



EQUITY ANALYSIS REPORT



Plan BayArea 2040

FINAL SUPPLEMENTAL REPORT



Metropolitan
Transportation
Commission



Association
of Bay Area
Governments

JULY 2017

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Chapter 1. Introduction

This report summarizes key findings from the equity analysis for Plan Bay Area (PBA) 2040, the combined Sustainable Communities Strategy (SCS) and Regional Transportation Plan (RTP) for the San Francisco Bay Area. The analysis includes both the federally-required disparate impact and non-discrimination (Title VI) and environmental justice analyses, as well as an analysis of the overall performance of PBA 2040 based on equity measures adopted by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The equity analysis for PBA 2040 demonstrates MTC's compliance as a metropolitan planning organization (MPO) with federal requirements related to Title VI and environmental justice in the RTP development process. It also helps policymakers, local jurisdictions and the public understand the equity-related implications of implementing PBA 2040 on the region's disadvantaged communities. This report is one of several activities supporting regional equity objectives that MTC and ABAG to carry out as part of their regional planning efforts. Other activities range from public outreach to technical analysis, policy and program development, and implementation and monitoring.

Senate Bill 375

PBA 2040 is the second RTP to be developed with an SCS under California State Senate Bill (SB) 375,¹ which went into effect in 2009 to help achieve reductions in greenhouse gas (GHG) emissions to levels established by the California Air Resources Board and mandated under Assembly Bill 32. The Bay Area's per capita GHG emission targets are a 7 percent reduction by 2020 and 15 percent reduction by 2035 from 2005 levels. The primary purpose of SB 375 is to integrate land use and transportation planning to help lower GHG emissions and vehicle miles traveled through the development of an SCS that links future development, including housing for all income categories, with the region's transportation investments.

Legal and Policy Context

The contents of this report are intended to satisfy several federal requirements as well as regional policy objectives outlined in this section. At the federal level, requirements include: civil rights protections against discrimination in federally-funded programs on the basis of a person's race, color, or national origin; and federal environmental justice objectives aimed at avoiding disproportionately high and adverse effects on minority and low-income populations. At the regional level, MTC has adopted environmental justice principles that incorporate social equity throughout the agency's regional planning efforts, including PBA 2040. The following sections describe each set of the requirements.

Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 states that “[n]o person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”² Title VI further authorizes federal agencies that make grants (for example, the U.S. Department of Transportation [DOT]) to develop compliance guidance for its recipients.

¹ For more information on the bill, see: <https://www.arb.ca.gov/cc/sb375/sb375.htm>.

² Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d et seq. See: <https://www.justice.gov/crt/fcs/TitleVI-Overview>.

MTC's Roles and Responsibilities

As a recipient of DOT funds, MTC is responsible for complying with DOT regulations related to Title VI³ (see feature on page 1-4). In October 2012, the Federal Transit Administration (FTA) issued a new Circular with guidance to its recipients for compliance with DOT Title VI requirements.⁴ This guidance lays out requirements for FTA's recipients, including MPOs such as MTC, to ensure that their programs, policies and activities comply with DOT's Title VI regulations. The guidance offers several specific requirements that MPOs must submit to the state and FTA as part of their overall Title VI programs, including:

- “All general requirements set out in [the General Requirements section of] the Circular;
- “A demographic profile of the metropolitan area that includes identification of the locations of minority populations in the aggregate;
- “A description of the procedures by which the mobility needs of minority populations are identified and considered within the planning process;
- “Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data ... and charts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes...; and
- “An analysis of impacts identified in [the bullet above] that identifies any disparate impacts on the basis of race, color, or national origin, and, if so, determines whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact.”⁵

The methodology for conducting the analysis to meet these requirements is included in Chapter 2. In addition to analyzing PBA 2040 as described in this report, MTC's Title VI program includes a variety of commitments to ensure nondiscrimination on the basis of race, color or national origin in its programs and activities.⁶

Environmental Justice Executive Order 12898

In 1994, President Clinton signed Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which directs each federal agency to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations...”⁷ Furthermore, the Executive Order directs each federal agency to develop an agency-wide environmental justice strategy.

Accordingly, the DOT issued its original Environmental Justice Order in April 1997, establishing its overall strategy and procedures to comply with EO 12898. In response to a Memorandum of Understanding on Environmental Justice (August 4, 2011) signed by heads of federal agencies, DOT issued its revised environmental justice strategy, DOT Order 5610.2(a), in March 2012.⁸ This updated

³ Part 21—Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964. 49 CFR Subtitle A. See: <https://www.gpo.gov/fdsys/pkg/CFR-2012-title49-vol1/pdf/CFR-2012-title49-vol1-part21.pdf>.

⁴ Federal Transit Administration Circular 4702.1B, Title VI Requirements and Guidelines for Federal Transit Administration Recipients. See: <https://www.transit.dot.gov/regulations-and-guidance/civil-rights-ada/title-vi-civil-rights-act-1964>.

⁵ FTA Circular 4702.1B, Chapter VI-3, page VI-1f. See:

https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf.

⁶ For more information, see MTC's Title VI page at: <http://mtc.ca.gov/about-mtc/access-everyone/civil-rights-act-file-complaint>.

⁷ Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Code of Federal Regulations, Title 3 (1994). See: <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>.

⁸ Memorandum of Understanding on Environmental Justice and Executive Order 12898. See:

DOT Order places responsibility on the head of each Operating Administration within DOT to determine whether programs, policies or activities for which they are responsible will have an adverse human health or environmental effect on minority and low-income populations and whether that adverse effect will be disproportionately high.

As operating administrations within DOT, FTA and the Federal Highway Administration (FHWA) both define three fundamental environmental justice principles consistent with the Executive and DOT Orders:⁹

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The DOT Order further defines “disproportionately high and adverse effect on minority and low-income populations” as an adverse effect that:

- Is predominately borne by a minority and/or a low-income population, or
- Will be suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority and/or non-low-income population.

In June 2012, FHWA released a new and updated Order 6640.23A, *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.¹⁰ This Order clarifies FHWA’s environmental justice policies, guidance, and responsibilities consistent with the updated DOT Order. In August 2012, FTA released its final guidance in the form of a Circular on incorporating environmental justice principles into plans, projects and activities that receive funding from FTA.¹¹

This final guidance provides recommendations to recipients of FTA funds, including metropolitan planning organizations, on how to fully engage environmental justice populations in the public transportation decision-making process; how to determine whether environmental justice populations would be subjected to disproportionately high and adverse human health or environmental effects as a result of a transportation plan, project or activity; and how to avoid, minimize or mitigate these effects.

MTC’s Environmental Justice Principles

In addition to MTC’s long-standing commitment to supporting DOT, FHWA and FTA in fulfilling their environmental justice mission under EO 12898, MTC’s commitment to environmental justice is embodied in two Environmental Justice Principles adopted by the MTC Commission in 2007.

The adopted principles affirm MTC’s ongoing commitments to:

- Create an open and transparent public participation process that empowers low-income communities and communities of color to participate in decision-making that affects them; and
- Collect accurate and current data essential to defining and understanding the presence and extent of inequities, if any, in transportation funding based on race and income.

<https://www.epa.gov/environmentaljustice/memorandum-understanding-environmental-justice-and-executive-order-12898>.

⁹ “Environmental Justice at Department of Transportation,” Federal Highway Administration. See: http://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/.

¹⁰ FHWA Order 6640.23A, available at: <http://www.fhwa.dot.gov/legregs/directives/orders/664023a.cfm>.

¹¹ FTA Circular 4703.1, Environmental Justice Policy Guidance for Federal Transit Administration Recipients, available at: http://www.fta.dot.gov/legislation_law/12349_14740.html.

U.S. Department of Transportation Title VI Regulations

Specific discriminatory actions prohibited under Title VI regulations include:

- (a) A recipient under any program to which this part applies may not, directly or through contractual or other arrangements, on the grounds of race, color, or national origin:
 - i. Deny a person any service, financial aid, or other benefit provided under the program;
 - ii. Provide any service, financial aid, or other benefit to a person which is different, or is provided in a different manner, from that provided to others under the program;
 - iii. Subject a person to segregation or separate treatment in any matter related to his receipt of any service, financial aid, or other benefit under the program;
 - iv. Restrict a person in any way in the enjoyment of any advantage or privilege enjoyed by others receiving any service, financial aid, or other benefit under the program;
 - v. Treat a person differently from others in determining whether he satisfies any admission, enrollment, quota, eligibility, membership, or other requirement or condition which persons must meet in order to be provided any service, financial aid, or other benefit provided under the program;
 - vi. Deny a person an opportunity to participate in the program through the provision of services or otherwise or afford him an opportunity to do so which is different from that afforded others under the program; or
 - vii. Deny a person the opportunity to participate as a member of a planning, advisory, or similar body which is an integral part of the program.
- (b) A recipient, in determining the types of services, financial aid, or other benefits, or facilities which will be provided under any such program, or the class of person to whom, or the situations in which, such services, financial aid, other benefits, or facilities will be provided under any such program, or the class of persons to be afforded an opportunity to participate in any such program; may not, directly or through contractual or other arrangements, utilize criteria or methods of administration which have the effect of subjecting persons to discrimination because of their race, color, or national origin, or have the effect of defeating or substantially impairing accomplishment of the objectives of the program with respect to individuals of a particular race, color, or national origin.

MTC's Roles and Responsibilities

FTA's annual Master Agreement requires recipients, including MTC, to promote environmental justice by following FTA's compliance with EO 12898 and DOT's order on environmental justice. MTC fulfills these responsibilities through a range of programs and activities including:

- Identifying mobility needs of low-income and minority communities through MTC's Community-Based Transportation Planning Program;
- Developing and implementing MTC's Public Participation Plan, which lays out specific strategies for engaging low-income and minority populations and other traditionally underrepresented stakeholders throughout the metropolitan planning process;
- Conducting an environmental justice analysis of the RTP (as summarized in this report), including an analysis of the distribution of regional transportation investments for low-income and minority populations, and an analysis of benefits and burdens, using equity measures to determine whether the proposed investment strategy results in any disproportionately high and adverse human health and environmental effects on low-income and minority populations; and
- Continually refining and updating the data and analytical methods required to carry out environmental justice analysis at the regional, programmatic level, incorporating both stakeholder feedback and ongoing improvements in analytical tools and data collection.

Additional information on these and other activities as they relate specifically to PBA 2040 is provided in the following section.

Plan Development Process

Equity is one of the three overarching themes in PBA 2040. The three themes are equity, environment, and economy, or the “three Es” of sustainability. To realize all three themes, PBA 2040 was developed with meaningful and extensive participation of key stakeholders that range from community-based advocates and labor organizations to public agencies, business groups and individual residents. These engagement activities are described below.

Stakeholder Involvement

MTC and ABAG have a variety of practices and policies in place to ensure full and fair participation of all residents and stakeholder groups in the PBA 2040 update process, and specifically to identify needs and priorities of low-income, minority and underserved communities.

MTC’s Public Participation Plan

In February 2015, MTC adopted an update to the region’s Public Participation Plan, to guide agency outreach and public involvement efforts throughout the development of PBA 2040.¹²

This plan outlined several initiatives to support engagement with low-income and minority communities, including:

- Three rounds of equity analysis to incorporate equity considerations throughout the plan development process, including an assessment of project performance, an analysis of proposed plan scenarios, and an analysis of the preferred alternative; and
- Multiple rounds of outreach to low-income, minority and traditionally underrepresented communities via partnerships with community-based organizations, both early in the plan development process and again prior to adoption of the preferred alternative.¹³

Regional Equity Working Group

In spring 2015, MTC and ABAG staff solicited participation by members of MTC’s Policy Advisory Council (PAC) and the MTC/ABAG Regional Advisory Working Group in the formation of a Regional Equity Working Group (REWG). The group first convened in May 2015 and has met frequently throughout the planning process. The primary purpose of the REWG is to advise MTC and ABAG staff on the development of the equity analysis, including identifying equity measures, defining communities of concern and developing the methodology for assessment. The REWG brought together stakeholders from around the region representing low-income and minority communities; seniors and persons with disabilities; staff representing local jurisdictions, transit agencies and county congestion management agencies (CMAs); public health departments; and community-based organizations and advocacy groups. All REWG meetings are open to the public.

Goals and Performance Targets

MTC and ABAG rely on a performance-based approach to long-range planning and forecasting activities, including indicators such as impacts on disadvantaged communities. For PBA 2040, the performance targets were developed with extensive input from the Performance Working Group, which was composed of key stakeholders including members of MTC’s PAC, staff from CMAs and local jurisdictions, transit operators, community groups, business organizations, and environmental protection groups, among others. The targets were used to compare scenarios, highlight tradeoffs between goals,

¹² For more information on MTC’s Public Participation Plan, see http://mtc.ca.gov/sites/default/files/FINAL_Combined-2015_PPP_and_Appendix_A.pdf.

¹³ A summary of input received during the winter 2012 community-based-organization outreach efforts can be found at: <http://www.planbayarea.org/previous-plan/final-supplementary-reports-and-additional-resources>.

analyze proposed investments and flag issue areas where the plan may fall short.

The goals for PBA 2040 were adopted by MTC and ABAG in September 2015. In September and November 2015, the two agencies also adopted a total of 13 performance targets.¹⁴ Two of these 13 performance targets, reducing per capita greenhouse gas emissions from passenger vehicles by 15 percent and housing future population growth in the region, are statutory requirements. The remaining 11 targets address healthy and safe communities, open space protection, equity, economic vitality and transportation system effectiveness. Six of the 13 targets are directly tied to equitable outcomes and form the basis for conducting the equity analysis. These six targets are referred to as equity measures in this report. (see Chapter 2 for more details).

¹⁴ For more information on the performance targets and the overall Plan Bay Area 2040 performance assessment, see: <http://www.planbayarea.org/2040-plan/plan-details/goals-and-targets>.

Chapter 2. Methodology

In January 2016, the MTC Commission adopted Resolution 4217, which defines the equity analysis framework for Plan Bay Area (PBA) 2040.¹⁵ The framework defines Communities of Concern (CoCs) and describes the various qualitative and quantitative analyses for the plan. Components of the equity framework are described in this chapter.

Analysis Methodology

The primary purpose of the equity analysis is to estimate the distribution of benefits and burdens of proposed land use and transportation policies and projects on disadvantaged communities, and to assess whether these benefits and burdens are shared equitably across all population groups. This chapter summarizes the various definitions and methodologies used by MTC and ABAG to identify disadvantaged populations, establish metrics to assess potential benefits and burdens, and conduct quantitative and qualitative analyses.

The analysis is conducted for the Draft Plan as well as three additional scenario alternatives being studied in the Environmental Impact Report (EIR).¹⁶ For the analysis, the Draft Plan and other scenarios are compared to a “No Project Alternative” using six equity measures identified later in this chapter. The relative impacts of each alternative are measured over a defined time period – in the case of PBA 2040, the time period is 2010¹⁷ to 2040, where 2010 is considered the baseline year and 2040 the plan horizon year. The No Project Alternative, also analyzed over this time period, refers to a scenario where the Draft Plan is not adopted. This comparison between scenarios and a No Project Alternative is intended to capture the specific impacts of adopting the Draft Plan versus no action, as required by state and federal environmental protection laws.

This report summarizes the results from the following four types of analysis:

- Quantitative analysis of potential benefits and burdens of proposed land use and transportation policies and projects (scenarios) on disadvantaged communities based on six performance factors (the equity measures), using outputs from land use and transportation models and forecasts;
- Quantitative analysis of the share of potential benefits of proposed transportation investments that accrue to low-income and minority populations compared to non-low-income and non-minority populations, using demographic and travel survey data;
- Qualitative analysis of the share of potential benefits of proposed transportation projects that accrue to communities of concern and minority populations compared to the rest of the region and non-minority populations, using a mapping tool; and
- Quantitative analysis to demonstrate compliance with Title VI and environmental justice laws. The findings from these analyses are summarized in Chapters 5 and 6.

Populations and Geographies

The underlying methodology for conducting an equity analysis for the Draft Plan relies on a comparison of benefits and burdens of proposed policies and investments on different population groups (minority

¹⁵ MTC Resolution 4217, available at: <https://mtc.legistar.com/LegislationDetail.aspx?ID=2542165&GUID=D89FCABA-8814-4F0C-990D-B6803291A4D5>.

¹⁶ For more information on the Draft Plan EIR, see: <http://www.planbayarea.org/2040-plan/environmental-impact-report>.

¹⁷ For a limited number of measures, the baseline year is 2005.

vs. non-minority and low-income vs. non-low-income populations), and across different geographies (communities of concern vs. the remainder of the region). The section below defines these populations and geographies.

Minority Populations

The Bay Area is a “majority minority” region, where non-Hispanic Whites are not an absolute majority (they do not constitute more than 50 percent of the total population), even though they form the largest group in the region. This report uses the term “minority” primarily for maintaining consistency with the federal definition of disadvantaged populations.

Minority populations include persons who identify as any of the following groups as defined by the Census Bureau¹⁸ in accordance with guidelines provided by the U.S. Office of Management and Budget.

- American Indian or Pacific Islander Alone (non-Hispanic/non-Latino);
- Asian Alone (non-Hispanic/non-Latino);
- Black or African-American Alone (non-Hispanic/non-Latino);
- Hispanic or Latino of Any Race;
- Native Hawaiian or Pacific Islander Alone (non-Hispanic/non-Latino); and
- Other (Some Other Race, Two or More Races).

All residents who identify as Hispanic or Latino, even if they also identify with another race, are considered Hispanic or Latino. The “Non-minority” population therefore consists of persons who identify as non-Hispanic Whites or “White alone.”

Low-Income Persons and Households

MTC defines persons as low-income if they live in a household with incomes less than 200 percent of the federal poverty level established by the Census Bureau. MTC established the 200 percent threshold in 2001 to account for the Bay Area’s high cost of living relative to the rest of the country.¹⁹ The Census Bureau establishes poverty status for individuals based on a combination of an individual’s household composition, size and income in the Bay Area. In 2015, 100 percent of the federal poverty level was \$11,770 a year for a single person living alone, and approximately \$24,250 a year for a family of four.²⁰

The federal poverty level provides a reasonable benchmark to understand trends over time relative to the share of population that may be considered low-income. However, because the actual income thresholds for poverty are determined each year, it is hard to forecast the share of population below the threshold in future years. Therefore, for modeling and forecasting applications, MTC uses a different definition of low-income households, as described below.

For MTC’s travel model (see description of MTC Travel Model One under the Data Sources section later in the chapter), households that earn \$30,000 or less per year (in 2000 dollars)²¹ are considered low-income, which represents about a quarter of all households in the region. In comparison, households that earn \$100,000 or more per year (in 2000 dollars) are considered high-income, which also represents about a quarter of all households. For MTC’s assessment of transportation investments, households that earn \$50,000 or less per year (in 2006 dollars)²² are considered low-income. The different definitions of

¹⁸ For Census Bureau’s definitions for race and ethnicity, see: <http://www.census.gov/topics/population/race/about.html>.

¹⁹ The Census Bureau is working with other federal agencies toward development of a new Supplemental Poverty Measure (SPM). The SPM extends the information provided by the official poverty measure by including many of the government programs designed to assist low-income families and individuals that are not included in the current official poverty measure, and to account for other identified shortcomings of the current “official” poverty measure. See: <https://www.census.gov/content/census/en/library/publications/2016/demo/p60-258.html>.

²⁰ See the federal poverty level for 2015 here: <https://aspe.hhs.gov/2015-poverty-guidelines#thresholds>.

²¹ The income is inflated based on the official inflation rate for each year since 2000.

²² The regional Transit Passenger Demographic Survey collected information on income in 2006, which is one of several data

low-income households were established by the respective agencies that collected the underlying data (also see the Data Sources section later in the chapter). MTC will continue to work with these agencies to adopt more consistent definitions for low-income households in future data collection efforts.

Communities of Concern

MTC defines communities of concern (CoCs) as census tracts that have a concentration of both minority and low-income residents, or that have a concentration of low-income residents and any three or more of the following six disadvantage factors: persons with limited English proficiency,²³ zero-vehicle households, seniors aged 75 years and over, persons with one or more disability, single-parent families,²⁴ and renters paying more than 50 percent of their household income on housing.²⁵

Table 2-1: Plan Bay Area 2040 Communities of Concern Thresholds

Disadvantage Factor	Share of Regional Population 2009	Share of Regional Population 2014	Concentration Threshold*
Minority	54%	59%	70%
Low-Income	23%	25%	30%
Limited English Proficiency	9%	9%	20%
Zero-Vehicle Household	9%	10%	10%
Senior	6%	6%	10%
People with a Disability	18%	9%	25%
Single-Parent Family	14%	14%	20%
Cost-Burdened Renter	10%	11%	15%

Source: 2005-2009 and 2010-2014 American Community Survey 5-Year Average, MTC analysis.

* Concentration thresholds are higher than the regional mean (average) but below one standard deviation.

Table 2-2: Population, Households or Families within Communities of Concern, 2014

	Communities of Concern			Remainder of the Region			Region	
	Share within CoCs	% of CoCs		Share outside CoCs	% of RoR			
Minority	1,414,908	33%	83%	2,890,820	67%	51%	4,305,728	59%
Low-Income	797,603	43%	47%	1,040,227	57%	18%	1,837,830	25%
Limited English Proficiency	289,441	48%	17%	318,816	52%	6%	608,257	9%
Zero-Vehicle Household*	96,606	38%	18%	160,685	62%	8%	257,291	10%
Senior	78,821	18%	5%	349,640	82%	6%	428,461	6%
People with a Disability	187,368	28%	11%	486,533	72%	9%	673,901	9%
Single-Parent Family*	86,737	37%	25%	146,913	63%	11%	233,650	14%
Cost-Burdened Renter*	109,906	38%	20%	180,459	62%	9%	290,365	11%
Total Population	1,708,260	23%	100%	5,630,702	77%	100%	7,338,962	100

Source: 2010-2014 American Community Survey 5-Year Average

* Share calculated using the total number of households, families or renters. In 2014, the Bay Area had 2,636,267 households; 1,725,913 families; and 6,915,962 people above the age of 5.

Based on this definition, MTC designated 365 census tracts (or 23 percent of the total number of tracts) as CoCs for the equity analysis. These census tracts have a significant concentration of disadvantage in

sets used in the Transportation Investment Analysis.

²³ Populations above the age of 5 years that can speak less than “well” as defined by the U.S. Census.

²⁴ As a share of all families regardless of whether or not they have any children.

²⁵ As a share of all households regardless of occupancy status (renter or owner).

the region. It is worth noting that 23 percent of the region’s total population, 33 percent of minority persons and 43 percent of low-income persons reside within CoCs. See Table 2-2 for the shares of disadvantaged populations who reside within CoCs and the remainder of the region.

Except where noted, this report uses the Census Bureau’s 2010–2014 American Community Survey data and 2010 Decennial Census geographies for analysis, the most recent data and information available that is also compatible with MTC’s existing unit for conducting spatial analysis using the travel model – the traffic analysis zone (TAZ).²⁶ This cross-walk allows demographic characteristics from the Census data to be linked to travel characteristics from travel model outputs. This linkage is useful for comparing benefits and burdens of transportation investments on CoCs.

Table 2-3 below shows the total population within CoCs and the remainder of the region in 2014 and 2040.²⁷ As noted above, about 1.7 million people, or 23 percent of the region’s total population in 2014, reside in CoCs. Population growth in the remainder of the region (27 percent) is forecast to outpace growth in the CoCs (20 percent) between 2014 and 2040.

Table 2-3: Population in Communities of Concern, 2014 and 2040

	2014 Population		2040 Population		Change 2014–2040	
	#	%	#	%	#	%
Communities of Concern	1,708,260	23%	2,054,137	22%	345,877	20%
Remainder of Region	5,630,702	77%	7,141,432	78%	1,510,730	27%
Bay Area Total	7,338,962	100%	9,552,300	100%	2,213,338	30%

Source: ABAG Demographic Forecast, 2010–2014 American Community Survey 5-Year Average

Equity Measures

To conduct the analysis of benefits and burdens on disadvantaged communities, MTC and ABAG adopted six quantitative performance targets, or *equity measures*. These six measures are a subset of 13 performance targets²⁸ for the entire plan.

The equity measures for PBA 2040 include:

1. *Healthy and Safe Communities* (Performance Target #3) – to measure the health benefits and burdens associated with air quality, road safety and physical inactivity for high-income and low-income households;²⁹
2. *Equitable Access* (Performance Target #5) – to measure a lower-income household’s share of income consumed by transportation and housing costs, compared to the share for a higher-income household;³⁰
3. *Equitable Access* (Performance Target #6) – to measure the share of affordable housing in Priority Development Areas (PDAs), Transit-Priority Areas (TPAs), or High-Opportunity Areas (HOAs),³¹ within and outside CoCs;
4. *Equitable Access* (Performance Target #7) – to measure the share of low- and moderate-

²⁶ Most TAZs in the region correspond to one census tract, except for dense urban areas like downtown San Francisco, where more than one TAZ may “nest” within a census tract.

²⁷ ABAG Demographic Forecast.

²⁸ Plan Bay Area 2040 Performance Targets, see:

<https://mtc.legistar.com/LegislationDetail.aspx?ID=2542165&GUID=D89FCABA-8814-4F0C-990D-B6803291A4D5>.

²⁹ Households that earned more than \$100,000 (in 2000 dollars) are considered high-income, and those that earn less than \$30,000 (in 2000 dollars) are considered low-income for this analysis.

³⁰ Households that earned more than \$60,000 (in 2000 dollars) are considered higher-income, and those that earn less than \$60,000 (in 2000 dollars) are considered lower-income for this analysis.

³¹ See the Fair Housing and Equity Assessment report, ABAG, 2015, for a definition of high-opportunity areas: http://abag.ca.gov/files/1_FHEAFinalReport_3.13.15.pdf.

income households in PDAs, TPAs and HOAs that are at an increased risk of displacement, within and outside CoCs;

5. *Economic Vitality* (Performance Target #8) – to measure the share of jobs that are accessible by auto and transit in congested conditions, within and outside CoCs; and
6. *Economic Vitality* (Performance Target #9) – to measure the share of middle-wage jobs in the region, within and outside CoCs.

MTC and ABAG conducted an equity analysis using these equity measures at four stages leading up to the adoption of a Preferred Alternative in November 2016. These phases are: project performance; scenario analysis; draft preferred analysis; and, finally, EIR. Results from the analysis of EIR scenarios are summarized in Chapter 5.

The underlying methodology for assessing the equity impacts of the Draft Plan is:

- Designate each of the region's 1,588 census tracts as either a CoC or the remainder of the region. Based on the CoC definition and demographic analysis, this report identifies 365 tracts that are CoCs. The remaining 1,223 census tracts are designated as the remainder of the region.
- Calculate the indicator variables for both CoCs and the remainder of the region for each alternative based on the six equity measures. For two of the six equity measures, this analysis is done for low-income vs. high-income populations instead of CoCs vs. the remainder of the region.
- Evaluate the results relative to the No Project Alternative to assess whether (among other questions):
 - The scenario has a beneficial effect on CoCs or low-income populations; and whether
 - This benefit is similar or greater than the benefit to the remainder of the region or high-income populations.

