Downtown Area Profile Report

San Rafael, CA

Downtown Precise Plan
June 2019

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What's Inside?

Downtown Area Profile Report


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Introduction

CHAPTER 1

In this chapter

Background and Purpose

The Downtown Profile Report is intended to provide a summary of existing conditions in Downtown San Rafael, and act as a source of reference for future work on the Downtown Precise Plan.

San Rafael is located in the North Bay region of the San Francisco Bay Area, in central Marin County. It is the largest city in the county, with a population of 60,000. Marin County's oldest city, San Rafael lies midway between San Francisco and California's wine country.

San Rafael serves as the county seat and is a major economic, financial, cultural and service center. As a regional transportation hub, San Rafael is the center of highway and transit access to west Marin, Sonoma County, the East Bay and San Francisco. It is also home to two new commuter rail stations of the Sonoma-Marin Rail Transit (SMART) line.

Within San Rafael, Downtown covers an area of 265 acres and is the economic, cultural and civic heart of the City. With approximately 2,300 residents and more than a million square feet of non-residential uses, it is a major mixed-use center in the North Bay.

Downtown Precise Plan

Downtown was designated a 'Transit Town Center' Priority Development Area (PDA) in 2009. In 2012, the City adopted a Downtown Station Area Plan, establishing a vision for land use and circulation improvements in the area around the new Downtown SMART station.

The ongoing Downtown San Rafael Precise Plan is an effort to assess the vision laid out for Downtown, analyze current conditions and identify growth and development opportunities for the next 20 years. The Downtown Precise Plan covers the PDA and adjacent West End neighborhood, and will provide zoning-level development standards for new development and reinvestment, as well as updated design direction to improve architectural quality, streetscape, and historic preservation.

Relation to General Plan Update

The Downtown Precise Plan process is concurrent with the General Plan 2040 Update.

Purpose of the Profile Report

The Downtown Profile Report is an important milestone within the Precise Plan effort. It is intended as a summary of existing conditions and key findings on relevant topics that would guide the Precise Plan. The individual analysis by topic has been carried out by the larger consultant team, and organized in the form of chapters in this report. The topics are:

- Historic Resources
- Demographic Profile
- Economic Conditions
- Urban Design
- Transportation Network
- Utility Infrastructure
- Natural Hazards

Related Plans

The following plans and documents provide important background information, and are being referenced by the consultant team in the preparation of the Downtown Precise Plan. These include past planning efforts that have set the direction for downtown growth.

1993
'Our Vision of Downtown San Rafael'
Downtown Community Plan and Implementation Strategy
This plan provided a long-term vision for Downtown for 2010 and divided Downtown into six distinct districts. It strengthened Downtown's role as Marin County's economic center. It envisioned a new corporate district on Lindaro Street, promoted high-quality architecture and historic preservation, and encouraged activation of Fourth Street.

The Vision and Implementation Strategy was developed to serve as an initial consensus document, as a basis for detailed land use policies and urban design plans, and as a road map for public and private investment. The plan envisioned a future downtown as a “great place to walk around”, “a busy place” with “increased traffic”, and a “Transportation Center and County Transitway” serving as “popular and busy alternatives to driving Downtown”.

2004
City of San Rafael General Plan 2020
The General Plan serves as the blueprint for the community's future growth and development, and includes actions and implementing policies. By law, the General Plan must address seven areas, known as 'elements' that need to be mutually consistent. The seven required elements are Land use, Transportation, Open Space, Conservation, Housing, Noise, and Safety. As well as the seven required elements, the San Rafael General Plan 2020 (adopted in 2004) has eight additional elements: Air and Water Quality, Community Design, Culture and the Arts, Economic Vitality, Governance, Infrastructure, Neighborhoods, and Parks and Recreation.

2009 + 2019
City of San Rafael Climate Change Action Plan
In 2006 San Rafael was one of the early signatories to the U.S. Conference of Mayors Climate Protection Agreement, committing the City to working towards meeting the goals of the Kyoto Protocol. The Climate Change Action Plan (2009) identified recommended programs to achieve a 25 percent greenhouse gas (GHG) reduction goal that included implementation of the SMART train and completion of Highway 101 HOV lanes. By the end of 2016, the City had reduced community-wide GHG’s by 18 percent, meeting the State target of 15% reduction and on track to meet the local 25 percent stretch goal.

In 2016 California issued new interim targets for 2030 of 40 percent reduction of GHG’s below 1990 levels. The updated Plan, adopted in April 2019, indicates that the City could reduce GHG emissions 42 percent below 1990 levels by 2030. Low carbon transportation strategies including increasing the rate of Zero Electric Vehicle (ZEV) ownership, increasing transit use through incentives, and enabling better walking and biking opportunities comprise 38 percent of the anticipated reductions.

2012
San Rafael Downtown Station Area Plan
The Downtown Station Area Plan was a response to the construction of the SMART commuter rail line, and designation of Downtown as a Priority Development Area (PDA). It looked at opportunities for Transit-Oriented Development around the proposed SMART station in Downtown and recognized the potential for intensifying development along the east side

of Highway 101. It laid emphasis on housing, retail and office uses and provided a strategy for the area within a ½-mile radius of the planned SMART station. Guiding principles identified in the plan included fostering a strong sense of place as a gateway to Downtown San Rafael, improving the street network and bicycle/pedestrian connections to promote transit use, enabling new Transit-Oriented development with a mix of uses at higher intensities, and modifying parking and land use regulations to support development.

2017

'Good Design' Guidelines for Downtown

This was an effort by the City to define elements of 'good design' to guide development projects in the pipeline, and to act as a reference for decision makers. The guidelines aimed to address community concerns regarding growth in Downtown by identifying what 'good design' meant for Downtown San Rafael. The goals were to improve the quality of architecture and public spaces within Downtown, enhance existing historic resources and promote environmental sustainability.

2018

San Rafael Bicycle & Pedestrian Master Plan

The Plan identifies five key goals, documents existing bicycle facilities and programs, evaluates collision data and safety countermeasures, and identifies a prioritized list of projects. The Plan calls for a new Downtown East-West Connection, enhancements at Highway 101 Undercrossings, and creation of a class IV protected bikeway on West Tamalpais Avenue.

Ongoing

San Rafael Transit Center Replacement Project

The Golden Gate Bridge Highway & Transportation District (GGBHTD) is the lead agency working to identify a new location for the San Rafael Transit Center, which must be relocated as the planned SMART extension to Larkspur will go through the center of the current site.

Ongoing

Third Street Rehabilitation Project

The City of San Rafael is developing an improvement plan that will include safety enhancements, infrastructure repair, congestion relief, and beautification from Grand Avenue to the west end of Downtown.

2018

Downtown Parking and Wayfinding Study

The study identified existing and future parking needs within Downtown San Rafael and identified parking management strategies that maximize the supply and utilization of Downtown parking spaces. The study also developed viable options for a wayfinding program for vehicles, pedestrians, and bicycles within the Downtown Area.

Zoning Ordinance (Title 14)

The zoning code allocates Downtown zones that reflect the 1993 'Our Vision of Downtown San Rafael' plan. It provides development and use standards, including heights, density, setbacks, parking requirements, permits and procedures.

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Citywide Context

Situated in the North Bay region of the San Francisco Bay Area, San Rafael is the largest city in Marin County and the County seat. Within commuting distance of San Francisco and cities in the East Bay, San Rafael is an important regional employment and cultural center.

San Rafael is a city with a population of 59,000 and covers an area of approximately 22 square miles. Originally inhabited by several Coast Miwok tribes, it derives its present-day name from Mission San Rafael Arcángel, the 20th Spanish mission established in 1817, in what was then the colonial Mexican province of Alta California.

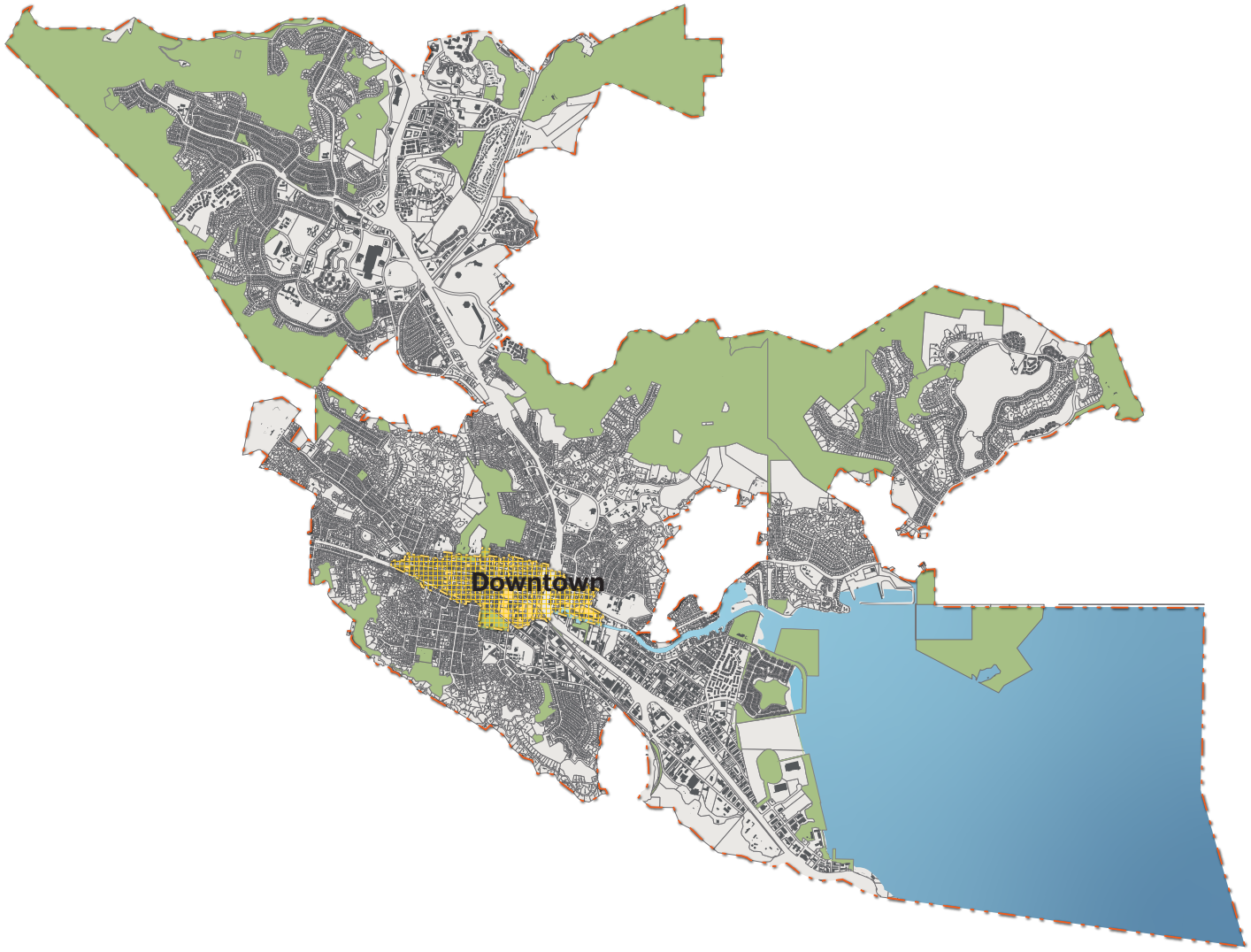
San Rafael is an important employment center in the San Francisco Bay Area, and is well connected to cities within the region. US 101 is the main north-south circulation spine, and I-580 connects it to the East Bay and beyond. The SMART regional train service connecting Santa Rosa to Larkspur passes through San Rafael and has two stations within it.

The natural setting for San Rafael within the North Bay.

Natural Setting

San Rafael has a wide diversity of natural habitats, from forests at the higher elevations to marshland and estuaries. Its riparian areas include the San Rafael Creek and Gallinas Creek corridors. The city has good access to open spaces, beaches and parks, including China Camp State Park, which is a popular regional attraction.

Bound by hills and the San Francisco Bay, parts of the city are susceptible to climate change and face hazards from wildfire, flooding and sea level rise.



Streets and Urban Areas

The City of San Rafael is 22.4 square miles, an area that includes 16.5 square miles of land and approximately 6 square miles of water. Development patterns respond to topographic and environmental features. Downtown San Rafael occupies relatively flat land and has gridded streets, while some streets and development along the canal parallels this waterway. Development in hilly areas typically has curvilinear streets that follow the topography of the hills.

The Downtown Precise Plan encompasses 265 acres (0.4 square miles) and represents less than 3 percent of the city's land area.

Legend

- Parks and Open Space
- Building Footprints
- Project Area
- City Boundary

Scale 1" = 3000'

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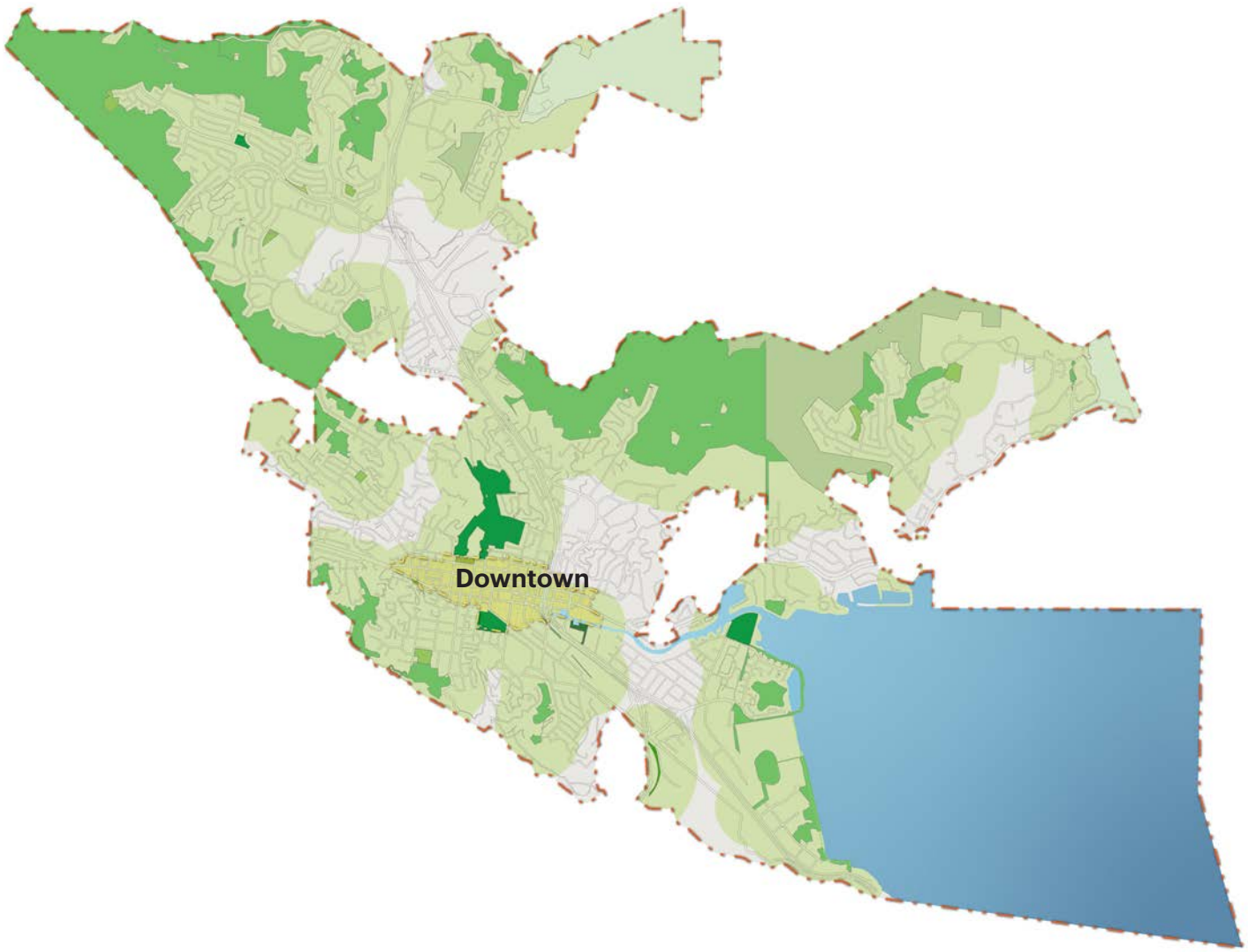


Citywide Access to Parks and Open Space

San Rafael includes a wealth of parks and open space. State parks and regional parks at the edge of the city serve San Rafael residents while also drawing regional visitors. Community parks and neighborhood parks are distributed throughout San Rafael and help provide proximate access to open space for most residents. A majority of the city is within a 1/4 mile (5-minute walk) radius of a park or open space.

Legend

- Open Space
- State Park
- Regional Park
- Community Park
- Neighborhood Park
- 5-Minute Pedestrian Walk Radius
- Project Area
- City Boundary

Scale 1" = 3000'

N

0 *3000'* *6000'*

Primary Circulation

San Rafael is situated in the heart of Marin County, at the crossroads of Highway 101 and Interstate 580.

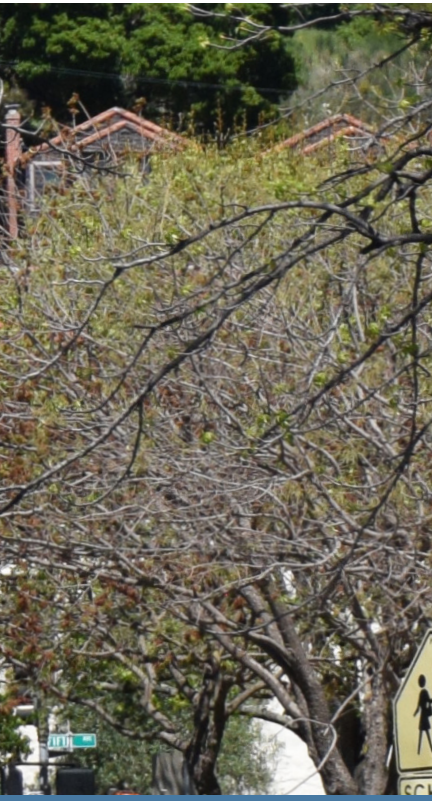
Legend

- SMART Train Line
- SMART Train Stop
- Highway
- Bus Route
- Bike Lane
- Project Area
- Transit Center
- City Boundary

Scale 1" = 3000'

N

0 *3000'* *6000'*



CHAPTER 2

Historic Resources

This chapter provides information on historic resources in the Downtown Precise Plan Area.

In this chapter

Historical Context

Once the site of several Coast Miwok villages, San Rafael has evolved and adapted to socio-political changes from the early 1800s to the present. Today, as one of the major cities in Marin county, San Rafael plays a prominent economic and cultural role within the region.

Historical Context

The area that is now the City of San Rafael was once the site of several Coast Miwok villages, including the village of Nanaguani along San Rafael Creek, inhabited by the Aguasto[1] tribe. In 1817, Mission San Rafael Arcangel was founded as the 20th of 21 Spanish missions in the Spanish colonial province of Alta California. Originally planned as an asistencia (hospital) for Native Americans who became ill at Mission Dolores in present day San Francisco, Mission San Rafael Arcangel gained full mission status in 1822[2]. Following the secularization of Spanish missions in 1833, the mission was placed under the control of administrators. In 1837, Timothy Murphy was appointed as administrator, and by 1844, was granted three contiguous parcels that shaped the future boundaries of San Rafael as Murphy's land was eventually devised and portioned into smaller tracts[3].

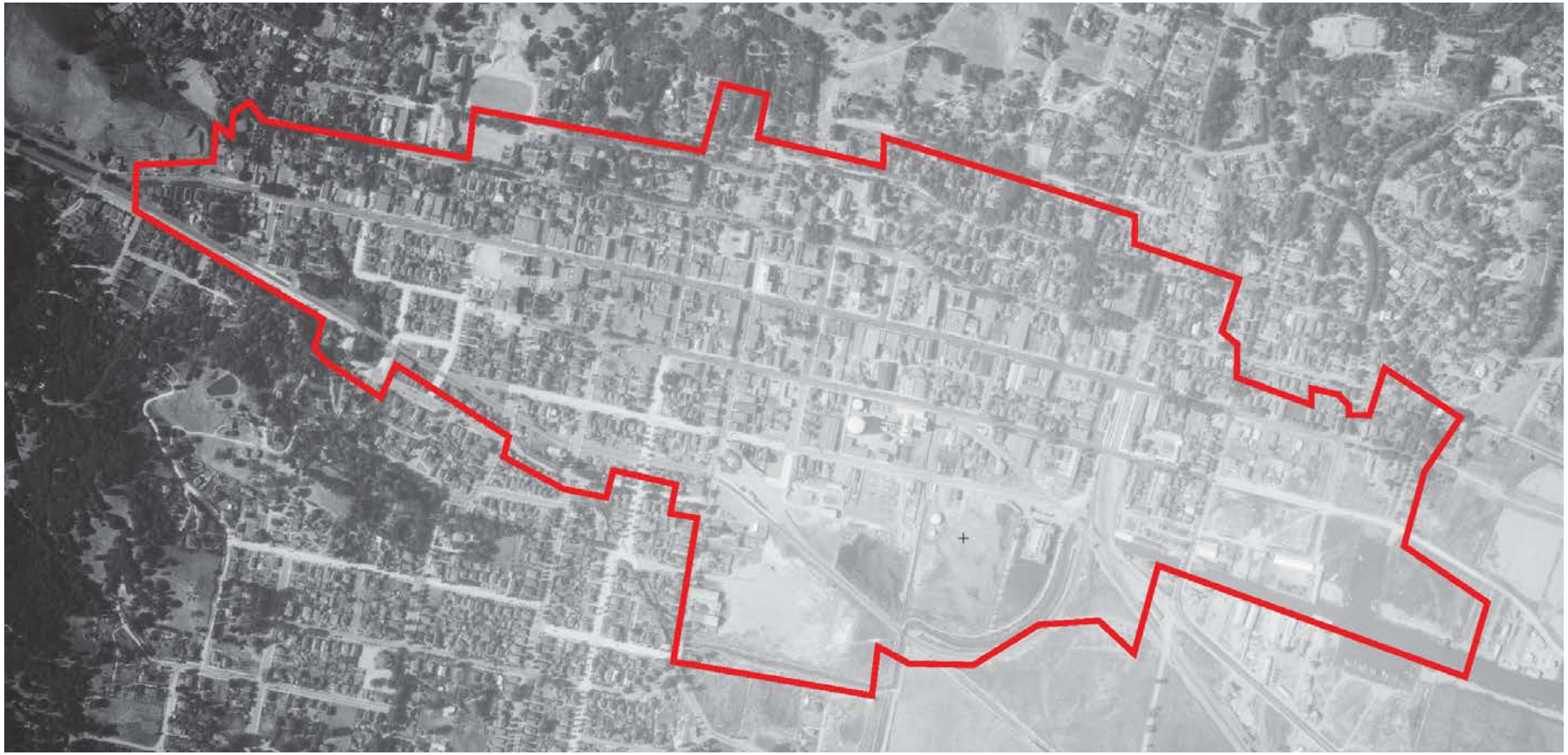
San Rafael grew gradually after California statehood in 1850, and was named county seat in 1851. Following the completion of the Transcontinental Railroad in 1869, the construction of the County Courthouse in 1872, and incorporation in 1874, San Rafael entered a period of accelerated growth. Over the ensuing decades leading into the turn of the twentieth century, the nascent town built out as freight, passenger, and streetcar extensions were completed[4].

The opening of the Golden Gate Bridge in 1937, and the increasing popularity of the automobile, increased connectivity between Marin County and San Francisco, effectively ending the rail transit era as the Great Depression neared its end and World War II dawned[5].

Following the war, housing starts increased, and the Terra Linda and Marinwood neighborhoods were developed on former ranch lands in 1953 and 1955, respectively. In the years immediately after the war, Fourth Street emerged as the main shopping area for Marin County. San Rafael's downtown continued to prosper, as department stores, restaurants, the County Courthouse, and City Hall combined with churches, nearby residences, and emerging postwar industries to define the modern city.

Over the mid-twentieth century, San Rafael's downtown continues to be centered on its Fourth Street commercial corridors, which displays a great variety of period architecture, embodied in its stores, shops, and restaurants. In 2017, Downtown San Rafael was designated as a California Cultural District.

[1]. Marin County History Museum, Images of America: Early San Rafael, (Charleston, CS: Arcadia Publishing, 2008), 9.
[2] "History of San Rafael," San Rafael Chamber, website. Accessed April 24, 2019. http://srchamber.com/history-of-san-rafael/.; and, "History of Mission San Rafael Arcangel," California Missions Foundatin, website. Accessed April 24, 2019. http://californiamissionsfoundation.org/mission-san-rafael/.
[3] Images of America: Early San Rafael, 19.
[4] Images of America: Early San Rafael, 37.
[5] Images of America: Early San Rafael, 37; and, Marin County History Museum, Images of America: Modern San Rafael: 1940-2000, (Charleston, CS: Arcadia Publishing, 2008), 9.

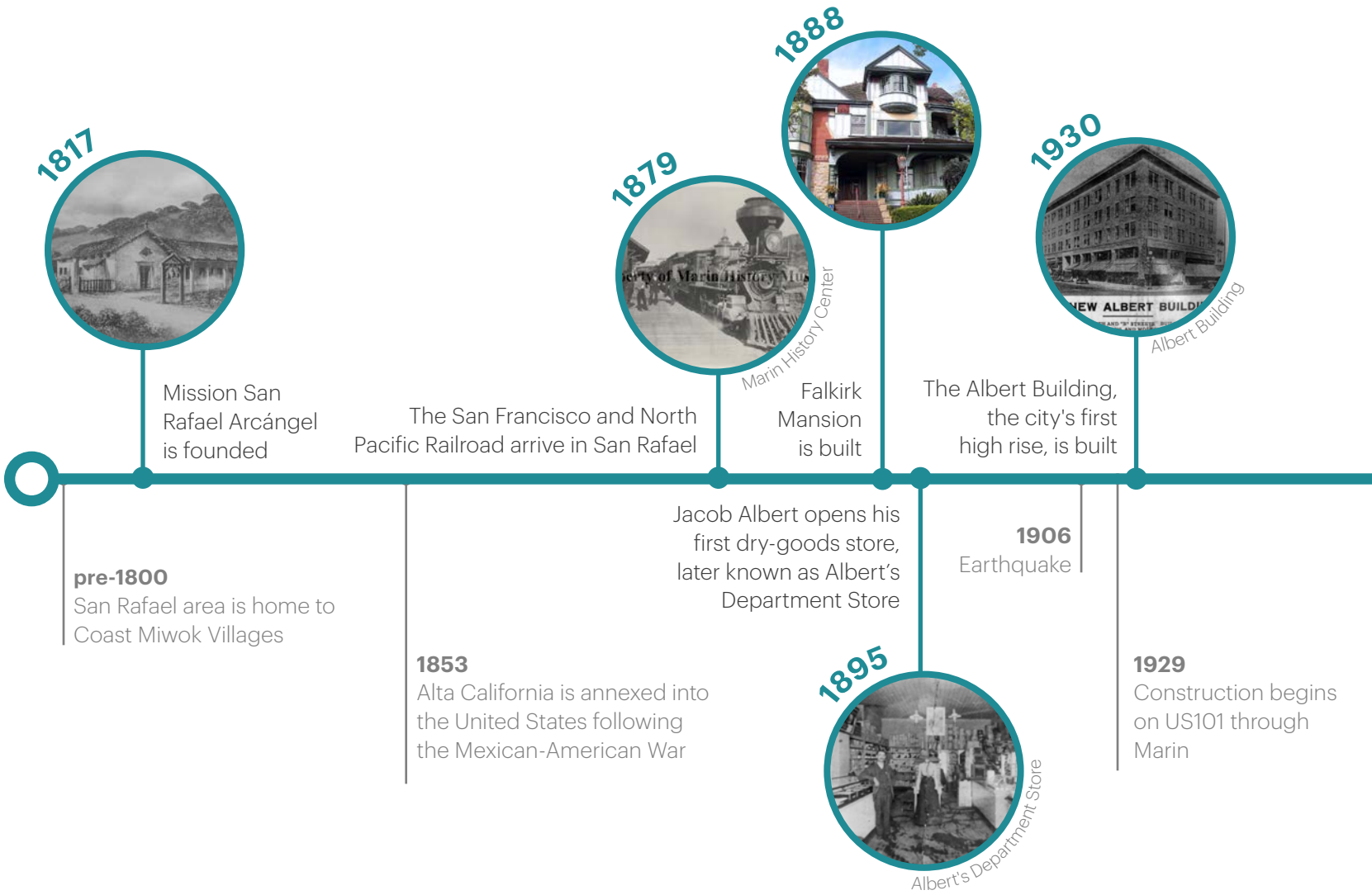


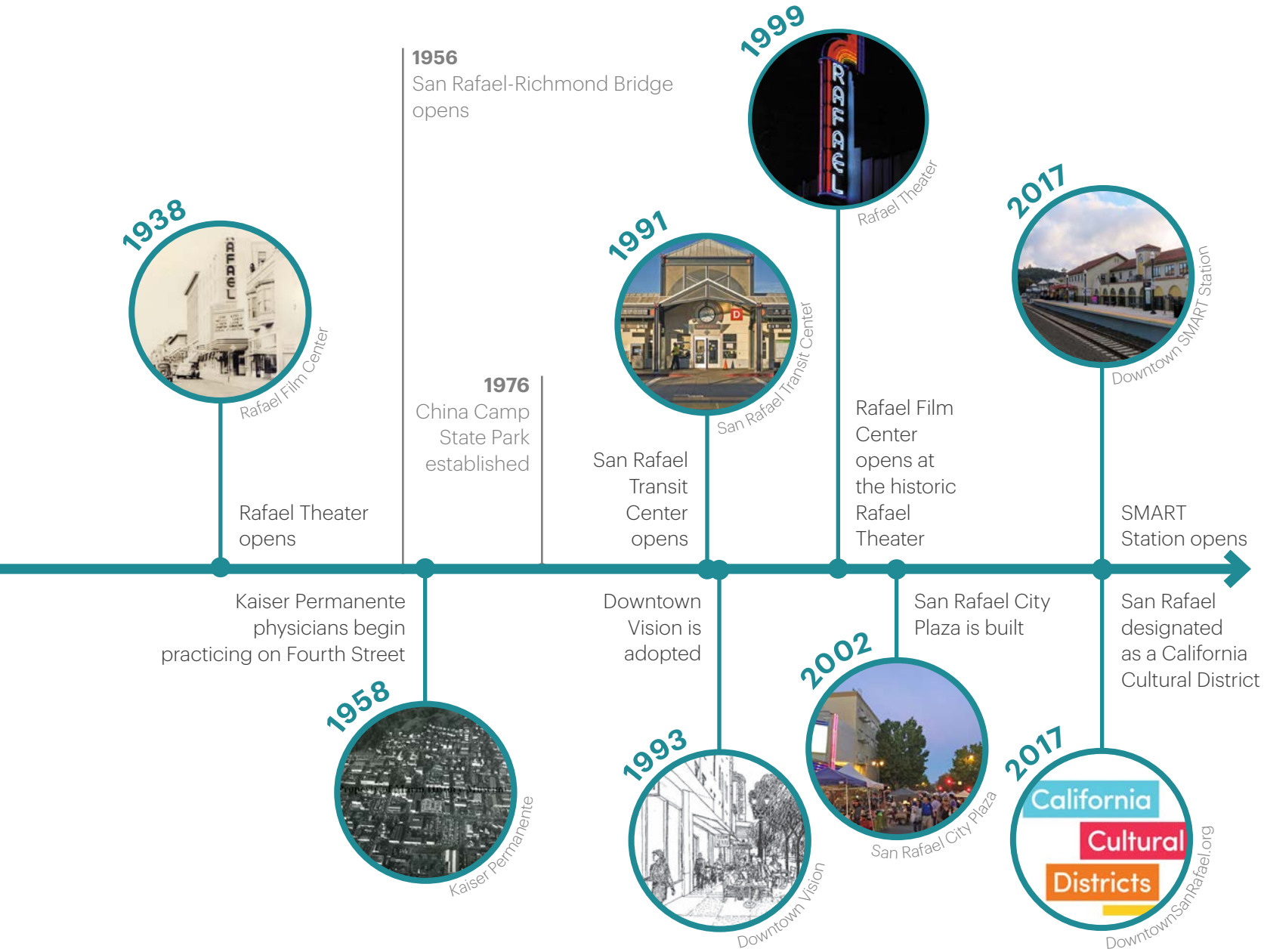
1931 Aerial Photo of Downtown San Rafael

Source: Garavaglia Architecture

Downtown San Rafael: Timeline of Key Events

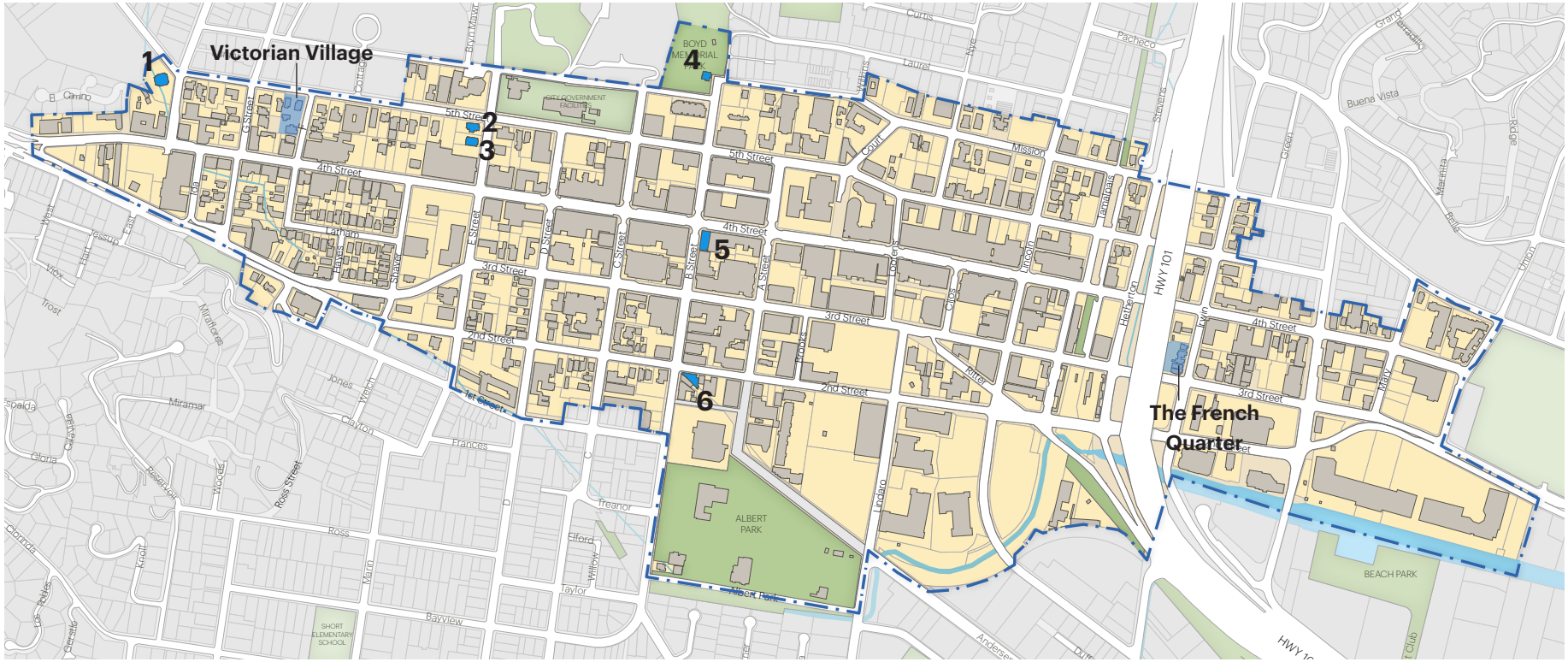
Downtown San Rafael has a 200-year legacy of being the cultural hub of Marin County. Through its significant history, the area has evolved into the commercial core of the City. The timeline below illustrates key events that have shaped both the City and the Downtown area.




1938
Rafael Film Center
Rafael Theater opens
1956
San Rafael-Richmond Bridge opens
1958
Kaiser Permanente
Kaiser Permanente physicians begin practicing on Fourth Street
1976
China Camp State Park established
1991
San Rafael Transit Center
San Rafael Transit Center opens
1993
Downtown Vision
Downtown Vision is adopted
1999
Rafael Theater
Rafael Film Center opens at the historic Rafael Theater
2002
San Rafael City Plaza
San Rafael City Plaza is built
2017
Downtown SMART Station
SMART Station opens
2017
California
Cultural
Districts
DowntownSanRafael.org
San Rafael designated as a California Cultural District

Historic Resources in Downtown

Currently San Rafael has 15 designated local Landmarks, and three historic districts. Among these, six individual resources and two historic districts are within the Downtown Plan Area.



Historic (Local) Landmarks

1. San Rafael Improvement Club (1800 Fifth Avenue)
2. The Chisholm Residence (1505 Fifth Avenue)
3. The Schlosser/Cole Residence (1023 E Street)
4. The Boyd House and Memorial Park (1125 B Street)
5. The Mulberry House (1149 Fourth Street)
6. The Flatiron Building (724 B Street)

Historic Districts

- Victorian Village (1623-1627 Fifth Avenue)
- The French Quarter (901-911 Irwin Street)

Legend

- Project Area Boundary
- Historic Local Landmarks
- Historic Districts

Historic Preservation

The City of San Rafael has developed several policies to protect historic resources. The policies and guidelines conform, for the most part, to California Environmental Quality Act (CEQA) guidelines, and recommendations provided by the California Office of Historic Preservation (OHP). The policies and goals are outlined in the General Plan 2020 document, and in the Historic Preservation Ordinance adopted in 1978 (Municipal Code Chapter 2.18 – Historic Preservation).

San Rafael General Plan 2020

Among the goals developed in the San Rafael General Plan 2020, Goal 28: 'Protected Cultural Heritage' provides an outline of goals for the protection and maintenance of the historic buildings in San Rafael, including:

CA 13. Historic Buildings and Areas
Preserve buildings and areas with special and recognized historic, architectural or aesthetic value including but not limited to those on the San Rafael Historical/Architectural Survey. New development and redevelopment should respect architecturally and historically significant buildings and areas. (CA-13a. Inventory Update.; CA-13b. Preservation Ordinance.; CA-13c. Historic Preservation Advisory Committee.; CA-13d. Public Education.; CA-13e. Preservation Reference Materials.; CA-13f. Public Events.; CA-13g.Public Recognition.)

CA-14. Reuse of Historic Building
Encourage the adaptation and reuse of historic buildings, in order to preserve the historic resources that are a part of San Rafael's heritage. (CA-14a. Historical Building Code.; CA-14b. Zoning.; CA-14c. Incentives.)

While some goals have been realized and achieved, several will need to be addressed in the upcoming work for the General Plan 2040. Recommendations will be included in this chapter to guide the General Plan 2040 development, and implement policies that will further protect and maintain the architectural resources in San Rafael.

Historic Preservation Ordinance

While comprehensive, the City's Historic Preservation Ordinance lacks several ordinance recommendations provide by the California Office of Historic Preservation, including: a provision for creation of a local historic preservation commission and the responsibilities and powers given to that commission; preservation incentives; definition of key terms used in the ordinance.

City policy has been to protect and build upon the historic character that exists in the City. The City adopted a Historic Preservation Ordinance in 1978. The ordinance established guidelines regarding remodeling or demolishing historic buildings. The ordinance is implemented by the Design Review Board and Planning Commission.

The City's Historic Preservation Ordinance (Chapter 2.18 of the Municipal Code) requires Planning Commission review of exterior modifications or demolition of structures listed as Landmarks and those within a Historic District. The City Council has the authority to add or eliminate properties or districts to the Historical/Architectural Survey.

The most notable omission in the Historic Preservation Ordinance is the establishment of a historic preservation commission, outside of the Planning Commission, as individual expertise differs. Recommendations will be included in this chapter to update the Historic Preservation Ordinance, including better alignment of the criteria for landmark designation with the evaluation criteria established by the

National Register of Historic Places (NRHP)/California Register of Historical Resources (CRHR), and permitting procedures for historic resources. The ordinance does not currently reference the Secretary of the Interior's Standards for the Treatment of Historic Properties, which should be considered in developing ordinance language.

Historical/Architectural Survey and Inventory

The initial survey of properties in San Rafael to create an inventory was completed in 1977, and updated in 1986. The resulting San Rafael Historical/Architectural Survey lists approximately 300 properties, including the street address, the common name of the property or building, and a classification of the resource as good, excellent, or exceptional. The list was updated 2017 to include California Historical resource Statue Codes.

Current Efforts

Methodology to Complete Survey/Inventory Update
The current San Rafael Historical/Architectural Survey includes approximately 305 buildings and sites, many of which are located within the DTPP area. As such, Garavaglia Architecture, Inc. (GA) will complete a survey of properties that were not surveyed or evaluated in 1977/86, including those that are now over 50 years old, or were excluded from the 1977/86 survey/inventory. The survey will take place over several days of fieldwork and will include: verification of extant buildings surveyed in 1977/86; initial evaluation of character-defining features and conditions; and photo documentation of the properties.

GA will analyze the findings of the survey, and conduct limited research to evaluate individual properties and potential districts for significance. After the fieldwork is complete GA will develop State of California Department of Parks and Recreation Primary Records and Building Records (DPR523A and DPR523B forms) of the properties in the survey area, including a written evaluation of potential individual and district eligibility.

Following the survey, GA will prepare an analysis of the historic resources, including evaluation of character-defining features, eligible properties and districts, and recommendations and priorities for continued preservation. The recommendations will include new processes and procedures for the protection of historic resources, documentation of the benefits of preservation, and ideas for cost mitigation of historic preservation actions. These types of activities will be considered as complying with (as applicable) The Secretary of the Interior's Standards for the Treatment of Historic Properties.

GA will continue to develop and finalize a methodology with City staff and key historic preservation stakeholders to complete the Historical/Architectural Survey and Inventory update. The methodology will describe evaluation methods and criteria, including observing and documenting each resource and evaluating historic and architectural integrity.

Evaluation
No comprehensive historic context for San Rafael has been developed to date, and so GA will develop a cohesive context for the development of Downtown San Rafael to effectively evaluate the eligibility and integrity of the identified properties. Existing publications on the history of San Rafael, and previously prepared reports on individual properties, will be utilized to continue to develop the context.

Historic Resources: Key Findings

The following reflect the key findings on historic resources that can help guide the upcoming work on the San Rafael Downtown Precise Plan:

Historical/ Architectural Survey

The existing San Rafael Historical/Architectural Survey (1977/updated 1986) is not inclusive of all resources in Downtown San Rafael that are potentially eligible for listing as a local Landmark, or as a resource on the California Register of Historical Resources or the National Register of Historic Places.

Historical Context

A historic context statement is a written document that provides the framework for evaluating a property for its historic significance and integrity. There is currently no single, comprehensive historic context statement for San Rafael, or specifically Downtown San Rafael.

Historic Preservation Ordinance

San Rafael's Historic Preservation Ordinance lacks several ordinance recommendations provide by the California Office of Historic Preservation (OHP), including: a provision for creation of a local historic preservation commission and the responsibilities and powers given to that commission; preservation incentives; and definitions of key terms used in the ordinance.

The missing elements of the Ordinance, along with changing policies, has resulted in a lack of clarity in permitting processes and planning procedures for historic resources.

Historic Preservation Incentives

Comprehensive incentives have yet to be fully developed to support historic preservation in San Rafael.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CHAPTER

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Demographic Profile

This chapter provides information on relevant demographic information, with a focus on the Downtown Precise Plan Area.

In this chapter

Downtown Demographics

The population data below is based on 2010 Census, 2017 American Community Survey, and ESRI Business Analyst data set; some of which are projections.

Population

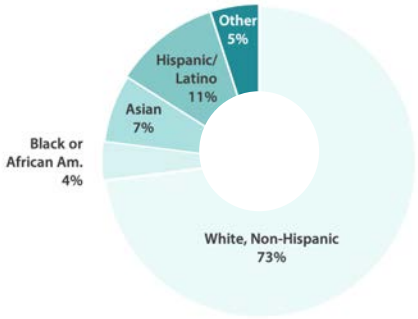
The San Rafael Precise Plan Area (Plan Area) is home to approximately 2,300 residents according to 2018 estimates. (ESRI Business Analyst Data, 2018) The city-wide population is approximately 59,000 residents, making the Plan Area home to nearly 4 percent of the total population in San Rafael. The population in both the Plan Area and city-wide grew slightly from 2010 through 2017. The Plan Area saw an estimated 6 percent growth between that period, while the city-wide population grew by about 3 percent.

Race and Ethnicity

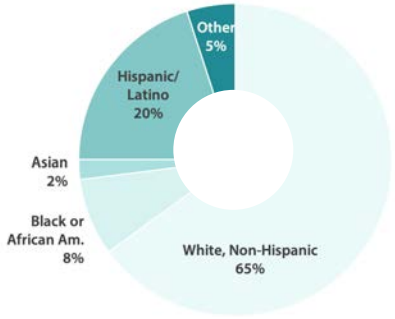
Race and ethnicity data were analyzed across different categories and organized by geographic area and year. Categories used in this analysis included White, Non-Hispanic; Black or African American; Asian; Hispanic or Latino; and Other. The "Other" category includes those listing "Other" as their race as well as those who identify as Native American and/or Pacific Islander; both of which constituted less than 1 percent of the population count.

As demonstrated in the pie chart graphics, findings from this analysis show "White, Non-Hispanic" as the most common race in the Plan Area and city-wide in both 2010 and 2017. A decrease in the percentage of those identifying as "White" was apparent in the Plan Area and city-wide between 2010 and 2017, while the “Hispanic or Latino” category showed a measurable increase.

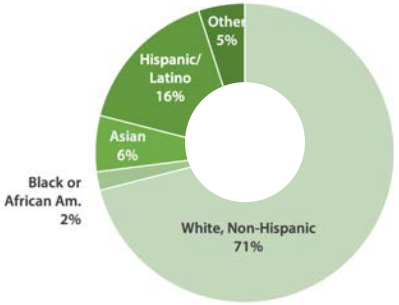
Plan Area Population (2010)



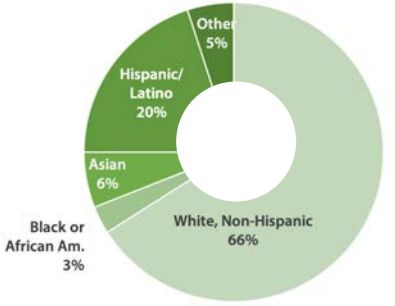
Plan Area Population (2017)



City-wide Race and Ethnicity (2010)



City-wide Race and Ethnicity (2017)



** Source: US Census, 2010 and American Community Survey, 2017*

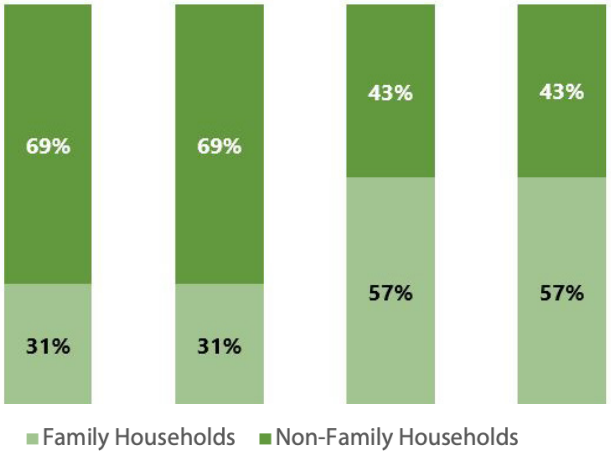
Household Composition

Plan Area and city-wide average household size figures from 2010 to 2017 have remained consistent in both areas, with an average household size of 1.7 in the Plan Area and 2.4 citywide. The data illustrates that the household composition city-wide includes a higher percentage of family-households as compared to the Plan Area.

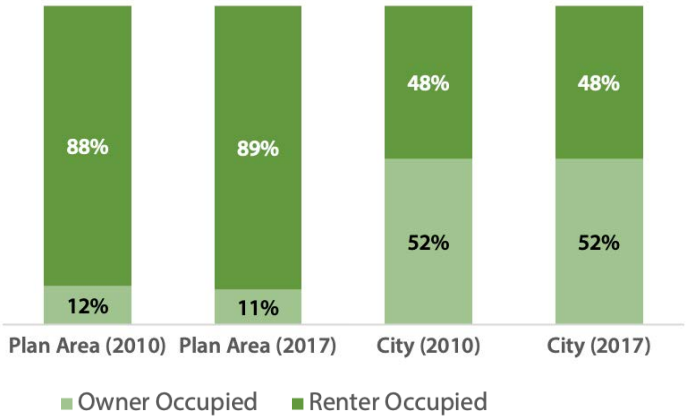
Owner versus Renter Occupied Housing

An analysis of owner occupied versus rental housing statistics shows that city-wide, roughly half of all households are renters, while in the plan area almost nine out of ten households are renters.

Household Composition



Owner vs. Renter Occupied

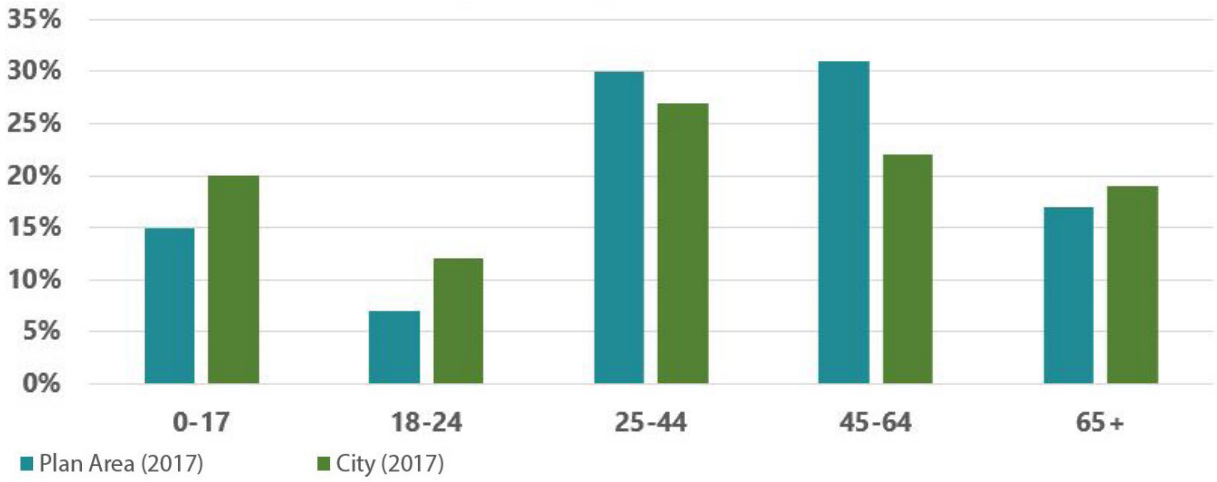


Source: US Census, 2010 and American Community Survey, 2017

Age Distribution

Data on age distribution was grouped by five different age ranges; 17 and younger, 18-24, 25-44, 45-64, and 65 and older. The graphic below illustrates the total number of residents in each age group organized by geographic area (based on ACS 2017 data). The figures show that approximately half the population in both the Plan Area and city-wide fall within the 25-44 and 45-64 combined age groups, with the median age in both the city and Plan Area at around 42. Young adults are the least represented age group in both areas (18-24), with a larger proportion of youth city-wide as compared to the Plan Area. The older adult segment of the community (65+) is consistent at around 15-20 percent of the total population in both areas.

Age Range Distrbution

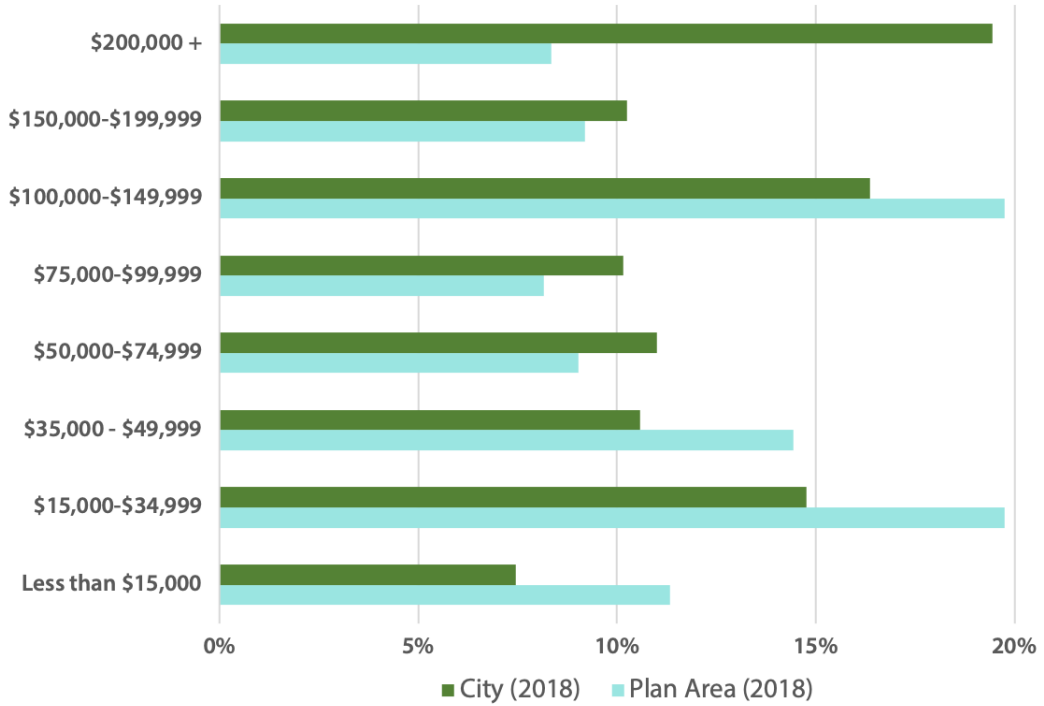


Source: American Community Survey, 2017

Income Distribution and Median Household Income

The available data on income shows that the median household income in the Plan Area is approximately $60,000 as compared to nearly $90,000 citywide. Proportionally, there is a large percentage of households citywide making more than $200,000 per year (20 percent of all households city-wide as compared to 10 percent of households in the Plan Area). The data illustrates that there is a much higher percentage of low income households within the Plan Area compared to city-wide. Almost one-third of the households in the Plan Area have an income of $35,000 or less.

Income Distribution



Source: ESRI Business Analyst, 2018

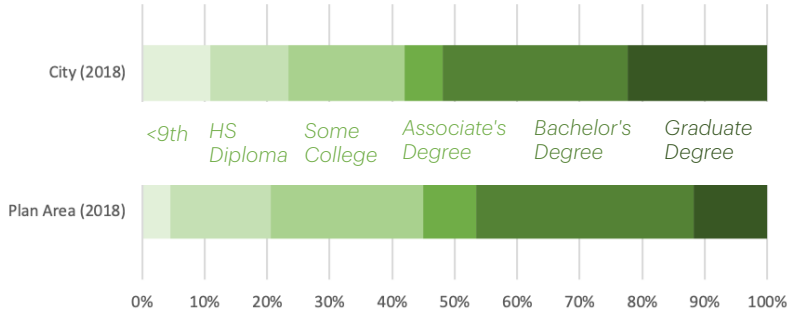
Educational Attainment

The level of education data illustrates that city-wide about a fifth of residents have a graduate or professional degree, compared to a tenth of residents in the Plan Area. The data also shows that the population in the Plan Area is less likely to have a college degree than residents in the city as a whole.

Modes of Transportation and Travel Time to Work

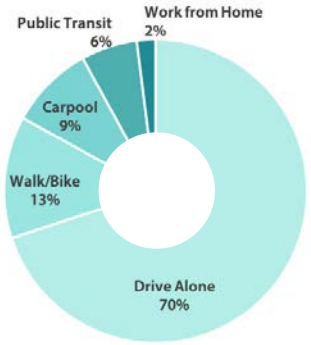
Travel data indicates fairly consistent travel mode and time to work trends between residents in the Plan Area and city-wide. Many work trips are reported to be completed within a 30-minute window for both the Plan Area and city-wide residents, with nearly half of the work trips originating from the Plan Area being less than 15 minutes long. The data shows that residents in the Plan Area are much more likely to walk or bike to work, as compared to residents city-wide.

Educational Attainment

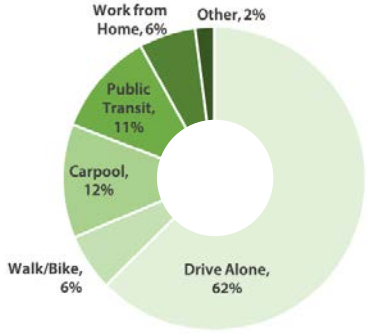


Source: ESRI Business Analyst, 2018

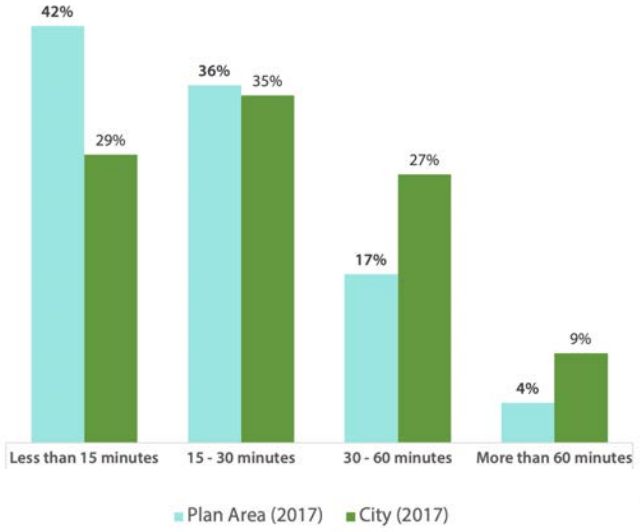
Transportation to Work Plan Area (2017)



Transportation to Work Citywide (2017)

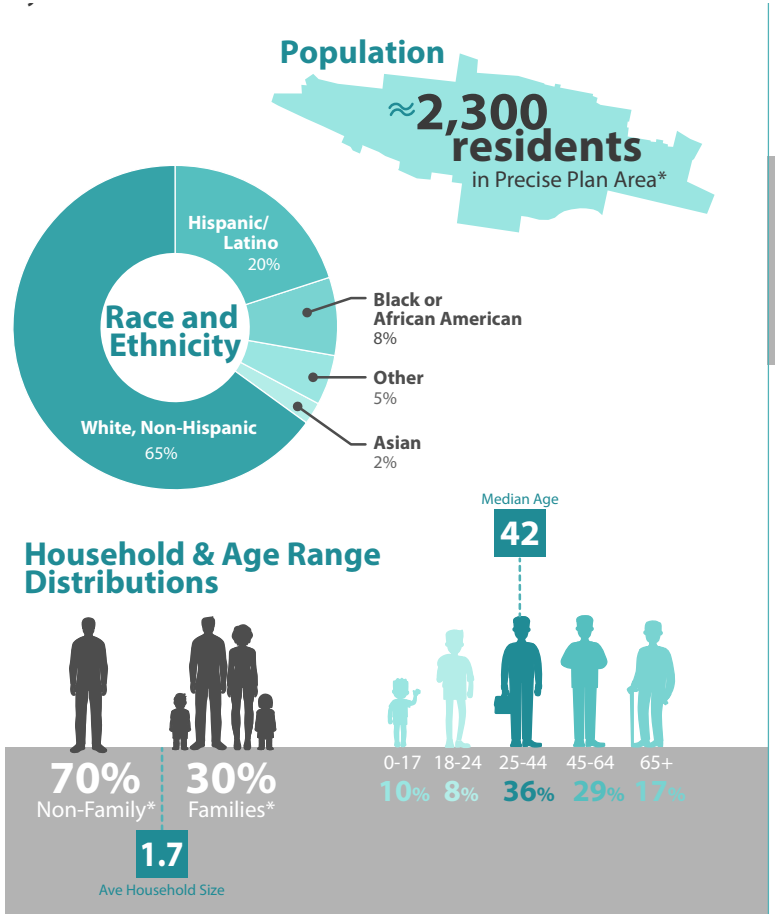


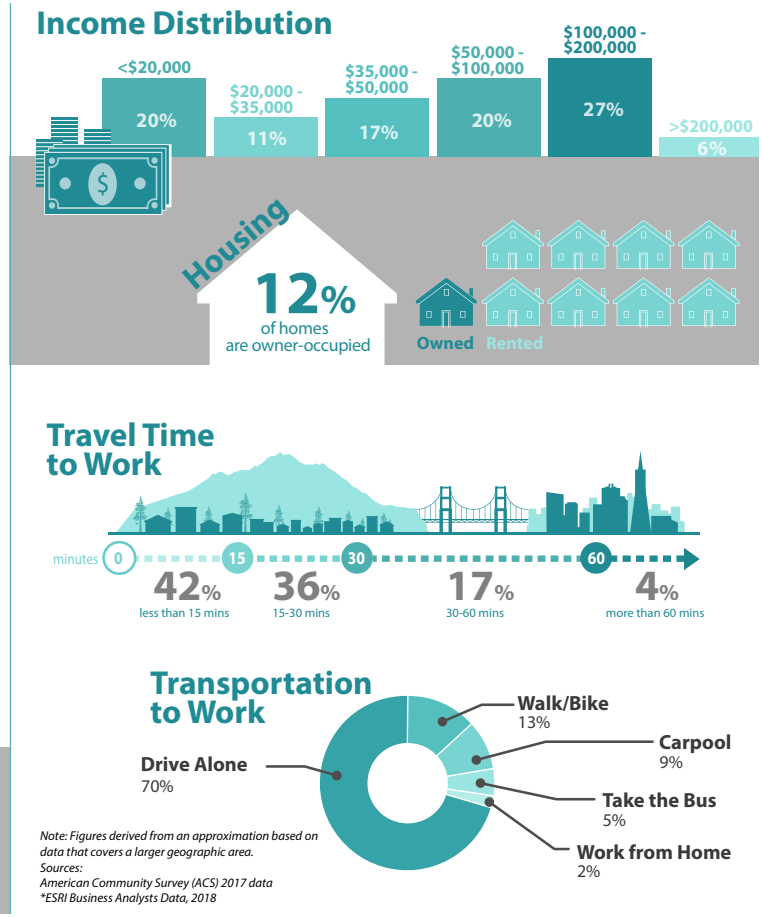
Travel Time to Work: Plan Area and Citywide



Downtown Demographics: Key Findings

The demographic analysis of the San Rafael Downtown Precise Plan Area (Plan Area) was conducted based on site visits, existing surveys and projections, and available mapping data. The analysis includes a comparison between the Plan Area and city-wide demographics to identify general trends from 2010 through 2017/2018. A range of demographic indicators were analyzed, and a summary of the key findings from the latest data available for the Plan Area are illustrated below.





