

3.17 Regional Growth

3.17.1 Introduction

This section describes the effects on regional growth from the implementation of the San Francisco to San Jose Project Section (Project Section, or project) and whether the changes as a result of construction and operations of the project would be substantial. Regional growth describes the potential for planned and unplanned growth in the region, as well as the potential for growth-inducing effects of the project alternatives. It is measured in terms of increases in population, employment, and the related development of land providing housing, commercial and industrial buildings and facilities, and community services supporting both residents and businesses.

The *San Francisco to San Jose Project Section Community Impact Assessment* (California High-Speed Rail Authority [Authority] 2019) provides additional technical details on regional growth, such as employment and demographic information.

The following appendices, in Volume 2, Technical Appendices, of this Draft Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) provide additional information related to regional growth:

- Appendix 2-I, Regional and Local Plans and Policies, provides a list by local government jurisdiction and regional planning agency of applicable regional and local plans and policies.
- Appendix 2-J, Policy Consistency Analysis, provides a summary by local government jurisdiction and regional planning agency of project inconsistencies and reconciliations with local plans and policies.
- Appendix 3.17-A, RIMS II Modeling Details, provides information on the Regional Input-Output Modeling System (RIMS) and the results of the model to estimate construction and operations employment.
- Appendix 6-A, San Francisco to San Jose Project Section: PEPD Record Set Capital Cost Estimate Report, presents the capital cost estimating methodology and summary of capital cost estimates.
- Appendix 6-B, High-Speed Rail Operating and Maintenance Costs for Use in EIR/EIS Project-Level Analysis, summarizes the assumptions used to estimate full system high-speed rail (HSR) operations and maintenance (O&M) costs.

Regional growth effects, including the potential growth-inducing effects of the project alternatives, are important because they are connected to a wide range of societal and environmental outcomes. The following six Draft EIR/EIS resource sections and chapters provide additional information related to regional growth.

- Section 3.3, Air Quality and Greenhouse Gases, evaluates the net effect of the project on air quality and greenhouse gas (GHG) conditions as a result of permanent operations.
- Section 3.12, Socioeconomics and Communities, evaluates changes to demographics, property, economic factors, and affected communities and neighborhoods as a result of the

Overview of Impacts on Regional Growth

- Construction of both project alternatives would generate direct, indirect, and induced employment. Alternative A would generate 4,620 construction-related job-years, Alternative B (Viaduct to I-880) would generate 6,950 job-years and Alternative B (Viaduct to Scott Boulevard) would generate 8,110 job years. Peak-year construction employment in 2024 would represent less than 1.8 percent of the region’s projected construction jobs.
 - Local businesses would benefit from project-related spending and construction workers’ spending.
 - Project operations would generate 380 direct jobs and another 530 indirect or induced jobs annually under both project alternatives.
 - The population and employment gains associated with operations and increased accessibility would represent small additions to the expected growth in the entire three-county region—less than 1 percent above the projected 2040 population and employment.
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project. The California Environmental Quality Act (CEQA) threshold related to regional growth is discussed in Section 3.12.

- Section 3.13, Station Planning, Land Use, and Development, evaluates how growth is addressed in local land use regulations and local measures that would encourage increased development density and transit-oriented development around stations.
- Section 3.18, Cumulative Impacts, evaluates cumulative impacts of the project on resource areas, including growth.
- Chapter 5, Environmental Justice, evaluates impacts of the project on minority and low-income populations, including economic factors.
- Chapter 6, Project Costs and Operations, presents cost estimates for construction, operations, and maintenance of the project.

3.17.2 Laws, Regulations, and Orders

This section presents federal and state laws and regulations, orders, and plans related to regional growth. The Authority would implement the HSR system, including the project, in compliance with all federal and state regulations. Regional and local laws, regulations, orders, and plans considered in the preparation of this analysis are provided in Volume 2, Appendix 2-1.

3.17.2.1 Federal

NEPA Requirements to Analyze Growth

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969, as amended (NEPA), require evaluation of the reasonably foreseeable environmental impacts of all proposed federal activities and programs. These regulations include a requirement to examine both direct and indirect impacts, which may occur in areas beyond the immediate influence of an action alternative and at some time in the future. Positive and negative growth (i.e., change) is a potential impact of the project alternatives.

Direct growth effects would be those caused by any project alternative, occurring at the same time and place (40 Code of Federal Regulations [C.F.R.] § 1508.08). Direct growth effects include any jobs directly associated with the project alternatives, as well as any displacement of housing or commercial or industrial businesses related to the construction and operations of the proposed HSR facilities. Indirect growth effects are considered to be reasonably foreseeable effects caused by the project alternatives, typically occurring later in time or farther in distance from the project (40 C.F.R. §§ 1502.15(b), 1508(b)). These include positive or negative growth in population numbers and/or patterns, positive or negative growth in local or regional economic vitality, and associated alterations in land use patterns that could occur with implementation of the project. Removal of existing obstacles to growth would also be considered indirect growth effects. Removal of obstacles to growth would include the extension of public services and utilities to a previously undeveloped area, where the provision of such services could cause a foreseeable increase in population and/or economic growth.

Federal Railroad Administration, Procedures for Considering Environmental Impacts (64 Federal Register 28545)

The Federal Railroad Administration (FRA) Procedures for Considering Environmental Impacts states that “the EIS should identify any significant changes likely to occur in the natural environment and in the developed environment. The EIS should also discuss the consideration given to design quality, art, and architecture in project planning and development as required by U.S. Department of Transportation Order 5610.4.”

Section 16(n)(16) of the FRA Procedures for Considering Environmental Impacts states that an EIS should consider possible impacts on the socioeconomic environment (such as the number and kind of available jobs, the potential for community disruption or cohesion, the possibility of demographic shifts, impacts on local government services and revenues, the need for and availability of relocation housing, and impacts on commerce, including existing business districts,

metropolitan areas, and the immediate area of the alternative). Section 3.12 of this Draft EIR/EIS covers in detail the federal policies relating to the socioeconomic environment. The discussion of regional growth is closely related.

3.17.2.2 State

CEQA Requirements to Analyze Growth

CEQA Guidelines Section 15126.2(d) requires an EIR to evaluate the potential growth-inducing impacts of a proposed project. An EIR must discuss the ways in which a project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. A project that removes an obstacle to growth, for example, would have an indirect growth-inducing effect, whereas a project that constructs new housing would have a direct growth-inducing effect. The CEQA Guidelines emphasize that “it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.”

Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375)

The Sustainable Communities and Climate Protection Act of 2008 requires California’s 18 metropolitan planning organizations (MPO) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) as part of their regional transportation plans (RTP). The purpose of the SCS or APS is to reduce GHG emissions from automobiles and light trucks within each region to meet emissions targets set by the California Air Resources Board (CARB). The project is located in the San Francisco Bay Area (Bay Area) MPO (Metropolitan Transportation Commission [MTC]/Association of Bay Area Governments [ABAG]). The emissions targets for the Bay Area MPO (MTC/ABAG) is a 7 percent per capita reduction by 2020 and a 15 percent per capita reduction by 2035 (MTC 2018).

Pursuant to California Government Code Section 65080(b)(2)(B), the SCS or APS will:

- i. Identify the general location of uses, residential densities, and building intensities within the region.
- ii. Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan, taking into account net migration into the region, population growth, household formation, and employment growth.
- iii. Identify areas within the region sufficient to house an 8-year projection of the regional housing need for the region pursuant to Section 65584.
- iv. Identify a transportation network to service the transportation needs of the region.
- v. Gather and consider the best practically available scientific information regarding resource areas and farmland in the region, as defined in subdivisions (a) and (b) of Section 65080.01.
- vi. Consider the state housing goals specified in Sections 65580 and 65581.
- vii. Set forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportation measures and policies, will reduce the greenhouse gas emissions from automobiles and light trucks to achieve, if feasible, the greenhouse gas emission reduction targets approved by the state board.
- viii. Allow the regional transportation plan to comply with Section 176 of the federal Clean Air Act (42 United States Code [U.S.C.] § 7506).

The RTP adopted by MTC/ABAG identifies the region’s transportation needs, including specific projects to meet those needs, and establishes the basis for distributing federal, state, and local funding to implement those projects. Senate Bill (SB) 375 is intended to require the MPOs to direct transportation funding toward investments that would reduce GHG emissions and away from investments that would not.

SB 375 grants no new land use powers to the MPOs. However, to meet the assigned emissions reduction targets, the SCS or APS is expected to call for more-compact development patterns that can be served by transit and other modes of transportation. These development patterns would be encouraged by the requirement that the SCS or APS both reduce GHG emissions (which are linked to vehicle miles traveled) and plan to accommodate regional housing needs (which are expected to continue to increase).

Pursuant to SB 375, the MPOs are expected to work with city and county authorities responsible for adopting general plans to guide community development, including adopting housing elements. The regional housing needs allocation is statutorily linked to the housing element that must be adopted by each city and county as part of its general plan. The housing element must provide opportunities for the housing need assigned to the city or county to be filled through new construction or rehabilitation of housing. The housing need includes specific allotments for very-low- and low-income housing.

Preparation of the SCS is mandated by law and the ability of each SCS to meet the emissions reduction target for the vicinity of the project must be reviewed and approved by the CARB. If implementation of the SCS would not meet the target, then the MPO must adopt an APS that would. However, the APS is not a required component of the RTP and therefore would be less likely to be implemented. MTC/ABAG prepared and adopted its SCS, known as *Plan Bay Area*, in July 2013, which was reviewed and approved by the CARB (ABAG and MTC 2013).

Subsequently, the MTC/ABAG prepared an updated SCS, known as *Final Plan Bay Area 2040*, which was adopted on July 26, 2017 (ABAG and MTC 2017).

2015 State Environmental Goals and Policies

In November 2015, the State of California published *A Strategy for California @ 50 Million, the Governor's Environmental Goals and Policy Report* (EGPR) (California Office of Planning and Research 2015). This report updates *the 1978 Urban Strategy for California* (California Office of Planning and Research 1978), the last EGPR prepared and adopted. Assembly Bill (AB) 2070 (1970) directed the Governor's Office of Planning and Research to prepare and maintain an EGPR. The goals and objectives focus on land use, population growth and distribution, conservation of natural resources, and air and water quality. The 2015 EGPR broadens the scope of the goals and objectives to the state as a whole, not just to urban areas.

Achieving sustainable growth in California with 50 million residents requires a clear plan of action and sustained effort. The 2015 EGPR outlines five important goals:

- Increase the share of renewable energy in the state's energy mix to at least 50 percent by 2030
- Reduce petroleum use by up to 50 percent by 2030
- Increase the energy efficiency of existing buildings by 50 percent by 2030
- Reduce emissions of short-lived climate pollutants
- Steward natural resources, including forests, working lands, and wetlands to ensure that they store carbon, are resilient, and enhance other environmental benefits

To achieve these long-term goals, California must implement effective growth management strategies that would require integrated actions that promote multiple benefits. The state planning priorities identify infill development in previously developed areas as the top priority for new development. To meet this priority, the EGPR includes the following additional state actions to support infill development, including specific transportation actions:

- Develop a priority order for state transportation investment that includes investments in public transportation and other modes that are alternatives to single-occupant vehicles.
- Enhance support for infill development and transit-oriented development in communities along the HSR corridor. In particular, the state will prioritize investment in infill development and transit-oriented development in these communities and fund projects that promote HSR system ties to, and support for, local public transportation systems.