Regional Trends Analysis

In addition to an analysis based on the equity measures and transportation investments described above, this report also summarizes key demographic and socioeconomic trends in Chapters 3 and 4 to provide further context for understanding the challenges faced by disadvantaged communities in the Bay Area. The REWG selected the following topics for this trends analysis:

- *Proximity to Services and Amenities* – to measure trends in the share of lower-income households that live in neighborhoods with a high walk score;³²
- *Exposure to Contamination and Pollutants* – to measure trends in the share of lower-income households exposed to air contaminants (diesel particulate matter and fine particulates [PM_{2.5}]);³³
- *Proximity to Opportunity Areas* – to measure trends in the share of lower-income households that live in high-opportunity areas;
- *Poverty in the Suburbs* – to measure trends in the share of low-income households that reside in suburban or inland jurisdictions, as defined by PBA 2040; and
- *Concentration of Poverty* – to measure trends in the share of low-income households that reside in neighborhoods that have a high concentration³⁴ of poverty.

³² Walk score is calculated by MTC and is based on access to a range of amenities and services, including parks, schools, grocery stores, primary care facilities, transit stations, jobs and libraries, among others, subject to data availability.

³³ See Community Air Risk Evaluation Program, Bay Area Air Quality Management District, at: <http://www.baaqmd.gov/plans-and-climate/community-air-risk-evaluation-care-program>, and the California Environmental Protection Agency (CalEPA), California Communities Environmental Health Screening Tool: CalEnviroScreen, at: <http://oehha.ca.gov/ej/ces2.html>.

³⁴ Census tracts with more than 40 percent low-income households; see: Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. May 2015. "Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." NBER Working Paper Series. National Bureau of Economic Research. <http://www.nber.org/papers/w21156>.

Chapter 3 also summarizes key demographic trends, with an emphasis on the eight disadvantage factors that define CoCs, as well as recent trends in housing affordability and access to opportunity.

Scenario Alternatives

The equity analysis compares the relative performance of four scenarios described below using six equity measures. The relative performance of scenarios is calculated by comparing model outputs for a No Project Alternative, which represent conditions in 2040 if the Draft Plan is not adopted, to the three scenario alternatives (developed through an extensive public process) and the Draft Plan itself, which was adopted by MTC and ABAG in November 2016.

Each scenario alternative is defined by a set of land use and transportation policies, projects and investments that reflect different growth patterns for the region. With the exception of the No Project Alternative, all other scenarios were developed to achieve a 15 percent reduction in per capita greenhouse gas emissions (mandated by the California Air Resources Board) and a specific amount of housing growth that assumed no net increase in in-commute to the region from neighboring counties (also called the regional housing control total).

A brief description of the No Project and other scenario alternatives is provided below. For more detailed description, see the PBA 2040 Draft EIR, section 3.1.

No Project Alternative – An EIR must analyze the “no project alternative.” (CEQA Guidelines, § 15126.6(e).) The purpose of the No Project Alternative is to allow a comparison of the environmental impacts of approving the proposed project with the effects of not approving it. The No Project Alternative must discuss the existing conditions, “as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.”

The No Project Alternative represents implementation of the general plans of all nine counties and 101 cities in the Bay Area without influence of a regional plan that integrates transportation, growth, and GHG reduction. No new regional land use plan would be developed and no new SCS policies would be implemented to influence the locations of housing and employment centers in the region. Transportation projects that would occur under the No Project Alternative would be substantially limited compared to the Draft Plan, consisting of five major regional transit, three local transit, and two highway projects from the previous plan that are fully committed with funding and completed environmental review.

Main Streets Alternative – The Main Streets Alternative envisions future population and employment growth in the downtowns of every city in the Bay Area to foster a region of moderately-sized, integrated town centers. This alternative comes closest to resembling a traditional suburban pattern, because it would result in increased greenfield development relative to the Draft Plan. To support this alternative’s dispersed growth pattern, transportation investment priorities would emphasize highway strategies, including the expansion of high-occupancy toll lanes on all regional highway and highway widening projects at key bottlenecks.

Big Cities Alternative – The Big Cities Alternative concentrates future population and employment growth in the locally-identified PDAs and TPAs within the Bay Area’s three largest cities: San Jose, San Francisco, and Oakland. Neighboring cities that are already well-connected to these three cities by transit would see moderate to substantial increases in population and employment growth, particularly in their locally-identified PDAs and HOAs. To support this alternative’s big city-focused growth pattern, the transportation infrastructure within and directly serving the region’s core would be maintained to a state of good repair, modernized to boost service and improve commutes and capacity, and expanded to meet increased demand. Bicycle and pedestrian infrastructure would be expanded in these cities, including a robust network of bike sharing.

Environment, Equity, and Jobs Alternative – The Environment, Equity, and Jobs (EEJ) Alternative includes strategies to focus more growth in suburban communities compared to the Draft Plan, in part to

reduce risk of displacement in urban areas. In addition, the EEJ Alternative includes more funding for bus operations in suburban areas to serve lower-income residents and reduces funding for highway expansion and efficiency projects with the objective of reducing adverse environmental impacts. This alternative would encourage intensification of land use beyond PDAs to include jobs-rich, high-opportunity TPAs not currently identified as PDAs. This alternative seeks to strengthen public transit by boosting service frequencies in most suburban and urban areas, other than on Muni, BART or Caltrain, and providing free transit passes to youth throughout the region.

Draft Plan – The Draft Plan provides a strategy for accommodating projected household and employment growth in the nine-county Bay Area by 2040 as well as a transportation investment strategy for the region. For a more detailed description of the Draft Plan, see the PBA 2040 Draft EIR, section 3.1.

Transportation Investment Analysis

In addition to modeling travel and socioeconomic outcomes based on various land use and transportation investments using equity measures, MTC carried out an off-model analysis of the Draft Plan's overall transportation investment strategy. This analysis illustrates the distribution of the investments relative to different population subgroups and communities in the region. In an ongoing effort to ensure equity in the metropolitan transportation planning process, MTC has previously carried out similar analyses of the 2009 RTP (*Transportation 2035*), the 2011 Transportation Improvement Program (TIP), the 2013 Plan Bay Area and TIP, the 2015 TIP, and, most recently, the 2017 TIP.

The Transportation Investment Analysis serves three key functions, including:

- Complying with Title VI regulations (per FTA Circular 4702.1B, issued in October 2012) by conducting an assessment with “charts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes...” and “an analysis of impacts ... that identifies any disparate impacts on the basis of race, color, or national origin...”;
- Complying with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which directs each federal agency to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations...”; and
- Complying with MTC's own adopted Environmental Justice Principles.

To carry out these functions, the Transportation Investment Analysis relies on three different methodologies described in this section to determine whether the Draft Plan's investments are shared equitably among low-income and minority populations, and to determine whether there is any disparate impact at the regional level on the basis of race, color or national origin. No specific federal standard currently exists for conducting an environmental justice assessment. Similarly, FTA's Title VI guidance for MPOs does not provide any specific benchmarks for the analyses. Finally, there are no established best practices or approved comparative analyses available against which MTC can measure its findings. Therefore, for this analysis, MTC is building on its prior work undertaken in the 2013 PBA investment analysis, and the 2013, 2015 and 2017 TIP.

Population/Use-Based Analysis

The population/use-based investment analysis compares the estimated share of investments that benefit low-income and minority populations to the share of their respective use of the transportation system (roadways and transit) and to their respective share of the region's population.

As an example, if a higher share of low-income populations rely disproportionately on the transit system for their access and mobility needs, and if the Draft Plan invests a higher share of revenues in the transit

system, then the low-income population will accrue a bigger share of the benefits. This scenario would therefore be considered equitable to low-income populations. In the aggregate, the analysis measures transit and motor vehicle trips using the 2012 California Household Travel Survey (CHTS) and various transit passenger demographic surveys (TPDSs).

The steps involved in conducting the population/use-based analysis include:

1. Using Census data, determine the share of low-income (L0) and minority (M0) population in the region.
2. Using the CHTS and TPDS data, calculate the share of all roadway trips by county and all transit trips by transit operator for low-income (L1 and L2) and minority (M1 and M2) populations.
3. Using the Draft Plan transportation project list, tally the total investments in roadways by county (RR) and transit by operator (TT).
4. For roadway investments, for each county, assign a share of the investment (refer to RR above) to the low-income population (L3) based in their share of roadway trips (refer to L1 above) for that county. Repeat for minority population (M3).
5. For transit investments, for each transit operator, assign a share of the investment (refer to TT above) to the low-income population (L4) based on their share of transit trips (refer to L2). Repeat for minority population (M4).
6. Sum all the investments (roadway and transit) that were assigned to low-income (L5) and minority (M5) populations.
7. Compare the share of population (L0 and M0) and trips by mode (L1/L2 and M1/M2) to the share of assigned investments (L5 and M5) to assess the level of benefit accrued to low-income and minority populations.

Table 2-4: Population/Use-Based Analysis

Population	Share of Regional Population	Share of Roadway Trips	Share of Transit Trips	Share of Roadway Investments	Share of Transit Investments	Share of Total Investments
Low-Income	L0	L1	L2	L3	L4	L5
Minority	M0	M1	M2	M3	M4	M5

At a regional level, while this approach takes advantage of the available data on trips for low-income and minority populations by county and transit operator, it is still a coarse analysis that has the following limitations:

- The analysis does not account for benefits and burdens at the project level. While a roadway project may benefit all users of that facility, the benefits may not necessarily accrue at the same proportion to each population group as their share of all trips in a county where the facility is located.
- The analysis also assumes that the share of trips by mode by a particular population group remains the same in future years, regardless of investments that improve efficiency, safety, capacity or access.
- The analysis does not adjust for the relative size of populations in future years. For example, the share of low-income population in 2040 may or may not be the same as in 2014.

- Lastly, pedestrian and bicycle projects are assigned to local streets and roads due to a lack of sufficient data on use by income and race/ethnicity, and some regional programs such as the climate initiative were not included in the assessment since they do not fit the roadway or transit categories.³⁵

The Title VI analysis is a subset of the population/use-based analysis, which only considers public transit projects that are funded through federal and state sources (described in more detail below).

Project Mapping Analysis

To supplement the population/use-based analysis described above, MTC mapped all roadway and transit projects to show the spatial distribution of projects relative to CoCs and census tracts with a concentration of minority populations. This analysis only presents data visually. It does not use a metric to estimate the potential benefit or burden of each project on disadvantaged communities. It also does not include projects that cannot be mapped. For example, a substantial share of total funding in the Draft Plan is dedicated to transit operators, but this investment cannot be mapped as a project.

This qualitative assessment involves examining the distribution of projects for any indication of systematic exclusion of CoCs or minority communities in the distribution of benefits. It also involves examining the distribution of projects for any systematic imbalances within the distribution of projects between CoCs and the remainder of the region, or between minority and non-minority communities. The analysis for minority populations satisfies one component of the Title VI analysis of the Draft Plan, as described below.

Title VI Analysis

As described in Chapter 1, the Federal Transit Administration (FTA) released updated guidance in October 2012 specifying how metropolitan planning organizations (MPOs) such as MTC must demonstrate compliance with Title VI of the Civil Rights Act of 1964 and DoTs Title VI regulations in the metropolitan planning process. This section describes the methodology for conducting the analysis that demonstrates compliance with these requirements, including the methodology for conducting a disparate impact analysis.

Table 2-5: FTA Requirements for Title VI Analysis

FTA Requirement	Related Plan Bay Area 2040 Analysis
“Demographic maps that overlay the percent minority and non-minority populations as identified by Census or ACS data ...”	Project mapping analysis that overlays projects that can be mapped over above-regional-average concentrations of minority residents.
“[C]harts that analyze the impacts of the distribution of State and Federal funds in the aggregate for public transportation purposes...”	Population/use-based analysis of public transit investments using state and federal funding sources.
“An analysis of impacts identified in paragraph [above] that identifies any disparate impacts on the basis of race, color, or national origin” ³⁶	Disparate impact analysis comparing Plan Bay Area 2040 investments per capita and per rider for minority and non-minority populations.

Because MTC does not have sufficient data to map only those projects that receive state and federal funds, the disparate impact analysis shows all transit investments overlaid against minority tracts, regardless of fund source. MTC will continue to investigate the feasibility of updating future Regional

³⁵ For example, the Sonoma-Marín Area Rail Transit service will start in early 2017, so there is no usage data currently available, even though the plan allocates funding for the project.

³⁶ FTA Circular 4702.1B, page VI-2. See: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf.

Transportation Plan (RTP) project databases and/or travel model parameters to include more specific fund source information in light of FTA requirements. MTC has the data to distinguish between public transportation investments that receive state and federal funds for the population/use-based analysis.

The state and federal fund sources included in the Title VI analysis are:

- *Transit Operating* – State Transit Assistance (revenue- and population-based), FTA Sections 5307 and 5311, Low Carbon Transit Operations Program (Cap and Trade);
- *Transit Capital (Replacements)* – FTA Sections 5307, 5340, 5311, 5337, and 5339, FHWA Ferry Boat Program, FTA Passenger Ferry Grant Program, FTA Bus and Bus Facilities Discretionary Program, STP/CMAQ, Anticipated; and
- *Transit Capital (Expansions)* – FTA Section 5309, STP/CMAQ, Transit and Intercity Rail Program (Cap and Trade), Affordable Housing and Sustainable Communities Program (Cap and Trade), High Speed Rail, Anticipated.

To conduct the disparate impact analysis, the results of the population/use-based analysis of public transit investments using state and federal funds are assigned to minority and non-minority populations on a per capita and per-rider basis. A comparison of the per capita and per-rider investments for the two groups determines whether there is any disparate impact.

Although FTA does not provide specific guidance or standard benchmarks to determine whether any given result represents a disparate impact, a general practice in such analysis is to use the percentage result to determine whether any differences between benefits for minority or non-minority populations may be considered statistically significant. If a disparate impact is found to be statistically significant, consideration must then be given to “whether there is a substantial legitimate justification for the policy that resulted in the disparate impacts, and if there are alternatives that could be employed that would have a less discriminatory impact.”³⁷

Environmental Justice Analysis

Under Executive Order 12898 and the associated DOT Order on Environmental Justice, MTC must assist DOT, FTA and the Federal Highway Administration (FHWA) in their mission “to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects,” on environmental justice (EJ) populations. For the EJ analysis in this report, adverse effects are estimated using the six equity measures to determine whether EJ populations share in the benefits of the Draft Plan’s investments without bearing a disproportionate share of the burdens.

To make this determination, this report uses DOT’s definition of a “disproportionately high and adverse effect,” which relies on meeting the following two conditions:

- An adverse impact is predominately borne by minority and/or low-income populations, and
- An adverse impact on minority and/or low-income populations is significantly more severe or greater in magnitude than the adverse effect on non-minority and/or non-low-income populations.

To test the first condition, the analysis compares the effect of the No Project Alternative and the Draft Plan on EJ populations. This analysis shows whether the measure is moving in the right direction for EJ populations. To test the second condition, the analysis compares the effect of the Draft Plan on EJ populations and non-EJ populations. An EJ population is determined to experience “disproportionately high adverse effect” when this condition is met AND when the EJ population is more impacted by the Draft Plan compared to the No Project Alternative.

³⁷ Ibid.

Data Sources

This section describes the various data and their sources used for the analyses in this report. They range from large, multi-purpose public data products, such as those provided nationally by the Census Bureau, to smaller, more specialized regional data collected and maintained by MTC and ABAG.

Decennial Census and American Community Survey

The Census Bureau provides two key data sets used in this report. The first is the Decennial Census, which was completed in 2010 and is a 100 percent count of all persons in the U.S. The Decennial Census includes information on a person's race and ethnicity as well as age and certain household and family characteristics. The second data set is the American Community Survey (ACS) data, which is an ongoing, annual, sample-based survey of the U.S. population. Compared to the Decennial Census, ACS provides far greater detail on various socioeconomic characteristics, including data on household income, poverty status, level of proficiency in English, household vehicle ownership, disability status, housing costs and commutes.

Because the ACS is based on sample data (as opposed to 100 percent counts of the population in the Decennial Census), any analysis using detailed socioeconomic data must be done for a larger population or geography. In this report, data from ACS is used to define communities of concern, summarize regional trends (Chapters 3 and 4), and calculate the share of low-income and minority populations for the Transportation Investment Analysis (Chapter 5). Data from the 2000 Decennial Census is used mainly for historical comparisons.

ABAG Forecasts

The Association of Bay Area Governments (ABAG) maintains the regional population, household, and employment forecasts for the nine-county region. MTC and ABAG use these forecasts throughout the plan development process, starting with estimating future population size by income category, number of jobs by sector and number of households by size. This information is used as input into the land use and transportation model, as well as for off-model analysis such as healthy communities.

MTC Travel Model One

MTC's Travel Model One is an activity-based travel demand forecasting model that simulates trips and travel patterns for different time periods, such as for the baseline year as well as the plan horizon year of 2040. MTC's travel model uses an advanced population synthesizer to support more sophisticated travel behavior simulations compared to MTC's previous travel model. The simulations capture coordinated travel among members of the household and the availability of time periods in scheduling. Results for the six equity measures analyzed in Chapter 5 are calculated in part using MTC's travel model.

UrbanSim Land Use Model

In 2011, ABAG and MTC staff partnered with researchers at the University of California Berkeley to develop a spatial, parcel-based economic and land use model known as UrbanSim. The model was developed to predict economic behavior based on detailed market and regulatory information stored at a parcel level and subsequently to simulate economic behavior of developers and development patterns.³⁸ This modeling approach is analogous to Travel Model One's simulation of household travel behavior.

UrbanSim and Travel Model One work in an integrated manner to help regional planners examine the connections between transportation investments and land use patterns. MTC utilizes UrbanSim in conjunction with Travel Model One to estimate the relative performance of various land use and transportation strategies and investments analyzed in the EIR. The results for the six equity measures analyzed in Chapter 5 are calculated in part using the UrbanSim model.

³⁸ For more information, see: <http://www.urbansim.org/>.

Bay Area Household Travel Survey 2012-2013

The Bay Area Travel Survey (BATS) is MTC's periodic regional household travel survey, most recently completed in 2012-2013, and conducted in concert with the California Department of Transportation's statewide California Household Travel Survey (CHTS). The CHTS is an activity-based travel survey that collects information on all in-home and out-of-home activities, including all trips, over a one-day period for approximately 10,000 Bay Area households. The survey provides detailed information on many trip characteristics such as trip purpose, mode, origins and destinations, as well as household demographic and socioeconomic characteristics, and informs development of the regional travel model. In this report, data on usage of the regional transportation system, the share of trip-making on the region's road and highway system, and different demographic groups comes from CHTS.

Bay Area Transit Passenger Demographic Survey

In 2012, MTC began a program of collecting consistent demographic and trip data from Bay Area transit passengers. Since then, passengers from 15 transit agencies have been surveyed, and the rest of the region's system is anticipated to be surveyed by 2017. MTC works with transit operators to collect consistent demographic and travel-activity data across all transit systems surveyed.³⁹ In order to make best use of available funding and resources to support these extensive survey efforts, surveys are being conducted for different systems on a serial basis over time.

Data collected include geographic detail of the transit trip taken and passenger race/ethnicity, age, fare payment information, household income and household vehicle availability. Results for this survey are used in the Transportation Investment Analysis⁴⁰ to determine transit-investment benefits to low-income and minority populations based on these groups' share of transit use on individual systems and across the region as a whole. The Transit Passenger Demographic Survey also informs the Title VI analysis of PBA 2040 by establishing a consistent demographic profile of the region's overall transit ridership across all systems by minority and non-minority status.

³⁹ Surveys are being conducted on all transit systems claiming funds under the Transportation Development Act (TDA), consistent with those included in MTC's annual Statistical Summary of Bay Area Transit Operators.

⁴⁰ Operator-collected data was used when recent MTC-collected data was not available, including surveys collected by San Francisco Municipal Transportation Agency and Santa Clara Valley Transportation Authority. Data from MTC's 2007 Transit Passenger Demographic Survey provided information for the remaining six operators. Where appropriate, the 2015 MTC Statistical Summary of Bay Area Transit Operators was used to provide current ridership totals for regional comparisons.

Chapter 3. Regional Trends

This chapter describes key regional trends related to demographics, housing and transportation. The demographics section summarizes recent trends in the population subgroups, households and families at the regional and county level; the housing section summarizes the challenges associated with affordability, supply and location in relation to jobs and transit; and the transportation section summarizes travel patterns for low-income and minority populations as they relate to mode of travel, means of travel to work and affordability. The demographic trends analysis for low-income and minority populations satisfies the requirements for Environmental Justice and Title VI analysis, summarized in more detail in Chapter 6.

Demographic Characteristics

This section summarizes key demographic characteristics of Communities of Concern (CoCs) as well as trends since 1990 for the eight factors that define CoCs, including: minority, low-income, senior and disabled populations; people with limited English proficiency; zero-vehicle and rent-burdened households; and single-parent families. For a definition of each of the eight factors and CoCs, see Chapter 2.

Communities of Concern

MTC identifies CoCs based on the relative concentration of disadvantage at a census tract level. The demographic makeup of CoCs is therefore distinct from the region as a whole (see Table 3-1 below). While 23 percent of the region's total population resides in CoCs (1.71 million out of 7.34 million residents), this percentage captures a meaningful cross-section of disadvantaged communities in the Bay Area. For example, 83 percent of the population in CoCs is minority and 47 percent is low-income, compared to 59 percent and 25 percent respectively for the region. But for seniors and people with disabilities, the difference is indistinguishable, suggesting that these populations tend to be more dispersed around the region.

For all population sub-groups that comprise CoCs, the share that reside within CoCs is higher than the regional average, except for the minority population. For example, even though persons with limited English proficiency comprise about 9 percent of the region's population, 48 percent reside within CoCs. Similarly, 43 percent of the region's low-income population, 38 percent of households without a vehicle, 37 percent of single-parent families and 38 percent of severely cost-burdened renters reside within CoCs, even though they comprise 25 percent, 10 percent, 14 percent and 11 percent of the region's population, households or families, respectively. None of the population shares within CoCs are higher than in the rest of the region.

Only for minority populations, the share of population within CoCs (33 percent) is lower than the regional average (59 percent), suggesting that there is a large minority population in the Bay Area and that they are dispersed around the region. At the same time, it is important to note that a majority of all sub-groups resides outside CoCs, where they are either dispersed spatially or, if they are concentrated, do not overlap with as many other groups to qualify as a CoC.

Table 3-1: Communities of Concern (CoCs) and Remainder of the Region (RoR), 2014

	Communities of Concern			Remainder of the Region			Region	
	Share within CoCs		% of CoCs	Share outside CoCs		% of RoR		
Minority	1,414,908	33%	83%	2,890,820	67%	51%	4,305,728	59%
Low-Income	797,603	43%	47%	1,040,227	57%	18%	1,837,830	25%
Limited English Proficiency	289,441	48%	17%	318,816	52%	6%	608,257	9%
Zero-Vehicle Household*	96,606	38%	18%	160,685	62%	8%	257,291	10%
Senior	78,821	18%	5%	349,640	82%	6%	428,461	6%
People with a Disability	187,368	28%	11%	486,533	72%	9%	673,901	9%
Single-Parent Family*	86,737	37%	25%	146,913	63%	11%	233,650	14%
Cost-Burdened Renter*	109,906	38%	20%	180,459	62%	9%	290,365	11%
Total Population	1,708,260	23%	100%	5,630,702	77%	100%	7,338,962	100

Source: 2010-2014 American Community Survey 5-Year Average

* Share calculated using the total number of households, families or renters. In 2014, the Bay Area had 2,636,267 households; 1,725,913 families; and 6,915,962 people above the age of 5.

Minority Population

The Bay Area officially became a “majority minority” region in 2000,⁴¹ and like the rest of California and the United States, its population is expected to become even more diverse over time. At a neighborhood level, between 2000 and 2014, the minority population increased in almost every community in the region, with the notable exceptions of West and North Oakland, Emeryville, and West Berkeley, where the minority population declined significantly (see Maps 5,6 and 7).

In 2014, there were approximately 3.1 million Whites in the Bay Area, or 41.4 percent of the total population. Between 1990 and 2014, the White population declined by 608,016 (-17 percent). During the same time, the Black or African American population declined by 60,555 (-12 percent); the Asian population increased by 874,244 (+99 percent); and the Latino or Hispanic population increased by 820,348 (+89 percent). At the same time, the total Bay Area population increased by 22 percent, from approximately 6.0 million to 7.4 million (see Maps 8 to 11).

Table 3-2: Bay Area Population by Race, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990- 2014 (%)
White Alone	3,658,309	3,392,204	3,165,395	3,050,293	-17
Black Alone	516,420	497,205	463,359	455,865	-12
Asian Alone ⁴²	884,547	1,278,515	1,519,768	1,758,791	+99
Latino / Hispanic	923,606	1,315,175	1,521,456	1,743,954	+89
All	6,023,577	6,783,760	6,950,764	7,360,487	+22

Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Table P8, American Community Survey 2005-2009 and 2010-2014 Table B03002

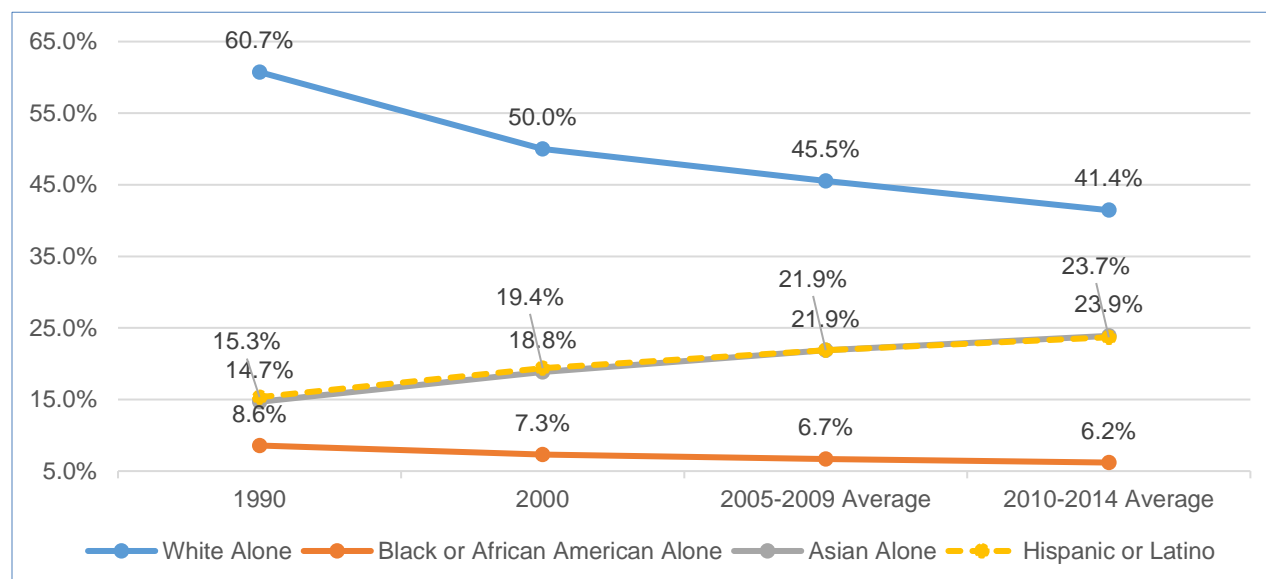
While all nine counties experienced a decline in their White population between 1990 and 2014, the steepest declines occurred in Alameda (-24 percent), San Mateo (-22 percent) and Santa Clara (-28 percent) counties. In 2014, the largest share of the White population in the region lived in Santa Clara County (21 percent). While the White population declined at the regional level, it increased in the

⁴¹ U.S. Decennial Census, 2000.

