southern California with its relatively warm weather and limited rainfall, as compared to other locations. Additionally, shade trees create an aesthetic value that is pleasing to the pedestrians.

Grade: People are more inclined to walk in areas that are relatively flat or have limited grade changes.

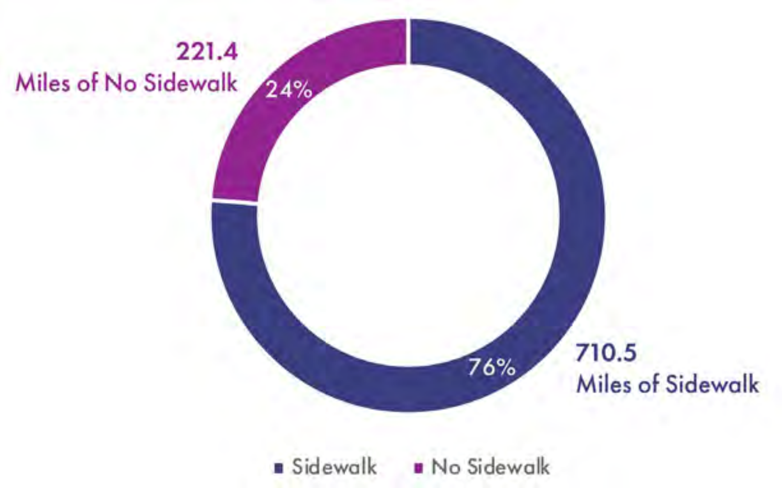
Amenities: All else being equal, people are more inclined to walk in areas that have interesting environments with shopping, retail, restaurants, and other similar uses. Pedestrian-friendly amenities include street furniture, attractive paving, public art, high visibility crosswalks, frequent crossings, slower vehicle speeds, way-finding signage, enhanced landscaping, and pedestrian-level lighting.

Buffers: A more walkable environment includes some degree of separation between the pedestrian and the motorist. This typically includes wider sidewalks, bicycle facilities, landscaping, street parking, and sidewalk bulb-outs at intersections where feasible. Crosswalks with appropriate signage serve as an important buffer as well.

Land use is inherently tied to transportation, and therefore policies that seek to make walking attractive, easy, and safe are important, particularly in activity centers. As described above, there are opportunities to improve sidewalk continuity and mid-block crosswalks, complete sidewalks between crosswalks, and provide an optimal number of adequate crosswalks and sidewalks. Sidewalk conditions can be improved with regular maintenance and compliance measures.

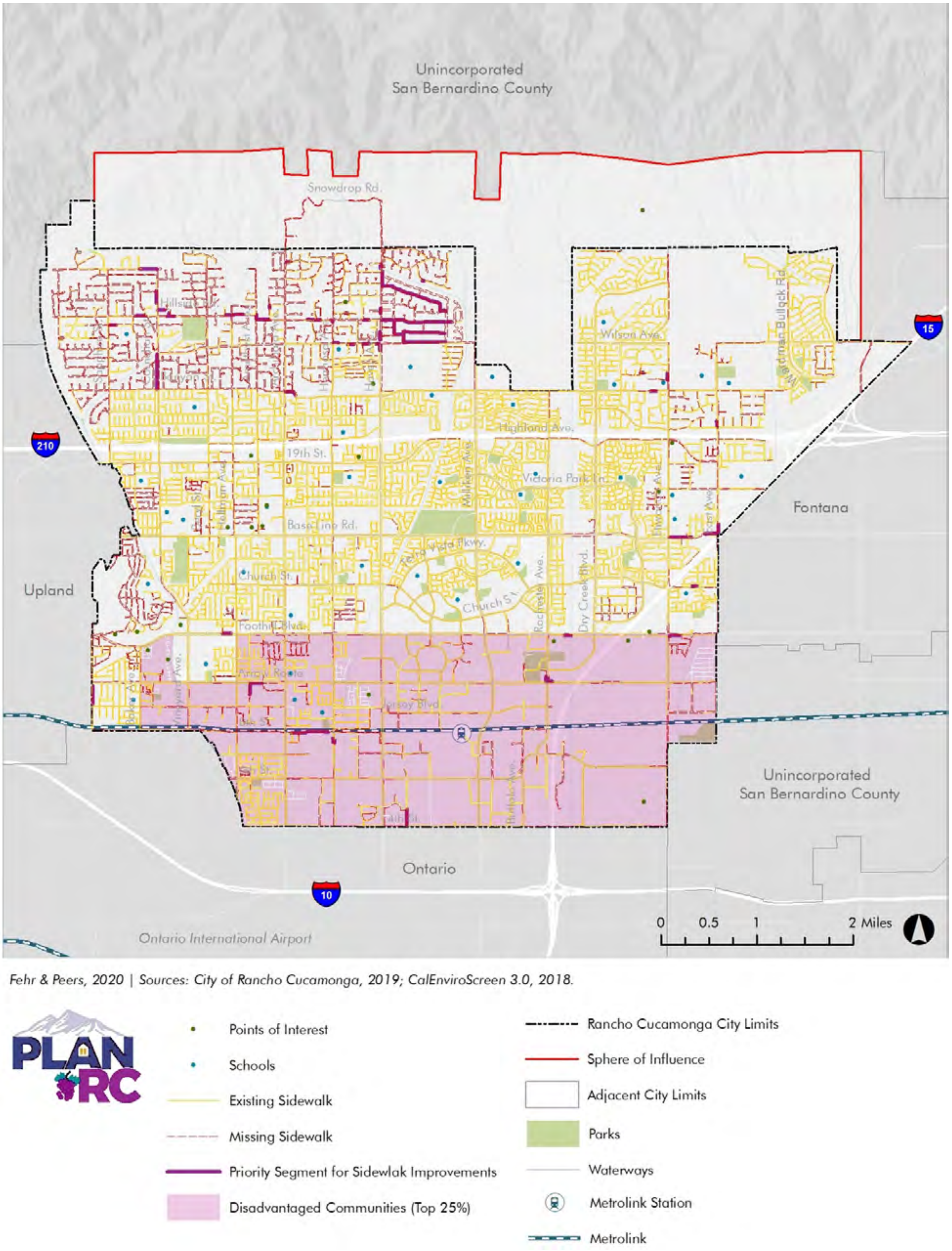
Treatments such as high-visibility crosswalks, curb extensions, curb cuts, and landscaped buffers may also improve safety and accessibility for all pedestrians, particularly near schools and other activity centers where pedestrian activity is high. Providing shade trees will make pedestrians more comfortable in hot weather. These improvements can enhance the transportation experience for non-driving populations, such as older adults and children, who may use routes for short distance trips, including recreation and school trips.

Figure 3.15. Sidewalk Coverage (2020)



Source: Fehr & Peers (2020); Active San Bernardino Open Data (2020)

Figure 3.16. Pedestrian Facilities (2019)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019; CalEnviroScreen 3.0, 2018.

Circulation Master Plan for Bicyclists and Pedestrians

The City of Rancho Cucamonga published a Circulation Master Plan for Bicyclists and Pedestrians in May 2015. The Plan calls for an increase in bicycling and walking to enhance livability, health, transportation, the environment, and economic development. In addition to developing a connected network, The Plan also recommends bicycle programs to improve facilities that can make it safer for users of all ages and abilities to ride a bicycle on city streets. A recommended implementation action item for PlanRC would be to update the Circulation Master Plan for Bicyclists and Pedestrians in light of updates to the General Plan.The City of Rancho Cucamonga has also led the Pacific Electric Trail Master Plan in collaboration with SBCTA and neighboring cities.

Through extensive community outreach, the Plan developed bicycle facilities network recommendations as well as additional suggestions on improving bike facilities, intersections, bicycle sharing, wayfinding, bicycle parking, end-of-trip amenities, etc. The recommended pedestrian improvements included sidewalk gap closures and high priority segments. The trail implementation recommendations included wayfinding, high visibility crosswalks, sidewalk furniture, etc. The Healthy RC initiative of Safe Routes to School (SRTS) program has been in place since 2009 to increase the physical activity of children by encouraging walking and biking to get to and from school.

In addition, educational programs were recommended to create awareness about biking and walking among different ages and abilities. They included the creation of family-focused bicycling classes, safe routes to school programs, volunteer ambassador programs, bicycle hubs, personalized travel encouragements, bicycle valet program, car-free street events, etc. The recommended educational programs should be evaluated and considered for inclusion as goals or programs in the General Plan update.

Rancho Cucamonga has a rich network of local streets laid out in a grid fashion in the city's core, which collectively are excellent for a low-stress bicycle network. The City of Rancho Cucamonga could take advantage of the grid network and mix of land uses to develop bicycle boulevards that will increase the safety of people walking and bicycling. Local trips made by bicycle or on foot may be prioritized by expanding bicycle boulevards in the area. The City could pursue bicycle boulevards to improve the walking and bicycle experience through the menu of treatments listed in areas where the bicycle facilities overlap with truck routes.

Freight and Goods Movement

Truck Routes

Goods movement plays an important role in both the circulation network and the economy of Rancho Cucamonga. Often, it can be difficult to accommodate trucks and other vehicles without impeding other modes or the well-being of residents. Due to its important location between two highways and the role of logistics in the local economy, effectively accommodating goods movement along its roadways is critical for local transportation planning.

Truck traffic on City streets is restricted to specific routes that are designated for thru traffic of trucks over three tons. These truck routes help to facilitate the movement of goods throughout the City, while providing a connection between major freeway facilities to local roadways. Trucks are allowed on designated routes even if they do not have an origin or destination within the City of Rancho Cucamonga. Figure 3.17 displays the truck route system in the city.

Table 3.7 has information on the total truck traffic on I-10, I-15, and SR-210 that go through Rancho Cucamonga. Truck traffic on the freeway made up about 10% of total daily travel on I-10, up to about 8% on I-15, and up to about 5% on SR-210 in 2017. There are approximately 8,000-25,000 trucks passing through the City of Rancho Cucamonga each day on local freeways. As population increases and development occurs in the City, this number is likely to rise due to higher demand for goods.

Based on available Caltrans Truck Annual Average Daily Traffic (AADT) data throughout the SCAG region, Rancho Cucamonga freeways contain similar levels of truck traffic. San Bernardino County freeways average approximately 10% trucks, and Riverside County freeways average around 14%.

There are bicycle routes that exist or are proposed along existing and/or proposed truck routes. These two modes may not be compatible on specific routes, and a layered network approach is recommended to prioritize each mode on select streets.

Technological innovation is presenting opportunities to improve the efficiency of goods movement in the future. Blockchain technology, a record-keeping technology that allows for faster and more secure transfer of information, has the potential to revolutionize the future of trucking and logistics by creating a new system of documenting transactions, tracking shipments and managing fleets.[13] The same number of heavy vehicles are expected to travel along roadways while decreasing truck travel during peak congestion hours and reducing total truck travel times. In updating the General Plan, it will be important to consider the impact of this type of innovation and provide a flexible policy framework in response.

Table 3.7. Truck Traffic Volumes on Freeways (2017)

Description	Vehicle Annual ADT	Truck AADT	Truck – Percent of Total
I-10/Etiwanda Avenue	250,000	25,575	10.23%
I-10/ I-15 Interchange	264,000	17,662	6.69%
I-15/Foothill Boulevard	203,000	16,443	8.10%
SR-210/I-15 Interchange	186,000	8,705	4.68%

Source: Caltrans, Annual Average Daily Truck Traffic on the California State Highway System, 2018

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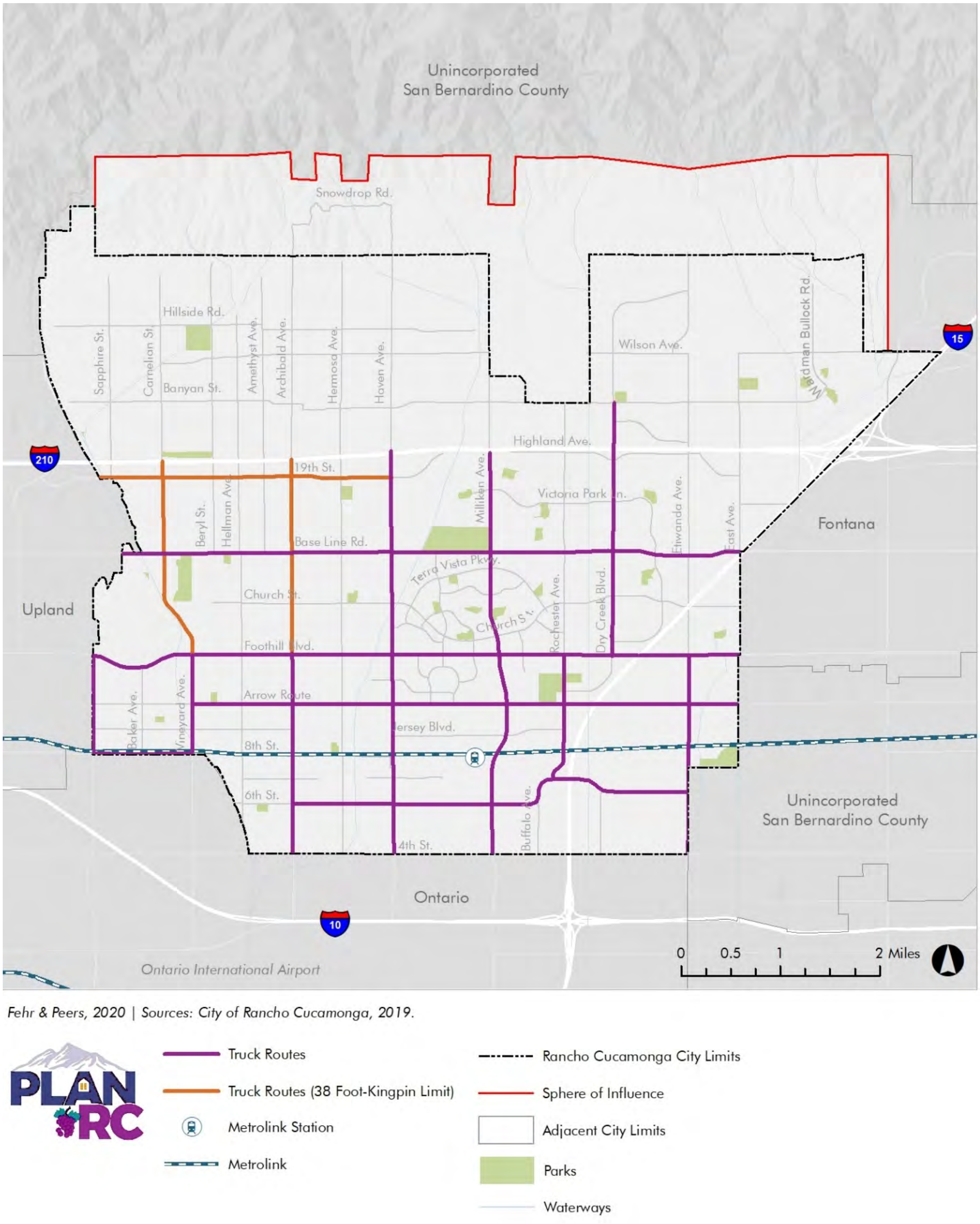
[13] Penske', The Role of Trucking Technology in Blockchain, accessed 15 January 2019, https://www.pensketruckleasing.com/resources/industry-resources/trucking-blockchain/

Figure 3.17. Truck Routes (2019)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019.

Freight Rail Lines

Local freight service operates through trackage rights on the Metrolink San Gabriel subdivision (formerly owned by Santa Fe Railroad) through Rancho Cucamonga – the same line that carries Metrolink trains on the San Bernardino line. This is not a main freight line; both the Union Pacific and Burlington Northern Santa Fe Railway (BNSF Railway) main lines are located farther south. The line does not serve through-freight traffic except for occasional diversions when the main freight lines to the south are closed or restricted for limited periods. Freight traffic levels are very light, with only infrequent service to local industrial uses.

The line serves local freight traffic and switchers to various spur lines to industrial areas and lineside industries in south Rancho Cucamonga, including:

- A spur line between Archibald Avenue and Hermosa Avenue, with sidings to the south just east of Haven Avenue,
- Spur tracks north of the tracks just west of Milliken Avenue,
- Spurs to both the north and the south between Milliken Avenue and Rochester Avenue, and
- Spur tracks to the north between I-15 and Etiwanda Avenue.

Citywide, railroad lines cross most streets at grade, including on Vineyard, Hellman, Archibald, Hermosa, Rochester, and Etiwanda Avenues. The grade separated crossings at Milliken Avenue and Haven Avenue have been constructed along these key travel corridors. A grade separation at Etiwanda Avenue and the BNSF Railway line is currently under design to better accommodate truck traffic.

Aviation

Ontario International Airport

Ontario International Airport (ONT) is a medium-hub, full-service airport with commercial jet service to major U.S. cities and many international destinations. The airport, located in the City of Ontario, is approximately one mile from Rancho Cucamonga's southern boundary. ONT is one of five commercial airports providing air travel in the Los Angeles metropolitan area. Carrying the third highest passenger volume, behind Los Angeles International Airport (LAX) and John Wayne Airport (SNA), this is the only airport in the region with significant capacity for growth.

Today, access to ONT is almost exclusively by passenger vehicles, accessing the airport via surface streets and the freeway system (Interstate 10 and 15 (I-10, I-15) and State Route 60 (SR-60)). Airport parking is plentiful and convenient; terminal-area parking costs range from $21-$27 per day and the airport-operated remote is also available.

Other available modes include airport shuttle services, taxis, and hotel/motel courtesy vehicles. The only available public transportation is OmniTrans Route 61 which travels on Airport Drive but does not enter the terminal area. Although, ONT is within five miles of three Metrolink stations, train schedules and bus links are not timed to coincide with flight arrivals and departures.

As previously noted, the City supports the desire to connect ONT to the Rancho Cucamonga Metrolink station via rail access that should be reflected in the General Plan update. Additionally, airport influence areas have specific restrictions to building heights and other planning factors that the General Plan update should also consider (if needed).

Upland Cable Airport

Cable airport is a non-towered public-use airport located three miles from the western boundary of Rancho Cucamonga. Covering a 95-acre area, it is a privately owned airport with an average of 252 aircraft operations per day. The General Plan update should review any land use regulations due to the proximity of Cable Airport and ensure that the General Plan is consistent with those requirements.

Network Performance and Safety

Traffic Volumes

For evaluating the major street segments and signalized intersections within the jurisdiction of Rancho Cucamonga, traffic count collections at the intersections are required. However, the traffic count effort is currently pending due to COVID-19 and will be carried out at a later time to reflect the typical traffic volumes on the streets.

Collision Profile (2014-2018)

A traffic collision is any event where a moving vehicle strikes any object. That object could be another car, a pedestrian, or something fixed in place (such as a light post). When collisions cause damage or injury, the details are recorded by the local law enforcement agency and loaded into the California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS). The City's database, which includes the latest SWITRS data (2014-2018), was used to analyze collisions.

From 2014 to 2018, there were a total of 1,233 collisions in Rancho Cucamonga, with a total of 21 fatalities and 34 people severely injured. The fatality rate in the City was 1.63%, compared to the countywide fatality rate of 2.6%.

As shown in Figure 3.18, the top three cited factors contributing to collisions in the City were right-of-way violations (28%), unsafe speed (23%), and traffic signals and signs (14%). The top three cited factors in the County were unsafe speed (33%), improper turning (17%) and right-of-way violations (15%). The state of California has identified the lane departures, impaired driving and aggressive driving as the top three challenge area involvement in fatalities and severe injuries[14].

The number of vehicle collisions of any type during the five-year period between 2014 and 2018 ranged from 150 to 215 per year, as shown on Figure 3.19 [vehicle with vehicle traffic collisions (2014-2018)]**.** Most years showed a similar number of vehicle-to-vehicle collisions (Figure 3.20). During the same time period, the rate of collisions involving a pedestrian was 6.8% and bicyclist was 6.4%, compared to countywide rate of 5.3% and 3.3% respectively.

The percentage of collisions involving a pedestrian or bicyclist was disproportionately higher than the vehicle-to-vehicle collisions among the fatalities and severe injuries during these five years. Among the collisions with fatalities or severe injuries, the collisions involving a pedestrian was 22% and a bicyclist was 5%, compared to countywide rate of 24% and 5% respectively. In the state of California, between 2008 and 2017, the percent of a pedestrian involved in fatalities or severe injuries was 19% and 8% involved a bicyclist[15].

Collision Density (2014-2018)

During the five-year period between 2014 and 2018, the vehicle collision density was spread out in the City with most major intersections seeing high number of collisions (Figure 3.21). The intersections that showed higher

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[14] https://www.ots.ca.gov/wp-content/uploads/sites/67/2020/02/Annual_Report_Final_WEB_back_1-28-20.pdf
[15] https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/safety/shsp/shsp-2020-2024-a11y.pdf

number of vehicle collisions density were Foothill Boulevard and Hermosa Avenue, Foothill Boulevard and Rochester Avenue, Foothill Boulevard and Day Creek Boulevard, and Base Line Road and Milliken Avenue. Bicycle collisions occurred at specific areas, with high number occurring at the southwest part of the city, as shown in Figure 3.22. The intersections that showed higher number of bicycle collisions density were Base Line Road and Vineyard Avenue, Base Line Road and Rochester Avenue, and Foothill Boulevard and Hellman Avenue. As shown in Figure 3.23, the higher density of pedestrian collisions occurred mostly on Foothill Boulevard to the southwest part of the city as well. Several fatal collisions involving a pedestrian occurred at the edge of the city on 4th Street.

While the vehicle collisions were occurring throughout the city, the collisions involving a pedestrian and bicycle were more concentrated to the southwest part of the city. The number of fatal collisions involving a pedestrian and bicycle were comparatively higher than collisions involving a vehicle. The City should consider recommendations and policies for safer streets to protect its vulnerable users such as the pedestrians and bicyclists.

By making safety a high-level priority, it can be acknowledged that traffic deaths and injuries are preventable. This understanding allows cities to approach prioritizing projects differently – not only addressing current problems, but proactively targeting future safety concerns. The process to achieve safety for all includes multidisciplinary engagement, identifying high-risk areas and implementing strategies geared toward eliminating or curbing the risks.

Figure 3.18. Violation Categories for Collisions (2014-2018)

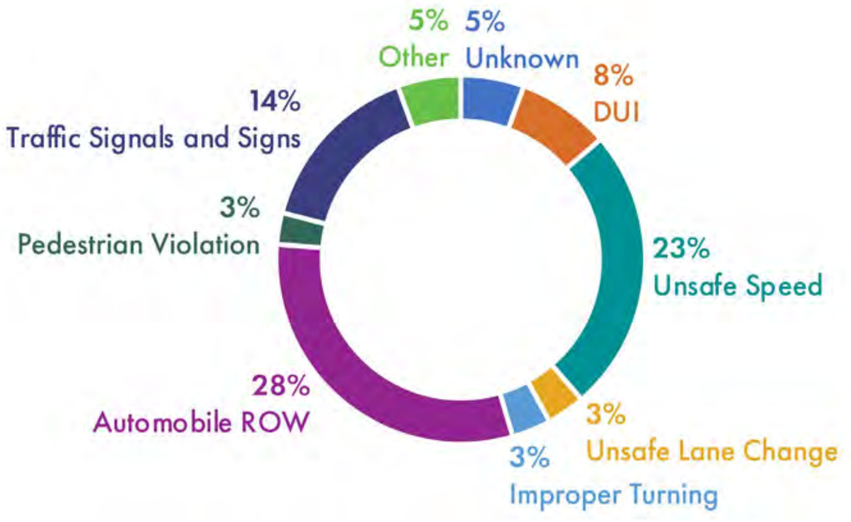
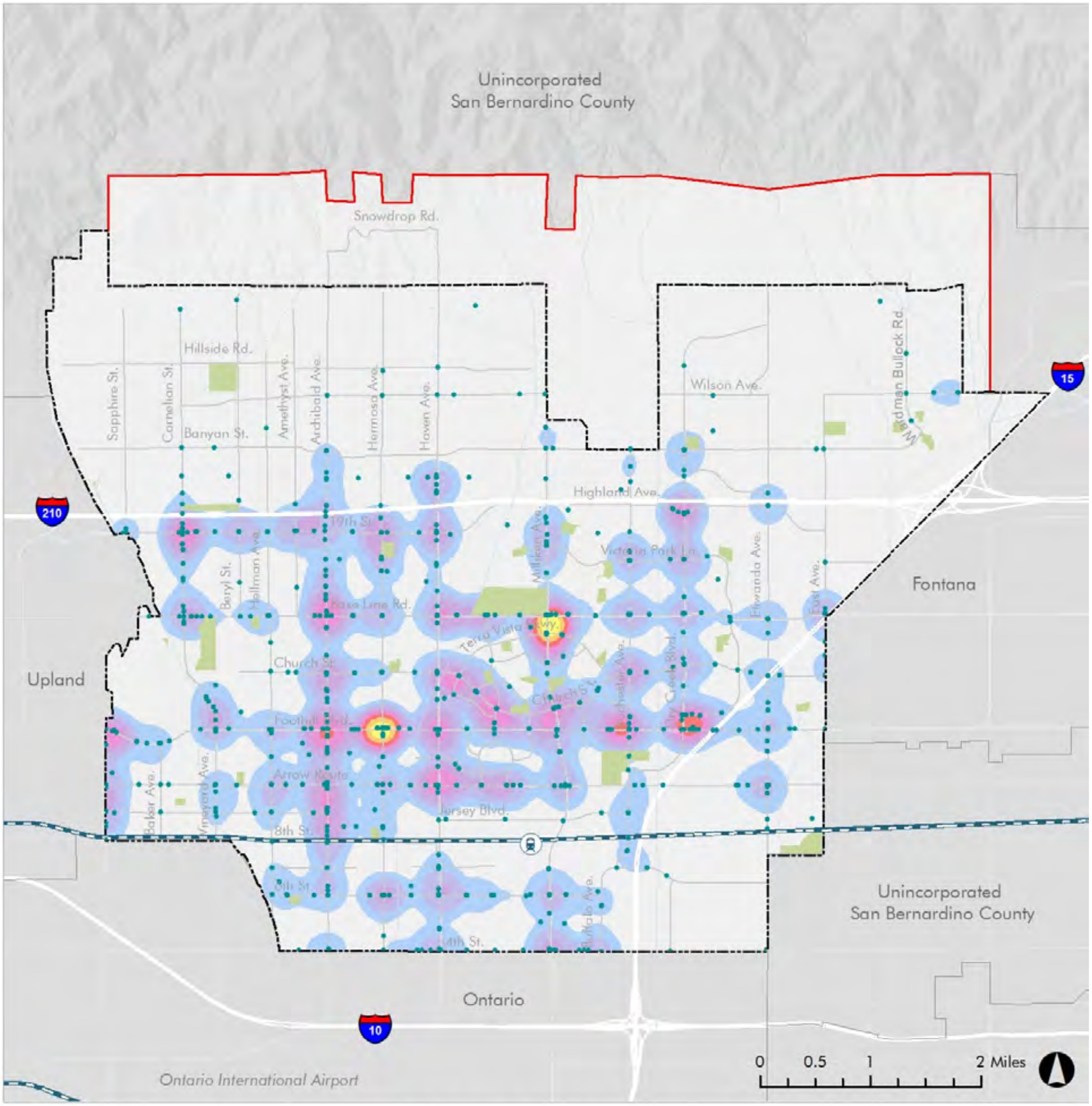


Figure 3.19. Vehicle with Vehicle Traffic Collisions (2014-2018)

Figure 3.20. Pedestrian and Bicycle with Vehicle Traffic Collisions (2014-2018)

Source: Fehr & Peers (2020); Transportation Injury Mapping System (2014-2018)

Figure 3.21. Vehicle Collisions (2014-2018)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019; TIMS, 2014-2018.

● Vehicle Collisions

● KSI Collisions

Vehicle Collision Density

High

Low

-·-·- Rancho Cucamonga City Limits

── Sphere of Influence

☐ Adjacent City Limits

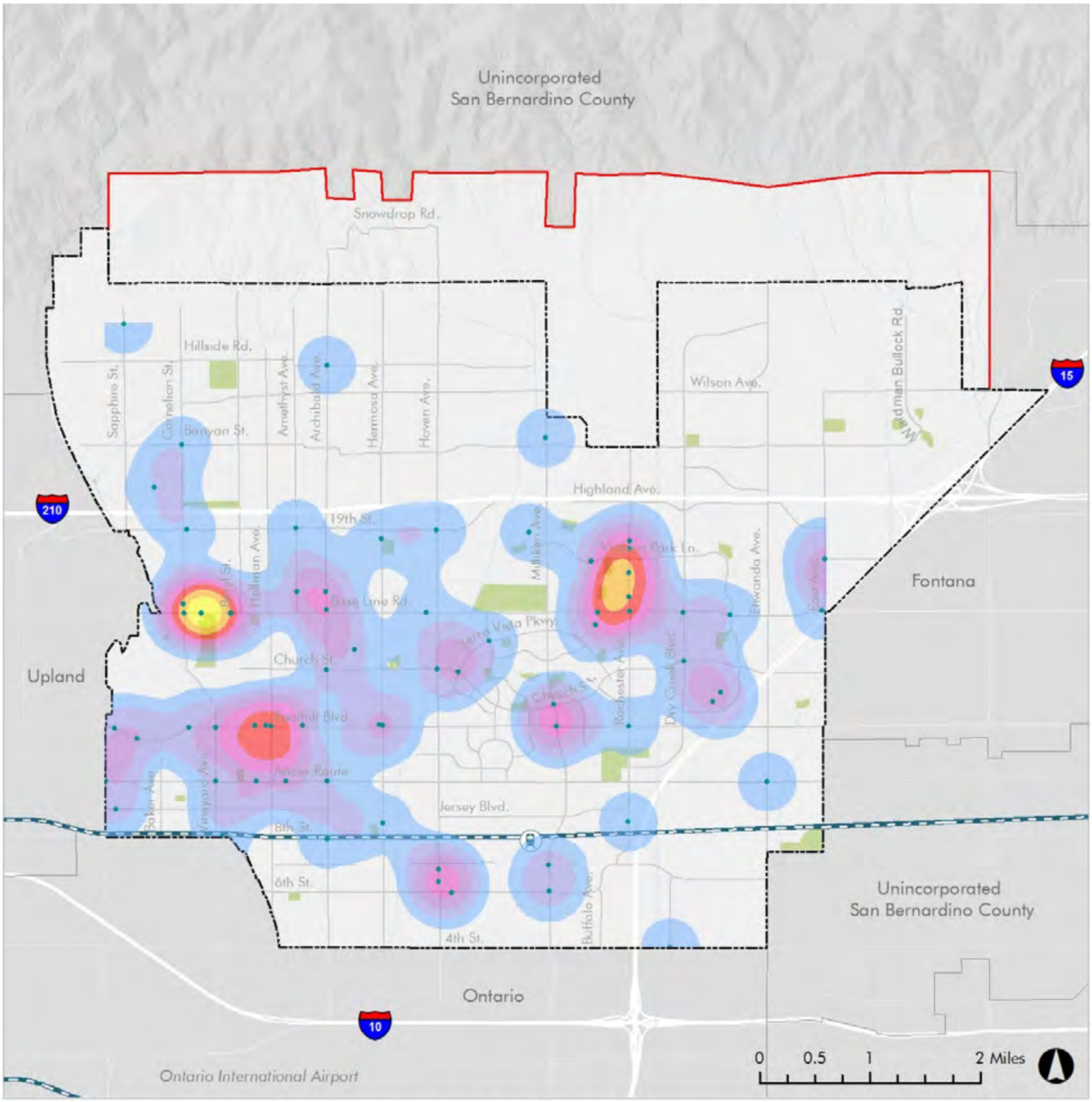
🟩 Parks

── Waterways

Metrolink Station

▬ ▬ Metrolink

Figure 3.22. Bicycle Collisions (2014-2018)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019; TIMS, 2014-2018.

● Bicycle Collisions

● KSI Collisions

Bicycle Collision Density

High

Low

-·-·- Rancho Cucamonga City Limits

— Sphere of Influence

☐ Adjacent City Limits

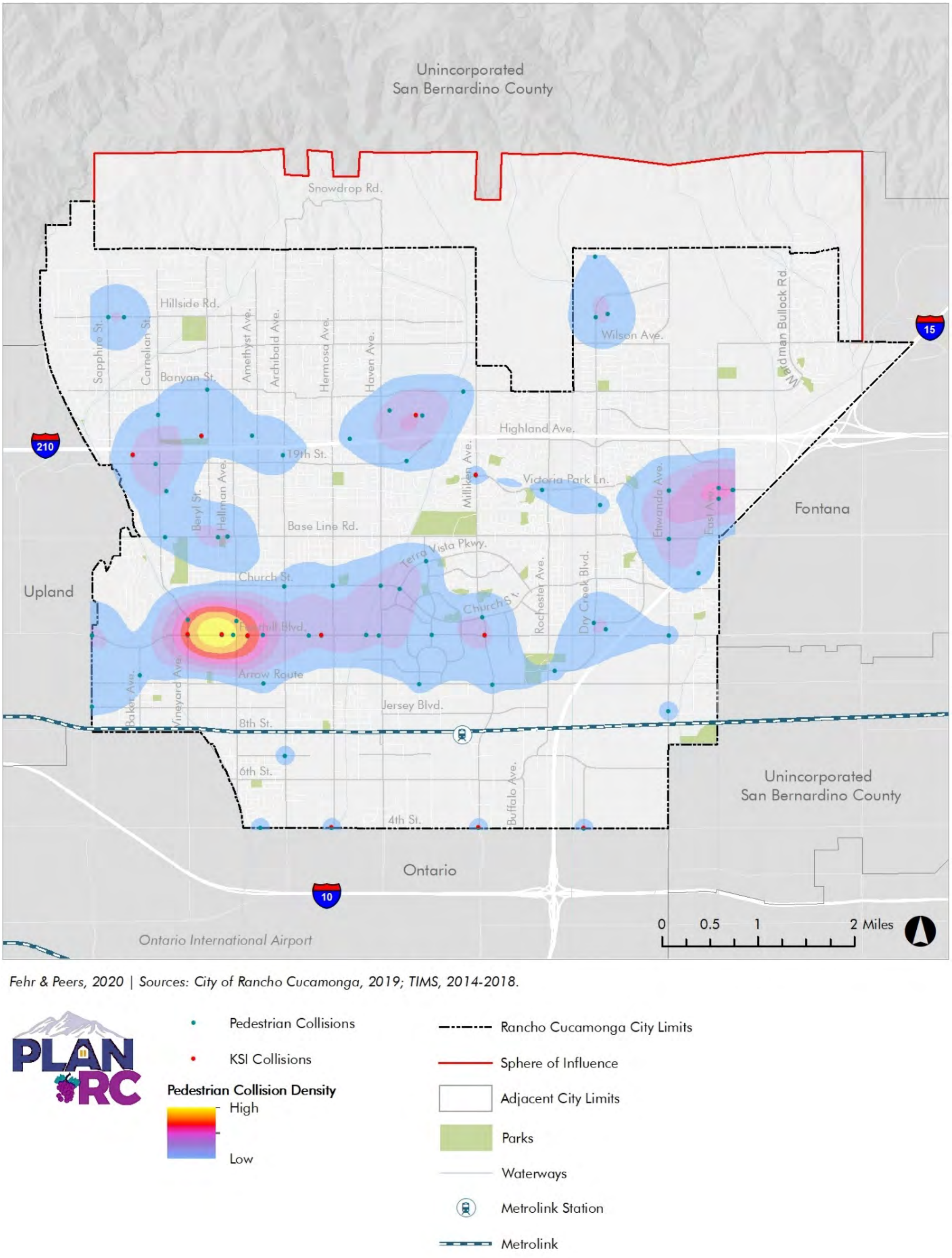
🟩 Parks

— Waterways

Metrolink Station

- - - Metrolink

Figure 3.23. Pedestrian Collisions (2014-2018)



Fehr & Peers, 2020 | Sources: City of Rancho Cucamonga, 2019; TIMS, 2014-2018.

Other Key Items

This section discusses key items, such as the future of transportation and state regulations. The General Plan can respond to these items and set forth policies to address concerns and anticipate growing technologies.

Transportation Improvement Funding

Senate Bill 1 Transportation Funding

The California Legislature passed Senate Bill No. 1 (SB 1) in 2017. The bill focuses on transportation funding through an increase in vehicle fees and gas taxes. The increases in fees and taxes are expected to raise an average of $5 billion per year in new revenue for road repairs, transit, and active transportation. The City can anticipate funding from these sources to assist with maintenance of existing infrastructure and construction of new infrastructure once existing roads have been brought up to a state of good repair. Measure I and SB 1 are the City's prime sources of funding for transportation improvements and maintenance. Additional funding is still needed to fund the gap in deferred maintenance of roadways.

Active Transportation Program

The Active Transportation Program (ATP) was created by Senate Bill 99 and Assembly Bill 101 to encourage increased use of active modes of transportation, such as biking and walking. The ATP consolidates various transportation programs, including the Federal Transportation Alternative Program, State Bicycle Transportation Account, and federal and state Safe Routes to School Programs, into a single program.[16] The ATP is meant to increase the proportion of active mode trips, increase the mobility and safety of active transportation users, enhance public health, improve greenhouse gas reduction efforts, and ensure disadvantaged communities benefit from the program by dedicating 25% of program funds.

Program funding is distributed in three ways, including to the State of California, to areas with populations of 200,000 or less, and to Metropolitan Planning Organizations. While the City has not been awarded ATP funding to date, it has partnered with SBCTA (the lead applicant) on two ATP funded projects to improve active transportation access to the Metrolink Station that include improved bicycle facilities along Milliken Avenue and a proposed cycle track on 6th Street. Continued efforts to secure ATP funding is a recommended implementation action item for PlanRC in light of updates to the General Plan. These efforts improve equity and help reach AB 32 goals of reducing greenhouse gas emissions.

Emerging Technologies

From electric vehicles to autonomous vehicles and ride hailing services, new technology is already changing the way we get around in the 21st Century. Further developments and innovations have the potential to make travel safer, more convenient, and more environmentally sustainable. This section covers some of the new technologies to consider in planning for mobility through 2040.

Shared Mobility

The City has recently adopted a shared mobility ordinance and is planning to initiate a pilot program to evaluate the impact of shared mobility alternatives such as bikeshare and scooter-share within the City. Under this pilot program, the City would select one or more operators to deploy shared mobility devices within designated city locations,

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[16] www.catc.ca.gov/program/ATP

generally in the Terra Vista area of the City. In response to the COVID-19, the City is currently investigating the potential nature of the application and process of the pilot program in a post-pandemic environment.

Autonomous Vehicles

California has granted permits to 65 firms allowing for self-driving cars to be tested on the street with a backup driver at the wheel. This technology has the potential to revolutionize mobility and is important to consider in updating the circulation element of the General Plan.

There are several levels of vehicle autonomy. They range from cruise control (low level of autonomy) to fully autonomous vehicles (AVs) that require no interaction with the driver. Manufacturers are developing this technology, and the Federal and State governments will likely determine regulations for a fully autonomous fleet. It is unknown how long it will take to convert all cars to autonomous vehicles or if that will ever happen. However, the expansion of AVs will likely alter travel behavior in the city. AVs are expected to make car travel less stressful, increase travel safety, and reduce operational inefficiencies on freeways, all leading to an increase in demand for automobile travel and potential farther expansion of land uses. The transition period, when streets carry large numbers of both conventional and autonomous vehicles, will involve complex interactions and require new informed analysis methods and professional judgment to address conflicts and benefits. Developing strategies that anticipate a future AV fleet and provide infrastructure to support this fleet will be an important part of the General Plan Update.

Parking utilization will be altered by the introduction of AVs. In the United States, a considerable amount of land is dedicated to parking by way of minimum parking requirements. Today there are about five parking spaces per vehicle in the United States; however, in the future as more shared AVs are available, the need for parking will likely be reduced. The General Plan Update will need to anticipate how these changes could affect the design of streets.

Electric Vehicles

Adoption of electric vehicles is becoming more widespread, and facilities for charging electric vehicles are in demand. In a car-dependent community, owning electric vehicles could be encouraged by constructing supporting facilities for them. As driving electric vehicles helps reduce emissions and supports AB 32 goals, the City of Rancho Cucamonga should consider guiding policies for vehicle charging infrastructure.

In this space, there could be an opportunity to create wireless charging areas for cars, bikes, scooters, microtransit, and other mobility options that can charge in these areas. As the City retrofits parking areas or develops roadways, they may want to consider this potential future and incorporate specific elements to make implementation easier once an integrated platform is developed.

Solar Roadway Technology

Solar roadway is another technological advancement that is currently being researched by agencies such as the Federal Highway Administration (FHWA). Solar panel cells are embedded into the roadway in order to harvest solar radiation into renewable energy. The surface of the solar cells is laminated in glass and light-emitting diodes (LEDs). While there are still constraints to work through, such as surface friction, water infiltration, cost of construction/maintenance, and lower than expected energy returns, the potential for this technological advancement and others similar to it may be considered in the update of the General Plan policies.

Transportation Network Companies

Transportation network companies (TNCs), such as Uber and Lyft, are increasing in popularity and usage. TNCs combine web-based applications, such as mobile applications, and ridesharing vehicles. While TNCs could reduce private vehicle ownership levels, they are also likely to increase total vehicle miles traveled. The greatest factors that

TNCs will affect in cities include parking, curb-space management, and transit use—especially in areas where parking is currently considered “difficult”.

When people use TNC services in place of a privately-owned automobile, the demand for parking goes down, while the demand for curbside drop-off and pick-up locations rises. As TNCs continue to rise and capture a greater share of travel modes, the City will have to identify areas where it is difficult park and develop strategies for curb space management, while reconsidering minimum parking requirements. Minimum parking requirements may be reduced or eliminated; or maximum parking requirements could be introduced in specific areas of the city.

TNCs can help improve first-last mile connections, where a person must find transportation options to get to a transit station, and from transit to their destination. The General Plan Update should consider appropriate curbside management strategies, such as areas that either prioritize or restrict passenger loading and unloading, as well as safety.

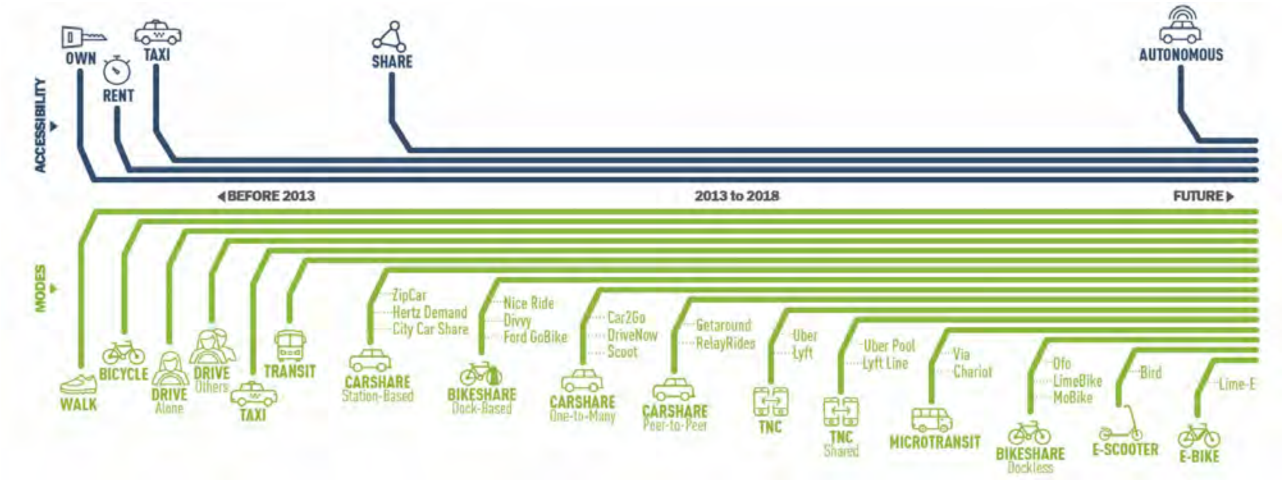
Microtransit

Microtransit is technology-enabled, demand-responsive transit services that are open to everyone. They can be used as incremental improvements to coverage-oriented dial-a-ride or paratransit services by suburban transit agencies, as supplements of low-performing suburban fixed route services by transit agencies, or as a premium for-profit fixed route service interlining with already overcapacity urban transit corridors. When considering a new service, a fixed-route bus is likely to best accomplish a ridership goal, while microtransit is better suited to a coverage goal that complements existing fixed-route transit service.

Mobility Hubs

Mobility Hubs can range from a small (bus shelter, bike parking, Transportation Network Company (TNC) drop-off spaces to very large (commuter rail integration with a bus transfer facility, transit plaza, bike repair station, bike share, TNC pick up, microtransit, bikeshare etc.). In Rancho Cucamonga, the Metrolink station currently provides the best potential to implement a robust mobility hub. While selecting a location for a mobility hub, the following components should be considered:

- Proximity to key transportation infrastructure and services,
- Easily accessible on foot or bicycle,
- Residents with low levels of mobility accessibility,
- Mixed land use, and
- Potential for future growth.



Disruptive trends in vehicle accessibility and travel mode

Emerging technologies in transportation: Autonomous Vehicles, Electric Vehicles, TNC's, Microtransit

Cultural Resources

Existing Conditions Report

June 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

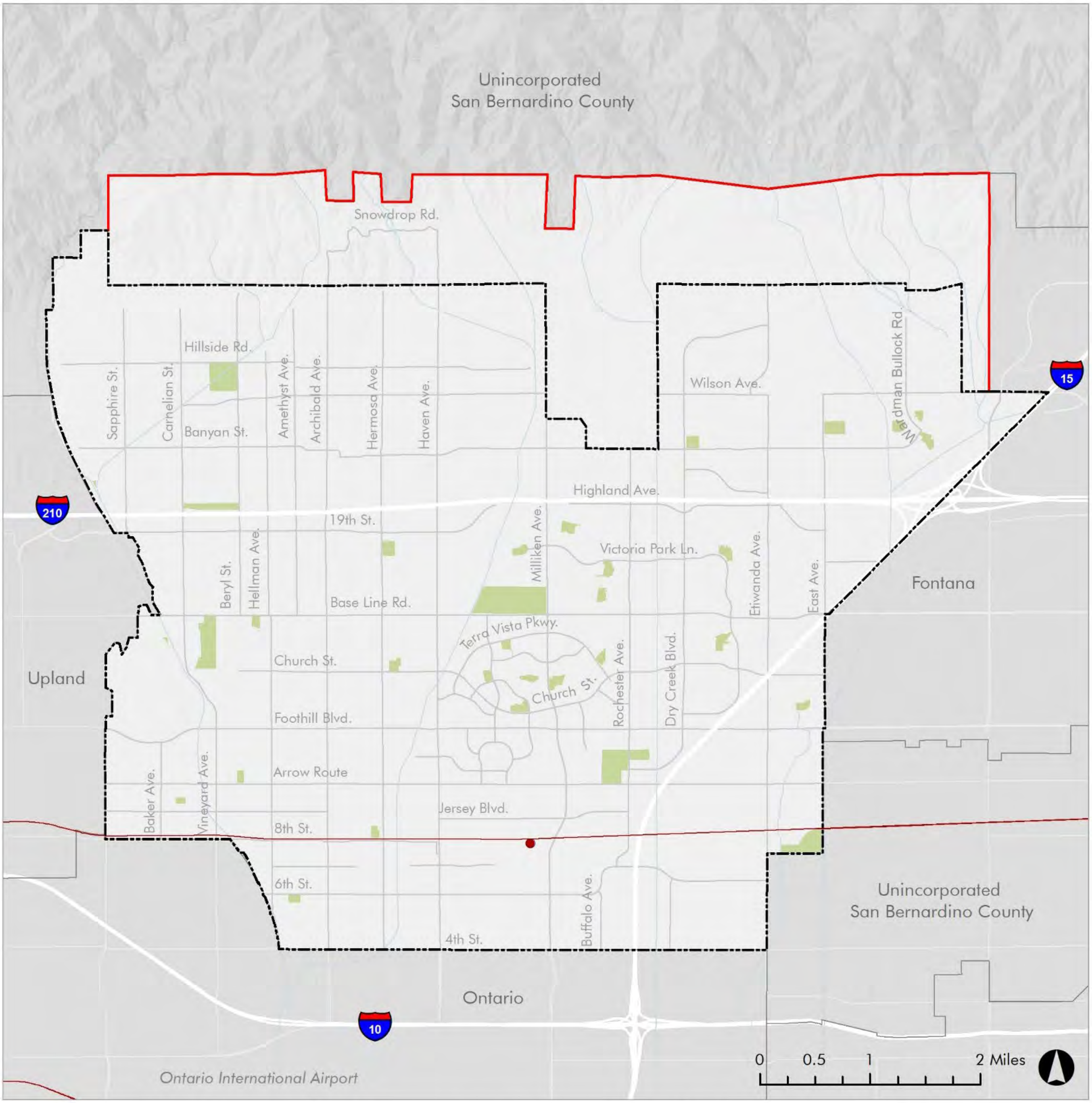
Summary

Historic-era buildings, archaeoloigcal sites, and tribal resources (collectively, cultural resources) are scattered throughout the City. The opportunity for more to be identified in the City exists, as buildings reach the 50-year or older mark or as development under the General Plan proceeds. To better guide development in the City, the Rancho Cucamonga General Plan update strategy is to identify existing and future cultural resources in the City and ensure compliance with applicable laws before they can be altered or impacted. Figure 1, Plan Area Map, shows the project area, including the Sphere of Influence, and surrounding cities.

Key Findings

1. Preservation of cultural resources in place is preferred, where feasible.
2. Periodic reassessment of cultural resources is necessary because buildings, structures, objects, or sites increase in age over time and may become subject to laws regarding cultural resources in the future.
3. The various historic neighborhoods within the City each have their own style of development and historic character and it would be helpful to identify key characteristics to help with subsequent analysis.
4. A working relationship with affected Tribes, and development of standard mitigation, will make the consultation process more efficient.

Figure 1. Plan Area Map



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020.

Rancho Cucamonga City Limits
Sphere of Influence
☐ Adjacent City Limits
🟩 Parks
Waterways
● Metrolink Station
Metrolink

Cultural Resources

Cultural resources are found throughout the City and reflect the rich diversity of cultures and history of the City over many generations.

Introduction

The City of Rancho Cucamonga is located in the western portion of San Bernardino County, just south of the San Bernardino National Forest. The land now occuped by the City of Rancho Cucamonga was home to ancestral Gabrielino populations of Native Americans, who continue to live in the area to this day. The City was incorporated in 1977, consolidating the three historic towns of Alta Loma, Cucamonga, and Etiwanda into one municipality. Given its fertile soil, temperate climate, and access to an ample supply of water, agriculture developed as the main industry in Rancho Cucamonga in the latter half of the 19th Century, when farmers and vintners began producing a variety of crops, particularly citrus fruits and grapes for wine-making. Although the local agriculture industry has changed over time due to a variety of factors, including technological advancement and transportation improvements, agriculture remains a recognizable, although, fading, feature of Rancho Cucamonga's physical landscape.

Regulatory Environment

There are many federal, state, and local regulations designed to protect cultural resources within the City, some of which have been enacted since the last General Plan update. The most commonly invoked laws and regulations are summarized below. Most of these regulations are independent of the process under the California Environmental Quality Act. This means that the regulations apply to a cultural resource even if there is no discretionary permit that would require an environmental analysis for the overall project.

Federal Regulations

National Historic Preservation Act of 1966

Cultural resources are considered during Federal undertakings under Section 106 of National Historic Preservation Act (NHPA) of 1966 (as amended) through one of its implementing regulations (36 *Code of Federal Regulations* [CFR] 800, Protection of Historic Properties). Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of NHPA.

Section 106 of NHPA (54 *United States Code* [USC] 300101 *et seq.*) requires Federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, the significance of any adversely affected cultural resource is assessed and mitigation measures are proposed to reduce the impacts to a less than significant level. Significant cultural resources are those that are listed or are eligible for listing in the NRHP in accordance with the criteria stated in 36 CFR 60.4, which are listed below:

> "The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. That are associated with the lives of persons significant in our past; or
>
> C. That embody the distinctive characteristics of a type, period, or method of construction, or that respresent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. That have yielded, or may be likely to yield, information important in prehistory or history.
>
> In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4)".

In addition, the resource must be at least 50 years old, except in exceptional circumstances" (36 CFR 60.4).

Effects to NRHP-eligible resources, deemed "historic properties" under Section 106, are adverse if the project may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

State Regulations

California Register of Historical Resources

CEQA requires a lead agency to determine whether a project would have a significant effect on one or more historical resources. A "historical resource" is defined as a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (*California Public Resources Code* [PRC] §5024.1, Title 14 CCR, Section 4850 *et seq.*) (14 CCR 15064.5[a][1])"a resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code"(14 CCR, Section 15064.5[a][2]); or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record" (14 CCR 15064.5[a][3]).

PRC Sections 5020 to 5029.5 continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The Commission oversees the administration of the California Register of Historical Resources and is responsible for designating State Historical Landmarks and Historical Points of Interest.

Section 5024.1 of 14 CCR 15064.5 of the CEQA Guidelines requires evaluation of historical resources to determine their eligiblity for listing on the CRHR. The purposes of the CRHR are to maintain listings of the State's historical resources and to indicate which properties are to be protected from substantial adverse change. The criteria for listing resources in the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP (per the criteria listed at 36 CFR 60.4). The criteria listed below are used to determine whether or not a cultural resource is considered historically significant and eligible for listing on the CRHR.

A) "Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code, § 5024.1, Title 14 CCR, Section 4852) including the following:Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B) Is associated with the lives of persons important in our past;

C) Embody the distinctive characteristics of a type, period, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D) Has yielded, or may be likely to yield, information important in prehistory or history.

According to Section 15064.5(a)(3)(A-D) of the CEQA Guidelines (14 CCR), a resource is considered historically significant if it meets the criteria for listing in the NRHP (per the criteria listed at 36 CFR 60.4 previously discussed). Impacts that affect those characteristics of the resource that qualify it for the NRHP or that would adversely alter the significance of a resource listed in or eligible for listing in the CRHR are considered to have a significant effect on the environment.

PRC Sections 5079 to 5079.65 define the functions and duties of the Office of Historic Preservation (OHP), which administers federal- and state-mandated historic preservation programs in California as well as the California Heritage Fund.

Tribal Cultural Resources

Effective July 1, 2015, Assembly Bill 52 (AB 52) amended CEQA to mandate consultation with California Native American tribes during the CEQA process to determine whether or not the proposed project may have a significant impact on a Tribal Cultural Resource, and that this consideration be made separately from cultural and paleontological resources.

Section 21073 of the Public Resources Code defines California Native American tribes as "a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004." This includes both federally and non-federally recognized tribes.

Section 21074(a) of the Public Resource Code defines Tribal Cultural Resources for the purpose of CEQA as: sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

a. included or determined to be eligible for inclusion in the California Register of Historical Resources; and/or

b. included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; and/or

c. a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Because criteria A and B also meet the definition of a Historical Resource under CEQA, a Tribal Cultural Resource may also require additional consideration as a Historical Resource. Tribal Cultural Resources may or may not exhibit archaeological, cultural, or physical indicators.

Recognizing that California tribes are experts in their tribal cultural resources and heritage, AB 52 requires that CEQA lead agencies carry out consultation with tribes at the commencement of the CEQA process to identify Tribal Cultural Resources. Furthermore, because a significant effect on a Tribal Cultural Resource is considered a significant impact on the environment under CEQA, consultation is required to develop appropriate avoidance, impact minimization, and mitigation measures. Consultation is concluded when either the lead agency and tribes agree to appropriate mitigation measures to mitigate or avoid a significant effect, if a significant effect exists, or when a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached (21080.3.2[b], whereby the lead agency uses its best judgement in requiring mitigation measures that avoid or minimize impact to the greatest extent feasible.

Mills Act

In 1972, California State Senator James Mills introduced a bill known as the Mills Act to grant property tax relief to owners of qualified historic properties. The Mills Act is a preservation tool created by the California legislature to encourage the preservation and restoration of historic properties. The Act enables cities to enter into historical property agreements with owners of qualifying properties; these agreements will result in reductions to the owner's property taxes. The agreements provide a benefit to cities in that they ensure preservation and guarantee authentic rehabilitations and a high level of maintenance of cultural resources important to communities.

Local Regulations, Programs, and Plans

City of Rancho Cucamonga Municipal Code

The purposes of Chapter 2.24, Historic Preservation, of the Rancho Cucamonga Municipal Code, are to:

1. Provide a mechanism to identify, designate, protect, preserve, enhance, and perpetuate those historic sites, structures, and objects that embody and reflect the City's aesthetic, cultural, architectural, and historic heritage;
2. Foster civic pride in the beauty and accomplishments represented by the City's historic landmarks and distinctive neighborhoods and recognize these resources as economic assets;
3. Encourage the protection, enhancement, appreciation, and use of structures of historical, cultural, architectural, community, or aesthetic value that have not been designated as historical resources but are deserving of recognition;
4. Enhance the quality of life and promote future economic development within the City by stabilizing and improving the aesthetic and economic value of such districts, sites, structures, and objects;
5. Encourage adaptive reuse of the City's historic resources by promoting public awareness of the value of rehabilitation, restoration, and maintenance of existing buildings as a means to conserve reusable material and energy resources;
6. Integrate historic preservation within the City's comprehensive development plan; and
7. Promote and encourage historic preservation through continued private ownership and utilization of such sites, buildings, and other structures now so owned and used, to the extent that objectives listed above can be attained under such policy.

The Rancho Cucamonga Municipal Code was amended in 2012 to include Chapter 17.18, Historic Preservation Commission Decisions, the purpose of which is to:

> "…establish permits and entitlements that are decided by the historic preservation commission and is intended to work in conjunction with chapter 2.24 (Historic Preservation) of this Code. This chapter provides mechanisms to identify, designate, protect, preserve, enhance, and perpetuate historic sites, structures, and objects that embody and reflect the city's aesthetic, cultural, architectural, and historic heritage. Each permit and entitlement type is described in this chapter in terms of purpose and applicability, exemptions, review process, findings for approval, and conditions. General processing procedures are established in chapter 17.14 (General Application Processing Procedures). (Code 1980, § 17.18.010; Ord. No. 855, § 4, 2012)"

Chapter 17.18 provides detailed information on the criteria for designation of historic resources; the certification, maintenance, and preservation of historic resources; and the processes by which historic resources may be demolished; and information regarding the historic preservation fund and preservation incentives that may be utilized for the benefit of property owners and the greater community.

Landmark Designation Program

An important element of the program is the identification of benefits and incentives to encourage participation. The City has designated many Landmarks and Points of Interest within Rancho Cucamonga and there exists a potential to do the same within the Sphere of Influence, once additional areas are annexed into the City limits. Participation in the Landmark Designation Program provides the following benefits:

- Qualifies buildings to use the flexible Historical Building Code
- Qualifies the owners to apply for use of the Mills Act contract for lower property taxes
- Enables owners to receive free information about rehabilitation
- Fosters civic pride and encourages additional historical research
- Allows qualified owners to participate in the City's Landmark Plaque Program

Specific and Neighborhood Plans

The City also has a number of specific or neighborhood plans to guide development in certain areas within the City. These plans must be consistent with the General Plan, but can reflect the individuality of each of the areas subject to these plans. Several of the existing plans are listed below. Future plans present an opportunity to incorporate historic presevation and management of our City's history and prehistory using the goals and policies of the existing General Plan, plus new goals and policies that reflect the changes in regulations and the historic profile of the City.

- Caryn Planned Commuity
- Central Park Master Plan
- Empire Lakes Specific Plan
- Empire Yards Specific Plan
- Etiwanda Heights Neighborhood and Conservation Plan
- Etiwanda Specific Plan
- Etiwanda North Specific Plan
- Etiwanda HighlandsFoothill Boulevard Visual Improvement Plan
- Pacific Electric Trail Master Plan
- Terra Vista Community Plan
- Town Square Master Plan
- Trail Implementation Plan
- University Property
- VG Master Plan
- Victoria Arbors Master Plan
- Victoria Community Plan

Rancho Cucamonga General Plan

Existing General Plan Goals and Policies

The following existing goals and policies are aimed at providing guidance and policy direction regarding historic resources in the City. The goals and policies allow for the continued protection, preservation, maintenance, recognition, and documentation of historic resources so that future residents can enjoy what many residents value today.

- **Goal LU-9: Foster a cohesive, healthy community through appropriate patterns and scales of development, including complementary transitions between districts, neighborhoods, and land uses.**
    - **Policy LU-9.1:** Preserve and enhance the special qualities of existing districts and neighborhoods through focused attention on land use, community design, and economic development.
    - **Policy LU-9.4:** Ensure that infill development is sensitive and compatible with the design and scale of all adjacent historic properties.
- **Goal LU-15: Maintain a local historic resource survey, local inventory of historic resources, and local register of historic resources.**
    - **Policy LU-15.1:** Regularly update the City's historic context statement, historic resource survey, and the inventory of historic resources.
    - **Policy LU-15.2:** Identify funding sources to support regularly updating the historic context statement and historic resource survey.
    - **Policy LU-15.3:** Continue to encourage listing local historic resources in the California and National Registers.
    - **Policy LU-15.4:** Define local register of historic resources.
    - **Policy LU-15.5:** Designate local landmarks from the inventory.
- **Goal LU-16: Protect historic resources.**

  - **Policy LU-16.1:** Incorporate historic preservation principles into the City's project review process.
  - **Policy LU-16.2:** Avoid illegal demoilition of historic resources and "demolition by neglect."
- **Goal LU-17: Expand preservation incentives.**
  - **Policy LU-17.2:** Create a conservation easement program for historic resources.
  - **Policy LU-17.3:** Develop a preservation grant program.
  - **Policy LU-17.4:** Facilitate acqusition of preservation loans.
  - **Policy LU-17.5:** Continue to pursue designation as a Certified Local Government (CLG).
  - **Policy LU-17.6:** Continue to utilize Community Development Block Grant (CDBG) funds for historic preservation.
  - **Policy LU-17.7:** Continue to promote use and knowledge of the California Historical Building Code (CHBC).
  - **Policy LU-17.8:** Promote the use of the Federal Historic Preservation Tax Incentives Program.
  - **Policy LU-17.9:** Address adpative re-use in the Historic Preservation Ordinance.
  - **Policy LU-17.10:** Employ the use of floor area incentives.
  - **Policy LU-17.11:** Continue to make available land development incentives and modifications to development standards.
  - **Policy LU-17.12:** Promote the use of National Park Service (NPS) Route 66 Corridor Preservation Program's cost-share grant program for preservation of Historic Route 66 resources.
- **Goal LU-18: Identify and protect cultural landscape features.**
  - **Policy LU-18.1:** Prepare a Cultural Landscape Report.
  - **Policy LU-18.2:** Update files for identified historic resources to include extant cultural landscape features.
  - **Policy LU-18.3:** Create a conservation easement program for cultural landscapes.
  - **Policy LU-**18.4 Continue to rebuild agricultural landscapes.
  - **Policy LU-18.5:** Retain and restore windbreaks where appropriate.
- **Goal LU-19: Identify and protect historic districts and Neighborhood Character Areas (NCAs).**
  - **Policy LU-19.1:** Identify historic districts and Neighborhood Character Areas (NCAs).
  - **Policy LU-19.2:** Create new, and modify existing, specific plans to guide development of historic districts and Neighborhood Character Areas (NCAs).
  - **Policy LU-19.3:** Evaluate post-World War II buildings for historic significance.
- **Goal LU-20: Develop a historic resource interpretation program.**
  - **Policy LU-20.1:** Create a historic resource interpretation program aimed at enhancing both public awareness of local history and opportunities for heritage tourism.
- **Goal LU-21: Preserve and interpret Historic Route 66 for residents, visitors, and business owners.**
  - **Policy LU-21.1:** Evaluate Route 66 properties and designate Route 66-related historic resources.
  - **Policy LU-21.2:** Amend the existing Foothill Boulevard Specific Plan (Development Code § 17.32) to include a linear Route 66 Neighborhood Character Area (NCA).

  - **Policy LU-21.3:** Clarify the Foothill Boulevard Specific Plan and Route 66/Foothill Boulevard Visual Improvement Plan/Foothill Boulevard/Route 66 Mural Program to include policies that prioritize preservation of documented historic character of Route 66.
- **Goal LU-22: Create interpretive programs for the Pacific Electric Railway right-of-way.**
  - **Policy LU-22.1:** The City shall maintain and build on existing programs for Pacific Electric Trail development and interpretation.
- **Goal LU-23: Educate residents and City staff to address historic properties.**
  - **Policy LU-23.1:** Continue to work with City staff and homeowners' organizations, historical societies, and historic preservation advocacy groups to develop education programs about the maintenance and care of historic buildings.
  - **Policy LU-23.2:** Continue to train City staff in historic preservation.

Cultural Resources

Rancho Cucamonga General Plan

General Plan Environmental Impact Report

According to the background research conducted for the existing General Plan and more recent research for the General Plan Update, the City of Rancho Cucamonga has at least 445 previously identified properties listed in the City's "Historic Site List" dated April 23, 2009 and three properties listed in the NRHP, nine properties listed in the CRHR, three California Historical Landmarks, and six California Points of Historical Interest. Some of these properties are provided below. In addition, there are numerous archaeological sites representing the prehistoric and historic occupation and history of the City that are withheld from public disclosure due to confidentiality.

National Register of Historic Places

- Casa de Rancho Cucamonga (John Rains House Museum) at 8810 Hemlock
- Cucamonga Service Station (Multiple Property Listing, Highway 66), 9670 Foothill Boulvevard
- Pacific Electric Etiwanda Depot, 7092 Etiwanda Avenue

California Register of Historical Resources

- Padre/Biane Winery, 9951 8th Street (1909)
- Ernst Mueller House, 6563 East Avenue (date unknown)
- James G. Isle House, 6490 Etiwanda Avenue (date unknown; moved to 7086 Etiwanda Avenue)
- Herbert Goerlitz House, 6558 Hermosa Avenue/9893 Highland Avenue (1926; moved to 6558 Hermosa Avenue)
- John Rains House Museum, 7869 Vineyard Avenue (1859; currently at 8810 Hemlock Street)
- Christmas House / Whitson House, 9240 Archibald Avenue (1904)
- Cucamonga Chinatown Site, south of San Bernardino Rd between Klusman and Hellman Ave (pre-1919)
- Cucamonga Rancho Winery/Thomas Vineyards, 8916 Foothill Boulevard (1839)
- Milliken Ranch, Arrow Highway and Haven Avenue (ca. 1891)

California Historical Landmarks

- Cucamonga Rancho Winery/Thomas Vineyards, 8916 Foothill Boulevard (1839) (California Historical Landmark No. 490)
- Site of Tapia Adobe, top of Red Hill, approximately 8501 Red Hill Country Club Drive (1839; California Historical Landmark No. 360), demolished. Note: Property is also a local Designated Point of Interest (DPI).
- Historic Route 66 / National Old Trails Highway (California Historic Landmark No. 781)

California Points of Historical Interest

- Base Line Road, Highway from Highland to Claremont (1853; Point of Historical Interest No. SBR-012)
- Cucamonga Chinatown Site, 9591 San Bernardino Road (1920; Point of Historical Interest No. SBR-077)
- Christmas House, 9240 Archibald Avenue (1904; Point of Historical Interest No. SBR-073)
- Garcia Ranch House (currently the Chaffey-Garcia House), 7150 Etiwanda Avenue (1874; Point of Historical Interest No. SBR-082)
- Sycamore Inn (historically Uncle Billy's Tavern), 8318 Foothill Bouelvard (1848; Point of Historical Interest No. SBR-070)
- Milliken Ranch, 8798 Haven Avenue (1891; Point of Historical Interest No. SBR-075)

The City has 77 Designated Local Landmarks (DLLs) and 29 Designated Points of Interest (DPI). In addition, the City identified eight properties potentially eligible for listing in the NRHP, which were identified as "Potential National Register" (PNR) properties; 115 properties identified as "Potential Local Landmarks" (PLLs), three of which have been demolished; 24 properties determined insignificant or "Survey Determined Insignificant" (SDI); and 154 properties that were documented by listed as "Survey Undetermined Significance" (SUS).

Eligible for Inclusion in the National Register of Historic Places

Of the recorded properties from the SCCIC records search, several properties appear to be individually eligible for listing in the NRHP, receiving a California Historical Resource Status Code 3S. These resources, as discussed below, would also be eligbile for listing in the CRHR and for local designation, if not already listed or designated:

- **Sam and Alfreda Maloof Compound.** The Sam and Alfreda Maloof Compound is located at 5131 Carnelian Street.
- **Demens-Tolstoy House.** The Demens-Tolstoy House is located at 9686 Hillside Road (Assessor's Parcel Number [APN] 106156104).
- **Cucamonga Rooming House.** The Cucamonga Rooming House is located at 9680 San Bernardino Road (APN: 20813109).
- **China House.** China House is located at 9591 San Bernardino Road (APN: 20815124).
- **Biane Winery.** Biane Winery is located at 9985 8th Street (APNs 20920119/20920120).
- **Kincaid Ranch.** Kincaid Ranch is located at 9449 9th Street (APN 0209-031-03)
- **W.J. Kincaid House.** W.J. Kincaid House is located at 7609 Turner Avenue (APN 1077-281-44)
- **Strane House.** Strane House is located at 7403 Archibald Avenue (APN 1077-011-43)
- **Old Stone Church.** Old Stone Church is lovated at 7656 Archibald Avenue (APN 0208-041-29)

Eligible for Inclusion in the California Register of Historical Resources

Based on the records search, there were several properties, including four that appear eligible for the NRHP, that appear indvidually eligible for listing in the CRHR, receiving a California Historical

Resource Status Code 3CS. The following 10 resources would be eligible for designation in the CRHR and as local landmarks.

- **Stone House.** Stone House is located at 10270 Church Street (APN 107727103).
- **Sanchez Home and Winery.** The Sanchez Home and Winery is located at 7402 Hermosa Avenue (APN 107703105).
- **Jones House.** The Jones House is located at 13232 Victoria Avenue (APN 22706171).
- **Mandala Winery.** The Mandala Winery is located at 10277 Foothill Boulevard (APN 20833123).
- **Sweeten Hall.** Sweeten Hall, which was formerly Cucamonga Public School, is located at 9324 San Bernardino Road (APN 20811109).
- **Scott House.** The Scott House is located at 8555 Grove Avenue (APN 20722203).
- **Stone House.** This property is located at 8619 Barker Avenue (APN 20713253).
- **Willows School.** Willows School is located at 8968 Archibald Avenue (APN 20917115).
- **Billings House.** This property is located at 7601 Archibald Avenue (APN 107732112).
- **Southern Pacific Overcrossing.** This overcrossing is located on Foothill Boulevard (APN 20710139).

Local Designation

There are also 110 properties that appear individually eligible for local designation, receiving a California Historical Resource Status Code of 5S3.

Historic Districts and Neighborhood Character Areas

A historic district is a definable unified geographic entity that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development. It can be distinguished from surrounding properties and presents the same constraints and opportunities as individually listed properties. Historic districts can be designated at the national, State, and local level.

A neighborhood character area (NCA), also commonly referred to as a conservation district, is a tool used to define a group of significant historic resources that do not retain adequate integrity to qualify as a historic district but still maintain important levels of cultural, historic, or architectural significance. The focus of a neighborhood character area is on maintaining basic community character of an area.

The neighborhoods of Alta Loma, Cucamonga, and Etiwanda are historic NCAs, as each have their own style of development. The City of Rancho Cucamonga recognizes the heritage and history of these communiinities, and strives to preserve, honor, and enhance them by encouraging the preservation and restoration of historical buildings and cultural resources. However, the City has faced the challenge of not only respecting the qualities of these communities, but achieving coherence and identity for the City as a whole. General design principles of the existing General Plan include incorporating theme and innovative designs in districts with a strong historical character, and to ensure that development reflects the commuity's aesthetic values while ensuring the incorporation of features that are compatible with existing buildings.

Moreover, historic landscaping and trees provide reminders of Rancho Cucamonga's agrarian past and highlight the importance of mature landscaping as a design component. Within Rancho Cucamonga, certain types of vegetation also provide a historic link to the City's agricultural past. Stands of eucalyptus tree windrows in Alta Loma and Etiwanda were planted in the late 1800s to protect crops from severe winds. Remaining vineyards and citrus trees enhance the historic rural atmosphere of the City, and are scenic and historical assets.

Alta Loma

The Alta Loma area encompasses roughly one-quarter of Rancho Cucamonga and is bordered by the City boundary to the north and west, Deer Creek to the east, and Base Line Road to the south. This area is characterized by stable neighborhoods, established single-family homes situated on larger one-half acre equestrian oriented lots in the northern portion and one-quarter acre lots to the south. The neighborhood contains a variety of multi-family housing complexes that are situated along the major boulevards in the southern portion.

Cucamonga

The Cucamonga area encompasses roughly one-quarter of Rancho Cucamonga and is bordered by Base Line Road to the north, Deer Creek Channel to the east, and the City boundary to the west and south. This area contains a stable mix of single-family and multi-family housing. This area also contains the Red Hill area distinguished by hillside terrain, a non-traditional street layout, a wide mix of lot sizes, and is anchored by the Red Hill Country Club.

Etiwanda

The Etiwanda area is located along the eastern portion of Rancho Cucamonga and is bordered by the City boundary to the north and east, Day Creek Channel to the west, and Foothill Boulevard to the south. The Etiwanda Specific Plan was developed to retain the rural character of the area and equestrian oriented residential development. The area is characterized by stable residential neighborhoods surrounded by Eucalyptus windrows reminiscent of the agricultural heritage of the area. Residential uses include a mix of one acre, one-half acre, and one-quarter acre residential lots, with the larger lots suitable for equestrian uses.

Latino community of North Town

The Latino community of North Town area is located in the southern portion of Rancho Cucamonga and surrounds Eighth Street and the Burlington Northern Santa Fe Railway. The North Town area is bordered by Ninth Street to the north, Haven Avenue to the east, Hellman Avenue to thewest, and Seventh Strreet to the south. The Latino community of North Town specifically includes properties located between Hermosa Avenue to the west, Marine Avenue to the east, and the Deer Creek Channel runs through the nieghborhood. The neighborhood contains contains single-family housing, a modern suburban street layout, and standard lot sizes. Secondo Guasti purchased eight square miles of land in the Cucamango Valley in the early 1900s and founded the Italian Vineyard Company. Many of the laborers of Guasti's vineyard lived in the town north of it and the area was known as North Cocamonga or Northtown. This neighborhood however is located in southern Rancho Cucamonga and is anchored by the Northtown Community Center. This neighborhood dates back to the 1900s.

Red Hill

This area is contained within the Cucamonga area and is distinguished by hillside terrain, a non-traditional street layout, a wide mix of lot sizes, and is anchored by the Red Hill Country Club. This area more specially includes the historic residential neighborhood located on Red Hill. These residences were constructed beginning in the late 1930s and are located northeast of the Red Hill Country Club and Golf Course.

Bear Gulch area of Foothill Blvd/Route 66

The Bear Gulch area is located in the western portion of Rancho Cucamonga and is located at the base of the Red Hill area. The Bear Gulch area is bordered by the City boundary to the west and the Cucamonga Creek Channel to the east. This area contains commerical properties located on either side of Foothill Blvd/Route 66 and is anchored by Sycamore Inn. The Sycamore Inn overlooks the historic Route 66 which was previously the Sante Fe Trail. This area contained groves of Cottonwoods, Williows, Sycamores, and natural drainages. The area was named the Arroyo Los Oso by the Spaniards which was translated to Bear Gulch from the California bears that meandered the creeks.

Cucamonga Vineyard Tract Subdivision B, Tract No. 5576

The Cucamonga Vineyard Tract Subdivision B, Tract No. 5576 area includes Hellman Avenue, San Bernardino Road, Harvard Street, Montara Avenue, and Selma Avenue. This area contains post-war tract housing. This area is located one block north of Route 66 and contains single-family housing, a modern suburban street layout, and standard lot sizes.

Tract Nos. 5591, 5593, and 8892

The Tract Nos. 5591, 5593, and 8892 areas include Effen Street, Dorset Street, Stafford Street, Hermosa Avenue, Center Avenue, Ashford Street, Norwick Street, and Kinlock Avenue. This area contains post-war tract housing. This area is located north of Route 66 and south of Church Street. This area contains single-family housing, a traditional street layout, and standard lot sizes.

General Plan Update

As it has been approximately 10 years since the preparation of the 2010 General Plan EIR, additional buildings in the City would have reached the 50-year mark, thereby increasing the number of potentially eligible historic resources in the City. As seen in Figure 2, *Building Age – Pre-*1970, and Figure 3, *Building Age –*1970-2019, there are core areas where there may be more potential for historic structures. In addition to the individual structures the neighborhoods may also have historic characteristics that could be affected by future development.

In addition, the existing General Plan did not include consideration of tribal cultural resources and archaeological sites. Through the update of the General Plan, there exists an opportunity to re-evaluate and refine the General Plan goals and policies. Such updates may take the following forms.

- **Goal LU-10: Encourage sustainable landscaping and streetscape design.**
    - **Policy LU-10.7**: Seek oppoprtunities to incorporate traditional native plants into sustainable landscaping.
- **Goal LU-25: Preserve and manage tribal cultural resources.**
    - **Policy LU-25.1:** Seek opportunities, through meaningful tribal consultation with Native American communities, to develop educational programs for residents regarding the local history of the area prior to European contact.

Figure 2. Building Age – Pre 1970

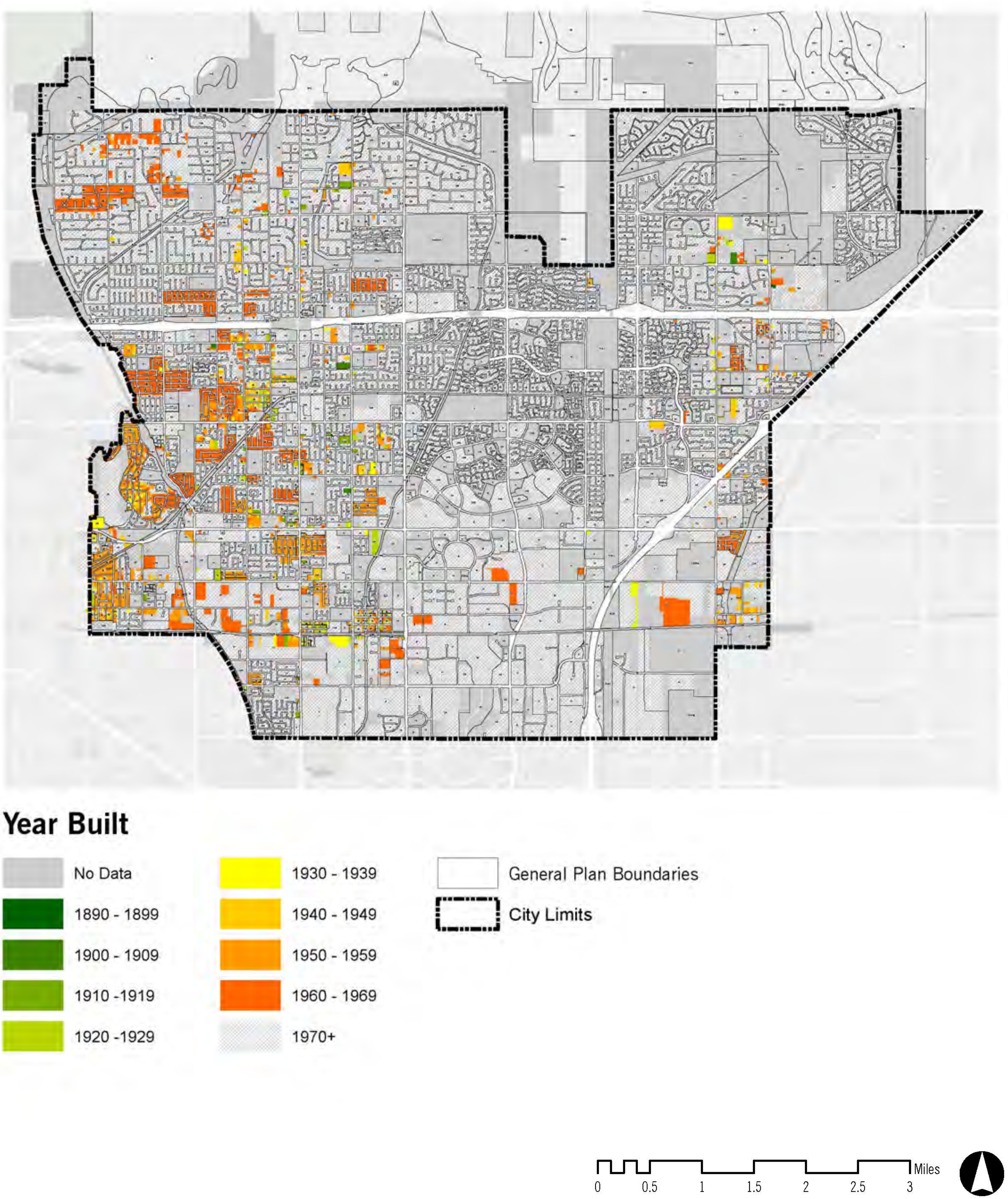
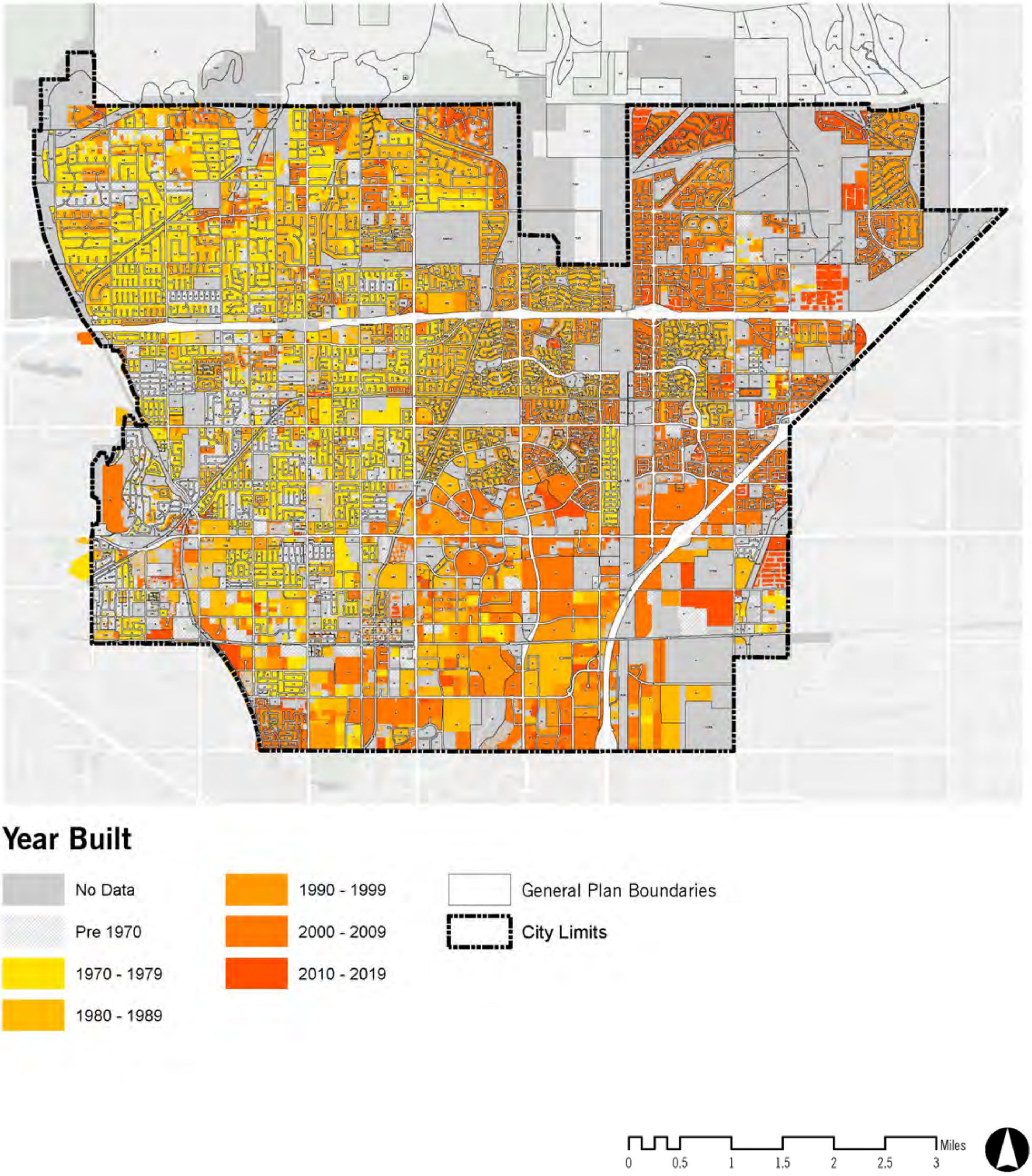


Figure 3. Building Age –1970-2019



Economic Profile and Market Conditions

Existing Conditions Report

May 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Summary

This chapter provides an overview of economic and market conditions for the City of Rancho Cucamonga. It reviews the city's population and demographic trends, employment and workforce characteristics, and local housing market trends. The city's market performance and economic characteristics are compared to the Inland Empire region (defined in this report as the combined San Bernardino and Riverside Counties). The findings will form the basis for the commercial and residential market analysis in the Citywide Visioning phase of the Rancho Cucamonga General Plan update.

Impact of COVID-19

The analyses in this report were conducted prior to, and during the initial stages of, the COVID-19 global pandemic. At the time of writing, California, like many states, is taking steps to slow the spread of the coronavirus and has issued a shelter-in-place order, interrupting a wide range of economic activity. While it is too early to bring many specific conclusions about the pandemic to bear on the General Plan, or on any long-term planning effort, COVID-19 will no doubt have profound short- and long-term effects on the region's economy. These impacts will include job losses and an overall economic retraction in the very near term, as well as potentially lasting shifts in the labor market, new business investment, and commute patterns. While the available data and, thus, the key findings in this report reflect mainly pre-pandemic conditions, some of the likely impacts of the pandemic are noted where appropriate.

Key Findings

- Since the Great Recession, population growth of both Rancho Cucamonga and the Inland Empire region has slowed to a modest rate of one percent per year.
- Despite a relative balance between the number of jobs and the number of employed residents pre-pandemic, there is a mismatch between the types of jobs available in Rancho Cucamonga and residents' skills. Rancho Cucamonga has a highly skilled resident workforce with higher educational attainment than the region as a whole.
- Due to the mismatch in local jobs and the skill levels of residents, 85% of Rancho Cucamonga residents commute to other locations for work, and only 15% of residents work in Rancho Cucamonga. The shelter-in-place measures in response to the COVID-19 pandemic have resulted in a steep drop in commute volumes, especially for office workers. It is not yet clear if this is a temporary situation, or a more lasting shift to remote working and telecommuting.
- Providing more workforce housing options in Rancho Cucamonga would help reduce the amount of in-commuting required from other lower cost cities.
- Largely due to its good access to transportation facilities and ports of entry, Rancho Cucamonga is a very competitive location for manufacturing and logistics industries.
- Employment in logistics is expected to continue growing nationally and in the region. While manufacturing output remains strong, the number of jobs in manufacturing industries are not forecast to grow. However, both logistics and manufacturing industries can spin-off jobs in other supporting industries, including technology and business services.
- Rancho Cucamonga has a diverse economic base that also includes knowledge-based firms, lodging near the Ontario airport, and several corridors of retail businesses.
- Accommodations and retail have been severely affected by the shelter-in-place measures in response to the COVID-19 pandemic. It is unknown what the duration of the impacts will be, but it is likely that traditional brick-and-mortar retail and the hospitality industry will take longer to recover than other sectors.
- In addition to logistics, regional economic forecasts show potential for growth in a variety of sectors, including health care and knowledge-based industries, which have higher average wages. However, the COVID-19 pandemic may impede new investment and job growth in the short term.
- Like in most of California, housing costs (particularly for owner-occupied homes) have escalated rapidly in recent years, while the rate of housing production has fallen.

List of relevant documents + regulations

- Economic Background Report (Strategic Economics, 2014)
- Economic Development Strategic Plan (Strategic Economics, 2015)
- Rancho Cucamonga General Plan and EIR (2010)

Population and Demographics

This section provides an overview of Rancho Cucamonga's population and demographic characteristics, highlighting key areas where Rancho Cucamonga's residents differ from the Inland Empire region as a whole.

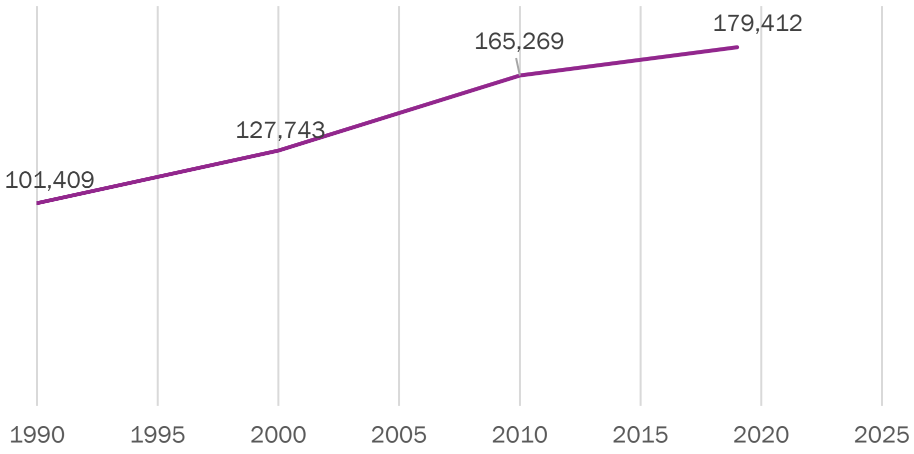
Introduction

Rancho Cucamonga's population growth and some key demographic indicators are described in this section, including a comparison to the Inland Empire region (defined in this report as the combination of San Bernardino and Riverside Counties). The first subsection examines population growth trends for Rancho Cucamonga and the Inland Empire, while the second subsection profiles basic demographic characteristics such as household size and composition, race and ethnicity, age distribution, educational attainment, and household income.