3.17.2.3 Regional and Local

At a regional level, *Plan Bay Area 2040* (ABAG and MTC 2017) provides a comprehensive plan for land use, transportation, and housing throughout the nine counties of the Bay Area. This plan is intended to support a growing economy, provide more housing and transportation choices, and reduce transportation-related pollution as part of an SCS that meets GHG reduction targets adopted by the CARB. At the local level, the general plans for the counties and cities along the project include specific goals related to housing, transportation, and economic development. Many policies focus on urban development and strategies to encourage diversification, strengthen local economies, and balance job growth with housing and public services. Regional and local plans and policies adopted by the counties and cities in the resource study area (RSA) that are applicable to regional growth are listed in Volume 2, Appendix 2-I.

In addition to the adopted local general plans, the Authority is working with cities to help local governments prepare plans in anticipation of future construction and operations of the HSR system, particularly where new HSR stations are planned within the RSA. The Authority is working with the City of Millbrae to develop a station area plan that will guide the design of the HSR station and the area surrounding the station. The key objective of the station area plan is to help the City promote economic development, encourage station area development, and enhance connectivity to other modes of transportation.

3.17.3 Consistency with Plans and Laws

As indicated in Section 3.1.5.3, Consistency with Plans and Laws, CEQA and CEQ regulations require a discussion of inconsistencies or conflicts between a proposed undertaking and federal, state, regional, or local plans and laws. Accordingly, this Draft EIR/EIS describes the inconsistency of the project alternatives with federal, state, regional, and local plans and laws to provide planning context.

There are a number of federal and state laws and implementing regulations, listed in Section 3.17.2.1, Federal, and Section 3.17.2.2, State, that are relevant to regional growth. A summary of the federal and state requirements considered in this analysis follows:

- NEPA and the CEQ guidance on implementation of NEPA provide assessment on how human-made activities may influence population growth.
- CEQA and the California Department of Transportation (Caltrans) Standard Environmental Reference guidance call for the assessment of growth-related impacts above projected population and employment.
- SB 375 Sustainable Communities Strategies policies require MPOs to plan for future urban growth to be more compact in order to reduce vehicle miles traveled and GHG emissions in their RTPs.

The 2015 EGPR outlines statewide growth management objectives for land use, population growth and distribution, conservation of natural resources, air and water quality, reduced petroleum consumption and increased energy efficiency, and reduced GHG emissions through prioritization of transportation investments for alternatives to single-occupant vehicles and infill development in support of public transportation systems.

The Authority, as the lead agency proposing to construct and operate the HSR system, is required to comply with all federal and state laws and regulations and to secure all applicable federal and state permits prior to initiating construction of the selected alternative. Therefore, there would be no inconsistencies between the project alternatives and these federal and state laws and regulations.

The Authority is a state agency and is therefore not required to comply with local land use and zoning regulations; however, it has endeavored to design and construct the HSR system so that it is compatible with land use and zoning regulations. For example, the Authority has and will continue to coordinate with counties and local municipalities during design and construction of the project to minimize disruption to local communities by using existing Caltrain infrastructure and

right-of-way to the extent possible, and minimizing the need for additional right-of-way acquisition. The Authority reviewed 26 plans and 102 goals, objectives, and policies and determined the project alternatives were inconsistent with 3 adopted policies, goals, and objectives from the following two regional and local plans:

- **Plan Bay Area 2040** (ABAG and MTC 2017)—*Plan Bay Area 2040* identifies the vacant and industrial lands in Brisbane between Bayshore Boulevard on the west and U.S. Highway 101 on the east as a Priority Development Area because of its potential for transit-oriented development. The project alternatives, however, would construct a light maintenance facility (LMF) on a portion of these lands, which would be inconsistent with the Priority Development Area designation.
- **City of Brisbane General Plan** (City of Brisbane 1994, 2020)—Policy 8: Maintain and diversify the City’s tax base, consistent with community character, in order to generate adequate revenues for City Government and sustain a healthy local economy, and Policy LU.5: Establish a mix of uses with a diversified economic base to maintain and increase tax revenues and contribute to the City’s ability to provide services. Alternatives A and B would displace several industrial businesses and one commercial business in Brisbane, resulting in a reduction in property tax revenues for the City. Additionally, the East or West Brisbane LMF would be inconsistent with General Plan designations for planned development in Brisbane Baylands, and would reduce the commercial and residential development potential of the Brisbane Baylands. Alternative A would have the greater impact on planned development (residential prohibited), while Alternative B would have the greater impact on planned development (residential permitted). The reduced development potential under both project alternatives would have a long-term effect on the City’s tax revenues. These potential reductions in property tax revenues would be offset by beneficial regional and local economic effects of project construction and operations.

Further details are discussed in Volume 2, Appendix 2-J. The Authority is a state agency and is therefore not required to be consistent with these policies. While the Authority seeks to adhere to regional and local growth policies and has followed existing transportation corridors to reduce HSR-related impacts, there are locations where the project alternatives would not be consistent with local government growth policies. As planning and design for the project alternatives progresses, the Authority plans to continue to work with stakeholders, including the City of Brisbane, to address local concerns.

3.17.4 Methods for Evaluating Impacts

This section defines the RSA and summarizes the methods used to analyze regional growth impacts. As described in Section 3.17.1, Introduction, additional information related to regional growth is available in six other resource sections and chapters of this Draft EIR/EIS; Volume 2, Appendix 3.17-A; and the *San Francisco to San Jose Project Section Community Impact Assessment* (Authority 2019).

3.17.4.1 Definition of Resource Study Area

RSAs are the geographic boundaries in which the environmental investigations specific to each resource topic were conducted. The RSA for regional growth is defined as the multicounty region encompassing any county touched by some part of the project (rail tracks, stations, or LMF). The RSA for direct and indirect regional growth impacts for this project encompasses San Francisco, San Mateo, and Santa Clara Counties. This RSA captures most of the potential employment and population growth, and growth-related land consumption and redevelopment that the project would induce.

3.17.4.2 *Impact Avoidance and Minimization Features*

Impact avoidance and minimization features (IAMF) are project features that are considered to be part of the project and are included as applicable in each of the alternatives for purposes of the environmental impact analysis. The full text of the IAMFs that are applicable to the project is provided in Volume 2, Appendix 2-E, Project Impact Avoidance and Minimization Features. There are no IAMFs applicable to the discussion of regional growth.

3.17.4.3 *Methods for Impact Analysis*

Overview of Impact Analysis

This section describes the sources and methods used to analyze potential impacts on regional growth from implementing the project. This impact analysis focuses the discussion of most environmental impacts by geographic area (at a regional level) rather than by project alternative, because there would be little difference in impacts between the alternatives, as both project alternatives include similar station and maintenance facilities and have similar track lengths.

The support for additional workers in the region is an important consideration because a potential influx of workers could increase the demand for housing and public services and require new or altered government and public facilities. The methodology presented in this section analyzes the potential increase in population that would result from jobs supported during the construction (short-term) and operations (long-term) phases of the project, potential increases in RSA jobs and population resulting from improved transportation accessibility provided by an operating HSR system, and the potential effects of these increases. Land consumption demands and patterns related to growth are also considered, as is the potential for induced population growth in exurban areas. Historic and projected population, employment, and housing data have been assembled from the U.S. Census Bureau; the California Department of Finance (CDOF), Demographic Research Unit; the California Employment Development Department (CEDD), Labor Market Information Division; and the Caltrans Office of State Planning, Economic Analysis Branch.

The methodology presented in this section applies to both NEPA and CEQA. The analysis focuses on employment and associated population growth from construction and operations of the project alternatives. CEQA requires an assessment of the environmental effects of growth, but does not specifically require significance determinations for potential growth-inducing impacts. CEQA also requires significance determinations for potential growth-inducing impacts on population and housing, if the project would directly or indirectly (a) induce substantial unplanned population growth in the region, or (b) displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

CEQA thresholds regarding regional growth effects are addressed in Section 3.12 and Section 3.13. Section 3.12 also summarizes the regional growth impacts evaluated in this section to provide a comprehensive analysis for determining significance under CEQA for potential socioeconomic and community impacts. Therefore, this section includes a summary of NEPA effects (Section 3.17.8, Impacts Summary), but does not include a summary of CEQA impacts.

Construction Impacts

The assessment of construction-related impacts focuses on construction employment impacts, the demand for construction workers, and the forecasted availability of construction workers. The analysis also evaluates the likelihood that construction workers and their families would move to the region for employment opportunities, thus potentially resulting in population impacts. The impact analysis focuses on the regional impacts of the project, where meaningful; construction impacts are assessed separately for each project alternative. The following key steps summarize the analytical process:

- **Estimate the construction costs for each project alternative**—The Authority used the capital cost estimates for the project to identify the overall construction costs anticipated to affect construction-related employment. The Authority also relied on detailed capital cost

estimates for project improvements.¹ These capital costs estimates were developed for the project alternatives by the Authority in July 2019 based on the San Francisco to San Jose Project Section: PEPD Record Set Capital Cost Estimate Report (Volume 2, Appendix 6-A). Capital costs used in the construction-related employment analysis excluded costs for HSR trains, right-of-way acquisition, land, final design, finance charges, and program implementation because they would not measurably affect employment in the RSA or are systemwide costs. Volume 2, Appendix 3.17-A provides additional information related to the project's construction costs and their analyses.

- Estimate the location and pace of project construction spending**—The Authority estimated the anticipated portion of the total construction budget that would be expended within the RSA, allocated construction costs to the region, and calculated the rate of expenditure through the multiyear construction period. At the time the analysis was conducted, the construction period for the project was anticipated to be 2021 to 2025, with the peak construction year occurring in 2024 (Volume 2, Appendix 3.17-A).
- Estimate the number of jobs created by construction spending**—The Authority used the construction cost estimates and spending allocations by construction year to estimate the direct, indirect, and induced employment impacts by project alternative. These construction-related employment estimates were calculated using the Bureau of Economic Analysis RIMS II model (Volume 2, Appendix 3.17-A).
- Compare construction-related jobs to the expected supply of appropriate workers**—The calculated construction-related employment demand was then compared to the forecasted 2024 peak-year construction workforce in the three-county RSA and 90-minute commute area, to assess whether the demand for skilled construction workers could be supplied by the three-county construction sector, including construction workers residing in the commute area, or whether the project could result in the relocation of construction workers and their households to the region for employment opportunities.

What is RIMS II?

The Regional Input-Output Modeling System (RIMS II) is a regional economic model developed by the Bureau of Economic Analysis to objectively assess the potential impacts of economic development projects. The model produces multipliers that are used in economic impact studies to estimate the total impact of a project on a region. The intent is to capture the additional rounds of spending that occur when an initial change in economic activity occurs. Impacts can be expressed in terms of output (sales), value added (gross domestic product), earnings, or employment.

Operations Impacts

The regional growth assessment for the HSR operations phase modeled direct, indirect, and induced employment impacts, as well as overall systemwide employment growth spurred by increased connectivity and accessibility, particularly between the Bay Area and the Los Angeles Basin. The Authority examined whether the forecasted employment growth associated with the project would result in regional employment impacts compared to projected employment growth for the region without the project. The analytical process to estimate growth inducement (employment and population) during project operations required extensive use of modeling tools and data. The following key steps summarize the process:

- Define the analysis contexts**—The future baseline conditions of the No Project Alternative and the economic modeling process were used to forecast the incremental changes associated with the HSR system. For direct, indirect, and induced employment and population growth related to local operations in the Project Section, the focus study region was the RSA. The potential additional employment and population growth related to improved

¹ The term *project improvements* as used in this discussion includes all track modifications (e.g., tracks, track structures, and site work), stations, and the LMF for the project alternatives.

connectivity and accessibility of the entire Phase I HSR system was also allocated to the region (Authority and FRA 2017).