⁴² In 1990, the "Asian Alone" category includes Pacific Islanders, and Pacific Islanders are not included in the "Other" category.

Mission District and Presidio in San Francisco; West Berkeley, West Oakland, Oakland Chinatown, and the city of Emeryville in the East Bay; and parts of the cities of St. Helena and Napa in the North Bay.⁴³ Areas where the White population increased between 2000 and 2014 also experienced a decline in their share of low-income population, indicating that at least some of this shift occurred due to rising housing costs in transit-accessible areas in inner bay communities.

Chart 3-A: Share of Bay Area Population by Race, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Table P8, American Community Survey 2005-2009 and 2010-2014 Table B03002

Between 1990 and 2014, the steep declines for Black or African American populations occurred in Alameda (-19 percent), San Francisco (-40 percent), San Mateo (-46 percent) and Santa Clara (-15 percent) counties. Marin County also experienced a decline, but from a small base. At the same time, the Black or African American population increased in Contra Costa (+28 percent) and Solano (+32 percent) counties. Napa and Sonoma counties also experienced a gain, but from a small base. In 2014, the largest share of the Black or African American population lived in Alameda County (40 percent).

At a neighborhood level, between 2000 and 2014, the Black or African American population declined substantially in West Oakland, North Oakland, East Oakland, West Berkeley, the unincorporated community of North Richmond and the Iron Triangle neighborhood in the city of Richmond. The Black or African American population also declined in the cities of East Palo Alto and Dublin, in the Hunters Point and Mission District neighborhoods in San Francisco, and in parts of the city of Vallejo.⁴⁴ At the same time, the Black or African American population increased substantially in the communities of Pittsburg, Antioch and Oakley in East Contra Costa County – areas where the share of low-income residents also increased between 2000 and 2014.

Between 1990 and 2014, all nine counties experienced an increase in their Asian and Latino or Hispanic populations. Steep increases for the Asian populations occurred in Alameda (+128 percent), Contra Costa (+116 percent), San Francisco (+34 percent), San Mateo (80 percent) and Santa Clara (+141 percent) counties. Similar to the Asian population, the Latino or Hispanic population also increased in Alameda (+94 percent), Contra Costa (+193 percent), San Francisco (+27 percent), San Mateo (64 percent) and Santa Clara (+57 percent) counties. For both the Asian and the Latino or Hispanic

⁴³ US Decennial Census 2000 and American Community Survey 2010-2014 5-year average.

⁴⁴ Ibid.

populations, Marin, Napa, Solano and Sonoma counties also experienced a gain, but from a small base. At a neighborhood level, between 2000 and 2014, the Hispanic population grew in almost all the communities in the region, but especially in the cities of Redwood City and Palo Alto in the Peninsula; San Jose, Mountain View and Gilroy in the South Bay; Richmond, Pinole, Oakland and Hayward in the East Bay; Pittsburg, Antioch and Concord in East Contra Costa County; and San Rafael, Santa Rosa, Napa, Vallejo and Fairfield in the North Bay.⁴⁵ Significantly, the Hispanic population declined substantially in the Mission District in San Francisco, West and South San Jose, the Great Mall area in the city of Milpitas, and the cities of Brentwood, Napa and St Helena.

Between 2000 and 2014, the Asian and Pacific Islander population increased significantly in the South Bay (Palo Alto to Cupertino and Milpitas), inner East Bay (Alameda, Hayward and Fremont), and the Tri Valley area (San Ramon, Dublin and Pleasanton) (see Map 3c).⁴⁶

Low-Income Population

The Bay Area has experienced a significant rise in the number and share of low-income residents since 1990, a trend that is mirrored at the state and national level. The “sub-urbanization” of poverty is another overarching trend across the country, which has accelerated in the Bay Area following the Great Recession and the resulting foreclosure crisis.⁴⁷ In 1990, 43 percent of the region’s population below 200 percent of the poverty level lived in the cities of San Francisco, Oakland and San Jose, which offer a relatively higher level of transit access and services but lower school quality and personal safety compared to the rest of the region. By 2000, that share had fallen to 39 percent, and continued to decline to 37 percent in 2014.⁴⁸

At a neighborhood level, between 2000 and 2014, the low-income population declined substantially in the Presidio, Mission District, South of Market, Financial District, Chinatown and Twin Peaks neighborhoods in San Francisco; West and North Oakland, Chinatown and the Fruitvale area in the city of Oakland; the city of Vacaville and parts of Napa in the North Bay; and West San Jose and parts of Palo Alto in the South Bay (see Maps 12, 13 and 14).⁴⁹

At the same time, the low-income population increased substantially in the Hunters Point and Visitacion Valley neighborhoods in San Francisco; the unincorporated community of North Fair Oaks in San Mateo; South and East San Jose, the Del Mar High School area, and South Morgan Hill in the South Bay; parts of the cities of Newark and Hayward in the inner East Bay; parts of the cities of Martinez, Concord, Pittsburg and Antioch in East Contra Costa County; and parts of the cities of Vallejo, Fairfield, Napa, St. Helena and Santa Rosa in the North Bay.

In 2014, 1.8 million individuals, or 25 percent of the total population in the Bay Area, lived in households that earned less than twice the federal poverty level (FPL) (200 percent FPL), or \$47,700 for a family of four. Alameda County accounted for more than 23 percent of all individuals in low-income households in the region, followed by Santa Clara (23 percent), Contra Costa (14 percent) and San Francisco (13 percent) counties.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Soursourian, Matthew. January 2012. "Community Development Research Brief: Suburbanization of Poverty in the Bay Area." Federal Reserve Bank of San Francisco. <http://www.frbsf.org/community-development/files/Suburbanization-of-Poverty-in-the-Bay-Area2.pdf>.

⁴⁸ MTC staff analysis of 1990 Census STF3 Table P117, 2000 Census SF3 Table B88, and American Community Survey 2014 1-Year Estimates Table B17002.

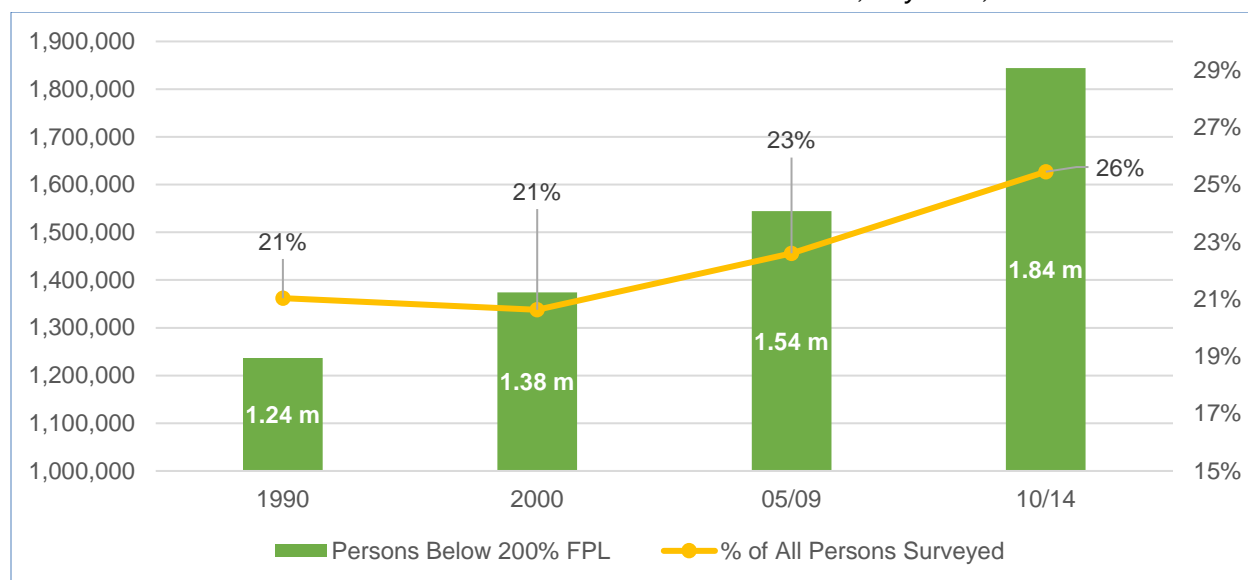
⁴⁹ U.S. Decennial Census 2000 and American Community Survey 2010-2014 5-year average.

Table 3-3: Share of Bay Area Individuals in Low-Income Households by County, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change in #s 1990-2014 (%)
Alameda	24%	24%	25%	28%	+42
Contra Costa	18%	19%	21%	25%	+92
Marin	14%	16%	16%	20%	+54
Napa	21%	23%	25%	28%	+70
San Francisco	30%	26%	27%	28%	+8
San Mateo	17%	16%	19%	20%	+42
Santa Clara	18%	18%	21%	23%	+57
Solano	22%	23%	24%	28%	+65
Sonoma	22%	22%	25%	30%	+72
Bay Area	21%	21%	23%	25%	+49

Source: 1990 Census data from NHGIS.ORG Code E1C, Census 2000 Table P088, American Community Survey 2005-2009 and 2010-2014 Table C17002

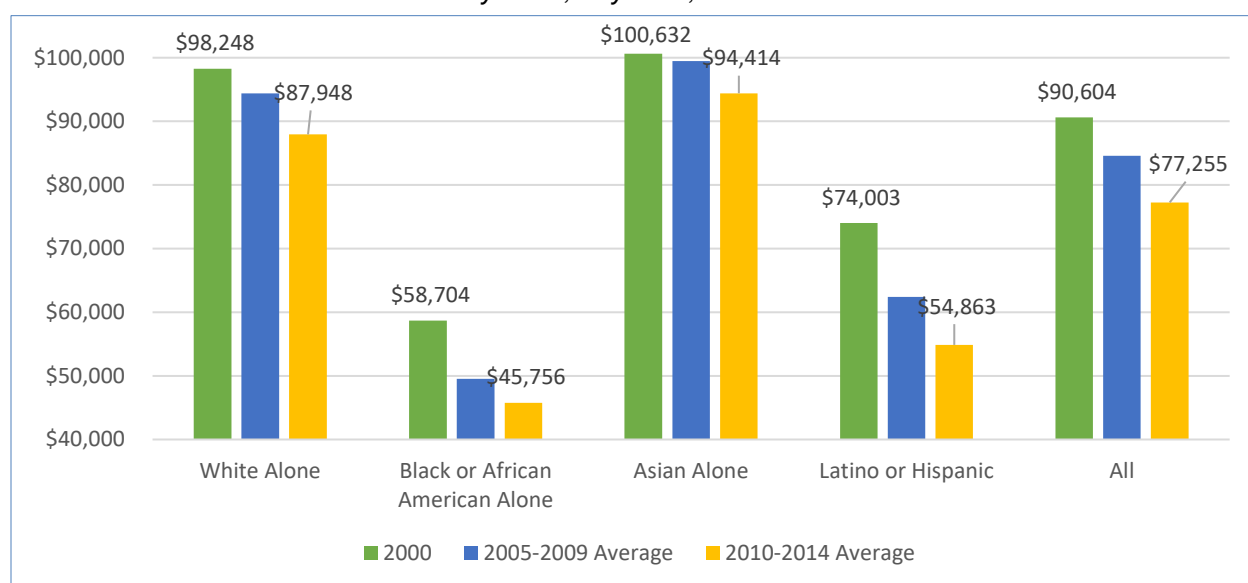
Chart 3-B: Number and Share of Individuals in Low-Income Households, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code E1C, Census 2000 Table P088, American Community Survey 2005-2009 and 2010-2014 Table C17002

Between 1990 and 2014, the number of individuals in low-income households in the Bay Area increased by 49 percent in the Bay Area, 8 percent in San Francisco and 92 percent in Contra Costa. At the same time, the share of individuals in low-income households also increased in every county except San Francisco, where the share dropped from 30 percent to 28 percent. Between 2000 and 2014, median household income in the Bay Area declined by 15 percent, from \$90,604 to \$77,255. At the same time, the median income (adjusted for inflation) for Black or African American households declined by 22 percent and for Latino or Hispanic households by 26 percent. In 2014, the median income for Black or African American households was below 200 percent FPL, at \$45,756.

Chart 3-C: Median Household Income by Race, Bay Area, 2000-2014



Source: 1990 Census data from NHGIS.ORG Code E1C, Census 2000 Table P088, American Community Survey 2005-2009 and 2010-2014 Table C17002

Seniors 75 Years and Over

In 2014, 430,195 people in the Bay Area, or 5.8 percent of the total population, were aged 75 years and over. About 70 percent of all seniors in the region resided in four counties: Alameda (19 percent), Contra Costa (15 percent), San Francisco (13 percent) and Santa Clara (23 percent). Between 1990 and 2014, the number of seniors in the region increased by 56 percent, from 275,753 to 430,195. During the same time, the biggest increases in the number of seniors were in Contra Costa (82 percent), Marin (75 percent), Santa Clara (89 percent) and Solano (115 percent) counties (see Maps 15, 16 and 17).

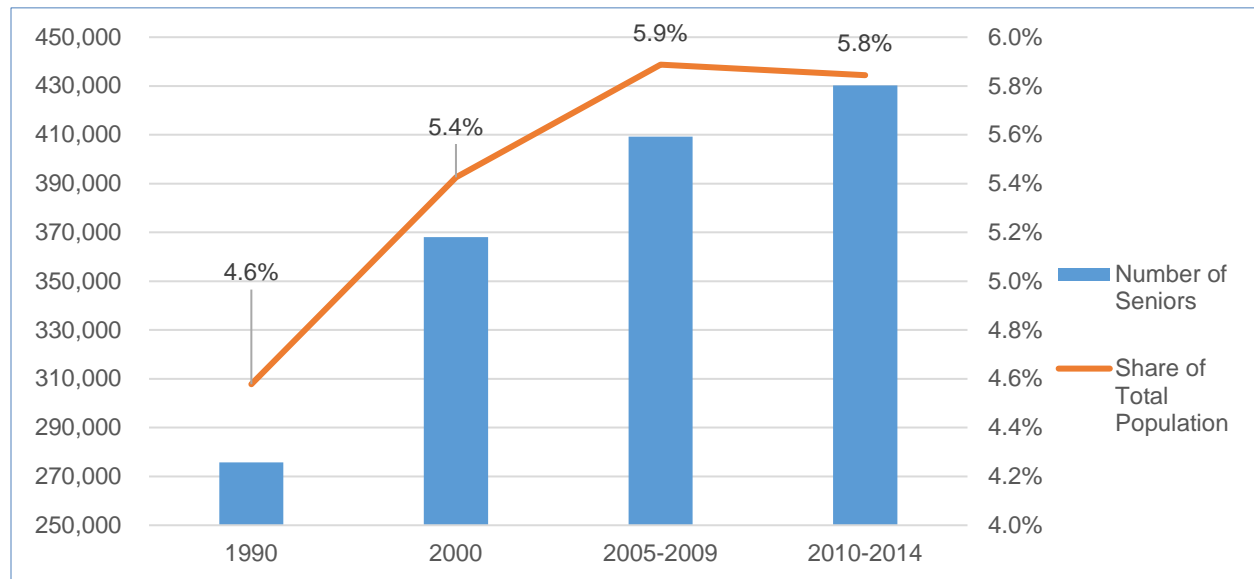
Table 3-4: Share of Bay Area Seniors 75 Years and Over, Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	4%	5%	5%	5%	+43
Contra Costa	4%	6%	6%	6%	+82
Marin	5%	7%	7%	8%	+75
Napa	8%	8%	8%	7%	+24
San Francisco	7%	7%	7%	7%	+18
San Mateo	5%	6%	7%	6%	+48
Santa Clara	3%	4%	5%	5%	+89
Solano	3%	4%	5%	5%	+115
Sonoma	6%	7%	7%	7%	+43
Bay Area	5%	5%	6%	6%	+56

Source: 1990 Census data from NHGIS.ORG Code ET3, Census 2000 Table P012, American Community Survey 2005-2009 and 2010-2014 Table B01001

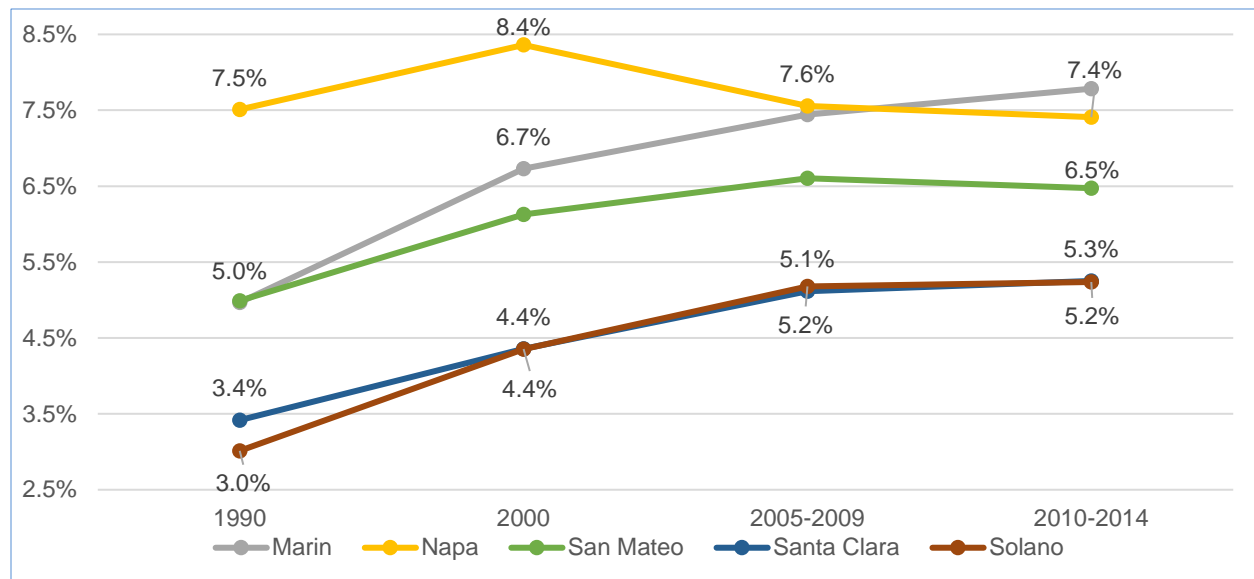
At the same time, the share of total population that was above 75 years varied by county. In Alameda, Napa, San Francisco, San Mateo and Sonoma counties, the share of seniors declined, even though the total number of seniors increased in each of these counties. About 50 percent of seniors in the Bay Area in 2014 also experience a disability (see section on people with disabilities below).

Chart 3-D: Number and Share of Seniors 75 Years and Over, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET3, Census 2000 Table P012, American Community Survey 2005-2009 and 2010-2014 Table B01001

Chart 3-E: Share of Seniors 75 Years and Over, Select Counties, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET3, Census 2000 Table P012, American Community Survey 2005-2009 and 2010-2014 Table B01001

At a neighborhood level, seniors are dispersed around the region, but between 2000 and 2014 their share decreased substantially in the Twin Peaks and South of Market neighborhoods in San Francisco and in South San Jose, while their share increased somewhat in census tracts on the periphery of existing urban areas.⁵⁰

⁵⁰ Ibid.

Single-Parent Families

In 2014, 234,075 families with at least one child, or 27 percent of all such families in the Bay Area, were headed by a single parent. Between 2000 and 2014, the number of these single-parent families increased by 6 percent, or about 13,000 additional families. At the same time period, the number of all families with at least one child increased by 1 percent, or about 7,500 additional families.

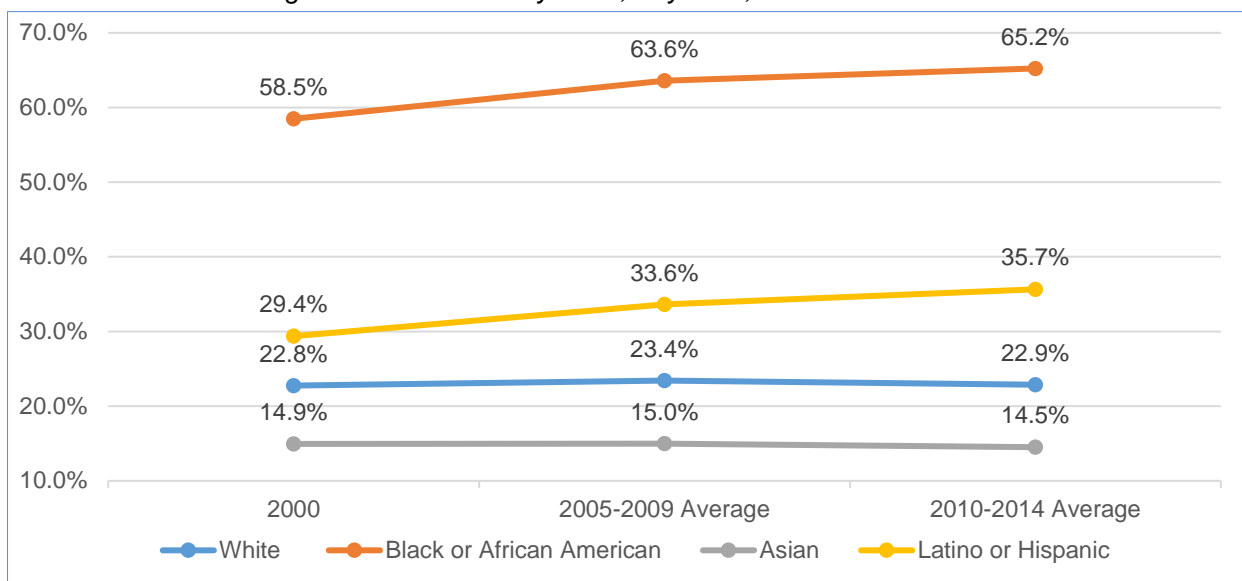
In 2014, the largest share of single-parent families who were White resided in Alameda (14 percent), Contra Costa (14 percent) and Santa Clara (15 percent) counties; who were Black or African American in Alameda (38 percent) and Contra Costa (20 percent) counties; who were Asian in Alameda (31 percent), San Francisco (20 percent) and Santa Clara (40 percent) counties; and finally, the largest share of single-parent families who were Latino or Hispanic resided in Alameda (32 percent), Contra Costa (33 percent) and Santa Clara (40 percent) counties (see Maps 18, 19 and 20).

Table 3-5: Single-Parent Families by Race, Bay Area, 2000-2014

	2000	2005-2009 Average	2010-2014 Average	Change 2000-2014 (%)
White Alone	23%	23%	23%	-18
Black or African American Alone	58%	64%	65%	-12
Asian Alone ⁵¹	15%	15%	15%	+28
Latino or Hispanic	29%	34%	36%	+57
All	26%	27%	27%	+6

Source: 1990 Census data from NHGIS.ORG Code E1E, Census 2000 Tables P090 and P160B-I, American Community Survey 2005-2009 and 2010-2014 Tables B17010 and B17010B-I

Chart 3-F: Share of Single-Parent Families by Race, Bay Area, 2000-2014



Source: 1990 Census data from NHGIS.ORG Code E1E, Census 2000 Tables P090 and P160B-I, American Community Survey 2005-2009 and 2010-2014 Tables B17010 and B17010B-I

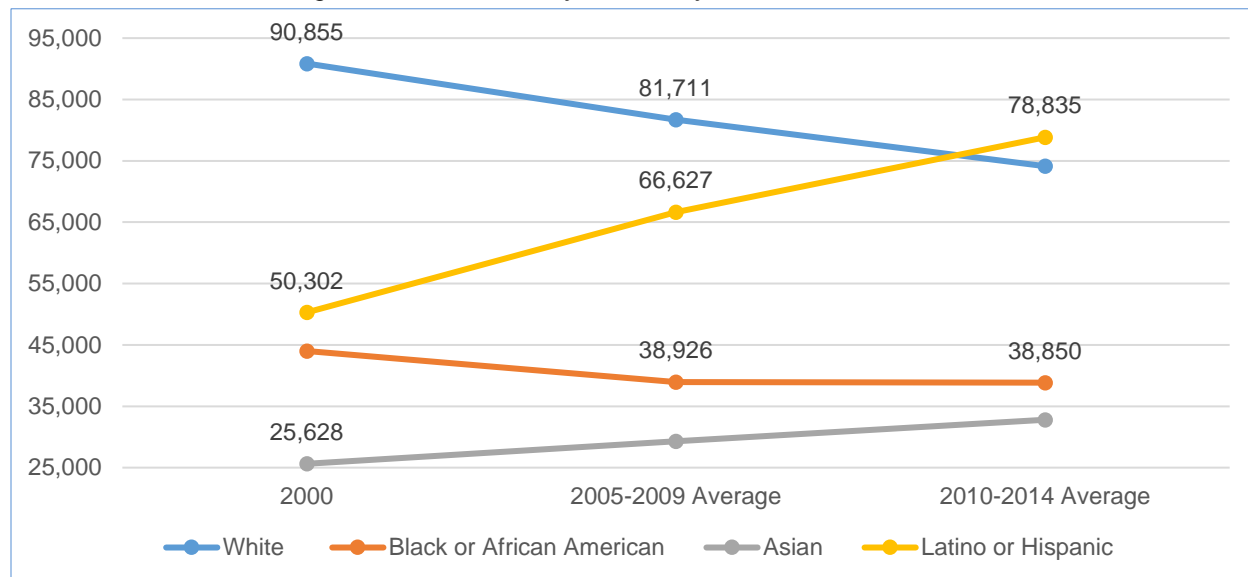
The share of Black or African American families who were headed by a single parent increased from 58.5 percent in 2000 to 65.2 percent in 2014, even when the total number of single-parent Black or African American families in the Bay Area decreased from 44,003 to 38,850. The share of Latino or Hispanic families headed by a single parent increased from 29.4 percent in 2000 to 35.7 percent in 2014.

⁵¹ In 1990, the "Asian Alone" category includes Pacific Islanders, and Pacific Islanders are not included in the "Other" category.

But unlike the Black or African American families, the number of single-parent Latino or Hispanic families also increased in that time, from 50,302 to 78,835.

The share of single-parent White families remained about the same between 2000 and 2014, at 23 percent, though the total number of single-parent White families decreased from 90,855 to 74,129. The share of single-parent Asian families also remained about the same between 2000 and 2014, at 15 percent, but unlike the White families, their numbers increased slightly, from 25,628 to 32,801.

Chart 3-G: Number of Single-Parent Families by Race, Bay Area, 2000-2014



Source: 1990 Census data from NHGIS.ORG Code E1E, Census 2000 Tables P090 and P160B-I, American Community Survey 2005-2009 and 2010-2014 Tables B17010 and B17010B-I

Between 2000 and 2014, the share of single-parent families decreased significantly in the Hunters Point and Dogpatch neighborhoods in San Francisco, West and North Oakland, parts of Emeryville, and West Berkeley. At the same time, the share of these families increased the most in East Contra Costa County, East Oakland, South and East San Jose, and the cities of Vallejo and Alameda.⁵²

Zero-Vehicle Households

In 2014, 257,502 households, or 10 percent of all households in the region did not own a personal vehicle. Between 1990 and 2014, the number of zero-vehicle households increased by 20,970, or 8.9 percent. San Francisco has the highest share of households without a personal vehicle, at 30 percent, followed by Alameda, at 10 percent. San Francisco gained the most zero-vehicle households in the region, at 12,236 additional households, while Alameda lost the most, at 1,728 households.