Note: Figures derived from an approximation based on data that covers a larger geographic area.
Sources:
American Community Survey (ACS) 2017 data
**ESRI Business Analysts Data, 2018*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CHAPTER

4

Economic Conditions

This chapter provides information on San Rafael's economy, with a focus on the Downtown Precise Plan Area, including employment and real estate market trends, and evaluates future demand for new residential and non-residential development in the Precise Plan Area.

In this chapter

Jobs and Employment Trends

San Rafael serves as a significant employment node within Marin County, with jobs across a range of industry sectors. The Downtown Precise Plan area accommodates a relatively modest share of the City's overall employment, accounting for approximately 15 percent of total employment in San Rafael, but serves a unique role within the City's economy, with a high concentration of arts, entertainment, and restaurant uses, along with a range of office-based businesses.

Jobs by Place of Work

There are approximately 6,700 persons employed in the Downtown Precise Plan area, out of 44,000 workers citywide[1]. San Rafael is a major job center for Marin County, accounting for over one-third of the County's workers by place of work (see Table 4.1). The mix by industry sector in the Precise Plan area is similar to the industry mix in the City and County, with the highest proportion of jobs (approximately one-fifth) is in education, health, and social services industries, and over 10 percent in each of the following sectors: retail trade; professional, scientific, management, administrative, and waste management services; and arts, entertainment, recreation, accommodation, and food services.

Compared to the City and County overall, the Downtown Precise Plan area has a high concentration of workers in finance, insurance, real estate, rental, and leasing as well in arts, entertainment, recreation, accommodation, and food services. Employment in the Precise Plan area consists of a comparatively low proportion of construction and manufacturing employment.

The largest concentration of Downtown workers by occupation is in office-related or retail and food service-related occupations, including management, sales, office and administrative support, finance, and food services. Together, these occupations account for well over half of Downtown employment. These same occupations are also strongly present in the City and County, albeit at a slightly lower level of concentration.

As shown in Figure 4.1 on the next page, the number of jobs in Downtown San Rafael showed a modest increase between 2005 and 2015, with fluctuations during this period in tandem with macroeconomic trends such as the Great Recession. The increase in employment during this period has coincided with decreases in vacancies and increases in rents for commercial space, as San Rafael has experienced relatively little commercial construction activity in recent years (discussed in more detail below). It is possible that a lack of new commercial construction has limited the pace of recent employment growth in San Rafael, while future employment growth could depend on new construction to provide the space needed to accommodate additional workers.

1. Much of the discussion in this and following sections is based on recently released data from the Census Transportation Planning Package for 2012-2016, based on the American Community Survey. Based on an assessment of various sources, this source was deemed to have the best coverage of workers and employed residents. This assessment will be the subject of a forthcoming memorandum.

Industry	Downtown San Rafael (a) #	Downtown San Rafael (a) %	City of San Rafael #	City of San Rafael %	Marin County #	Marin County %
Agriculture, Forestry, Fishing, Hunting, and Mining	40	0.6%	140	0.3%	860	0.7%
Construction	120	1.8%	2,905	6.7%	8,450	6.6%
Manufacturing	160	2.4%	2,060	4.7%	5,555	4.4%
Wholesale Trade	155	2.3%	1,160	2.7%	3,130	2.5%
Retail Trade	815	12.2%	4,910	11.3%	14,260	11.2%
Transportation, Warehousing, and Utilities	100	1.5%	1,770	4.1%	3,365	2.6%
Information	185	2.8%	1,470	3.4%	3,680	2.9%
Finance, Insurance, Real Estate, Rental, and Leasing	780	11.7%	3,310	7.6%	10,320	8.1%
Professional, Scientific, Mgmt., Admin., & Waste Mgmt. Svcs.	1,215	18.1%	7,305	16.8%	22,680	17.8%
Educational, Health and Social Services	1,295	19.3%	8,530	19.6%	26,875	21.1%
Arts, Entertainment, Recreation, Accomm. and Food Svcs.	910	13.6%	3,485	8.0%	13,110	10.3%
Other Services (Except Public Administration)	580	8.7%	3,320	7.6%	9,670	7.6%
Public Administration	340	5.1%	3,200	7.3%	5,390	4.2%
Armed Forces	0	0.0%	4	0.0%	165	0.1%
Total (b)	**6,695**	**100.0%**	**43,569**	**100.0%**	**127,510**	**100.0%**

Table 4.1: Workers by Industry, 2012-2016

Sources: Census Transportation Planning Package, 2012-2016 five-year sample data, Table A202104; BAE, 2019.

Notes:

Estimates are based on data from American Community Survey (ACS) and the Census Transportation Planning Package (which is in turn based on special tabulations of ACS data). Data subject to sampling error, especially for smaller estimates.

(a) For the purposes of analyzing workers, Downtown San Rafael is defined as three Traffic Analysis Zones (TAZs) that encompass most of the non-residential properties in the Downtown area: 00101619, 00101627, and 00101637.

(b) Totals may differ slightly from other sources due to independent rounding.

Table 4.2: Top Five Downtown Worker Occupational Categories, 2012-2016

Sources: Census Transportation Planning Package, 2012-2016 five-year sample data, Table A202106; BAE, 2019.

Occupation of Downtown Workers	Downtown San Rafael		City of San Rafael		Marin County	
	Number	Percent	Number	Percent	Number	Percent
Management	905	13.5%	5,365	12.3%	16,375	12.8%
Sales and Related	900	13.4%	4,955	11.4%	14,530	11.4%
Office and Administrative Support	885	13.2%	5,670	13.0%	14,765	11.6%
Business & Financial Operations Specialists	580	8.7%	2,860	6.6%	8,520	6.7%
Food Preparation and Serving Related	560	8.4%	2,055	4.7%	7,080	5.6%
All Other Occupations	2,869	42.8%	22,645	52.0%	66,250	52.0%
Total (b)	**6,699**	**100.0%**	**43,550**	**100.0%**	**127,520**	**100.0%**

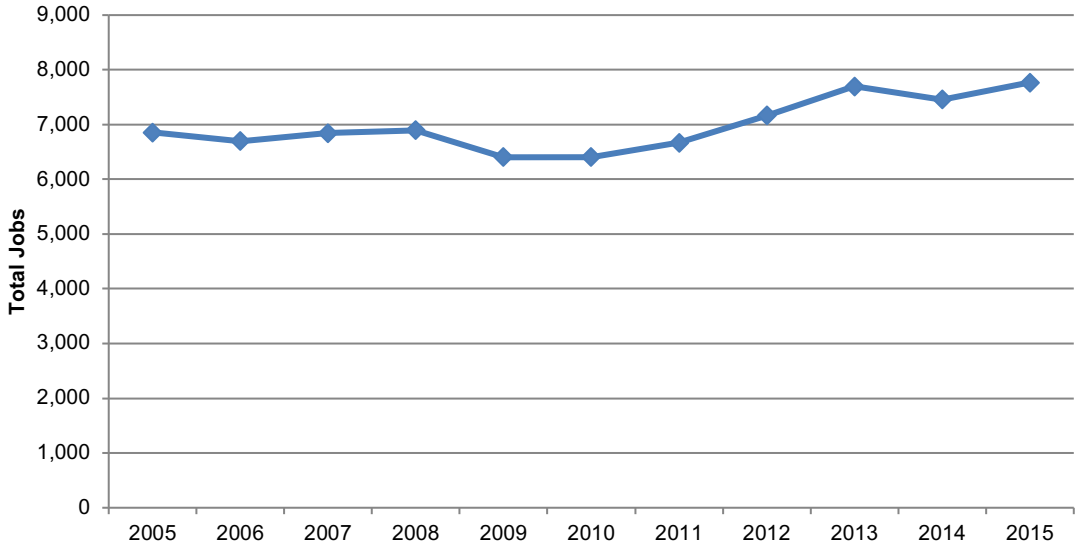
Notes:

(a) For the purposes of analyzing workers, Downtown San Rafael is defined as three Traffic Analysis Zones (TAZs) that encompass most of the non-residential properties in the Downtown area: 00101619, 00101627, and 00101637.

(b) Totals may differ slightly from other sources due to independent rounding.

Figure 4.1: Job Trends by Workplace Geography for Downtown San Rafael

Source: Local Employment and Housing Dynamics, U.S. Census Bureau.



***Note**: Due to source data limitations, the geography covered by the chart in Figure 4.1 varies somewhat from that used in the discussion previously. Furthermore, the methodology for counting jobs is not consistent between the source for this chart and the previous tables.*

Thus, the jobs numbers shown in this chart, while internally consistent and thus useful for showing a trend, should not be compared directly to those based on the American Community Survey and Census Transportation Planning Package.

Venture-Funded Start-Up Activity-

Employment growth in San Rafael, including the Downtown Precise Plan area, has many drivers. One driver of particular importance in the Bay Area region is venture capital-backed enterprises. Companies in San Rafael receive a small share of the region's venture capital. As shown in Table 4.3, fourteen San Rafael-based companies raised just over $97.4 million in angel, seed, and venture capital. This is less than one percent of venture capital raised in the Bay Area during the same time period, however. San Rafael companies that raised private equity in multiple rounds include Byte Foods, EQIS, Ekho, and The Peak Beyond. Start-up firms, particularly those involved with services, software, gaming, and cloud computing typically occupy office space and seek locations with onsite or nearby amenities. Enhancing the vitality of San Rafael's Downtown will position the City to retain and attract more technology and other innovative start-up enterprises.

Business	Funding Type	Funds Raised	Announced Date	Business Description
Byte Foods	Venture	$ 10,400,000	9/27/2018	Manufactures smart vending machines and refrigerators
Centriq Technology Inc	Venture	$ 1,225,000	8/31/2018	Smart home platform
EQIS	Venture	$ 500,000	8/28/2018	Wealth management fintech
MODit 3D Inc.	Pre-Seed	$ 1,300,000	1/15/2018	Smart, automated quality control for manufacturing via 3D scanning
Byte Foods	Seed	$ 1,000,000	11/30/2017	Manufactures smart vending machines and refrigerators
Tablet Command	Venture	$ 314,999	11/14/2017	Tablet based incident and tactical command software
Portico.ai	Seed	$ 600,000	9/28/2017	Employee training through speech recognition & artificial intelligence
Centriq Technology Inc	Venture	$ 4,800,000	6/23/2017	Smart home platform
Nomadic	Seed	$ 6,000,000	6/12/2017	Immersive entertainment, walkable VR adventures
The Peak Beyond	Seed	$ 278,000	5/2/2017	Developer of interactive smart tables for cannabis dispensaries
Byte Foods	Seed	$ 5,500,000	12/28/2016	Manufactures smart vending machines and refrigerators
The Peak Beyond	Funding Round	$ 222,000	9/1/2016	Developer of interactive smart tables for cannabis dispensaries
Worktap	Angel	$ 1,600,000	4/28/2016	Cloud-based on-boarding and engagement
EQIS	Private Equity	$ 15,000,000	2/17/2016	Wealth management fintech
EQIS	Venture	$ 6,210,000	7/17/2015	Wealth management fintech
Ekho	Venture	$ 1,200,000	5/12/2015	Digital advertising development platform
Endurance	Seed	$ 20,000	4/1/2015	Development and sales of lasers, robots, & drones
Telltale Games	Series D	$ 40,000,000	2/24/2015	Develops and publishes interactive episodic video game series
Endurance	Seed	$ 200,000	1/11/2015	Development and sales of lasers, robots, & drones
New Momentum	Venture	$ 950,000	11/5/2014	Develops and provides SaaS based online brand protection
Galcon	Grant	$ 63,095	10/1/2014	Manufacturer of smart monitoring and control irrigation solutions
Ekho	Seed	$ 50,000	10/1/2014	Digital advertising development platform
Total		**$ 97,433,094**		

Table 4.3: Job Venture Capital-Funded Companies 2014-2019 YTD

Source: Crunchbase Inc.; BAE, 2019.

Employed Residents

The San Rafael Downtown Precise Plan area has limited housing relative to the amount of commercial and institutional space, and accordingly has far fewer employed residents than workers. As shown in Table 4.4, there are approximately 1,200 employed residents in the Downtown area, compared to 6,700 jobs.

Downtown shows a high concentration of employed residents in education, health, and social services; this sectoral group accounts for nearly one-fourth of Downtown's employed residents, a higher concentration than citywide or countywide. Relative to the City and County, Downtown also shows a high concentration of employed residents that work in the retail trade and manufacturing industries, which account for 19 percent and 14 percent of employed residents that live in the Downtown Precise Plan area. Downtown has lower proportions of employed residents in finance, insurance, real estate, rental, and leasing jobs or professional, scientific, management, administrative, and waste management services jobs sectors than San Rafael as a whole or the County.

Table 4.4: Employed Residents by Industry, 2012-2016

Sources: Census Transportation Planning Package, 2012-2016 five-year sample data, Table A102105; BAE, 2019.

	Downtown San Rafael (a)		City of San Rafael		Marin County	
Industry	**#**	**%**	**#**	**%**	**#**	**%**
Agriculture, Forestry, Fishing, Hunting, and Mining	0	0.0%	110	0.4%	780	0.6%
Construction	50	4.1%	1,750	6.0%	6,430	5.1%
Manufacturing	165	13.6%	1,395	4.8%	5,905	4.6%
Wholesale Trade	30	2.5%	485	1.7%	3,080	2.4%
Retail Trade	230	19.0%	2,995	10.2%	12,265	9.6%
Transportation, Warehousing, and Utilities	35	2.9%	770	2.6%	3,695	2.9%
Information	24	2.0%	985	3.4%	4,785	3.8%
Finance, Insurance, Real Estate, Rental, and Leasing	20	1.7%	2,330	8.0%	13,175	10.4%
Professional, Scientific, Mgmt., Admin., & Waste Mgmt. Svcs.	70	5.8%	5,540	18.9%	25,695	20.2%
Educational, Health and Social Services	290	24.0%	5,790	19.8%	26,610	20.9%
Arts, Entertainment, Recreation, Accomm. and Food Svcs.	145	12.0%	3,690	12.6%	12,050	9.5%
Other Services (Except Public Administration)	50	4.1%	2,415	8.2%	8,000	6.3%
Public Administration	100	8.3%	1,020	3.5%	4,485	3.5%
Armed Forces	0	0.0%	10	0.0%	220	0.2%
Total (b)	**1,209**	**100.0%**	**29,285**	**100.0%**	**127,175**	**100.0%**

Note:

(a) For the purposes of analyzing employed residents, Downtown San Rafael is defined as two Traffic Analysis Zones (TAZs) that encompass most residential properties in the Downtown area and minimize the capture of non-Downtown residential properties: 00101627 and 00101637.

(b) Totals may differ slightly from other sources due to independent rounding.

Employed residents of Downtown San Rafael are much more strongly concentrated in office and administrative support occupations than residents of San Rafael or Marin County overall. Nearly one-fourth of the employed residents in the Downtown Precise Plan area are in office and administrative support occupations, in contrast to only nine to ten percent city- and countywide (see Table 4.5). The top occupational category for the City and the County is management, followed by sales and related occupations, which is also ranked second for Downtown.

	Downtown San Rafael		City of San Rafael		Marin County	
Occupation	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Office and Administrative Support	270	22.2%	2,705	9.2%	12,370	9.7%
Sales and Related	115	9.5%	3,430	11.7%	15,650	12.3%
Production	105	8.6%	880	3.0%	2,570	2.0%
Management	95	7.8%	3,855	13.2%	21,350	16.8%
Personal Care and Service	95	7.8%	1,340	4.6%	5,415	4.3%
All Other Occupations	534	44.0%	17,085	58.3%	69,820	54.9%
Total (b)	**1,214**	**100.0%**	**29,295**	**100.0%**	**127,175**	**100.0%**

Table 4.5: Top Five Downtown Employed Resident Occupational Categories, 2012-2016

Sources: Census Transportation Planning Package, 2012-2016 five-year sample data, Table A102107; BAE, 2019.

Note:

(a) For the purposes of analyzing employed residents, Downtown San Rafael is defined as two Traffic Analysis Zones (TAZs) that encompass most residential properties in the Downtown area and minimize the capture of non-Downtown residential properties: 00101627 and 00101637.

(b) Totals may differ slightly from totals in other tables due to independent rounding.

Commute Flows

Over 60 percent of persons working in Downtown San Rafael live within Marin County, with over one-quarter coming from within San Rafael itself (see Table 4.6). Only a very small percentage lives within the Downtown area itself. The remaining workers commute in from a variety of other locations. Aside from Marin County, Sonoma County provides the most workers, accounting for approximately 10 percent of all Downtown San Rafael workers.

Table 4.6: Commute Flows, Downtown San Rafael, 2012-2016

Sources: 2012-2016 five-year sample data from Census Transportation Planning Package Table A302100 and American Community Survey 2012-2016; BAE, 2019.

Places of Residence for Downtown San Rafael Workers (a)			**Places of Work for Downtown San Rafael Employed Residents** (b)		
	Workers			**Employed Residents**	
Place of Residence (c)	**Number**	**Percent**	**Place of Work** (c)	**Number**	**Percent**
Alameda County, CA	280	4.2%	Alameda County, CA	15	1.2%
Contra Costa County, CA	451	6.7%	Contra Costa County, CA	10	0.8%
Marin County, CA	**4,164**	**62.1%**	**Marin County, CA**	852	**70.1%**
San Rafael	*1,860*	*27.8%*	*San Rafael*	*410*	*33.7%*
Downtown San Rafael (b)	*104*	*1.6%*	*Downtown San Rafael (a)*	*104*	*8.6%*
Other San Rafael	*1,756*	*26.2%*	*Other San Rafael*	*306*	*25.2%*
Napa County, CA	-	0.0%	Napa County, CA	0	0.0%
San Francisco County, CA	390	5.8%	San Francisco County, CA	225	18.5%
San Mateo County, CA	95	1.4%	San Mateo County, CA	0	0.0%
Santa Clara County, CA	15	0.2%	Santa Clara County, CA	0	0.0%
Solano County, CA	263	3.9%	Solano County, CA	0	0.0%
Sonoma County, CA	689	10.3%	Sonoma County, CA	45	3.7%
All Other Locations	353	5.3%	All Other Locations	68	5.6%
Total Workers (d)	**6,700**	**100.0%**	**Total Employed Residents** (d)	**1,215**	**100.0%**

Notes:

Estimates are based on data from American Community Survey (ACS) and the Census Transportation Planning Package (which is in turn based on special tabulations of ACS data). Data subject to sampling error, especially for smaller estimates.

(a) For the purposes of analyzing workers and evaluating Downtown San Rafael as a place of work, Downtown San Rafael is defined as three Traffic Analysis Zones (TAZs) that encompass most of the non-residential properties in the Downtown area: 00101619, 00101627, and 00101637.

(b) For the purposes of analyzing employed residents and evaluating Downtown San Rafael as a place of residence, Downtown San Rafael is defined as two Traffic Analysis Zones (TAZs) that encompass most residential properties in the Downtown area and minimize the capture of non-Downtown residential properties: 00101627 and 00101637.

(c) Due to limitations of the available source data, the County-level data are only inclusive of incorporated places and census-designated places (CDPs) for all counties except Marin and San Francisco. Data for those two counties are all-inclusive.

(d) Totals may differ slightly from other sources due to independent rounding.

Of the approximately 1,200 employed residents in Downtown San Rafael, over 70 percent work within Marin County, with one-third working within San Rafael itself. Less than 10 percent work Downtown. Outside of Marin County, San Francisco is the major destination, providing the workplace for approximately 19 percent of Downtown residents.

As shown in Table 4.7, commute patterns for persons working in San Rafael are similar to those for the Downtown, with 57 percent of workers commuting from within Marin County and San Rafael, and with Sonoma County as the next most common county of residence.

Also mirroring the pattern for Downtown, a large majority of employed San Rafael residents work within Marin County, with nearly 40 percent working within the City itself. Over 18 percent of San Rafael's working residents work in San Francisco, with the remainder employed at locations scattered throughout the Bay Area and beyond.

Table 4.7: Commute Flows, City of San Rafael, 2012-2016

Sources: 2012-2016 five-year sample data from Census Transportation Planning Package Table A302100 and American Community Survey 2012-2016; BAE, 2019.

Places of Residence for San Rafael Workers			Places of Work for San Rafael Employed Residents		
	Workers			Employed Residents	
Place of Residence	**Number**	**Percent**	**Place of Work** (a)	**Number**	**Percent**
Alameda County, CA	1,955	4.5%	Alameda County, CA	1,115	3.8%
Contra Costa County, CA	4,040	9.3%	Contra Costa County, CA	447	1.5%
Marin County, CA	24,890	57.1%	**Marin County, CA**	**20,436**	69.8%
San Rafael	*11,620*	*26.7%*	*San Rafael*	*11,620*	*39.7%*
Napa County, CA	665	1.5%	Napa County, CA	25	0.1%
San Francisco County, CA	2,225	5.1%	San Francisco County, CA	5,325	18.2%
San Mateo County, CA	350	0.8%	San Mateo County, CA	289	1.0%
Santa Clara County, CA	70	0.2%	Santa Clara County, CA	234	0.8%
Solano County, CA	2,490	5.7%	Solano County, CA	95	0.3%
Sonoma County, CA	5,920	13.6%	Sonoma County, CA	675	2.3%
All Other Locations	960	2.2%	All Other Locations	644	2.2%
Total Workers (b)	**43,565**	**100.0%**	**Total Employed Residents** (b)	**29,285**	**100.0%**

Note:

Estimates are based on data from American Community Survey (ACS) and the Census Transportation Planning Package (which is in turn based on special tabulations of ACS data). Data subject to sampling error, especially for smaller estimates.

(a) Due to limitations of the available source data, the County-level data for place of work are only inclusive of incorporated places and census-designated places (CDPs) for all counties except Marin and San Francisco. Data for those two counties are all-inclusive.

(b) Totals may differ slightly from other sources due to independent rounding.

Retail Trends

Since 2009, retail sales in San Rafael, Marin County, and the Bay Area have increased as the economy grew out of the last recession. On an inflation-adjusted basis, taxable retail sales[2] increased 22 percent between 2009 and 2017 in San Rafael, with an increase of 15 percent for Marin County and 25 percent for the nine-county Bay Area region. However, sales levels peaked in San Rafael and the County in 2014, with small declines between 2014 and 2017, while sales levels in the Bay Area have been flat. The decreases in San Rafael and Marin County may reflect increasing impacts of online shopping on local retail sales.

Although the Downtown Precise Plan area accounts for an estimated 35 percent of the City's retail square footage, according to data from CoStar provided below, the Precise Plan area accounts for a substantially lower proportion of citywide taxable sales. This low share is accounted for by the large-format retailers that are located outside of the Downtown Precise Plan Area along Highway 101 to the north, along Highway 101 and Francisco Boulevard West to the south, and along Interstate 580 and Francisco Boulevard East also to the south.

Table 4.8: Taxable Retail Sales Trends, 2009-2017

Sources: CA State Board of Equalization; CA Department of Tax and Fee Administration; CA Department of Finance; CA Department of Industrial Relations; U.S. Bureau of Labor Statistics; BAE, 2019.

Sales in 2017 $000 (a) (b)

Year	San Rafael	Marin County	Bay Area
2009	$1,200,683	$3,392,368	$80,039,705
2010	$1,268,956	$3,523,709	$83,372,542
2011	$1,356,940	$3,692,044	$88,453,843
2012	$1,416,221	$3,852,129	$93,415,336
2013	$1,500,071	$4,045,052	$97,755,086
2014	$1,535,739	$4,086,263	$99,461,555
2015	$1,516,794	$4,078,750	$99,609,859
2016	$1,471,195	$3,979,868	$99,006,337
2017	$1,461,443	$3,903,138	$99,806,052
% Change 2009-2017	22%	15%	25%
% Change 2014-2017	-5%	-4%	0%

Notes:

(a) Retail sales have been adjusted to 2017 dollars based on the Bay Area Consumer Price Index, U.S. Bureau of Labor Statistics.

(b) Analysis excludes all non-retail outlets (business and personal services) reporting taxable sales.

2. The State of California publishes annual reports reporting taxable sales by city, county, and statewide. Nontaxable items include most food for consumption at home, prescriptions, and some other items. Sales are reported here in inflation-adjusted 2017 dollars (last year for which data are available).

In 2018, Downtown San Rafael reported approximately $265 million in taxable sales, out of a total of $1.6 billion for the entire city. On an inflation-adjusted basis, taxable sales declined by 15 percent between 2009 and 2018, even as sales citywide increased by 14 percent. As a result, Downtown's share of taxable sales in the City has declined from 19 percent in 2009 to 14 percent in 2018.

While taxable sales overall have declined in Downtown, taxable sales in restaurants in Downtown have increased, especially in the core area Business Improvement District.[3] As a result, restaurants have become a more important component of the Downtown retail mix. The other key major sector reported for Downtown is general consumer goods, which covers a broad range of retail subsectors, excluding automotive-related businesses, food and drug stores, and building materials outlets. However, inflation-adjusted taxable sales in the general consumer goods sector have declined over the last decade, reflecting a general trend of sales moving to online.

***Note**: Taxable sales as shown here include all businesses reporting taxable sales in San Rafael, not just retail and food services. Data for Downtown not available for retail and food services only; citywide, retail and food service sales account for approximately 80 percent of total taxable sales. Sales have been adjusted to 2018 dollars based on the Bay Area Consumer Price Index, U.S. Bureau of Labor Statistics. Data reported are from HdL, and the areas covered are not exactly coterminous with the Precise Plan Area, but most of the businesses in the plan area are within the reporting geography.*

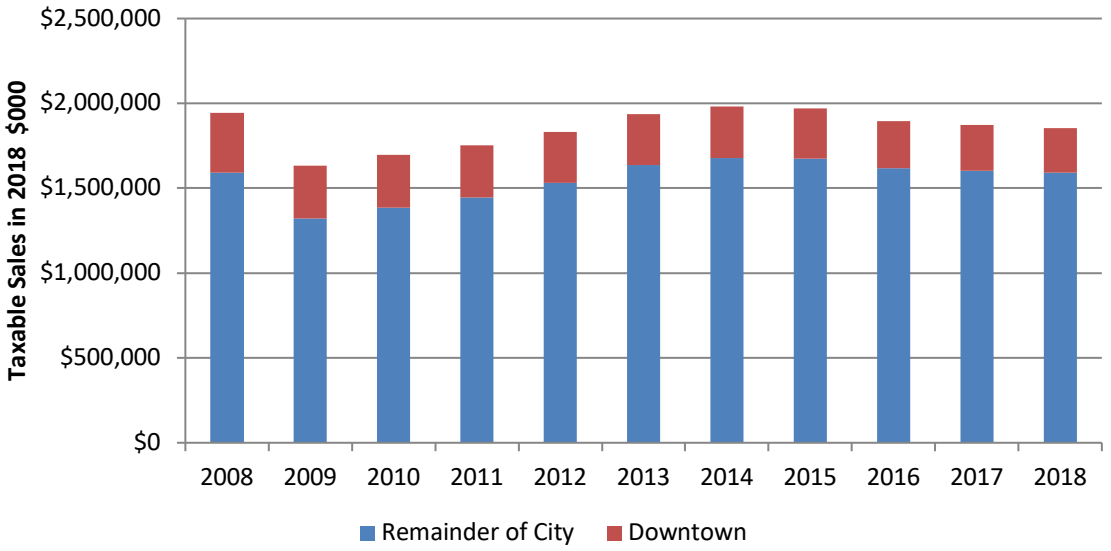


Figure 4.2: Taxable Sales in Downtown San Rafael, 2009-2018

Sources: The HdL Companies; CA State Board of Equalization; CA Department of Tax and Fee Administration; CA Department of Finance; U.S. Bureau of Labor Statistics; BAE, 2019.Labor Statistics; BAE, 2019.

3. Due to confidentiality rules for reporting sale tax data, actual taxable sales data for specific sectors Downtown cannot be reported.

Real Estate Market Trends

This section provides information on real estate market trends in San Rafael and the Downtown Precise Plan area, including inventory characteristics, pricing trends, and vacancy rates. The information provided in this section provides insight into the potential demand for future development of residential, office, retail, industrial, and hotel uses in the Downtown Precise Plan area over the planning period for the Downtown Precise Plan.

Multifamily Rental Market

Multifamily Market Context

The Downtown Precise Plan area has a large number of multifamily rental units, which constitute the majority of the housing stock within the Precise Plan boundaries. While CoStar tracks a total of 545 multifamily rental units in the Precise Plan Area, the total number of units in the Plan Area is somewhat higher than the number tracked by CoStar, in part because many of Downtown San Rafael's existing rental housing stock is in mixed-use buildings with retail on the ground floor and apartments on the second floor. Outside of Downtown, major concentrations of multifamily rental residential are found in the Canal, Gerstle Park, Montecito/Happy Valley, Marinwood, and Terra Linda neighborhoods.

Multifamily Rental Market Conditions

San Rafael has a strong multifamily rental market, including in the Downtown Precise Plan Area, with low vacancy rates and relatively high rents, particularly for new developments and those that have been recently renovated. Among properties tracked by Costar, the average multifamily asking rent in the Downtown Precise Plan Area has steadily increased over the past ten years, from $1,725 per unit per month in 2010 to $2,605 per unit per month in the first quarter of 2019. The average multifamily rent also increased citywide over the past ten years with an average asking rent of $2,194 per month in the first quarter of 2019. During the same period, multifamily rental vacancy rates decreased to less than five percent both citywide and in the Plan Area, signifying strong demand.

Moreover, units in newer multifamily rental properties command rents that are significantly higher than the average for the City and the Precise Plan area. Among the three newest multifamily rental buildings in the Precise Plan area – G Square, Lofts at Albert Park, and San Rafael Town Center – monthly asking rents averaged $3,418 per unit, $3,142 per unit, and $2,503 per month, respectively, as of the first quarter of 2019.

Excluding these buildings, the average multifamily rent in the Precise Plan would be $1,896 per unit per month in the first quarter of 2019. Online listings for available multifamily rental units indicate that recently renovated projects in the Downtown Precise Plan Area rent at rates that are similar to the rental rates for newer properties.

The Downtown Precise Plan Area has experienced very little multifamily rental construction activity over the past ten years. CoStar reports a total of ten new units delivered between the first quarter of 2009 and the first quarter of 2019. San Rafael City staff report that the actual number of new units constructed during this period may be slightly higher than the figure reported by CoStar but even a revised figure would be fewer than 20 units.

Several factors for this lack of housing production emerged from discussions with Downtown Precise Plan stakeholders. Parcels in the Downtown Precise Plan area are generally small and in diverse ownership, making assembly of sites difficult and expensive. In addition, many long-time owners do not wish to sell their property. The difficulty of parcel assemblage, coupled

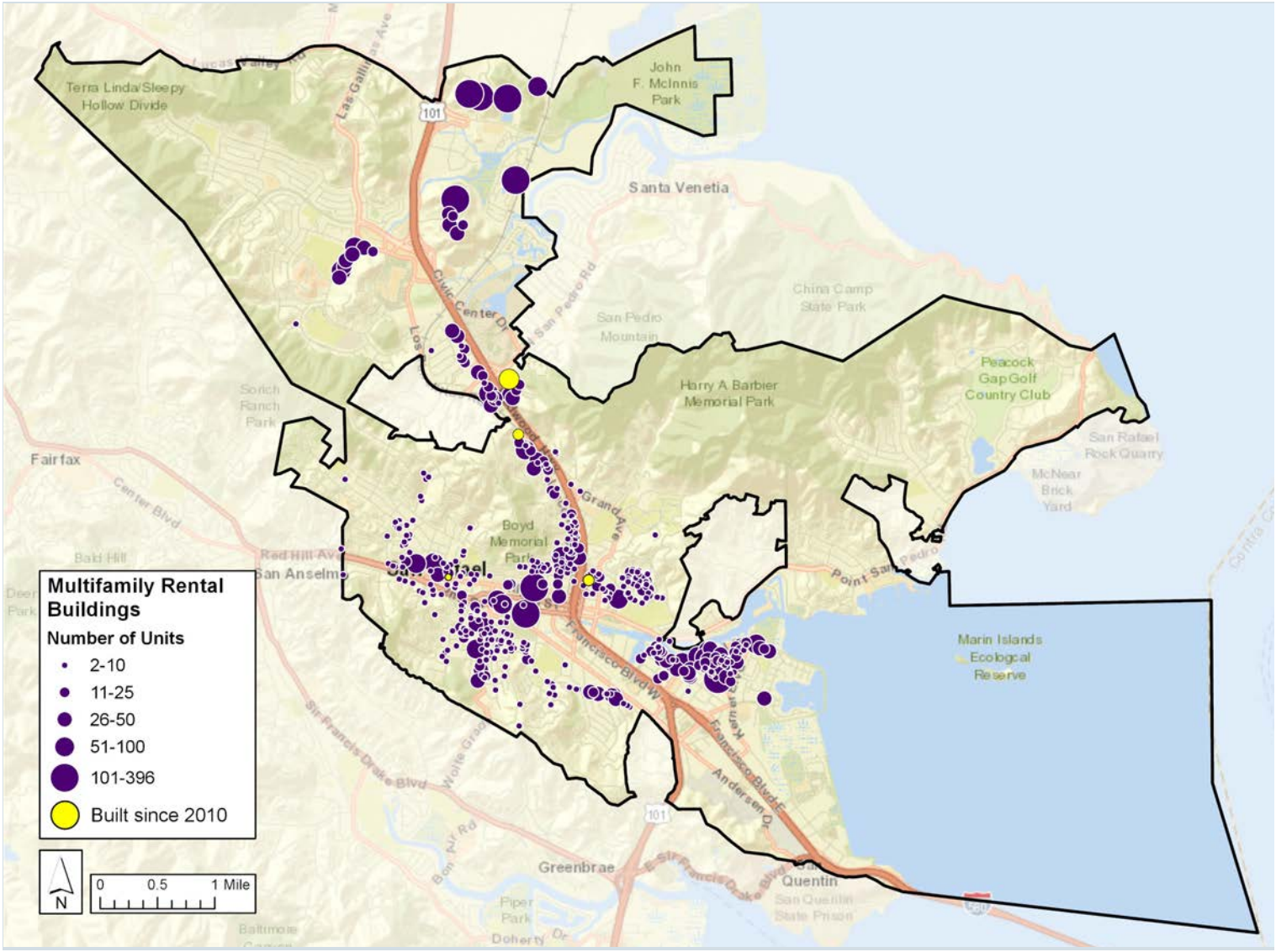


Figure 4.3. Geographic Distribution of Rental Multifamily in Sn Rafael

Sources: CoStar; BAE 2019.

with lengthy planning and environmental reviews, discourage multifamily developers locally, as well as developers active elsewhere in the region, from entering the downtown market.

Further, the structure of the City's inclusionary housing requirements may be working against new multifamily rental housing. The threshold for the 20 percent affordable requirement is 20 or more units, which is often not financially feasible under current market conditions even in the strongest rental submarkets in the region (such as San Francisco and the Peninsula). Construction cost escalations have recently out-paced rental rate increases, creating a squeeze on project margins and rendering many infeasible.

National and Regional Multifamily Trends

Millennials and Immigrants are primary drivers of multifamily rental demand

Households formed by Millennials (born 1985 to 2004) and immigrants are primary drivers of household growth. The Joint Center for Housing Studies at Harvard University reports that millennials are moving into prime housing-formation age which expands the demand for housing units[4] . Due to high housing costs and other factors such as student debt, Millennials have tended to be renters rather than homeowners although surveys show that Millennials desire to own their home in the future. New immigrants have also been a driver of household demand by entering the market to replace native born households that have migrated out of the region,

Table 4.9: San Rafael Multifamily Rental Real Estate Market Snapshot, Q1 2019

Sources: CoStar; BAE, 2019.

Multifamily Summary	Downtown San Rafael	City of San Rafael	Marin County
Vacancy Rate	4.2%	3.6%	3.2%
Avg. Asking Rents, Q1 2018 - Q1 2019			
Avg. Asking Rent, Q1 2018	$2,499	$2,144	$2,399
Avg. Asking Rent, Q1 2019	$2,605	$2,194	$2,492
% Change Q1 2018 - Q1 2019	4.2%	2.3%	3.9%
Under Construction (units), Q1 2019	0	15	15
Deliveries (units), Q1 2009 - Q1 2019	10	108	428

Notes:

Universe is units in market-rate and market-rate/affordable mixed income buildings only.

(a) First quarter 2019 data current as of March 25, 2019.

4. The State of the Nation's Housing 2018, Joint Center for Housing Studies of Harvard University, Figure 14

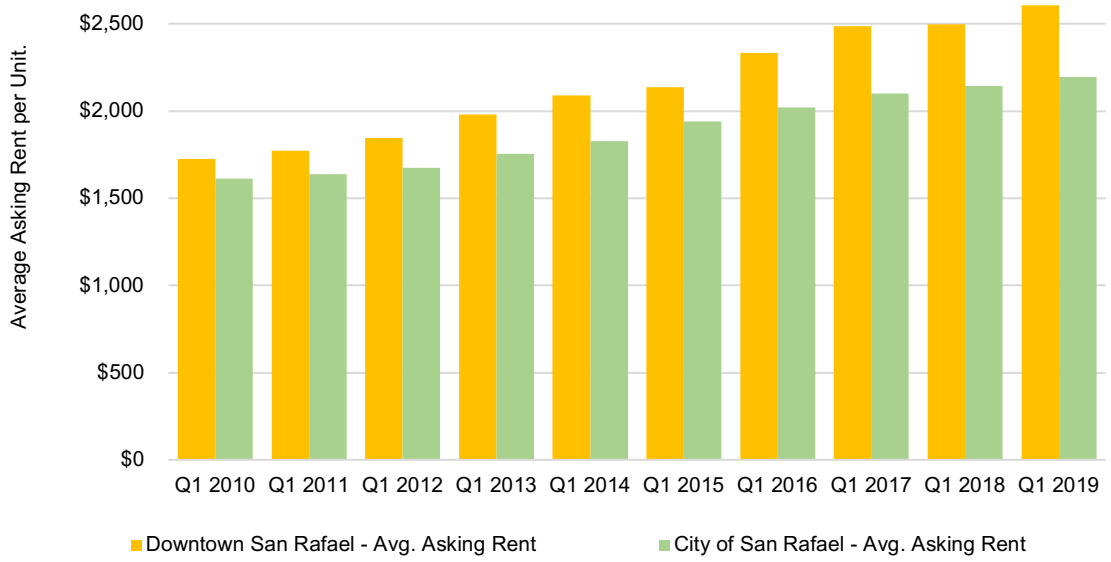


Figure 4.4: San Rafael Multifamily Rental Trends, 2010-2019

Sources: CoStar; BAE, 2019.

***Note**: Universe is units in market-rate and market-rate/ affordable mixed income buildings only.*

(a) First quarter 2019 data current as of March 25, 2019.

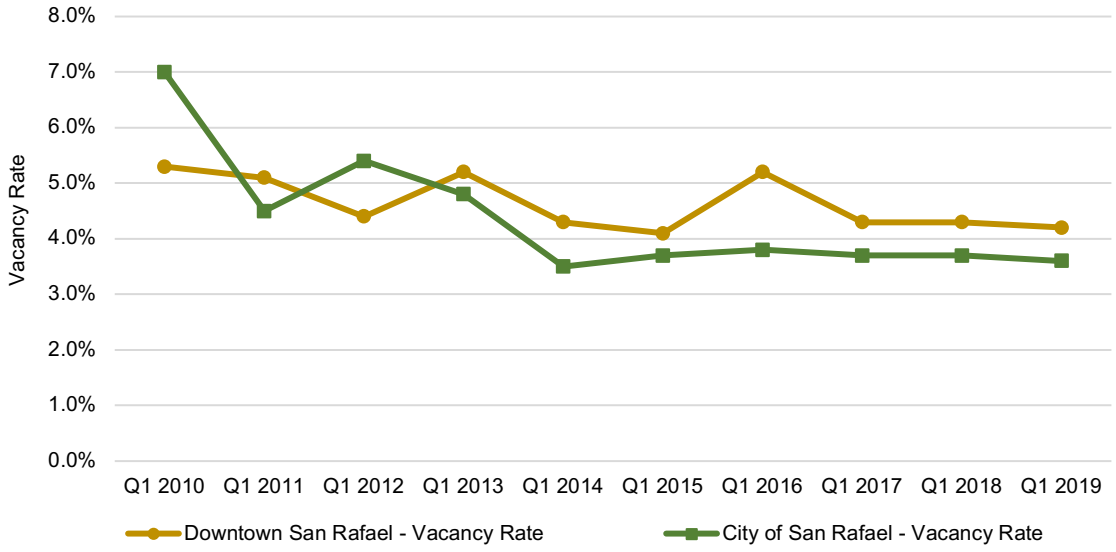


Figure 4.5: San Rafael Multifamily Vacancy Trends, 2010-2019

Sources: CoStar; BAE, 2019.

***Note**: Universe is units in market-rate and market-rate/ affordable mixed income buildings only.*

(a) First quarter 2019 data current as of March 25, 2019.

New market-rate multifamily developments are being targeted to the top of the market with luxury amenities
Primarily due to high construction costs that require top end rents to achieve project feasibility, developers have targeted the upper end of the rental residential market by building luxury, Class A multifamily rental projects. This has been particularly true in the Bay Area which has some of the highest construction costs in the nation coupled with an influx of high-paying technology jobs.

Both younger and older renter households have many shared apartment amenity preferences
Renters are seeking apartments in locations where one can walk to restaurants, retail, and entertainment. Along with standard amenities such as storage, fitness center, pool, and clubrooms, developers are now expanding apartment amenities to include pet-oriented facilities (dog park or pet wash stations), bike storage and repair rooms; yoga studios, secure package delivery rooms, fast speed WiFi in common areas, smart security systems, electric car charging stations, rideshare waiting areas at front entries, rooftop gardens, and sustainable energy and water systems.

There is a severe housing shortage in the region
Since the recovery from the Great Recession began in 2010, the Bay Area has generated approximately 722,000 jobs but has produced only 106,000 units of housing, creating a severe housing shortage with escalating rents and home prices[5]. This may eventually negatively impact the ability of the Bay Area to sustain its economic prosperity.

According to an Urban Land Institute survey of residents, approximately 74 percent of Millennials living in the Bay Area are considering moving out of the region within the next five years[6]. Access to talent and a deep labor pool is a key factor in business location decisions and a key competitive advantage of the Bay Area.

Implications for Multifamily Rental Residential in San Rafael
- Downtown San Rafael offers a walkable environment with retail, entertainment, and other amenities that are attractive to today's renters.
- Increasing rents and low vacancy rates indicate demand for new rental residential in the City and its downtown.
- San Rafael may need to consider policies to facilitate residential development in the Precise Plan area, such as incentives for parcel assembly and streamlining elements of the development review process. Despite high rental rates for new multifamily rental units, residential developers can achieve comparable or higher rents in other Bay Area cities and may be hesitant to pursue complex projects in San Rafael under current market conditions.
- New apartment developments with contemporary design and amenities will attract skilled labor and support the City's efforts to grow jobs locally.
- Due to high local construction costs, developers of market-rate multifamily rental projects will target the top end market.
- The City maintains a robust Below Market Rate (BMR) program that requires developers to include affordable housing units in their residential projects. In projects of two to ten units, developers are required to set aside 10 percent of units as affordable. Projects of 11 to 20 units require as 15 percent set-aside, and projects larger than 20 units require a 20 percent set-aside. In rental projects, half of the affordable units must be made affordable to very low-income households and the other half to low-income households.

5. See CASA COMPACT: A 15-Year Emergency Policy Package to Confront the Housing Crisis in the San Francisco Bay Area January 2019, page 1.
6. Bay Area in 2015: A Survey of the Views on Housing, Transportation, and Community in the Greater San Francisco Bay Area, Urban Land Institute, 2016.

The City Council may permit a developer to pay a fee in lieu of providing affordable units on site; the fee is equal to the projected cost of constructing the affordable units. These requirements are substantial in comparison to those enacted by other jurisdictions in the region, and the costs associated with them may make some projects infeasible.

For-Sale Residential Market

For-Sale Market Conditions

San Rafael has a strong for-sale residential market, located almost entirely in locations outside of the boundaries of the Precise Plan area. Due to the limited for-sale inventory in the Plan area, there is a minimal amount of data on recent single-family home and condominium sales within the Plan area. According to data from ListSource, a private data vendor that compiles data from the County Assessor, there were a total of four home sales in the Precise Plan area between April 1, 2018 and March 31, 2019, all of which were sales of condominiums, with a median sale price of $680,000. Three of the homes sold during this period were constructed in 1981 and the remaining home sold was constructed in 1994, reflecting the lack of new residential construction in the Precise Plan area.

Citywide, home sale prices have increased steadily over the past several years as the market has recovered from the recession, with a citywide median home sale price of $975,000 in 2018, indicating a robust for-sale housing market (this average includes both condominium and single-family home sales). Home sale price trends in San Rafael generally mirrored countywide trends between 2005 and 2018, with the San Rafael median remaining slightly lower than the median for Marin County throughout this period (see Figure 4.6). The median home sale price in San Rafael may be lower than the countywide median in part because of the relatively high share of condominium sales in the San Rafael - 32 percent of all home sales in the City between April 2018 and April 2019.

During this period, the median sale price for condominiums sold in San Rafael was $638,000, while that for single-family homes was $1.16 million. These data indicate robust demand for ownership housing in San Rafael, some of which could potentially be captured in the Downtown Precise Plan Area.

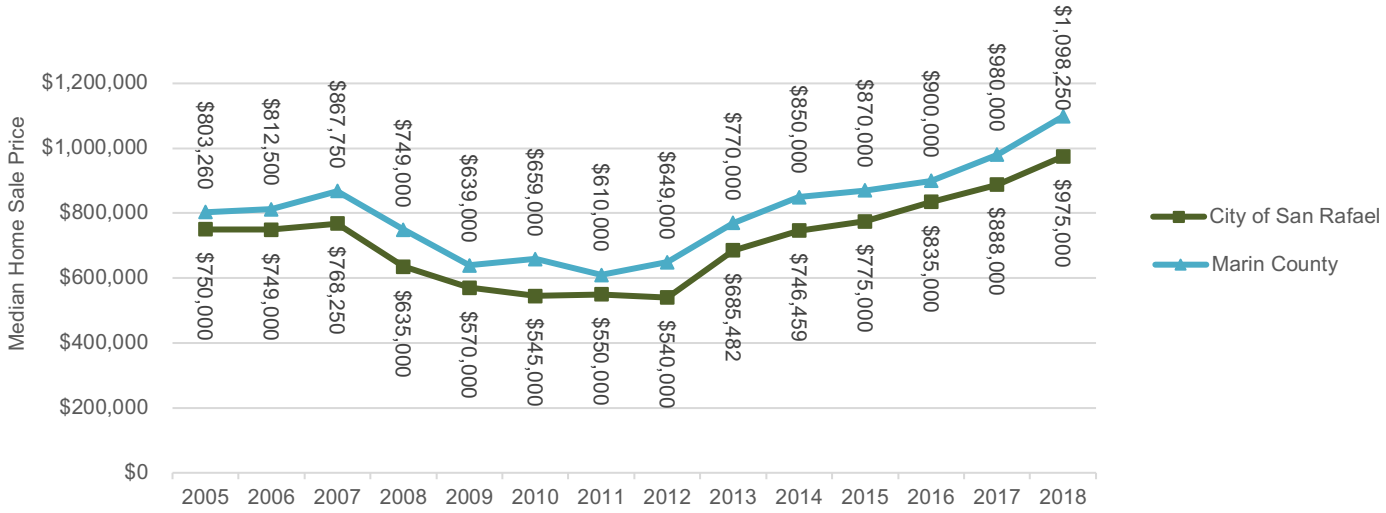


Figure 4.6: Median Home Sale Price, San Rafael and Marin County, 2005-2018

Sources: CoStar; BAE, 2019.

Office Market

Office Market Context

As discussed above, San Rafael is a significant employment node in Marin County, due largely to the strong presence of BioMarin, Autodesk, the County Civic Center, and various smaller office-based businesses in the city. BioMarin currently occupies a significant portion of the office space in downtown San Rafael. The company has applied for City approval to construct an additional 207,000 square feet adjacent to its current location on Second Street. In addition to the larger companies such as BioMarin and Autodesk, demand for office space in San Rafael is generated by a mix of smaller high-tech companies and companies that offer professional services to local businesses and residents.

San Rafael serves as a primary office node within Marin County, accounting for 43 percent of all office space countywide. The office market in Marin County consists of a number of submarkets with varying demand for office space, which is generally reflected in vacancy, lease, and absorption rates. San Rafael's office inventory totals approximately 5.4 million square feet of office space, 1.6 million of which is located within the Downtown Precise Plan boundary, according to data from Costar (see Table 4.10). San Rafael serves as a primary office node within Marin County, accounting for 43 percent of all

Table 4.10: San Rafael Office Real Estate Market Snapshot, Q1 2019

Sources: CoStar; BAE, 2019.

Office Summary	Downtown San Rafael	City of San Rafael	Marin County
Inventory (sf), Q1 2019 (a)	**1,563,012**	**5,356,187**	**12,406,461**
Occupied Stock (sf)	1,483,350	4,897,905	10,652,703
Vacant Stock (sf)	79,662	458,282	1,753,758
Vacancy Rate	5.1%	8.6%	14.1%
Avg. Asking NNN Rents			
Avg. Asking Rent (psf/mo), Q1 2018	$2.89	$2.87	$3.06
Avg. Asking Rent (psf/mo), Q1 2019	$2.92	$2.91	$3.18
% Change, Q1 2018 - Q1 2019	1.0%	1.4%	3.9%
Net Absorption			
One-Year Net Absorption (sf), Q1 2018 - Q1 2019	(18,422)	3,214	(94,614)
Ten-Year Net Absorption (sf), Q1 2009 - Q1 2019	234,419	541,465	(22,900)
New Deliveries (sf), Q1 2009 - Q1 2019	**266,028**	**341,916**	**386,740**
Under Construction (sf), Q1 2019	**0**	**17,091**	**17,091**

Note:

(a) First quarter 2019 data current as of March 25, 2019.

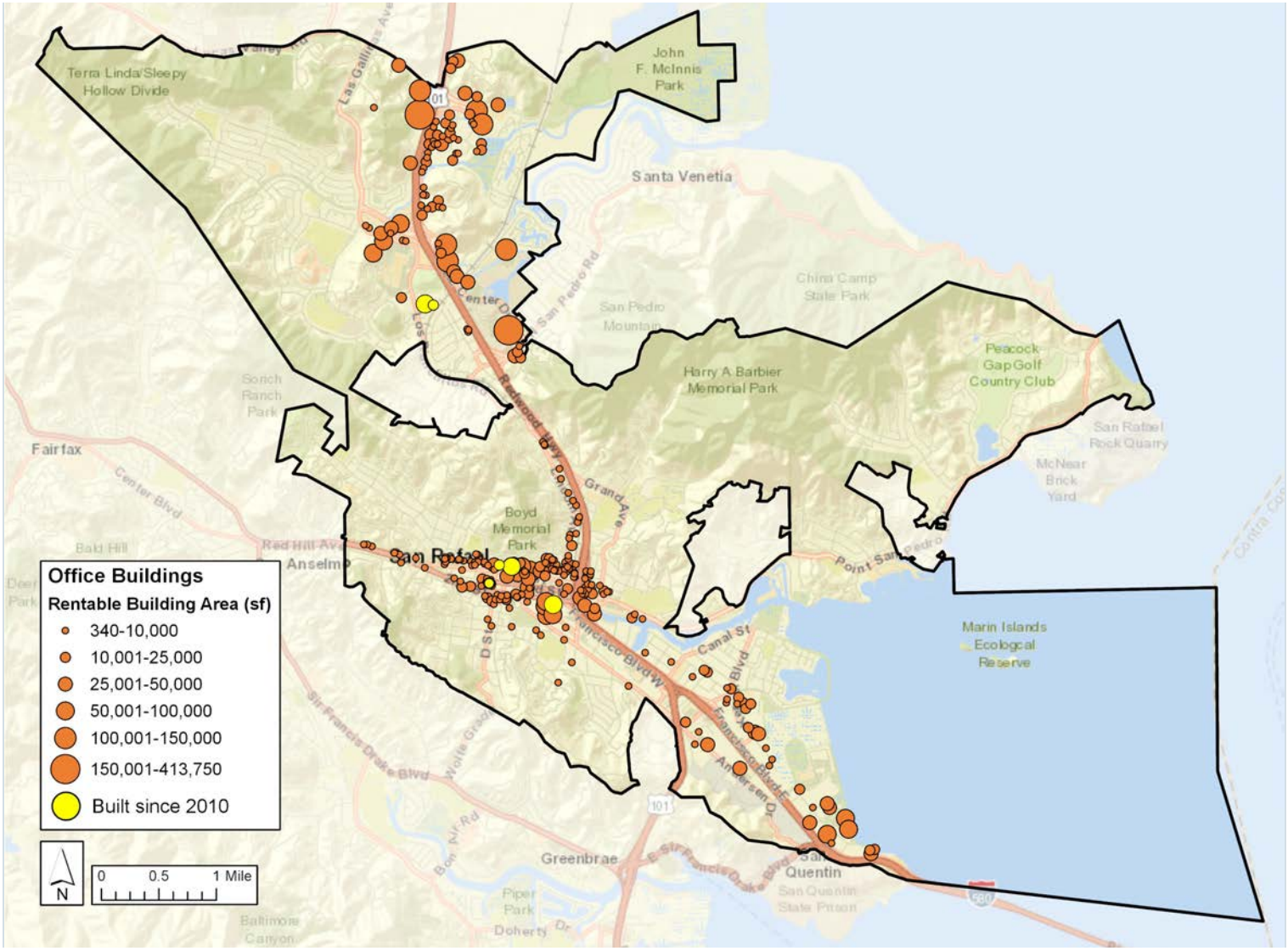


Figure 4.7. Geographic Distribution of Office Inventory in San Rafael

Sources: CoStar; BAE 2019.

office space countywide. The geographic distribution of San Rafael's office inventory is shown in Figure 4.7.

Office Market Conditions

Office real estate market trends indicate potential demand for new office in Downtown San Rafael. Asking rents for office space in the Precise Plan have demonstrated small but steady increases during the past several years, recovering from decreases between 2011 and 2013, and are currently similar to the 2010 average in the Plan Area and the 2019 citywide average, at $2.92 per square foot per month (see Figure 4.8).

Meanwhile, office vacancy rates in the Plan Area have decreased substantially since 2010, and as of the first quarter of 2019 had a 5.1 percent vacancy rate, indicating healthy demand for office space in the Downtown area. Vacancy rates also decreased citywide during this period but remain higher than in the Plan Area at 8.6 percent.

While the average asking rent for office space in San Rafael and the Precise Plan area is lower than the rent needed to support new construction, the market may be stronger for new, Class A office space in the area. According to a local broker, there is strong demand among small and mid-sized professional services firms to locate in Downtown San Rafael. These prospective tenants are attracted to Downtown's strong transportation connectivity and pedestrian amenities relative to other Marin County submarkets.

However, current office spaces in Downtown San Rafael are older and smaller than what most prospective office tenants are seeking. This limits what existing spaces can command in asking rent, driving down the average rent. As of the first quarter of 2019, CoStar tracked 549,001 square feet of Class A office space in the Precise Plan Area, 73 percent of which is in the San Rafael Corporate Center on Lindaro Street and Lincoln Avenue south of Second Street. This property was recently purchased by BioMarin, which occupies most of the square footage, and CoStar does not provide asking rent data for this property.

As of the first quarter of 2019, Costar tracked 549,001 square feet of Class A office space in the Precise Plan Area, 73 percent of which is in the San Rafael Corporate Center on Lindaro Street and Lincoln Avenue south of Second Street. This property was recently purchased by BioMarin, which occupies most of the square footage, and CoStar does not provide asking rent data for this property.

The only Class A property in the Precise Plan area for which Costar does provide asking rent data has a total of 518 square feet of space available. While this space has an asking rent of $2.45 per square foot per month, this rent is not likely to be representative of the rent that a property owner would achieve from a larger, more traditional office space. The Precise Plan area has a low 1.2 percent vacancy rate among Class A office properties, potentially indicating strong demand for additional high-quality office space in the area. A local office broker noted that rents for existing Class A product are approximately $4.00 per square foot (on a full-service basis), and that new, turnkey space could command even higher rents.

Local brokers suggest that new office space be concentrated near the eastern end of Downtown to maximize connectivity to the Downtown San Rafael SMART Station and the freeways. Most prospective tenants are seeking between 2,000 and 5,000 square feet, though firms with larger space needs could be attracted to Downtown and have very limited options in existing buildings. For that reason, brokers recommend that new office developments utilize a 10,000-square-foot floorplate divisible to 2,000 square feet.

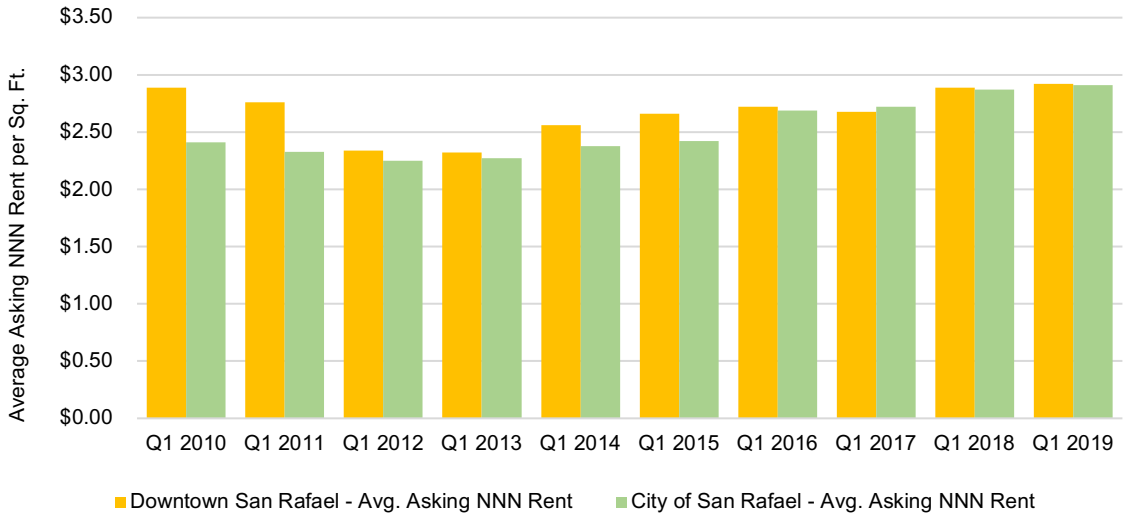


Figure 4.8: San Rafael Office Rental Trends, 2010-2019

Sources: CoStar; BAE, 2019.