- **Estimate RSA employment growth impacts related to local operations of the project**—The Authority modeled long-term direct, indirect, and induced employment from local operations of the project guideway, stations, and LMF using projections of O&M costs (Volume 2, Appendix 6-B) and RIMS II multipliers for the RSA (Volume 2, Appendix 3.17-A).
- **Estimate RSA employment growth impacts related to connectivity and accessibility changes during operations of the Phase I HSR system**—Operations of the Phase I HSR system is expected to improve travel times and convenience between homes and job centers, and cause employment growth to occur in places where it would not under the No Project Alternative. The accessibility-related employment growth projections were included as potential effects of the project operations (Authority and FRA 2017).

The estimated total RSA employment with the project was compared to employment projected for 2040 without the project to determine if employment impacts would occur. The Authority then determined if the estimated project-induced population from operations-related and accessibility-based employment and the demand for housing would result in an impact on planned population and housing growth in the RSA.

- **Estimate RSA population growth related to employment changes during operations of the Phase I HSR system**—Applying locally prevalent household formation rates and sizes, the Authority estimated the amount of population growth that would be expected in the RSA based on the number of jobs added from the direct, indirect, and induced economic activity derived from project O&M. In addition, the analysis incorporated the population growth estimated by the Authority as a result of the improved accessibility provided by the Phase I HSR system (Authority and FRA 2017). The analysis then determined if the estimated project-induced population from operations-related and accessibility-based employment and the demand for housing would result in an impact on planned population and housing growth in the RSA.
- **Compare RSA employment and growth projections related to Phase I HSR to the No Project Alternative**—Each county and city government general plan sets out goals and policies to accommodate anticipated employment and population growth for the coming decades. These county and city general plans are inputs to the MPO (MTC/ABAG), which produces longer-range regional growth projections for RTPs in the RSA, and to the state agencies producing comprehensive mid- and long-range employment and demographic forecasts for California: the CDOF, Demographic Research Unit; the CEDD, Labor Market Information Division; and the Caltrans Office of State Planning, Economic Analysis Branch. The projected employment and population growth in the RSA resulting from Phase I HSR operations and accessibility improvements were compared to anticipated RSA growth under the No Project Alternative.
- **Assess RSA population growth impacts related to Phase I HSR’s potential to induce additional population growth in exurban counties**—In analyzing the potential population growth associated with direct, indirect, and induced employment growth, the Authority considered whether the HSR system could also result in a redistribution of population unrelated to economic growth, such as households electing to relocate from more expensive to less expensive housing markets while still having access to current job centers (Authority 2018a).
- **Estimate RSA land consumption impacts related to potential population and employment growth**—The Authority estimated the extent to which the additional population and employment related to the Phase I HSR system O&M and improved accessibility would alter the amount of land consumed for new development compared to existing urbanized areas and projections under the No Project Alternative.

3.17.5 Affected Environment

This section describes recent historic trends, existing and projected employment and unemployment rates, population, and housing in the region. This information provides the context for the environmental analysis and evaluation of impacts described in Section 3.17.6, Environmental Consequences.

3.17.5.1 Overview

The RSA is an economically vibrant urbanized area, with population densities, income levels, educational attainment levels, and employment levels exceeding statewide averages by significant margins. Table 3.17-1 shows some key indicators of the three counties compared to each other, the RSA overall, and the state of California.

Table 3.17-1 RSA and County Characteristics, 2015 Estimates¹

Indicator	San Francisco County	San Mateo County	Santa Clara County	RSA	State of California
Population	857,508	759,155	1,903,974	3,520,637	38,907,642
Population/square mile	18,294	1,693	1,476	1,972	250
Income per capita	\$96,903	\$88,087	\$79,302	\$85,482	\$53,224
% Households below poverty line ¹	13.5%	7.1%	8.8%	9.8%	14.5%
Population with bachelor's degree or higher ¹	53.8%	45.6%	47.9%	49.0%	31.4%
Unemployment rate	3.6%	3.4%	4.2%	4.0%	6.2%
% Farm jobs	>0.1%	0.4%	0.4%	0.3%	2.6%
% Manufacturing jobs	1.4%	6.7%	15.4%	9.3%	7.8%
% Professional services and information jobs	30.8%	27.9%	28.0%	28.9%	18.1%
Number of Total Jobs	674,120	392,850	1,033,110	2,100,080	16,474,000

Sources: CDOF 2016; CEDD 2016a; Caltrans 2016; U.S. Census Bureau ACS 2010–2014, 2011–2015a, 2011–2015b

> = greater than

RSA = resource study area

¹ The households below poverty line and population with bachelor's degree or higher ratios are based on U.S. Census Bureau ACS 2011–2015, 5-year estimates; all other estimates are for 2015.

Located at the northern end of the San Francisco Peninsula, the City and County of San Francisco is one of the most densely populated major cities in the country. San Francisco has a diversified service economy, with employment spread across a wide range of professional services, including financial services, tourism, and high technology. In the peninsula midsection, San Mateo County extends across most of the San Francisco Peninsula and has long served as a place of relatively small suburbs to San Francisco. San Mateo County is primarily suburban, with some urban areas, and several corporate campuses and headquarters. At the southern end of the peninsula, Santa Clara County has the largest population and number of jobs of the RSA counties, and is home to Silicon Valley firms, a highly educated workforce, and substantial venture capital investment in entrepreneurial activities. These activities are largely concentrated in the northern and central areas of the county, as the southern end is characterized by lower density development, including housing for the Silicon Valley workforce and agricultural activity. The percentage of manufacturing jobs located in Santa Clara County is more than two times the other counties in the RSA. These three counties have among the highest per-capita income levels in California and low unemployment rates indicative of near full employment.

3.17.5.2 *Employment and Unemployment*

Employment

Table 3.17-2 shows information on historic and recent regional employment by industry using CEDD data for 2000 and 2015 (CEDD 2016a). These data show that employment in the RSA is heavily concentrated in San Francisco and Santa Clara Counties, which have 32 percent and 49 percent of the RSA's total jobs, respectively. San Francisco and San Mateo Counties are the location of headquarters of major technology-based firms including Twitter, Salesforce, and Uber in San Francisco and numerous biotechnology firms in San Mateo County. Santa Clara County is the center of Silicon Valley, known as the origin and/or headquarters of many technology and internet firms such as Apple, Google, and Facebook. The RSA has an integrated economy, with many workers commuting between the three counties and many firms having locations in multiple jurisdictions in the RSA. Variations in employment concentrations exist in the RSA, with Santa Clara County having a higher proportion of manufacturing jobs than the other counties and San Francisco having a higher proportion of jobs in finance and real estate. All three counties have strong employment in the professional services industries, while none has a substantial number of agricultural jobs. Unemployment has generally been very low in the RSA. Between 1990 and 2015, CEDD records show the annual average civilian unemployment rates for all three counties were below the California state unemployment rates for all years except from 2002 to 2004, when the bursting of the "dot-com" bubble exacerbated the local impacts of the national recession of the early 2000s (CEDD 2016a).

Between 2000 and 2015, total employment increased by about 10 percent in San Francisco County and about 1 percent in San Mateo County, and decreased by 0.7 percent in Santa Clara County. The Great Recession of 2007 to 2009 brought unemployment spikes for all three counties. The highest unemployment rates occurred in 2009 and 2010, exceeding those of the prior recessions in the early 1990s and early 2000s. San Francisco and San Mateo Counties experienced their highest recession unemployment rates of 8.9 percent and 8.4 percent, respectively, in 2010; while Santa Clara's 10.6 percent unemployment rate for 2009 was even higher (CEDD 2016a).

The decrease in total employment in Santa Clara County between 2000 and 2015 was caused by substantial declines in the construction, manufacturing, and wholesale/retail trade industries. However, Santa Clara County gained jobs in the information, finance, educational/health, and arts/entertainment/recreation industries. The modest overall net job loss in Santa Clara County over the 15 years can also be explained by the county's extraordinary employment conditions in 2000—just before the end of the "dot-com" boom. That boom affected not only technology jobs, but also the local jobs supporting those workers (Bay Area Council et al. 2002).

Table 3.17-2 shows projected employment by industry for San Francisco, San Mateo, and Santa Clara Counties through 2024, the projected peak year for construction activities for the project. As shown, all three counties are projected to experience continued employment growth, with about 240,400 net new jobs projected for the region between 2015 and 2024. The greatest shares of growth by sector are projected for professional services (about 106,500 new jobs); educational, health and social services (about 37,500 new jobs); information (about 26,900 new jobs); and arts, entertainment, recreation, accommodation, and food services (about 24,600 new jobs).

Table 3.17-3 shows the projected 2040 total employment for San Francisco, San Mateo, and Santa Clara Counties and in the region. The region's job growth, projected at about 488,000 net new jobs between 2015 and 2040, is anticipated to concentrate in San Francisco and Santa Clara Counties, which is consistent with the region's current spatial distribution of jobs. The projections show that employment in San Mateo County will grow at the highest average annual rate of the three counties, by a small margin, adding about 91,400 projected new jobs between 2015 and 2040. San Francisco and Santa Clara Counties are projected to add approximately 155,300 and 241,300 net new jobs, respectively. The region overall is expected to experience an annual average job growth rate that is slightly lower than the statewide average over the next 25 years.

Table 3.17-2 San Francisco, San Mateo, and Santa Clara Counties: Regional Employment by Industry, 2000–2024¹

Industry	San Francisco County			San Mateo County			Santa Clara County			RSA		
	2000	2015	Projected 2024	2000	2015	Projected 2024	2000	2015	Projected 2024	2000	2015	Projected 2024
Agriculture, forestry, fishing, and hunting	300	200	200	2,900	1,800	1,800	5,000	3,600	3,700	8,200	5,600	5,700
Construction, mining, and logging	19,700	18,500	17,800	19,800	23,100	18,900	48,500	42,300	33,300	88,000	83,900	70,000
Manufacturing	22,000	10,300	10,000	36,400	25,500	27,800	248,600	159,400	175,600	307,000	195,200	213,300
Wholesale trade	14,900	15,000	16,600	15,100	12,100	12,200	42,400	36,000	41,800	72,400	63,100	70,700
Retail trade	47,000	47,700	49,300	39,700	33,900	37,800	91,400	84,900	89,000	178,100	166,500	176,200
Transportation and warehousing, and utilities	21,300	12,300	12,300	35,500	28,300	33,700	17,500	15,000	16,200	74,300	55,600	62,200
Information	36,700	31,700	33,700	26,300	28,100	33,000	43,200	74,700	94,700	106,200	134,500	161,400
Finance, insurance, real estate, and rental and leasing	66,900	52,000	53,400	25,500	21,600	22,600	33,900	35,000	37,100	126,300	108,600	113,000
Professional, scientific, management, administrative, and waste management services	134,400	184,600	217,000	73,000	76,500	92,300	228,400	214,900	273,200	435,800	476,000	582,500
Educational, health, and social services	60,300	85,700	99,200	30,000	44,300	50,900	86,900	155,400	172,800	177,200	285,400	322,900
Arts, entertainment, recreation, accommodation, and food services	75,100	93,300	108,200	31,700	42,500	46,500	71,500	94,500	100,100	178,300	230,300	254,900
Other services (except public administration)	25,600	26,200	28,600	10,700	14,000	16,400	26,700	26,700	33,500	63,000	66,900	78,500
Public administration	84,800	91,600	87,500	32,500	32,700	32,000	95,900	89,900	94,900	213,200	214,200	214,400
Total	608,900	668,900	733,700	379,000	384,100	426,000	1,039,900	1,032,200	1,166,000	2,028,000	2,085,200	2,325,600

Sources: CEDD 2016a; Caltrans 2015

RSA = resource study area

¹ All numbers have been rounded to the nearest 100 for employment.