Population

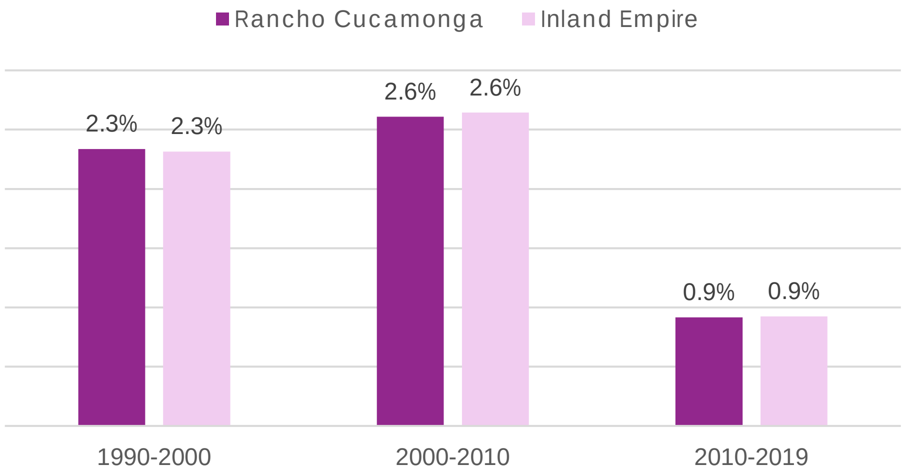
- **Rancho Cucamonga and the Inland Empire as a whole grew rapidly in the 1990s and 2000s, but growth has slowed as the city recovered from the Great Recession and approaches buildout.** The 1990s and 2000s saw a boom of single-family residential development in Rancho Cucamonga and in the Inland Empire generally, with the number of residents in both the city and the region growing at more than two percent annually (Figures 1 and 2). After the Great Recession, population growth has slowed to 0.9 percent per year during the 2010s.
- **As Rancho Cucamonga meets State mandates for housing production over the next decade, the city's population may expand by one to two percent per year**. The Regional Housing Needs Assessment (RHNA) process required by California law is expected to allocate 10,500 units to Rancho Cucamonga over an eight-year period beginning in 2021. As shown in Figure 3, nearly half this number is required to be affordable to low and very low income households. Meeting this mandate would translate to population growth of approximately 2000 to 4000 residents per year.

Figure 1. Population of Rancho Cucamonga, 1990 to 2019



Sources: U.S. Decennial Census, 1990-2010; California Department of Finance, 2019; Strategic Economics, 2020.

Figure 2. Average Annual Population Growth, Rancho Cucamonga and Inland Empire, 1990 to 2019



Sources: U.S. Decennial Census, 1990-2010; California Department of Finance, 2019-2030; Strategic Economics, 2020.

Figure 3. Regional Housing Needs Allocation by Income Category, Rancho Cucamonga, 2021-2028

	Units	Share
Very low income	3,236	31%
Low income	1,916	18%
Moderate income	2,033	19%
Above moderate income	3,315	32%
Total Units	**10,500**	**100%**

Sources: Southern California Association of Governments RHNA Estimate as of March 2020; Strategic Economics, 2020.

Demographics

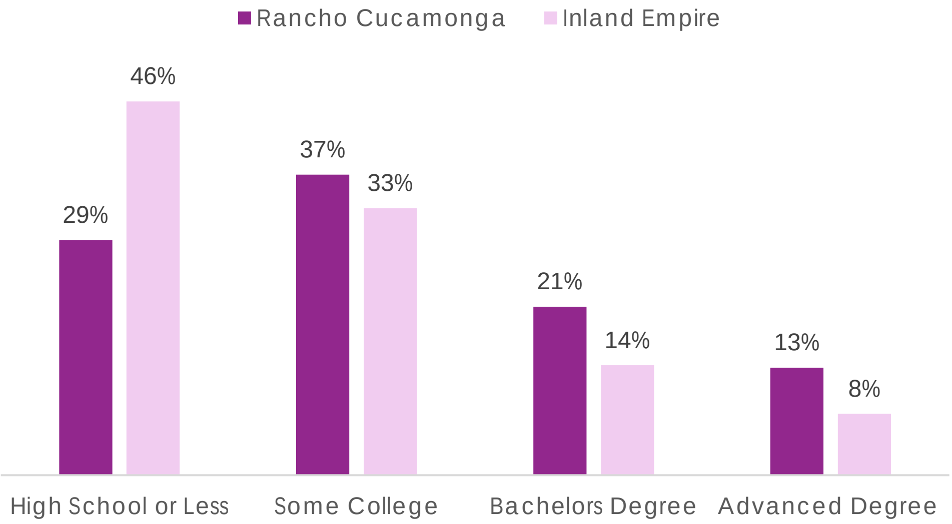
- **Rancho Cucamonga, like most surrounding communities, is predominantly a family community.** In both Rancho Cucamonga and the Inland Empire, about three quarters of households are families, shown in Figure 4**.** At 3.1 persons per household, the average household size in Rancho Cucamonga is higher than the national average (2.6), but slightly lower than the average household size in the Inland Empire (3.3). Both Rancho Cucamonga and the wider region have a similar mix of age groups (Figure 7).
- **Rancho Cucamonga's residents have higher levels of educational attainment and higher incomes compared to the Inland Empire.** One third of Rancho Cucamonga residents have Bachelor's degrees or above, as compared with only 22 percent in the Inland Empire (Figure 5). The City's more highly educated workforce enjoys overall higher incomes than many surrounding communities, with a median household income approximately $24,000 higher per year than the median for the Inland Empire (Figure 6).
- **Rancho Cucamonga is an ethnically diverse community, but with a somewhat smaller share of Hispanic or Latino residents than the surrounding region.** Hispanic or Latino residents still make up the largest ethnic group (38 percent versus 51 percent for the region), followed by non-Hispanic White, Asian, and Black residents (Figure 7).

Figure 4. Average Household Size and Household Types in Rancho Cucamonga and the Inland Empire, 2014-2018

	Rancho Cucamonga		Inland Empire	
	Number	Share	Number	Share
Average Household Size	**3.1**		**3.3**	
Household Type				
Families w/ children	21,719	39%	539,005	40%
Families w/o children	21,124	38%	466,618	35%
Householder living alone	10,383	19%	274,107	20%
Other non-family household	2,724	5%	69,252	5%
Total Households	**55,950**	**100%**	**1,348,982**	**100%**

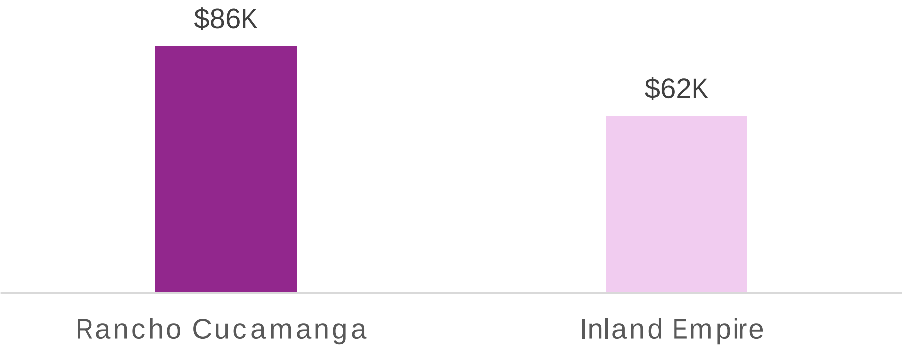
Sources: American Community Survey, 2014-2018; Strategic Economics, 2020.

Figure 5. Educational Attainment for Population over 25 Years of Age in Rancho Cucamonga and the Inland Empire, 2014-2018



Sources: U.S. Census American Community Survey, 2014-2018; Strategic Economics, 2020.

Figure 6. Median Household Income in Rancho Cucamonga and the Inland Empire, 2014-2018



Sources: U.S. Census American Community Survey, 2014-2018; Strategic Economics, 2020.

Figure 7. Race/Ethnicity and Age in Rancho Cucamonga and Inland Empire, 2014-2018

	Rancho Cucamonga		Inland Empire	
	Number	Share	Number	Share
Race and Ethnicity				
White, non-Hispanic	64,732	37%	1,479,730	33%
Black or African-American, non-Hispanic	15,621	9%	313,367	7%
Asian or Pacific Islander, non-Hispanic	22,527	13%	305,241	7%
Hispanic or Latino	66,540	38%	2,282,330	51%
All Other Races, non-Hispanic	6,259	4%	138,031	3%
Total		**100%**		**100%**
Age				
Under 18	41,961	24%	1,186,660	26%
18 to 24	17,185	10%	470,058	10%
25 to 44	49,542	28%	1,225,673	27%
45 to 64	47,577	27%	1,074,356	24%
65 and over	19,414	11%	561,952	12%
Total		**100%**		**100%**

Sources: American Community Survey, 2014-2018; Strategic Economics, 2020.

Workforce and Employment

This section gives an overview of Rancho Cucamonga's resident workforce and employment within the city, including a discussion of commute patterns, the match between jobs and residents' skills and major industry sectors where Rancho Cucamonga is competitive.

Introduction

This section analyzes the employment patterns of both the residents who live in Rancho Cucamonga and the jobs located within the city. Commute patterns, both inbound and outbound, are illustrated, with particular attention to the match between residents' jobs and skill-levels and the job opportunities currently found in Rancho Cucamonga. This is followed by an analysis of the city's industry sectors, current trends in regional employment, and potential areas of growth and transition for the city's economy. These trends will lay the groundwork for the land use strategy and visioning in the General Plan.

Where appropriate, the potential impacts of COVID-19 are discussed, although the long-term effects of the pandemic on Rancho Cucamonga's workforce and employment remain unclear.

Workforce and Employment Overview

- **Prior to the COVID-19 pandemic, Rancho Cucamonga had approximately 82,000 jobs.** There were approximately 76,000 employed residents in Rancho Cucamonga, for a ratio of 1.08 jobs per employed resident (Figure 8).
- **In 2016, the California Employment Development Department (EDD) was projecting significant regional employment increases in the coming years (including in logistics, health care, hospitality, construction, and knowledge-based employment), suggesting that Rancho Cucamonga is well positioned to continue growing.** EDD has projected 228,000 new jobs in the Inland Empire between 2016 and 2026, which would represent a 16 percent increase in regional employment during the ten-year period.
- **However, the COVID-19 pandemic has already resulted in job losses and will alter the economic outlook globally and locally.** While most of the current wave of unemployment claims have yet to be officially reported as of this writing, the unemployment rate in the Inland Empire is expected to reach more than 30 percent in May 2020.[1] The most vulnerable industries are expected to be leisure and hospitality, retail trade, and certain services such as childcare and personal services.[2] It is still too early to predict the pace or extent of recovery from these losses.

Commute Patterns and Jobs-Skills Match

- **While there is an overall balance between the number of jobs and resident workers in Rancho Cucamonga, only fifteen percent of resident workers actually work within the city.** Prior to the shelter-in-place measures, the remaining 85 percent of resident workers commutes to nearby communities or to employment centers in Downtown Los Angeles, San Bernardino, or Orange County (Figure 9).

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[1] "Employment Impact of COVID-19: Southern California," Los Angeles Economic Development Corporation Institute for Applied Economics, April 21, 2020.
[2] "COVID-19: Economic & Fiscal Vulnerabilities and Impacts," Economic & Planning Systems, Inc., April 30, 2020.

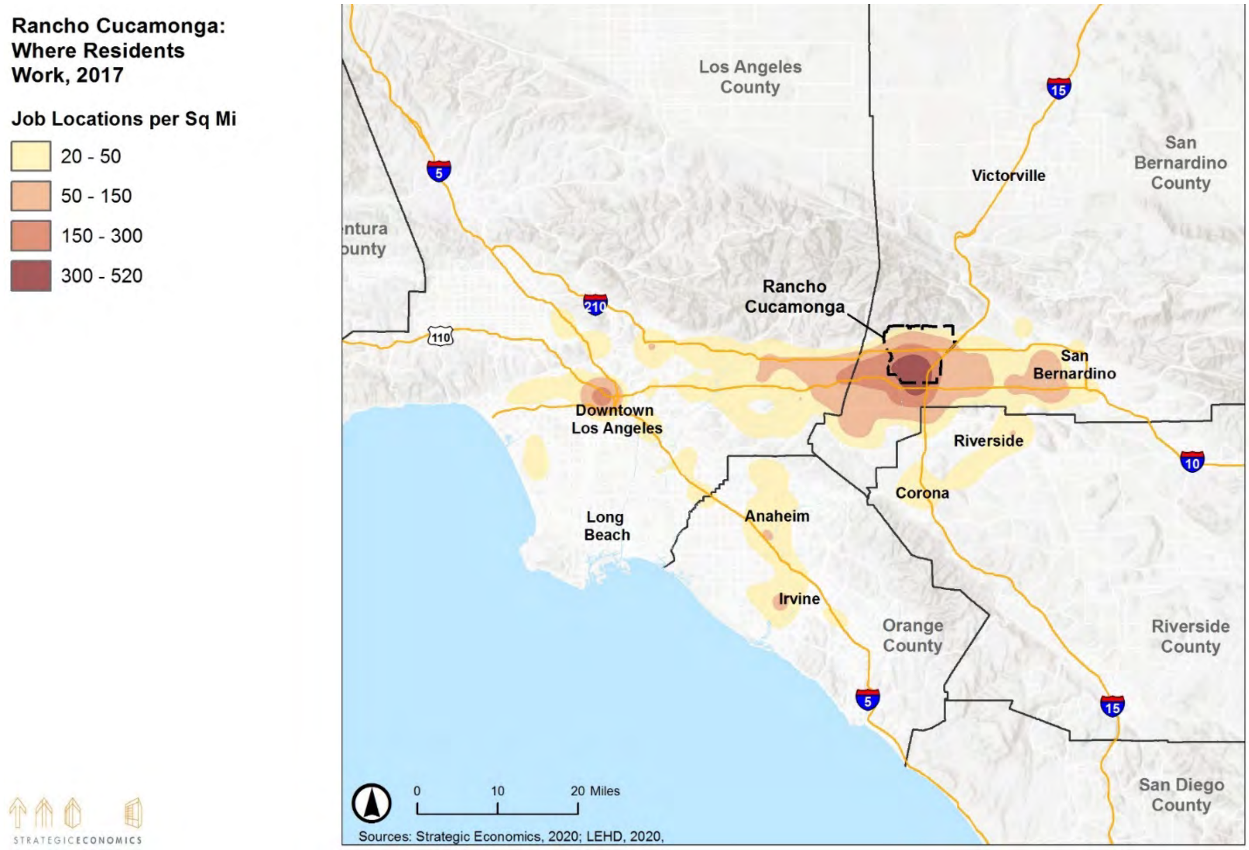
- **Workers employed in Rancho Cucamonga commute into the city from a variety of locations, including nearby cities, Los Angeles, Orange County, and even the Victor Valley (Figure 10).** The city's freeway access and Metrolink station facilitate connections with the broader region, largely from areas to the east and north with lower housing costs. According to stakeholder interviews, the lengthy commutes from the east and northern regions is partially a result of the cost of housing in Rancho Cucamonga compared to those locations.
- **COVID-19 is expected to significantly reduce both inbound and outbound commuting for the foreseeable future.** Recent layoffs and furloughs, as well as employed people newly working from home, have drastically curtailed commute volumes in and out of Rancho Cucamonga. Even as the local economy recovers and begins to restore and add jobs, some of this reduction in commuting may last over the medium- to long-term as social distancing measures continue and remote working, shopping, and business transactions are increasingly normalized.
- **The skill levels required for jobs that are currently in Rancho Cucamonga are not well-balanced with the educational attainment levels of Rancho Cucamonga residents.** Strategic Economics estimated the educational requirements for the industry sectors located in Rancho Cucamonga based on data from the Bureau of Labor Statistics. A comparison between these estimates and the education levels of resident workers in Rancho Cucamonga is shown in Figure 11. Employers in Rancho Cucamonga employ relatively few city residents because overall, most of the jobs associated with the major industry sectors within the city do not require a degree beyond high school. While an estimated 69 percent of jobs require a high school degree or less, most of the workers in Rancho Cucamonga have at least some postsecondary education, with one-third having a bachelor's degree or higher.
- **There is also a mismatch between jobs and residents at the industry level**. As shown in Figure 12, the production, distribution, and repair and dining, accommodations, and entertainment sectors combined have 35,800 jobs, but only about 26,600 of Rancho Cucamonga's residents work in these sectors. Meanwhile, more of Rancho Cucamonga residents work in health, social services, and education fields than is represented in the city's employment base. (See the next section for further analysis of the city's industry sectors.)

Figure 8. Rancho Cucamonga Employment Overview, 2017 (Pre-COVID-19)

Jobs Located in Rancho Cucamonga	**81,718**
Employed Residents in Rancho Cucamonga	**75,951**
Jobs / Employed Resident	**1.08**
Share of Residents Also Working in Rancho Cucamonga	**15%**

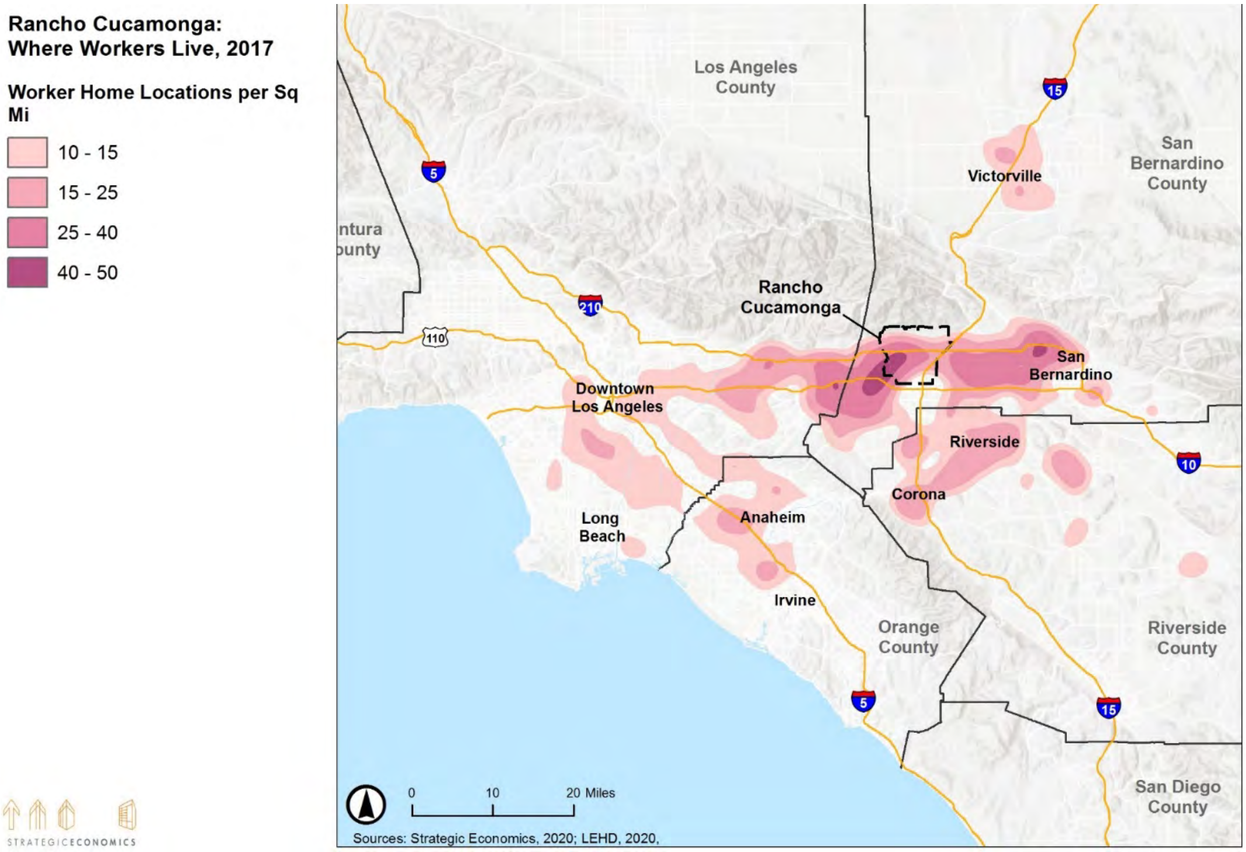
Sources: US Census Longitudinal Employer-Household Dynamics, 2017; Strategic Economics, 2020.

Figure 9. Outbound Commutes: Where Rancho Cucamonga Residents Work, 2017



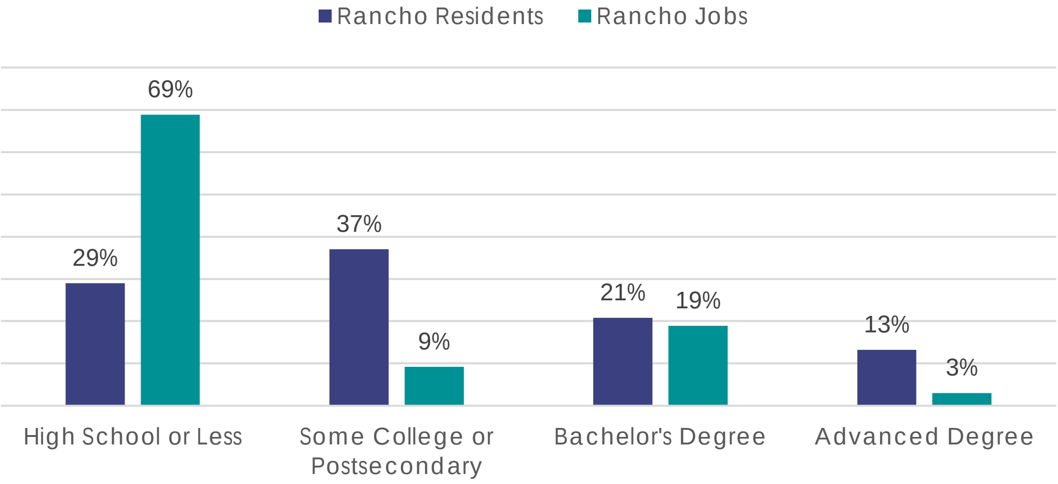
Sources: US Census Longitudinal Employer-Household Dynamics, 2017; Strategic Economics, 2020.

Figure 10: Inbound Commutes: Where Rancho Cucamonga Workers Live, 2017



Sources: US Census Longitudinal Employer-Household Dynamics, 2017; Strategic Economics, 2020.

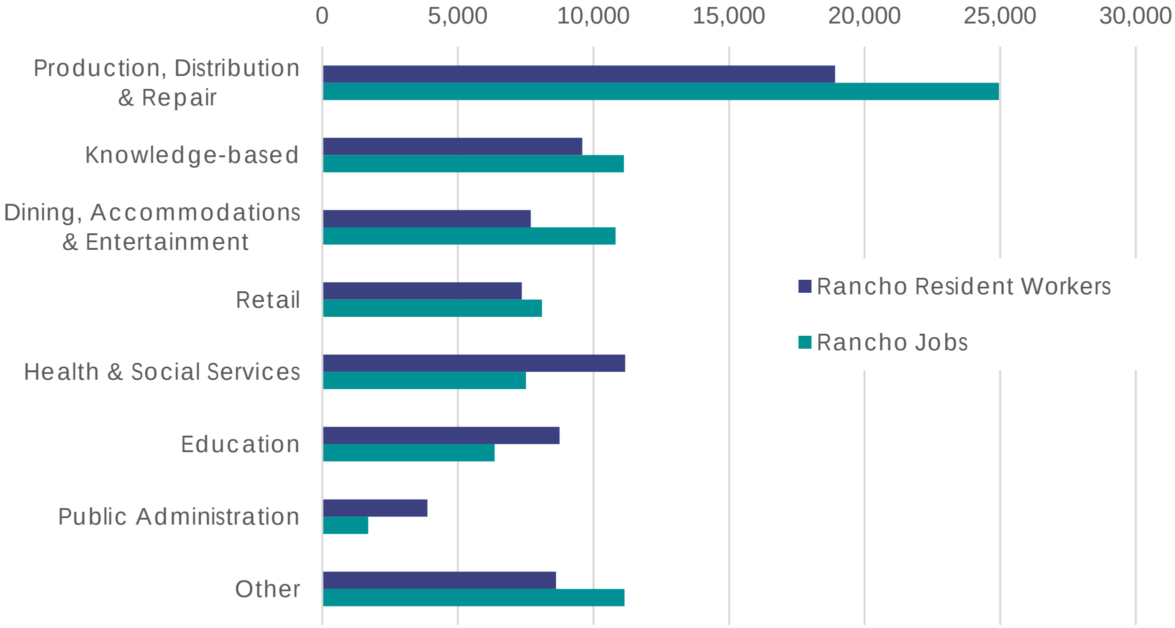
Figure 11. Educational Attainment of Rancho Residents and the Minimum Educational Requirements of Rancho Jobs, 2017



Rancho Residents shown are for ages 25 and older.

Sources: American Community Survey, 2014-2018; Longitudinal Employment Household Dynamics, 2017; U.S. Bureau of Labor Statistics, 2018; Strategic Economics, 2020.

Figure 12. Industries for Rancho Cucamonga Resident Workers Compared with Rancho Cucamonga Jobs, 2017



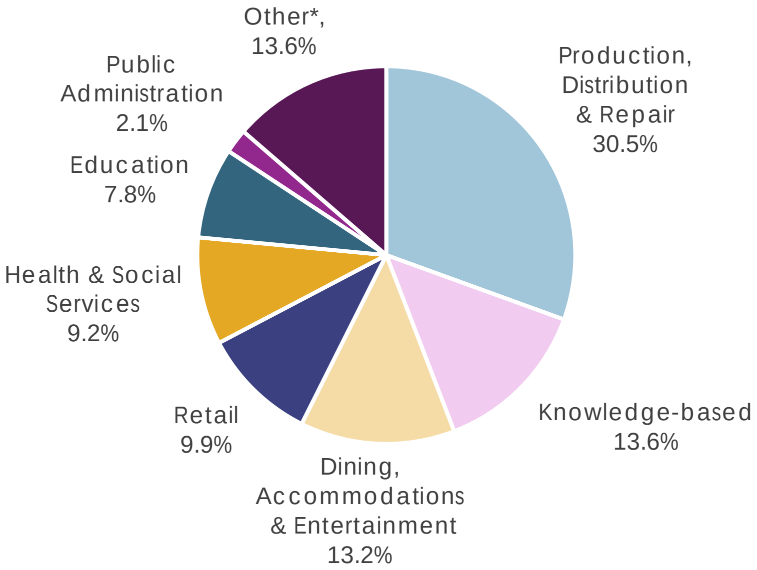
The "Other" industry category includes Administration & Support; Waste Management & Remediation; Other Services; Utilities; and Agriculture, Forestry, Fishing & Hunting.

Sources: US Census Longitudinal Employer-Household Dynamics, 2017; Strategic Economics, 2020.

Industry Employment Sectors

- **Manufacturing has been an important part of Rancho Cucamonga's employment base, but there is limited growth potential for traditional manufacturing jobs.** Like the Inland Empire as a whole, Rancho Cucamonga historically has had a strong economic base in manufacturing. Currently about 12 percent of all jobs are in the manufacturing sector, shown in Figure 14. However, national trends are forecasting low employment growth in manufacturing due to a higher degree of automation and global competition. Locally, the number of manufacturing firms in Rancho Cucamonga has dropped from 239 in 2011 to 230 in 2017, according to estimates from County Business Patterns (Figure 15).
- **Rancho Cucamonga is a competitive location for the wholesale trade and logistics industries.** In addition to good freeway connectivity, Rancho Cucamonga has good access to the Ontario Airport, BNSF rail lines, and the Port of Los Angeles. These transportation facilities are all keys assets for the logistics industry, which includes transportation and warehousing businesses. Currently wholesale trade and logistics jobs account for about 11 percent of total citywide employment (Figure 14).
- **Helping to diversify the city's employment base, other significant industry sectors include knowledge-based industries, dining, accommodations, and retail.** Although it is not a major office center, 14 percent of employment in Rancho Cucamonga is in knowledge-based industries. Prior to COVID-19, there was significant hotel employment due to the proximity of nearby Ontario International Airport, as well as approximately 10 percent of jobs in retail, spread among the city's several retail clusters (Figure 14).
- **Demand for dining, accommodations, and brick-and-mortar retail have been drastically reduced by shelter-in-place measures, and these industries are unlikely to be completely restored to their pre-pandemic operations.** While the longer-term future of these industries is still unclear, social distancing measures will continue to reduce travel and accommodations demand in the near-term. The freeze on many brick-and-mortar sales may accelerate a preexisting trend toward e-commerce sales.
- **While the employment growth estimates from 2011 to 2017 are not currently available, the number of firms in Rancho Cucamonga has grown by 21 percent during that period.** About half of new firms were in the production, distribution and repair (PDR) and knowledge-based sectors. Although the health care, education, and dining, accommodations, and entertainment sectors represent a smaller share of firms citywide, the rate of growth in the number of firms in those sectors was the strongest (Figure 15).
- **Rancho Cucamonga is well-positioned to capture employment growth in a variety of industries, building on its strengths in wholesale trade, logistics, and accommodations, with potential growth in areas that generate higher-paying jobs, such as office-based and health care employment.** According to projections from the California Employment Development Department (Figure 16), logistics-related industries are anticipated to expand by over 60,000 jobs in the Inland Empire between 2016 and 2026. While most logistics businesses create mostly lower-skilled employment (and may require larger format buildings than can be accommodated in Rancho Cucamonga), new businesses and higher quality jobs can be created in industries that support logistics, such as information technology. Other industries with a strong regional economic outlook include education, health care, leisure and hospitality, construction, and professional and business services.
- **As many industries, including manufacturing and logistics, become more technologically advanced, they will spur growth in a variety of occupations, some of which will require more skilled labor.** Rancho Cucamonga can strengthen relationships with existing educational institutions, including the school districts and Chaffey College, as well as local employers, to prepare students and adults for a variety of jobs. These workforce development partnerships, along with other economic development efforts, can help to ensure that the next generation of Rancho Cucamonga's workforce can find job opportunities locally, rather than commuting to other job centers.

Figure 13. Employment in Rancho Cucamonga by Industry Category, 2017



**The "Other" industry category includes Administration & Support; Waste Management & Remediation; Other Services; Utilities; and Agriculture, Forestry, Fishing & Hunting.*

Sources: US Census Longitudinal Employer-Household Dynamics, 2017; Strategic Economics, 2020.

Figure 14. Employment in Rancho Cucamonga by Industry Category and Sector, 2017

Industry Sector	Numbers of Employees	Share of Employment
Production, Distribution & Repair	**24,958**	**30.5%**
Manufacturing	10,145	12.4%
Construction	5,954	7.3%
Transportation and Warehousing	4,481	5.5%
Wholesale Trade	4,378	5.4%
Knowledge-Based	**11,121**	**13.6%**
Finance and Insurance	5,213	6.4%
Professional, Scientific, and Technical Services	3,312	4.1%
Real Estate and Rental and Leasing	1,268	1.6%
Management of Companies and Enterprises	870	1.1%
Information	458	0.6%
Dining, Accommodations & Entertainment	**10,821**	**13.2%**
Accommodation and Food Services	10,135	12.4%
Arts, Entertainment, and Recreation	686	0.8%
Retail Trade	**8,098**	**9.9%**
Health Care and Social Assistance	**7,516**	**9.2%**
Educational Services	**6,359**	**7.8%**
Public Administration	**1,698**	**2.1%**
Other	**11,129**	**13.6%**
Administration & Support, Waste Management and Remediation	7,972	9.8%
Other Services (excluding Public Administration)	2,119	2.6%
Utilities	1,038	1.3%
Agriculture, Forestry, Fishing and Hunting	18	0.0%
Total	**81,718**	

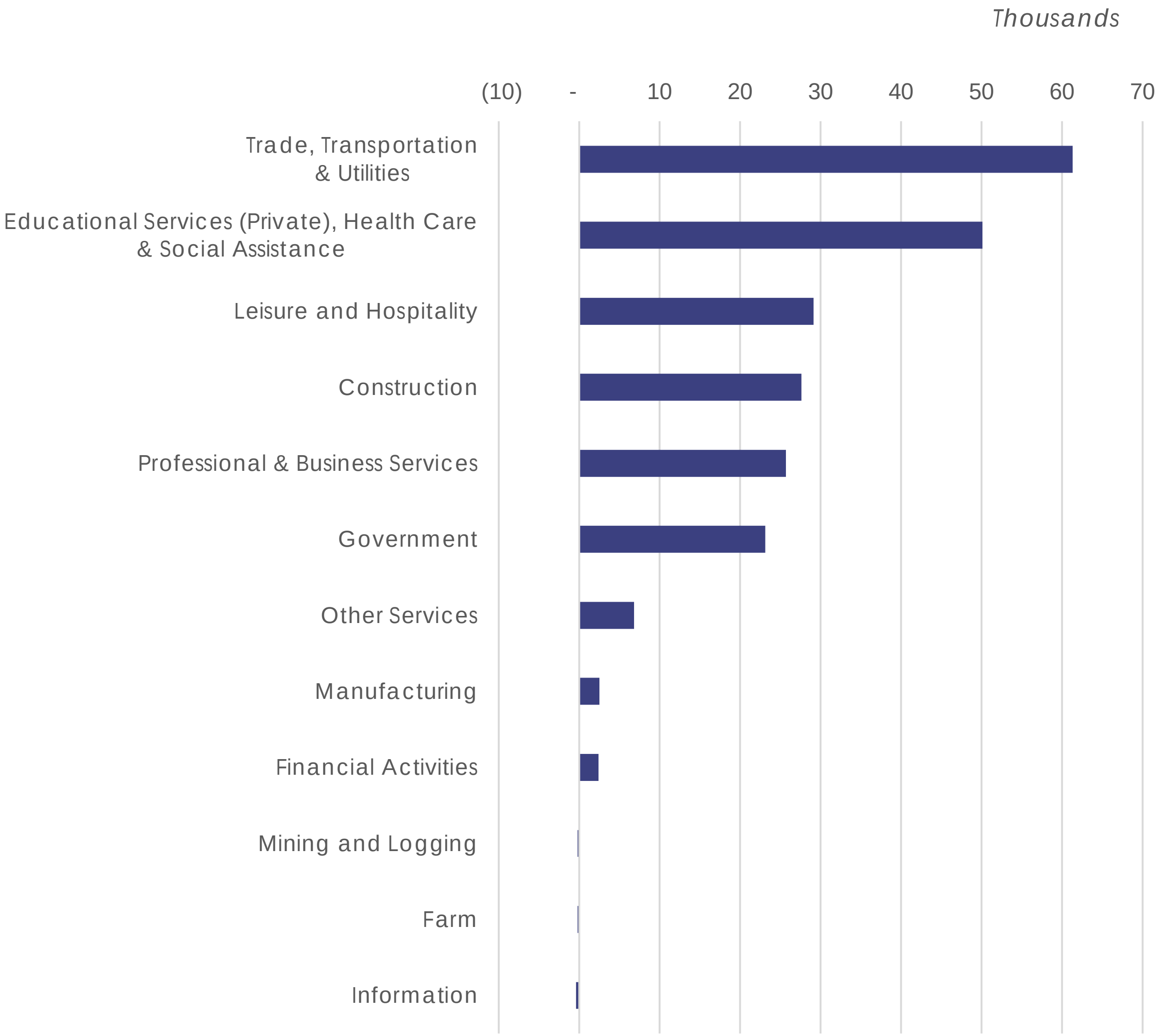
Sources: US Census Longitudinal Employer-Household Dynamics, 2017; Strategic Economics, 2020.

Figure 15. Number of Firms by Industry Sector in Rancho Cucamonga, 2011-2017

Industry Sector	2011	2017	Net Change, 2011-2017	Percent Change, 2011-2017
Production, Distribution, and Repair	**1,087**	**1,255**	**168**	**15%**
Manufacturing	239	230	-9	-4%
Construction	373	427	54	14%
Transportation and Warehousing	148	183	35	24%
Wholesale Trade	327	415	88	27%
Knowledge-Based	**838**	**1,057**	**219**	**26%**
Finance and Insurance	215	241	26	12%
Professional, Scientific & Technical	390	496	106	27%
Real Estate and Rental and Leasing	181	251	70	39%
Management of Companies and Enterprises	19	23	4	21%
Information	33	46	13	39%
Dining, Accommodations, & Entertainment	**344**	**450**	**106**	**31%**
Accommodation and Food Services	313	400	87	28%
Art, Entertainment, and Recreation	31	50	19	61%
Retail	**431**	**473**	**42**	**10%**
Health Care and Social Assistance	**390**	**537**	**147**	**38%**
Education Services	**43**	**57**	**14**	**33%**
Other	**484**	**559**	**75**	**15%**
Administration & Support, Waste Management and Remediation	208	208	0	0%
Other Services and Unclassified	270	343	78	29%
Agriculture, Mining, and Utilities	6	8	2	33%
Total	**3,617**	**4,388**	**771**	**21%**

Sources: County Business Patterns, 2011-2017; Strategic Economics, 2020.

Figure 16. Projected Change in Inland Empire Employment by Industry Category, 2016-2026



Sources: California Employment Development Department, 2016-2026; Strategic Economics, 2020.

Housing

This section reviews trends in production, market prices, and rents of Rancho Cucamonga's housing stock.

Introduction

This section gives a brief overview of the city's housing market. The first subsection reviews trends in housing costs for homeowners and renters. This is followed by a summary of recent trends in new housing development.

Homeownership and Rental Markets

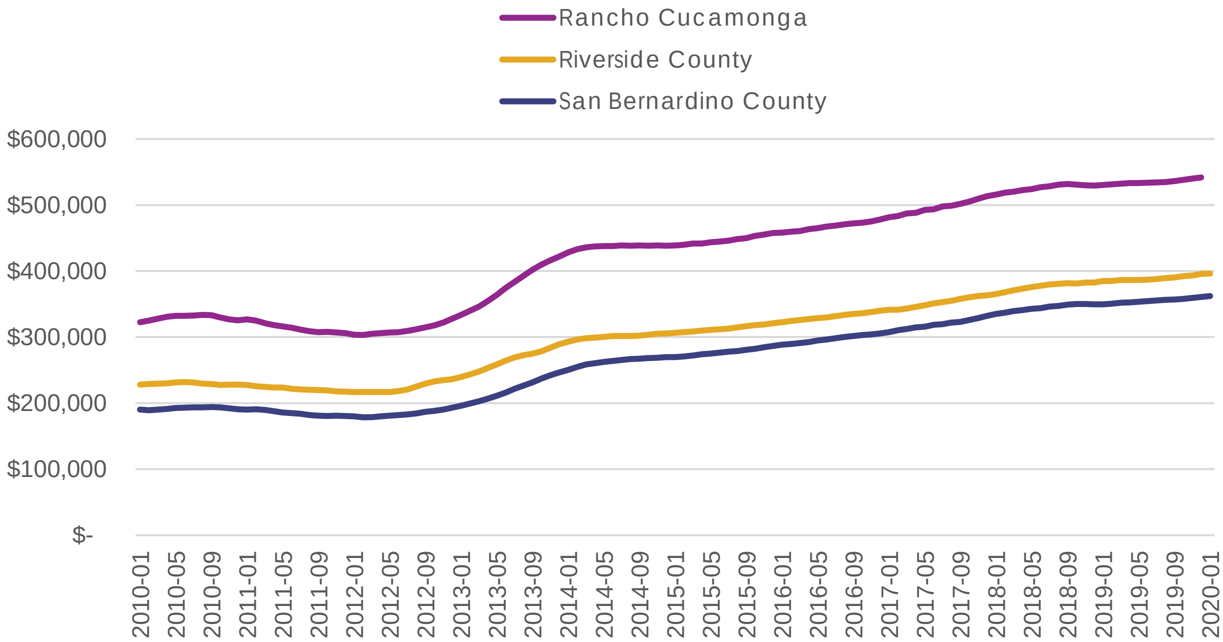
- **As with the Inland Empire, Rancho Cucamonga is predominantly a suburban-style community of single-family homeowners.** Some 62 percent of Rancho households are homeowners, compared with 63 percent in the region (Figure 17).
- **For-sale homes in Rancho Cucamonga are valued at a significant premium compared with many communities in the Inland Empire region, reflecting the city's reputation as a desirable place to live.** Rancho Cucamonga has historically had higher home prices than the region, shown in Figure 18. The median home value in Rancho is now $543,000, 30 percent higher than in Fontana to the east, but still five percent below Upland to the west (Figure 19). Home values specific to the condominium market are significantly lower but follow a similar pattern relative to neighboring communities. Residents and other local stakeholders have cited the city's high quality public schools, convenient location, attractive neighborhoods, shopping and dining amenities, and recreational opportunities as factors that contribute to the city's quality of life and strong housing market. While higher home values benefit existing property owners, higher home prices may also prevent the City's workforce from entering the local housing market.
- **Like most of California, home prices in Rancho Cucamonga and the Inland Empire generally have risen much faster than the rate of inflation.** Over the last ten years, home sales prices in Rancho Cucamonga grew at an average annual rate of 5.3 percent. Starting from a lower base, home values in Riverside and San Bernardino counties grew at an even faster rate, at 5.7 and 6.7 percent annually (Figure 18).
- **Apartment rents are higher in Rancho Cucamonga than in the rest of the Inland Empire.** Rancho's average rental rate is currently $2.06 per square foot, compared to $1.61 per square foot in the Inland Empire region. An average 1,000-square-foot apartment currently has effective rents of $2,000 per month, or 28 percent higher than the average for the Inland Empire. Rental rates per square foot in Rancho rose 3.8 percent per year over the last ten years, slightly slower than the escalation in home prices during the same period (Figure 20).
- **Apartment vacancy rates are low regionwide.** According to Costar, overall vacancy is four percent in Rancho Cucamonga and five percent in the Inland Empire as a whole.

Figure 17. Housing Tenure for Occupied Housing Units in Rancho Cucamonga and the Inland Empire, 2018

	Rancho Cucamonga		Inland Empire	
	Count	Share	Count	Share
Owner Occupied	34,410	62%	846,141	63%
Renter Occupied	21,540	38%	502,841	37%
Total Occupied Housing Units	**55,950**	**100%**	**1,348,982**	**100%**

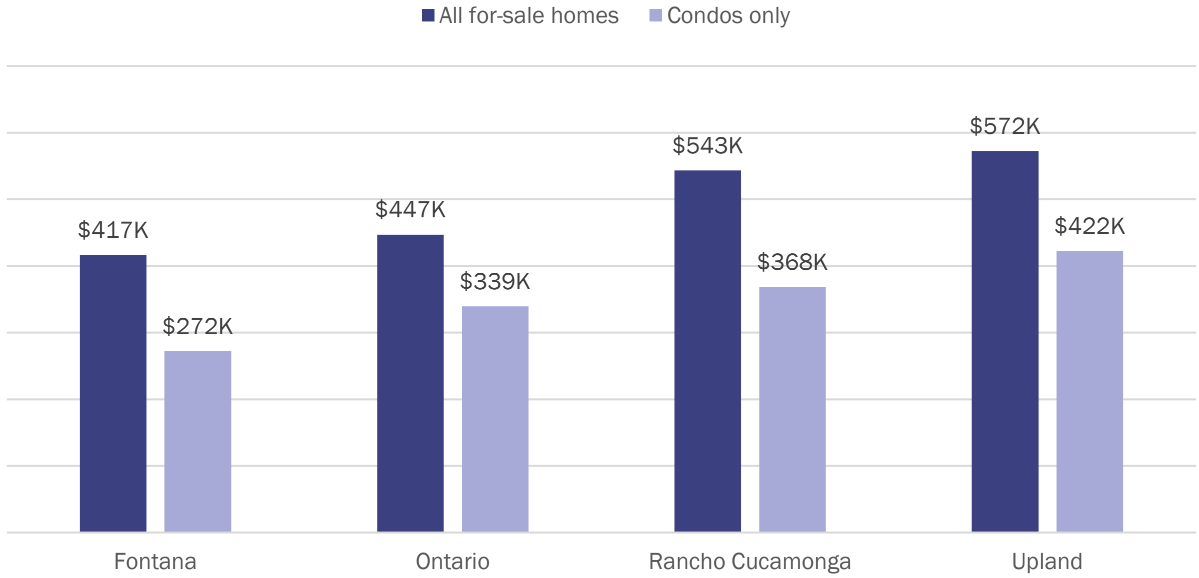
Sources: American Community Survey, 2014-2018; Strategic Economics, 2020.

Figure 18. Zillow Home Value Index for Rancho Cucamonga, San Bernardino County, and Riverside County, 2010-2020



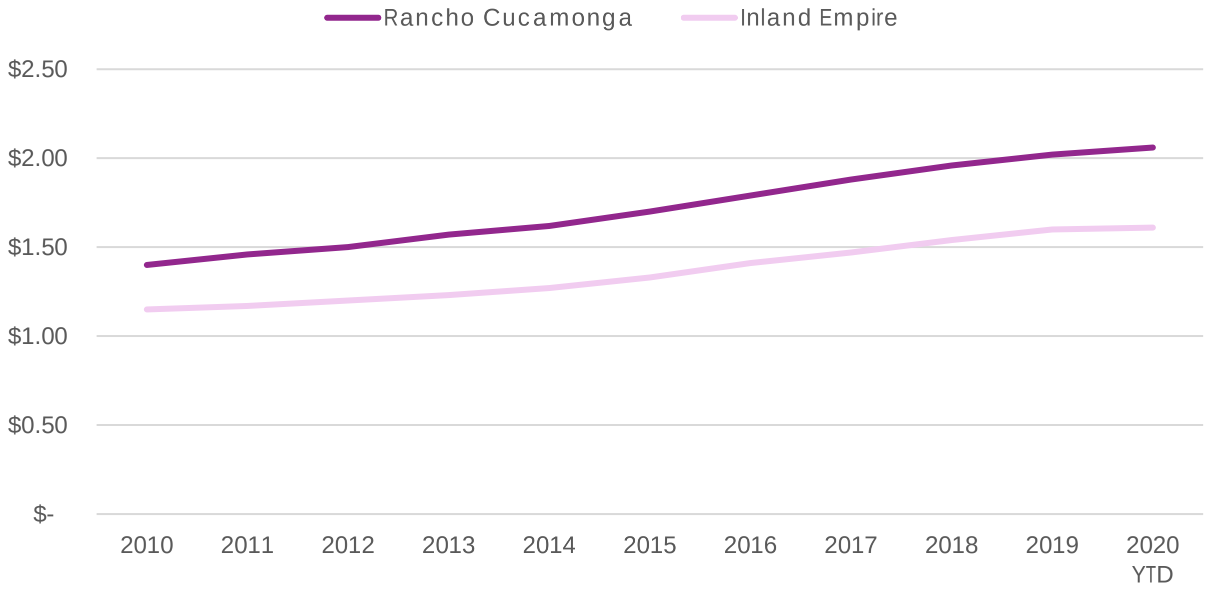
Sources: Zillow Home Value Index, 2010-2020; Strategic Economics, 2020.

Figure 19. Zillow Home Value Index for Rancho Cucamonga, San Bernardino County, and Riverside County, 2010-2020



Sources: Zillow Home Value Index, January 2020; Strategic Economics, 2020.

Figure 20. Average Asking Rent per Square Foot for Multifamily Apartment Buildings in Rancho Cucamonga and the Inland Empire, 2010-2020

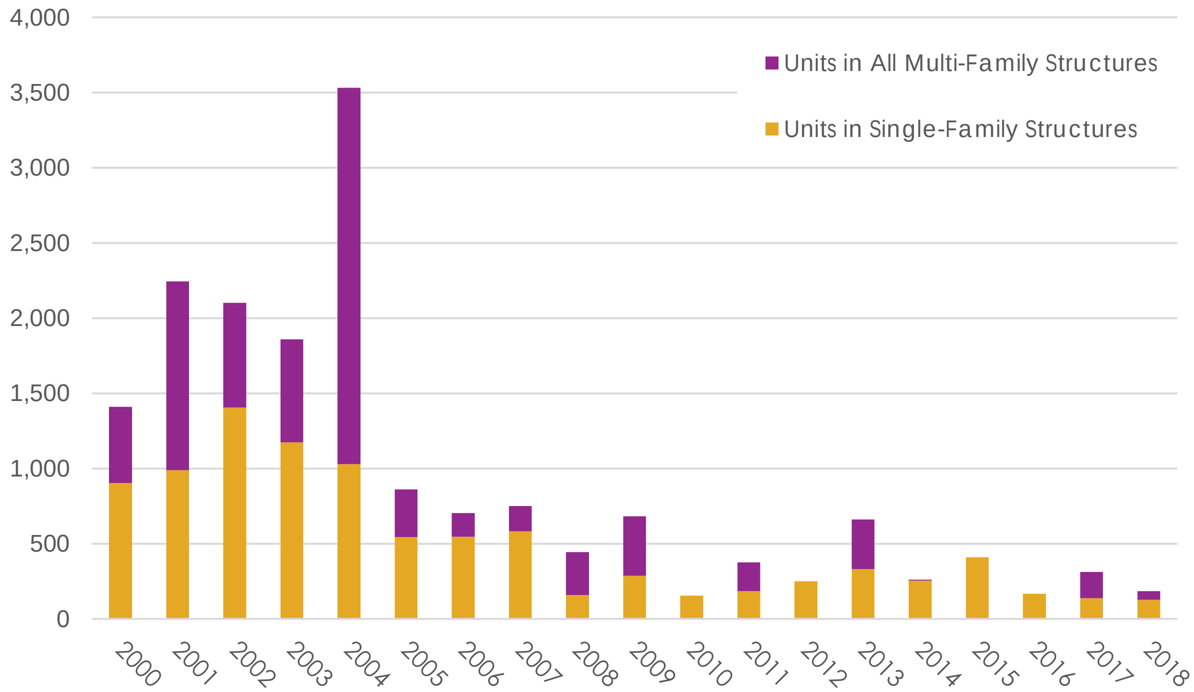


Sources: Costar, 2010-2020; Strategic Economics, 2020.

Development Trends

- **Housing permits in Rancho slowed significantly prior to the Great Recession and have never returned to pre-Recession levels as the city approaches buildout**. Issuance of building permits for both single-family and multi-family properties peaked in 2004, as shown in Figure 21, which was also true for San Bernardino County and much of Southern California. (Multi-family properties include all buildings with more than one unit.)
- **Since the 2000s, multifamily buildings have played a major role in new housing production in Rancho Cucamonga.** Multifamily units accounted for 45 percent of all permitted units since 2000 (Figure 21).
- **Several large, major multifamily developments in the pipeline should help lift the level of residential production by adding more compact housing types located near transit.** Projects include The Resort (up to 3,450 units under construction) and Empire Yards (500 units in the planning stages), which will add a combination of townhomes and apartment flats accessible to the Metrolink station area.
- **Other sources of new housing stock include the Etiwanda Heights Neighborhood and Conservation Plan as well as mixed use projects along some of the city's commercial corridors.** Up to 3,000 detached and attached single family homes are planned for Etiwanda Heights. The City has also seen developer interest in mixed use housing along some of its commercial corridors.

Figure 21. Residential Building Permits Issued in Rancho Cucamonga, 2000-2018



Source: Department of Housing and Urban Development, 2000-2018; Strategic Economics, 2020.

Natural Hazards

Existing Conditions Report

May 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN

Summary

To better guide the development of Rancho Cucamonga's General Plan update strategy, which identifies the potential hazards and strategies to protect and enhance the safety of residents and businesses throughout Rancho Cucamonga, this chapter identifies the various natural hazards that may impact the City. It further identifies potential issues and opportunities to consider within the City's Safety Element update.

Key Findings

Provided below are the key findings from this report:

- Seismic hazards (earthquakes) have the greatest potential to cause loss and damage within the City.
- While wildfire hazards are generally limited to areas of the City north of Interstate 210, they have the potential to cause significant harm to residents in this part of the City and cause challenges associated with fire response and evacuation.
- During wildfire events, there is the potential for other parts of the City to be impacted by limited resources, poor air quality, and increased response times for services, which could affect all residents.
- A recent update to California Government Code Section 65302(g) requires a review of evacuation routes and identification of developments with less than two routes, or routes that have issues with capacity, safety, or viability.
- Flooding hazards in the City have been managed effectively over the years; there is minimal exposure to 100-year flood zone impacts.
- Severe weather impacts are anticipated to increase in the future as these conditions become exacerbated by changing climatic conditions.
- Future development should focus on areas of reduced hazard threat, which will ensure residents and businesses are operating in safer and more resilient locations.

Natural Hazards

Rancho Cucamonga is located in an area of southern California that is prone to a variety of hazards due to it's proximity to the steep mountainous terrain of the San Gabriel Mountains.

Introduction

The city of Rancho Cucamonga is located in the western portion of San Bernardino County, just south of the San Bernardino National Forest. As a foothill community situated along the base of the San Gabriel Mountains, the City is prone to the effects of natural hazards related to seismic activity, flooding, wildfire, and geologic hazards. Additionally, as an inland community, the City is susceptible to hazards associated with severe weather such as extreme heat, drought, and wind. Many of these hazards have affected the community previously; the City should anticipate impacts will continue and will possibly change in the future as a result of new and changing conditions.

Regulatory Environment

California Government Code Section 65302 (g) identifies the statutory requirements that govern the preparation of a General Plan Safety Element. This section of the Government Code has been modified several times to respond to the changing issues and priorities of the State since its original adoption. For additional detail regarding the statutory requirements governing General Plan Safety Elements, please refer to Appendix A of this report.

Basic Element Requirements

Government Code Section 65302 (g) 1 requires the Safety Element to address the protection of the community from any unreasonable risks associated with the effects of the following hazards:

- Seismically induced surface rupture
- Ground shaking
- Ground failure
- Slope instability leading to mudslides and landslides
- Tsunami
- Seiche
- Dam Failure
- Flooding
- Subsidence
- Liquefaction
- Other geologic hazards
- Wildland and Urban Fires

In addition, Safety Elements are required to address these non-hazard specific issues, as they apply to the City:

Peakload Water Supply Requirements

Evacuation Routes

Military Installations

Minimum Road Widths and Clearances Around Structures

Recent Bill Changes

Changes by the California Legislature have recently been made and will require the following topics be addressed in the Safety Element:

Evacuation Concerns (AB 747 and SB 99)

SB 99—California Government Code Section 65302 (g) 5—requires the identification of developments in any hazard area that do not have two evacuation routes. Also, AB 747 —California Government Code Section 65302.15— further requires that Safety Elements shall be reviewed and updated as necessary to identify the capacity, safety, and viability of evacuation routes under a range of emergency scenarios within the jurisdiction. While this requirement identifies the Safety Element, there is the potential this analysis may overlap with the Circulation Element and will require coordination to reduce any potential conflicts.

Climate Change Concerns (SB 379)

SB 379 —California Government Code Section 65302 (g) 4— requires that the Safety Element be reviewed and updated, as necessary, to address climate adaptation and resiliency. This review occurs in conjunction with the preparation of a vulnerability assessment or with reliance on a Local Hazard Mitigation Plan (LHMP), which addresses climate adaptation risks and vulnerabilities. Compliance with this requirement will rely on the integration of the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment, Sustainable Community Action Plan, and an LHMP. Reliance on these documents ensures compliance and leveraging of these plans, effectively allowing for comprehensive implementation of future projects and programs that support addressing the effects of climate change.

Plan Integration (AB 2140)

AB 2140 —California Government Code Section 65302.6— recommends the integration of the LHMP into the General Plan Safety Element. Upon completion of this voluntary requirement, the City would be eligible for potential cost savings during future disaster/emergency events where the California Disaster Assistance Act requirements are activated. Preparation of the LHMP and General Plan Safety Element anticipates compliance with this requirement.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The intention of the Alquist-Priolo Earthquake Fault Zoning Act (1972)—California Public Resources Code (PRC), Chapter 7.5, Section 2621-2699.6—is to reduce the risks associated with surface faults. It requires the designated State Geologist to identify and map “Earthquake Fault Zones” around known active faults. Per PRC Section 2623, before the approval of a project, cities and counties shall require a geologic report defining and delineating any hazard of surface fault rupture. If a city or county finds that no undue hazard of that kind exists, the State Geologist may waive the report. For a list of project types, please refer to PRC Section 2621.6.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act —California Public Resources Code, Chapter 7.8, Section 2690-2699.6— created a statewide seismic hazard mapping and technical advisory program in 1990 to help cities and counties address the effects of geologic and seismic hazards caused by earthquakes. Per PRC 2697, cities and counties shall require, before the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard. If a city or county finds that no undue risk of this kind exists, based on information resulting from studies conducted on sites near the project and of similar soil composition to the project site, the geotechnical report may be waived. After report approval or a waiver granted, subsequent geotechnical reports shall not be required, provided that new geologic datum, or data, warranting further investigation is not recorded. Each city and county shall submit one copy of each approved geotechnical report, including the mitigation measures, if any, and are delivered to the State Geologist within 30 days of report approval. For a list of project types, please refer to PRC Section 2693.

Section 1 - Hazards of Concern

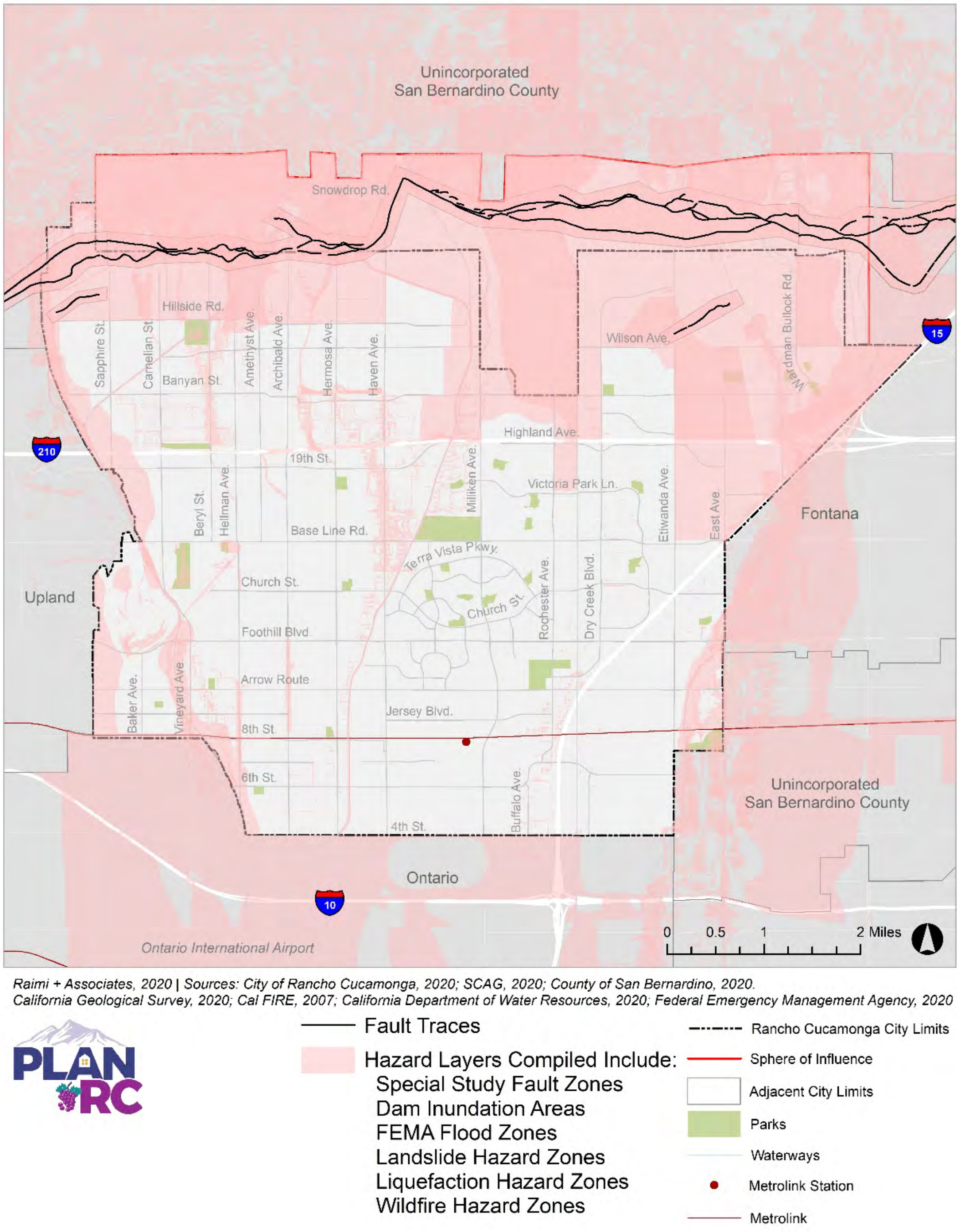
Hazards of Concern Discussion

The Safety Element is the primary location for the city of Rancho Cucamonga to address natural hazard issues within and nearby the community. The California Government Code identifies the minimum requirements of this element based on the location and setting of the City, and addresses the following hazards:

- Seismic Hazards
- Flooding
- Wildfire
- Other Geologic Hazards
- Severe Weather

Figure 1 helps to understand the interaction of these various hazards better. This figure maps the different hazard layers available from local, regional, state, and federal sources. By overlaying individual hazard layers, the map highlights darker areas (where multiple hazards overlap) and lighter areas, where few hazards are identified. Based on this map, it is evident which areas of the City should be the primary focus for new development versus those areas where a significant amount of risk is prevalent. In these riskier areas, development should be modified to reduce future impacts or relocated to more suitable areas.

Figure 1. Rancho Cucamonga Hazard Overlay Compilation



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020. California Geological Survey, 2020; Cal FIRE, 2007; California Department of Water Resources, 2020; Federal Emergency Management Agency, 2020

Seismic Hazards

Rancho Cucamonga is located in a seismically active region of southern California. Surrounded by active earthquake faults of varying size and significance, the City is prone to seismic hazards (earthquakes). Typically seismic shaking and fault rupture are deemed primary hazards as they occur as a result of an earthquake. Liquefaction and earthquake-induced landslides are considered secondary hazards since an earthquake event often triggers them. Often, earthquakes can trigger other effects such as building damage/collapse, infrastructure failure, pipeline breakage, and damage to transportation and communication facilities. The size of the earthquake and distance from the epicenter typically determine the severity of these events.

Primary Seismic Hazards

Primary Seismic Hazards are the direct result of an earthquake. These hazards usually occur in the form of moderate to strong seismic shaking, as well as fault rupture directly resulting from the seismic event.

Seismic Shaking

Seismic shaking (ground shaking) is the term that refers to the movement of the earth's surface resulting from an earthquake. This shaking is typically the primary cause of damage in earthquakes, which generally correlates to the magnitude of the earthquake and proximity to the event's epicenter.

Typically, the Modified Mercalli Intensity (MMI) scale measures the intensity of seismic shaking, based on the amount of observed damage. The MMI scale replaced the Richter Scale, which loses its effectiveness when measuring stronger earthquakes. Since the degree of shaking, and consequently damage, generally decreases as the seismic energy travels further away from the fault rupture's point of origin, different sections of a city or region can report different MMI measurements in different locations. The MMI scale (Table 1) uses Roman numerals on a 12-point scale to measure each degree of shaking intensity.

The City is located near a variety of active faults in southern California. The closest faults include the Etiwanda Avenue Fault and Cucamonga Fault, both located within the City and Sphere of Influence(SOI). While these faults are considered active and have the potential to generate earthquakes, the probability of producing a significant event is low. According to the Third Uniform California Earthquake Rupture Forecast, depicted in Figure 2, the Cucamonga Fault has an approximately 1.5% chance of generating an M6.7 earthquake in the next 30 years. In contrast, located within 8 to 12 miles of the City are two of the most active faults in Southern California (San Jacinto and San Andreas). They have a probability between 4% and 20%, respectively, of rupturing over the same time frame.

Seismic shaking associated with an earthquake has the most significant potential to result in loss of life along with property and economic damage within the City. To better estimate the potential impacts associated with an extreme seismic event, a HazUS estimate was prepared for the City as part of the San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan update. Based on the results of this analysis (Table 2), the city of Rancho Cucamonga can anticipate estimated losses of approximately $5.2 billion, resulting from a significant earthquake along the San Andreas Fault.

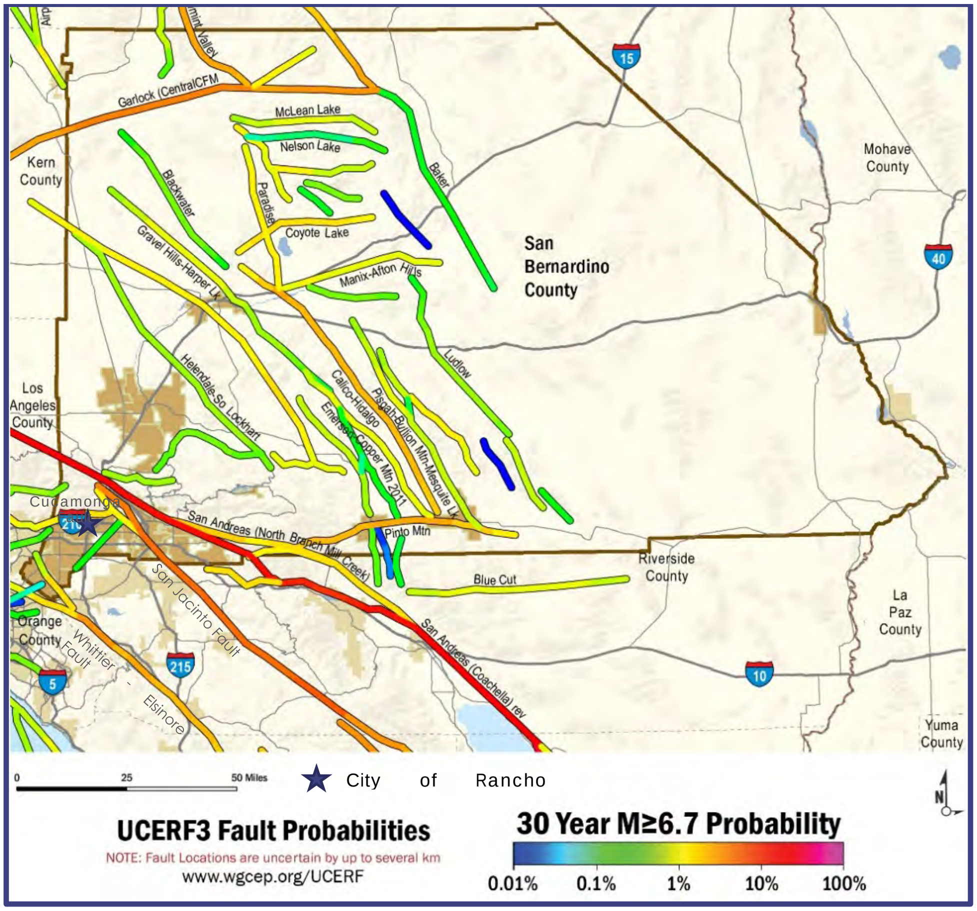
Table 1. Modified Mercalli Scale

Intensity	Description	Effects Observed
I	Instrumental	Felt only by a few people, under especially favorable conditions.
II	Feeble	Felt only by a few people at rest, especially on the upper floors of buildings.
III	Slight	Noticeable by people indoors, especially on upper floors, but not always recognized as an earthquake.
IV	Moderate	Felt by many indoors, and by some outdoors. Sleeping people may be awakened. Dishes, windows, and doors are disturbed.
V	Slightly strong	Felt by nearly everyone, and many sleeping people are awakened. Some dishes and windows broken, and unstable objects overturned.
VI	Strong	Felt by everyone. Some heavy furniture is moved, and there is slight damage.
VII	Very strong	Negligible damage in well-built buildings, slight to moderate damage in ordinary buildings, and considerable damage in poorly built structures.
VIII	Destructive	Slight damage in well-built buildings, considerable damage and partial collapse in ordinary buildings, and great damage in poorly built structures.
IX	Ruinous	Considerable damage in specially designed structures. Significant damage and partial collapse in substantial buildings, and buildings are shifted off foundations.
X	Disastrous	Most foundations and buildings with masonry or frames are destroyed, along with some well-built wood structures. Rail lines are bent.
XI	Very disastrous	Most or all masonry structures are destroyed, along with bridges. Rail lines are substantially bent.
XII	Catastrophic	Damage is total. The lines of sight are distorted, and objects are thrown into the air.

Additionally, Figure 3 identifies the faults located within the City and vicinity, as well as the potential intensity of seismic shaking, resulting from a massive earthquake along the San Andreas Fault. The data mapped is measured in relationship to the force of Earth's gravity (g) or percent g. Percent g is computed by determining the acceleration of the earthquake's motion relative to the force of gravity, which is 1.0g. Based on this, parts of the City are expected to experience shaking intensity ranging from .65g (65%) to 1.55g (155%). Factors that impact the intensity of shaking include the types of earth materials (soil, rock, etc.), degree of consolidation (loose, compact, etc.), and proximity to the source of the earthquake. Areas in the northeastern portion of the City (closest to the San Andreas and San Jacinto Faults) will likely experience the highest degrees of shaking.

- Proximity to the Cucamonga Fault Zone could subject the City to significant seismic shaking; however, the likelihood of a strong earthquake is relatively low.
- The probability of a significant seismic event is higher along the San Jacinto and San Andreas Fault zones, which are some of the most active faults in Southern California.
- Damage associated with a significant earthquake will likely have the greatest impact on the community, with estimated losses exceeding $5 billion.

Figure 2. Major Active Faults within San Bernardino County



Source: San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan, July 13, 2017

Table 2. HazUS Earthquake Damage Estimate

Building Type	Total Value	Total Loss Estimation (% of Total Value)	Total Estimated Loss
Agricultural	$120,868,000	15.8%	$19,137,000
Commercial	$8,306,428,000	20.9%	$1,733,335,000
Educational	$316,191,000	14.8%	$46,745,000
Government	$112,050,000	15.8%	$17,695,000
Industrial	$3,882,509,000	20.6%	$800,729,000
Religious	$408,060,000	18.3%	$74,692,000
Residential	$32,521,315,000	8.0%	$2,601,189,000
Grand Total	**$45,667,421,000**	**11.6%**	**$5,293,523,000**

Source: San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan, July 13, 2017

Fault Rupture

Fault Rupture occurs when the earth's surface shifts and cracks along a fault line during a seismic event. While this phenomenon is not especially dangerous in natural environments, issues arise when structures are built near or on top of an active fault. Per the California Geologic Survey (CGS), an active fault is one that has experienced surface movement in the past 11,700 years.

CGS Special Study Zones

Based on this definition, the CGS has identified special study zones (AP Zones) under the Alquist-Priolo Earthquake Fault Zone Act that require additional investigation before the construction of habitable structures or critical facilities.

Figure 4 identifies the CGS designated AP Zones, which encompass the following faults:

- Cucamonga Fault: an east-west trending thrust fault that separates the basement rock of the San Gabriel Mountains from the alluvial fan deposits at the base of the mountain range. This fault, located within a special study zone, is believed to generate M6.0-7.0 earthquakes and could impact the City if a major earthquake were to occur. The majority of this fault zone is located within the City's SOI.
- Etiwanda Avenue Fault: a northeast-southwest trending thrust fault found in the northern portion of the City. This fault is delineated within a special study zone and thought to be active; however, its slip rate and rupture interval is currently unknown. This fault is believed to be the northern segment of the Red Hill-Etiwanda Avenue Fault.

Rancho Cucamonga Special Study Zone

In addition to the AP Zones identified, the City has established its own special study zone for the Red Hill – Etiwanda Avenue Fault. The southern section of the fault is located at the base of Red Hill, which is better defined and located by changes in subsurface geology and groundwater elevations in the area as mapped by the California Department of Water Resources. As the fault moves northeast, the theory is that a central segment connects the Red Hill segment to the Etiwanda Avenue Fault (discussed above); however, previous studies have not located this segment.

Given the uncertainty of the fault location and lack of understanding regarding its potential activity, the City identified this zone for the southern and central segments to gather evidence of any connection between the Red Hill Fault and the Etiwanda Avenue Fault. As of 2018, a Geologic Fault Investigation, prepared by RMA for the City's Proposed Public Safety Facility, found no conclusive evidence of an active fault crossing the site, which is located in the vicinity of the central segment of the Red Hill Fault.

Table 3 identifies the characteristics of the properties located within the mapped AP Zones. Based on this information, it is estimated that approximately 4,018 acres of property within the City and SOI is situated in an AP Zone. Of the nearly 600 parcels within these areas, about 61% contain single-family residences, while nearly 26% are vacant. In total, the properties within the AP Zones are valued at nearly $325 million, which could be at risk if fault rupture impacts them.

Secondary Seismic Hazards

Secondary Seismic Hazards include those that involve the interaction/reaction of earth materials to a seismic event. In 1990, the Seismic Hazards Mapping Act went into effect, which identifies and maps potential hazard conditions, typically including liquefaction and earthquake-induced landslides.

Table 3 – Fault Rupture Risks

Parcels Located in AP Zones	Parcels	Acreage
Total	592	4,081.2
Vacant Uses	*153*	*2,854.1*
Single Family Residential	*363*	*902.6*
Other Uses (Commercial, Religious, Infrastructure)	*76*	*324.5*
Property Values		
Average	$ 530,114	
Maximum	$ 9,741,968	
Total	$ 324,429,645	
Source: City of Rancho Cucamonga Assessor Parcel Database, 2019		

Liquefaction

Liquefaction is a ground failure phenomenon that occurs as a result of a seismic event. Ground failure typically occurs when the following occur:

- Loose unconsolidated granular soils
- Shallow groundwater conditions
- Strong seismic shaking

When all three of these conditions are met, and liquefaction occurs, soils experience a total or substantial loss of shear strength and behave like a liquid. Figure 5 identifies Secondary Seismic Hazards within the City, which indicates minor locations of liquefaction potential in the vicinity of Hellman Avenue and Baseline Road, and west of Vineyard Avenue, south of Baseline Road. These locations were identified due to the presence of shallow groundwater (less than 50 feet from the ground surface) and will require additional analysis associated with new development.

In terms of risk, approximately 166 acres are located within these liquefaction hazard zones, with a majority of it dedicated to residential use. Table 4 identifies property values of nearly $55 million in this hazard zone, which could be at risk should liquefaction occur.

- Within the City, areas of liquefaction potential are limited. A review of future developmental proposals within the vicinity of these locations should verify that groundwater elevations are deeper than 50 feet per CGS requirements for liquefaction analysis.

Earthquake Induced Landslides

Ground failure resulting from an earthquake can also occur in the form of an Earthquake-Induced Landslide. These failures typically happen in areas with steep slopes or unstable soil conditions. Usually, post-wildfire conditions and intense precipitation can further exacerbate these unstable hillside conditions, contributing to greater landslide vulnerability. Landslides can impact structures, sever utility lines, block roadways, and impact people and properties in the path of the failure. Figure 4 identifies the Secondary Seismic Hazards associated with Earthquake Induced Landslide, which requires evaluation of the stability of hill slopes.

Table 4 also identifies the properties located within the earthquake-induced landslide zone. Approximately 3,704 acres of land are located within this zone, which is isolated from the steep topography within the City's SOI. Of these properties, approximately 73% are vacant parcels, and approximately 14% contain single-family residences, which is expected, given the steep nature of the terrain in this area. Total estimated property values within the zone are approximately $64 million, which could be affected by this hazard.

- Earthquake Induced Landslide hazards are isolated to the City's SOI, which primarily consists of vacant parcels. Limiting development in these areas would reduce future impacts associated with slope instability.
- The establishment of a transfer of development rights program would assist in reducing development pressure in risky areas of the City, like the Earthquake Induced Landslide areas.

Table 4 – Secondary Seismic Hazard Risks

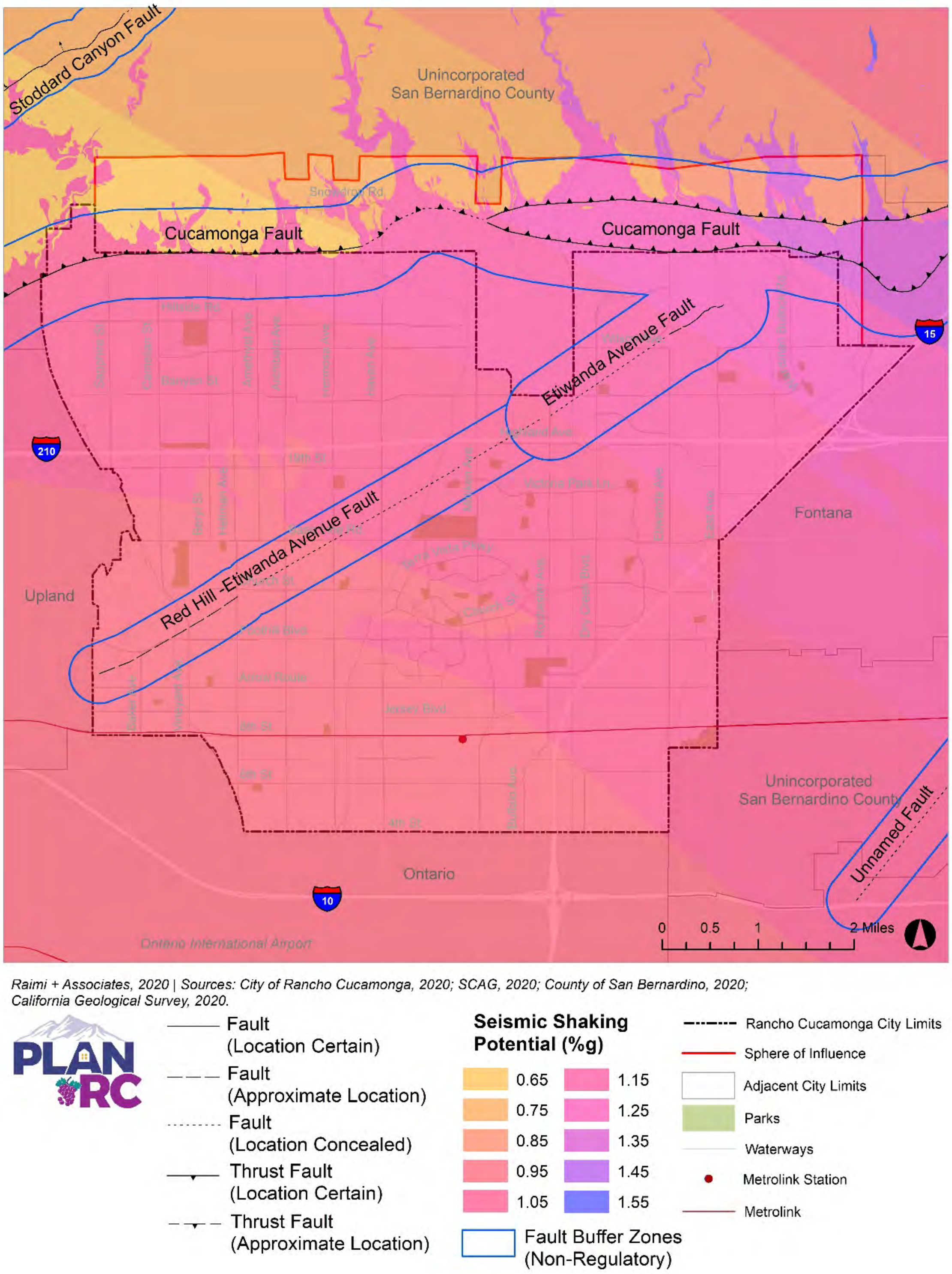
Parcels within Secondary Seismic Hazard Zones	Liquefaction	EQ Landslide
Total Acres	166.7	3703.6
Total Parcels	125	162
Vacant Parcels	*5*	*118 (10 units)*
Single Family Residential Parcels	*91 (139 units)*	*22(22 units)*
Other Parcels	*29*	*22*
Average Property Value	$438,657	$393,621
Maximum Property Value	$4,794,000	$3,118,609
Total Property Value	$54,832,141	$63,766,582
Source: City of Rancho Cucamonga Assessor Parcel Database, 2019		

Settlement

Seismic settlement can occur as a result of an earthquake. Typically the amount of settlement that occurs is based on the intensity and duration of ground shaking and the relative density of the subsurface soils. Most soils are susceptible to some degree of seismic settlement, and much of the soil underlying the City is alluvial and could settle as a result of an earthquake. However, most damage from an earthquake is associated with differential settlement, which is a phenomenon associated with two different earth materials settling at two different rates. This type of settlement typically occurs slowly and isn’t considered dangerous to building occupants. However, over time it can cause significant damage to buildings.

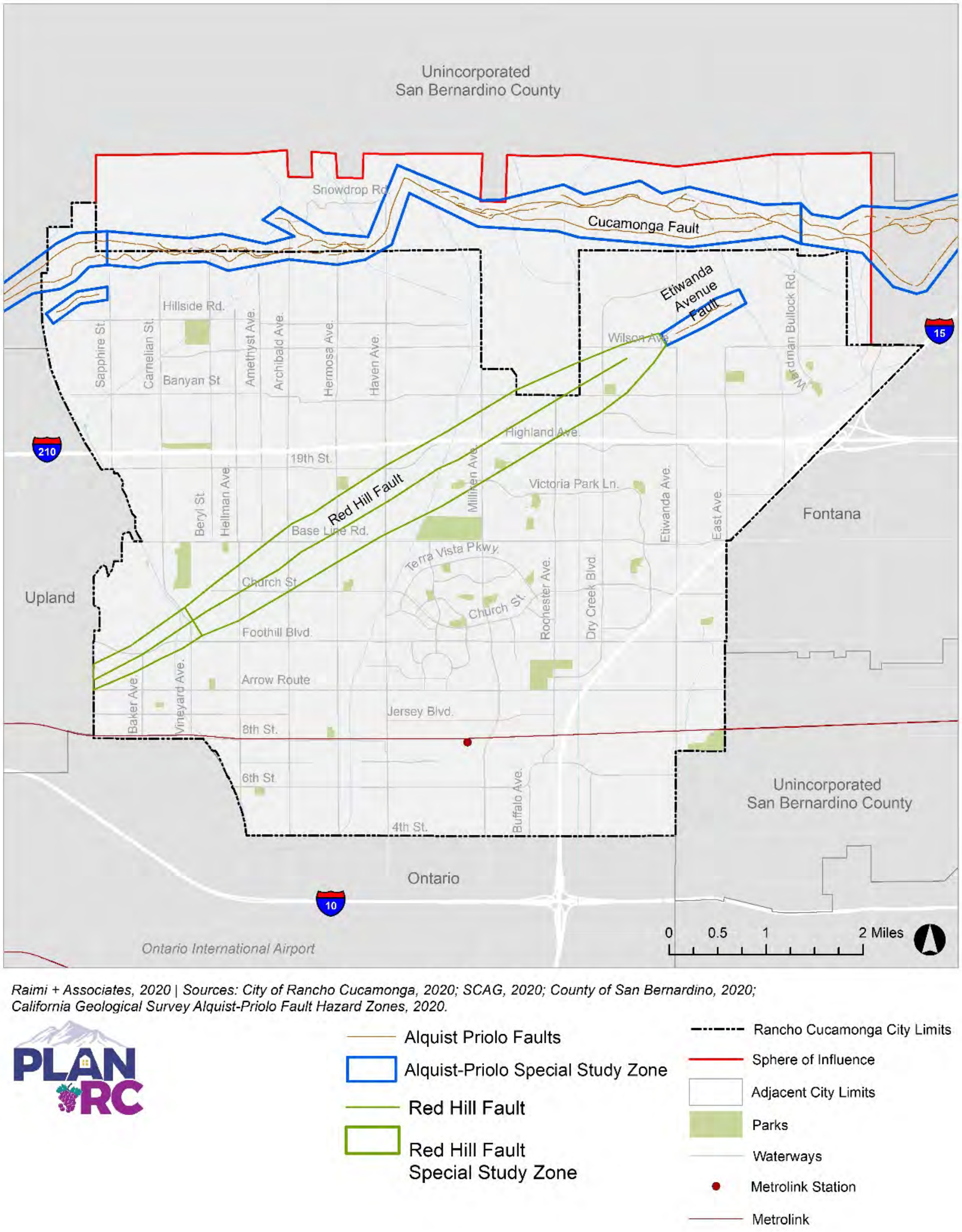
- If differential settlement occurs within the City, it is anticipated to be located in areas where un-engineered fill or areas where loose soils occur, which have not been identified at the city-scale.
- Mapping of areas of potential settlement is not currently available; however, this information is typically identified during investigation within site-specific developments.

Figure 3.Seismic Shaking Potential



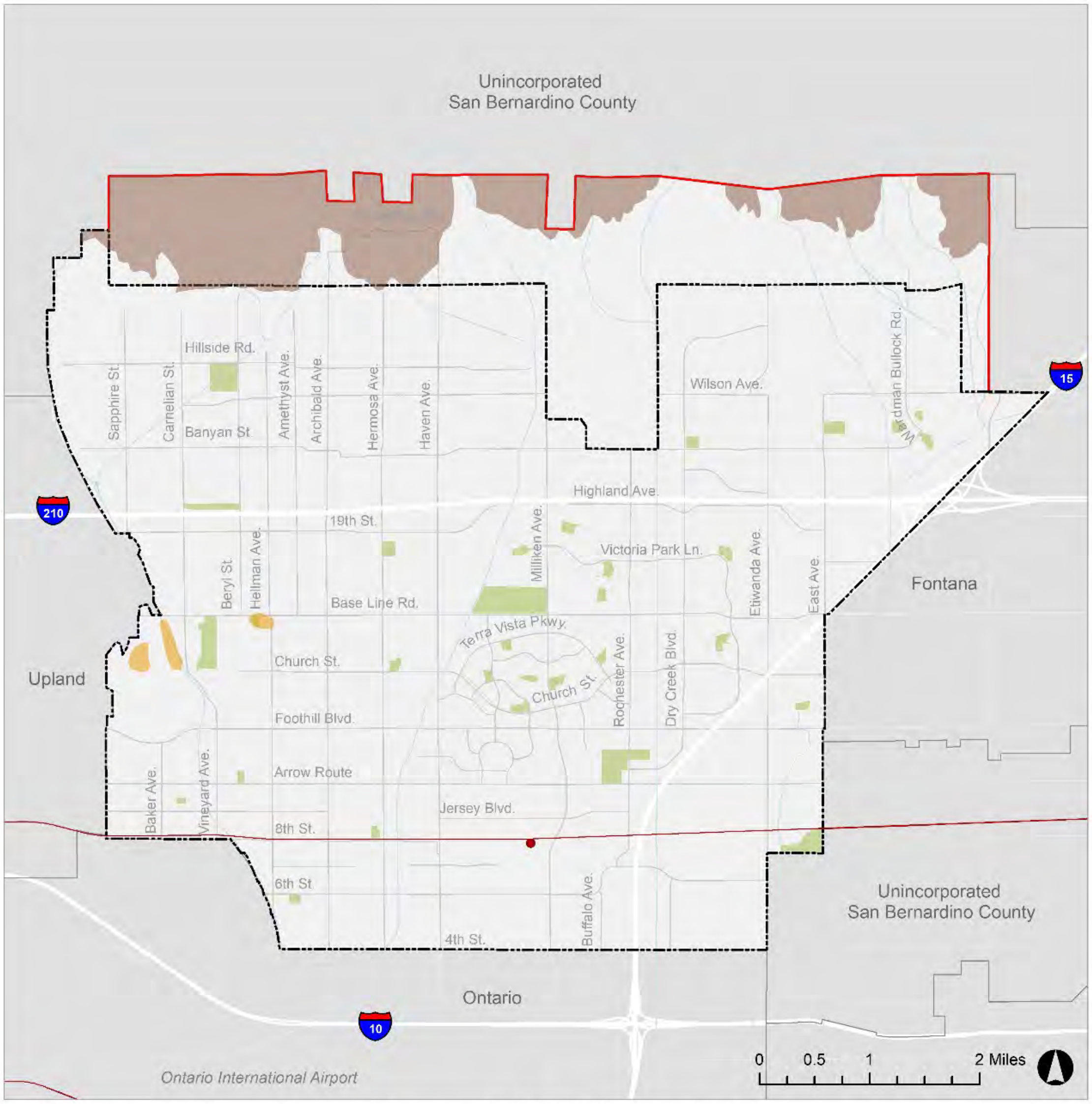
Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; California Geological Survey, 2020.

Figure 4 – Alquist Priolo Special Study Zones



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; California Geological Survey Alquist-Priolo Fault Hazard Zones, 2020.

Figure 5 – Secondary Seismic Hazards



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; California Geological Survey Seismic Hazards Mapping Program, 2020.

▨ Earthquake-Induced Landslide Hazard Zone

▨ Liquefaction Hazard Zone

-·-·- Rancho Cucamonga City Limits

— Sphere of Influence

☐ Adjacent City Limits

🟩 Parks

— Waterways

● Metrolink Station

— Metrolink

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Flooding

Located at the base of the San Gabriel Mountains, the city of Rancho Cucamonga has a long history of flooding. Since it's incorporation, the City has worked with San Bernardino County on flood management and mitigation projects. In addition, the City takes steps on an annual basis to maintain and prepare for flood events ensuring the existing infrastructure can convey floodwaters effectively. Flood hazards within the City can occur either as the result of large storms and flash flooding that overwhelms infrastructure or the failure of flood control facilities that inundate downstream communities.