In 2014, over 41 percent of all zero-vehicle households (106,042) in the Bay Area were in San Francisco, followed by over 22 percent (56,983) in Alameda County. These shares reflect little change from 1990, when these two counties accounted for about 40 percent and 25 percent, of all zero-vehicle households. At the neighborhood level, in 2014, the share of zero-vehicle households was highest in the Chinatown, Haight Ashbury, Mission, Financial District, Visitacion Valley and Hunters Point neighborhoods in San Francisco; Downtown Oakland; central Vallejo; and the unincorporated community of Rockram in Napa County (see Maps 21, 22 and 23).⁵³

⁵² U.S. Decennial Census 2000 and American Community Survey 2010-2014 5-year average.

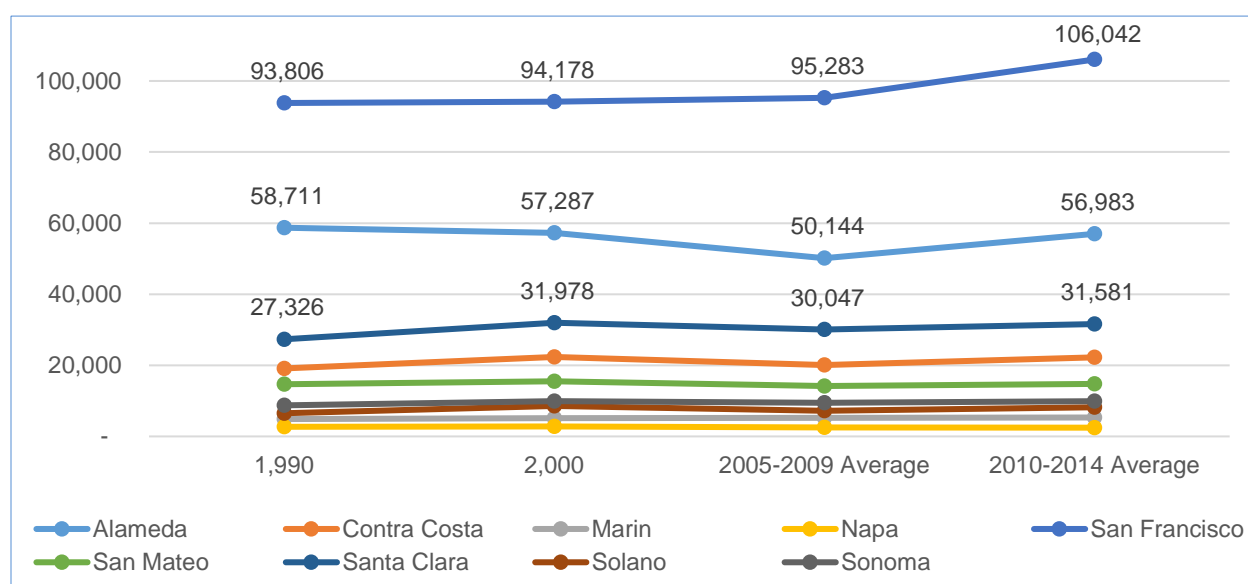
⁵³ Ibid.

Table 3-6: Share of Zero-Vehicle Households by County, Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	12%	11%	10%	10%	-3%
Contra Costa	6%	6%	6%	6%	+16
Marin	5%	5%	5%	5%	+9
Napa	7%	6%	5%	5%	-10
San Francisco	31%	29%	29%	30%	+13
San Mateo	6%	6%	6%	6%	+1
Santa Clara	5%	6%	5%	5%	+16
Solano	6%	7%	5%	6%	+26
Sonoma	6%	6%	5%	5%	+13
Bay Area	11%	10%	9%	10%	+9

Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Tables H044 and HCT033B-I, American Community Survey 2005-2009 and 2010-2014 Table B25044

Chart 3-H: Number of Zero-Vehicle Households by County, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code ET2, Census 2000 Tables H044 and HCT033B-I, American Community Survey 2005-2009 and 2010-2014 Table B25044

Between 2000 and 2014, the share of zero-vehicle households increased significantly in Visitacion Valley in San Francisco, the unincorporated community of Rockram in Napa County, and the cities of Alameda and Fairfield. At the same time, there was a significant decrease in the Financial District in San Francisco, East San Jose, Downtown and West Oakland, central Martinez, the unincorporated community of North Richmond, and the Iron Triangle neighborhood in the city of Richmond.

People with Limited English Proficiency (LEP)

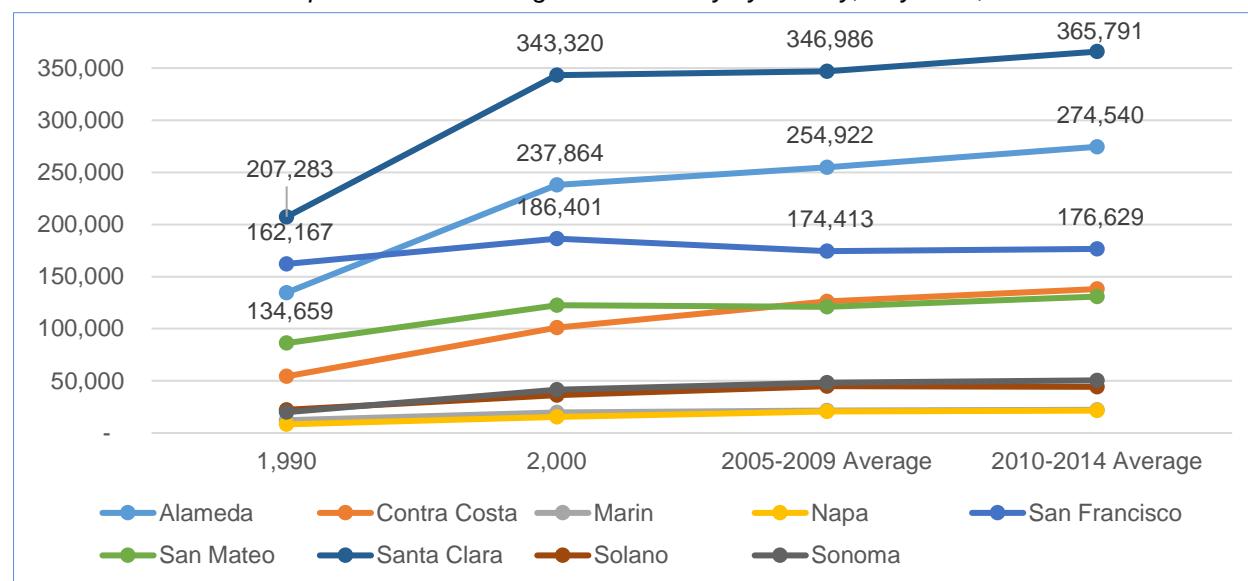
In 2014, approximately 1.2 million people, or 18 percent of the total population in the Bay Area above the age of 5 years, did not speak English “very well” as their primary language or had a limited ability to read, speak, write or understand English. Over 52 percent of LEP individuals resided in just two counties: Alameda (22 percent) and Santa Clara (30 percent). San Francisco had the highest share of LEP individuals (22 percent), followed by Santa Clara (21 percent). Marin had the lowest share of LEP individuals, at 9 percent.

Table 3-7: Share of People with Limited English Proficiency by County, Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990-2014 (%)
Alameda	11%	18%	19%	19%	+104
Contra Costa	7%	11%	13%	14%	+154
Marin	6%	8%	9%	9%	+81
Napa	8%	13%	17%	16%	+159
San Francisco	24%	25%	23%	22%	+9
San Mateo	14%	18%	19%	19%	+52
Santa Clara	15%	22%	22%	21%	+76
Solano	7%	10%	12%	11%	+99
Sonoma	6%	10%	11%	11%	+153
Bay Area	13%	17%	18%	18%	+73

Source: 1990 Census data from NHGIS.ORG Code E26, Census 2000 Tables P019 and PCT062B-I, American Community Survey 2005-2009 B16005 and 2010-2014 Tables B16005 and B16005B-I

Chart 3-1: Number of People with Limited English Proficiency by County, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code E26, Census 2000 Tables P019 and PCT062B-I, American Community Survey 2005-2009 B16005 and 2010-2014 Tables B16005 and B16005B-I

Between 1990 and 2014, the number of LEP individuals grew by just 9 percent in San Francisco, the lowest rate in the region. At the same time, Napa and Sonoma grew by more than 150 percent during the same time, but from a small base. At the neighborhood level, between 2000 and 2014, the share of LEP

individuals decreased significantly in the Richmond District, South of Market and Chinatown neighborhoods in San Francisco; Chinatown and East Oakland in Oakland; the West San Jose and Alviso neighborhoods in San Jose; and the city of Sonoma (see Maps 24, 25 and 26).⁵⁴

Severely Rent-Burdened Households⁵⁵

In 2014, approximately 1.1 million households (43 percent) in the Bay Area were renters, of which 291,119 households (26 percent) were paying more than 50 percent of their income in rent. Between 1990 and 2014, the number of severely rent-burdened renter households increased by 58 percent, or 105,010 households. Santa Clara County gained the most severely rent-burdened households, with 25,278 additional households (24 percent of the entire increase), followed by Alameda County with 20,989 (20 percent) and Contra Costa County with 16,407 (16 percent). The slowest rate of growth in severely rent-burdened households was in San Francisco County, at 30 percent, and the fastest rate of growth was in Solano County, at 123 percent.

Table 3-8: Share of Severely Rent-Burdened (Renter) Households by County,⁵⁶ Bay Area, 1990-2014

	1990	2000	2005-2009 Average	2010-2014 Average	Change 1990- 2014 (%)
Alameda	22%	21%	27%	27%	+45
Contra Costa	20%	19%	28%	28%	+86
Marin	22%	21%	27%	29%	+48
Napa	23%	19%	22%	27%	+65
San Francisco	19%	17%	21%	23%	+30
San Mateo	17%	18%	23%	24%	+52
Santa Clara	18%	18%	23%	24%	+68
Solano	18%	19%	28%	30%	+123
Sonoma	21%	19%	27%	30%	+102
Bay Area	20%	19%	24%	26%	+58

Source: 1990 Census data from NHGIS.ORG Code FBA, Census 2000 Table H069, American Community Survey 2005-2009 and 2010-2014 Table B25070

At the neighborhood level, between 2000 and 2014, the share of rent-burdened households increased significantly in the Hunters Point neighborhood in San Francisco; the unincorporated community of North Fair Oaks and the city of East Palo Alto in San Mateo County; the cities of Santa Clara, Morgan Hill and Gilroy in Santa Clara County; South and East San Jose; Newark and almost all of the inner East Bay from Union City to Richmond; the cities of Martinez, Concord, Pittsburg and Antioch in Eastern Contra Costa County; and Vallejo, Fairfield, Napa, St. Helena, Santa Rosa, and the unincorporated community of Rockram in the North Bay (see Maps 27, 28 and 29).⁵⁷

In 2014, neighborhoods with 40 percent or more rent-burdened households included Hunters Point in San Francisco; East San Jose and parts of Morgan Hill and Gilroy in the South Bay; parts of Newark and Hayward in the East Bay; East, West and North Oakland; parts of Danville, Concord, Pleasant Hill, Pittsburg, Antioch, Oakley and Brentwood in East Contra Costa County; the Iron Triangle neighborhood in the city of Richmond; and parts of Vallejo, Fairfield, Rohnert Park, Novato, San Rafael, and the unincorporated community of Rockram in the North Bay.

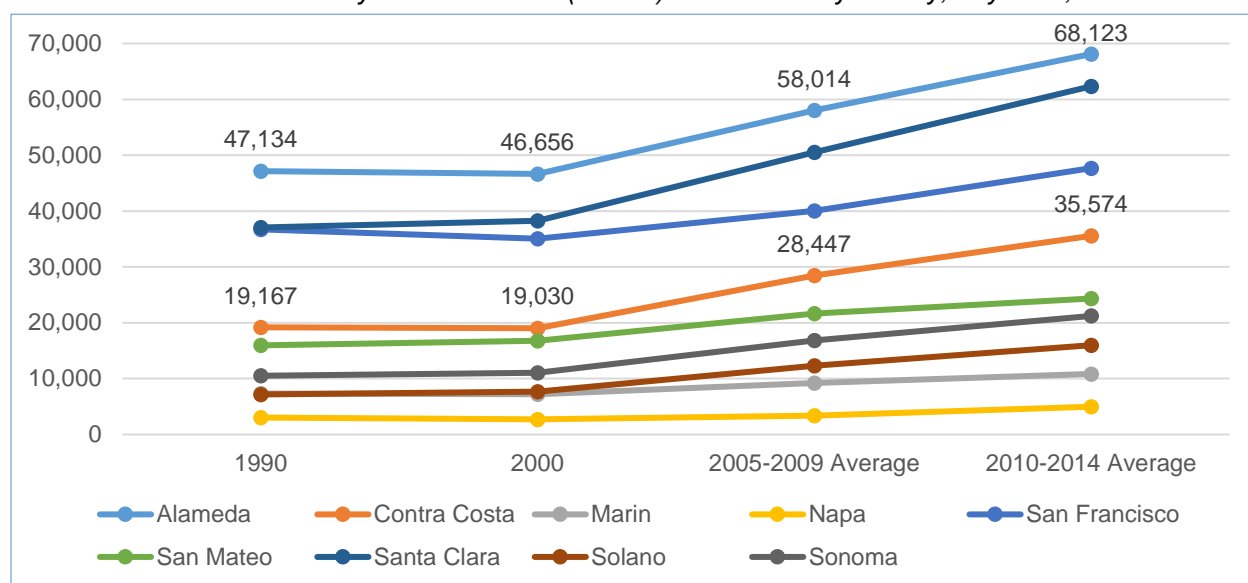
⁵⁴ Ibid.

⁵⁵ Renter households that spend more than 50 percent of their income on rent.

⁵⁶ Note that units for which no rent was paid and units occupied by households that reported no income (about 4 percent of the total in 2014) are not included in the table above and chart below.

⁵⁷ U.S. Decennial Census 2000 and American Community Survey 2010-2014 5-year average.

Chart 3-J: Number of Severely Rent-Burdened (Renter) Households by County, Bay Area, 1990-2014



Source: 1990 Census data from NHGIS.ORG Code FBA, Census 2000 Table H069, American Community Survey 2005-2009 and 2010-2014 Table B25070

People with Disabilities⁵⁸

In 2014, 678,925 people in the Bay Area, or 9.3 percent of the total population, experienced a disability including, hearing, vision, cognitive, ambulatory, self-care or independent living difficulty. Over 70 percent of seniors 65 years and older, and over 50 percent of seniors 75 years and over, suffered from a disability. Over 71 percent of persons with a disability reside in just four counties: Alameda (21 percent), Contra Costa (17 percent), San Francisco (13 percent) and Santa Clara (21 percent). At a neighborhood level, people with disabilities are dispersed across the region (see Map 30).

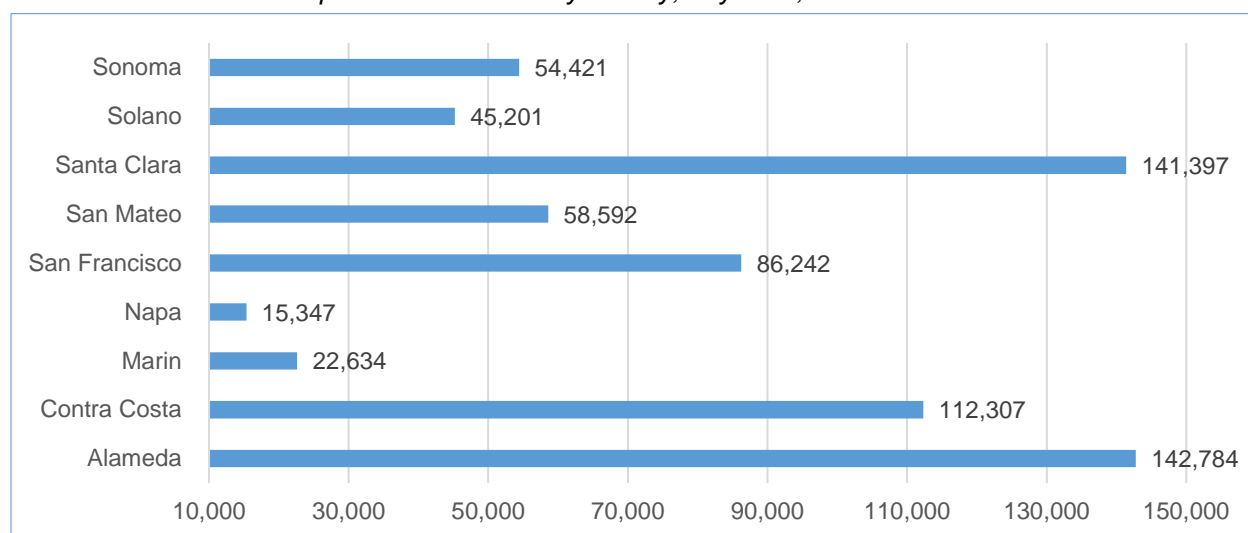
Table 3-9: Share of Population with Disabilities by Age and County, Bay Area, 2014

	<17 years	18-64 years	>65 years	>75 years	All Disabled
Alameda	4%	13%	72%	51%	9%
Contra Costa	5%	15%	73%	51%	10%
Marin	3%	11%	55%	41%	9%
Napa	4%	15%	74%	54%	11%
San Francisco	3%	13%	77%	53%	11%
San Mateo	4%	10%	61%	45%	8%
Santa Clara	4%	10%	70%	51%	8%
Solano	5%	17%	78%	53%	11%
Sonoma	5%	17%	71%	51%	11%
Bay Area	4%	12%	71%	50%	9%

Source: American Community Survey 2010-2014 Table B18101

⁵⁸ The U.S. Census Bureau defines disability as: Hearing difficulty – deaf or having serious difficulty hearing (DEAR); Vision difficulty – blind or having serious difficulty seeing, even when wearing glasses (DEYE); Cognitive difficulty – because of a physical, mental, or emotional problem, having difficulty remembering, concentrating, or making decisions (DREM); Ambulatory difficulty – having serious difficulty walking or climbing stairs (DPHY); Self-care difficulty – having difficulty bathing or dressing (DDRS); Independent living difficulty – because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor’s office or shopping (DOUT).

Chart 3-K: Number of People with Disabilities by County, Bay Area, 2014



Source: American Community Survey 2010-2014 Table B18101

Housing

The Bay Area faces many challenges related to housing, which have a disproportionate impact on the region's low-income population. These challenges include: rising housing costs and decreasing affordability; lack of supply to meet current and future needs; a spatial mismatch between the location of jobs and housing; lack of adequate public funding to provide new affordable units or preserve existing ones; and rising poverty along with declining economic opportunities. As a result, the whole region is impacted by adverse outcomes such as diminished quality of life, as well as direct impacts on the environment, economic growth and long-term sustainability. This section summarizes some of these challenges and trends.

Rising Housing Costs

As outlined in Plan Bay Area (PBA) 2040, the acute housing affordability crisis in the Bay Area reflects the region's strong economy, with robust growth in high-wage jobs in recent years, near-zero median wage growth, and limited housing construction, especially near job centers.⁵⁹ The housing crisis is disproportionately affecting low-income households, as high costs consume an even larger share of family budgets and scarcity of affordable units limits housing options.

According to an analysis conducted by Trulia, a real estate firm, in 2014 only 14 percent of homes for sale in San Francisco were affordable to middle-class families, even though median household income is higher in San Francisco than almost anywhere else in the country.⁶⁰ This share was down from 20 percent just a year earlier. In San Jose and Oakland, the share of homes affordable to middle-class families in 2014 were 34 and 40 percent, respectively, down from 42 and 52 percent in the year before. All three metro areas were in the top ten least affordable places for a middle-class family, among a hundred metro areas studied by Trulia. These economic pressures affect not just San Francisco, San Jose and Oakland, but almost every community in the region.^{61, 62}

⁵⁹ For example, between 2010 and 2015, the region added about 500,000 jobs and only about 50,000 new housing units. Source: MTC Vital Signs. See: www.vitalsigns.mtc.ca.gov.

⁶⁰ Trulia, May 2014: <https://www.trulia.com/blog/trends/middle-class-may-2014/>.

⁶¹ MTC Vital Signs: <http://www.vitalsigns.mtc.ca.gov/housing-affordability>; 2000 and 2010 Decennial US Census; American Community Survey (2009-2013) data.

⁶² The Urban Displacement Project, University of California Berkeley: www.urbandisplacement.org/.

Table 3-10: Share of Homes for Sale that are Affordable to the Middle Class⁶³

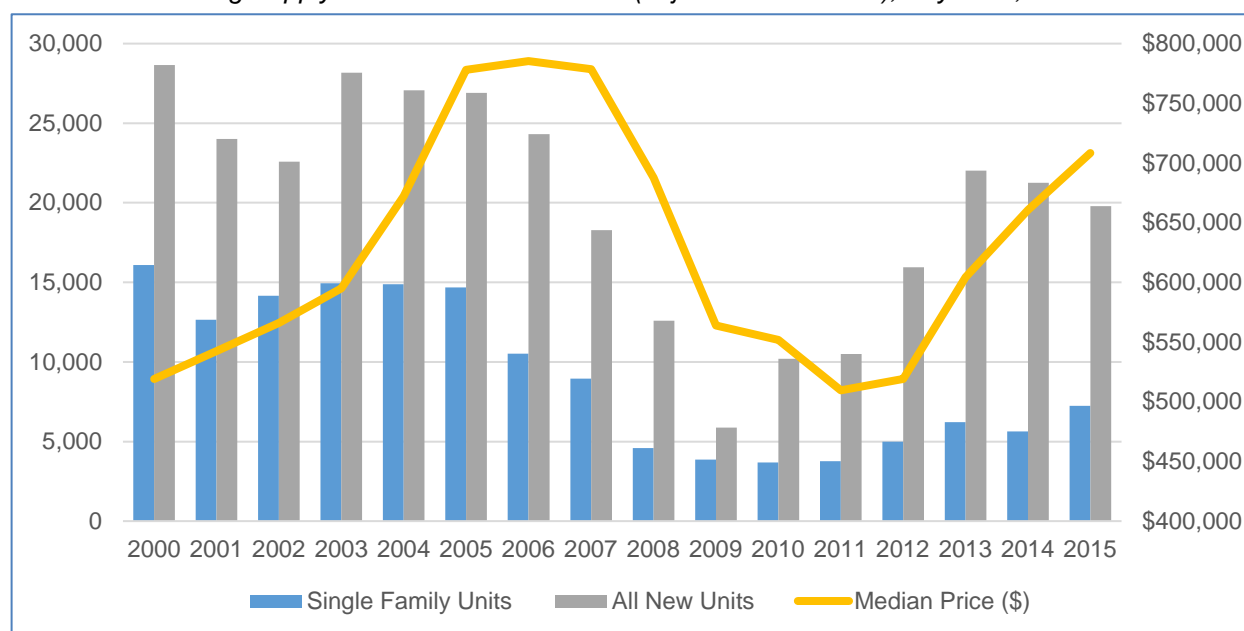
Metro Area	Rank among 100 metro areas	Percent of homes for sale within reach of the middle class		Median household income	Maximum affordable home price
		2014	2013		
San Francisco	1	14%	20%	\$84,129	\$440,000
San Jose	7	34%	42%	\$94,078	\$484,000
Oakland	10	40%	52%	\$72,281	\$366,000

Source: Trulia, May 2014

The Bay Area does have some affordable homes, but they are primarily located in inland communities. Median home prices in Solano County were under \$300,000 in 2014, which was less than half the regional average. Antioch and Pittsburg in eastern Contra Costa County had similarly low home prices, but had seen them rise above \$400,000 by the end of 2016. While these homes may be newer, larger, served by better schools, and/or more affordable, their residents face longer commutes and have access to fewer services and amenities close to where they live.⁶⁴

Conditions are even worse for renters. The average rent in the region was \$2,526 in the second quarter of 2015, which rose another 10 percent in the final quarter. The steepest rent increases were experienced in San Francisco and Oakland, where, since 2010, the average asking rent has increased 57 and 88 percent, respectively.⁶⁵ Similar to home values, all counties experienced rising rents, which gained between 46 and 82 percent in inflation-adjusted dollars between 1970 and 2013.

Chart 3-L: Housing Supply and Median Home Price (adjusted for inflation), Bay Area, 2000-2014



Source: MTC Vital Signs, using US Census and American Community Survey data

Affordable homes in the rental market have also grown scarcer, with rents across the region much closer to the regional average than ever before. In the North Bay, both Napa and Sonoma counties experienced the fastest growth in rents between 1970 and 2015, which exceeded rent increases even in high-cost San Francisco. Solano County, traditionally the most affordable place for Bay Area renters, saw a 64 percent

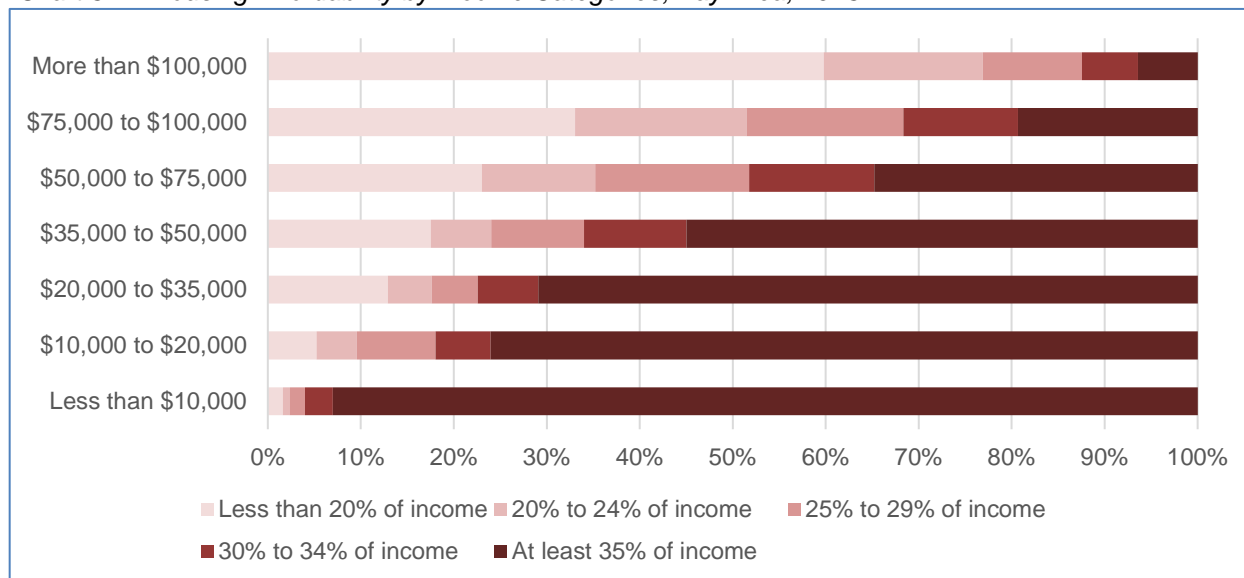
⁶³ Families that earn a median income in a metropolitan area are considered middle class.