***Note**: First quarter 2019 data current as of March 25, 2019.*

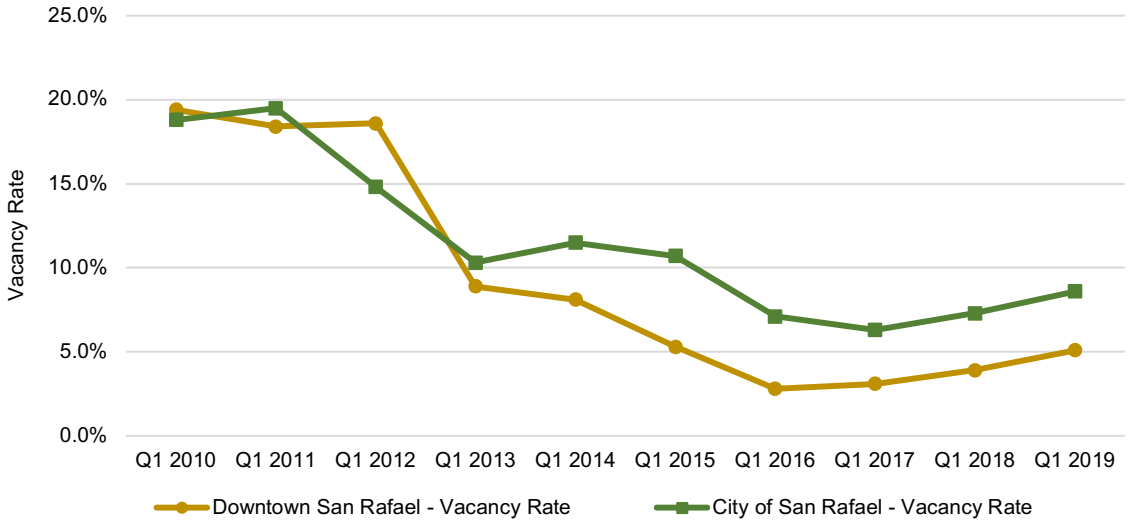


Figure 4.9: San Rafael Office Vacancy Trends, 2010-2019

Sources: CoStar; BAE, 2019.

***Note**: First quarter 2019 data current as of March 25, 2019.*

National and Regional Office Market Trends

Demand for State-of-the-Art, Sustainable Workplaces

There has been a notable increase in the number of office property owners and developers renovating or developing their office space into LEED certified structures, often at the gold or platinum levels. Two factors drive this increase in interest in sustainable office space: (i) implementing design and building system features that qualify a structure for LEED certification can result in significant operational savings over the life of the building; and (ii) building users and tenants can market their sustainable office space as a positive feature to attract employees. Younger workers, particularly in knowledge-based sectors but not exclusively, seek to work for companies whose values align with their own and environmental sustainability is one such important value. Locally within the Downtown Precise Plan area, the San Rafael Corporate Center is a certified LEED Gold office property.

Demand for Building, Site and Neighborhood Amenities

During the current economic expansion, there has been a significant shift in tenant location preferences to urban core or high-amenity and transit-rich suburban locations. Office workers increasingly demonstrate a preference for workplace locations that offer proximity to public transportation, bicycle and pedestrian access, attractive retail and service offerings, and entertainment options. In response to this shift in preferences among workers, companies are more often seeking office locations that offer more urban-style amenities instead of opting for traditional suburban office parks.

Higher Employment Densities in Office Space

During the current economic expansion, office tenants have preferred office space with open floor plans to both encourage interaction among employees as well as accommodate more employees in their office space to reduce real estate costs. As a result, owners of existing properties have had to open up their building interiors as part of building renovation programming. This trend has also led to increased employment densities with the gross square feet of office per employee falling from 275 or 250 square feet per employee to 225 to 250 per employee. In many cases, this ratio has reached 200 square feet per employee.

Affordable Housing and Office Tenant Retention and Recruitment

Lack of affordable housing is frequently cited by employers as a barrier to retaining and recruiting employees[7]. Employees at lower and median levels of compensation have to search for affordable housing in communities that require a long commute to the workplace. Companies based in the Bay Area frequently expand their operations in other regions with skilled labor and a lower cost of living in order to expand their employment base. The lack of affordable housing is widely considered a major barrier over the long-term to continued economic growth in the region.

7. See, for example the following articles cited in Solving the Housing Crisis Is Key to Inclusive Prosperity in the Bay Area published by the Bay Area Equity Atlas, 2018: George Avalos, "Silicon Valley Job Boom Unleashes Challenges That Could Choke Growth," The Mercury News, April 7, 2016, https://www.mercurynews.com/2016/04/07/silicon-valley-job-boom-unleashes-challenges-that-could-choke-growth/.35 Adam Nagourney and Conor Dougherty, "The Cost of a Hot Economy in California: A Severe Housing Crisis," The New York Times, July 17, 2017, https://www.nytimes.com/2017/07/17/us/california-housing-crisis.html?_r=0.36 Annie Sciacca, "Bay Area Restaurants Struggle to Keep Workers as Living Costs Rise," East Bay Times, August 15, 2016, http://www.eastbaytimes.com/2016/05/12/bay-area-restaurants-struggle-to-keep-workers-as-living-costs-rise/.37 Ashley Stewart and Silicon Valley Business Journal staff, "Why Silicon Valley Tech Workers Are Packing Their Bags for Seattle," Silicon Valley Business Journal, March 21, 2017, https://www.bizjournals.com/sanjose/news/2017/03/21/silicon-valley-tech-workers-seattle-housing-costs.html.38 Josh Lipton and Morgan Brasfield, "Silicon Valley Techies Are Fleeing to Seattle," CNBC, March 20, 2017, https://www.cnbc.com/2017/03/17/silicon-valley-tech-talent-fleeing-to-seattle.htm

Downtowns Well Positioned Against Traditional Business Parks
Many suburban downtowns, including Redwood City, Walnut Creek, Santa Rosa, Mountain View, and San Leandro, have seen strong demand for office space as a result of these cities having BART and Caltrain stations and robust nearby amenities, including retail, open spaces, cultural and recreation facilities, and other common amenities.

Response by Business Park Owners and Developers.
Owners of existing suburban business park and commercial property owners and developers in the San Francisco Bay Area (and elsewhere) have taken steps to reposition existing office assets to respond to these trends and shifts in demand. In general, these strategies aim to better integrate suburban office development into the surrounding area through mixed-use development and the addition of public spaces, bicycle paths, and pedestrian networks. Elements of a repositioning strategy can also include the construction of additional housing, particularly housing affordable to local workers, and expanding the mix of retail and entertainment options. Implementation of some or all of these strategies may be necessary for San Rafael to continue to capture a significant portion of future employment growth in the North Bay.

Implications of Office Market for San Rafael

- Vacancy rates for office space (all classes) in Downtown San Rafael are significantly lower than for the City as a whole and Marin County, indicating potential support for new Class A office space.
- Brokers report strong demand for office space in San Rafael, with a lack of supply to meet small to mid-size tenants' needs, indicating potential support for new construction.
- Only a nominal amount of new office space is under construction. This likely reflects the unwillingness of developers and lenders to pursue projects on a speculative basis (with no anchor tenant in hand prior to commencing construction) since reported rental rates are not high enough to justify new construction. However, BioMarin has approval for an additional 72,000 of office/R&D space at its existing location at the San Rafael Corporate Center and has submitted plans for 207,000 square feet of office/R&D on Lindaro Street. Major employers like BioMarin often generate 'spin-off' businesses that typically cluster in the same location to reduce the costs of attracting employees by drawing from the same labor pool. These clusters often attract other companies that specialize in related support functions, attracting additional employment to the area. Accordingly, BioMarin's expanding presence in the Precise Plan Area could generate additional demand for office space in the area in addition to the space that BioMarin directly occupies.
- Historic downtown San Rafael provides an authentic urban environment with retail and entertainment that is attractive to today's workforce.
- The recently opened SMART passenger rail service from downtown San Rafael to the Sonoma County airport is a major mobility enhancement that will be further strengthened when the under-construction extension to Larkspur is completed. This transportation improvement will be attractive to current and prospective employers.
- To retain and attract new office tenants, the City should consider ways it can increase its stock of affordable housing.

Retail Market

Retail Market Context

San Rafael is home to several of the County's major shopping centers and districts, including its downtown shopping and entertainment district, Northgate Mall, Montecito Plaza and retail/service commercial businesses between Anderson Drive and Interstate 580 and along Francisco Boulevard East east of Interstate 580 (including a Home Depot and Target on Shoreline Parkway). San Rafael has a retail inventory that totals approximately 4.9 million square feet, slightly more than one-third of which (1.7 million square feet) is located in Downtown Precise Plan Area (according to data from CoStar; see Table 4.11).). The Montecito Plaza shopping center, located east of Highway 101, accounts for 130,500 square feet, or 7.5 percent, of Downtown's retail inventory.

Other major retail nodes in Marin County include a major regional and specialty centers in Corte Madera, Marin County Mart in Larkspur, destination retail in Sausalito, and a specialty center in Novato. Marin County offers a variety of shopping opportunities and retail experiences, and San Rafael competes to some extent, particularly with respect to regional and specialty offerings, with these other retail clusters.

Table 4.11: San Rafael Retail Real Estate Market Snapshot, Q1 2019

Sources: CoStar; BAE, 2019.

Retail Summary	Downtown San Rafael	City of San Rafael	Marin County
Inventory (sf), Q1 2019 (a)	**1,732,985**	**4,923,472**	**13,013,890**
Occupied Stock (sf)	1,695,083	4,846,868	12,768,536
Vacant Stock (sf)	37,902	76,604	245,354
Vacancy Rate	2.2%	1.6%	1.9%
Avg. Asking NNN Rents			
Avg. Asking Rent (psf), Q1 2018	$2.16	$2.24	$2.83
Avg. Asking Rent (psf), Q1 2019	$2.91	$2.37	$3.05
% Change, Q1 2018 - Q1 2019	34.7%	5.8%	7.8%
Net Absorption			
One-Year Net Absorption (sf), Q1 2018 - Q1 2019	91	(13,822)	67,379
Ten-Year Net Absorption (sf), Q1 2009 - Q1 2019	(3,402)	18,838	468,164
New Deliveries (sf), Q1 2009 - Q1 2019	**0**	**17,340**	**100,921**
Under Construction (sf), Q1 2019	**0**	**0**	**8,700**

Note:

(a) First quarter 2019 data current as of March 25, 2019.

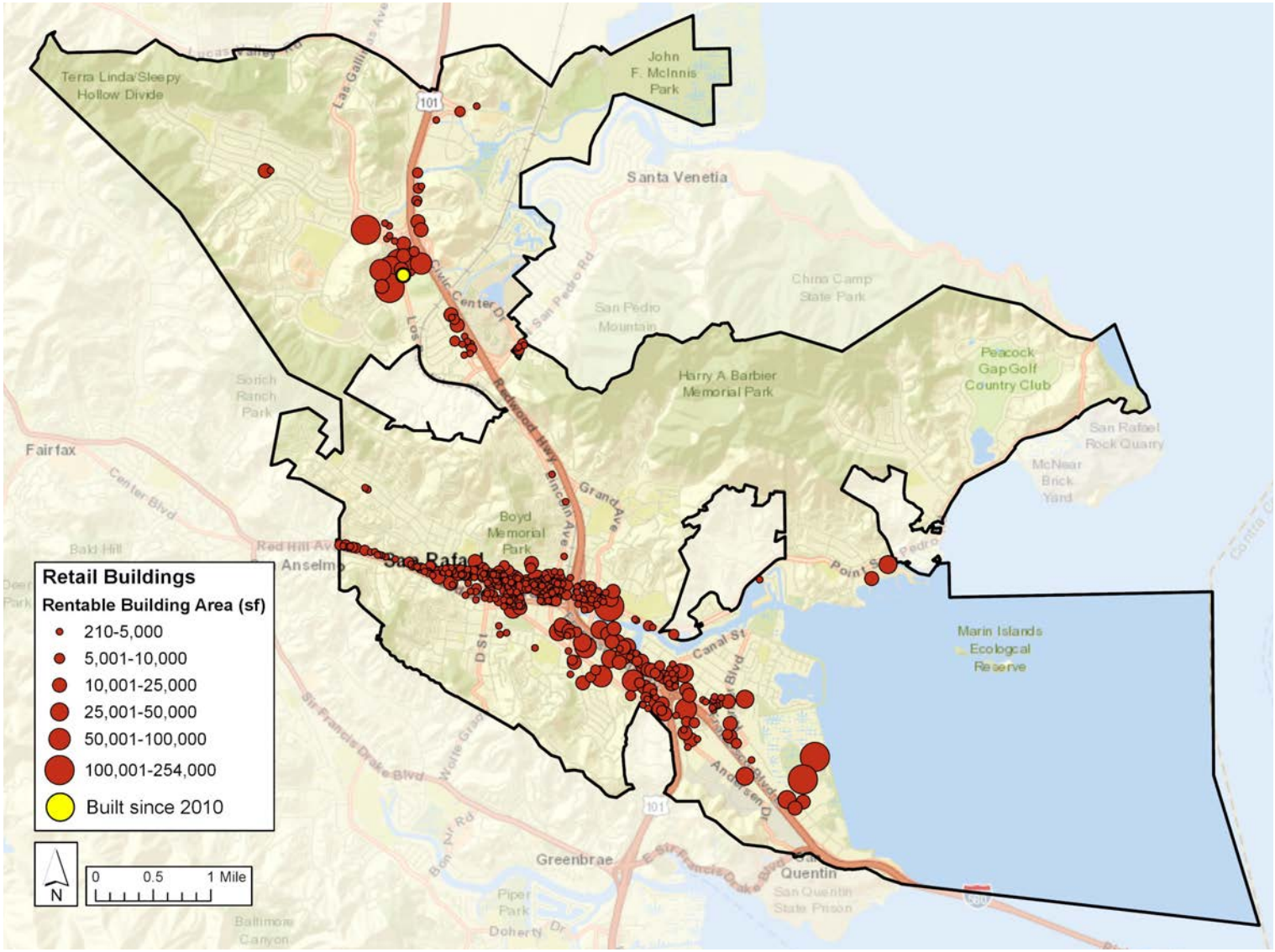


Figure 4.10. Geographic Distribution of Existing Retail Inventory in San Rafael

Sources: CoStar; BAE 2019.

Retail Market Conditions

The retail real estate market in San Rafael and the Downtown Precise Plan area is characterized by low vacancy rates and increasing rental rates, indicating strong market support for retail space. As of the first quarter of 2019, the average asking retail rent in the Precise Plan Area was $2.91 per square foot per month, reflecting a 35-percent increase since 2018 and an even more significant increase compared to asking rents between 2010 and 2017 (see Figure 4.11).

The recent increase in rent has coincided with decreases in the retail vacancy rate, reflecting a general upward trend over several recent quarters. The Plan area has a low 2.2-percent retail vacancy rate, while San Rafael overall has a low 1.6-percent retail vacancy rate, according to data provided by CoStar (see Figure 4.12). Retail real estate market trends in the Plan area and City mirror trends countywide, where retail rents have increased sharply over the past few years while vacancy rates have decreased to less than two percent. Low retail vacancies and increasing retail rents in the Plan Area, City, and County indicate potential unmet demand for additional retail space locally and countywide, which could potentially be captured in the Plan area. The affluence of the San Rafael trade area supports spending on retail goods and services.

Despite the strong market fundamentals reported in the CoStar data, local brokers and others familiar with the local business community report challenges with the retail sector in Downtown San Rafael. Multiple stakeholders emphasize that businesses in the Downtown area operate primarily during weekdays, with a lack of activity on weekends and during the evening. This limits Downtown's appeal to retailers and restauranteurs who seek an "alive after five" environment, as well as its appeal to residents as a destination for a downtown experience. Stakeholders mentioned a need to reduce restrictions for uses that are active on weekends and in evenings, as well as a need for additional residents Downtown to support businesses during these times and additional family-friendly places to gather. Many stakeholders reported that issues related to homelessness hamper the Downtown's ability to attract retail tenants and patrons. One stakeholder reported a need for a collaborative, coordinated marketing effort and events to encourage people to spend time Downtown. One broker noted that Downtown San Rafael lacks a clear identity, and as result prospective retailers, seeking to tap into particular consumer segments, do not have a clear picture of what Downtown San Rafael can offer them.

The retail inventory in the Downtown Precise Plan area is fairly old, with over half of the area's retail buildings and nearly half of its retail square footage having been constructed before 1950, as shown in Table 4.12. These older buildings offer smaller spaces and floor plates as well, as shown in Table 4.13 where nearly 60 percent of the area's retail inventory is in buildings with less than 5,000 total square feet. These older spaces may not be suitable for many prospective tenants, particularly as the tenant mix has shifted over time, generating demand for different types of retail space.

Brokers indicate that the largest sources of demand for Downtown retail space are, and will likely continue to be, restaurants, coffee shops, breweries, and boutique fitness (e.g. small gyms and yoga studios), and other service retail. Few spaces in Downtown's existing retail inventory have the size, layout and utilities (e.g. electrical capacity, plumbing, ventilation) these prospective tenants seek. Upgrading existing spaces to tenant specifications may prove cost prohibitive for many landlords and tenants with rents at current levels. To the extent that new development in the Downtown area includes retail space, these spaces should be designed to accommodate these uses.

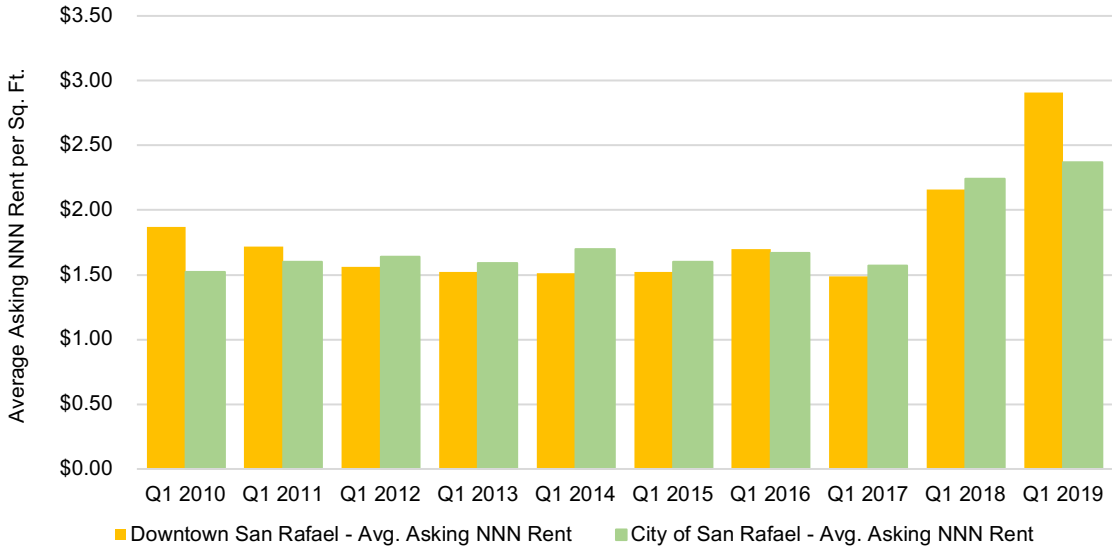


Figure 4.11: San Rafael Retail Rental Trends, 2010-2019

Sources: CoStar; BAE, 2019.

***Note**: First quarter 2019 data current as of March 25, 2019.*

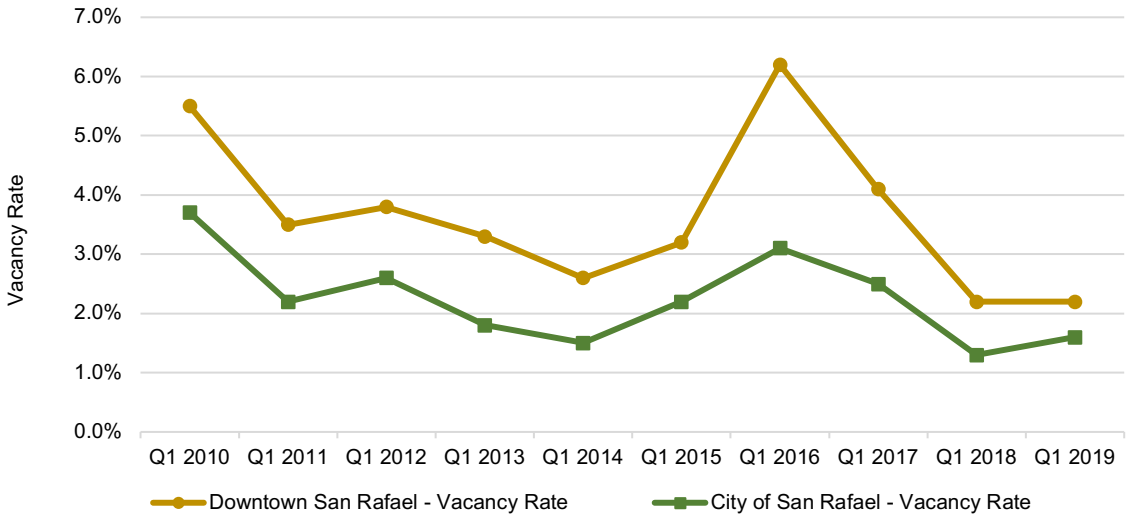


Figure 4.12: San Rafael Retail Vacancy Trends, 2010-2019

Sources: CoStar; BAE, 2019.

***Note**: First quarter 2019 data current as of March 25, 2019.*

Table 4.12: Retail Inventory by Year Built, Downtown San Rafael

Sources: CoStar; BAE, 2019.

Year Built	Buildings		Square Footage	
	Number	Percent	Number	Percent
Before 1949	138	52.5%	822,679	47.4%
1950 - 1989	84	31.9%	660,645	38.1%
1990 or Later	3	1.1%	52,279	3.0%
Unknown	38	14.4%	200,342	11.5%
Total	**263**	**100.0%**	**1,735,945**	**100.0%**

Table 4.13: Retail Inventory by Building Size, Downtown San Rafael

Sources: CoStar; BAE, 2019.

Rentable Bldg. Area (sf)	Buildings		Square Footage	
	Number	Percent	Number	Percent
Less than 4,999	156	59.3%	452,363	26.1%
5,000 - 9,999	66	25.1%	465,203	26.8%
10,000 - 24,999	35	13.3%	514,719	29.7%
25,000 - 49,999	5	1.9%	173,160	10.0%
50,000 - 99,999	0	0.0%	0	0.0%
100,000 or Larger	1	0.4%	130,500	7.5%
Total	**263**	**100.0%**	**1,735,945**	**100.0%**

National Retail Market Trends

Downtowns to Malls to Big Box back to Downtowns and Town Centers.

Over the past sixty years as the United States became more auto dependent, downtown shopping districts gave way to suburban shopping including enclosed malls and strip shopping centers. Downtowns struggled to retain and attract retailers. Over the past twenty-five years, the retail market evolved yet again with department stores giving up market share to big box retailers that focus on value (e.g., Costco, Best Buy, Walmart, Staples, and Target) and consequently the number of viable shopping malls and centers has contracted. During this same period, many downtowns have staged a revival with mixed-use redevelopment and urban shopping and entertainment districts as consumers sought more authentic urban experiences; however, while downtown retail centers have shown strength, they have not replaced stronger suburban regional shopping centers.

Suburban communities for their part are now faced with repurposing underperforming centers and malls. Many have sought to create denser, more walkable mixed-use centers as they compete for new residents and jobs with urban centers and other suburbs[8]. This has led to suburban cities planning 'town centers' and 'urban villages' that include a large retail component along with other commercial uses and residential development. The "North San Rafael Town Center" envisioned in San Rafael's General Plan 2020 is an example of this concept.

8. See Dunham-Jones, Ellen and Williamson, June, Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs, 2011; and Urban Land Institute, Creating Great Town Centers and Urban Villages, 2008.

Lifestyle and Hybrid Centers.
With respect to so-called lifestyle and hybrid commodity-specialty projects, Urban Land Institute's Professional Real Estate Development manual states: "Early lifestyle centers successfully combined desirable retail shops with appealing architecture and a variety of outdoor settings spawning the lifestyle center. [...] These early centers were, in part driven by a trend in which small specialty retailers faced a shortage of high quality specialty retail space at the same moment that regional mall failures were accelerating."[9]

The dominant new commodity retail and shopping center formats had, in fact, left small store specialty retailers with few reliable anchors, and developers with no clearly defined shopping center template to replicate, spawning the ill-defined and somewhat chaotic lifestyle center concept. Most malls failed to function as places conducive to social interaction and connection to community. Retail designer Roy Higgs has noted a "[n]eed to create a powerful and different sense of place. This is especially true of mixed-use developments where, very often, it is the space between the buildings that requires more design attention. As lifestyle projects proliferated, more and more frequently, they failed to incorporate a well-designed sense of place, the absence of which had helped hasten the demise of many malls."[10] With its historic building stock and diversity of uses, downtown San Rafael provides a sense of place and provides an environment for social interaction.

Higgs also notes that hybrid commodity-specialty projects "are generally a risky option for a shopping center developer because the elements of price and convenience that underlie optimal commodity shopping center development generally weaken the elements of better product and place-making essential to well-executed specialty retail centers. Likewise, the higher costs and place-making principles central to specialty retail degrade the price/convenience equation essential to commodity retailers."

Multi-channel and Omnichannel Retailing.
With the advent of e-commerce, retail is undergoing rapid changes as sticks and bricks retailers compete with e-retailers such as Amazon and eBay. While there were early fears that physical stores would be obsolete, and many retailers disappeared or suffered sharp decline in sales, the best performing retailers have adapted and are promoting sales through multiple channels, including physical stores, retail websites, social media, and other media (often referred to as "omnichannel retailing").[11]

This trend is characterized by retailers creating a seamless shopping experience regardless of whether consumers are shopping online, from portable devices, from catalogs, or in a store. Physical retailers – Macy's, Target, and Walmart are good examples— have established robust e-commerce portals and utilize their stores as fulfillment centers for online order pick-up and returns. Meanwhile retailers such as Amazon, Warby Parker, Allbirds, and Bonobos that were exclusively e-commerce are now "clicks to bricks" retailers, having opened physical stores to further expand their sales.[12] The consensus among retail analysts is that retailers with "brick and mortar" stores will continue to be the foundation of omnichannel retailing since stores provide a sensory experience of the offered goods as well as convenience.

9. Peiser, Richard and Hamilton, David, Professional Real Estate Development, Third Edition, Urban Land Institute, 2012.

10. Higgs Roy, Now Trending: Design of the Times, Chain Store Age, August 15, 2015.

11. Retail Systems Research, Inc., Gaming Google: The Growing Importance of Omniretail, March 2011.

12. E-commerce Retailers Plan 850 Physical Stores in the Next 5 Years, JLL, Inc. Retail Research Point of View, 2018.

Branding Retail as 'Local'

The primary goal of hyper-localization is to drive traffic from virtual shopping environments to bricks-and-mortar shopping environments. Strategies aimed at combining opportunities both to experience and to buy a product are employed because consumers have more of a connection, and by extension, will be more likely to purchase products they can see, touch, and try. Likewise, a hyper-local marketing strategy must emphasize sourcing, service, and shopping. The correlation between experience and purchasing is the reason REI offers free classes, Williams Sonoma has cooking demonstrations, local bookstores have authors reading from their latest works, and Costco offers free samples.

The most successful hyper-local strategies combine a robust merchandise mix, stellar service, an immersive environment, and the right mix of price and convenience. Ultimately, retailers who are able to balance the seemingly opposing forces of cost, convenience, and customization on the same plane will be the most compelling in today's rapidly evolving retail world. Something to watch is whether this marketing strategy will evolve further into local or chain players offering unique, region-specific goods, like etsy.com in a bricks-and-mortar format.

Ground Floor Retail Challenges

Ground floor retail in a mixed-use project can enliven a street and create a "sense of place," but success can be challenging in a suburban environment. Zoning codes may require ground floor retail in contexts that lack the scale and critical mass of residents, workers, and visitors necessary to attract and sustain retailers, leading to persistent vacancies. Ground floor retail is especially likely to struggle in areas with limited pedestrian or vehicular traffic.

To increase the viability of ground floor retail and attract a creditworthy tenant, developers must be thoughtful about visibility, access, space size, and configuration. However, as ground floor retail is rarely a major value generator in a mixed-use development, some developers choose not to prioritize such considerations and simply assume the space will remain vacant long term. Even developers who prioritize the success of ground floor retail in their projects may struggle to meet formula retailers' size and configuration standards given site dimensions and competing demands on ground floor space, such as podium parking.

Implications of Retail Market for San Rafael

- Despite the disruptions in the macro retail environment with major retailers closing stores, San Rafael has enjoyed tightening vacancy rates and rising rental rates, indicating demand by businesses selling retail goods and services.
- Retail in downtown San Rafael is supported by strong spending power by local residents and employees.
- Downtown San Rafael is on both sides of Highway 101 at the center of its trade area, generating high traffic volumes on its east-west thoroughfares, providing the visibility that many retailers rely on to drive sales.
- Downtown San Rafael provides an authentic town center experience that is difficult to replicate and can be further improved through the Precise Plan to support existing and new retailers.
- Downtown continues to face challenges within the retail sector, which include lack of activity during evenings and weekends, issues related to homelessness, and a lack of a coordinated marketing effort and strong identity for the Downtown.

- Existing retail spaces are fairly old and may be unsuitable for the type of tenants that are currently seeking space Downtown, particularly restaurants. Facilitating upgrades and renovations to existing spaces and ensuring that new spaces meet the needs of the tenants that want to locate Downtown could draw additional tenants to the Downtown area.
- The addition of family-friendly gathering places and support for businesses that will be active during evenings and weekends could enhance Downtown's image as an experiential retail destination.
- Permitting additional housing and office development downtown will add buying power to the local consumer spending base and help enliven the downtown, particularly during evenings and weekends.

Industrial/Flex Market

Industrial Market Context

While the City of San Rafael provides a significant amount of the industrial and flex space inventory in Marin County, the Downtown Precise Plan area currently serves a relatively limited role in the local and regional industrial and flex space real estate market. San Rafael's inventory of industrial and flex space totals 4.2 million square feet, accounting for more than half of the industrial/flex inventory in Marin County, according to data from Costar.

Only 1.3 percent of San Rafael's industrial/flex inventory (57,554 square feet) is located in the Precise Plan Area. Other clusters of industrial space in San Rafael are located at Highway 101 and Smith Ranch Road, between Anderson Road and Interstate 580 south of downtown, and along Francisco Boulevard East parallel to Interstate 580 towards the San Rafael-Richmond Bridge, as shown in Figure 4.13.

Industrial Market Conditions

Although current data on asking rents for industrial/flex space in San Rafael are not available from CoStar, the low vacancy rates for industrial/flex space citywide (1.2 percent) and throughout Marin County (3.8 percent) indicate strong demand for this type of space locally and regionally. While the vacancy rate in the Precise Plan Area is relatively high, all of the vacant inventory in the Plan area is in one 8,371-square foot property, and therefore the vacancy rate is not indicative of weak real estate market demand.

Additionally, while the Precise Plan Area and San Rafael recorded sizable negative net absorption—also typically an indicator of weak demand—over the past year, this was largely driven by the demolition of a single 38,000-square-foot building in the Precise Plan Area. Prior to that demolition, industrial occupancy had held relatively steady for at least ten years. Thus, this negative net absorption does not necessarily signal weak demand for industrial space, but it may underscore that industrial properties in Downtown San Rafael are targets for demolition, potentially in anticipation of redevelopment to higher value uses. Over the past ten years, the only new construction of industrial or flex space in Marin County has consisted of a small 8,325-square foot property in San Rafael, potentially indicating a shortage of modern industrial/flex space in the County.

Asking rents for industrial space in Marin County are reported by CoStar to have fallen by slightly over 17.1 percent (from $1.38 monthly per square foot on a triple net basis to $1.17 monthly per square foot) from the first quarter of 2018 to the first quarter of 2019, however, reported average asking rents are subject to large changes when only a few properties make up the vacant inventory. Cushman and Wakefield indicate that first quarter average asking rental rates in Central San Rafael are $1.44 monthly per square foot on a triple net basis, the highest quoted rate in Marin County.

While these trends suggest relatively strong demand for industrial and flex space in San Rafael, this type of use may be better suited for areas of the City other than the Downtown Precise Plan area. Large- or medium-scale industrial and flex uses could potentially be incompatible with existing and future residential uses in the downtown area. Additionally, these types of uses typically require a large, single-story floor plan on large site that accommodates truck access and loading requirements, and therefore are often incompatible with a transit-oriented development environment.

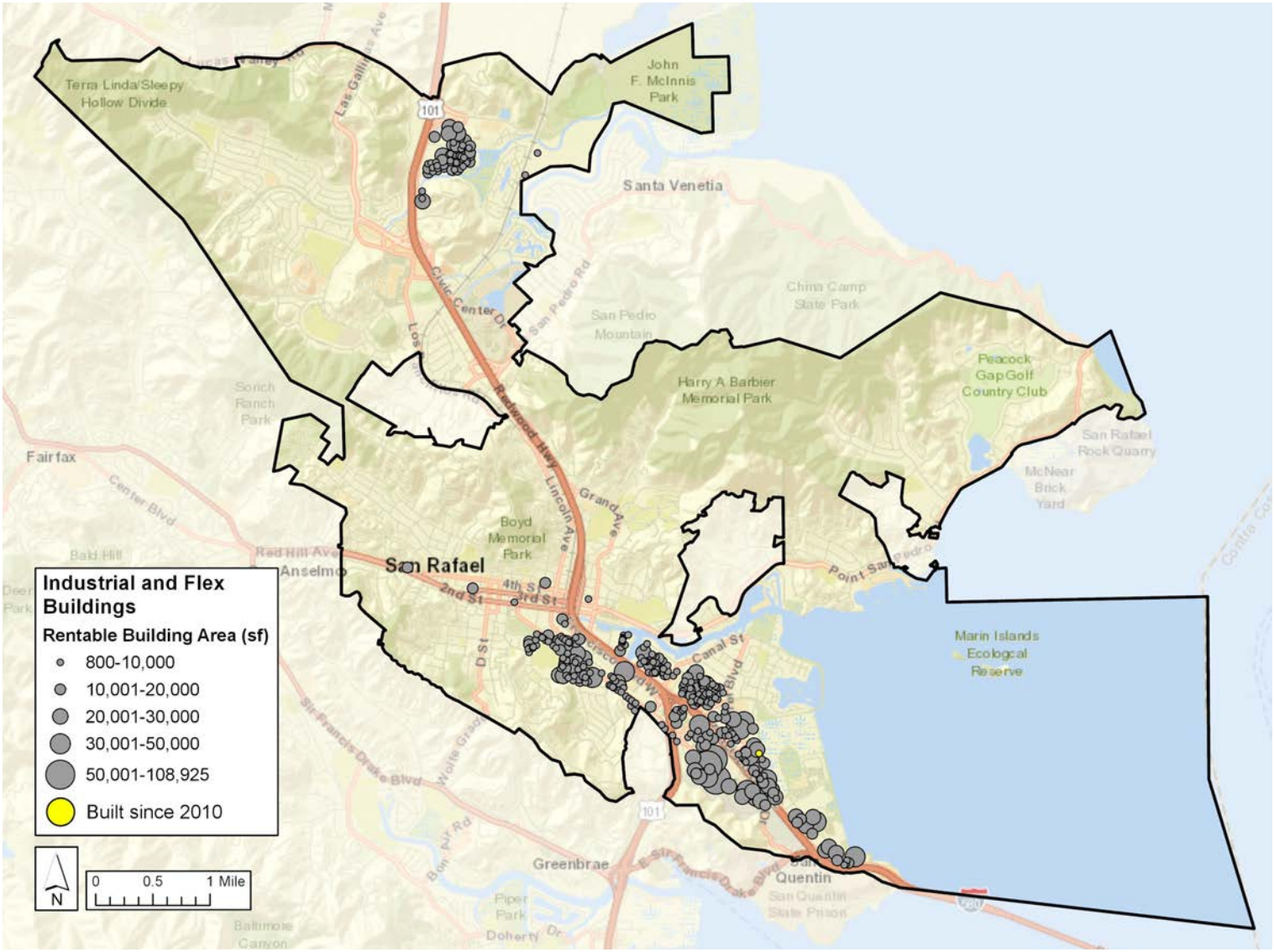


Figure 4.13. Geographic Distribution of Existing Industrial Inventory in San Rafael.

Sources: CoStar; BAE 2019.

Table 4.14: San Rafael Industrial/ Flex Real Estate Market Snapshot, Q1 2019

Sources: CoStar; BAE, 2019.

Industrial and Flex Summary	Downtown San Rafael	City of San Rafael	Marin County
Inventory (sf), Q1 2019 (a)	**57,554**	**4,207,520**	**8,210,822**
Occupied Stock (sf)	49,183	4,156,893	7,901,805
Vacant Stock (sf)	8,371	50,627	309,017
Vacancy Rate	14.5%	1.2%	3.8%
Avg. Asking NNN Rents			
Avg. Asking Rent (psf), Q1 2018	N/A (b)	N/A (b)	$1.38
Avg. Asking Rent (psf), Q1 2019	N/A (b)	N/A (b)	$1.14
% Change, Q1 2018 - Q1 2019	N/A (b)	N/A (b)	-17.4%
Net Absorption			
One-Year Net Absorption (sf), Q1 2018 - Q1 2019	(38,000)	(14,704)	(143,959)
Ten-Year Net Absorption (sf), Q1 2009 - Q1 2019	(40,177)	54,651	(55,237)
New Deliveries (sf), Q1 2009 - Q1 2019	0	8,325	8,325
Under Construction (sf), Q1 2019	0	0	0

Notes:

(a) First quarter 2019 data current as of March 25, 2019.

(b) Data not available from Costar.

National Industrial Trends

Location Criteria

Industrial developers, end users, and tenants typically seek large parcels with desirable topography (e.g., flat and with minimum potential for flood or other hazards), access to major interstate freeways and connecting arterials that avoid residential uses, access to other transportation modes such as freight rail, airports, or water (depending on nature of industrial activity), and access to workforce.

Flex Space

Flex space is typically developed at a low density (0.24 floor area ratio) to permit parking and truck movement. Office space comprises between 15 and 25 percent of total floor area with the remainder in high-bay configuration for warehouse, assembly, or R&D use. Flex space can accommodate a wide range of industrial sectors for businesses not requiring customized facilities. Flex space can also be attractive to technology or bioscience firms that are moving from a start-up or incubation phase to growth and expansion as well as PDR enterprises.

Warehouse

Logistics centers are a growing and evolving segment of the industrial sector that will continue to drive warehouse demand. With online retailers shifting to same-day deliveries and the proliferation of chain convenience stores, distributors are seeking smaller facilities (70,000 to 100,000 square feet compared to larger centers of up to one million square feet) at sites closer to major urban markets. The market for large facilities is also changing. Ceiling clear height requirements are moving from 20 to 25 feet to up to 80 to 100 feet. For all new or rehabilitated warehouse space, developers and tenants require highly energy efficient buildings in locations with excellent transportation connectivity.

Implications of Industrial Market for San Rafael

- While demand for industrial uses is high, location of this use in downtown San Rafael would not be appropriate due to the generally low intensity of this use. Industrial uses generally have fewer employees per 1,000 square feet than most other commercial land uses and do not activate the street as other commercial would such as office, hotel, and retail.
- Downtown San Rafael is also not a suitable location for industrial uses because industrial tenants typically seek locations separated from residential uses to avoid conflicts arising from truck traffic, noise, and vibrations.
- To the extent that the City of San Rafael has a goal of preserving existing industrial uses in and around the Precise Plan area, policies should generally discourage or disallow residential uses on or adjacent to existing industrial sites. Industrial properties tend to have relatively low values, creating an incentive for redevelopment to higher-value residential uses when allowed. Additionally, conflicts between residential uses and industrial uses can hamper the operation of industrial businesses, making industrial operations less viable over time.
- Due to its central location in Marin County and access to both Highway 101 and Interstate 580, "last-mile" distribution uses would be attracted to San Rafael if appropriate buildings and/or undeveloped parcels of sufficient size were available. However, most commercial areas of San Rafael are built out, requiring redevelopment of existing properties. These factors limit opportunities for new industrial.
- Many industrial spaces are used for PDR uses, including service commercial (e.g., auto repair, construction material suppliers, and home improvements), that seek low-cost locations and facilities.

Lodging Market

Lodging Market Context

San Rafael's lodging inventory consists of nine properties with a total of 792 rooms. Smith Travel Research (STR), a private data vendor that tracks performance trends in the lodging industry, distinguishes hotel properties by "class," based on the average room rates associated with the property's brand. As shown in Table 4.15, San Rafael's hotel inventory includes properties that range in scale from "Economy" (the most affordable class) to Upper Upscale Class (the second most expensive class). It also includes four independent (non-brand) lodging facilities. The City does not have any luxury class properties. Though none of the existing hotels in San Rafael are within the Downtown Precise Plan area, the City has received a proposal to construct a 140-room Marriot hotel on Fifth Avenue in the Precise Plan area. The City has also received a proposal to construct a 184-room Hampton Inn and Suites outside of the Precise Plan area, which would be located directly east of I-580 in the Canal area. These hotels would be the first constructed in San Rafael in the past 12 years; most of the lodging facilities in San Rafael are over 30 years old.

With the exception of the Embassy Suites and Panama Hotel, all of the existing lodging properties in San Rafael are clustered around the I-580/US 101 corridor, as shown in Figure 4.14. The Embassy Suites property is located slightly east of 101 near the Marin County Fairgrounds and adjacent to the Autodesk property. The Panama Hotel is a small bed and breakfast inn located west of 101 and just outside of the southern edge of the Downtown Precise Plan area boundary.

Within a relatively short distance of San Rafael, major regional attractions that drive visitation and hotel room demand include San Francisco and the Napa and Sonoma wine region as well as numerous attractions in western Marin County such as Muir Woods, Muir Beach, the Marin Headlands, and Stinson Beach. While San Rafael hotels likely benefit somewhat from these attractions, other locations within the region provide better proximity to these attractions and are therefore more competitive for hotel room stays.

However, San Rafael is home to several local drivers of visitation and hotel room demand that may support continued or increasing demand for lodging in San Rafael over the planning period of the Downtown Precise Plan. These include local companies, such as BioMarin and Autodesk, Dominican University of California, the Mill Valley Film Festival, the Marin County Fair, and Mission San Rafael Arcángel. Individuals familiar with the local area report that business travel is the primary driver of hotel room demand in San Rafael.

Table 4.15: Lodging Inventiry, 2019

Sources: STR; BAE, 2019.

Name	Class	# of Rooms	Year Opened
Embassy Suites by Hilton San Rafael Marin County	Upper Upscale	236	1990
Four Points by Sheraton San Rafael Marin County	Upscale	235	1970
Extended Stay America San Rafael Francisco Boulevard East	Economy	112	2007
Motel 6 San Rafael	Economy	68	1958
Villa Inn	Independent	60	1955
Travelodge San Rafael	Economy	32	1978
North Bay Inn	Independent	19	2005
Marin Lodge	Independent	17	1947
Panama Hotel	Independent	13	1984

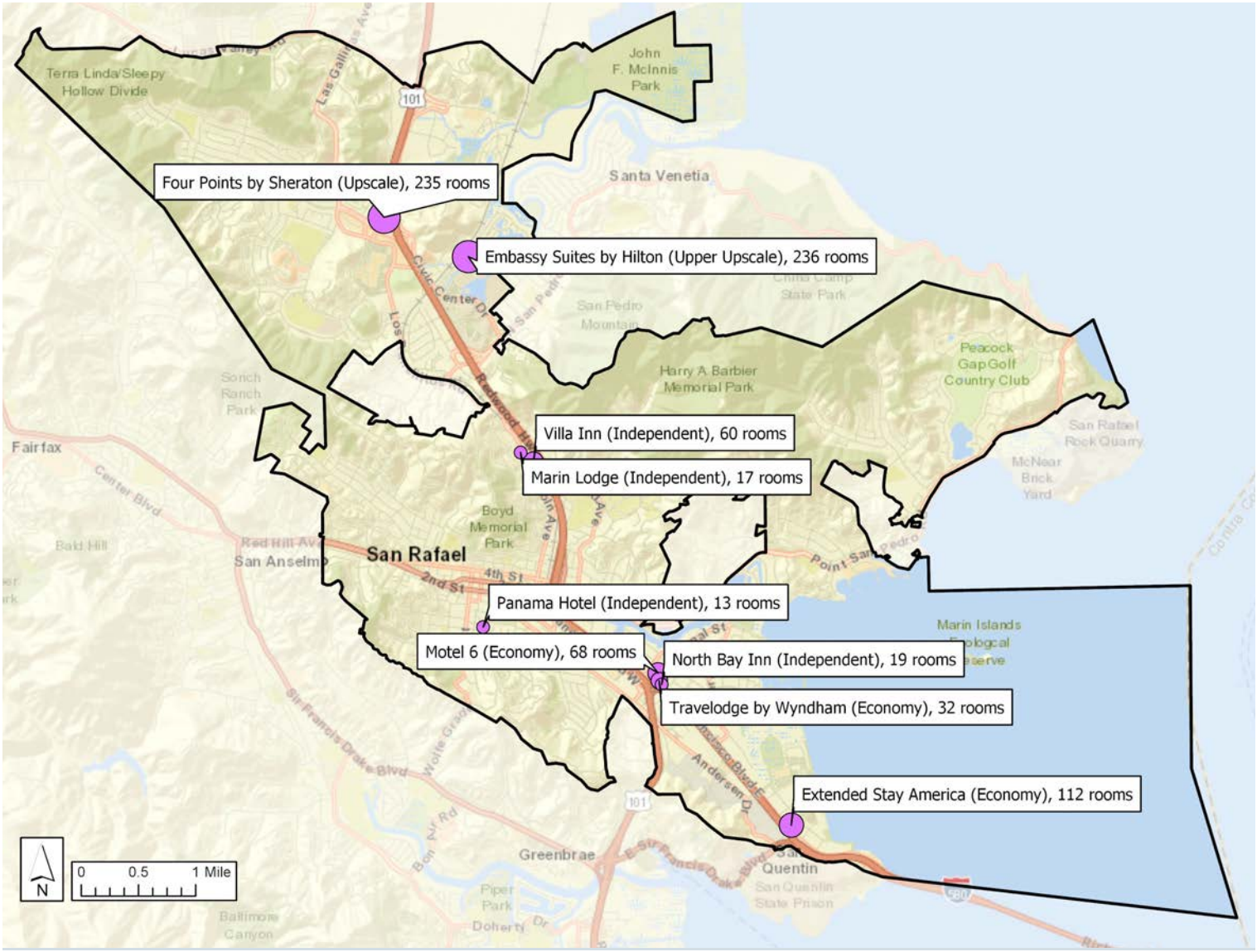


Figure 4.14. Location of Lodging Properties in San Rafael.

Sources: CoStar; BAE 2019.

Occupancy and Average Room Rates

The San Rafael hotel market has maintained relatively steady occupancy and average daily room rates (ADR) in recent years. As illustrated in Figure 4.15, the market recorded modest gains in occupancy accompanied by a surge in average daily room rates (ADR) between 2013 and 2016. Growth has slowed since 2016, with ADR holding in the low-to-mid $140s and the occupancy rate hovering around 82 percent.

Demand for hotel rooms in San Rafael tends to be higher during the week than on weekends, indicating that business travel is the primary source of hotel demand in the area, while leisure travel constitutes a smaller portion of demand. Figure 4.16 shows the average daily occupancy rates among STR-tracked hotels in the year spanning from May 2018 through April 2019. Occupancy rates are relatively strong throughout the week, peaking at nearly 90 percent on Tuesday and Wednesday nights. However, occupancy rates on Saturday nights are also relatively high, averaging 83 percent, indicating that leisure travel constitutes a portion of lodging demand in San Rafael.

National Lodging Market Trends

Business, leisure, and events drive hotel room demand
There are three primary sources of demand for hotel rooms, as well as related services such as meeting and event space. One of the largest sources of demand for hotels is from local business activity, for both individual business travel and business-related meetings, and most of this demand is associated with office-based employment. Leisure travelers, including tourists, represent another major source of demand, with group travel and events making up the third category of demand, including social, educational, non-profit, family, and others. Generating demand in all three segments are major businesses, educational and medical institutions, convention centers, and sports complexes, as well as tourist attractions.

Hotel room demand is heavily impacted by economic cycles
All of the sources of hotel room demand cycle with the general economy, and the currently strong and growing regional economy has led to increased occupancy and room rates throughout much of the Bay Area. The long-term planning horizon of the Precise Plan will span multiple economic cycles, causing fluctuations in market support for new hotel development over time.

Impact of Private Rentals
Private home rentals through online platforms such as Airbnb and VRBO have become increasingly prominent in the market for overnight accommodations. Private rentals typically offer a different type of accommodation and experience than traditional lodging options and therefore serve different segment of the demand for overnight accommodations to an extent. However, many travelers consider both private lodging and traditional lodging when planning overnight stays, potentially creating competition between the two types of accommodations. While research is mixed on the effect that private rentals have on more traditional lodging options, over the long term private home rentals may absorb a portion of the demand for traditional lodging, including in San Rafael.

Enhanced demand for experience-oriented stays
Some hotels operators are taking on an enhanced role in connecting guests to experiences, both at the hotel itself and in the local area, as part of their hotel stay. These experiences can range from social events and informal communal spaces within the hotel to offering classes and providing tours of local attractions.

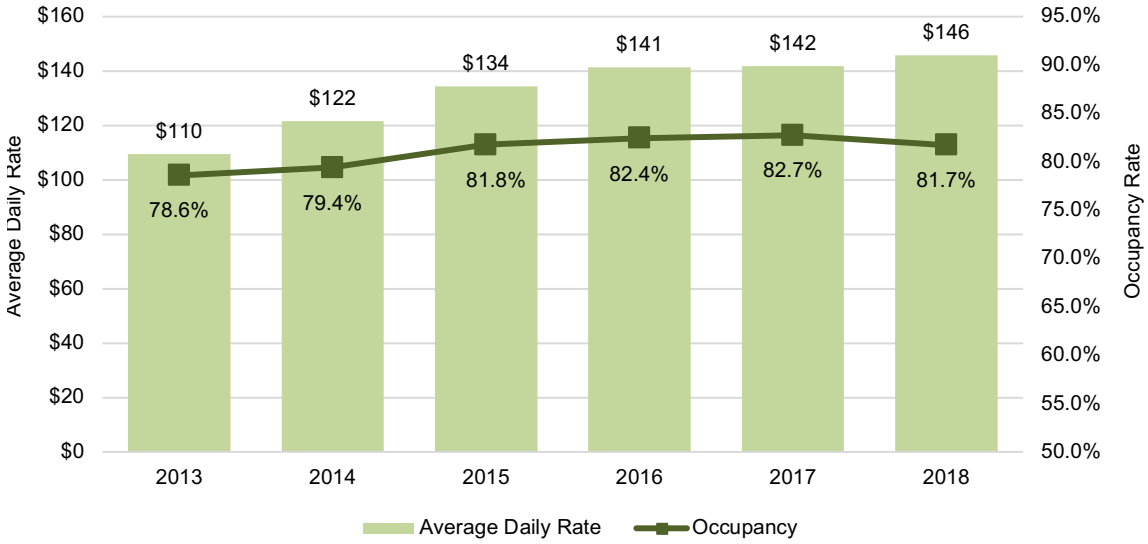


Figure 4.15: Average Daily Rate and Occupancy Trends, San Rafael, 2013-2018

Sources: STR; BAE, 2019.

***Note**: Five San Rafael hotel properties participate in STR hotel occupancy and room rate surveys. These include three economy class hotels (Motel 6 San Rafael, Extended Stay America, and Travelodge), one upscale class hotel (Four Points by Sheraton) and one upper-upscale class hotel (Embassy Suites).*

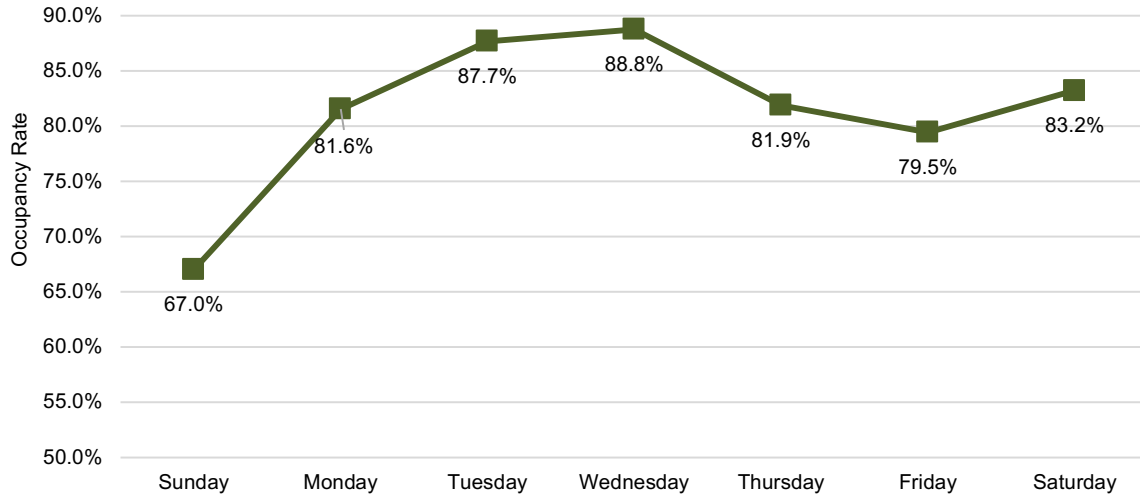


Figure 4.16: Occupancy by Day of the Week, San Rafael, May 2018 - April 2019

Sources: STR; BAE, 2019.

***Note**: Five San Rafael hotel properties participate in STR hotel occupancy and room rate surveys. These include three economy class hotels (Motel 6 San Rafael, Extended Stay America, and Travelodge), one upscale class hotel (Four Points by Sheraton) and one upper-upscale class hotel (Embassy Suites).*

Focus on health & well-being
Many hotels have developed well-being strategies to enable guests to maintain healthy habits during their stay, including enhancing fitness centers and offering fitness classes.

Labor shortages in tight labor markets with high housing costs
Tight labor markets have increased competition for hotel workers in markets throughout the United States, while markets with high housing costs face increasing challenges in attracting and retaining employees.

Implications of Lodging Market for San Rafael

- San Rafael may be poised to experience increases in hotel room demand, particularly in the Precise Plan area, as BioMarin continues its expansion, potentially generating additional business-related travel. On a citywide level, increases in demand associated with BioMarin's expansion may counteract decreases in demand related to Autodesk reducing its local presence. However, these shifts in the City's employment base may have differential impacts on specific hotels, increasing demand for hotels in and near the Plan Area and reducing demand at hotels further north in San Rafael.
- New hotels in San Rafael, including in the Downtown Precise Plan Area, may be able to secure a competitive position in the local market relative to the existing lodging inventory, most of which is over 30 years old, by offering a more modern aesthetic and amenities.
- Hotels in San Rafael may seek to increase leisure travel stays in part by enhancing connections with local and regional attractions and experiences. Consistent with this trend, operators may be increasingly attracted to Downtown San Rafael, as it offers travelers an authentic downtown environment with restaurants, art, and entertainment options.
- Increasing the availability of affordable housing could be critical to the local hotel industry's ability to attract and retain employees in San Rafael's high-cost housing market.

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Economic Conditions: Key Findings

Looking to the future, San Rafael's downtown is well positioned to capture new residential, office, and retail growth based upon the following findings and observations drawn from its economic existing conditions:

Authentic Urban Environment

Downtown San Rafael offers an urban experience at a scale that is attractive to both existing and prospective residents, shoppers, and office employees. The downtown's sizeable stock of historic buildings gives it character and authenticity.

Retail Center of Gravity

Downtown is at the center of San Rafael's retail gravity with high traffic flows along Second and Third Streets, Highway 101, and other collector roads connecting to many of the City's residential neighborhoods, making it a convenient destination for shopping and entertainment.

SMART Service

The recent inauguration of SMART train service enhances the marketability of downtown by offering a new mobility option for both downtown residents and workers. Office brokers interviewed for this study have confirmed that office tenants strongly prefer a downtown location with amenities and multiple transit alternatives. Indeed, office vacancy rates downtown are lower than the citywide average (5.1 percent and 8.6 percent, respectively).

Residential Developer Preferences

Bay Area developers of multifamily residential seek transit-rich locations to give their projects a competitive edge and potentially higher rents.

Strong Household income in Market Area

While household income in San Rafael is close to the Bay Area median, the City is located in central Marin County which is one of the most educated and affluent counties in the nation, making it desirable for retailers.

Daytime Worker Population

The Census estimates that there are approximately 6,700 persons who work in Downtown San Rafael and the relocation and expansion of BioMarin to the downtown adds to the overall spending power of downtown workers.

Millenial Housing Preferences

More millennials (persons born between 1985 and 2004) having been moving into prime household formation age, generating demand for additional housing; renters prefer apartments that offer a rich set of amenities, including walkability to retail, restaurants, and entertainment.

Lodging and Hospitality

There are no existing hotels in downtown San Rafael and the City's last hotel opening was in 2007. New hotels may be able to secure a competitive position in the local market due to the obsolescence of the City's inventory with seven out of nine properties being 30 years old. There now is a proposal for a Marriot Hotel on Fifth Avenue. Adding a hotel to downtown will fill a gap in its existing mix of retail, office, and residential uses and a hotel will serve as an important amenity.

At the same time, downtown San Rafael faces challenges that the Precise Plan should address to realize the downtown's full potential, including:

Imbalance of Daytime Workers and Downtown Residents

There are far more daytime workers (6,700) in the Downtown Precise Plan area than employed residents who live there (1,200). This results in many businesses not staying open in the evening, resulting in fewer San Rafael residents patronizing the downtown.

Through Traffic and One-Way Streets

Second and Third Avenues in the Downtown Precise Plan area are one-way streets and support high through-traffic volumes. These two corridors are generally not pedestrian friendly and the street environment they create is not supportive of ground floor retail. B, C, and D Streets are also one-way but do not support as high traffic volumes as Second and Third Streets. The effect of so many one-way streets is that prospective patrons of downtown businesses are forced to drive several blocks out of their way if they miss an address or are seeking parking near a business destination. As part of the Downtown Precise Plan process, the City should consider reverting B, C, and D Streets back to a two-way configuration to make vehicular circulation easier and more convenient to prospective shoppers.

Small Parcels and Building Floor Plates

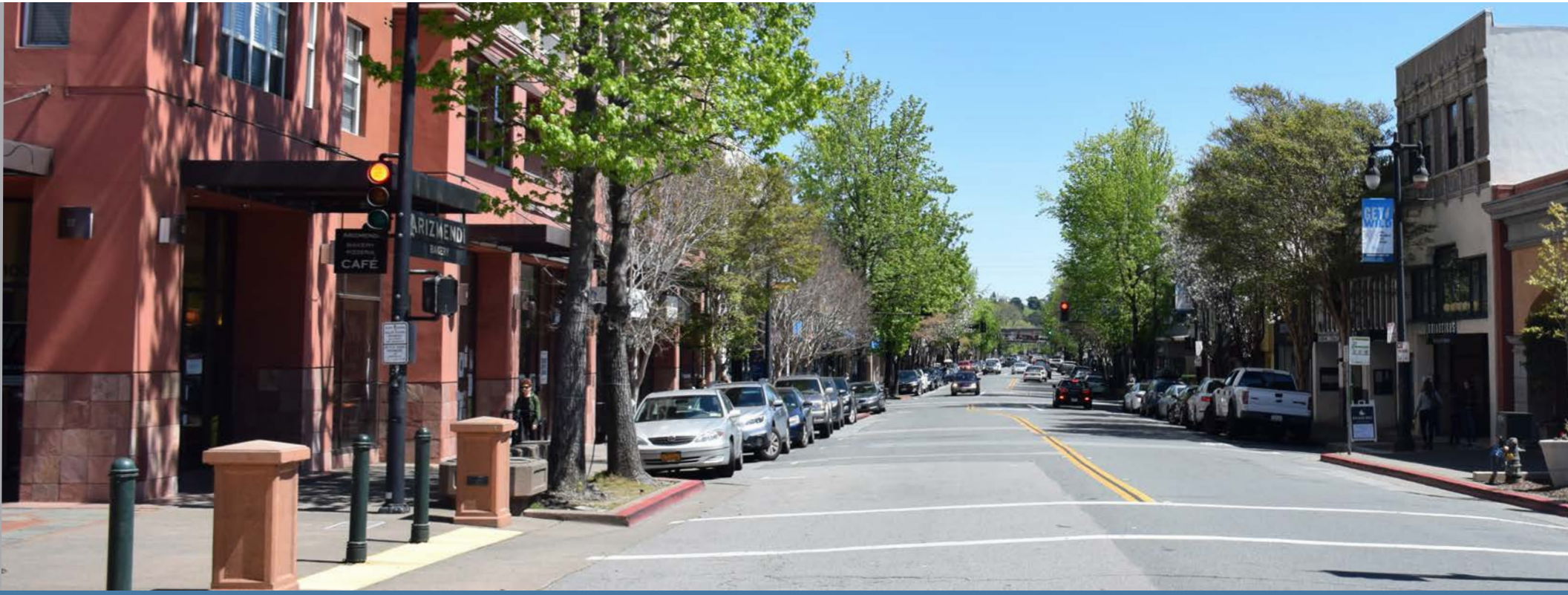
The Downtown Precise Plan area is comprised of many small parcels with nearly 60 percent of retail square feet contained in older buildings with less than 5,000 total square feet floor area. While in many cases smaller storefronts are attractive to small retailers and independent retailers offering goods and services, the age of the building stock often presents barriers to change in use due to code upgrade requirements and lack of ventilation to accommodate restaurant and entertainment uses. With retail and office rental rates at current levels, it is often not economically feasible to undertake a rehabilitation or adaptive reuse of these buildings. Small parcel sizes in Downtown makes it difficult to assemble sites for new infill development at an economically efficient scale and is one contributory factor to the lack of new housing development in the area.