Table 3.17-3 Regional Long-Range Employment Projections, 2015, 2020, 2024, and 2040¹

Geographic Area	Employment in 2015	2020			2024			2040		
		Employment in 2020	Change 2015–2020	Ann. Avg. Growth Rate 2015–2020	Employment in 2024	Change 2020–2024	Ann. Avg. Growth Rate 2020–2024	Employment in 2040	Change 2015–2040	Ann. Avg. Growth Rate 2015–2040
San Francisco County	668,900	710,400	6.2%	1.21%	733,700	3.3%	0.81%	824,200	23.2%	0.84%
San Mateo County	384,100	413,100	7.6%	1.47%	426,000	3.1%	0.77%	475,500	23.8%	0.86%
Santa Clara County	1,032,200	1,127,100	9.2%	1.77%	1,166,000	3.5%	0.85%	1,273,500	23.4%	0.84%
RSA	2,085,200	2,250,600	7.9%	1.54%	2,325,600	3.3%	0.82%	2,573,200	23.4%	0.84%
California	16,474,800	17,588,100	6.8%	1.32%	18,228,500	3.6%	0.90%	20,895,900	26.8%	0.96%

Sources: CEDD 2016a; Caltrans 2015

Ann. Avg. = annual average

RSA = resource study area

¹ All numbers have been rounded to the nearest 100 for employment.

Unemployment

The recession that began in 2007 had a substantial impact on employment and unemployment in the RSA, as it did throughout the state and nation. Table 3.17-4 shows annual civilian labor force and unemployment rates in the RSA in 2000, 2010, and 2015. As indicated, the unemployment rate in most locations more than doubled from the peak of the “dot-com” boom in 2000 to the depths of the Great Recession in 2010, but it improved substantially between 2010 and 2015, indicating a general economic recovery generally exceeding 2000 employment levels. The RSA, which is economically dominated by its robust, technology-driven employment, has consistently had lower unemployment than the state average. Variation in historical and recent unemployment rates exists within the RSA because of differing local conditions, but all jurisdictions show the general trend of struggles during the recession, followed by significant recovery.

Table 3.17-4 Labor Force Characteristics by County and City/Community in the RSA, 2000–2015

Geographic Area	2000	2010	2015
City and County of San Francisco			
Civilian labor force	473,100	486,000	548,000
Percent unemployment rate	3.4	8.9	3.6
San Mateo County			
Civilian labor force	398,500	393,000	442,000
Percent unemployment rate	2.9	8.4	3.4
City of Brisbane			
Civilian labor force	2,216	2,700	3,000
Percent unemployment rate	5.4	10.6	4.3
City of South San Francisco			
Civilian labor force	30,981	34,500	38,500
Percent unemployment rate	3.8	8.9	3.6
City of San Bruno			
Civilian labor force	21,964	23,600	26,400
Percent unemployment rate	2.7	8.1	3.3
City of Millbrae			
Civilian labor force	9,827	10,800	12,200
Percent unemployment rate	1.8	7.2	2.9
City of Burlingame			
Civilian Labor Force	15,729	15,700	17,800
Percent unemployment rate	2.2	6.6	2.6
City of San Mateo			
Civilian labor force	49,650	55,400	62,600
Percent unemployment rate	2.8	8.1	3.3

Geographic Area	2000	2010	2015
City of Belmont			
Civilian labor force	14,677	14,600	16,300
Percent unemployment rate	3.0	7.4	3.0
City of San Carlos			
Civilian labor force	15,440	15,300	17,200
Percent unemployment rate	2.0	8.3	3.4
City of Redwood City			
Civilian labor force	41,470	41,800	48,200
Percent unemployment rate	3.3	7.7	3.1
Town of Atherton			
Civilian labor force	3,230	2,700	3,000
Percent unemployment rate	2.0	8.4	3.4
City of Menlo Park			
Civilian labor force	15,849	16,800	18,800
Percent unemployment rate	2.7	6.7	2.7
Santa Clara County			
Civilian labor force	941,500	926,500	1,018,400
Percent unemployment rate	3.1	10.4	4.2
City of Palo Alto			
Civilian labor force	31,982	32,200	35,300
Percent unemployment rate	1.9	7.3	2.8
City of Mountain View			
Civilian labor force	42,310	44,200	49,700
Percent unemployment rate	2.8	8.1	3.2
City of Sunnyvale			
Civilian labor force	75,227	76,500	85,200
Percent unemployment rate	3.3	9.4	3.7
City of Santa Clara			
Civilian labor force	57,472	61,300	66,900
Percent unemployment rate	3.4	9.4	3.7
Resource Study Area			
Civilian labor force	1,813,100	1,805,500	2,008,400
Percent unemployment rate	3.1	9.6	3.8
California			
Civilian labor force	16,867,800	18,336,300	18,981,800
Percent unemployment rate	4.9	12.2	6.2

Sources: CEDD 2016a, 2016b; U.S. Census Bureau 2000a, 2000b

3.17.5.3 Population

Table 3.17-5 shows the population in 2000 and 2015 and growth rates for the counties in the RSA. The three counties vary greatly in terms of population, with Santa Clara County's population just over 2.2 times the size of San Francisco County's population despite Santa Clara encompassing more than 7 times the urbanized area² (U.S. Census Bureau 2018). The demographics of the RSA population are discussed in additional detail in Section 3.12.5.2, Population and Households.

Table 3.17-5 Population Growth, 2000–2015

Geographic Area	Population in 2000	Population in 2015	Change 2000–2015	2000–2015 Annual Average Growth Rate
San Francisco County	776,733	857,508	10.4%	0.7%
San Mateo County	707,161	759,155	7.4%	0.5%
Santa Clara County	1,682,585	1,903,974	13.2%	0.8%
RSA	3,166,479	3,520,637	11.2%	0.7%
California	33,871,648	38,907,642	14.9%	0.9%

Source: CDOF 2016
RSA = resource study area

Of the three counties, Santa Clara County had the highest annual average population growth rate at 0.8 percent. San Mateo County, the lowest-population county in the RSA, also had the lowest annual average growth rate at 0.5 percent. Overall, the RSA population grew at a pace slower than the California average rate, while still adding 354,200 persons between 2000 and 2015.

Table 3.17-6 shows the RSA county population for 2015 and projections for 2040. These estimates anticipate that only Santa Clara County will grow at a higher average annual rate than the state of California. Over the next 25 years, population is projected to increase in San Francisco, San Mateo, and Santa Clara Counties by about 20 percent, 15 percent, and 22 percent, respectively. The economic growth analysis presented in the *Final Bay Area to Central Valley High-Speed Train (HST) Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS)* (Authority and FRA 2008) found that the overflow of people from urban coastal areas seeking affordable housing within commuting range of major metropolitan areas, such as the RSA, contributes to the growth projections for nearby exurban areas such as San Benito and Merced Counties.

Table 3.17-6 Population Projections, 2015–2040

Geographic Area	Population in 2015	Population in 2040	Change 2015–2040	2015–2040 Annual Average Growth Rate
San Francisco County	857,508	1,027,004	19.8%	0.7%
San Mateo County	759,155	874,626	15.2%	0.6%
Santa Clara County	1,903,974	2,331,887	22.5%	0.8%
RSA	3,520,637	4,233,517	20.2%	0.7%
California	38,907,642	47,233,240	21.4%	0.8%

Sources: CDOF 2014, 2016
RSA = resource study area

² The Census Bureau identifies two types of urban areas: urbanized areas of 50,000 or more people and urban clusters of at least 2,500 and less than 50,000 people. For this analysis, the urbanized area for each RSA county has been defined as that acreage located within urban area or urban cluster boundaries as defined in *2018 TIGER/Line Shapefiles: Urban Areas (National)* (U.S. Census Bureau 2018), and also located within the county boundary.

3.17.5.4 Housing Demand

Table 3.17-7 shows the number of housing units in the RSA for 2015 and 2040. Santa Clara County’s housing supply is projected to grow at a faster rate of change than either San Francisco County or San Mateo County, and the absolute number of new housing units added in Santa Clara County is projected to be much greater, with a net increase in housing from 2015 to 2040 more than the combined sum of the other two counties in the RSA.

Table 3.17-7 Housing Units and Vacancy Rates, 2015 and 2040

Geographic Area	Existing Housing Units in 2015	Projected Housing Units in 2040 ¹	Change 2015–2040	2015–2040 Annual Average Growth Rate
San Francisco County	384,657	469,900	22.2%	0.8%
Percent vacancy rate	7.3%	6.0%		
San Mateo County	274,612	336,800	22.6%	0.8%
Percent vacancy rate	5.4%	4.4%		
Santa Clara County	652,007	840,200	28.9%	1.0%
Percent vacancy rate	4.5%	3.5%		
Resource study area	1,311,276	1,646,900	25.6%	0.9%
Percent vacancy rate	5.5%	4.4%		
California	13,914,716	17,240,100	23.9%	0.9%
Percent vacancy rate	7.5%	6.0%		

Sources: CDOF 2014, 2015, 2016

¹Housing unit projections for 2040 are based on projected 2040 total population by county (CDOF 2014), minus the trend line extrapolation of 2010–2030 group quarters population by county (CDOF 2015) to 2040, divided by the trend line extrapolation of 2010–2030 average persons per household by county (CDOF 2015) to 2040, to account for anticipated continuing decreases in overall rates of persons per household. The estimated number of vacant housing units by county in 2015 (CDOF 2016) has been added to the calculated projections of households (occupied housing units) in 2040, to estimate 2040 total housing units.

The majority of existing housing in the RSA, about 56 percent, is single-family homes. However, multifamily housing has become more prevalent throughout the RSA. From 2010 to 2017, almost 100 percent of new residential construction in San Francisco County was multifamily dwelling units, with just about 0.5 percent being single-family units (CDOF 2017). In contrast, about 79 percent of San Mateo County housing built from 2010 to 2017 consisted of multifamily units, and about 77 percent of new residential construction in Santa Clara County was multifamily units (CDOF 2017).

Household sizes differ throughout the RSA, with an average 2015 household size ranging from 2.33 persons in San Francisco County to 3.01 persons in Santa Clara County (CDOF 2015). Single-family development, particularly subdivisions of single-family detached housing, typically consumes land at higher rates per dwelling unit than more compact multifamily dwelling types. Section 3.12.5.3, Property Displacements and Relocations, provides more information on housing characteristics in the region.

Based on population projections, housing needs for the next 25 years will increase by 25.6 percent in the region, with the highest proportionate increase in Santa Clara County at 28.9 percent and the highest absolute growth also in Santa Clara County at about 188,200 new units. In 2015, approximately 72,000 housing units were vacant in the region, which represents about 5.5 percent of the available housing stock (CDOF 2016). The RSA’s housing vacancy rate was lower than the state’s overall rate, and is expected to remain lower than the state average in the future.

Housing demand indicators generally reflect the strong economic circumstances throughout the RSA. For example, housing list prices in Santa Clara County were estimated by Zillow to be roughly \$700 per square foot at the end of the third quarter of 2018, while in neighboring San Benito County just south of the RSA, the median list price was estimated at just \$315 per square foot, which dropped to about \$170 per square foot for Merced County (Zillow 2019). These differences in housing prices echo other differences in income levels and employment sectors among local residents, and indicate that demand for housing is much greater in Santa Clara County largely because of its impressive employment base. The housing list prices estimated by Zillow for the end of the third quarter of 2018 are about \$890 per square foot for San Mateo County and nearly \$1,040 per square foot in San Francisco, even more expensive than Santa Clara County. In addition to income differences and demand based on employment, RSA housing prices are also driven up by constraints on housing and land supply, including high development costs, limited infrastructure capacity, and land development policies or practices that affect growth.