⁶⁴ MTC Vital Signs.

⁶⁵ RealFacts, LLC, 2015 2nd Quarter Report.

spike in rents. These rapid increases partially reflect the relative affordability of North Bay communities in 1970 and partly the lack of affordability in other parts of the region.

Chart 3-M: Housing Affordability by Income Categories, Bay Area, 2013



Source: MTC Vital Signs, using US Census and American Community Survey data

While almost every household in the Bay Area is experiencing high housing costs, these conditions have an oversized impact on low-income populations. In 2013, more than half the households in the Bay Area earn less than \$50,000 per year experienced an excessive housing cost burden (they spent more than a third of their income on housing), regardless of where they lived in the region. Only when household incomes exceed \$100,000 does the region seem marginally more affordable.⁶⁶

The share of Bay Area households who spend more than a third of their incomes on housing has also steadily increased in the last few decades. Between 2000 and 2010, the share of cost-burdened households in the Bay Area increased from 27 to 36 percent.⁶⁷ High housing costs and stagnated wages have both contributed to severe overcrowding in the Bay Area and in the state (overcrowding in California is now nearly four times the national average).⁶⁸

Addressing housing affordability and neighborhood stability in the Bay Area is critical to ensuring that all residents have access to decent and safe living conditions and access to jobs, transit and essential services.

Jobs-Housing Fit

According to a study conducted by the University of California Davis in 2015,⁶⁹ the lack of affordable housing close to low- and moderate-wage jobs, which usually co-locate with high-wage jobs, creates an even bigger imbalance for low- and moderate-income households. This jobs-housing mismatch is one of the primary drivers of high displacement risk, and higher housing and transportation costs for the region's lower-wage workers. The impact of low housing supply in location-efficiency areas is more traffic congestion and delays, lower worker productivity, and higher environmental and health impacts.

⁶⁶ MTC Vital Signs.

⁶⁷ Ibid.

⁶⁸ Special Report on Overcrowding, California Housing Partnership Corporation, 2014. <http://chpc.net/wp-content/uploads/2015/11/12-ContraCostaHousingNeed2015.pdf>.

⁶⁹ "Regional Opportunity Index." Center for Regional Change, University of California Davis, 2015. See: <http://interact.regionalchange.ucdavis.edu/roi/>.

The study notes that a desirable jobs-to-housing ratio is a little less than 2 (or about two jobs or less for every home) in a community. A higher ratio often creates a tight housing market, and a lower ratio reflects a weak jobs market. Neither condition is ideal, but the impacts are greatest on low- and moderate-wage workers. By 2015, local jurisdictions had permitted only about 28 percent of the units needed to meet state projections for very-low-, low- and moderate-income housing between 2007 and 2014, a shortfall of over 90,000 units.⁷⁰

Most of the Bay Area has a jobs-housing ratio higher than 4 (see Map 31), though San Francisco provides more housing opportunities for its low- and moderate-wage workers compared to the rest of the region. Other neighborhoods in the region that perform well on this measure include East San Jose; West and Downtown Oakland; central Richmond; the cities of Alameda, Pittsburg and Oakley; and parts of Solano county. With the exceptions of San Francisco and Oakland, many of these communities have a lower jobs-housing ratio due to a lack of job opportunities.

On the other hand, neighborhoods that have a jobs-to-housing ratio higher than 2 include most of the North Bay, almost all the communities along Highway 680 and 580 in east Alameda and Contra Costa counties, the entire Peninsula area, almost the entire South Bay, and the cities of Fremont, Newark, Union City and Hayward.

Transportation

Low-income and minority populations have somewhat similar travel behaviors compared to the broader population. But there are still some notable differences. The needs of transportation- disadvantaged populations, such as youth, seniors and people with disabilities, vary substantially from the rest of the population, irrespective of income and race/ethnicity. This section describes the travel patterns of low-income and minority populations, with an emphasis on commute to work and neighborhood walkability. For additional details on travel needs of seniors and people with disabilities, see MTC's San Francisco Bay Area Coordinated Public Transit-Human Services Transportation Plan.⁷¹

Mode of Travel

Low-income populations in the region account for 25 percent of the total population but 53 percent of all transit trips, indicating not just their higher propensity to use transit but also a greater dependence on that mode. Low-income populations also account for 27 percent of all roadway trips, which makes up the vast majority of all their trips (88 percent), indicating continued reliance on the private vehicle for mobility needs, despite the relatively higher costs of car ownership and operations.

Table 3-11: Share of Bay Area Population and Mode of Transportation, 2014

Population Subgroup	Share of Population	Share of Transit Trips	Share of Roadway Trips	Share of All Trips
Low-Income Population	25%	53%	27%	28%
Minority Population	59%	61%	52%	52%

Source: U.S. Census American Community Survey 2010-2014, 2012/2013 California Household Travel Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys

Similarly, minority populations in the region account for 59 percent of the total population, 61 percent of transit trips and 52 percent of roadway trips. Transit trips are a smaller share of trips taken by minorities (8 percent), compared to low-income populations (12 percent). It is unclear why the total number of trips taken by minority populations is lower than their share of the total population, but some

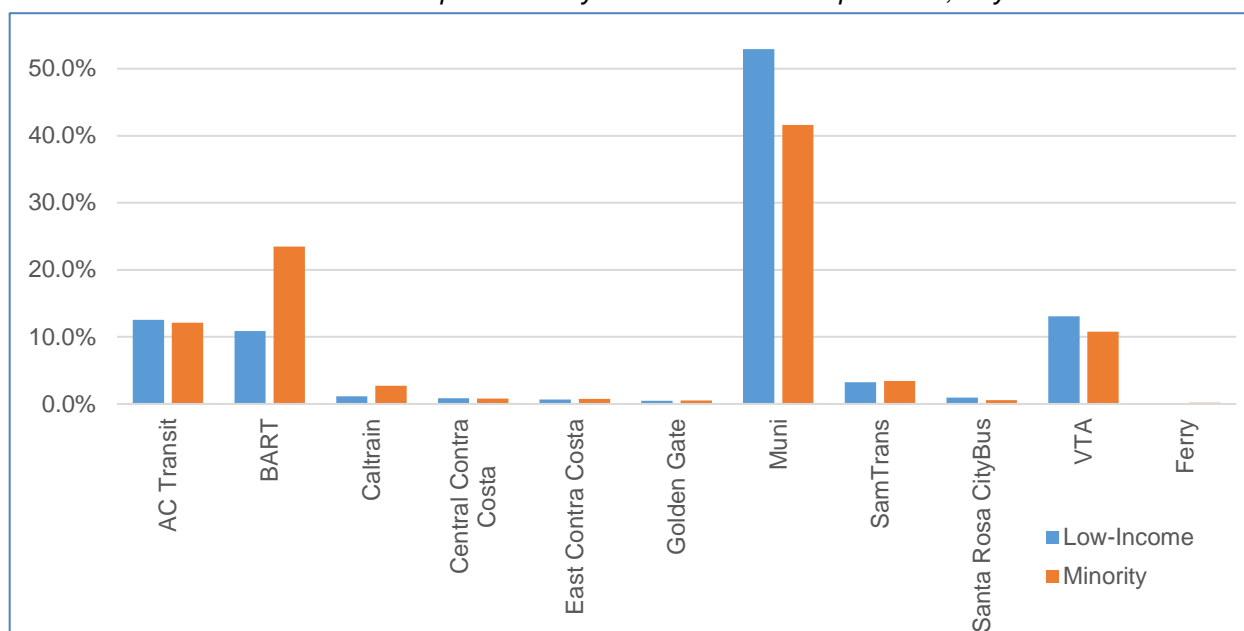
⁷⁰ Data compiled by the Association of Bay Area Government from local jurisdictions. Regional Housing Needs Allocation for the Bay Area was 125,258 units for very-low, low- and moderate-income housing, of which only 35,165 were permitted.

⁷¹ The full report can be downloaded here: http://mtc.ca.gov/sites/default/files/Coord_Plan_Update.pdf.

of the difference is a result of using multiple data sources. While the demographic data is derived from the U.S. Census Bureau, roadway trips are summarized from the California Household Travel Survey and transit trips from both MTC's transit passenger survey and previous data collected by each transit operator.

While low-income and minority populations have a higher reliance on transit, this dependence varies widely between different operators and counties. Of the 27 transit operators in the Bay Area, AC Transit, BART, San Francisco Muni and Santa Clara Valley Transportation Authority (VTA) account for around 90 percent of all transit trips in the region, for both population groups. Notably, Muni accounts for about 53 percent of all transit trips for low-income and 42 percent for minority populations, confirming the role of land use (higher-density, mixed-use, walkable communities) in supporting not just higher transit ridership but also access and mobility for transit-dependent populations.

Chart 3-N: Share of Transit Ridership for Minority and Low-Income Populations, Bay Area



Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys

AC Transit and VTA also carry some of the highest shares of low-income and minority populations in the region. About 75 percent of AC Transit's riders are low-income and 78 percent are minorities. Similarly, 75 percent of VTA's riders are low-income and 76 percent are minorities. Of the larger transit operators, BART, Caltrain, Golden Gate Transit (Marin County) and the ferry service have the smallest share of low-income riders, at 26 percent, 19 percent, 23 percent and 11 percent, respectively. Golden Gate Transit and the ferry service also have the smallest shares of minority riders, at 29 and 38 percent, respectively.

Chart 3-O: Share of Minority and Low-Income Riders by Transit Operator, Bay Area



Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys

Commute

Commute trips for low-income and minority populations vary by distance, time and mode in each county. For this section, low-wage workers earn less than \$36,500 per year, or \$18 per hour. Given the relatively dispersed development pattern across the Bay Area, most low-wage workers above the age of 16 years drive to work (81 percent). They also tend to have shorter commutes (56 percent of low-wage workers have commutes of less than 20 minutes, compared with 43 percent for higher-wage workers), work in the county where they reside⁷² (between 67 percent and 90 percent), and are more likely to walk (nearly 7 percent compared with less than 3 percent of higher-wage workers) and take transit to work (12 percent). Additionally, nearly 10 percent of the lowest-wage workers (those earning less than \$12 per hour) take the bus to work, compared to 4 percent of the entire workforce.⁷³

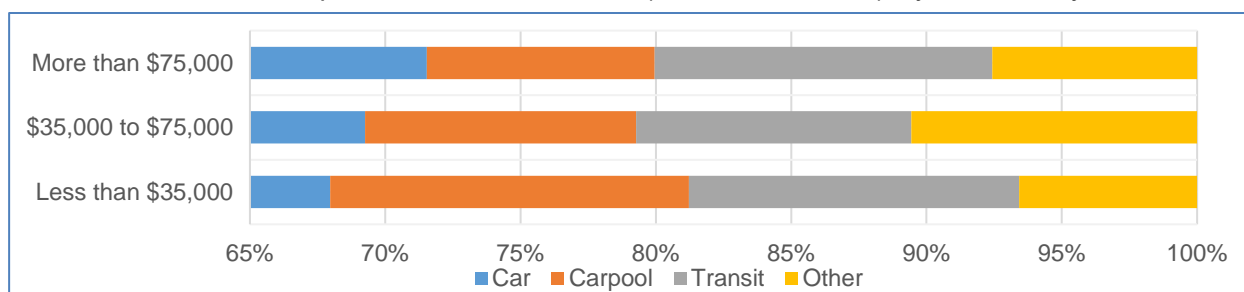
Means of transportation to work also varies by county. In Sonoma, Solano and Napa counties, more than 80 percent of low-wage workers drive alone or carpool to work, compared to a little more than 30 percent in San Francisco, which has the highest share of transit trips, at more than 40 percent of total trips region-wide. Alameda County has the second highest share of low-wage workers taking transit to work, at 18 percent, followed by San Mateo County, at 12 percent. San Francisco also has the highest share of low-wage workers walking to work, at 16 percent, followed by Alameda County, at 9 percent, and Marin County, at 8 percent.

Lower-wage jobs and workers are located throughout the region, removing the incentive for them to travel farther for a job that does not pay substantially more. On the other hand, higher-wage workers may be more willing to commute longer distances to access a higher-paying job. Improved and cost-effective regional transit service may be one way to better connect lower-wage workers with middle-wage opportunities across the region.

⁷² U.S. Census American Community Survey, 2011-2015, 5-Year Average

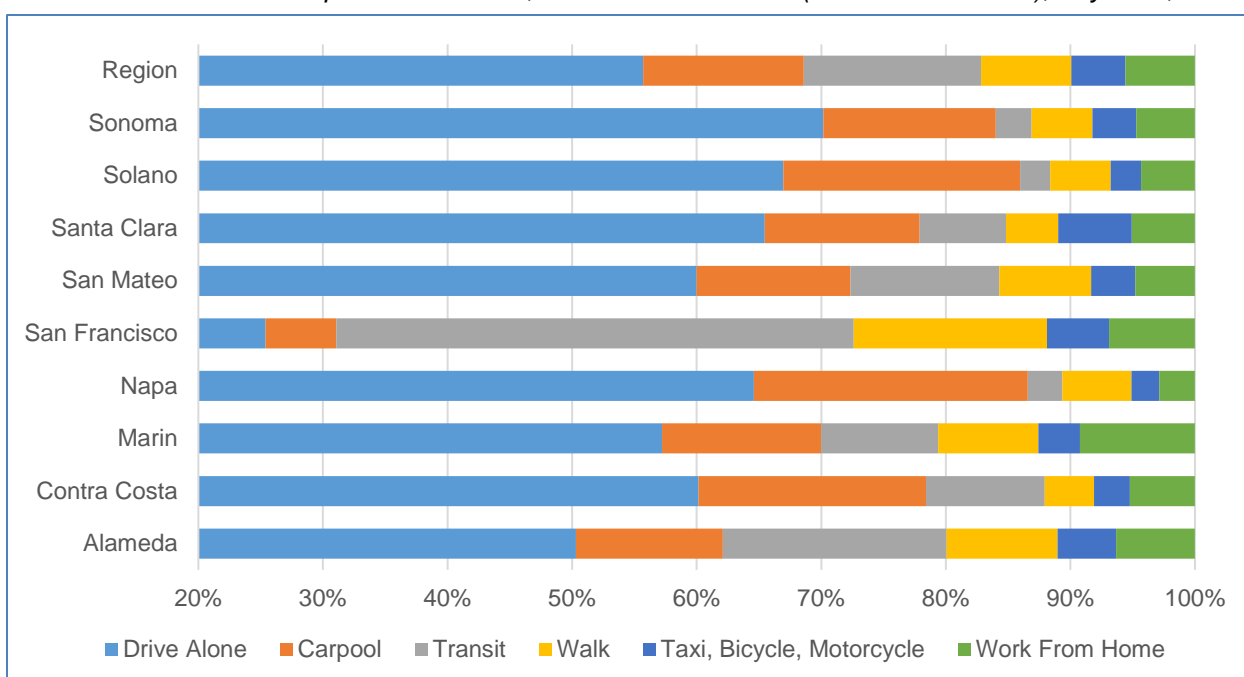
⁷³ Economic Prosperity Strategy, 2014, SPUR: <http://www.spur.org/publications/spur-report/2014-10-01/economic-prosperity-strategy>.

Chart 3-P: Means of Transportation to Work, Workers (16 Years and Over), by Income, Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Chart 3-Q: Means of Transportation to Work, Low-Income Workers (16 Years and Over), Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Note: 150 percent of federal poverty line for 2015 is less than \$36,500 per year for a family of four.

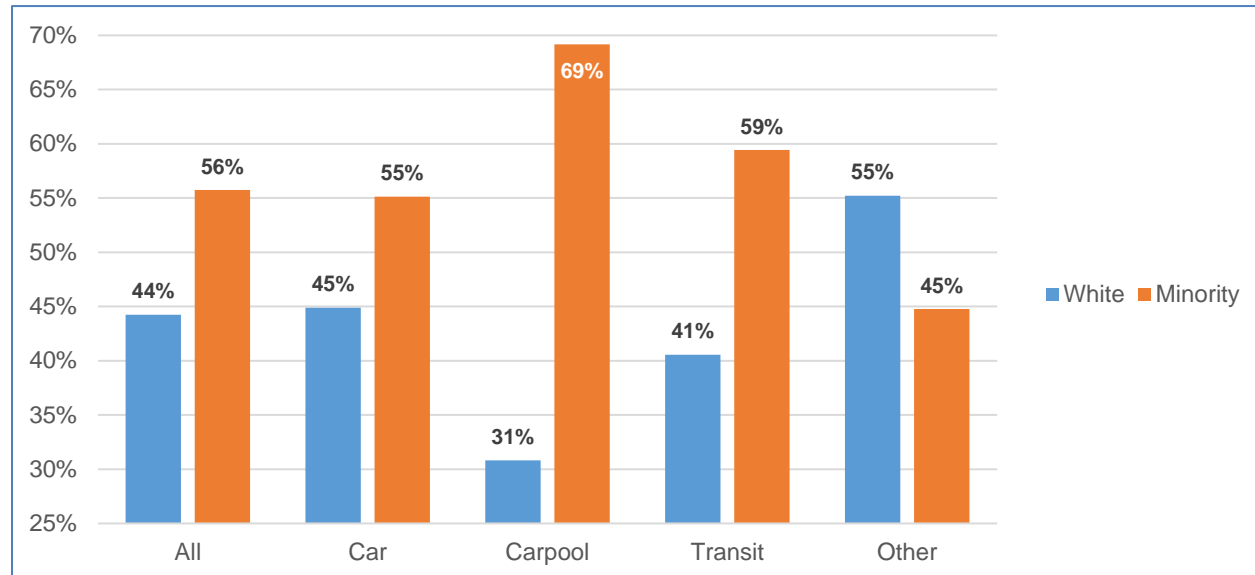
Among lower-wage workers who lack their own vehicles, transportation is the single largest barrier to middle-wage work, and transit is often inadequate in many parts of the region. The cost of car ownership can be prohibitive for some lower-wage workers, which limits their future employment opportunities. The three North Bay counties—Napa, Solano and Sonoma—have the highest percentages of both lower-wage residents and lower-wage jobs (in 2011, over 50 percent of employed residents were lower-wage, and over 54 percent of jobs in these counties paid lower wages). These counties are also the least connected to the rest of the region by transit, and commuters within these counties are more car-dependent than in other parts of the region.⁷⁴

Travel behavior for minorities also varies by mode and county of residence. While minorities are 56 percent of the workforce, they comprise 69 percent of workers who carpool to work and 59 percent who take transit. These shares vary somewhat among various racial/ethnic groups. Ten percent of Hispanic/Latino and White workers take transit to work, compared to 13 percent for Asians and 17 percent for African Americans/Blacks. About 80 percent of Asian and Hispanic/Latino workers drive

⁷⁴ Analysis conducted by SPUR, U.S. Census, Longitudinal Household Dynamics (LEHD, 2011): <http://lehd.ces.census.gov>.

alone or carpool to work, compared to about 74 percent for African Americans/Blacks and Whites. With 12 and 14 percent of workers who carpool to work, Asian and Hispanic/Latino workers have the highest rates of carpooling.

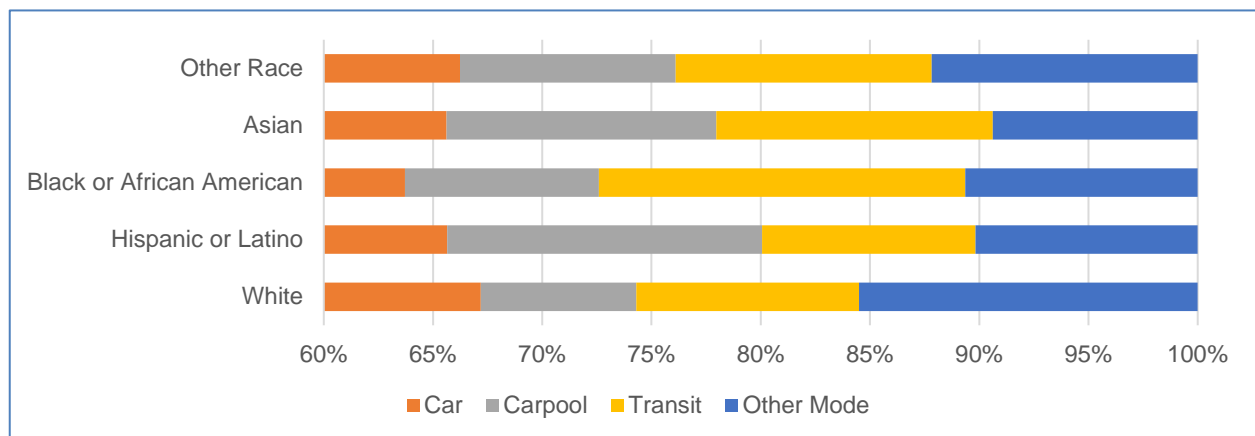
Chart 3-R: Means of Transportation to Work, (16 Years and Over), White and Minority, Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

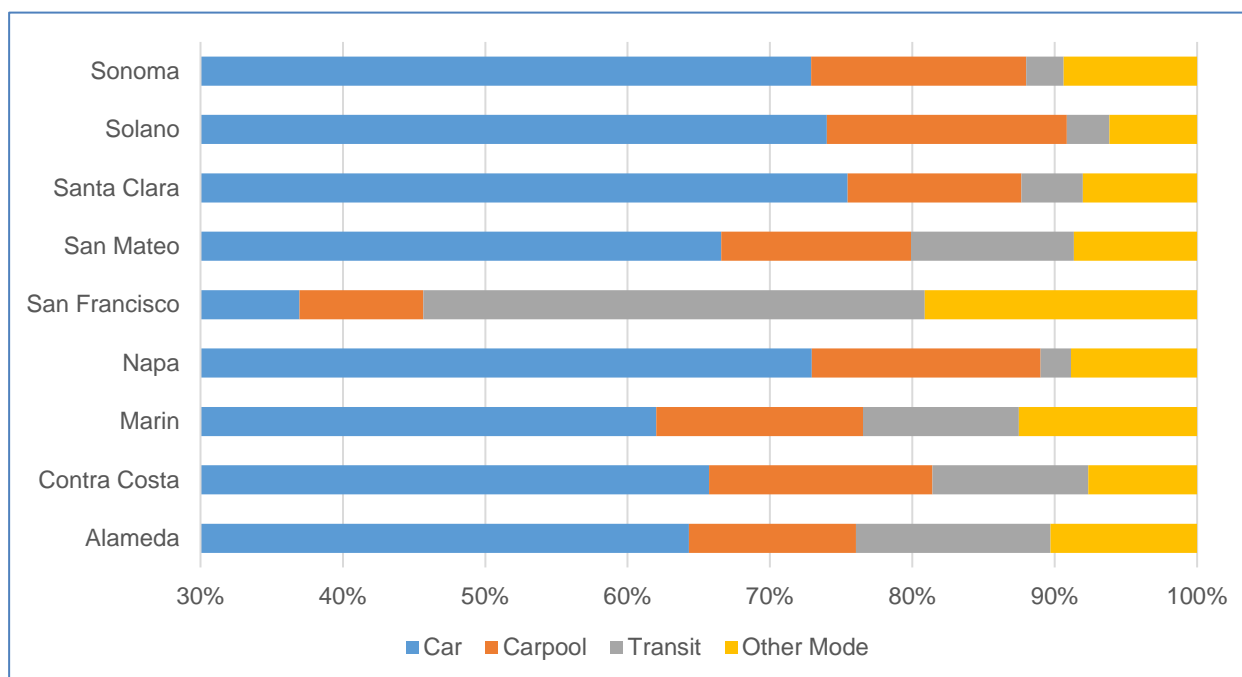
Only 46 percent of minority workers in San Francisco drive alone and carpool, a much lower rate than in any other county. In comparison, 88 percent of the minority workers in Sonoma, 91 percent in Solano, 87 percent in Santa Clara and 89 percent in Napa drive alone or carpool to work. The share of minority residents who ride transit was highest in San Francisco, at 35 percent, followed by Alameda at 14 percent and San Mateo, Marin and Contra Costa counties at 11 percent each in.

Chart 3-S: Means of Transportation to Work, (16 Years and Over) by Race/Ethnicity, Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Chart 3-T: Means of Transportation to Work, Minority Workers (16 Years and Over), Bay Area, 2015



Source: U.S. Census American Community Survey, 2011-2015, 5-Year Average

Cost and Affordability

Transportation costs are the third largest expense for a low-income household in the Bay Area, after housing and food. According to a report published by the Center for Housing Policy⁷⁵ in 2006, families in the region that earned under \$70,000 annually spent a combined average of 61 percent of their earnings on housing (39 percent) and transportation (22 percent). The national average of the combined housing and transportation cost is about 10 percentage points lower, reflecting the high cost of living in the Bay Area. In 2013, MTC estimated that the combined cost of transportation and housing for low-income households would increase to 64 percent by 2040. MTC now estimates that this share will grow to 67 percent.

Of the two components of the combined cost, housing accounts for the vast majority of current and future cost burden on Bay Area residents. While the cost of transportation will also increase over time, it is anticipated to be in line with the increase in the cost of fuel. Of the 13 percent projected increase in the combined cost of transportation and housing by 2040, just 1 percentage point is contributed by transportation.

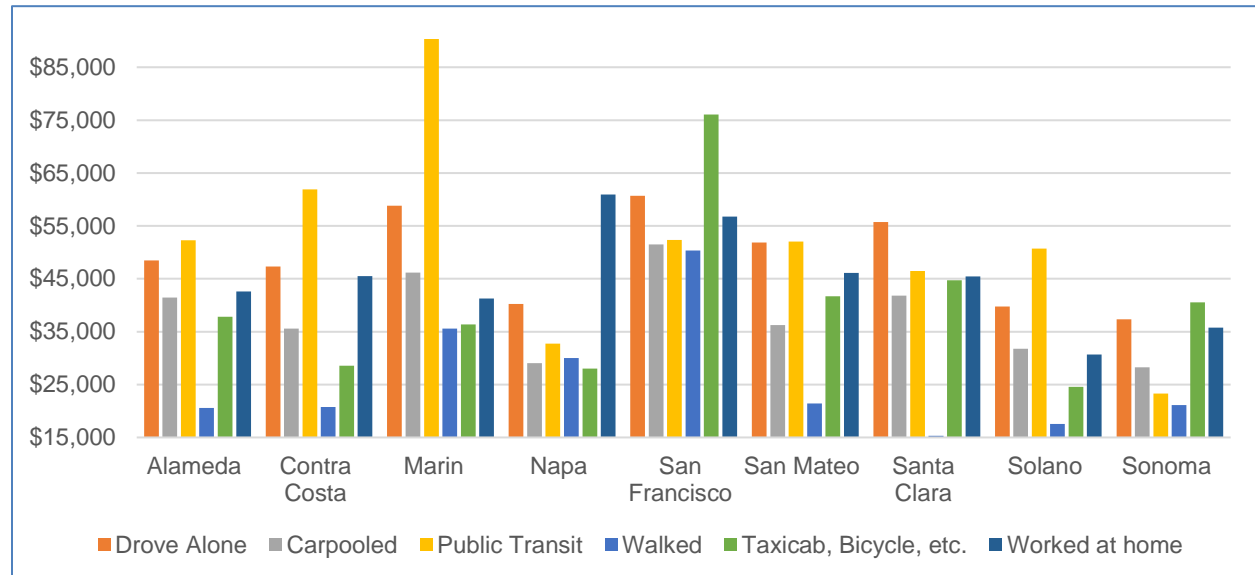
However, the two components of the combined cost are interrelated, and they vary significantly among different population groups in the Bay Area. Low-income households that are unable to afford to live near transit and job centers commute further from less urbanized areas, thereby increasing the amount of time and household budget they spend on transportation. In addition to a lower quality of life, this results in an increase in emissions from cars and light trucks, which undermines the ability of the region to meet its greenhouse gas emission reduction targets.