Affordable Housing Requirements

The level and structure of the City's inclusionary housing requirements may be working against new multifamily rental housing in the Downtown Precise Plan area. The affordable housing requirement is 20 percent for a residential multifamily project with 20 or more units, which is often not financially feasible under current market conditions – even in the strongest rental sub-markets in the region (such as San Francisco and the Peninsula). Construction cost escalations have recently out-paced rental rate increases, creating a squeeze on project margins and rendering many proposed projects infeasible.

Public and Private Investment

The Downtown Precise Plan gives San Rafael the opportunity to formulate a plan and roadmap for new public and private investment in the downtown area. As seen in other similar communities in the Bay Area with historic downtowns, a combination of public and private investment in infrastructure can lead to a virtuous cycle of additional private investment and vitality as rents and property values increase in response to the positive impacts of these initial investments.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CHAPTER

5

Urban Design

This chapter examines Downtown San Rafael's development patterns in terms of existing urban form, uses, quality of public realm, development projects in the pipeline as well as regulatory controls in place such as zoning and land use designations.

In this chapter

Downtown San Rafael

Located at the crossroads of highways Highway 101 and Interstate 580, Downtown San Rafael is considered by many to be the business and cultural center for the city of San Rafael as well as Marin county.

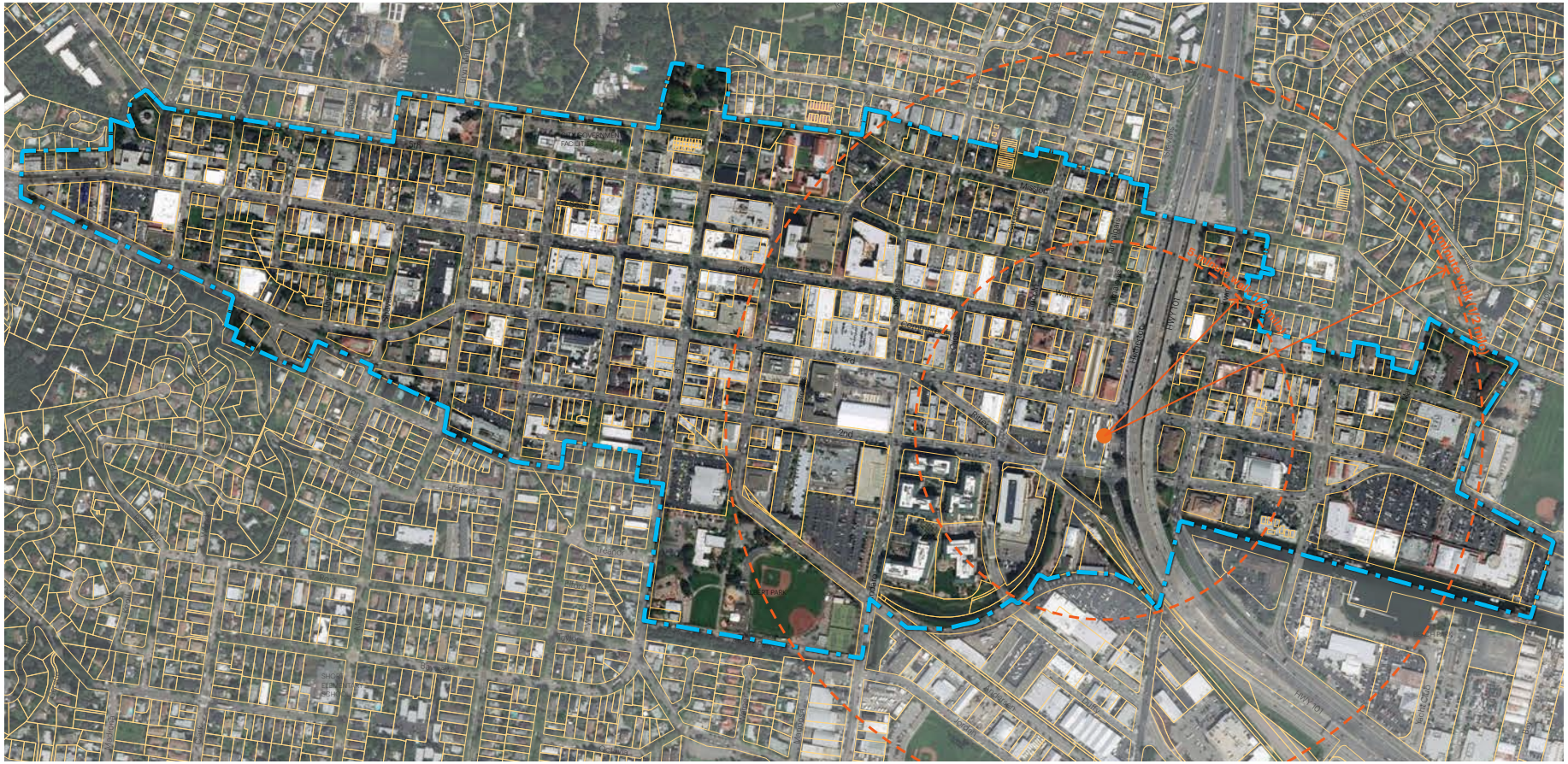
Location and Context

Downtown San Rafael is located approximately 20 miles north of San Francisco, at the junction of US-101 and I-580. It is strategically located at the entrance to Marin county, easily accessible from both San Francisco across the Golden Gate bridge, and to the East Bay across the Richmond bridge. It is within easy driving distance to major tourist destinations in Napa and Sonoma, and is a major transit hub for Marin county.

The planned extension of the Sonoma-Marin Area Rail Transit (SMART) will connect San Rafael to Sonoma airport and to the Larkspur ferry terminal.

Downtown San Rafael covers an area of approximately 500 acres (about five percent of the city) and is a major employment and mixed-use center. It has over a million square feet of retail and service uses, several large employers such as BioMarin and Kaiser Permanente, as well as civic uses including City Hall.

Downtown has a walkable character and an eclectic mix of uses. It is a shopping destination of choice, primarily along the Fourth Street corridor. Downtown has several structures of historic and cultural value, and is a regional destination for a variety of cultural and arts-related events. It has been recognized as one of California's 14 Cultural Districts by the California Arts Council.



Streets and Blocks

Downtown San Rafael has a regular street grid, with an average block size of 300 feet x 300 feet. Street widths vary approximately from 60 to 80 feet.

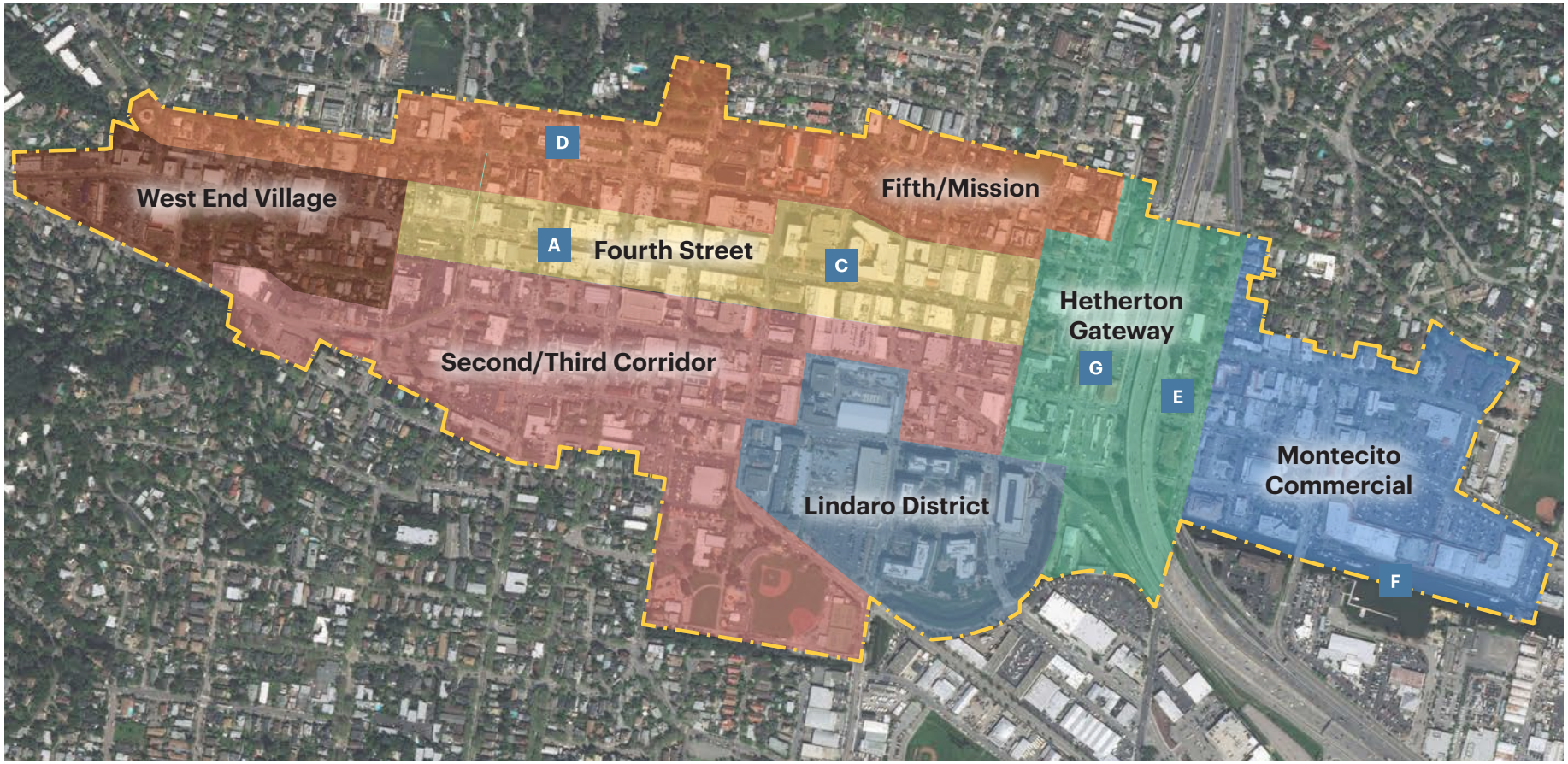
Legend

- Parcels Within Project Area
- Project Area Boundary
- SMART Train Station
- 5-minute and 10-minute walk radii

Scale 1" = 800'

0 *800'* *1600'*

Built Character



Legend

- Project Area
- Fifth/Mission
- Fourth Street
- Second/Third Corridor
- West End Village
- Lindaro District
- Hetherton Gateway
- Montecito Commercial
- B — Location of photos shown on facing page

Scale 1" = 800'

0 *800'* *1600'*

Downtown Sub-Areas

Downtown San Rafael is defined by several sub-areas, each with its unique characteristics.

At the core of downtown is Fourth Street, that functions as its Main Street and center for culture and recreation. The Lindaro District and the Second/Third Street Corridor have an employment focus, with larger office and mixed-use buildings. The West End Village has a more residential feel, as do some parts of the Montecito area. The Hetherton Gateway is an area that will be directly affected by the extension of the SMART rail line and the planned Transit Center. The Fifth/ Mission district has several civic and institutional buildings.

Boundaries for some of these sub-areas were initially defined in the 1993 Downtown Vision. The Downtown Precise Plan provides an opportunity to rethink how Downtown may function in the future, and could result in new boundaries and districts.

Fourth Street serves as the major Main Street of San Rafael.

Mission San Rafael Arcangel

The San Rafael Town Center Plaza

City Hall and the public library

The French Quarter, one of Downtown's historic districts

San Rafael Creek adjacent to the Montecito plaza

The SMART station

Existing Conditions: Urban Form

Urban Form

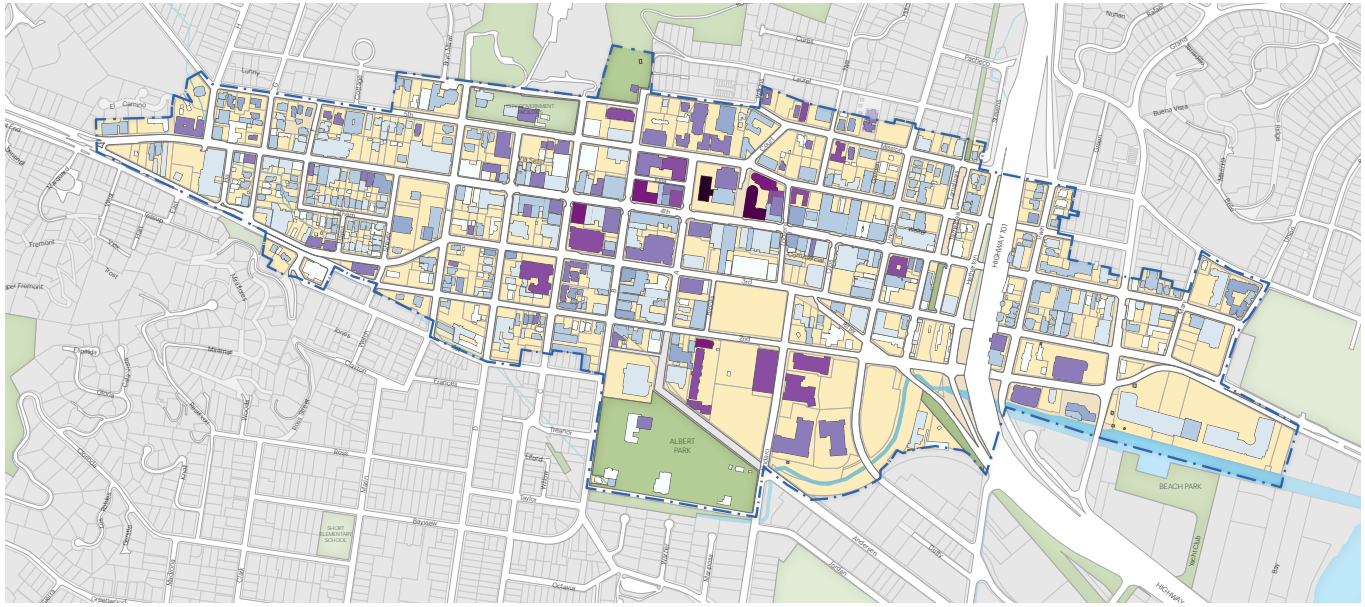
The map above shows existing building footprints in Downtown. As the figure-ground map on the facing page shows, Downtown has a higher proportion of 'block-form' buildings than surrounding residential neighborhoods, that typically are 'house-form' in character. .

Legend

- Parcels Within Project Area
- Parcels Outside Project Area
- Parks/Open Space
- Project Area Boundary
- SMART Train Station
- 5-minute and 10-minute walk radii

Figure Ground Analysis

- Building Footprints Within Project Area
- Building Footprints Outside Project Area
- Parks/Open Space
- Project Area Boundary



Existing Average Heights

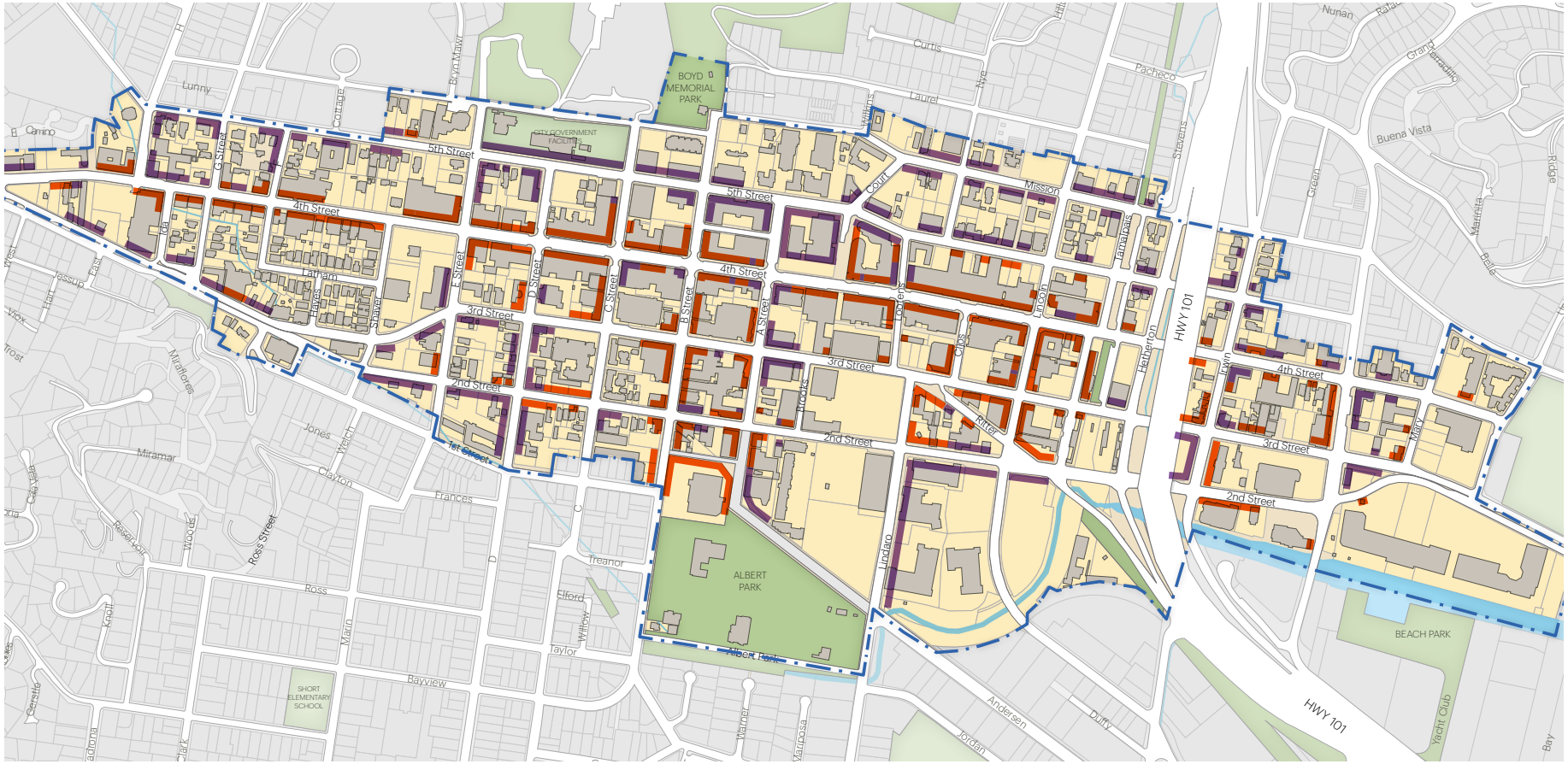
- 1 story
- 1.5 stories
- 2 stories
- 2.5 stories
- 3 stories
- 4 stories
- 5 stories
- 6 stories
- > 7 stories
- Parks/Open Space
- Project Area Boundary

N

Scale 1" = 1000'

0 500' 1000'

Analysis: Existing Frontages



Frontages

Frontage can be simply described as the way in which a building interacts with the adjacent street and sidewalk. The building facade and uses affect the public realm and pedestrian experience. The map above shows a preliminary analysis of frontage conditions in Downtown.

Legend

- Active Retail or Service Frontage
- Active Office or Bank Frontage
- Parcels Within Project Area
- Parcels Outside Project Area
- Parks/Open Space
- Project Area Boundary

Legend

- Private Frontage
- Sidewalk
- Public Frontage
- Furniture/Planting Zone

Frontages, Public Realm and Walkability

The quality of frontage and the adjacent public realm - the street and sidewalk - play a key role in determining how walkable or pedestrian-friendly a place is considered to be. Streets and sidewalks are typically the largest contiguous public space in many Downtown conditions, and shape the way most residents and visitors experience a place.

Active frontages are those that engage the adjacent public realm and encourage pedestrian activity. This could be in the form of the facade treatment - entrances oriented towards the sidewalk, large windows, appropriate setbacks or spaces for outdoor seating, etc.

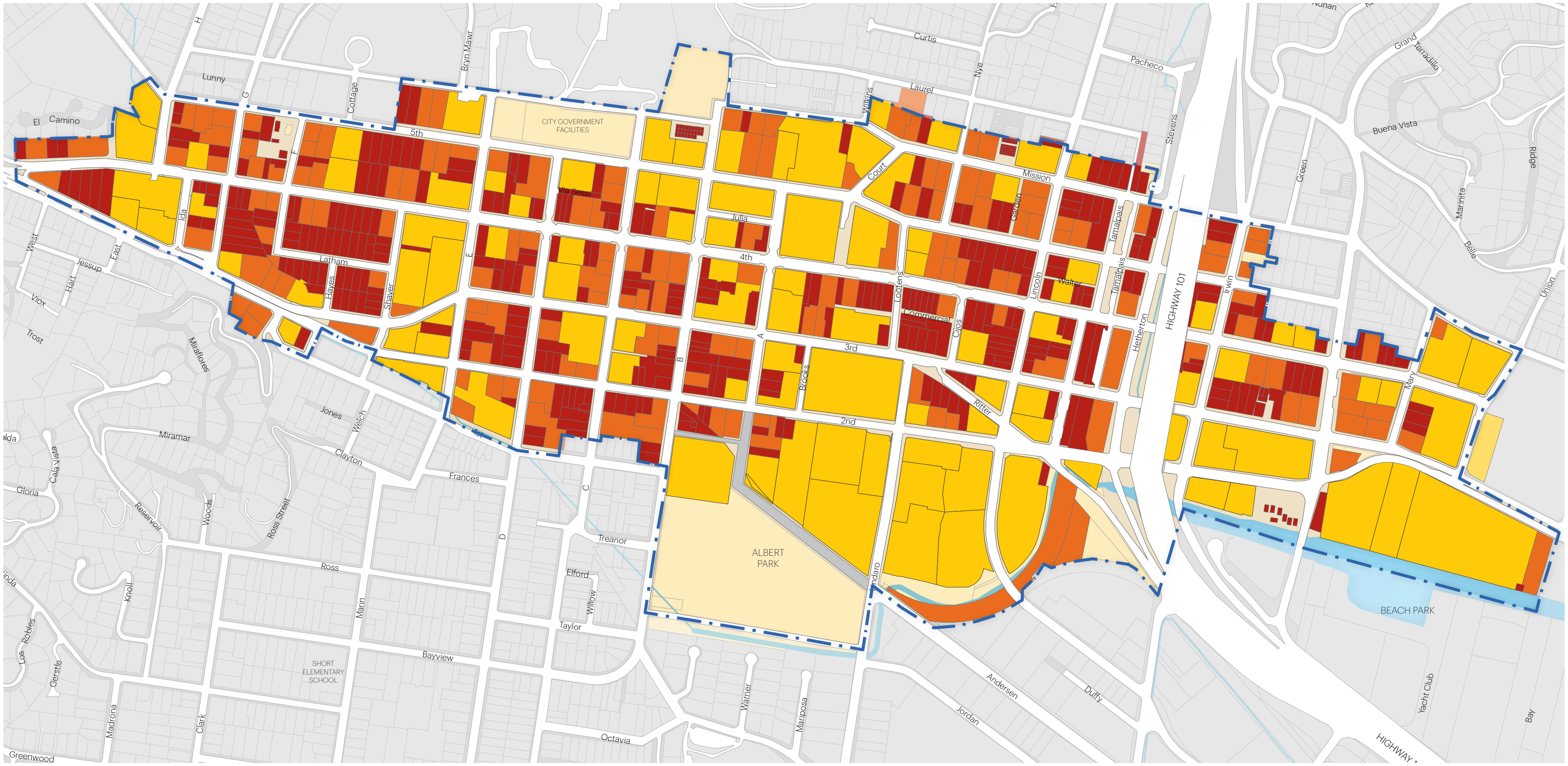
The design of the public realm determines the range of uses and activities that can be accommodated. Ideally there should be space for pedestrians to walk comfortably, as well as space for people to linger and window-shop; space for outdoor seating; street furniture, bike parking, planting strips and trees.

An example of good frontage: building entrances, large windows, street furniture, shaded space for outdoor activity.

An example of mediocre frontage: engaging facades but inadequate space for outdoor seating; lack of shade

An example of poor frontage: the facade is set back and has no active relationship with the adjacent street.

Analysis: Lot Widths



Lot Widths

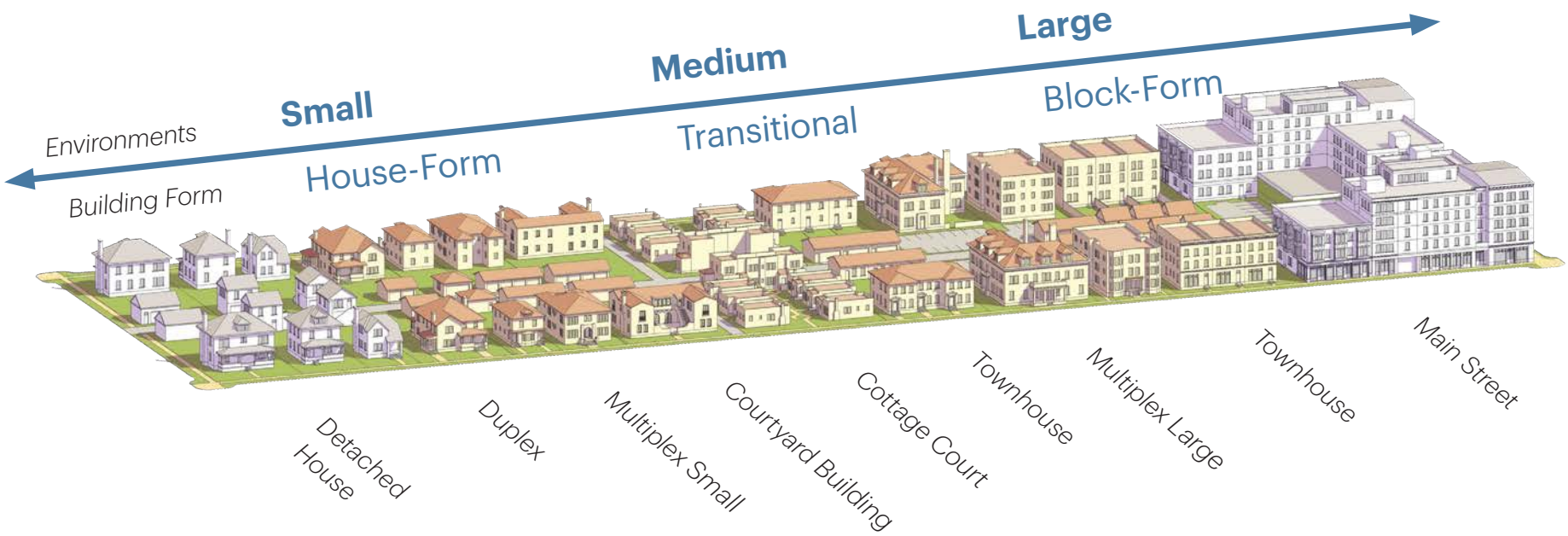
A preliminary analysis revealed that Downtown has wide variation in lot widths. The larger parcels seen on the map are typically a result of lot consolidation by the City or individuals.

Legend

- Parks/Open Space
- Project Area Boundary
- Lot width = 0'-59'
- Lot width = 60'-119'
- Lot width = 120' and above

Scale 1" = 800'

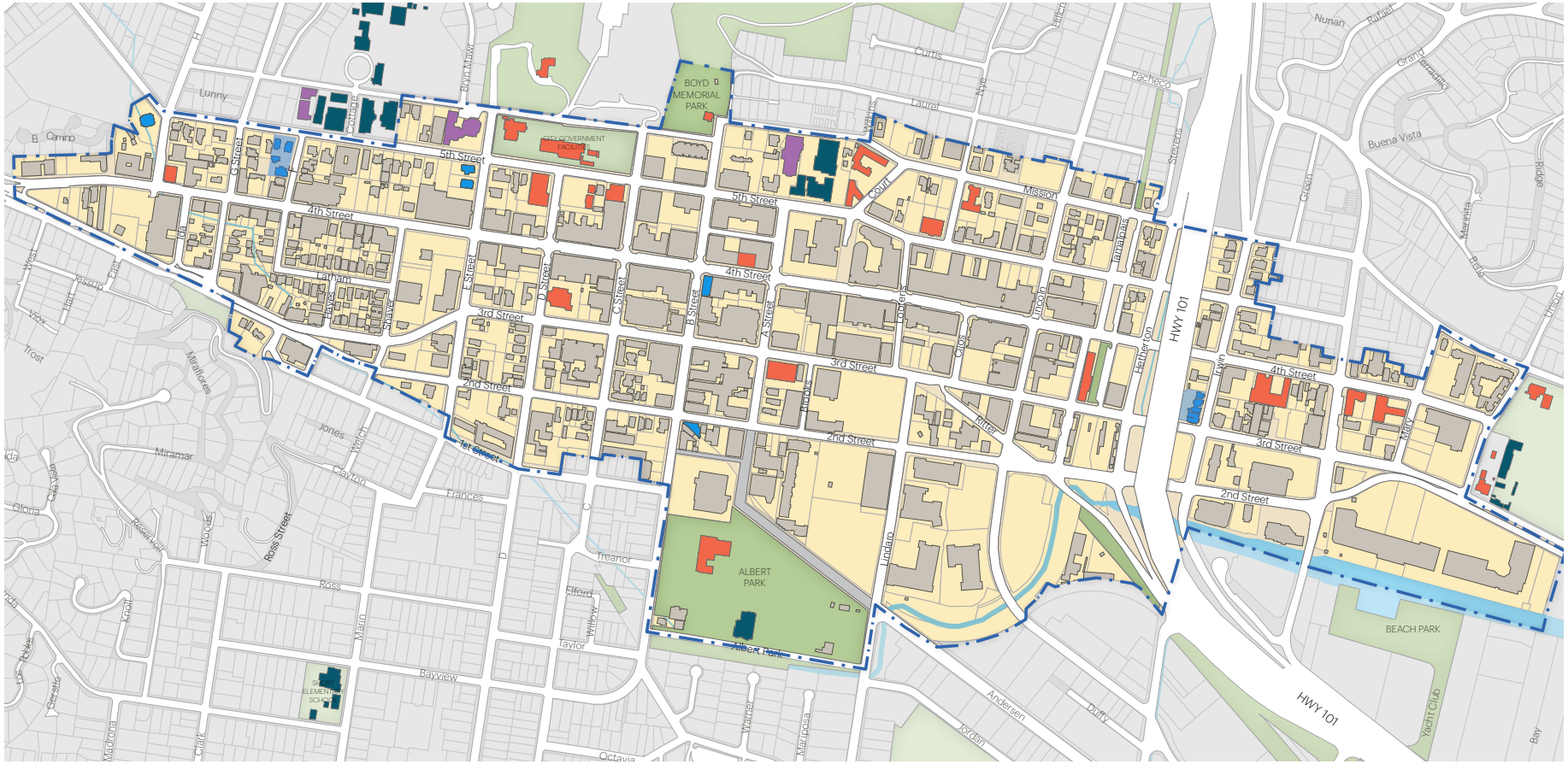
0 — 800' — 1600'



Small, Medium and Large Building Types

The Downtown Plan will include analysis and testing of opportunity sites with a wide variety of building types to assess what the future built form could look like, and be economically viable. The lot width analysis is the first step in assessing the range of building types that could be accommodated on a given parcel.

Parks, Open Space + Institutions



Legend

- Parcels Within Project Area
- Parcels Outside Project Area
- Project Area Boundary
- SMART Train Station
- 5-minute and 10-minute walk radii
- Parks/ Recreation Greens (public)
- Institutional Open Space (private)
- Institutions: Civic/ Community
- Institutions: Religious
- Institutions: Educational
- Historic resources (local landmarks, historic districts)

Scale 1" = 800'

0 *800'* *1600'*

2nd Friday Art Walk, a regional attraction

The Italian Street Painting festival, a popular annual event

Boyd Memorial Park

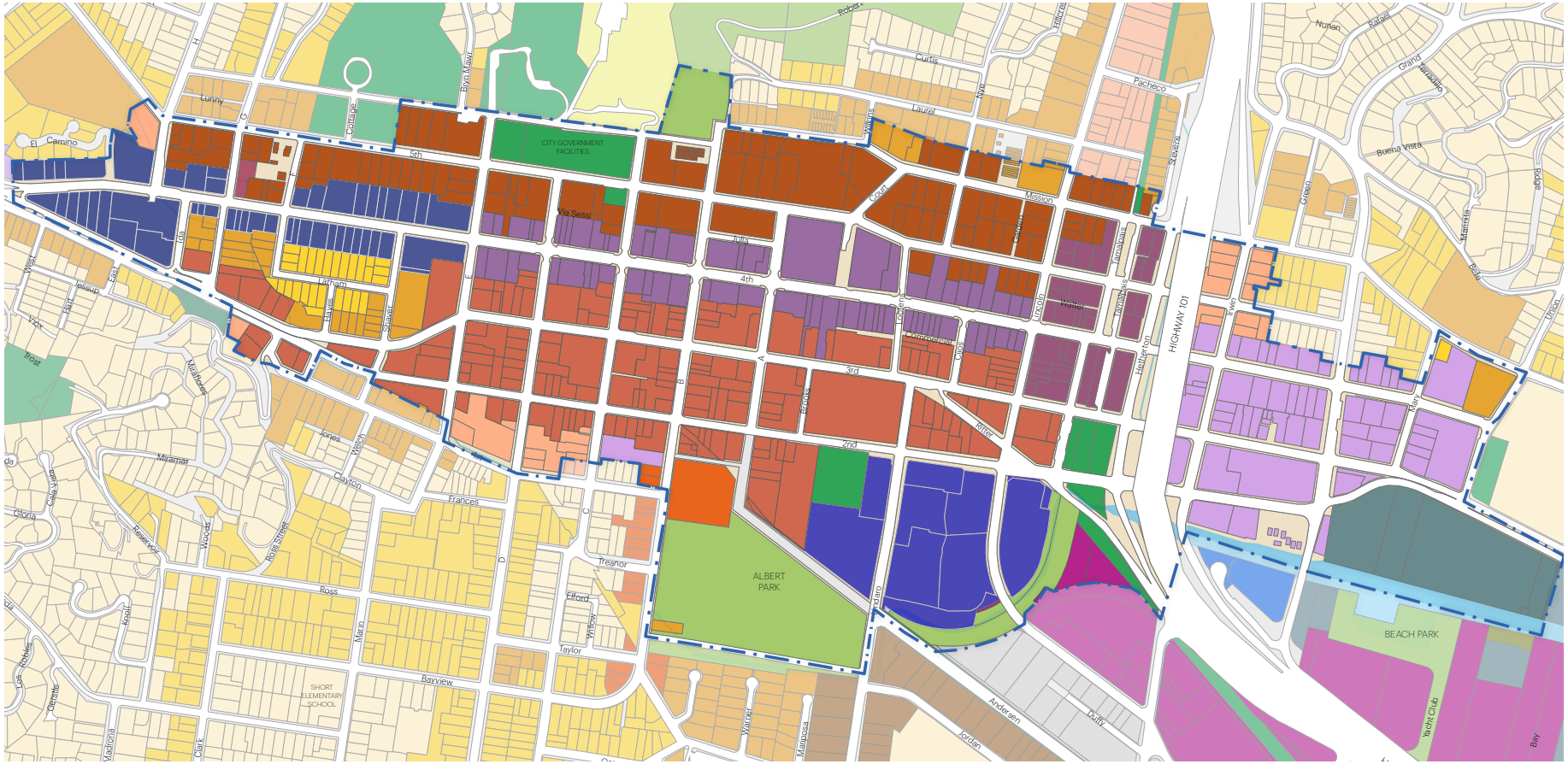
Mission San Rafael Arcangel

San Rafael Theatre

Boyd Museum, a designated local landmark

San Rafael Canal

Existing General Plan Land Use Designations

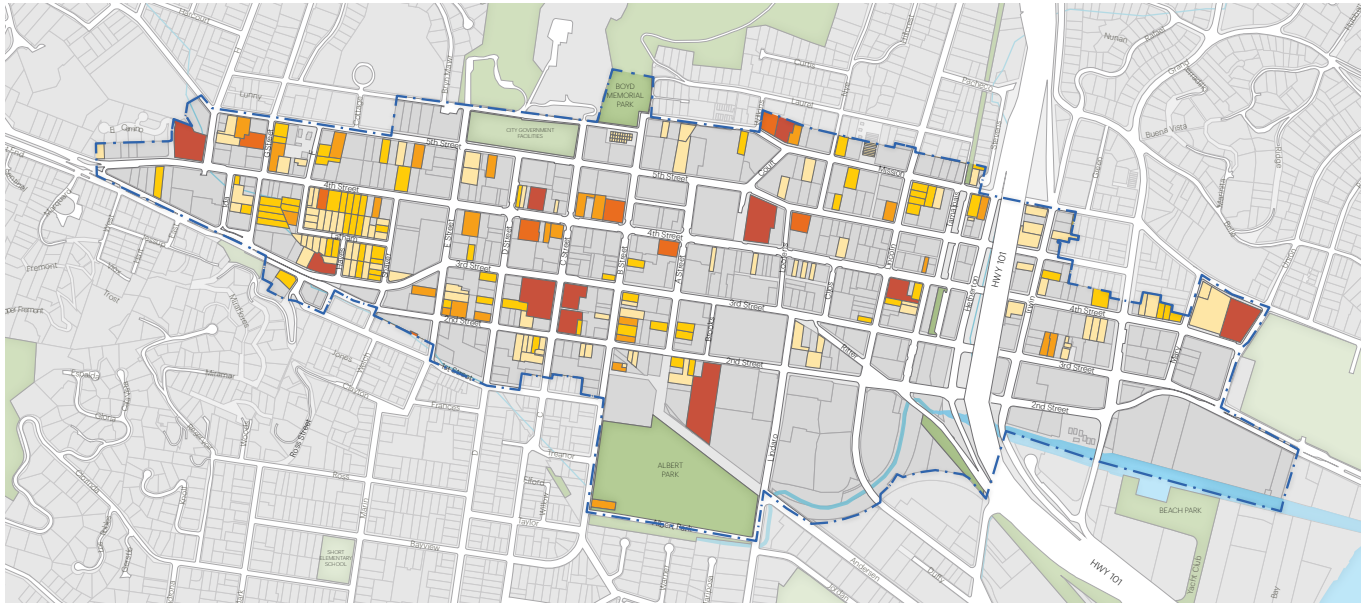


Legend

- Second/Third Mixed Use
- Fourth Street Retail Core
- Fifth/Mission Residential/Office
- Public/Quasi Public
- General Commercial
- Lindaro Office
- Residential Office
- Retail Office
- Park
- Hetherton Office
- Neighborhood Commercial
- West End Village
- Lindaro Mixed Use
- Office
- Marine-related
- Industrial
- Hillside Resource Residential
- Low Density Residential
- High Density Residential
- Medium Density Residential
- Project Area Boundary

Scale 1" = 800'

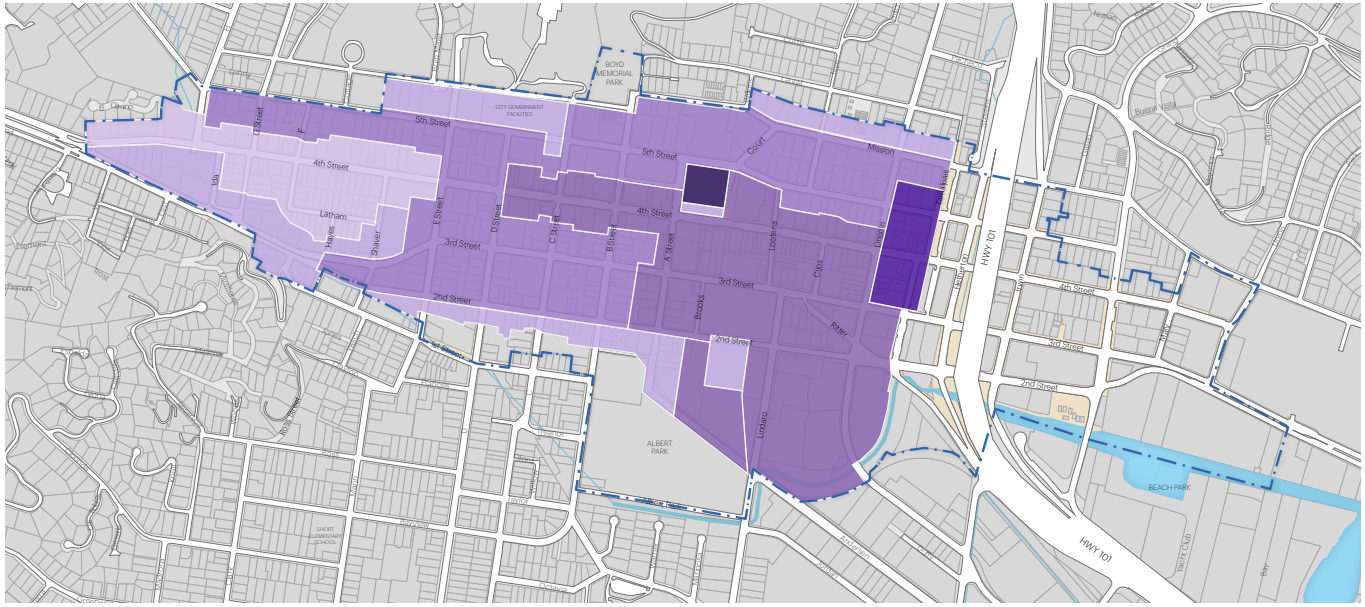
0 *800'* *1600'*



Number of Units per Parcel

Source: City of San Rafael GIS data

- 0
- 1
- 2-4
- 5-12
- 13-24
- ≥25



Allowed Heights (General Plan)

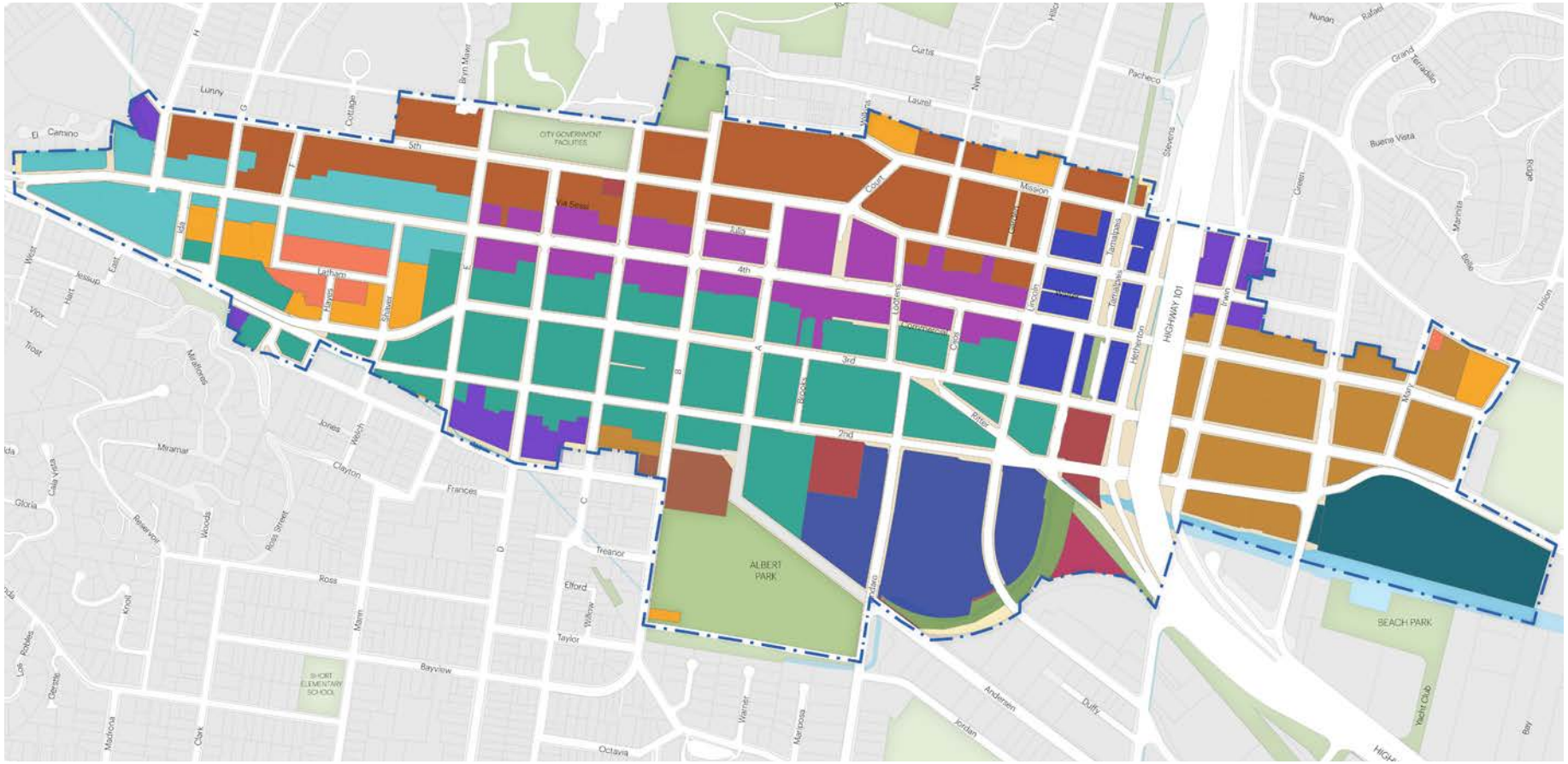
- 30'
- 36'
- 42'
- 54'
- 66'
- 102'
- Project Area Boundary

N

Scale 1" = 1000'

0 *500'* *1000'*

Existing Zoning



Legend

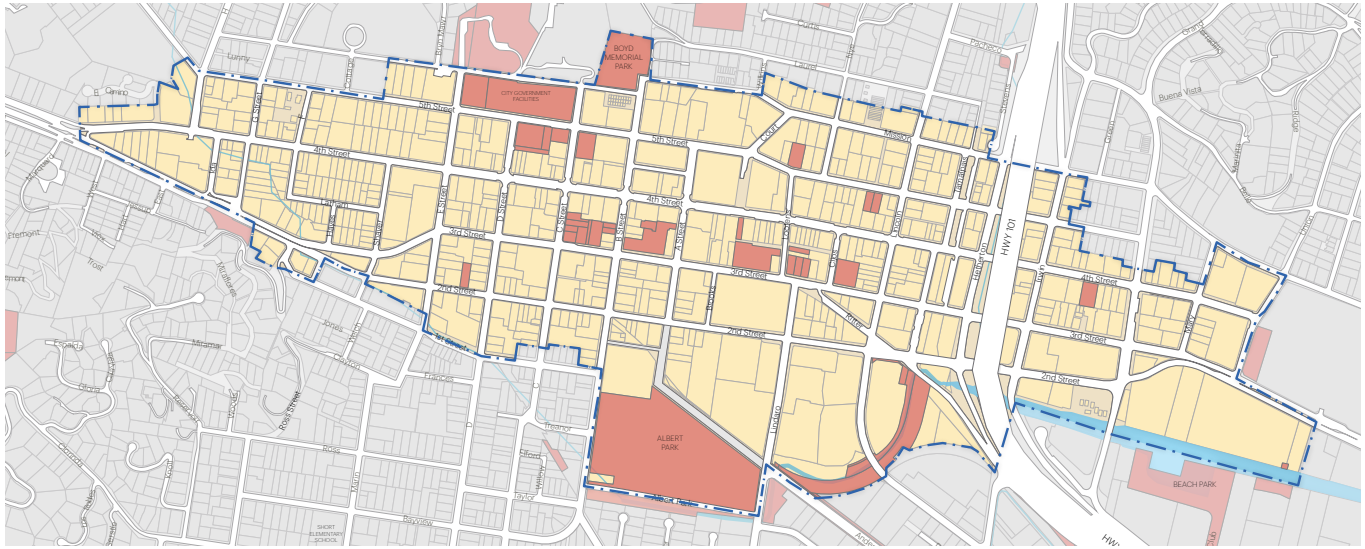
- WEV
- 2/3 MU
- 4SRC
- HO
- 5/M R/O
- R/O
- HR1
- NC
- LO
- MR2.5
- GC
- M
- C/O
- P
- PQ/P
- Project Area Boundary

Scale 1" = 800'

0 *800'* *1600'*

Legend with Zoning District Snapshot						
	Zoning District	Maximum height of structure (ft.)*	Front (ft.)	Side (ft.)	Side street (ft.)	Rear (ft.)
	WEV	30-36	0	0	0	0
	2/3 MU	36-42 west of A St.; 54 east of A St.	5	0	0	0
	4SRC	36-54 (102 Courthouse Square	0	0	0	0
	HO	46-66	NR	NR	NR	NR
	5/M R/O	42	NR-15	NR	NR	NR
	R/O	36	NR	NR	NR	NR
	HR1	36	15	10% of lot width, min. 3', max. 5'	10	5
	NC	36; 30 for a residential-only building	NR	NR	NR	NR
	LO	36	20	10 or 20/0	NR	10
	MR2.5	36	15	10	10	5
	GC	36	NR	NR	NR	NR
	M	36	NR	NR	NR	NR
	C/O	36	NR	NR	NR	NR

** Maximum height excludes density bonuses that are available through provision of affordable housing and other community benefits.*



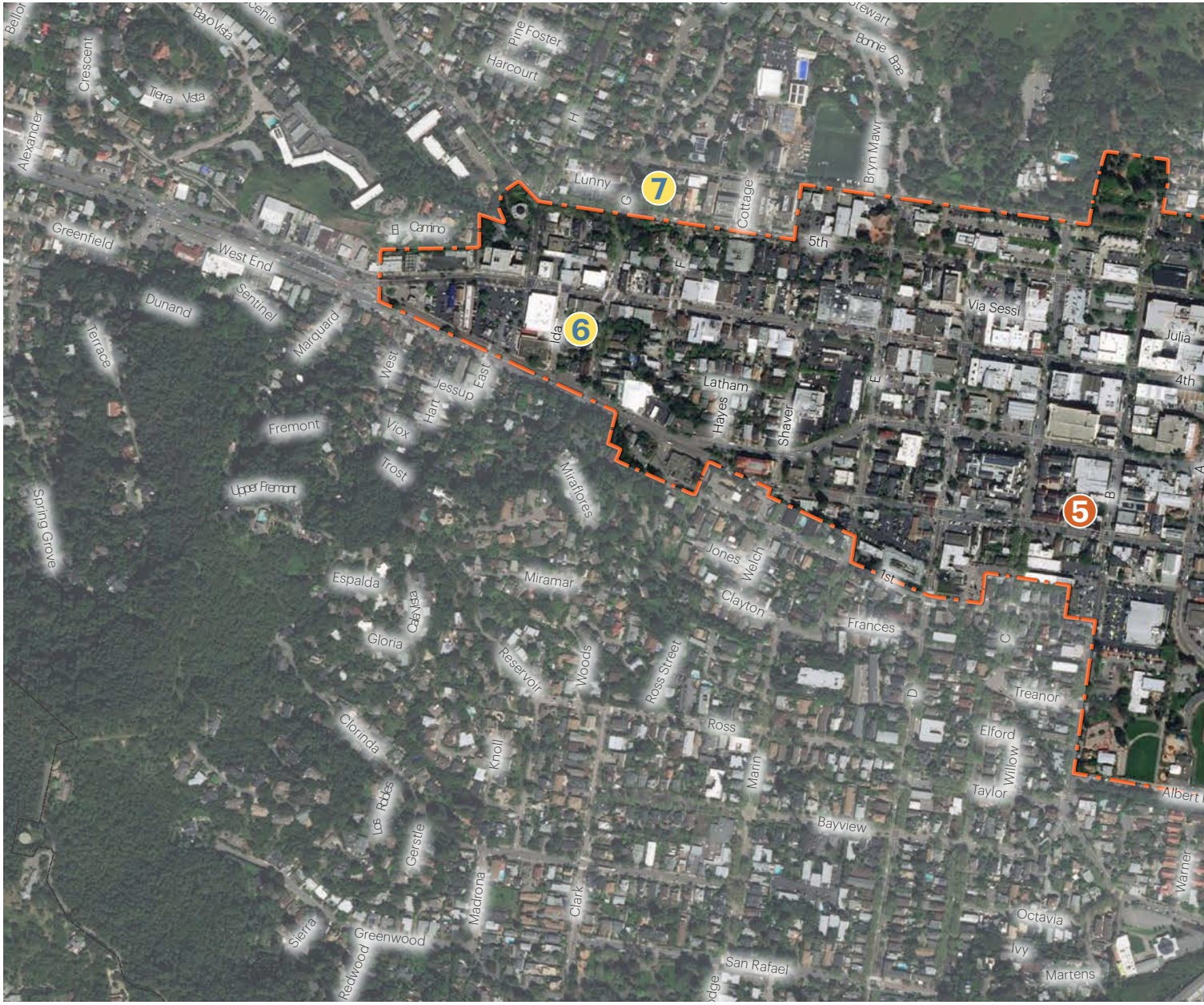
City-Owned Parcels

City-owned

Project Area Boundary

Development Projects in San Rafael

1. **800 Mission Avenue.** *Assisted living-seniors (Aegis), 88 residences + memory care. Status: Approved.*
2. **703-723 Third Street.** *120 Residential apartment units. Status: Under Review.*
3. **999 Third Street.** *68 Senior apartments (low income), 207,000 sq ft BioMarin expansion. Status: Under Review.*
4. **1001 Fourth Street.** *Potential Mixed-Use Project.*



5 **815 B Street.** *41 Residential Apartments. Status: Approved.*

6 **21 G St.** *8 Residential Townhomes. Status: Approved.*

7 **1628 Fifth Avenue.** *8 Residential Apartments. Status: Approved.*

8 **755 Lindaro Street.** *A 72,396 sq. ft. office building.*

Legend

- Housing Project
- Office Project
- Mixed Use Project

Urban Design: Key Findings

The following reflect the key findings on urban design that can guide the upcoming work on the San Rafael Downtown Precise Plan:

Walkable Street and Block Network

Downtown San Rafael has a grid of small blocks (approximately 300 ft x 300 ft) with street widths varying between 60 to 80 feet on average. This creates a very walkable environment, and is a key strength. It also offers significant potential to develop a well-connected bicycle network within Downtown.

Mixed Use Character with Sub-Areas

With a variety of residential, retail, office, cultural and civic uses, as well as historic resources, Downtown San Rafael is a vibrant mixed-use destination for the region. Downtown also several sub-areas, each with its distinct characteristics, that offer a variety of experiences for residents and visitors.

Built Character

Parts of Downtown San Rafael are very memorable due to its built form, historic buildings and vistas. There is also an interesting variety in built form, ranging from 'house-form' structures in the residential areas to more 'block-form', mixed use buildings in the heart of Downtown. However, there is inconsistency in the built form, and several blocks have large surface parking lots or buildings with deep setbacks that create gaps in the urban fabric.

Transit Center as an Opportunity

Downtown San Rafael is a regional transit hub for Marin county, and the proposed relocation of the Downtown Transit Center (due to the extension of the SMART line south to the Larkspur Ferry Terminal) offers a valuable development opportunity.

Variety in Lot Sizes

There is a wide variation in lot sizes with some lots too narrow to be feasible for redevelopment. Lot consolidation can be an effective strategy, guided by design and massing controls.

Connectivity and Barriers

The Second and Third Street couplet, as well as the streets running adjacent to Highway-101 have high volumes of traffic, and create significant barriers to pedestrian connectivity and movement in both the east-west and north-south direction. The Montecito Commercial Area, while a part of Downtown, is not as well-connected as others. Similarly, the Lindaro District is often perceived as a self-contained campus, though it is within a ten minute walk from Fourth Street shops and restaurants.

Public Spaces

Downtown San Rafael lacks a cohesive central open space. The Courthouse plaza is well-used but could be developed to attract more people, and accommodate a wider variety of activities. Since the downtown is largely built out, there are few vacant parcels that could be used to create new open spaces.

Allowed Building Heights

The building heights allowable in Downtown are from the General Plan and do not correspond well with the zoning districts. They also do not take into account density bonuses available to developers. The Precise Plan is an opportunity to re-examine Downtown zones and adjust heights to establish a clear hierarchy while accommodating development.

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COUNTY

CHAPTER

6

Transportation Network

This chapter provides information on San Rafael's transportation network, with a focus on the Downtown Precise Plan Area. This includes vehicular, transit, bicycle and pedestrian circulation.

In this chapter

Background + Context

The transportation network described in this section, alongside land use patterns and urban design framework, plays a considerable role in shaping the built environment of Downtown San Rafael. Convenient access to Downtown restaurants, shops, offices, and service providers is important not only for regular daily errands and activities, but also for the livelihood of Downtown businesses. As such, a well-connected and effective multimodal transportation network is an essential component of the overall Downtown San Rafael experience for residents, employees, visitors, and businesses.

Regional Context

Marin County travel data collected for the Transportation Authority of Marin (TAM) in September 2018 indicate that about 60 percent of work commute trips made by central Marin residents are made to work places within Marin County. The remaining work commute trips are made by residents to San Francisco/Peninsula (28 percent), Contra Costa/Alameda counties (6 percent), Sonoma County (4 percent), and Napa/Vallejo counties (2 percent).

The TAM travel data also shows that Marin County imports workers, a reflection of the high cost of housing. About 35 percent of the approximately 125,000 employees who work in Marin County live outside the county, with the highest share of imported workers coming from Sonoma, Contra Costa, and San Francisco counties.

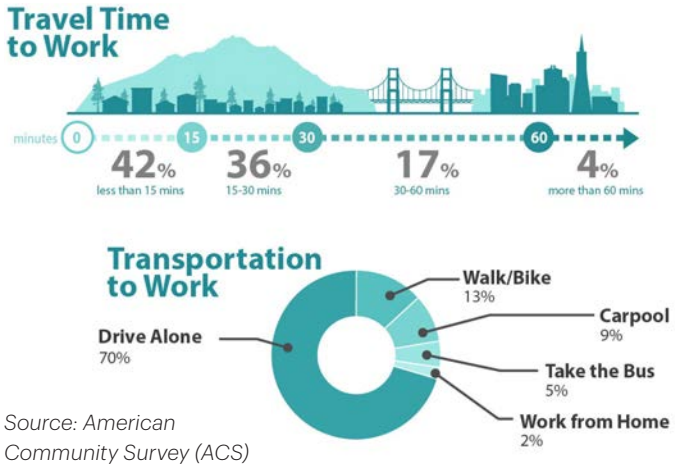
Travel data extracted from the regional travel model developed by the Metropolitan Transportation Commission (MTC) indicate that most jurisdictions in Marin County have a Vehicle Miles Traveled (VMT) per capita value for home-based trips that is higher than the Bay Area as a whole, with San Rafael residents generating 6 percent greater VMT per capita than the regional average.

Local Context

Data from the MTC travel model indicates the following allocation of current city-wide San Rafael VMT by trip purpose.

Trip Purpose	VMT Shares
Work	58.7%
Shopping	9.2%
Escorting children or others	4.8%
Going out to eat	3.6%
K-12 school trips	3.2%
Social	2.4%
University	1.0%
Other	17.1%

2017 census data indicates the following travel time to work and mode share for commute trips to work for San Rafael residents.



Source: American Community Survey (ACS) 2017 data.

Existing Downtown Transportation Infrastructure

14 miles
of roadway

3 miles
of bicycle facilities

21 miles
of sidewalks

4,414
Public vehicle parking spaces

3,785
Private vehicle parking spaces

282
Bicycle parking spaces

Roadway Network

Existing Roadway Network

Downtown San Rafael is served by an extensive system of regional and local streets. Within Downtown San Rafael, the roadway network is a grid-based network of lettered north-south streets and numbered east-west streets. Many of the core Downtown blocks are 360 feet by 360 feet with roadway widths ranging from about 40 to 52 feet.

Downtown roadways serve a variety of users, including people traveling by foot, bike, bus, and vehicle, as well as delivery trucks serving Downtown Businesses and residences. The multimodal roadway network proves to be a dynamic environment for users of all types.

The City of San Rafael organizes local roadways using a hierarchical system, whereby individual roadways are classified by their intended function within the overall roadway network. These classifications – highways, major arterials, minor arterials, local streets, and short alleys – define the desired functional and operational characteristics of a roadway, such as traffic volume capacity and level of service.

Within Downtown San Rafael, several major arterials serve as primary vehicle routes in and out of Downtown including Second Street, Third Street, Andersen Drive, and Point San Pedro Road. Minor arterial streets that also serve as key vehicle routes include Fourth Street, Fifth Avenue, Mission Street, Grand Avenue, Irwin Street, Hetherton Street, Lincoln Street, Lindaro Street, and A Street through E Street.

The following streets and portions thereof in or adjacent to Downtown San Rafael are designated as truck routes: Francisco Boulevard, Jordan Street, Lincoln Avenue from the north line of Third Street to its intersection with Irwin Street, San Pedro Road, Second Street, Third Street, DuBois Street from Irwin Street to Woodland Avenue, Fourth Street from its westerly terminus to Second Street, Irwin Street from Third Street to Woodland Avenue, Lindaro Street from Third Street to Jordan Street, Lovell Avenue from Irwin Street to Jordan Street, and Woodland Avenue from its easterly terminus to Irwin Street.

Downtown roadways are controlled by a variety of traffic control devices. Most intersections on arterial streets are controlled by traffic signals. The traffic signals mostly operate on fixed time. City staff are planning implementation of a more responsive, dynamic signal system. Less heavily travel streets are controlled by multi-way or side-street stop controls. Generally, roadways within the Downtown have a posted speed limit of 25 mph to 35 mph.