3.17.6 Environmental Consequences

3.17.6.1 Overview

This section discusses the anticipated impacts on regional growth that could result from implementing the No Project Alternative and the project alternatives. The discussion of construction impacts considers common regional growth impacts and several issues pertaining to construction-related employment. The discussion of operations impacts considers common regional growth impacts, operations-related employment, employment growth due to improved accessibility, the potential to induce additional population growth in exurban counties, and land use consumption.

Construction Impacts

Construction of the project could affect regional growth through the purchasing of materials and contracting of labor that would result in increasing employment in the construction industry as well as industries that support construction activity and its workers. These impacts would be temporary, occurring during the expected 5-year construction period, from 2021 to 2025. The project's demand specifically for construction workers would increase the RSA's expected construction employment above the No Project Alternative estimate for the 2024 peak year. This demand, however, would not be anticipated to result in the relocation of construction workers to the RSA because the projected available and accessible construction workforce is considered sufficient to meet the demand. Seven counties have land areas within a drive-time boundary centered at the City of Belmont (which is the project's midpoint) and extending to the distance a vehicle could travel on roadways in 90 minutes at typical interregional afternoon-evening peak hour commuting speeds. Construction workers from these counties—Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Santa Cruz—could commute to the project site (Volume 2, Appendix 3.17-A, Attachment 1).

The expected peak year of construction employment for the San Francisco to San Jose Project Section is 2024, or the fourth year of the 5-year construction period from 2021 to 2025. This would overlap the construction period for the San Jose to Merced Project Section, which is expected to extend from 2022 to 2028, with a peak construction year of 2024. Construction workers trained and experienced in work on one of these project sections would provide a valuable labor resource for the other, because the daily commute sheds³ for the two project sections overlap substantially.

The Authority has been working with various California organizations to increase training and improve opportunities for workers who would like to do construction work, through programs like the Central Valley Infrastructure Employment Project. Contract requirements that a substantial share of the construction expenditures go to small businesses would also increase opportunities for workers in the RSA. The emphasis on providing job training and the requirements to use small

³ *Commute shed* is defined as the area that workers might or are known to commute to for employment, assuming maximum travel time or distances.

businesses would provide employment opportunities for construction workers in the region. Also, the strong propensity of construction workers to endure long commutes to periodically changing job sites rather than relocate their households, combined with the large labor force of construction workers within a reasonable commute shed beyond the RSA (typically from the urban Bay Area), suggest that it is unlikely that many construction workers would compete for traditional owner-occupied or rental housing units in the region to seek employment opportunities that would be created by the project alone. It is also unlikely that many construction workers from outside the RSA would relocate their families to communities in the RSA because of the high cost of housing in the RSA and because the disruption to their family and social networks may not be considered worthwhile for a construction job that is likely to last a few years.

Operations Impacts

Operations of the project could affect regional growth through the hiring of workers and purchasing of materials and labor to maintain tracks and systems as well as O&M of the HSR stations and the Brisbane LMF. These effects would be ongoing throughout project operations. The employment associated with project operations represents a small addition to the employment growth expected under the No Project Alternative.

The HSR system also would increase population and contribute to employment growth because of improved accessibility throughout the state and the enhanced attractiveness of station areas for development and investment. The Authority estimates that just over 8,000 of these accessibility-generated jobs would be located in the RSA (Authority and FRA 2017). This level of growth would not represent an impact on this region, which is projected to have nearly 2.6 million jobs by 2040.

Some exurban communities would experience population growth in response to the improved accessibility offered by the HSR system. For example, households residing in the expensive housing markets in the Bay Area may move to other counties with less expensive housing, while still being able to access their employment centers due to HSR service. Estimating specific numbers of such households and their related impacts on specific locations would be highly speculative, because households make location decisions for many different reasons. For this reason, this section of analysis is more qualitative than quantitative. While such exurban growth can be reasonably expected as a result of HSR, it is not anticipated to represent a major shift in growth that is otherwise anticipated.

As employment and population growth occurs throughout the RSA, new development would consume currently undeveloped or underutilized land. The level of growth related to HSR operations in the RSA would be marginal compared to the No Project Alternative; thus, the amount and pattern of land consumption associated with HSR is also expected to make only a marginal difference.

3.17.6.2 No Project Alternative

This section describes the conditions expected to be present in the RSA if the project were not built and operated; thus the No Project Alternative represents the baseline conditions against which the impacts of the project can be compared. The RSA is already the location of a large population and economy, both of which are projected to grow substantially even under the No Project Alternative.

Projected population growth in the RSA under the No Project Alternative is shown in Table 3.17-6 above. The land use plans of San Francisco, San Mateo, and Santa Clara Counties encourage infill and higher-density development in urban areas and concentration of uses around transit corridors and stations to accommodate future population growth and provide more modal choices for residents and workers. These policies are being implemented in the region regardless of whether the HSR project were to be built. Under the No Project Alternative, the existing 4th and King Street and Millbrae Stations would not provide HSR service and associated ridership increases. Additionally, under the No Project Alternative, the new Salesforce Transit Center would not feature an HSR connection to the existing 4th and King Street Station, and this

downtown San Francisco multimodal center would not ultimately serve as the Northern California hub for future HSR service from Los Angeles.

However, these stations are already served, or planned to be served, by Caltrain or Bay Area Rapid Transit regional transit systems, or both, around which both residential and commercial development has proven to be in demand, and these stations are well located within the dynamic and growing RSA economy. While these station areas might gain competitive advantages and development might occur more quickly or at higher values if HSR service were introduced, the station areas are still expected to be in high demand for development and capable of achieving extensive growth over the coming decades under the No Project Alternative.

To some extent, the SCSs adopted by the MPOs as part of the Counties' most recent RTPs would be expected to encourage both more-compact development and greater investment in local transit modes as a means of reducing GHG emissions. An APS adopted by the MPO encourages compact development. In either case, the fact that the SCS/APS would address reductions in GHG emissions would encourage cities and counties to consider its provisions during planning and zoning deliberations to comply with CEQA's requirement to mitigate, to the extent feasible, the impacts of planning and zoning decisions on GHG emissions. *Plan Bay Area 2040* (ABAG and MTC 2017) is a voluntary plan, not mandatory. It is expected to encourage more-compact development, but the extent of any increase in compact development would be difficult to quantify unless the city or county were to choose to adopt *Plan Bay Area 2040* policies as part of its general plan.

Construction of planned residential, commercial, and industrial development and transportation projects identified in Section 3.18.4.3, Cumulative Project Lists and Regional Projections, would generate short-term construction employment in the region.

3.17.6.3 Project Impacts

Construction and operations of the project would result in both temporary and permanent impacts on regional growth. The construction of the HSR system, however, is consistent with the long-term land use plans and discussions of regional growth (Volume 2, Appendix 2-I). The following sections discuss construction and operations impacts.

Construction Impacts

Common Regional Growth Impacts

The start of project construction would be preceded by acquisition of right-of-way for HSR track modifications, stations, and the Brisbane LMF. Some parcels, including buildings or other facilities or improvements, would be purchased outright. In other cases, narrow strips of land along the edges of large parcels would be leased for construction easements or purchased for permanent use. The land acquired for the right-of-way would change to public transportation use and would no longer generate property tax revenues for local governments (Section 3.12.6.1, Overview). The purchase of property and relocation of residences and businesses would disrupt both residential and commercial or industrial property and business owners along the Project Section. The economic impacts of these property acquisitions are discussed in Section 3.12.6.1.

The Authority designed the project alternatives to be predominantly within existing transportation rail rights-of-way to the maximum degree feasible. Therefore, permanent land acquisitions would represent small acquisitions along the entire 49-mile alignment, amounting to approximately 239 acres of permanent right-of-way acquisition under Alternative A, 277 acres of permanent right-of-way acquisition under Alternative B (Viaduct to Interstate [I-] 880), and 272 acres of permanent right-of-way acquisition under Alternative B (Viaduct to Scott Boulevard) (Section 3.13.6.2, Alteration of Land Use Patterns). As such, the total amount of land that would need to be purchased or converted from current use is a small proportion of all land of that type in the region. These permanent conversions of land uses would not contribute to incremental population and housing growth, but rather a redistribution of a small number of households and commercial and industrial businesses, primarily in the vicinity of the converted uses.

Construction-Related Employment

During project construction, workers would be required for construction activities. In addition, workers would be required in industries supporting the supply chain (e.g., equipment rentals) and industries supporting the worker spending on everyday goods and services (e.g., food, vehicle fuel). The employment and economic activities associated with the project alternatives are estimated and compared in this section. In addition, the availability of workers to fill those jobs is assessed, including already skilled or potentially trained workers who reside in the RSA, as well as workers who may commute from beyond the RSA. The relationship between different HSR project sections is also considered because the timing of work on each project section may affect the availability of workers for other HSR project sections.

Direct, Indirect, and Induced Employment

The number of jobs directly generated by a construction project typically relates to the size and budget of that project. The project also generates other indirect effects in the surrounding economy as local businesses provide goods and services to support the project, and they may have induced effects as project workers spend portions of their wages on goods and services for themselves and their households.

Total construction costs for each project alternative were developed using standard cost categories adopted by the Authority (Chapter 6). RIMS II modeling has produced estimates of local construction expenditures—that is, the anticipated portion of the total construction budget that would be expended for goods, labor, and services in the RSA, and the related direct, indirect, and induced employment impacts. The RIMS II modeling procedure, assumptions, and results presented in this section are described in detail in Volume 2, Appendix 3.17-A.

Table 3.17-8 shows the range of capital, construction, and local construction cost estimates for the two project alternatives. Alternative A would have the lowest capital and local construction costs. Alternative B (Viaduct to Scott Boulevard) would have the highest capital and local construction costs. Local construction costs⁴ would range from \$765 million to \$1.345 billion. The table also shows the anticipated annual construction expenditures during the 2021 to 2025 construction period.

Table 3.17-8 Project Alternatives Costs (2018\$, in millions)

Alternative / Cost	Alternative A	Alternative B (Viaduct to I-880)	Alternative B (Viaduct to Scott Boulevard)
Capital costs	\$4,253	\$6,128	\$6,858
Total construction costs	\$2,186	\$3,292	\$3,842
Local construction costs	\$765	\$1,152	\$1,345
Local construction costs during 2021	\$70	\$100	\$115
Local construction costs during 2022	\$172	\$270	\$312
Local construction costs during 2023	\$180	\$283	\$330
Local construction costs during 2024 (peak year)	\$191	\$284	\$335
Local construction costs during 2025	\$152	\$216	\$252

Sources: Authority 2016a, 2018b, 2019

I = Interstate

⁴ For the purposes of this analysis, local construction costs are assumed as those spent within the RSA that includes San Francisco, San Mateo, and Santa Clara Counties.

Table 3.17-9, Table 3.17-10, and Table 3.17-11 show the calculated RSA impacts of local construction costs for the project alternatives in numbers of total and annualized job-years during the expected 5-year construction period. The estimates were made using RIMS II modeling for direct, indirect, and induced employment associated with the construction of the project improvements. *Direct employment* refers to the jobs primarily involved in the construction sector. *Indirect employment* refers to the jobs created in existing businesses in the region (e.g., material and equipment suppliers) that supply goods and services to project construction. *Induced employment* refers to jobs created in new or existing businesses (e.g., retail stores, gas stations, banks, restaurants, service companies) that supply goods and services to workers and their families.

Table 3.17-9 Alternative A Construction Employment Impacts

Construction Year	Direct Employment (annual job-years)	Indirect and Induced Employment (annual job-years)	Total New Employment (annual job-years)
2021	260	160	420
2022	640	400	1,040
2023	670	420	1,090
2024 (peak year)	710	440	1,150
2025	560	360	920
Total	2,830	1,780	4,620

Sources: Authority 2017; U.S. Bureau of Economic Analysis 2018
Totals may not add up due to rounding.