FEMA Floodplains

Since Rancho Cucamonga is vulnerable to flooding during the winter storm season, the City is an active participant in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). Through this program, "Special Flood Hazard Areas" within the City are identified and mapped on Flood Insurance Rate Maps (FIRMs), which identify the areas that require flood insurance. FIRMs generally describe flooding in terms of a 100- or 500-year flood event, which translates into the probability (1.0% or 0.2%, respectively) that flooding could occur within the designated zone in any given year. In addition to the federal requirements within the NFIP, the City has also adopted flood protection standards requiring minimum building elevation, flood-proofing, and anchoring of buildings in areas identified as prone to flooding. Figure 5 identifies the FEMA Flood Hazard Zones identified within the City.

While these flood hazard zones cover approximately 3,857 acres of the City, other areas within the City may experience flooding during a heavy precipitation event. Table 5 identifies over 4,500 improved parcels (developed parcels with residential, commercial, industrial, or institutional uses) located within flood hazard zones, as mapped in Figure 6. A majority of these parcels are located within a 500-year flood hazard zone, which accounts for approximately $1.49 billion in total exposure. This accounts for approximately 77% of the total exposure of $1.9 billion in potential property losses resulting from flooding. While this estimate is significant, there is still some uncertainty involved, since changing precipitation conditions can cause flooding in areas that haven't experienced these conditions in the past. For additional discussion regarding future flooding implications associated with changing climatic conditions, please refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report.

Table 5 – Flood Hazard Risks

Flood Hazard Zone	Improved Parcel Count (Percentage) *	Acreage	Total Exposure
100-Year Flood	310 (6.7%)	871.2	$174,652,000
500-Year Flood	3,450 (75.4%)	2,338.4	$1,488,227,000
500-Year (Protected By Levee)	814 (17.8%)	647.8	$ 260,682,000
Total	4,574	3,857.3	$1,923,561,000

** Improved parcels include residential, commercial, industrial, and institutional uses within the flood hazard zone.*

Source: San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan, July 13, 2017

- Flooding hazards have the potential to impact a significant amount of the community; however, less than 10% of this area is subject to a 100-year event.
- Development within flood hazard areas are expected to comply with flood protection standards that reduce vulnerability to flood impacts and ensure safe use and occupation of structures.

Dam Failure/Inundation

The City currently has seven catch-basins that are defined as dams by the State of California. These are:

- Alta Loma Basin
- Cucamonga Creek

- Day Creek
- Deer Creek
- Demens Creek
- Etiwanda Basin
- San Sevaine Basin

With the adoption of SB 92 in 2017, new dam safety requirements mandate that dam owners map the downstream inundation areas for dams governed by the California Department of Water Resources (DWR). In addition to the mapping, owners are required to prepare Dam Emergency Action Plans that identify the emergency management plans and procedures in place for these facilities. Figure 7 identifies the inundation areas mapped for these seven catch basins located within the City. For inundation to occur as depicted in this map, it is assumed the reservoir behind the dam is full, and failure occurs suddenly, releasing water in a relatively short amount of time. Failures typically occur as a result of an earthquake, erosion, design flaw, or water overflow condition during intense storms.

Based on the mapping in Figure 7, Table 6 identifies the estimated size of each inundation area mapped within the City. Of these seven inundation areas, two have the potential to flood properties outside of the City —Cucamonga Creek and San Sevaine. Based on this mapping, the San Sevaine Basin generates the largest inundation area, which inundates a portion of the City and neighboring Fontana.

Table 6 – Dam Inundation Areas

Catch Basin Name	Reservoir Capacity	Dam Inundation Area
Alta Loma Basin	155 acre-feet	332.4 acres
Cucamonga Creek	355 acre-feet	353.3 acres*
Day Creek	140 acre-feet	122.9 acres
Deer Creek	24 acre-feet	212.3 acres
Demens Creek	35 acre-feet	206.9 acres
Etiwanda Basin	283 acre-feet	119.9 acres
San Sevaine Basin	2,765 acre-feet	2,982.7 acres*

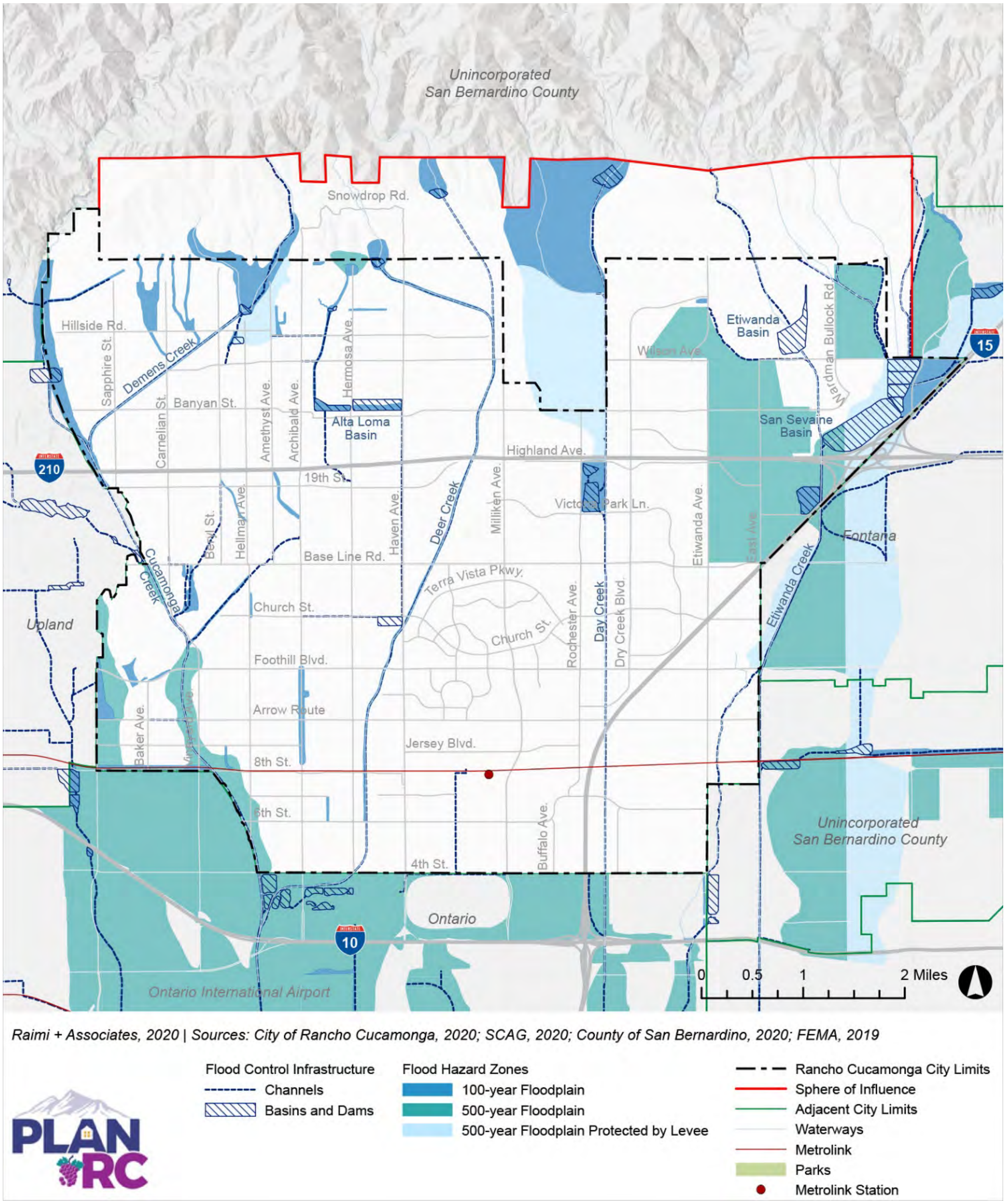
** Inundation zones impact areas outside of the city limits.*
Source: Dams Within Jurisdiction of the State of California, September 2019, Califonia Department of Water Resources, Division of Safety of Dams.

- Areas downstream of catch-basins are at greater risk of dam inundation and should be notified and educated on the potential risks associated with this hazard.
- Development within these areas should identify possible flood mitigation improvements that can reduce of minimize both flood and inundation impacts.

Wildfire

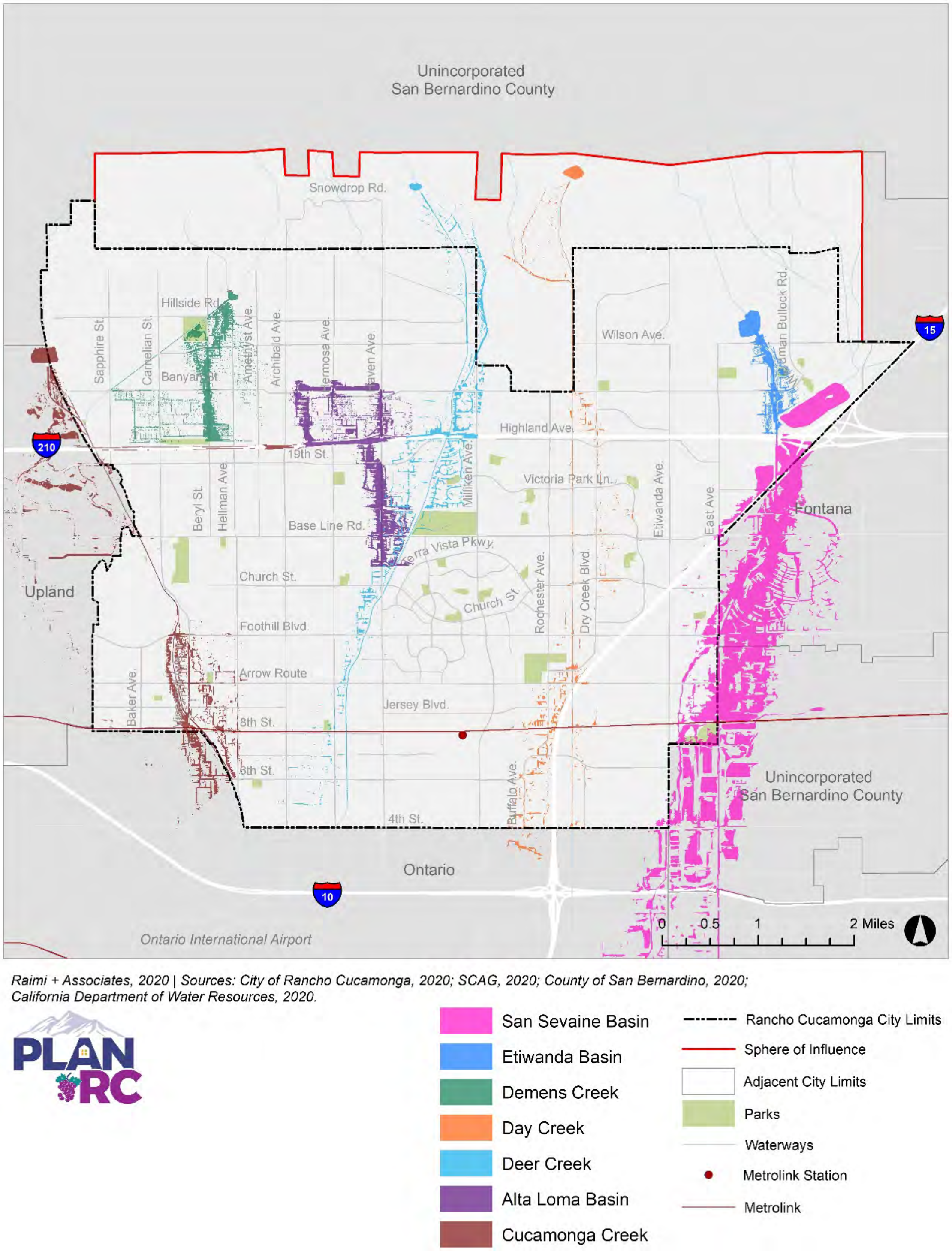
As a community located along the foothills of the San Gabriel Mountains (and adjacent to the San Bernardino National Forest), Rancho Cucamonga has a long history of dealing with wildfire. Much of this wildfire threat comes from the types of plants that inhabit the foothills and mountainous areas of the City and adjacent national forest. Chapparal is the most common plant-type found in these areas, which is considered a fire-adapted species that are accustomed to burning on a regular interval.

Figure 6 – FEMA Flood Hazard Zones



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; FEMA, 2019

Figure 7 – Dam Inundation Zones



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; California Department of Water Resources, 2020.

Figure 8 identifies Historic Fire Perimeters dating back to 1964. Based on the location and extent of these historic fires, the northern portions of the City within the foothills of the San Gabriel Mountains have experienced numerous large fires throughout the City's history. The most recent fires that have affected the City include:

- **2003 Grand Prix Fire (Old Fire):** this Santa Ana wind-driven fire burned over 91,000 acres within San Bernardino and Los Angeles Counties. In total, the fires destroyed 975 buildings and killed six people. The total cost associated with fire response and suppression activities totaled over $1.2 billion in 2003 dollars. Within the City, the fire destroyed 15 homes, and thousands of residents were threatened and evacuated during the incident.
- **2014 Etiwanda Fire:** this Santa Ana wind-driven fire burned over 2,100 acres within the City's SOI and required the evacuation of 1,650 homes and closure of nine schools. The location of this fire coincides with the proposed Etiwanda Heights community.

Much of the City north of Interstate 210 (I-210) is located within the Wildland Urban Interface Fire Area (WUIFA), which is a zone of heightened wildfire hazard. The designated WUIFA includes Cal FIRE Very High Fire Hazard Severity Zones within unincorporated San Bernardino County (State Responsibility Area) within the SOI and the City of Rancho Cucamonga (Local Responsibility Area), and other areas designated by the Rancho Cucamonga Fire District to be at a significant risk from wildfires based on historical fire activity and prevalent vegetation types. The WUIFA is adjacent to the San Bernardino National Forest, which is a designated Federal Responsibility Area (FRA) for wildfire prevention and suppression. In 2008, CalFire mapped wildfire hazards throughout the entire state and ranked those hazards with varying degrees of severity. The mapping is expected to be updated soon and, based upon evaluation by the Fire District, could change the extent of the areas at risk due to wildfire hazards. Figure 9 identifies the current designated WUIFA and the adjacent State and Federal Responsibility Areas. Based on this mapping, a majority of the area north of I-210 is at high risk of a wildfire event, especially during windy, dry conditions. Within the WUIFA, there are currently 5,424 improved parcels, which have an estimated value of approximately 2.825 billion dollars. This potential risk of wildfires is the second greatest threat to residents and businesses in the City.

For many of the developed neighborhoods within this area, wildfire vulnerability may increase with the presence of highly combustible landscape vegetation and construction techniques that may not meet current wildfire standards. For areas within the WUIFA, new construction is required to comply with California Building Code Chapter 7A and California Residential Code Section R337, including requirements for fire retardant or ignition resistant construction materials at roofs, eaves, vents, exterior walls, exterior windows, doors, and decks. While compliance with these standards reduces the vulnerability to new structures, existing structures that haven't complied with these standards may be susceptible to undue fire risk.

- Wildfire hazards are a significant threat to portions of the City north of I-210. Much of the development that has occurred in these areas were not built to current standards. This could result in many of these structures requiring mitigation and retrofit to reduce this potential threat.
- Landscaping and vegetation throughout the WUIFA areas can play a critical role in wildfire mitigation. The types of plants and trees used in landscaping can play a role in exacerbating or mitigating wildfire conditions. Greater use and expansion of the Fire District's Undesirable Plants and Trees list can reduce wildfire threats, allowing City and Fire District resources to be used better during a fire incident. Also, the City has an aging population of windrows that consist mainly of Blue Gum Eucalyptus trees. These windrows can increase wildfire risk if not maintained (removal of undergrowth and debris) or if they become diseased. In addition, as these windrows age and deteriorate in health, they may also become susceptible to loss of limbs or could fall over during extreme wind events.
- Wildfire threats in the northern portion of the City continue to pose a serious threat to existing and anticipated new development. Based on wildfire threat projections associated with climate change, wildfire threats are expected to increase. For additional discussion, please refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report.

Other Geologic Hazards

In addition to seismic hazards, Rancho Cucamonga is also susceptible to other geologic hazards based on the City's proximity to the San Gabriel Mountains, which is one of the fastest rising and disintegrating mountain ranges in the world. Uplift of this mountain range is approximately two centimeters per year, which is relatively quick on a geological time scale. When rapid uplift like this occurs, these areas will be more susceptible to debris flows, rockfalls, erosion, and slope stability issues due to the steepness and fractured nature of the rock units being uplifted. Typically these issues are further exacerbated by intense rainstorms and vegetation losses associated with wildfires. Additionally, steeper slopes generally increase stream flows, which accelerates erosion processes.

Landslides / Slope Stability

Slope stability is dependent on many factors and their interrelationships. Some of the most important factors include height and steepness of slopes, coupled with the strength and orientation of the geologic units, which plays a key role in slope stability. Ultimately, conditions like prolonged rainfall, stream erosion, and alterations to the slope create favorable conditions for failure. Many of these factors are prevalent throughout the hillsides along the northern portion of the City and SOI.

Figure 10 identifies landslide susceptibility within the City based on CGS mapping of deep-seated landslide hazards. Based on this mapping, a majority of the area within the City's SOI has a high degree of landslide susceptibility due to the presence of steep slopes and weak underlying geologic units. In this hazard zone within the City, there are 166 improved parcels (containing residential, commercial, institutional, or public uses) valued at approximately $67 million.

In addition to landslide susceptibility, many of these areas are also prone to debris flows, which can occur rapidly and without warning during intense rainstorms. These events can move large amounts of sediment composed of boulders, cobble, and sand, which can impact downstream drainage facilities and structures. For this reason, many of the catch-basins along the creeks and drainages within and surrounding the City (Alta Loma Basin, Cucamonga Creek, Demens Canyon, Deer Canyon, Day Canyon, Etiwanda Creek, and San Sevaine Basin) were constructed to prevent downstream impacts (see Figure 6).

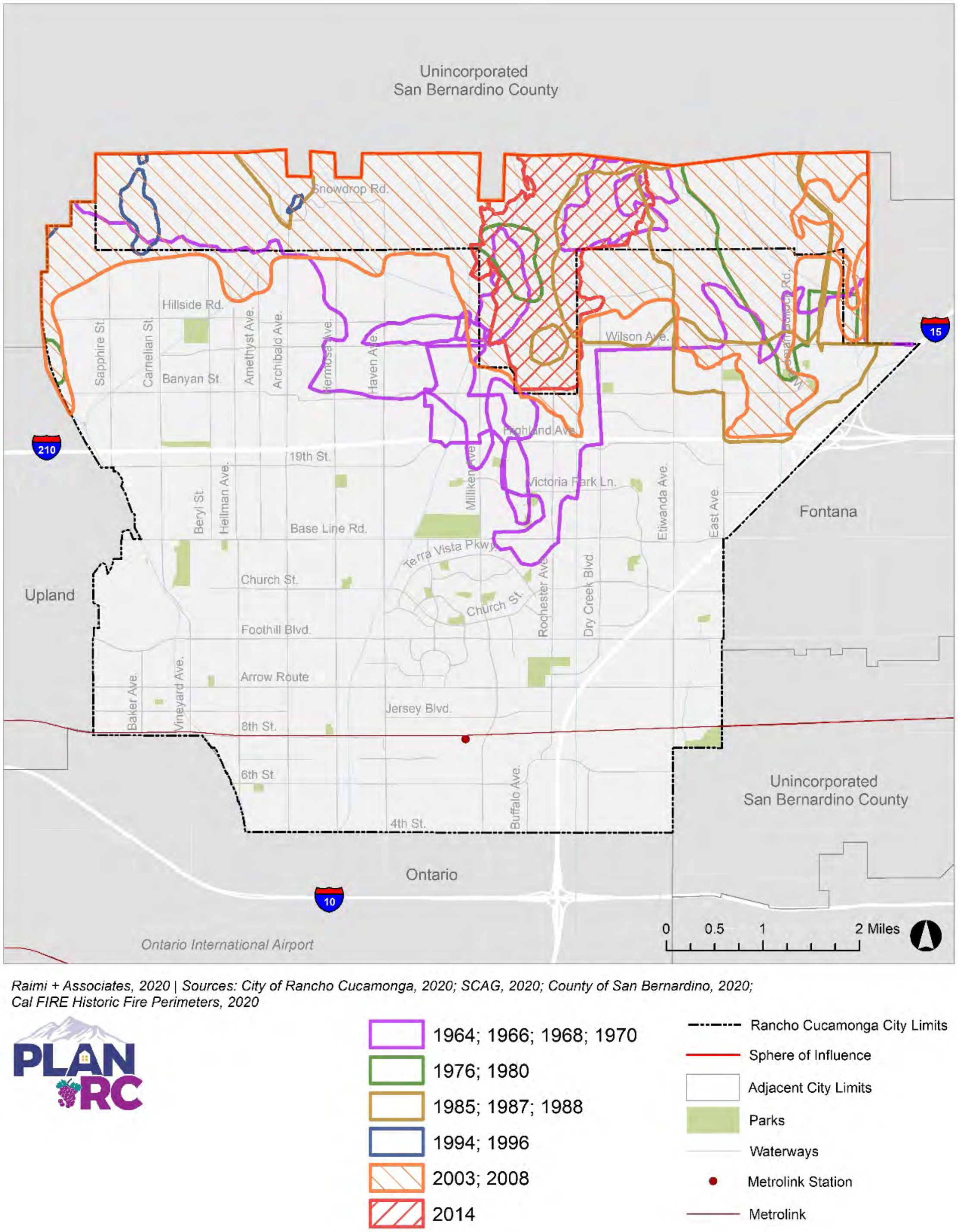
- While slope stability is a major concern for areas within the northern portion of the City and SOI, there is a limited amount of development within these areas, exposed to these risks.
- Typically slope instability and debris flow conditions are exacerbated after a wildfire event due to the loss of vegetation and changes in soil characteristics. After a wildfire event, the City should monitor these areas and prepare for these hazards leading up to a large rain event.
- Future slope stability impacts may be exacerbated by changing climatic conditions resulting in more intense storm events or changes in fire regimes. For additional discussion, refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report.

Subsidence

In addition to slope stability, ground subsidence is another geologic hazard that involves the gradual settlement or sinking of the ground. This hazard typically involves vertical movement as the result of the extraction of groundwater, oil, or gas; or the decomposition of organic materials like peat. The break down of these materials results in a loss of volume within soils that can result in vertical movement. The likely source for subsidence within the City would be the result of groundwater extraction. According to the Cucamonga Valley Water District 2015 Urban Water Management Plan, groundwater extraction through 2040 is not projected to exceed historical pumping that has occurred in the past. Since subsidence has not been identified as a historic issue within the community, future instances may only occur if a significant amount of groundwater is extracted beyond historic averages or groundwater basin elevations drop significantly.

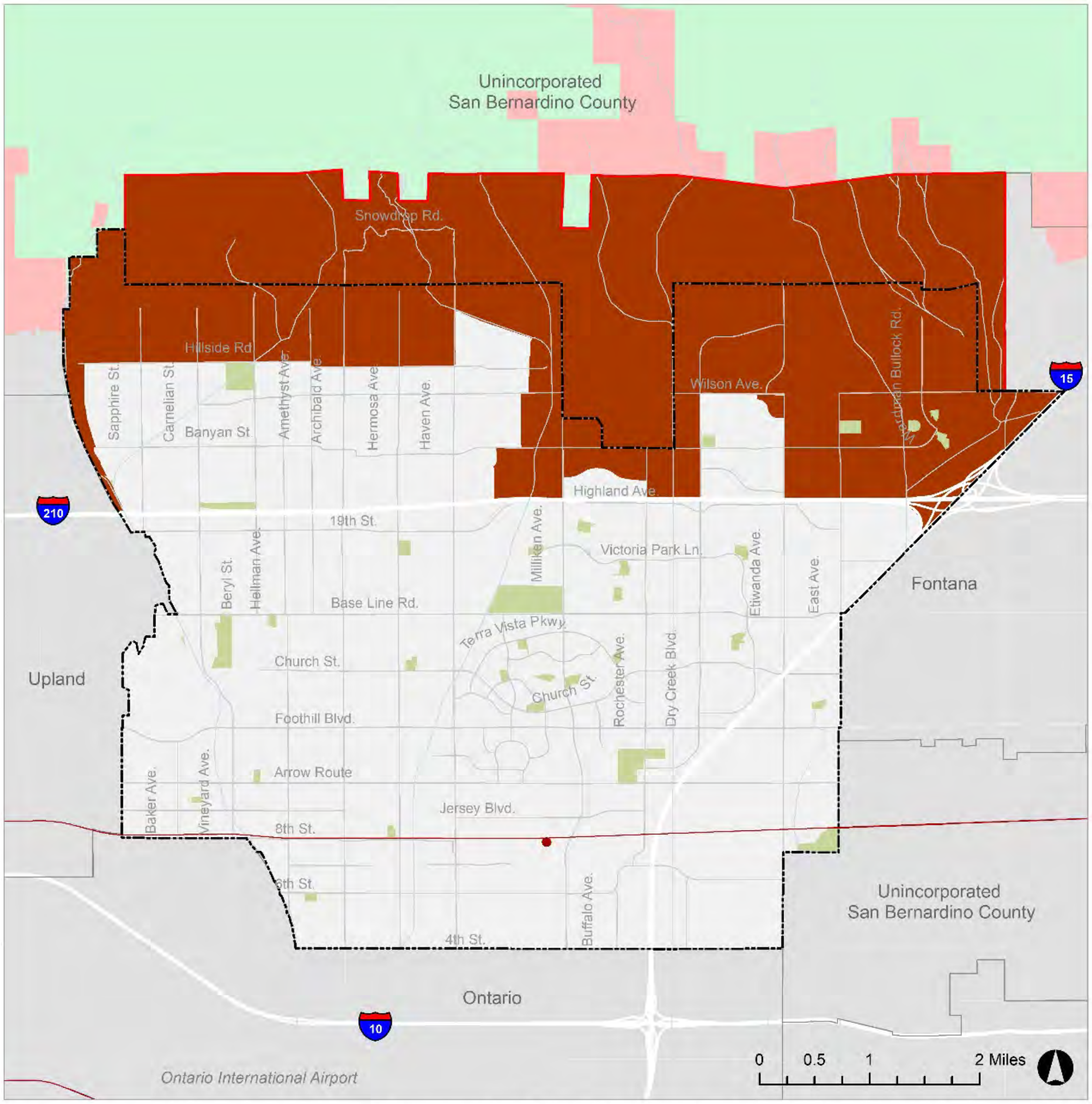
- Coordination with Cucamonga Valley Water District is recommended to monitor groundwater elevations and track any issues that may be related to subsidence.

Figure 8 – Historic Wildfire Perimeters



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; Cal FIRE Historic Fire Perimeters, 2020

Figure 9 – Fire Hazard Severity Zones



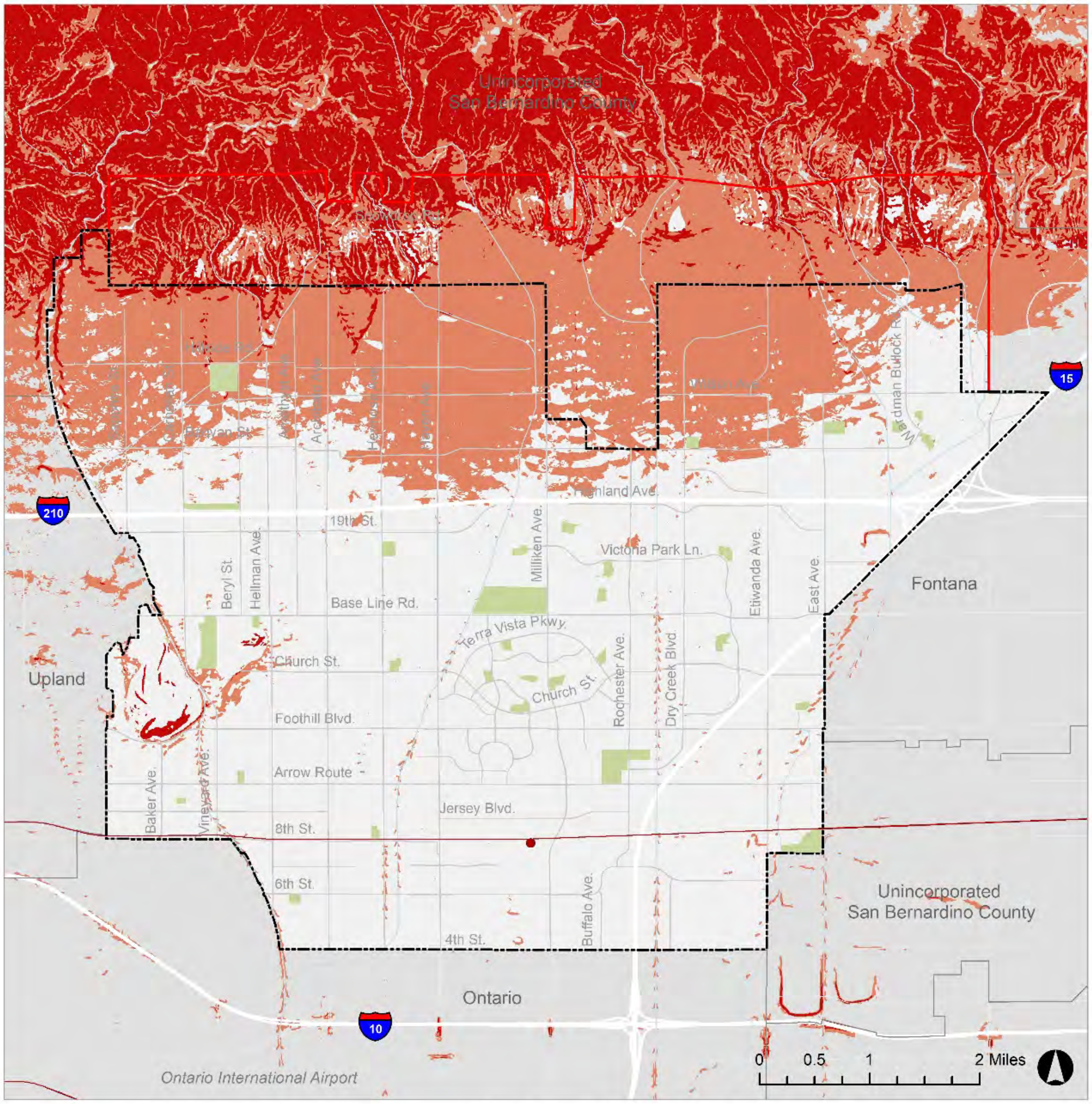
Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; Cal FIRE, 2007

Fire Hazard Severity Zones

- 🟥 Rancho Cucamonga Wildland Urban Interface Fire Area
- 🟥 Cal FIRE State Responsibility Areas
- 🟩 National Forest (Federal Responsibility Area)

- -·-·-· Rancho Cucamonga City Limits
- — Sphere of Influence
- ☐ Adjacent City Limits
- 🟩 Parks
- — Waterways
- ● Metrolink Station
- — Metrolink

Figure 10 – Landslide Susceptibility



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; California Geological Survey, MS 58 Landslide Susceptibility Classes, 2020.

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Section 2 - Hazards Exacerbated by Climate Change

Severe Weather

The information provided below is limited to severe weather hazards, including extreme heat, drought, and wind. These discussions focus on historical and current conditions within the City. To better understand how these conditions may change in the future, please refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report, which discusses these hazards and many others as they relate to changing climatic conditions.

Extreme Heat

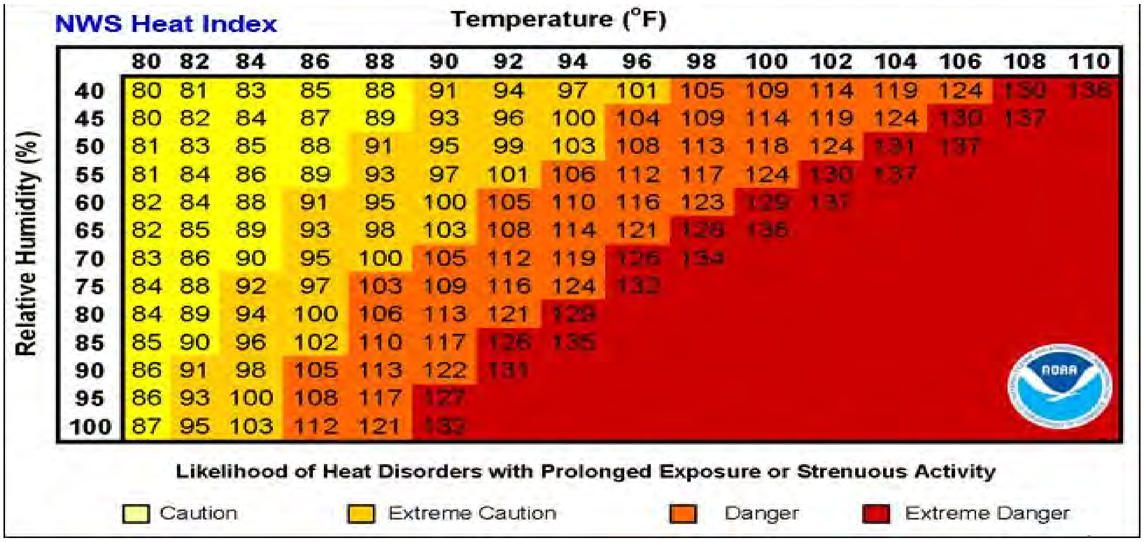
Extreme heat is a period when temperatures are abnormally high relative to the normal temperature range. There are generally three types of extreme heat events:

- Extreme Heat Days: a day during which the maximum temperature surpasses 98 percent of all historic high temperatures for the area, using the time between April and October from 1950 to 2005 as the baseline.
- Warm Nights: a day between April to October when the minimum temperature exceeds 98 percent of all historic minimum daytime temperatures observed between 1950 to 2005.
- Extreme Heat Waves: a successive series of extreme heat days and warm nights where extreme temperatures do not abate. While no universally accepted minimum length of time for a heatwave event exists, Cal-Adapt considers four, successive extreme heat days and warm nights to be the minimum threshold for an extreme heatwave.

Extreme heat events will feel different from region to region since different areas have different historic high temperatures. For example, an extreme heat day on the coast will feel different than an extreme heat day in the High Desert. The reason for this is how humidity plays a factor in the perceived heat that people feel. Humid conditions will make a day feel hotter than non-humid conditions, even though the temperature may be the same. The difference between the perceived temperature and the actual temperature is known as the “heat index.” To illustrate the effect of the heat index, a 90-degree day with 50 percent humidity feels like 95°F, whereas a 90°F day with 90 percent humidity feels like 122°F. Figure 11 shows the National Oceanic and Atmospheric Administration (NOAA)’s National Weather Service Heat Index.

- According to Cal-Adapt, an extreme heat day in Rancho Cucamonga involves a temperature that exceeds 103.9° F.
- Historically the City has experienced an average of 4 extreme heat days during the period from 1950 to 2005. During this same period, the City experienced a 4-day heatwave, approximately every five years.
- For a discussion of the anticipated changes associated with extreme heat events, please refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report.

Figure 11 – NOAA National Weather Service Heat Index



NWS Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

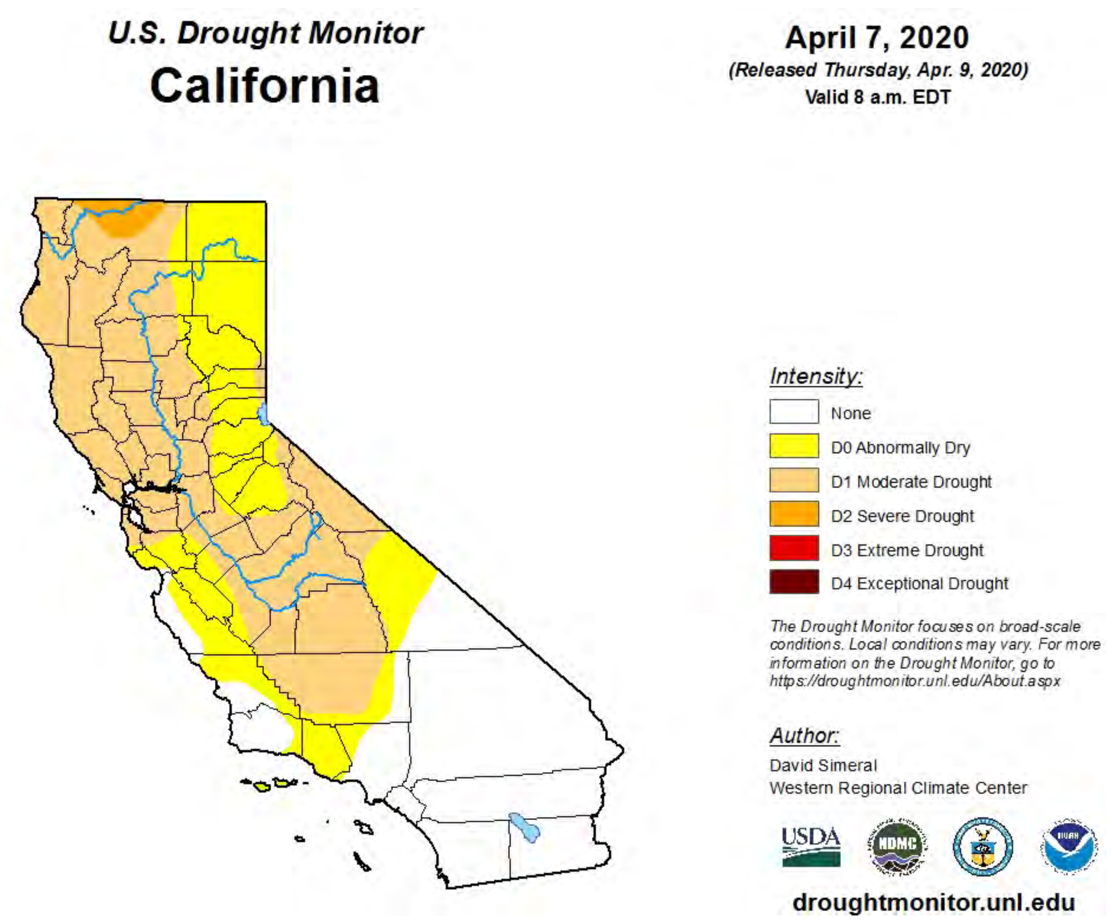
🟨 Caution
🟨 Extreme Caution
🟧 Danger
🟥 Extreme Danger

Drought

Droughts are somewhat frequent in California and typically occur when precipitation is limited for an extended period. Rain arrives in California via atmospheric rivers (channels of moist air located high in the atmosphere), as well as the El Niño Southern Oscillation (ENSO) cycle (a regional meteorological phenomenon in the southern Pacific Ocean). This cycle typically gives rise to two distinct phases known as *El Niño*, the warm and wet phase, or *La Niña*, the dry and cold phase. When California experiences a drought, it is typically the result of fewer atmospheric rivers or an active *La Niña* phase, which results in lower than average levels of precipitation. A drought may also occur when conditions in areas where water sources are located experience drought conditions, even though the local region does not. Figure 12 identifies the drought conditions within California identified by the US Drought Monitor program. The city of Rancho Cucamonga is not currently experiencing drought conditions based on this mapping.

- Southern California is not currently considered to be in a drought condition, while other parts of the State—Northern California and the Sierra Nevada mountain range—are experiencing moderate drought conditions due to lower than average precipitation.
- Communities that rely on water supplies from these parts of the State may feel the effects of drought versus communities that source their water supplies locally from Southern California. Currently, the Cucamonga Valley Water District sources almost half of its water from imported sources that may come from outside the region.
- For a discussion of the anticipated future trends associated with drought, please refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report.

Figure 12 – California Drought Conditions (April 7, 2020)



U.S. Drought Monitor
California

April 7, 2020
(Released Thursday, Apr. 9, 2020)
Valid 8 a.m. EDT

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

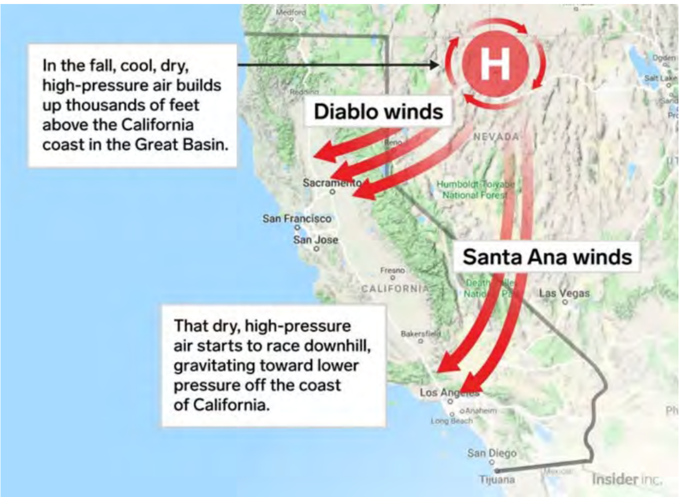
Author:
David Simeral
Western Regional Climate Center

droughtmonitor.unl.edu

Wind

Wind is simply the movement of air caused by differences in atmospheric temperature. High-pressure air will naturally move to areas of low pressure. Usually, the distance between these high- and low-pressure zones is far; however, on occasion, these low- and high-pressure zones may be near one another. When this happens, air will flow dramatically, creating high-speed winds. The most common wind events in southern California are the "Santa Ana" wind conditions that typically occur in the fall and winter.

Rancho Cucamonga has a history of extensive windstorms, often related to Santa Ana winds. High winds can also result from thunderstorm inflow and outflow or high and low-pressure systems moving through the region. Wind speeds during these events can typically range from 50 to



In the fall, cool, dry, high-pressure air builds up thousands of feet above the California coast in the Great Basin.

That dry, high-pressure air starts to race downhill, gravitating toward lower pressure off the coast of California.

100 miles per hour, which can often damage structures, uproot trees, and generate dust and debris that can impact visibility and damage vehicles and structures.

- Since Santa Ana wind events occur several times throughout the year, they are one of the most frequent hazard events that affect the City, however significant incidents are not as common. Generally, 2-4 wind events occur on an annual basis that have the potential to cause damage within the City.
- A significant wind event on January 6, 2003, impacted the City, causing damage to residences and businesses, knocking down power lines and trees, damaging fences, street lights, and signs. In total, 56 incidents were reported that day from this single wind incident, which impacted streets and city services during the incident.
- A major wind event in 2011 impacted the City, causing over 500 downed trees and significant property damage citywide.
- Between 2017 and 2019, the City experienced at least two wind events a year that resulted in downed trees, property damage, and damaged traffic signs and signals.
- Significant wind events can exacerbate fire conditions within Southern California and the City, which could impact residents, businesses, and city services.
- Climatic conditions may worsen future events. Please refer to the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report for additional detail.

Section 3 - Emergency Management

Emergency Management

The City's extensive Emergency Management Program is administered by the Rancho Cucamonga Fire Protection District through collaboration with all city departments and the community . This program focuses on FEMA's four phases of emergency management illustrated in Figure 13.

Figure 13 – Four Phases of Emergency Management

Key components of this program include the City's Emergency Operations Plan, ReadyRC programs and Local Hazard Mitigation Plan, which support City and District functions during emergencies and assist in day to day activities.

Emergency Operations Plan

The Rancho Cucamonga Emergency Operations Plan (EOP) addresses the City's planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in both war and peacetime. This plan supports the City's preparedness functions and is designed to be read, understood, and exercised before an emergency. The EOP provides the planning basis for hazard identification, hazard mitigation, disaster preparedness, emergency response, and recovery efforts.

The purpose of the EOP is to create a uniform structure for emergency management that integrates the City into the California Standardized Emergency Management System and National Incident Management System. This document is written primarily for:

- City Management Staff,
- City Employees,
- Federal, State and County Governments,
- Special Districts who serve city of Rancho Cucamonga residents, and
- Private and volunteer organizations involved in emergencies.

Local Hazard Mitigation Plan

Hazard mitigation involves making a community more resilient to disasters so that when hazard events do ultimately occur, the community suffers less damage and can recover more effectively. It differs from disaster preparedness, which involves advanced planning for how best to respond when a disaster occurs or is imminent.

The Rancho Cucamonga Local Hazard Mitigation Plan (LHMP) provides a comprehensive assessment of the threats that the City faces from natural and human-caused hazard events and contains a coordinated strategy to reduce these threats. It identifies resources and information that can help community members, City staff, and local officials understand local risks and make informed decisions. The LHMP can also support increased coordination and collaboration between the City, other public agencies, local employers, service providers, community members, and other key stakeholders.

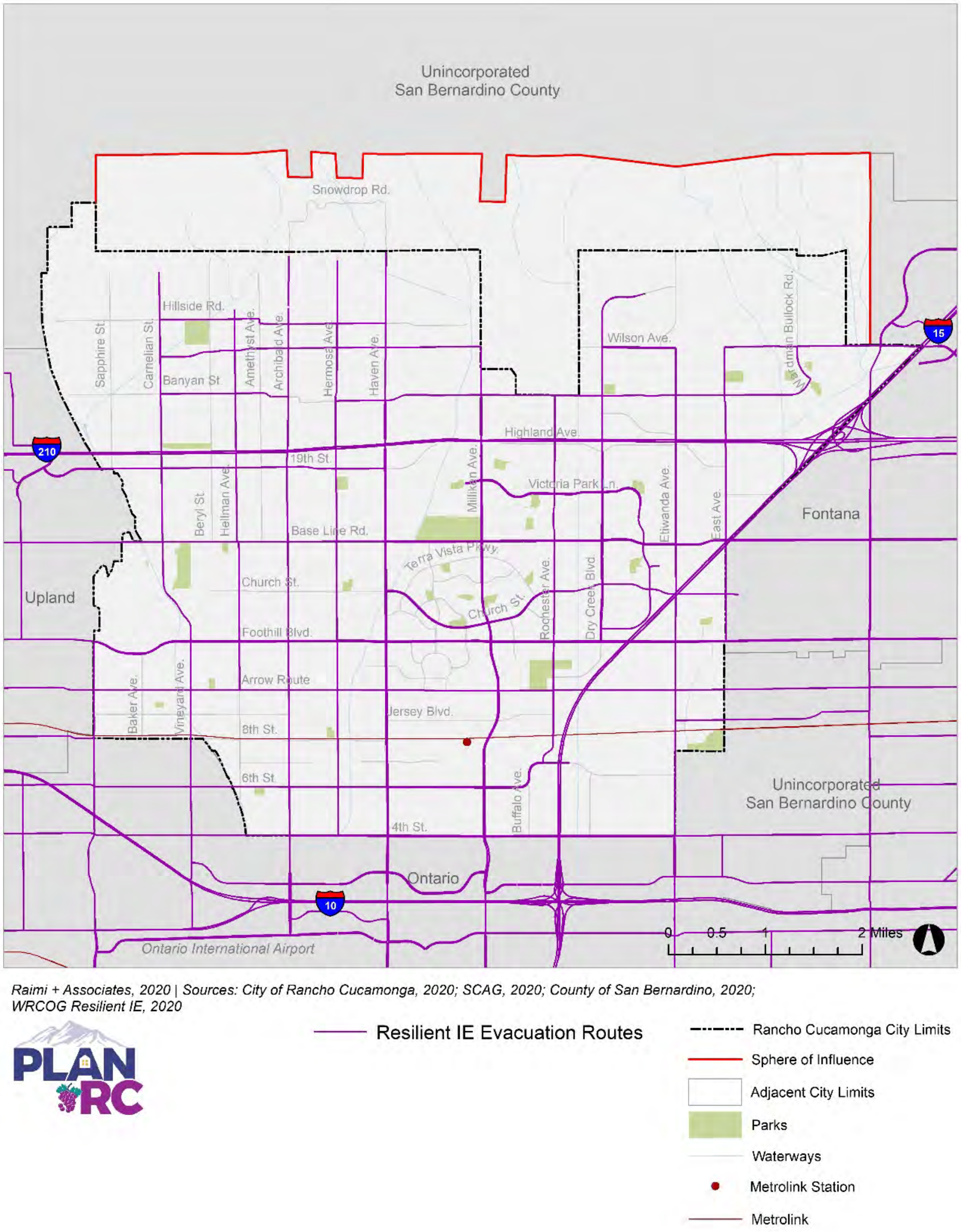
A vital outcome of the hazard mitigation planning process is the City's ability to pursue FEMA hazard mitigation grant funds, which are only available to communities that have a FEMA approved plan. Once an LHMP is approved by FEMA and adopted by City Council, the City has five years to pursue and receive available grant funds in support of implementation. Updating of the plan every five years ensures the City will have continuous access to these funding opportunities. The City's current plan has expired and will be updated as part of the PlanRC project.

Evacuation Routes

Since there are a variety of hazards within the City that could impact businesses and residents, it is vital to identify critical routes for evacuation purposes. Figure 14 identifies recommended evacuation routes along many of the major thoroughfares throughout the City. While these routes are recommended, they are not anticipated to be the only routes used for evacuation purposes. Future evacuations will take into consideration the type of hazard event, areas impacted by the event, expected migration from areas of impact, and establishment of the safest routes necessary to move people out of harm.

- To better understand the City's evacuation constraints and meet the requirements of SB 99 and AB 747, evacuation routes will need to be analyzed to determine:
    - Areas where routes are lacking or inadequate
    - Areas where the circulation network is undersized or inefficient
    - Roadway extensions or modifications that can enhance evacuation.
    - Addressing these issues will play a key role, as a critical evacuation concern for the City is the connectivity across I-210. This freeway creates a barrier for the critical movement of people and utilities (water, electricity, natural gas), which PlanRC should address.

Figure 14 – Potential Evacuation Routes



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; WRCOG Resilient IE, 2020

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Summary of Issues and Opportunities

Rancho Cucamonga has a full suite of natural hazard issues with which to contend. Over the years, the City has taken great steps to address these issues and continues to reduce their risk of impact from many of these hazards. As the City looks forward, the following areas should become a primary focus for the PlanRC project:

Hazards of Concern

Seismic/geologic hazards, wildfire, and severe weather are hazards of concern that pose the greatest challenge to the City.

Seismic Hazards

The greatest hazard of concern for the City is earthquakes. Many of the studies conducted over in the past decade conclude that a significant earthquake event will occur and could cause significant disruption to the economy, damaging and destroying buildings and infrastructure, and affecting residents and businesses throughout the City. With loss estimates greater than $5 billion for the City, future preparedness and mitigation efforts should strive to reduce this vulnerability wherever possible.

Additionally, the City has an opportunity to focus on expanding knowledge and understanding of seismic and geologic hazards. A better understanding of the Red Hill-Etiwanda Fault, as well as the potential for landslides and debris flows in the foothills of the San Gabriel Mountains, are opportunities to protect life and property better.

Wildfire

Wildfire hazards are a significant threat to portions of the City north of I-210. Much of the development that has occurred in these areas was not built to current standards that apply to the Wildland Urban Interface Area (WUIFA). As a result, many of these structures may require mitigation and retrofit to reduce this potential threat.

Landscaping and vegetation throughout the WUIFA areas can play a critical role in wildfire mitigation. The types of plants and trees used in landscaping can play a role in exacerbating or mitigating wildfire conditions. Greater use and expansion of the Fire District’s Undesirable Plants and Trees list can reduce wildfire threats, allowing City and Fire District resources to be better used during a fire incident. In addition, the City has an aging population of windrows that consist mainly of Blue Gum Eucalyptus trees. These windrows can increase wildfire risk if not maintained (removal of undergrowth and debris) or become diseased. In addition, as these windrows age and deteriorate in health, they may also become susceptible to loss of limbs or could fall over during extreme wind events.

Severe Weather

Extreme heat is anticipated to be a major focus for the City and many inland communities in the foreseeable future. As summer temperatures increase along with the number of extreme heat days and heatwaves, the City should focus on improvements to their assets that can accommodate these new conditions. While the number of extreme heat days has been relatively low in the past (4 days per year on average), it is anticipated that by 2050-2099 the City could experience between 21 and 35 extreme heat days per year, under medium and high emissions projections. This increase should be accounted for in any improvements to city-owned facilities dealing with energy efficiency and resilience.

Since winds are one of the most common hazards impacting the City annually, strategies focused on better design and construction to reduce wind impacts can play a key role in mitigating wind hazards. Critical to reducing wind hazards is a better understanding of the health and condition of large trees within the City as well as remaining windrows that are most vulnerable to strong winds. A key component to understanding these potential impacts would be areas where inadequate planting and maintenance techniques have been practiced.

Changes, Trends, and Opportunities

Evacuation Routes

The need to further analyze evacuation routes and access is one of the most recent changes in Safety Element requirements. These new requirements focus on the identification of areas where routes are lacking or inadequate. A key opportunity with PlanRC is the ability to look at circulation and mobility issues comprehensively to address both everyday community needs as well as specific evacuation needs.

Pending Legislation

In addition to evacuation requirements, the California Legislature is currently developing new legislation (SB 182) that would require the Safety Element be reviewed and updated as necessary to include a comprehensive retrofit strategy to reduce the risk of property loss and damage during wildfires.

Key elements of the strategy should include:

- A list of the types of retrofits needed in an area based on fire risk.
- A process for identifying and inventorying structures in need of retrofit for fire hardening. The strategy shall prioritize the identification and inventorying of residential structures in very high fire risk areas.
- Goals and milestones for completing the needed retrofit work.
- Potential funding sources and financing strategies to pay for needed retrofits on public and private property.
- Once adopted, the planning agency shall submit the adopted comprehensive retrofit strategy to the Office of Planning and Research for inclusion in the clearinghouse established according to Section 71360 of the PRC.

As of April 2020, this bill is currently being held in the California State Assembly, awaiting completion and final approval from the Governor. Moving forward, the City should monitor and incorporate these elements into key plans and programs to ensure easy implementation. Many of the strategies identified can be integrated into existing plans, eliminating the need for additional planning and tracking. The City should investigate the integration of these requirements into the City’s updated Community Wildfire Protection Plan, once completed.

Risk Management

Finally, the PlanRC project has an opportunity to identify risk management strategies that can support greater investment in infrastructure to better support resilience. Key strategies may include:

- Expansion and enhancement of fiber optic infrastructure to better support telecommuting and greater reliance on flexible working environments.
- Backup power storage and generation to reduce the threat of power loss during extreme weather events, as well as Public Safety Power Shutoff periods.
- Transfer of development rights from areas of significant hazards to areas with little to no hazards (see Figure 1).

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Appendix A

The following overview provides detailed information regarding the California Government Code pertaining to General Plan Safety Element Requirements.

Overview of Government Code Section 65302 (g)

This section of the California Government Code is organized into nine subsections that address a variety of issues. The basic requirements are identified in subsection 1, while specific updates and new requirements are identified in the subsequent eight sections.

GC Section 65302 (g) (1): requires that a jurisdiction prepare a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence; liquefaction; and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wildland and urban fires.

The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, military installations, peak load water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

GC Section 65302 (g) (2) adopted through AB 162 (2007): requires upon the next Housing Element update after 2009 that the jurisdiction:

A. Identify information regarding flood hazards from a variety of sources like FEMA, US Army Corps of Engineers, Central Valley Flood Protection Board, California Department of Water Resources, and other relevant sources that identify areas of historical/current flooding, existing and planned development in flood hazard zones, and other relevant flood issues that pertain to the jurisdiction.

B. Establish a set of comprehensive goals, policies, and objectives for the protection of the community from the unreasonable risks of flooding, and

C. Establish a set of feasible implementation measures designed to carry out those goals, policies, and objectives.

65302 (g) (3) adopted through SB 1241 (2012): Upon the next Housing Element update after January 1, 2014, the safety element to be updated as necessary to address the risk of fire for land classified as state responsibility areas, as defined in Section 4102 of the Public Resources Code, and land classified as very high fire hazard severity zones, as defined in Section 51177. This update should include:

A. Information regarding the location of fire hazard severity zones, historical wildfire information, wildfire information from Federal Agencies (USGS), location of existing and planned uses in fire-prone areas, and identification of responsible agencies overseeing fire protection.

B. A set of goals, policies, and objectives based on the above information for the protection of the community from the unreasonable risk of wildfire.

C. A set of feasible implementation measures designed to carry out the goals, policies, and objectives above that focus on avoiding or minimizing new development in fire-prone areas, locating essential facilities outside of high fire risk areas, when feasible, designing adequate infrastructure in fire-prone areas, and working cooperatively with other agencies responsible for fire protection in or near the jurisdiction.

D. If a city or county has adopted a fire safety plan or document separate from the general plan that fulfills the commensurate goals and objectives above can be used to comply with these requirements.

65302 (g) (4) adopted through SB 379 (2015): Upon the next revision of a local hazard mitigation plan, adopted in accordance with the federal Disaster Mitigation Act of 2000 (Public Law 106-390), on or after January 1, 2017, or, if a local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2022, the safety element shall be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to a city or county. This review shall consider the advice provided in the Office of Planning and Research's General Plan Guidelines and shall include all of the following:

A. A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including, but not limited to, an assessment of how climate change may affect the risks addressed.

Information that may be available from federal, state, regional, and local agencies that will assist in developing the vulnerability assessment and the adaptation policies and strategies.

B. A set of adaptation and resilience goals, policies, and objectives based on the information above.

C. A set of feasible implementation measures designed to carry out the goals, policies, and objectives identified above.

D. If a jurisdiction has prepared a local hazard mitigation plan, or other climate adaptation plan or document that fulfills the requirements above, that document can be referenced or attached to the Safety Element and where necessary, provide the information needed to show compliance with these requirements.

65302 (g) (5) adopted through SB 99 (2019): Upon the next revision of the housing element on or after January 1, 2020, the safety element shall be reviewed and updated as necessary to identify residential developments in any hazard area identified in the safety element that do not have at least two emergency evacuation routes.

65302 (g) (6) adopted through SB 1035 (2018): After the initial revision of the safety element pursuant to paragraphs (2), (3), (4), and (5), the planning agency shall review and, if necessary, revise the safety element upon each revision of the housing element or local hazard mitigation plan, but not less than once every eight years, to identify new information relating to flood and fire hazards and climate adaptation and resiliency strategies applicable to a city or county that was not available during the previous revision of the safety element.

65302 (g) (7): Cities and counties that have flood plain management ordinances that have been approved by FEMA that substantially comply with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions or the flood plain ordinance, specifically showing how each requirement of this subdivision has been met.

65302 (g) (8): Before the periodic review of its general plan and before preparing or revising its safety element, a city and county shall consult the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board, if a city or county is located within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code, and the Office of Emergency Services for the purpose of including information known by and available to the department, the agency, and the board required by this subdivision. ***Additional provisions to this requirement are identified in the discussion regarding "Recent Government Changes that Integrate into the Schedule."***

65302 (g) (9): To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to a city's planning area in satisfaction of the requirement imposed by this subdivision.

Recent Government Code Changes that Integrate into a Safety Element Update Schedule

65302.5. adopted through AB 2911 (2018): establishes required review time frames for Safety Element review by state agencies.

California Geological Survey

At least 45 days prior to adoption or amendment, the safety element shall be submitted to the California Geological Survey of the Department of Conservation to determine whether they incorporate known seismic and other geologic hazard information, and report its findings to the planning agency within 30 days of receipt. The legislative body shall consider the division's findings prior to final adoption of the safety element or amendment unless the division's findings are not available within the above prescribed time limits or unless the division has indicated to a city or county that the division will not review the safety element. If the division's findings are not available within those prescribed time limits, the legislative body may take the division's findings into consideration at the time it considers future amendments to the safety element. Each county and city shall provide the division with a copy of its adopted safety element or amendments. The division may review adopted safety elements or amendments and report its findings. All findings made by the division shall be advisory to the planning agency and legislative body.

Cal FIRE

The draft element of or draft amendment to the safety element shall be submitted to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in a city or county at least 90 days before either of the following:

- The adoption or amendment to the safety element for each county that contains state responsibility areas.
- The adoption or amendment to the safety element for each city or county that contains a very high fire hazard severity zone.

The State Board of Forestry and Fire Protection shall, and a local agency may, review the draft of an existing safety element and recommend changes to the planning agency within 60 days of its receipt regarding both of the following:

- Uses of land and policies in state responsibility areas and very high fire hazard severity zones that will protect life, property, and natural resources from unreasonable risks associated with wildland fires.
- Methods and strategies for wildland fire risk reduction and prevention within state responsibility areas and very high fire hazard severity zones. These methods and strategies shall reflect accepted best practices in the most recent guidance document entitled “Fire Hazard Planning, General Plan Technical Advice Series.”
- Prior to the adoption of its draft element or draft amendment, the board of supervisors of the county or the city council of a city shall consider the recommendations, if any, made by the State Board of Forestry and Fire Protection and any local agency that provides fire protection to territory in a city or county. If the board of supervisors or city council determines not to accept all or some of the recommendations, if any, made by the State Board of Forestry and Fire Protection or local agency, the board of supervisors or city council shall communicate in writing to the State Board of Forestry and Fire Protection or the local agency, its reasons for not accepting the recommendations.
- If the board of supervisors or city council proposes not to adopt the board’s recommendations concerning its draft element or draft amendment, the board, within 15 days of receipt of the board of supervisors’ or city council’s written response, may request in writing a consultation with the board of supervisors or city council to discuss the board’s recommendations and the board of supervisors’ or city council’s response. The consultation may be conducted in person, electronically, or telephonically. If the board requests a consultation pursuant to this subparagraph, the board of supervisors or city council shall not approve the draft element or draft amendment until after consulting with the board. The consultation shall occur no later than 30 days after the board’s request.

If the State Board of Forestry and Fire Protection’s or local agency’s recommendations are not available within the time limits required by this section, the board of supervisors or city council may act without those recommendations. The board of supervisors or city council shall take the recommendations into consideration the next time it considers amendments to the safety element.

Health and Environmental Justice

Existing Conditions Report

June 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Table of Contents

Introduction

This chapter provides an overview of healthy communities, outlines the structure of the report, and discusses early implications of COVID-19 for community health planning.

Overview

The purpose of this report is to support development of health and environmental justice strategies through PlanRC, the General Plan Update for the City of Rancho Cucamonga. Health and environmental justice are achieved when every person can reach their optimal social, physical, and mental well-being at all stages of life, regardless of where they live or their racial and ethnic background. This chapter helps readers to understand how social determinants of health shape both individual and community outcomes and how these topics fit into the general plan update.

What are Healthy Communities?

Healthy communities are places that foster positive health outcomes for all who live, work, or play in them. They do this through policy, program, and design interventions in the physical environment. Research has shown that the physical environment of a community is one of the social determinants of health that shapes both individual and community health. Other social and economic determinants of health, that fall outside of the realm of planning, include health behaviors and the socioeconomic status of the population. Together, physical environment, health behaviors, and the socioeconomic conditions in a community have a complex relationship that shapes the health outcomes of all people in a community.

This report provides an overview of health outcomes and behaviors and socioeconomic conditions, then focuses on seven components of the physical environment, where the general plan update process may be most influential (Figure 1). These components have rich data that can be analyzed historically and spatially or by socioeconomic characteristics of the population and each have a relationship to community health outcomes:

1. **Healthcare Status.** Access to quality health care, including access to service providers, health institutions, and insurance coverage and usage, strengthens the safety net and helps people stay healthy year-round. This component of healthy communities covers several of the conditions that most people think of first when asked to explore possible explanations for existing public health issues or disparities.
2. **Housing Affordability.** Stable housing, which is often connected to affordability and employment opportunities, can improve health outcomes if it is safe from environmental threats or habitability conditions. It can also reduce health care costs by reducing psychological distress which can exacerbate or complicate illness.
3. **Public Safety.** Rates of crime in a community can influence perceptions of safety, promote use of public spaces, and support social cohesion strategies that reduce distress and chronic illness in the population. Public safety response times, particularly for health and hazard mitigation, can be improved through urban design and crime reduction that decreases strain on emergency resources.
4. **Walkability and Mobility.** Walk access to various key destinations can support increases in physical activity, promote pedestrian and vehicular safety, and increase access to and use of basic services that enhance population health. Safe and affordable modes of transportation can also encourage residents and workers to shift

from greenhouse gas emitting private vehicles to more environmentally friendly and health-promoting means of transportation.

5. **Healthy Food Environment.** Supporting healthy food access can promote nutritious food options, lower risk for chronic diseases, and address food insecurity for vulnerable populations. When access to health care services is limited, a healthy diet can serve both as a strong foundation of health promotion and as medicine to aid in chronic disease management. Outside of the healthy food environment, factors such as travel time to work, household income, and home cooking facilities also shape healthy eating behaviors.
6. **Exposure to Pollution and Other Toxins.** Addressing environmental burdens promotes health equity and ensures every person in a community has an opportunity to reach their optimal social, physical, and mental well-being at all stages of life. Exposure to pollution, whether in the home, workplaces, or community and from stationary sources, like industrial facilities, or mobile sources, like vehicles on high-traffic roadways, has significant impacts on the health of people across all ages. For example, research has shown that ozone, a byproduct of vehicle exhaust, can affect pregnant women, resulting in low birth weight. This health condition can affect child physical and cognitive development and have lasting effects through adulthood into senior age. When considered with other components, exposure to pollution and other toxins can even cancel out the benefits of healthy behaviors and access to health-promoting assets.
7. **Resilience to Climate and Natural Hazards.** Identifying climate risks can help local governments support community preparedness, while also advancing racial and social justice more broadly. While many indicators reviewed in other components—such as pedestrian collisions, crime, and housing cost-burden—measure short-term impacts and outcomes in a healthy community, resilience to climate and natural hazards concerns itself with how prepared, overall, a community or population is for long-term impacts of shocks to the environment. The indicators addressed in this component often reflect and magnify disparities or inequities found in other community health components.

Figure 1. Healthy Communities Components

Sources: Raimi + Associates

Report Structure

This report begins with an overview of the existing policies related to community health and the physical environment and is then followed by four assessments, illustrated in Figure 2: Overview of Report Structure: Context, Assessments, and Indicators. Data comes from public agencies and private entities that record and produce analyses on population health and environmental quality. Where possible, data from Healthy RC surveys of self-reported health and quality of life conditions supplements the analyses.

The **Overview of Existing Policies and Programs** provides context for understanding the current conditions in Rancho Cucamonga. It is intended as an overview of highlights and successes and not as an exhaustive accounting of efforts related to health and environmental justice.

The **Disadvantaged Communities/Priority Neighborhoods Assessment** provides statutory context related to Senate Bill 1000 (SB 1000), The Planning for Healthy Communities Act, and analyzes pollution exposures and income to identify disadvantaged communities. This chapter meets the State of California for determination of SB 1000 applicability in the general plan update.

The **Health Outcomes and Behaviors Assessment** is an overview of the health status of the population across indicators that paint a picture of community wellbeing. Having a sense of statistics related to life expectancy, leading causes of death, and incidence of chronic disease can highlight areas where the City is doing well and where there may be a need for improvements to the physical environment.

The **Demographic and Socioeconomic Assessment** establishes a baseline of information on race and ethnicity, income, education, and other indicators that can be used to explore spatial, racial, and economic disparities across priority neighborhoods or the population. Socioeconomic status is the most influential determinant of health outcomes and it is highly correlated with race. Understanding demographic and socioeconomic distribution and concentration can help the City develop targeted physical environment strategies to mitigate disadvantages related to income.

The **Healthy Communities Assessment** is the most comprehensive of the four assessments. It intersects information from the first three assessments with maps and data on the physical environment in Rancho Cucamonga. The analysis across all seven components results in health and environmental justice strengths, weaknesses, opportunities, and threats for the city as a whole and for priority neighborhoods.

Across all five assessments, data is provided and analyzed at the following units of analysis:

- <u>Citywide</u>: Outcomes for the City of Rancho Cucamonga are compared to outcomes for the County of San Bernardino or the State of California. This data is typically collected by public health and planning agencies, such as the California Department of Public Health, the County of San Bernardino, or the Southern California Association of Governments, and provides comparison points across California's jurisdictions to support planning and policy activities.
- <u>Census Tract</u>: Public agencies, across all sectors, often disaggregate their data into smaller units of analysis. This allows for more detailed analysis and for understanding conditions across neighborhoods within a jurisdiction. Census tract level data in this report comes from a range of entities, including the American Community Survey, the CalEnviroScreen 3.0 Tool, and from other public agencies. Census tract level data can be used as-is or can be combined into city, county, or state estimates. This flexibility makes it the golden standard for data collection. The City of Rancho Cucamonga, in its own local data collection activities, also disaggregates citywide

data into this unit of analysis—making it easy to compare responses from a local survey to datasets from a range of agencies.

To facilitate discussion of the distribution or concentration of any outcome or condition, this report relies on the City of Rancho Cucamonga's census tract coding system (Figure 3). This system overlays a code, with numbers between 0 and 29, onto census tract boundaries within the city and is helpful in shortening the "naming" of these geographic units.[1]

- Census Block Groups: The U.S. Census Bureau disaggregates its data into even smaller units of analysis, such as block groups. While not all public agencies provide data at the census block group level, this report uses block groups when mapping some indicators from the American Community Survey. This approach allows more detail to come across when assessing the spatial distribution or concentration of certain indicators.

Figure 2. Overview of Report Structure: Context, Assessments, and Indicators

Overview of Existing Policies and Programs

This chapter of the report introduces Healthy RC and related existing policies and programs.

Disadvantaged Communities / Priority Neighborhood Assessment

The Disadvantaged Communities / Priority Neighborhood Assessment identifies environmental justice areas of the City of Rancho Cucamonga to determine Senate Bill 1000 applicability for the general plan update process. Indicators considered are the CalEnviroScreen 3.0 Index Scores, Area Median Income, and Exposure to Pollution.

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[1] Each map in the report is displayed either by census block group or by census tract, as noted in the title or below each map. In addition, each map includes the boundaries of all identified disadvantaged communities in Rancho Cucamonga.

Health Outcomes and Behaviors

The Health Outcomes and Behaviors Assessment looks at a set of indicators influenced by the physical environment:

- Life Expectancy
- Leading Causes of Death
- Chronic Diseases (Cancer, Cardiovascular Disease, Respiratory Disease)
- Mental Health (Youth, Adults)
- Health Behaviors (Physical Activity and Diet)

Demographic and Socioeconomic

The Demographic and Socioeconomic Conditions Assessment looks at social and economic indicators that are determinants of health outcomes:

- Race and Ethnicity
- Language
- Age
- Household Income
- Educational Attainment
- Unemployment and Poverty

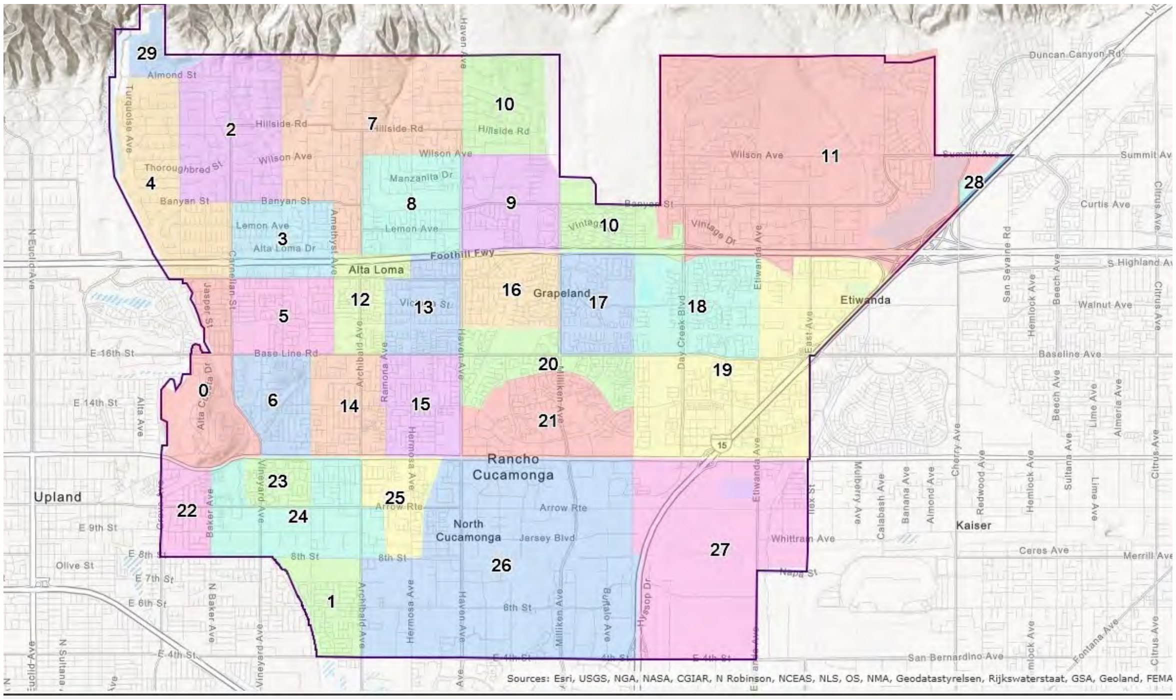
Healthy Communities Assessment

The Healthy Communities Assessment looks at the physical environment as a social determinant of health across seven components, each with its own set of indicators:

- **Healthcare Status**
  - Insurance Coverage
  - Healthcare Facilities
- **Housing Affordability**
  - Tenure
  - Housing Cost Burden
- **Public Safety**
  - Property Crimes
  - Violent Crimes
- **Healthy Food Environment**
  - Healthy Food Access
  - Self-Reported Food Insecurity
  - Free and Reduced Lunch Eligibility
- **Walkability and Mobility**
  - Intersection Density
  - Walkability Index
  - Walk Access (to Commercial Uses, to Transit Stops, to Parks and Schools)
  - Limited Vehicle (1 or less) Ownership
  - Collisions (Pedestrian, Bicycle, Vehicle)
- **Exposure to Pollution and Other Toxics**
  - Pollution Burden
  - Ozone
  - PM 2.5
  - Diesel PM
  - Toxic Releases from Facilities
  - Solid Waste Sites and Facilities
  - Hazardous Waste Generators and Facilities
  - Cleanup Sites
- **Resilience to Climate and Natural Hazards**
  - *Note: Analysis of this component will be completed through the SB 379 (Safety Element) Needs Assessment of the General Plan Update. This report includes a discussion of the research on resilience to climate and natural hazards and impacts on disadvantaged communities/priority neighborhoods.*

Source: Raimi + Associates

Figure 3. City of Rancho Cucamonga Census Tract Coding System, Reference Map



Source: City of Rancho Cucamonga

Relationship to Other PlanRC Existing Conditions Reports

Other existing conditions reports prepared as part of the Rancho Cucamonga General Plan Update cover related topics that impact overall health and quality of life. These include:

- The **Land Use, Urban Design, and Public Realm Report**, which covers topics related to walkable access to goods and services, use of public spaces, and the creation of vibrant neighborhoods.
- The **Mobility and Transportation Report**, which addresses active transportation, access to public transit, and transportation safety, including pedestrian, vehicle, and bicycle collisions.
- The **Economic Profile and Market Conditions Report**, which discusses future economic growth, business opportunities, workforce systems, and development of a strong local economy.
- The **Climate Change, Air Quality, and Noise Reports**, which provide an in-depth analysis of strategies to reduce greenhouse gas emissions and address negative health impacts.
- The **Environmental Report**, which covers biological, cultural, and historical resources, important assets in promoting community health.

Together, these reports provide a thorough assessment of existing conditions in the city and a framework for addressing health and environmental justice impacts in the City of Rancho Cucamonga.

The City of Rancho Cucamonga strives to improve health through its progressive policies. Nevertheless, like all cities in the United States, it has been shaped by city planning policies and social norms of the past that have legacies of effects on how the city has developed and what the conditions are today. This includes disparities across access to parks, protection from pollution exposure, or access to safe and affordable housing. As a suburban city located in the second-largest metropolitan area in the United States, it faces many urban problems, such as socioeconomic and racial inequities. This context may sometimes be a barrier to achieving the vision of a Rancho Cucamonga where all generations lead vibrant, healthy, happy lives.

COVID-19 and the Community Health Planning Process

At the time of writing this report, the COVID-19 Pandemic has emerged as a threat to the decades-long work of planning for health in Rancho Cucamonga. Local governments are being tasked with enacting "social distancing" measures, closing large segments of the economy, sanitizing public infrastructure, and taking other similarly restrictive measures to protect the health of their residents and workforce. What we know about the impacts of COVID-19 on the human body, the economy, and the future of cities continues to change. In the first six months, we have come to understand:

- Environmental injustices, such as cumulative exposure to pollutants in the home or workplace, have resulted in weakened or compromised immunity for older adults.
- Pre-existing chronic health diseases—like diabetes, heart disease and asthma—are all leading factors in complications requiring hospitalization or, at worse, mortality.
- Incidence and mortality rates are worse for Black/African American, Hispanic/Latino, and Native Hawaiian or Pacific Islander populations. All of these racial or ethnic population groups are more likely than White populations to have a lower socioeconomic status, which is the greatest determinant of health outcomes.
- Unhoused residents, who are poor or have fixed or no income, and "essential workers," particularly in the goods movement and food delivery sectors, are less able to "shelter in place," seek medical treatment, or take paid leave when ill. This results in a dual threat of increased community transmission and decreased testing in poor and low-income communities.
- Lastly, many people are unable to afford historic high rents that continue to rise through the crisis. Prior to the pandemic, the housing crisis caused large-scale displacement and migration across the Los Angeles and Inland Empire regions and is now made worse by historic unemployment, which renders poor and working-class residents unable to pay rent.

These are just some of the health and economic conditions that we have begun to experience and observe because of the pandemic. More will change and the impacts of the virus, from lives lost and long-term economic losses, will affect society for many years to come, reinforcing the necessity for comprehensive health and environmental justice planning with a social determinants of health approach.

Overview of Existing Policies and Programs

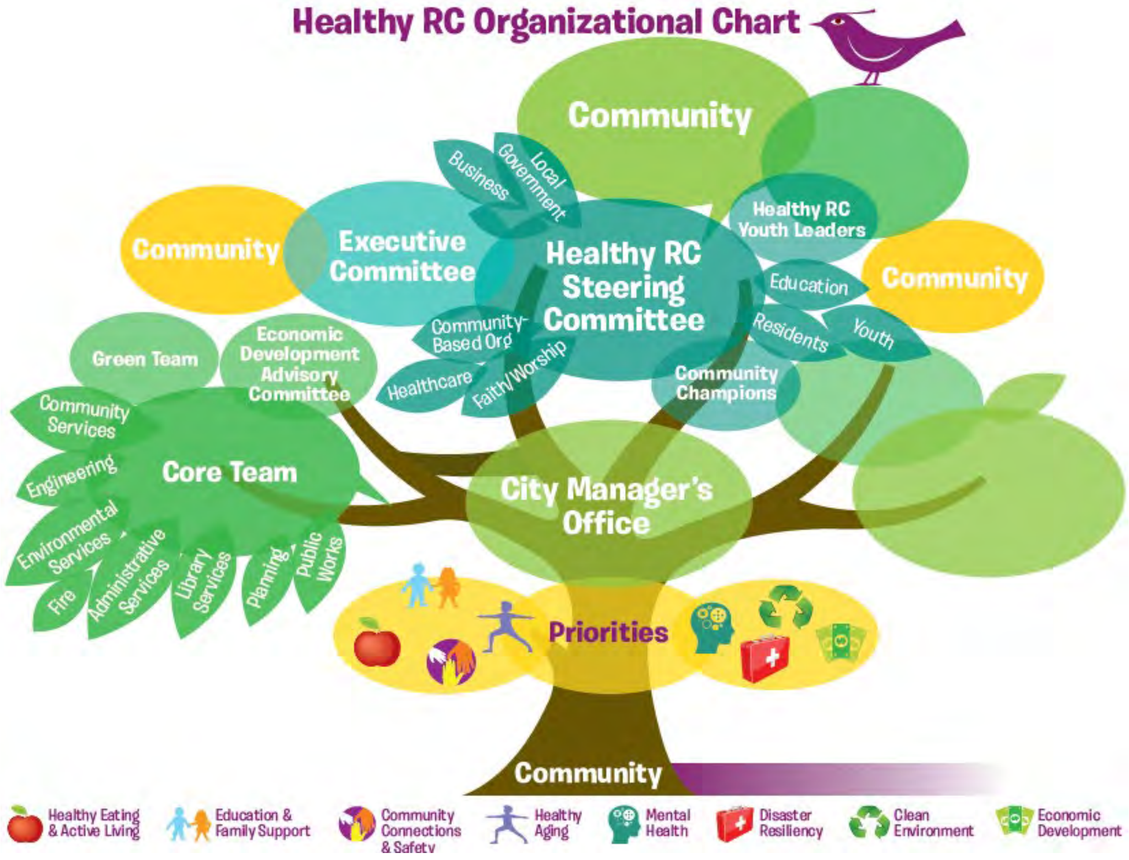
This section provides a summary of existing policies and programs related to health in Rancho Cucamonga. It provides context for discussion of many of the indicators analyzed in the report by discussing the latest efforts of the Healthy RC initiative.

Healthy RC

In 2008, the City Council established Healthy RC – a comprehensive City-community partnership committed to long-term policy, systems, and environmental changes to support healthy living and a sustainable community. Healthy RC's initial activities defined health broadly by identifying and promoting City efforts to improve community health within and across all City departments. The Healthy RC partnership has evolved from a small group of agencies to a broad community partnership of over 75 committed residents, community organizations and public entities representing the diversity of Rancho Cucamonga, as illustrated in Figure 4. Each of the icons at the center and roots of the tree represents a community-identified health priority for Rancho Cucamonga.

As the City's culture of health has grown, so have efforts to create healthy environments and put good health within reach of all residents. While the initiative focuses on the entire community, Healthy RC places special emphasis on those most at risk for adverse health conditions, based on race/ethnicity, income, and/or geographic location. It is through Healthy RC's teamwork, innovation, and commitment to creating a culture of health that has positioned the City as a leader in community health planning in the region and country.

Figure 4. Healthy RC Organizational Chart



Source: City of Rancho Cucamonga

Vision and Goals

Healthy RC envisions "a community where all generations lead vibrant, healthy, happy lives" and provides community leaders, partners, and City staff with the resources and understanding to implement this vision. Since its inception in 2008, Healthy RC has evolved to meet the changing needs of the community outlined in both the 2011 Healthy RC Strategic Plan and the 2015 Healthy RC Evaluation Plan. Each of the eight priority areas has community-identified goals, as outlined in Table 1, developed through robust and intentional engagement—from surveys to stakeholder interviews to forums and more.

Table 1. Healthy RC Priority Areas and Goals

Healthy Eating and Active Living *Goal: Rancho Cucamonga residents of all ages and income levels have knowledge, motivation, and easy access to eat healthy and be physically active.*	**Economic Development** *Goal: The City of Rancho Cucamonga has a strong, growing economy that provides employment opportunities for local residents, attracts investments, supports local businesses, and generates public revenue.*
Community Connections and Safety	**Clean Environment**

Goal: Rancho neighborhoods, schools, families, businesses, community organizations, and government agencies have a strong sense of community and shared responsibility for the health and safety of their city.	*Goal: Residents of Rancho Cucamonga live in a clean, healthy environment and actively contribute to sustaining and protecting the natural resources of their city and region.*
Education and Family Support *Goal: Youth, families, and adults in Rancho Cucamonga receive high quality education, healthcare, and support services to realize their full potential and contribute to their community.*	**Healthy Aging** *Goal: Older adults in Rancho Cucamonga are healthy, active, engaged members of the community and the City is positioned to respond effectively to the needs of an increasing older population.*
Mental Health *Goal: Mental health support services are easily accessible, culturally appropriate, and free of stigma for all residents of Rancho Cucamonga.*	**Disaster Resiliency** *Goal: Rancho Cucamonga residents, businesses, community organizations, and government agencies are well prepared to survive, respond to, and recover from disasters and emergencies.*

Source: City of Rancho Cucamonga

Accomplishments

As a result of continued commitment to health and to the role of community leadership and collaboration across businesses, schools, and other organizations, the following lists just some of the planning and policy documents or programs have incorporated community and individual health as a top priority in the City of Rancho Cucamonga:

Planning or Policy Documents

- **2010 General Plan** – The City's guiding constitution, organized into a planning framework echoing three tents of Healthy RC: Healthy Mind, Body, and Earth.
- **Farmers' Market Ordinance** – Expands zoning for farmers' market locations throughout the City of Rancho Cucamonga and reduces associated fees.
- **Community Garden Ordinance** - Promotes community gardens by allowing them in most locations throughout the city and reducing associated fees.
- **Healthy Nutrition and Beverage Standards Resolution** – Requires 50 percent of items (food & beverages) sold and served at City facilities to meet health standards established by the federal "Dietary Guidelines for Americans."
- **Complete Streets Ordinance** – Creates a safe, comfortable, and interrelated transportation network for all users (regardless of age, ability, income, ethnicity) and modes of transportation (vehicles, pedestrians, bicyclists, transit riders).
- **Circulation Master Plan** – Works in concert with the complete streets ordinance to increase physical activity, reduce risk of chronic illness, improve local businesses, and reduce greenhouse gas emissions to improve air quality throughout the city.
- **Sustainable Community Action Plan** – Summarizes the direction and future goals for sustainability in Rancho Cucamonga.

- **Lactation Accommodation Policy** – Promotes infant health by making private breastfeeding space available in all City facilities.
- **Community Engagement Policy with a Health Equity Lens** – The most recent accomplishment of Healthy RC, sets Citywide policy and engagement practices to ensure all voices are heard in the decision-making processes of the City.

Programs

- **Cocinando Amigos Saludables y Alegres** (CASA, *Healthy and Happy Cooking Friends*) – A program that has served thousands of participants over the years by improving their cooking and eating habits in support of individual and family health.
- **Play and Learn Islands at City Libraries** – Helps young children at Rancho's libraries build a variety of lifelong learning and literacy skills through play, including developing their understanding of the importance of healthy food and physical activity.
- **Employee Health and Wellness Program**– Designed to help City employees and their families live healthy and productive lives by increasing access to nutritional classes, stress therapy, health fairs, and physical fitness opportunities.

Together, these planning and policy documents and programs create momentum for the realization of a vision of community health. They have also led to local and national recognition of the Healthy RC initiative and of the City of Rancho Cucamonga as a leader in health planning.

Quality of Life Assessments

The City of Rancho Cucamonga regularly conducts surveys and analyses to track the impact of Healthy RC on community health. The Quality of Life Assessment was first conducted in 2016 and asks a range of questions touching on each of the eight priority areas of the Healthy RC initiative. In the latest assessment, completed in 2019, the city surveyed 1,704 residents. The Teen Quality of Life Survey looks at similar questions but is only taken by teens. The latest assessment, also completed in 2019, was taken by 1,252 teenagers. Results of this survey and related existing health conditions are woven throughout this report.

Disadvantaged Communities / Priority Neighborhoods Assessment

This chapter introduces Senate Bill 1000, the Planning for Healthy Communities Act, defines environmental justice concepts, and describes the methods of analysis and results of identification of disadvantaged communities / priority neighborhoods.

What is Environmental Justice?

People of color and low-income households often have limited access to the health-promoting benefits of Healthy Communities, instead experiencing a greater share of the health-harming burdens. This is a social and economic dynamic referred to as environmental justice and can look like:

- Only having the option to rent or buy homes that are sited next to incompatible uses, like warehouses, industrial sites, freeways, or waste management facilities.
- Being unable to access high-quality and well-maintained public services or amenities, such as schools, parks, libraries, or community centers because the quality of these public amenities is often determined by the property values of homes—and property values of homes near incompatible uses are often lower than in areas without these incompatibility issues.
- Not being considered or having decision-making power in review of projects and proposals that often lead to even higher concentration of health-harming burdens in your neighborhood.

Environmental injustice, thus, is an outcome of the complex relationships of social and economic determinants of health and can, like community health, be addressed through interventions in the physical environment.

This report and the general plan update process provide an opportunity for the City of Rancho Cucamonga to begin integrating these concepts into the vision, policies, and programs to continue improving health for all.

Senate Bill 1000

The State of California recognizes that environmental justice disparities are a threat to overall quality of life across all communities and has developed various policies, such as Senate Bill 1000 (SB 1000) and the Planning for Healthy Communities Act, to identify and address these environmental justice disparities.[2] The bill was passed in 2016 and serves three important purposes:

1. Reducing harmful pollutants and associated health risks in environmental justice communities;
2. Promoting equitable access to health-inducing benefits; and
3. Promoting transparency and public engagement.

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[2] The California Environmental Protection Agency (CalEPA) defines environmental justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

Through SB 1000, the State of California mandates that jurisdictions concurrently updating two or more elements of their General Plan identify "disadvantaged communities," engage stakeholders in these communities, and adopt either an environmental justice (EJ) element or integrate EJ policies throughout the General Plan to reduce unique and compounded health risks and pollution burdens. The final EJ element or EJ policies must address at least the following five health and environmental justice outcomes: Reduction of pollution exposure, including improvement of air quality; Promotion of public facilities; Promotion of food access; Promotion of safe and sanitary homes; and Promotion of physical activity.

Identification of Disadvantaged Communities

The Office of Planning and Research (OPR) provides guidance for implementing SB 1000. Additionally, the Office of the Attorney General (OAG) provides monitoring and compliance review of SB 1000. These state agencies recommend two methods for the identification of disadvantaged communities (DACs):

1. **CalEnviroScreen 3.0 Tool to Identify Disadvantaged Communities**

   The CalEnviroScreen (CES) Tool was developed by the Office of Environmental Health Hazards Assessment (OEHHA) to identify areas of the State, using census tract mapping, with high exposures to pollution and significant vulnerabilities related to demographic or socioeconomic characteristics of the population. Data for multiple indicators is collected for each census tract and combined into an index which is used as a scoring mechanism that compares communities across the State.

   The tool is currently in its third iteration (CES 3.0) and OEHHA has produced publicly available maps, data tables, and reports that show the statewide distribution of CES 3.0 scores.[3] Based on SB1000, all census tracts with CES 3.0 scores that are in the percentile range of 75 to 100 are to be identified as disadvantaged communities.

2. **Low Income Communities Analysis to Identify Disadvantaged Communities**

   California law defines low income disadvantaged communities as "an area that is a low-income" and "disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation." Guidance on SB 1000 requires use of income limits set by the Housing and Community Development Department to identify low income communities as areas with household incomes at or below 80 percent of those limits.