The average city-wide daily trip length for San Rafael, according to the TAM data, is 8.2 miles, slightly higher than the overall county average of 8.1 miles and 19 percent higher than the Bay Area average of 6.9 miles.

Regional travel to and from Downtown San Rafael is provided by Interstate 580 and Highway 101. Both highways are owned, operated, and maintained by Caltrans. Interstate 580 is a freeway that extends from San Rafael east across the San Francisco Bay, via the Richmond-San Rafael Bridge, and through the East Bay to its eastern terminus at I-5 on the east side of Livermore. Highway 101 is a major north-south highway that runs through the states of California, Oregon and Washington. Highway 101 has four lanes in each direction through Downtown San Rafael and carries approximately 202,000 vehicles per day. Interstate 580 has two lanes in each direction through Downtown San Rafael and carries about 77,000 vehicles per day just east of Highway 101.

Existing Roadway Facilities

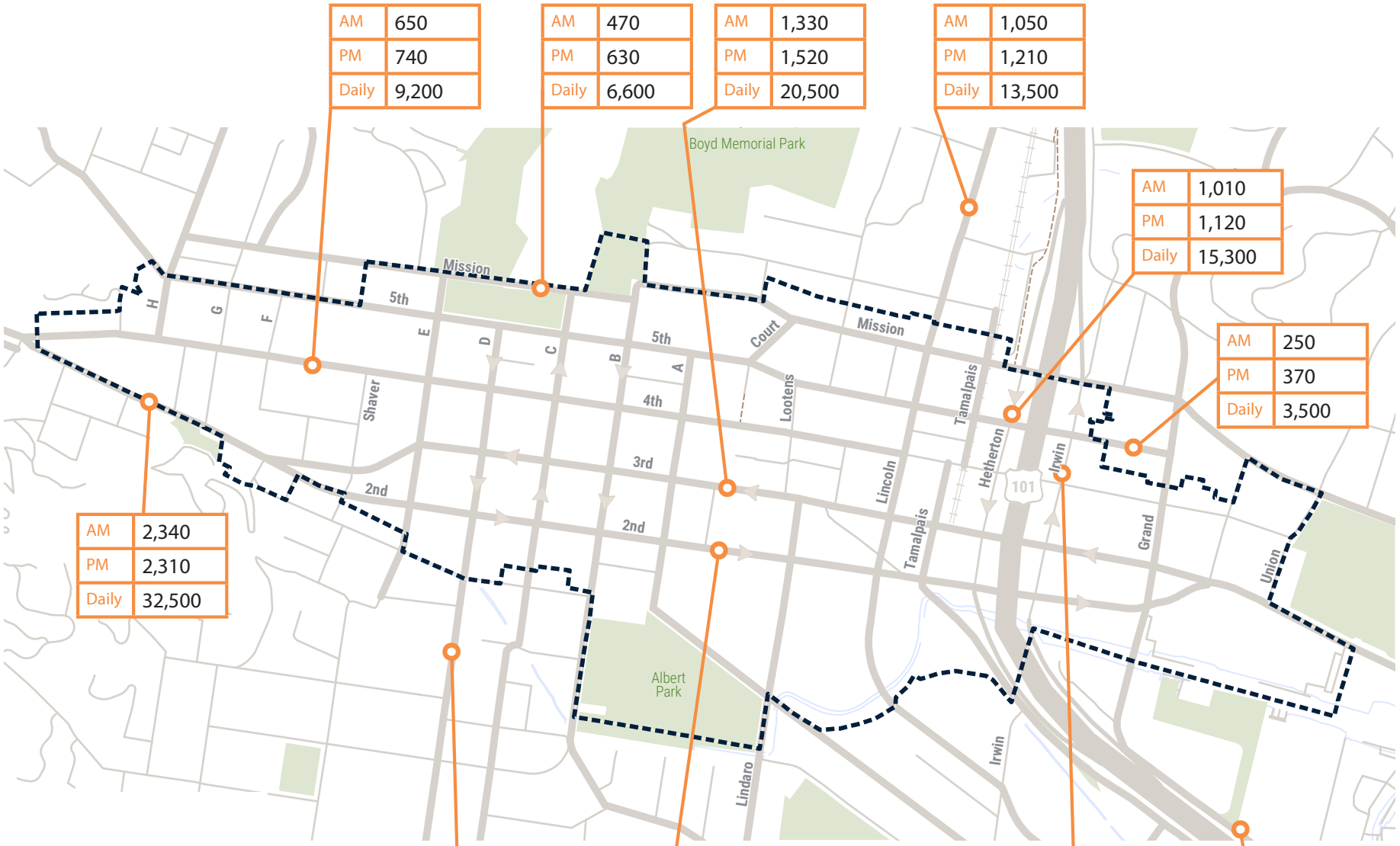
Legend

- Study Area
- Rectangular Rapid Flash Beacon
- Traffic Signal
- Highway
- Major Arterial
- Minor Arterial

Scale 1" = 800'

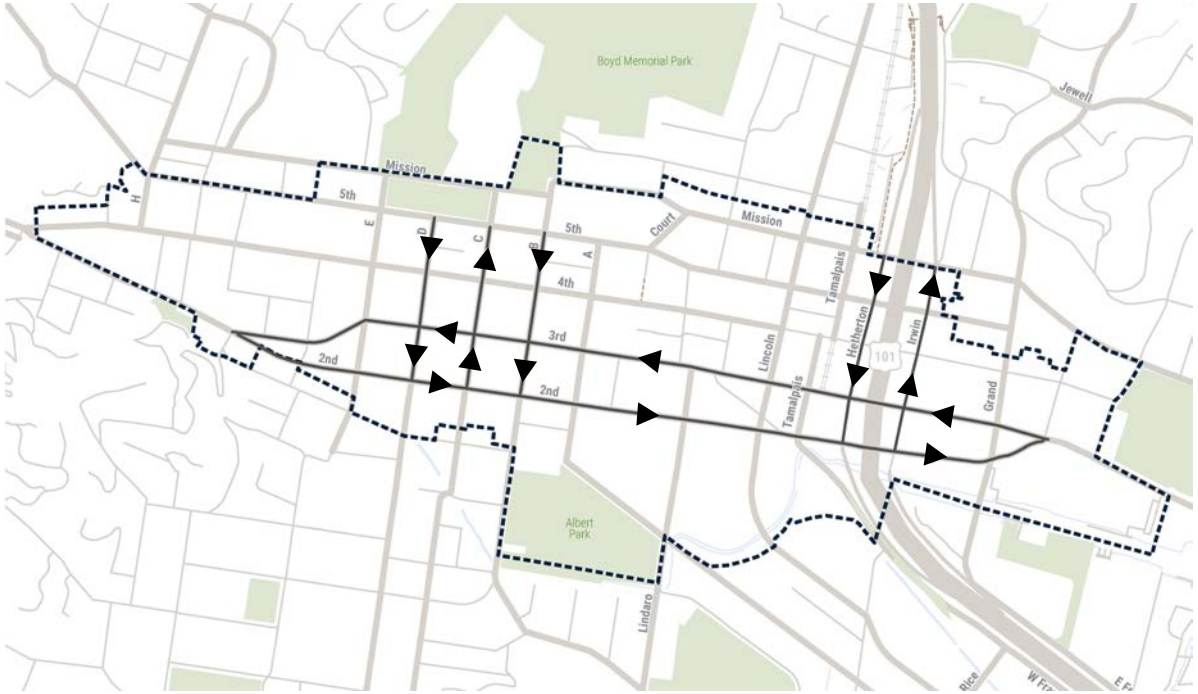
0 *800'* *1600'*

Existing Traffic Volumes



Source: Fehr and Peers, May 2019 traffic counts

Existing Street Character



One-way streets in Downtown. *The Second/Third Street one-way couplet is the primary east-west route through Downtown.*

Second Street

Fourth Street

Downtown San Rafael Transit Center, a regional hub

SMART Station adjacent to Whistlestop

Downtown Gateway

Traffic Safety and Issues

Congestion

Congested conditions occur during weekday morning and evening commute periods, and to a lesser extent during the mid-day, on arterials both immediately adjacent and feeding Highway 101. The greatest levels of vehicle delay occur on Second Street, Third Street, Irwin Street and Hetherton Street.

Collisions

The California Office of Traffic Safety (OTS) develops collision rankings so that individual cities can compare their city's traffic safety statistics to those of other cities with similar-sized populations. OTS notes that their rankings are only indicators of potential problems and that there are many factors that must be evaluated based on local circumstances. In the OTS rankings, the City of San Rafael is grouped with 104 other California cities with a population between 50,001 and 100,000.

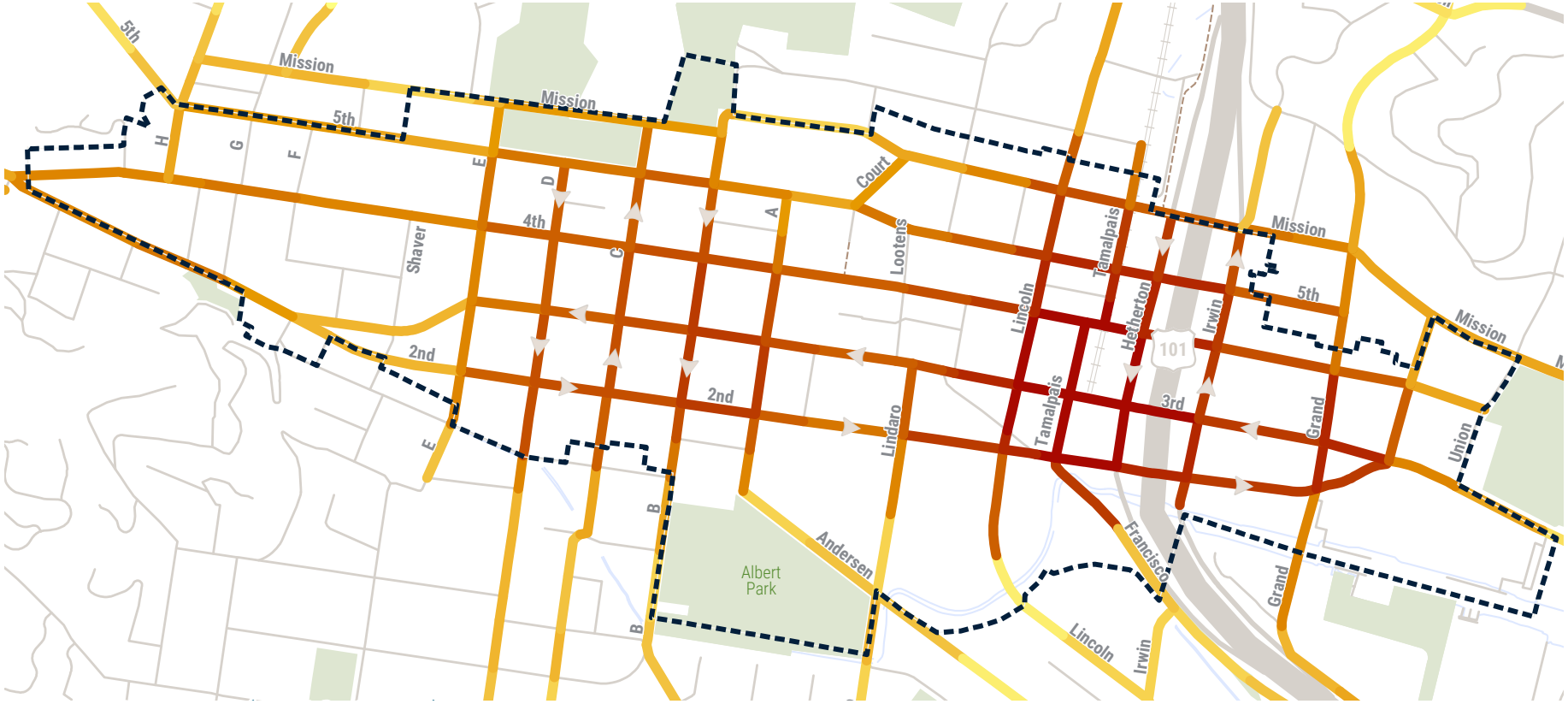
The latest 2016 OTS rankings show that the City of San Rafael ranks among the Top 12 of those 104 cities (i.e., highest frequency of collisions) in 6 of the 14 OTS collision categories.

- Pedestrian collisions - #2
- Bicycle collisions (younger than 15) - #4
- Pedestrian collisions (older than 65) - #6
- Bicycle collisions - #8
- Speed related collisions - #11
- Had been drinking (driver less than 21) - #11

The City of San Rafael collaborated with all Marin jurisdictions to develop the 2018 Marin County Travel Safety Plan. Chapter 11 of the Plan provides specific information for the City of San Rafael. The crash-based safety assessment is based on five years of collision data obtained from the Transportation Injury Mapping System (TIMS) crash database that was developed and is maintained by SafeTREC, a University of California, Berkeley research center. The database is comprised of the most recent local reported crashes from the Statewide Integrated Traffic Records System (SWITRS) between 2012 and 2016.

A collision severity index figure was developed for each jurisdiction. The index is based on a blend of actual (75%) and predicted (25%) collisions at each study location. The index weights different mode collision equally relative to each other. All observed collision in which a person was killed are weighted by a factor of 3. The collision severity index figure for Downtown San Rafael is shown on the facing page. The figure shows that the highest concentration of collisions occurs around the San Rafael Transportation Center and SMART station. The second highest concentration of collisions occurred on the portion of the Downtown network bounded by A Street, D Street, Second Street, and Fifth Avenue.

Collision Density (2012-2016)



Source: 2018 Marin County Travel Safety Plan

Legend

Study Area

Collision Density

Low — High

Scale 1" = 800'

0 *800'* *1600'*

Pedestrian Network

Existing Pedestrian Network

The pedestrian experience is an important part of an overall Downtown environment since it is required to support the density of land uses. In addition to basic pedestrian facilities such as sidewalks and crosswalks, roadway geometrics and traffic control devices within a Downtown area influence vehicle speeds and the level of traffic that shape the pedestrian environment.

Sidewalks or paths are located along most streets in Downtown San Rafael with a few exceptions, as shown on the figure on the following page. Portions of Downtown San Rafael, particularly along Fourth Street and Fifth Avenue from Lincoln Avenue to the West End, are walkable, pedestrian-friendly streets.

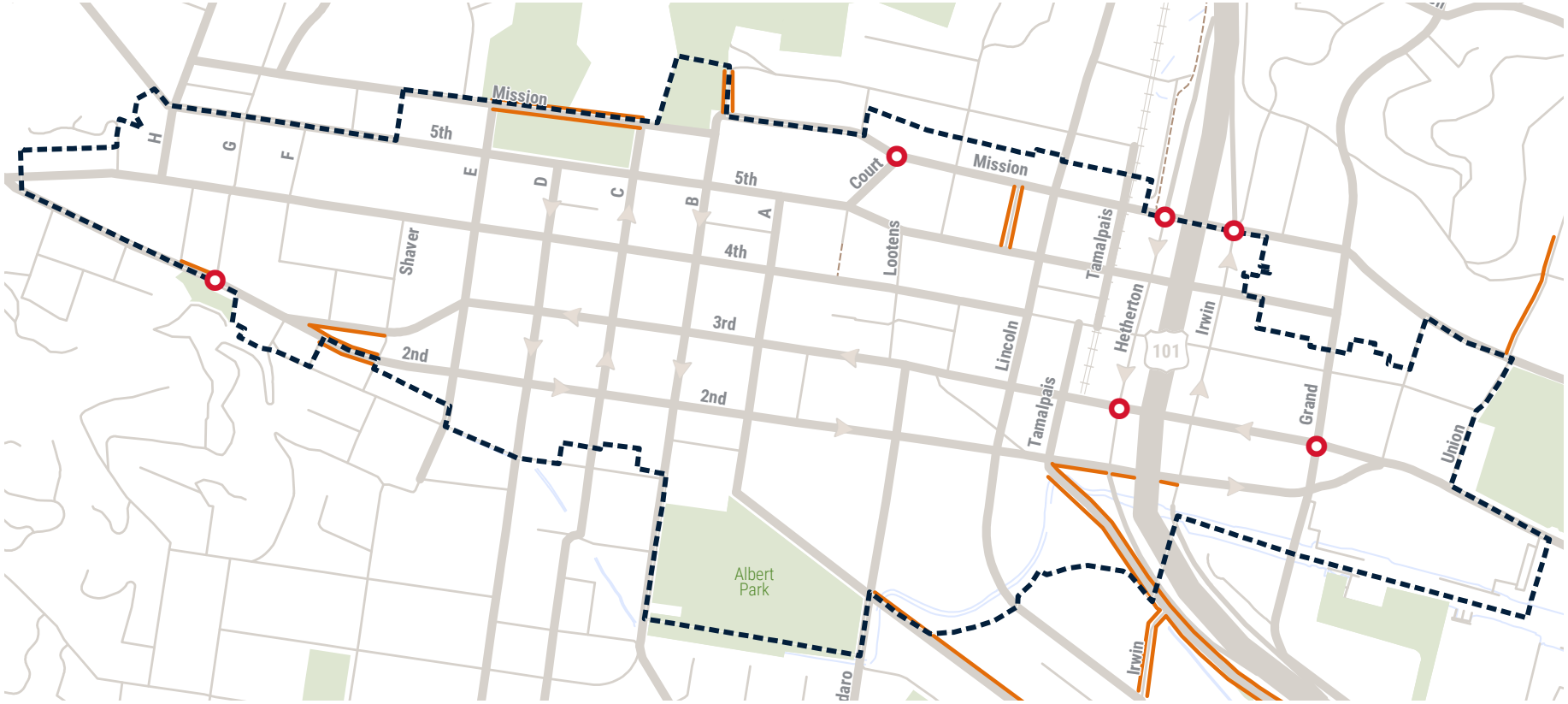
Streets that have higher traffic volumes, vehicle speeds, greater vehicle turning volumes, and/or attached sidewalks without a buffer present a less comfortable pedestrian environment. Examples of these streets include Second Street, Third Street, Hetherton Street, Irwin Street, Andersen Drive, Francisco Boulevard West, and Francisco Boulevard East.

The San Rafael Bicycle and Pedestrian Master Plan (2018 Update) identified pedestrian network gaps and difficult crossing locations (i.e., crossing length, pedestrian visibility, signal timing, lack of curb ramps, etc.) based on public comments. In the Downtown area, difficult street crossings were identified at intersections near the Transit Center (Hetherton Street, Irwin Street, Second Street, and Mission Avenue), along Grand Avenue, and at several locations in the West End. Sidewalk gaps exist along portions of Second Street, Mission Street, Grand Avenue, Francisco Boulevard West, and Francisco Boulevard East.

Downtown locations with high volumes of foot traffic generally coincide with concentrations of attractions, or along routes that link activity center. For example, the concentration of restaurants, bars, and shops along Fourth Street are a primary attraction that result in surges of pedestrian activity during the lunch and evening hours. The San Rafael Mission, Rafael Theater, Albert Park, and the Downtown Transit Center/SMART station are major activity centers that generate significant pedestrian activity levels. City Hall and the San Rafael Library are two major public uses in the north central portion of Downtown that attract pedestrians. The Downtown San Rafael Farmer's Market is held every Thursday evening, from May through September from 6:00 to 9:00 pm, on Fourth Street between Cijos and B Streets. The segment of Fourth Street is closed to vehicle traffic during the Thursday evening Farmer's Market.

The Downtown San Rafael pedestrian realm along the core segment of Fourth Street features amenities that foster the prolonged use of the streetscape by Downtown visitors. Street furniture (e.g., benches), landscaping, and outdoor dining areas contribute to a welcoming pedestrian environment.

Marked crosswalks facilitate pedestrian crossings at most Downtown intersections. Most intersections have standard crosswalk treatments, which consist of two 12 inch wide white stripes that delineate the sides of the pedestrian walking area. Several intersections have high-visibility crosswalks that are marked using the continental pattern of crosswalk striping, which consists of a series of wide strips parallel to the curb for the length of the crossing. This includes intersections around the Transit Center/SMART station, along Fourth Street in the West End, on Second Street, Grand Avenue, Fifth Avenue, and Mission Avenue.



Source: San Rafael Bicycle & Pedestrian Master Plan, 2018 Update

Legend

- Study Area
- Difficult Crossing
- Sidewalk Gap

Scale 1" = 800'

0 *800'* *1600'*

Pedestrian Collision Density (2012-2016)

Source: 2018 Marin County Travel Safety Plan

Legend

Study Area

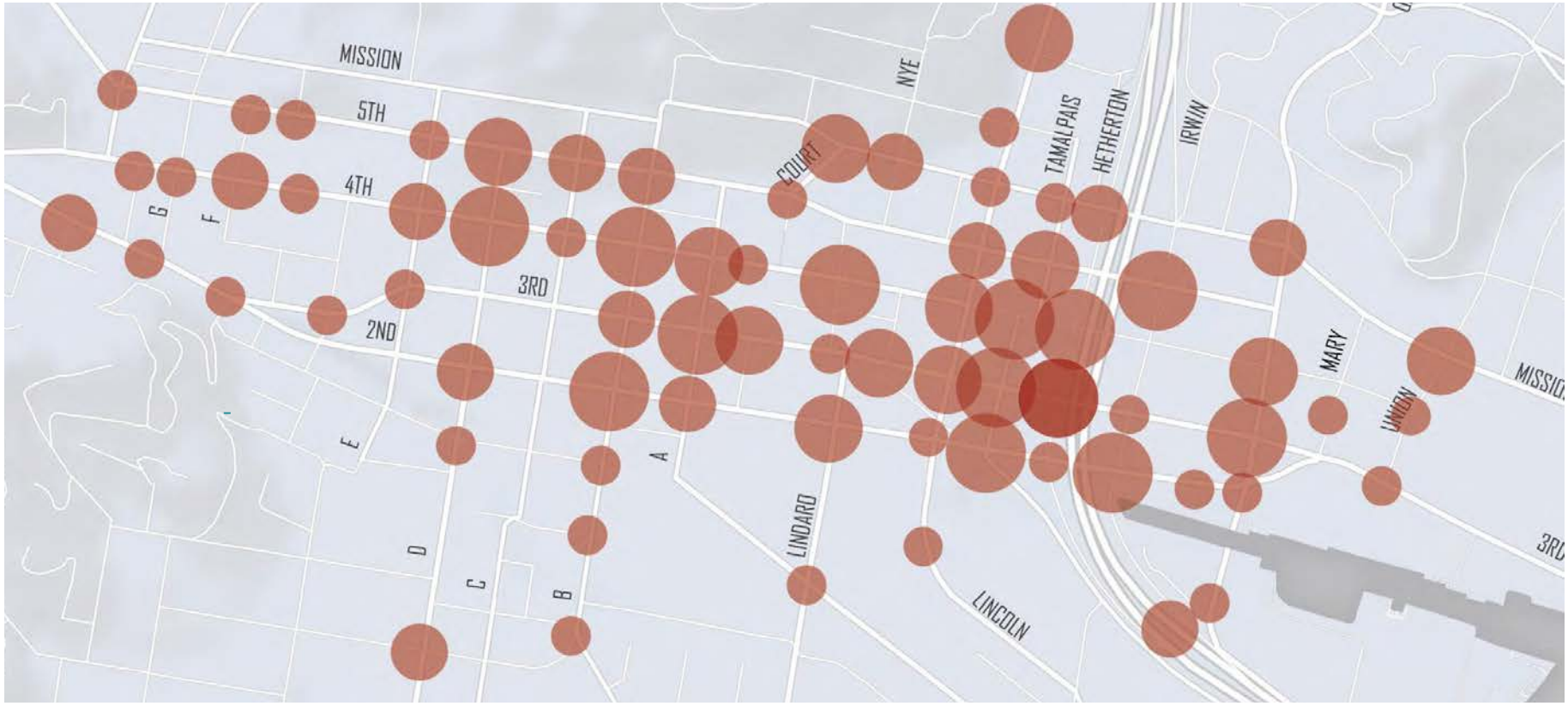
Collision Density

Low — High

Scale 1" = 800'

0 — *800'* — *1600'*

All Pedestrian Collisions



Source: 2018 San Rafael Bicycle and Pedestrian Master Plan. Please note that the red color denotes areas with a higher density of pedestrian collisions and have no relationship to pedestrian traffic volumes.

65% of collisions involving pedestrians in San Rafael occured in the Downtown area.

Pedestrian Collisions

The City of San Rafael had the second highest frequency of pedestrian collisions of 104 comparably sized cities in California, based on 2016 rankings by the state Office of Traffic Safety. According to data analyzed for the San Rafael Bicycle & Pedestrian Master Plan (2018 Update), 1 in 10 collisions in San Rafael involves a pedestrian, and 65 percent of pedestrian-involved collisions in San Rafael occurred in the Downtown area.

A review of collision maps prepared for the Marin County Travel Safety Plan and the Bicycle & Pedestrian Master Plan, on the following two pages, shows that pedestrian collisions in the Downtown area are clustered in the following areas.

- Transit Center/SMART Station/Highway 101 area
- Area bounded by A Street, B Street, Fourth Street, and Second Street
- D Street at Fourth Street and Fifth Avenue
- Grand Avenue at Third and Fourth Streets

The highest frequency and severity of collisions has occurred at intersections around the Transit Center, SMART Station, and intersections adjacent to Highway 101. The City of San Rafael has added high visibility crosswalks and new signals at intersections in this area along Third Street, Fourth Street, and Fifth Avenue. The City has also procured federal funding through the Highway Safety Improvement Program (HSIP) to design and construct proposed improvements at the intersection of Third Street and Hetherton Street, where many of the most severe collisions have occurred.

Bicycle Network

Existing Bicycle Network

Caltrans recognizes four classifications of bicycle facilities.

- Class I – commonly referred to as a bike path or bikeway, is a facility separated from automobile traffic for the exclusive use of bicyclists.
- Class II – commonly referred to as bike lanes, are dedicated facilities for bicyclists immediately adjacent to automobile traffic.
- Class III – commonly referred to as bike routes, are on-street routes where bicyclists and automobiles share the road.
- Class IV – commonly referred to as cycle tracks or protected bike lanes, are a facility that combines elements of Class I and Class II facilities to offer an exclusive bicycle route immediately adjacent to a roadway similar to a Class I facility, but provides a physical separation from traffic with raised curb, plastic delineators, or parked automobiles.

Downtown San Rafael has a limited bicycle network. Of the 14 miles of roadway in the study area, only 21 percent of these roadways have space dedicated for the use of bicycles.

Bicyclists traveling to the Downtown area utilize a series of on- and off-street bicycle facilities to access the Downtown grid. Bicyclists traveling from the north can utilize either a Class I path adjacent to the SMART rail line or Class III route along Grand Avenue. Bicyclists travel from the south can utilize a Class II lane on Andersen Avenue or a Class III shared route on D Street. Bicyclists traveling from the east can use Point San Pedro Road, which has a combination of Class II lanes and Class III shared route facilities. Bicyclists traveling from the west can use a Class III shared facility on Greenfield Avenue.

Through Downtown, bicycle facilities are limited to a Class I path along a few blocks of Hetherton Street and Class III shared routes on Fourth Street and Grant Avenue.

The Marin County Bicycle Coalition bicycle route map shows Mission Avenue, Lincoln Avenue, Andersen Avenue, and D Street as suggested primary routes through Downtown San Rafael.

Bicycle Collisions

The City of San Rafael had the eighth highest frequency of bicycle collisions of 104 comparably sized cities in California, based on 2016 rankings by the state Office of Traffic Safety. According to data analyzed for the San Rafael Bicycle & Pedestrian Master Plan (2018 Update), 1 in 10 collisions in San Rafael involves a bicyclist.

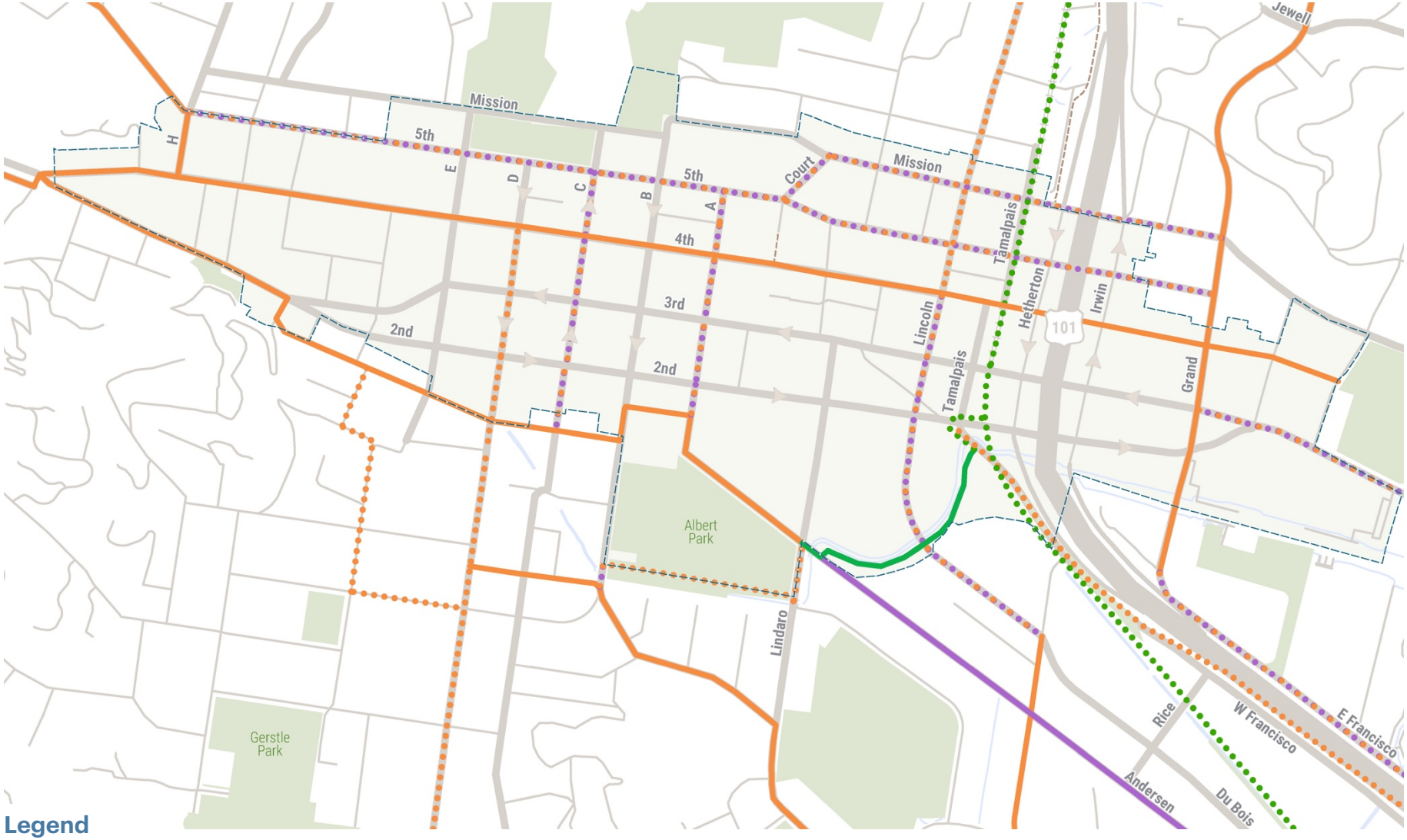
A review of collision maps prepared for the Marin County Travel Safety Plan and the Bicycle & Pedestrian Master Plan, on the following two pages, shows that bicycles collisions in the Downtown area are clustered in the following areas.

- Transit Center/SMART Station/Highway 101 area
- Fourth Street between A Street and G Street
- Second Street between D Street and Grand Avenue
- Grand Avenue at Third Street

Bicycle Parking

Once Downtown, bicyclists can store their bikes in one of approximately 282 bicycle parking spaces. Most bicycle parking is intended for short-term use (e.g., bike racks). A total of eight long-term lockers are provided immediately north of the SMART train station on the east side of Tamalpais Avenue (e-lockers) and under Highway 101 just north of Third Street (keyed blue lockers).

Existing and Planned Bicycle Facilities

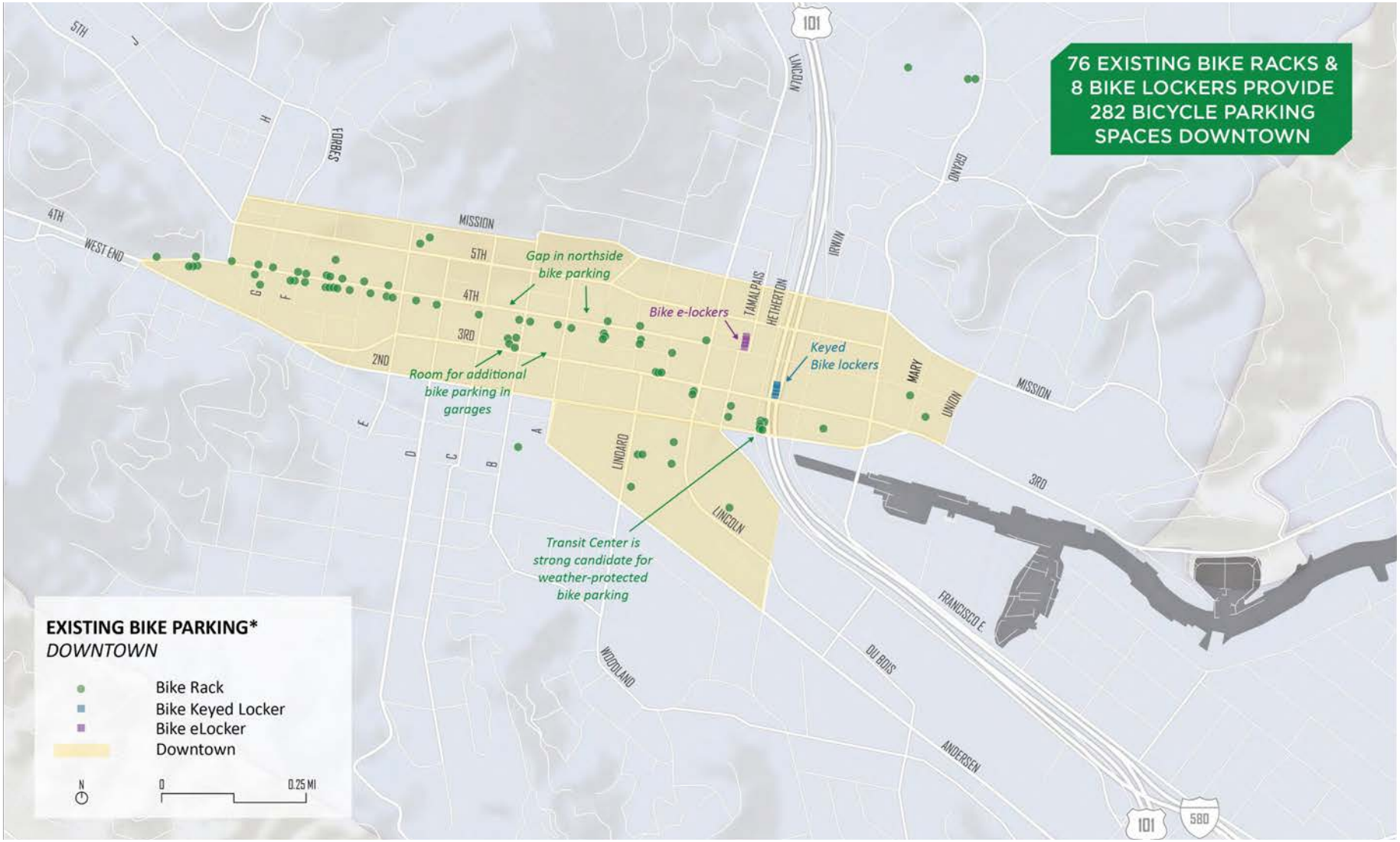


Legend

- Existing Class I Multi-Use Path
- Existing Class II Bike Lane
- Existing Class III Bike Route
- Proposed Class I Multi-Use Path
- Proposed Class I-II Bike Path/Lane
- Proposed Class II Bike Lane
- Proposed Class II-III Bike Lane/Route
- Proposed Class III Bike Route

Source: 2018 San Rafael Bicycle & Pedestrian Master Plan

Existing Bicycle Parking



Source: 2018 San Rafael Bicycle & Pedestrian Master Plan

Bicycle Collision Density (2012-2016)

Source: 2018 Marin County Travel Safety Plan

Legend

Study Area

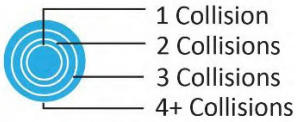
Collision Density

Low — High

All Bike Collisions

Source: 2018 San Rafael Bicycle and Pedestrian Master Plan. Please note that the blue color denotes areas with a higher density of bicycle collisions and have no relationship to bicycle traffic volumes.

23 bike collisions in Downtown because of wrong-way travel by bicyclists on one-way streets.



Transit Network

Downtown San Rafael is served by several transit service types, ranging from passenger rail to fixed route bus service. Bus routes operate on a variety of Downtown streets, connecting Downtown San Rafael with surrounding neighborhoods, other Marin and Sonoma County communities, and other Bay Area communities including San Francisco and Richmond.

Existing Transit Network

Rail Service

Sonoma-Marin Area Rail Transit (SMART) provides passenger rail service in Marin and Sonoma counties. SMART's initial 43 miles of rail corridor includes 10 stations, from Downtown San Rafael to the Sonoma County Airport. SMART served about 723,000 passengers during its first year of operations beginning on August 25, 2017. Twenty-nine (29) percent of all passengers boarded at the San Rafael Downtown station, which equates to about 700 daily passenger boardings on weekdays.

SMART trains are accessible to passengers with disabilities and also provide spaces for bicycles on each train. SMART stations have bike storage including bike racks and secured bike lockers.

Fares can be purchased in a variety of ways, including Clipper and the SMART eTickets app, with discounted rates for seniors, youth, and persons with disabilities. SMART offers a 31-Day Pass for unlimited rides for 31 consecutive days from the date of first use, as well as Eco Passes - unlimited, flat rate passes available to employers and institutions as an employer-sponsored transit benefit - available in four, six, or twelve month increments.

Since 2017, the Transportation Authority of Marin (TAM) and Lyft have offered a $5 discount for all "Lyft Line" rides to and from SMART stations in Marin County. The program is designed to support access to and from Marin's SMART stations and encourage carpooling options to reduce congestion and pollution. TAM has also partnered with Whistlestop to ensure this service is available to all users, including providing rides with wheelchair accessible vehicles.

SMART is currently constructing a 2.2 mile extension connecting San Rafael and Larkspur. The extension will provide a terminal station in Larkspur Landing adjacent to the Larkspur Ferry Terminal. SMART train service to Larkspur is projected to begin in late 2019. The extension is estimated to add 800 daily riders.

Regional Bus Service

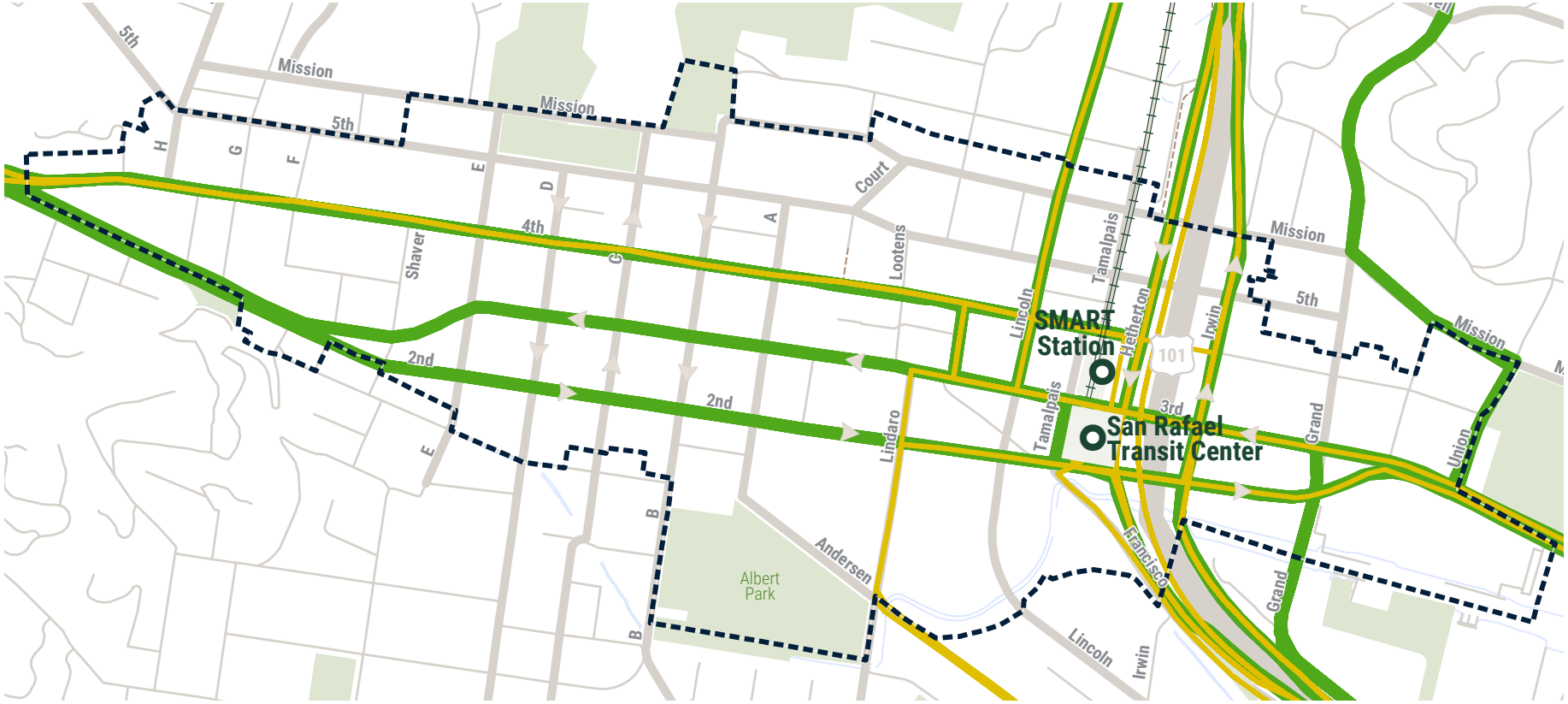
The Golden Gate Bridge and Highway Transportation District (GGBHTD) directly operates two fixed-route transit services: Golden Gate Transit (GGT) regional bus service and Golden Gate Ferry (GGF).

Regional bus service began in 1972 and is provided on 26 fixed routes. These routes fall into three categories:

- **Basic** routes provide daily service throughout the day and evening between San Francisco, Marin, Sonoma, and Contra Costa counties.
- **Commute** routes provide weekday service primarily during morning and afternoon peak periods between San Francisco, Marin, and Sonoma Counties.
- **Commute Shuttle** routes provide weekday service primarily during morning and afternoon peak periods and are designed to supplement other GGBHTD services.

Basic routes that stop at the San Rafael Transit Center include routes 30 (San Rafael to SF), 40 and 40X (San Rafael to El Cerrito), 70 (Novato to SF) and 101 (Santa Rosa to SF).

Existing Bus + Train Transit



Source: Fehr & Peers

Legend

- Study Area
- Golden Gate Transit
- Marin Transit
- Sonoma-Marin Area Rail Transit

Commute routes that stop at the San Rafael Transit Center include routes 27 (San Anselmo to SF) and 44 (Lucas Valley to SF).

Local Bus Service

Marin Transit provides a total of 29 fixed route, six community shuttle, nine supplemental school, two rural fixed route, and one Muir Woods shuttle service within Marin County. Marin Transit bus and shuttle services carried over 3.2 million passenger trips in 2017.

Marin Transit owns 95 vehicles including 32 paratransit vehicles, 18 hybrid diesel-electric buses, 12 community shuttles, ten Muir Wood shuttle vehicles, ten articulated vehicles, nine Stagecoach vehicles, two battery electric (zero emission) buses, and two supplemental school vehicles. Marin Transit acquired the two battery electric buses, which can seat 32 passengers, in September 2018. Staff are evaluating performance, reliability, cost, and scalability.

The San Rafael Transit Center is served by nine fixed route, four community shuttle, and one West Marin Stagecoach route. Fixed routes 22, 23, 23X, and West Marin Stagecoach route 68 connect the San Rafael Transit Center to destinations to the west via Fourth Street and Red Hill Avenue. Fixed route 23, 23X, 29, 35, and 36 connect the San Rafael Transit Center with the Canal Neighborhood to the southeast. Fixed route 35 and Community Shuttle route 257 connect the San Rafael Transit Center with destinations to the north via Lincoln Avenue. Marin Transit Community Shuttle routes 233 and 257 connect the Transit Center to destinations to the north via Grand Avenue.

Marin Transit offers a 31-Day Pass for unlimited rides for 31-consecutive days from the date of first use, as well as a 7-Day and a 1-Day Pass. Discounted rates are available for seniors, youth, and persons with disabilities.

Marin Transit offers a six month or annual Youth Pass through participating Marin County schools.

Transit Centers

SMART Train Station

The Downtown San Rafael SMART station is bounded by Fourth Street, Third Street, and Tamalpais Avenue. It is located just north of the San Rafael Transit Center located between Third Street and Second Street. Presently the southern terminus of the SMART line, it serves more boardings (29 percent) than any other station along the SMART line.

For SMART riders using a Clipper card, free shuttle service to the Larkspur Ferry Terminal is available. The SMART rail extension to the Larkspur Ferry station is scheduled to be complete by late 2019.

Downtown Transit Center

The San Rafael Transit Center (SRTC) serves as the regional transit hub for Marin County. It connects rail service, bus service, airporter service, and taxi service. Transfers are provided to San Francisco, Sonoma and Contra Costa counties.

The current 17-bay transit center serves 9,000 boardings and alightings on over 500 buses. Nearly half of the trips made by weekday riders have origins or destinations within the downtown San Rafael area. Just over half are transferring between buses or between bus and rail at the transit center. With 16 bus bays occupied during peak times, the SRTC is currently operating at or beyond its capacity.

A multi-year process to develop a new transit center for San Rafael has been underway since early 2018. The current transit center will be affected by the extension of Sonoma Marin Area Rail Transit (SMART) system to Larkspur. Five alternative station concepts are being considered.

Automobile Parking

Parking Supply

The Downtown Planning Study Area contains a total of 6,709 parking spaces allocated as follows:

- 1,627 on-street parking spaces
- 1,297 public parking spaces
- 3,785 private parking spaces

Almost 80 percent of the on-street parking spaces are metered (782) or have a two-hour time limit (487). The remaining on-street spaces are unrestricted (335), loading zones (18), or have a 20-minute time limit (5). There are a total of 1,627 on-street spaces in areas along the edge of Downtown. The 'edge of Downtown' is defined as the area outside of the Downtown Planning Study Area, but within the half-mile radius of the San Rafael SMART station.

Almost 90 percent of public off-street parking spaces are paid all-day (892) or paid two-hour (252) spaces. The remaining public off-street spaces are either paid for different durations or electric vehicle parking (32), reserved/permit only (50), free (31), or handicap (40) spaces. Caltrans provides 196 free park & ride lot spaces. Persons driving to the SMART train station or Transit Center may park in one of four Caltrans park-and-ride lots under Highway 101 (total of 191 spaces).

Parking Occupancy

The peak parking demand period within the Downtown Planning Study Area for both the weekday (Wednesday) and weekend (Saturday) surveys was found to occur between 1:00 PM and 3:00 PM. Although the 1:00 PM to 3:00 PM time frame was the period with the highest parking demand. Similar levels of demand were also observed between 11:00 AM and 1:00 PM, indicating that parking demand is generally highest between 11:00 AM to 3:00 PM on both weekdays and weekends. While off-street parking saw demand fall off after the peak period, demand for on-street parking stayed relatively constant throughout the afternoon and evening. This is indicative of the evening demand for Downtown retail and dining uses, whose patrons would be most likely to use on-street parking.

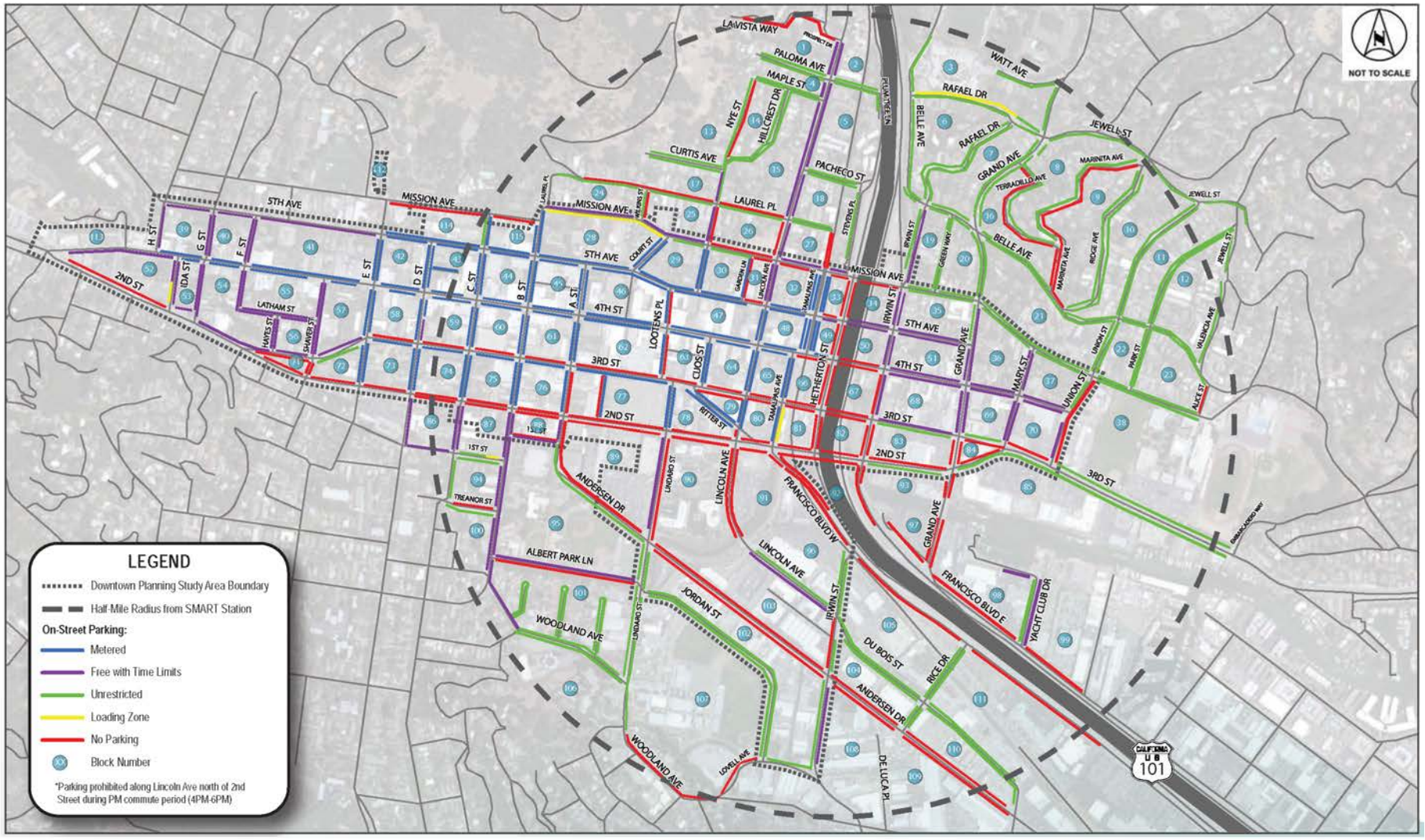
During peak conditions, the total parking occupancy in the Downtown Planning Study Area was approximately 66 percent on weekdays and 46 percent on weekends. Peak period occupancy levels at five of the most heavily used public off-street parking facilities exceeded 85 percent on weekdays, meaning they are effectively fully utilized. This includes public off-street facilities at Third & Lootens (1st floor), Third & Cijos, 830 Third Street –Walgreens, Fifth & Lootens, and Fifth & Garden. All of these public off-street parking facilities are located in the core of the Downtown between Lincoln Avenue and Court Street.

On-street parking demand in the 'edge of Downtown' remained relatively constant throughout the survey periods. The demand for parking ranged between 61 percent and 62 percent for the weekday survey, and between 59 percent and 62 percent for the weekend survey; because of this low variability in parking demand, there is no single peak period for the 'edge of Downtown'.

Parking Revenue

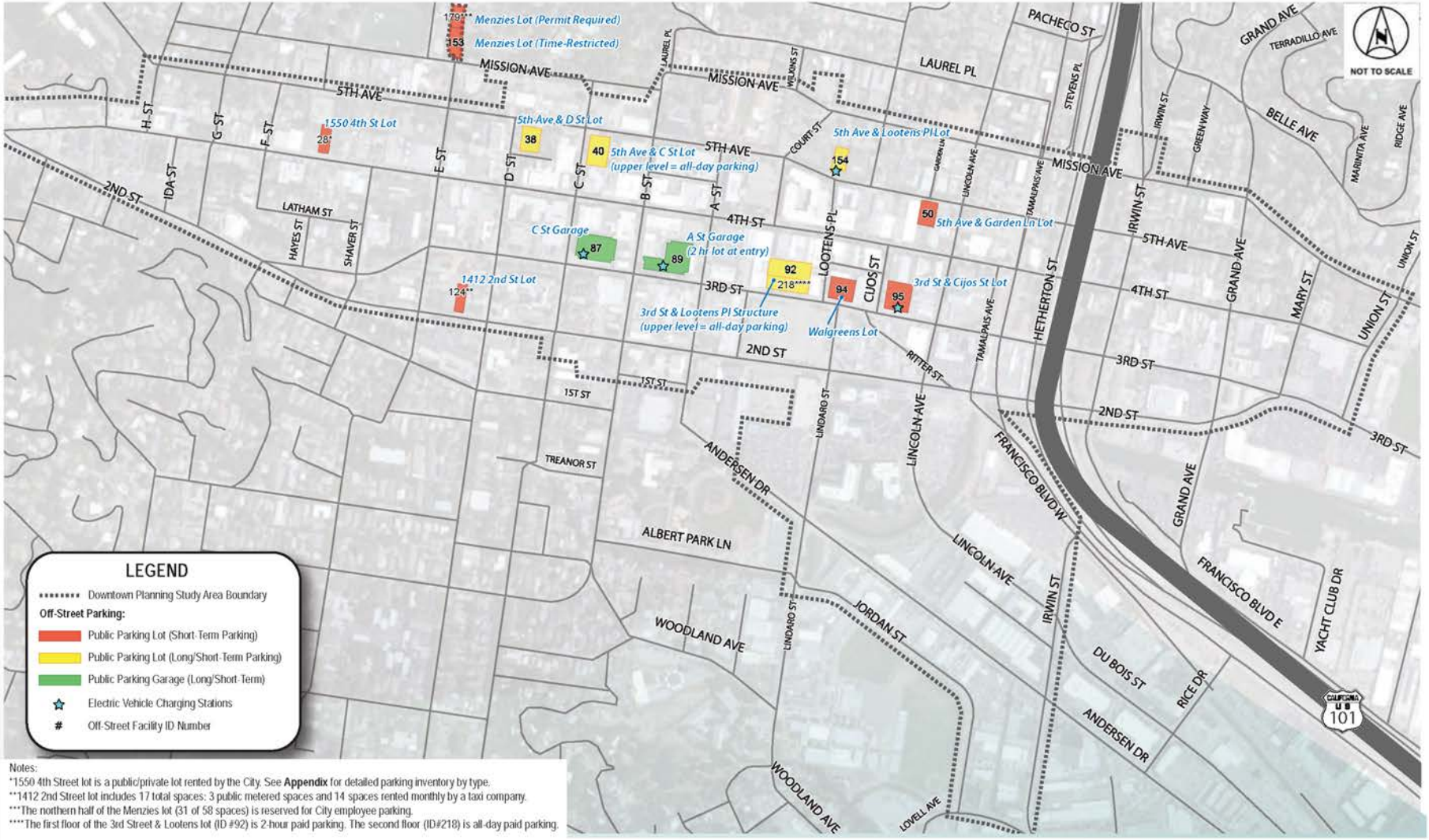
Parking revenue for on-street meters and off-street public parking facilities has increased from $2.25 million in 2009 to $3.15 million in 2018. Parking rates were increased in 2013, which resulted in increased revenue from 2013 to 2015. Since 2015, however, total parking revenue for Downtown San Rafael has been flat. The trend of declining parking revenues (as measured in either absolute or real terms) has been experienced to varying degrees by cities in recent years despite continued economic growth. Many point to the launch of ridehailing companies such as Uber and Lyft as a cause for flat or declining parking revenue.