Table 3.17-10 Alternative B (Viaduct to I-880) Construction Employment Impacts

Construction Year	Direct Employment (annual job-years)	Indirect and Induced Employment (annual job-years)	Total New Employment (annual job-years)
2021	370	230	600
2022	1,000	630	1,630
2023	1,050	660	1,700
2024 (peak year)	1,050	660	1,710
2025	800	500	1,300
Total	4,260	2,690	6,950

Sources: Authority 2017; U.S. Bureau of Economic Analysis 2018
I = Interstate
Totals may not add up due to rounding.

Table 3.17-11 Alternative B (Viaduct to Scott Boulevard) Construction Employment Impacts

Construction Year	Direct Employment (annual job-years)	Indirect and Induced Employment (annual job-years)	Total New Employment (annual job-years)
2021	430	270	700
2022	1,160	730	1,880
2023	1,220	770	1,990
2024 (peak year)	1,240	780	2,020
2025	930	590	1,520
Total	4,980	3,140	8,110

Sources: Authority 2017; U.S. Bureau of Economic Analysis 2018
 Totals may not add up due to rounding.

Because job creation corresponds to the local spending on the project, Alternative B (Viaduct to Scott Boulevard) would result in the highest level of employment, generating more than 8,100 total annual job-years. Alternative A would result in the lowest employment, generating 4,620 total annual job-years.

Both project alternatives would increase local and regional employment beyond what would be experienced under the No Project Alternative, and the scale of the impact is comparable between Alternative A and Alternative B (both viaduct options). The combined total employment for construction activity associated with the project improvements (direct, indirect, and induced jobs) is roughly 1,150 jobs under Alternative A; 1,710 jobs under Alternative B (Viaduct to I-880); and 2,020 jobs Alternative B (Viaduct to Scott Boulevard) in the peak year of 2024 (Table 3.17-12). If added to the RSA's projected total employment for 2024 (about 2,325,600 jobs from Table 3.17-2, which shows the No Project Alternative estimate), these peak construction-period jobs would add just 0.05 percent under Alternative A, 0.07 percent under Alternative B (Viaduct to I-880), or 0.09 percent under Alternative B (Viaduct to Scott Boulevard) to the total projected employment in the region.

The combined direct employment for construction for the project improvements is projected to be 710 jobs under Alternative A; 1,050 jobs under Alternative B (Viaduct to I-880); and 1,240 jobs under Alternative B (Viaduct to Scott Boulevard) in the peak year. If added to the RSA's projected construction employment for 2024 (70,000 jobs from Table 3.17-2, which shows the No Project Alternative estimate), these peak year direct construction jobs would add just 1.0 percent under Alternative A, 1.5 percent under Alternative B (Viaduct to I-880), or 1.8 percent under Alternative B (Viaduct to Scott Boulevard) to the total projected construction industry employment in the region. Again, this would not be substantial in the context of the RSA's overall economy.

Table 3.17-12 Total One-Time Economic Impact of Construction in the RSA

Alternative/Sector	Employment (Job-Years) ¹
Alternative A	
Direct impact	2,830
Indirect/induced impact	1,780
Total impact	4,620
2024 peak year direct jobs	710
2024 peak year direct, indirect, and induced jobs	1,150
Alternative B (Viaduct to I-880)	
Direct impact	4,260
Indirect/induced impact	2,690
Total impact	6,950
2024 peak year direct jobs	1,050
2024 peak year direct, indirect, and induced jobs	1,710
Alternative B (Viaduct to Scott Boulevard)	
Direct impact	4,980
Indirect/induced impact	3,140
Total impact	8,110
2024 peak year direct jobs	1,240
2024 peak year direct, indirect, and induced jobs	2,020

Sources: Volume 2, Appendix 6-A and Appendix 6-B; Authority 2018b; U.S. Bureau of Economic Analysis 2018

I- = Interstate

RSA = resource study area

¹ All numbers have been rounded to the nearest 10 for employment.

Workforce Development and Small Business Contracting

To increase both the number and ability of California workers and firms to compete for available project construction jobs, the Authority and others have been implementing a variety of programs. Through a cooperative partnership with skilled craft unions, the Authority is promoting and helping to develop education, pre-apprenticeship, and apprenticeship training programs. These activities in economically disadvantaged communities focus on helping lower-income persons, persons receiving public assistance, single parents, persons with no high school or General Education Development diploma, and/or those who suffer from chronic unemployment compete for available jobs. Community organizations have implemented similar programs to get workers trained, retrained, and certified for upcoming construction work. Through the Authority's Community Benefits Agreement (CBA), the Authority requires each prime contractor of an awarded construction package to commit 30 percent of all construction dollars to hiring small businesses, including separate goals for the hiring of disadvantaged and disabled veterans businesses. Moreover, many construction workers residing in the RSA may already have obtained HSR construction experience by working on one of the first several construction packages awarded by

the Authority beginning in 2013. Additional information on the CBA, active construction packages, and other HSR construction and contracting topics are available on the Authority's website.⁵

Expanded Construction Workforce Available Beyond the RSA

The emphasis on job training for local workers and contract requirements to use small businesses should provide employment opportunities for construction workers in the RSA. However, substantially increasing the RSA's local supply of qualified construction workers to meet project demand would require an extensive and successful job training program. Even with great success, it is possible that some construction workers would be residents of counties outside the RSA. Whether these workers from outside the RSA would affect the population and housing demand inside the RSA depends on whether the construction workers would be likely to relocate their households, temporarily or permanently, to the RSA to be nearer their work at the construction site. The likelihood of household relocation by construction workers is related to not only the locations and durations of construction employment opportunities, but also to the skills and occupations of the workers. A small number of highly skilled workers could come to the region for short periods, but would likely stay in area motels, mobile homes, recreational vehicles, or short-term rental units.

The U.S. Census Bureau's American Community Survey data show that more California workers are commuting long distances rather than relocating to be near jobs. California extreme commuters, those workers regularly commuting 90 minutes or more one way, increased by 40.3 percent from 2010 to 2015, when the number of such workers surpassed 600,000 (Henderson 2017). American Community Survey data also show that construction and mining workers had the longest average journey-to-work times among major occupational groups, averaging 33 minutes or 25 percent longer than that of the average commuter. Construction workers living in major metropolitan areas had even longer average commute times of 36 minutes, indicating a propensity for long commutes to work on projects in urban areas like the RSA (Kopf 2016).

Assuming typical interregional PM peak hour commuting speeds and a maximum one-way commute time of 90 minutes, construction workers at project locations near the midpoint of the San Francisco to San Jose Project Section might commute from cities as far away as Corte Madera, Richmond, Livermore, and Santa Cruz, and from the adjacent Northern California area extending across portions of seven counties, well beyond the RSA. Residents of that commute shed with primary employment in the construction industry were estimated at about 100,374 workers in 2017 (U.S. Census Bureau 2019a).

Caltrans has forecasted construction jobs within the RSA to be about 70,000 in 2024, the projected peak year of project construction (Caltrans 2015). The roughly 710 to 1,240 construction workers required for the project in the peak year of 2024 therefore represent just 1.0 to 1.8 percent of the 2024 construction workers that are forecast to be working in the RSA without the project.

Given the upheaval it would cause to their social networks and institutions, it is unlikely that many construction workers from outside the RSA would relocate their families to communities in the immediate RSA to pursue local HSR construction jobs because nearly all of the project's construction activity are anticipated to be completed within the 5-year period from 2021 to 2025 (Volume 2, Appendix 6-A). Skilled construction trade workers and heavy/specialized equipment operators are in high demand and may undertake work assignments at different construction sites from month to month, week to week, or even day to day, resulting in a continuing need to alter their commute patterns.

⁵ The CBA is a cooperative partnership and commitment among the Authority, skilled craft unions, and contractors. All construction contracts have a CBA, which is based on the Community Benefit Policy that promotes employment and business opportunities during the construction of the HSR project. For more information, refer to: https://www.hsr.ca.gov/business/general/community_benefits.aspx. Additional information on the Authority's design-build construction packages is available at: <http://www.hsr.ca.gov/Programs/Construction/index.html>.

Case studies of other large-scale infrastructure projects, such as the Electric Power Research Institute's report on the socioeconomic impacts of power plants, have shown that construction workers may commute weekly rather than daily, use mobile homes or recreational vehicles, or seek short-term rental units or hotel/motel accommodations as needed to facilitate temporary commute access to the construction sites (Electric Power Research Institute 1982). A limited number of contractors having both highly specialized skills and the expectation of sustained work contracts at a fixed location might need to relocate temporarily to the region during the construction period,⁶ but many construction workers who may be residents of the larger metropolitan region that extends beyond the RSA would drive or carpool to active project construction sites and return home at the end of the day. No construction worker camps would be established in the project footprint.

Employment Issues Resulting from Overlapping HSR Project Section Construction Schedules

The project is just one of several HSR project sections expected to be built within a relatively short timeframe and within relative proximity to one another. The RSA for the project includes Santa Clara County, which is also one of the counties comprising the RSA for the San Jose to Merced Project Section (Authority 2020). This section explores how those RSAs overlap and phasing considerations that may affect worker availability and related impacts.

The San Jose to Merced Project Section construction period (2022 to 2028) is anticipated to overlap the construction period anticipated for the San Francisco to San Jose Project Section (2021 to 2025). The peak construction year for the San Jose to Merced Project Section is anticipated to be 2024 (Authority 2020). The peak year for the San Francisco to San Jose Project Section is also anticipated to be 2024.⁷ Peak demands for workers for the two project sections are not anticipated to conflict. Some construction workers could work on both project sections, depending on project subsections' construction timing and workers' skills.

Construction workers experienced on one of these project sections would provide a valuable labor resource for the other, and the estimated daily commute sheds for the different project sections would overlap. Approximately 55,300 (or 73 percent) of the 76,150 employed residents who were primarily employed as construction workers in 2017 and living within the 90-minute commute shed for the San Jose to Merced Project Section were also residing within the commute shed for the San Francisco to San Jose Project Section (U.S. Census Bureau 2019a, 2019b; see also Volume 2, Appendix 3.17-A, Attachment 1).⁸

Operations Impacts

Common Regional Growth Impacts

Operations impacts that could affect regional growth relate directly to operating cost estimates, number of workers employed to operate and maintain the project, and related indirect or induced employment in the region. The project would result in operation of approximately 49 miles of

⁶ The San Jose to Merced Project Section alternatives would require the construction of more than 15 miles of tunnel between Gilroy and Merced, which would likely involve the use of tunnel-boring machines. Environmental impact reports for other proposed California large infrastructure projects using tunnel-boring technology, such as the Lake Elsinore Advanced Pumped Storage Project, also note the possibility of relocating tunnel-boring machine operators and support staff to the vicinity, unlike most project construction workers (The Nevada Hydro Company 2017). General descriptions of tunnel-boring occupations mention the significant time sometimes required by tunnel workers to travel through shafts or tunnels to reach the boring location, in addition to the standard journey-to-work commute time from those workers' permanent or temporary places of residence.

⁷ Excluding the San Jose to Diridon Station Approach Subsection, the peak year of construction for San Francisco to San Jose Project Section Alternatives A and B construction would be 2022.

⁸ Nine counties have land area within a drive-time boundary centered on the intersection of San Felipe Road and the Pacheco Pass Highway near Gilroy, and extending to the distance a vehicle could travel on roadways in 90 minutes at typical interregional PM peak commuting speed (see Volume 2, Appendix 3.17-A, Attachment 1). These counties are Alameda, Fresno, Merced, Monterey, San Benito, San Mateo, Santa Clara, Santa Cruz, and Stanislaus. The geographic centers of four of these counties (San Benito, San Mateo, Santa Clara, and Santa Cruz) are well within the 90-minute drive-time from the San Felipe Road and the Pacheco Pass Highway intersection, and the geographic centers of two counties (Alameda and Merced Counties) are less than a mile beyond the estimated 90-minute drive-time limit.

blended system infrastructure with Caltrain and HSR service sharing tracks; stations at the existing 4th and King Street and Millbrae Stations; and the LMF in Brisbane.