In terms of median earnings of workers who use different modes of travel to work. For example, transit riders have the highest earnings in Alameda, Contra Costa, Marin, San Mateo and Solano counties. In San Francisco and Sonoma counties, workers who used a taxicab or rode their bicycles and motorcycles to work had the highest earnings. But most notably, the median earnings of workers who walked to

⁷⁵ Lipman, Barbara J. October 2006. "A Heavy Load: The Combined Housing and Transportation Burdens of Working Families." Center for Housing Policy. <http://www.reconnectingamerica.org/assets/Uploads/pubheavyload1006.pdf>.

work are the lowest in every county, by a wide margin, except in San Francisco. The other exception is Napa County, where median earnings of workers who walked to work is not the lowest, but closely tied for last place with those who carpooled, used a taxicab, and rode their bicycles or motorcycles. Mode choice for workers in different counties is most likely governed by local land use (both where workers live as well as where they work), the robustness of first- and last-mile connections, transit frequency and reliability, congestion on roadways, and distance to the place of work.

Chart 3-U: Median Earnings by Mode of Travel, Bay Area, 2015



Source: U.S. Census, American Community Survey, 2011-2015, B08121 (workers 16 years and over with earnings)

For a discussion of walkable neighborhoods, as outlined in Resolution 4217, see Chapter 4, Additional Research Focus Areas.

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Chapter 4. Additional Research Focus Areas

This chapter summarizes findings from additional research on exposure to contamination and pollutants, access to opportunity, poverty in the suburbs, concentration of poverty, and proximity to services and amenities as outlined in MTC's Resolution 4217.⁷⁶ The discussion of these additional research topics, while not exhaustive, illuminates key challenges facing the region's low-income and/or minority communities. Each topic includes findings from national research and information specific to the Bay Area. The environment section summarizes information on exposure to contaminated sites and air pollution in disadvantaged communities, while the economy section describes how low-income and minority populations fare in terms of access to opportunity, growing poverty in the suburbs, concentration of poverty, employment opportunities, and access to goods and services.

Environment

As described in Chapter 1, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was enacted in February 1994 to ensure that minority and low-income populations, including tribal populations, do not suffer disproportionately high and adverse human health or environmental effects due to any federal program, policy or activity.

However, low-income people of color in the United States experience higher cancer rates,⁷⁷ asthma rates⁷⁸ and mortality rates⁷⁹ and overall poorer health outcomes compared to affluent and White populations.⁸⁰ The presence of higher concentrations of environmental pollution in these communities is one of the many causes of the health disparity.⁸¹ Exposure to contaminants and pollutants can occur in the home due to the presence of lead and asbestos, as well as in the neighborhood due to proximity to major roadways, rail corridors, contaminated sites and toxic releases from industry. This section looks at three types of contaminants and pollutants that affect human health: toxic sites, fine particulate matter

⁷⁶ MTC Resolution 4217: <https://mtc.legistar.com/View.ashx?M=F&ID=4216456&GUID=42E0CBF3-9490-4A6D-A6A6-B04003451057>.

⁷⁷ Ward, Elizabeth et al. "Cancer Disparities by Race/Ethnicity and Socioeconomic Status." *CA: A Cancer Journal for Clinicians* 54, no. 2 (2004): 78-93. ("For all cancer sites combined, residents of poorer counties [those with greater than or equal to 20 percent of the population below the poverty line] have 13 percent higher death rates from cancer in men and 3 percent higher rates in women compared with more affluent counties [less than 10 percent below the poverty line]. Even when census tract poverty rate is accounted for, however, African American, American Indian/Alaskan Native, and Asian/ Pacific Islander men and African American and American Indian/Alaskan Native women have lower five-year survival than non-Hispanic Whites.")

⁷⁸ Gray, Lolita D. and Glenn S. Johnson. "A Study of Asthma as a Socio-Economic Health Disparity Among Minority Communities." *Race, Gender & Class* 22, no. 1-2 (2015): 337-357.

⁷⁹ McLaughlin, Diane K. and C. Shannon Stokes. "Income Inequality and Mortality in US Counties: Does Minority Racial Concentration Matter?" *American Journal of Public Health* 92, no. 1 (2002): 99-104. ("Higher income inequality at the county level was significantly associated with higher total mortality. Higher minority racial concentration also was significantly related to higher mortality and interacted with income inequality.")

⁸⁰ See, e.g., Centers for Disease Control and Prevention. "CDC Health Disparities and Inequalities Report — United States, 2013." *Morbidity and Mortality Weekly Report* 62, suppl no. 3 (2013): 1-187. https://www.cdc.gov/mmwr/preview/ind2013_su.html#HealthDisparities2013.

⁸¹ Bay Area Air Quality Management District. Improving Air Quality & Health in Bay Area Communities: Community Air Risk Evaluation Program Retrospective & Path Forward (2004-2013): http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CARE%20Program/Documents/CARE_Retrospective_April2014.ashx.

and diesel particulate matter. Data used in this section is reported by the California Environmental Protection Agency (EPA) and the Bay Area Air Quality Management District (BAAQMD).

Contaminated Sites

National Studies

Land that has suffered environmental degradation due to the presence of hazardous substances poses significant health risks.⁸² Exposure to contaminants is the primary concern for such “brownfields,” which are often located in active or former industrial and military zones. Hazardous substances from these sites can also migrate off-site and impact surrounding communities through volatilization, groundwater plume migration or windblown dust. Studies have found levels of organochlorine pesticides in blood⁸³ and toxic metals in house dust⁸⁴ that were correlated with residents’ proximity to contaminated sites.

A study in New York City found an association between prevalence of liver disease and the number of Superfund sites per 100 square miles.⁸⁵ Research also indicates that the relationship between pollutant exposure, stress and health outcomes can vary based on the race and ethnicity of a population. Multiple studies provide evidence that social stressors play a role in determining vulnerability to the health impacts of environmental exposures.

A study of socioeconomic factors in communities in Florida found that census tracts with Superfund sites had significantly higher proportions of African Americans, Latinos and people employed in “blue collar” occupations.⁸⁶ Other studies have shown that maternal exposure to particulate pollution results in a greater reduction in infant birth weight among African American mothers than White mothers.⁸⁷ A study of the effect of blood lead level on blood pressure found there are significant racial and ethnic disparities, with the strongest association occurring in African Americans with symptoms of depression.⁸⁸

Differences have also been observed in the effect of PM 2.5 exposure on emergency room visits for asthma among patients of different races. The effect was found to be significant and greater in African American populations compared to Whites.⁸⁹ Among children, a study on the effects of nitrogen dioxide (NO₂) on children without health insurance in Phoenix found that Hispanic/Latino children had twice the risk of hospitalization for asthma from NO₂ exposure as White children. African American children showed about twice the risk of asthma hospitalization from NO₂ exposure as Hispanic/Latino children, regardless of insurance status.⁹⁰

⁸² These sites also have the potential to degrade nearby wildlife habitats, resulting in potential ecological impacts as well as threats to human health.

⁸³ Gaffney, S.H. et al. “Influence of geographic location in modeling blood pesticide levels in a community surrounding a U.S. Environmental protection agency superfund site.” *Environmental Health Perspectives* 113, no. 12 (2005): 1712-6.

⁸⁴ Zota, A.R. et al. “Metal sources and exposures in the homes of young children living near a mining-impacted Superfund site.” *Journal of Exposure Science and Environmental Epidemiology* 21, no. 5 (2011): 495-505.

⁸⁵ Ala, Aftab et al. “Increased prevalence of primary biliary cirrhosis near Superfund toxic waste sites.” *Hepatology* 43, no. 3 (2006): 525-31.

⁸⁶ Kearney Greg and Gebre-Egziabher Kiros. “A spatial evaluation of socio demographics surrounding National Priorities List sites in Florida using a distance-based approach.” *International Journal of Health Geographics* 8, no. 33 (2009): <https://ij-healthgeographics.biomedcentral.com/articles/10.1186/1476-072X-8-33>.

⁸⁷ Bell, Michelle L., Keita Ebisu, and Kathleen Belanger. “Ambient air pollution and low birth weight in Connecticut and Massachusetts.” *Environmental Health Perspectives* 115, no. 7 (2007): 1118-24.

⁸⁸ Hicken, Margaret T. “Black-white blood pressure disparities: depressive symptoms and differential vulnerability to blood lead.” *Environmental Health Perspectives* 121, no. 2 (2013): 205-9: <https://ehp.niehs.nih.gov/1104517/>.

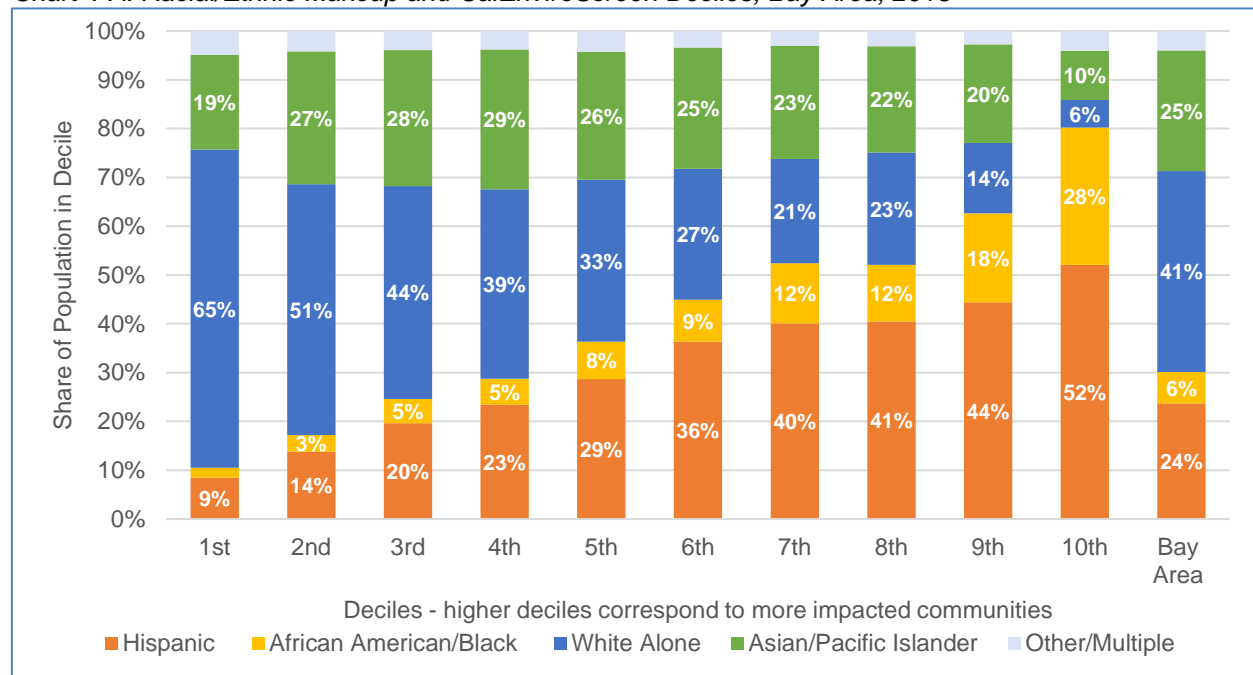
⁸⁹ Glad, Jo Ann et al. “The relationship of ambient ozone and PM_{2.5} levels and asthma emergency department visits: Possible influence of gender and ethnicity.” *Archives of Environmental & Occupational Health* 67, no. 2 (2012): 103-108.

⁹⁰ Grineski, Sara E. et al. “Children’s asthma hospitalizations and relative risk due to nitrogen dioxide (NO₂): Effect modification by race, ethnicity, and insurance status.” *Environmental Research* 110, no. 2 (2010): 178-88.

Bay Area Trends

Chart 4-A shows the breakdown of population by race/ethnicity in the Bay Area by the level of exposure to pollutants (the data is divided into ten categories, with the tenth decile representing areas that are the most burdened by environmental pollution and risk factors). EPA's data confirms the findings of national studies – that minority populations have higher exposure to pollutants and contaminants compared to the White population. The findings are most concerning for African American/Black and Hispanic populations.

Chart 4-A: Racial/Ethnic Makeup and CalEnviroScreen Deciles, Bay Area, 2015



Source: Analysis of CalEnviroScreen 3.0 Scores and Race/Ethnicity, California EPA, American Community Survey 2010-2014 5-year average, MTC analysis.

African Americans/Blacks make about 6 percent of the regional population and Hispanics about 24 percent, but both subgroups represent a higher share of the people who live in more impacted areas (from the sixth to tenth decile).⁹¹ About 40 percent of the population that resides in areas in the sixth to tenth decile is Hispanics, about 12 percent is African Americans/Blacks and 22 percent is Whites.

In the most affected areas (ninth and tenth deciles), the concentration of minorities is even higher. Only a little more than 1 percent of all Whites in the region reside in these highly impacted communities, compared to about 13 percent of all African Americans/Blacks. About 46 percent of the population that resides in areas in the ninth and tenth deciles is Hispanic, 20 percent is African American/Black, and 19 percent is Asian/Pacific Islander.

The reverse is also true for both population subgroups. Both African Americans/Blacks and Hispanics are underrepresented in areas that are the least impacted. Both Whites and Asians fare much better in comparison. Whites are the majority in the least disadvantaged areas (the first and second deciles) and a small minority in the most disadvantaged areas. EPA also estimates that, in the Bay Area, about 45 percent of the low-income population resides in impacted areas (from the sixth to the tenth decile).⁹²

⁹¹ American Community Survey 2010-2014 5-year average.

⁹² Residents in households that earn less than 200 percent of the federal poverty level in 2014.

Particulates

National Studies

Exposure to particulate matter can result in long-term negative health outcomes as well as environmental degradation, which compounds the effects on human health. People who experience higher exposure due to physical proximity or extended exposure face higher risks. Children, the elderly, pregnant women and those who are already sick are especially vulnerable.

PM 2.5, or fine particulate matter, refers to particles that have a diameter of 2.5 micrometers or less. Particles of this size can have adverse effects on the heart and lungs, including lung irritation, exacerbation of existing respiratory disease, and cardiovascular effects.

These particles are emitted from many sources, including cars and trucks, industrial processes, wood burning, and other activities involving combustion. The smaller the particle size, the more deeply the particles can penetrate into the lungs. Some fine particles have also been shown to enter the bloodstream.

Children, the elderly, and persons suffering from cardiopulmonary disease, asthma, and chronic illness are most susceptible to the effects of PM exposure.⁹³

Diesel particulate matter (diesel PM) is emitted from both on-road and off-road sources. Major sources of diesel PM include trucks, buses, cars, ships and locomotive engines. Diesel PM is therefore concentrated near ports, rail yards and freeways, where many such sources exist. Exposure to diesel PM has been shown to have numerous adverse health effects, including irritation to eyes, throat and nose; cardiovascular and pulmonary disease; and lung cancer.⁹⁴

Bay Area Trends

While EPA data confirm that no census tract in the Bay Area suffers from high exposure to PM 2.5,⁹⁵ the EPA estimates that 47% of Bay Area residents of a low-income census tract (i.e., where 30 percent or more of the residents are low-income) are exposed to high levels of diesel PM. Residents in very low-income census tracts (i.e., where the poverty rate is 50 percent or more) are even more impacted, with almost two thirds (64 percent) exposed to high levels of diesel PM.

Map 32 shows the spatial distribution of major truck routes in the region and the location of CoCs. A visual analysis of the map shows that almost all CoCs in the region are exposed to some truck traffic, and thereby to emissions such as diesel PM. The Bay Area Air Quality Management District's (BAAQMD) analysis indicates that reductions in cancer risk can be expected as new statewide emissions rules come online.⁹⁶ In the meantime, BAAQMD's Community Air Risk Evaluation (CARE) Program seeks to further reduce health impacts in communities with disproportionate exposure to air pollution, which overlap with CoCs (see Map 33).

Economy

This section summarizes two regional trends that impact not only low-income communities but also the economic competitiveness of the entire region. One of these trends is the growing gulf between residents who have access to opportunities such as jobs, transit, parks, schools and grocery stores and those that have little, if any, access to these amenities near their neighborhoods. The other trend is the slow but

⁹³ U.S. EPA. December 2012. "The National Ambient Air Quality Standards for Particle Pollution: Particle Pollution and Health." <http://www.epa.gov/pm/2012/decfshealth.pdf>.

⁹⁴ Ibid.

⁹⁵ CalEnviroScreen, California EPA; see next page for more information on the state program.

⁹⁶ Bay Area Air Quality Management District. Improving Air Quality & Health in Bay Area Communities: Community Air Risk Evaluation Program Retrospective & Path Forward (2004-2013): http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CARE%20Program/Documents/CARE_Retrospective_April2014.ashx.

consistent decline in the number of middle-wage jobs in the Bay Area. High cost of living and a lack of job opportunities have pushed many families looking for affordable housing into adjacent regions such as the Central Valley, or even across state lines. This section briefly describes both trends.

Access to Opportunity

National Studies

A recent study conducted at Harvard University⁹⁷ found that social and economic mobility for low-income residents depends largely on the quality of their neighborhoods. Residents of a neighborhood that provides good schools, safe streets, healthy food options, quality parks and community facilities, safe housing, and multiple transportation options are more likely to do well on a broad range of social, economic and health indicators. Conversely, the lack of access to these amenities is likely to hinder mobility and opportunity, especially among children.

According to the study, a low-income child (at age eight on average) who grew up in a high-poverty neighborhood would earn up to \$302,000 less over his or her lifetime⁹⁸ compared to a low-income child who lives in a low-poverty neighborhood. The study based its findings on data from 741 “community zones”⁹⁹ across the country. The authors of the study conclude that any effort to integrate low-income families with children into mixed-income communities is likely to reduce the persistence of inter-generational poverty.

Neighborhood characteristics that are strongly correlated with low inter-generational mobility include: a high share of minority population (the study cites the share of African Americans¹⁰⁰), which is also a measure of segregation;¹⁰¹ a high rate of poverty and income inequality¹⁰² (measured as the Gini coefficient); a low-performing K-12 school system¹⁰³ (measured as lower test scores, higher dropout rates and large class sizes); low social capital indices (measured as the strength of social networks and community involvement¹⁰⁴); and a high share of single-parent families (measures of family structure are the strongest predictors of upward mobility).¹⁰⁵

Another study conducted at Stanford University¹⁰⁶ found that differences in life expectancy among the poor are less associated with a lack of access to health care or levels of income inequality, and more dependent on whether the poor lived in affluent cities with a highly educated population and high levels of local government expenditures such as New York and San Francisco. Both studies use “big data” to test the hypothesis that place matters – i.e., where you grow up affects your health outcomes as well as the persistence of inter-generational poverty. Mere physical access (transportation links) to higher opportunity areas was not found to correlate with these outcomes.

⁹⁷ The Health Inequality Project (<https://healthinequality.org/>); Chetty, R., Stanford, Principal Investigator, Corresponding Author; Cutler, D., Harvard, Principal Investigator; Stepner, M., MIT, Senior Researcher.

⁹⁸ This is equivalent to a gain of \$99,000 per child in present value at age 8, discounting future earnings at a 3 percent interest rate.

⁹⁹ The study defines community zones as geographical aggregations of counties that are similar to metro areas but which also cover rural areas.

¹⁰⁰ Areas with larger black populations tended to be more segregated by income and race, which could have an adverse effect on both white and black low-income individuals.

¹⁰¹ The study clarifies that racial shares matter at a community rather than individual level.

¹⁰² The study confirms that factors that erode the middle class hamper inter-generational mobility more than the factors that lead to income growth for the wealthy.

¹⁰³ Areas with high taxes, which are predominantly used to finance public schools, have higher rates of mobility.

¹⁰⁴ Areas with high upward mobility tend to have greater participation in local civic organizations.

¹⁰⁵ As with race, parents' marital status does not matter purely through its effects at the individual level. Children of married parents also have higher rates of upward mobility if they live in communities with fewer single parents.

¹⁰⁶ The Health Inequality Project (<https://healthinequality.org/>); Chetty, R., Stanford, Principal Investigator, Corresponding Author; Cutler, D., Harvard, Principal Investigator; Stepner, M., MIT, Senior Researcher.

What are high-opportunity areas?

For an individual or household, opportunity means having access to quality education, well-paying jobs, community amenities, a safe home and a healthy living environment. High-Opportunity Areas (HOAs) therefore offer their residents access to services and amenities such as good schools, safe and walkable neighborhoods, multiple transportation options, quality parks and open space, grocery stores and fresh food markets, and better public services such as police, fire and street cleaning, among others.

As a result, high-opportunity areas – or “desirable neighborhoods” – typically have high housing costs, both for renters and homeowners. For the purpose of this report, high-opportunity areas are defined using the Kirwan Institute’s* composite index of opportunity, which includes the following indicators:

- **Education** – reading and math proficiency; class size; share of students on free or reduced lunch; and adult education attainment.
- **Economics and Mobility** – proximity to jobs (within 5 miles); share of residents on public assistance; unemployment rate; commute time; and transit access.
- **Neighborhood and Housing Quality** – median home value; residential vacancy rate; neighborhood poverty rate; median gross rent; crime risk index; proximity to waste sites and toxic releases; and proximity to parks and open space.

Based on this definition, MTC and ABAG have identified 339 census tracts as low- and very-low-opportunity areas and 430 tracts as high- and very-high-opportunity areas in the region (see Map 5m). Large parts of San Francisco, San Mateo and west Santa Clara counties, along with inland Contra Costa and Alameda counties, can be classified as high-opportunity areas. Portions of Marin and Sonoma counties also rank among high opportunity areas. The inner East Bay (including the cities of Richmond, Oakland and unincorporated Alameda County), East Contra Costa County and East San Jose can be classified as low-opportunity areas.

* *The Kirwan Institute for the Study of Race and Ethnicity, Columbus, OH (see: <http://kirwaninstitute.osu.edu/>)*

Bay Area Trends

A study conducted by the Association of Bay Area Governments¹⁰⁷ (ABAG) found that access to High-Opportunity Areas (HOAs) in the Bay Area is mostly a function of housing cost, which is a bigger barrier for lower-income households. According to the study, Whites and Asians are more likely to live in census tracts with higher access to opportunity than the population overall, whereas Hispanic and Black residents are more likely to live in census tracts with lower access to opportunity. Further, poor Hispanic and Black residents are worse off compared to poor Whites and Asians as they are more likely to live in areas of *low or very low* access to opportunity.

In 2014, of the 1.8 million low-income residents in the Bay Area, just 8 percent lived in an HOA.¹⁰⁸ Similarly, just 12 percent of the 4.3 million people with a minority status lived in an HOA. The share for the African American/Black population was even lower, at 5 percent. In comparison, of the 3 million

¹⁰⁷ The Fair Housing and Equity Assessment (FHEA) of the San Francisco Bay Area – Enhancing Regional Economic Opportunity, 2014:

http://www.planbayarea.org/sites/default/files/pdf/prosperity/research/FHEA_BAY_AREA_and_Appendices.pdf.

¹⁰⁸ Over 1.13 million people in the Bay Area lived in HOAs in 2014, of which 54 percent were White, 2 percent Black, and 12 percent low-income. While the share of minority populations in HOAs has risen significantly between 2000 and 2014, from 30 percent to 46 percent, 88 percent of people of color still live outside HOAs. (2010-2014 American Community Survey 5-year average.)

Whites in the region, 21 percent lived in an HOA.¹⁰⁹ The ABAG study concludes that segregation persists in the region, particularly for Blacks and Hispanics. Historically, this segregation was most prominent in city centers, where many low-income people of color were concentrated. As more low-income households continue to disperse geographically in the region, the pattern of segregation is being replicated in the suburbs, where these communities face lower access to opportunity. Black residents continue to leave historically Black neighborhoods in San Francisco, Oakland and Richmond, where they had relatively good access to transit and social services, to suburban communities such as East Contra Costa County, where transit as well as social services are relatively scarce.¹¹⁰

In Alameda County, 43 percent of the low-income population and 31 percent of the minority population lives in areas that are considered to have *higher* levels of disadvantage. That share is 23 and 14 percent respectively in the *highest* disadvantaged areas. In comparison, in Sonoma and Napa counties, these shares are close to zero percent.

This data highlights multiple related but distinct challenges: one, Sonoma County does not have any *higher and highest* disadvantaged areas; two, Napa County may have *highest* disadvantaged areas, but a very low share of the County's low-income population lives in these areas; three, Alameda County has many *higher and highest* disadvantaged areas, and a high share of the county's large low-income population lives in these areas; and four, a large share of this low-income population in Alameda County lives in concentrated areas of poverty (see Map 2).

Table 4-1: Share of Low-Income and Minority Population by Level of Disadvantage, Bay Area, 2014

County	Higher Disadvantage Areas		Highest Disadvantage Areas	
	Low-Income	Minority	Low-Income	Minority
Alameda	43%	31%	23%	14%
Contra Costa	32%	25%	14%	11%
Marin	16%	16%	11%	10%
Napa	1%	1%	1%	1%
San Francisco	33%	25%	17%	13%
San Mateo	32%	21%	9%	7%
Santa Clara	30%	20%	16%	10%
Solano	19%	15%	3%	3%
Sonoma	0%	0%	0%	0%

Source: American Community Survey 2010-2014, Kirwan Institute, MTC Analysis

In San Francisco and San Mateo counties, 27 percent of the low-income population lives in *high- or very-high*-opportunity areas, which is a larger share than the regional average of 17 percent. In Napa and Solano counties, this share drops to two and one percent respectively. This data also highlights multiple related but distinct challenges: one, Napa and Solano counties have very few *high- and very-high*-opportunity areas; two, in San Francisco, twice as many low-income residents live in *high- and very-high*-opportunity areas (27 percent) as do in low- and very-low opportunity areas (12 percent); and three, even in San Francisco, most of the *high- and very-high*-opportunity areas do not overlap with CoCs (see Map 34).

¹⁰⁹ In 2014, low-income people were 25 percent of the total population, minorities 59 percent, African Americans or Blacks 6 percent and Whites 41 percent. The total number of African American or Black population in the Bay Area was 474,069. (2010-2014 American Community Survey 5-year average.)

¹¹⁰ Contra Costa Health Services. May 2013. "Health Indicators and Environmental Factors Related to Obesity for Antioch, Bay Point and Pittsburg." <http://cchealth.org/prevention/pdf/Health-Indicators-and-Environmental-Factors-Related-to-Obesity-2013.pdf>.