On-Street Parking Supply



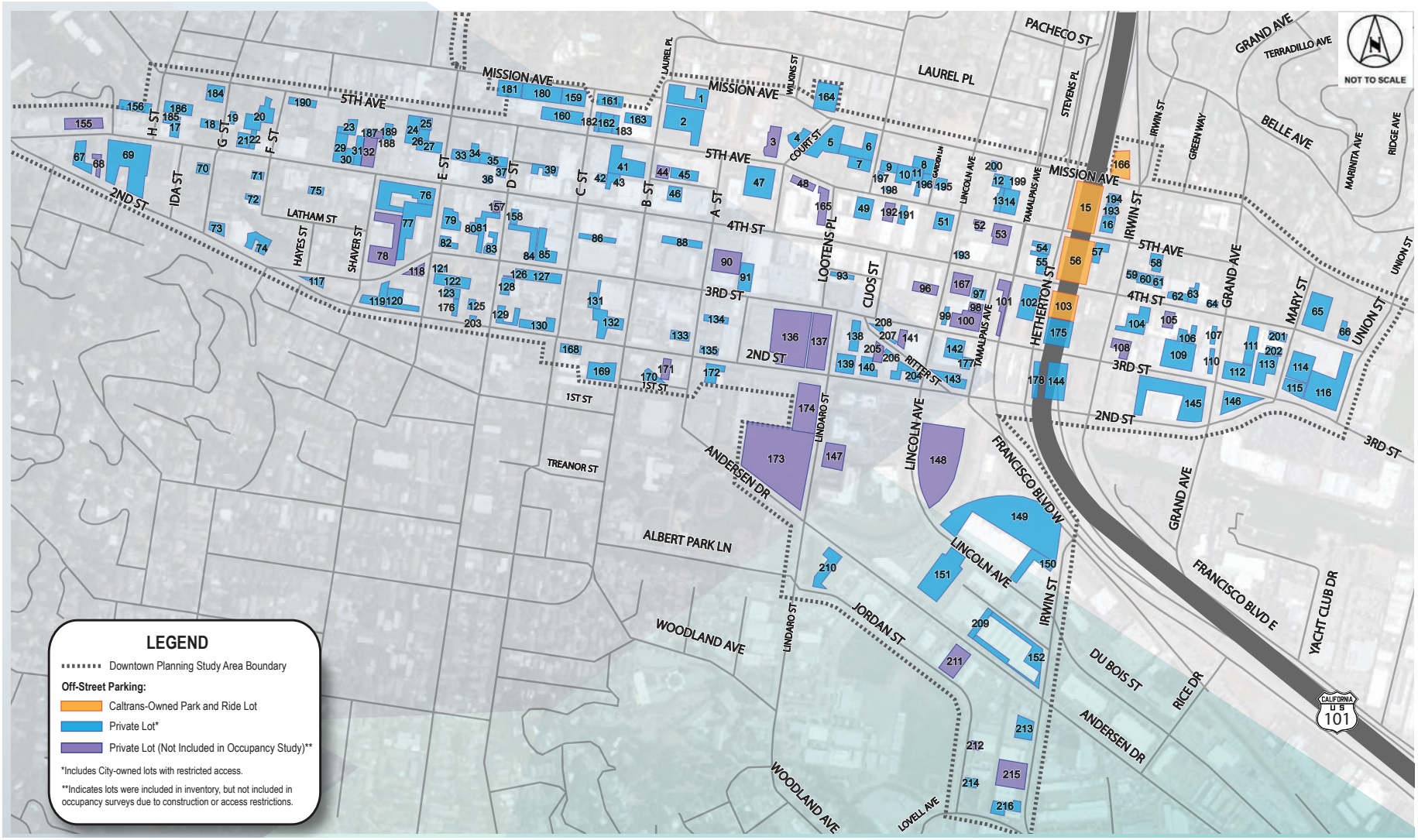
Source: Downtown Parking & Wayfinding Study, July 2017

Off-Street Public Parking Supply



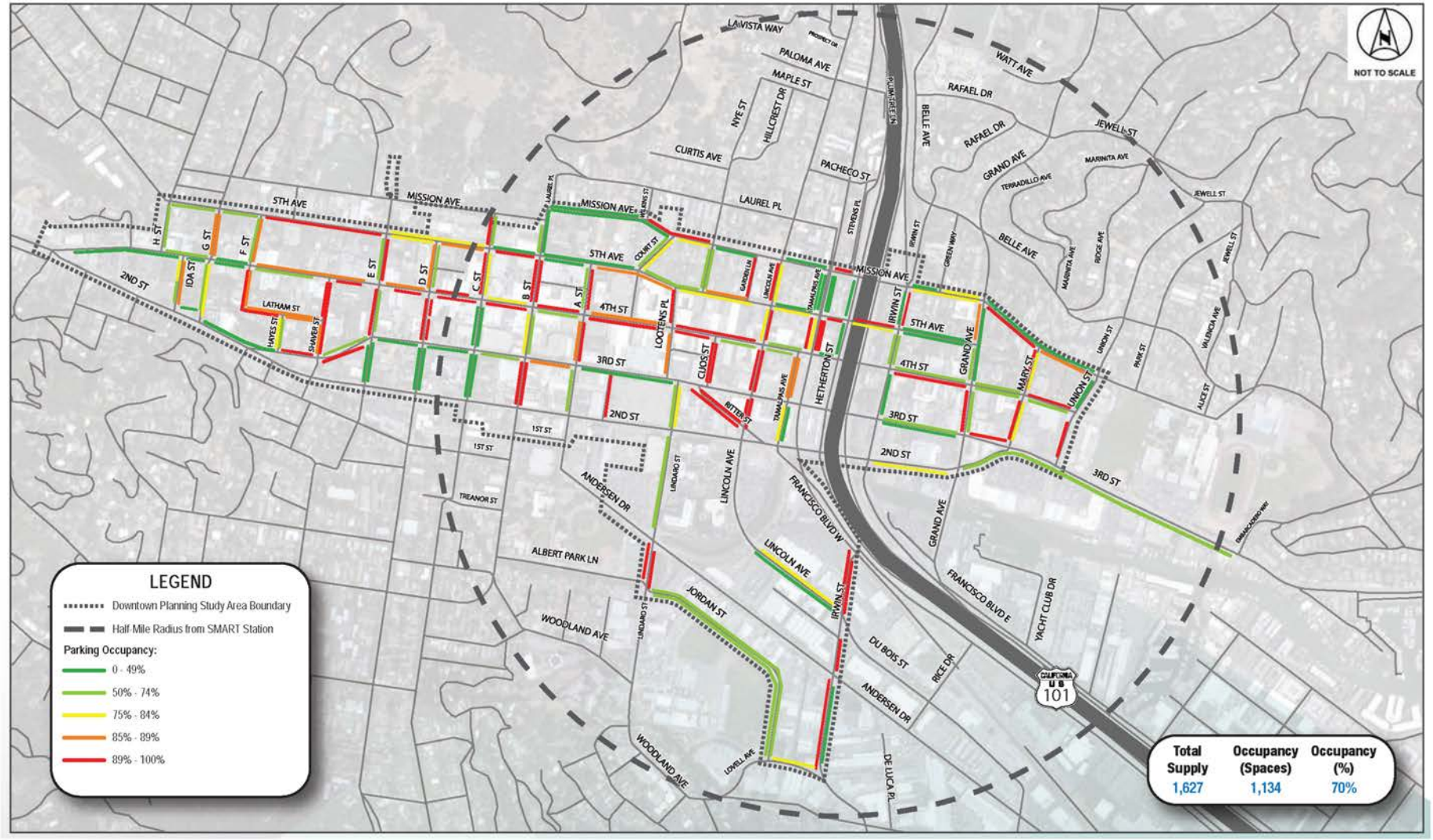
Source: Downtown Parking & Wayfinding Study, July 2017

Off-Street Private Parking Supply



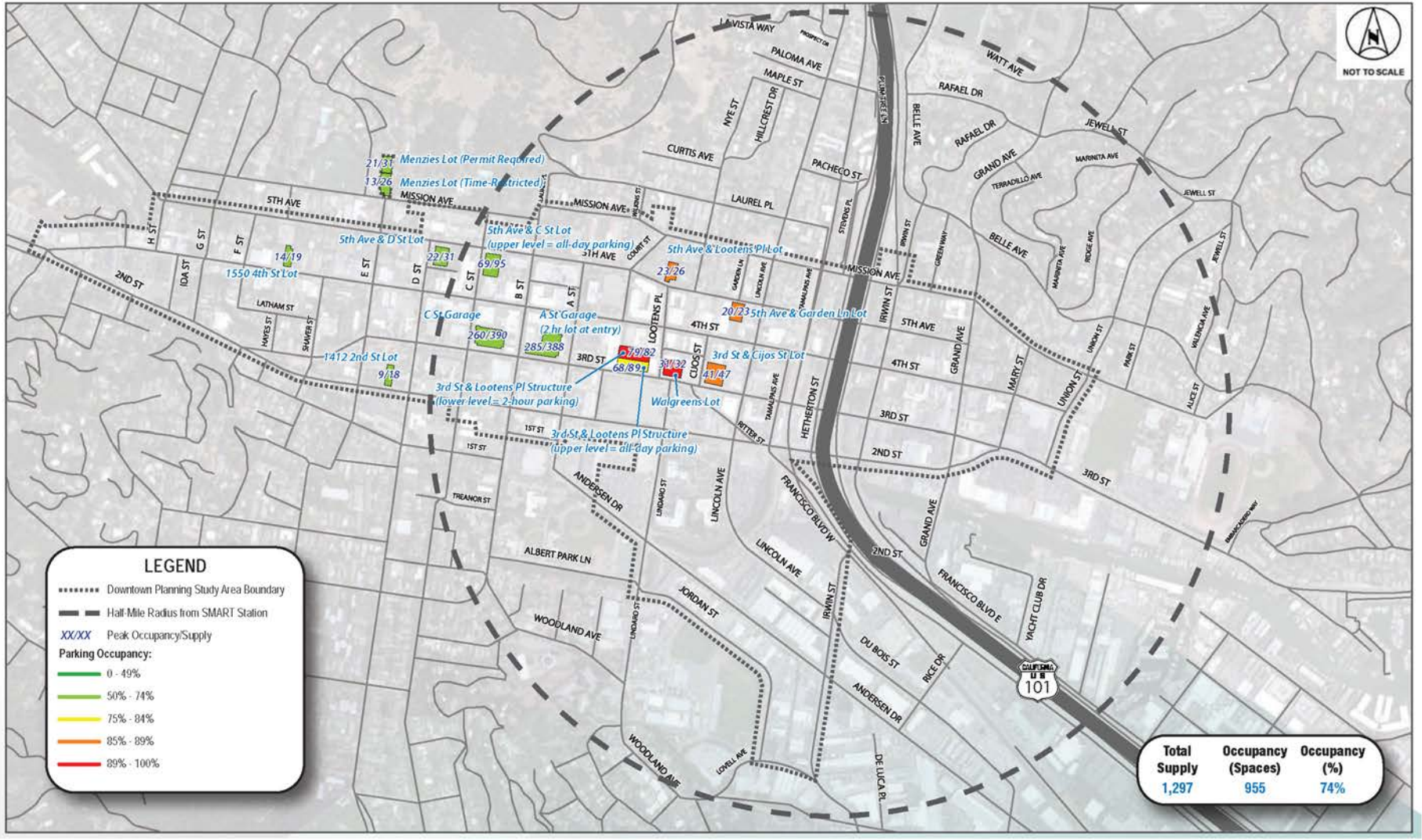
Source: Downtown Parking & Wayfinding Study, July 2017

On-Street Parking Occupancy: Weekday Peak



Source: Downtown Parking & Wayfinding Study, July 2017

Off-Street Public Parking Occupancy: Weekday Peak



Source: Downtown Parking & Wayfinding Study, July 2017

Off-Street Private Parking Occupancy: Weekday Peak

Source: Downtown Parking & Wayfinding Study, July 2017

Shared Mobility

Shared Mobility Options

According to the Shared-Use Mobility Center, shared mobility is defined as transportation services and resources that are shared among users, either concurrently or one after another. The services are grouped into five different shared mobility typologies:

- Bikesharing/Scooter-sharing
- Carsharing
- Ridesharing/Ridehailing
- Public Transit
- Microtransit/Shuttles

Bikesharing, scooter-sharing, or microtransit services are not currently provided in Downtown San Rafael. They are, however, provided in many other Bay Area cities. Limited carsharing options are provided by several ZipCar spaces near the San Rafael Transit Center.

Traditional ridesharing includes carpooling, vanpooling, and real-time matching of drivers and passengers through mobile apps in which the passenger pays a share of the trip cost.

Ridehailing providers such as Uber and Lyft use online platforms to connect passengers with drivers who use personal, non-commercial, vehicles. UberPOOL and Lyft Line are ridesharing options that allow drivers to carry multiple passengers who split the cost of a trip.

Taxis and limos are regulated for-hire vehicles. Numerous companies provide these services in Downtown San Rafael.

Transportation: Key Findings

The following reflect the key transportation findings that can help guide the upcoming work on the San Rafael Downtown Precise Plan:

Roadway Network

East-west traffic travelling through Downtown is heavily concentrated on 2nd Street and 3rd Street, while north-south traffic travelling through Downtown is more evenly distributed along the north-south roadways.

Pedestrian Network

Sidewalks are located along most streets in Downtown San Rafael, however sidewalk gaps exist along portions of streets outside the Downtown Core. Difficult crossing locations exist at intersections near the Transit Center (Hetherton Street, Irwin Street, Second Street, and Mission Avenue), along Grand Avenue, and at several locations in the West End.

Bicycle Network

Downtown San Rafael has a limited bicycle network; through Downtown, bicycle facilities are limited to a Class I path along a few blocks of Hetherton Street and Class III shared routes on Fourth Street and Grand Avenue.

Transit Network

Downtown San Rafael is served by passenger rail, regional bus, and local bus, with the San Rafael Transit Center (SRTC) serving as the regional transit hub for Marin County. The Downtown San Rafael SMART station is presently the southern terminus of the SMART line and serves more boardings than any other station along the SMART line. The extension south to the Larkspur Ferry Terminal is scheduled to open later this year.

Roadway Congestion

Congested conditions occur during weekday morning and evening commute periods, and to a lesser extent during the mid-day, on arterials both immediately adjacent and feeding Highway 101 (i.e., 2nd Street, 3rd Street, Irwin Street and Hetherton Street).

Collision Density

The City of San Rafael ranks among the top 10 comparably sized cities in California for pedestrian collisions and bicycle collisions of cyclists younger than 15. The highest collision density occurs on roadways adjacent to the Transit Center/ SMART Station/Highway 101 area and within the Downtown Core.

Automobile Parking

Parking demand is highest in the Downtown Core along 4th Street and within one block along adjacent cross-streets. Outside this area, parking is available in most locations throughout the day.

Parking Revenue

Since 2015, total parking revenue for Downtown San Rafael has been flat, which is likely due to a combination of declining retail sales due to internet sales and food delivery services as well as the launch of ride hailing companies such as Uber and Lyft.

CHAPTER 7

Utility Infrastructure

This chapter provides information on the existing conditions related to utility infrastructure in the Downtown Precise Plan Area. The chapter evaluates existing capacities along with the need for improvements or expansion of water, wastewater, stormwater, gas/electric, and telecommunication facilities. It also evaluates the long-range plans and programs of each service provider, including the consideration of sea level rise, technological improvements, and other factors.

In this chapter

Water Service: Existing Conditions

The City of San Rafael gets its water supply primarily from the Marin Municipal Water District (MMWD). This section outlines the existing conditions of the water services to the Downtown Precise Plan area. This section summarizes federal, State, regional and local regulations related to water supply in San Rafael.

Water Supply Sources

The Marin Municipal Water District (MMWD) serves roughly 190,000 customers within approximately 147 square miles along the eastern corridor of Marin County from the Golden Gate Bridge northward. MMWD serves ten incorporated cities and towns, including San Rafael, Mill Valley, Fairfax, San Anselmo, Ross, Larkspur, Corte Madera, Tiburon, Belvedere and Sausalito.

The MMWD's water supplies presently come from a combination of local surface water supplies, imported water from the Sonoma County Water Agency (SCWA), and recycled water.[1]

Purchased Water

Since 1975, the MMWD has contracted with the SCWA for a supplemental supply of water, primarily from Lake Sonoma via the Russian River. The agreement for water supply allows the MMWD to take deliveries of up to 14,300 acre-feet per year (AFY). Projections are consistent with SCWA's Urban Water Management Plan (UWMP). The agreement will remain in force through June 30, 2025 and includes a renewal provision that will extend the agreement through June 30, 2040.

Groundwater

There are three groundwater basins identified in the Department of Water Resources (DWR) Bulletin 118 that are at least partially within the MMWD's service area. These three basins include Ross Valley, San Rafael Valley, and part of the Novato Basin. All three basins are categorized by the California Statewide Groundwater Elevation Monitoring program as very low priority basins.

Groundwater use within the MMWD's service area is limited to small, domestic use through private groundwater pumping wells. The MMWD has studied the potential for municipal groundwater use since the 1970's. Several studies since that time have determined that the potential for municipal groundwater use within the boundaries of the MMWD service area is very limited due to limited production capabilities, water quality constraints, and potential water rights issues. As a result of these studies, groundwater is not currently or planned to be used as a municipal water supply source by the district, though private groundwater wells are used in the MMWD's service area.[2]

Surface Water

The MMWD's primary water supply is local surface water. The MMWD's surface water supply comes from a network of seven local, rain-fed reservoirs. Five of the seven MMWD reservoirs (Alpine, Bon Tempe, Kent, Lagunitas, and Phoenix Lake) are located on the north slope of Mt. Tamalpais. The remaining two MMWD reservoirs (Nicasio and Soulajule) are outside the MMWD's service area in western Marin County. The total reservoir storage operated by the MMWD is 25.9 billion gallons (79,566 AFY),[3] but the MMWD estimates that operational yield of the reservoirs is about 29,020 AFY.[4,5] Development of the MMWD's reservoir system is provided in Table 7.1.

Surface water from Kent Lake, Bon Tempe Lake, Alpine Lake, Phoenix Lake, and Lagunitas Lake is aerated seasonally in the reservoirs to maintain adequate dissolved oxygen concentration. From the reservoirs, the water is conveyed to either the Bon Tempe Treatment Plant (BTTP) near Ross or the San Geronimo Treatment Plant in Woodacre.[6]

TABLE 7.1 MARIN MUNICIPAL WATER DISTRICT SURFACE WATER RESERVOIR SYSTEM (AF)

Reservoir Name	Year Constructed	Storage Capacity
Lake Lagunitas	1873	350
Phoenix Lake	1905	411
Bon Tempe Reservoir	1948	4,017
Alpine Lake	1918	3,069
	1924	4,600
	1941	8,891
Kent Lake	1953	16,050
	1982	32,895
Nicasio Reservoir	1960	29,000
Soulajule Reservoir	1980	10,572
	Total Existing Reservoir Storage:	*79,566*

Source: City of San Rafael, 2016, Urban Water Management Plan, 2015 Update.

Water Supply Infrastructure

The MMWD's water supply pipelines range from 3/4-inch pipes connecting customers' water meters to the MMWD's mains, and the 42-inch transmission mains that carry source water to the WWTP. The pipes are made of various materials depending on when and where they were installed. MMWD implements an on-going Pipeline Replacement Program to replace approximately eight miles of pipelines that have reached the end of their useful life.

Water pipelines throughout San Rafael range from one-to 30-inch diameter pipes. Water pipelines in the Downtown Precise Plan area range from two- to 18-inch diameter pipes.

As described in Table 7.2, the MMWD's potable water distribution system includes approximately 886 miles of water mains, 94 pump stations, and 127 treated water storage tanks with a total storage capacity of 81.9 million gallons (MG). To treat the MMWD water supply, the district operates three water treatment plants, including the Bon Tempe Treatment Plant, the San Geronimo Treatment Plant, and the Ignacio treatment facility.[7]

San Geronimo and Bon Tempe Plants, with 35 mgd and 20 mgd maximum capacity, respectively, treat water originating from the MMWD reservoirs. Ignacio Pump Station, with a 16 mgd maximum capacity, performs chemical treatment in a "polishing" operation on water received from SCWA via the North Marin Intertie Pipeline.[8] Together, these facilities have a combined design capacity of 71 mgd. Observed high flows have reached 58 mgd; however, the average daily maximum flow is approximately 25 mgd. In 2015, the total production of the three plants averaged 20.4 mgd.[9] The MMWD's water treatment plants, and potable water distribution system are illustrated in Figure 7.1.

TABLE 7.2 SUMMARY OF POTABLE WATER FACILITIES

Facility	Value
Miles of Pipeline	886
Number of storage tanks	127
Total tank storage capacity	81.9 MG
Number of pump stations	94
Number of potable water treatment plants	3
Maximum daily treatment capacity (designed)	71 mgd
Maximum daily treatment capacity (observed)	58 mgd
Average daily treatment plant production	20 mgd

MG = Million gallons, mgd = million gallons per day

Source: City of San Rafael, 2016, Urban Water Management Plan, 2015 Update.

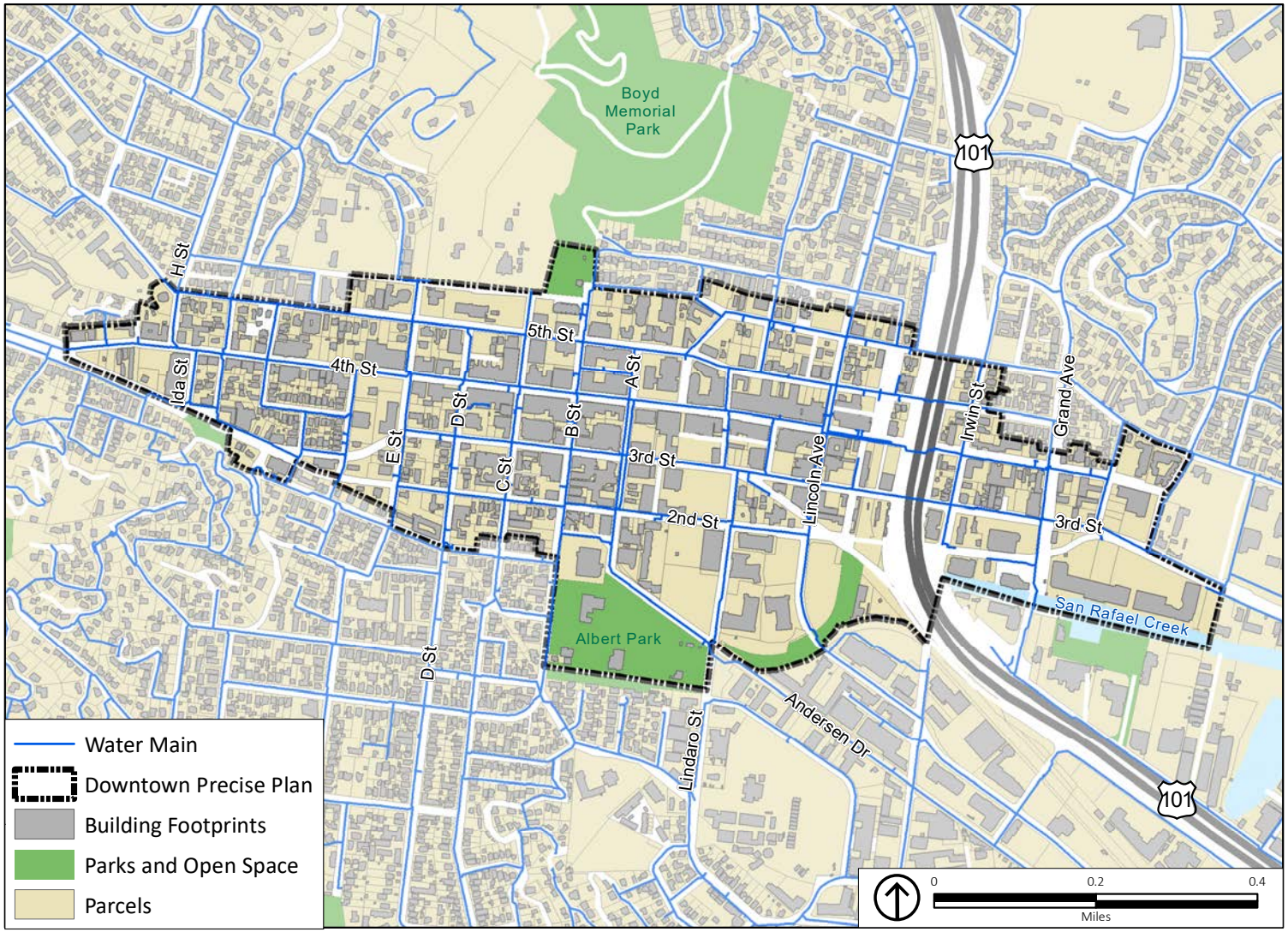


Figure 7.1 Downtown Utility Infrastructure

Source: ESRI, 2017; City of San rafael, 2019: Placeworks, 2019

Capital Improvements Initiatives

MMWD's major capital improvement projects in the Downtown Precise Plan Area include:

- **Pipeline Replacement Program:** This is an on-going program to replace approximately 8 miles of pipelines that have reached the end of their useful life. In the next five years 4,000 feet of pipeline, located in Third Street between Irwin Street and Fourth Street, are planned for replacement in the Downtown Precise Plan Area.
- **Transmission and Distribution Pumps Replacement Program:** This is a program to replace aging pumps and upgrade MMWD pump stations.
- **Slide Repair:** This is to repair damage caused by the 2017 storms.
- **Fire Flow Improvement Program (FFIP):** The FFIP proposes to replace 52 miles of fire-flow deficient pipe, comprising 49 miles of distribution piping and 3 miles of transmission piping. None of the 5.2 miles of pipes to be replaced during 2018 and 2019 are located in the Downtown Precise Plan Area.[10]
- MMWD has not identfied Downtown infrastructure constraints.

Projected Supply and Demand

Water within the MMWD's service area is largely used for single- and multi-family residential homes, which make up 75 percent of the MMWD's total demand. Commercial, institutional, and landscape comprise the remaining 25 percent of total demand. The service area has a relatively low growth rate. The 2040 population is projected to be just over 210,000; up from 190,000 in 2015. The Bay Area Governments (ABAG) figures project a continued slow growth rate of about 0.46 percent per year for the 25-year period.

Current demand for potable and recycled water, is 38,866 AFY, which is expected to increase to roughly 42,109 AFY by 2040. Water loss and passive conservation is included in this demand.

Table 7.3 shows projected normal, dry, and multiple dry year supply and demand comparisons. Note that while projections account for passive savings, the district has taken a more conservative approach to demand projections by not accounting for conservation savings associated with future active measures. This approach, while conservative, safeguards against potential future shortages by planning for the highest level of demand; any potential shortages at this level of demand could be mitigated by active conservation. Active conservation would thus increase resiliency for MMWD customers by stretching available supply.[11]

As shown in Table 7.3, the MMWD has sufficient supply during normal, dry, and multiple dry years conditions.

SB X7-7 requires urban water suppliers to report in the UWMP a baseline water use calculation and specific water use targets to meet the 2020 goal of 20 percent water use reduction. All water suppliers are required to submit the SB X7-7 Verification Form, which is typically an appendix of the UWMP. The MMWD's 2020 water use target is 124 gallons per capita per day (GPCD) and its interim (2015) target is 137 GPCD. The MMWD is currently meeting both its interim and 2020 water use targets, as the daily per capita water use in 2015 was 110 GPCD, well below both targets. Through continued implementation of demand management measures and other conservation activities, MMWD is expected to be in compliance with its water use target in the year 2020.[12]

TABLE 7.3 PROJECTED NORMAL, DRY, AND MULTIPLE-DRY SUPPLY AND DEMAND COMPARISONS (AFY)					
	2020	2025	2030	2035	2040
Normal Year					
Supply Totals	151,254	152,714	152,794	152,794	152,794
Demand Totals	41,940	41,797	41,685	41,835	42,109
Difference	*111,019*	*110,917*	*111,109*	*110,959*	*110,685*
Dry Year					
Supply Totals	60,442	60,442	60,442	60,442	60,442
Demand Totals	41,940	41,797	41,685	41,835	42,109
Difference	*18,502*	*18,645*	*18,757*	*18,607*	*18,333*
Multiple Dry Year					
First Year					
Supply Totals	123,407	123,407	123,407	123,407	123,407
Demand Totals	41,940	41,797	41,685	41,835	42,109
Difference	*81,467*	*81,610*	*81,722*	*81,572*	*81,298*
Second Year					
Supply Totals	76,300	76,300	76,300	76,300	76,300

Potential Threats to Reliability

To understand potential changes in future supply availability under various future conditions, the MMWD simulated reliability threats that would result from events that could impact baseline supply conditions. Events considered included earthquakes, drought, climate change, wildfire, landslides, and water quality issues.

The only reliability threats that resulted in supply shortfalls in MMWD's system were simulated droughts that are longer and drier than historical hydrology. Modeling also indicated that MMWD's system would approach a shortfall condition if an earthquake disabled San Geronimo treatment plant for one peak demand month, or if Nicasio Lake was unusable due to water quality issues for six months. MMWD could meet demand under these reliability threats, but storage would drop to levels near the 25 percent emergency storage reserve.[13]

Resiliency Measures

Because the MMWD's current supply portfolio is sufficient to meet demands under the conditions evaluated, there is no immediate need to invest in infrastructure to secure additional resiliency at this time. However, the 2040 Water Resources Plan recommends that MMWD expand its existing water efficiency programs to continue strengthening MMWD's water supply resiliency. This could include implementing a program which would increase water conservation, expand watershed management, and explore opportunities associated with in-lieu groundwater transfers.[14]

Water Shortage Contingency Plan

As part of urban water management planning, water suppliers are required to provide a Water Shortage Contingency Plan (WSCP) that outlines how the supplier will prepare for and respond to water shortages. The MMWD's WSCP includes five stages of rationing tied to water supply conditions. These are shown in Table 7.4. In addition to the stages that are linked to local water supply conditions, the MMWD has added an additional stage that is decoupled from local supply conditions. Outside factors, such as executive orders, could require the MMWD to implement water use reductions for reasons potentially unrelated to supply conditions. For example, Executive Order B-29-15 required the MMWD to reduce demand by 20 percent, not because its local storage had reached a level that would dictate this reduction as necessary.

Recognizing that outside factors could generate a need for demand reduction, the MMWD has included a stage that, should an outside factor dictate a reduction, allows the district to select a stage from one of the five stages in Table 7.4 based on the level of reduction needed.[15]

Sea Level Rise

A detailed discussion of sea level rise, including maps, is provided in the natural hazards section of this report. This discussion is specific to water infrastructure as it relates to sea level rise conditions.

MMWD asset managers are confident that the water distribution system can sustain the impacts of regular high tides[16]. It would take more than five feet of sea level rise to compromise the pressurized water pipes. This scenario will also restrict access to the MMWD headquarters in Corte Madera.

With five feet of sea level rise and a 100-year storm surge the corporation yard, operations laboratory, workshop, emergency generators, and above ground fuel tanks at the MMWD eadquarters would be impacted. Increased exposure to saltwater could also cause more rapid degradation of trucks and other equipment brought in and out of the facility.

TABLE 7.4 STAGES OF WATER SHORTAGE CONTINGENCY PLAN

Stage	Percent Supply Reduction	Water Supply Condition
1: Advisory Stage (Voluntary Rationing)	10%	Total reservoir storage is less than 60,000 acre-feet on April 1
2: Alert Stage (Mandatory Rationing)	20%	Total reservoir storage is less than 50,000 acre-feet on April 1
3: Severe Stage (Mandatory Rationing)	25%	Total reservoir storage is less than 40,000 acre-feet on April 1
4: Critical Stage (Mandatory Rationing)	30%	Total reservoir storage is less than 30,000 acre-feet on April 1
5: Emergency Stage (Mandatory Rationing)	%0%	Total reservoir storage on December 1 is projected to be in the vicinity of, or less than, 25,000 acre-feet

Source: Marin Municipal Water District, 2017, Water Resource plan 2040.

Other vulnerabilities to the water system may include:

- Saltwater intrusion which could contaminate water in pipes through air valves, and wells for drinking and fire protection.
- Water distribution pipes must maintain 24" of space from the groundwater table, and 32" below ground. As the water table rises, pipes will be exposed to saltwater and shift underground. Pipes thus may be vulnerable to increased saltwater corrosion and subsidence.[17]

Sanitary Wastewater: Existing Conditions

The City of San Rafael is serviced by the San Rafael Sanitation District (SRSD), Las Gallinas Valley Sanitary District (LGVSD), and the Central Marin Sanitation Agency (CMSA). Locations north of Puerto Suello Hill is within the boundary of LGVSD, and locations south of Puerto Suello Hill is within the boundary of SRSD. The Downtown Precise Plan area is serviced by SRSD. CMSA provides wastewater treatment for special districts and municipalities in San Rafael.[18]

Wastewater Collection

The Downtown Precise Plan Area is within the service area of San Rafael Sanitation District (SRSD). CMSA operates a Wastewater Treatment Plant (WWTP) in the city that services the Downtown Precise Plan Area.

The SRSD is a sanitation district of the County of Marin formed in 1947. It serves the southern two thirds of the City of San Rafael, in the Central San Rafael area south from the top of Puerto Suello Hill, and the adjacent unincorporated areas.

SRSD provides wastewater collection and transportation service over its entire collection system area, which is 12.75 square miles consisting of 134 miles of gravity sanitary sewer piping, 32 wastewater pump stations, and 13 miles of force main piping. The SRSD's flows are ultimately conveyed to the CMSA wastewater treatment plant, located at 1301 Anderson Drive in San Rafael (see Figure 7.2).

SRSD sewer pipelines in San Rafael range from six- to 36-inch diameter pipes and include both gravity driven lines and pressurized lines (force mains). Sewer pipelines in the Downtown Precise Plan area also range from six- to 36-inch diameter pipes and include gravity lines and force mains.

One of the goals of the SRSD's Capital Improvement Plan (CIP) is to provide hydraulic capacity of key sanitary sewer system elements in order to prevent future SSOs. The SRSD continues to make upgrades to ensure adequate hydraulic capacity in key areas. From the SSOs that the SRSD has recorded from 2005 to 2014, only one was reported to be caused from flow capacity deficiency. The SRSD performed a capacity assessment for four key trunk sewer lines to determine potential capacity related issues. The SRSD has incorporated the prioritized recommendations from the Capacity Assessment Report into its CIP and has completed many of the high priority and medium priority projects.[19]

Wastewater Treatment

Central Marin Sanitation Agency Wastewater Treatment Plant

The CMSA wastewater treatment plant is located at 1301 Andersen Drive in San Rafael. The WWTP has a two-mile outfall through which the treated wastewater is discharged into San Francisco Bay. CMSA processes and treats an average of 7.8 million gallons a day (MGD) during dry weather flows and 13 MGD during wet weather flows. The CMSA WWTP has treated in excess of 120 MGD during peak rainfall periods. CMSA receives an average dry weather flow[20] of 3.1 MGD from the SRSD, an average annual flow of 4.95 MGD, an average wet weather flow of 6.51 MGD, and a peak wet weather flow of 58.5 MGD[21].

The NPDES permit for the treatment facility was issued by the RWQCB-San Francisco as Order No. R2-2018-0003 (NPDES No. CA0038628), adopted on January 10, 2018. This Order establishes a maximum average dry weather effluent flow of 10 mgd and a facility design flow of 30 mgd. During wet weather periods, primary-treated wastewater above 30 mgd is routed around the secondary treatment processes and blended with

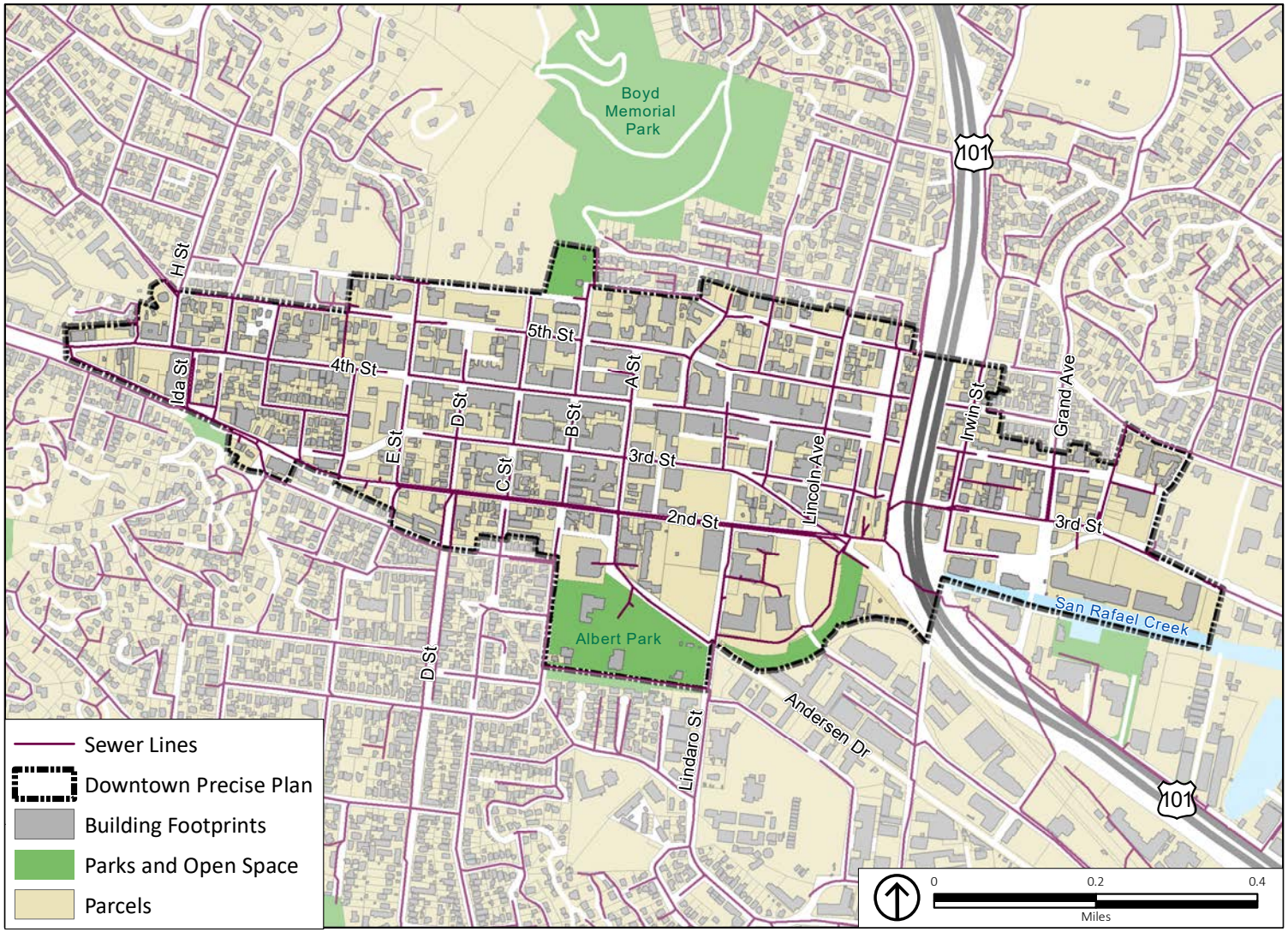


Figure 7.2 Downtown Sanitary Wastewater Infrastructure

Source: ESRI, 2017; City of San rafael, 2019: Placeworks, 2019

the secondary-treated wastewater prior to disinfection. Such discharges are approved under the bypass conditions of the NPDES permit when the blended discharge complies with the effluent and receiving water limitations contained in the Order. CMSA discharges blended effluent about 11 times per year.[22]

Because there is limited potential for growth in the CMSA's service area, the WWTP's ability to meet future needs is related to the condition of the CMSA's aging facilities. The CMSA Master Plan focuses on the condition of the facilities and impacts associated with potential regulatory changes, reduction in energy usage and GHG emissions, operational improvements, and climate change. The Master Plan focuses on recommendations for when aging infrastructure should be replaced in-kind or retrofitted with a newer technology and identifies facility and/or equipment improvements to address sea level rise and potential regulatory changes.[23]

Capital Improvement Initiatives

Major capital improvement initiatives recently completed, underway, or planned by SRSD in the Downtown Precise Plan Area are shown in Table 7.5.

The 10-Year CMSA CIP includes the replacement and rehabilitation of existing capital assets, as well as the acquisition or construction of new capital assets. Agency staff monitor development of new technologies and consider processes that may improve treatment methods, save energy, reduce chemical usage, and assist with meeting changing regulatory requirements. Two major projects in the 2019 CIP include:

- **Primary Clarifier Gates Actuator System:** The five original primary clarifiers have several large gates that control flow. The hydraulics system for these gates was constructed in 1985. This project will replace the hydraulic gate operators with an electronic actuator system.
- **Secondary Clarifiers Rehabilitation:** There are four secondary clarifiers in the treatment plant. The large turntables on three of the four clarifiers will be replaced. This is a multi-year project that is projected for completion in 2022.[24]

Wastewater Supply Infrastructure Constraints

CMSA confirmed there are no deficiencies or constraints with respect to sewage treatment capacity. Deficiencies in the sewer system piping allow stormwater and groundwater to infiltrate into the sewer system, resulting in peak wet weather flows that are larger than the dry weather flows. CMSA's WWTP has a wet weather capacity of 120 to130 MGD, which is larger than the predicted peak wet weather flows, and there are no plans to expand or increase capacity.[25]

TABLE 7.5 SAN RAFAEL SANITATION DISTRICT CAPITAL IMPROVEMENT PROJECTS			
Project [1]	Status	Year of Completion (if Complete)	Planned Year of Completion
Gravity Sewer Improvement Projects			
H Street, Fourth to Forbes[1]	Completed	2015	NA
Shaver, Latham to Second[1]	Completed	2015	NA
Tamalpais Sewer Relocation[1]	Completed	2016	NA
Lincoln Avenue, Paloma to Mission[1]	Completed	2016	
Francisco Boulevard to East-Medway to Hoag and Vivian[1]			
Second Street, Ida street, to E Streets[1]			
Force Main Improvement Projects			
Cathodic Protection	Completed	2015	NA
Cathodic Protection, Phase 2	Completed	2016	NA

[1] These projects are either entirely within the Downtown Precise Plan area or a portion of the project is in the Downtown Precise Plan Area.

Source: San Rafael Sanitation District,2015, Sewer System Management Plan.

Sea Level Rise

A detailed discussion of sea level rise, including maps, is provided in the natural hazards section of this report. This discussion is specific to sewer infrastructure as it relates to relationship to sea level rise conditions.

Vulnerable assets include the entire Canal neighborhood and Kerner Business District, and shoreline development and boating facilities off Point San Pedro Road. In time, the impacts are projected to move into downtown San Rafael, Peacock Gap, and Marin Lagoon.

The majority of businesses, facilities, and residences in the Downtown Precise Plan area depend on the community wastewater systems that connect to the CMSA treatment plant, or the MMWD water recycling systems. SRSD and CSMA all have assets that are vulnerable to sea level rise. Because of its low-lying nature, development on bay mud, and population density, southern Marin communities are especially vulnerable to wastewater treatment issues. The SRSD could be impacted by inflow and infiltration into sanitary pipes and manholes. The excess water creates inefficiencies in treatment, and potentially could flood the system. Impacts to buildings near damaged pipeline or backed up systems is also possible for SRSD and CMSA in all of these districts. Subsiding pipes, mains, and pump stations are also a potential concern.

If the power is out for extended periods of time, diesel emergency sources for back-up generators at pump stations would need to be used. Operating on diesel emergency sources could be significantly more expensive than operating on power provided by the grid. If pump stations fail, sewage could back up and out of manholes and into the streets, parks, or yards. If the area is also flooded, harmful sewage could spread widely throughout the flooded area creating significant public health risks.[26] General sanitary district system vulnerabilities are summarized in Table 7.6.

TABLE 7.6 SANITARY DISTRICT SYSTEM VULNERABILITIES	
System	System Vulnerabilities
Pumping Stations	Lift stations or pumps below water. Pump stations can be overburdened by saltwater infiltration into the pipelines.
Pipes	Older underground metal pipes are corroding and more susceptible to increased saltwater exposure. Older clay or metal pipes have cracks and wear that allow for inflow and infiltration. If not replaced, this will likely worsen, and could burden treatment plants. Not all systems are pressurized and vulnerable to changes in the ebb and flow of the tides. Subsidence can place bending forces on pipes. Manholes extend below grade. If flooded, access will be lost and inflow and infiltration could occur.
Treatment Plants	Levees protecting low-lying treatment plants could be overtopped, flooding the plants and offices, and exposing the facility to corrosive saltwater. Facilities built on mud may experience increased rates of subsidence. Administrative and maintenance buildings are vulnerable to flooding.
Utility Users	The lateral pipes connecting each building to the sewer mains could be vulnerable to infiltration of saltwater. This decreases efficiency and effectiveness of treatment. Excess water can cause back-up into and damage buildings.

Source: Marin County Department of Public Works,2016, Marin Shoreline Sea Level Rise Vulnerability Assessment

Stormwater Service: Existing Conditions

The City of San Rafael, Department of Public Works maintains the City's stormwater system. The system comprises of 20 miles of corrugated metal pipe, 84 miles of concrete pipe, 12 miles of plastic pipe, and approximately 35 miles of open ditches and culverts. The storm drain system includes 3,800 drain inlets, 20 major headwalls, and 12 stormwater pump stations.

Regional Hydrology

The City of San Rafael is located within approximately nine watersheds. The major watersheds include Gallinas Creek, San Rafael Creek, and Miller Creek. Water typically flows from the northwest to the southeast through natural and urbanized creeks. The downtown area is within the San Rafael Creek Watershed, described below:

San Rafael Creek Watershed.
The San Rafael Creek Watershed is located in the central region of the City, between the Gallinas Creek Watershed and Corte Madera Creek Watershed. The watershed encompasses 11 square miles, including the Downtown Precise Plan Area.[27] The watershed originates in the hills above Tamalpais Cemetery and flows through highly urbanized areas towards the San Rafael Canal. The San Rafael Creek flows through open stream channels and underground culverts in the upper watershed and into the San Rafael Bay at Pickleweed Park.[28] Elevations of the San Rafael Creek Watershed range from 1,100 feet in the hills above Tamalpais Cemetery to sea level at the San Pablo Bay.[29]

Local Hydrology

The storm drain system in San Rafael comprises of 20 miles of corrugated metal pipes, 84 miles of concrete pipe, and 12 miles of plastic pipe. The City also maintains approximately 35 miles of open ditches and culverts. The storm drain system has 3,800 drain inlets, 20 major headwalls and 745 smaller headwalls.[30] The City also operates 12 stormwater pump stations.[31] Stormwater pipes and pumping stations are shown in Figure 7.3.

Storm water pipelines in San Rafael range from 4 to 48 inches in diameter. Strom water pipelines in the Downtown Precise Plan area also range from 4 to 48 inches in diameter.

The City is responsible for maintaining the storm drains in City easements and property owners are responsible for storm drains that are located on their properties.[32] The City also maintains certain waterways that have easements. Those without easements are maintained by private property owners. San Rafael Creek is maintained by the Army Corps of Engineers since it is a navigable waterway.[33]

The State Water Resources Board (SWRCB), as the implementing agency for the Trash Amendments, mandates that the City must install certified trash treatment control systems on all catch basins no later than December 2, 2030. There currently are some trash devices installed at commercial properties, such as the Northgate Mall, but the City does not maintain these devices.[34]

Water Quality

Surface water quality is affected by point source and non-point source pollutants. Point source pollutants are those emitted at a specific point, such as a pipe, while non-point source pollutants are typically generated by surface runoff from diffuse sources, such as streets, paved areas, and landscaped areas. Point source pollutants are controlled with pollutant discharge regulations or waste discharge requirements (WDRs). Non-point source pollutants are more difficult to monitor and control,

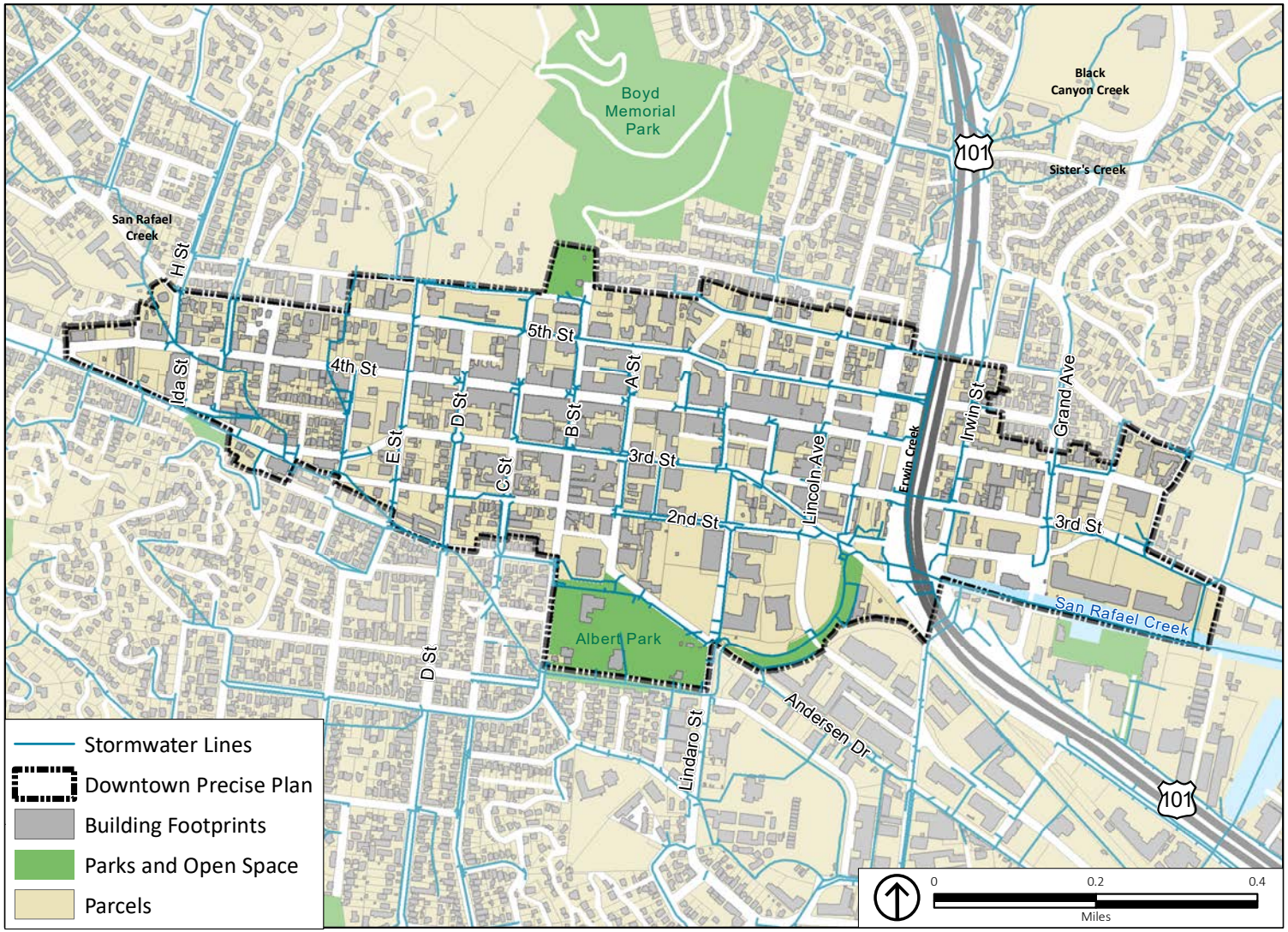


Figure 7.3 Downtown Stormwater Drainage System

Source: ESRI, 2017; City of San rafael, 2019: Placeworks, 2019

although they are important contributors to surface water quality in urban areas.

Stormwater runoff pollutants vary based on land use, topography, the amount of impervious surface, and the amount and frequency of rainfall and irrigation practices. Runoff in developed areas typically contains oil, grease, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas. The highest pollutant concentrations usually occur at the beginning of the wet season during the "first flush," when early rainfall flushes out pollutants that have accumulated on hardscape surfaces during the preceding dry months.

The San Francisco Bay Regional Water Quality Control Board (RWQCB) monitors surface water quality through implementation of the Basin Plan and designates beneficial uses for surface water bodies and groundwater within the Marin County and San Rafael.

In accordance with Section 303(d) of the Clean Water Act (CWA), the State must present the CalEPA with a list of impaired water bodies that do not meet water quality standards. Listed impaired water bodies in San Rafael and their associated pollutants of concern are presented in Table 7.7.

Once a water body has been placed on the 303(d) list of impaired waters, states are required to develop a TMDL threshold to address each pollutant causing impairment. A TMDL defines how much of a pollutant a water body can tolerate and still meet water quality standards. A TMDL has been approved by the EPA for mercury in Central San Francisco Bay and Diazinon in the San Rafael Creek.

TABLE 7.7 LISTED IMPAIRED WATER BODIES IN SAN RAFAEL

Name	Pollutants of Concern
San Rafael Creek	Diazinon[1]
Central San Francisco Bay	Chlordane[2] DDT[1] Diazinon Dieldrin[1] Dioxin Compounds[3] Furan Compounds[4] Invasive Species Mercury PCBs[5] PBDEs[6] Selenium[7] Trash

[1] Used as an insecticide.

[2] Used as a pesticide.

[3] Burning processes, such as commercial or municipal waste incineration, backyard burning, and the use of fuels, such as wood, coal, or oil, produce dioxins. The compounds then collect in high concentrations in soils and sediments.

[4] Furan is used in the formation of lacquers and as a solvent for resins.

[5] PCBs were used widely in electrical equipment like capacitors and transformers. They were banned in the US in 1979.

[6] PBDEs are fire retardant chemicals.

[7] The greatest use of selenium compounds is in electronic and photocopier components, but they are widely used in other products as well. Selenium releases to the environment have been primarily from copper smelting industries.

Source: State Water Resource Control Board, 2019, Impaired Waters.

Flood Control

A detailed discussion of flood hazards, including maps, is provided in the natural hazards section of this report. Most of the land along Miller Creek and the outlets of Gallinas Creek and San Rafael Creek is within the 100-year floodplain and is subject to overflow from the creeks.[35] The land adjacent to San Pablo Bay, including McNears Beach, McInnis Park, and the Canal neighborhood, is also within the 100-year floodplain and is subject to tidal flooding from San Francisco Bay. Inland areas within the 100-year floodplain include the Glenwood neighborhood and the northern portion of the Mont Marin/San Rafael Park neighborhood.

As shown in the figure, the southeastern portion of the Downtown Precise Plan area is within the 100-year floodplain and is subject to both overflow from San Rafael Creek and tidal flooding from San Francisco Bay. Flood control measures, including levees and stormwater pumping stations, have been implemented to reduce the potential for flooding and facilitate the removal of stormwater during flood events. The levee system in the northern portions of the city extends from Miller Creek outlet to Gallinas Creek outlet and includes levees along the north side of McInnis County Park. In the southern portion of the city, the levee system extends from Pickleweed Park along San Rafael Canal to Highway 580 along the shoreline.[36]

Capital Improvement Initiatives

Construction of new stormwater facilities and maintenance of existing facilities are managed through the City's CIP. The CIP is a major element of the City's budget and includes projects that have been evaluated and prioritized through the City's interdepartmental review process. The CIP lists expected new facilities as well as facility improvements and repairs: the list includes fully funded projects as well as projects where funding is not yet available. As part of the City's budget, the CIP is updated on a bi-annual basis. The list of CIP projects identifies funding priorities. These priorities change in response to the amount of funds available. Sources of funding include the City's General Fund, Storm Water Fund, State and regional grants, and private donations.[37] Table 7.8 lists the CIP stormwater projects in the Downtown Precise Plan Area.

With limited funding available for new projects, Public Works must defer a considerable number of projects out to future years until additional funding sources can be identified. The department is aware that funding shortfalls exist for the City's drainage system. Therefore, projects that are not currently funded are identified in the CIP as "Unfunded". The City is actively seeking better long-term funding strategies for these projects, including:

- More aggressive pursuance of grant funding for non-Right of Way capital projects
- Pursuance of ballot measure to raise current per-parcel stormwater assessment in FY 2018-19
- Exploring alternative funding mechanism such as assessment districts or public private partnerships.[37]

One project that is identified as "Unfunded" in the CIP relates to catch basin trash capture. This improvement is required to meet the requirements of the SWRQCB's Trash Amendment. The amendment mandates that the City needs to install catch basin filters on all of the City's catch basins by December 2, 2030.[38]

TABLE 7.8 STORMWATER CAPITAL IMPROVEMENT PROJECTS			
Project[1]	Status	Year of Completion (if Complete)	Planned Year of Completion
G Street Drainage and Roadway Improvement Project	Complete	2018	NA
D Street and Via Sessi Storm Drainage Improvements	Complete	NA	
Catch Basin Trash Capture	Unfunded		
Second Street Drainage Improvements - Between C and E Streets	New Project	NA	2021
Pump Station Communication System Upgrades	Active project	NA	2019

[1] These projects are either entirely within the Downtown Precise Plan area or a portion of the project is in the Downtown Precise Plan Area.

Source: San Rafael Department of Public Works, 2018, 3-Year Capital Improvement Program.

Stormwater Infrastructure Constraints

The City has deficiencies in the stormwater system in the area of C and D Streets as well as Oleander Street in North San Rafael. The CIP includes improvements to the storm drainage system at D Street and a study assessing the required improvements in Oleander Street has already been completed. The improvements needed for Oleander Street are not funded.[39]

The City's Public Works Department did not identify any constraints in the storm drain system. However, the system was installed in 1950 and consists mainly of corrugated metal pipes which need to be replaced regularly.[40]

Sea Level Rise

A detailed discussion of sea level rise, including maps, is provided in the natural hazards section of this report. This discussion is specific to potential impacts to stormwater infrastructure.

Storm drains, culverts, pipes, storm sewers, outfalls, and pump stations are all critical utilities aligned with or under roads. Sediment build-up and sea level rise can block gravity flow through stormwater drainage paths that travel under the roads. This is especially common in areas with lagoons or other retention areas in San Rafael. Several outlets to the bay are regulated by tidal flap gates that would not be operable as sea level rises past design elevations. If the storm drains are unable to function, upstream flooding could occur and potentially flood buildings, weaken and erode the road, or worse, a hillside.

Overburdened stormwater systems could cause road flooding and traffic delays, or even flood buildings, such as school and recreation areas. Pump stations may also be vulnerable in a storm if electrical power is down for an extended period of time, though not likely from sea level rise alone.[41]

Electric, Gas + Telecommunications: Existing Conditions

This section describes the existing conditions addressing electric, natural gas, and telecommunication services and infrastructure. Deficiencies, and potential future needs in the City of San Rafael and the Downtown Precise Plan area are also discussed.

Electric power and natural gas are provided to City of San Rafael customers by Pacific Gas & Electric (PG&E). Customers may also choose to purchase cleaner energy from Marin Clean Energy (MCE). Internet, phone, and satellite TV services are currently provided by a variety of private sources, including Sonic, AT&T, Xfinity, Dish, and Comcast.

Pacific Gas and Electric

PG&E provides "grid" electricity and natural gas services to the San Rafael. PG&E is a publicly traded utility company which generates, purchases, and transmits energy under contract with the California Public Utilities Commission (CPUC). PG&E owns and maintains above- and below-ground networks of electric and gas transmission and distribution facilities throughout the city.

Electricity

PG&E's total service territory electricity distribution system consists of 106,681 circuit miles of electric distribution lines and 18,616 circuit miles of interconnected electric transmission lines.[42] PG&E electricity is generated by a combination of sources such as coal-fired power plants, nuclear power plants, and hydro-electric dams, as well as newer sources of energy, such as wind turbines and photovoltaic plants or "solar farms." "The Grid," or bulk electric grid, is a network of high-voltage electric transmission lines that link power plants with the PG&E system. The distribution system, comprised of lower voltage secondary electrical lines, is at the street and neighborhood level, and consists of overhead or underground electric distribution lines, transformers, and individual service "drops" that connect to the individual customer.

PG&E produces or buys its energy from various conventional and renewable generating sources, which travel through PG&E's electric transmission and distribution systems. The power mix PG&E provided to customers in 2017 consisted of nuclear generation (27 percent), large hydroelectric facilities (18 percent), eligible renewable resources (33 percent) such as wind, geothermal, biomass, solar and small hydro, from natural gas/other (20 percent) and unspecified sources (2 percent). Unspecified power refers to electricity that is not traceable to specific generation sources by any auditable contract trail. PG&E met California's 2020 renewable energy goal three years ahead of schedule, supplying 33 percent of electricity from renewable resources that qualify under California's RPS. PG&E continue to add more renewable energy to their power mix and are projected to supply electricity from 50 percent eligible renewables by the end of 2030.[43]

The total mid-energy demand in the PG&E service area in 2015 was about 104,868 gigawatt-hours (GWh); demand is forecast to rise to about 119,633 GWh by 2027.[44]

Four 60 kV underground electrical lines and two 115 kV underground electrical lines run through the City.[45] The two 60 kV electric transmission lines in Anderson Drive terminate in the Downtown Precise Plan Area at San Rafael substation. The substation is located on 2nd street between A street and Lindaro Street. The 115-kV electric transmission line in Lincoln Avenue also runs through the Downtown Precise Plan area.

Natural Gas

PG&E's natural gas (methane) pipe delivery system includes 42,141 miles of distribution pipelines, and 6,438 miles of transportation pipelines.[46] Gas delivered by PG&E originates in

gas fields in California, the US Southwest, US Rocky Mountains, and from Canada. Transportation pipelines send natural gas from fields and storage facilities in large pipes under high pressure. The smaller distribution pipelines deliver gas to individual businesses or residences.

Seven PG&E gas high pressure transmission pipelines run beneath the City as shown in Figure 7.4. Three of these pipelines are within the Downtown Precise plan Area:

- One 16-inch pipeline running in Lindaro Street to 3rd street to Lincoln Avenue
- One 12-inch pipeline running in Lindaro Street to 2nd Street
- One 12-inch pipeline running along Ida Street to H Street.[47]

PG&E's 2018 California Gas Report (CGR) projects total system demand to decline at an annual average rate of 0.4 percent between 2018 and 2035. PG&E anticipates that sufficient supplies will be available from a variety of sources at market-competitive prices to meet existing and projected market demands in its service area.[48] Table 7.9 shows the winter peak day demand, the summer peak day demand, and the total resources available to meet demands.

TABLE 7.9 DEMAND AND SUPPLY FORECAST FOR PG&E

Year	Demand	Resources Available to Meet Demand
Winter Peak Demand		
2018	3,671	5,200
2019	3,557	4,317
2020	3,463	4,317
Summer Peak Demand		
2018	1,805	5,200
2019	1,681	4,317
2020	1,557	4,317

Source: San Rafael Department of Public Works, 2018, 3-Year Capital Improvement Program.

Marin Clean Energy

MCE is the default electricity provider for all communities in Marin County, including San Rafael, and several other communities in the Bay Area. As a Community Choice Aggregation program and not-for-profit public agency, MCE is independently run by representatives from participating communities. MCE provides electricity generated from renewable sources such as solar, wind, bioenergy, geothermal, and hydropower. Individuals residing or working within the MCE service area are automatically enrolled in MCE. Customers can opt out of MCE and choose to be provided service by PG&E.

MCE offers four program options:

1. Light Green program which provide 60 percent renewable power service
2. Deep Green program which provide 100 percent renewable power service form solar and wind sources in California
3. Local Sol program which provides 100 percent locally produced solar power from the Novato Cooley Quarry solar farm
4. Opt Out program which allows individuals to continue to receive PG&E's basic service.[49] The electric energy provided by MCE is conveyed to customers through PG&E's existing infrastructure. PG&E continues to maintain the grid, repair lines, and customer billing within the MCE service area.

Telecommunication Service Providers

Sonic

Sonic offers internet service within the state of California. Sonic provides Digital Subscriber Line (DSL) internet to an estimated 2.9 million people, making it the eighth largest residential DSL provider in the U.S. by coverage area.

In addition to DSL broadband, Sonic also offers copper and fiber internet service. Its copper service is available to businesses in 487 zip codes. Its fiber service is available to approximately 398,000 people. Sonic provides internet and phone services to homes and businesses in San Rafael.[50]

AT&T Internet

AT&T Internet offers internet service across 22 states with the greatest coverage in California, Texas, and Florida. DSL internet from AT&T Internet is available to an estimated 122 million people, making it the largest residential DSL provider in the nation by coverage area.

In addition to DSL broadband, AT&T Internet also offers fiber and fixed wireless internet service. Its fiber service is available to approximately 20.4 million people, making it the second largest provider of fiber broadband in the U.S. by coverage area. Its fixed wireless service is available to approximately 1.6 million people.[51] AT&T also provides internet and phone services to San Rafael.

XFINITY

XFINITY from Comcast offers internet service across 39 states with the greatest coverage in California, Florida, and Illinois. Cable internet from XFINITY is available to an estimated 111.7 million people. In addition to cable broadband, Xfinity also offers fiber internet service. Its fiber service is available to approximately 17,000 people.[52] Xfinity offers internet service in San Rafael. Figure 7.4 (on next page) shows PG&E's natural gas transmission pipelines.

Other Services
Other telecommunication services in San Rafael include Dish Network and Internet Essential by Comcast.