   The State does not specify the geographic unit of analysis necessary to complete the first step of the analysis. A City may choose to use census block groups, census tracts, zip codes, or other units of analysis to identify low income communities. The best practice is to use census block groups—a unit of analysis that is small enough to show the full range of variation in household income across a community.

   The State also does not provide direct guidance on how to complete the second part of the analysis. Nevertheless, both OPR and OAG identify the CalEnviroScreen Tool as a reliable tool to identify negative health effects, exposure, or environmental degradation.

In most jurisdictions across California, it is necessary to apply both identification methods—as the first method may not fully capture the vulnerabilities of low-income communities. Disadvantaged communities in Rancho Cucamonga, also called "priority neighborhoods," have been identified by applying both methods. The results of the first method are in Figure

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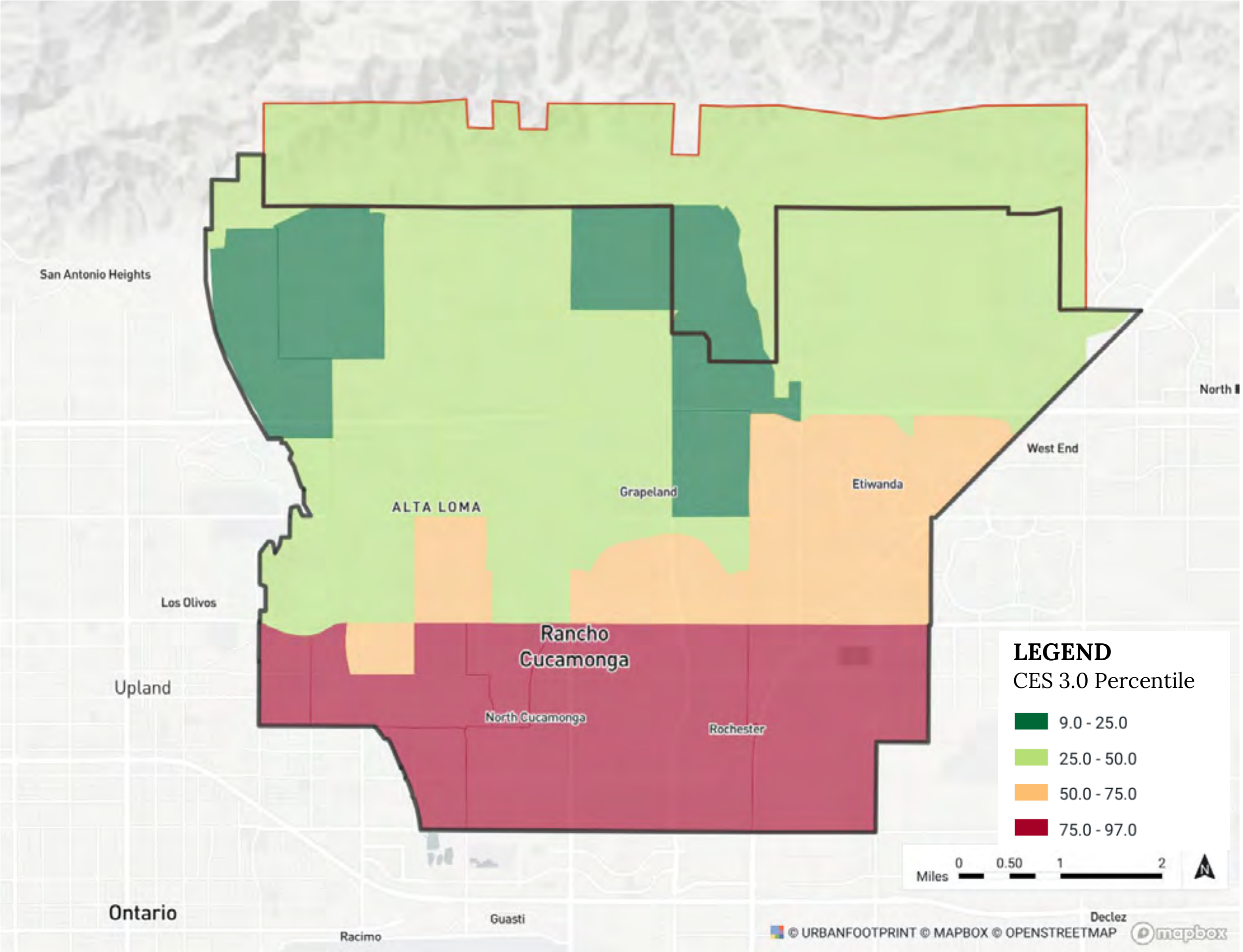
[3] All information is available through the CalEnviroScreen webpage on the OEHHA website at https://oehha.ca.gov/calenviroscreen.

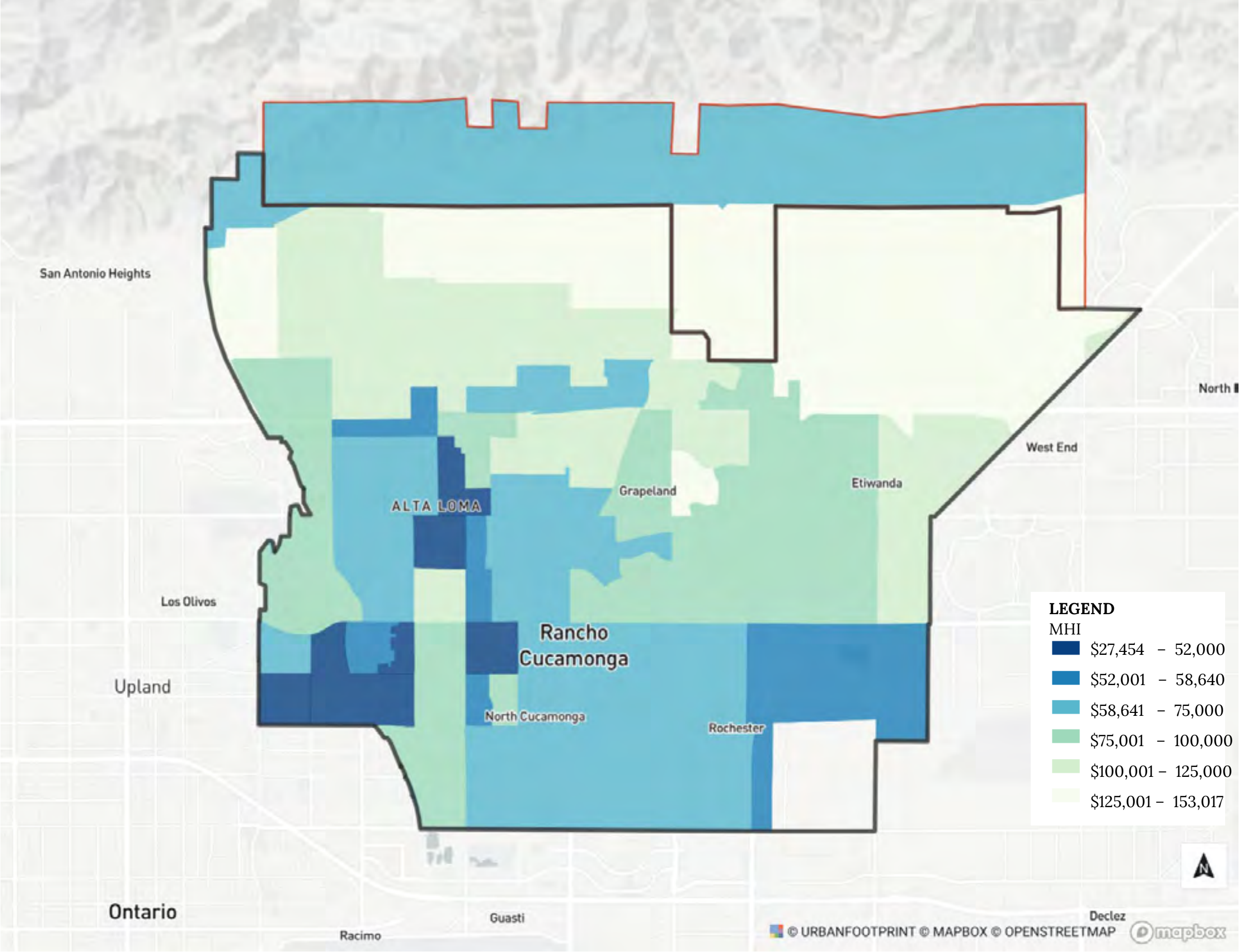
5 and those of the second method are in Figure 6. As discussed in the "Low Exposure to Pollution and Other Toxins" section of the report, all of Rancho Cucamonga experiences poor air quality and the City will have to address this through the General Plan update, thus, to apply the second method. Figure 6 shows "areas that are low-income" at the block group level. A series of composite maps of low-income communities that are affected by environmental pollution and other hazards are included in the "Low Exposure to Pollution and Other Toxins" section. The last map in this section, Figure 7, shows the combined boundaries of disadvantaged communities in Rancho Cucamonga.

Figure 5. CalEnviroScreen 3.0 Percentile Scores in Rancho Cucamonga (2018)



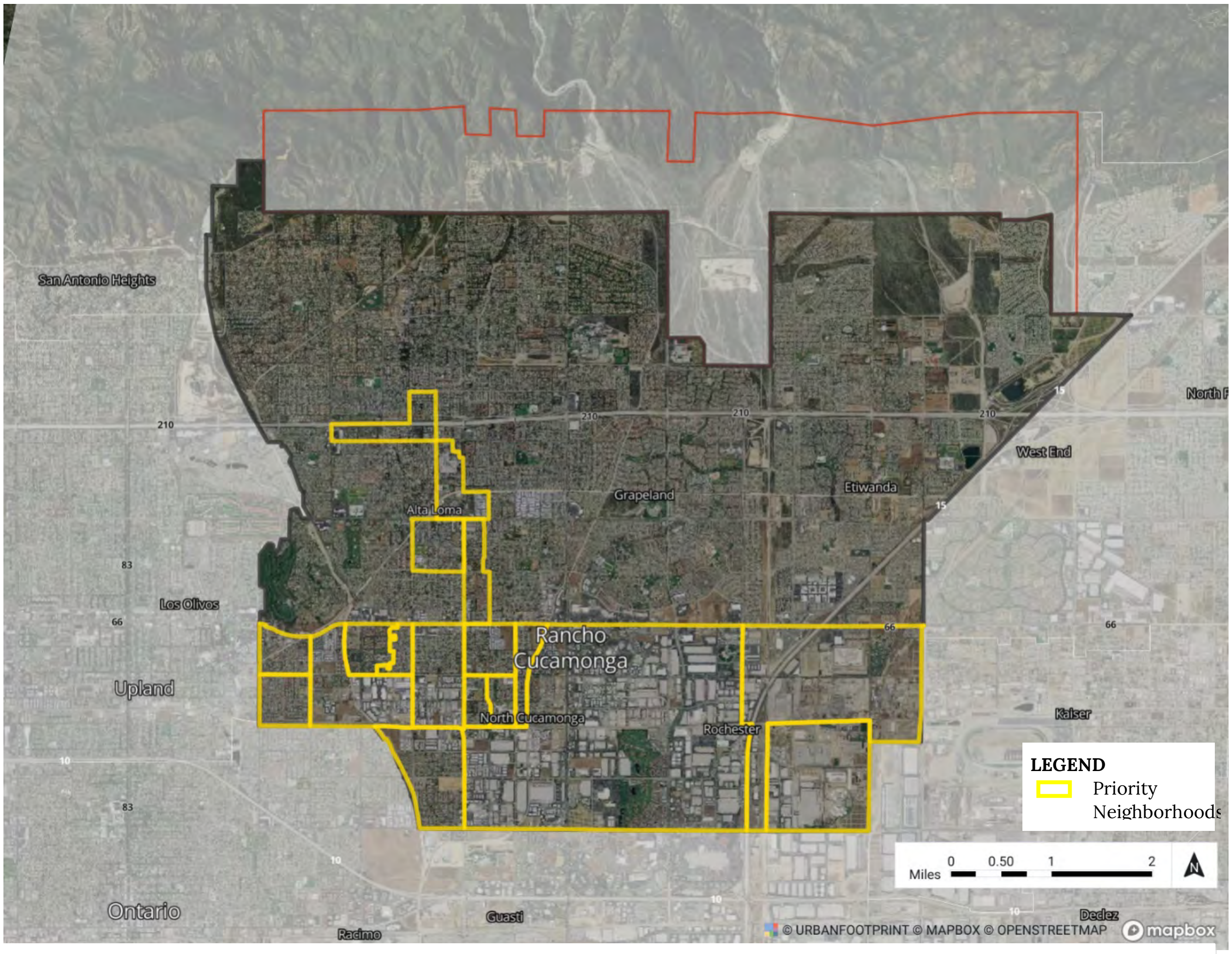
Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018)

Figure 6. Median Household Income in Rancho Cucamonga, by Census Block Group (2018)



Source: American Community Survey 5-Year Estimates 2013-2017 (2018)

Figure 7. Priority Neighborhoods (Disadvantaged Communities) in Rancho Cucamonga (2020)



Source: Raimi + Associates; OEHHA, CalEnviroScreen 3.0; American Community Survey 5-Year Estimates 2013-2017.

Health Outcomes and Behaviors Assessment

The following indicators are discussed in this section: life expectancy, leading causes of death, chronic diseases, mental health, and health behaviors.

Good health outcomes can be attributed to individual behaviors, as well as to a range of dimensions from demographic and socioeconomic status, to transportation and mobility, to access to public facilities, and to limited exposure to pollution. Having a sense of the health statistics related to life expectancy, leading causes of death, and incidence of chronic disease can highlight dimensions of health where the City of Rancho Cucamonga is performing well and areas for improvement. It can also help underscore why improving community health is a critical long-term goal for the City by identifying quality of life issues.

Life Expectancy

Life expectancy gives an approximation of quality of life and community health, overall. It is a commonly used measure that considers the impact of several dimensions of health behaviors and healthy communities' components. While this report does not make a determination of why life expectancy is high or why it varies across the city, research has shown that gaps in life expectancy within a jurisdiction are related to race and socioeconomic status, which are shown to limit access to health-promoting resources, financial and physical access to health care, or ability to live and work in areas that are not polluted. These and other factors that impact health and quality of life are discussed throughout the report and are, as discussed in each section, unequally distributed across the population, both by race and by neighborhood.

(Note: *This data is available at the census tract, city, county, and federal levels.*)

- People in Rancho Cucamonga have an average life expectancy of 80 years; this is higher than the San Bernardino County life expectancy of 78.8 years and slightly lower than the life expectancy of 81.6 years for the State of California as a whole.[4] Since factors such as air quality, mobility, and economic wellbeing affect life expectancy, consider looking at some of these factors to determine why Rancho Cucamonga's life expectancy ranks higher than the County but lower than the State.
- Life expectancy varies by census tract in Rancho Cucamonga and ranges from 73.9 to 85.8 years (Figure 8). This gap of almost 12 years across neighborhoods indicates disparities in quality of life and access to health-promoting services and resources.
- The geographic disparity in life expectancy overlaps closely with the location of priority neighborhoods south of Foothill Boulevard on the eastern and western boundaries of the city, where life expectancy estimates are in the range of 73.9-78.7 years (Figure 8). Outside of the priority neighborhood boundaries, life expectancy is also low in Census Tracts 0, 5, and 13; more research is needed to understand why life expectancy is lower in these tracts.
- Census Tract 24, a priority neighborhood, has a slightly higher life expectancy (84.6) than all other tracts or block groups identified as disadvantaged communities; also an observation worth exploring in the general plan update, as it could help with

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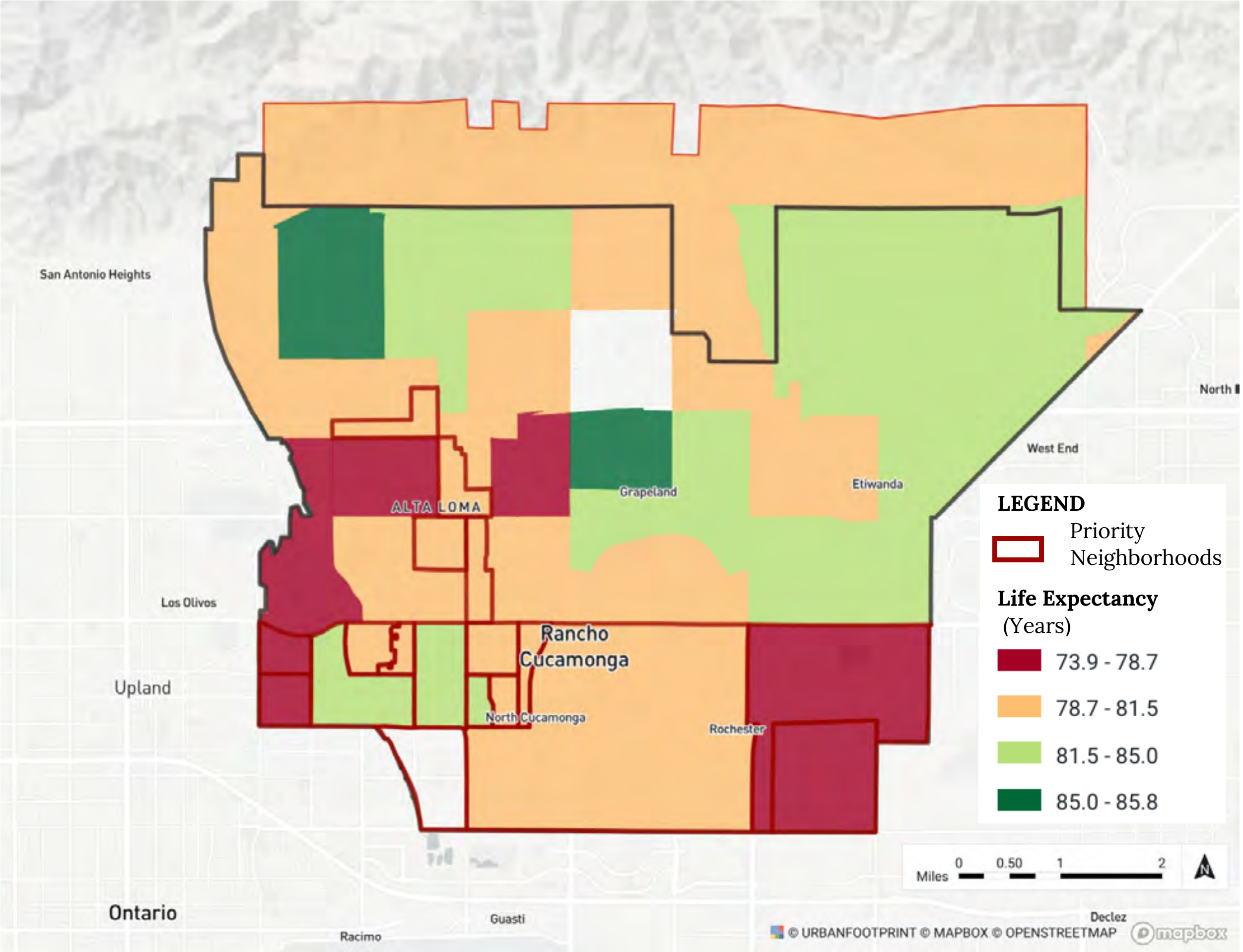
[4] USALEEP Life Expectancy Estimates; County Health Rankings (2018).

identifying health and environmental justice solutions for other areas of the city that are low income or disproportionately affected by pollution exposures.[5]

Figure 8. Life Expectancy in Rancho Cucamonga, by Census Tract



Source: USALEEP

Leading Causes of Death

Leading causes of death provide an understanding of the critical health needs in a community. The highest morbidity rates for any particular health issue often correlates with the highest-incidence of chronic diseases—that is, if more people have cardiovascular disease, then more people will likely experience complications, including mortality, from that chronic disease. Because leading causes of death are linked to chronic disease, they are also, thus, heavily influenced by the physical environment conditions in a community and further exacerbated by the socioeconomic status of a population.

Data on total number of deaths is available at the zip code level and has been aggregated for the City of Rancho Cucamonga. The most reliable data for this indicator, age-adjusted death rates, is only available at the county level. This section begins with total number of deaths

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[5] ibid.

and is followed by age-adjusted death rates for the County of San Bernardino. These two measures are not the same but are used to provide a point of comparison to explore where the City may need to identify physical environment interventions that reduce morbidity for chronic diseases.

- **Leading Causes of Death, by Total Number of Deaths in Rancho Cucamonga**
    - The five leading specific causes of death, by order from most to least number of total deaths, in Rancho Cucamonga are: All Cancers, Coronary Heart Disease, Chronic Lower Respiratory Disease, Alzheimer's Disease, and Cerebrovascular Disease (Stroke) (Figure 9).[6]
    - Figure 9 shows the third leading cause of death by total number of deaths in Rancho Cucamonga is "All other Causes," a category which is designated by the California Department of Public Health to include causes like homicide, chronic liver disease, influenza/pneumonia, drug-induced deaths, fire-arm deaths, traffic collisions, and others—for which data is provided at the county level, but not disaggregated at the zip code level.
    - Since 2009, the total number of deaths from cancers or heart diseases has fluctuated, reaching peak highs in 2017 and 2016, respectively. The total number of deaths tends to fluctuate over time, which is true for all leading causes of death in Figure 9. For example, intentional self-harm (suicide) and hypertension deaths have an overall similar rate over time, but each had a year (2015 and 2017, respectively) where the number of deaths was almost quadruple or more (18 and 15 deaths) when compared to all other years (average of 4 for both causes). These differences are to be expected and can be an important reference point to understand how conditions change over time.

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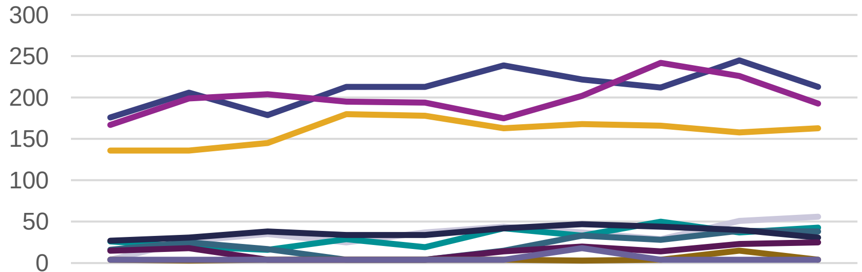
[6] California Department of Public Health. Number of Deaths by Zip Code (2019).

Figure 9. Number of Deaths by Cause, Change Over Time (2009-2018)



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cancers	176	206	179	213	213	239	222	212	245	213
Heart Diseases	167	199	204	195	194	175	202	242	226	193
All other Causes	136	136	145	180	178	163	168	166	158	163
Alzheimer's Disease	4	27	35	25	37	44	37	29	51	56
Stroke	26	20	16	29	19	42	33	50	37	43
Diabetes	16	25	17	4	4	15	33	28	39	38
Chronic Lower Respiratory Disease	27	31	38	34	34	42	47	44	40	31
Unintentional Injuries	15	18	4	4	4	14	20	14	23	25
Hypertension	4	3	4	4	4	4	3	4	15	4
Intentional Self Harm (Suicide)	4	4	4	4	4	4	18	4	4	4

Source: California Department of Public Health, 2019.

Notes: This table was produced by combining data for all zip codes in Rancho Cucamonga. "All other Causes" includes several causes of death—such as homicide, chronic liver disease, influenza/pneumonia, drug-induced deaths, fire-arm deaths, traffic collisions, and others—for which data is provided at the county level, but not disaggregated at the zip code level.

Source: California Department of Public Health County Profile for San Bernardino (2019).

Chronic Diseases

Chronic Diseases are defined as "conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both."[7] According to the Centers for Disease Control, six in ten adults in the United States have a chronic disease and four in ten adults have two or more.[8]

This section includes indicators on incidence or burden of cancer, cardiovascular disease, and respiratory disease. These chronic diseases are the greatest contributors to the leading causes of death in the City of Rancho Cucamonga and, nationally, tend to make up a significant share of annual healthcare and economic costs due to their impact on the ability of a person to live a full and healthy life.

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[7] ibid.

[8] National Center for Chronic Disease Prevention and Health Promotion. About Chronic Diseases. Accessed on April 10, 2020 at: https://www.cdc.gov/chronicdisease/about/index.htm.

(Note: *Data for these indicators is available at varied geographic units. Where possible, census tract data and city data are provided; where not possible, the smallest unit of analysis is the county level.*)

Cancer

Cancer is the leading cause of death of in Rancho Cucamonga, San Bernardino County, and the State of California. It is also the second leading cause of death in the United States with nearly 600,000 annual deaths. Many types of cancer can be treated when identified early or are preventable with changes to lifestyle and risk behaviors, or policy changes that address and mitigate health and environmental justice hazards from sources of toxins and pollution exposure.

- The type of cancer with the highest incidence rates in San Bernardino County differs between men (prostate cancer, 136.9 per 100,000) and women (breast cancer, 111.5 per 100,000). Mortality rates in the county for these types of cancer (Men – 49.4 per 100,000; Women – 33.0 per 100,000) are higher than in the state (Men – 43.5 per 100,000; Women – 30.4 per 100,000) (Table 2).[9]
- Rates of lung cancer incidence for both men and women are higher in San Bernardino County (Men – 61.5 per 100,000; Women – 43.3 per 100,000) than in the State (Men – 55.8 per 100,000; Women – 42.1 per 100,000). Overall, men have a higher incidence rate of lung cancer than women (Table 2). These elevated rates of mortality indicate a need to address the high level of air pollution and its related impacts on respiratory health. Ozone and particulate matter, major sources of air pollution, are discussed later in this report; the data and maps illustrate that exposures are a major concern across the entire city (Figures 40, 41 and 42).
- Generally, across all types of cancer, combined rates of incidence trend towards being higher for men than for women, both in the County of San Bernardino and the State of California (Table 2).
- When looking at all cancer types combined, Black men have cancer incidence (546.1 per 100,000) and mortality rates (247.3 per 100,000) that are higher than for Non-Hispanic White men, Hispanic men, and Asian men (Figures 10 and 11). While this data is not available at the city level, it is worth noting that Black people, as a whole, are less likely to have access to quality and affordable healthcare that may help address such a grave health diagnosis.
- Asian men and women tend to have lower incidence (284.3 and 283.2 per 100,000) and mortality (109.6 and 110.1 per 100,000) rates of cancers than all other groups (Figures 10 and 11). This could indicate that many Asian residents in the city have not been exposed to as many carcinogens and may need to prioritize limiting further exposure in order to maintain low levels of incidence and mortality.
- In the City of Rancho Cucamonga Quality of Life Survey (2019), only 7 percent of respondents self-reported having received a cancer diagnosis. This was the lowest self-reported chronic disease in the results, nevertheless it does not indicate cancer is not of concern for the city and the planning process. While results from the survey are statistically significant, it could point to a fear of stigma related to certain types of cancers or to privacy concerns. Regardless, the high rates of cancer incidence in the county and of total deaths in the city point to a need for more local data, which the City and Healthy RC initiative might be able to collect and analyze by working

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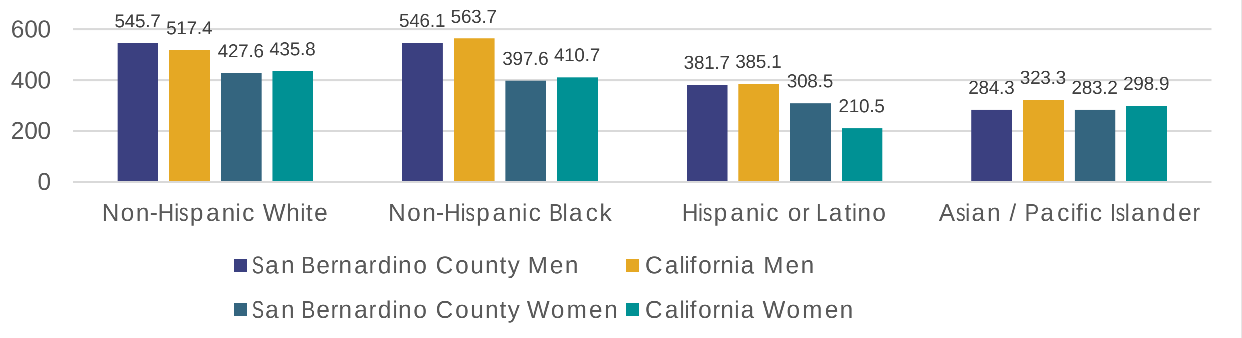
[9] California Cancer Rates Tool. Retrieved from: https://www.cancer-rates.info/ca

with the County Health Department or other entities that work closely with health professionals.

Table 2. Most Common Cancers and Cancer-Related Deaths by Sex, San Bernardino County, 2008-2012

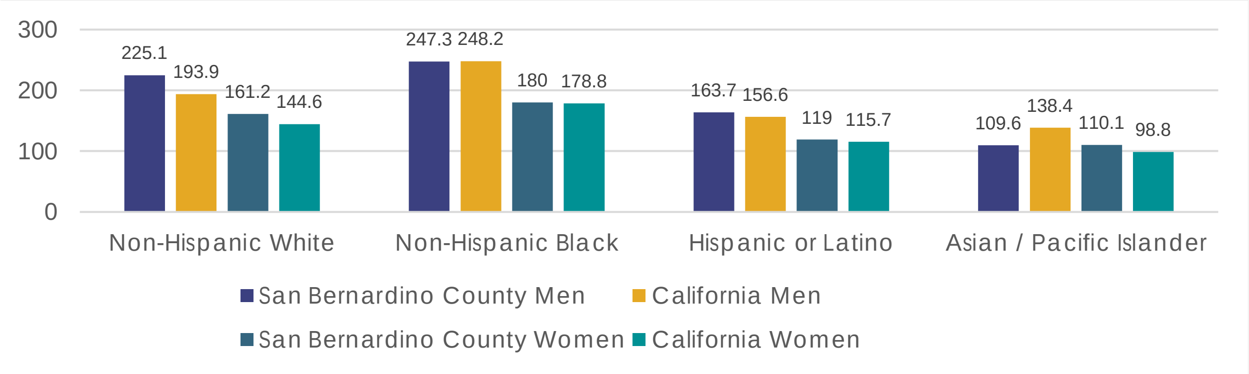
Incidence					
Men	**County Rate**	**State Rate**	**Women**	**County Rate**	**State Rate**
1. Prostates	136.9	126.9	1. Breast	111.5	122.1
2. Lung and Bronchus	61.5	55.8	2. Lung and Bronchus	43.3	42.1
3. Colon and Rectum	52.9	46	3. Colon and Rectum	36.9	35.1
4. Bladder	32.8	32.6	4. Uterus	23.4	23.3
5. Melanoma	21.7	27.9	5. Thyroid	15.5	17.9
All Sites	486.2	476.7	All Sites	376.4	388.8
Mortality					
Men	**County Rate**	**State Rate**	**Women**	**County Rate**	**State Rate**
1. Prostates	49.4	43.5	1. Breast	33	30.4
2. Lung and Bronchus	25.3	21.1	2. Lung and Bronchus	24	21.2
3. Colon and Rectum	20.7	16.7	3. Colon and Rectum	14.2	12.1
4. Pancreas	10.8	11.7	4. Pancreas	9.5	9.3
5. Liver and Intrahepatic Bile Duct	10.6	10.5	5. Ovary	7.6	7.6
All Malignant Cancers	202.2	182.7	All Malignant Cancers	146.2	134.8
Note: Rates shown as the number of new cases or deaths per 100,000 persons. All rates are age-adjusted to the 2000 United States Standard Population. Confidence intervals can be obtained for the CCR Data and Mapping tool (http://www.cancer-rates.info/ca/) and may help to assess statistical significance of age-adjusted rates.					

*Figure 10. Age-Adjusted Cancer Incidence Rates (All Cancers) by Race/Ethnicity and Sex, San Bernardino County Compared to California**



Source: California Cancer Registry; California Department of Public Health.
** The Age-Adjusted Cancer Incidence Rates by Race/Ethnicity and Sex Data shows all cancer sites combined.*

*Figure 11. Age-Adjusted Cancer Mortality Rates (All Cancers) by Race/Ethnicity and Sex, San Bernardino County Compared to California**



Source: California Cancer Registry; California Department of Public Health
** The Age-Adjusted Cancer Mortality Rates by Race/Ethnicity and Sex Data shows all cancer sites combined.*

Cardiovascular Disease

Cardiovascular disease, also referred to as heart disease or coronary heart disease, is the second-leading cause of death in Rancho Cucamonga, San Bernardino County, and the State of California. Many types of cardiovascular diseases—like diabetes, stroke, and heart attack—can be prevented or ameliorated through health-promoting behaviors like healthy eating and active living. Nevertheless, there is a strong connection between lower incomes and higher rates of cardiovascular diseases, indicating that the physical form of the built environment can critically impact residents' cardiovascular health.

- Within Rancho Cucamonga, there is a higher rate of emergency room visits for heart attacks in the priority neighborhoods (Census Tracts 14, 23, 24, 1, 25, and 26). Outside of these areas, Census Tracts 21, 18, and 11 have the same rate of about 10-12.2 visits to the emergency room for heart attacks per 10,000 residents (Figure 12). These rates are almost double the 5.0-8.0 rate in census tracts that have lower occurrence of visits.
- Census Tract 27, in the southeastern area of the city, has a significant lower rate of emergency room visits for heart attacks (3.7 to 5.0 per 10,000) than all other tracts in the city. Information on why this difference exists is not available, although it is important to note that Census Tract 27 is mostly industrial and has a Detention Center within its boundaries. With limited residents in the area and with the unique prison population, this could skew the results to demonstrate a lower rate of emergency room visits. It could also be due to the way in which data on emergency care for prisoners is collected and reported.
- The rate of emergency room visits for heart attacks only tells one fragment of the story of cardiovascular disease. Not all people who have a cardiovascular disease will end up needing emergency care. Many people will be able to control or reduce the severity of underlying conditions like obesity, diabetes, or high cholesterol through

lifestyle changes and preventive care. Higher rates of emergency room visitation in priority neighborhoods, thus, indicate that the disparity may be related to underlying racial or socioeconomic characteristics that are connected to the quality of neighborhood and quality of care one can have access to or afford (Figure 12). Residents in low-income or otherwise disadvantaged communities often put off care for cardiovascular diseases until the complications require an emergency room visit.

- Weight and body composition are indicators related to cardiovascular health. Overall, Rancho Cucamonga has lower obesity rates across age groups when compared to San Bernardino County and California (Figure 13).
    - Young children (ages 2-11) in the city have an obesity rate of 11.3 percent that is lower than the county's (15 percent) and the state's (15.1 percent).
    - Adolescents (ages 12-17) have an obesity rate of 18.1 percent that is slightly lower than the county's (21.7 percent) and drastically lower than the state's (38.2 percent).
    - Adults (age 18 and over) have an obesity rate of 26.6 percent that is like the state's rate (28 percent) and significantly lower than the county's rate (30.7 percent). Nevertheless, this is a concerning statistic, as it indicates 1 in 4 adults may experience health complications related to obesity.
        - In the Quality of Life Survey, 33 percent of respondents reported being told by a health professional that they are overweight or obese.
- Nevertheless, rates of obesity are still concerningly high and a key issue to address in the General Plan update, especially when considering the results from the Quality of Life Survey (2019) that show about one quarter of respondents have a chronic cardiovascular disease:
    - 24 percent reported that they were diagnosed with high blood pressure.
    - 24 percent reported that they were diagnosed with high cholesterol.
- Self-reported results for diabetes diagnoses (9 percent in the 2019 Quality of Life Survey) are on par with data on adult diabetes reported by the UCLA AskCHIS Neighborhood Edition Platform (9 percent). These rates of diabetes are slightly lower than for the County of San Bernardino as a whole (10.4 percent).[10]

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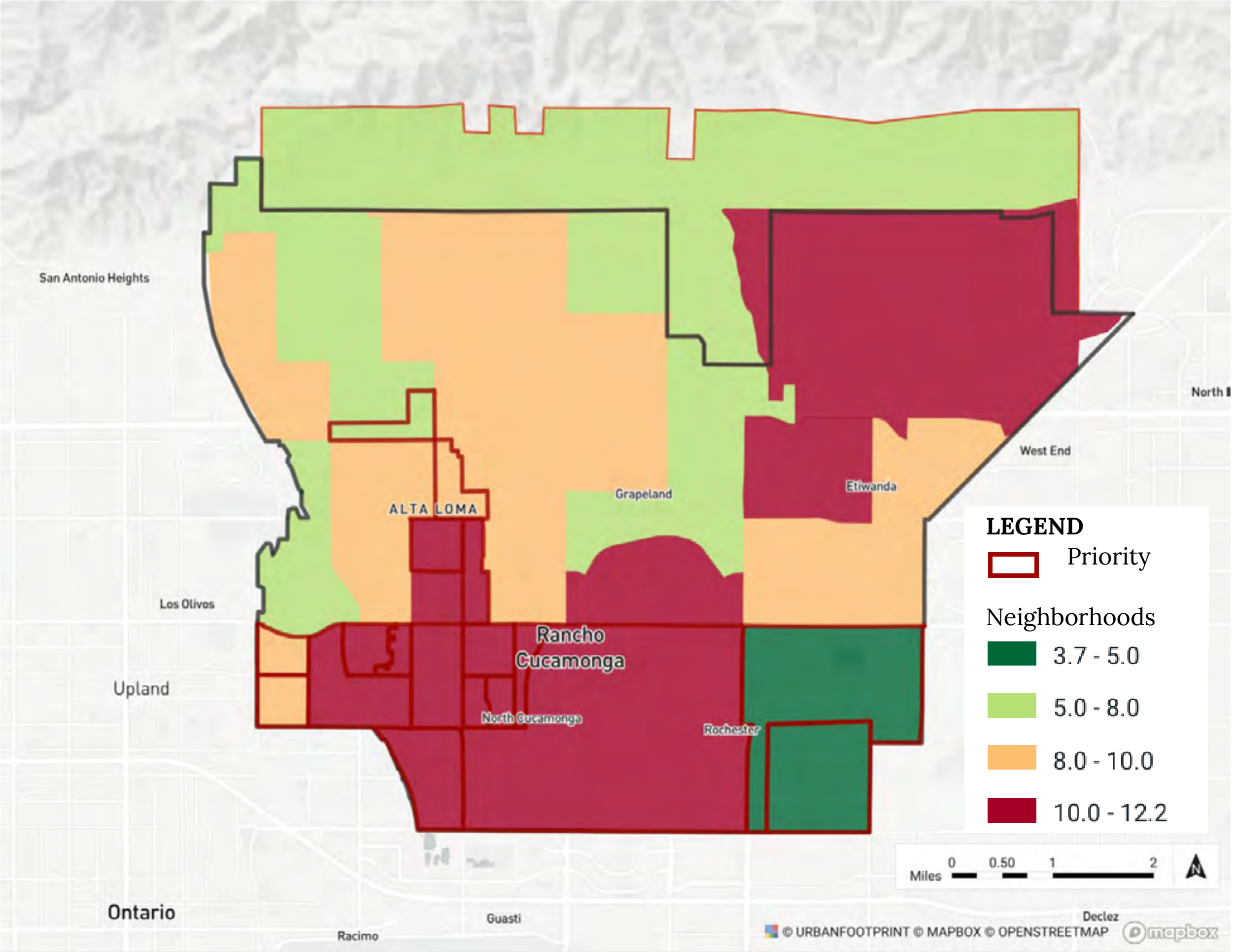
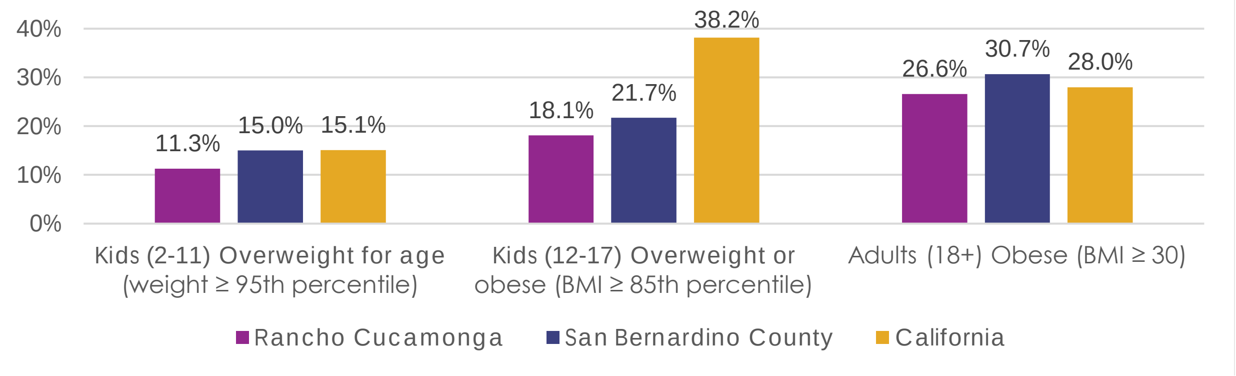
[10] UCLA Center for Health Policy Research. AskCHIS Neighborhood Edition (2016).

Figure 12. Age-Adjusted Rate of Emergency Visits for Heart Attack, per 10,000, by Census Tract (2018)



Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0, 2018.

Figure 13. Overweight or Obese by Age Group in Rancho Cucamonga, Compared to San Bernardino County and California (2016)



Source: UCLA Center for Health Policy Research. AskCHIS Neighborhood Edition, 2016.

Respiratory Disease

Respiratory disease is a contributor to both the first (particularly, including lung cancer) and third (chronic lower respiratory disease) leading causes of death in San Bernardino County. In Rancho Cucamonga, chronic lower respiratory disease is the seventh leading cause of death by total number of deaths. Chronic lower respiratory disease includes a range of conditions that affect the respiratory tract, such as bronchitis and asthma. As with other chronic diseases, both individual-level behaviors and environmental or built environment conditions affect the incidence and mortality rates of asthma and chronic lower respiratory disease overall.

Children, youth, adults, and older adults all can experience complications and limitations on quality of life as a result of asthma. Increased exposures to poor air quality, especially as pollutants from both stationary and mobile sources continue to accumulate in the environment, have been shown to increase rates of emergency room visits for asthma. Further, as a result of climate change and related hazards, the rate of asthma-related illness and mortality is rising in the State.

- Within Rancho Cucamonga, there is generally a higher rate of emergency room visits for asthma in census tracts that are priority neighborhoods (40-50 visits per 10,000) than in areas in the northern part of the city (17.3-20 visits per 10,000), where there are no priority neighborhoods identified for the purposes of SB 1000 (Figure 14).[11]
- As with cardiovascular disease, Census Tract 27, in the southeastern area of the city, has a significantly lower rate of emergency room visits for asthma attacks (17.3 to 20.0 per 10,000) than all other tracts in the city, except for Census Tract 10. As previously noted, Census Tract 27 is mostly industrial and has a Detention Center which could skew the results to demonstrate a lower rate of asthma attack emergency room visits. It could also be due to the way in which data on emergency care for prisoners is collected and reported.
- Also, as with cardiovascular disease, the rate of emergency room visits for asthma only tells one fragment of the story of chronic lower respiratory disease. Not all people who have asthma or other types of respiratory diseases will end up needing emergency care. Many people will be able to control or reduce the severity of asthma through lifestyle changes and preventive care. Higher rates of emergency room visitation in priority neighborhoods, thus, indicate that the disparity may be related to underlying racial or socioeconomic characteristics that are connected to the quality of neighborhood and quality of care one can have access to or afford (Figure 14). Residents in low-income or otherwise disadvantaged communities often put off care for asthma until the complications require an emergency room visit. Residents in priority neighborhoods south of Foothill also live in closer proximity to the industrial land use of the city, closer to the Metrolink route, and closer to major regional interstates and highways; all of these are major sources of air pollution contaminants that are known to cause or complicate asthma.
- Asthma in childhood often resolves in early adolescence, but it can persist into adulthood. For families with children or individuals who have a lifelong symptomatic asthma diagnosis, the costs of disease management, activities lost, and potential medical complications can significantly add up. In Rancho Cucamonga, about 15 percent of the population has been diagnosed with asthma—the rate of incidence may

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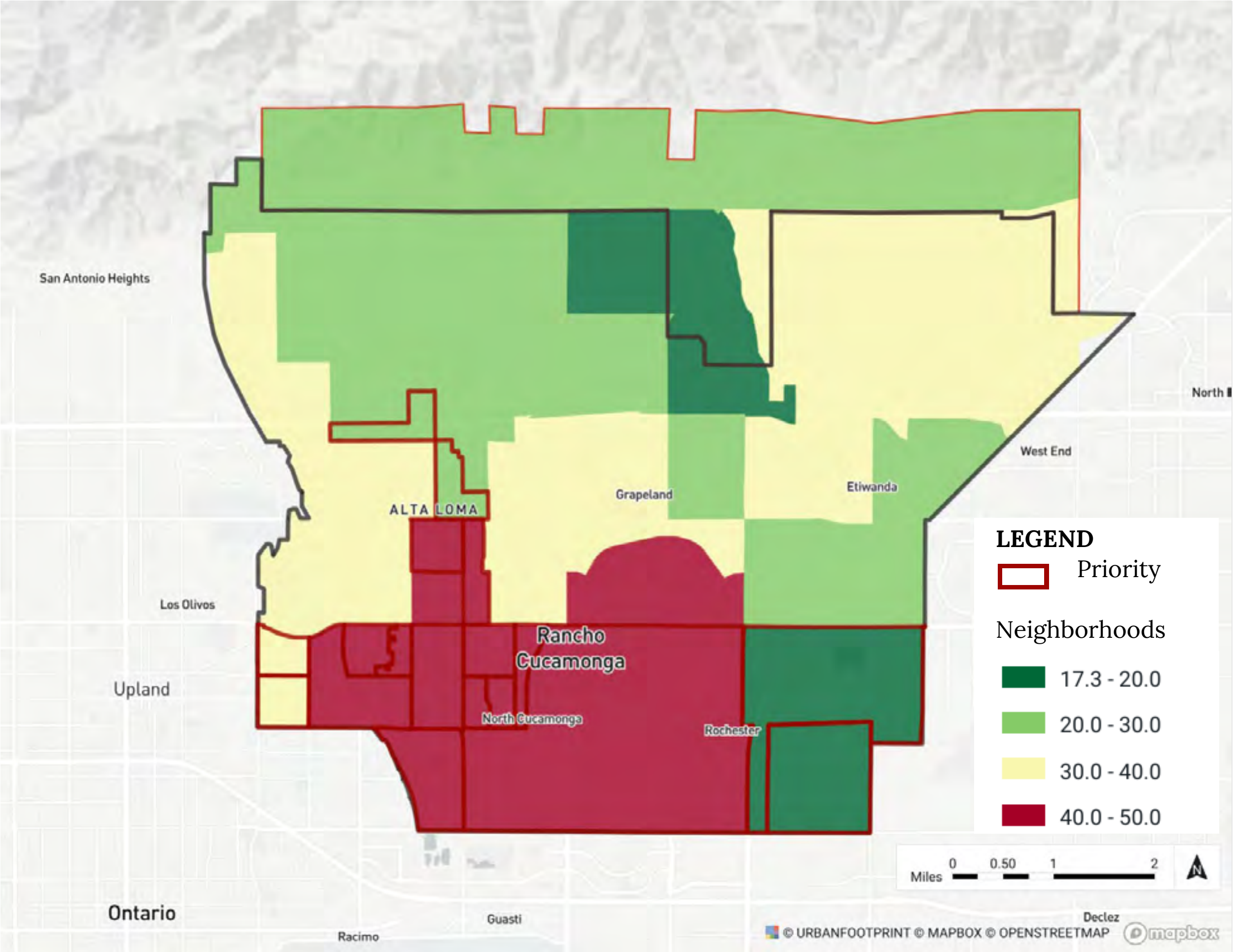
[11] The indicator used for this analysis is a spatially modeled, age-adjusted rate of emergency department visits per 10,000, averaged over 2011-2013.

be higher, especially when considering that many people, especially older adults, often delay seeking medical care.

- According to AskCHIS Neighborhood Edition (AskCHIS NE) Children (ages 1-17) in Rancho Cucamonga have a slightly higher incidence of asthma diagnoses (16.1 percent) than in San Bernardino County (15.8 percent).[12]
- In the Quality of Life Survey (2019), 15 percent of respondents self-reported having been diagnosed with asthma.

Figure 14. Age-Adjusted Rate of Emergency Visits for Asthma, per 10,000, by Census Tract (2018)



Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0, 2018.

Mental Health

The U.S. Surgeon General relates positive mental health with allowing “people to realize their full potential, cope with the stresses of life, work productively, and make meaningful contributions to their communities.”[13] Mental health is becoming an increasingly critical

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[12] UCLA Center for Health Policy Research. AsckCHIS Neighborhood Edition (2016).

[13] *Surgeon General. (n.d.). Mental and Emotional Well-being. Retrieved from: https://www.surgeongeneral.gov/priorities/prevention/strategy/mental-and-emotional-well-being.html*

health concern across the United States and, in Rancho Cucamonga, the Healthy RC Youth Leaders have made Teen Mental Health a priority of their work in schools and in the community.

(Note: *Health industry data for this indicator is only available at the city and census tract level for adults and not for youth. Data on youth comes solely from the Teen Quality of Life Survey* (2019).)

Youth

The latest Teen Quality of Life Survey surveyed youth from across the City of Rancho Cucamonga and found that many youths feel isolated and are struggling with self-esteem, relational health, and other intimate or interpersonal mental health issues.

- While most youth often or always feel (combined 70 percent) they matter to their friends, about one quarter of youth only feel that way sometimes or rarely (combined 26 percent), and a small percentage (2 percent) never feel they matter to their friends.
- Outside of friendships in the school environment, many youth (37 percent) always or often feel connected to their community. Nevertheless, the majority (49 percent) of youth only feel that way sometimes or rarely and 14 percent never feel connected to their community.
- The majority of youth (54 percent) responded "Yes" or "Not sure" when asked if they have ever felt so sad or hopeless that they stopped doing their usual activities.

Adults

Healthy RC as a citywide initiative also touches on adult mental health and the Quality of Life Survey includes questions to assess the status of adult socioemotional health. Some of the results from that survey are discussed here, with data from the Surgeon General and the Centers for Disease Control 500 Cities Project.

- Most (88 percent) of respondents in the Quality of Life Survey reported their mental health was good, very good, or excellent. Results show a varied range of responses across dimensions of mental health:
  - 8 percent reported that they are nervous, tense, or anxious all or most of the time.
  - 13 percent reported that they are stressed all or most of the time.
  - 3 percent reported that they are hopeless or alone all or most of the time.
  - 4 percent reported that they are sad or depressed all or most of the time.
  - 1 percent intentionally harmed themselves.
- About one in five respondents, regardless of their self-reported quality of mental health, have sought help for a mental health issue. This is closely aligned with the Surgeon General and CDC 500 Cities Project data:
  - Rancho Cucamonga adults have a similar rate of seeking help for mental health or substance use problems (16.6 percent) as adults throughout California (16.9 percent). Both of these rates are slightly higher than the San Bernardino County (15.7 percent).[14]

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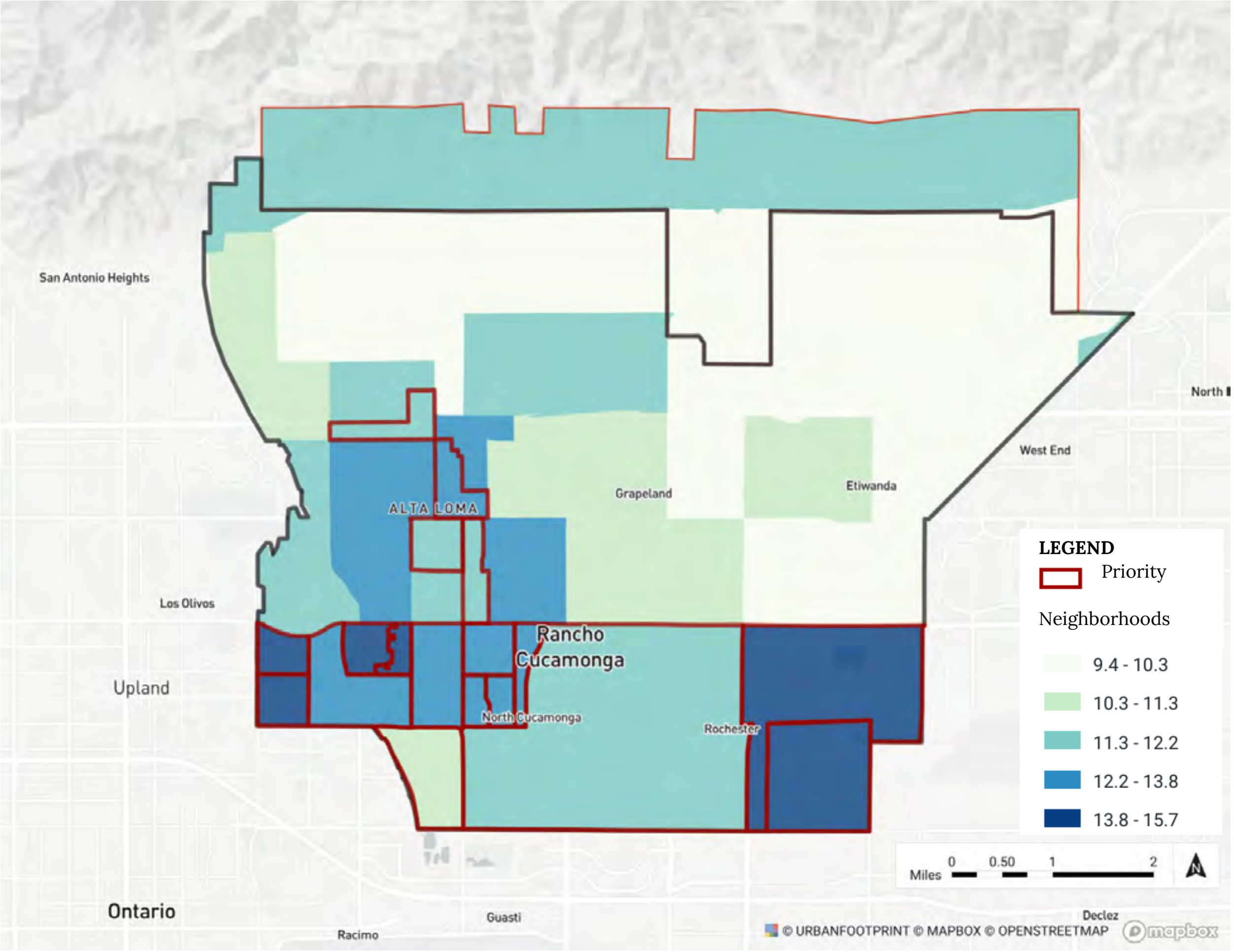
[14] ibid.

- At the census tract level, more adults in priority neighborhoods (Census Tracts 22, 23, and 27) report prolonged poor mental health days (13.8 percent to 15.7 percent of people) compared to tracts in the northern area of the city (9.4 percent to 10.3 percent of people). Research has shown that health conditions, economic hardship, and other factors combined with disadvantages related to racial or socioeconomic disparities increase stress for poor and low-income communities.

Healthy RC and their Youth Leaders are working to address these findings. Changes in the built environment, for example, through building more inclusive gathering spaces with more greenery, diversifying the types of public amenities available, or other similar strategies that build social infrastructure can improve community social cohesion and improve socioemotional health for adults and youth. Changes to community design and development patterns can limit daily commute times which can decrease stress and improve mental health. It is also crucial to consider the development of safe spaces, whether that means safety in terms of crime or traffic, these changes can significantly improve mental health and wellness in the community.

Figure 15. Crude Prevalence of Prolonged Poor Mental Health Status, Adults, by Census Tract (2016)



Source: CDC 500 Cities, Behavioral Risk Factor Surveillance System, 2016.

Health Behaviors

Health Behaviors are individual decisions that influence one's overall health outcomes. While health behaviors are individual decisions, they are strongly influenced by the physical and social environments in which a person lives. For example, people tend to visit parks and be more physically active when parks are nearby, safe, and well-maintained. This section includes data on physical activity, diet, and preventive care for seniors. Data for these indicators are available at either the census tract or city levels.

Physical Activity and Diet

Physical activity refers to daily exercise compared to national and health organization recommended levels of exercise. This behavior is closely linked to prevention and maintenance of chronic disease and facilitated or hindered by social and economic determinants of health, including conditions of the built environment.

- Physical activity for both youth and adults in Rancho Cucamonga is equal to or better than in San Bernardino County as a whole:
    - 35 percent of adults in the city walk at least 150 minutes for transportation or leisure weekly, compared to 33.6 percent in the county; and
    - 21 percent of children in the city engage in at least 60 minutes of weekly physical activity outside of school, compared to 18.7 percent in the county.[15]
- Research has established a connection between lack of physical activity and higher rates of cardiovascular disease. Healthy RC addresses this through the Healthy Eating and Active Living area of work and has developed several initiatives to facilitate improvements in physical activity.
    - In the Teen Quality of Life Survey, 87 percent reported feeling their health was good, very good, or excellent.
    - The Quality of Life Survey (2019) responses show an overall more positive picture of physical health and activity than the CDC data:
        - 84 percent reported their physical health was good, very good, or excellent.
        - 76 percent are physically active at least 30 minutes a week.
        - 25 percent meet the weekly minimum recommended exercise levels (150 min/week).

Source: Centers for Disease Control. 500 Cities Database. BRFSS, 2016.

* Note: Core services considered for women include flu shot in the past year, pneumococcal shot ever, colorectal cancer screening, and mammogram

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[15] ibid.

Demographic and Socioeconomic Assessment

This chapter discusses the distribution and concentration of demographic and socioeconomic characteristics across the population and, at times, neighborhoods of Rancho Cucamonga. Indicators include: Race and Ethnicity, Language, Age, Household Income and Poverty, Education, and Employment.

Researching the demographic and socioeconomic status of a population helps planners, public health professionals, and decision makers understand how disparities in the quality of the physical environment are linked to social and economic status. This can help refine the development of environmental justice interventions in the physical environment through the General Plan update process and improve community health overall. This chapter includes data on race and ethnicity, language, age, household income and poverty, education, and unemployment.

Current population demographics from the American Community Survey (2018) are compared to recent Decennial Census data (2000 and 2010) to show change over time. Data points for the City of Rancho Cucamonga are also compared to San Bernardino County to give perspective on contrasts and similarities. Each figure or table includes information on the geographic unit of analysis used.

Race and Ethnicity

Race and ethnicity are not on their own determinants of health, rather they are closely correlated with socioeconomic status—including income and poverty—which are the strongest determinants of health outcomes.

- Black, Hispanic or Latino, Asian, Native American and Hawaiian (or Pacific Islander), and other people of color live throughout the city's neighborhoods and comprise over half (63.6 percent) of all Rancho Cucamonga residents, compared to 71.6 percent in San Bernardino County.[16]
    - 38 percent of all City residents identify as Hispanic or Latino (of any race)
    - 13 percent of all City residents identify as Asian alone
    - 9 percent of all City residents identify as African American alone
    - 3 percent of all City residents identify as other; and
    - 0.6 percent of all City residents identify as Native Hawaiian and Other Pacific Islander alone.
- Since 2010, the Asian population has doubled, from 6 percent in 2000 to 13 percent in 2018. The Hispanic or Latino population has also shown an increase, from 28 percent to 38 percent during the same period. The White population, on the other hand, has steadily decreased from 55 percent in 2000 to 37 percent in 2018 (Figure 16).[17]

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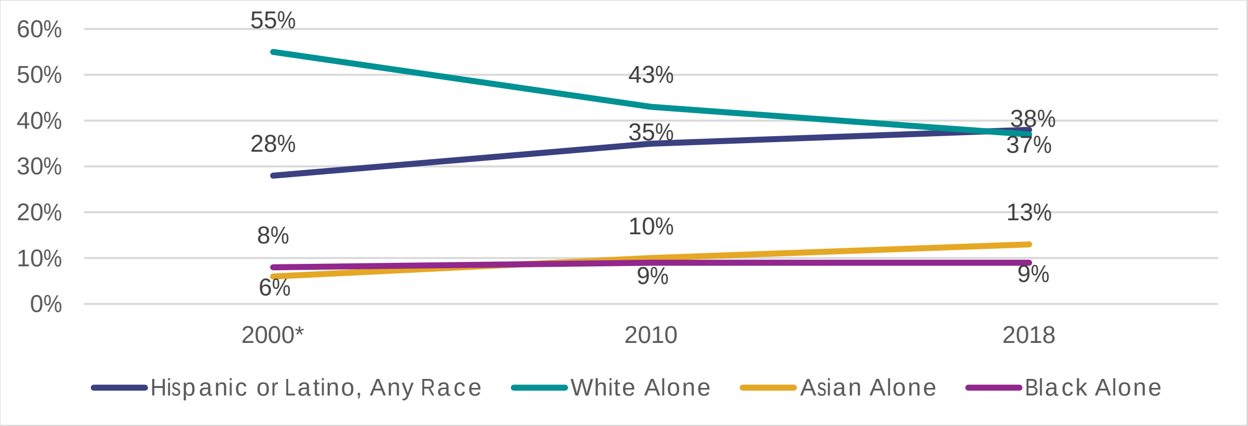
[16] US Census (2000). American Community Survey 5-year estimates (2010-2018)

[17] US Census (2000). American Community Survey 5-Year estimates (2010-2018).

Figure 16. Demographic Change in Rancho Cucamonga (2000-2018)



Source: US Census. American Community Survey 5-Year Estimates, 2018.

Source: US Census. American Community Survey 5-Year Estimates, 2018.

Language

In the City of Rancho Cucamonga, as across the United States, English is a primary language of communication; schools, government agencies, decision makers, media, and healthcare information all are primarily communicated in English and sometimes translated or interpreted into other languages spoken by a target audience population. The top five languages spoken, other than English, are Spanish, Chinese (Mandarin and Cantonese), Tagalog, Arabic and other Indo-European languages. Language and English literacy skills are, thus, determinants of health because they facilitate the flow of information.

- More than a third (33 percent) of Rancho Cucamonga residents speak another language, compared to 42 percent in San Bernardino County.[18]
- Of residents that speak another language, 22 percent speak English "very well" and 13 percent speak English "less than very well."[19]
- Of residents that speak English "less than very well":

Language	**Percent that speaks English "less than very well"**
Spanish	47%
Indo-European	11%
Asian or Pacific Island	35%
Other	7%

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[18] US Census (2000). American Community Survey 5-Year estimates (2018).

[19] ibid.

- Among Hispanic or Latino residents, 49 percent speak only English, 38 percent identify speaking English "very well," and 13 percent identify speaking English less than very well. Among Asian residents, 31 percent speak only English, 31 percent identify speaking English "very well," and 38 percent identify speaking English less than very well (Table 3).[20]

Table 3. English Proficiency by Race/Ethnicity in Rancho Cucamonga, Compared to San Bernardino County (2018)

		Percent of Population	Speak Only English	Speak Another Language	Speak English "Very Well"	Speak English "Less than Very Well"
Total	**Rancho Cucamonga**		**67%**	**33%**	**22%**	**13%**
	San Bernardino		**58%**	**42%**	**27%**	**16%**
Hispanic or Latino	**Rancho Cucamonga**	**38%**	**49%**	**51%**	**38%**	**13%**
	San Bernardino	**53%**	**33%**	**67%**	**45%**	**22%**
White	**Rancho Cucamonga**	**37%**	**91%**	**9%**	**6%**	**3%**
	San Bernardino	**29%**	**94%**	**6%**	**5%**	**2%**
Asian	**Rancho Cucamonga**	**13%**	**31%**	**69%**	**31%**	**38%**
	San Bernardino	**7%**	**24%**	**76%**	**41%**	**35%**
Black	**Rancho Cucamonga**	**9%**	**90%**	**10%**	**9%**	**1%**
	San Bernardino	**8%**	**93%**	**7%**	**6%**	**1%**

Source: US Census. American Community Survey 5-Year Estimates 2013-2017.

Age

Understanding the age distribution of a population is important because people of different ages and genders have different health needs and interact differently with components of the physical environment. For example, children may have specific developmental growth health needs and be less able to navigate communities on their own, while older adults may have more chronic health issues.

- Approximately one quarter (26 percent) of people in Rancho Cucamonga are 19 years old or younger, slightly less than the County (29 percent).[21]

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[20] ibid.

[21] ibid.

- There is a higher number of adults between the ages of 30-34 (9 percent), compared to all younger population groups in the City (Figure 17) .
- Compared to the County (22 percent), there are slightly more older adults in the City (26 percent) over the age of 55 (Figure 17).
- There is a lower population of children under the age of 5 in Rancho Cucamonga (6.5 percent) compared to the County (7.2 percent) (Figure 17). The majority of these children, as seen in Figure 18, are Hispanic or Latino (43 percent), followed by White (30 percent), Asian (15 percent), and Black (8 percent).[22]
- As seen in Figure 19, older adults—for both age groups 65-84 and 85 and over—have a very different race/ethnicity distribution than children, with most (53 and 59 percent) identifying as White.[23] This is commonly referred to as the racial generation gap and may have significant implications for the social and emotional health of young people.[24]
- The highest concentration of children under the age of 5 are in thein the northeast, central, and central south of Foothill Boulevard areas of the city.

Figure 17. Age Distribution Pyramids, Rancho Cucamonga Compared to San Bernardino County (2018)

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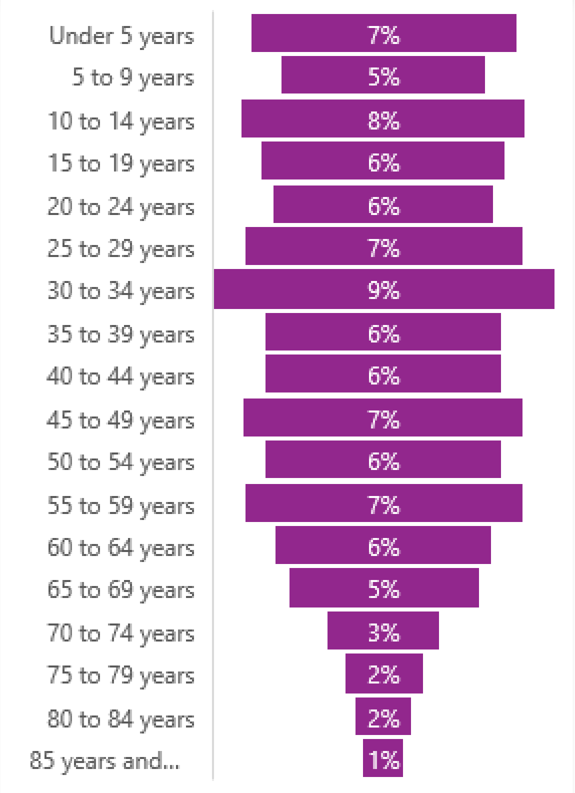
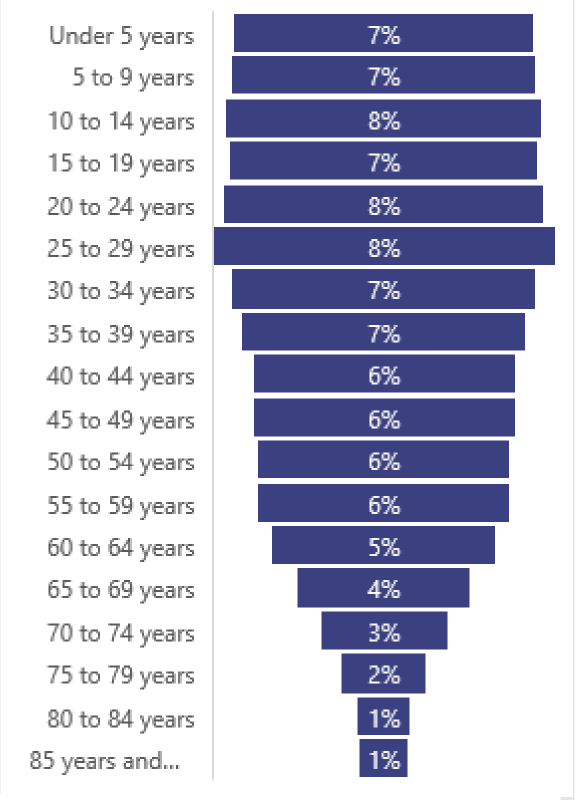
[22] ibid.

[23] ibid.

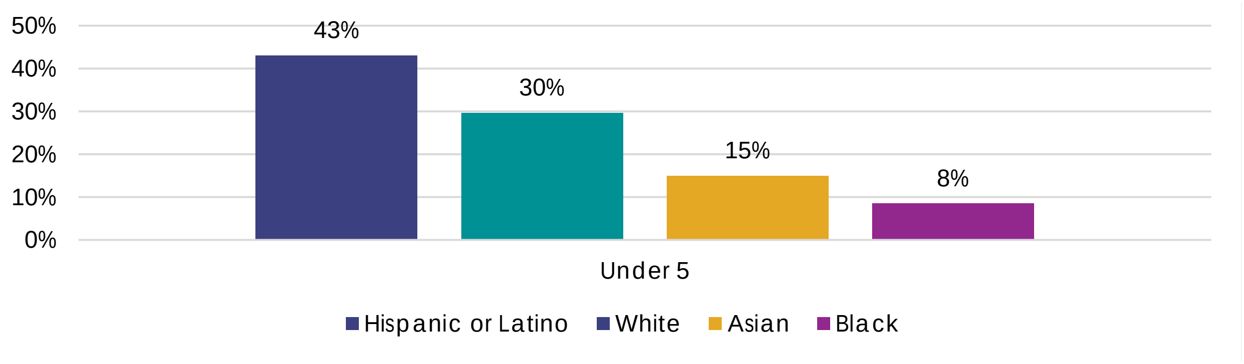
[24] PolicyLink and the USC Program for Environmental and Regional Equity (PERE)-- whose director, Professor Manuel Pastor, gave a presentation during a Culver City GPU Speaker Series event—has produced a wide body of research in support of understanding and bridging the racial generation gap. For more information and resources such as the report "*Talkin' 'Bout Our Generations: Data, Deliberation, and Destiny in a Changing America*" (2015), visit: https://dornsife.usc.edu/pere/generations-data-deliberation/.





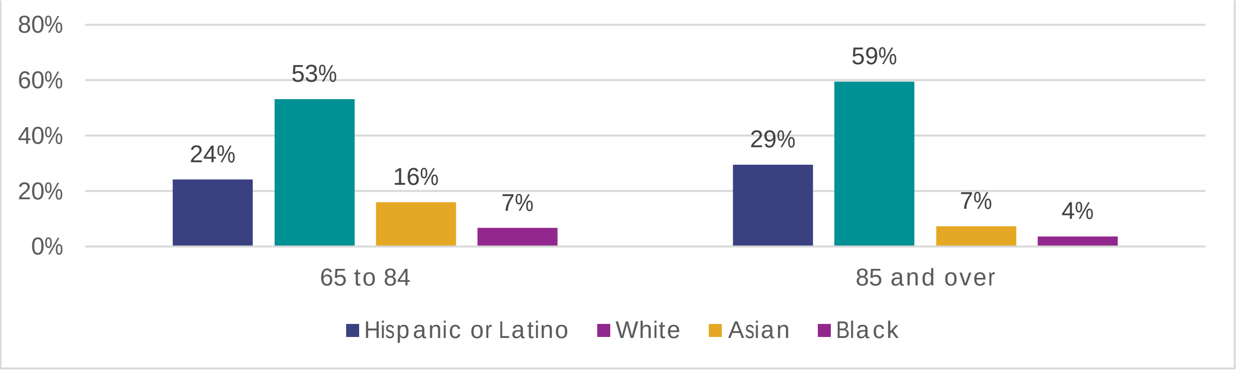
Source: US Census. American Community Survey 5-Year Estimates, 2018.

Figure 18. Children Under 5 by Race/Ethnicity in Rancho Cucamonga (2018)



Source: US Census. American Community Survey 5-Year Estimates, 2018.

Figure 19. Older Adults by Race/Ethnicity in Rancho Cucamonga (2018)



Source: US Census. American Community Survey 5-Year Estimates, 2018.

Household Income

Income has the most significant impact on health outcomes: it determines, among other things, the ability to afford quality housing, live in areas free of pollution, afford healthcare, and purchase healthy foods. Nevertheless, combined with the legacy of racial and economic segregation, income itself, even when holding race and ethnicity constant, is not sufficient to mitigate historically entrenched health and environmental justice disparities. Taking proactive steps to support access to housing, parks, and economic opportunity for low income communities can play a powerful role in transforming health outcomes across the city.

- On average, all racial and ethnic groups in Rancho Cucamonga have higher median household incomes than their counterparts in the County of San Bernardino and differences across median household income by race or ethnicity are lower in the city than in the county (Figure 20).
- There is an approximately $11,500 difference between White households and Black/African American households ($92,288 versus $80,739) but this is less than the difference at the County level, where White households have a $64,704 median income and Black/African American households have a $45,424 median income (Figure 20).

- The community areas with the lowest incomes, as shown in Figure 7 for the analysis of disadvantaged communities, are in the areas south of Foothill Boulevard or generally near or west of Haven Avenue, between Interstate-10 (I-210) and Interstate-210 (I-210).

Educational Attainment

Education is another social and economic determinant of health that in and of itself does not determine health outcomes, rather it is related because it determines a person's ability to access higher paying jobs. Higher income then enables individuals to access better quality care, housing, and other health-promoting services and goods.

- Asian adults have the highest educational attainment of all ethnic/demographic groups with 56 percent of the adults having a bachelor's degree (Figure 21).
- Asian adults have nearly 2.5 times the educational attainment as Hispanic/Latino adults (56 percent compared to 22 percent).
- Black/African American and White adults have the same level of educational attainment with 36 percent achieving a bachelor's degree or higher.
- Across all racial and ethnic categories, the City of Rancho Cucamonga has, on average, higher educational attainment levels than the County.
- Generally, the areas with the lowest educational attainment are south of Foothill Boulevard and the areas with the highest educational attainment are north of the I-210.

Unemployment and Poverty

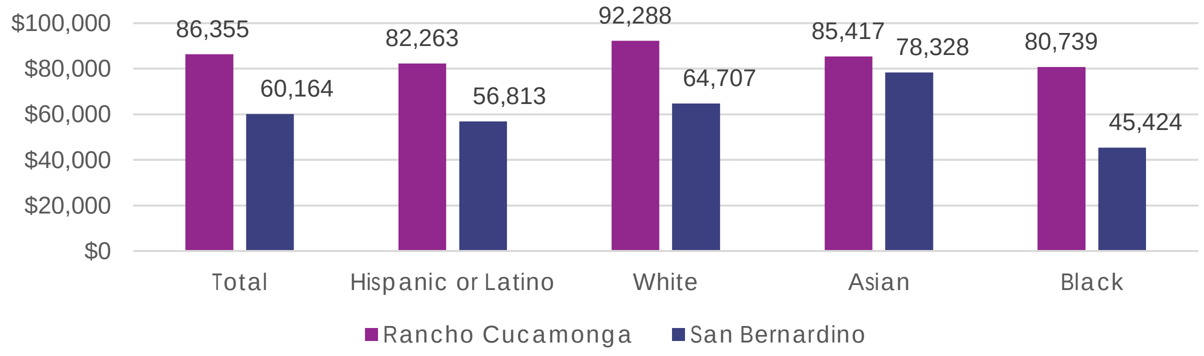
Unemployment rates measure the percent of the population that is actively looking for but unable to secure employment, but they do not paint a full picture of the population that lives with fixed, limited, or no income. Poverty rates can be used to supplement the unemployment data and provide an understanding of the distribution and concentration of residents who face cumulative barriers to accessing health-promoting resources and services, who may be experiencing elevated levels of mental distress, or who may be most vulnerable to sudden economic or natural crises.

- The unemployment rates are lower in the city versus the county across all racial and ethnic groups (Figure 22). Despite overall low unemployment rates, there are pockets of very high unemployment in the city that align with priority neighborhood boundaries, which take race / ethnicity and other socioeconomic conditions into account:
    - In Rancho Cucamonga, the Black/African American population has unemployment rates that are double the rates for White and Asian populations. As discussed earlier in this report, the current conditions related to unemployment are changing due to the COVID-19 Pandemic.
    - The community areas with the highest unemployment rates are priority neighborhoods south of Foothill Boulevard. Prior to the COVID-19 Pandemic, two block groups in the western area south of Foothill Boulevard had unemployment rates over 15 percent.
- Poverty rates are much lower in the city than the county as a whole and across all racial and ethnic groups (Figure 23). Despite these low rates of poverty, there are

differences across racial and ethnic groups and, spatially, there are pockets of concentrated poverty that align closely with priority neighborhood boundaries:

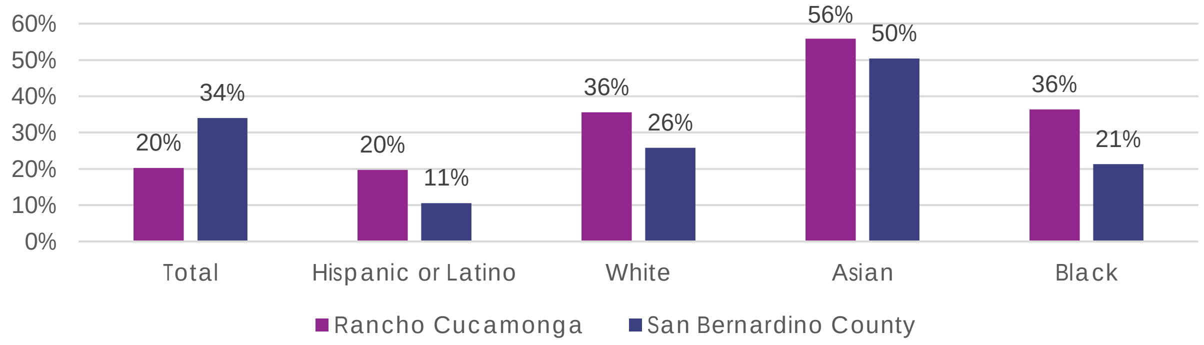
- Black/African American and Hispanic/Latino populations have poverty rates of 10 percent and 9 percent respectively compared to Asian and White (7 percent each).
- Nearly half of priority neighborhoods south of Foothill Boulevard have poverty rates above 20 percent with one block group in the westernmost area having an unemployment rate of nearly one-third of the population (between 30 and 32.2 percent).

Figure 20. Median Household Income, Total and by Race/Ethnicity in Rancho Cucamonga, Compared to San Bernardino County (2018)



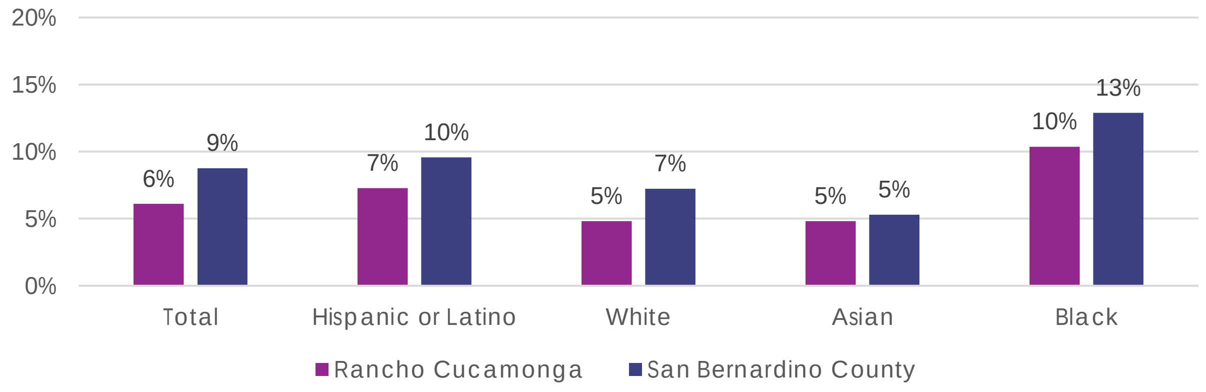
Source: US Census. American Community Survey 5-Year Estimates, 2018.

Figure 21. Percent of the Population with a Bachelor's Degree or Higher, Total and by Race/Ethnicity in Rancho Cucamonga, Compared to San Bernardino County (2018)



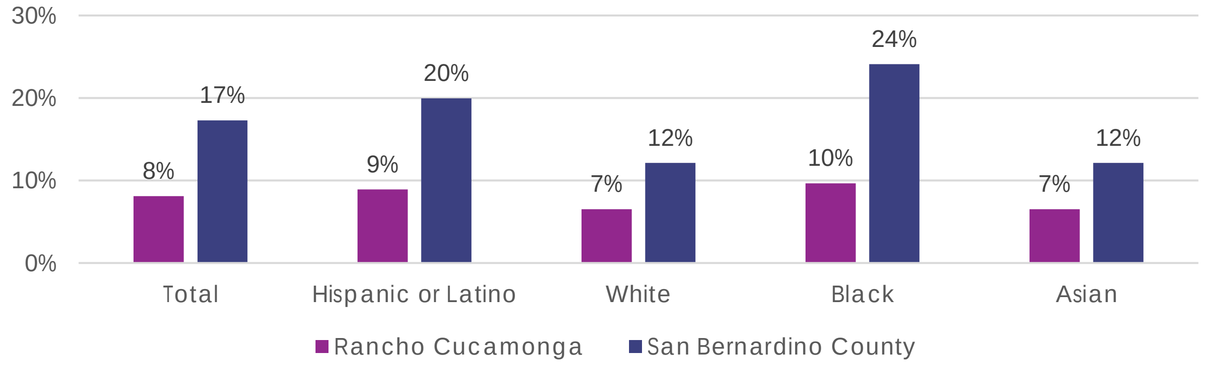
Source: US Census. American Community Survey 5-Year Estimates, 2018.

Figure 22. Unemployment Rates by Race/Ethnicity in Rancho Cucamonga, Compared to San Bernardino County (2018)



Source: US Census. American Community Survey 5-Year Estimates, 2018.

Figure 23. Total Population Below Poverty by Race/Ethnicity in Rancho Cucamonga, Compared to San Bernardino County (2018



Source: US Census. American Community Survey 5-Year Estimates, 2018.

Healthy Communities Assessment

This assessment discusses each of the healthy communities components and indicators identified in Figure 2. It intersects information from the first three assessments with maps and data on the physical environment in Rancho Cucamonga.

Community health depends on many factors. The field of public health has historically been concerned with increasing healthy behaviors and access to preventive care to decrease incidence and mortality rates of disease. In addition, the cleanliness of water and air, among other aspects of the built environment, are larger scale factors that impact the health of populations.

Healthcare Status

Two barriers to achieving higher rates of healthy behaviors—such as use of preventive care services or screenings—are affordability and proximity. Many people put off visits to doctors or specialists due to high costs. This is especially true if individuals are uninsured, which then results in worsening of conditions and, often, increased visits to the emergency room. Health insurance coverage, thus, is an important determinant of access to healthcare because it can lower the costs of doctors' visits and medicines. Proximity to providers also influences the ability and willingness of people to access care. While the General Plan cannot determine health insurance coverage, it can address access to health-promoting infrastructure through identification of areas of the community where there is low insurance coverage and limited physical proximity to healthcare.

Barriers to Care

- Respondents to the Quality of Life Survey (2019) identified the following barriers to accessing health services, overall:
    - 9 percent could not get appointment or wait is too long to get an actual appointment.
    - 6 percent Insurance did not cover what they needed
    - 5 percent had no health insurance.
    - 5 percent doctors would not take their insurance.

Insurance Coverage

- Almost all people in Rancho Cucamonga have insurance coverage (94.3 percent). This is significantly better than the insurance coverage rate for San Bernardino County (90.6 percent).[25]
- Across all racial and ethnic groups, Rancho Cucamonga has lower rates of uninsured people when compared to the county. This is true for all groups except for the Black or African American population, for which it is higher: 8.1 percent in Rancho Cucamonga, compared to 6.5 percent in San Bernardino County (Figure 24).
- As shown in Figure 25, there are city areas where there are high rates of uninsured persons:

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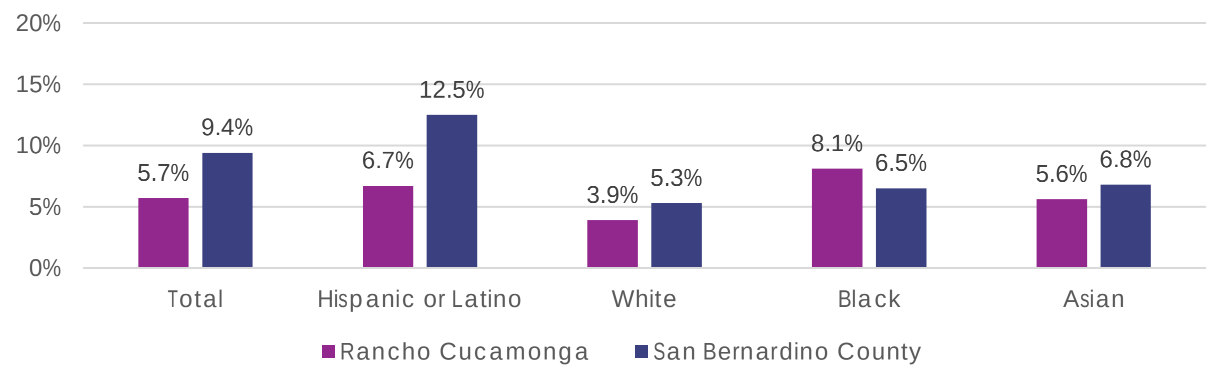
[25] US Census. American Community survey 5-Year Estimates (2018).

  - Census Tract 25, identified as a priority neighborhood, has a rate of 20-21.6 percent uninsured people.
  - Census Tracts 6, 22, 27, and 29, at various edges of the city, also have several block groups with rates of 15 to 20 percent uninsured people.
- Areas north of the I-210 all generally have the lowest rates of uninsured people (0 percent to 10 percent) (Figure 25).

Healthcare Facilities

- There are 60 healthcare facilities in Rancho Cucamonga. The majority of these (54) are home health agencies or hospice facilities and are concentrated in the central and southern areas (Figure 26). This map shows that there are very few facilities in the northern half of the city where the greatest percentage of adults 65 and older live, which may be an issue for both access to preventive care and during medical emergencies over time.
- While Figure 26 and Table 4 show that within Rancho Cucamonga only one facility is classified as a community clinic and another as a general acute care hospital, there is generally a lower level of service of healthcare facilities in the city (Figure 26). There are general acute care hospitals in neighboring cities like Ontario and Upland, so this access to hospitals is not likely an issue for non-emergency care.[26] Nevertheless, there may be an issue for residential or first responder access due to the prolonged travel time needed to access a hospital in medical emergency situations.

Figure 24. Percent Uninsured Persons, by Race/Ethnicity in Rancho Cucamonga, Compared to San Bernardino County (2018)



Source: US Census. American Community Survey 5-Year Estimates, 2018.