Operations of either alternative would result in similar and small direct and indirect or induced impacts on employment, population increases, and overall consumption of land associated with regional growth. The operating costs would be nearly the same for each alternative because both alternatives include the same number of stations, a similar LMF, and nearly the same track lengths. Other economic impacts from project operations are discussed in Section 3.12.6.1, including changes in tax revenues to local governments. Under each project alternative, the employment and population growth and the related consumption of land is projected to be not only comparable but also of comparably limited impact relative to the No Project Alternative.

Operations-Related Employment

Table 3.17-13 shows the estimated total annual employment associated with the operations of the project. The estimates include the direct jobs to operate and maintain the project (approximately 380 jobs), as well as the indirect or induced jobs created to support these new workers (approximately 530 jobs). This analysis does not distinguish between the two project alternatives because operations-related employment would be very similar under both project alternatives. Details regarding these calculations are provided in Volume 2, Appendix 3.17-A.

Table 3.17-13 Annual Employment Impacts during Operations and Maintenance

Impact	Employment ¹
Direct	380
Indirect/induced	530
Total	910

Sources: Volume 2, Appendix 6-B; U.S. Bureau of Economic Analysis 2018; CEDD 2017

¹ Calculated by application of RIMS II Multipliers for Industry Aggregation 33, Rail Transportation.

The direct O&M jobs would include train operations, infrastructure and equipment maintenance, station and train cleaning, ticketing and other commercial activities, and administration. Approximately 530 additional permanent jobs are estimated for the RSA, as indirect and induced impacts of the direct O&M employment and expenditures. The indirect or induced jobs would include additional employment supporting, servicing, or supplying train operations, administration and dispatching, infrastructure and equipment maintenance, station and train cleaning, ticketing and other commercial activities, and other occupations such as security, operations of concessions, and provision of goods and services to riders entering and leaving the HSR system.

Because O&M employment impacts would occur in many industrial sectors and beyond the construction industry, comparisons to total employment projected for the RSA under the No Project Alternative are appropriate. The total employment impact, both direct and indirect or induced, adds up to roughly 910 jobs per year associated with project operations. This represents well below 0.1 percent of the RSA's projected total employment in 2040 (2,573,200 from Table 3.17-3, No Project Alternative estimate). O&M employment would not be an adverse impact but rather a benefit to the local and regional economy, and it would not draw substantial numbers of workers from outside the region. Table 3.17-14 shows the estimated growth of direct, indirect, and induced employment and population associated with project operations.

Table 3.17-14 Operations-Related Employment and Population Growth

Impact	Employed Residents ¹	Population ²
Direct	380	690
Indirect/induced	530	970
Total	910	1,660

Sources: CEDD 2016a; CDOF 2016

CDOF = California Department of Finance

CEDD = California Employment Development Department

EIR/EIS = Environmental Impact Report/Environmental Impact Statement

O&M = operations and maintenance

RSA = resource study area

¹ For purposes of the Draft EIR/EIS analysis, all Phase 1 O&M direct and indirect and induced workers projected for the Project Section, and their households, are assumed to reside within the RSA.

² Calculated using 2015 ratios of employed residents (CEDD) to total population (CDOF), about 0.5 in aggregate for the RSA, applied to estimated 2040 direct and indirect and induced O&M employment.

Employment Growth Due to Improved Accessibility

A transportation project also can induce employment growth in a geographic area if it removes obstacles to employment growth (e.g., the establishment or expansion of an essential public service or the extension of a roadway to an area). Projects such as the HSR system can induce employment growth by providing an additional mode of fast and efficient transportation that facilitates travel between areas.

HSR service is expected to enhance access among cities in the region and between the Bay Area and the Los Angeles metropolitan regions, resulting in “long-term dynamic economic effects such as enhanced labor market accessibility, increased business travel and transactions, direct transport cost savings, improved business and worker productivity, support of tourism and other important service sectors requiring patron accessibility, etc.,” compared to the No Project Alternative (Authority and FRA 2017). The Authority conservatively estimates that the HSR system could support approximately 102,000 more jobs statewide than under the No Project Alternative through 2040 by improving connectivity between employment centers and residential areas. The analysis indicates that about 2,530 of these accessibility-based jobs would be located in the RSA and can be allocated to the Project Section.⁹

Table 3.17-15 shows the impact that the project is expected to have on employment growth in the RSA. The growth attributable to project O&M is small, an increase of about 0.1 percent to the expected 2040 conditions in the No Project Alternative. Also, in aggregate, the employment gains associated with increased accessibility represent small additions to the expected growth in the entire RSA—less than 1 percent above the No Project Alternative.

Induced Population Growth

A project can foster population growth in a geographic area if it removes obstacles to population growth (e.g., the establishment or expansion of an essential public service or the extension of a roadway to an area). Projects such as the HSR system could induce population growth by providing an additional mode of fast and efficient transportation that facilitates travel between areas.

⁹ About 30 percent of the accessibility increase for Santa Clara County is allocated to the Project Section, based on the San Francisco to San Jose and San Jose to Merced Project Sections' proportional shares of proposed HSR route miles within Santa Clara County, plus 6.03 route miles for the San Jose Diridon Station Approach Subsection overlap included in the regional growth modeling analysis for both project sections. All accessibility increases for San Francisco County and San Mateo County are allocated to the San Francisco to San Jose Project Section.

Table 3.17-15 Operations-Related Employment and Population Growth, Including Increased Accessibility Impacts

Region	Year 2015 Existing Conditions	No Project Alternative 2015–2040 Growth	No Project Alternative 2040 Baseline Forecasts	Phase I O&M Direct, Indirect and Induced Growth ³	2040 HSR Increased Accessibility Potential ³	Total HSR-Induced Growth ³	Total 2040 Projections with HSR	Total HSR Growth Inducement
Employment^{1,2}								
RSA	2,085,800	488,010	2,573,200	910	2,530	3,440	2,576,700	0.13%
Population³								
RSA	3,520,640	712,880	4,233,500	1,660	4,900	6,560	4,240,100	0.15%

Sources: CEDD 2016a; CDOF 2016; Authority and FRA 2017; Authority 2017

HSR = high-speed rail

O&M = operations and maintenance

RSA = resource study area

¹ Regional O&M direct employment is projected at about 380 by 2040, based on approximate route miles, and including 6.03 route miles for the San Jose Diridon Station Approach Subsection overlap.

² Accessibility increase allocations are assigned to the region (Authority and FRA 2017). About 30 percent of the accessibility increase for Santa Clara County was allocated to the Project Section, based on the San Francisco to San Jose and San Jose to Merced Project Sections' proportional shares of proposed HSR route miles within Santa Clara County, plus 6.03 route miles for the San Jose Diridon Station Approach Subsection overlap included in the regional growth modeling analysis for both project sections. All accessibility increases for San Francisco and San Mateo Counties are allocated to the San Francisco to San Jose Project Section.

³ Population was calculated using 2015 ratios of employed residents (CEDD 2016a) to total population (CDOF 2016), which are about 0.5 in aggregate for the RSA.

As described in the previous section on induced employment growth, HSR service is expected to enhance access among cities in the region and between the Bay Area and Los Angeles metropolitan regions compared to the No Project Alternative (Authority and FRA 2017). The Authority conservatively estimates that the HSR system and the 102,000 jobs it would encourage through improved accessibility could support approximately 230,000 more residents statewide than under the No Project Alternative through 2040.¹⁰ The analysis indicated that roughly 6,560 individuals would be induced to move to the RSA as a result of improved accessibility in the RSA.

Table 3.17-15 shows the impact that the project is expected to have on total induced population growth in the RSA. The growth attributable to project O&M is small, an increase of about 0.15 percent to the expected 2040 conditions in the No Project Alternative. Also, in aggregate, the population and employment gains associated with increased accessibility represent small additions to the expected growth in the entire RSA—less than 1 percent above the No Project Alternative.

Potential to Induce Additional Population Growth in Exurban Counties

The Authority assessed the extent to which workers might use the HSR system on a daily or frequent basis to commute from suburban and exurban communities to their places of work in the metropolitan central cities, and whether the planned HSR system could result in a redistribution of population unrelated to economic growth in outlying areas (Authority 2018a). In particular, suburban and exurban counties could attract population because of the high housing costs in California's heavily urbanized areas. People could relocate from the San Francisco and San Jose metropolitan areas to less expensive outlying communities (Authority 2018a).

For workers moving and purchasing housing in suburban and exurban communities but continuing to work in one of the metropolitan central cities, housing costs would decrease but transportation costs would likely increase (Authority 2018a). Living in suburban and exurban communities may also require those workers to make 2- and 3-hour, one-way commutes to their place of employment, under current conditions. More than 5,000 individuals routinely commute from Merced County for jobs in Santa Clara County (Authority 2018a). To the extent that the HSR system can reduce overall transportation costs by reducing the time and expense associated with commuting to high-paying job centers from the suburban and exurban communities, people may be encouraged to consider using the HSR system to access more affordable housing in suburban and exurban communities.

Phase 1 of the HSR system would include stations in the densely urbanized cities of San Francisco, Millbrae, and San Jose (Authority 2016). Additional stations would serve the suburban/exurban communities of Gilroy, Merced, Fresno, and Kings/Tulare. HSR travel time objectives from Central Valley communities to the central cities of the Bay Area would be less than 1 hour, considerably shorter than the 2- to 3-hour automobile commutes.

Individuals with median or higher-paying jobs in the metropolitan central cities but who live in a suburban or exurban community could reduce their household total average annual housing cost, pay somewhat higher transportation costs, and still reduce their total combined costs by about 5 percent or more.¹¹ This savings could be used to purchase a home rather than rent, purchase a bigger home, and/or access more community amenities. Some of the savings could be used for more costly but faster transportation if the HSR train travel durations, frequencies, and connecting modes of transportation between home, HSR stations, and work destinations are convenient. Some households could afford the HSR train for commuting on a daily or less frequent basis.

¹⁰ Residents were estimated using a constant statewide employment-to-population ratio of 2,257, times 102,000 jobs (Authority and FRA 2017).

¹¹ The change in percent of household income comparison was estimated by calculating the percent of average annual housing plus transportation (H+T) cost for central cities compared to suburban/exurban cities based on the same median household income for residents of San Francisco, Santa Clara, and Los Angeles Counties. For example, the H+T cost for Los Angeles is 57 percent of the median household income for Los Angeles County. The H+T cost for Bakersfield is 52 percent of the median household income for Los Angeles County, about 5 percent less.

Some individuals and their households may choose to relocate to suburban and exurban communities to purchase more affordable housing because of convenient access to potentially affordable HSR services. The number, magnitude, and distribution of households that may make this decision are difficult to estimate, because these values involve many economic factors and individual preferences. Such households would likely relocate to these suburban and exurban communities over time: during project construction, just prior to operations or after HSR operations have been proven to be fast, reliable, and affordable. Local governments would take steps to accommodate this potential population growth and increased demand for housing by updating their general plan policies, transit plans, zoning, and building codes. The increases in population within these suburban and exurban cities would not be stimulated by local economic growth but rather would be a shift of some population growth from expensive metropolitan central cities to suburban and exurban communities.