Dish Network provides satellite TV services and as of December 2017 had 13.24 million subscribers. Standard programming packages generally include programming provided by national broadcast networks, local broadcast networks, and national and regional cable networks. Latino and international packages are also available, allowing subscribers to choose from channels in over 28 languages.[53]

Internet Essentials has been offering internet services to low income families, seniors, and veterans since 2011. Currently 6 million low-income Americans are connected to low-cost, high-speed Internet at home through Internet Essentials.[54]

Capital Improvement Projects

PG&E has implemented a Gas Pipeline Replacement Program (GPRP) to improve gas service to customers. PG&E replaces old gas pipelines with modern new piping that is more resistant to corrosion and earth movement. The goal is a more reliable system with less maintenance and lower energy costs. The GPRP is implemented through an agreement between PG&E and the CPUC. The pipe replacement priorities are based on age and pipe leakage history so that the highest priority pipes are replaced first.[55]

As part of the GPRP, PG&E has completed work on a natural gas main that travels through the Bret Harte neighborhood in San Rafael and feeds most of southern Marin County. PG&E's construction involved excavating, removing and replacing the existing gas main down 2nd Street, Irwin Street, Lindaro Street, Andersen Drive, Woodland Avenue, and Du Bois Street.[56]

PG&E plans to start the following replacement projects in 2019:

- Replacement of natural gas transmission pipelines on 2nd Street and Lindaro Street,
- Ongoing maintenance on natural gas pipeline valves and response to leaks.[57]

Electric, Gas, and Telcommunication Infrastructure Constraints

PG&E has no capital reinforcement projects identified to address deficiencies in San Rafael since PG&E's load forecast does not show any deficiency within the 2027-time frame.[58] However, the forecast does not extend to the year 2040, which is the expected buildout year for the General Plan Update.

Sea Level Rise

A detailed discussion of sea level rise, including maps, is provided in the natural hazards section of this report. This discussion is specific to electricity and natural gas infrastructure as it relates to relationship to sea level rise conditions.

According to PG&E, some electric distribution lines, distribution transformers, electric transmission lines, and substations in Marin County could be vulnerable to sea level rise. In San Rafael, the 60 kV electric transmission lines in Anderson Drive and the substation from which they originate, are vulnerable to sea level rise. The substation is located in the Downtown Specific Plan area. Furthermore, the 150 kV and 60 kV electric transmission lines trending southwest to northeast are also vulnerable along with twelve transmission towers associated with the 150-kV electrical line . While these towers can tolerate flooding, they are susceptible to increased rates of subsidence and erosion from near the mounting platform that supports them. The PG&E buildings along Anderson Drive is also vulnerable to sea level rise.

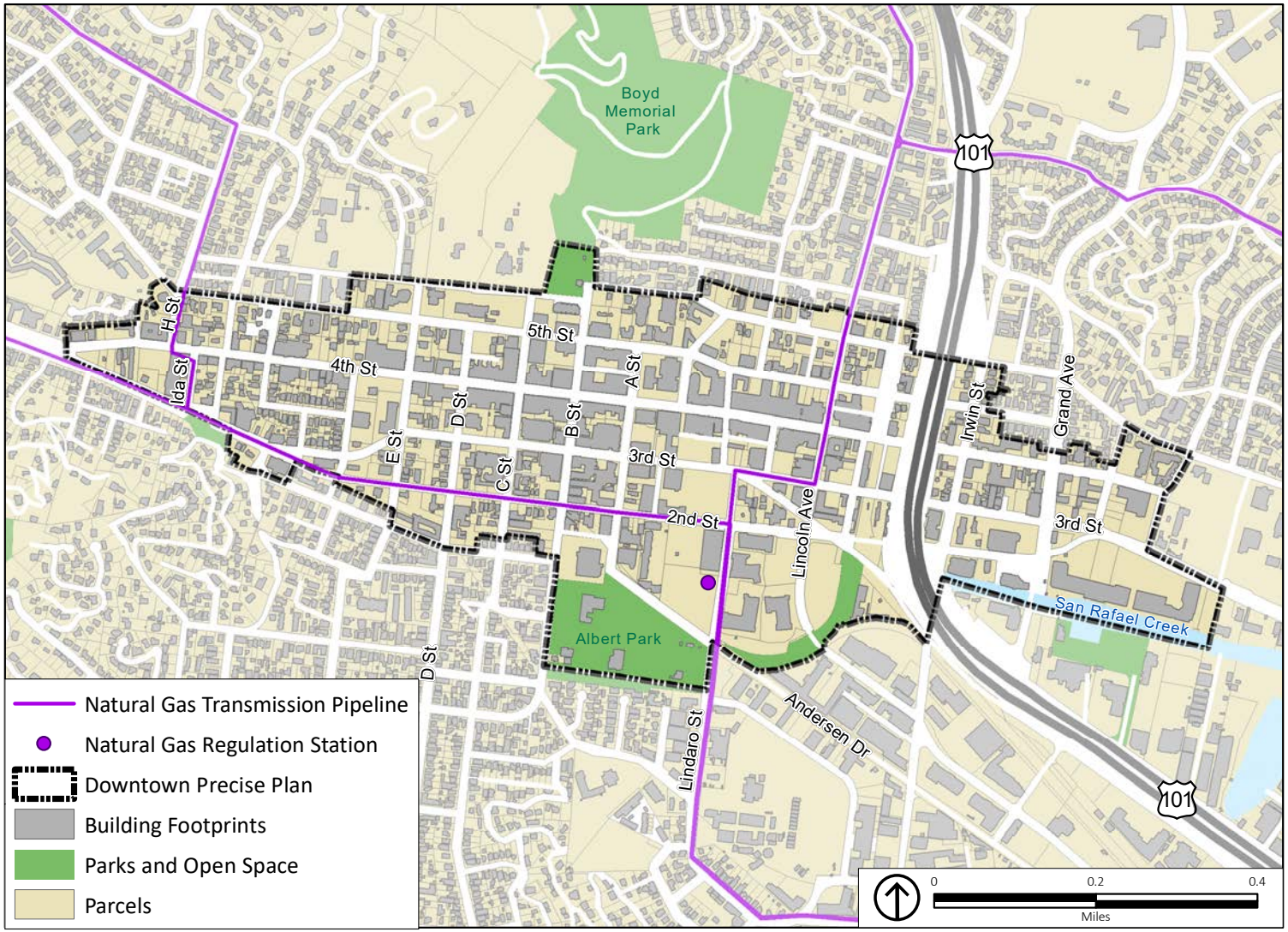


Figure 7.4 PG&E Natural Gas Transmission Pipeline

Source: ESRI, 2017; City of San rafael, 2019: Placeworks, 2019

Other features that could expect increased rates of wear and tear from increased tidal influence are electrical poles. The tall large wooden poles could be vulnerable, currently and in the future, to falling tree branches; however, they can withstand some degree of flooding. Excessive or permanent flooding could weaken the poles over time, warranting replacement. Poles are also vulnerable to roadway collapse because the poles are often located in the right-of-way alongside roads.[59]

PG&E gas infrastructure in Downtown Precise Plan area vulnerable to sea level rise includes: [60,61]

- The natural gas pipeline running in 2nd street between Lindaro Street and A Street
- The natural gas pipeline along Lindaro Street into 3rd Street and north along Lincoln Avenue. The portion of this pipeline susceptible to sea level rise starts at the intersection of Woodland Avenue and Lindaro Street and terminates at the intersection of Lincoln Avenue and 4th Street.
- The natural gas regulating station on Lindaro Street could see flooding from storms in the medium-term and tidal flooding by the long-term.

Furthermore, underground gas pipes could face buoyancy pressures as the water table beneath them rises and pushes them to the surface. The pressure can place bending forces on the pipes, especially where they are held down by roads. Moreover, if a road sheltering a natural gas pipe is damaged enough to rupture the pipes the consequences could be severe.[62]

Several asset managers provide telecommunication services including AT&T, Comcast, Dish, and others. According to AT&T, telecommunication assets are not vulnerable on their own, as they are designed to withstand wet weather and tidal impacts. In addition, consistent level of service is a primary goal of these companies; therefore, the company would anticipate and prepare for potential impacts. The most vulnerable assets are the communication cables under vulnerable roads. Poles are also vulnerable during storms to falling trees.

Utilities Infrastructure: Key Findings

This report provides information on the existing conditions related to utility infrastructure in the Downtown Precise Plan area and evaluates existing capacities along with needs for improvements or expansion of water, wastewater, stormwater, gas/electric, and telecommunication facilities. The report also evaluates the long-range plans and programs of each service provider, and consideration of sea level rise, technological improvements, and other factors. The purpose is to provide preliminary background information on utility infrastructure in the downtown area to provide context for the forthcoming Downtown Precise Plan.

The following bullets reflect the key transportation findings from the Downtown Area Profile Report compiled as part of the San Rafael Downtown Precise Plan:

Water Supply Infrastructure

- The Marin Municipal Water District (MMWD) is the water purveyor for the City of San Rafael. The MMWD serves roughly 190,000 customers within approximately 147 square miles along the eastern corridor of Marin County. On average, the City consumes approximately 27 percent of MMWD provided water. The Forbes Hill Reservoir, rehabilitated by MMWD in 2015, serves the Downtown Precise Plan Area.
- There are no deficiencies in water distribution system within the Downtown Precise Plan Area.
- The water supply infrastructure within the Downtown Precise Plan Area could potentially be impacted by downstream sea level rise impacts to the MMWD headquarters in Corte Madera and pipes exposed to saltwater intrusion, corrosion, and soil subsidence.

Sanitary Sewer Infrastructure

- The Downtown Precise Plan Area is serviced by the San Rafael Sanitation District (SRSD), and the Central Marin Sanitation Agency (CMSA) provides wastewater treatment. Sewer pipelines in the Downtown Precise Plan area also range from 6-inch to 36-inch diameter pipes and include gravity lines and force mains.
- There are no deficiencies in sanitary sewer system within the Downtown Precise Plan Area with respect to sewage treatment capacity.

Stormwater Infrastructure

- The City of San Rafael, Department of Public Works (DPW) maintains the City's stormwater system. The Downtown Precise Plan area is within the San Rafael Creek watershed, which encompasses 11 square miles. The San Rafael Creek flows through open stream channels and underground culverts in the upper watershed and into the San Rafael Bay at Pickleweed Park.
- The City has deficiencies in the stormwater system in the area of C Street and D Street within the Downtown Precise Plan Area. The Capital Improvement Program includes improvements to the storm drainage system at D Street.
- The southeastern portion of the Downtown Precise Plan Area is within the 100-year floodplain and is subject to both overflow from San Rafael Creek and tidal flooding from San Francisco Bay. Flood control measures, including levees and

stormwater pumping stations, have been implemented to reduce the potential for flooding and facilitate the removal of stormwater during flood events.

Electricity and Natural Gas Infrastructure

- Electric power and natural gas are provided to the City of San Rafael by Pacific Gas & Electric (PG&E). Internet, phone, and satellite TV services are currently provided by a variety of private sources, including Sonic, AT&T, Xfinity, Dish, and Comcast.
- The PG&E electric substation is located on 2nd street between A street and Lindaro Street. There are two 60 kilovolt (kV) electric transmission lines along Anderson Drive which terminate in the Downtown Precise Plan Area at San Rafael substation. The 115 kV electric transmission line in Lincoln Avenue also runs through the Downtown Precise Plan Area.
- PG&E owns three high pressure natural gas pipelines within the Downtown Precise Plan area: 16-inch pipeline in Lindaro Street-3rd Street-Lincoln Avenue, 12-inch pipeline in Lindaro Street-2nd Street, and 12-inch pipeline in Ida Street and H Street.
- Within the Downtown Precise Plan Area, the following electric and gas infrastructure could be vulnerable to sea level rise: the 60 kV electric transmission lines in Anderson Drive, 115 kV electric transmission line in Lincoln Avenue, the electric substation on 2nd Street, underground gas pipes, and the natural gas regulation station on Lindaro Street.

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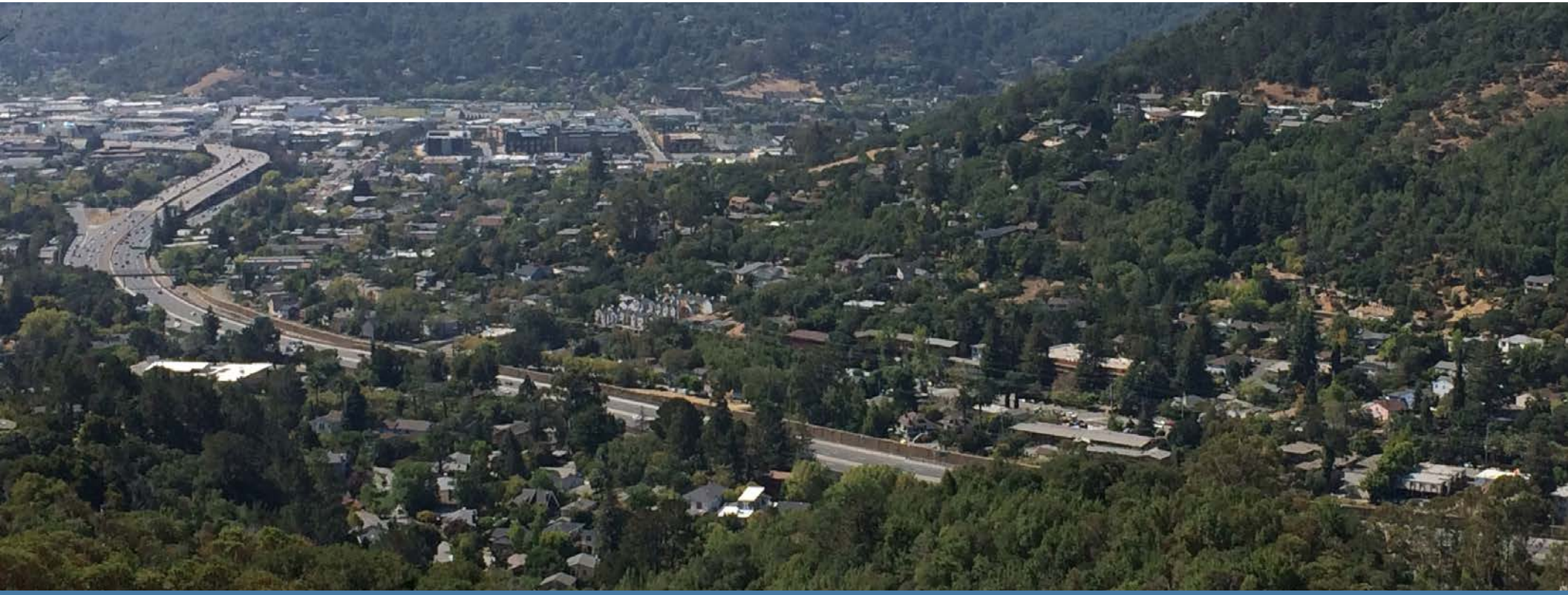

CHAPTER

8

Natural Hazards

This chapter provides information on the existing conditions related to natural hazards, including wildfire, flooding, sea level rise, and drought, geology and soils, and hazardous materials in the Downtown Precise Plan area. The report evaluates the hazard mitigation and adaptation plans and programs and provides preliminary background information on natural hazards in the downtown area to provide context for the Downtown Precise Plan.

In this chapter

Wildfire

Wildfire hazard is the potential for wildfire to occur in an area and wildfire risk is the likelihood for wildfire to harm people and/or damage property.[1] This section provides a general overview of wildfire, describes wildfire hazards and risks, and defines the wildfire conditions within the Downtown Precise Plan areas.

Wildfire in the Region

The City of San Rafael 2017 Local Hazard Mitigation Plan (LHMP) describes two wildfire disaster declarations within Marin County and eight wildfires within the County from 1919 to 2016. Two of the eight wildfires were within close proximity to the City of San Rafael (Kent Woodlands Wildfire, 1972; Sorich Park Wildfire, 1976).

The LHMP also describes three structural fires that have occurred within the city, including the Downtown Fire in July 1957, the Courthouse Fire in May 1971, and the Marin History Museum Fire in July 1990.[2] CAL FIRE's Historic Wildfire Perimeters (1950-2017) database shows three additional fires that have occurred within the city limits: Margarita Drive Fire in 1968, San Rafael Assist Fire in 1975, and the San Rafael Hill fires in 2000 and 2001.[3] One additional fire occurred in June 2018 on lands within Boyd Memorial Park and burned approximately 65 acres.

Wildfire Hazards in the Project Area

Wildfire Responsibility Areas and Fire Hazard Severity Zones

The City of San Rafael is not located within a Federal Responsibility Area. The City does contain land within both State Responsibility and Local Responsibility Areas, as shown in Figure 8.1. The State Responsibility Area (SRA) includes approximately 62 acres in the Sun Valley neighborhood.[4] The Local Responsibility Area (LRA) covers approximately 14,169 acres, or the remaining acreage within the City.[5]

As shown in Figure 8.1, the 62 acres within the SRA is designated as a high fire hazard severity zone. The land within the LRA contains 8,315 acres that is not within a fire hazard severity zone, 3,467 acres within a moderate fire hazard severity zone, and 2,387 acres within a high fire hazard severity zone. The City does not contain land within a very high fire hazard severity zone.[6]

Wildland-Urban Interface

According to California Office of Emergency Services, a Wildland-Urban Interface (WUI) is defined as any area where structures and other human development meet or intermingle within wildland vegetation.[7] Developments in the wildland-urban interface exacerbate fire occurrence and fire spread in several ways, including:

- Increased numbers of human-caused wildfires.
- Wildfires become harder to fight.
- Firefighting resources are diverted from containing the wildfire to protecting lives and homes.
- Letting natural fires burn becomes impossible; leading to buildup of fuel, increasing wildfire hazard further.[8]

Increased fire frequency tends to eliminate and replace native shrubs with weedy, highly flammable annual grasslands.[9]

Approximately 5,984 acres of land within San Rafael is located within the WUI, as shown in Figure 8.2.[10] Land use within the WUI is comprised of approximately 3,959 acres of residential uses and 2,025 acres of industrial, commercial, and open space uses. According to the Wildfire Prevention and Protection

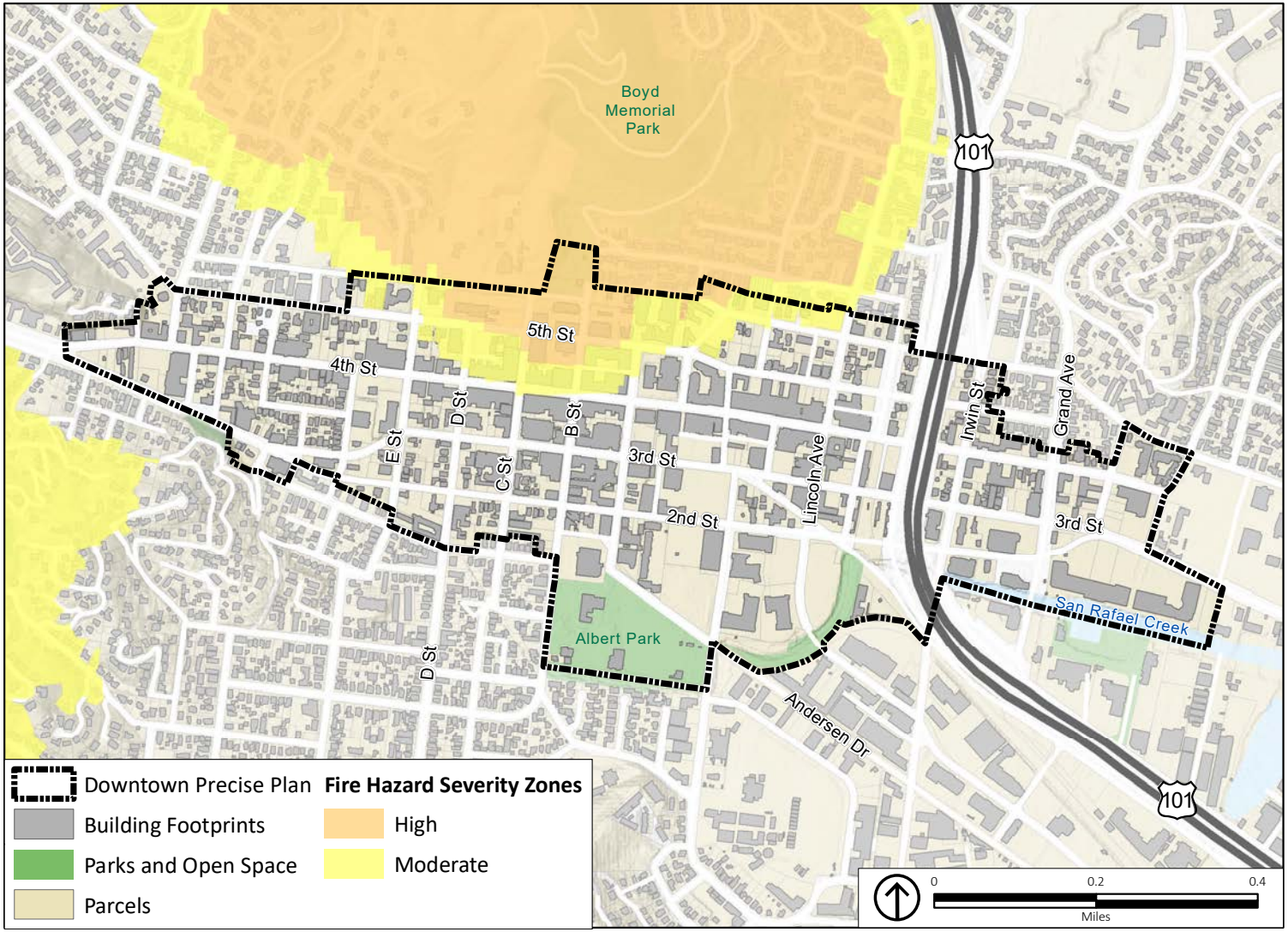

Figure 8.1 Fire Hazard Severity Zones

Source: ESRI, 2017; CAL FIRE, 2018; City of San Rafael, 2019: Placeworks, 2019

Action Plan, the City's current wildfire prevention efforts are focused on the WUI.[11]

Fire Protection Resources

The San Rafael Fire Department (SRFD) serves the City of San Rafael and operates six fire stations and one fire administration office.[12] The fire department, along with a Vegetation Management Specialist, Vegetation Management Inspector, and two open-space rangers with the Police Department, manage fire prevention efforts throughout the city. Existing programs include monthly chipper days, WUI home inspections, and removal of dangerous items at encampments that pose immediate fire risks.[13]

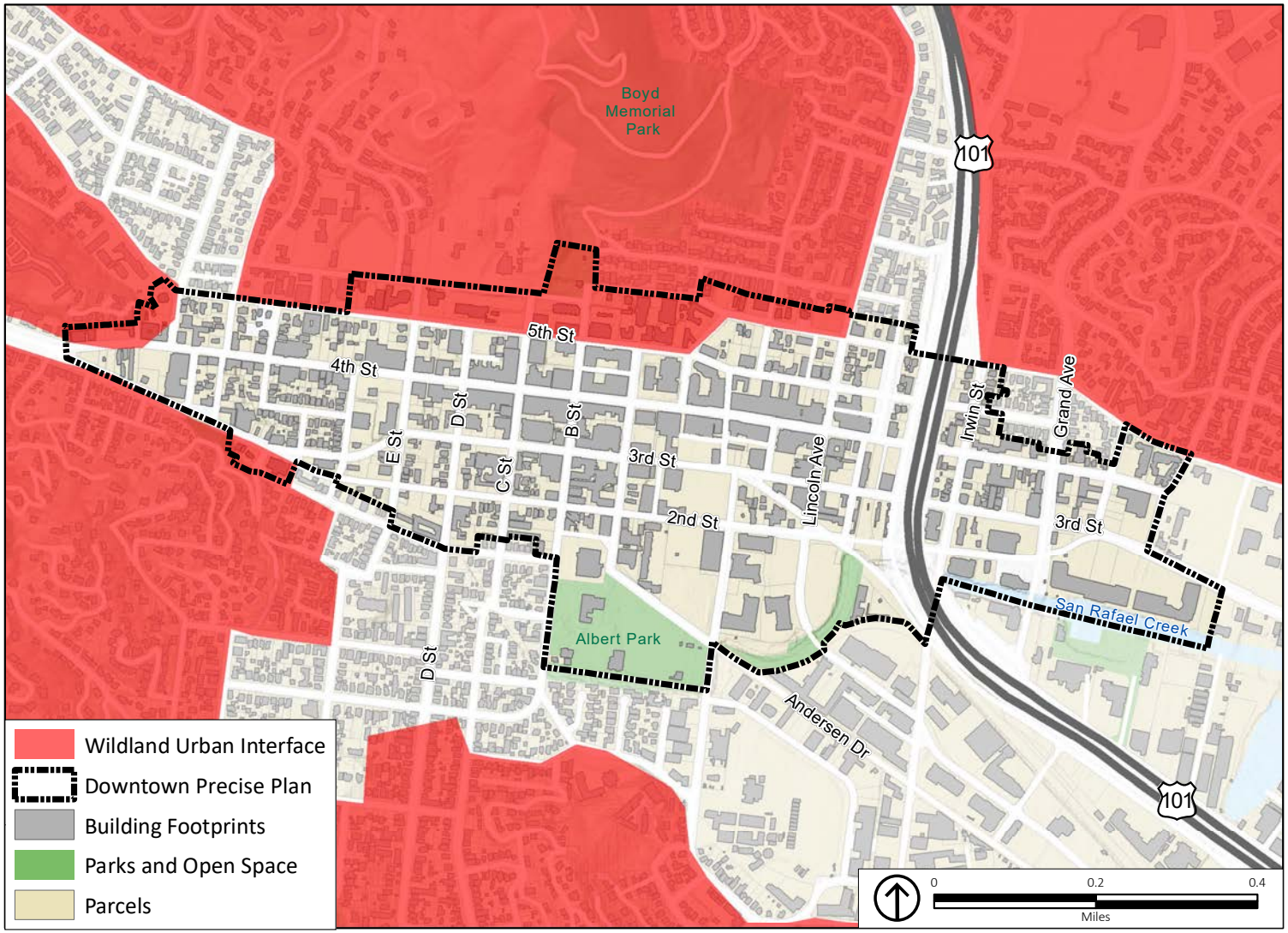

Figure 8.2 Wildfire Urban Interface

Source: ESRI, 2017; US Forest Service, 2006; City of San Rafael, 2019: Placeworks, 2019

Flooding, Sea Level Rise and Drought

This section describes the flooding, sea level rise, and drought conditions within the City of San Rafael and Downtown Precise Plan Area (DPPA) and provides a summary of the relevant regulatory setting necessary to evaluate potential environmental impacts resulting from the implementation of the DPPA.

Physical Environment

This section describes the physical environment that affects hydrological conditions in the Downtown Precise Plan area, including topography, watershed and creek system, climate, water resources, and water quality.

Topography

San Rafael stretches from 1,000 feet above sea level in the coastal mountains northwest of the Downtown Precise Plan area and in the Terra Linda neighborhood in the northwest corner to the city boundary, to sea level at the tidal marshes and baylands on the eastern edge of the city.[14] The Downtown Precise Plan area is relatively flat, with strongly sloping portions on the northern and western ends of downtown, towards Boyd Memorial Park and San Anselmo.[15] The higher, hilly portion of the city include the Terra Linda and Sleep Hollow Open Space Area in the northwest corner of the project area, Southern Heights Ridge on the southwestern edge of the project area, and Black Canyon and San Pedro Mountain in the eastern portion of the city. The lower, flatter portions of the city include the Downtown and Canal neighborhoods.

Watershed and Drainage Area

San Rafael is located within approximately nine watersheds. The major watersheds include Gallinas Creek, San Rafael Creek, and Miller Creek, as shown in Figure 8.3. Water typically slows from of the northwest to the southeast through natural and urbanized creeks. The San Rafael Creek Watershed is located in the central region of the city, between the Gallinas Creek Watershed and Corte Madera Creek Watershed. The watershed encompasses 11 square miles, including the Downtown Precise Plan Area.[16] The watershed originates in the hills above Tamalpais Cemetery and flows through highly urbanized areas towards the San Rafael Canal. The San Rafael Creek flows through open stream channels and underground culverts in the upper watershed and into the San Rafael Bay at Pickleweed Park.[17] Elevations of the San Rafael Creek Watershed range from 1,100 feet in the hills above Tamalpais Cemetery to sea level at the San Pablo Bay.[18]

Groundwater

There are three groundwater basins identified in the Department of Water Resources Bulletin 118 that are at least partially within the Marin Municipal Water District's (MMWD) service area. These three basins include Ross Valley, San Rafael Valley, and part of the Novato Basin. All three basins are categorized by the California Statewide Groundwater Elevation Monitoring program as very low priority basins.

Groundwater use within the MMWD's service area is limited to small, domestic use through private groundwater pumping wells. The MMWD has studied the potential for municipal groundwater use since the 1970's. Several studies since that time have determined that the potential for municipal groundwater use within the boundaries of the MMWD service area is very limited due to limited production capabilities, water quality constraints, and potential water rights issues.

As a result of these studies, groundwater is not currently or planned to be used as a municipal water supply source by the MMWD, though private groundwater wells are used in the MMWD's service area.[19]

Climate

San Rafael experiences a semiarid, Mediterranean climate, which consists of hot, dry summers with low humidity and very mild winters. The city receives approximately 35.6 inches of rain annually, primarily experiences from the five-month stretch between October and April. The winter average low temperature is about 41 degrees Fahrenheit (°F) and the average summer high temperature is about 82 °F.[20]

Water Quality

Surface water quality is affected by point source and non-point source pollutants. Point source pollutants are those emitted at a specific point, such as a pipe, while non-point source pollutants are typically generated by surface runoff from diffuse sources, such as streets, paved areas, and landscaped areas. Point source pollutants are controlled with pollutant discharge regulations or WDRs. Non-point source pollutants are more difficult to monitor and control, although they are important contributors to surface water quality in urban areas.

Stormwater runoff pollutants vary based on land use, topography, the amount of impervious surface, and the amount and frequency of rainfall and irrigation practices. Runoff in developed areas typically contains oil, grease, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas. The highest pollutant concentrations usually occur at the beginning of the wet season during the "first flush," when early rainfall flushes out pollutants that have accumulated on hardscape surfaces during the preceding dry months.

The San Francisco Bay Regional Water Quality Control Board (RWQCB) monitors surface water quality through implementation of the Basin Plan and designates beneficial uses for surface water bodies and groundwater within the Marin County and San Rafael.

In accordance with Section 303(d) of the Clean Water Act (CWA), the State must present the CalEPA with a list of impaired water bodies that do not meet water quality standards. Listed impaired water bodies in San Rafael and their associated pollutants of concern are presented in Table 8.1.

TABLE 8.1 LISTED IMPAIRED WATER BODIES IN SAN RAFAEL

Name	Pollutants of Concern
San Rafael Creek	Diazinon[1]
Central San Francisco Bay	Chlordane[2] DDT[1] Diazinon Dieldrin[1] Dioxin Compounds[3] Furan Compounds[4] Invasive Species Mercury PCBs[5] PBDEs[6] Selenium[7] Trash

[1] Used as an insecticide.

[2] Used as a pesticide.

[3] Burning processes, such as commercial or municipal waste incineration, backyard burning, and the use of fuels, such as wood, coal, or oil, produce dioxins. The compounds then collect in high concentrations in soils and sediments.

[4] Furan is used in the formation of lacquers and as a solvent for resins.

[5] PCBs were used widely in electrical equipment like capacitors and transformers. They were banned in the US in 1979.

[6] PBDEs are fire retardant chemicals.

[7] The greatest use of selenium compounds is in electronic and photocopier components, but they are widely used in other products as well. Selenium releases to the environment is primarily from copper smelting industries.

Source: State Water Resource Control Board, 2019, Impaired Waters.

Once a water body has been placed on the 303(d) list of impaired waters, states are required to develop a TMDL threshold to address each pollutant causing impairment. A TMDL defines how much of a pollutant a water body can tolerate and still meet water quality standards. A TMDL has been approved by the EPA for mercury in Central San Francisco Bay and Diazinon in the San Rafael Creek.

Flood Hazard Areas

FEMA prepares maps of the 100-year flood hazard area of U.S. communities. Areas within the 100-year flood hazard area are subject to 100-year flood, which means that in any given year, the risk of flooding in the designated area is 1 percent. Maps are also available for 500-year floods, which means that in any given year, the risk of flooding in the designated area is 0.2 percent.

In some locations, FEMA also provides a measurement of base flood elevation for the 100-year flood, which is the minimum height of the flood waters during a 100-year event; base flood elevation is reported in feet above sea level. Depth of flooding is determined by subtracting the land's height above sea level from the base flood elevation. Areas within the 100-year flood hazard area that are financed by Federally-backed mortgages are subject to mandatory federal insurance requirements and building standards to reduce flood damage. Digital Flood Insurance Rate Maps for Marin County and San Rafael dated March 16, 2016, are used to analyze flood hazards.

Most of the land along Miller Creek and the outlets of Gallinas Creek and San Rafael Creek is within the 100-year floodplain and is subject to overflow from the creeks.[21] The land abutting the San Pablo Bay, including McNears Beach, McInnis Park, and the Canal neighborhood is also within the 100-year floodplain and is subject to tidal flooding from San Francisco Bay. Inland areas within the 100-year floodplain include the Glenwood neighborhood and the northern portion of the Mont Marin/San Rafael Park neighborhood.

A map of the locations in the Downtown Precise Plan area that are within the 100-year floodplain is shown on Figure 8.4. As shown, the southeastern portion of the downtown is within the 100-year floodplain and is subject to both overflow from the San Rafael Creek and tidal flooding from the San Francisco Bay.

The Marin County Flood Control District and Water Conservation District has designated one of the areas in the 100-year floodplain as a flood control zone, designated as Zone 6: San Rafael Meadows. Zone 6 was created in the 1960's to address frequent flooding in the low-lying neighborhood just west of Highway 101 across from the County Civic Center. It is overseen by a five-member Advisory Board. Zone 6 is the County's smallest flood control zone, covering only 0.16 square mile entirely within the City of San Rafael. The Zone occupies a very small part of the Gallinas Creek Watershed. The Zone 6 work program includes an annual vegetation maintenance program along 0.75 mile of creek.[22]

Additional flood control measures, including levees and stormwater pumping stations have been implemented to ensure that floodplains are not inundated and can be drained when storm drains are inundated. As shown in Figure 8.5, levees are located along the creek outlets and many of the bayfront areas. The levee system in the northern portions of the city spans from the Miller Creek outlet to the Gallinas Creek outlet and includes levees that cross over McInnis Park. In the southern portion of the city, the levee system spans from Pickleweed Park along the San Rafael Canal to Highway 580 along the shoreline.[23]

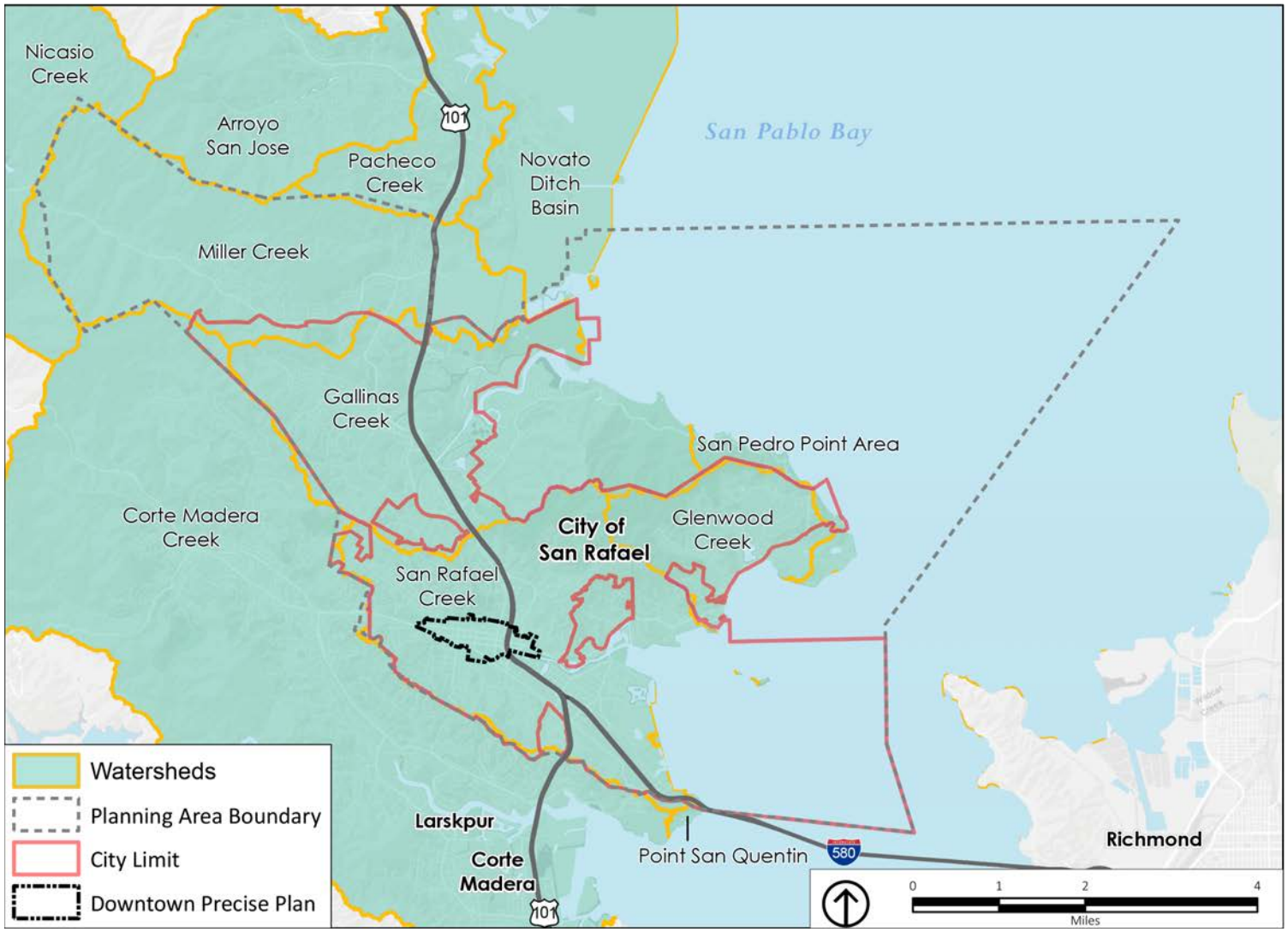

Figure 8.3 Watersheds in San Rafael

Source: ESRI, 2019; Marin Municipal Water District, 2019; City of San Rafael, 2019: Placeworks, 2019

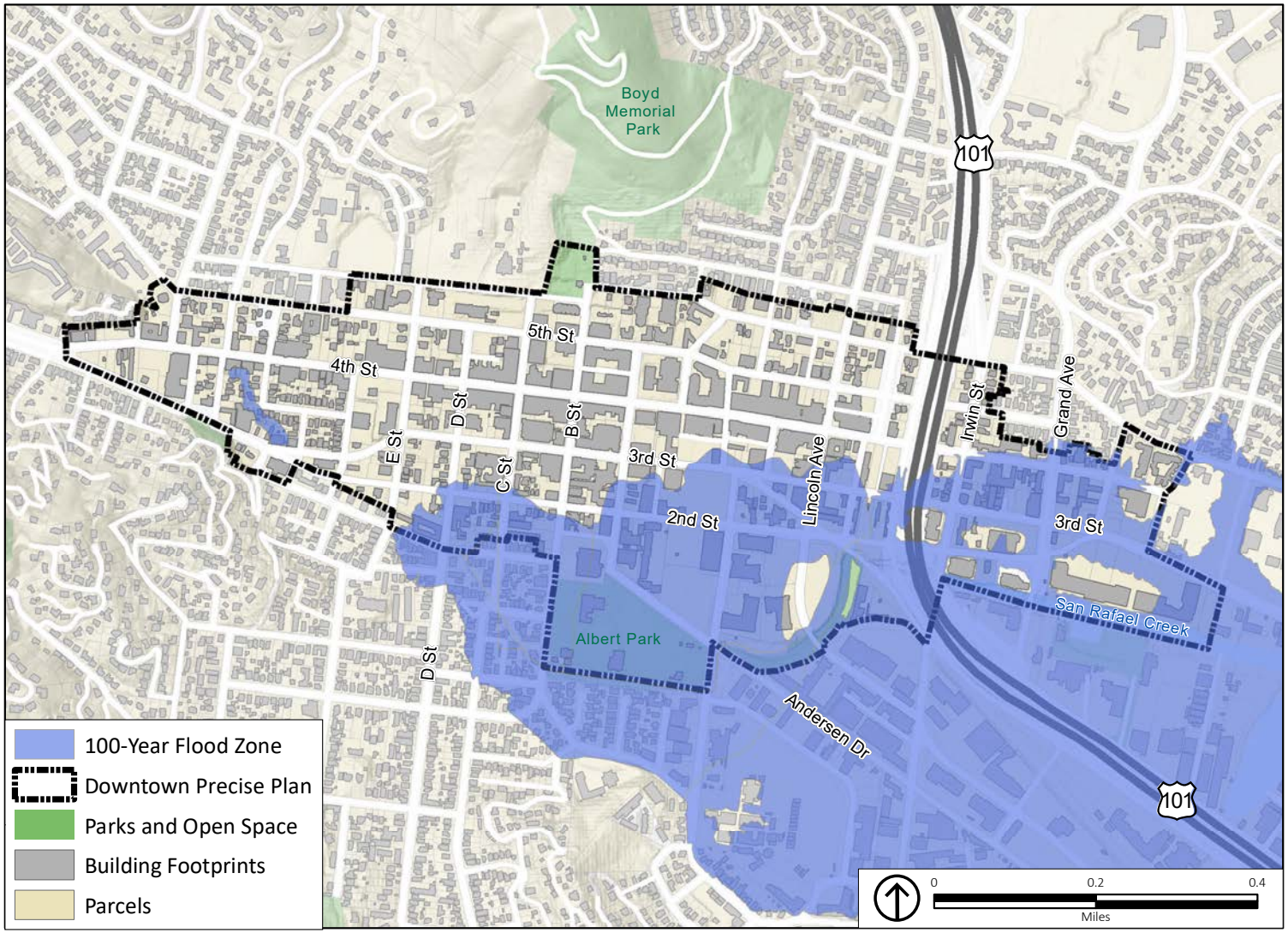

Figure 8.4 Downtown FEMA Flood Hazard Zones

Source: ESRI, 2017; FEMA, 2016; City of San Rafael, 2019: Placeworks, 2019

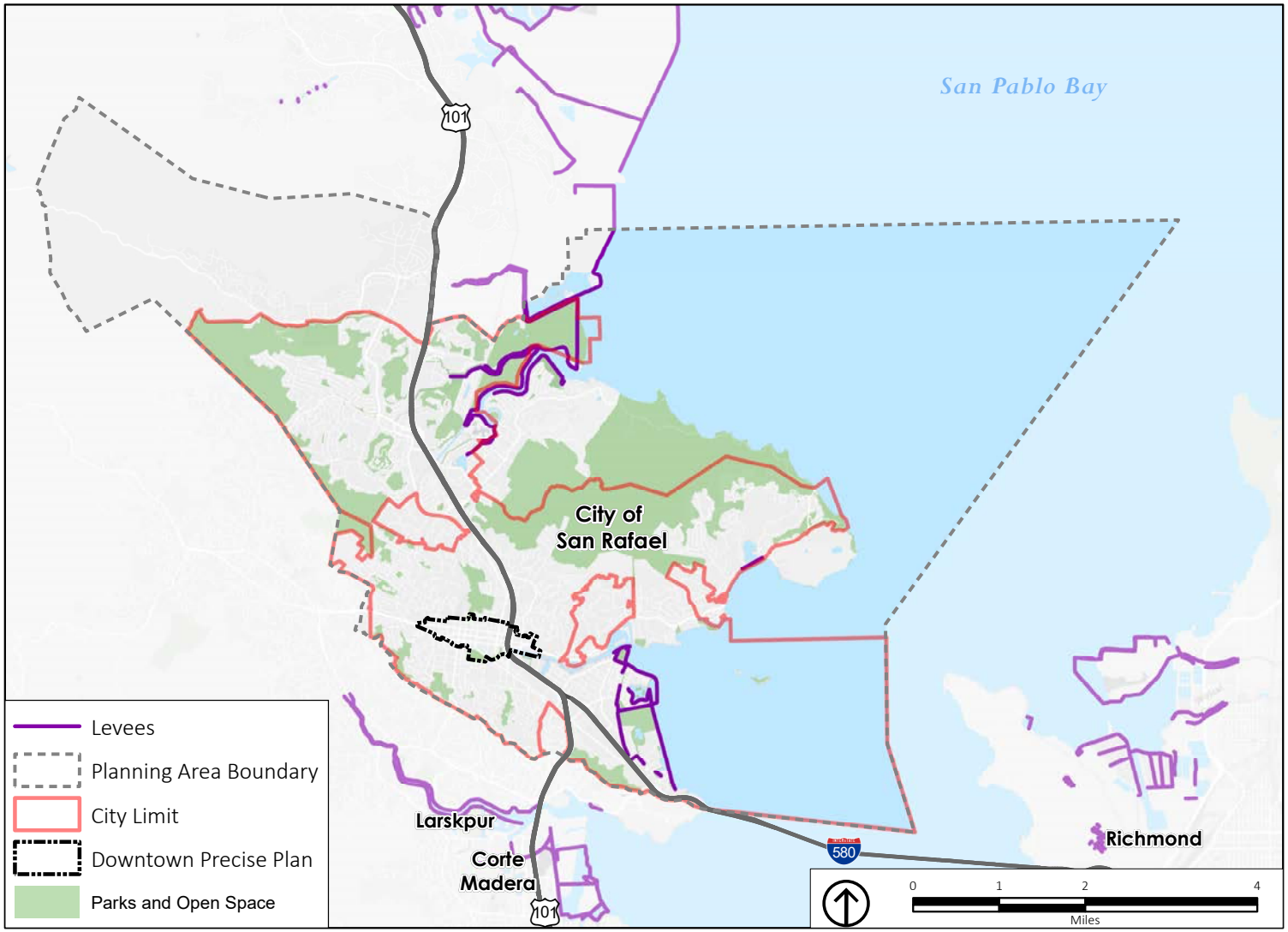

Figure 8.5 Levees in San Rafael

Source: ESRI, 2019; FEMA, 2015; City of San Rafael, 2019: Placeworks, 2019

Sea Level Rise

A rise in average global temperatures due largely to an increase in greenhouse gas (GHG) emissions is expected to be accompanied by a rise in global sea levels. California Executive Order S-13-2008 states that all state agencies planning construction projects in areas vulnerable to sea level rise must consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and to the extent feasible, reduce expected risks to sea level rise.[24]

The State of California Sea-Level Rise Guidance, 2018 Update incorporates the most recent scientific findings from the Ocean Protection Council (OPC).[25] OPC predicts a range for San Francisco Bay sea level rise based on risk aversion scenarios. Risk aversion is defined as the strong inclination to avoid taking risks in the face of uncertainty.[26] Using medium-high risk aversion OPC projects sea level rise in the San Francisco Bay Area to be 1.9 feet by 2050 and between 5.7 and 6.9 feet by 2100.[27] Most shoreline damage from sea level rise will occur as a result of coastal storms in combination with higher sea levels, which can temporarily raise sea levels by an additional 2 feet. The key factors that contribute to coastal flooding include high tides, storm surge, high waves, and high runoff rates from rivers and creeks.[28]

The current San Francisco Bay Conservation and Development Commission (BCDC) policy language allows for the protection of existing structures from flooding, encourages innovative means of dealing with flood danger, and makes it clear that local governments will determine how best to deal with development proposals inland of BCDC's jurisdiction. The BCDC has jurisdiction to regulate new development within 100 feet inland from the Bay shoreline. Local government retains its authority over development more than 100 feet inland from the Bay shoreline and the provisions of the Bay Plan do not apply outside BCDC's jurisdiction for purposes of implementing CEQA.[29]

The new BCDC policies require sea level rise risk assessments to be conducted when planning shoreline areas or designing large shoreline projects within BCDC's jurisdiction. Risk assessments are not required for repairs of existing facilities, interim projects, small projects that do not increase risks to public safety, and infill projects within existing urbanized areas. Risk assessments are only required within BCDC's jurisdiction and projects located only in the shoreline band, the area within 100 feet of the shoreline, need only address risks to public access.

The risk assessment should be prepared by a qualified engineer and should be based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current and planned flood protection. A range of sea level projections for mid-century and end of century should be used in the risk assessment and inundation maps should be prepared. The risk assessment should identify all types of potential flooding, degrees of uncertainty, consequences of defense failures, and risks to existing habitat from proposed flood protection devices. All projects should be designed to be resilient to a mid-century sea level rise projection. If it is likely that the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long-term impacts that will arise, based on the risk assessment.

Shoreline protection projects, such as levees and seawalls, must be designed to withstand the effects of projected sea level rise and to be integrated with adjacent shoreline protection. Whenever feasible, projects must integrate hard shoreline protection structures with natural features, such as marsh or upland vegetation, that enhance the Bay ecosystem.[30]

Marin County has recently completed a sea level rise vulnerability assessment with a broad coalition of civic leaders, elected officials, and concerned citizens to better understand and prepare for the potential impacts of sea level rise related to flooding and inundation and coastal storms.[31] The vulnerability assessment includes both incorporated and unincorporated areas of Marin County and assessing impacts to land use, buildings, transportation networks, utilities, recreation, and emergency services. Storm and tidal impacts are already occurring, and according to the Marin Sea Level Rise Vulnerability Assessment, approximately 2,121 acres, over 4,700 living units, 7.5 miles of road, 475 commercial parcels, and approximately 58,000 people in San Rafael will be affected by sea level rise by 2100.[32]

Figures 8.6 and 8.7 show the projected sea level rise for the Downtown Precise Plan area for both 2050 and 2100, respectively. Figures 8.8 and 8.9 show the projects sea level rise with 100-year storms for both 2050 and 2100. As shown. The southeastern corner of the downtown is vulnerable to flooding with projected sea level rise with a 100-year storm by 2050. By 2100, the area vulnerable to flooding will spread north and west into the DPP.

Dam Failure Inundation

The City of San Rafael and the Downtown Precise Plan area are not located within a dam failure inundation zone.

Drought

The United State Geologic Survey defines drought as "... a period of drier-than-normal conditions that results in water-related problems. When rainfall is less than normal for several weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water-supply problems develop, the dry period can become a drought."[33]

However, the California Department of Water Resources states that drought begins as a function of drought impacts on water users.[34] Repeated dry years can cause drawdown of groundwater tables and increase pumping costs for both domestic and agricultural wells. The most significant effects of drought are to industries associated with water intensive activities, such as wildfire protection, municipal usage, commerce, tourism, recreation, and agriculture. Marin County generally contains sufficient groundwater and surface water supplies to serve the population through drought of the past century, and the San Rafael receives its water from surface reservoirs in Marin County.[35]

Historical drought data for San Rafael demonstrates that there have been five significant droughts in the past 84 years, and it is likely that droughts will continue to occur in the future.[36] San Rafael relies primarily on surface water supplies within the MMWD, which are likely to be affected by both short and long term water shortages.[37] According to Cal-Adapt, a long-term drought scenario in San Rafael would reduce precipitation by an average of 6 inches per year, decrease baseflow of streams from an historical average of 12.1 inches to a projected 7.7

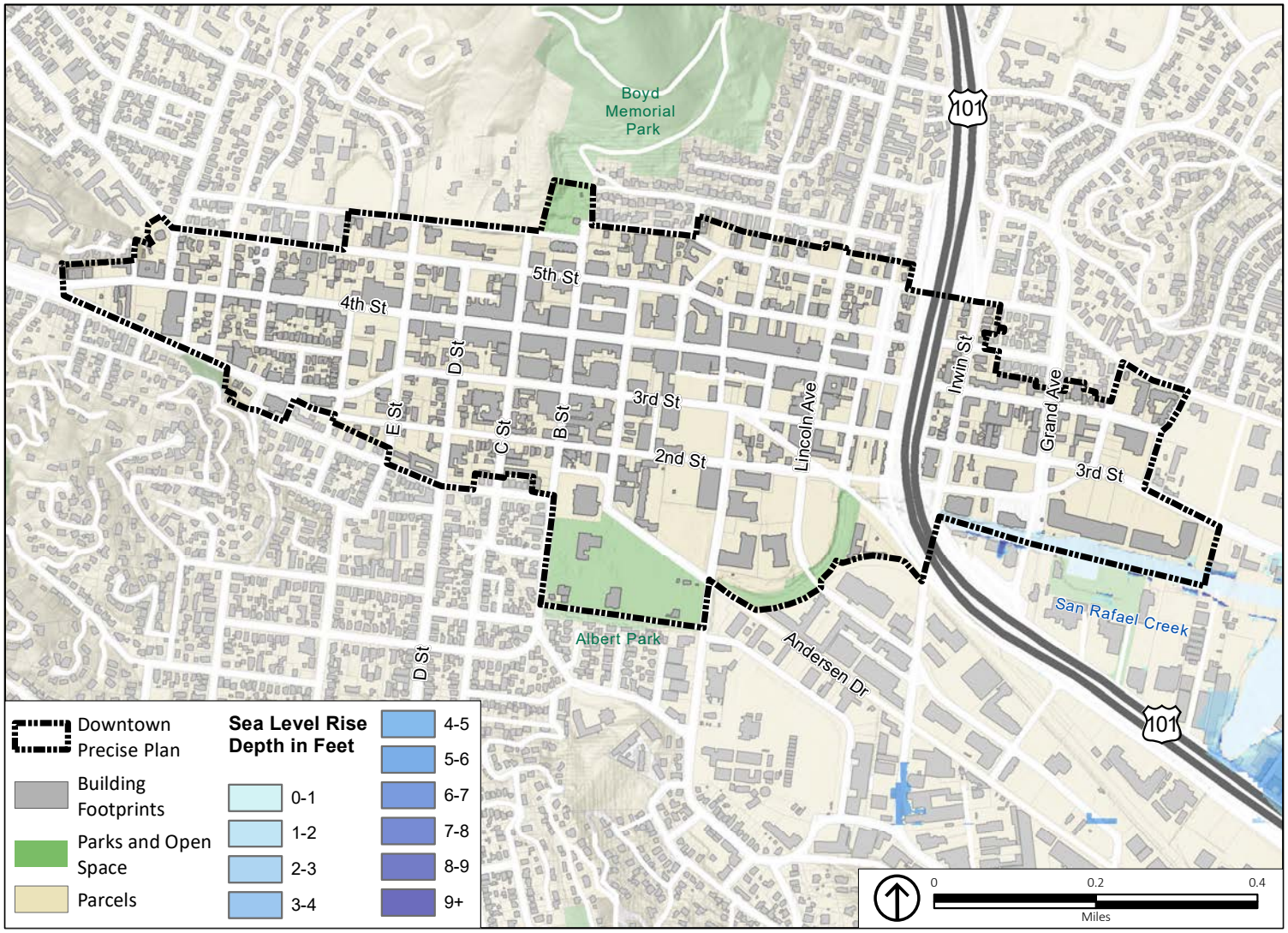

Figure 8.6 Downtown Area 2050 Sea Level Rise

Source: ESRI, 2017; FEMA, 2016; City of San Rafael, 2019: Placeworks, 2019

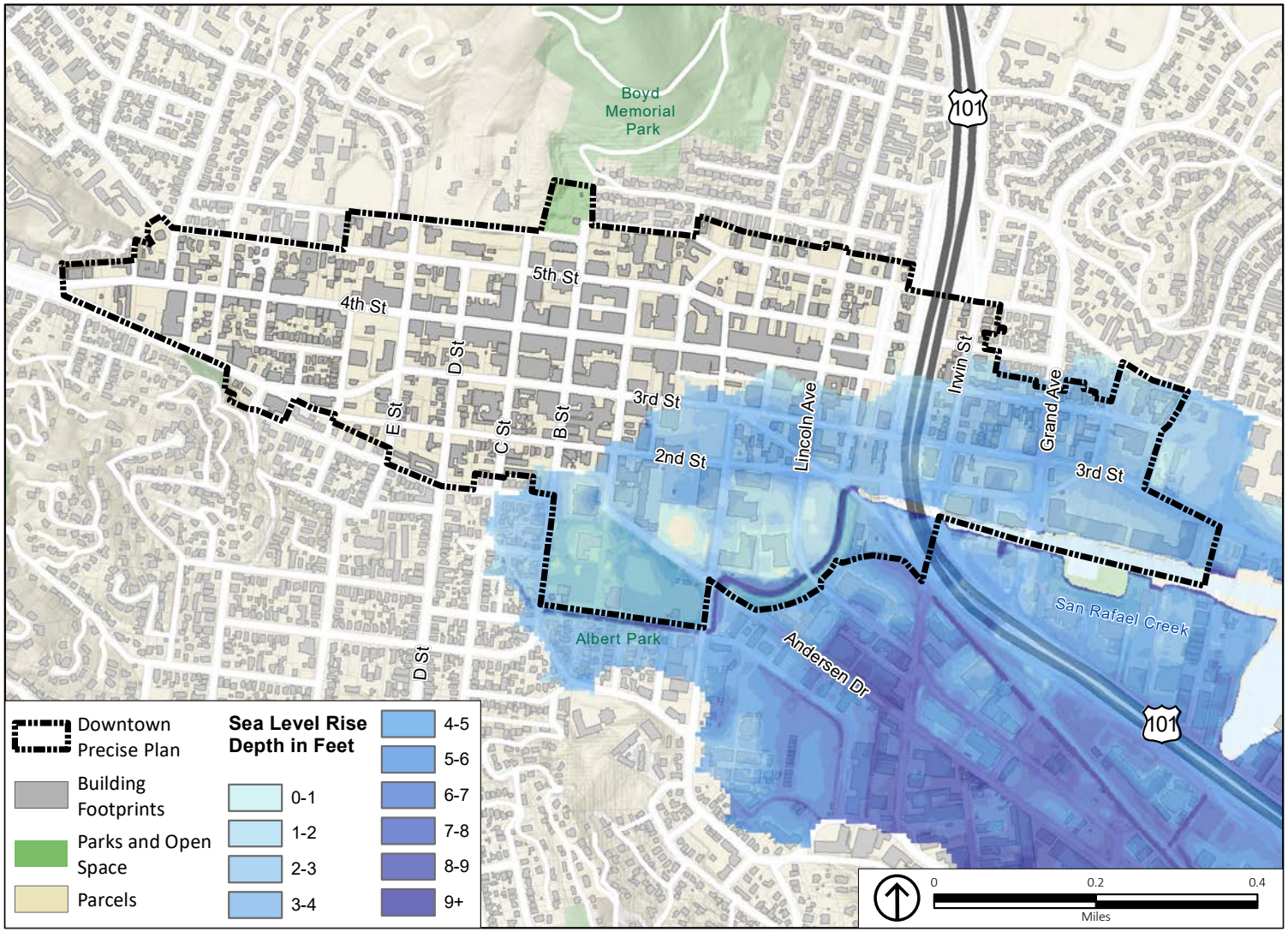

Figure 8.7 Downtown Area 2100 Sea Level Rise

Source: ESRI, 2019; FEMA, 2015; City of San Rafael, 2019: Placeworks, 2019

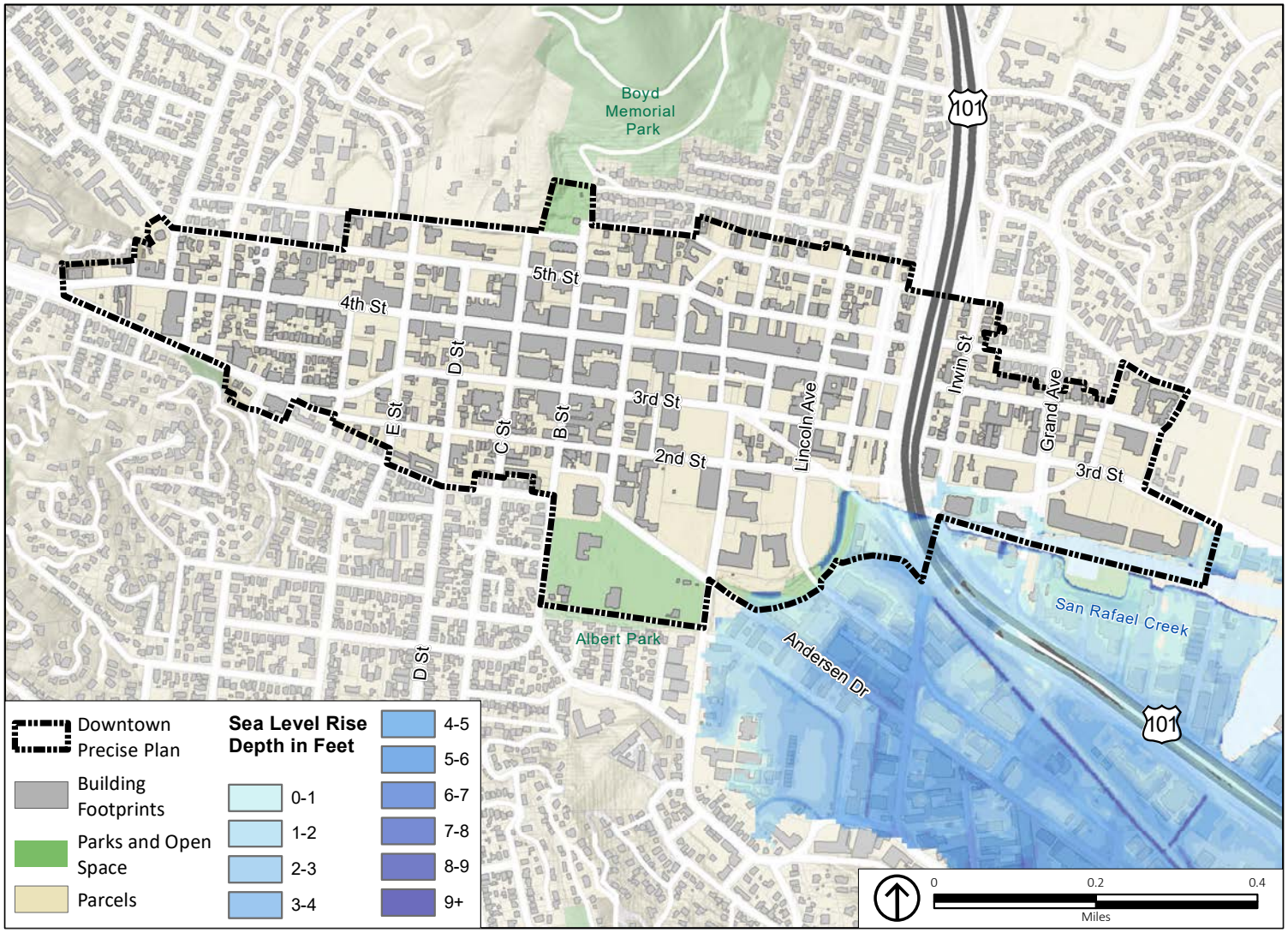

Figure 8.8 Downtown Area 2050 Sea Level Rise + 100-Year Storm

Source: ESRI, 2017; FEMA, 2016; City of San Rafael, 2019: Placeworks, 2019

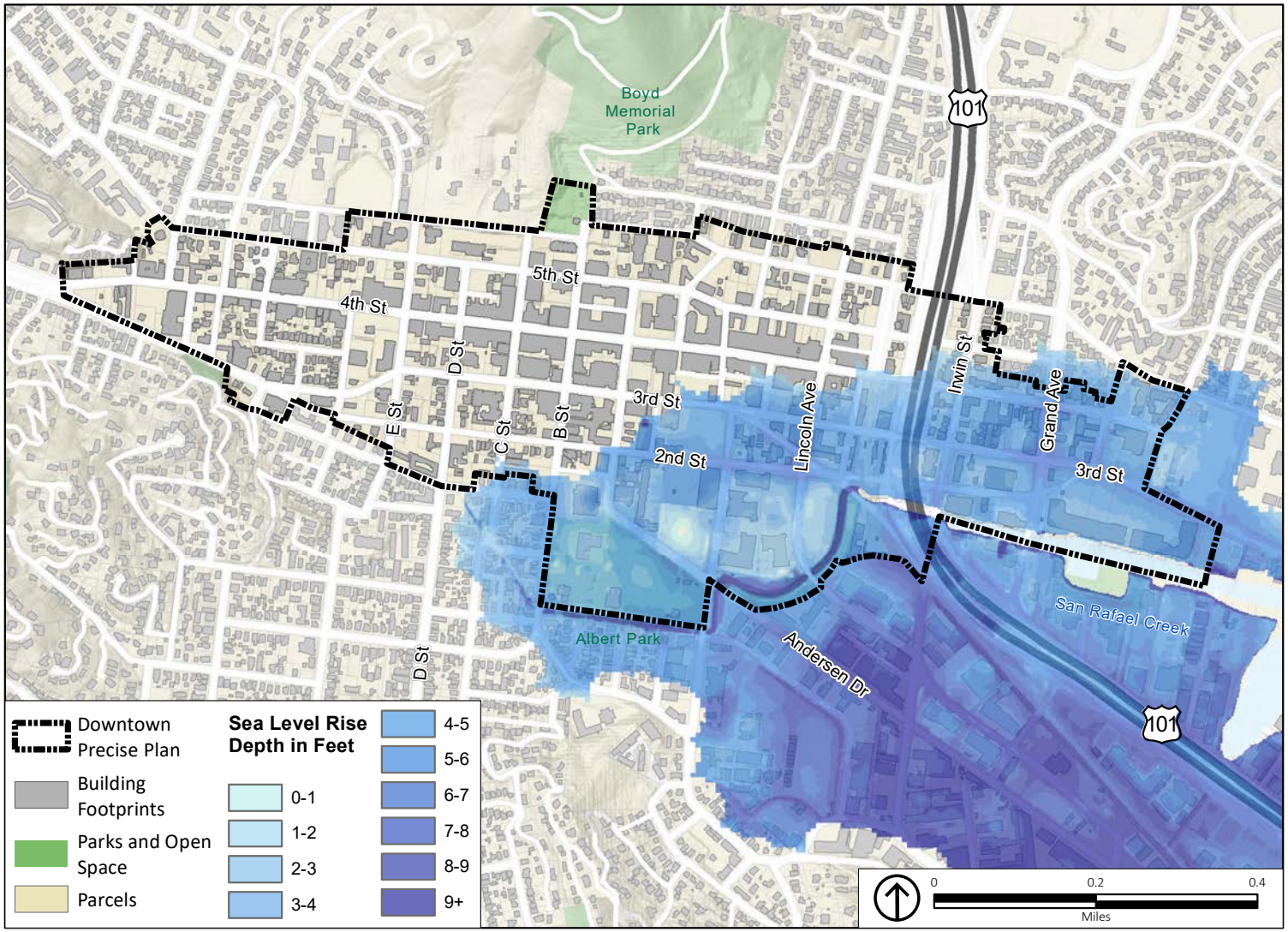

Figure 8.9 Downtown Area 2100 Sea Level Rise + 100-Year Storm

Source: ESRI, 2019; FEMA, 2015; City of San Rafael, 2019: Placeworks, 2019

inches, and decrease runoff from an historical 7.1 inches to a projects 5.7 inches.[38]

Seiche, Tsunami and Mudflow

Tsunami

A tsunami is a series of traveling ocean waves generated by a rare, catastrophic event, including earthquakes, submarine landslides, and volcanic eruptions. Tsunamis can travel over the ocean surface at speeds of 400 to 500 miles per hour (mph) or more, and wave heights at the shore can range from inches to an excess of 50 feet. Factors influencing the size and speed of a tsunami include the source and magnitude of the triggering event, as well as off-shore and on-shore topography. A bay front levee system currently protects portions of the city from high tides and waves, however, this could be overtopped by a tsunami.[39]

According to the Cal OES tsunami inundation map for emergency planning, both the northern and southern shorelines of San Rafael are within the tsunami inundation zone. The land surrounding the outlets of the Gallinas Creek and San Rafael Creek, in addition to McInnis Park, the and the coastal areas of the Canal, Loch Lomond, Glenwood, and Peacock Gap neighborhoods are within the tsunami inundation zone.[40] As shown in Figure 8.10, the southwestern corners of the Downtown Precise Plan area is also within this zone. Neighborhoods further inland and upslope are outside of the tsunami inundation zone. In addition, Marin County and San Rafael are part of the tsunami warning system that would be implemented to evacuate and protect citizens in the unlikely event that a tsunami occurs.[41]

Seiche

A seiche is an oscillation wave generated in a closed or partially closed body of water, which can be compared to the back-and-forth sloshing in a bathtub. Seiches can be caused by winds, changes in atmospheric pressure, underwater earthquakes, tsunamis, or landslides into the water body. Bodies of water such as bays, harbors, reservoirs, ponds, and swimming ponds can experience seiche waves up to several feet in height during a strong earthquake.