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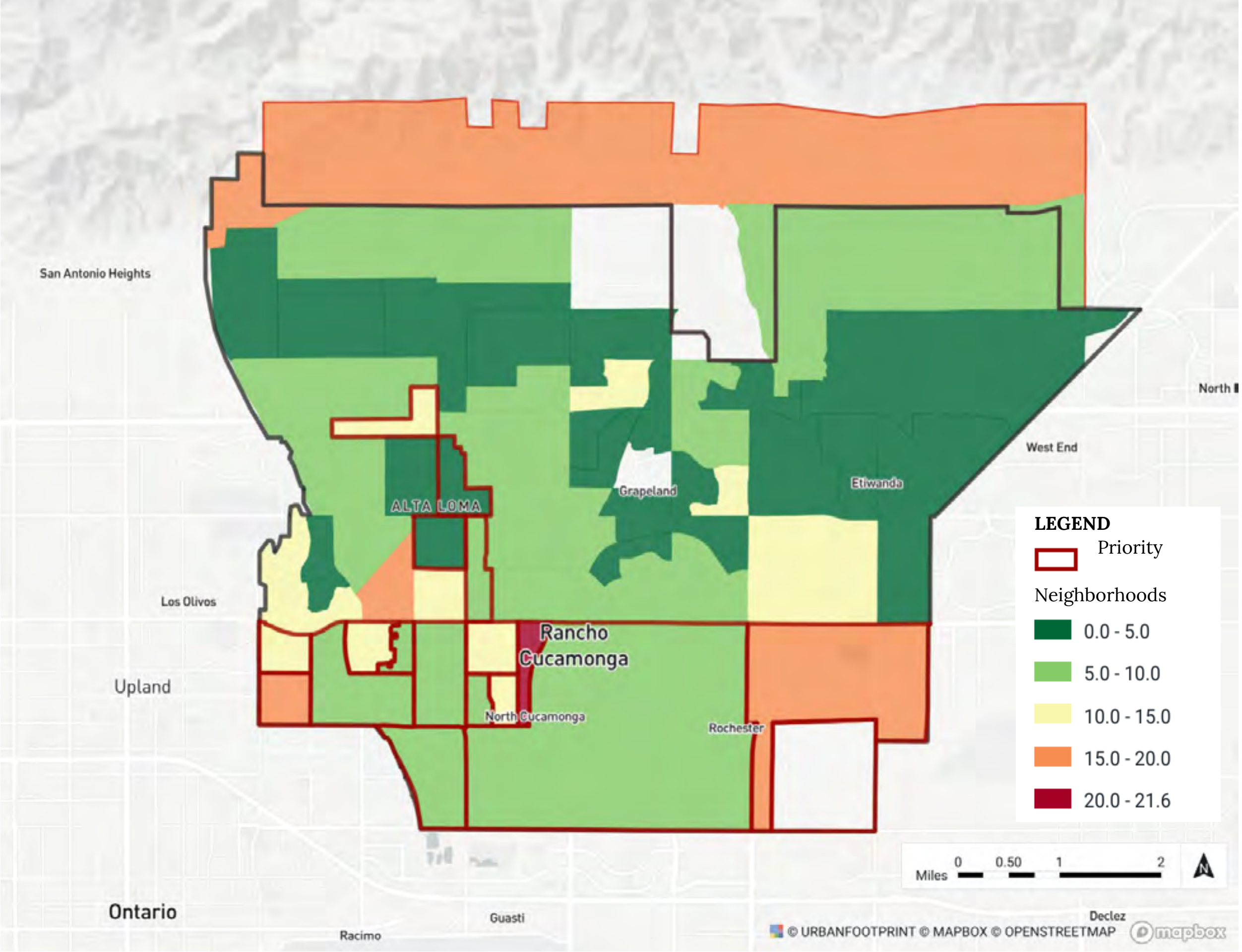
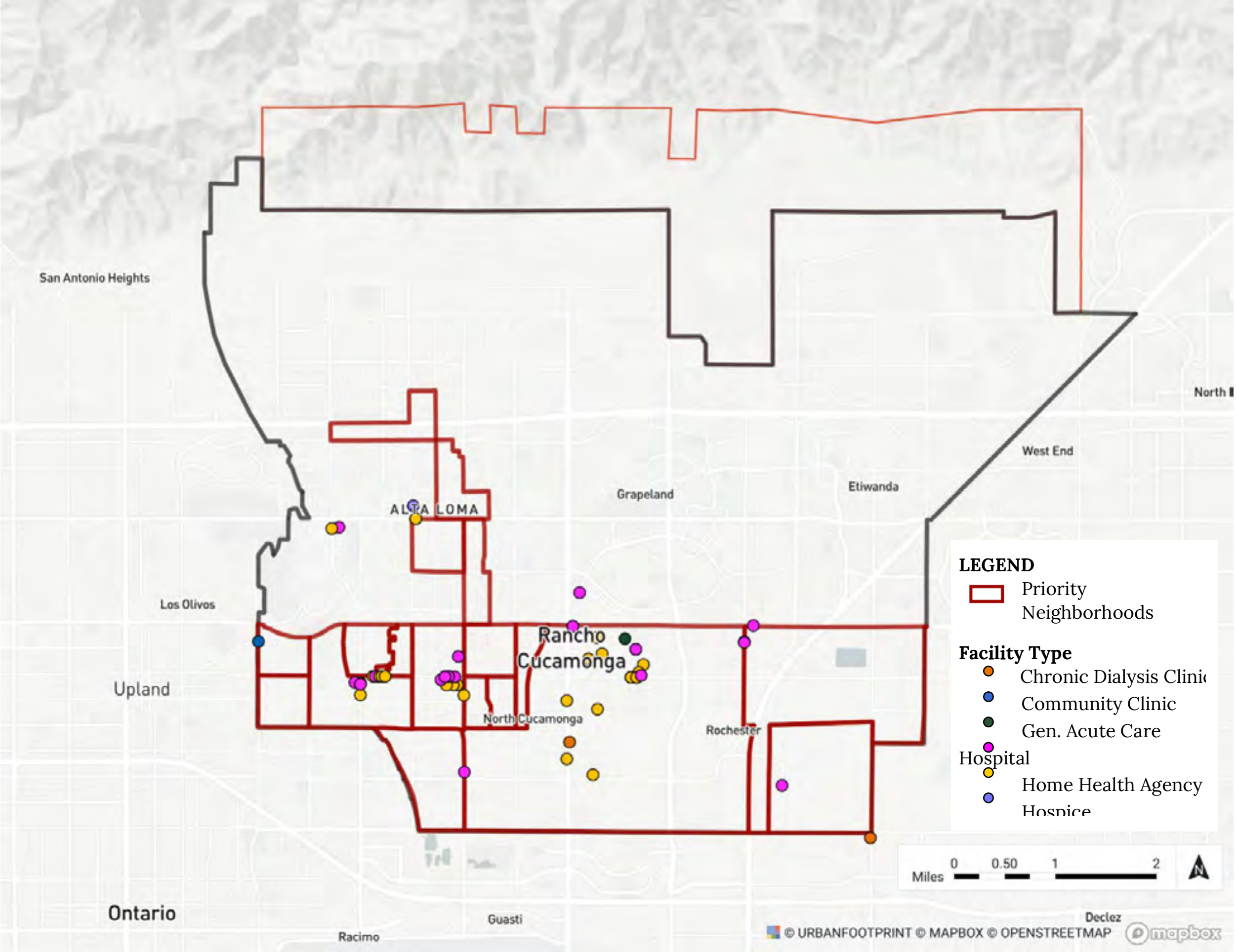
[26] This was a comment heard several times during the stakeholder interviews conducted in the discovery phase of the general plan update.

Figure 25. Percent Uninsured People, by Census Block Group (2018)



Source: US Census. American Community Survey 5-Year Estimates, 2018.

Figure 26. Licensed Healthcare Facilities in Rancho Cucamonga, by Type (2020)



Source: Office of Statewide Planning and Development, 2020.

Table 4. Total Licensed Healthcare Facilities by Type in Rancho Cucamonga (2020)

Facility Type	Count
Chronic Dialysis Clinic	3
Community Clinic	1
General Acute Care Hospital	1
Home Health Agency	23
Hospice	31
Skilled Nursing Facility	1
Grand Total	**60**

Source: Office of Statewide Planning and Development, 2020.

Housing Affordability

Housing is a basic human need and having safe, affordable, and healthy housing is critical to overall health and wellness. This section examines two components of housing: housing tenure and housing cost burden. Housing tenure is whether residents rent or own their homes. Research has found that owners have more stable housing since they are not subject to rent increases or evictions. Housing cost burden applies to both renters and owners. Households that pay more than 30 percent of their income on housing costs are considered "cost-burdened." Housing cost burden is a critical issue in Rancho Cucamonga and impacts the ability of households to pay for basic needs, including food, transportation, childcare, and medical care. For those who are overburdened, it can lead to homelessness.

Tenure

- Over half of Rancho Cucamonga households own their homes (61.5 percent), compared to 59.3 percent in San Bernardino County.[27]
- In Rancho Cucamonga, 38.5 percent of households rent their home, compared to 40.7 percent in San Bernardino County. The highest concentration of renter-occupied households is south of Foothill Boulevard, with some pockets north of Foothill Boulevard.[28]

Housing Cost Burden

- In Rancho Cucamonga, one third (33 percent) of all owner-occupied households are housing cost-burdened, a rate that is similar to that of San Bernardino County (32 percent). The rate is almost double for all renter-occupied households (54 percent), which is similar to the 58 percent in San Bernardino County.[29]
    - The similar rate may have different impacts on overall health and wellbeing in Rancho Cucamonga versus in the County of San Bernardino: overall, both renter- and owner-occupied households have a higher income than in the county, so the remaining 70 percent of income not spent on housing may still be enough to afford other goods and services. Housing cost-burden, though, may still be an issue to address in the event that rents and housing prices continue to increase, while wages stagnate or are significantly reduced in the case of an emergency. For lower-income households, high housing costs place significant strains and disparities in rent burden and are magnified across racial and ethnic lines.
- Renter-occupied cost-burdened households are distributed across the city with concentrations south of Foothill Boulevard, which generally correspond to the lower income areas of the city and are some of the areas identified as priority neighborhoods in the SB 1000 analysis.
- When housing prices force typical households to spend more than 30 percent of their income on rent, those communities are more likely to experience increases in homelessness. Based on 2019 Point in Time Count (PITC) Data, Rancho Cucamonga had a total of 58 homeless individuals (10 sheltered and 48 unsheltered). Although this number seems low, please note that it is not representative of the homeless

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[27] US Census (2000). American Community Survey 5 Year Estimates (2017)

[28] ibid.

[29] US Census (2000). American Community Survey 5 Year Estimates (2018)

population in the City, as the PITC only has data on homeless individuals counted on that specific day of the count. Providing affordable housing options can prevent individuals/families from becoming homeless and removing barriers to affordable housing can help homeless individuals transition into more stable housing environments.

Public Safety

A variety of factors can impact community safety, including underemployment, the presence of gangs, racism, and lack of youth and family activities. Urban design has also been linked to crime and safety issues for vulnerable populations, including people with disabilities, older adults, children, pedestrians, and cyclists. Violent crime, such as homicides, directly affect the health outcomes of communities. Direct exposure to physical violence is also associated with a range of negative mental health consequences, such as depression, anxiety, suicide, and post-traumatic stress disorder. The perception of crime can also impact individual health, businesses, and social cohesion.

Real and perceived crime can have health, social, and behavioral implications. This section includes data from the Quality of Life Survey and indicators for property crimes and violent crimes.

- Healthy RC frames issues of public safety within the context of Community Connection and Safety. The Quality of Life Survey (2019) found that most respondents feel connected and safe:
  - 86 percent agreed that Rancho Cucamonga is a good place to raise children.
  - 77 percent agreed that Rancho Cucamonga is a safe place to live.
  - 55 percent agreed that there is plenty of help for people during the times of need in Rancho Cucamonga.
  - 44 percent feel connected to the community.
- Generally, the City of Rancho Cucamonga's community trust the police and law enforcement to do what's right, as shown in Figure 27. The census tracts located in the southern portions of the City display less trust in police and law enforcement, compared to the census tracts in the northern part of the City. Decreased trust in police and law enforcement is often associated with lower socioeconomic status and people of color. Census Tract 27 displays the least amount of trust (75%) in police and law enforcement but it is important to note that within Census Tract 27 is a Detention Center which could skew the results.
- Property crimes account for the most crime across the city and the county. Generally, there have been fluctuations in property crimes since 2008, with some upward increases between 2010-2012 and 2014-2017.[30]
- Generally, there has been an overall decrease in violent crimes since 2008. Between 2008-2018, violent crimes in the city fluctuated, as shown in Figure 28. Periodic fluctuations are common for city-level crime rates and may be impacted by the local economy, policing, and social factors.[31]

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[30] FBI Data Explorer (2008-2018)

[31] ibid.

Figure 27. Trust in Police and Law Enforcement, as Reported by Healthy RC's Quality of Life Survey. (2019)

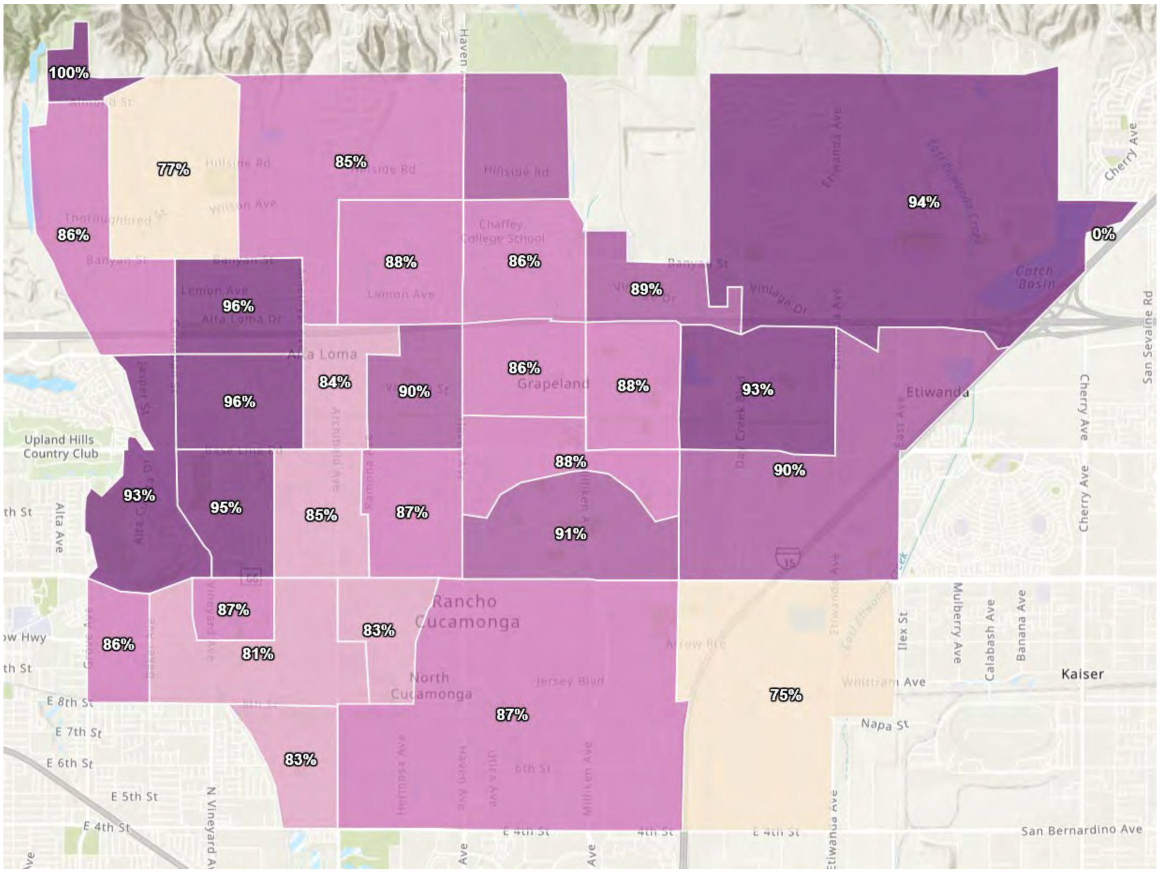
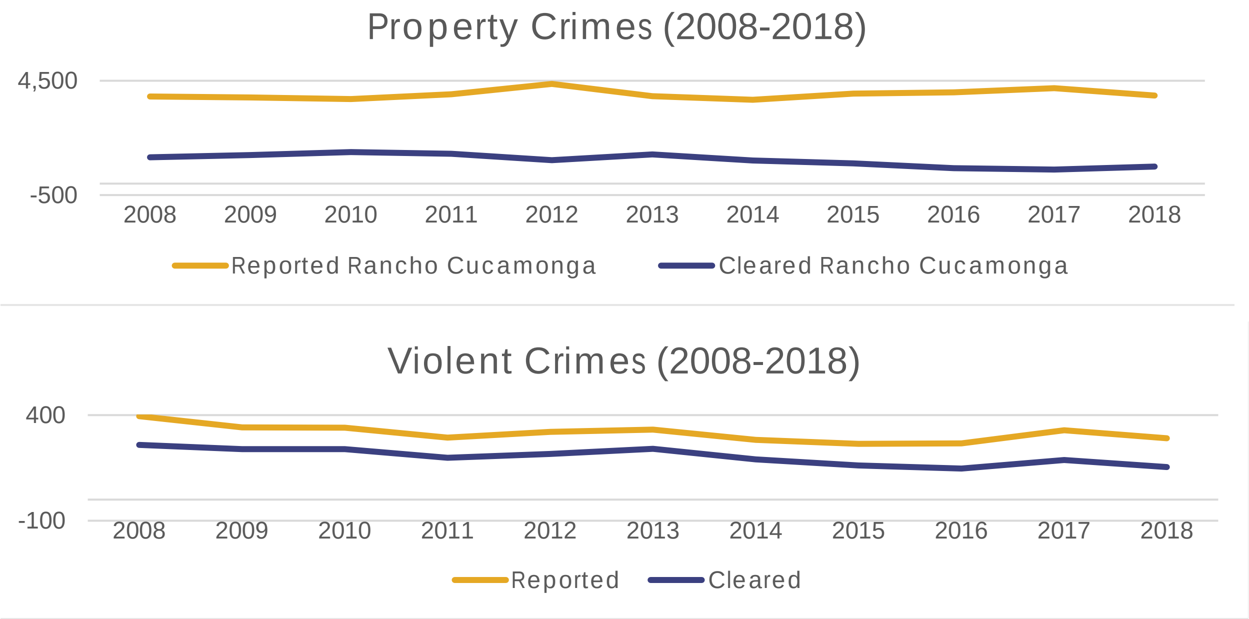


Figure 28. Property and Violent Crimes in Rancho Cucamonga, as Reported by Police Dept. (2008-2018)



Source: Rancho Cucamonga Police Department, 2020.

Walkability and Mobility

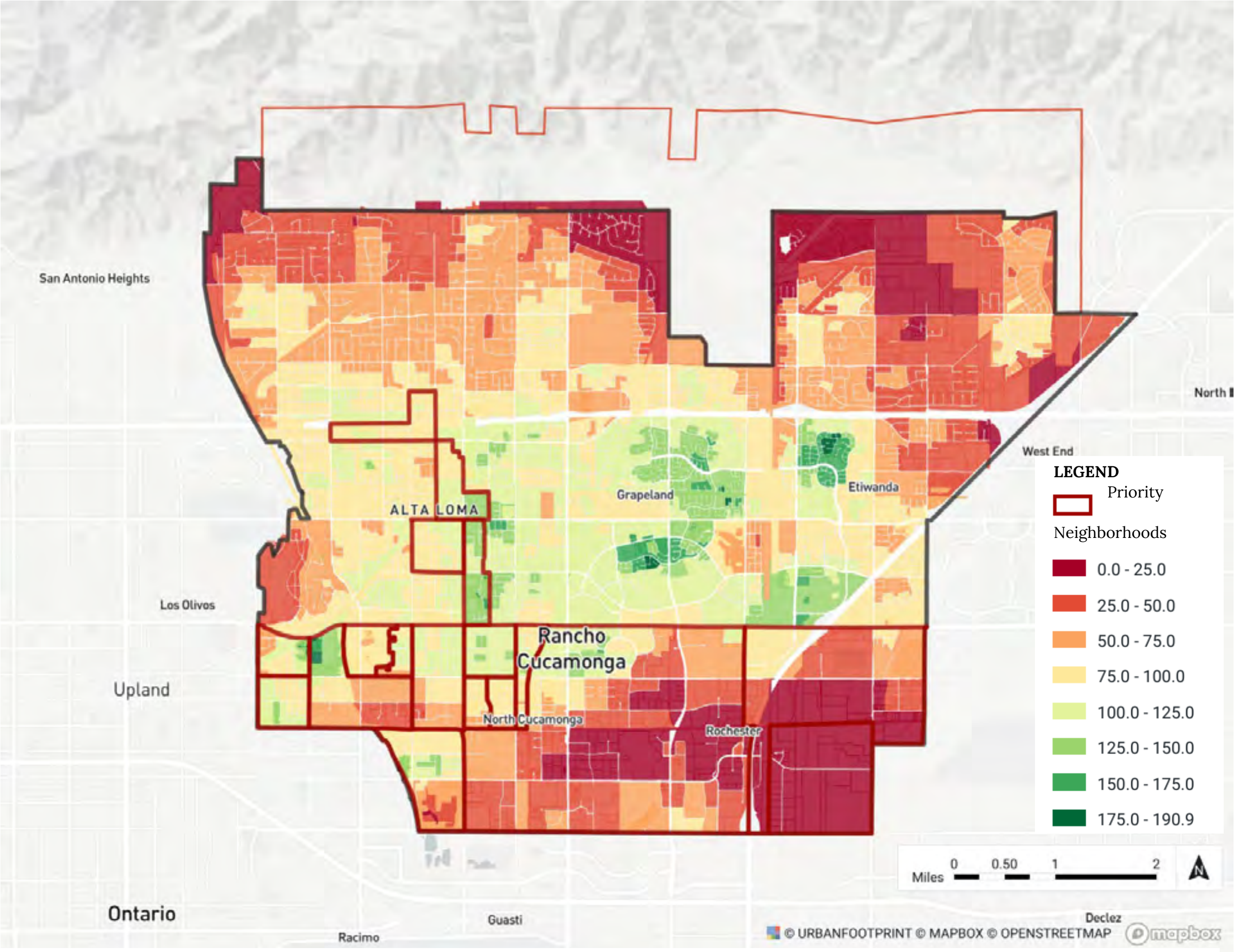
A person's preferred and actual mode of transportation depends on several factors, from travel distance, to cost, to scheduling, to accessibility, and more. The mode share and frequency of use of each type of use then impacts a person's health. For example, research shows that driving for long periods of time contributes to increased rates of obesity and, in the big picture, vehicular traffic is the greatest contributor to greenhouse gases and poor air quality—which causes, complicates, and accelerates many of the serious health conditions in the City of Rancho Cucamonga and throughout California. The physical environment, including walk access to parks, schools, commercial uses, and transit, also has an influence on health outcomes since there is a strong correlation between walking and lower obesity rates and reduced vehicle use.

This section covers a variety of topics related to walkability and mobility that impact overall health outcomes of Rancho Cucamonga residents. Individually and collectively, these indicators paint a picture of health and transportation in the city. Please note that many of these maps were prepared for other reports, particularly the Mobility Report and the Land Use and Urban Design Report, and are included here as supplementary information for the Healthy Communities Assessment.

Intersection Density

- Intersection density (measured as the number of intersections per square mile) is an indicator of the overall walkability of a community as shorter blocks are correlated to increased rates of walking. Thus, locations with a higher intersection density have smaller blocks and higher rates of walking while areas with lower intersection densities correspond to increased VMT and less walking.
- Rancho Cucamonga's historical development patterns as a suburban community results in an overall low level of intersection density across the city (Figure 29). Areas with concentrations of large lot single-family homes and industrial uses tend to have some of the lowest intersection density scores in the city. The most walkable areas (according to this metric) are located in the center third of the city on and around Foothill Boulevard. Interestingly, the areas that have the highest intersection densities are also the areas that have the greatest mix of uses (residential and commercial) in close proximity to one another. This map is useful to identify locations where new pedestrian connections or new blocks can be created to enhance walkability.

Figure 29. Intersection Density (Intersections per Square Mile) in Rancho Cucamonga (2020)

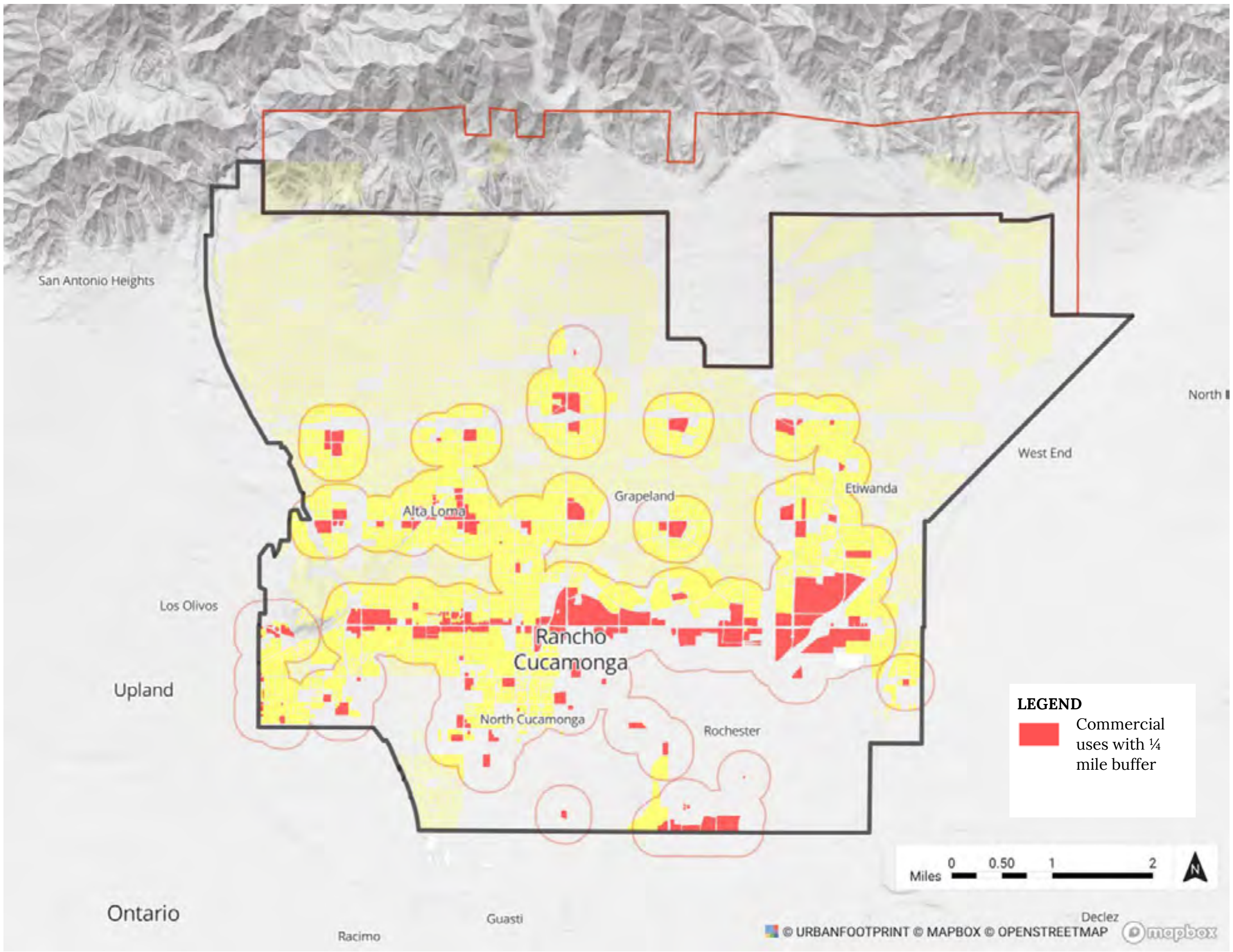


Source: Urban Footprint Base Canvas, 2020. Prepared for the Land Use and Urban Design Existing Conditions Report

Walk Access to Commercial Uses

- Figure 30 shows commercial uses in the city and residential locations within a quarter mile of these uses. Research has found that residents within walking distance to goods and services tend to walk more and drive less. Thus, walk access to commercial uses is an important indicator of health.
- The map also identifies locations where the City could target new commercial uses to bring existing residents closer to daily goods and services. As is shown in Figure 30, the large lot single family areas north of the I-210 and the southeast are of the city have the lowest access to commercial uses whereas the areas in the southwest and along Foothill Boulevard tend to have the highest access to commercial uses.

Figure 30. Walk Access from Residential Uses to Commercial Uses in Rancho Cucamonga (2020)

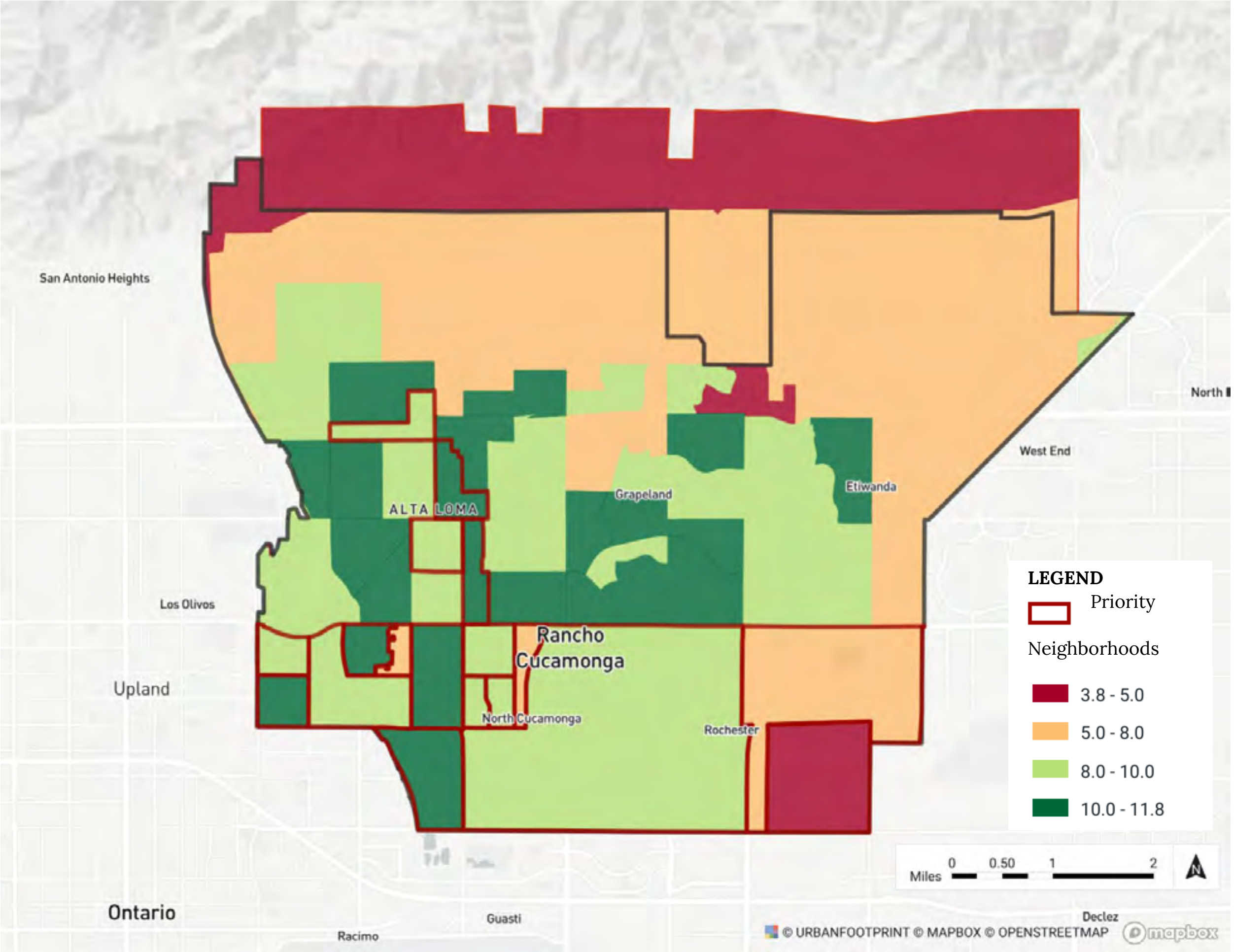


Source: Urban Footprint Base Canvas, 2020. Prepared for the Land Use and Urban Design Existing Conditions Report

Walkability Index

- The Walkability Index is an analytical tool developed by the U.S. Environmental Protection Agency and included in the UrbanFootprint scenario planning software. The Index includes measures of walkability including intersection density and access to goods and services and is calculated by census block group. As is shown in Figure 31, the areas with highest walkability scores are the same areas with the highest intersection densities and the best residential access to commercial uses (see the previous two figures).
- This map supports the conclusions that areas with large lot single family homes, lack of services within walking distances, and large industrial areas tend to be the least walkable, whereas areas with a greater mix of uses and smaller blocks tend to be more walkable.

Figure 31. Walkability Index Scores in Rancho Cucamonga, by Census Block Group (2014)++*



Source: US Environmental Protection Agency, National Walkability Index. Accessed through Urban Footprint Base Canvas, 2020. Prepared for the Land Use and Urban Design Existing Conditions Report

* The National Walkability Index from US EPA aggregates the following data at block group level: Intersection density; Mix of employment types; Mix of occupied housing + employment types; Predicted commute mode split.

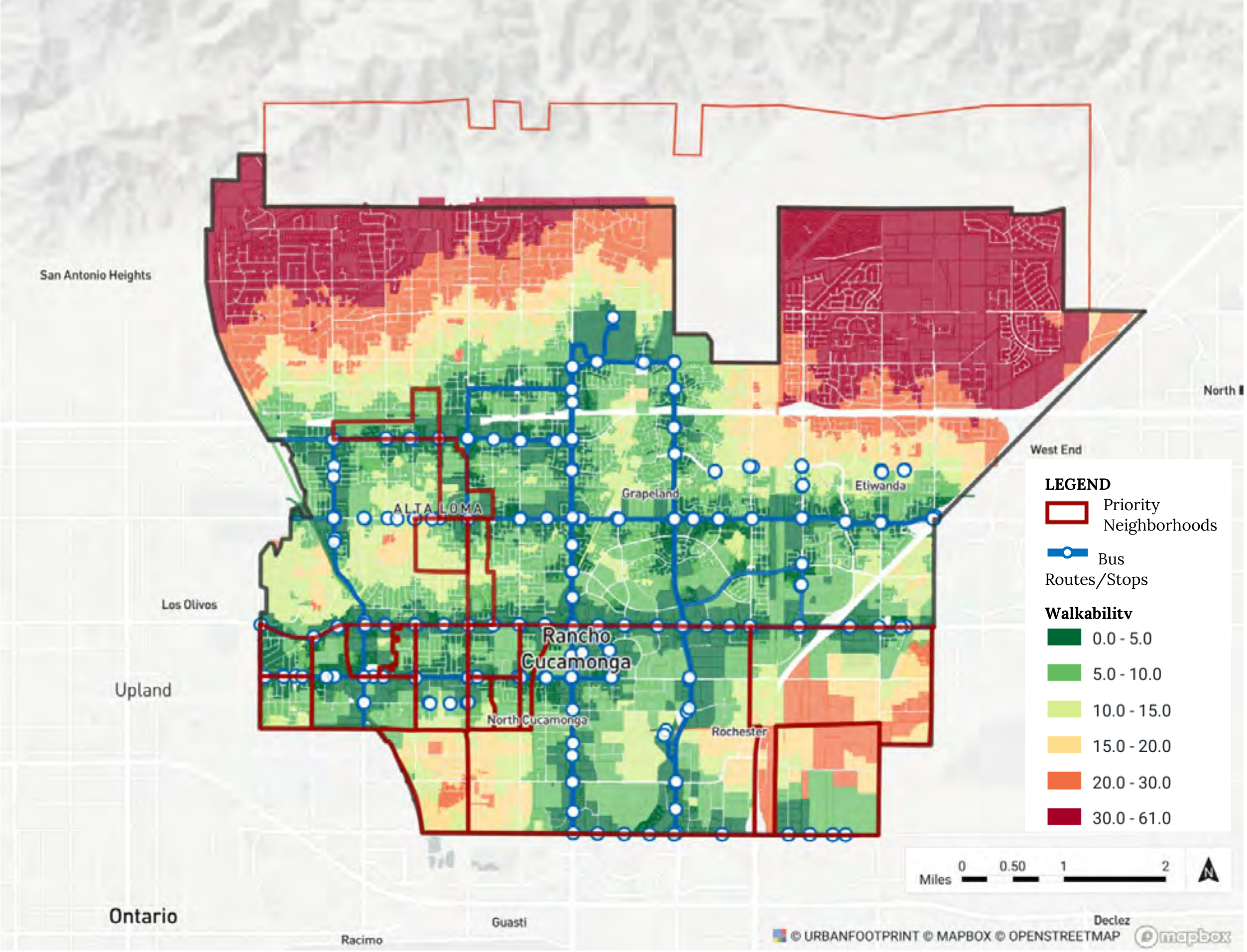
++Interpreting scores: Higher score means higher suitability for walking as a means of travel

Walk Access to Transit Stops

- Figure 32 shows the walking distance to each transit stop in the City of Rancho Cucamonga. This is an important indicator of health because many lower income families are reliant on transit to access goods and services, schools, jobs, and health care. In addition, transit riders are also walkers and research has found that regular transit users tend to walk more and drive less, which can support decreasing rates of chronic disease, particularly cardiovascular disease.
- Transit service is generally located along major arterial and collector roadways with stops spaced approximately ¼ mile apart. This pattern provides great access to residents and employees such that the majority of the city south of I-210 is within a 15-minute walk of a transit stop. While the coverage is good, the map does not address three critical aspects of transit ridership: the quality of the pedestrian environment

between the destination and the transit stop; the headways (or frequency) of transit service; and whether the transit allows riders to easily reach their destinations. All of these topics warrant further study as the General Plan update process evolves.

Figure 32. Access to Transit, Measured as Walkability to Nearest Transit Stop (2020)



Source: Urban Footprint Base Canvas (2020). Prepared for the Land Use and Urban Design Existing Conditions Report

Walk Access to Parks and Schools

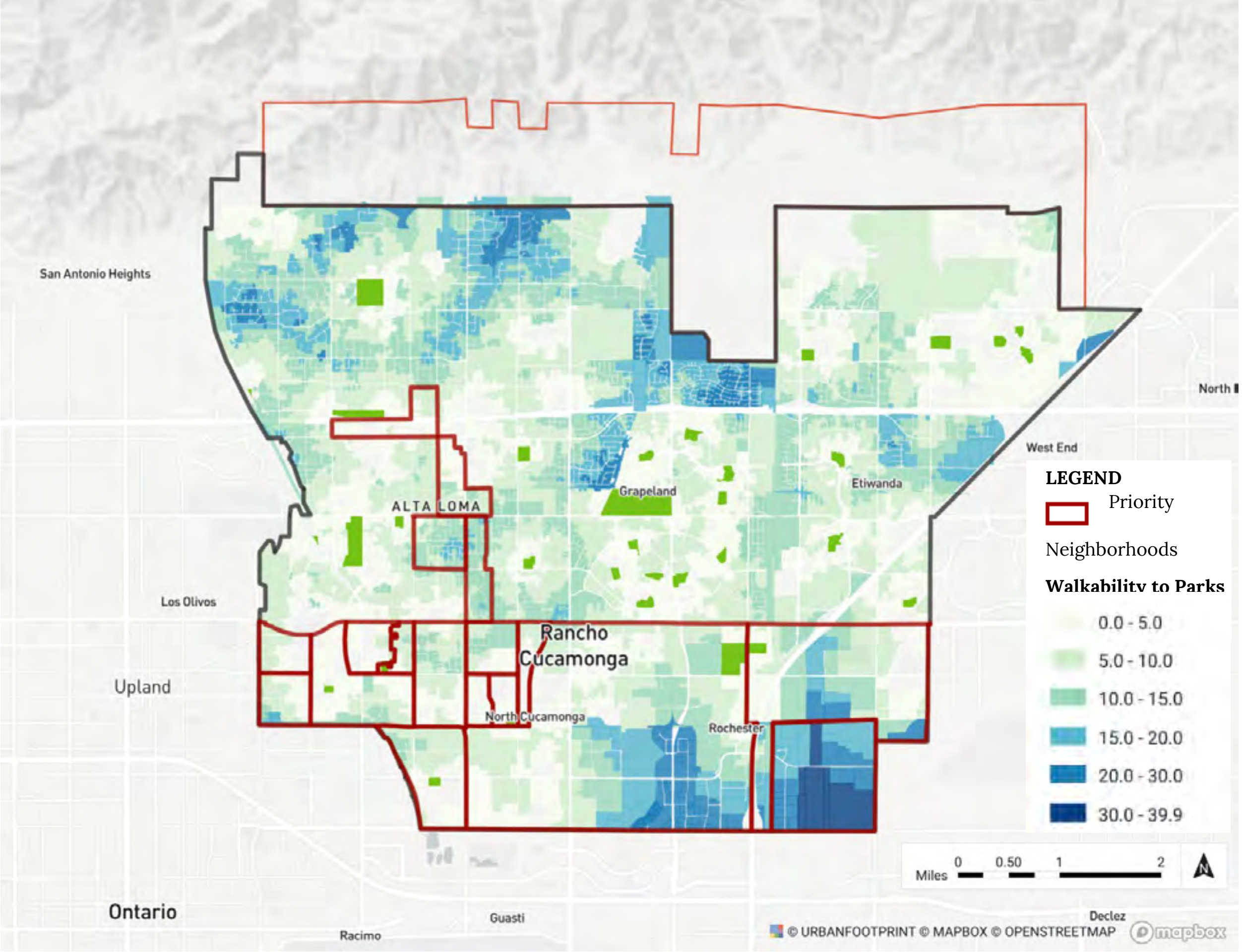
[Note: The Land Use and Urban Design report includes more detailed information on parks and recreational facilities.]

- Walk access to parks and schools are both indictors of a healthy community as residents who walk to schools and parks tend to have improved physical and mental health outcomes. For young children and through adolescence, walking to their school or local park can improve feelings of connection to the community, perceptions of safety, and social cohesion.
- Figures 33 and 34 show walk access (measured in minutes) to parks and schools. It is important to note that the quality and safety of the pedestrian environment also impact the likelihood of a person's willingness to walk to these destinations. The City

understands this connection and has a robust "safe routes to schools" program that is working to improve the physical environment around schools.

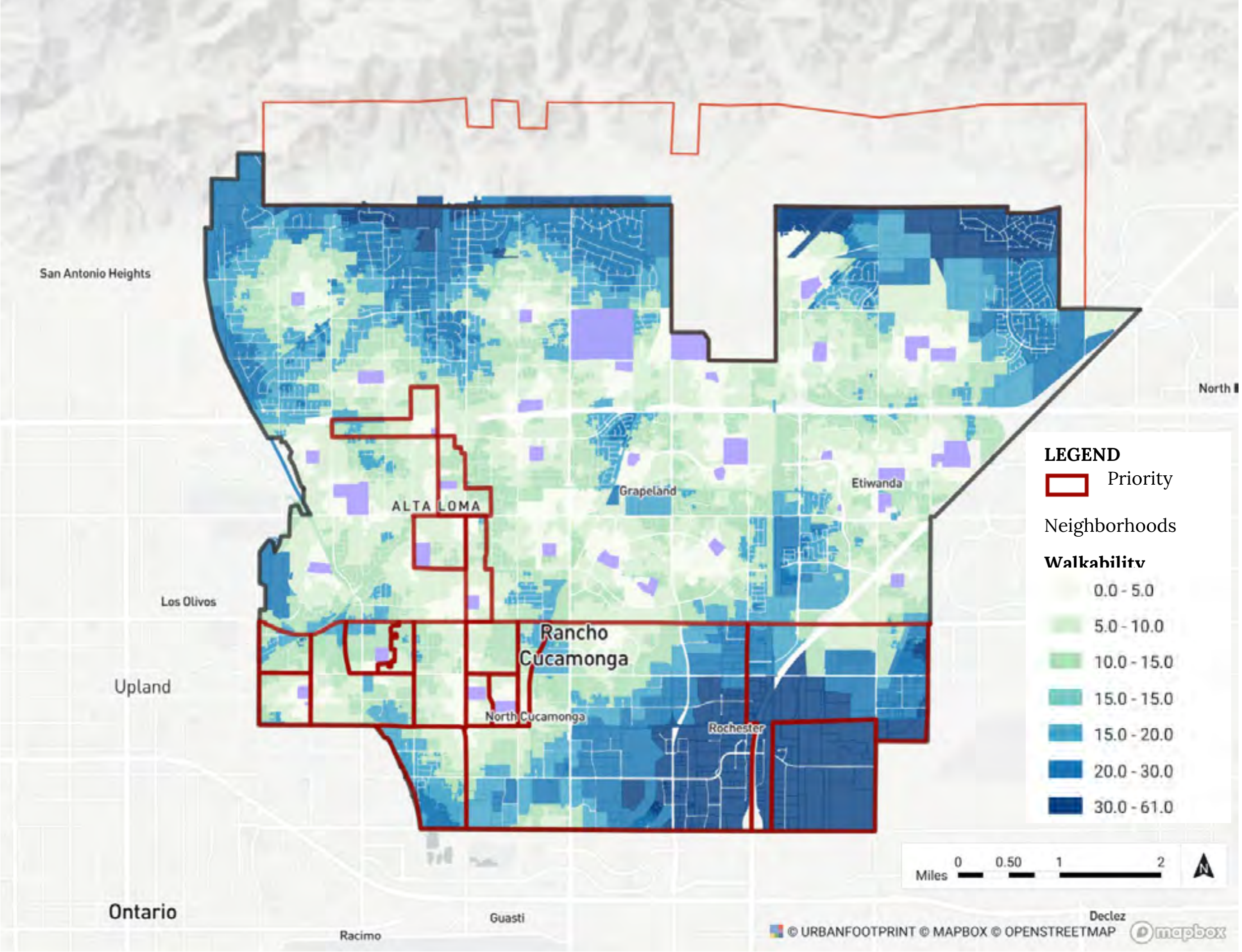
- The majority of people in Rancho Cucamonga are within a 0-15-minute walk to their nearest park (Figure 33). Some places north of the I-210 are further, with the nearest park at a 20-30-minute walk.
- Walkability to public schools is much lower than to parks (Figure 34). In Rancho Cucamonga, there are a great number of places towards the northern and southeastern boundaries of the city where people must walk 20 to 30 minutes, or even between 30 and 60+ minutes, to get to their nearest school. This means that students must drive, bike, or take public transit to schools.

Figure 33. Walkability to Parks



Source: UrbanFootprint Base Canvas, 2020. Prepared for the Land Use and Urban Design Existing Conditions Report.

Figure 34. Walkability to Public Schools



Source: UrbanFootprint Base Canvas, 2020. Prepared for the Land Use and Urban Design Existing Conditions Report.

Vehicle Ownership

- High rates of vehicle ownership per household are correlated with more driving whereas lower vehicle ownership rates (including zero and 1 vehicle households) are indicative of lower income and transit dependent households.
- Overall, Rancho Cucamonga and San Bernardino County have similarly distributed rates of number of vehicles owned per household. Most households, in both the city (over 85 percent) and county (83 percent), have two or more vehicles available.[32] Only a very small share of households in Rancho Cucamonga (1.1 percent) and San Bernardino County (1.8 percent) have no vehicle available.[33] This is indicative of an auto-oriented community and high driving-alone to work rates (as discussed in the Mobility Report).
- Areas with limited vehicle ownership (1 vehicle per household) generally correspond to the priority communities as identified in the SB 1000 analysis (Figure 35).

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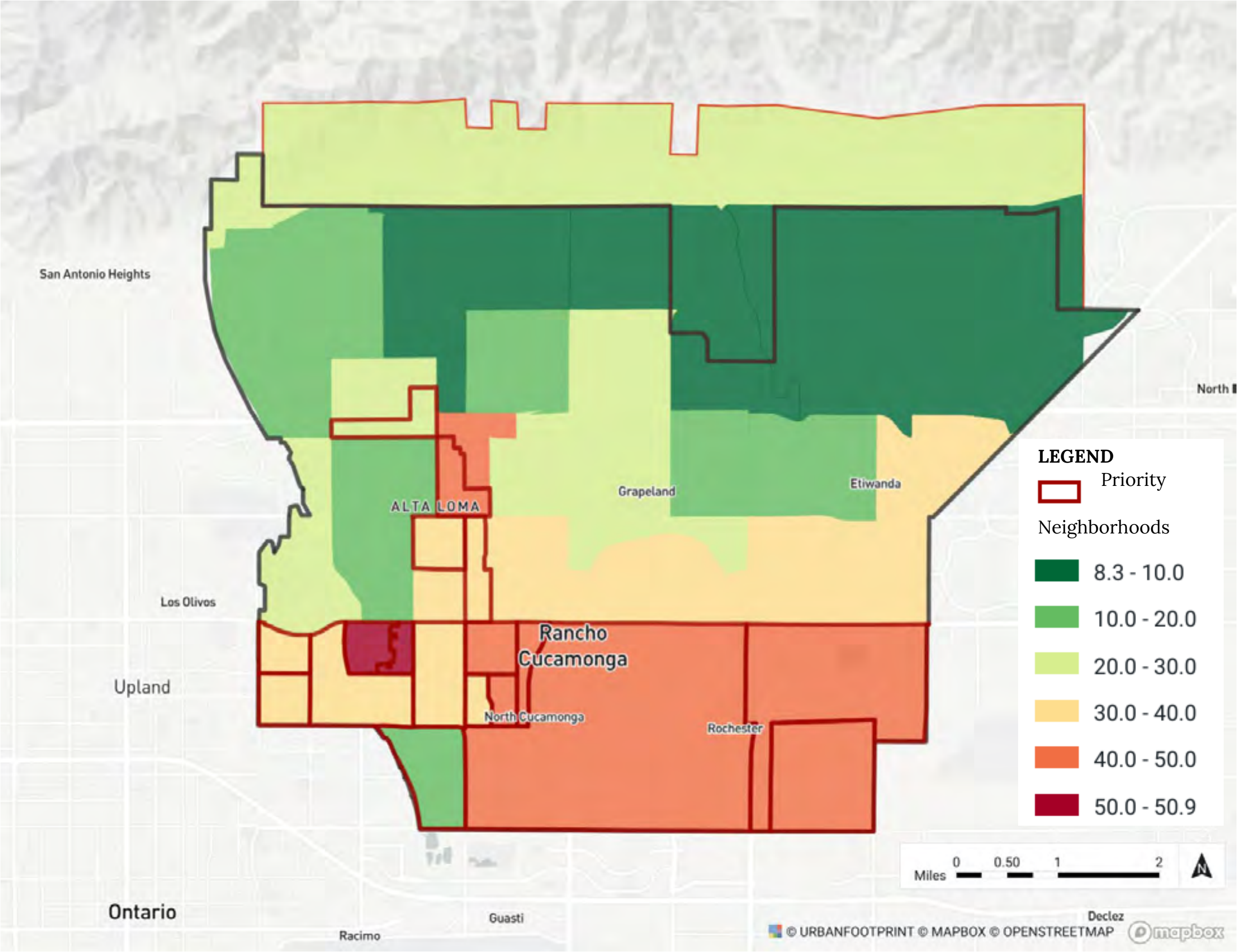
[32] US Census. American Community Survey 5-Year Estimates (2018).

[33] ibid.

Identification of these areas is critical since low vehicle ownership locations are more dependent on transit, walking, and biking to access goods and services.

Figure 35. Percent Households with Limited (One) Vehicle Ownership, by Census Tract (2017)



Source: State Traffic Safety Information System, 2015.

Healthy Food Environment

Healthy communities provide access to affordable and healthy food at grocery stores, produce markets, community gardens, and farmers' markets. Residents of communities with access to a full-service grocery store tend to eat more fruits and vegetables, have lower body weights, and lower rates of chronic diseases. Local food production can also reduce the distance food is shipped, lowering the environmental footprint of food production and distribution.

While various food stores can exist in the city, food access disparities exist depending on where people live or what their socioeconomic status is. "Healthy food access" is based on physical access to a food store (e.g., supermarket, large grocery store, etc.). "Food security" is defined as having access to enough food for an active, healthy life for all people always. Food insecurity can lead to undernourishment and malnutrition, which coincide with fatigue, stunted child development, and other health issues. This section includes indicators for: healthy food access, food insecurity, free and reduced lunch eligibility, and is supplemented with findings from the Quality of Life and Teen Quality of Life Assessments.

Healthy Food Access

- Access is most limited in neighborhoods south of Foothill Boulevard (Figure 36). In these areas, there are various low-income census tracts where over a quarter of the population lives more than a mile away from a supermarket or grocery store. [34] However, these areas may have smaller markets or newer markets that provide for the food needs of residents and these markets may not yet be included in the database utilized for this analysis. The Quality of Life Survey responses below highlight some of these gaps in the data:
    - 79 percent reported that they can find fresh fruits and vegetables in their neighborhood usually or always.
    - 67 percent reported that fresh fruits and vegetables are usually or always affordable in their neighborhood.
    - 72 percent reported that they buy most of their fresh and vegetables from big chain supermarkets
- There is a high concentration of fast food restaurants along Foothill Boulevard which exacerbates the issue of limited access to healthy food for residents. Locating grocery stores or neighborhood markets that sell affordable, high quality fruits and vegetables in proximity to homes both encourages walking and reduces demand for driving.[35]
    - In the Quality of Life Survey, 70 percent of respondents reported eating fast food at least once in the past 7 days.
- The City of Rancho Cucamonga has a Bringing Health Home Program, which provides a dollar-for-dollar match incentive for purchasing healthy food at farmers' markets.

Food Insecurity

- Food insecurity disproportionately affects lower income households. Based on data from the UCLA Center for Health Policy, 4.9 percent of adults reported food insecurity in Rancho Cucamonga, compared to 8.6 percent in San Bernardino County, and 7 percent in the State (Figure 37).[36]
- Households that lack "food security" in the city are eligible for supplemental assistance from government programs, such as the Federal Supplemental Nutrition Assistance Program (SNAP) and Women Infants and Children (WIC) program; the State CalFresh program, based on food stamps assistance; and local emergency programs, including the Emergency Food Assistance Program and Community Pantry Program.
    - For older adults, the City also offers two supplemental food programs: a Family Service Association (FSA) home delivered meal program and a congregate meal site at the Brulte Senior Center.

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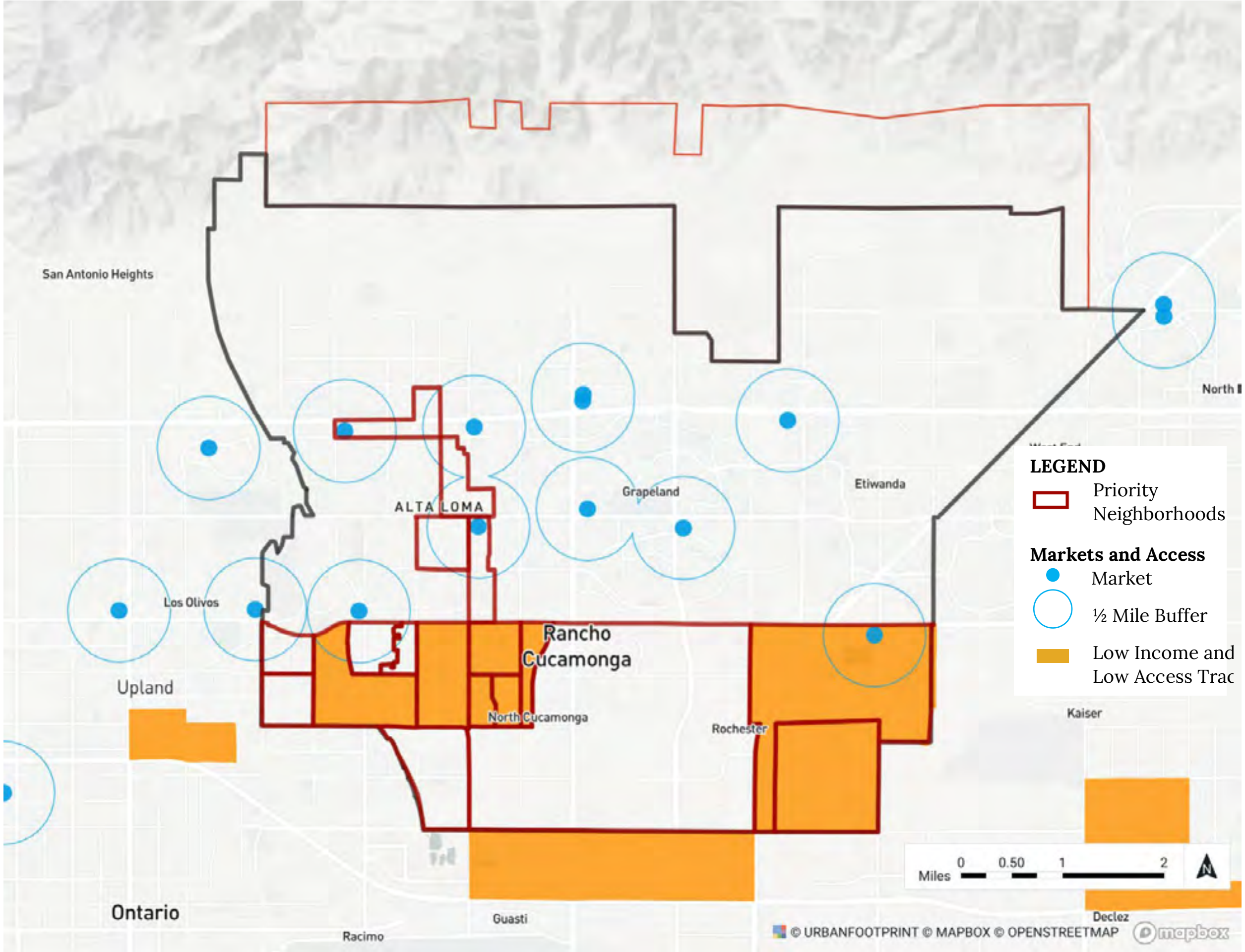
[34] USDA Food Research Atlas (2017), Open Streets Map (2020)

[35] ibid.

[36] AskCHIS, Neighborhood Edition (2016).

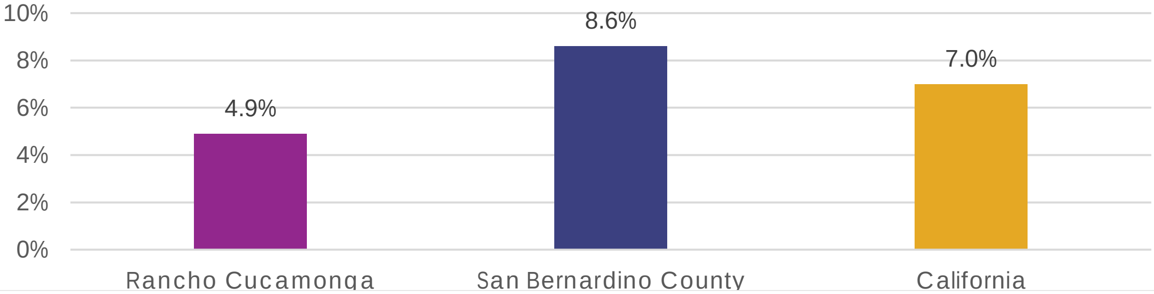
- More than half (53 percent) of all students in the Rancho Cucamonga School Districts are eligible for free and reduced lunch, compared to nearly three-quarters (71 percent) in County of San Bernardino School Districts (Figure 38).

Figure 36. Low Income and Low Access to Grocery Food in Rancho Cucamonga (2020)



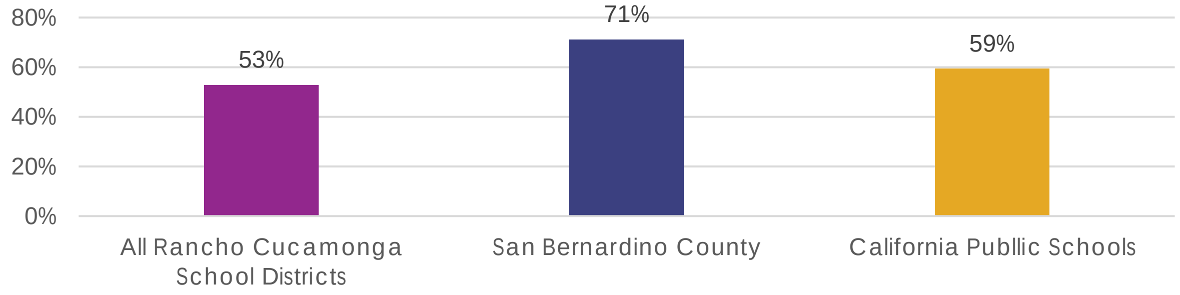
Source: USDA Food Access Research Atlas, 2017. Open Street Map, 2020.

Figure 37. Percent of Households Identified as Being Low-Income and Food Insecure in Rancho Cucamonga, Compared to San Bernardino County and California (2016)



Source: AskCHIS, Neighborhood Edition, 2016.

Figure 38. Students Eligible for Free and Reduced Lunch in Rancho Cucamonga School Districts, Compared to in the County and across all California Public Schools (2018-2019)



Source: California Department of Education, 2018-2019.

Exposure to Pollution and Other Toxics

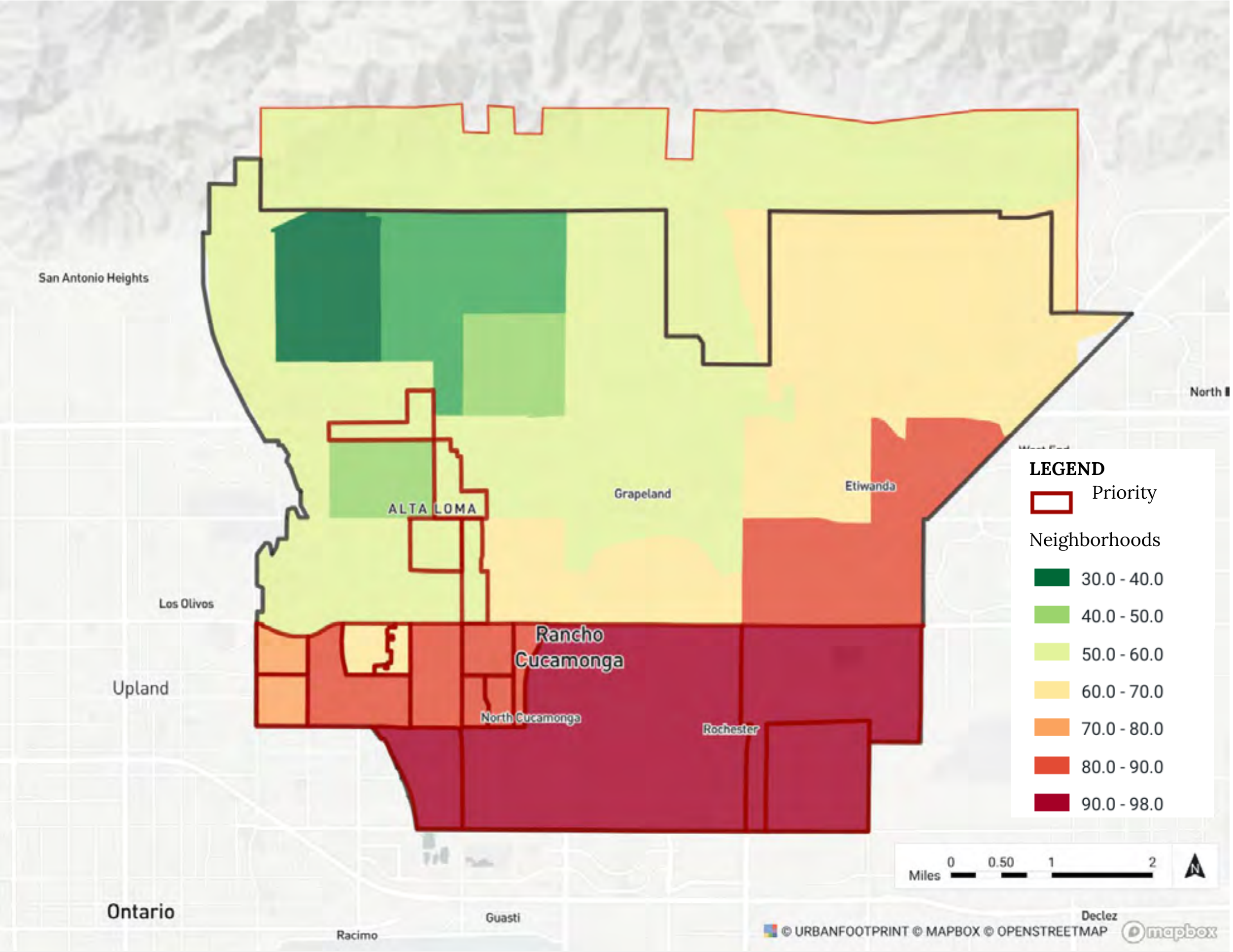
Research has shown that many communities throughout the state bear a disproportionate burden of exposure to pollution and other toxics in their homes, communities, workplaces, and even schools. This is due in large part to the legacy of exclusionary zoning that led to residential segregation, as well as to land use decisions that collocated sensitive uses like residences and schools in close proximity to industrial facilities or freeways, and continues today with the growing level of stress from vehicular travel and goods movement traffic on air quality and quality of life in the San Bernardino County Region.

The result of increasing levels of exposure to pollution and other toxics in the air, water, and in homes is an undeniable effect, unique and compounded, on the health of people in these communities. Pollution burden can cause new or exacerbate existing chronic health diseases, such as cancer and respiratory illness, and, over time, can be deadly. This can lead to premature births or birth defects, unhealthy or irregular development in children, and lethal complications for older adults. This section includes the following indicators from the CalEnviroScreen 3.0 Tool: overall pollution burden score, ozone, particulate matter less than 2.5 micrograms (PM 2.5), diesel particulate matter, drinking water contaminants, ground water threats, impaired water bodies, traffic density, toxic releases from facilities, pesticide use, solid waste sites and facilities, hazardous waste generators and facilities, and cleanup sites.

Overall Pollution Burden Score

- Most tracts in Rancho Cucamonga score in the bottom half of all tracts in the State with regard to pollution burden; meaning that neighborhoods in those tracts experience a relatively low exposure to pollution (Figure 39).
- Nevertheless, the region south of Foothill Boulevard has pollution burden scores that are worse than in 75 percent of the state; meaning that these neighborhoods experience some of the highest levels of exposure to multiple of the indicators discussed in this section. In this area, the most polluted tracts are concentrated in the priority neighborhoods south of Foothill Boulevard, where there is a significant concentration of industrial land uses (Figure 39).

Figure 39. Overall Pollution Burden Percentile Scores in Rancho Cucamonga, by Census Tract (2018)



Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

Ozone

- Nearly all of Rancho Cucamonga experiences ozone level concentrations of .062 to .065 parts per million (ppm).[37] This is very close to the standard of .070 set by the US Environmental Protection Agency (Figure 40).[38]
- When compared to the rest of California, ozone exposure in Rancho Cucamonga is worse than in 98 percent of all other census tracts in the state. Ozone is, thus, a key area of concern citywide (Figure 40). Rancho Cucamonga is geographically located at the foothills of the San Gabriel Mountains and in the Inland Empire region, which is a hub of the logistics and goods movement industries in Southern California. Further, it has historic and present-day connections to the agriculture industry and historic

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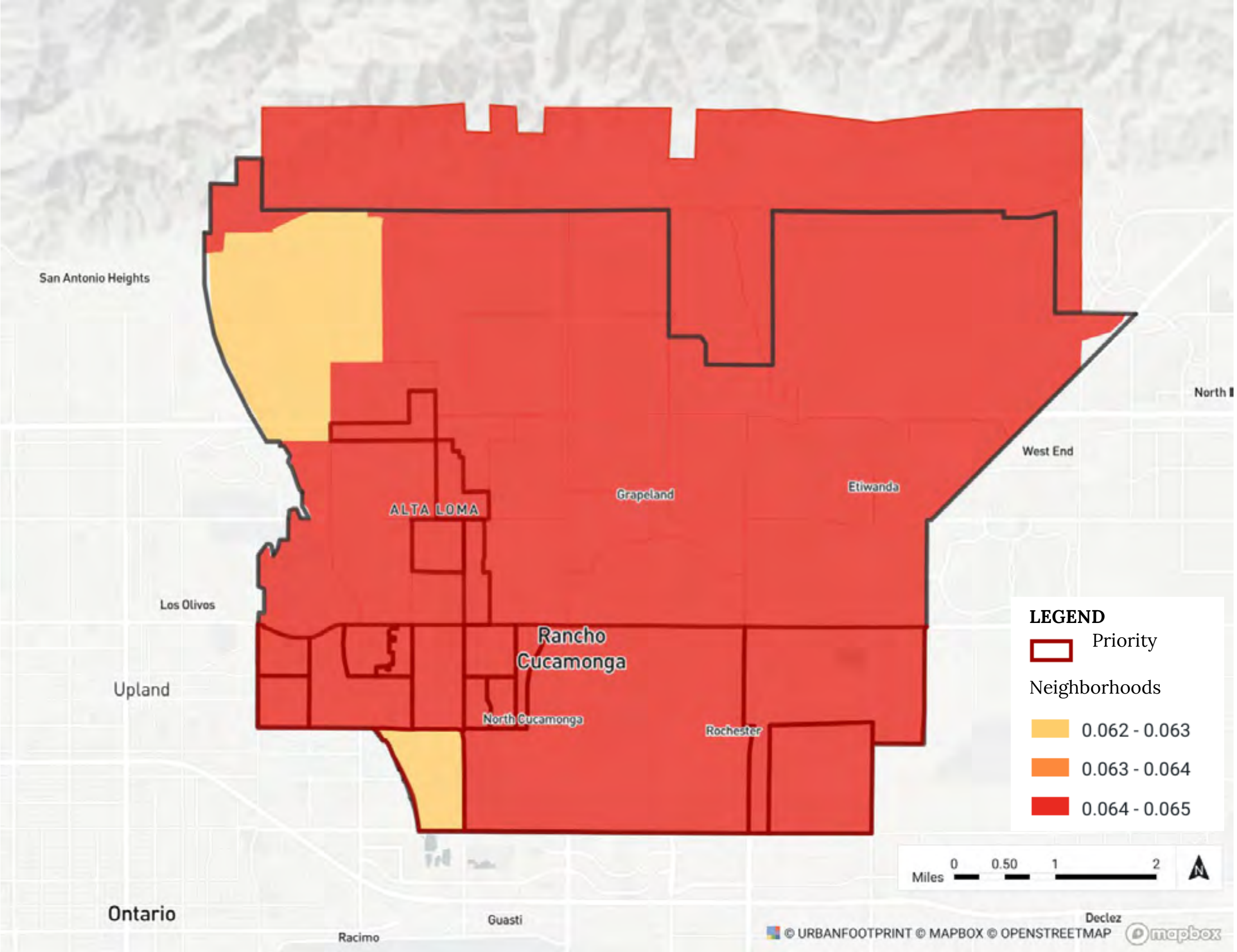
[37] According to the CalEnviroScreen 3.0 report, Ozone is the primary component of smog and its levels are typically higher in the afternoon and on hot days, when the presence of sunlight causes oxygen in ozone to with other air pollutants.

[38] US EPA. Ground Level Ozone Pollution: 2015 National Ambient Air Quality Standards (AAQS) for Ozone. Retrieved from: https://www.epa.gov/ground-level-ozone-pollution/2015-national-ambient-air-quality-standards-naaqs-ozone

travel routes, such as Route 66. These patterns of development and the geographic location of the city may be at the root of the elevated levels of ozone exposure that residents in and outside of priority neighborhoods face.

Figure 40. Ozone PPM in Rancho Cucamonga, by Census Tract (2018)



Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

PM 2.5

- Nearly all of Rancho Cucamonga experiences an annual mean PM2.5 concentration of 12 to 13.3 micrograms per cubic meter (µg/m3).[39] This is at or above the 12 µg/m3 concentration standard set by the US Environmental Protection Agency (EPA) (Figure 41).[40]

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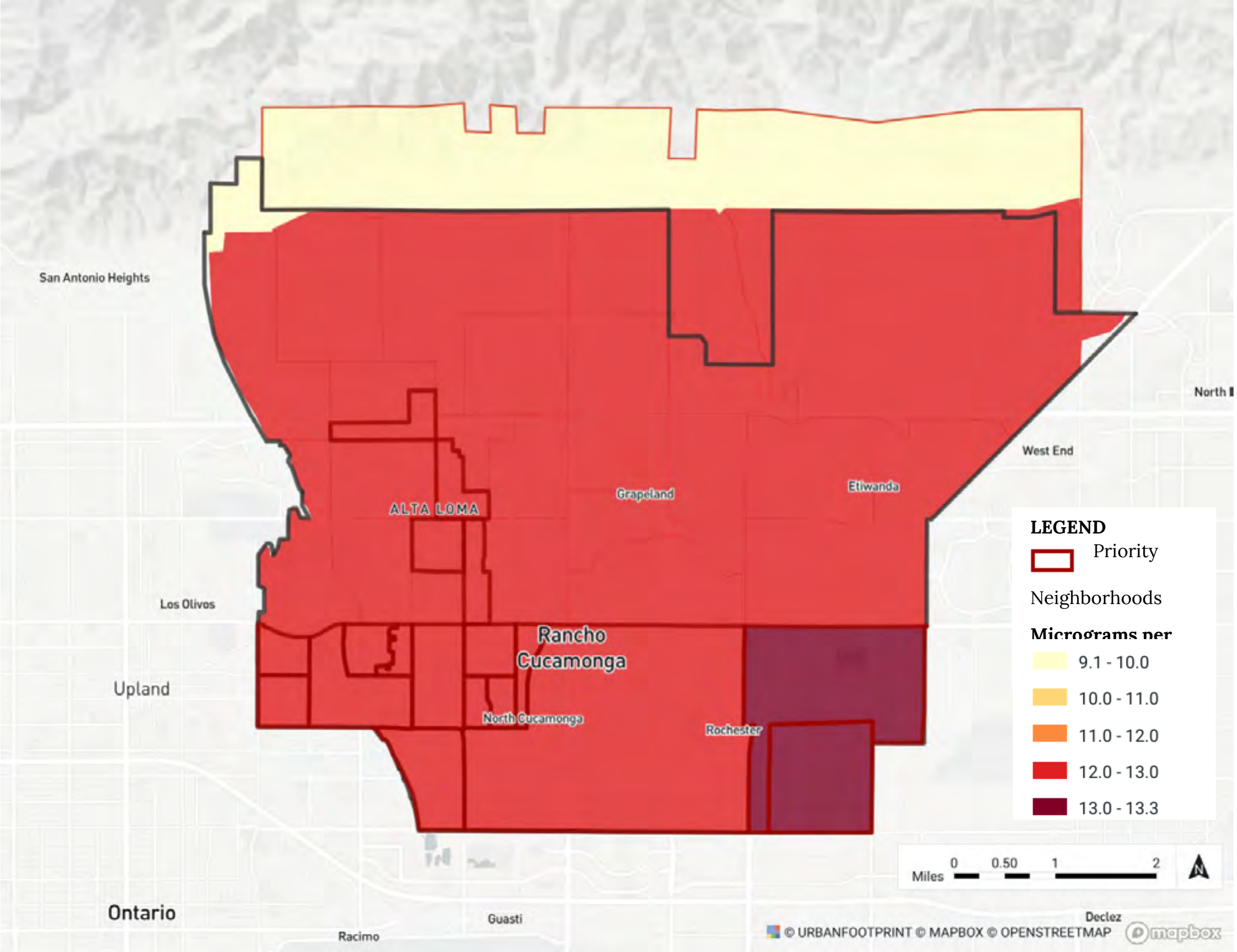
[39] Particulate matter (PM) 2.5 is a mixture of fine particles such as dust, allergens, and metals that can come from cars and trucks, industrial processes, wood burning, and other combustion activities, like wildfires.

[40] CalEPA. CalEnviroScreen 3.0 Report. 2017.

- When compared to the rest of California, PM 2.5 exposure varies across census tracts in Rancho Cucamonga and is worse than in 84-94 percent of all other census tracts in the state. PM 2.5 is, thus, a key area of concern citywide (Figure 41).
- Priority neighborhoods in the southeast area of the city have the highest level of concentration of PM 2.5 (13-13.3 μg/m3). Long-term exposure to this high level of PM 2.5 can significantly compound health risks for the workers and the detained population that spend prolonged time in the West Valley Detention Facility, which is located in this area (Figure 41).

Figure 41. Fine Particulate Matter (PM 2.5) in Rancho Cucamonga, by Census Tract (2018)



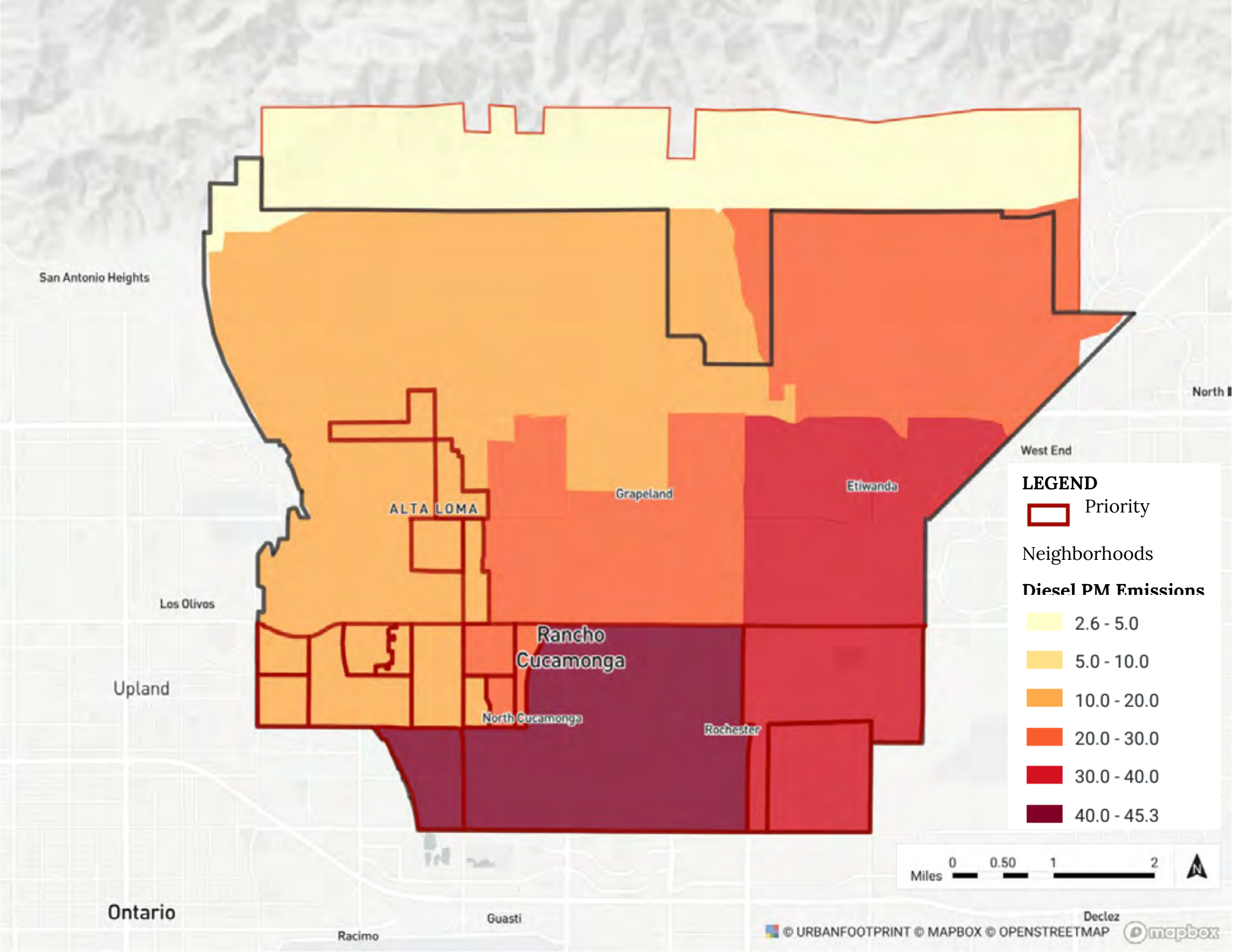
Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

Diesel PM

- Much of Rancho Cucamonga, particularly in the northwestern and western areas of the city, experiences low levels of Diesel PM exposures. Exposure levels here range from 2.6 to 20 kg/day, making these some of the lowest levels in the state (Figure 42).[41]

- Elevated levels of diesel PM exposure, in the range of 30 to 45.3 kg/day, are experienced in various census tracts (1, 18, 19, 25, 26, and 27) in Rancho Cucamonga. These are generally associated with the priority neighborhoods that are in the industrial core, proximal to multiple highways, or intersected by the Metrolink line (Figure 42).
- The area near the intersection of Foothill Boulevard and Rochester Avenue is not classified as a priority neighborhood, but experiences elevated exposure to diesel PM that may be attributed to the closer proximity to I-15 (Figure 42).

Figure 42. Diesel Particulate Matter (Diesel PM) in Rancho Cucamonga, by Census Tract (2018)



Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

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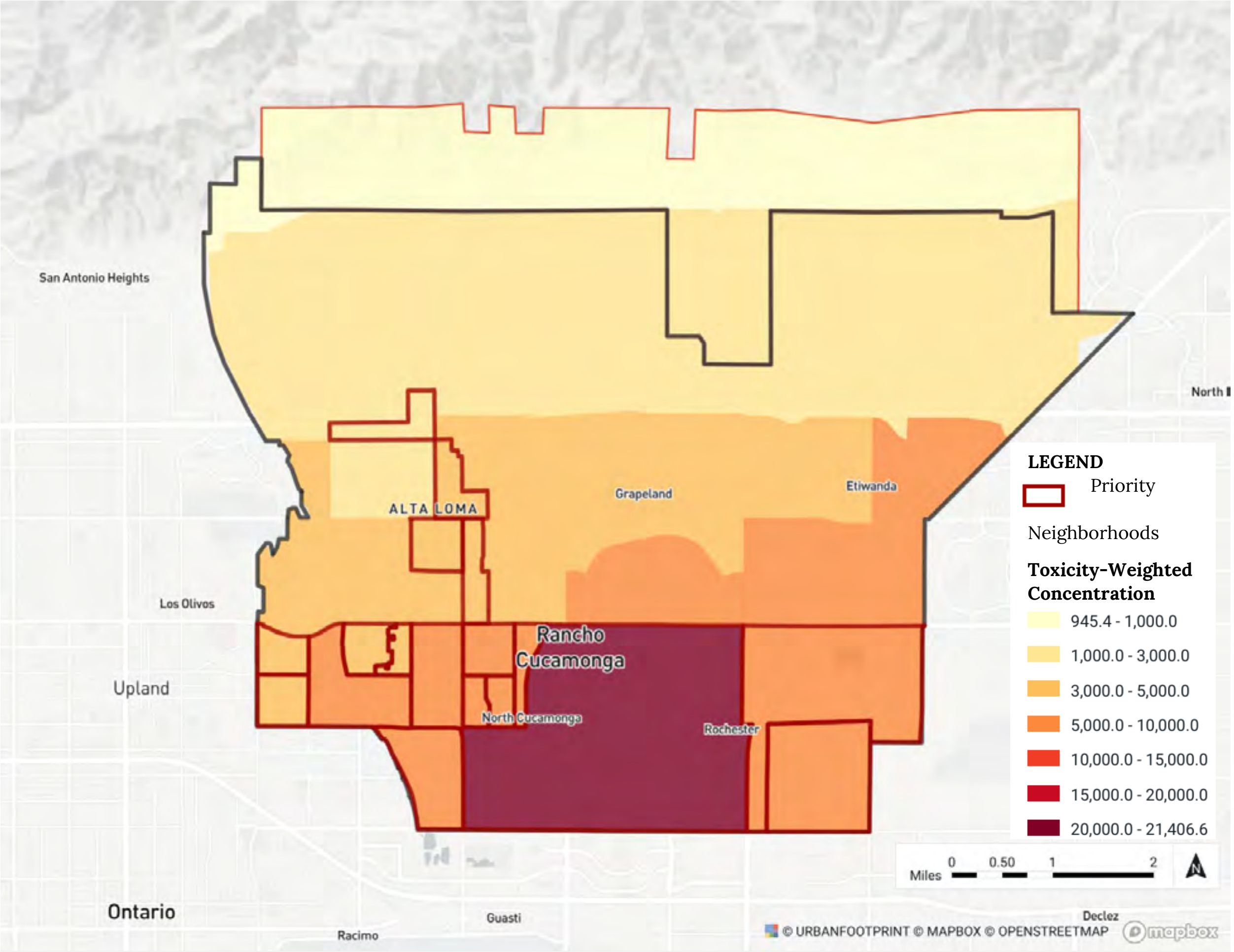
[41] Diesel particulate matter (diesel PM) comes from diesel engines of on-road and off-road sources—like trucks, buses, locomotive engines—and is concentrated near ports, rail yards, and freeways. Exposure to diesel PM contains known carcinogens and irritates the eyes, throat, and nose, causes complications for heart and lung disease, and contributes to the incidence and mortality of lung cancers

Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

Toxic Releases from Facilities

- In the CalEnviroScreen tool, tracts with toxic release scores of ~5,000 or higher have worse exposures than 80 percent of all tracts in the state of California. Large areas of the city have scores of ~5,000 or higher. This includes some census tracts outside of priority neighborhoods, near the intersection of Foothill Boulevard. and Milliken Avenue., where industrial uses exist near residential uses, and near Old Etiwanda, where more investigation is needed to identify the potential sources of toxic releases (Figure 43).
- The highest concentration of toxic releases is in the industrial hub of the city, central and south of Foothill Boulevard (tract 26), where the score of 21,406—which is four times higher than in more than 80 percent of California tracts—means exposure ranks worse than in 98 percent of all census tracts in California (Figure 43). This is a major health and environmental justice concern.

Figure 43. Exposure to Toxic Releases from Facilities in Rancho Cucamonga, by Census Tracts (2018)

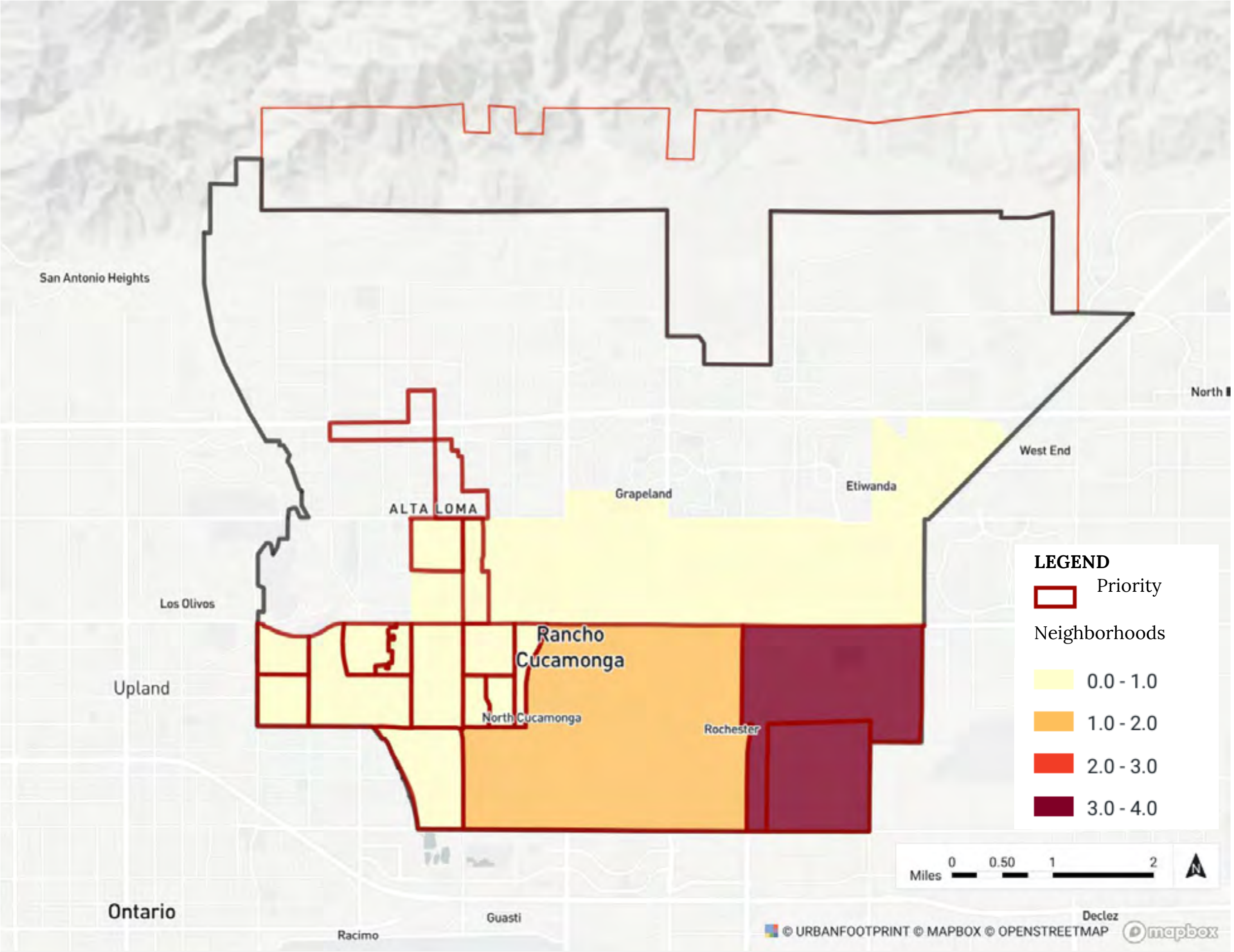


Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

Hazardous Waste Generators and Facilities

- Most of the residential areas of the City of Rancho Cucamonga have no hazardous waste generators or facilities nearby, meaning the city overall has limited exposures to pollutants from these sources (Figure 44).
- Two census tracts (26 and 27) have a weighted count of 2-4 generators or facilities in them; these same tracts that have a higher concentration of other exposures, indicating a need for policies that assess and address cumulative impacts (Figure 44).

Figure 44. Hazardous Waste Generators and Facilities in Rancho Cucamonga, by Census Tract (2018)



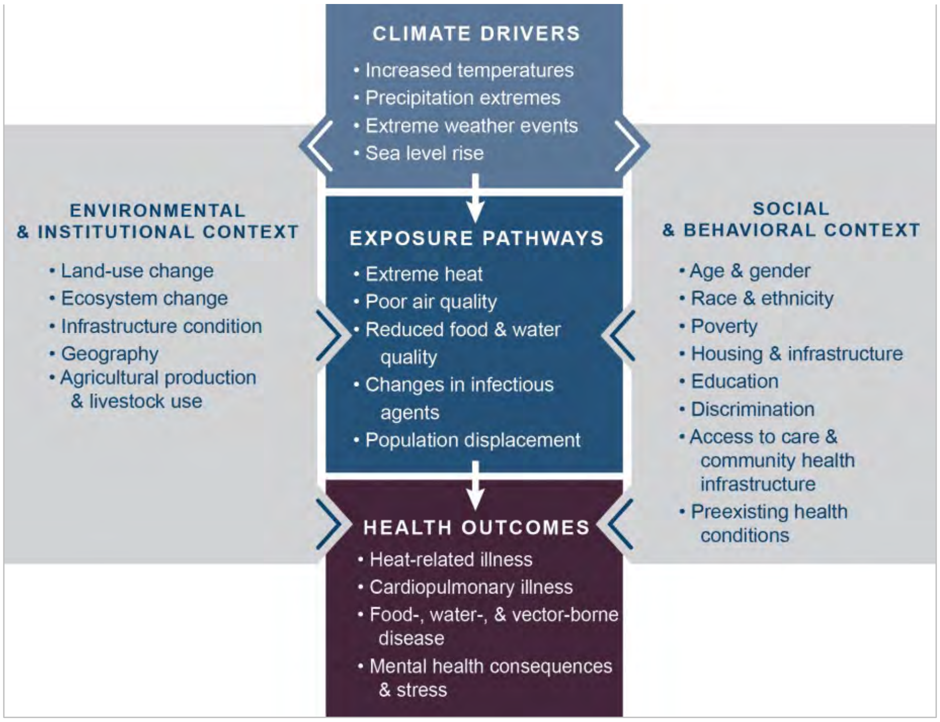
Source: Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 (2018).