Table 4-2: Low-Income and Minority Population by Type of Opportunity Area, Bay Area, 2014

County	High- and Very-High-Opportunity Areas				Low- and Very-Low-Opportunity Areas			
	Low-Income		Minority		Low-Income		Minority	
Alameda	65,283	15%	205,302	20%	140,380	33%	281,267	27%
Contra Costa	16,252	6%	43,688	8%	110,458	42%	204,223	35%
Marin	9,217	19%	16,218	23%	9,583	19%	14,470	21%
Napa	720	2%	1,015	2%	6,787	18%	9,592	16%
San Francisco	62,254	27%	150,279	31%	28,784	12%	52,122	11%
San Mateo	40,476	27%	160,639	37%	36,015	24%	78,542	18%
Santa Clara	98,728	23%	391,414	32%	87,167	21%	228,432	19%
Solano	1,265	1%	3,545	1%	54,184	47%	111,553	45%
Sonoma	17,716	12%	18,551	11%	65,924	46%	75,054	44%
Bay Area	311,911	17%	990,651	23%	539,282	29%	1,055,255	25%

Source: American Community Survey 2010-2014, Kirwan Institute, MTC Analysis

Poverty in the Suburbs

National Studies

In 1999, large U.S. cities and their suburbs had roughly equal numbers of poor residents. But by 2008, the number of suburban poor exceeded the poor in central cities by 1.5 million.¹¹¹ Although the poverty rate remained higher in central cities than in suburbs (18.2 percent versus 9.5 percent in 2008), it continues to rise at a faster pace in the suburbs.¹¹² In part, this is due to sustained population growth outside cities; a majority of all Americans now live in the suburbs. The two economic recessions that bracketed the past decade, however, have also contributed to the changing mix of opportunity in urban and suburban areas.

More than in previous recessions, suburban communities have experienced rates of unemployment comparable to those in cities.¹¹³ And increasingly, urban and suburban poor are becoming more similar in terms of their household structure and educational attainment.¹¹⁴ The vast majority of urban and suburban poor are working families, have a high school diploma or less, and live in deep poverty (with incomes less than half the federal poverty level, or around \$24,250 for a family of four in 2015).

Bay Area Trends

A study conducted by the Federal Reserve Bank of San Francisco in 2012¹¹⁵ mapped the extent of growing poverty in the suburbs in the Bay Area. The study concluded that several push and pull factors contributed to the trend: The housing boom of the mid-2000s offered affordable homeownership in outer suburbs, while rising home prices in the urban core encouraged homeowners to sell their houses for larger homes farther from the central city; when the housing bubble burst in 2007, these suburban areas

¹¹¹ Kneebone, Elizabeth, and Alan Berube. *Confronting Suburban Poverty in America*. Washington: Brookings Institution Press, 2013.

¹¹² Kneebone, Elizabeth and Emily Garr. January 2010. "The Suburbanization of Poverty: Trends in Metropolitan America, 2000 to 2008" Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/06/0120_poverty_paper.pdf.

¹¹³ Roth, Benjamin and Scott W. Allard. October 2010. "Strained Suburbs: The Social Service Challenges of Rising Suburban Poverty." Metropolitan Opportunity Series. Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/06/1007_suburban_poverty_allard_roth.pdf.

¹¹⁴ Berube, Alan et al. 2010. "The State of Metropolitan America: On the Front Lines of Demographic Transformation" Metropolitan Policy Program, Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/07/metro_america_report1.pdf.

¹¹⁵ Soursourian, Matthew. January 2012. "Community Development Research Brief: Suburbanization of Poverty in the Bay Area." Federal Reserve Bank of San Francisco. <http://www.frbsf.org/community-development/files/Suburbanization-of-Poverty-in-the-Bay-Area2.pdf>.

saw home values plummet furthest; and the frenzy of housing construction had largely supported many of these local economies, which collapsed when demand dried up, leading to further job losses and increased poverty in suburban communities.

The number of census tracts in the region with 20 percent or more people living in poverty (those earning below 100 percent federal poverty level) jumped by 168 percent between 2000 and 2012, and the number of poor who live in these tracts jumped by 171 percent. This shift was accelerated in part by new immigration patterns, the continued outward shift of employment, and the growing prevalence of low-wage jobs, and the loss of millions of manufacturing and construction jobs in the Bay Area.¹¹⁶

Table 4-3: Population in Households Earning Below 100 percent FPL, Bay Area, 2000-2012

Bay Area	2000		2012		Change ¹¹⁷ 2000-2012	
	Poor Tracts ¹¹⁸	Poor ¹¹⁹ Population	Poor Tracts	Poor Population	Poor Tracts	Poor Population
Metropolitan	108	122,534	182	212,234	69%	73%
Cities	86	94,500	123	136,193	43%	44%
Suburbs	22	28,034	59	76,041	168%	171%

Source: Brookings Institution, using tabulation of 2000 Decennial Census and 2012 American Community Survey 1-year data

The study also found that, between 2000 and 2009, while household poverty rates rose across the region in both urban and suburban areas, the population in poverty rose faster in suburban census tracts (16 percent in the suburbs, compared to 7 percent in urban areas), and the share of the poor living in suburban tracts increased across all racial groups, even though the change was the highest among African Americans/Blacks (with a 7 percent increase). On the other hand, poverty rates did not increase among Asians and foreign-born immigrants living in the suburbs.

Previous studies conducted by the University of California Berkeley¹²¹ and ABAG¹²² have found that the growing poverty in suburbs is a consequence of indirect displacement, as some landlords converted rental units to condominiums and tenancy in common, or raised rents to the upper limit of what was allowed by local regulations.

The Federal Reserve study presents another explanation for rising poverty in the suburbs. Low-income residents in the urban core may have moved to the suburbs seeking safer neighborhoods with less crime and more opportunities. And since employment had become more decentralized, with job growth occurring fastest outside central cities,¹²³ some workers followed job opportunities to the suburbs to shorten their commutes. In the late 2000s, as the economy began to contract, many of the same people who moved outside the central city to seek employment may have found themselves without jobs, and in jurisdictions that had no capacity to deal with high poverty and unemployment.

¹¹⁶ Kneebone, Elizabeth, and Alan Berube. *Confronting Suburban Poverty in America*. Washington: Brookings Institution Press, 2013.

¹¹⁷ Significant at the 90 percent confidence level per: Kneebone, Elizabeth. July 2014. "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012." Metropolitan Opportunity Series. Brookings Institution. <https://www.brookings.edu/interactives/the-growth-and-spread-of-concentrated-poverty-2000-to-2008-2012/>.

¹¹⁸ Tracts with 20 percent of more concentration of poor; excludes both tracts with small populations and those with more than 50 percent of residents enrolled in college or graduate school.

¹¹⁹ Population in households earning less than 100 percent of federal poverty level in 2012.

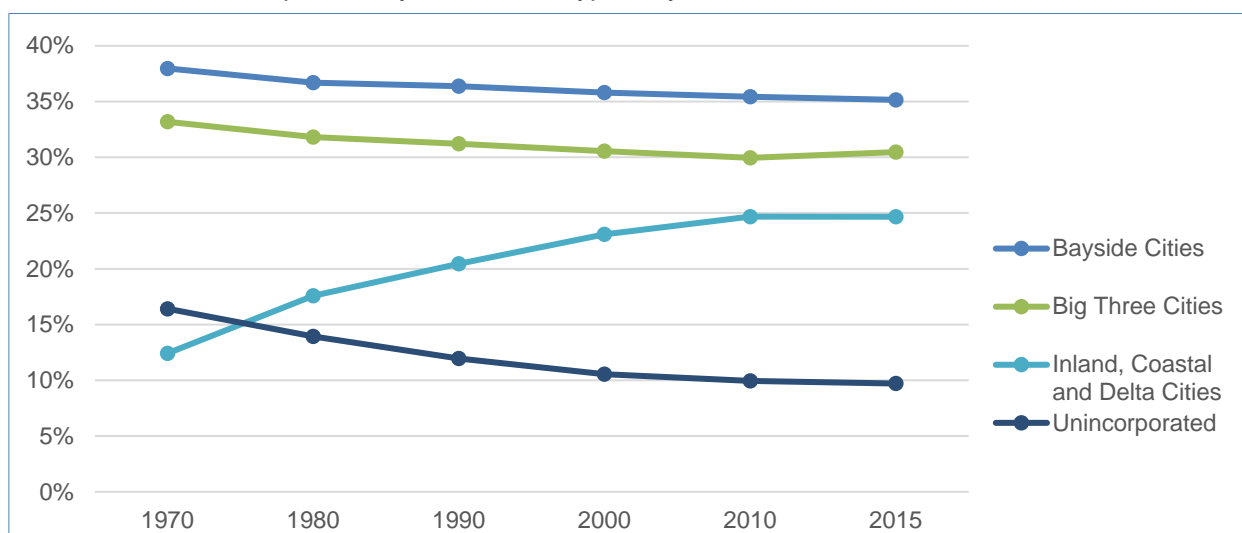
¹²⁰ Defined as the San Francisco-Oakland-Hayward and San Jose-Sunnyvale-Santa Clara metropolitan areas.

¹²¹ Chapple, Karen. August 2009. "Mapping Susceptibility to Gentrification: The Early Warning Toolkit." The Center for Community Innovation at UC-Berkeley. <http://communityinnovation.berkeley.edu/reports/Gentrification-Report.pdf>.

¹²² Cravens, Marisa et al. December 2009. "Development Without Displacement: Development With Diversity." Association of Bay Area Governments. <http://abag.ca.gov/files/DevelopmentwithoutDisplacement.pdf>.

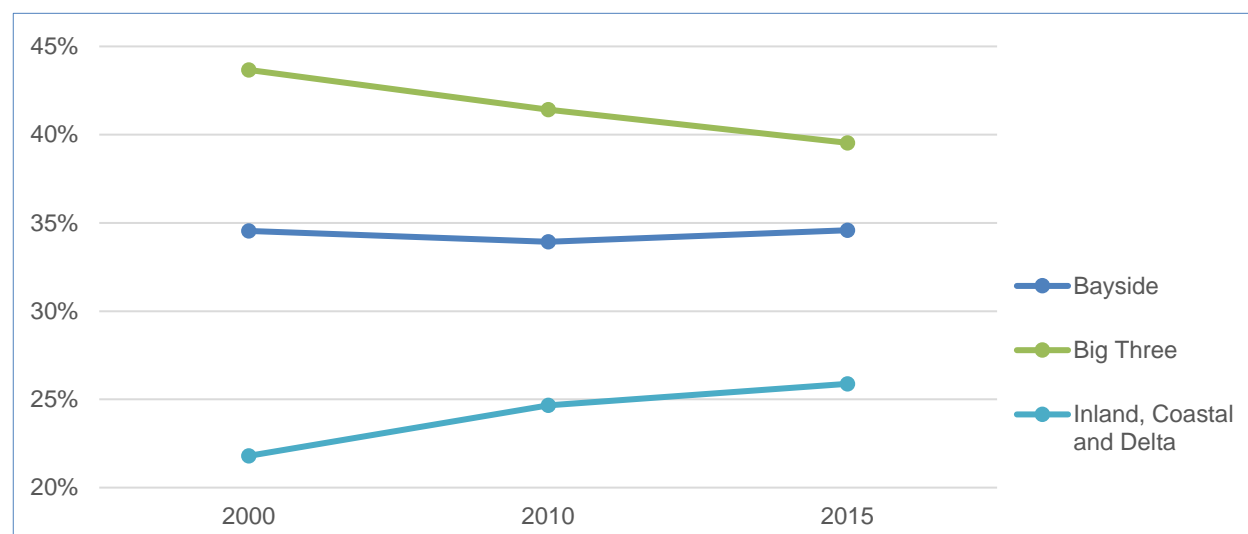
¹²³ Locally, San Francisco saw moderate employment decentralization from 1998 to 2006, as the number of jobs within three miles of downtown decreased by 2.6 percent.

Chart 4-B: Share of Population by Jurisdiction Type, Bay Area, 1970-2015



Source: MTC Vital Signs; U.S. Census Data, 1970, 1980, 1990, 2000, 2010, Decennial; 2011-2015 American Community Survey 5-Year Average; California Department of Finance, Population and Housing Estimates 1961-2016

Chart 4-C: Share of Low-Income Population by Jurisdiction Type, Bay Area, 2000-2015



Source: MTC Vital Signs; U.S. Census Data, 2000, 2010 Decennial; 2011-2015 American Community Survey 5-Year Average; California Department of Finance, Population and Housing Estimates 1961-2016

All three studies conclude that suburbs with growing poverty face a distinct set of challenges: They are more geographically isolated from job centers; they lack reliable and affordable transit options to better employment opportunities; they have limited and widely dispersed social services; they lack reserves to prevent layoffs in the public sector; and, finally, they have many failing schools.

Another way to look at poverty in the suburbs is to track the share of low-income residents within and outside the region's Priority Development Areas (PDAs) and Transit Priority Areas (TPAs). The results from this assessment reinforce the trend highlighted in the previous section (see Maps 35, 36 and 37). Between 2000 and 2014, the share of low-income residents living in PDAs decreased from 54 to 51 percent. In TPAs, that share decreased from 64 to 60 percent. Similarly, between 2000 and 2014, the share of minority population in PDAs decreased from 49 to 46 percent, and in TPAs from 64 to 59 percent. At the same time, the share of White population in PDAs grew from 30 to 31 percent and in

TPAs from 45 to 46 percent.¹²⁴ These trends are significant, since between 2000 and 2014, the low-income population in the Bay Area increased from 21 to 25 percent, the minority population increased from 50 to 59 percent, and the White population decreased from 50 to 41 percent. Even as the share of low-income and minority populations in the Bay Area is rising, their share of these populations living within PDAs and TPAs is declining.

Table 4-4: Share of Low-Income and Minority Population Outside TPAs and PDAs, Bay Area, 2016

	Region		Outside TPAs		Outside PDAs	
	Low-Income	Minority	Low-Income	Minority	Low-Income	Minority
Alameda	28%	67%	21%	27%	37%	46%
Contra Costa	25%	53%	51%	55%	61%	65%
Marin	19%	27%	62%	67%	83%	88%
Napa	27%	44%	83%	82%	83%	82%
San Francisco	28%	59%	0%	0%	29%	34%
San Mateo	20%	59%	26%	31%	58%	62%
Santa Clara	23%	66%	25%	30%	41%	49%
Solano	27%	59%	78%	83%	79%	85%
Sonoma	29%	35%	50%	50%	57%	57%

Source: American Community Survey 2010-2014, 5-year average, MTC Analysis.

Additionally, in very-low-income census tracts¹²⁵ outside PDAs and TPAs, the share of disadvantaged populations increased at an even faster rate. The low-income population grew by 333 percent outside PDAs and 351 percent outside TPAs. This share was 126 percent and 134 percent, respectively, for minority populations.¹²⁶ Poverty is not just growing in the suburbs in the Bay Area, it is also concentrating in a few neighborhoods.

At a county level, in 2014, the share of low-income and minority populations outside TPAs and PDAs varied widely. In San Francisco, almost no low-income or minority resident lived outside a TPA, whereas in Solano and Napa counties that share was around 80 percent. In San Francisco, the share of low-income and minority populations outside PDAs was similarly low, at 29 and 34 percent respectively, whereas in Marin, Napa and Solano counties, that share was between 79 and 88 percent.

Concentrated Poverty

National Studies

As mentioned in previous sections, low-income families face many challenges while living in poor neighborhoods, including higher crime rates, low-performing schools, worse health outcomes and fewer job opportunities. But as poverty concentrates in neighborhoods, the negative impacts magnify exponentially.¹²⁷ Low-income residents in areas of highly concentrated poverty face the “double burden” of not only their own poverty, but also the disadvantages of those around them. The heightened disadvantage affects not just low-income residents but entire communities, curtailing long-term

¹²⁴ U.S. Decennial Census, 2000, and American Community Survey, 2010-2014, 5-year average.

¹²⁵ Census tracts with 50 percent or more low-income population.

¹²⁶ More than 78,000 low-income and more than 16,500 minority people lived in high-poverty census tracts outside PDAs in 2014. Similarly, more than 86,500 low-income and 14,000 minority people lived in high-poverty census tracts outside TPAs in 2014.

¹²⁷ For a review of the literature on the effects of concentrated poverty, see: Berube, Alan et al. 2008. “The Enduring Challenge of Concentrated Poverty in America: Case Studies from Communities Across the U.S.” Federal Reserve System and the Brookings Institution. https://www.brookings.edu/wp-content/uploads/2016/06/1024_concentrated_poverty.pdf. See also: Sharkey, Patrick. *Stuck in Place: Urban Neighborhoods and the End of Progress Toward Racial Equality*. Chicago: University of Chicago Press, 2013.

economic growth potential, limiting the impact of public investments and undermining efforts to sustain inclusive growth.

A study published by the Brookings Institution¹²⁸ notes that after two economic downturns and the subsequent periods of trepid recovery, which failed to improve conditions for all residents, the number of people living below the federal poverty line (\$23,492 for a family of four in 2012)¹²⁹ reached record highs. The study concludes that, across the U.S., poverty became more concentrated in disadvantaged neighborhoods between 2000 and 2012.¹³⁰ And more of these low-income communities were now in the suburbs, marking a significant shift from 2000, when the number of poor was higher in urban areas.¹³¹ This shift only adds to the growing number of challenges faced by suburban jurisdictions that may be ill-equipped to deal with a growing low-income population.¹³²

At the same time that the share of low-income residents living in concentrated poverty is rising, the racial and ethnic makeup of low- and high-poverty neighborhoods is also changing. Lower-poverty neighborhoods have become somewhat more diverse since 2000, although residents of these neighborhoods remain largely White. In contrast, minority residents, who experience heightened disadvantage at higher rates than White residents, continue to make up a disproportionate share of residents in high-poverty neighborhoods.

A study conducted by Harvard University¹³³ finds substantial evidence that young children (ages four to 12) whose families move to lower-poverty neighborhoods are more likely to attend college, are less likely to become single parents, and have substantially higher incomes. The study analyzed data collected by the U.S. Department of Housing and Urban Development (HUD), starting in the 1990s, on 4,600 families who at the time lived in public housing.

The Harvard study confirms that children who moved to a better neighborhood when they were young enjoyed much greater economic success in adult life than similarly aged children who stayed behind in public housing. And the children who moved when they were older experienced no gains or perhaps worse outcomes, probably the result of a disruptive move, paired with few benefits from spending only a short time in a better neighborhood. The opposite effects are symmetric as well: Each extra year in a worse neighborhood led to worse long-term outcomes, and beyond age 23, any exposure to good neighborhoods had no effect. What mattered was not just the quality of the neighborhood, but also the number of childhood years spent growing up in it.

Bay Area Trends

There are many definitions of concentrated poverty, but research at Harvard University¹³⁴ suggests that social and economic mobility declines precipitously as the share of low-income residents in a neighborhood approaches 40 percent. In the Bay Area in 2014, 296 census tracts (or approximately 20 percent) met that threshold. About 38 percent of the region's low-income residents lived in these census

¹²⁸ Kneebone, Elizabeth. July 2014. "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012." Metropolitan Opportunity Series. Brookings Institution. <https://www.brookings.edu/interactives/the-growth-and-spread-of-concentrated-poverty-2000-to-2008-2012/>.

¹²⁹ For more information on the federal poverty level, see: <https://www.federalregister.gov/documents/2016/01/25/2016-01450/annual-update-of-the-hhs-poverty-guidelines>.

¹³⁰ As poverty has spread, it has also become more concentrated in distressed and high-poverty neighborhoods, eroding the brief progress made against concentrated poverty during the late 1990s (Kneebone, Elizabeth, "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012").

¹³¹ Kneebone, Elizabeth, and Alan Berube. *Confronting Suburban Poverty in America*. Washington: Brookings Institution Press, 2013.

¹³² Kneebone, Elizabeth. July 2014. "The Growth and Spread of Concentrated Poverty, 2000 to 2008-2012." Metropolitan Opportunity Series. Brookings Institution. <https://www.brookings.edu/interactives/the-growth-and-spread-of-concentrated-poverty-2000-to-2008-2012/>.

¹³³ Ibid.

¹³⁴ Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. May 2015. "Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." NBER Working Paper Series. National Bureau of Economic Research. <http://www.nber.org/papers/w21156>.

tracts, which increased from 25 percent in 2000 (see Map 14). At the regional level, more than a third of the low-income population (37 percent) lived in a concentrated area of poverty. At a county level, this share is the highest in Solano (46 percent), Alameda (44 percent), and Contra Costa (41 percent) counties.

Table 4-5: Share of Low-Income Population in Concentrated Areas of Poverty, Bay Area, 2014

	Population	Low-Income Population	Low-Income Population in Concentrated Poverty
Alameda	21%	28%	44%
Contra Costa	15%	25%	41%
Marin	3%	19%	22%
Napa	2%	27%	35%
San Francisco	11%	28%	37%
San Mateo	10%	20%	29%
Santa Clara	25%	23%	32%
Solano	6%	27%	46%
Sonoma	7%	29%	35%
Bay Area	100%	25%	37%

Source: American Community Survey 2010-2014 5-year average, MTC analysis

Wages and Middle-Wage Jobs

National Studies

A national study conducted by the University of California Berkeley and the Paris School of Economics¹³⁵ estimates that between 1962 and 2014, the bottom 50 percent of individual income earners in the U.S. gained only one percent in earnings, or \$16,000 per adult after adjusting for inflation. In comparison, the top 10 percent of individual income earners gained 121 percent and the top one percent gained 205 percent between 1980 and 2014.¹³⁶ In addition, the median wage for moderate-income workers remains stagnant or has declined since 2000 when adjusted for inflation.

While wages have stagnated, opportunities for economic mobility have also declined. Middle-wage jobs lost during the two recessions in 2000 and 2008 have largely been replaced with lower-paying service sector jobs.

Bay Area Trends

Despite the job losses during the Great Recession, the regional economy is in the midst of a strong recovery. Employment expanded in the San Jose Metro Area by 23.7 percent from its lowest point in July 2009, and in San Francisco by 17.6 percent from its low in August 2010. Together, these two metro areas make the Bay Area one of the five fastest growing economic regions in the country – a product of the region’s diverse technology-driven economy and strong global ties.¹³⁷

Since 2009, job growth has been strongest in industries related to technology as well as in the service sectors like education, healthcare, and leisure and hospitality. Manufacturing has continued to decline, with total number of jobs at 32 percent below 1990 levels, reflective of a broader trend for blue-collar

¹³⁵ MTC Vital Signs.

¹³⁶ Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. December 2016. "Distributional National Accounts: Methods and Estimates for the United States." NBER Working Paper No. 22945. National Bureau of Economic Research. <http://www.nber.org/papers/w22945>. See also: <http://gabriel-zucman.eu/files/PSZ2016.pdf>.

¹³⁷ Bay Area Council Economic Institute. 2012. "A Roadmap for Economic Resilience: The Bay Area Regional Economic Strategy." <http://www.bayareaeconomy.org/files/pdf/BACEI-RES-Report.pdf>.

jobs in all U.S. metro areas.¹³⁸ Professional services jobs grew by double digits in the past two decades with most of this growth concentrated in Santa Clara, San Mateo and San Francisco counties. The East Bay has benefitted from some service-sector job growth, though its dominant industries are in government and logistics – two sectors that have seen relatively stagnant job growth.¹³⁹

The benefits of the employment growth are therefore not evenly distributed among all workers. A recent study conducted for the Bay Area Regional Prosperity Plan (RPP)¹⁴⁰ found that, in 2014, more than 1.1 million workers in the region, or over one third of the total workforce, earned less than \$18 per hour (or less than \$36,000 per year for full-time work), with the majority earning less than \$12 per hour.¹⁴¹ The number of jobs that pay less than \$18 per hour is expected to increase even more over the coming years.

Table 4-6: Job Growth Projections by Wage Level

Wage Levels	Share of Jobs 2010	Share of Job Growth 2010-2020	Share of Jobs 2020 Projections
Low- and Moderate-Wage (under \$18 per hour)	36%	34%	35%
Middle-Wage (\$18 to \$30 per hour)	27%	22%	26%
Higher-Wage (Above \$30 per hour)	38%	44%	39%

Source: *Economic Prosperity Strategy: Improving Economic Opportunity for the Bay Area's Low- and Moderate-Wage Workers.* http://mtc.ca.gov/sites/default/files/Economic_Prosperty.pdf. Note: nearly 36 percent of jobs pay less than \$18 per hour, and the share of jobs in the middle is projected to decline relative to the proportions of jobs at the top and bottom of the wage spectrum. This limits opportunities for current lower-wage workers to move into higher-paying jobs.¹⁴²

To put earnings and wages into perspective, a household with two adults and two children in Alameda County would need to earn over \$65,000 per year (or more than \$30 per hour) just to cover basic expenses.¹⁴³ Using this same self-sufficiency standard, a four-person household would need to earn close to \$60,000 per year in Solano County and over \$75,000 in San Francisco. There are many more lower-wage jobs relative to middle-wage jobs, and as a result, too many of the region's workers remain in lower-wage jobs, lacking clear pathways for advancement. For location of major employment centers in the Bay Area see Maps 38 and 39.

Walkability: Access to Neighborhood Goods and Services

National Studies

There are three primary benefits to living in a walkable neighborhood. The first is safety. Research confirms that a built environment that is conducive to safe walking increases the likelihood that residents will walk or bicycle more often, at all times of the day.¹⁴⁴ As residents spend more time outside their homes, on streets or in neighborhood parks, they provide more “eyes on the street,” which has been shown to reduce criminal activity.¹⁴⁵ Traffic collisions are also lower in walkable communities, as

¹³⁸ MTC Vital Signs.

¹³⁹ Ibid.

¹⁴⁰ Terplan, Egon et al. October 2014. “Economic Prosperity Strategy: Improving Economic Opportunity for the Bay Area's Low- and Moderate-Wage Workers.” http://mtc.ca.gov/sites/default/files/Economic_Prosperty.pdf.

¹⁴¹ \$18 per hour is equivalent to approximately 80 percent of the region's median wage. It represents the bottom end of the range of middle-wage jobs in the Bay Area. The Economic Prosperity Strategy defines middle-wage jobs as those that pay between \$18 and \$30 per hour.

¹⁴² Terplan, Egon et al. October 2014. “Economic Prosperity Strategy: Improving Economic Opportunity for the Bay Area's Low- and Moderate-Wage Workers.” http://mtc.ca.gov/sites/default/files/Economic_Prosperty.pdf.

¹⁴³ The earnings are based on the Family Economic Self-Sufficiency Standard, which covers expenses for housing, food, child care, transportation, health care and taxes. See: <http://www.insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

¹⁴⁴ Centers for Disease Control and Prevention. “Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities.” <https://www.cdc.gov/physicalactivity/walking/call-to-action/pdf/partnerguide.pdf>.

¹⁴⁵ In her 1961 book *The Death and Life of Great American Cities*, Jacobs proposed the “eyes on the street” theory. Jacobs argues that increased street traffic, day and night, not only help communities flourish socially and economically, but also acts as self-

vehicles move slower and drivers are more mindful of pedestrians and bicyclists.¹⁴⁶

The second benefit is improved health. For example, the average resident of a walkable neighborhood weighs 6 to 10 pounds less than the average residents of a sprawling neighborhood.¹⁴⁷ Multiple national and international studies confirm that increased physical activity through moderate exercise such as walking can reduce the risk of cardiovascular disease, type 2 diabetes and metabolic syndrome, as well as some cancers in children and adults. Regular physical activity also improves mental health and reduces morbidity and mortality due to chronic diseases.¹⁴⁸ Lastly, a lower reliance on the automobile for mobility reduces emissions from cars and light trucks, which improves air quality.