San Rafael is located next to the San Pablo Bay and San Francisco Bay and portions of the city are within the tsunami inundation zone. A seiche could theoretically occur in the Bay as the result of an earthquake or other disturbance, but the flooding impact would be no greater than that of a tsunami inundation zone.

There are no large bodies of water within the city that could trigger a seiche.

Mudflow

Mud and debris flows are mass movements of dirt and debris that occur after intense rainfall, earthquakes, and severe wildfires. The speed of a slide depends on the amount of precipitation, steepness of the slope, and the presence of active or frequent forces such as rain, groundwater, and earthquakes. According to the San Rafael LHMP, flows are common within the city and can occur suddenly when soils become saturated and break away from the hillsides. Mudflows are most likely to occur when four or more inches of rain falls within a 10-hour period.[42]

The City of San Rafael includes moderate to steeply sloped areas that are within rainfall-induced landslide and debris flow source areas.[43] The Downtown Precise Plan Area is within close proximity to rainfall-induced landslide zones to the north and west, as shown in Figure 8.11.

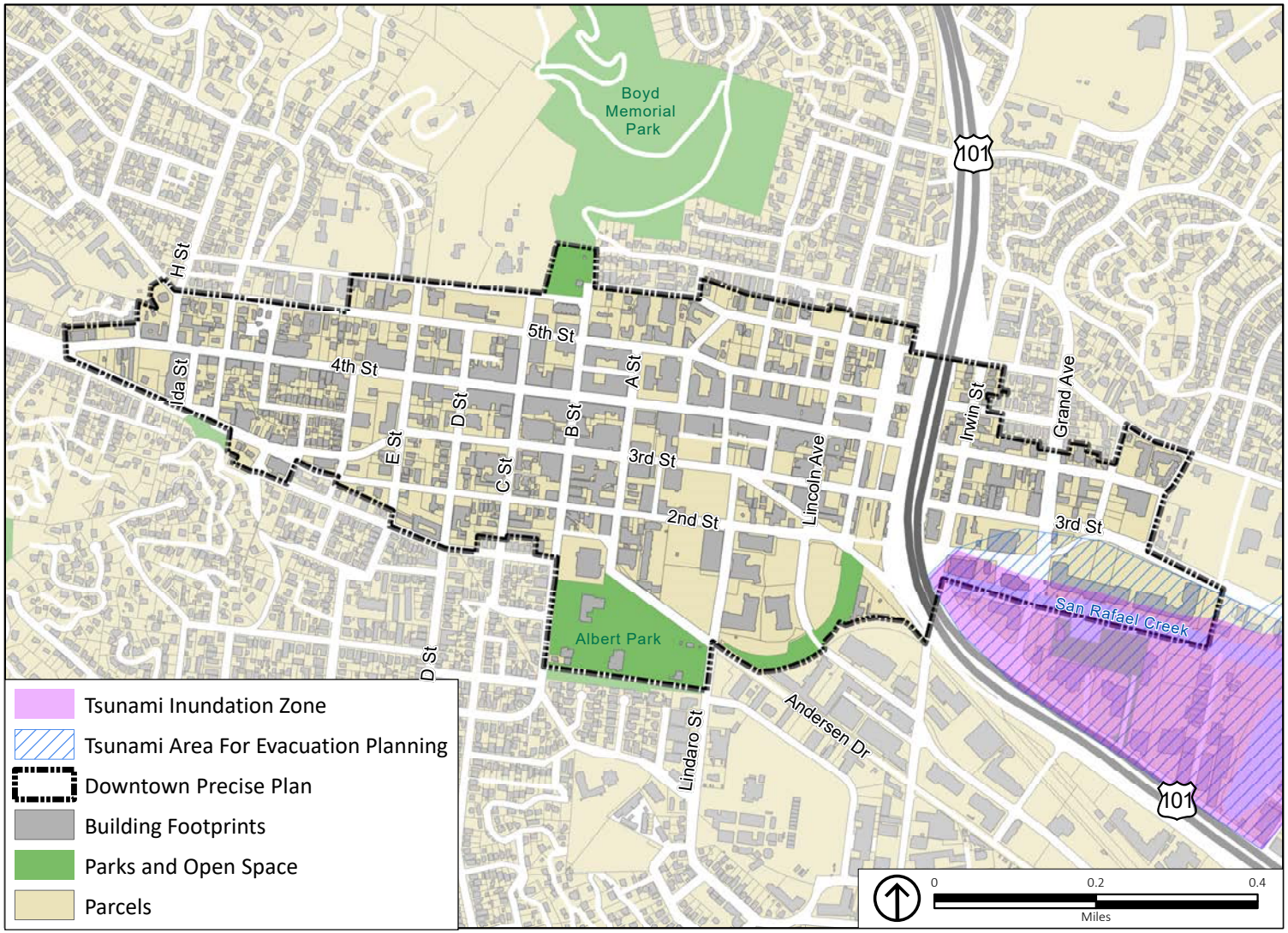

Figure 8.10 Downtown Area Tsunami Inundation Zones

Source: ESRI, 2017; ABAG, 2019; City of San Rafael, 2019: Placeworks, 2019

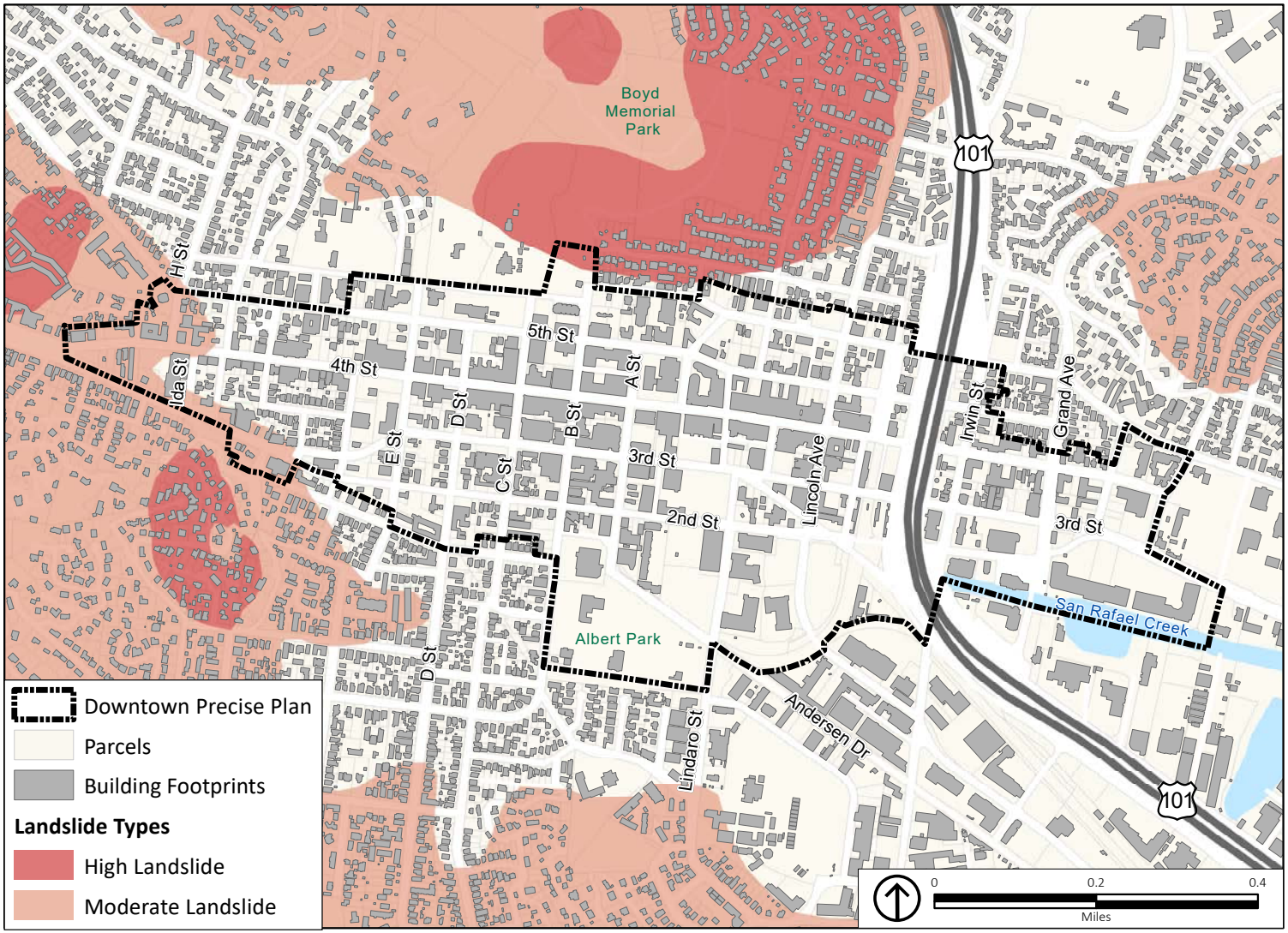

Figure 8.11 Downtown Area Rainfall-Induced Landslides

Source: ESRI, 2019; USGS, 1997; ABAG, 2019; City of San Rafael, 2019: Placeworks, 2019

Geology + Soils

Geology

The City of San Rafael is located within the United States Geological Survey's (USGS) San Rafael, Novato, San Quentin, and Petaluma Point Quadrangle 7.5-minute topographic map areas.[44] The area is typified by northwest-southwest rending mountain ridges and intervening valleys.[45] Elevations range from sea level to approximately 1,800 feet along Big Rock Ridge.

Regional mapping completed by the California Geologic Survey (CGS) indicates that there are five geologic units in San Rafael. Figure 8.12 on the next page shows the four geologic units within the Downtown Precise Plan area. The geology within the Downtown Precise Plan area is described below:

Alluvium
The alluvium geologic units consists of sedimentary rock that has been transported and deposited by streams. Alluvium is vulnerable to seismically induced instability.[46]

Artificial Fill
The artificial fill geologic units consist of manmade fill materials where the deposition is ongoing in many locations. The artificial is located above marine and marsh deposits (bay mud), beach sand, dune sand, landslide deposits, alluvium, or other fill materials. This geologic units is susceptible to seismic shaking, liquefaction, and differential settlement.[47]

Coast Range Ophiolite
The Coast Range Ophiolite geologic unit is a serpentinite of the Franciscan Complex that is a piece of the Middle Jurassic oceanic crust. Extensive faulting has led to the upward movement of this geologic unit.[48]

Franciscan Complex
The Franciscan Complex geologic unit forms the base of the coastal ranges east of the San Andreas Fault. This units consists of sandstone and argillite and are typically fractured and disrupted, create a mix of rock types on a local scale called a mélange.[49]

Soils

The soils in the vicinity of San Rafael have been mapped by the United States Department of Agriculture (USDA) Natural Resource Conservation Services. In general, the soils beneath the Downtown Precise Plan area are dominated by well-drained, shallow to moderately deep, fine-loamy soils such as loam and clay loam in the uplands, with additional areas of poorly drained, clay and silty soils in the tidal flats and salt marshes.[50] The urban land Xerorthents soils consist of tidal flats, valley floors, and salt marshes. According to the USDA, the most prevalent soil types are the, Xerorthents, as shown in Figure 8.13 on the next page.[51]

The properties of these soils are variable, ranging from well-drained soils consisting of fine-loamy soils the Tocaloma-McMillin series and Saurin-Bonnydoon series, to completely urbanized or 100 percent water in the Xerorthents-urban complex and water, respectively. According to published soil data, several soil types, notably the Tocaloma-McMillin, are characterized by steep slopes and erosion hazards, where landslides and flows are possible.[52]

In the Downtown Precise Plan area, the majority of soils are characterized as Urban land-Xerorthents with the hillsides in the northern and western portion characterized as Tacoloma-McMullin.[53]

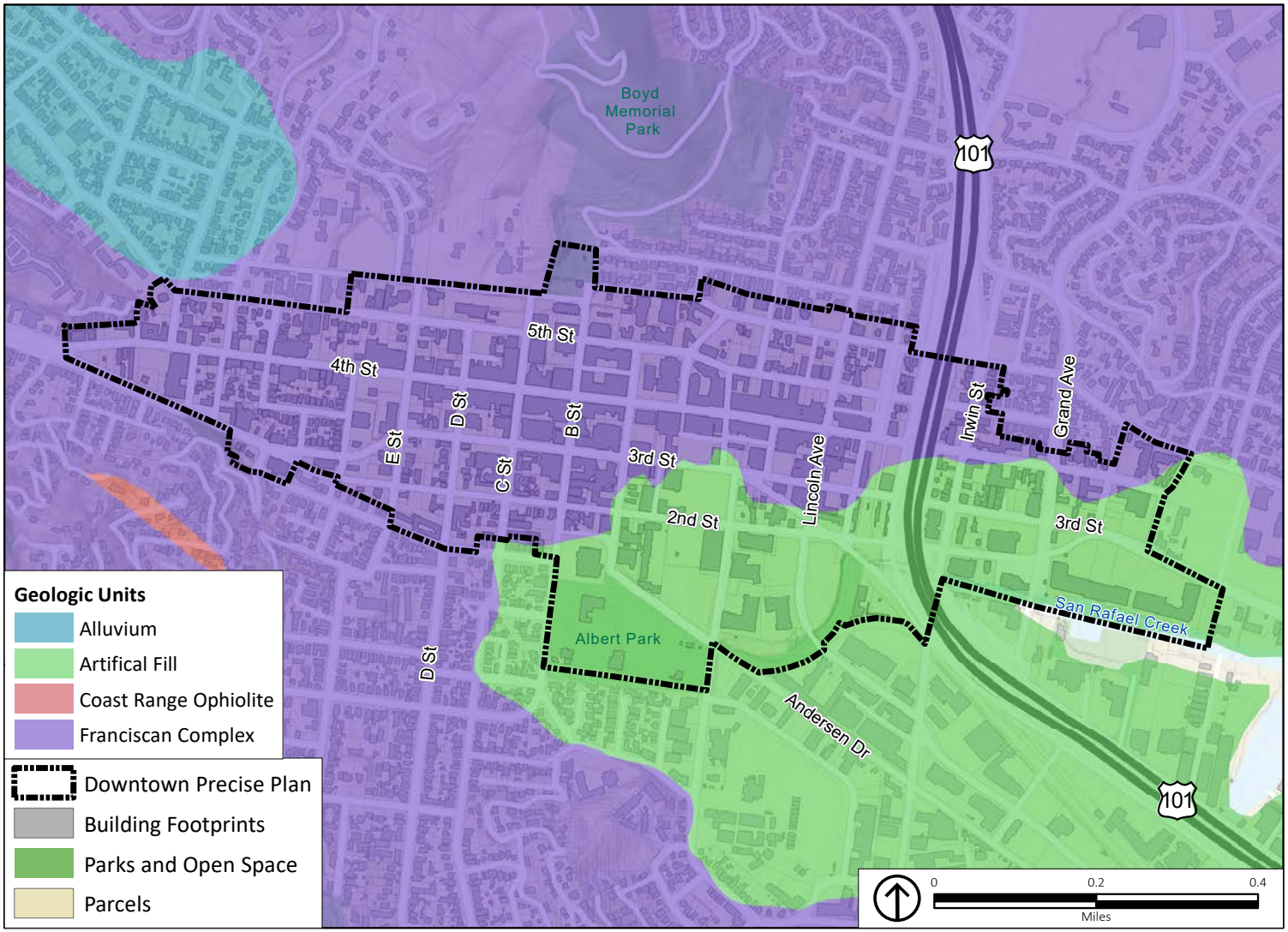

Figure 8.12 Geologic Units Downtown

Source: ESRI, 2017; Marin County, 2019; City of San Rafael, 2019: Placeworks, 2019

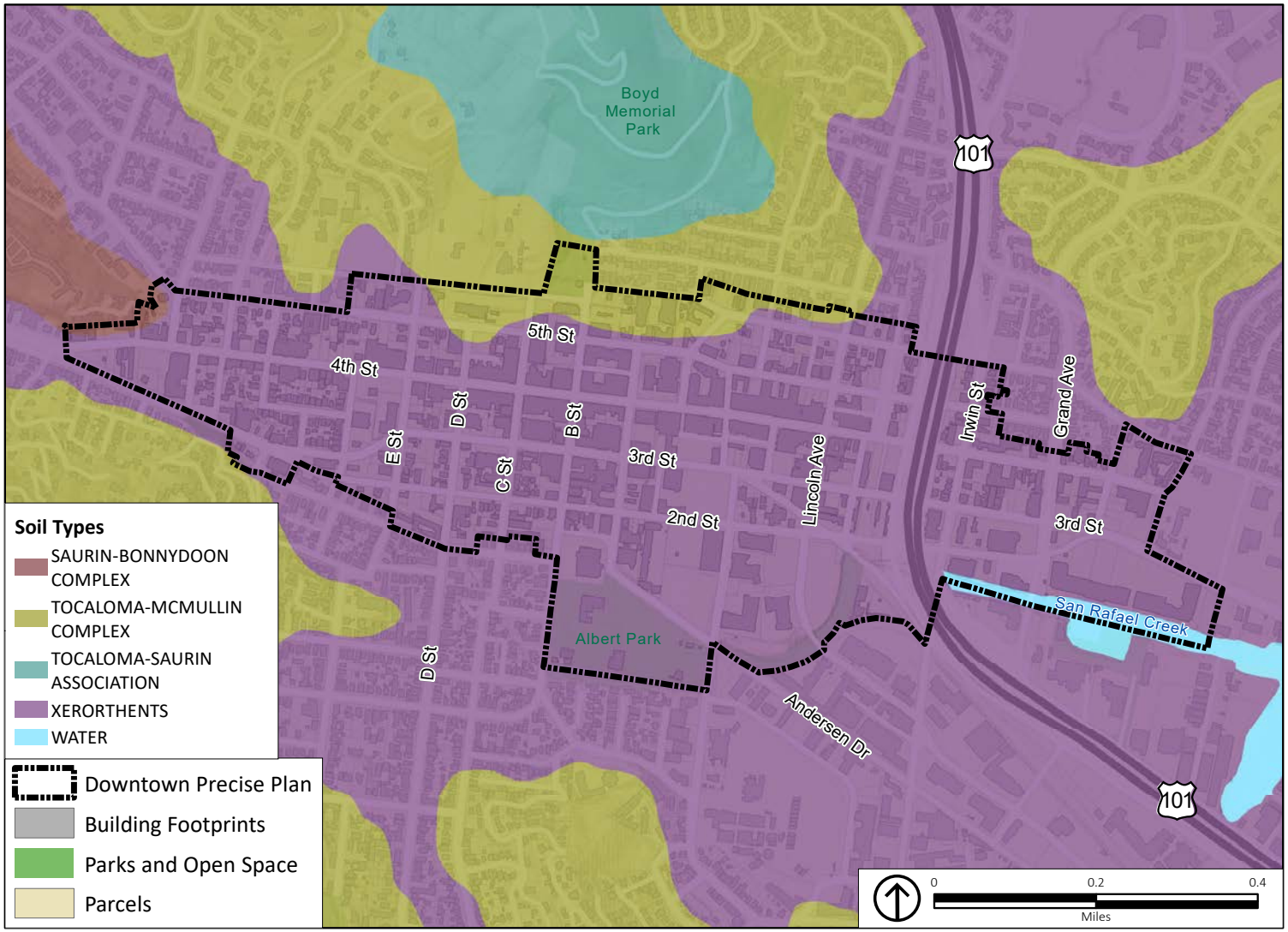

Figure 8.13 Downtown Soils Map

Source: ESRI, 2017; Marin County, 2019; City of San Rafael, 2019: Placeworks, 2019

Regional Seismicity

The Earth's crust includes tectonic plates that locally collide with or slide past one another along plate boundaries. California is particularly susceptible to such plate movements, notably the largely horizontal or "strike-slip" movement of the Pacific Plate, as it impinges on the North American Plate. In general, earthquakes occur when the accumulated stress along a plate boundary or fault is suddenly released, resulting in seismic slippage. This slippage can vary widely in magnitude, ranging in scale from a few millimeters or centimeters, to tens of feet.

Faults

San Rafael, like much of the San Francisco Bay area, is vulnerable to seismic activity due to the presence of active faults in the region. The most prominent active fault near the study area is San Andreas Fault System, which is located approximately 10 miles to the west of the Downtown Precise Plan area. Other active faults in the region include the Hayward Fault which lies approximately 9 miles to the east, the San Gregorio Fault which lies 16 miles to the southwest, and Rodgers Creek Fault which lies 15 miles to the northeast of San Rafael, as shown in Figure 8.14. There are no known active faults within the Downtown Precise Plan Area.

Ground Shaking

The severity of ground shaking depends on several variables such as earthquake magnitude, hypocenter proximity, local geology including the properties of unconsolidated sediments, groundwater conditions, and topographic setting. In general, ground shaking hazards are most pronounced in areas that are underlain by loosely consolidated soil/sediment.[54]

When earthquake faults within the Bay Area's nine-county area were considered, the US Geological Survey (USGS) estimated that the probability of a magnitude (M) 6.7 or greater earthquake prior to year 2032 is 62 percent, or roughly a two-thirds probability over this timeframe. Individually, the forecasted probability for each individual fault to produce an M 6.7 or greater seismic event by the year 2032 is as follows: 27 percent for the Hayward Fault, 21 percent for the San Andreas Fault, 11 percent for the Calaveras Fault, and ten percent for the San Gregorio Fault.[55]

Earthquakes of this magnitude can create ground accelerations severe enough to cause major damage to structures and foundations not designed to resist the forces generated by earthquakes. Underground utility lines are also susceptible where they lack sufficient flexibility to accommodate the seismic ground motion.[56] In the event of a M 7.8 earthquake on the San Andreas Fault, the seismic forecasts presented on the Association of Bay Area Governments' interactive GIS website (developed by a cooperative working group that included the USGS and the CGS) suggest that most parts of San Rafael are expected to experience "strong" shaking, whereas the central areas and easternmost portions of the study area are expected to experience "very strong" shaking, as shown in Figure 8.15.[57]

The April 1906 earthquake on the San Andreas Fault, estimated between M 7.7 and 8.3, was the largest seismic event in recent history that affected the Downtown Precise Plan Area. More recently, the M 6.9 Loma Prieta earthquake of October 1989 on the San Andreas Fault caused significant damage throughout the Bay Area, although no deaths were reported in Marin County.

Liquefaction

Liquefaction typically occurs in areas where moist, fine-grained, cohesionless sediment or fill materials are subjected to strong, seismically induced ground shaking. Under certain circumstances, the ground shaking can temporarily transform

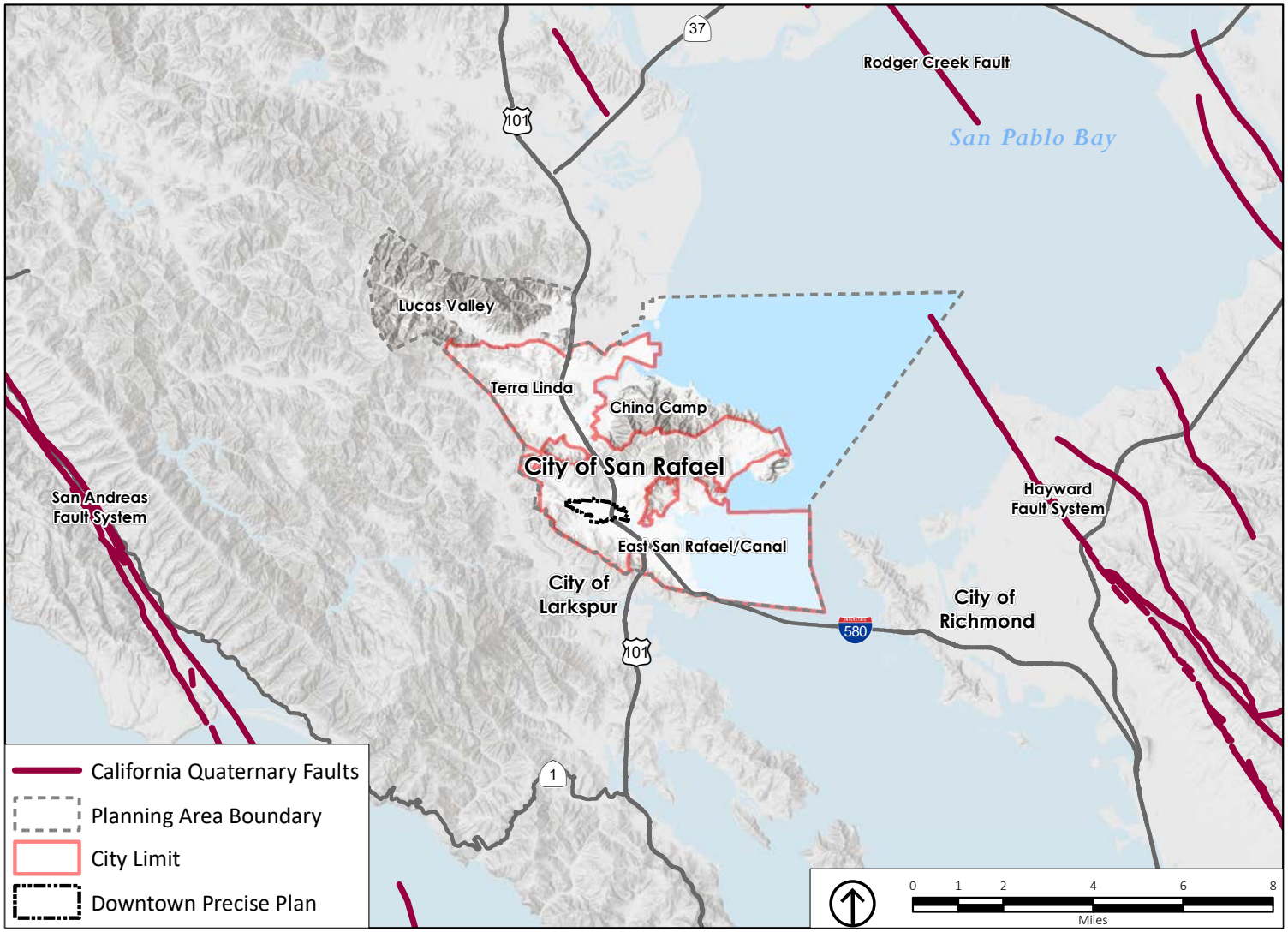

Figure 8.14 Fault Map

Source: ESRI, 2017; California Geologic Survey, 2014; City of San Rafael, 2019: Placeworks, 2019

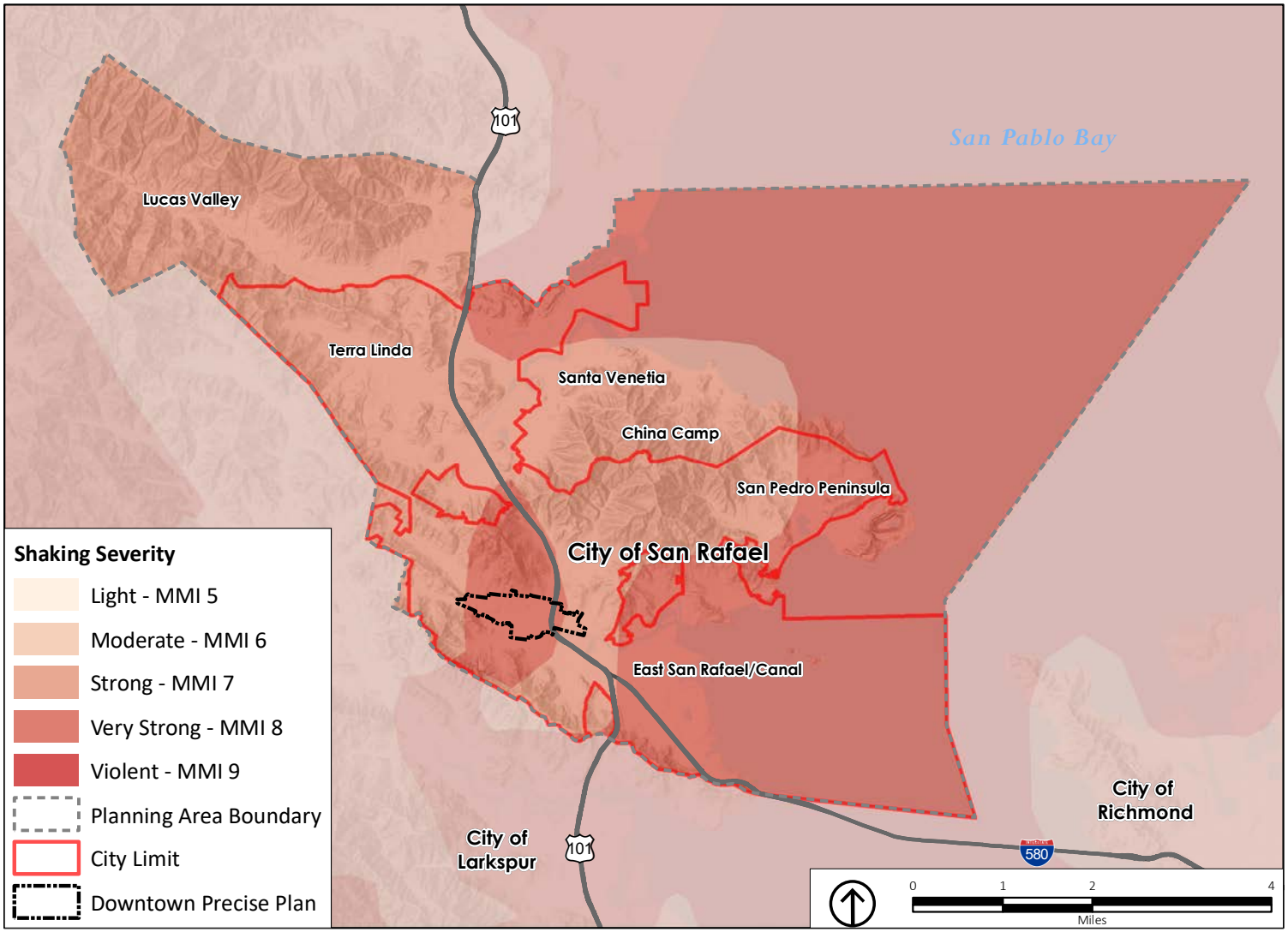

Figure 8.15 Ground Shake Potential (San Andreas M7.8) Map

Source: ESRI, 2017; ABAG, 2019; City of San Rafael, 2019: Placeworks, 2019

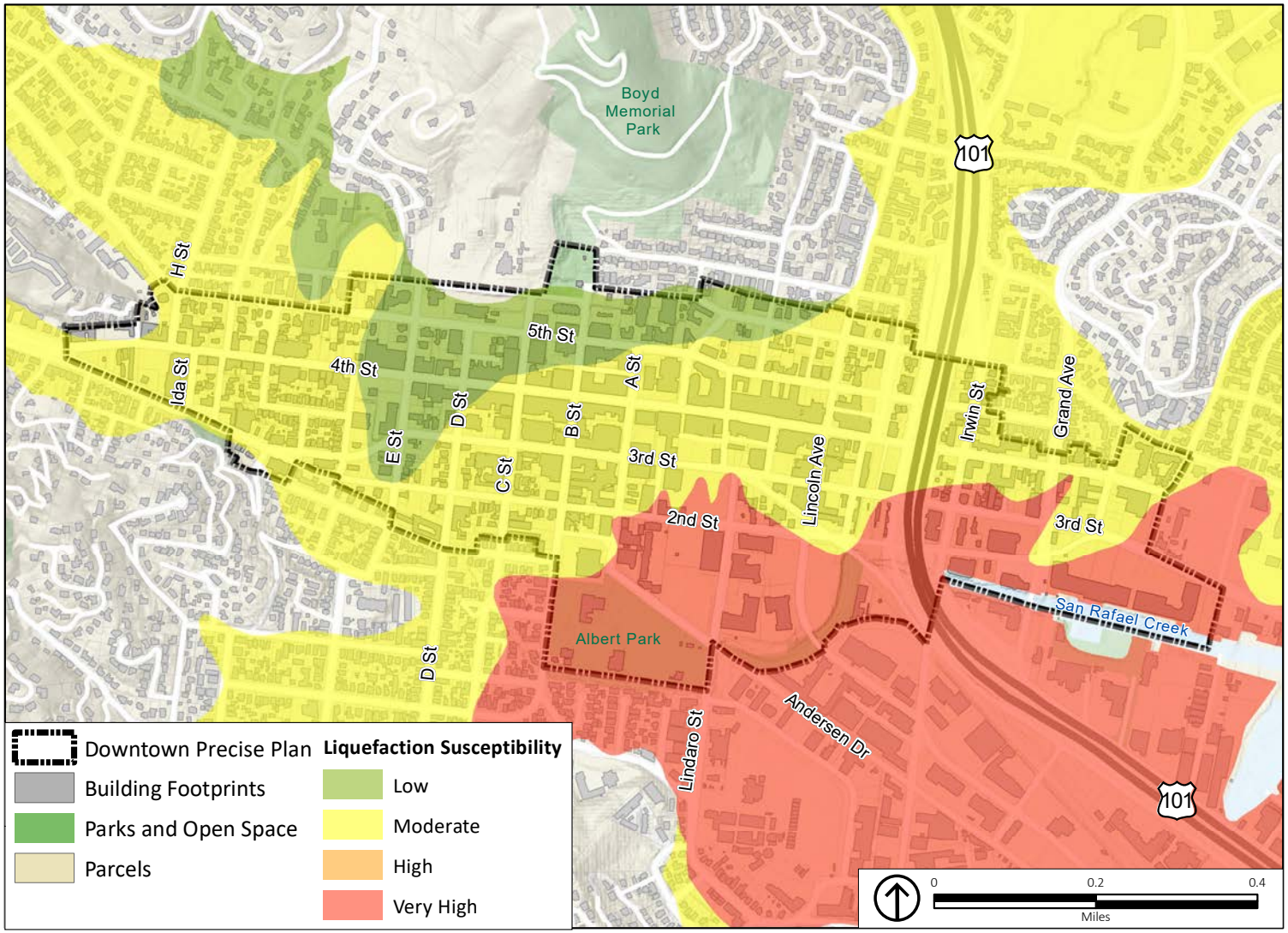

Figure 8.16 Downtown Area Liquefaction Susceptibility Zones

Source: ESRI, 2017; ABAG, 2019; City of San Rafael, 2019: Placeworks, 2019

an otherwise solid material to a fluid state. Liquefaction is a serious hazard because buildings in areas that experience liquefaction may subside and suffer major structural damage. Liquefaction is most often triggered by seismic shaking, but it can also be caused by improper grading, landslides, or other factors. In dry soils, seismic shaking may cause soil to consolidate rather than flow, a process known as densification.

Liquefaction in San Rafael ranges from very low in the hillsides to very high in the marshland and tidal marshes on the eastern side of the city, as shown in Figure 8.16 on the previous page. The southern portion of the Downtown Precise Plan area is within a very high liquefaction area, which transitions to a moderate and low liquefaction zones as the terrain become steeper in the northern areas of downtown.

The western portions of the city along the San Pablo Bay and San Francisco Bay are predominantly Bay Mud soil types, which consist of soft, unconsolidated, water saturated silty clay with peaty material, plant material, and mollusk shells.[58] These low-lying areas that front the bay are particularly susceptible to liquefaction. According to the hazard maps published by USGS, areas surrounding Miller Creek and the outlets to Gallinas Creek and San Rafael Creek have been designated as liquefaction hazard zones.[59] In the Downtown Precise Plan area, the soils have a low, moderate, and very high susceptibility to liquefaction.

Landslides, Erosion, Subsidence

Landslides are gravity-driven movements of earth materials that can include rock, soil, unconsolidated sediment, or combinations of such materials. The rate of landslide movement can vary considerably; some move rapidly, as in a soil or rock avalanche, while other landslides creep or move slowly for long periods of time. The susceptibility of a given area to landslides depends on many variables, although the general characteristics that influence landslide hazards are widely acknowledged. Some of the more important contributing factors are:

Slope Material
Loose, unconsolidated soils and soft, weak rocks are more hazardous than are firm, consolidated soils or hard bedrock.

Slope Steepness
Most landslides occur on moderate to steep slopes.

Structure and Physical Properties of Materials
This includes the orientation of layering and zones of weakness relative to slope direction.

Water Content
Increased water content increases landslide hazard by decreasing friction and adding weight to the materials on a slope.

Vegetation Coverage
Abundant vegetation with deep roots promote slope stability.

Proximity to Areas of Erosion or Man-made Cuts
Undercutting slopes can greatly increase landslide potential.

Earthquake Ground Motions
Strong seismic ground motions can trigger landslides in marginally stable slopes or loosen slope materials, and also increase the risk of future landslides.

Landslides have the potential to occur in San Rafael, most notably on the steeper slopes that lie on the western edge of San Rafael, in addition to hilly areas surrounding Boyd Memorial State Park and Harry Barbier Memorial Park as shown in Figure 8.17. In these areas, landslides are commonly associated with slopes underlain with Franciscan Melange and pre-existing landslide deposits, which indicates unstable underlying materials.[60] Historically, five landslide events have been

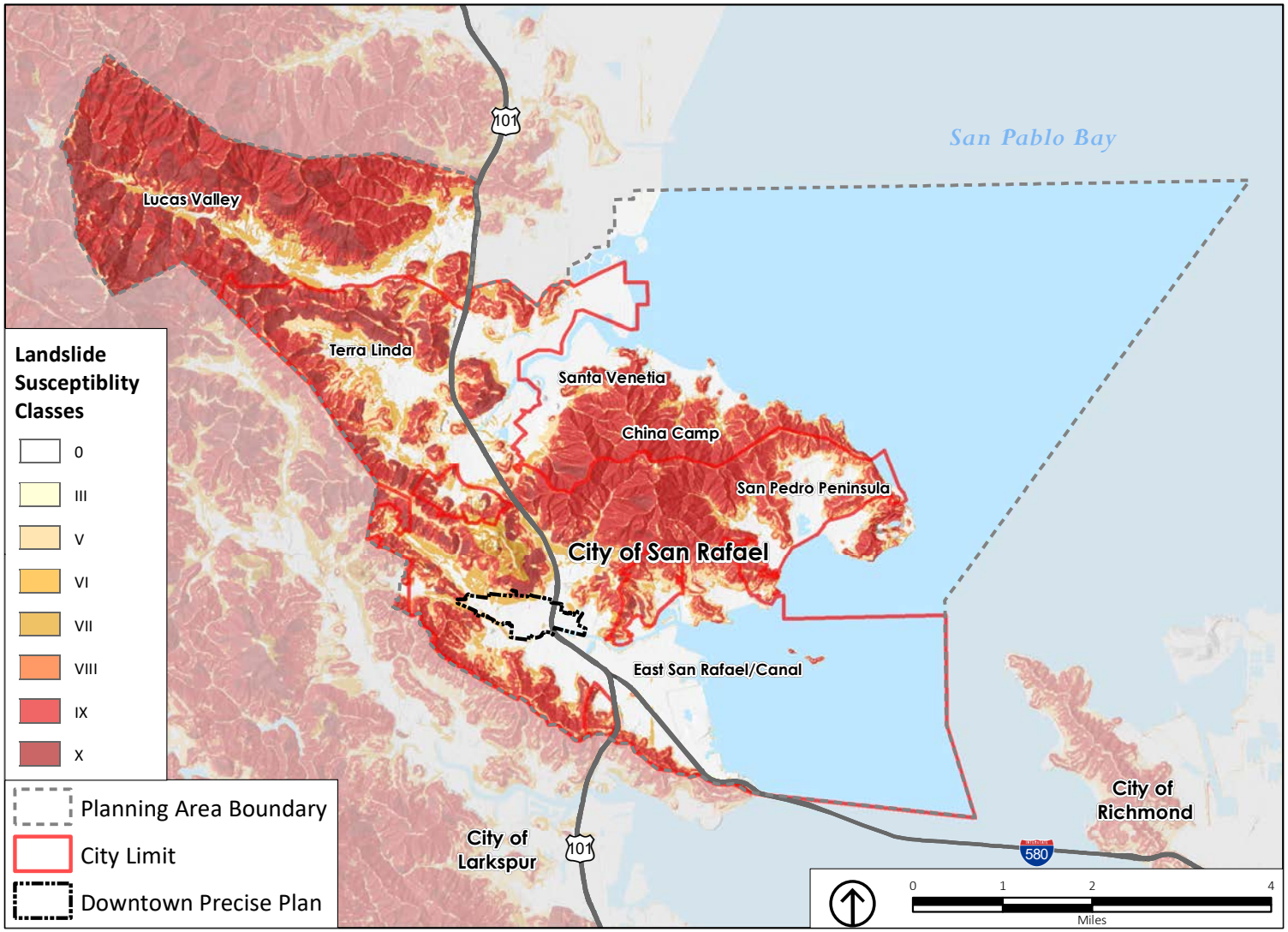

Figure 8.17 Deep-Seated Landslide Susceptibility Map

Source: ESRI, 2017; California Geologic Survey, 2008; City of San Rafael, 2019: Placeworks, 2019

recorded in San Rafael, including landslides in 1925, 1982, April 2006, January 2017, and February 2017.[61]

Shale is the most unstable of the many rock types within the Franciscan Formation, whereas sandstone and conglomerate units tend to be more stable with a lower landslide risk. Much of the upland areas in the city are typified by steep slopes and soils that overly Franciscan bedrock. Landslides are not an issue in parts of the city where the topography is flat. Due to the differences in the physical characteristics of slope materials, which markedly influence landslide potential, some superficially similar areas may differ widely in terms of landslide hazards.

Land Subsidence

Subsidence hazards are known to be present in San Rafael. In areas containing Bay Mud and fill materials that occupy the eastern edge of the city, historical subsidence has been attributed to the highly compressible nature of the underlying fill and sediments. This has resulted in development constructed in east San Rafael to subside below the 100-year flood elevation.[62] With sea level rise, subsidence rates could increase within the city.[63]

Expansive Soils

Expansive soils can change dramatically in volume depending on moisture content. When wet, these soils can expand; conversely, when dry, they can contract or shrink. Sources of moisture that can trigger this shrink-swell phenomenon can include seasonal rainfall, landscape irrigation, utility leakage, and/or perched groundwater. Expansive soil can exhibit wide cracks in the dry season, and changes in soil volume have the potential to damage concrete slabs, foundations, and pavement. Special building/structure design or soil treatment are often needed in areas with expansive soils.

Expansive soils are typically very fine-grained with a high to very high percentage of clay, typically montmorillonite, smectite, or bentonite clay. Linear extensibility soil tests are often used to identify expansive soils, wherein soil sample volume/length changes in response to reduced moisture content.[64] A linear extensibility of 3 percent or greater connotes moderate to high shrink-swell potential. This soil behavior has the potential to cause damage to buildings, roads, and other structures.

Expansive soils are not common in the Downtown Precise Plan area; however, they can exist in localized areas such as the Bay Mud geologic units that underly eastern San Rafael.[65] The USDA Web Soil Survey (a nationwide data repository) for San Rafael demonstrates low ratings of linear extensibility and plasticity for the majority of the soils in the city, with moderate or high ratings dispersed throughout the northern and eastern areas of the city.[66] Expansive soils are typically identified during project review stages prior to construction, and require specific engineering methods to reduce stresses to buildings and infrastructure.

Hazardous Materials

Hazardous Materials Sites

The required lists of hazardous material release sites are commonly referred to as the "Cortese List" named after the legislator who authored the legislation. Because the statute was enacted more than 20 years ago, some of the provisions refer to agency activities that were conducted many years ago and are no longer being implemented and, in some cases the information required in the Cortese List does not exist. Those requesting a copy of the Cortese Lists are now referred directly to the appropriate information resources contained on internet websites hosted by the boards or departments referenced in the statute, including DTSCs online EnviroStor database and the SWRCB's online GeoTracker database. These two databases include hazardous material release sites, along with other categories of sites or facilities specific to each agency's jurisdiction.

A search of the online databases on May 20, 2019 identified 180 sites within the City boundaries, including 42 sites within the Downtown Precise Plan area. The majority of the identified sites are closed cases meaning they are no longer pose a hazard. Accordingly, Table 8.2 and Figure 8.18 show the eight identified sites that were not listed as being closed.

TABLE 8.2 RELEVANT HAZARDOUS MATERIAL SITES IN DOWNTOWN SAN RAFAEL

Map ID	Site Name	Address	Site Type	Potential Contaminants	Cleanup Status
Envirostor Cleanup Program Sites					
A.	Former Maxim Gas Plant Office	Fourth Street between A and B Streets	State response	No contamination found	No further action
B.	Marin-Sonoma Mosquito Abatement District	201 Third Street	Voluntary cleanup	Benzene, DDT, Diesel, Xylenes	Certified / Operation and Maintenance
C.	PG&E, San Rafael MGP	Second Street And Lindaro Street	Voluntary cleanup	Contaminated soil, Lead, PAHS, VOCs	Active
Geotracker Sites					
D.	Former Grand Auto Store #9	850 Fourth Street	Cleanup Program site	None specified	Open - Inactive
E.	Marin Cleaners	520 Fourth Street	Cleanup Program site	Other chlorinated hydrocarbons, PCE, TCE	Open - Remediation
F.	Marin/Sonoma Mosquito (former)	201 Third Street	Cleanup Program site	Diesel	Open - Verification Monitoring
G.	PG&E - MGP - San Rafael	Third Street and Brooks Avenue	Cleanup Program site	Petroleum, Fuels, Soils, Polynuclear aromatic hydrocarbons	Open - Remediation - Land Use Restriction
H.	Shell	834 Irwin Street	LUST Cleanup site	Diesel, Gasoline, Waste oil	Open - Verification Monitoring

Source: DTSC EnviroStar 2019 and SWRCB GeoTracker 2019

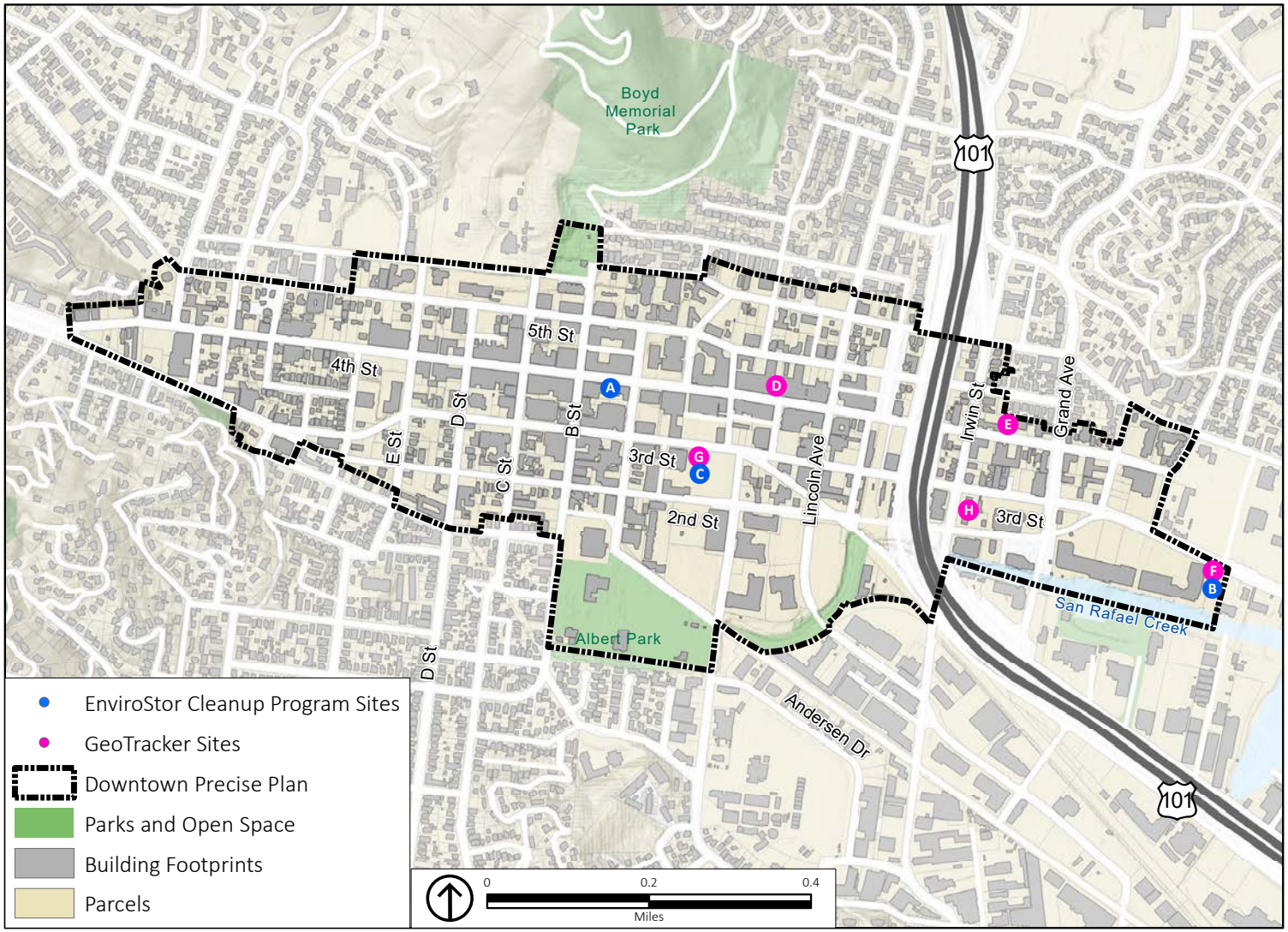

Figure 8.18 Downtown Active Hazardous Materials Sites

Source: ESRI, 2017; FEMA, 2016; City of San Rafael, 2019: Placeworks, 2019

Existing Schools

Existing Schools

Four schools are located within the Downtown Precise Plan Area:

- Marin Day School, 1123 Court Street, San Rafael
- Marin Academy, 1600 Mission Avenue, San Rafael
- Early Head Start, 1510 Fifth Avenue, San Rafael
- Parkside Children's Center, 51 Albert Park Lane, San Rafael

12 schools are within 0.25 miles of the Downtown Precise Plan area (within San Rafael):

- Short Elementary School, 35 Marin Street (to the south)
- Coleman Elementary School, 800 Belle Avenuel (to the north)
- Madrone High School, 185 Mission Avenue (to the east)
- James B. Davidson Middle School, 280 Woodland Avenue (to the southeast)
- San Rafael High School, 150 Third Street (to the east)
- Laurel Dell Elementary, 225 Woodland Avenue (to the south)
- Little Bears Day Care, 1845 2nd Street (to the east)
- Lily's Playground, 35 Bayview Street (to the south)
- Trinity Preschool and Kindergarten, 333 Woodland Avenue (to the south).
- Lucca Bambucca Child Day Care, 343 D Street (to the south)
- Canal Child Care Center, 215 Mission Avenue (to the north)
- Edna's Daycare, 408 Belle Avenue (to the north)

Airport Hazards + Noise

Airport Hazards

The Downtown Precise Plan area is not located within an airport land use plan area. There is one private airstrip (San Rafael Airport) located in the northeastern portion of the city. The nearest public airport is the Marin County Airport, located approximately 8 miles to the north of the Downtown Precise Plan area.[67] The nearest heliport is the San Rafael Private Heliport located on Kerner Boulevard located approximately 2.6 miles to the southeast of the Downtown Precise Plan Area.

Noise

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, and local governments have established standards and ordinances to control noise. At the State level, the California Building Code (CBC), Title 24, Part 2, Volume 1, Chapter 12, Interior Environment, Section 1207.11.2, Allowable Interior Noise Levels, requires that interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room.

The noise metric is evaluated as either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan. The California Green Building Standards Code (CALGreen), Chapter 5, Division, 5.5 has additional requirements for insulation that affect exterior-interior noise transmission for non-residential structures. In addition, at the local level, the City of San Rafael aims to limit the exposure of the community to excessive noise levels and has adopted its own land use compatibility standards.

Primary noise sources in the Downtown Precise Plan area include US Highway 101, the SMART rail, and traffic on local roadways. In commercial and retail areas, such as the Montecito Commercial District, truck loading docks can be a source of localized noise. Existing and future noise sources will be discussed in more detail, including traffic and rail noise modeling, as part of the final Downtown Precise Plan and EIR.

Natural Hazards: Key Findings

The key findings related to natural hazards are:

Wildfire

The Downtown Precise Plan area is within the wildfire Local Responsibility Area and contains land within the Moderate and High Fire Hazard Severity Zones in the northern portion of downtown. The northern and eastern borders of this area are also within the Wildland-Urban Interface, which is any area where structures and other human development meet or intermingle within wildland vegetation.

Flood Hazard

The southeastern portion of the Downtown Precise Plan area is within the FEMA 100-Year Flood Hazard Zone. The floodplain starts at the San Rafael Canal and covers an area that extends from E Street to the eastern Downtown Precise Plan boundary, and Fourth Street to the southern Downtown Precise Plan boundary. A small portion of the easternmost border of the Downtown Precise Plan area lies within a Tsunami Inundation Zone and there are no levees within this area.

Flood Hazard

The Downtown Precise Plan area will experience little inundation from sea level rise in 2050. Coastal storms in 2050 will cause flooding in a small southeastern portion of the Downtown Precise Plan area. In 2100, the southeastern portion of the Downtown Precise Plan Area will be inundated with water spanning from C Street to the eastern downtown boundary, and Fifth Avenue to the southern downtown boundary. Coastal storms in 2100 will cause flooding and deeper ponding of water in this same area of the Downtown Precise Plan Area.

Geology

Geology within the Downtown Precise Plan Area consist of alluvium, artificial fill, coast range ophiolite, and Franciscan complex. The San Andreas Fault System is the nearest fault line, which can cause “strong” ground shaking in the downtown in the event of a Magnitude 6.7 or greater seismic event. The southeastern portion of the Downtown Precise Plan area lies within a very high liquefaction zone, and the remaining area is within a moderate to low liquefaction zone. The northern and western portions of the Downtown Precise Plan area are located within a moderate landslide susceptibility zone.

Hazardous Materials

There are eight hazardous materials sites within the Downtown Precise Plan area with a non-closed status. These sites are located east of B Street between Fifth Avenue and Second Street/the San Rafael Creek. Two sites are listed on both EnviroStor and GeoTracker, including the PG&E, San Rafael MGP site and the Marin-Sonoma Mosquito Abatement District.

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