Resilience to Climate and Natural Hazards

Climate change is a critical environmental challenge and poses significant threats to the health and wellbeing of communities across the region. Not everyone will experience the impacts of climate change in the same way. The impacts of climate change will fall hardest on those who are historically over-burdened and under-resourced. In these neighborhoods and communities, factors ranging from disproportionately poor environmental quality, lack of health care access, and linguistic isolation, will contribute to greater climate risk.[42] The burden is compounded by having fewer resources to prepare for or recover from the impacts of climate change.

In Rancho Cucamonga, the impacts of extreme heat, poor air quality, wildfire, and other climate hazards are anticipated to negatively affect human health, health behaviors, and the socioeconomic factors that influence health outcomes. Figure 45 illustrates the relationships between climate drivers and health.

Figure 45. Climate Drivers and Health Outcomes Diagram



Source: U.S. Global Climate Change Research Program, Climate and Health Assessment, 2016.

Climate hazards and impacts are covered in detail as part of the *Safety* and *Greenhouse Gas Emissions and Climate Change Vulnerability Assessment* existing conditions reports. As part of the General Plan update and in compliance with Senate Bill 379 (Safety Element), the PlanRC Team will be conducting a needs assessment that will include assessment of hazards and risks across the city and in priority neighborhoods. This is discussed in the Climate Change, Air Quality, and Noise Report.

Based on the research on community resilience to climate and natural hazards, the City of Rancho Cucamonga can expect impacts on health and environmental justice. The following

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[42] U.S. Global Change Research Program, Climate and Health Assessment (2016).

examples may occur citywide or in priority neighborhoods and effects may also be compounded:

- The increased cost of water and energy during an extreme climate event, including heat waves and droughts, can place an additional burden on low-income households that must spend a greater percentage of their earnings on basic services and tend to live in older, poorly insulated, inefficient housing.
- During events such as wildfires, flooding, or extreme storms, vulnerable populations may require additional assistance due to limited access to emergency supplies and emergency information in multiple languages.
- Climate change hazards can result in additional health hazards for people reliant on power to sustain medical equipment/assistive technology use.
- Wildfires, flooding, landslides, and extreme wind can cause physical damage to existing city infrastructure and facilities. The damage resulting from climate change-related hazards can have a greater impact on disadvantaged populations, particularly communities that are low-income or individuals who have low mobility.
- Climate change impacts can affect various populations in the city, but would disproportionately affect vulnerable populations including low-income communities, communities of color, senior citizens, linguistically isolated populations, individuals with disabilities or preexisting medical conditions, and individuals experiencing homelessness.

While these do not offer an analysis of the existing conditions, they offer a concrete illustration of the compounded and interconnected vulnerabilities and consequences of climate change. In responding to the health and environmental justice issues that have been overlapped with climate and natural hazards, Rancho Cucamonga has an opportunity to build more resilient communities that adapt well to changes in the built environment, natural ecosystems, and economy.

Conclusion and Key Findings

The analysis from the four assessments results in health and environmental justice strengths, weaknesses, opportunities, and threats for the city as a whole and for priority neighborhoods. These are summarized here according to Healthy RC priorities.

Overall, Rancho Cucamonga has established itself as a health leader in the Inland Empire through its efforts on Healthy RC and the goals and policies in the current General Plan. The City seeks to build upon these successes in the new General Plan and has an opportunity to continue to innovate and be a leader in the region by how it addresses state requirements for SB 1000. This process entails identifying "disadvantaged communities" that have a disproportionate negative health burden, conducting a robust engagement process to engage these communities, and developing targeted goals and strategies to address health inequities, especially as it relates to environmental justice. This process is familiar to the City, as it follows the same steps that the City takes to develop priorities and goals through Healthy RC. The opportunity lies in broadening the understanding of health to include the environment and building support for policies and strategies that reduce the racial and economic inequities of access to the health-promoting benefits of the physical environment.

Based on a thorough evaluation of health conditions in Rancho Cucamonga, the City, overall, performs better than San Bernardino County and the State for many indicators of health outcomes. Despite these successes, citywide health and environmental justice issues exist, with observed differences across geographic areas, race and ethnicity, and socioeconomic status. Table 5 provides a detailed summary of findings from this Health and Environmental Justice Existing Conditions Report, organized according to the Healthy RC priorities. This information, coupled with the detailed findings in each assessment of the report, should be used to conduct targeted outreach to areas with health disparities and to craft citywide and localized policies to improve health conditions for all residents of Rancho Cucamonga.

Table 5. Conclusions, Organized by Healthy RC Priority Areas

Healthy RC Priorities	**Related Findings**
Healthy Eating and Active Living *Goal: Rancho Cucamonga residents of all ages and income levels have knowledge, motivation, and easy access to eat healthy and be physically active.*	Rancho Cucamonga residents have better outcomes related to Healthy Eating and Active Living overall, with some areas for improvement: • A high rate of adult obesity (27 percent), that is slightly lower than the County's (28 percent), can contribute to chronic disease and reduce quality of life. • Limited access to grocery stores and healthy foods in areas that have a higher proportion of low-income households, particularly south of the Foothill Boulevard corridor, which has a concentration of fast food restaurants. • A high rate of multiple-vehicle ownership, with 83 percent of households owning 2 or more vehicles. High dependence on vehicles contributes to higher traffic density, reduces incentives to use alternate modes of transportation, and emissions from vehicles increase negative impacts on air quality and the environment.

Community Connections and Safety *Goal: Rancho neighborhoods, schools, families, businesses, community organizations, and government agencies have a strong sense of community and shared responsibility for the health and safety of their city.*	Rancho Cucamonga is very similar to the region regarding housing affordability, public safety, and access to public facilities: • Rancho Cucamonga has high rates of housing cost-burdened households; 33 percent of owner-occupied units and 54 percent of renter-occupied units pay more than 30 percent of their income on housing costs. This can increase stress and reduce the income available for other health-supporting needs, like healthcare. The city experiences periodic fluctuations of property and violent crimes. These trends are generally declining overall, indicating that increasing awareness of these low levels of crime can foster more community connections.
Education and Family Support *Goal: Youth, families, and adults in Rancho Cucamonga receive high quality education, healthcare, and support services to realize their full potential and contribute to their community.*	The population in Rancho Cucamonga has high levels of educational attainment, English language proficiency, insurance coverage, and access to healthcare, creating a cohesive environment for health support. • As in neighboring communities, the Asian population is growing and has a higher rate of non-English-speaking persons (38 percent of the Asian population in the city). • Some low-income areas of the city, particularly south of Foothill Boulevard, have high rates (up to 20 percent) of uninsured persons. • Residents and emergency responders must travel outside of Rancho Cucamonga for general acute hospital care.
Mental Health *Goal: Mental health support services are easily accessible, culturally appropriate, and free of stigma for all residents of Rancho Cucamonga.*	While Healthy RC has created a supportive environment for youth and adults to talk about and access services for mental health issues, some areas of concern identified in this report include: • More adults in priority neighborhoods south of Foothill Boulevard report prolonged poor mental health days (13.8 percent to 15.7 percent) compared to in neighborhoods in the northern area of the city (9.4 percent to 10.3 percent). • Adult rates of seeking help for mental health and substance abuse in Rancho Cucamonga are slightly higher (16.6 percent) to rates in the county (15.7 percent).
Economic Development *Goal: The City of Rancho Cucamonga has a strong, growing economy that provides employment opportunities for*	This analysis was completed prior to the COVID-19 Pandemic and related economic recession, at which time Rancho Cucamonga had a strong, growing economy with the following strengths: • A high median household income ($86,355 in the city versus $60,115 in the County of San Bernardino). • A low poverty rate (eight percent in the city versus 17 percent in the County of San Bernardino).

local residents, attracts investments, supports local businesses, and generates public revenue.	• A low unemployment rate (six percent in the city versus nine percent in the County of San Bernardino).
Clean Environment *Goal: Residents of Rancho Cucamonga live in a clean, healthy environment and actively contribute to sustaining and protecting the natural resources of their city and region.*	Rancho Cucamonga's geographic location, topographic features, and historic development as a suburb with major east-west traffic corridors and highways creates several environmental challenges and threats to health: • Poor air quality, especially for indicators on ozone and particulate matter, which have been shown to significantly impact respiratory disease, cardiovascular disease, and other health conditions. • Many sensitive uses, such as daycare facilities and housing, and vulnerable populations, such as the incarcerated or seniors, are within or near several sources of pollution. Concentrated exposures, such as from waste management facilities or high-traffic roadways and freeways, can have cumulative health burdens and cause long-term health complications. • Overall, the area south of Foothill Boulevard and East of Archibald Avenue, where many of the city's industrial uses have been concentrated over time, has higher rates of pollution exposures than the rest of the city.
Healthy Aging *Goal: Older adults in Rancho Cucamonga are healthy, active, engaged members of the community and the City is positioned to respond effectively to the needs of an increasing older population.*	Healthy aging as a priority for health and environmental justice, touches on all the components discussed in the report. Findings most relevant to an aging population include: • Life expectancy is almost 12 years longer in the northern areas (85.5 years) than in the southern areas (73.9 years) of the city. When mapped, this gap overlaps with household income, race/ethnicity distribution, and several other socioeconomic factors. • Older adults (men and women 65 years and older) in the city have low rates of keeping up with preventive care services. The rates are lowest (21.9 to 25 percent) for men and women in the southeast area of the city than in the northern area of the city (where they reach up to 34.7 percent for men and 37.5 percent for women). This indicates that more support is needed for older adults in healthy aging practices. • Cancer is the leading cause of death by death rate in the county (155.1 deaths per 100,000 population) and by number of deaths (213 deaths, or 28% of all deaths, in 2018) in the city. Cancer affects Black or African American and

	Hispanic or Latino residents more than White residents. This may be connected to both socioeconomic conditions, access to care, and to increased neighborhood, workplace, school, and other exposures to pollutants.
Disaster Resiliency *Goal: Rancho Cucamonga residents, businesses, community organizations, and government agencies are well prepared to survive, respond to, and recover from disasters and emergencies.*	Similarly, disaster resiliency touches on multiple dimensions health and environmental justice: • Not everyone will experience the impacts of climate change in the same way. The impacts of climate change will fall hardest on those who are historically over-burdened and under-resourced. • The burden is compounded by having fewer resources to prepare for or recover from the impacts of climate change. • As part of the General Plan update and in compliance with Senate Bill 379 (Safety Element), the PlanRC Team will be conducting a needs assessment that will include assessment of hazards and risks across the city and in disadvantaged communities.

Source: Raimi + Associates

Land Use

Existing Conditions Report

December 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Introduction

Rancho Cucamonga enjoys a wealth of high-quality resources. Through the City's strategic development efforts to provide a sustainable balance of residential, commercial, industrial, and recreational uses, the City has grown and prospered. Land use planning ensures that land uses are located in proximity to each other to achieve economic efficiencies while minimizing incompatibilities. Following the boom period of the early 2000s that resulted in an 87% build-out of the City, a dramatic slowdown in development occurred. As Rancho Cucamonga achieves a degree of maturity, the primary challenge for land use planning will be to determine the best use for remaining infill properties. A second challenge will be to guide re-use of aging commercial and industrial properties for long-term community and property owner benefit.

Community design is integral to balancing aesthetic qualities and functionality for the many different land uses that are required of a complete community. Such balance is necessary to maintain and enhance a community that is highly enjoyable for living, working, and recreation. In Rancho Cucamonga, a strong emphasis on community design has allowed the City to achieve a particular identity, incorporating the history and character qualities of the three communities that preceded it: Alta Loma, Cucamonga, and Etiwanda.

Preservation of historic resources has allowed Rancho Cucamonga to retain its rich culture and heritage while facing growing and expanding development. The City is committed to preserving and developing aspects of the community that provide a sense of its origin and history.

This report focuses on land use and how it helps shape the physical development of Rancho Cucamonga.

Rancho Cucamonga's stable residential neighborhoods, diverse commercial and industrial development, extensive parks and recreational facilities, and high-quality community amenities can be attributed to the City's long-standing commitment to land use planning and urban design.

Key Findings

The City has a mix of older neighborhoods and newer developments across a large geographic area. Development patterns are based on an automobile-centric environment, making it challenging to access necessary goods and services without the use of an automobile. These development patterns contribute to air pollution and poor health outcomes such as obesity, heart disease, and respiratory disease.

The City has also prioritized mid-sized single-family housing above other types of housing, limiting housing choices for our residents and making it difficult for new households that are just starting out to choose or remain in Rancho Cucamonga, as well as creating barriers for older residents to stay in Rancho Cucamonga as they retire and age.

While development patterns have been autocentric and residential development is mostly single-family housing, there is a mix of many, many types of places: rural, semi-rural, suburban, quasi-urban, office, and industrial. More can be done to better distinguish and accentuate the individual character of our different neighborhoods and districts.

Our regional location lends us to being attractive to many professionals who choose to establish households here but commute to jobs in Los Angeles, Orange County, and Riverside, leading to long commutes and impacts on quality of life.

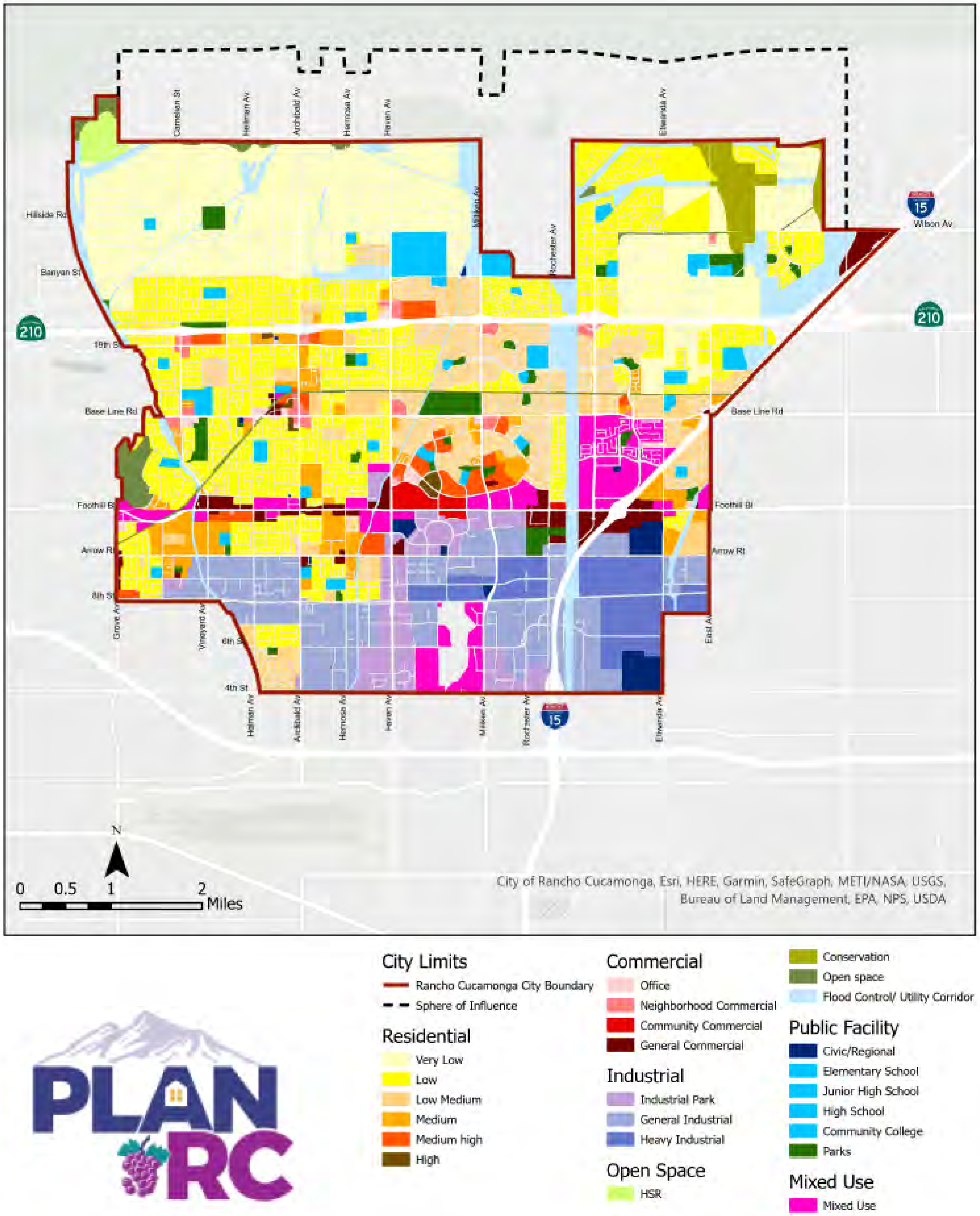
Rancho Cucamonga's is located at the crossroads of two very important highways and a railway not far from the busiest port on the West Coast. This location is also contributing to skyrocketing demand for logistics warehouses, creating unforeseen impacts on transportation networks, air quality, and fiscal sustainability, and exacerbating the City's jobs/skills imbalance.

With minimal large swaths of land available for new development, future development will be strategically focused on vacant opportunity parcels and redevelopment of existing properties.

Existing Land Use

The City of Rancho Cucamonga encompasses 40 square miles and is over 90% built out. Of the developed areas, residential uses are the most common land use in the City, accounting for 55% of land in the City. The pattern of development within Rancho Cucamonga is generally characterized as residential uses dominating north of Foothill Boulevard, with pockets of residential uses south of Foothill Boulevard, predominantly west of Haven Avenue. Commercial centers are primarily clustered along Foothill Boulevard, Base Line Road, Haven Avenue, and Day Creek Boulevard. The southern portion of the City, east of Haven Avenue, is dominated by industrial uses. West of Haven Avenue is a mix of industrial and residential uses.

Figure 1 – Land Use Map

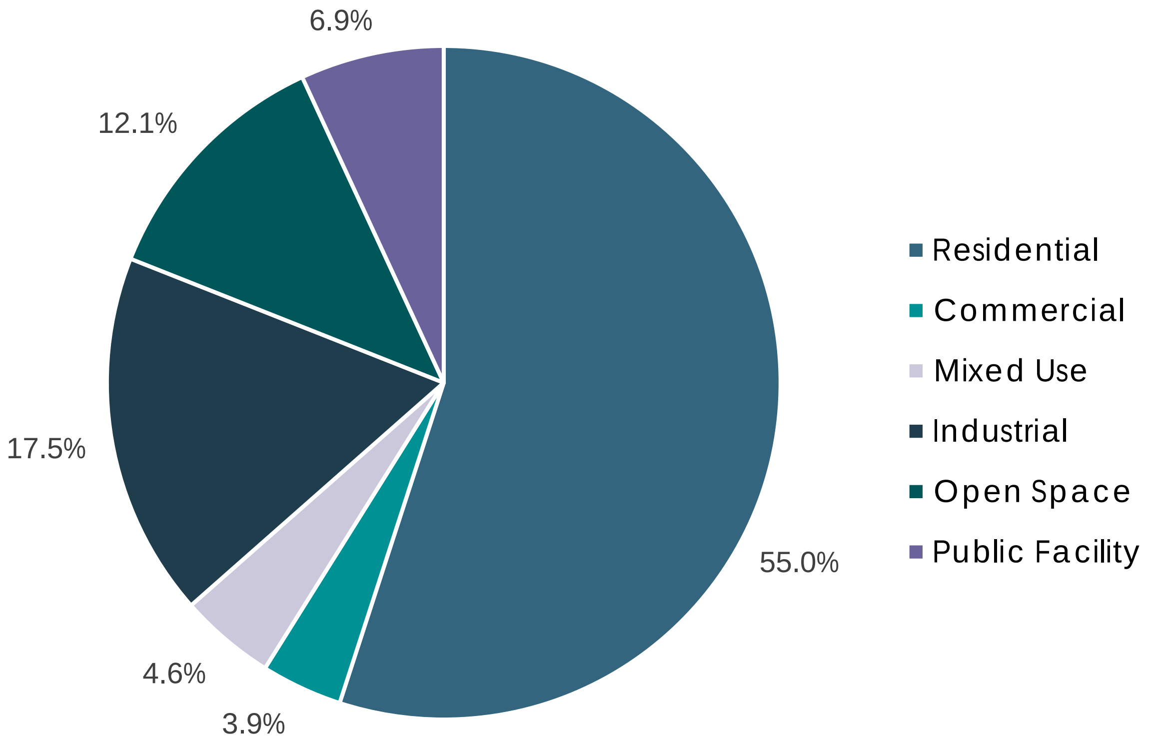


Rancho Cucamonga actively works toward creating a community with a balanced mix of land uses that fosters economic, environmental, and social sustainability. The City continues to lead Inland Empire cities in testing new ideas that support emerging business practices and lifestyle trends, such as high-density housing and flexible business space. New approaches to land use planning and development are driven by the need to create connections between land use and transportation choices, and to achieve more sustainable development approaches.

Table 1 – Land Use Distribution by Acreage

Land Use Type	Area (Acres)	Area (Percentage)
Residential	11420	55.0%
Commercial	799	3.9%
Mixed Use	950	4.6%
Industrial	3626	17.5%
Open Space	2517	12.1%
Public Facility	1436	6.9%
Total	20748	100.0%

Figure 2 – Distribution of Existing Land Uses



Residential Uses

Approximately 11,420 acres in Rancho Cucamonga (55% of all land) are designated for residential uses. Most residential land (about 90%) is zoned or developed as single-family residential with the remaining (about 10%) developed or designated for multi-family residential. In addition, other non-residential uses may be permitted on residentially zoned property, such as private schools and religious institutions.

Single-family lot sizes range from 5,000 square feet to 1 acre or more. Larger lots (10,000 square feet and larger) are generally located in the northern third of the city. Six residential land use designations have been established to preserve the character of existing residential neighborhoods and to create opportunities for new housing types. While residential uses are the primary permitted uses, other complementary and compatible uses can be entitled as Development Code regulations permit, such as parks, trails, special residential uses addressed by state law, childcare facilities, schools, and places of religious assembly. Each of the residential use categories includes a range of allowable densities. The maximum density defines the maximum number of units per net acre at which development can occur within a given area.

Very Low Residential (0.10 to 2.0 Dwelling Units per Acre) - The Very Low Residential designation is characterized by detached, very low-density single residential units on 0.5-acre lots or larger, with private yards and private parking. This designation generally applies to the foothill areas north of Banyan Street and north of the Pacific Electric Trail in the Etiwanda area. New development is required to provide community and local trails for equestrian use in accordance with the Hiking and Riding Trails Plan, the Trail Implementation Plan, and the Equestrian/Rural Area Overlay District.

Low Residential (2.0 to 4.0 Dwelling Units per Acre) - The Low Residential designation is characterized by detached, low-density single residential units on individual lots forming a cohesive neighborhood, with private yards and private parking.

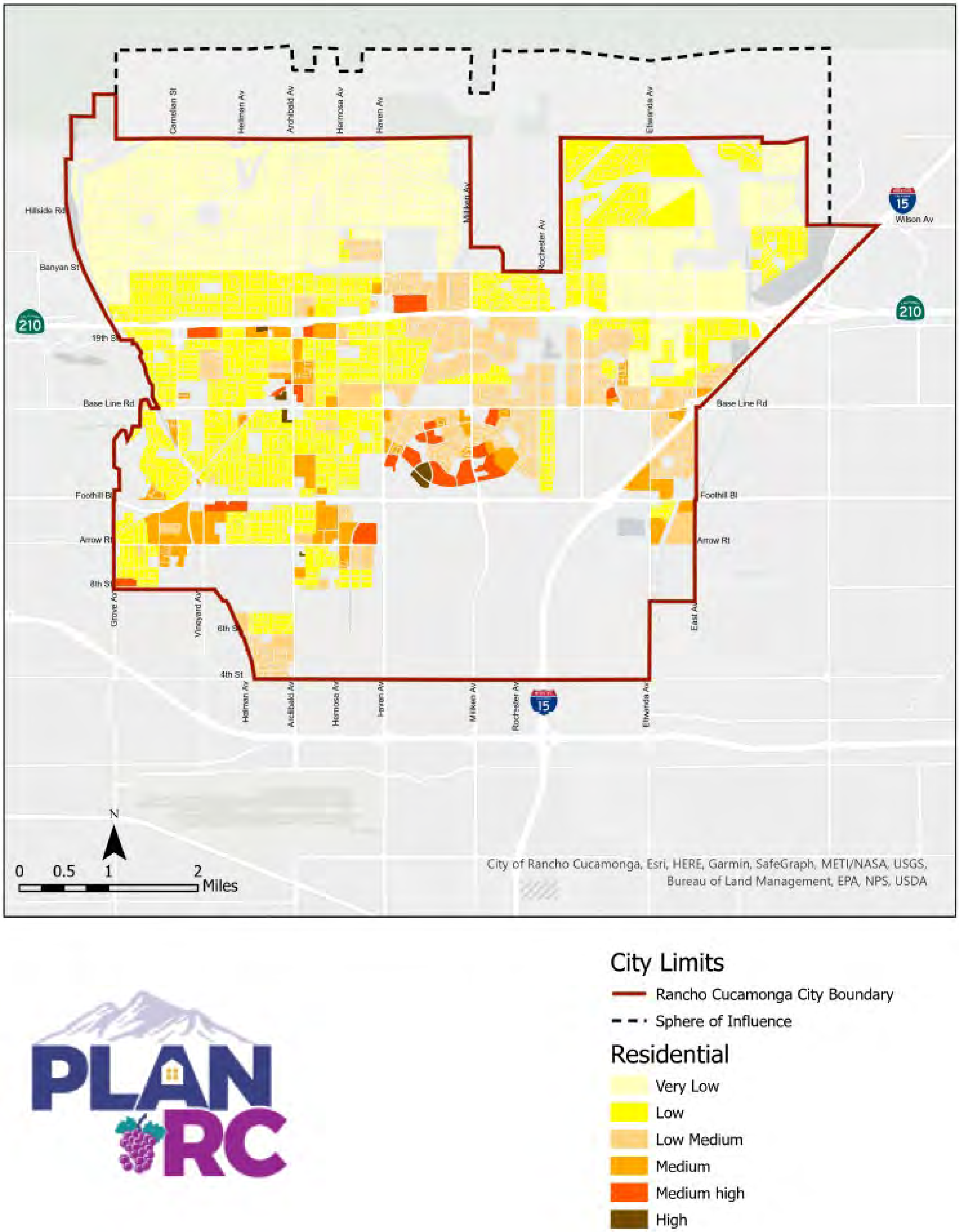
Low Medium Residential (4.0 to 8.0 Dwelling Units per Acre) - The Low Medium Residential designation is characterized by detached or attached housing structures that contain one or two individual dwelling units, such as single-unit zero-lot-line homes, cluster and patio homes, and duplexes. All development approaches include private, individually accessible parking for each unit. Development of townhomes at the upper end of the range may be suited to locations near commercial areas and along major arterials. This designation encourages housing diversity without changing the low-intensity character of the neighborhood.

Medium Residential (8.0 to 14.0 Dwelling Units per Acre) - The Medium Residential designation is characterized by detached and attached residential units, including small-lot subdivisions, duplexes and triplexes, and attached townhouse-type developments that provide private open space and multi-unit structures that comprise a cohesive development incorporating common open space areas. Mobile home parks are also allowed in this designation. Residential units may contain private yards and private parking or open common areas and shared parking. Building intensity at the lower end of the density range is suitable adjacent to low- and very low-density residential areas. The Medium Residential designation also serves as an appropriate buffer between low-density residential areas and areas of higher-density commercial activities.

Medium High Residential (14.0 to 24.0 Dwelling Units per Acre) - The Medium High Residential designation is characterized by low-rise condominiums and apartment buildings. Approaches to development may consist of multiple-unit buildings or groups of buildings, with private and common open space areas provided. This density is appropriate near major community facilities and employment centers, and along major thoroughfares with transit availability.

High Residential (24.0 to 30.0 Dwelling Units per Acre) - The High Residential designation is characterized by higher-density, multi-story residential development with a focus on providing an urban intensity and function at locations within walking distance to transit, recreation and community facilities, employment centers, and commercial services. Development typically is characterized by buildings between three and six stories in height and with open common areas. On-site amenities for residents are provided.

Figure 3 – Residential Land Use Distribution



Commercial Uses

Commercial areas provide places where residents and visitors can shop for goods and services, and where businesses can locate to serve local, regional, and international markets. Most commercial activities are located along major east-west arterials including Arrow Route, Foothill Boulevard, and Base Line Road, and adjacent to SR-210. Commercial uses are zoned in four categories.

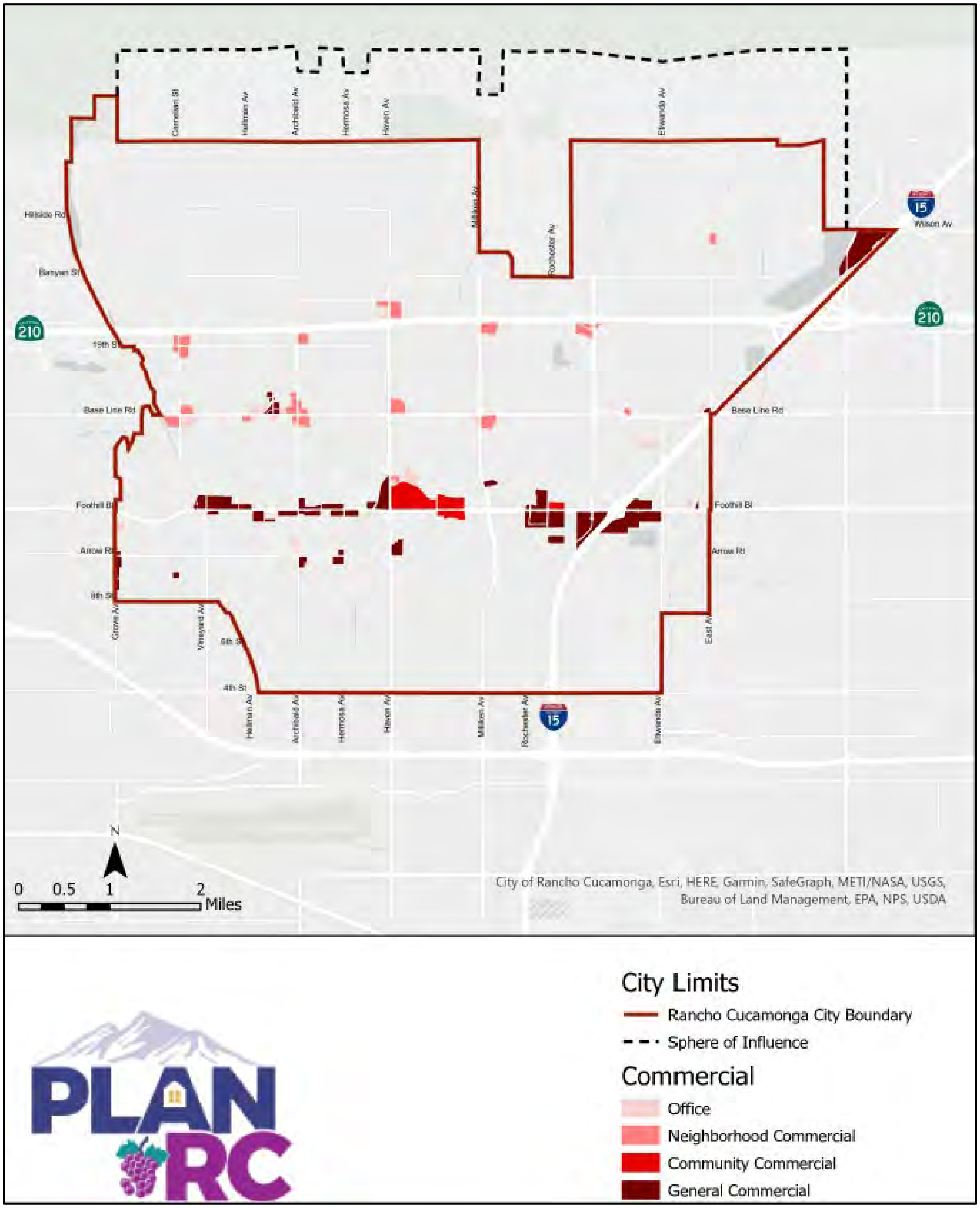
Office - The Office designation concentrates office-oriented business activities near centers of commercial activity and avoids the building of individual, isolated office buildings. Office developments may include low-rise, multi-tenant garden-type arrangements, particularly along the I-15 corridor, the Haven Avenue Office Overlay district, and within Mixed Use designated areas. Business activities permitted within this category include corporate headquarters, administrative and professional offices, finance, legal, insurance, real estate services, banks, and business support services. Supportive convenience retail and service commercial uses such as restaurants may also be allowed to serve the needs of employees and visitors.

Neighborhood Commercial - The Neighborhood Commercial designation provides for small-scale shopping centers (5 to 15 acres) located near or within residential neighborhoods and offering convenient retail goods and services for residents. Examples of permitted uses include small-scale restaurants, grocery and convenience stores, service businesses that generate limited traffic, and boutique retail sales. Neighborhood Commercial centers should be compatible in design and scale with adjacent residential areas. Convenient paths for pedestrian and bicycle access into and around the center should also be provided.

General Commercial - The General Commercial designation applies to properties along major activity corridors. This designation provides for a wide range of community-oriented and regional-oriented commercial businesses, including businesses that cater to tourists traveling on Historic Route 66 (Foothill Boulevard). Rather than perpetuate the linear “strip” configuration along arterial highways and parking-lot-dominated commercial centers that represent development approaches of the past, the General Commercial designation emphasizes cluster approaches and buildings pulled close to the roadway, with reciprocal access provided between commercial developments.

Community Commercial – The Community Commercial designation allows for development of larger retail, entertainment, and commercial service business centers, generally as part of a cohesive and coordinated shopping destination of retail and service-oriented businesses that serve the entire community. Community areas typically include larger retail uses, theaters, restaurants, professional and medical offices, and community facilities. Community Commercial centers encompass sites from 10 to 50 acres in size, with buildings or collections of buildings containing 100,000 square feet or more of floor area. Design of Community Commercial centers includes well-designed pedestrian connectivity between uses and parking areas.

Figure 4 – Commercial Land Use Distribution



Mixed Use

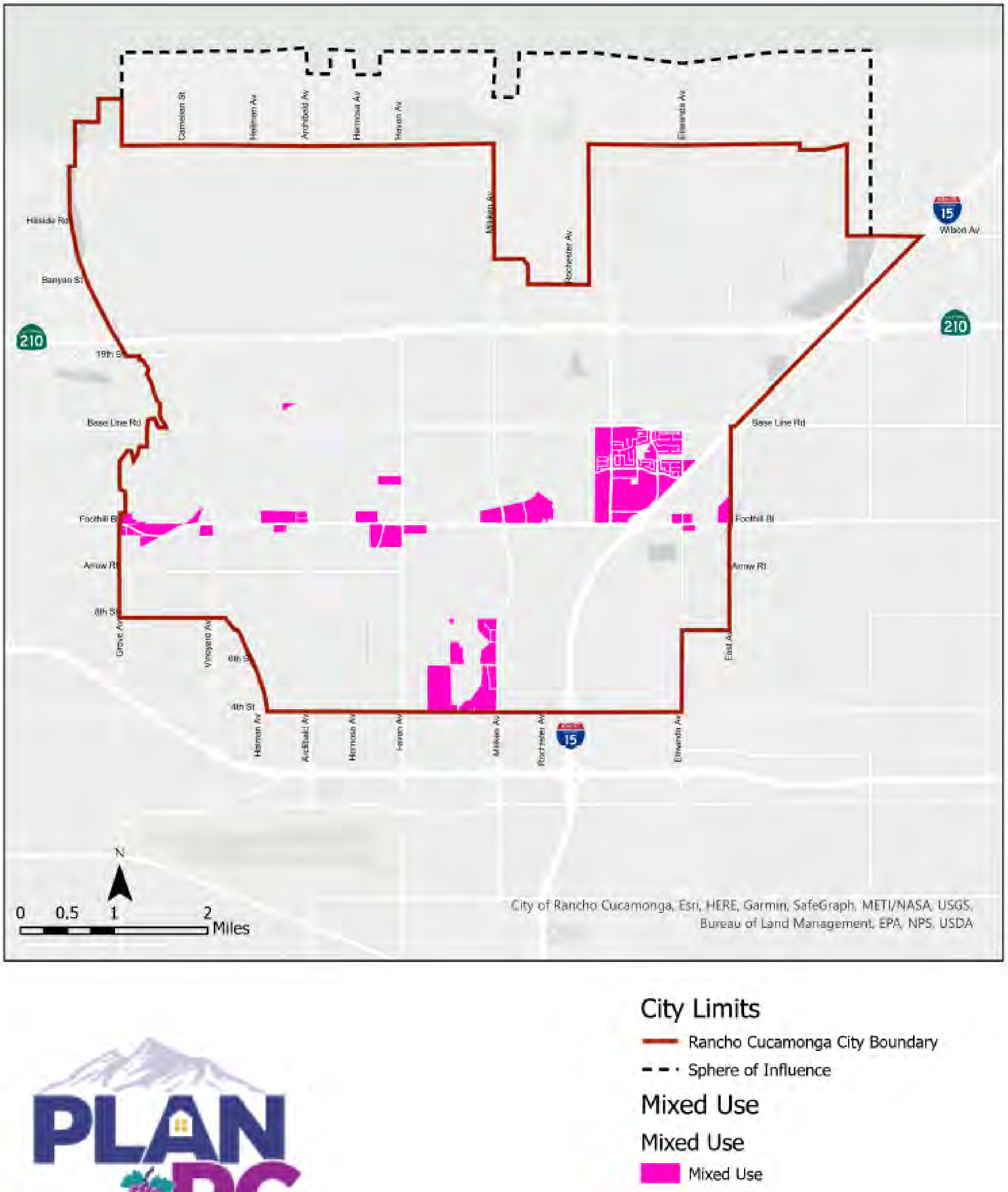
The Mixed Use designation recognizes that portions of Rancho Cucamonga are evolving into more urban places, and that the community desires the creation of new, more sustainable development forms. Mixed Use development approaches offer opportunities for people to live close to work or near transit stops, to walk to neighborhood stores and parks, to enjoy indoor and outdoor entertainment close to home, and to experience exciting pedestrian districts.

The Mixed Use designation offers opportunities for more intensely developed districts that combine complementary commercial, office, residential, and community uses in areas with easy access to transit. Mixed Use development may occur in two ways: 1) as a combination of uses within a single building (for example, retail on the first floor and residential or office on the upper floors); or 2) as a combination of uses on multiple parcels within a specified district of the City. In either case, the intent is to achieve a complete integration of the uses and their support functions into a livable development that fosters a strong sense of place. The desired outcome of the Mixed Use designation is to create special urban places within the general suburban pattern of single purpose uses. Victoria Gardens and the Town Center at Haven Avenue and Foothill Boulevard are exemplary developments that incorporate highly successful Mixed Use concepts. Community expectations of Mixed Use developments involve excellence in site planning, design, public safety, and use configurations based on the following criteria:

- Development projects will be interconnected rather than being rigidly separated.
- New Commercial and Mixed Use development will emphasize pedestrian orientation in site and building design and promote a walkable environment with active street frontages, well-scaled buildings, and usable public spaces such as small plazas, courtyards, and sidewalk cafes that are highly accessible and convenient to residents and visitors.
- Parking lots and enclosed parking facilities will generally be located to the rear of buildings or at other locations where they are not visible from major streets.
- Safe and convenient pedestrian movement will be provided into and within the site.
- The mix of uses will promote walkability by offering goods and services that appeal to and meet the needs of adjacent and nearby residents.
- Development forms will consist of generally higher intensities of use than in surrounding areas.
- Projects will express a common design theme that may be carried out by architectural styles, landscaping and lighting treatment, street improvements and street furniture, and other means of unifying the development. This does not preclude an eclectic mix of architectural styles, but development will be tied together in physical form by some means.
- Development approaches will involve a variety of scales and spaces to provide interest and diversity.
- An integrated circulation system of arterial access, internal circulation, parking facilities, pedestrian pathways, bicycle routes, transit stops (where applicable), and related signage will be provided. Movement among uses within a district will be possible without forcing patrons to use adjacent arterial highways.
- Crime Prevention Through Environmental Design (CPTED) principles will be integrated into development approaches to provide both the reality and perception of public safety.
- Adequate emergency vehicle access will be provided to address public safety needs.
- All development will provide a unique and engaging experience for residents and visitors to the City, like those often found in older, walkable towns and cities.

Mixed Use parcels are generally located along Foothill Boulevard and 4th Street between Milliken and Utica north to the Metrolink station. The largest Mixed Use development, Victoria Gardens, consists of over 1 million square feet of commercial uses, with residential and civic uses integrated within the development.

Figure 5 – Mixed Use Land Use Distribution



Industrial Uses

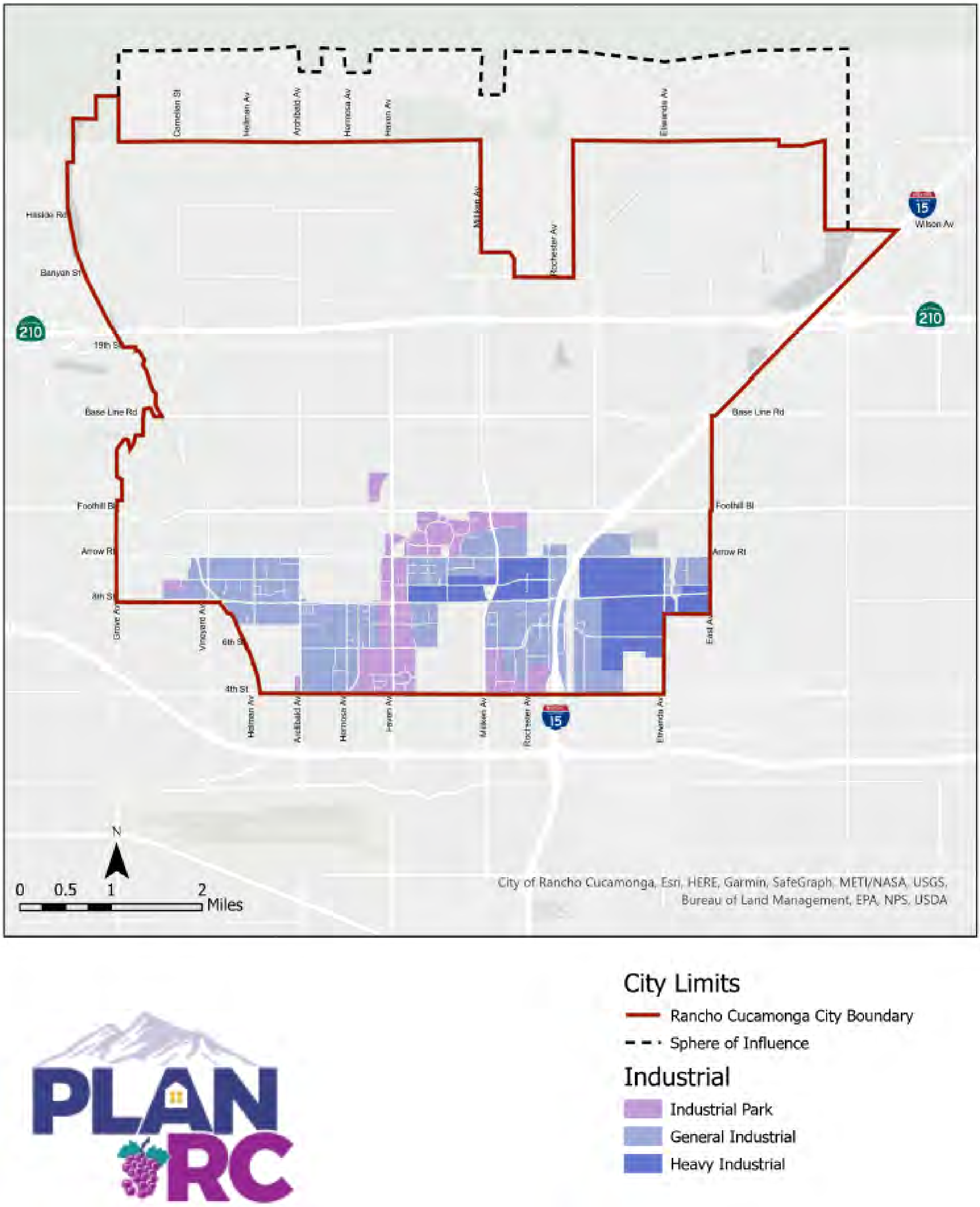
Industrial areas in Rancho Cucamonga benefit from their strategic location near the I-15 and I-10 freeways, the Metrolink station, and railway lines. A variety of light industrial, business park, office, manufacturing, heavy industrial, and similar business and industrial uses have been established, providing diverse employment opportunities for residents throughout the Inland Empire. Three Industrial designations are established that provide many employment development opportunities.

Industrial Park - The Industrial Park designation accommodates master-planned concentrations of light industrial, research and development businesses, green technology, and office uses. The designation also allows for limited convenience goods and services for employees and visitors. Industrial Park uses are typically labor intensive, meaning that the number of employees per acre is higher than uses involving mostly manufacturing or warehousing. The Industrial Park designation applies to major traffic corridors in the City, including 4th Street, Haven Avenue, Arrow Highway, and Foothill Boulevard, near the largest concentrations of civic and commercial activity.

General Industrial - The General Industrial designation permits a wide range of industrial activities that include manufacturing, assembling, fabrication, wholesale supply, heavy commercial, green technology, and office uses. Where adjacent to residential uses, properties designated General Industrial should be designed for office uses, or site planning should incorporate buffering techniques to minimize noise and traffic impacts associated with the industrial activity. General Industrial uses are located along Arrow Route, Archibald Avenue and on either side of I-15 from 4th Street to 8th Street.

Heavy Industrial - The Heavy Industrial designation permits heavy manufacturing, compounding, processing or fabrication, warehousing, storage, freight handling, and truck services and terminals, as well as supportive service commercial uses. Heavy Industrial areas are located to take advantage of rail lines and arterial roadway access, and to minimize impacts on surrounding land uses. Heavy industrial uses are mainly located on the east end of the City, between Arrow Route and Jersey Boulevard, continuing farther south on the east side of I-15.

Figure 6 – Industrial Land Use Distribution



City of Rancho Cucamonga, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Open Space

The Open Space designations identify areas devoted to the preservation of natural resources and outdoor recreation. The General Plan establishes four Open Space designations.

Hillside Residential (0.10 to 2.0 Dwelling Units per Acre) – The Hillside Residential designation is established to: 1) maintain the natural open space character of sensitive areas in the Sphere of Influence; 2) protect natural land forms from extensive grading and minimize erosion; 3) provide for public safety against wildland fire, fault, and flooding hazards; 4) protect water, plant, and animal resources; and 5) provide design standards that allow for limited residential development that respects and responds to the sensitive environmental conditions in the hillsides. The maximum dwelling unit density may not exceed two units per net buildable acre in accordance with the provisions of the Development Code. “Buildable acre” is considered to be a contiguous area of the lot, which is less than 30% in natural slope, or the area determined through the environmental studies and investigation as buildable and is subject to slope/capacity factor calculations contained in Section 17.24.080 of the Development Code. Maximum population density is 1.6 persons per acre.

Open Space (0 to 0.10 Dwelling Units per Acre) – The Open Space designation, which applies to public and privately owned lands, is designed to: 1) establish protection in areas of fire, geologic, seismic, or flood hazards through restriction of intensive uses; 2) promote the retention of open space for recreational use and the protection of natural resources; and 3) promote the preservation of open spaces that protect natural features, offer views to residents, and maintain open areas where flood, fire, geologic, and seismic conditions may endanger public health and safety. Recreational uses, including golf courses, are permitted where terrain and access are appropriate to accommodate such uses.

On private lands designated Open Space, one residential unit is permitted per 10 acres, with at least one unit permitted on lots less than 10 acres in size. Maximum population density is 0.3 persons per acre.

Conservation – The General Plan recognizes the sensitivity of the Riversidian Alluvial Fan Sage Scrub (AFSS) habitat and the benefits it provides for wildlife conservation. The purpose of the Conservation designation is to identify sensitive areas like AFSS habitat that will be managed to preserve and protect sensitive habitat, wetland resources, and sensitive plant and animal species potentially occurring in designated areas.

In cooperation with the County of San Bernardino, the City has designated vital AFSS areas within the Sphere of Influence as Conservation, and distinct and defined conservation areas have been set aside as mitigation sites for various state, county, city, and private projects. Additional parcels may be purchased in the future as mitigation for other projects in the region.

Flood Control/Utility Corridor – The Flood Control/Utility Corridor designation includes lands primarily used for flood control purposes and to support public utilities. Improvements typically include flood control channels, drainage basins, and major utility corridors, such as high-tension electric power transmission lines and towers. Flood control facilities include improved channels and natural waterways under the control of the City and the San Bernardino County Flood Control District. Both Deer and Day Creeks, along with utility easements within the Sphere of Influence, are key elements of the Flood Control/Utility Corridor designation. Because development of habitable structures is not permitted within this designation, no Floor Area Ratio (FAR) standard applies.

The majority of this designation falls in the City’s Sphere of Influence where the area is subject to flooding, potential wildland fires, and geologic and seismic hazards. To provide a high level of public safety, these areas should be left natural for the most part, offering residents the additional benefits of a scenic and recreational resource with limited development potential.

Figure 7 – Open Space Land Use Distribution

Public Facilities

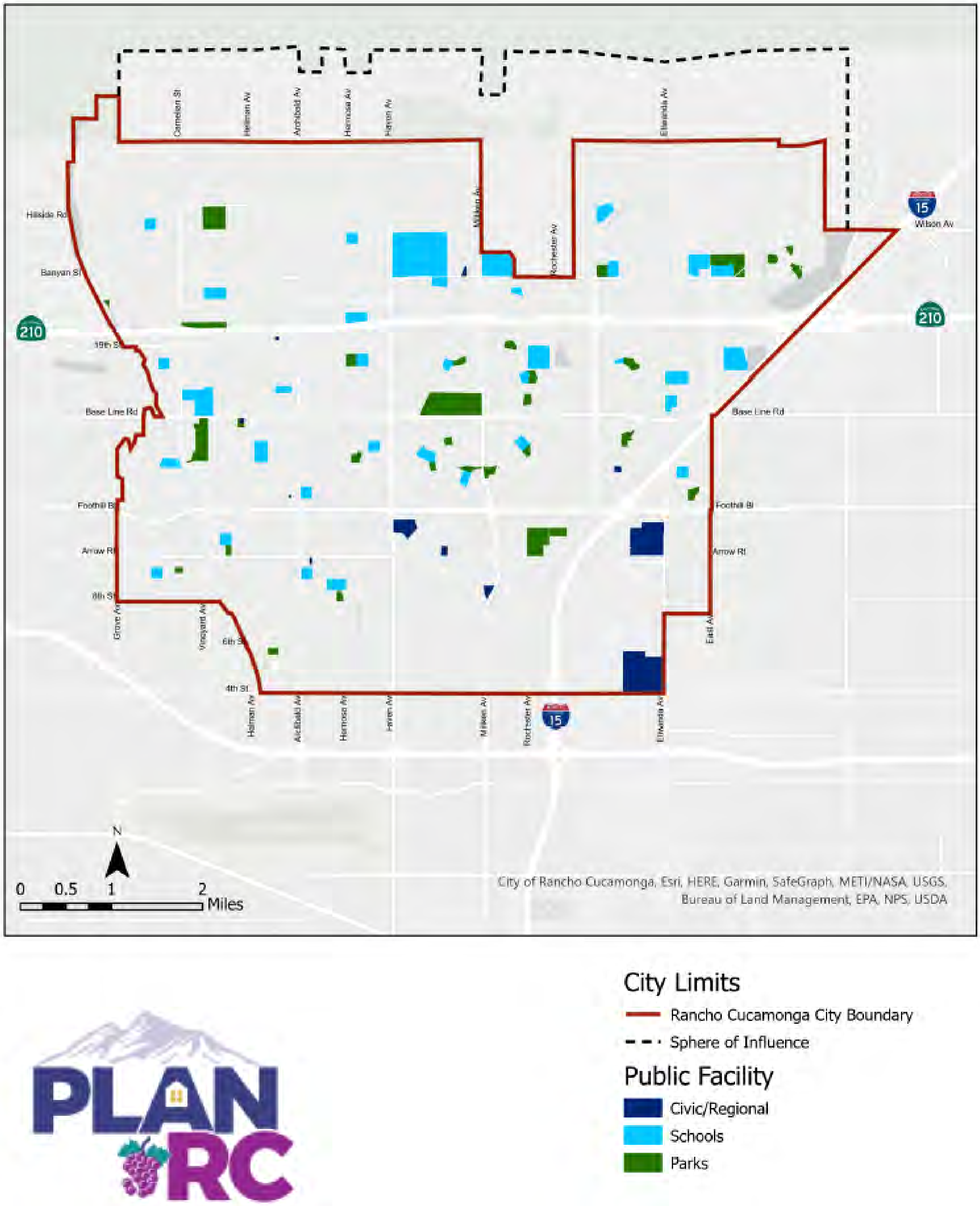
The Public Facility designations refer to uses operated for public benefit. The General Plan establishes the following three Public Facility designations.

Civic/Regional – The Civic/Regional designation applies to diverse public and quasi-public uses, including the Civic Center and police station, the County Courthouse facilities, the county jail/detention center, City fire stations, City libraries, post offices, and the City public works yard.

Schools – The Schools designation identifies existing and planned schools within the City and the Sphere of Influence. Elementary, junior high, high school, and college locations are indicated by type on the Land Use Policy Map. School sites indicated as “planned” may change as growth projections and student forecasts dictate.

Parks – The Parks designation identifies existing and planned public parks within the City and the Sphere of Influence. Existing parks include developed parkland owned by the City. Parklands include traditional neighborhood-level and community-level parks, as well as multi-purpose recreation-oriented lands such as the Epicenter and Central Park. Planned park sites are identified generally in areas where future residential development will occur. The location of future parks will be further defined by detailed neighborhood site planning and the City’s desire to locate new parks adjacent to and integrated with school sites. The City also controls 130 acres of undeveloped parkland not including undeveloped trail acreage.

Figure 7 – Public Facility Land Use Distribution



City of Rancho Cucamonga, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

Implementation Documents

Rancho Cucamonga is guided by a series of visioning and implementation documents.

General Plan

The most recent General Plan was adopted in 2010. The Rancho Cucamonga General Plan documents our shared vision of tomorrow and defines the steps to progress from the present to the future. The General Plan is a long-range policy document (with a projected horizon of 15 to 20 years), frequently referred to as the guidebook or "blueprint" for our City's development. This blueprint directs the look, the feel, and the experience of our City now and in the future.

The General Plan reinforces established land uses attained in the City over the last 10 to 15 years by emphasizing protection of existing residential neighborhoods, and targeting of new residential, office, and commercial growth along major corridors, such as Foothill Boulevard and Haven Avenue south of Foothill Boulevard, where development opportunities exist on vacant or underutilized properties.

The land use growth strategy will focus on the following three objectives:

- Protect and maintain established residential neighborhoods
- Target new infill development opportunities
- Integrate land use and transportation

Development Code

The implementation of the General Plan is generally managed by the Development Code (Title 17 of the Rancho Cucamonga Municipal Code). The Development Code includes zoning districts consistent with the General Plan and applies prescriptive development standards to each zoning district that guide the site layout and intensity. The Development Code also contains design standards for use types (residential, office, commercial, and industrial) that guide staff and the development community on the high-quality design aesthetics required within the City.

Specific Plans

Specific plans allow for flexibility in design and customized development standards tailored to specific needs and conditions. The Specific Plan is one of the most creative tools available for guiding and regulating development, but also requires considerable attention to detail and may be too involved for some situations. As specified by the California Government Code, a specific plan must be consistent with the General Plan and must respond to all of the required General Plan topics to the extent that they apply to the area in question.

- Etiwanda Specific Plan
- North Etiwanda Specific Plan
- Empire Lakes Specific Plan
- Etiwanda Heights Neighborhood and Conservation Plan (in progress)

Planned Communities

Planned Community zoning may be thought of as a less comprehensive form of a specific plan. It does allow custom design and development regulations, but its scope can be limited to only those aspects of the plan that deviate from conventional zoning requirements. It may include as many land use categories as are needed to implement the applicable General Plan designations. It is typically accompanied by thorough design guidelines to ensure a coherent, quality result as the Planning Area is built out.

- Caryn Planned Community
- Terra Vista Planned Community
- Victoria Planned Community

Master Plans

Master plans are discretionary planning entitlements (not a zoning district) that allow flexibility in the allowed uses and development standards for specific types of projects. Master plans are required for mixed-use projects and other integrated developments that warrant special development consideration beyond conventional zoning regulations to address the special or unique needs or characteristics. Master plans are also required for areas designated on the General Plan Land Use Map with the Master Plan symbol. The master plan entitlement requires preparation of a conceptual master plan to address issues such as circulation, drainage, open space linkages, trail connections, compatibility with adjacent uses, and similar concerns through a comprehensive approach and creative design flexibility. Master plans are intended to assure a harmonious relationship between the existing and proposed uses, and to coordinate and promote the community improvement efforts of private and public resources. Subsequent development within the master planned areas must be consistent with the approved conceptual master plans.

- Town Square Master Plan
- Victoria Arbors Master Plan
- Victoria Gardens Master Plan

Overlays

Overlay districts establish unique use and/or development regulations for certain geographic areas of the city to address special site conditions, protect resources, and/or address land use needs opportunities in combination with the base zoning districts of the same parcels. Regulations for overlay zoning districts supplement the regulations that apply to the corresponding base zoning district.

- Foothill Boulevard Overlay District
- Senior Housing Overlay District
- Equestrian Overlay District
- Hillside Overlay District
- Haven Avenue Overlay District
- Industrial Commercial Overlay District

Noise and Vibration

Existing Conditions Report

May 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Summary

The Noise and Vibration Background Report (Report) assesses and summarizes the existing environmental conditions of the City of Rancho Cucamonga (City) as they relate to noise and vibration. The Report also provides a summary of acoustic and vibration fundamentals and relevant federal, state, and local regulations pertaining to noise and land use planning. The following key findings, based on the results of the analysis, have been identified to help inform the development of goals and policies related to noise and vibration in the City's General Plan Update.

Key Findings

- Dominant sources of noise and vibration in the city of Rancho Cucamonga include traffic noise on major roadways throughout the city, freeways running through the city, as well as the more localized noise from passenger and freight trains that particularly affects nearby communities.
- Health effects of excessive noise and vibration range from minor psychological stress, irritability, and fatigue due to lack of sleep, to more serious stress-induced effects resulting from long-term exposure including cardiovascular disease, cognitive impairment, anxiety, and depression. Sensitive receptors and communities of the city in close proximity to noise sources may be more affected.
- Roadway traffic is the predominant source of noise affecting sensitive land uses in the city. Freeways and major arterial roadways are the primary sources of this traffic noise. Roadways in the city with the greatest traffic noise levels are Interstate 15 (I-15), State Route 210 (SR-210), Foothill Boulevard, and Base Line Road. To a lesser extent, Interstate 10 (I-10), which is located approximately 0.7 miles south of the city, may also contribute to some of the city's background noise, but it was not included as a source in noise modeling.
- Noise generated by industrial and stationary sources contribute to the ambient noise environment in their immediate vicinities.
- Metrolink and BNSF (Burlington Northern Santa Fe Railway Company) trains operating along the same corridor through the southern portion of the city, adjacent to East 8th Street, are existing noise and vibration sources. Sensitive receptors and other residents in the southern portion of the city near the Metrolink/BNSF railway experience a disproportionate amount of noise and vibration from these sources compared to the rest of the city.

Noise and Vibration

Noise and vibration in Rancho Cucamonga are regulated through the efforts of various federal, state, and local government agencies. These agencies work jointly and independently to standardize noise and vibration levels throughout their jurisdictions through the passage of legislation, regulation, land use planning, education, and policy making. These agencies and regulations, as well as a comprehensive evaluation of the existing sources of noise and vibration in Rancho Cucamonga are discussed, following a summary of acoustic fundamentals.

Introduction

This Noise and Vibration Background Report has been developed to assess and summarize the existing environmental conditions of Rancho Cucamonga as it relates to noise and vibration. The report also provides a summary of acoustic and vibration fundamentals and relevant federal, state, and local regulations pertaining to noise, vibration, and land use planning. This report is being developed as part of a larger process to set potential new goals, policies, and implementing actions related to noise to be incorporated into the Noise Element of the City's General Plan. The information provided in this report was derived from existing documentation, including the Noise section and Appendix G (Noise Assessment) of the City's Environmental Impact Report (EIR) prepared for the 2010 General Plan Update (City of Rancho Cucamonga 2010).

The analysis conducted for this report was informed by and is consistent with the current *General Plan Guidelines* issued by the Governor's Office of Planning and Research (OPR), guidance from the Federal Transit Administration (FTA) and the California Department of Transportation (Caltrans), and current academic literature regarding noise and vibration. Key findings, based on the results of the analysis, have been identified to help inform the development of goals and policies in the City's General Plan Update.

Acoustics Fundamentals

Before discussing the regulatory setting, background information about sound, noise, vibration, and common descriptors is needed to provide context to help understand the technical terms referenced throughout.

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a human ear. Noise is defined as loud, unexpected, or annoying sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilo Hz, or thousands of Hz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (µPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 µPa. Because of this large range of values, sound is rarely expressed in terms of µPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB).

A-Weighted Decibels

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of A-weighted decibels) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgment correlates well with the A-scale sound levels of those sounds. Thus, noise levels are typically reported in terms of A-weighted decibels or dBA. All sound levels discussed in this section are A-weighted decibels. For the remainder of this report, it is assumed that the shorthand "dB" refers to A-weighted decibels. Table 1 describes typical A-weighted noise levels for various noise sources.

Table 1. Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Gas leaf blower at 3 feet	— 110 —	Rock band
Jet fly-over at 1,000 feet	— 100 —	Baby crying
Gas lawn mower at 3 feet	— 90 —	Hair dryer
Diesel truck at 50 feet at 50 miles per hour	— 80 —	Food blender at 3 feet, Garbage disposal at 3 feet
Noisy urban area, daytime, Gas lawn mower at 100 feet	— 70 —	Vacuum cleaner at 10 feet, Normal speech at 3 feet
Commercial area, Heavy traffic at 300 feet	— 60 —	Quiet conversation
Quiet urban daytime	— 50 —	Large business office, Dishwasher in next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime	— 30 —	Library, Bedroom at night
Quiet rural nighttime	— 20 —	Concert hall (background)
Breathing	— 10 —	Broadcast/recording studio
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 2013

Addition of Decibels

Because decibels are logarithmic units, SPL values cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness at the same time, the resulting sound level at a given distance would be 3 dB higher than if only one of the sound sources was producing sound under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

Human Response to Noise

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory impacts to humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communication, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research indicates that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induce response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustomed to, the less tolerable the new noise source will be perceived.

As mentioned previously, the doubling of sound energy results in a 3-dB increase in the sound level. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear can discern 1-dB changes in sound levels when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000–8,000 Hz) range. In typical noisy environments, changes in noise of 1–2 dB are generally not perceptible. However, it is widely accepted that people can begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound would generally be perceived as barely detectable.

Common Noise Descriptors

Noise in our daily environment fluctuates over time. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors used throughout this Report.

Equivalent Continuous Sound Level (L_{eq}): L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a 1-hour period and is the basis for noise abatement criteria used by Caltrans and Federal Highway Administration (FHWA).

Maximum Sound Level (L_{max}): L_{max} is the largest instantaneous sound level measured during a specified period.

Minimum Sound Level (L_{min}): L_{min} is the smallest instantaneous sound level measured during a specified period.

Day-Night Level (L_{dn}): L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB “penalty” applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.

$L_{8.3}$: The noise level that is equaled or exceeded 8.3 percent of the specified time period (typically one hour).

L_{50}: The noise level that is equaled or exceeded 50 percent of the specified time period (typically one hour). The L_{50} represents the median sound level.

L_{90}: The noise level that is equaled or exceeded 90 percent of the specified time period (typically one hour). The L_{90} typically represents the background or ambient level of a noise environment.

Community Noise Equivalent Level (CNEL): Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The amount of noise is reduced with increasing distance from the source depends on the following factors.

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Roads and highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources, thus propagating at a slower rate in comparison to a point source. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

Ground Absorption

The propagation path of noise from a source to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance. This would hold true for point sources, resulting in an overall drop-off rate of up to 7.5 dB per doubling of distance.

Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels, as wind can carry sound. Sound levels can be increased at large distances (e.g., more than 500 feet) from the source because of atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction (Caltrans 2013, FTA 2018). Taller barriers provide increased noise reduction. Vegetation between the source and receiver is rarely effective in reducing noise because it does not create a solid barrier.

Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery) or transient in nature (e.g., explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV and RMS vibration velocity are normally described in inches per second (in/sec) or in millimeters per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (Caltrans 2013, FTA 2018).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2018). This is based on a reference value of 1 micro inch per second.

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Ground vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2018).

Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate enough ground vibrations to pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2018).

Vibrations generated by construction activity can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table 2 describes the general human response to different ground vibration-velocity levels.

Table 2. Human Response to Different Levels of Ground Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Notes: VdB = vibration decibels referenced to 1 micro inch per second and based on the root-mean-square (RMS) velocity amplitude.

Source: FTA 2018

Regulatory Setting

This section provides a summary of federal, state, and local regulations, ordinances, plans, and policies that are related to noise and vibration in Rancho Cucamonga. Also provided is a summary of noise guidance from the state's General Plan Guidelines.

Federal

U.S. Environmental Protection Agency Office of Noise Abatement and Control

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments. However, documents and research completed by the EPA Office of Noise Abatement and Control continue to provide value in the analysis of noise effects.

Federal Transit Administration

To address the human response to ground vibration, FTA has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines are presented below in Table 3.

Table 3. Ground-Borne Vibration Impact Criteria for General Assessment

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/second)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations.	65 [4]	65 [4]	65 [4]
Category 2: Residences and buildings where people normally sleep.	72	75	80

Category 3: Institutional land uses with primarily daytime uses.	75	78	83

Notes: VdB = vibration decibels referenced to 1 μ inch/second and based on the root mean square (RMS) velocity amplitude. GBV = Ground-Borne Vibration

[1] "Frequent Events" is defined as more than 70 vibration events of the same source per day.

[2] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

[3] "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.

[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels.

Source: FTA 2018

State

California Department of Transportation

In 2013, Caltrans published the Transportation and Construction Vibration Manual (Caltrans 2013). The manual provides general guidance on vibration issues associated with construction and operation of projects in relation to human perception and structural damage. Caltrans recommendations for vibration levels that could result in damage to structures exposed to continuous vibration are presented in Table 4.

Table 4. Caltrans Recommendations Regarding Levels of Vibration Exposure

PPV (in/sec)	Effect on Buildings
0.4–0.6	Architectural damage and possible minor structural damage
0.2	Risk of architectural damage to normal dwelling houses
0.1	Virtually no risk of architectural damage to normal buildings
0.08	Recommended upper limit of vibration to which ruins and ancient monuments should be subjected
0.006–0.019	Vibration unlikely to cause damage of any type

Notes: PPV= Peak Particle Velocity; in/sec = inches per second

Source: Caltrans 2013

Local

City of Rancho Cucamonga Exterior Noise Standards

Section 17.66.050(C) of the City of Rancho Cucamonga's municipal code regulates exterior noise levels. The noise ordinance provides Noise Standards relative to community noise level exposure, guidelines, and regulations. It is deemed unlawful to exceed the following exterior noise levels at any location within the city as adjusted below:

- Basic noise level for a cumulative period of not more than 15 minutes in any one hour; or
- Basic noise level plus five dBA for a cumulative period of not more than ten minutes in any one hour; or
- Basic noise level plus 14 dBA for a cumulative period of not more than five minutes in any one hour; or
- Basic noise level plus 15 dBA at any time.

City of Rancho Cucamonga Residential Noise Standards

Pursuant to Municipal Code Section 17.66.050(F), exterior noise levels should not exceed 65 dBA between the hours of 7:00 AM and 10:00 PM at residential uses (Table 5). These are the noise limits when measured at the adjacent residential property line (exterior) or within a neighboring home (interior).

Table 5. Residential Noise Limits

Location of Measurement	Maximum Allowable	
	10:00 p.m. to 7:00 a.m.	7:00 a.m. to 10:00 p.m.
Exterior	60 dBA	65 dBA
Interior	45 dBA	50 dBA

Notes:

(A) It shall be unlawful for any person at any location within the city to create any noise or to allow the creation of any noise which causes the noise level when measured within any other fully enclosed (windows and doors shut) residential dwelling unit to exceed the interior noise standard in the manner described herein.

(B) If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be determined, each of the noise limits above shall be reduced five dBA for noise consisting of impulse or simple tone noise.

Source: Rancho Cucamonga Municipal Code §17.66.050(F)

City of Rancho Cucamonga Commercial Noise Standards

The City of Rancho Cucamonga has adopted noise standards for commercial and office uses, pursuant to Municipal Code Section 17.66.050(G). All commercial operations and businesses shall be conducted to comply with the following standards:

- General: Commercial and office activities shall not create any noise that would exceed an exterior noise level of 65 dBA during the hours of 10:00 p.m. to 7:00 a.m. and 70 dBA during the hours of 7:00 a.m. to 10:00 p.m. when measured at the adjacent property line.
- Loading and unloading: No person shall cause the loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m., in a manner which would cause a noise disturbance to a residential area.
- Vehicle repairs and testing: No person shall cause or permit the repairing, rebuilding, modifying, or testing of any motor vehicle, motorcycle, or motorboat in such a manner as to increase a noise disturbance between the hours of 10:00 p.m. and 8:00 a.m. adjacent to a residential area.

Environmental Setting

Discussed in this section are local sources of concern and existing community conditions, including disproportionately affected neighborhoods in Rancho Cucamonga.

Existing Noise- and Vibration-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, schools, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Places of worship and transit lodging, and other places where low interior noise levels are essential are also considered noise sensitive. Those noted above are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

Community Noise Survey

Existing community noise in the city was documented during a noise monitoring survey completed for the City's 2010 General Plan Update EIR. Sampling was done at twenty-one individual noise monitoring locations in July of 2009. The monitoring locations are listed in Table 6 and depicted on an area map in Figure 1. Average noise measurements at these twenty-one sites are presented below as L_{eq} levels (Table 7). While these measurements were made in 2009, a recent Rancho Cucamonga profile report published by the Southern California Association of Governments (SCAG) indicated that only a small amount of growth occurred between 2010 and 2018, the most recent year for which data are available. From 2010 to 2018, the population of Rancho Cucamonga increased by 6.9

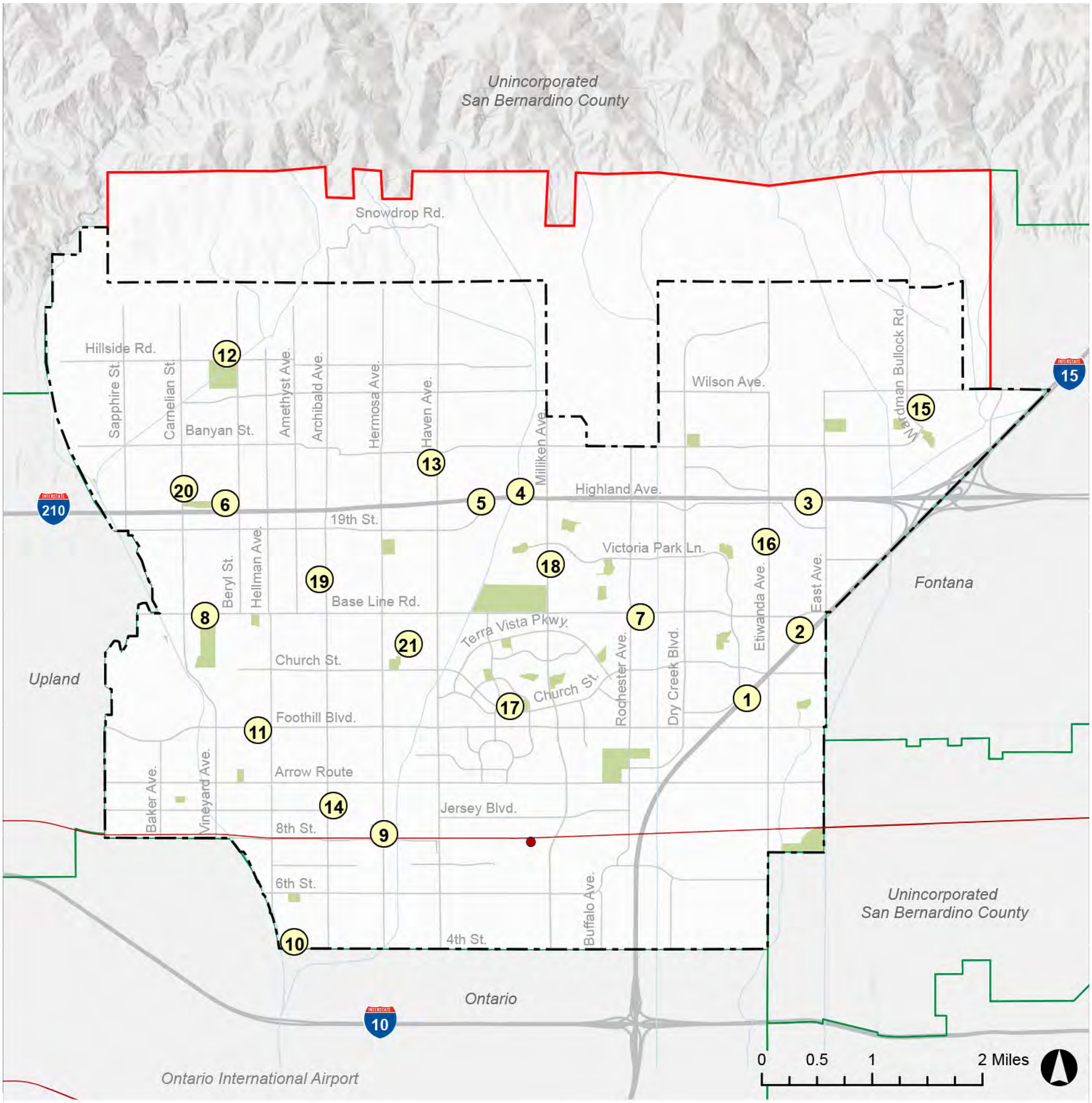
percent and the number of households within the city increased by 5.5 percent (SCAG 2019). While some growth has occurred since 2010, the primary result of these growth increases would be changes in traffic volume, rather than changes in the number or size of stationary noise sources. Noise due to increases in traffic volumes will be captured by the traffic noise modeling to be conducted, but community background noise measurements would not be significantly affected. The 2009 noise measurements presented below are therefore considered representative of existing community noise levels in 2020.

Table 6. Existing Noise Measurement Locations (dBA)

Site Number	Location
1	Inside apartment complex, central location, adjacent to the I-15 Freeway
2	Colonial Drive and Bungalow Way, on sidewalk, adjacent to I-15 Freeway
3	Mueller Court and Dicarlo Place, on sidewalk, adjacent to SR-210 Freeway
4	Near end of walking path, off of Silver Sun, adjacent to SR-210 Freeway
5	Ring Avenue, north tip of cul-de-sac, on sidewalk, next to SR-210 Freeway
6	Beryl Park, west of tennis courts, at edge of soccer field, next to SR-210 Freeway
7	Fennel Road, end of cul-de-sac, near Base Line Road
8	Redhill Community Park, (Base Line and Vineyard), north of shuffleboard area
9	North side of Humbolt Avenue, near cul-de-sac, on dirt
10	Glenaire Ct, end of cul-de-sac, near complex entrance on Golden Oak
11	On sidewalk inside complex, between Lion and Hellman, on Foothill
12	Intersection of Hillside and Buckthorn Ave, on grass at north-east side
13	Between sidewalks in complex, near Haven Ave, about 390 feet north of Lemon
14	On school ground, next to Archibald, near playground
15	In park, near intersection of Santa Ynez Pl and Hickcox Lane, on playground pad
16	On walking trail, west side of Etiwanda Ave, between Victoria and Carnesi
17	Walking path, Church St, between Ralph M Lewis Park and Jamboree complex
18	Genova Rd, end of cul-de-sac, between cul-de-sac and Milliken Avenue
19	On sidewalk, in complex near entrance from Archibald, south of Monte Vista
20	Intersection of Carnelian St and Somerset Dr, northeast corner, on sidewalk
21	On school ground, next to Palo Alto, at bus entrance, near Center and Palo Alto

Source: City of Rancho Cucamonga 2010

Figure 1. Noise Measurement Site Locations



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2010; SCAG, 2020; County of San Bernardino, 2020.

○ Noise Measurement Location
Rancho Cucamonga City Limits
Sphere of Influence
Adjacent City Limits
Waterways
Metrolink
🟩 Parks
● Metrolink Station

Table 7. Existing Noise Measurements (dBA)

Site Number	Date	Time	L_{eq}	L_{max}	L_{min}	$L_{8.3}$	L_{50}	L_{90}
1	7/7/2009	11:48 AM	67.9	73.7	59.1	70.5	67	63.5
2	7/7/2009	11:04 AM	66.2	73.7	61.7	67.5	65.5	63.5
3	7/7/2009	9:44 AM	62.2	77	57	63	61	59.5
4	7/7/2009	2:51 PM	72.3	78.4	66.4	73.5	72	70
5	7/8/2009	8:22 AM	56.6	72.6	51.2	58	55.5	53.5
6	7/8/2009	11:24 AM	60	64.2	56.4	61.5	59.5	58
7	7/7/2009	12:32 PM	53	68.8	40	56.5	49.5	44.5
8	7/8/2009	2:09 PM	57.5	72.7	45.8	60.5	55	49.5
9	7/9/2009	12:15 PM	67.8	93.2	46.1	62	58.5	54
10	7/9/2009	1:01 PM	52.9	71	42.7	56	50	46
11	7/9/2009	10:47 AM	60.8	73.8	46.4	64.5	58.5	52.5
12	7/8/2009	1:16 PM	64.3	89	39	65.5	48	41
13	7/8/2009	9:02 AM	56.9	76.5	44.3	60.5	54	48
14	7/9/2009	11:33 AM	69.7	84.3	52.2	72.5	68	60
15	7/7/2009	8:52 AM	48.9	64	43.2	51.5	46	44
16	7/7/2009	10:24 AM	53.1	68.8	38.6	58	43	40
17	7/7/2009	1:20 PM	60.7	69.8	45.6	65	58.5	51
18	7/7/2009	2:13 PM	65.9	79.4	43.4	70.5	61.5	51
19	7/8/2009	9:48 AM	59.1	70.6	41.8	62.5	57	48.5
20	7/8/2009	12:38 PM	68.7	84.1	47.2	72.5	66	55.5
21	7/8/2009	10:34 AM	47.9	64.5	38.2	50.5	41.5	40

Source: City of Rancho Cucamonga 2010

Existing Aircraft Noise Levels

The closest airport to Rancho Cucamonga is the Ontario International Airport (ONT), located approximately one mile south of the city's southern border. According to the latest noise contour (4th Quarter 2009 by Los Angeles World Airports), Rancho Cucamonga's southern border is approximately 1 mile north of the Ontario International Airport's 65 dBA CNEL noise contour. Therefore, aircraft noise does not significantly impact the city.

Existing Traffic Noise Levels

Several major roadways run through the city that contribute a notable amount of noise to the ambient environment. These roadways include the I-15 and SR-210 freeways, as well as Foothill Boulevard and Base Line Road, which are major local roadways. Additionally, the I-10 freeway lies approximately 0.7 miles south of the city and vehicles travelling along this route may also noticeably contribute to the city's ambient noise during quieter periods, such as evenings.

At a later stage of the process in updating the City's General Plan, a formal traffic analysis, including a determination of peak average daily traffic (ADT) volumes, will be completed. Peak ADT volume data from the traffic analysis will allow for quantitative traffic noise modeling to be performed. Results of the traffic noise modeling will be considered in developing comprehensive noise and vibration goals and policies to be included in the City's General Plan Update.

Existing Railroad Noise and Vibration Levels

Two east/west rail lines lie in the vicinity of Rancho Cucamonga. The Alameda Corridor East rail line does pass through San Bernardino county; however, it is located nearly one mile to the south of the city's southern boundary and does not pass through Rancho Cucamonga proper. The modeled train noise impact to the city from the Alameda Corridor has been estimated to be less than 65 CNEL (City of Rancho Cucamonga 2010). Thus, noise and vibration from this line does not have a significant noise impact on the city.

There is an additional pair of east/west rail lines that run through the southern portion of the city. Metrolink passenger trains and BNSF freight trains run along the double-tracked corridor (eastbound and westbound) located just north of East 8th Street. As verified by Metrolink's train schedule for the Rancho Cucamonga station in April 2020, during normal service conditions a total of 38 Metrolink trains pass through the City of Rancho Cucamonga each weekday, with an additional late-night train on Fridays. Of the total Metrolink trains, 30 are scheduled to operate between 7 a.m. and 10 p.m. While this rail line is primarily used as a secondary route for freight trains, it was conservatively assumed that an average of two BNSF freight trains pass through the city each day, between 7 a.m. and 10 p.m.

Noise levels along these railways are dependent on several factors, including the location of railroad crossings, where noise levels are greater due to horns blowing. Railway noise modeling performed by Ascent in 2020 determined that CNEL noise levels for both Metrolink and BNSF trains at railroad crossings, where horn use is more frequent, are as high as 81.7 dBA at a distance of 50 feet from the center of the two tracks. CNEL noise levels along other portions of the track, segments at least 1,000 feet from any crossings, are as low as 64.5 dBA at a distance of 50 feet from the tracks.

Existing Stationary Sources of Noise

Industrial operations comprise the primary stationary noise sources that contribute to local community noise levels. These stationary sources (e.g., loading areas, large mechanical equipment, fabrication) are often located in commercially- and industrially zoned areas and are isolated from noise-sensitive land uses. However, when noise-sensitive land uses such as residential housing are located in close proximity to industrial noise sources, they may be affected to a greater extent than non-adjacent areas. Other noise sources that affect sensitive receptors in the city include commercial land uses or those often associated with and/or secondary to residential development including, but not limited to, nightclubs, outdoor dining areas, gas stations, car washes, drive throughs, fire stations, air conditioning units, swimming pool pumps, school playgrounds, athletic and music events, and public parks.

Temporary Construction Noise

Construction is a temporary source of noise for residences and business located near construction sites. Construction noise can be significant for short periods of time at any location as a result of public improvement projects, private development projects, and remodeling. The greatest level of noise occurs during the grading and site excavation phases. Large earth-moving equipment, such as grader, scrapers, and bulldozers generated maximum noise levels of 80 to 85 dB when measured at 50 feet from a construction site. Other construction equipment, such as pile drivers, can generate levels of noise up to 101 dB at 50 feet (FTA 2018). Construction activities can elevate noise levels at adjacent land uses by 15 to 20 dB or more, depending on the project.

Findings

- Based on ambient noise level measurements throughout the city, the dominant sources of noise include traffic noise on major roadways and freeways, as well as transit and freight train noise, which is primarily localized to the southern portion of the city where the shared railway is located.
- Health effects of excessive noise and vibration range from minor psychological stress, irritability, and fatigue due to lack of sleep, to more serious stress-induced chronic effects, including cardiovascular disease, cognitive impairment, anxiety, and depression. Sensitive receptors and communities of the city in close proximity to noise sources may experience these effects more intensely.
- Roadway traffic is the predominant source of noise affecting sensitive land uses in the city. Freeways and major arterial roadways are the primary sources of traffic noise. Roadways in the city with the greatest traffic noise levels are Interstate 15, SR-210, Foothill Boulevard, and Base Line Road. I-10, which lies approximately 0.7 miles south of the city, may contribute to ambient background noise to a lesser extent, but it was not included as a source in noise modeling.
- Noise generated by industrial and stationary sources contribute to the ambient noise environment in their immediate vicinities.
- The Metrolink and BNSF trains operating along the same corridor, through the southern portion of the city, are existing noise and vibration sources. Sensitive receptors and other residents in close proximity to this railway experience a disproportionate amount of noise and vibration from these sources compared to the rest of the city.

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Acronyms

ADT	average daily traffic (volumes)
BNSF	Burlington Northern Santa Fe Railway Company
Caltrans	California Department of Transportation
CNEL	community noise equivalent level
dB	decibels
dBA	A-weighted decibels
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FTA	Federal Transit Administration
L_{eq}	Equivalent Continuous Sound Level
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
ONT	Ontario International Airport
OPR	Office of Planning and Research
PPV	peak particle velocity
RMS	root-mean-square (velocity)
SCAG	Southern California Association of Governments
SPL	sound pressure level
VdB	vibration decibels

Greenhouse Gas Emissions and Climate Change Vulnerability Assessment

Existing Conditions Report

May 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Summary

Scientific evidence shows that the Earth's climate is experiencing a warming trend. The warming is a result of increasing greenhouse gases (GHGs) in the atmosphere. Increasing average temperatures are also causing long-term changes in the climate, including extreme weather and precipitation volatility; this phenomenon is known as global climate change. As California continues to experience historic trends of increasing average temperatures, warmer storms, rising sea levels, and reduced snowpack, there is evidence that the effects of global climate change are already occurring and that reductions in GHG emissions are needed to prevent the most catastrophic effects of climate change.

Climate change is a global issue that requires action from all members of society, including local governments, to avoid the most adverse impacts in their communities. Acting on climate change means both reducing GHG emissions from activities within communities and improving community resilience to climate change impacts over the long term. The State has taken several steps to reduce GHG emissions and respond to the threat of global climate change. In 2006, the California Global Warming Solutions Act (Assembly Bill [AB] 32) established the State's first target to reduce GHG emissions, which set a goal of lowering emissions to 1990 levels by 2020. Based on inventory data from the California Air Resources Board (CARB), the State has achieved the 2020 target ahead of the milestone year. In 2016, Senate Bill (SB) 32 was signed into law, which codified into statute the mid-term GHG reduction target of 40 percent below 1990 levels by 2030, established by Executive Order (EO) B-30-15. This 2030 target places California on a trajectory towards meeting its longer-term goal, which is to lower emissions to 80 percent below 1990 levels by 2050, as directed by EO S-3-05. EO B-55-18, signed in September 2018, furthers the State's efforts to reduce GHG emissions by setting a goal to achieve carbon neutrality by 2045 and achieve net negative GHG emissions thereafter. This background report includes a summary of additional legislation from State and federal agencies related to climate change and GHG emissions. While the legislation and executive orders noted above describe the State's efforts, recently adopted and proposed changes in federal regulations for passenger vehicles may reduce the State's ability to achieve its GHG targets. There continues to be uncertainty about the ultimate effects of these regulations in California at the time of this writing.

The City of Rancho Cucamonga (City) has taken several steps to begin addressing climate change and reduce communitywide GHG emissions. These efforts include partnerships with regional agencies, including the San Bernardino Council of Governments/San Bernardino County Transportation Authority (SBCOG/SBCTA), to prepare the *San Bernardino Regional Greenhouse Gas Reduction Plan* and the City's *Sustainable Community Action Plan*, which identify strategies for reducing GHG emissions. Similarly, the *Resilient IE* program, developed through a partnership between Western Riverside Council of Governments (WRCOG) and SBCOG/SBCTA, identifies regional adaptation measures to assist cities in building resilience and adapting to anticipated climate change impacts. SBCOG/SBCTA is currently in the process of preparing an updated GHG inventory for the region for the year 2016. In addition to reporting GHG emissions generated regionwide, this update will include inventories for each member jurisdiction including the City.

This *Greenhouse Gas Emissions and Climate Change Vulnerability Assessment* report includes two chapters. Chapter 1, *Greenhouse Gas Emissions*, includes a summary of climate change science and existing guidance for setting communitywide reduction targets, and developing plans for GHG reduction. Further, this chapter acknowledges the City's communitywide GHG emissions inventory that will be prepared following this report. The inventory will provide an accounting of communitywide GHG emissions from activities within the city for a single year, forecast GHG emissions into the future consistent with State milestone years and the General Plan Update horizon year, and set emissions reduction targets consistent with State goals. Chapter 2, *Climate Change Vulnerability Assessment*, summarizes current and potential future climate-related impacts that may affect the city, evaluates how these impacts would potentially affect the community's populations, assets, and functions, and prioritizes how the City should address each vulnerability through the General Plan Update and Local Hazard Mitigation Plan.

Key Findings

The key findings from the GHG and Climate Change Vulnerability Assessment are summarized below. These key findings are discussed in further detail in each chapter.

- Based on previous GHG inventories prepared under the Regional Reduction Plan, a majority of the communitywide emissions are attributable to the on-road transportation and energy sectors. This is consistent with the major GHG emitting sectors identified at the State and regional levels. Contributions of individual emissions sectors will be confirmed through the updated baseline inventory.

- Climate change is anticipated to result in increased average temperatures and precipitation pattern variability globally. These changes would result in secondary impacts that could severely impact people and structures in the city, including:
  - Increased frequency and intensity of wildfires
  - Increased frequency of severe weather events such as extreme heat days, heat waves, and heavy precipitation events
  - Increased frequency of flooding and landslides
  - Increased frequency of droughts and reduced availability of potable water
  - Potential increased intensity of severe wind events
- These climate change impacts would affect various populations in the City, but would disproportionately affect vulnerable populations including low-income communities, communities of color, senior citizens, linguistically isolated populations, individuals with disabilities or preexisting medical conditions, and individuals experiencing homelessness.
- Increases in wildfire and landslide frequency would expose development north of State Route 210 (SR-210) (e.g. residential neighborhoods, educational buildings and campuses, flood control infrastructure) to increased risk of damage or destruction.
- Climate change-related impacts could severely impact public health by worsening air quality (i.e. increased occurrence of ground-level ozone [O_3]) and increasing the spread of infectious disease.
- The primary vulnerabilities the City should address through the General Plan Update include:
  - Increased risk of damage to structures and infrastructure and exposure to health risks from increased average temperatures, frequency of extreme heat events, and intensity of severe wind events.
  - Disproportionate exposure of vulnerable populations to reduced air quality, increased frequency of extreme heat events and flooding, and exacerbation of the urban heat island effect.
  - Increased exposure of transportation infrastructure, especially railways, to damage from increased frequency of extreme heat events, flooding, and landslides.
  - Increased stress on water supply, urban forests, and electricity generation and transmission facilities that the city relies on from elsewhere in the state or country.
  - Increased exposure of emergency responders to hazardous conditions during response events including wildfires and smoke, flood waters, and infectious diseases.
  - Increased stress on emergency response facilities during hazard events (e.g. wildfires, extreme heat days) from increased climate impact evacuees including shelter required as a result of loss of power (e.g. from downed power lines or Public Safety Power Shutoffs), loss of property, or cooling shelter availability during extreme heat events.
  - Increased risk to human health from worsened air quality (e.g. increased rates of asthma in exposed populations and decreased opportunity for outdoor exercise and recreation), and increased occurrence and spread of infectious disease.