Land Use Consumption

It is important to understand the extent to which a project and its associated regional growth may require increases to overall land consumption and major changes to urbanization patterns. The RSA contains approximately 330,960 acres of urbanized land area: 211,450 acres in Santa Clara County, 29,780 acres in San Francisco County, and 89,730 acres in San Mateo County (U.S. Census Bureau 2018).

Table 3.17-15 shows that total population in the RSA is projected to grow by about 712,900 between 2015 and 2040 under the No Project Alternative, while employment is projected to grow by about 488,000 jobs. Table 3.17-15 shows that direct, indirect, induced, and accessibility-related impacts of project operations would add about 3,440 more jobs and approximately 6,560 more persons to the RSA by 2040 than otherwise projected under the No Project Alternative. More of this increase in regional growth is attributed to the improved accessibility offered by the HSR system rather than to employment for or induced by the long-term O&M requirements of the HSR system. The overall increase of jobs in 2040 attributable to the project is about 0.13 percent; the overall increase of population in 2040 attributable to the project is about 0.15 percent.

For the RSA, these additional growth inducements for jobs and population between 2015 and 2040 would not impose substantial incremental demand on available land supply. Table 3.17-7 shows that the region's housing supply is expected to increase by roughly 335,600 units between 2015 and 2040 under the No Project Alternative, while the population will increase by 712,900 during the same period. This equates to about 2.1 new people per new housing unit under the No Project Alternative. At this ratio, the 6,560 new RSA residents attributed to the project would demand 3,088 housing units more than would otherwise be required under the No Project Alternative, or less than 1.0 percent more units. With 1,646,900 total housing units expected in the RSA by 2040 under the No Project Alternative, the additional 3,088 units attributed to HSR would represent 0.19 percent more total units in the region.

Recent housing production in the RSA (Section 3.17.5.4, Housing Demand) indicates that the vast majority of new units have been built as multifamily units, and this trend is likely to continue given the scarcity and value of developable land in the RSA. At an average density of 50 units per acre typical for recent multifamily construction in the RSA (City of San Jose 2015, 2018), the total demand for new housing in the No Project Alternative would consume 6,712 acres of land, equivalent to about 2.03 percent of the RSA's existing urbanized area.¹² Adding the 3,088 new units associated with the project would increase land consumption by only about 62 acres, or 0.02 percent of the RSA's existing urbanized area.

Similarly, the employment growth associated with the project would increase the total new jobs from 488,010 under the No Project Alternative to 491,450 with the project. As with population growth, more of these added jobs are attributed to accessibility improvements from the HSR service rather than workers directly or indirectly involved in the operation of the HSR system. The

¹² The U.S. Census Bureau's 2018 *TIGER/Line Shapefiles*: Urban Areas map layer classifies approximately 330,960 land acres as existing urbanized areas in the RSA (U.S. Census Bureau 2018).

Authority does not know or cannot project the precise blend of job types and industries likely to be added as a result of the accessibility improvements. However, assuming each job occupies 400 square feet of building space—a typical ratio for a blend of workplaces including office, retail, industrial, and lodging space—the amount of new workspace required would be 195.20 million square feet for the No Project Alternative and 196.58 million square feet for the project. Assuming an average floor-area ratio of 1.0¹³ typical of contemporary urban workplace development, these workspaces would require 4,481 acres and 4,513 acres (about 1.35 and 1.36 percent of the RSA's existing urbanized area), respectively, a difference of 32 acres across the RSA.

This analysis suggests that demand attributed to HSR may increase overall RSA urbanized residential land by 62 acres and nonresidential land by 32 acres, yielding a total increase of 94 acres or 0.03 percent more total urbanized land than under the No Project Alternative. This does not represent a material difference in the amount of total urban land required for development to accommodate regional growth. Still, the overall amount of land required to accommodate new population and employment growth associated with the project is likely overestimated because the analysis conservatively assumes all new development would occur on previously vacant land.

Much of the expected development in the RSA, however, is likely to occur on sites already occupied by existing uses. Small-scale buildings and low-density land uses are frequently replaced with higher-density land use or development types, and even large projects such as former shopping malls are redeveloped at much higher densities. This market trend is further supported by recent state law prioritizing and incentivizing infill development in urban areas and near transit facilities,¹⁴ long-standing state law requiring jurisdictions to plan and zone land for their fair share of regional housing growth,¹⁵ and the focus of many RSA communities on changes to zoning and general plans to encourage intensification of development.

Ultimately, the location of the jobs, population, and households induced by the project would be determined by market forces and local land availability, infrastructure capacity, by local government planning and zoning regulations, other development policies as well as by proximity to the HSR stations. Development resulting from induced growth would be consistent with these market realities and prevailing land use plans, codes, and policies. Virtually every jurisdiction in the Project Section has identified economic development, compact and efficient land use patterns, and strong linkages between land use and transportation as primary goals for their future growth. The advantages provided by the project should support the achievement of those local and regional goals.

3.17.7 Mitigation Measures

Under both project alternatives, impacts related to regional growth would be limited. Therefore, no mitigation measures would be required.

3.17.8 Impacts Summary

At the regional level, the project would not induce employment or population growth substantially beyond what is projected, and adverse impacts of this growth in the RSA are not anticipated. Spending on project construction would yield economic benefits to businesses in the RSA. Alternative B (Viaduct to Scott Boulevard) would support the highest demand for workers during the construction period. The project alternatives have the same construction peak year, 2024, and would involve building the same number of stations, a similar LMF, and nearly the same length of track. Table 3.17-16 (at the end of this section) summarizes the project impacts by alternative.

¹³ Non-residential development floor area ratios vary significantly within the RSA; a floor area ratio of 1.0 is typical of contemporary urban workplace development across the urbanized Bay Area.

¹⁴ For example, Proposition 1 was passed by California voters in 2018, authorizing \$150 million for transit-oriented development and \$300 million for infill infrastructure as part of a statewide housing bond, and Senate Bill 35 (2017) created streamlined entitlement for infill projects meeting certain criteria.

¹⁵ California Housing Element Statutes (California Government Code §§ 65580–65589.8 and §§ 65751–65761).

During the 5-year construction period expected to peak in 2024, the total peak employment attributable to the project would add about 1,150 to 2,020 jobs, less than 0.1 percent of the RSA's total employment for all industries under the No Project Alternative. Direct jobs in construction trades required for the project, about 710 to 1,240 jobs, would represent a larger percentage increase to the projected construction industry employment base for the No Project Alternative, ranging by project alternative from about 1.0 percent to 1.8 percent of total projected construction workers in the RSA at the peak year—not a substantial impact. Observable commuting patterns for construction industry workers indicate that such workers frequently drive 90 minutes or more to job sites and this drive time covers parts of seven counties, not just the three counties in the RSA. The construction workers required for the project would represent a much smaller proportion of total construction industry workers in this commute shed.

It is anticipated that most of the construction laborers attracted from beyond the RSA, if any, would commute to work from their existing homes rather than relocating their families because of the expense and disruption of moving to what would likely be a relatively short-term job in the RSA. A small number of highly skilled workers could come to the region for short periods, but would likely stay in area motels, mobile homes, recreational vehicles, or short-term rental units. Requirements and goals for small and local businesses and worker training programs would further help to promote opportunities for workers within the RSA to fill many of the construction jobs, rather than attracting workers from outside of the RSA.

The expected peak year for this Project Section's construction (2024) would coincide with the peak year for the adjoining San Jose to Merced Project Section. However, that coincidence of peak year is in part because of the inclusion of the San Jose Diridon Station Approach Subsection extending between Scott Boulevard and West Alma Avenue in the analyses of both project sections. The peak year for construction of Alternatives A and B, excluding the San Jose Diridon Station Approach Subsection and the San Jose Diridon Station would be 2022. The difference in effective peak years, excluding the San Jose Diridon Station Approach Subsection, creates opportunities to leverage the training of workers on other project sections while not competing for their labor at the same time.

The effects of project operations would be nearly the same for the two project alternatives because the alternatives have the same number of stations, one LMF, and have nearly the same track lengths. During project operations, the number of workers required for direct O&M and indirect and induced employment would be about 910 employees in the RSA, which has well over 2 million workers, or just about 0.035 percent of the RSA's total labor force. The enhanced accessibility of the RSA because of HSR service may attract as many as 2,530 jobs that would not occur under the No Project Alternative, but this figure represents an increase of just 0.07 percent over the employment expected under the No Project Alternative.¹⁶

¹⁶ About 30 percent of the accessibility increase for Santa Clara County would be allocated to the Project Section, based on the San Francisco to San Jose and San Jose to Merced Project Sections' proportional shares of about 65 proposed HSR route miles in the county, plus 6.03 route miles for the San Jose Diridon Station Approach Subsection between Scott Boulevard in Santa Clara and West Alma Avenue in San Jose included in the regional growth modeling analysis for both the San Francisco to San Jose and San Jose to Merced Project Sections.

Table 3.17-16 Summary of Regional Growth Impacts by Alternative

Impacts	Alternative A	Alternative B (Viaduct to I-880)	Alternative B (Viaduct to Scott Boulevard)
Construction			
2024 Peak year direct employment	710	1,050	1,240
2024 Direct employment as % of projected RSA construction jobs	1.0%	1.5%	1.8%
2024 Peak year direct, indirect, and induced employment	1,150	1,710	2,020
2024 Total employment as % of projected RSA total jobs	0.05%	0.07%	0.09%
Direct employment over 5 years of construction	2,830	4,260	4,980
Total employment (direct, indirect, induced over 5 years of construction)	4,620	6,950	8,110
Operations			
Employment Impacts			
2040 Direct employment	380 jobs		
2040 Direct employment as % of projected RSA total jobs	0.04%		
2040 Direct, indirect, and induced employment	910 jobs		
2040 Accessibility-based employment	2,530 jobs		
2040 Total induced employment	3,440 jobs		
2040 Total induced employment as % of projected RSA total jobs	0.13%		
Population Impacts			
2040 Direct, indirect, and induced population growth	1,660 people		
2040 Accessibility-based population growth	4,900 people		
2040 Total induced population growth	6,560 people		
2040 Total induced population as % of projected RSA total persons	0.15%		

I- = Interstate
RSA = resource study area

Assuming a ratio of about 1.9 local residents per local job, similar to conditions within the RSA circa 2015,¹⁷ the 3,440 total jobs induced by project operations and accessibility improvements in the RSA in 2040 would raise the total population by about 6,560 persons. The estimated total direct, indirect, induced plus accessibility-related employment and population impacts of project operations represent increases of just 0.13 percent over 2040 projected employment and just 0.15 percent over 2040 projected population under the No Project Alternative. Over time, during project construction, prior to operations, or after HSR operations have been proven to be fast, reliable, and affordable, additional households may choose to relocate from expensive metropolitan central cities to suburban and exurban communities with more affordable housing and convenient access to HSR. The increases in population within these suburban and exurban cities would not be stimulated by local economic growth, but rather would be a shift of some population within the RSA or within the adjoining region. These levels of growth are not anticipated to be substantial impacts on the region.

Throughout the RSA, jurisdictions have adopted policies and plans intending to enhance their economic base; promote dense, compact, and efficient land use; and plan growth around transportation infrastructure improvements and services. In most places, the additional employment and population resulting from the project would be accommodated without the additional construction of housing solely to meet the needs of employment and population growth of the project operations (Section 3.12.6.1). Much of the expected development in the RSA is likely to occur on sites already occupied by uses that no longer represent the highest and best use for the land, and which could be redeveloped to accommodate the additional employment and population growth estimated from improved accessibility provided by the HSR system. These project impacts would be consistent with regional land use policies and growth management plans, and could assist communities in realizing the goals of these plans.

¹⁷ Total population per employment by place of work ratio in the RSA were derived from CDOF and CEDD data for 2015 (CDOF 2016; CEDD 2016a).