Chapter 1

Greenhouse Gas Emissions

This Greenhouse Gas Emissions Background Report has been prepared for the City to characterize and summarize the existing regulatory setting for climate change and GHG emissions. This background report summarizes statewide GHG reduction goals, State and federal efforts to reduce GHG emissions and combat climate change, and the role the City plays in reducing local GHG emissions and adapting to climate change.

Introduction

This section provides a discussion of climate change science and GHG emissions sources statewide and within the city and its sphere of influence, and includes a summary of applicable regulations with respect to local, regional, and statewide GHG emissions sources. GHG emissions have the potential to adversely affect the environment because, on a cumulative basis, they contribute to global climate change. Global climate change is increasing average global temperatures, which is anticipated to result in adverse changes to water supply, increased exposure to hazards such as wildfires and landslides, and increased risks to human health, among others. GHGs are generated by a variety of sources including on-road vehicles, energy consumption, solid waste generation, off-road equipment, and water and wastewater treatment and conveyance. State regulations provide a framework for identifying GHG reduction targets to be met by local agencies. Based on the framework discussed in this section, the City will develop a GHG inventory, future emissions projections or forecasts, and local reduction targets to achieve GHG emissions reductions consistent with State goals. Additionally, the city's future projections will account for existing State and federal activities that would result in local GHG emissions reductions including on-road vehicle emissions regulations and renewable electricity generation requirements. A discussion of the impacts caused by global climate change in the city is included in Chapter 2, "Climate Change Vulnerability Assessment."

Key Findings

- Based on previous GHG inventories prepared under the Regional Reduction Plan, a majority of the communitywide emissions are attributable to the on-road transportation and energy sectors. This is consistent with the major GHG emitting sectors identified at the state and regional levels. Contributions of individual emissions sectors will be confirmed through the updated baseline inventory.

Existing Conditions

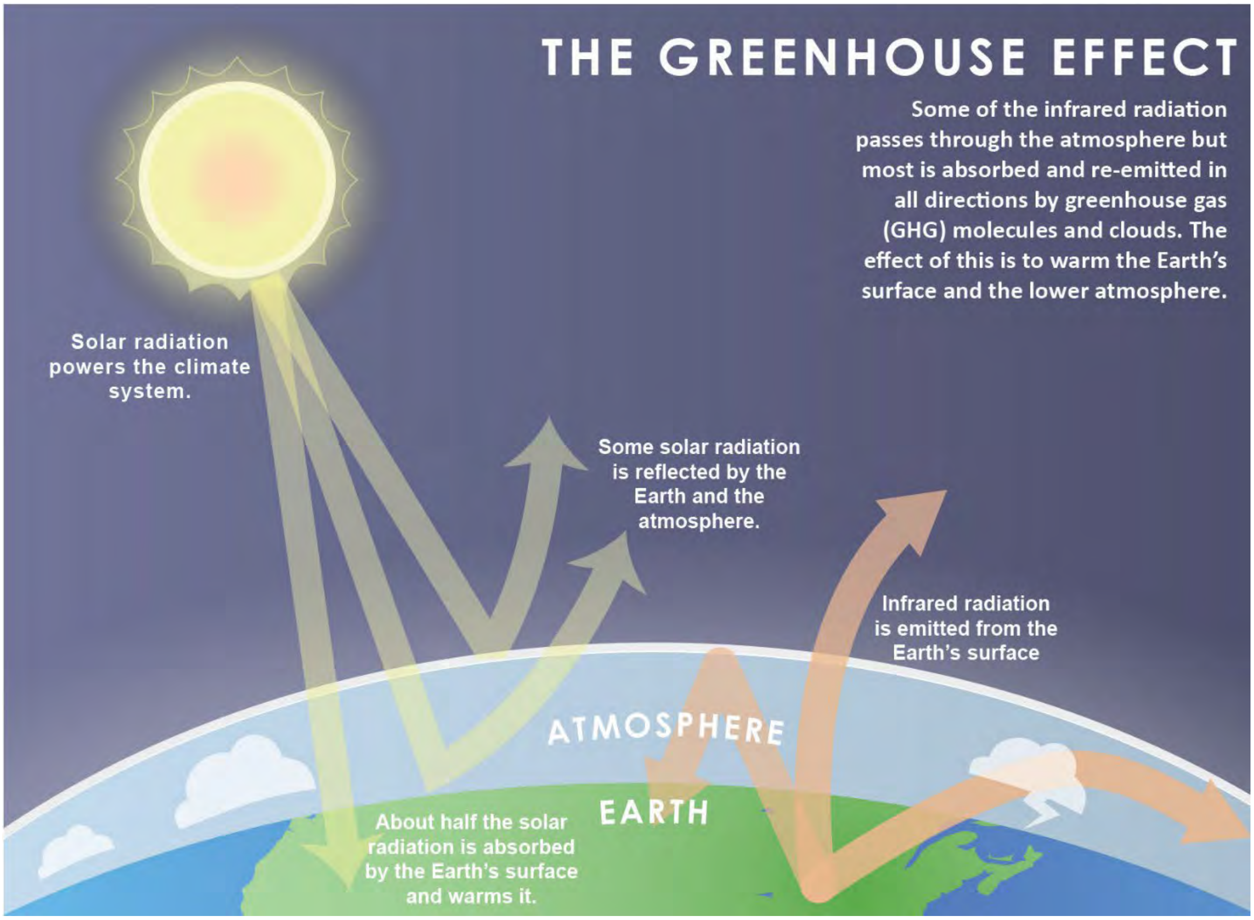
The city is already experiencing the impacts of global climate change as a result of human activities generating GHG emissions. These changes include warming average temperatures and increased volatility in precipitation patterns. A summary of climate change science, the primary causes of climate change, and the existing sources in the state contributing to climate change are discussed in this section.

Overview of Climate Change

In recent decades, human activities (e.g., burning fossil fuels for transportation and energy, increasing rates of deforestation and development) have contributed to elevated concentrations of GHG in the atmosphere. Human-caused (i.e. anthropogenic) emissions of GHGs above natural ambient concentrations are responsible for intensifying the "greenhouse effect," resulting in a trend of unnatural warming of the Earth's climate, known as global climate change. There is strong consensus among the scientific community that global climate change is occurring; seasons are shifting, average temperatures are increasing, precipitation levels are changing, and wildfires are increasing in frequency and severity. These and other changes have the potential to adversely affect human health and safety, economic prosperity, provision of basic services, and the availability of natural resources.

The greenhouse effect, outlined in Figure 1, results from a collection of atmospheric GHGs that insulate the Earth and help regulate its temperature. These gases, mainly water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and chlorofluorocarbons (CFCs), all act as effective global insulators, reflecting Earth's visible light and infrared radiation to keep temperatures on Earth conducive to life as we know it. The greenhouse effect is essential for the planet to support life. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result of increased amounts of GHGs in the atmosphere, radiation that would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere.

Figure 1. The Greenhouse Effect



Source: Ascent Environmental 2020.

Climate change is a global problem. Unlike criteria air pollutants and toxic air contaminants with relatively short atmospheric lifetimes (about one day), GHGs are global pollutants with long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the lifetime of a GHG molecule is dependent on multiple variables, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Approximately 55 percent of the annual human-caused CO_2 emissions is estimated to be sequestered through ocean and land uptake. The remaining 45 percent of these emissions remain stored in the atmosphere (Intergovernmental Panel on Climate Change [IPCC] 2013).

Statewide Greenhouse Gas Emissions

A majority of the statewide emissions of GHGs contributing to global climate change are attributable to human activities. These activities include on-road and off-road transportation, industrial/manufacturing, electricity generation by utilities and consumption by end users, residential and commercial on-site fuel usage, agriculture, high global warming potential (GWP) gases, and solid waste decomposition (CARB 2019).

GHG inventories provide a detailed accounting of the sources and quantities of GHG emissions generated from activities. At the state level, CARB prepares regular GHG inventory updates for a defined set of gases that contribute to climate change. The three primary GHGs quantified include CO_2, CH_4, and N_2O. Emissions of these gases are converted to a comparable unit by multiplying each non-CO_2 gas by their GWP, reporting emissions in terms of carbon dioxide equivalent (CO_2e). This conversion allows consideration of all gases in comparable terms and makes it easier to communicate how various sources and types of GHG emissions contribute to global climate change. These equivalencies are typically represented as million metric tons of CO_2e ($MMTCO_2e$) and metric tons of CO_2e ($MTCO_2e$).

Statewide GHG emissions inventories are summarized in Table 1. The transportation sector is the largest emitter of GHGs in the State, followed by the industrial sector. Statewide emissions of GHGs in 2017 were 424 $MMTCO_2e$, of which nearly 40 percent were attributable to the transportation sector.

Table 1. California Statewide Greenhouse Gas Emissions Inventory

Emissions Sector	$MMTCO_2e$				Percent of Total (2017)	Percent Change from 1990 (%)
	1990 [a]	2000	2010	2017		
Transportation	151	181	165	170	40%	13%
Electricity Generation [b]	111	105	90	62	15%	-44%
Industrial	103	97	92	89	21%	-13%
Commercial and Residential Fuel Use	44	43	45	41	10%	-7%
Agriculture	23	32	34	32	8%	41%
High GWP	- [c]	6	14	2	5%	N/A
Recycling and Waste	- [c]	7	8	9	2%	N/A
Total [d]	**431**	**471**	**448**	**424**	**100%**	**N/A**

Note: CARB = California Air Resources Board; GHG = greenhouse gas; GWP = global warming potential; IPCC = Intergovernmental Panel on Climate Change; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent

[a] *California's first 1990 GHG emissions inventory was prepared in 2007 by CARB using GWP values from the IPCC Second Assessment Report. All other inventory years shown use GWP values from the IPCC Fourth Assessment Report.*

[b] *Includes both in-state electricity generation and out-of-state imported electricity*

[c] *High GWP and Recycling and Waste sectors were included in the Industrial sector for the 1990 inventory only.*

[d] *Totals may not add due to rounding*

Source: CARB 2007, CARB 2019; data compiled by Ascent Environmental 2020.

Emissions of CO_2 are largely byproducts of fossil fuel combustion. CH_4 primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices, leaks from petroleum operations, and landfills. N_2O emissions are typically associated with agricultural practices and soil management. In addition to these GHGs, other high-GWP gases have atmospheric insulative properties that are hundreds to tens of thousands of times greater than that of CO_2, meaning that a high-GWP gas can trap far more heat in the atmosphere than the same amount of CO_2. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are some of the most common types of high-GWP gases and result from a variety of industrial processes including use of refrigerants and electrical insulation.

Baseline Communitywide Greenhouse Gas Inventory

A baseline year inventory of communitywide GHG emissions provides a detailed accounting of the sources and quantities of GHG emissions generated from activities within the city. Similar to the statewide GHG inventory, the City's inventory is estimated primarily based on emissions of CO_2, CH_4, and N_2O, and converted into comparable CO_2 equivalent values. A communitywide baseline inventory addresses GHG emissions generated by communitywide activities within a single calendar year. This accounting of emissions serves as a baseline level from which future emissions can be forecasted.

Previous Greenhouse Gas Inventories

The San Bernardino Associated Governments (SANBAG), now referred to as the San Bernardino County Transportation Authority/San Bernardino County Transportation Authority (SBCOG/SBCTA), prepared the *San Bernardino County Regional Greenhouse Gas Reduction Plan* (Regional Reduction Plan) in 2014. This inventory provided communitywide emissions estimates for all cities within the county, including the City of Rancho Cucamonga, based on 2008 GHG emissions levels. Based on this inventory, activities within the city generated approximately 1,559,136 $MTCO_2e$ in 2008. Emissions sectors estimated in this inventory included on-road transportation, building energy, off-road equipment, water conveyance, solid waste management, wastewater treatment, and agriculture. On-road transportation and building energy (i.e. electricity and natural gas consumption in residential and commercial buildings) emissions each accounted for approximately 45 percent (90 percent total) of the city's 2008 GHG emissions. These emissions were forecasted to the year 2020 to provide estimated future citywide emissions, and to set targets for the City to reduce GHG emissions consistent with State targets. The Regional Reduction Plan also included forecasted emissions for each city based on existing, relevant local and regional planning efforts. These forecasts were provided to identify the level at which additional actions would be required at the local levels to meet statewide reduction targets. Citywide emissions were estimated to generate approximately 1,594,101 $MTCO_2e$ in 2020 under business-as-usual conditions. Through the Regional Reduction Plan, the City set a goal to reduce emissions to 15 percent below 2008 levels by 2020, and would be able to meet this target through the implementation of existing State, regional, and local actions. Local actions identified in the Regional Reduction Plan for the city were based on policies and goals included in the City's 2010 General Plan (SANBAG 2014).

As a follow up to completion of the Regional Reduction Plan, the City adopted the *Rancho Cucamonga Sustainable Community Action Plan* (SAP) in April 2017. Using the inventory and forecasts included in the Regional Reduction Plan, the SAP is a visionary plan that provides a menu of strategies that the City could take that would reduce GHGs in support of its 2020 GHG emissions reduction target. The SAP identified goals and policies the City could implement to reduce emissions from communitywide activities from multiple emissions sectors. The key areas the SAP focused on to achieve communitywide reductions include: transportation and mobility; land use and open space; energy efficiency and renewables; green building performance; water and wastewater; and waste and recycling (City 2017).

Inventory Update

Through the General Plan Update, the City will prepare an updated baseline year inventory of communitywide GHG emissions. This baseline inventory will serve as an update to the 2008 baseline inventory of communitywide GHG emissions prepared by SANBAG (now SBCOG/SBCTA) and the 2016 inventory currently being prepared by SBCOG/SBCTA. in the Regional Reduction Plan. The updated inventory will serve as a reference point for the City to use in preparing updated emissions forecasts and reductions targets for 2030 and 2040 as part of the General Plan Update and accompanying Climate Action Plan. By preparing an updated inventory, the City will also honor its commitment in the SAP to update the GHG emissions inventory periodically to reflect changes in methodology, technology, and to set the baseline from which emissions would be forecasted to set reduction targets based on updated State requirements (City 2017). The communitywide inventory will address baseline year emissions from communitywide activities and sources.

Regulatory Setting

Federal

Federal Clean Air Act

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA) and its amendments. In 2007, the federal Supreme Court ruled that CO_2 is an air pollutant as defined under the CAA, and the EPA has the authority to regulate emissions of GHGs. The ruling in this case resulted in the

EPA taking steps to regulate GHG emissions and lent support for State and local agency efforts to reduce GHG emissions.

Federal Regulations for Vehicle Fuel Economy Standards

In October 2012, the EPA and the National Highway Traffic Safety Administration (NHTSA) issued final rules to reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond. NHTSA's CAFE standards have been enacted under the Energy Policy and Conservation Act since 1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 153 grams of CO_2 per mile for the fleet of cars and light-duty trucks by model year 2025, which represents five percent annual increases in fuel economy.

On August 24, 2018, the EPA and NHTSA jointly published a notice of proposed rulemaking entitled "The Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks" (SAFE Rule), which proposed (1) new and amended CO_2 and CAFE standards for passenger cars and light trucks, (2) to withdraw the waiver EPA had previously provided to California for that State's GHG and zero emission vehicle (ZEV) programs under Section 209 of the Clean Air Act, and (3) regulatory text to implement NHTSA's statutory authority to set nationally applicable fuel economy standards to explicitly preempt California's GHG and ZEV programs. On November 26, 2019, Part One of the SAFE Rule (One National Program) became effective, which withdrew California's waiver from EPA and finalized NHTSA's regulatory text related to preemption. On March 31, 2020, EPA and NHTSA announced Part Two of the SAFE Rule, which would set amended fuel economy and CO_2 standards for passenger cars and light trucks for model years 2021-2026. These revised CO_2 and CAFE standards would increase in stringency by 1.5 percent per year from model year 2020 over model years 2021-2026. Part Two would become effective 60 days after publication in the Federal Register.

State

Executive Order S-3-05

In 2005, EO S-3-05 was issued by Governor Schwarzenegger. It proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established GHG emission targets for the State and identified responsibilities for State agencies in meeting the targets. Specifically, statewide emissions are to be reduced to 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Assembly Bill 32

In September 2006, the California Global Warming Solutions Act of 2006, AB 32, was signed into law. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that "(a) the statewide greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020. (c) The [CARB] shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020." [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

Executive Order B-30-15

On April 20, 2015, Governor Brown issued EO B-30-15 establishing a California GHG reduction target of 40 percent below 1990 levels by 2030. This EO aligns California's GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California's new emission reduction target of 40 percent below 1990 levels by 2030 sets the next interim step in the State's continuing efforts to pursue the long-term target expressed under EO S-3-05 to reach the goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically-established levels needed in the U.S. to limit global warming below 2 degrees Celsius, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

Senate Bill 32

In August 2016, SB 32 was signed into law and serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the 2030 target established by EO B-30-15, which set the next interim step in the State's continued efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

Advanced Clean Cars Program

In January 2012, CARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of regulatory standards for vehicle model years 2017 through 2025. The new regulations strengthen the GHG standard for 2017 models and beyond. This would be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's ZEV regulation would require battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The number of stations would grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules would be fully implemented, the statewide fleet of new cars and light trucks would emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (CARB 2016). As of November 26, 2020, the State's waiver to implement these standards was revoked through Part One of the SAFE Rule. On March 31, 2020, amended fuel economy and CO_2 standards for passenger cars and lights for model years 2021-2026 were set through Part Two of the SAFE Rule. Part Two would become effective 60 days after publication in the Federal Register.

Senate Bill 100

In 2018, SB 100 increased California's Renewable Energy Portfolio targets to 52 percent renewables by 2027 and 60 percent renewables by 2030. SB 100 also established a new 100 percent zero-carbon electricity mandate by 2040.

California Building Energy Efficiency Standards (Title 24, Part 6)

California Code of Regulations (CCR), Title 24, Part 6, is California's Energy Efficiency Standards for Residential and Non-Residential Buildings. Title 24 Part 6 was established by California Energy Commission (CEC) in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy-efficiency standards for residential and nonresidential buildings. These standards are typically updated every three years as part of the State's triennial code update schedule and have resulted in substantial gains in energy efficiency in new construction with each code update cycle. For example, the 2013 Title 24 standards that became effective in 2014 are 23.3 percent more efficient than the previous 2008 standards for residential construction and 21.8 percent more efficient for nonresidential construction. Similarly, the 2016 Title 24 standards that became effective in 2017 are 28 percent more efficient than the 2013 standards for residential construction and are approximately 5 percent more efficient for nonresidential construction.

The 2019 Title 24 Part 6 Building Energy Efficiency Standards were adopted by CEC on May 9, 2018 and took effect on January 1, 2020. The standards are designed to move the State closer to its zero net energy goals for new residential development. It does so by requiring all new residences to install enough renewable energy to offset all the site electricity needs of each residential unit (CCR, Title 24, Part 6, Section 150.1(c)14). CEC estimates that the combination of mandatory on-site renewable energy and prescriptively-required energy efficiency features will result in new residential construction that uses 53 percent less energy than the 2016 standards. Nonresidential buildings are anticipated to reduce energy consumption by 30 percent compared to the 2016 standards primarily through prescriptive requirements for high-efficiency lighting (CEC 2018).

The Title 24 Building Energy Efficiency Standards are enforced through the local plan check and building permit process. Local government agencies may adopt and enforce additional energy standards for new buildings as reasonably necessary in response to local climatologic, geologic, or topographic conditions, provided that these standards are demonstrated to be cost effective and exceed the energy performance required by Title 24 Part 6.

California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of in landfills, the State Legislature passed the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. According to AB 939, all cities and counties were required to divert 25 percent of all solid waste from landfill facilities by January 1, 1995, and 50 percent by January 1, 2000. Through other statutes and regulations, this 50 percent diversion rate also applies to State agencies. In order of priority, waste reduction efforts must promote source reduction, recycling and composting, and environmentally-safe transformation and land disposal.

In 2011, AB 341 modified the California Integrated Waste Management Act and directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. The resulting Mandatory Commercial Recycling Regulation (2012) requires that on and after July 1, 2012, certain businesses that generate four cubic yards or more of commercial solid waste per week shall arrange recycling services. To comply with this requirement, businesses may either separate recyclables and self-haul them or subscribe to a recycling service that includes mixed waste processing. AB 341 also established a statewide recycling goal of 75 percent; the 50 percent disposal reduction mandate still applies for cities and counties under AB 939, the Integrated Waste Management Act.

Climate Change Scoping Plan

In December 2008, CARB adopted the first Climate Change Scoping Plan, which contained the main strategies California is now implementing to achieve the mandate of AB 32 (2006) to reduce statewide GHG emissions to 1990 levels by 2020. CARB has since adopted several updates to the Scoping Plan, the latest version of which is titled California's 2017 Climate Change Scoping Plan (2017 Scoping Plan) (CARB 2017). The 2017 Scoping Plan lays out the framework for achieving the mandate to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017). The 2017 Scoping Plan identifies the GHG reductions needed in each emissions sector to meet the statewide 2030 target.

Chapter 5 of the 2017 Scoping Plan includes guidance for local jurisdictions to reduce GHG emissions through local planning and permitting mechanisms. The guidance recommends that local governments evaluate and adopt robust and quantitative locally-appropriate GHG reduction goals that align with the statewide per capita targets of no more than six $MTCO_2e$ per capita by 2030 and no more than two $MTCO_2e$ per capita by 2050. Recognizing that not all statewide emissions can be reduced at the local level, the guidance also states that it is appropriate for local jurisdictions to derive evidence-based local per capita goals based on local emissions sectors and population projections but must ensure that these targets are consistent with the methodology used to derive the statewide per capita targets. The guidance notes that local GHG reduction strategies to achieve the statewide targets can be implemented through standalone documents such Climate Action Plans (CAPs) or can be integrated into other planning documents with policies that include GHG emissions reduction targets. Once developed and adopted, these plans and policies which include locally-set GHG goals can serve as a performance metric for later projects. Additionally, plans which meet the requirements of Section 15183.5(b) of the California Environmental Quality Act (CEQA) Guidelines can provide local governments with a valuable tool for streamlining project-level environmental review.

Cap-and-Trade Program

The Cap-and-Trade program was developed to reduce GHG emissions from major emissions sources (covered entities) by setting a firm cap on statewide GHG emissions that is gradually reduced over time while employing market mechanisms to cost-effectively achieve the State's emission-reduction goals. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, including electricity generators, large industrial facilities emitting a specified amount of annual emissions, and distributors of transportation, natural gas, and other fuels, and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide the approximately 450 entities covered by the program with the flexibility to seek out and implement the lowest cost options to reduce emissions. All covered entities are required to demonstrate compliance with the cap-and-trade program by implementing GHG reduction activities on-site or through use of free or purchased allowances, or purchase of offsets.

Local and Regional

City of Rancho Cucamonga 2010 General Plan

The 2010 General Plan addresses the impact of communitywide activities on global warming and climate change within the Public Health and Safety chapter. Further, the 2010 General Plan Environmental Impact Report (EIR) Climate Change section analyzes GHG emissions and climate change impacts associated with the implementation of the City's General Plan. The 2010 General Plan includes goals and policies to address vehicle trip reduction, energy conservation, water conservation, and reduction in solid waste generation. Motor vehicles represent the major source of regional emissions throughout the South Coast Air Basin (SCAB) and the city. Transportation and energy production (i.e. electricity generation) are the primary local activities associated with the generation of GHGs. The 2010 General Plan goals and policies for Public Health and Safety are designed to guide long-range planning decisions and daily activities to reduce emissions of GHGs and reduce the impact of local activities on climate change. Many actions identified in the 2010 General Plan undertaken by the City would also directly or indirectly reduce GHG emissions. These actions include building residential units near the Metrolink station, pursuing mixed-use development, supporting transit use, developing bicycle routes and trails, and supporting the use of alternative fuel vehicles in the City's vehicle fleet.

Rancho Cucamonga Sustainable Community Action Plan

As discussed previously, the City adopted the SAP in 2017. The SAP uses the inventory and forecasts prepared through the Regional Reduction Plan to aspire to reduce GHG emissions 15 percent below 2008 levels by 2020. The City's SAP is a visionary document that identified a menu of goals and actions the City could take locally to reduce citywide GHG emissions in key areas, including:

- Transportation and mobility
- Land use and open space
- Energy efficiency and renewables
- Green building performance
- Water and wastewater
- Waste and recycling

San Bernardino Regional Greenhouse Gas Reduction Plan

As discussed previously on Page 4, SANBAG (now SBCOG/SBCTA) prepared a 2008 GHG emissions inventory for each partnership city and forecasted each city's emissions to the year 2020, including for the City of Rancho Cucamonga, in the Regional Reduction Plan. In addition to city-specific GHG emissions inventory, the Regional Reduction Plan includes a comprehensive list of measures applicable to the region that were developed by SBCOG/SBCTA and presented to each city to identify measures that would be feasible for implementation locally. Partnership cities provided a selection of potential GHG reduction strategies that were used to identify the level of reduction that would be achieved locally toward achieving a 2020 emissions reduction target.

Through the Regional Reduction Plan, the City selected a goal to reduce community GHG emissions to a level 15 percent below 2008 GHG emissions by 2020. Through policies in the City's 2010 General Plan and reduction measures identified in the Regional Reduction Plan, GHG emissions in the city would be reduced through implementation of the following general strategies:

- Promoting sustainable development that reduces environmental impacts;
- Working towards a sustainable jobs-housing balance;
- Implementing land use patterns and policies that incorporate smart growth practices;
- Reducing operational energy requirements through sustainable and complementary land use patterns;
- Promoting pedestrian-friendly development; and
- Supporting development projects that are designed to facilitate convenient access for pedestrians, bicycles, transit, and automobiles.

Resilient IE

WRCOG in partnership with the SBCOG/SBCTA developed the Resilient IE program to support regional and local efforts to prepare for and mitigate risks associated with climate adaptation and transportation infrastructure. The Resilient IE program includes six primary components:

- Establish a regional climate collaborative, referred to as the Inland Southern California Climate Collaborative (ISC3),
- Revise WRCOG's community vulnerability assessment and establish a vulnerability assessment for San Bernardino County;
- Develop city-level, climate-related transportation hazards and evacuation maps;
- Develop a climate resilient transportation infrastructure guidebook;
- Prepare a regional climate adaptation and resiliency general plan element template; and
- Serve as a pilot project to assess the community cost of downed or damaged transportation assets.

Through the development of the San Bernardino County Vulnerability Assessment and Adaptation Strategies, the Resilient IE program includes a vulnerability assessment that summarizes projected climate change—related hazards that would affect the county and cities within it. The project also includes a summary of climate change adaptation measures developed through a regional context for consideration by local agencies to implement in their own

Chapter 2
Climate Change Vulnerability Assessment

Addressing climate change requires a combination of adaptation actions and reductions in emissions of GHGs. While reducing GHG emissions would potentially reduce the impacts of climate change on the city, climate change impacts are already occurring locally. This chapter assesses the city's vulnerability to climate change impacts occuring now and projected to occur in the future, and the populations and assets that would experience the most significant exposure to these impacts. The information provided in this Chapter will inform the adaptation strategies included in the General Plan Update.

general plans or other planning documents. Specific vulnerabilities and adaptation strategies identified in the Resilient IE program are discussed further in Chapter 2, "Climate Change Vulnerability Assessment."

Southern California Association of Governments

The City is a member agency of the Southern California Association of Governments (SCAG). Serving as the metropolitan planning organization (MPO) for its member agencies, SCAG is responsible for the development of the regional Sustainable Communities Strategy. SCAG adopted the *2016 – 2040 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) in April 2016. The RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. If implemented it would reduce GHG emissions from passenger vehicles by eight percent per capita by 2020, 18 percent by 2035, and 21 percent by 2040 relative to a 2005 baseline. The RTP/SCS focuses the majority of new regional housing and job growth in high-quality transit areas and other opportunity areas in existing main streets, downtowns, and commercial corridors, resulting in an improved jobs/housing balance and more opportunities for transit-oriented development.

The RTP/SCS identifies several GHG emission reduction actions and strategies for the State, SCAG, and local governments including:

- Updating zoning codes to accelerate adoption of RTP/SCS land use strategies;
- Prioritizing transportation investments to support compact infill development that includes a mix of land uses and housing options;
- Developing infrastructure plans and educational programs that promote active transportation options;
- Emphasizing active transportation projects; and
- Increasing the efficiency of existing transportation systems.

SCAG is currently in process of updating the regional RTP/SCS to include a horizon year of 2045. This updated plan, referred to as *Connect SoCal – The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy* (Connect SoCal), was released on March 27, 2020, for final public review and Regional Council Adoption. Connect SoCal builds upon the previous RTP/SCS to provide a long-range vision for transportation and land use strategies. Connect SoCal outlines more than $600 billion in transportation system improvements through 2045, that would improve regional sustainability, connections between transportation networks, and collaborative planning efforts amongst agencies (SCAG 2020).

Introduction

Global climate change is expected to exacerbate the impacts of certain hazards currently occurring at the local level. These hazards include wildfires, poor air quality, extreme heat events, landslides, and flooding, among others. The frequency and intensity of these hazards would increase as a result of global climate change. Through the General Plan Update, the City will develop reduction strategies to reduce GHG emissions from activities in the community and sphere of influence, and adaptation strategies to improve the city's resilience to anticipated climate change impacts. This vulnerability assessment would inform development of adaptation strategies by identifying the city's exposure to existing hazards, sensitivity to these hazards, potential impacts from these hazards that would be exacerbated by climate change, and the existing adaptive capacity of city populations and assets. This chapter focuses primarily on the hazards that would be exacerbated by climate change and how exposure to these hazards is projected to change in the future. Existing impacts of these hazards are briefly discussed in this chapter, and further detail for these hazards (and others that would not likely be exacerbated by climate change) is provided in the Natural Hazards Existing Conditions Report.

Key Findings

- Climate change is anticipated to result in increased average temperatures and precipitation pattern variability globally. These changes would result in secondary impacts that could severely impact people and structures in the city, including:
    - Increased frequency and intensity of wildfires
    - Increased frequency of severe weather such as extreme heat days, heat waves, and heavy precipitation events
    - Increased frequency of flooding and landslides
    - Increased frequency of droughts and reduced availability of potable water
    - Potential increased intensity of severe wind events
- These climate change impacts would affect various populations in the city, but would disproportionately affect vulnerable populations including low-income communities, communities of color, senior citizens, linguistically isolated populations, individuals with disabilities or preexisting medical conditions, and individuals experiencing homelessness.
- Increases in wildfire and landslide frequency would expose development north of SR 210 (e.g. residential neighborhoods, educational buildings and campuses, flood control infrastructure) to increased risk of damage or destruction.
- Climate change-related impacts could severely impact public health by worsening air quality (i.e. increased occurrence of ground-level O_3) and increasing the spread of infectious disease.
- The primary vulnerabilities the City should address through the General Plan Update include:
    - Increased risk of damage to structures and infrastructure and exposure to health risks from increased average temperatures, frequency of extreme heat events, and intensity of severe wind events.
    - Disproportionate exposure of vulnerable populations to reduced air quality, increased frequency of extreme heat events and flooding, and exacerbation of the urban heat island effect.
    - Increased exposure of transportation infrastructure, especially railways, to damage from increased frequency of extreme heat events, flooding, and landslides.
    - Increased stress on water supply, urban forests, and electricity generation and transmission facilities that the city relies on from elsewhere in the state or country.
    - Increased exposure of emergency responders to hazardous conditions during response events including wildfires and smoke, flood waters, and infectious diseases.
    - Increased stress on emergency response facilities during hazard events (e.g. wildfires, extreme heat days) from increased climate impact evacuees including shelter required as a result of loss of power (e.g. from downed power lines or Public Safety Power Shutoffs), loss of property, or cooling shelter availability during extreme heat events.

- Increased risk to human health from reduced air quality (e.g. increased rates of asthma in exposed populations and decreased opportunity for outdoor exercise and recreation) and increased occurrence and spread of infectious disease.

Existing Conditions

The global average temperature is expected to increase by 3.0 to 7.0 degrees Fahrenheit (°F) by the end of the century, depending on future worldwide GHG emission scenarios (IPCC 2007). According to California's Fourth Climate Change Assessment, depending on future GHG emissions, average annual maximum daily temperatures in California are projected to increase between 4.4 and 5.8 °F by 2050 and by 5.6 to 8.8 °F by 2100.

GHG emissions associated with human activities are the primary cause of climate change. As described in Chapter 1, "Greenhouse Gas Emissions," the City has identified a menu of strategies that could be implemented to reduce GHG emissions from communitywide activities and adapt to climate change impacts through the Regional Reduction Plan and its visionary SAP. Nevertheless, the impacts of climate change are already occurring at a local level because of worldwide GHG emissions and will continue to occur irrespective of the City's efforts to reduce communitywide emissions.

Climate change will adversely affect people, property, and the physical environment through increases in average global temperatures and precipitation pattern volatility. Precipitation patterns would be changed in a variety of ways as a result of climate change, including increased frequency of extreme storm events and reduced precipitation falling as snow in high elevation areas. These changes in precipitation patterns, along with increased average temperatures, will result in changes to water supply, threats to biological resources (i.e., sensitive habitats and slope supporting vegetation), and threats to human health and safety. In recent years, the state has been marked by extreme weather effects, the frequency and intensity of which have been exacerbated by climate change. Extreme weather effects such as volatility in precipitation, increased average temperatures, and increased frequency of extreme heat events have led to increases in the frequency and intensity of hazards to human health and safety such as wildfires, droughts, and changes in available water supply.

Unstable water supply and changing temperatures affect the prevalence of pests, disease, and species, which will directly impact crop development and forest health. Other environmental concerns include decline in water quality, reduced availability and overdrawing of groundwater supply, and declining soil health. Vulnerabilities of water resources also include risks related to degradation of watersheds, alteration of ecosystems, and loss of habitat.

Climate change is also causing impacts on energy, water, and transportation infrastructure throughout the state. Changes in temperature, precipitation patterns, extreme weather events, and sea-level rise have the potential to affect and decrease the efficiency of power plants and generation facilities, disrupt electricity demand, and threaten built infrastructure from increased risks of flooding and wildfire. Climate change impacts such as sea-level rise, storm surge, and flooding are imminent threats to roadways, bridges, airports, transit, and rail systems. Though sea-level rise would not directly impact the city due to its inland location, City functions may be impacted from reliance on water supply and electricity generation facilities in other cities that would be affected by sea-level rise. Additionally, temperature extremes and increased precipitation can increase the risk of road/pavement and railroad track failure, resulting in loss of access or ability to evacuate, decreased transportation safety, and increased maintenance costs. Finally, increased frequency of extreme storm events would increase the likelihood of landslides occurring in the San Gabriel Mountains' hillsides. These landslides could result in damage to residences, roadways and flood control infrastructure, and recreation areas. Frequency of landslides would be further exacerbated by increased wildfires that could remove soil supporting vegetation and habitats.

Regulatory Setting

The Governor's Office of Planning and Research (OPR), California Natural Resources Agency (CNRA), and CEC prepared *California's Fourth Climate Assessment* (Climate Assessment) in 2018. The Climate Assessment was designed to address critical information gaps that decision-makers at the State, regional, and local levels need to close to protect and build resilience of people, infrastructure, natural systems, working lands, and waterways.

Alongside the update to the Climate Assessment, CNRA released the *Safeguarding California Plan* in 2018 which provides a roadmap for State government action to build climate resiliency. The Safeguarding California Plan identifies actions the State government will take to protect communities, infrastructure, services, and the natural environment from climate change impacts and includes strategies for use as local examples for climate adaptation.

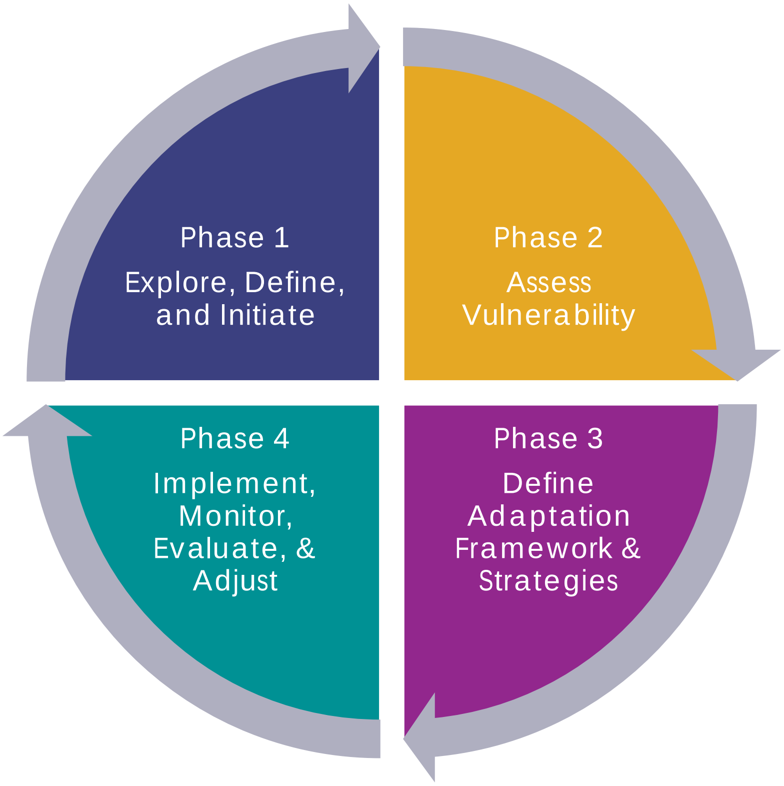
The California Office of Emergency Services (CalOES) and CNRA prepared the California Adaptation Planning Guide (APG) in 2012. The APG provides guidance for communities for adaptation planning to fit community needs. CalOES is in the process of updating the APG to provide additional flexibility and guidance for communities. This update, referred to as APG 2.0, was released in draft form for final public review in March 2020. It is anticipated that the final APG 2.0 would be publicly released in mid- to late-2020. Both the APG and APG 2.0 provide a framework for communities to identify potential climate change effects and important physical, social, and natural assets, create adaptation strategies to address climate change impacts, and develop a monitoring and implementation framework for climate change adaptation. APG 2.0 is described in further detail below and provides the framework for the vulnerability assessment prepared in this chapter.

In 2015, SB 246 was signed into law directing OPR to form the Integrated Climate Adaptation and Resiliency Program (ICARP). ICARP is designed to assist in developing a coordinated response to the impacts of climate change across the State, local, and regional levels. The primary component of ICARP is the maintenance of the State Climate Adaptation Clearinghouse (adaptation clearinghouse), which serves as a centralized source of information and resources to assist decision-makers in planning for and implementing climate adaptation and resiliency efforts. The adaptation clearinghouse provides a database of adaptation and resilience resources organized by climate impact, topic, and region, and allows State, local, and regional agencies to share case studies related to climate change impact response.

Vulnerability Assessment

APG 2.0 helps communities throughout the state plan for and adapt to impacts of climate change. APG 2.0 includes a four-phase process, illustrated in Figure 2, which allows communities to assess their specific climate vulnerabilities and provides a menu of strategies for communities to reduce climate-related risks and prepare for current and future impacts of climate change.

Figure 2. Adaptation Planning Process



Source: CalOES 2020.

Phase 1, "Explore, Define, and Initiate," includes identifying the potential climate change effects and important physical, social, and natural assets in the community. This phase also identifies key stakeholders in the local government and throughout the community. Phase 2, "Assess Vulnerability," includes an analysis of potential impacts and adaptive capacity to determine the vulnerability of populations, natural resources, and community assets. The vulnerability assessment identifies how climate change could affect the community. Phase 3, "Define Adaptation Framework and Strategies," focuses on creating an adaptation framework and developing adaptation strategies based on the results of the vulnerability assessment. Adaptation strategies identify how the community will address the potential for harm based on the community's resources, goals, values, needs, and regional context. In Phase 4, "Implement, Monitor, Evaluate, and Adjust," the adaptation framework is implemented, consistency monitored and evaluated, and adjusted based on continual learning, feedback, or triggers. The adaptation planning process is intended to be cyclical in nature.

The ultimate goal of adaptation planning is to improve community resiliency in the face of a changing climate. A resilient community is one that is prepared for current and future hazardous conditions and experiences less harm when a disaster happens. Resilient communities can recover from hazards more quickly and rebuild in a manner that accounts for continuing climate change. Ongoing learning and monitoring and adjusting adaptation planning in response to new information and opportunities, identified through this continuous process, is important for building resiliency.

The vulnerability assessment provided herein will be used by the City to inform the development of goals and policies for the General Plan Update. While climate adaptation efforts would be woven throughout the General Plan elements and the City's Local Hazard Mitigation Plan, goals and policies identified in the Safety element will most significantly reflect the information provided in this vulnerability assessment.

Exposure

The city is located at the base of the San Gabriel Mountains. This proximity creates the potential for several types of natural hazards. Open spaces in the foothills are susceptible to wildland fires, endangering residential properties that abut the wildland-urban interface (i.e. the transition zone between wildland and human development). Within the city and sphere of influence, this area consists entirely of residential and commercial developments along the San Gabriel Mountains' hillsides. Mountain canyons and passes can generate high wind conditions, further increasing wildfire risk. Canyon creeks and streams divert water runoff in the mountains into the city and can lead to flooding hazards during rain storms. Climate change would exacerbate the threat and potential impact of these hazards. Increased temperatures and prolonged drought conditions can increase dry fuel in the foothills, intensifying wildfires, and lengthened warm seasons can reduce the amount of precipitation falling as snow in the San Gabriel Mountains, increasing rainwater runoff during storms and the likelihood of flooding.

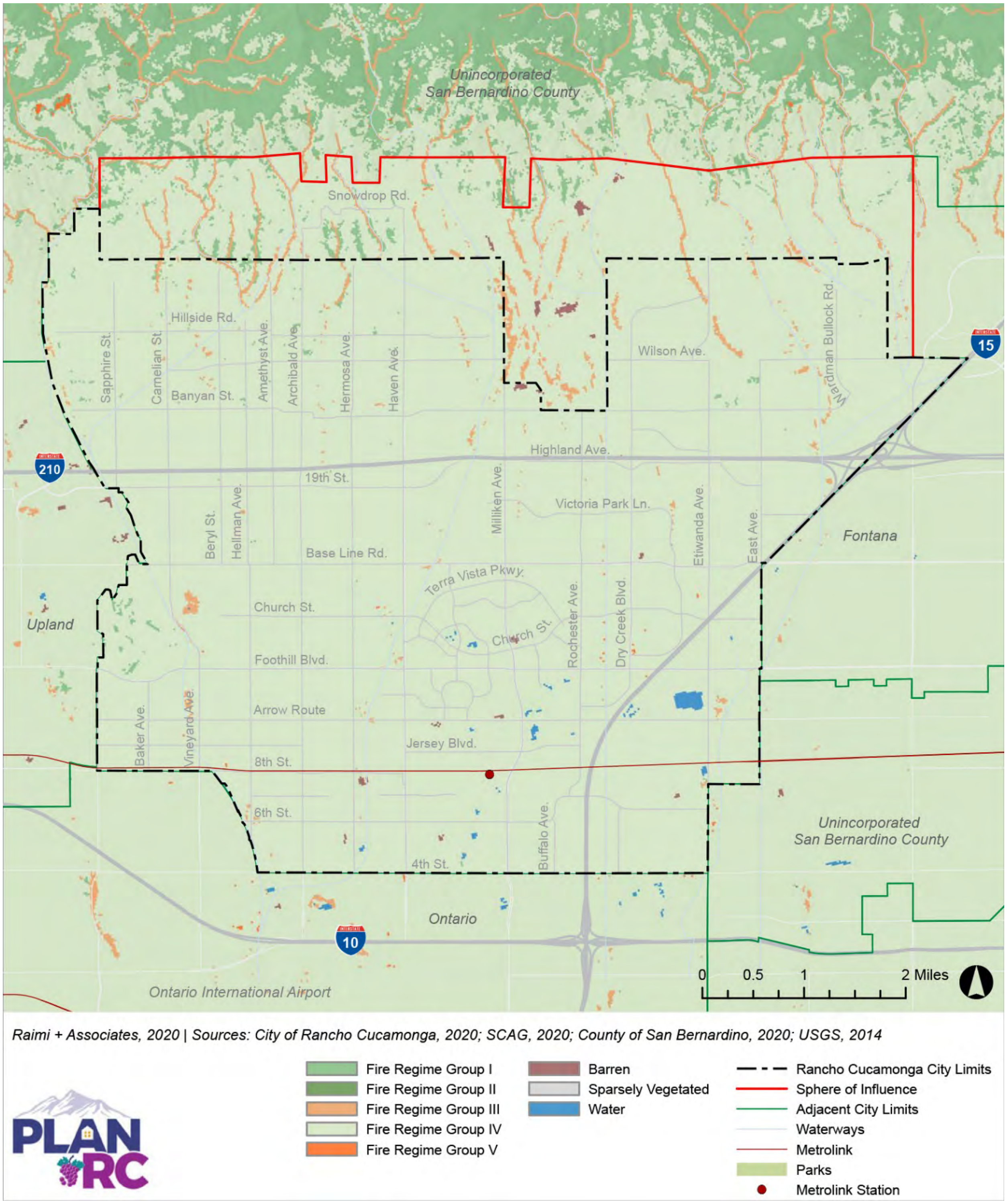
Existing Hazards

Historically, wildfires in the San Gabriel Mountains have threatened persons and property for areas in the city and its sphere of influence north of SR 210. Recent fires, summarized in detail in the Natural Hazards Existing Conditions Report, have impacted populations and assets in the city and surrounding area. The risk of wildfire in an area can typically be determined through two main factors: vegetation type and weather and climate patterns. Through these two factors, the United States Geological Survey (USGS) categorizes areas in "fire regimes," which generally define fire hazards in areas based on anticipated frequency of wildfire and potential severity. Fire regimes are categorized into five groups (I through V), where Fire Regimes I and II represent high wildfire frequency (once every 0 to 35 years), Regimes III and IV represent moderate wildfire frequency (once every 35 to 200 years), and Fire Regime V represents low wildfire frequency (once every 200 or more years). Figure 3 shows the fire regimes in the city and surrounding area. As shown in Figure 3, the entire city is located within Fire Regime IV, but areas immediately north of the city in the San Gabriel Mountains and within its sphere of influence are located in Fire Regime I. Fire hazard severity zones and state and local responsibility areas are identified in Figure 9, "Fire Hazard Severity Zones" of the Natural Hazards Existing Conditions Report.

The San Gabriel Mountains are identified as having a generalized landslide susceptibility of moderate to high immediately north of city limits and within city limits near Angalls Canyon and Demens Canyon (San Bernardino County 2009). A summary of existing and historic landslide hazards is provided in the Natural Hazards Existing Conditions Report. The landslide susceptibility of hillsides is exacerbated in recently burned areas. The San Gabriel Mountains' hillsides are highly susceptible to debris flows and mudslides after a wildfire event in even modest rainstorms (USGS 2020).

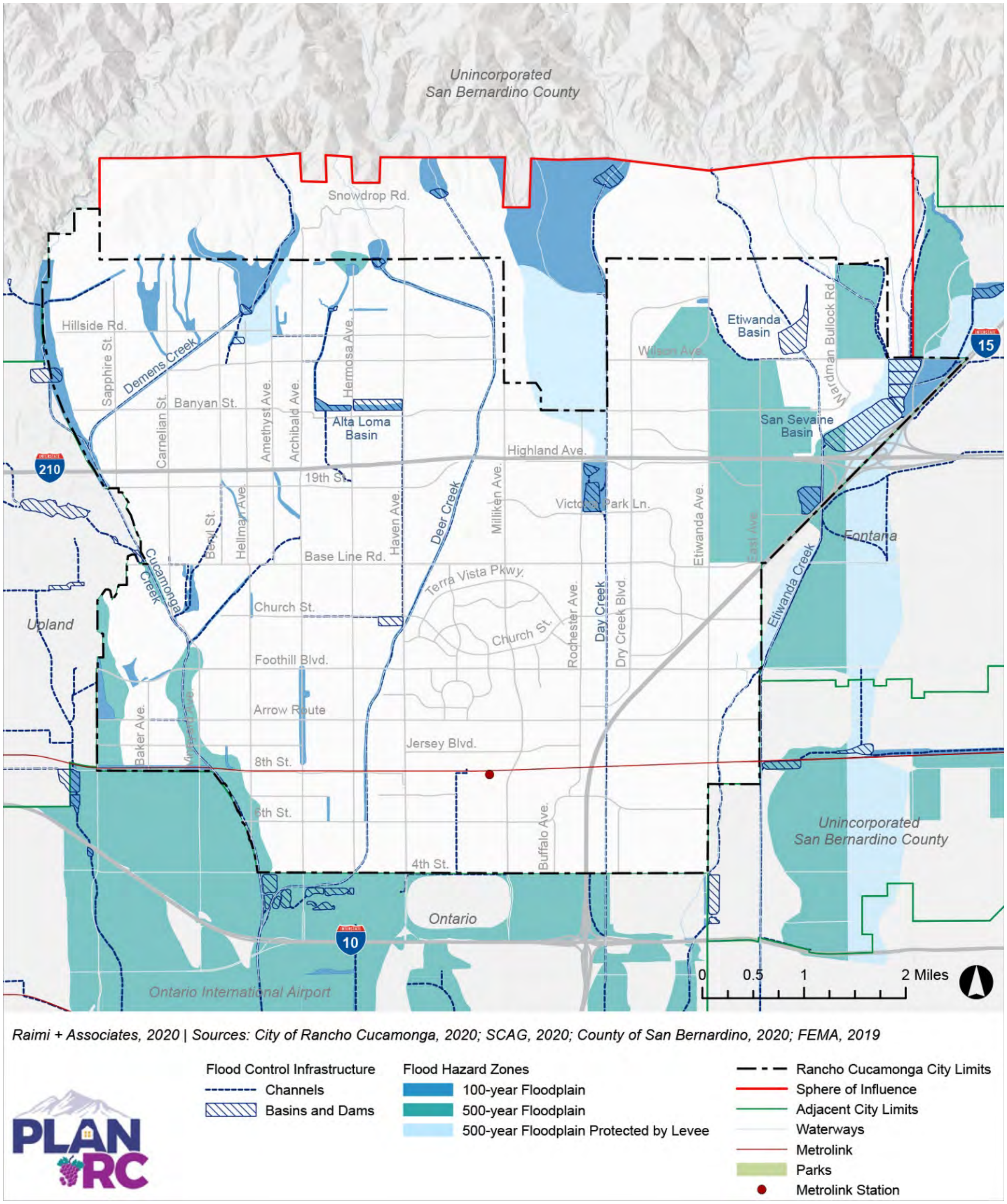
During past storm events, flooding in the city has resulted in disruptions in the transportation network (i.e. roadways and railways) and damage to roadways and property. Rainfall over the San Gabriel Mountains results in runoff flowing through the various canyons north of the city into numerous creeks and channels that flow north to south through the city. The San Bernardino County Department of Public Works manages the Flood Control District and is responsible for the installation, maintenance, and planning of flood control infrastructure. Beyond flood channels, the City is responsible for maintaining storm drain and flood control infrastructure within city limits. Multiple channels have been developed within the city to transport water runoff from the San Gabriel Mountains including the Cucamonga Creek Channel, Deer Creek Channel, and Day Creek Channel. These channels and ancillary channel arms primarily run north-south through the city. However, during extreme precipitation events such as prolonged rainfall and heavy rainfall events, excess runoff can create flooding hazards along these channels and areas within the city to the north of Interstate 10 (San Bernardino County 2020). Figure 4 shows the flood plains and flood control infrastructure in the city.

Figure 3. Fire Regime Groups



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; USGS, 2014

Figure 4. Flood Plains and Flood Control Infrastructure



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; FEMA, 2019

Climate Change Effects

Though the precise extent of future climate change effects is uncertain, historical data and anticipated future global GHG emissions levels can be used to project climate change effects through mid-century (2020-2049) and the latter half of this century (2050-2099). The Cal-Adapt tool, developed by the CEC and University of California, Berkeley Geospatial Innovation Facility, is a climate change scenario-planning tool. The direct, or primary, changes identified for the city include average temperatures and annual precipitation amounts. Secondary impacts, which can occur because of individual changes or a combination of these changes include heat wave frequency, intense storms, landslides, droughts, wildfire, flooding, and public health. Climate change is attributable to the generation of GHGs from human activities. Thus, climate outcomes are driven by the amount of GHGs emitted into the atmosphere and are subject to the adoption and effectiveness of GHG reduction measures globally. Despite extensive efforts to model these potential impacts and outcomes, they are ultimately uncertain (CalOES 2019).

To address the uncertainty in future emissions of GHGs, Cal-Adapt uses Representative Concentration Pathways (RCPs), which project global emissions and effects over time through medium and high future emissions scenarios. The Medium (RCP 4.5) emissions scenario models a future where communities attempt to reduce GHG emissions. This scenario predicts that GHG emissions will continue to rise until leveling-off, or plateauing, in the middle of the 21st century. Under this scenario GHG emissions would decrease to below 1990 levels by the end of the 21st century. The High (RCP 8.5) emissions scenario models business-as-usual (BAU) growth where GHG emissions continue to increase through the end of the 21st century.

Based on this vulnerability assessment, the City will develop goals and policies to build resiliency to climate change impacts in the General Plan Update and Local Hazard Mitigation Plan. While the City can take action towards reducing the potential impacts to areas within its jurisdiction, climate change does not respect geographic boundaries. Hazards outside of the City's jurisdiction or mitigation control may still be harmful to people and structures within the city. For example, wildfires occurring outside of the city's boundaries may still block major transportation routes, result in harmful levels of air pollution in the city, and create refugees that may seek shelter or housing in the city. The primary and secondary climate change effects addressed within this vulnerability assessment include:

Primary Effects

- Precipitation patterns
- Average temperatures

Secondary Effects

- Human health hazards
- Droughts
- Extreme heat events
- Heat waves
- Flooding
- Storms and extreme weather
- Landslides
- Wildfires
- Severe wind events
- Available water supply

Climate change is also causing tertiary impacts on energy, water, and transportation infrastructure throughout the state. Changes in temperature, precipitation patterns and extreme weather events have the potential to affect and decrease the efficiency of power plants and generation facilities, disrupt electricity demand, and threaten built infrastructure from increased risks of flooding and wildfire. Climate change impacts such as flooding, landslides, and wildfire are imminent threats to roadways, bridges, airports, transit, and rail systems.

Human Health Hazards

Climate change can cause primary and secondary impacts to human health related to extreme heat, poor air quality, wildfires, infectious disease, floods and landslides, mental health concerns, and increasing social disparities caused by disproportionate impacts to vulnerable populations. While some populations will be more severely affected than others, all persons in the city and region will experience the impacts of climate change. The SCAB, within which the city is located, is currently considered as having some of the worst air quality in the country, ranking as the most polluted region in the United States for O_3 (American Lung Association 2017). Higher temperatures as a result of climate change are likely to increase the production of ground-level ozone, a respiratory irritant that is a component of smog. Ground-level ozone is associated with various negative health outcomes, including reduced lung function, pneumonia, asthma, cardiovascular-related morbidity, and premature death (EPA 2013). Many of the same populations, such as those with existing health conditions and the elderly, that are vulnerable to the effects of extreme heat are also vulnerable to the effects of poor air quality.

Climate influences the population size, geographic distribution, and reproduction of vectors (rodents, mosquitoes, ticks, fleas, and others) that transmit disease to humans. The many factors that contribute to the incidence of vector-borne diseases, such as land use patterns and human behavior, present challenges in projecting their spread (Gubler et al. 2001). However, cases of certain viruses are known to increase during warm weather. Models for North America project increases in infectious disease spread to humans, such as West Nile Virus, caused by increasing temperatures and declines in rainfall (Harrigan et al. 2014).

Climate change may impact mental health through various pathways, including but not limited to increases in the frequency and severity of extreme weather events, increasing economic instability, and uncertainty about the future of the planet. Extreme weather events such as fires and floods can have acute mental health impacts and can be linked to increases in anxiety and depression in certain populations (Kar and Bastia 2006). Climate change can also precipitate chronic impacts including negative impacts to livelihoods (e.g. increased droughts reduce profitability for farmers), leading to mental health impacts such as chronic stress and depression (Hanigan et al. 2012).

Droughts and Available Water Supply

Changes in weather patterns resulting in increases in global average temperatures could result in a decreased proportion of precipitation falling as snow in California, and an overall reduction in snowpack in the Sierra Nevada. Increases in temperature are already causing decreases in snowpack (DWR 2019a), which provides as much as a third of California's water supply. Warmer temperatures have resulted in snowpack melting faster and earlier, resulting in issues storing water or use throughout the dry season and in reserve for drought conditions.

The projected changes in annual precipitation for the city are shown in Table 2. Under both the medium and high emissions scenarios, the city is not expected to experience significant changes in average precipitation. However, the city would experience increased variability in precipitation each year. The city's minimum annual precipitation would decrease while the maximum annual precipitation would increase under both emissions scenarios.

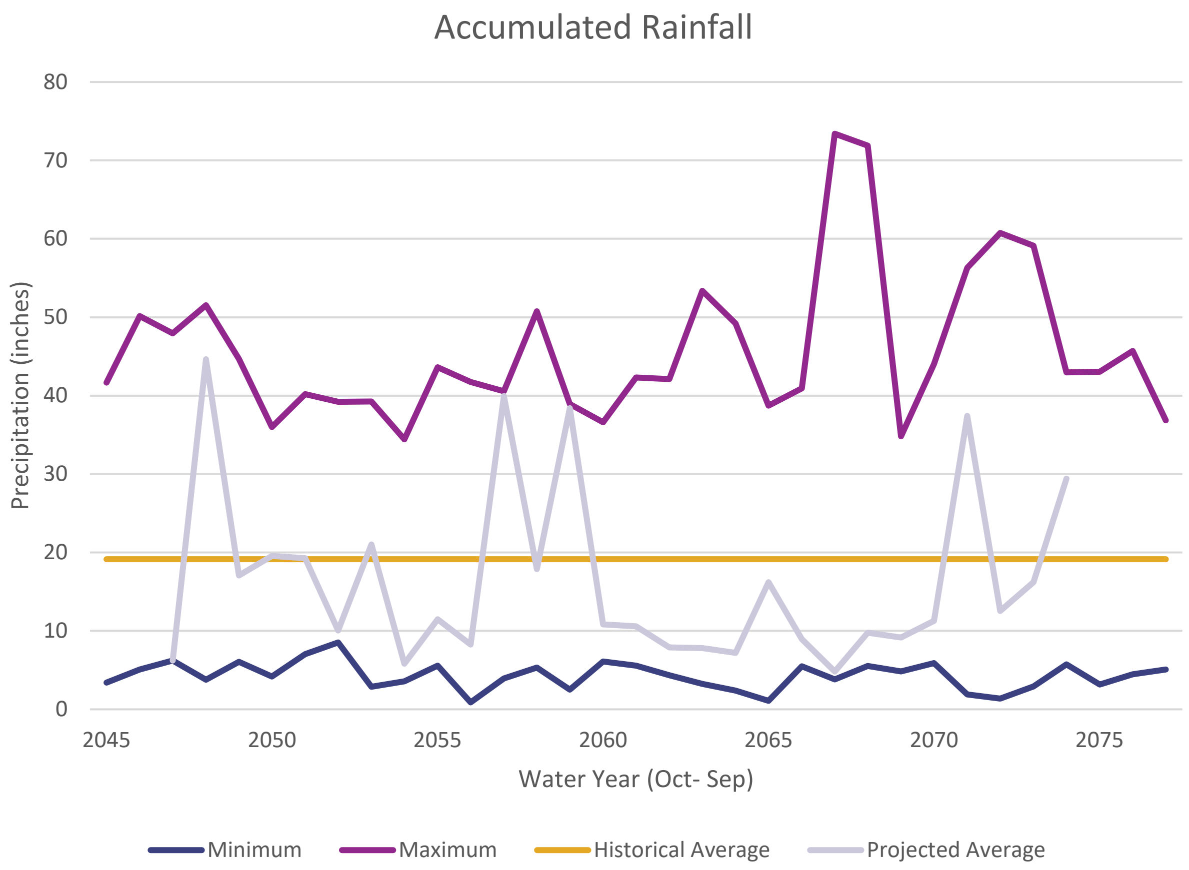
Table 2. Changes in Annual Average Precipitation in the City of Rancho Cucamonga

Scenario	Annual Precipitation		
	Minimum (in.)	Average (in.)	Maximum (in.)
Historical Average (1950-2005)	4.6	19.4	43.0
Medium Emissions Scenario (2050-2099)	3.3	19.7	54.9
High Emissions Scenario (2050-2099)	3.5	20.5	62.6

Notes: in = inches
Source: CEC 2020

Though the city's annual precipitation amounts would stay relatively constant, the city and state have a highly variable climate that is susceptible to dry spells. Recent research suggests that extended drought occurrence (a "mega-drought") could become more pervasive in future decades (CEC 2020). An extended drought scenario is predicted for all of California from 2051 to 2070 under a climate model using BAU conditions. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78 percent of the historic median annual precipitation averaged for the North Coast and Sierra California Climate Tracker regions. Shown in Figure 5, the city's observed historical average annual rainfall accumulation is 19.4 inches. Under the anticipated drought scenario between 2051 and 2070, the city's annual rainfall accumulation would decrease to 13.8 inches (CEC 2020).

Figure 5. Changes in Frequency of Drought Conditions



Snowpack plays a key role in water supply in the region. Snowpack in the Sierra Nevada Mountains replenishes the watersheds and reservoirs used as state water resources. Snowpack in the Sierra Nevada is expected to decline by as much as 33 percent by mid-century and 66 percent by end of century, relative to historic baseline snowpack (Bedsworth et al., 2018). Snow melt is expected to occur earlier in the year, which would disrupt the normal timing of water recharge in rivers and groundwater. Reduced snowpack and earlier snowmelt would lead to less water available to the State Water Project and other water supply systems, and lead to more frequent water shortages.

The Cucamonga Valley Water District (CVWD) depends on both local and imported water sources to supply water to city residents, businesses, and facilities. This includes water imported from the State Water Project. Southern California and San Bernardino county are highly prone to drought conditions. Drought conditions typically result in continued depletion of water resources and water diversion away from biological resources (e.g. flood control or sensitive habitat, recreation areas) to support resident and commercial consumption. As the availability of fresh water from existing supplies declines, the need for water storage to support City functions during drought conditions increases. The combination of these factors would result in potential water shortages for residents and businesses, and further reduction of water available for biological resources such as wetlands.

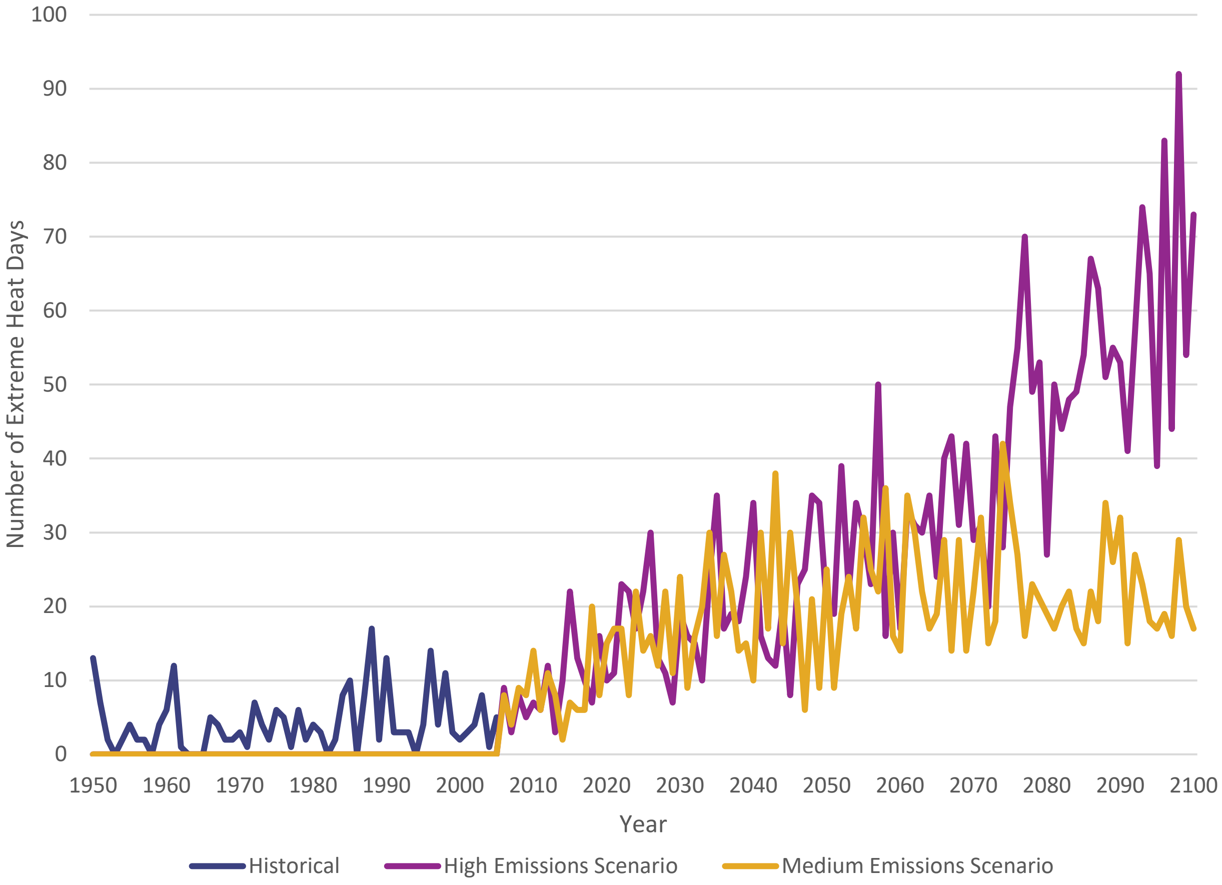
Extreme Heat Events and Heat Waves

Extreme heat events include extreme heat days and heat waves. Extreme heat days occur when the daily maximum/minimum temperature exceeds the 98th historical percentile of the daily maximum/minimum temperatures. Heat waves are characterized as periods of sustained extreme heat over multiple days (i.e. four or more consecutive extreme heat days).

The extreme heat day threshold for the city is 103.9 °F or higher. Historically (between 1950 and 2005), the city experienced an average four extreme heat days per year, typically occurring between April and October. As a result of rising average temperatures and climate change, the city is projected to experience between 21 and 35 extreme heat days annually from 2050 to 2099 under medium and high emissions projections (CEC 2020). As shown in Figure

6, the number of extreme heat days is already increasing from historic averages, and would continue to increase through the century.

Figure 6. Changes in Frequency of Extreme Heat Days



Extreme heat waves are defined as four or more consecutive extreme heat days. These events have historically been infrequent in the city, as the historical annual average is one heat wave approximately every five years, and a maximum of three heat waves occurring in a single year (1998) between 1950 and 2005. The city is expected to experience an increase in heat wave frequency as the climate changes. Between 2050 and 2099, the city is projected to experience between two and five heat waves per year (CEC 2020).

Urbanized areas can experience higher temperatures, greater pollution, and negative health effects, especially during summer months than communities that are more rural. This phenomenon is known as the Urban Heat Island Effect (UHIE). Urban heat islands are created by a combination of heat-absorptive surfaces (e.g. dark pavement and roofing), heat-generating activities (e.g., automobile engines and industrial generators), and the absence of “green spaces” (which provide evaporative cooling). During extreme heat days and heat waves, asphalt and darker surfaces reduce nighttime cooling (as retained heat is released from these surfaces). The UHIE can intensify extreme heat days and heat waves.

Flooding

Climate models indicate that precipitation volatility will intensify in the future as global climate continues to warm. While days with measurable precipitation become less frequent in Southern California, extreme precipitation will intensify. Similar to other California regions, the high year-to-year variability in San Bernardino county is heavily affected by extreme precipitation events (days having precipitation at or exceeding 95th percentile precipitation volumes), which accounts for 80 percent of the year-to-year variability (Kalansky and Cayan et al. 2018). Most of the heaviest events occur during winter.

The city currently experiences localized flooding in certain areas during heavy rainfall and extreme weather events, typically near creeks or channels and at intersections located at the low points of stormwater runoff basins. Although it is difficult to precisely estimate the increase in flood risk due to climate change, climate models suggest that extreme precipitation events may become more frequent and intense and be concentrated within a smaller wet season. Heavy precipitation events may increase the likelihood of flooding.

Storms and Extreme Weather

Extreme storms and weather include heavy rain, thunderstorms, and hail. Extreme storms are projected to become more intense and frequent by mid-century as a result of climate change. Extreme storms and weather in the city typically occur in the form of rainstorms, often driven by atmospheric rivers. An atmospheric river is a narrow band of the atmosphere that transports large amounts of water vapor and produces heavy precipitation across Southern California in the winter (NOAA 2015). Atmospheric rivers can last for several days, bringing heavy rains to lower elevations. Storms associated with atmospheric rivers can comprise of up to 50 percent of the state's annual precipitation. As a result, atmospheric rivers can lead to increased risks of flooding and high winds.

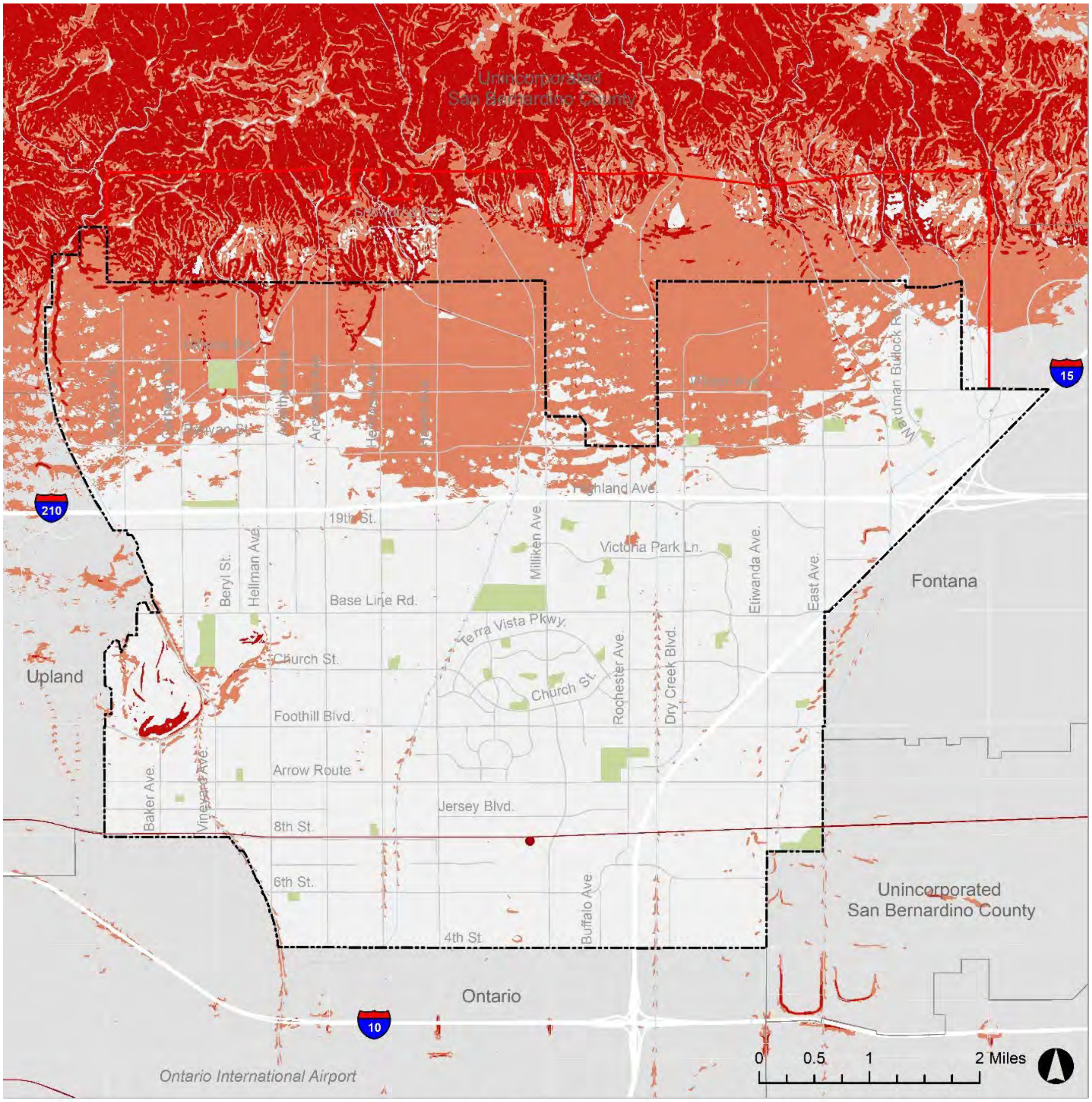
Climate change can result in longer and wider atmospheric rivers that carry larger amounts of water vapor compared to historic conditions (Espinoza et al. 2018). Larger atmospheric rivers would likely result in greater precipitation volumes and more frequent thunderstorms and hail, which can cause damage to infrastructure and endanger public safety.

Landslides

Landslides are events where a mass of earth or rock moves down a slope, which can be triggered by both geologic (e.g., earthquake) and climatologic factors. Landslides caused by geological factors are discussed in the Natural Hazards Existing Conditions Report; this report describes future hazards resulting from climate change, including mudslides and wildfires. Mudslides are a type of landslide that contain significant amounts of water and rapidly surge down hillsides. The likelihood of landslides can be significantly higher when heavy rainfall events occur after wildfires. The combination of increasing temperatures, increased likelihood of wildfires, and increased occurrence of extreme precipitation events could increase the risk of more frequent, and potentially larger, mudslides and landslides in the San Gabriel Mountains.

Landslides susceptibility is currently highest in mountainous terrain, such as the San Gabriel Mountains, where complex geology and fault zones intersect step terrain prone to wildfire risk and heavy precipitation events. Populated areas of the city are directly adjacent to this mountainous terrain, as is infrastructure including water runoff catchments, power transmission facilities, and hydroelectric power plants. As shown in Figure 7, a majority of the San Gabriel Mountains' hillsides adjacent to the city are considered to have a relatively high landslide susceptibility. Additionally, areas within the northern half of the city are considered to have a moderate landslide susceptibility, and are located in potential outfall areas during landslide events.

Figure 7. Landslide Susceptibility



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2020; SCAG, 2020; County of San Bernardino, 2020; California Geological Survey, MS 58 Landslide Susceptibility Classes, 2020.

Wildfires

Wildfires in the region are influenced by a range of factors including droughts, severe winds, wildfire fuel (i.e. dry vegetation), past wildfire suppression activity, and expanding wildland—urban interface. While wildfires can start from both natural and human ignitions, climate change is expected to exacerbate wildfire risk by creating hotter and drier landscapes more susceptible to burning. Wildfires pose risks to life and property, and can greatly reduce air quality during and following wildfire events.

Wildfire risk and annual area burned are expected to continue to increase through the end of the century as a result of warmer temperatures, more frequent drought, and expanding wildland-urban interface (Westerling 2018). Increased wildfire risk could adversely affect people living and working in the city, energy and transportation infrastructure, air quality, and biological resources.

Cal-Adapt provides projections for annual mean hectares burned within city limits. This projection only accounts for areas within the city that could experience wildfire events. As shown in Figure 9, "Fire Hazard Severity Zones, in the Natural Hazards Existing Conditions Report, approximately 4,700 hectares in the city are located within a Very High Fire Hazard Severity Zone. Historically, the annual average area burned within city limits was 82.8 hectares. In addition to the medium and high emissions projections included in Cal-Adapt, modeling for wildfires includes three scenarios for population growth. These population growth scenarios account for a range of development in the wildland-urban interface. Table 3 shows the projected change in annual average area burned within the city under medium and high emissions scenarios for the three population projections.

Table 3. Changes in Annual Average Area Burned within City of Rancho Cucamonga Limits

Population Growth Scenario	Annual Mean Hectares Burned (ha.)		
	Historical Average (1950-2005)	Medium Emissions Scenario (2050-2099)	High Emissions Scenario (2050-2099)
Low	82.8	100.3	95.6
Central	82.8	100.0	99.1
High	82.8	108.4	97.4

Notes: ha = hectares
Source: CEC 2020

Wildfire occurrence is anticipated to increase under all emissions and population scenarios from historic averages. Similarly, the total area burned within the city is expected to increase. At a regional level, the San Bernardino and San Gabriel Mountains are the areas for which wildfire occurrence is anticipated to experience the greatest increase in wildfires and total area burned (WRCOG 2019). The annual area burned within the city could increase between 13 and 26 hectares by the end of the century.

Severe Wind Events

Santa Ana wind events blow in an offshore direction in parts of Southern California and are caused by the formation of large high-pressure systems over eastern California, Nevada, and Utah, producing winds that are strong and extremely dry. Santa Ana winds can act as a catalyst to wildfires, and occur at very high strength in the city due to the various canyons and mountain passes nearby that accelerate winds as they pass over the San Gabriel Mountains. Although there is uncertainty in the future changes to severe winds known as Santa Ana events, the number of severe wind days per year may decrease by one to three days per year, but the intensity of these severe wind events may increase. These projections include both Santa Ana events and severe winds that occur at other times (WRCOG 2019).

Sensitivity and Potential Impacts

The primary impacts from climate change include precipitation pattern volatility and increased average temperatures. These primary changes will result in secondary impacts that would potentially impact the built and natural environments, and human health and safety. Climate change does not have the same effects in all parts of a community. Some people and physical assets will be affected much more severely than others. Adaptation policies are designed to respond to specific climate vulnerabilities in the city and build resiliency for the most susceptible people and assets in the community.

Key populations and assets in the city are identified as those having the greatest vulnerability to climate change impacts. These potential impacts include: increased exposure to wildfires, flooding, landslides, and severe storms; limited ability to respond to extreme heat events; and increased risk of damage from severe wind events. Key populations and assets identified in the city are organized in the following categories: populations, transportation, energy, water, biodiversity and habitat, and emergency services.

A summary of the potential vulnerabilities for key assets to each climate change impact is provided in Table 4, starting on Page 29. Within this table, the impacts of various climate change effects are identified for vulnerable populations and physical assets in the city. This table also summarizes the relationship between the impacts of primary human health hazards of climate change (i.e. those hazards that are not a secondary effect of a natural or climate change impact) and the city's vulnerable populations and physical assets. These primary health hazards, described previously in "Climate Change Effects," include exposure to poor air quality and related health conditions (e.g. asthma, heart disease), exposure to infectious diseases, and impacts to mental health.

Populations

Various populations are more susceptible to climate-related hazards due to limited access to financial resources, health challenges or disabilities, living or working conditions, or historical and current marginalization. These factors, among others, can lead to a greater potential for harm and many people fall into more than one category. Vulnerable populations in the city include low-income persons, persons in designated disadvantaged communities, persons in overcrowded households, persons with disabilities, senior citizens, persons experiencing homelessness, and linguistically isolated persons. Though certain vulnerable populations represent only a small percentage of the city's total population, it is important to plan for all groups that, for one reason or another, lack available resources or capacity to react or adapt to climate change impact themselves.

The city's population is culturally and economically diverse; approximately 8.1 percent of the city's population lived below the federal poverty level in 2018 (U.S. Census Bureau 2018a). Across the U.S., Hispanic and minority populations are disproportionately vulnerable to and impacted by climate change. This vulnerability seems to be tied to variables such as location, employment type, income level, and access to resources (Lynn et al. 2011). A large percentage of the city's population is of a typically vulnerable population including Hispanic (37.4 percent), black (8.8 percent), and American Indian or Alaska native (0.4 percent) (SCAG 2019). Communities of color can face additional climate change vulnerability due to limited English proficiency, including lack of access to climate change adaptation opportunities and involvement in the adaptation process. Approximately 32.9 percent of the city's population speaks a language other than English at home, of which, nearly a third speak English less than "very well" (U.S Census Bureau 2018b).

San Bernardino County conducts "point-in-time" counts of sheltered and unsheltered persons and families each year. These counts represent a best estimate of the number of individuals experiencing homelessness in communities within the county. According to the 2019 Point-In-Time Homeless Count, the city currently has at least 48 unsheltered persons (San Bernardino County 2019). Individuals experiencing homelessness are increasingly vulnerable to climate change impacts such as increase heat waves and extreme heat days, flooding, and impacts to human health. This vulnerability stems from lack of shelter, resources to respond to events, and sanitation. In addition to impacts from existing climate change risks, emergency events such as wildfires and flooding can disproportionately effect low-income residents and communities, resulting in increased occurrences of homelessness. These extreme weather events can result in the loss of housing stock and reduced regional housing affordability (Center for American Progress 2019).

Recent droughts in the state have demonstrated the potential impacts of water shortages on disadvantaged communities. A significant amount of the water imported to the city comes from areas in Northern California, where the effects of drought and decreased snowpack can have a significant effect on their water supply. Water shortages can particularly stress low-income households, which end up spending a greater percentage of their earnings on basic water services during shortages (WRCOG 219).

Table 4. Hazard Vulnerability for Key City Populations and Assets

Asset	Climate Change Hazard Vulnerability							
	Human Health Hazards	Droughts and Available Water Supply	Extreme Heat and Heat Waves	Flooding	Storms and Extreme Weather	Landslides	Wildfires	Severe Wind
Populations								
Low-Income	Increased exposure to poor air quality and infectious disease compared to non-low-income population. Exacerbated economic insecurity resulting in mental health concerns.	Water outages during droughts are more likely to impact low-income households.	Increased exposure to heat at homes from limited ability to afford air conditioning systems or increased costs related to system use. Increased exposure to UHIE.	Populations are more likely to be located in a flood-prone area. Increased exposure to flooding events and risk of property damage.	Limited access to warning messages and precautionary measures implemented by the City.	Limited access to warning messages and limited ability to evacuate. Higher recovery costs than other hazards like flooding.	Limited access to warning messages and limited ability to evacuate.	Increased risk of property damage and exposure to other hazards including wildfires.
Communities of Color	Increased exposure to poor air quality and infectious disease compared to non-communities of color.	Water outages during droughts are more likely to impact communities of color.	Increased likelihood of limited access to air conditioning and cooling facilities. Increased exposure to UHIE.	Populations are more likely to be located in a flood-prone area. Increased exposure to flooding events and risk of property damage.	Limited access to warning messages and precautionary measures implemented by the City.	Limited access to warning messages and limited ability to evacuate. Higher recovery costs than other hazards like flooding.	Limited access to warning messages and limited ability to evacuate.	Increased risk of property damage and exposure to other hazards including wildfires.
Linguistically Isolated	Increased exposure to poor air quality or infectious disease compared to non-linguistically isolated population.	Limited ability to interpret and react to drought and available water supply messaging.	Issues accessing cooling resources.	Potential inability to receive and interpret warning messages.	Limited access and ability to interpret to warning messages and precautionary measures implemented by the City.	Potential inability to receive and interpret warning messages and evacuation notices.	Potential inability to receive and interpret warning messages and evacuation notices.	Increased risk of property damage and exposure to other hazards including wildfires.
Senior Citizens	Increased exposure to poor air quality and infectious disease compared to non-senior citizen population.	Increased hazards to human health from limited access to potable water.	Increased vulnerability to heat-related health risks. Increased exposure to UHIE.	Limited mobility and ability to react to flooding events.	Limited ability to prepare for extreme weather events and reliance on existing supplies and infrastructure.	Limited ability to evacuate due to mobility impairment, ability to drive, or limited situational understanding from cognitive conditions.	Limited ability to evacuate due to mobility impairment, ability to drive, or limited situational understanding from cognitive conditions.	Increased risk of property damage and exposure to other hazards including wildfires.
Persons with Disabilities	Increased exposure to poor air quality and infectious disease	Increased hazards to human health from limited	Limited ability to access cooling	Limited mobility and potential health issues	Limited ability to prepare for extreme weather	Limited ability to evacuate due to mobility	Limited ability to evacuate due to mobility	Increased risk of property damage and

Asset	Climate Change Hazard Vulnerability							
	Human Health Hazards	Droughts and Available Water Supply	Extreme Heat and Heat Waves	Flooding	Storms and Extreme Weather	Landslides	Wildfires	Severe Wind
	compared to non-disabled population.	access to potable water.	centers. Increased exposure to UHIE.	from reliance on medication or devices.	events and reliance on existing supplies and infrastructure.	impairment or reliance on medication or devices.	impairment or reliance on medication or devices.	exposure to other hazards including wildfires.
Homeless	Increased exposure to poor air quality and infectious disease compared to non-homeless population. Exacerbated economic insecurity resulting in mental health concerns.	Increased hazards to human health from limited access to potable water.	Increased exposure to outdoor heat without access to air conditioning or protection. Increased exposure to UHIE.	Limited ability to receive warnings.	Limited ability to receive warnings and access to shelter.	Limited ability to receive warnings and ability to evacuate.	Limited ability to receive warnings and ability to evacuate.	Increased exposure to extreme weather conditions and other hazards including wildfires.
Transportation								
Roadways	N/A	N/A	Increased likelihood of roadway damage from heat expansion.	Increased likelihood of roadway damage from pavement saturation or washout of supporting soils.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage, and increased risk for vehicles traveling on bridges or high-wind exposed roadways.
Emergency Access/ Evacuation Routes	N/A	N/A	Damage to roadways, if substantial, can potentially reduce emergency response time but unlikely to significantly reduce access .	Potential closure of evacuation routes due to damage or water coverage. Potential removal of vehicle access to low-lying areas.	Flooding as a result of severe storms can reduce ability for emergency access to residents.	Potential closure of evacuation routes due to damage or landslide coverage.	High risk for areas on single-access roads. Potential damage or closure to evacuation routes.	Potential downing of power lines resulting in blocking of evacuation or access routes.
Transit Facilities and Service	Decreased transit ridership as a result of infectious disease.	N/A	Increased heat exposure for riders at stations without adequate cover. Increased stress on transit vehicles.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage.	Fixed routes limit effectiveness in evacuation and may experience physical damage.	N/A
Railroads	N/A	N/A	Increased likelihood of buckling.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage.	Fixed routes and exposure to physical impacts.	N/A
Bicycle Paths and Trails	N/A	N/A	Increased likelihood of	Risk of physical damage.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage	N/A

Asset	Climate Change Hazard Vulnerability							
	Human Health Hazards	Droughts and Available Water Supply	Extreme Heat and Heat Waves	Flooding	Storms and Extreme Weather	Landslides	Wildfires	Severe Wind
			damage from heat expansion.					
Energy Resources								
Electricity Transmission Lines and Natural Gas Pipelines	N/A	Increased stress on system and potential failure.	Increased stress on system and potential failure.	Risk of potential damage.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage.	Risk of physical damage.
Electricity Generation	N/A	Increased stress on systems.	Increased electricity demand for building cooling.	Reduced effectiveness of hydro-electric generation facilities.	Risk of physical damage and increased stress on generation facilities from turbulent weather.	Risk of physical damage.	Increased smoke cover reduces effectiveness of solar facilities. Risk of physical damage.	Risk of physical damage.
Water Resources								
Flood Control	N/A	N/A	Potential damage to channels and other engineered flood control facilities.	Increased demand for flood control facilities and increased risk of damage from overflow or ground saturation surrounding facilities.	Increased demand for flood control and storm surge facilities and increased risk of physical damage.	Risk of physical damage.	Risk of physical damage for flood control facilities.	N/A
Water Conveyance	N/A	Reduced efficiency of water conveyance from limited supply and increased energy costs.	Increased stress on conveyance system.	Potential physical damage to conveyance facilities.	Increased stress on conveyance and risk of physical damage.	Risk of physical damage.	Risk of physical damage to water conveyance facilities.	Increased stress on conveyance facilities.
Available Water Supply	N/A	Significant reduction in water available during droughts from reduced reserve supplies and changing water runoff patterns. Increased economic instability for low-	Increased demand for potable water.	Increased risk of water contamination and reduction in available potable water.	Increased risk of water contamination and reduction in available potable water.	Risk of physical damage.	Increased demand for water for refugees, exposed individuals, and for fire suppression.	N/A

Asset	Climate Change Hazard Vulnerability							
	Human Health Hazards	Droughts and Available Water Supply	Extreme Heat and Heat Waves	Flooding	Storms and Extreme Weather	Landslides	Wildfires	Severe Wind
		income populations.						
Biodiversity and Habitat								
Hillside Habitat	N/A	Damage to habitats from lack of rainfall and diversion of water to potable supplies.	Increased risk of erosion from limited soil moisture and risk to vegetation health.	Increased saturation significantly increases the risk of subsidence.	Risk of physical damage to habitats from excess precipitation and runoff.	Increased likelihood of subsidence as a result of wildfires, extreme storms, and flooding.	Risk of physical damage to habitats. Increased wildfire frequency results in limited recovery time for habitat.	Risk of potential damage to habitats.
Flood Control Habitat	N/A	Damage to habitats from lack of rainfall and diversion of water to potable supplies.	Risk to vegetation and wetland species health.	Increased stress on flood control habitat. Oversaturation of habitat can result in washout and remove of important vegetation and soils.	Increased stress on flood control habitats.	Destruction of wetland habitat can reduce flood control abilities.	Destruction of wetland habitat can reduce flood control abilities.	Risk of potential damage to habitats.
Recreation	Reduced access to recreation areas and activities as a result of poor air quality or risk of infectious disease spread.	Increased risk of erosion from continued use of recreation areas during drought conditions.	Increased risk of erosion from limited moisture in soil at outdoor recreation areas.	Risk of physical damage to outdoor recreation areas.	Risk of physical damage to outdoor recreation areas.	Risk of physical damage.	Risk of physical damage to outdoor recreation areas.	Risk of physical damage to outdoor recreation areas.
Emergency Services								
Emergency Response Personnel	Increased exposure to infectious disease.	Increased demand for emergency services and reduce available water supply for fire suppression.	Increased exposure to heat-related health impacts for emergency responders and increased likelihood of response needs to vulnerable populations.	Increased exposure to flood conditions from emergency response	Potential increases in emergency response times; may inhibit efforts to respond to emergencies, provide treatment during emergencies, or perform search and rescue operations.	Increased exposure to hazard areas during emergency response.	Increased exposure of emergency response personnel to extreme health risk including smoke inhalation and dangerous fire conditions.	Increased volatility of storms resulting in addition risk for emergency response.
Emergency Facilities	Increased stress on health care facilities in responding to health	Increased demand on facilities for emergency	Increased demand for cooling centers.	Increased stress on evacuation centers and risk	Risk of physical damage.	Risk of physical damage to facilities and	Risk of physical damage to facilities.	Risk of physical damage.

Asset	Climate Change Hazard Vulnerability							
	Human Health Hazards	Droughts and Available Water Supply	Extreme Heat and Heat Waves	Flooding	Storms and Extreme Weather	Landslides	Wildfires	Severe Wind
	impacts from exposure to poor air quality and infectious diseases.	response and preparedness planning.		of physical damage to emergency facilities.		increased demand on evacuation shelters.	Increased demand for evacuation shelters.	
Tele-communications	Increased demand on telecomm. systems during infectious disease outbreaks.	Increased stress on telecomm. systems.	Increased stress on telecomm. systems.	Risk of physical damage.	Risk of physical damage disruption to communication abilities in the city and region.	Risk of physical damage.	Risk of physical damage to telecomm. systems.	Risk of physical damage.

Notes: City = City of Rancho Cucamonga; N/A = not applicable; UHIE = urban heat island effect
Source: Ascent Environmental 2020

Other vulnerable communities, such as persons with disabilities, access and functional needs, and senior citizens, are disproportionately affected during hazardous events. During events such as wildfires, flooding, or extreme storms, these populations may require additional assistance to adequately respond. This response includes potential inability to access emergency supplies, evacuate, or properly receive emergency information. Further, effects of climate change hazards can result in infrastructure disruptions including power outages. Such events could result in additional health hazards for these populations reliant on power to sustain medical equipment/assistive technology use.

Transportation

Transportation assets include those managed by the City including major arterials, bridges, emergency access, and bike paths and trails, and transportation facilities managed by other agencies. Major arterials in the city are identified in the Transportation background report and include major roadways that provide connections from and between adjacent cities and elsewhere in the region. Major east-west arterials in the city include SR-210, Foothill Boulevard, and Base Line Road, which provide connections to Interstate 15, and the cities of Upland to the west and Fontana to the east. Major north-south arterials include Day Creek Boulevard, Milliken Avenue, Haven Avenue, and Archibald Avenue, which provide connections to Interstate 10, the Ontario International Airport, and City of Ontario to the south. The City maintains a comprehensive network of bicycle facilities and trails that provide non-automotive access through the city and to recreational activities areas in the city and the San Gabriel Mountains to the north. The effect of climate change impacts on roadway, trail, and bicycle facilities such as increased average temperatures and extreme heat can result in degradation of pavement. These effects can increase roadway hazards including potholes and roadway cracks. Further, additional climate related hazards such as flooding can wash out soil supporting roadways. Climate related impacts to roadway facilities can disrupt vehicular access and commerce between cities and industries and increase risk to human safety by damaging or blocking evacuation routes and limiting access for emergency responders.

The city is served by bus and rail transit facilities that provide access between the city, surrounding communities, and other population/employment hubs throughout the surrounding Southern California region. Major bus routes in the city provide connections to Metrolink stations, the Ontario International Airport, and various transit centers. Metrolink, operated by the Southern California Regional Rail Authority, is a regional rail system that provides rail transit service throughout the counties of Los Angeles, Orange, Riverside, and San Bernardino. The city currently has one Metrolink Station located on Milliken Avenue. Transit access, safety, and cost can be impaired by climate change impacts such as extreme heat. Transit stops without adequate sheltering (i.e., bus shelters or street trees) can lead to dangerous exposure to extreme heat or poor air quality. Additionally, bus and rail transit vehicles can undergo increased stress to maintain proper air conditioning and engine cooling during extreme heat events and risk failure (Cambridge Systems 2015).

The city is located strategically to provide for goods movement between the Los Angeles metro area, the central valley, and elsewhere in the state and country. Additionally, industrial areas in the city rely on proximity to major freeways, business and transportation hubs (e.g. Ontario International Airport), and railway lines. Within the city, railway lines are shared by both industrial freight (i.e. BNSF Railway) and transit services (i.e. Metrolink). During periods of extreme heat, rail lines can expand and result in “buckling” where tracks come out of alignment resulting in serious safety issues (Transportation Research Board 2008).

Energy Resources

Gas and electrical transmission lines, and electrical plants and facilities within the city are owned and maintained by a variety of agencies. Southern California Edison provides electricity to a majority of the residents and businesses in the city. In addition, the Rancho Cucamonga Municipal Utility (RCMU), owned and operated by the City, provides electricity to metered businesses and residents in the southeastern portion of the city (City 2020a). The provision of electricity to consumers in the city includes a mix of power sources from elsewhere in the region/state, and on-site generation of electricity at public and private facilities within the city. The City supports the maintenance and development of electricity generation and transmission facilities, and maintenance and operation of facilities on City-owned sites (i.e., on-site solar panels).

Impacts to electricity resources from climate hazards can include stress on the system and physical damage to the electricity generation, transmission, and distribution system. Transmission facilities face increasing climate related risks as a result of increased frequency of wildfires, extreme wind, and extreme heat events. Heat and drought events can add stress to transmission systems, resulting in system failure. Wildfires, flooding, landslides, and extreme wind can cause physical damage to or destruction of transmission facilities. These hazards can also affect underground pipelines providing natural gas to buildings in the city, including landslides, wildfires, and flooding exposing and/or damaging these pipelines. The damage resulting from climate change-related hazards on electricity and natural gas infrastructure can have a greater impact on disadvantaged populations, particularly communities that are low-income or individuals who have low mobility or lack the financial means to make repairs to their property.

Water Resources

Climate change is projected to affect the city's and the region's water resources by altering the amount, timing, and type of precipitation. Projections indicate that the city may experience an annual increase in precipitation throughout the century, however, these increases would likely occur in the form of larger, more intense precipitation events. These events can cause flooding which can limit access to water facilities and cause damage to facilities. As discussed previously, snowmelt in the Sierra Nevada Mountains is also projected to occur earlier in the year, causing springtime recharge to occur before the typically warmer and drier summer months. Reduced snowpack also reduces water captured for storage in surface water bodies and aquafers for potable drinking water, resulting in the city having less water available during spring and summer, which are also projected to become drier and warmer as a result of climate change (CEC 2020).

Shifts in rainfall and snowmelt timing can limit water supplies and hinder CVWD's and region's ability to provide potable drinking water. As temperatures in the city also increase, the demand for potable water will increase, particularly for more vulnerable populations more susceptible to heat related health impacts. While the CVWD may be able to rely on groundwater to provide additional supply, drawing from these sources can substantially drop water tables, potentially resulting in land subsidence. CVWD is currently implementing various strategies aimed at diversifying the water supply and reducing regional water consumption, including implementation of recycled water recharge programs and water conservation efforts. Drought conditions would further exacerbate potable water supply in the city.

Biodiversity and Habitat

Natural resources represent a critical source of food, cultural significance, and recreation in the city. Key natural resources in the city and its sphere of influence include natural hillside habitats, resource conservation areas, and flood control habitats. Drought can create stress for water-reliant biological resources such as marshes and precipitation-sensitive habitats like conifer forests, pinyon-juniper woodlands and grasslands. Increases in wildfire frequency creates additional risk for biological resources such as slope stabilizing vegetation and can destroy habitats not adequately adapted to recovering quickly from being burned. Similar threats to wetland and flood control habitats can increase the risk to buildings and persons by reducing each habitats ability to manage excess volumes of water runoff (San Bernardino County 2019).

Emergency Services

The region has already begun experiencing an increase in the frequency and intensity of emergencies exacerbated by climate change. The challenges brought on by climate change result in hardship for families, businesses, and local governments and demand an evolving response by government agencies tasked with protecting life and property. Climate change will continue to compound the impact of future emergencies in scope and severity, The City plays a planning, coordination, operational, training, and public education role in responding to emergencies.

As risks due to climate change impacts continue to increase, the demand for City emergency services will also increase during emergency and non-emergency situations. For example, as wildfire events become increasingly prevalent and more intense, more emergency services personnel from the Rancho Cucamonga Fire Protection District (RCFPD) will be required to work to combat the spread of wildfires while also working to protect human health and property in the city. During heat waves, resources such as ambulances and paramedics will likely be required to respond to increasing human health related concerns such as heat strokes, dehydration, and heat exhaustion.

Increased impacts from climate change will result in increased demand for emergency personnel, infrastructure, equipment, and management. More frequent hazard events will increase the risk to health and safety of emergency response personnel such as increased exposure to wildfire smoke, floodwater, or infectious diseases. All City departments will be responsible for an aspect of emergency response requiring the City to address long-term goals related to climate change, adaptation, and resilience and City departments to prepare for and react to climate-related emergencies.

The City maintains and approves telecommunication systems, providing residents and businesses with telecommunication services and access. These systems also play an important role in emergency response, supporting communication between emergency services, response agencies, and city residents and businesses. Though these services are typically provided by private enterprises, the City maintains an important role in managing telecommunication facilities and access during emergency situations.

Adaptive Capacity

Existing City functions and local and regional planning efforts have previously been established to address potential climate change impacts. These efforts, however, do not comprehensively identify actions that will be taken by local and regional governments and the community to adapt to all potential climate change impacts. A summary of the city's existing adaptive capacity is provided in this section and based on the existing planning efforts prepared regionally by San Bernardino County, CVWD, and WRCOG, and prepared locally by the City.

San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan

San Bernardino County most recently updated its Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) in 2017. The MJHMP is periodically reviewed, updated, and monitored to reflect changing climate conditions and to comply with federal regulations. The MJHMP presents information regarding hazards faced by the county, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and other board-governed Special Districts administered by the San Bernardino County Special Districts Department. The 2017 MJHMP update includes an assessment of risk and vulnerability associated with earthquakes, wildfires, flooding, drought, terrorism, and climate change. It also includes existing regionwide programs that address these hazards and proposes mitigation strategies to reduce risk associated with them (San Bernardino County 2017).

Cucamonga Valley Water District Hazard Mitigation Plan

CVWD continually updates its Hazard Mitigation Plan (HMP), consistent with Federal Emergency Management Agency (FEMA) requirements. This HMP provides guidance for mitigating hazards including earthquakes, wildfire, flooding, drought, climate change, and terrorism. The HMP assesses vulnerabilities and identifies actions to prevent or lessen the loss caused by disasters (CVWD 2019).

Resilient IE

WRCOG and SBCOG/SBCTA developed the Resilient Inland Empire (Resilient IE) program to support regional and local efforts to prepare for and mitigate risks associated with climate adaptation and transportation infrastructure. Resilient IE included the development of city-level, climate-related transportation hazards and evacuation maps, a regional climate adaptation and resiliency template and general plan element, and the establishment of the Inland Southern California Climate Collaborative (ISC3). Additionally, Resilient IE included the development of vulnerability assessments and adaptation strategies for the subregions of western Riverside County and San Bernardino County. The San Bernardino County vulnerability assessment and adaptation strategies include an overview of climate change-related threats to the city and adaptation strategies that the City should consider implementing, consistent with regional activities (WRCOG 2019).

City General Plan

The City's General Plan was most recently updated in 2010, which provides the long-term vision and policy direction guidance for residents, City staff, decision-makers, and the broader community. The General Plan serves as the foundation for most City regulatory documents and addresses land use, community mobility, economic development, community services, resource conservation, public facilities and infrastructure, public health and safety, and housing. The City's current General Plan incorporates climate change-related impacts in its Public Health and Safety Element by addressing existing hazards and identifying policies the City will implement to reduce the risk to human life and property associated with these hazards (City 2010).

The City is currently in the process of updating its General Plan document. This update will include additional visioning and planning for future technologies available for planning and adaptation purposes, and additional policies to increase the city's resiliency in the face of natural disasters.

Ready RC

The RCFPD Emergency Management Division plans for disasters specific to the community and assists residents and businesses in preparing for and reacting to disasters. The RCFPD Emergency Management Division operates the "ReadyRC" program which provides preparedness and training programs designed to provide residents and businesses the necessary tools to effectively mitigate, prepare, respond, and recover from all natural and man-made community disasters such as fire, flood, windstorms, and earthquakes. Through the ReadyRC program, the RCFPD hosts the ReadyRC Academy which includes preparedness courses available to the public on preparing your home for potential hazards, basic first aid and medical preparedness, understanding various hazards, and how to help yourself and others in emergency events. Additionally, the ReadyRC program supports emergency response and preparedness groups including the Community Emergency Response Team (CERT), Business Emergency Resiliency Training (BERT), Large Animal Response Team (LART), and Auxiliary Communications Service (ACS) (City 2020b).

Rancho Cucamonga Municipal Utility Wildfire Mitigation Plan

RCMU provides electricity to businesses and residents in the southeastern portion of the city. RCMU owns and maintains streetlights, fiber optic, and electricity infrastructure (below ground power transmission lines), that run throughout the city. RCMU also maintains an annual wildfire mitigation plan (WMP) that provides strategies to prevent, combat, and respond to wildfires within its service territory. The primary goal of the RCMU WMP is to identify existing programs, practices, and measures that effectively reduce the probability that RCMU's electric supply system could be the origin or contributing source for the ignition of wildfire. Though none of RCMU's maintained electricity transmission facilities are located in potential wildfire hazard areas (i.e., RCMU only owns and maintains transmission lines within an urbanized area), RCMU is committed and dedicated to ensuring safe and reliable electric service to its customers and community.

A summary of the existing plans and activities developed by the City and through partnerships with other agencies, and the climate hazards they address is shown in Table 5. These plans address strategies that have been identified in the city, its sphere of influence, and county to address climate change impacts and build resilience amongst participating agencies.

Local Hazard Mitigation Plan

The City prepared the *City of Rancho Cucamonga Local Hazard Mitigation Plan* (LHMP) in January 2013. The LHMP assess the significant natural and manmade hazards that may affect the city and its inhabitants, evaluates ongoing mitigation activities, and outlines a strategy to mitigate hazards and implement mitigation projects. The LHMP was developed to meet the requirements of FEMA and must be reviewed, updated, and approved by FEMA every five years to remain an eligible plan. The LHMP prepared by the City in 2013 has not since been updated. This LHMP is not currently considered an eligible plan because it has not been updated within a five-year period as required by FEMA. However, the information provided in it can be used to inform future hazard mitigation planning efforts. The City is in the process of updating the LHMP along with the General Plan Update.

Table 5. Adaptive Capacity in Existing Plans and Reports

Plan, Activity, or Policy	Climate Change Hazard							
	Human Health Hazards	Droughts and Available water supply	Extreme Heat and Heat Waves	Flooding	Storms and Extreme Weather	Landslides	Wildfires	Severe Wind
San Bernardino County MJHMP		X		X			X	
CVWD HMP		X		X				
Resilient IE	X	X	X	X	X	X	X	X
City General Plan (2010)	X	X		X			X	
ReadyRC	X		X	X	X		X	X
RCMU WMP							X	
LHMP				X	X	X	X	X

Notes: City = City of Rancho Cucamonga; CVWD = Cucamonga Valley Water District; IE = Inland Empire; HMP = hazard mitigation plan; MJHMP = multi-jurisdictional hazard mitigation plan; RCMU = Rancho Cucamonga Municipal Utility; WMP = wildfire mitigation plan

The City's current planning and emergency response documents present an opportunity to integrate climate hazard vulnerability information and resilience planning into existing frameworks. The city already experiences climate hazards to a certain degree. As a result, infrastructure, social systems, and residents have already begun adapting to current levels of these hazards. However, climate change will increase the frequency and severity of climate hazards in the future, requiring updates to emergency response process and land use planning.

As shown in Table 5, multiple planning agencies and planning efforts have been made to address a number of climate related-hazards that are expected to impact the city. Mitigation and adaptation measures for hazards including droughts and available water supply, flooding, and wildfires have been relatively well documented in assessments prepared previously. These existing assessments should be used by the City to identify local hazard mitigation and adaptation strategies, consistent with other regional agencies and nearby cities. Other climate change hazards including impacts to human health, extreme heat and heat waves, storms and extreme weather, and landslides are noted in various regional planning efforts, but do have established regional trends in developing adaptation strategies. As the City develops adaptation policies and prepares a Local Hazard Mitigation Plan (LHMP) alongside the General Plan Update, it should consider locally specific adaptation policies that could be implemented to address these hazards, and also be used as guiding policies for other regional agencies.

Generally, the adaptation policies and measures developed as part of the various regional adaptation plans provide overarching actions the region should take to address climate change impacts. However, these policies and measures often lack specificity for addressing climate change impacts to the most vulnerable communities. While these broad-based strategies for reducing risks for the city at-large are important and necessary, the City should ensure the development of policies and measures that specifically address the adaptive capability of the most vulnerable populations.

Vulnerability Scoring

The city's vulnerability to each identified climate change impact is assessed based on the risk posed by the hazard on populations and assets, and the existing plans in place to mitigate for and adapt to these hazards. These potential impacts and adaptative capability are rated on a qualitative scale from Low to High. A description each qualitative rating for both factors is provided in Table 6.

Table 6. Potential Impact and Adaptive Capacity Scoring

Score	Potential Impact	Adaptive Capacity

Low	Impact is unlikely based on projected exposure; would result in minor consequences to public health, safety, and/or other metrics of concern.	The population or asset lacks capability to manage climate impact; major changes would be required.
Medium	Impact is somewhat likely based on projected exposure; would result in some consequences to public health, safety, and/or other metrics of concern.	The population or asset has some capacity to manage climate impact; some changes would be required.
High	Impact is highly likely based on projected exposure; would result in substantial consequences to public health, safety, and/or other metrics of concern.	The population or asset has high capacity to manage climate impact; minimal to no changes are required.

Source: CalOES 2020

After scoring for a potential impact and adaptive capacity, a vulnerability score is assigned to each climate change impact. This vulnerability score is based on the combination of the potential impact and adaptive capacity and can be used by the City to prioritize climate change hazards to address in future planning efforts. A summary of the vulnerability scoring is provided in Table 7.

Table 7. Vulnerability Scoring

		Vulnerability Score		
Potential Impacts	High	3	4	5
	Medium	2	3	4
	Low	1	2	3
		High	Medium	Low
		Adaptive Capacity		

Source: CEC 2020.

A summary of the vulnerability scoring for each climate change-related impact on the various populations and assets identified previously are included below. A summary of the vulnerability scores for all impacts is provided in Table 13, at the end of this section.

Impacts to Vulnerable Populations

Climate change will have a variety of impacts on vulnerable populations including exposure to hazards, health risks, infectious disease, and the provision of shelter. Key populations identified in the city include low-income and communities of color, and senior communities. However, other vulnerable populations including individuals experiencing homelessness would experience disproportionate climate change impacts than other populations, and these populations have the potential to grow due to existing economic conditions and increased frequency of climate changed-related hazards.

Major climate change-related impacts to populations in the city include hazards to human health including increased air pollutants hazardous to human health, exposure to infectious disease, and exposure to wildfires, flooding, and extreme heat. Based on projections of climate change impacts, the city is expected to experience higher average temperatures, and more frequent droughts, extreme heat events, and wildfires. While many existing planning efforts address citywide hazards from wildfires, only limited resources are currently dedicated to health impacts from poor air quality, reducing exposure for vulnerable populations to extreme heat events, and risk from landslides and flooding. San Bernardino County and the San Bernardino Flood Control District address potential impacts related to flooding and plans for future flood control and mitigation facilities through the long range flood control plans and continuously updated flood zone maps. Through partnerships with San Bernardino County, the City can address potential hazards from landslides through development review and information for landslide susceptibility provided by the San Bernardino County Land Use Services. Table 8 provides a summary of the vulnerability scores for the potential climate change impacts to vulnerable populations.

Table 8. Vulnerability Scoring of Impacts to Vulnerable Populations

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Reduced available water supply from extended drought periods.	High	High	3
Increased exposure to extreme heat and heat waves.	High	Medium	4
Increased damage to property from flooding.	Medium	High	2
Increased exposure to landslides.	Medium	Medium	3
Increased exposure to wildfires and related air quality risks.	High	Medium	4
Increased risk of exposure to infectious disease.	High	Medium	4

Impacts to Transportation

Transportation facilities play an important role in the city's economic prosperity and in reacting to climate change-related hazards. These facilities not only provide access throughout the region for the movement of workers and goods, they provide evacuation routes and emergency service access during hazard events. Damage to transportation facilities such as highways and railways can have a severely negative impact on the city's economy as a whole. Conversely, impacts to transit services may not have a severe impact on citywide economic prosperity, but could disproportionately affect low-income communities or individuals with disabilities from accessing necessary employment centers or services.

The primary impacts of climate change on transportation facilities is physical damage to roadways and railways from extreme heat events, flooding, landslides, and wildfires. Severe wind events may also have an impact on transportation facilities by reducing the safety of traveling on elevated bridges, however, evidence does not suggest climate change would result in an increase in the frequency of severe wind events. Climate change impacts including extreme heat days, heat waves, and heavy precipitation events can reduce the likelihood of individual use of transit services due to various factors including exposure to extreme heat or heavy precipitation and flooding while waiting at a transit station. Further, increases in the spread of infectious disease can significantly reduce transit ridership as individuals seek to reduce exposure to areas in which they are in close proximity to others.

The vulnerability scores for impacts to transportation facilities in the city are provided in Table 9. The primary vulnerability of concern for the city is increased risk of damage to roadways and railways. Hazards to railways include extreme heat events resulting in buckling of railroad tracks, and flooding, wildfire, and landslide events physically damaging railways, removing supporting soils, or blocking tracks. Many industries in the city rely on rail transportation to transport goods between the city, ports, and customers throughout the State.

As development within the city and its sphere of influence is proposed in the San Gabriel Mountains' hillsides, the City should ensure potential hazards related to wildfire and subsidence are adequately addressed in project and site plans. Specifically, the City should ensure transportation facilities such as emergency access routes are adequately planned for and developed. Through partnerships with San Bernardino County, California Department of Forestry and Fire Protection (CAL FIRE), and other agencies, information is available for the City to best plan transportation infrastructure including roadways and railways to prevent potential impacts from climate change-related hazards. The City has the adaptive capacity to regularly maintain transportation infrastructure and plan for the development of new facilities. However, potential climate change impacts including flooding and landslides are expected to occur more frequently, resulting in increased damage to infrastructure and costs to the City related to repairing and maintaining this infrastructure.

Table 9. Vulnerability Scoring of Impacts to Transportation

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased risk of damage to roadways from extreme heat and heat waves.	High	High	3
Increased risk of damage to roadways from flooding and landslides.	Medium	High	2
Increased impacts to evacuation routes during hazard events.	Medium	Medium	3
Increased risk of damage to transit facilities.	Low	Medium	2
Disruptions in transit services during extreme heat events and heat waves.	Low	Low	3
Increased risk of damage to railways.	High	Medium	4
Increased risk of damage to bicycle paths and trails.	Low	High	1
Increased stress on transit service and reduced ridership from increased extreme weather events and spread of infectious disease.	Medium	Medium	3

Impacts to Energy Resources

Energy systems include electricity transmission lines, natural gas lines, and energy generation facilities (e.g. solar photovoltaic systems) that serve the city. While some of these facilities are located within the city, most of the electricity and natural gas infrastructure that provide energy resources to the city are located outside of city limits. Climate change impacts to these resources include increase demand on transmission systems and energy production, and risks of physical damage to infrastructure. A majority of the infrastructure providing electricity to the city is owned and maintained by Southern California Edison. While out of the City’s jurisdiction to maintain, the City should prepare adaptation measures and policies to address potential damage to these systems resulting in reduced power supply to City facilities, residents, and businesses. The primary vulnerability to the city for energy resources is the increased risk of damage to above ground electric transmission lines. As the frequency and intensity of wildfires, flooding, and landslides results in increased risk to physical damage to transmission infrastructure, the City can better adapt to these impacts by developing additional power generation supplies within the city; reducing reliance on power generated elsewhere in the region. The City currently relies on relationships with energy utilities for the provision of a majority of its electricity and natural gas supply, and a majority of the infrastructure and facilities related to this energy supply are maintained by other agencies. The City does not currently have high adaptive capacity to address electricity and natural gas needs, but can continue working with other agencies to provide these utilities. The vulnerability scores for impacts to energy resources are shown in Table 10.

Table 10. Vulnerability Scoring of Impacts to Energy Resources

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased system stress during droughts and extreme heat events.	Medium	High	2
Increased risk of damage to transmission lines.	High	Medium	4
Increased demand for electricity generation.	Medium	Low	2
Reduced effectiveness of renewable electricity generation facilities.	Medium	Medium	3

Impacts to Water Resources

The City works collaboratively with the San Bernardino County Flood Control District to develop and maintain flood control infrastructure adjacent to and within the city. This infrastructure primarily consists of engineered channels that divert water runoff from the San Gabriel Mountains to debris basins in the northern portion of the city and runoff catchment basins along the various creek channels that run primarily north-south through the city. Additional water resources include conveyance systems that transport potable water to the city from throughout the state, and CVWD treatment and conveyance facilities.

The primary vulnerabilities in the city to water resources include availability of water supply and damage to flood control systems. Increased frequency of wildfires, mudslides, and flooding have the potential to damage existing flood control facilities in the San Gabriel Mountains' hillsides. These facilities are managed by the San Bernardo County Flood Control District and help divert hillside runoff away from communities within the city. Potential damage to these flood control facilities could result in damage to structures within the city and risks to human safety. As a result of climate change, the city is expected to experience an increase in flooding that could disproportionately affect vulnerable communities. During these events, vulnerable communities may require additional assistance due to limited access to emergency supplies and emergency information, or from limited mobility. As flooding events become more frequent these areas are more likely to experience loss of property and increased risk to health hazards. The availability of water supplies are largely out of the City's control. A majority of all potable water supplied to the city is provided from sources elsewhere in the state. As changes in availability in water supplies occur, the City will need to work with the CVWD and other water suppliers to provide potable water to residents, businesses, and facilities.

While the city's existing water supply is not under direct jurisdiction of the City, future adaptation measures should encourage the diversity of water supplies to reduce the impacts of climate change on any one type of supply. As reliability of water supplied from the State Water project and other snowpack/snowmelt reliant supplies, the City should work with the CVWD to source water from alternative supplies including desalination and groundwater. The City has existing adaptive capacity through ongoing partnerships with the CVWD, but relies on the supply of water provided by sources outside of the City's jurisdiction. The vulnerability scores for impacts to water resources are shown in Table 11.

Table 11. Vulnerability Scoring of Impacts to Water Resources

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased risk of damage to flood control facilities.	High	Medium	4
Increased stress on flood control systems.	Medium	High	3
Increased energy required for water conveyance.	Low	Medium	2
Reduction in available water supply.	High	Low	5

Impacts to Biodiversity and Habitat

Biological resources are an important aspect of the city's identity. The city's location at the base of the San Gabriel Mountains serves as an important visual and recreational resource for residents. Climate change could severely impact biological resources such as sensitive habitats and slope stabilizing vegetation in the San Gabriel Mountains from increased frequency of wildfires, severe weather events, and landslides. As wildland areas experience the impacts of climate change, wildlife in these areas may experience reduced availability of food, water, and shelter. This loss of habitat for wildlife can result in increased amounts of wildlife (e.g. coyotes, mountain lions) traveling into urbanized areas in search of these resources. Increased interaction between humans and this displaced wildlife can result in increased risks to human health from animal attacks and exposure to vector-borne diseases that can be transmitted to humans by wild birds and mammals (Gubler et al 2001).

Potential impacts to hillside habits represent the primary vulnerability to biodiversity and habitats in the city and its sphere of influence. The increase in wildfire intensity and frequency could severely damage the existing biological resources located in the city and adjacent open space areas, resulting in loss of sensitive habitat and slope supportive vegetation. Though wildfire allows for natural regrowth of hillsides, the increased frequency of wildfires may limit the ability of forests and grasslands to experience full regrowth. Without adequate time for regrowth, some vegetation may be completely removed from these landscapes. This lack of naturally occurring vegetation can result in rapid reproduction of invasive species and reduction in hillside stability. As the City addresses development in hillside areas, it should encourage best practices in defensible space and forest/hillside maintenance to reduce potential intensity and frequency of wildfires. Through planning and land development efforts under the City's control, the City can account for habitat preservation through planning and conservation efforts and can work with adjacent communities and agencies with jurisdiction in the San Gabriel Mountains' hillsides to ensure development and conservation of hillside habitats that reflect the goal of protection of human and structure safety within the city. The vulnerability scores for impacts to biodiversity and habitat are shown in Table 12.

Table 12. Vulnerability Scoring of Impacts to Biodiversity and Habitat

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability
Increased risk of damage to hillside habitats from extreme storm events, flooding, and landslides.	Medium	High	4
Increased risk of damage to hillside habitats from wildfires.	High	Low	5
Increased risk of damage to flood control habitats.	Medium	Medium	3
Increased stress on flood control habitats.	Medium	Medium	3
Potential loss of sensitive habitat and vegetation.	Low	Medium	2
Increased risk of damage to recreation areas and assets.	Low	High	1
Increased human-wildlife interaction in urbanized areas.	Low	Medium	2

Impacts to Emergency Services

Climate change is anticipated to cause more frequent and severe hazard events. During these events, emergency service personnel and services will be increasingly relied upon to mitigate impacts to human safety and property. The increased frequencies of wildfires will require significant investments in City emergency services to adequately respond to increased demand for evacuation facilities, telecommunication support for fire suppression and information transference, and supporting vulnerable communities in reacting to hazards. These hazards will also result in increased exposure of emergency response personnel to hazardous conditions.

The primary vulnerability in the city for emergency services is the exposure of emergency responders to increased frequency of hazards, the demand for emergency facilities to provide shelter and safety for residents impacted by hazardous events, and existing reliance on telecommunication services to provide emergency communication to residents and emergency responders. Emergency response is increasingly reliant on the capability of telecommunication systems for the transference of information. Emergency responders typically have priority in disaster situations to transfer information through these systems; however, as the frequency of hazards events increases, the City should encourage adaptation measures that provide additional support for City functions during disaster situations.

The City should pursue policies that aim to reduce the exposure of emergency response personnel to hazardous situations. These situations often include assisting in evacuation efforts during wildfire or flooding events, assisting in wildfire suppression activities, and performing search and rescue in the aftermath of hazard events. Adaptation strategies could include additional investment in residential preparedness, increasing defensible space in hillsides, and providing additional trainings and availability of the ReadyRC Program.

The City currently manages a majority of the emergency response within the city including the RCFPD, police department (San Bernardino County Sheriffs Department), and supporting services (e.g. CERT and the ACS). However, staffing needs for these agencies are restricted to available City budget. As frequency of climate change-related hazards occur, increased damage to city infrastructure and increased costs related to infrastructure and service maintenance will increase. This increased cost to maintain existing infrastructure would potentially reduce the availability of funding to cover costs of increased staffing needs of emergency response services. The vulnerability scores for impacts to emergency services are shown in Table 13.

Table 13. Vulnerability Scoring of Impacts to Emergency Services

Vulnerability Description	Vulnerability Score		
	Potential Impact	Adaptive Capacity	Vulnerability

Increased exposure of emergency responders to hazards.	High	Medium	4
Increased staffing requirements for emergency responders.	Medium	High	2
Increased demand on emergency relief facilities and shelters.	High	Medium	4
Increased risk of damage to telecommunication systems.	High	Medium	4
Increased stress on telecommunication systems during hazard events.	High	Low	5

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List of Acronyms and Abbreviations

AB	Assembly Bill
ACS	Auxiliary Communications Services
APG	California Adaptation Planning Guide
BAU	business-as-usual
BERT	Business Emergency Resiliency Training
CAA	federal Clean Air Act
CAFÉ	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
CalOES	California Office of Emergency Services
CalRecycle	California Department of Resources Recycling and Recovery
CAP	climate action plan
CARB	California Air Resources Board
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFC	chlorofluorocarbons
CH_4	methane
City	City of Rancho Cucamonga
Climate Assessment	California’s Fourth Climate Assessment, prepared by CEC
CNRA	California Natural Resources Agency
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Connect SoCal	Connect SoCal – The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, prepared by SCAG
CVWD	Cucamonga Valley Water District
DWR	Department of Water Resources
EIR	Environmental Impact Report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GWP	global warming potential
ha.	Hectares
HFC	hydrofluorocarbons
HMP	hazard mitigation plan
ICARP	Integrated Climate Adaptation and Resiliency Program, prepared by OPR

in.	inches
IPCC	Intergovernmental Panel on Climate Change
ISC3	Inland Southern California Climate Collaborative
LART	Large Animal Response Team
LHMP	local hazard mitigation plan
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan, prepared by San Bernardino County
$MMCO_2e$	million metric tons of carbon dioxide equivalent
mpg	miles per gallon
MPO	metropolitan planning organization
$MTCO_2e$	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
NHTSA	National Highway Traffic Safety Administration
NOAA	National Oceanic and Atmospheric Administration
O_3	ozone
OPR	Governor’s Office of Planning and Research
PFC	perfluorocarbons
RCFPD	Rancho Cucamonga Fire Protection District
RCMU	Rancho Cucamonga Municipal Utility
RCP	Representative Concentration Pathway
Resilient IE	Resilient Inland Empire program, prepared by WRCOG
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SAFE Rule	Safer Affordable Fuel-Efficient Vehicles Rule
SANBAG	San Bernardino County Association of Governments (now SBCOG/SBCTA)
SAP	City of Rancho Cucamonga Sustainable Community Action Plan
SB	Senate Bill
SBCOG	San Bernardino Council of Governments
SBCTA	San Bernardino County Transportation Authority
SCAB	South Coast Air Basin
Scoping Plan	California’s 2017 Climate Change Scoping Plan, prepared by CARB
SF_6	sulfur hexafluoride
SR	state route
UHIE	urban heat island effect
USGS	U.S. Geological Survey
WMP	wildfire mitigation plan
WRCOG	Western Riverside Council of Governments
ZEV	zero emissions vehicle

Air Quality

Existing Conditions Report

May 2020

CITY OF RANCHO CUCAMONGA GENERAL PLAN UPDATE

Summary

The Air Quality Background Report has been prepared for the City of Rancho Cucamonga (City) to characterize and summarize the existing air quality conditions in the city, including the identifying and discussing criteria air pollutants, toxic air contaminants (TACs), and odors of concern. The following key findings have been identified to help inform the development of goals and policies in the City's General Plan Update.

Key Findings

- Rancho Cucamonga is located in the South Coast Air Basin (SCAB), where levels of airborne particulate matter (PM) and ozone exceed Federal and State air quality standards. High PM and ground-level ozone concentrations can result in adverse health effects for residents, including lung inflammation, reduced lung function, coughing, wheezing, chest pain, burning in the chest, and shortness of breath. These effects are especially severe in children, older adults, and people with asthma or other existing lung conditions.
- Based on California Air Resources Board (CARB) data for the SCAB portion of San Bernardino County, vehicles are the largest source of the pollutants that react in the air to form ozone. The largest contributors to the county's coarse PM emissions are areawide sources, such as asphalt paving and roofing. Stationary sources such as manufacturing and industrial processes, and landfills, along with areawide sources, contribute the most to the county's fine PM emissions (CARB 2017).
- Several major freeways and roadways that run through Rancho Cucamonga, including Interstate 15 (I-15), State Route 210 (SR-210), and Foothill Boulevard, are major thoroughfares contributing to the poor air quality experienced by many residents of Rancho Cucamonga. This includes notably high levels of diesel particulate matter (diesel PM), especially in areas of the city within 500 feet of these freeways and major roadways. This increased exposure to toxic air contaminants (TACs) places city residents, and especially any sensitive individuals in these areas, at higher risk for experiencing adverse cancer and noncancer health effects.
- Large stationary sources emitting more than 10 tons of at least one health-impacting pollutant per year within the city include Frito Lay, Mission Foods Corporation, Nongshim America, Inc., Southern California Edison (SCE) - Grapeland Hybrid Facility, Steelscape Inc., and Commercial Metals Company (CMC Steel).
- Sensitive land uses and individuals in the city include schools (K-12), a hospital, senior assisted living facilities, childcare centers, and residents with existing respiratory health issues.
- CalEnviroScreen, a tool that helps determine which California communities are most affected by multiple sources of pollution, was used to identify several census tracts in the city that are exposed to higher levels of air pollutants and experience more resulting adverse health impacts than other areas of the State. Census tracts in the southern portion of the city, primarily south of Foothill Boulevard, are exposed to higher concentrations of fine particulate matter and diesel PM, and also have a higher occurrence of asthma, especially census tracts in the southwestern quadrant.
- Census tracts across the entire city are consistently exposed to higher ground-level ozone concentrations than most other communities in California. High ozone concentrations in Rancho Cucamonga, and all of San Bernardino county, result from several factors, including the lack of diluting air from ocean breezes, as is experienced in Los Angeles county, the abundant sunshine contributing to ozone formation, and much of the pollution from Los Angeles being pushed inland by onshore winds.
- Climate change impacts that may worsen air quality in the city include rising temperatures in Southern California, which will facilitate ground-level ozone formation and result in more ozone accumulating in the air. A larger number of extreme heat days and heat wave events may also contribute to ozone formation, resulting in more days when air quality standards are exceeded. Another primary impact of climate change will be more frequent regional wildfires that will substantially increase the concentration of particulate matter in the air.

Air Quality

This Air Quality Background Report has been prepared for the City to characterize and summarize the existing air quality conditions in Rancho Cucamonga, including criteria air pollutants and TACs, and to identify the sources of these emissions, whether mobile, stationary, or areawide. Air quality in Rancho Cucamonga and San Bernardino county is regulated through the efforts of various federal, state, regional, and local government agencies. The agencies responsible for improving the air quality in the city and county, and their relevant rules and regulations, are discussed below.

Introduction

This report provides a summary of important laws, regulations, and guidance documents relevant to air quality and land use planning in California and Rancho Cucamonga; an overview of existing air quality issues and conditions; a description of local and regional air quality issues and programs; and a summary of findings. The findings from this analysis will inform the development of goals and policies in the City's General Plan Update.

The air quality analysis conducted for this report was informed by and is consistent with the current *General Plan Guidelines* issued by the Governor's Office of Planning and Research (OPR 2017), guidance from the California Air Resources Board (CARB) and the South Coast Air Quality Management District (SCAQMD), and academic literature regarding air quality, land use planning, and related issues.

Air Quality Background

Presented below is a scientific background on air quality and brief overview of pollutants of concern in the city, including criteria air pollutants and TACs.

Criteria Air Pollutants

Concentrations of criteria air pollutants are used to indicate the quality of the ambient air. A brief description of key criteria air pollutants in SCAB and the health effects resulting from acute and chronic exposures is provided below. Criteria air pollutants include ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead. However, for the City, the criteria air pollutants of primary concern because of their nonattainment status include ozone (and ozone precursors, i.e. ROG and NO_X) and particulate matter (PM_{10} and $PM_{2.5}$). A description of the sources and health effects for each criteria pollutant is provided in Table 1.

Table 1. Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	Secondary pollutant resulting from the reaction of ROG and NO_X in the presence of sunlight; ROG emissions result from the incomplete combustion and evaporation of chemical solvents and fuels, and NO_X results from the combustion of fuels	Increased respiration and pulmonary resistance; cough, pain, shortness of breath, and lung inflammation	Permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	Headache, dizziness, fatigue, nausea, vomiting, and death	Permanent heart and brain damage
Nitrogen dioxide	Combustion devices (e.g., boilers, gas turbines, and mobile	Coughing, difficulty breathing, vomiting, headache, eye	Chronic bronchitis and decreased lung function

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
(NO_2)	and stationary reciprocating internal combustion engines)	irritation, chemical pneumonitis or pulmonary edema, breathing abnormalities, cyanosis, chest pain, rapid heartbeat, and death	
Sulfur dioxide (SO_2)	Coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract and increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	Fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of SO_2 and ROG	Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, and premature death	Alterations to the immune system and carcinogenesis
Lead	Metal processing	Reproductive/developmental effects (fetuses and children)	Numerous effects, including neurological, endocrine, and cardiovascular effects

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases.

[1] "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.

[2] "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.

Source: EPA 2019

Toxic Air Contaminants (TACs)

TACs, or in federal parlance, hazardous air pollutants (HAPs), are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

A wide range of sources, from industrial plants to motor vehicles, emit TACs. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects, such as cancer, birth defects, neurological damage, asthma, bronchitis, and genetic damage, or short-term acute effects, such as eye watering, respiratory irritation (cough), running nose, throat pain, and headaches.

For evaluation purposes, TACs are separated into carcinogens and noncarcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. This contrasts with criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established. Cancer risk from TACs is expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime of exposure.

According to the *California Almanac of Emissions and Air Quality* (CARB 2013), most of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being diesel PM. In contrast to other TACs, diesel PM is not a single, homogenous substance but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, and lubricating oil and on whether an emission control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs (OEHHA 2015). CARB evaluates the health risk associated with exposure to TACs on a cumulative basis with a focus on cancer risk. The risk for an individual TAC is calculated by multiplying its unit risk factor with its average concentration during the exposure period. The unit risk factor is expressed as the probability, or risk, of contracting cancer because of consistent exposure to an ambient concentration of 1 microgram per cubic meter (μg/m^3) for 70 years (i.e., the risk of contracting cancer, or excess cancer cases, per 1 million people exposed over a 70-year period).

Odors

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., odors from a fast-food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. The reason for this is the phenomenon known as odor fatigue. A person can become desensitized to almost any odor, and recognition occurs only with an alteration in the intensity. Odor sources of concern include wastewater treatment plants, sanitary landfills, composting facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting operations, rendering plants, and food packaging plants.

Regulatory Setting

Air quality in Rancho Cucamonga is regulated through the combined efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, planning, policymaking, education, and a variety of programs. The agencies responsible for improving the air quality within the air basin are discussed below.

Federal

The U.S. Environmental Protection Agency (EPA) has been charged with implementing national air quality programs. EPA's air quality mandates draw primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments to the CAA were made by Congress in 1990. EPA's air quality efforts address criteria air pollutants, ozone precursors, and HAPs. EPA regulations concerning criteria air pollutants and HAPs are presented in greater detail below.

Criteria Air Pollutants

The CAA required EPA to establish National Ambient Air Quality Standards (NAAQS) for seven common air pollutants found all over the United States, which are referred to as criteria air pollutants. EPA established primary and secondary NAAQS for criteria air pollutants are shown in Table 2. The primary standards protect public health, and the secondary standards protect public welfare. The CAA also required each state to prepare a state implementation plan (SIP) for attaining and maintaining the NAAQS.

The federal Clean Air Act Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. California's SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If a SIP is determined to be inadequate, EPA may prepare a federal implementation plan that imposes additional control measures. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin.

Table 2. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[a,b]	NAAQS[c]	
			Primary[b,d]	Secondary[b,e]
Ozone	1 hour	0.09 ppm (180 μg/m^3)	–[e]	Same as primary standard
	8 hours	0.070 ppm (137 μg/m^3)	0.070 ppm (137 μg/m^3)	
Carbon monoxide (CO)	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Same as primary standard

Pollutant	Averaging Time	CAAQS[a,b]	NAAQS[c]	
			Primary[b,d]	Secondary[b,e]
	8 hours	9 ppm[f] (10 mg/m^3)	9 ppm (10 mg/m^3)	
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	—
	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	Same as primary standard
Sulfur dioxide (SO_2)	1 hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	—
	3 hours	—	—	0.5 ppm (1,300 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	—	—
Respirable particulate matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3	Same as primary standard
	Annual arithmetic mean	20 µg/m^3	—	
Fine particulate matter ($PM_{2.5}$)	24 hours	—	35 µg/m^3	Same as primary standard
	Annual arithmetic mean	12 µg/m^3	12 µg/m^3	15.0 µg/m^3
Lead [f]	30-day average	1.5 µg/m^3	—	—
	Calendar quarter	—	1.5 µg/m^3	Same as primary standard
	Rolling 3-month average	—	0.15 µg/m^3	Same as primary standard
Hydrogen sulfide	1 hour	0.03 ppm (42 µg/m^3)	No national standards	
Sulfates	24 hours	25 µg/m^3		
Vinyl chloride [f]	24 hours	0.01 ppm (26 µg/m^3)		
Visibility-reducing particulate matter	8 hours	Extinction of 0.23 per km		

Notes: µg/m^3 = micrograms per cubic meter; CAAQS = California ambient air quality standards; km = kilometers; mg/m^3 = milligrams per cubic meter; NAAQS = national ambient air quality standards; ppb = parts per billion; ppm = parts per million (by volume).

[a] *California standards for ozone, carbon monoxide, SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.*

[b] *Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*

[c] *National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.*

Pollutant	Averaging Time	CAAQS[a,b]	NAAQS[c]	
			Primary[b,d]	Secondary[b,e]

[d] National primary standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. This allows for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: CARB 2016

Hazardous Air Pollutants and Toxic Air Contaminants

EPA regulates HAPs through its National Emission Standards for Hazardous Air Pollutants (NESHAP). The standards for a source category require the maximum degree of emission reduction that EPA determines to be achievable, which is known as the Maximum Achievable Control Technology standards (MACT). These standards are authorized by Section 112 of the CAA, and the regulations are published in 40 Code of Federal Regulations Parts 61 and 63.

EPA and, in California, CARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of federal MACT standards or, in California, Best Available Control Technology (BACT), for air toxics to limit emissions.

State

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS) (Table 2).

Criteria Air Pollutants

CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases, the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to attain and maintain the CAAQS by the earliest date practical. It specifies that local air districts should focus attention on reducing the emissions from transportation and areawide emission sources. The CCAA also provides air districts with the authority to regulate indirect emission sources.

Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Hot Spots Act) (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified 21 TACs and adopted EPA’s list of HAPs as TACs. diesel PM is one of the TACs identified by CARB.

After a TAC is identified, CARB then adopts an airborne toxics control measure for associated source types. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate BACT for toxics to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). Recent milestones included the low-sulfur diesel fuel requirement and tighter emission standards for heavy-duty diesel trucks (effective in 2007 and subsequent model years) and off-road diesel equipment (2011). Over time, replacing older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than the current fleet. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) in California have been reduced substantially over the last decade; such emissions will be reduced further through a progression of regulatory measures (e.g., low emission vehicle/clean fuels and Phase II reformulated-gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan, it is expected that diesel PM concentrations are 85 percent less in 2020 than they were in 2000 (CARB 2000). Adopted regulations are also expected to continue to reduce formaldehyde emissions emitted by cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

Assembly Bill 617 (AB 617)

California AB 617 aims to help protect air quality and public health in disadvantaged communities (DACs) that are disproportionately affected by air pollution and experience a high cumulative exposure burden. It imposes a new state-mandated, community-scale program to address local sources of criteria air pollutants and TACs. The bill requires CARB and local air districts (e.g. SCAQMD) to identify heavily polluted communities suffering from a high exposure burden and directs regional air districts to focus air quality improvement efforts through implementation of community air monitoring plans and adoption of emission reduction programs in these identified areas. Currently, air districts use command-and-control strategies to review individual sources and impose emissions limits on emitters based on BACT, pollutant type, and proximity to nearby existing land uses. AB 617, however, addresses the cumulative and additive nature of air pollutant health effects on a community by requiring local air quality monitoring and emission reduction planning while in close coordination with the local community.

Air Quality and Land Use Handbook

In 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective*, a guidance document for siting sensitive land uses near freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline-dispensing facilities. The document includes recommendations for distances and details regarding siting new sensitive land uses (e.g., residences, schools, daycare centers, playgrounds, and medical facilities) near major stationary and nonstationary sources. For example, CARB recommends avoiding siting of new sensitive land uses within 500 feet of roadways that experience an average daily traffic (ADT) volume of 100,000 or more.

Planning Guidelines and Air Quality

In 2017, the Governor's Office of Planning and Research completed an update to the *General Plan Guidelines*, which serves as the guidance document for jurisdictions in California that are developing or updating their general plans. It identifies important regulations that guide the development of general plans and land use planning at the local level. While a stand-alone Air Quality element is not required in a general plan, Chapter 4, "Required Elements," of the guidelines provides guidance for local jurisdictions on air quality and land use planning issues, providing recommendations for goals and policies in a general plan element that addresses air quality issues. Specifically, the *General Plan Guidelines* provides recommendations for strategies to avoid health impacts for residents near high-volume roadways, including site design considerations to avoid pollutant exposure, vegetation for pollutant dispersion, and indoor high-efficiency air filters for buildings near high-volume roadways (OPR 2017). The chapter also includes examples of policies included in general plans related to air quality and air quality mitigation. Finally, throughout the *General Plan Guidelines*, air quality issues are given consideration in the discussion of related policies, including those related to land use, transportation, health, safety, DACs, and environmental justice. The following example strategies from the *General Plan Guidelines* may be relevant to the City's air quality–related General Plan policies:

- Require that new multifamily residential buildings and other sensitive land uses in areas with high levels of localized air pollution be designed to achieve good indoor air quality through landscaping, ventilation systems, or other measures.
- Provide incentives to promote air pollution reductions, including incentives for developers that go beyond applicable requirements and mitigate pollution for facilities and operations that are not otherwise regulated.
- Employ strategies that reduce driving rates and improve air quality through land use and urban design. These strategies include transit-oriented development, compact development, an appropriate mix of land uses, a jobs/housing balance, transit-oriented development, and walkable streets.
- Minimize exposure to air pollution and hazardous substances.
- Encourage nonpolluting industry and clean green technology companies to locate to the city.

Regional and Local

South Coast Air Quality Management District

Air quality planning for SCAB, the air basin within which Rancho Cucamonga is located, is under the jurisdiction of SCAQMD. SCAQMD's most recent Air Quality Management Plan (AQMP) was adopted in 2016 as a program to bring SCAB into compliance with the NAAQS and CAAQS. It relies on emissions forecasts based on demographic and economic growth projections provided by the Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy. SCAG is charged by federal and state law to prepare and approve "the portions of each AQMP relating to demographic projections and integrated regional land use, housing, employment, and transportation programs, measures and strategies" (SCAQMD 2016).

Environmental Setting

This section will discuss local and regional atmospheric conditions affecting air quality, the regional attainment status, sources of concern, and community conditions in Rancho Cucamonga.

Climate, Meteorology, Topography

The City of Rancho Cucamonga is in San Bernardino county, which lies in the northwest portion of the SCAB and is bordered to the north by the San Gabriel and San Bernardino mountain ranges. These mountain ranges create a barrier to westerly winds, which can lead to inversion layers in the atmosphere, preventing vertical dispersion of air pollutants.

An inversion is a layer of warmer air over a layer of cooler air. Inversions affect air quality conditions significantly because they influence the mixing depth (i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground). The highest air pollutant concentrations in the SCAB generally occur during inversions. Two types of inversions occur regularly in the SCAB. One is more common in summer and fall, while the other is most common during winter.

Subsidence inversions, which are formed in valleys such as the San Bernardino Valley as lower altitude air increases in temperature as it is compacted against surrounding mountains and becomes trapped under a layer of cooler air, are prevalent in the summer and fall months. The frequent occurrence of this type of elevated temperature inversions in summer and fall acts to cap the mixing height, limiting the volume of air available for dilution of pollutants.

The inversions typical of winter, called radiation inversions, are formed as heat quickly radiates from the earth's surface after sunset, causing the air in contact with it to rapidly cool. Radiation inversions are strongest on clear, low-wind, cold winter nights, allowing the buildup of such pollutants as CO and particulate matter. When wind speeds are low, there is little mechanical turbulence to mix the air, resulting in a layer of warm air over a layer of cooler air next to the ground. Mixing heights under these conditions can be as low as 50–100 meters, particularly in rural areas.

Urban areas usually have higher minimum mixing heights because of heat island effects and increased surface roughness. During radiation inversions, downwind transport is slow, the mixing heights are low, and turbulence is minimal, all factors that also contribute to ozone formation. Although each type of inversion is most common during a specific season, either one can occur at any time of the year. Sometimes, both occur simultaneously. Moreover, the characteristics of an inversion often change throughout the course of a day as atmospheric temperatures change.

Attainment Designations

Although air pollution potential is strongly influenced by climate and topography, the air pollution that occurs in a location also depends on the amount of air pollutant emissions in the surrounding area or transported from more distant places. Air pollutant emissions generally are highest in areas that have high population densities and high motor vehicle use and/or industrialization. Contaminants created by photochemical processes in the atmosphere, such as ozone, may result in high concentrations many miles downwind from the sources of their precursor chemicals.

Criteria air pollutant concentrations are measured at several monitoring stations in the SCAB and are used by EPA and CARB to designate areas according to their attainment status for criteria air pollutants. The current attainment designations for San Bernardino county are shown below in Table 3. For ozone, EPA classifies areas of nonattainment, in order of greatest to lesser exceedance, as "extreme," "severe," "serious," "moderate," or "marginal." These designations indicate the degree to which an area exceeds the standard as well as the amount of time allowed to demonstrate attainment, with the time allowed correlated with the difficulty of the challenge involved.

Table 3. Attainment Status Designations for San Bernardino County

Pollutant	National Ambient Air Quality Standard	California Ambient Air Quality Standard
Ozone	Attainment (1-hour)[1]	Nonattainment (1-hour) classification[2]
	Nonattainment (8-hour)[3] classification = extreme	Nonattainment (8-hour)
	Nonattainment (8-hour)[4] classification = extreme	
	Nonattainment (8-hour)[5] classification = extreme	
Respirable particulate matter (PM_{10})	Attainment (24-hour)	Nonattainment (24-hour)
		Nonattainment (annual)
Fine particulate matter ($PM_{2.5}$)	Nonattainment (24-hour)	No state standard for 24-hour
	Nonattainment (annual)	Nonattainment (annual)
Carbon monoxide (CO)	Attainment (1-hour)	Attainment (1-hour)
	Attainment (8-hour)	Attainment (8-hour)
Nitrogen dioxide (NO_2)	Unclassified/attainment (1-hour)	Attainment (1-hour)
	Unclassified/attainment (annual)	Attainment (annual)
Sulfur dioxide (SO_2)[6]	(Attainment) (1-hour)	Attainment (1-hour)
		Attainment (24-hour)
Lead (particulate)	Attainment (3-month rolling average)	Attainment (30-day average)
Hydrogen sulfide	No federal standard	Unclassified (1-hour)
Sulfates		Attainment (24-hour)
Visibility-reducing particles		Unclassified (8-hour)
Vinyl chloride		Unclassified (24-hour)

Notes:

[1] *Air quality meets federal 1-hour ozone standard (77 Federal Register 64036). The U.S. Environmental Protection Agency revoked this standard, but some associated requirements still apply.*

[2] *Per Health and Safety Code Section 40921.5(c), the classification is based on 1989–1991 data and therefore does not change.*

[3] *1997 standard.*

[4] *2008 standard.*

[5] *2015 standard.*

[6] *2010 standard.*

Source: SCAQMD 2016

Existing Community Conditions

County Emissions Inventory

CARB provides projected estimates for San Bernardino county's 2020 emissions inventory for use in SIP planning. While these source type percentages are only available at the county level (separate inventory data are available for the portion of San Bernardino county within SCAB), the specific breakdown of source categories is representative of the diversity of source types contributing to airborne emissions in Rancho Cucamonga. Therefore, these are the best available data for identifying the dominant sources of PM and ozone precursors in the city, as well as estimating the percentage of emissions resulting from each source category.

According to the 2020 projected emissions inventory data for San Bernardino county (SCAB portion) from CARB, mobile sources (e.g., passenger vehicles and medium- and heavy-duty trucks) are the largest contributor to the air pollutant levels of ROG and NO_X, accounting for approximately 42 percent and 84 percent, respectively, of the total mass emissions. Areawide sources (e.g., asphalt paving and roofing, farming operations) account for approximately 75 percent and mobile sources account for 14 percent of the county's PM_{10} emissions. Stationary sources (e.g., manufacturing and industrial processes, landfills) account for 22 percent of the county's $PM_{2.5}$ emissions, while 56 percent are due to areawide sources (CARB 2017).

Monitoring Station Data

SCAQMD and CARB operate a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants in the South Coast Air Basin. Existing and potential future levels of air quality in San Bernardino county can generally be inferred from ambient air quality measurements conducted by SCAQMD at its nearby monitoring stations.

The CAA required EPA to establish NAAQS, which regulate criteria air pollutants. The CCAA required CARB to establish CAAQS. National and California standards, along with the corresponding San Bernardino county (SCAB portion) attainment status for each criteria pollutant, are shown above in Table 3. To monitor progress toward achieving its CAAQS attainment goals, SCAQMD continuously measures the concentrations of criteria pollutants at various monitoring stations throughout the SCAB. Data from two of the monitoring stations nearest Rancho Cucamonga are presented below.

Tables 4 and 5 show the most recent 3-year summaries of ambient air quality data from the Fontana-Arrow Highway monitoring station, located just east of the city (near the intersection of Almond Ave. and Arrow Route), and the Upland monitoring station, located on the western boundary of the city (near the intersection of Grove Ave. and Foothill Boulevard), for ozone, $PM_{2.5}$, and PM_{10}, the main pollutants of concern in San Bernardino county. As can be seen, ambient concentrations of ozone exceed both the national and state standards approximately 30 to 90 days per year, while ambient PM_{10} and $PM_{2.5}$ concentrations exceed the standards less than five days per year on average.

Table 4. Annual Air Quality Data - Fontana-Arrow Highway Station (2016–2018)

Ozone	2016	2017	2018
Maximum concentration (1-hr/8-hr, ppm)	0.139/0.105	0.137/0.119	0.141/0.111
Days state standard exceeded (1-hr/8-hr)	34/52	33/51	38/72
Days national standard exceeded (8-hr)	49	49	69
Respirable Particulate Matter (PM_{10})	2016	2017	2018
Maximum concentration (µg/m^3)	94.8	75.3	61.5
Days state standard exceeded (measured[1])	*	*	*
Days national standard exceeded (measured[1])	0	*	0

Ozone	2016	2017	2018
Fine Particulate Matter ($PM_{2.5}$)	**2016**	**2017**	**2018**
Maximum concentration (μg/m^3)	58.8	39.2	29.2
Annual average (μg/m^3)	*	12.9	10.1
Days national standard exceeded (measured[2])	3	3	0

*Notes: μg/m^3 = micrograms per cubic meter; ppm = parts per million; * = data insufficient to determine the value.*

[1] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Source: CARB 2019a

Table 5. Annual Air Quality Data - Upland Station (2016–2018)

Ozone	2016	2017	2018
Maximum concentration (1-hr/8-hr, ppm)	0.156/0.116	0.150/0.128	0.133/0.112
Days state standard exceeded (1-hr/8-hr)	53/89	66/89	25/54
Days national standard exceeded (8-hr)	88	87	52
Respirable Particulate Matter (PM_{10})	**2016**	**2017**	**2018**
Maximum concentration (μg/m^3)	184.0	106.5	156.6
Days state standard exceeded (measured[1])	*	*	*
Days national standard exceeded (measured[1])	1	0	*
Fine Particulate Matter ($PM_{2.5}$)	**2016**	**2017**	**2018**
Maximum concentration (μg/m^3)	44.9	53.2	47.9
Annual average (μg/m^3)	17.6	*	*
Days national standard exceeded (measured[2])	*	*	*

*Notes: μg/m^3 = micrograms per cubic meter; ppm = parts per million; * = data insufficient to determine the value.*

[1] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Source: CARB 2019a

Both CARB and EPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are “nonattainment,” “attainment,” and “unclassified.” “Unclassified” is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. Attainment designations for 2016–2018 in San Bernardino county are shown above in Table 3 for each criteria air pollutant.

Stationary Sources

Stationary sources of pollutants are regulated by SCAQMD and mitigated through requirements for emission offsets and the implementation of BACT. Large stationary sources of emissions (those emitting more than 10 tons of one or more criteria air pollutants per year) are more comprehensively regulated than mobile sources and can sometimes be subject to requirements for additional mitigation. Rancho Cucamonga has six large stationary sources that are included on CARB's inventory of stationary source facilities in the state (CARB 2019b). Annual NO_X, ROG, PM_{10}, and $PM_{2.5}$ emissions data for these facilities from 2017, the most recent year for which they are available, are presented in Table 6. Based on the results presented below in Table 6, these large stationary sources that are emitters of substantial quantities of PM and ozone precursors are monitored closely by SCAQMD to ensure that compliance with District permit limits is maintained as the SCAB steadily progresses toward attainment with the national and state ambient air quality standards. To demonstrate compliance with permit requirements, stationary sources are required to undergo periodic source testing and submit a source test report summarizing the results to SCAQMD.

Table 6. Large Stationary Sources - Emissions Inventory (2017)

Facility	NO_X (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	ROG (ton)
Frito Lay	11.6	11.3	10	2.5
Mission Foods Corporation	8.7	2.1	1.5	38.2
Nongshim America, Inc.	1.6	3.0	2.5	1.9
Southern California Edison (SCE) - Grapeland Hybrid Facility	1.3	1.3	1.3	0.4
Steelscape Inc.	24.1	1.4	1.4	5.8
CMC Steel	108	51.9	37.8	17.4

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; PM_{10} and $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than 10µm and 2.5µm, respectively.

While CARB's Pollution Mapping Tool (CARB 2019b) provides gaseous organic data as "VOC - volatile organic compounds," we label the data here as "ROG" to maintain consistency with the rest of the report. This is appropriate because EPA defines "VOC" as "reactive organic gases" in Title 40, Code of Federal Regulations, Part 51, §51.100(s).

Source: CARB 2019b

Mobile Sources

Several large roadways, including I-15, SR-210, and Foothill Boulevard, traverse the city, and the I-10 is nearby, passing less than a mile south of the city boundary. Mobile sources along these major roadways are one of the largest sources of criteria air pollutants and ozone precursors (ROG and NO_X) in the city and significantly contribute to the degradation of air quality.

From a land use planning perspective, high-volume roadways are a concern because they are often the primary source of TACs in an urban setting. CARB defines a high-volume road as an urban road with 100,000 or more vehicle trips per day or a rural road with 50,000 or more vehicle trips per day (CARB 2005).

According to the California Department of Transportation, for the year 2018, the most recent year for which data are available, the following roadways had an annual average daily traffic (AADT) volume of more than 100,000 (Caltrans 2018):

- I-15 at the junction with the I-10 (210,000 AADT),
- I-15 at the junction with Base Line Road (160,000 AADT),
- I-15 at Miller Avenue (180,000 AADT), and
- SR-210 at the junction with Haven Avenue (200,000 ADT).

Toxic Air Contaminants

Two stationary sources within the City of Rancho Cucamonga have been identified as sources of TACs in South Coast AQMD's 2018 Annual Report on AB 2588 Air Toxics Hot Spots Program (SCAQMD 2019). One of the main goals of AB 2588 is to provide the public with information regarding potential health effects from toxic air contaminants emitted from existing permitted facilities, and to develop plans to reduce associated risks.

Cancer and non-cancer health risks are identified for each facility, as determined by a quantitative health risk assessment (HRA), which considers both the toxicity of individual TACs and the dispersion pattern around the facility based on specific source parameters, as well as local geographical and meteorological conditions. Cancer risk is presented as the increased number of cancer cases per million people, when exposed over an average lifetime of 70 years. Non-cancer risks indicate the likelihood of experiencing other adverse health effects due to acute (short-term) or chronic (long-term) exposures. Non-cancer risk is presented in terms of a hazard index, which is the ratio of the exposure due to source emissions to the baseline reference exposure level. Health risks for both existing AB 2588 facilities in Rancho Cucamonga are presented in Table 7.

Table 7. AB 2588 "Hot Spots" Facilities - Health Risks

Facility	Cancer Risk (per million)	Non-Cancer Acute Hazard Index	Non-Cancer Acute Hazard Index	HRA Approval Year
Schlosser Forge Co./Arconic	9.5	1.6	1.1	2002
CMC Steel	8.7	0.49	0.61	2015

Notes: HRA = Health Risk Assessment

Source: SCAQMD 2019

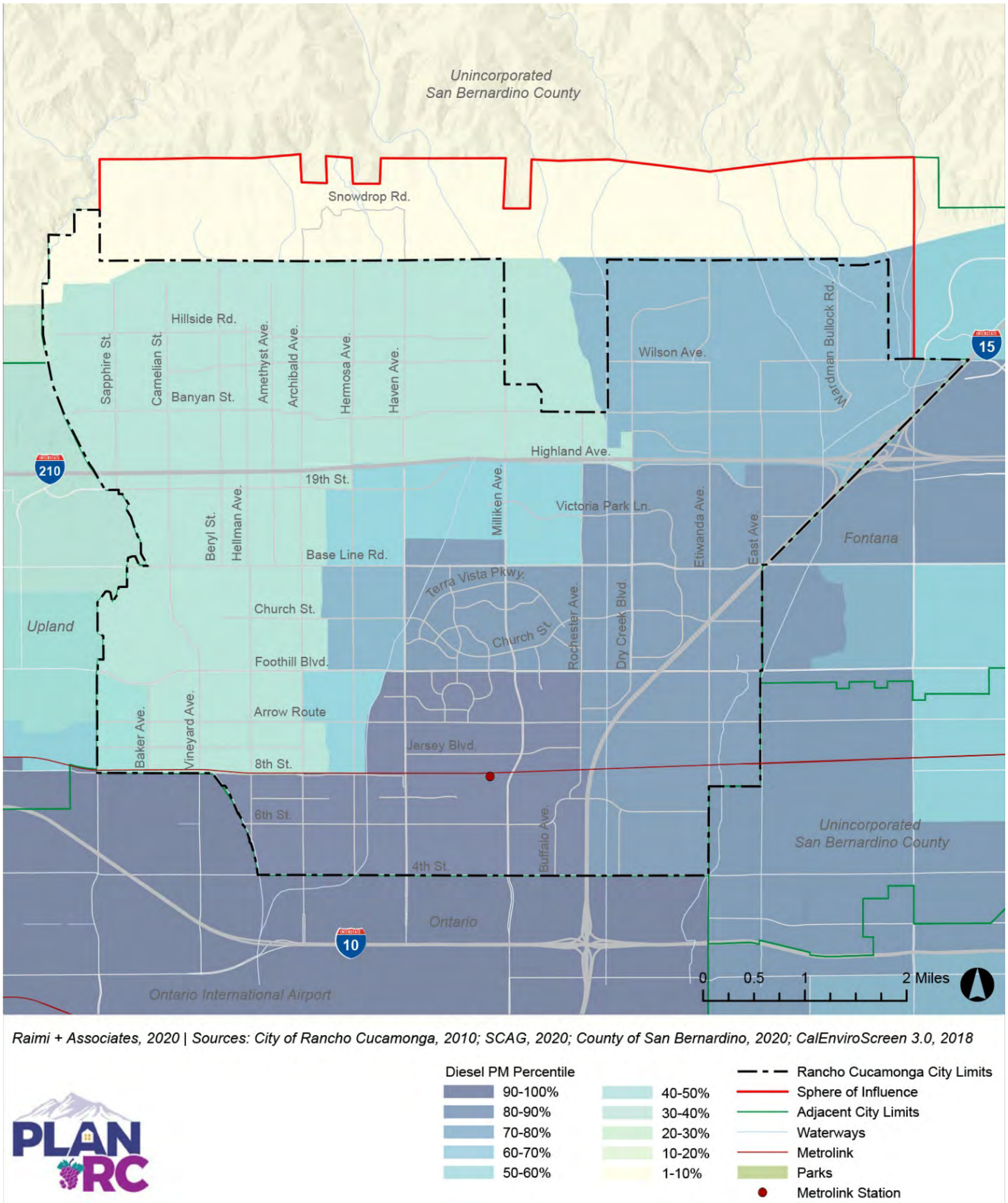
CalEnviroScreen 3.0

CalEnviroScreen is a mapping tool developed by the Office of Environmental Health Hazard Assessment (OEHHA) to help identify low-income census tracts in California that are disproportionately burdened by and vulnerable to multiple sources of pollution. CalEnviroScreen uses environmental, health, and socioeconomic information based on data sets available from state and federal government sources to produce scores for every census tract in the state. Data used in the most recent version of CalEnviroScreen (3.0) are from 2018. Scores are generated using 20 statewide indicators which fall into four categories: exposures, environmental effects, sensitive populations, and socioeconomic factors. Exposures and environmental effects characterize the pollution burden that a community faces, while sensitive populations and socioeconomic factors define population characteristics. Higher scores indicate a higher comprehensive pollutant exposure burden (OEHHA 2018).

In terms of air pollution, the composite CalEnviroScreen 3.0 score incorporates several indicators, including criteria air pollutant concentrations, frequency of adverse health impacts, and traffic density, for each census tract in the city, as shown in Figures 1 through 4. Details of specific indicator scores are presented below.

- **Ozone**—The ozone percentile across all census tracts in the city is uniformly 98, meaning that the ground-level ozone concentration across Rancho Cucamonga is higher than in 98 percent of all census tracts in California.
- **$PM_{2.5}$**—Generally, the $PM_{2.5}$ percentile for census tracts in the city is 93, meaning that the $PM_{2.5}$ concentrations residents of the city are exposed to is higher than the ambient concentrations in 93 percent of all California census tracts (Figure 1).

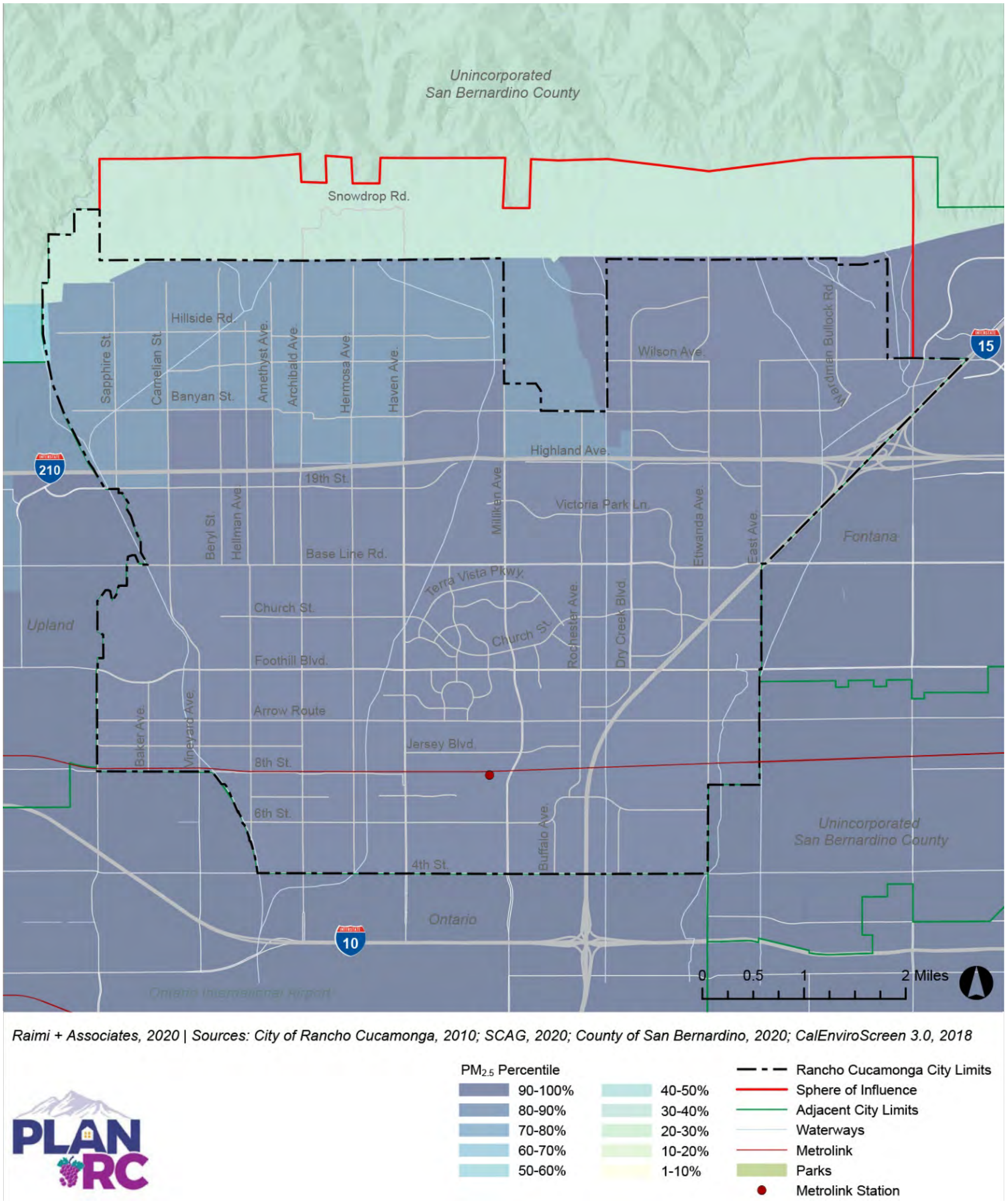
Figure 1. Diesel PM Percentiles near the City of Rancho Cucamonga



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2010; SCAG, 2020; County of San Bernardino, 2020; CalEnviroScreen 3.0, 2018

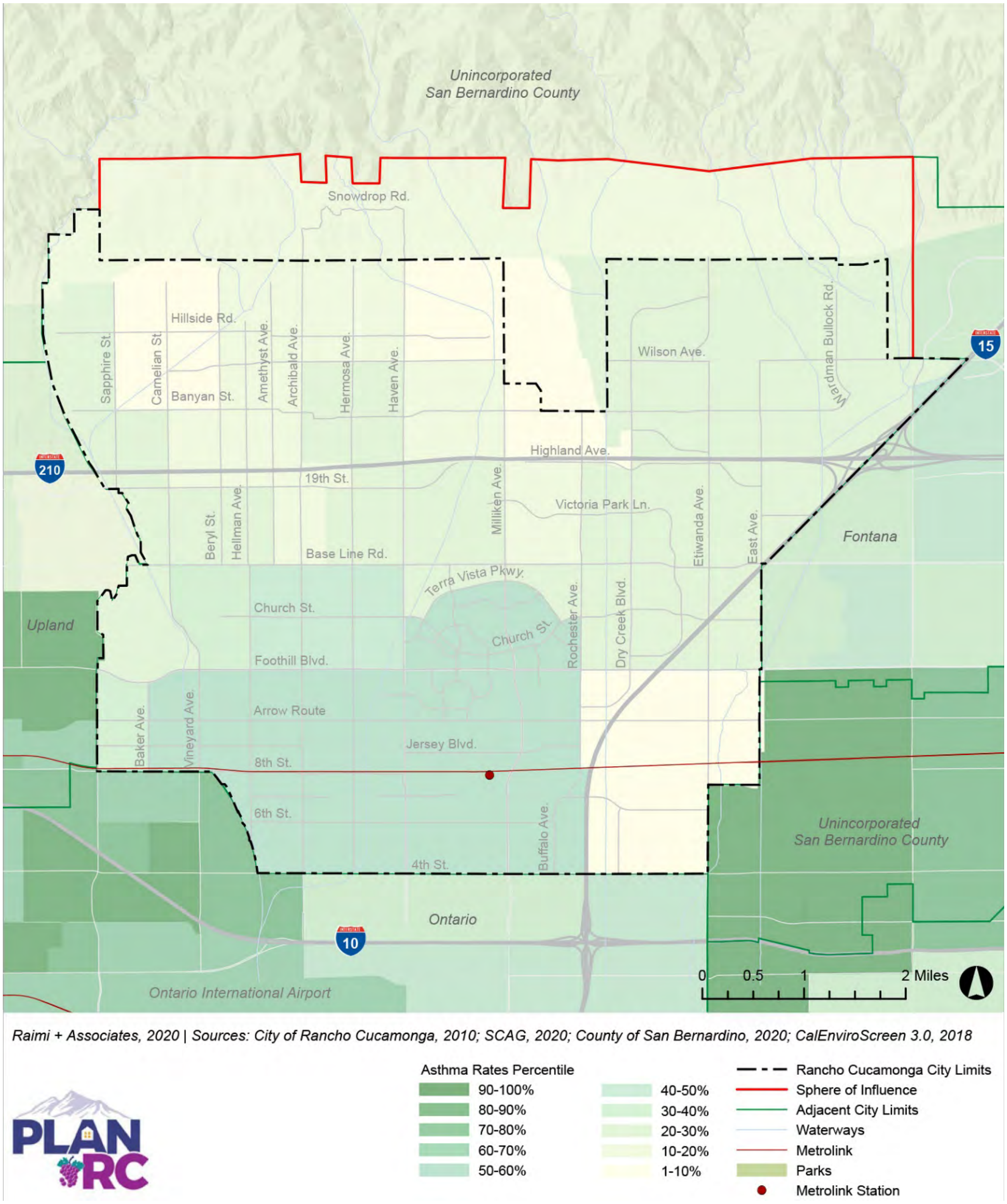
- **Diesel PM**—Generally, the diesel PM percentile for census tracts in the city ranges from 42 to 95, with an average of 60, meaning that the concentration of diesel PM in many areas of the city is, on average, higher than the ambient concentrations experienced by residents in 60 percent of all the census tracts in California (Figure 2).
- **Asthma Rates**—Generally, the asthma incidence percentile for census tracts in the city ranges from 8 to 41, with an average of 32, meaning that the incidence of asthma in many areas of the city is, on average, higher than the ambient concentrations experienced by residents in 32 percent of all the census tracts in California (Figure 3). While incidence of asthma is not dramatically higher in the city than other areas of the state, it is telling that the highest incidence rates among residents occur in the southwestern quadrant, where diesel PM and $PM_{2.5}$ concentrations are higher than the rest of the city.
- **Traffic Density**—The traffic density percentile for census tracts in Rancho Cucamonga generally ranges from 26 to 89, with an average percentile of 60, meaning that each tract experiences a density of traffic higher than 26–89 percent of the census tracts in California (Figure 4). Traffic density is calculated as the volume of traffic in a census tract divided by the total length of its roads. Census tracts in the eastern portion of the city, along both sides of I-15, as well as census tracts alongside SR-210, are within the 83rd to 88th percentiles for traffic density. Tracts just south of the city, between I-10 and East 4th Street, are within the 93rd to 99th percentiles. Higher than average diesel PM emissions in these portions of the city may partially be explained by the high traffic densities in these areas. Large numbers of diesel trucks entering and exiting the freeways, particularly when idling at a backed up on-ramp, also contribute to diesel PM emissions in these areas.

Figure 2. PM$_{2.5}$ Percentiles near the City of Rancho Cucamonga



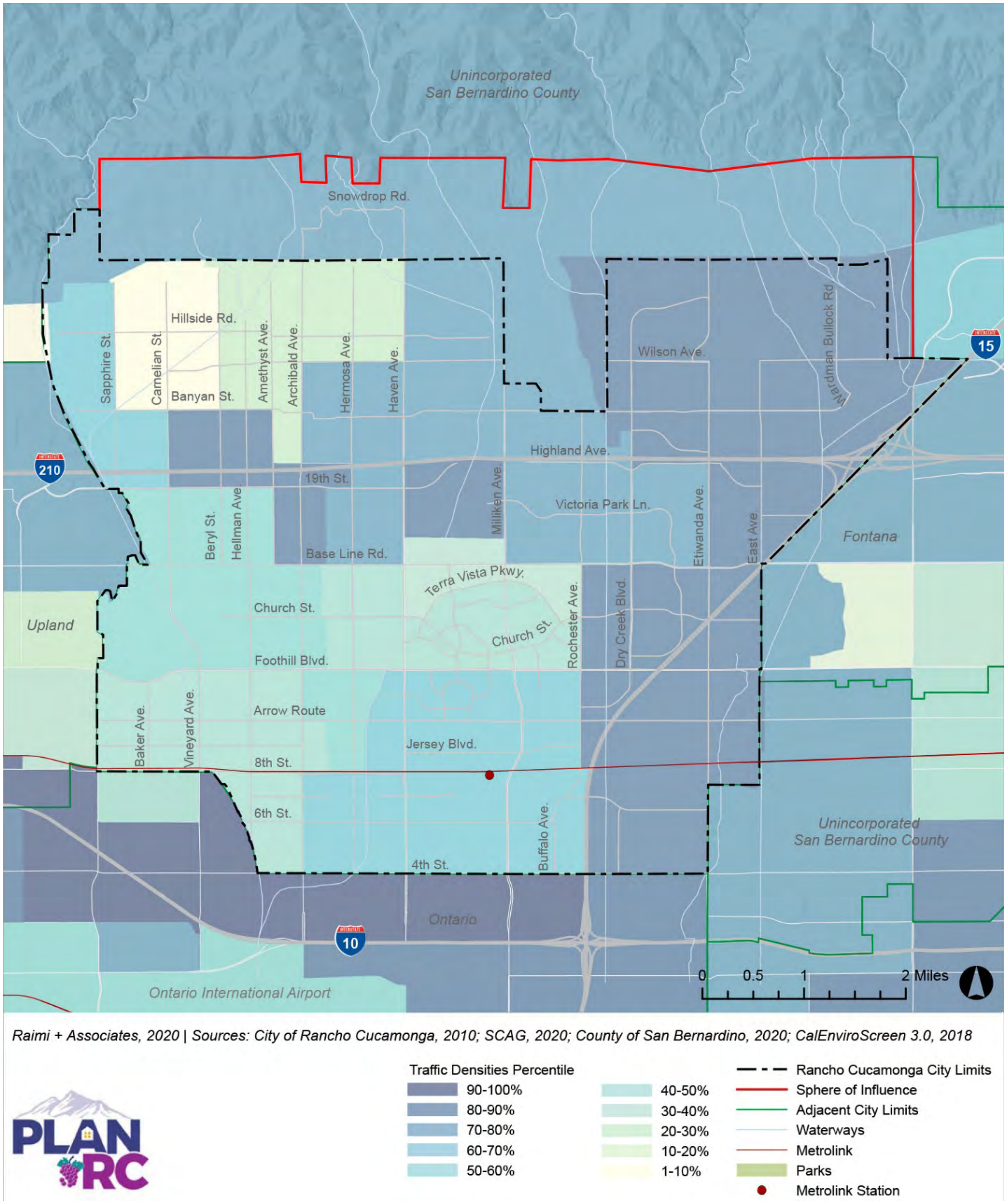
Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2010; SCAG, 2020; County of San Bernardino, 2020; CalEnviroScreen 3.0, 2018

Figure 3. Asthma Rate Percentiles near the City of Rancho Cucamonga



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2010; SCAG, 2020; County of San Bernardino, 2020; CalEnviroScreen 3.0, 2018

Figure 4. Traffic Density Percentiles near the City of Rancho Cucamonga



Raimi + Associates, 2020 | Sources: City of Rancho Cucamonga, 2010; SCAG, 2020; County of San Bernardino, 2020; CalEnviroScreen 3.0, 2018

Findings

As discussed in this report, residents of Rancho Cucamonga are subject to ozone, PM_{10}, and $PM_{2.5}$ concentrations that exceed both national and state air quality standards, along with the resulting health impacts, that affect many communities across San Bernardino county including the city of Rancho Cucamonga. These exceedingly high concentrations of ozone, PM_{10}, and $PM_{2.5}$ result in several adverse health effects for residents, especially sensitive receptors such as children, older adults, and people with asthma or other existing lung conditions, including inflammation of the lining of the lungs, reduced lung function, and increased respiratory symptoms such as cough, wheezing, chest pain, burning in the chest, and shortness of breath.

Current air quality issues that affect the city, such as extreme nonattainment for ozone, are being addressed through regulations and programs at the federal, state, regional, and local levels. These regulations and programs have made considerable improvements to air quality in the region compared to its worst period, in the 1970s. However, certain air quality issues persist—specifically, emissions of ozone precursors and particulate matter largely from mobile sources in the SCAB. Additionally, as indicated by multiple CalEnviroScreen indicators, not only does the entire city of Rancho Cucamonga experience greater air pollution than much of the state, within the city these impacts are generally localized to census tracts along its southern and southwestern borders. Finally, the impacts of climate change, including increased peak hourly temperatures and frequencies of heat waves and wildfires, are projected to exacerbate existing air quality issues in the city.

As the City looks forward, air quality will remain an important issue for the community and should be given careful consideration in future planning efforts, particularly as they relate to sensitive receptors, including children and seniors, disproportionately burdened communities, and the city's residents in general. Presented below are key findings that will help the public and elected officials understand the important takeaways from this report and help inform policy development for updating the City's General Plan:

- Rancho Cucamonga is in San Bernardino county, where on many days of the year ambient concentrations of $PM_{2.5}$, PM_{10}, and ozone exceed Federal and State air quality standards. These standards are set by EPA and CARB to protect public health. Ambient concentrations of these three criteria pollutants in excess of the standards will cause city residents to experience adverse health effects such as respiratory distress, lung inflammation, and exacerbation of asthma symptoms such as coughing, wheezing, and chest pain. In addition to these respiratory ailments, $PM_{2.5}$ exposures may also lead to cardiovascular complications and acceleration of cognitive decline due to aging. Because ambient ozone concentrations in the SCAB have in the recent past exceeded the standards roughly 30 to 90 days per year, it is predicted that respiratory effects due to ozone exposures will be more frequent than health effects due to PM exposures, especially among sensitive individuals.
- Based on the CARB's most recent countywide inventory of air pollution sources, the largest contributors to ozone, PM_{10}, and $PM_{2.5}$ emissions in San Bernardino county (SCAB portion), including Rancho Cucamonga, are mobile sources (e.g., passenger vehicles and medium and heavy-duty trucks). Areawide sources (e.g., asphalt paving and roofing, farming operations) are the largest contributors to the county's PM_{10} emissions, while stationary sources (e.g., manufacturing and industrial processes, landfills) and areawide sources are the largest contributors to $PM_{2.5}$ emissions (CARB 2017).
- Several major freeways and roadways run through Rancho Cucamonga, including I-15, SR-210, and Foothill Boulevard. Vehicles using these roadways contribute to worsening air quality, and are responsible for notably higher levels of diesel PM in the air, especially in areas of the city within 500 feet of these freeways and major roadways. This increased exposure of city residents, especially sensitive individuals, in these areas to TACs places them at a higher risk for experiencing adverse cancer and noncancer health effects.
- Rancho Cucamonga has two stationary sources of TACs, which have been identified as AB 2588 "hot spots," and six large stationary sources of criteria air pollutants. These facilities are required to report their emissions to CARB and SCAQMD every four years. SCAQMD is the agency responsible for categorizing each facility, using their reported emissions to classify each as either high, intermediate, or low priority, and to determine whether a facility needs to conduct an additional Health Risk Assessment (HRA). While these sources are subject to strict permit limits as well as SCAQMD and CARB regulatory requirements, the implication of having six large criteria pollutant sources and two AB 2588 "hot spots" facilities within the city is that these stationary sources must be closely monitored by SCAQMD to ensure that nearby residents are not exposed to an excessive pollutant exposure burden.
- CalEnviroScreen data indicate that residents of Rancho Cucamonga experience very high ambient ozone concentrations compared to the rest of the state, with exceedances of federal ozone standards occurring between 30 to 90 days of the year. Additionally, city residents, particularly those living in the southern portion of the city, are exposed to very high diesel PM and $PM_{2.5}$ concentrations and exhibit increased

incidence rates of asthma, which is especially frequent in the southwestern quadrant of the city. Finally, traffic density in the city is especially pronounced near major freeways, including I-15 and SR-210.

- Climate change is anticipated to exacerbate air quality issues in Rancho Cucamonga, including an expected increased ozone formation due to rising ground-level temperatures, an effect often referred to as the “climate penalty,” in Southern California. A greater number of extreme heat days and heatwave events could also result in more days of ground-level ozone exceeding State and Federal standards. Finally, the projected increases in the frequency and magnitude of wildfires in Southern California associated with climate change will also likely worsen air quality issues in the city, primarily an increase in $PM_{2.5}$ emissions associated with smoke generated during large wildfire events. Increases in ambient ground-level concentrations of both ozone and $PM_{2.5}$ will results in more residents experiencing adverse health effects, which may be particularly severe in sensitive individuals such as children, the elderly, and people with asthma or other existing lung conditions.

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Acronyms

AADT	annual average daily traffic (volume)
ADT	average daily traffic (volume)
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
BNSF	Burlington Northern Santa Fe Railway Company
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CO	carbon monoxide
DAC	disadvantaged community
Diesel PM	diesel particulate matter
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FTA	Federal Transit Administration
HAP	hazardous air pollutants
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
OEHHA	Office of Environmental Health Hazard Assessment
ONT	Ontario International Airport
OPR	Office of Planning and Research
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than 2.5 micrometers (µm)
PM_{10}	particulate matter with an aerodynamic diameter less than 10 micrometers (µm)
ROG	reactive organic gases
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SIP	state implementation plan
SO_2	sulfur dioxide
TAC	toxic air contaminant