The third benefit of living in a walkable neighborhood is better access to amenities and services. According to WalkScore,¹⁴⁹ walkable neighborhoods generally have a main street with local businesses; high-quality public transit; parks and public places to gather and play; schools and workplaces; and streets that accommodate pedestrians, bicyclists and transit. The physical proximity to a diverse range of amenities and a built environment that promotes walking and bicycling together contribute to the residents' greater access to these daily goods and services.¹⁵⁰ Secondary benefits of walkable neighborhoods include reduced isolation and higher social capital,¹⁵¹ which are critical for disadvantaged communities that include seniors, people with disabilities and low-income residents.¹⁵²

Bay Area Trends

In the Bay Area, pre-1950 neighborhoods, which have connected street grids and small blocks, are generally more walkable than newer, suburban developments. The six decades following 1950 were dominated by conventional suburban development. Cities and suburbs built in this era are largely characterized by subdivisions, shopping centers, office parks and automobile-oriented thoroughfares. The average WalkScore of traditional cities in the US is 78—nearly double that of more sprawling cities.¹⁵³

In the Bay Area, the average WalkScore for the entire region is 58.¹⁵⁴ About half the region's population and households reside in census tracts with a WalkScore higher than the regional average. A large share of low-income (60 percent), zero-vehicle households (80 percent), people with disabilities (50 percent), and rent-burdened households reside in these moderately walkable neighborhoods. Among Bay Area counties, San Francisco has the highest average WalkScore of 82, followed by Alameda, at 63. Sonoma and Napa counties have the lowest average WalkScore, at 46. Solano, Contra Costa and Marin counties

policing, which deters criminal and anti-social behavior. Jacob's theory holds that populated areas are less likely to have criminal activity if the criminal believes there is a greater likelihood of him/her being seen or caught by others.

¹⁴⁶ U.S. Department of Transportation, Federal Highway Administration. January 2015. "A Resident's Guide for Creating Safer Communities for Walking and Biking." FHWA-SA-14-099.

http://safety.fhwa.dot.gov/ped_bike/ped_cmnty/ped_walkguide/residents_guide2014_final.pdf.

¹⁴⁷ "Communities." Natural Resources Defense Council. <https://www.nrdc.org/issues/communities>.

¹⁴⁸ "Physical Activity and Health." Centers for Disease Control and Prevention. <https://www.cdc.gov/physicalactivity/basics/pa-health/>.

¹⁴⁹ WalkScore is a private company that provides walkability services and apartment search tools through a website and mobile applications. Its flagship product is a large-scale, public access walkability index that assigns a numerical walkability score to any address in the United States, Canada, and Australia: <https://www.walkscore.com/>.

¹⁵⁰ Accessibility is often expressed as a measure of people's ability to reach destinations within a certain period of time by a certain travel mode. It measures both whether the means to access destinations exists (such as a road, highway, or transit route) as well as the number of destinations reachable within a certain travel time from trip's origin. Thus, good accessibility results from having both a large number of destinations within a reasonable distance as well as the means available to get to them.

¹⁵¹ "Social capital is a measure of an individual's or group's networks, personal connections, and involvement. Like economic and human capital, social capital is considered to have important values to both individuals and communities" -Rogers, Shannon H. et al. "Examining Walkability and Social Capital as Indicators of Quality of Life at the Municipal and Neighborhood Scales." *Applied Research in Quality of Life* 6, No. 2 (2011): 201–213.

¹⁵² Ibid.

¹⁵³ Steuteville, Robert. "Traditional cities are having a big decade." Public Square: A CNU Journal, December 5, 2016. <https://www.cnu.org/publicsquare/2016/12/05/traditional-cities-are-having-big-decade>.

¹⁵⁴ Data downloaded from WalkScore's website in January 2017 and analyzed by MTC.

perform only marginally better, at 48 (see Maps 40 and 41).

The average WalkScore in Priority Development Areas (PDAs) is 70, followed by communities of concern (CoCs) and Transit Priority Areas (TPAs), at 68, and High-Opportunity Areas (HOAs) at 60. Though higher than the regional average, WalkScores in PDAs, CoCs, TPAs and HOAs are far lower than in a traditional city in the US, at 78.

If the threshold for WalkScores is increased to 80, which represents a walkable neighborhood, the share of the region's population that resides in these areas drops to 12 percent. The majority of census tracts with an average WalkScore of 80 or higher are in San Francisco (57 percent), followed by Alameda (32 percent) and San Mateo (6 percent). Marin, Napa, Solano and Sonoma counties have one or no such census tracts. A little more than 30 percent of low-income residents and zero-vehicle households reside in walkable neighborhoods (with a WalkScore of 80 or higher).

Chapter 5. Analysis Results

This chapter summarizes the equity analysis results for the Draft Plan, incorporating relevant findings from related Title VI analyses (in the distribution of investment benefits and the spatial distribution of projects included in the plan, intended to satisfy federal nondiscrimination requirements) and environmental justice analyses (intended to address whether communities of concern [CoCs] are subject to disproportionately high and adverse effects). The complete results from the Title VI and EJ analysis are presented in Chapter 6.

The analysis presented in this chapter has two parts. The first uses the six equity measures described in Chapter 2 to evaluate the plan as well as four alternatives studied in the Draft Environmental Impact Report (EIR) for their relative benefits to CoCs and low-income populations. The EIR alternatives incorporate a range of land use and transportation policies, programs and projects to test their relative performance on the 13 performance targets, as well as other environmental indicators required by state law.¹⁵⁵ As described in Chapter 2, six of the 13 targets are also considered equity measures.

For a description of EIR scenario alternatives, see Chapter 2 of this report. For a description of the 13 performance targets, see the Draft Plan. For a description of all the environmental and equity topics studied in the EIR, see the Draft Plan Bay Area 2040 EIR report.

The second part of the equity analysis is conducted on the transportation investments included in the Draft Plan, to assess their relative benefits to low-income and minority populations compared to non-low-income and non-minority populations. This analysis is conducted using the population-based, use-based and project mapping methodologies, described in more detail in Chapter 2. Chapter 7 describes a range of proposed or adopted land use and transportation policies, programs and planning efforts that address many of the challenges identified throughout this chapter as well as in chapters 3 and 4.

Analysis of Equity Measures

To conduct the analysis of benefits and burdens on disadvantaged communities, MTC and ABAG adopted six quantitative performance targets, or *equity measures*, in January 2016. These six measures are a subset of 13 Performance Targets¹⁵⁶ for the entire plan. The equity measures for the plan include:

- *Healthy and Safe Communities* (Performance Target #3) – to measure the health benefits and burdens associated with air quality, road safety and physical inactivity for high- and low-income households;¹⁵⁷
- *Equitable Access* (Performance Target #5) – to measure a lower-income household's share of income consumed by transportation and housing costs, compared to a higher-income household;¹⁵⁸
- *Equitable Access* (Performance Target #6) – to measure the share of affordable housing in Priority Development Areas (PDAs), Transit Priority Areas (TPAs), or High-Opportunity Areas (HOAs),¹⁵⁹ within and outside CoCs;

¹⁵⁵ For more details on state requirements for environmental impact reports for regional transportation plans, see: http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_cfa_20070531_141448_sen_comm.html.

¹⁵⁶ Plan Bay Area 2040 Performance Targets; see:

<https://mtc.legistar.com/LegislationDetail.aspx?ID=2542165&GUID=D89FCABA-8814-4F0C-990D-B6803291A4D5>.

¹⁵⁷ Households that earned more than \$100,000 (in 2000 dollars) are considered high-income, and those that earn less than \$30,000 (in 2000 dollars) are considered low-income for this analysis.

¹⁵⁸ Households that earned more than \$60,000 (in 2000 dollars) are considered higher-income, and those that earn less than \$60,000 (in 2000 dollars) are considered lower-income for this analysis.

¹⁵⁹ See the Fair Housing and Equity Assessment report, ABAG, 2015, for a definition of High-Opportunity Areas:

- *Equitable Access* (Performance Target #7) – to measure the share of low- and moderate-income households in PDAs, TPAs and HOAs that are at an increased risk of displacement, within and outside CoCs;
- *Economic Vitality* (Performance Target #8) – to measure the share of jobs that are accessible by auto and transit in congested conditions, within and outside CoCs; and
- *Economic Vitality* (Performance Target #9) – to measure the share of middle-wage jobs in the region, within and outside CoCs.

Table 5-1 summarizes the modeled results for each of the six measures as well as for the baseline year, No Project Alternative, Main Streets Alternative, Big Cities Alternative, Environment Equity and Jobs (EEJ) Alternative, and the Draft Plan. The Draft Plan performs better than or as well as the other EIR alternative for the six performance measures.

Table 5-1: Summary of Performance Results for EIR Alternatives

Equity Measures	Sub-Geography	Plan Target	Base Year	No Project	EIR Alternatives			
					Main Streets	Big Cities	EEJ	Draft Plan
3. Reduce Adverse Health Impacts	HI-HHs	-10%	204,593	-1%	-1%	-1%	-1%	-1%
	LI-HHs		142,064	-0%	-0%	-1%	-1%	-1%
5. Decrease H+T * Share for LI-HHs	HI-HHs	-10%	20%	+5%	+5%	+5%	+5%	+5%
	LI-HHs		54%	+15%	+13%	+13%	+12%	+13%
6. Increase Share of Affordable Housing	RoR **	+15%	8%	+0%	+3%	+2%	+3%	+3%
	CoCs		23%	-2%	-1%	-2%	+3%	-0%
7. Share of LI-HHs at Risk of Displacement	RoR	+0%	14%	+16%	+9%	+8%	+8%	+7%
	CoCs		32%	+25%	-1%	+13%	-0%	+1%
8. Increase Share of Jobs Accessible	RoR	+20%	17%	-3%	-1%	-1%	-1%	-0%
	CoCs		20%	-1%	-2%	-2%	-0%	+0%
9. Increase Middle-Wage Jobs	RoR	+38%	38%	+43%	+43%	+43%	+43%	+43%
	CoCs		38%	+43%	+43%	+43%	+43%	+43%

Source: MTC Analysis

Notes: For equity measure #3, low-income households (LI-HHs) earn less than \$30,000, and high-income households earn more than \$100,000, in year-2000 dollars. For equity measure #5, lower-income households earn less than \$60,000, and higher-income households earn more than \$60,000 in year-2000 dollars. For equity measures #6 and #7, the measures are specific to Priority Development Areas, Transit Priority Areas or High-Opportunity Areas. Note that communities of concern do not generally overlap with High-Opportunity Areas.

* Housing and Transportation (H+T)

** Remainder of the Region (RoR)

The main finding of the equity analysis is that housing affordability remains the most significant challenge for the Bay Area. Some of these challenges are described in more detail in chapters 3 and 4. While there are a number of factors that contribute to the lack of housing affordability at the neighborhood and regional levels (most of which are beyond the direct control or influence of regional agencies), the outcomes negatively affect every equity measure adopted for the plan (see Table 5-1).

Public agencies have a role to play in solving this crisis. Regional agencies can support local jurisdictions and facilitate the construction of new housing units (both market rate and affordable) to

http://abag.ca.gov/files/1_FHEAFinalReport_3.13.15.pdf.

¹⁶⁰ Health outcomes are measures as DALYs, or disability-adjusted life years. For more information about this measure, see: http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/.

keep pace with job growth, and the plan can provide incentives and planning assistance to communities that are willing to adopt supportive policies and programs. Local jurisdictions can allow new high-density residential development and protect vulnerable populations, while the state can alter its tax policies and regulatory requirements to allow more housing to be built and preserved for working families, low-income populations, seniors, veterans, the homeless and people with disabilities.

Health Outcomes

For the health measure, the Draft Plan reduces negative health outcomes for households earning less than \$30,000 per year by one percentage point over the 24-year planning horizon of Plan Bay Area (PBA) 2040. The benefit for households earning more than \$100,000 per year is the same. While this may not seem like much, a reduction of even this magnitude is challenging given the predominantly dispersed nature of development in the region. Unless a large number of residents move to mixed-use, walkable communities, this benefit is unlikely to rise significantly, despite substantial investments in active transportation, road safety and public transit. Still, the role of transportation in improving health outcomes is well established, and the Draft Plan makes some progress in realizing this potential.

Housing and Transportation Costs

For the combined housing and transportation cost measure, the Draft Plan increases the total cost for households that earn less than \$60,000 per year by 13 percentage points. Of this increase, 12 percentage points are attributable to rising housing costs and one percentage point to rising gas prices due to inflation. More than any other equity measure, the combined cost of housing and transportation accurately reflects the huge role that housing affordability plays in the everyday challenges faced by lower-income households in the region.

But while the Draft Plan performs as well as or better than other EIR alternatives for this measure, the outcome for higher-income households (those earning more than \$60,000 per year) is relatively better, with a five percentage point increase over the 24-year period. The relatively modest increase for higher-income households is also from a much lower base of 19 percent (in combined housing and transportation costs) in the baseline year (2005). By 2040, the combined cost of housing and transportation for higher-income households will rise to 23 percent of income, and for lower-income households to 67 percent.

Affordable Housing

For the affordable housing measure, which estimates the share of affordable housing units in PDAs, TPAs and HOAs, the Draft Plan decreases the share of affordable housing units in communities of concern (CoCs) by less than one percentage point. Despite this shift in the wrong direction, the Draft Plan performs better than two of the other three EIR alternatives in CoCs. The exception is the EEJ scenario, which increases the share of affordable housing by 3 percentage points. The Draft Plan, however, performs better in the remainder of the region, which is the area outside CoCs but still within PDAs, TPAs and HOAs, by increasing the share of affordable units by 3 percentage points. This is better than or as good as the other EIR alternatives.

Even though the share of affordable units in the remainder of the region increases by 3 percentage points (from 8 percent in 2010 to 11 percent in 2040), the overall share of affordable units within CoCs is still much higher, at 20 percent (though down from 21 percent in 2010). The region must continue to build more affordable units in PDAs, TPAs and HOAs to accommodate lower-income households near amenities and services, irrespective of whether these units are within or outside CoCs, especially since concentrating low-income housing within existing disadvantaged communities raises fair housing concerns.

Risk of Displacement

For the displacement measure, the Draft Plan increases the risk for low-income households by one

percentage point within CoCs and 7 percentage points in the remainder of the region. The Draft Plan performs better within CoCs than the remainder of the region, and it performs marginally worse than the Main Streets and EEJ alternatives. Still, 37 percent of all low-income households in PDAs, TPAs and HOAs are at risk of displacement in 2040 within CoCs (up from 36 percent in 2010), and 21 percent in the remainder of the region (up from 14 percent in 2010).

By definition, the risk of displacement for this measure is higher in areas that accept more growth, especially if these areas also have existing low-income populations. This definition of risk does not account for communities that resist residential development and at the same time continue to add a significant number of jobs, which increases housing affordability pressures on neighboring communities, lower-income households and working families. Those who have fewer resources face limited choices – double up to stay in the same community, or move away.

In the Bay Area, this pattern of displacement has resulted in a significant shift of the lower-income population from urban to suburban and exurban areas that have limited access to transit, job opportunities and many other amenities and services (see Map 42). More choices for housing close to transit and job centers can relieve this pressure, but the Bay Area has a large deficit of housing production that dates back to the 1970s.

Solving the region's housing affordability crisis will require a significant push to build more housing at all income levels, to build these units closer to transit and jobs, and to build them at a much faster pace than even in the current economic cycle.

Job Access

For the job access measure, the Draft Plan increases the share of jobs that are accessible by auto or transit in congested conditions by less than one percentage point within CoCs, compared to no change in the remainder of the region. Of all the EIR scenarios, only the Draft Plan moves the CoCs in the right direction. The accessibility measures for all the other scenarios is negative, reflecting the anticipated rise in traffic congestion across the region in 2040.

Middle-Wage Jobs

For the middle-wage jobs measure, the Draft Plan increases the share of well-paying jobs in high-growth industries by 43 percentage points, thereby exceeding the target set at 38 percentage points. All the EIR scenarios, however, increase the share of middle-wage jobs by 43 percentage points, since the growth projections for middle-wage jobs are independent of the land use and transportation policies studied in the plan development process.

The Draft Plan does not meet the performance targets for most equity measures (except for the middle-wage jobs measure), and in three instances, moves in the opposite direction. This outcome is not entirely unexpected in a built-out region such as the Bay Area. Not only are the plan targets ambitious, but meeting or exceeding them requires sustained commitment for action from multiple stakeholders and public agencies at numerous levels over a long period of time. By recognizing, measuring and prioritizing the housing challenge in the Bay Area, the Draft Plan lays the foundation for a more informed and collaborative regional discussion regarding effective policy solutions and implementation.

Transportation Investment Analysis

This section summarizes the results from an analysis of Draft Plan investments for their relative impact on minority and low-income populations, compared to non-minority and non-low-income populations. The methodology for conducting the investment analysis is described in more detail in Chapter 2. The legal and policy context for the analysis is provided in Chapter 1.

The transportation investment analysis includes the following two components:

- *A population/use-based analysis* – which quantifies the benefits of the region’s transportation investments, and assigns these benefits to low-income and minority populations based on their share of system usage for both roadway and transit modes of travel. This share of benefits is then compared to the overall share of minority and low-income populations in the region.
- *A mapping analysis* – which relies on a qualitative assessment of the spatial distribution of major roadway and transit projects in relation to the location of minority and low-income populations.

Population/Use-Based Analysis

The population/use-based investment analysis is conducted in four distinct steps, described below.

Step 1: Determine the Share of Population and System Usage

For the population/use-based analysis, as a first step, the region’s total population and total trips are assigned to four subgroups: low-income, non-low-income, minority and non-minority populations (see Table 5-2 below). The trip data includes both transit and roadway trips calculated as average daily trips for the entire region. Note that the minority subgroup’s share of average daily trips is lower than its share of the regional population. Some of this difference is attributable to the fact that demographic numbers in the 2010-2014 American Community Survey dataset differ slightly from those in the 2012/2013 California Household Travel Survey datasets.¹⁶¹

Table 5-2: Share of Population and System Usage by Subgroup

	Population		Average Daily Trips	
	#	% of Total	#	% of Total
Low-Income Status *	1,837,830	25%	6,730,534	28%
Non-Low-Income Status	5,501,132	75%	17,059,291	72%
Minority Status **	4,305,728	59%	12,803,815	54%
Non-Minority Status	3,033,234	41%	11,098,119	46%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey

* Low-income status includes population in households with incomes below \$50,000 per year in 2006 dollars

** Minority status includes populations that are not White

Relative to their share of the regional population, minority and low-income populations have different travel behaviors. Low-income populations comprise 25 percent of the regional population but take 28 percent of all trips in the region (average daily trips). Minority populations, on the other hand, comprise 59 percent of the regional population but account for only 54 percent of all trips. When factoring in the mode of travel (transit ridership and roadway trips, see Table 5-3 below), the variations are even more significant. Low-income populations account for the majority of transit trips in the region, at 52 percent, which is more than twice their regional share of the population, and minority populations account for 62 percent of transit trips.

Though low-income populations account for a disproportionately large share of transit ridership in the region, 88 percent (or a little less than 6 million trips out of a total of about 6.7 million trips) still drive alone or carpool to their destinations. That share is even higher for minority populations, at 92 percent (or about 11.5 million out of a total of 12.5 million trips). The dependence on non-transit modes of travel for both low-income and minority populations may in large part be a function of the dispersed development pattern in the region, where a majority of jobs and homes are not transit-accessible.

¹⁶¹ The differences in the share of trips and population are primarily due to differences in overall regional demographics from the 2012/2013 California Household Travel Survey (which was weighted according to the region’s 2010 Census population), used to allocate funding on the basis of usage, and the 2014 Census data, used for the overall regional population comparison.

Table 5-3: Share of System Usage by Mode by Subgroup

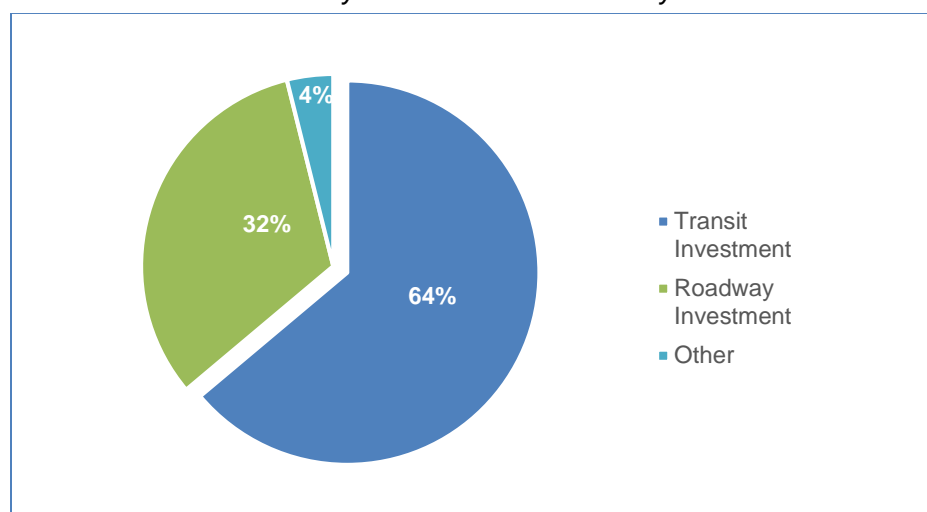
	Transit Ridership (All Operators)		Roadway Trips (All Counties)	
	# ¹⁶²	% of Total	#	% of Total
Low-Income Status	782,633	52%	5,947,902	27%
Non-Low-Income Status	720,325	48%	16,338,965	73%
Minority Status	998,992	62%	11,506,128	53%
Non-Minority Status	616,075	38%	10,482,044	47%

Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey

Step 2: Determine the Share of Plan Investments by Mode

The next step in the analysis is to determine how much of the total investment in the Draft Plan is allocated to the following two travel modes: transit (which includes investments in operations and capital improvements) and roadways (which includes investments in roads, highways and bridges). The largest share of the investment in the Draft Plan is in public transit, at 64 percent, followed by roadways, at 32 percent (see Chart 5-A below). A portion of the investment is excluded from the analysis, in cases where investments had no modal component or otherwise could not be assigned to a particular county or transit operator (such as regional planning funds, Climate Program funds, etc.).

Chart 5-A: Share of Plan Bay Area 2040 Investments by Mode



Source: MTC

The total investment included in the Draft Plan is around \$303.45 billion (year-of-expenditure) over a 24- year period. See the Draft Plan for more information on the investment strategy.

Step 3: Assign Investment Benefit by Mode to Population Subgroups

Next, investments for each mode are allocated to the four population subgroups—minority, non-minority, low-income and non-low-income—based on their level of usage of that particular mode. For example, if the Draft Plan invests \$100 in System A, if half of their users are low-income and three-quarters are minority, then the “benefit” of the \$100 investment is allocated as follows: \$50 to low-income and \$75 to minority populations.

This is a multi-step process that is different for each mode. For transit, investments are first aggregated

¹⁶² Note that the total transit rides by low- and non-low-income population equals about 1.5 million, whereas the total for minority and non-minority population equals about 1.6 million. These numbers are inconsistent in the transit surveys.

by transit operator (which may include expenditures for operations, capital improvement, modernization, etc.). Then, a share of this investment is allocated to low-income and minority riders based on their share of use (by operator). Once all investments are allocated to the four population subgroups, the total for each subgroup determines how much they benefit from the Draft Plan's investments in transit relative to the other subgroups.

A similar approach is used to assign roadway investments to low-income and minority populations, but instead of assigning investments to transit operators, they are assigned to each county. Again, based on their relative usage of roadways in each county, each population subgroup is allocated a share of the county's investment in roadways. These allocations, once aggregated for all nine counties, determine how much each subgroup benefits from the Draft Plan's investments in roadways relative to the other subgroups. The results of this assessment by mode by subgroup is summarized in Table 5-4 below.

Table 5-4: Share of Investment by Mode by Subgroup

	Transit Investment		Roadway Investment	
	\$ millions	% of Total	\$ millions	% of Total
Low-Income Status	\$92,240	48%	\$26,591	27%
Non-Low-Income Status	\$101,704	52%	\$73,146	73%
Minority Status	\$117,386	61%	\$51,736	52%
Non-Minority Status	\$76,557	39%	\$48,001	48%
Total	\$193,944	100%	\$93,717	100%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey, MTC analysis of Draft Plan investments

Step 4: Compare the Share of Investment Benefit to the Share of Population and System Usage

The final step involves combining the investment benefits for both modes into one metric for each subgroup. This data, along with shares of population, trips by mode and investments by mode, are summarized in Table 5-5 below.

Table 5-5: Summary of Population/Use-Based Analysis Results

	Share of People	Share of Trips			Share of Investments		
		Transit + Roadway	Transit	Roadway	Transit + Roadway	Transit	Roadway
Low-Income Status *	25%	28%	52%	27%	40%	48%	27%
Non-Low-Income Status	75%	72%	48%	73%	60%	52%	73%
Minority Status **	59%	54%	62%	53%	58%	61%	52%
Non-Minority Status	41%	46%	38%	47%	42%	39%	48%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, 2012/2013 Bay Area Household Travel Survey, MTC Analysis

As noted before, in the Bay Area, transit investments provide higher benefits to low-income and minority populations relative to their share of the region's population. This is primarily due to their propensity for using transit. Conversely, because minority populations are underrepresented in the share of regional roadway usage (53 percent) relative to their share of the region's population (59 percent), investments in roads, highways and bridges provide relatively lower benefits to minority populations.

Equally important is the finding that investments in roads, highways and bridges also provide relatively higher benefits to low-income populations, though not as much as transit investments, compared to non-low-income populations in the Bay Area. In summary, any investment in improving transportation infrastructure and services regardless of mode will benefit low-income populations, but the higher the

investment in transit, the greater the benefits to both low-income and minority populations.

Overall, across both modes, low-income populations receive a higher share of the Draft Plan investment benefits (40 percent) relative to their overall share of the region's population (25 percent) and trips (28 percent). Minority populations across both modes receive a slightly lower share of the Draft Plan investments benefits (58 percent) relative to their overall share of the region's population (59 percent) and trips (54 percent).

As noted earlier in this chapter, there is a small but not insignificant margin of error in these calculations, because of both the nature of the analysis and the fact that data for this analysis is derived from multiple sources. For example, demographic data in the 2010-2014 American Community Survey (ACS) dataset differs slightly from those in the 2012/2013 California Household Travel Survey datasets. The same is true for trip data from ACS and transit passenger surveys conducted by operators and MTC.

In addition, since the analysis is conducted at a regional, aggregate level, there are bound to be factors such as system reliability, user cost and location of transportation services that are not captured here. Lastly, the distribution of the four population subgroups varies by county, so it is safe to assume that an investment in a county does not benefit all populations that live there, but this level of data is not currently available. Given all these limitations with the analysis methodology and data, it is prudent to look at the orders of magnitude rather than the exact percentages when determining whether low-income and minority populations benefit significantly less or more than non-low-income and non-minority populations from the Draft Plan.

Project Mapping

The second part of the investment analysis is to map the location of transit and roadway projects included in the Draft Plan, overlaid with census tracts that are designated as CoCs and have a higher-than-regional-average (>59 percent) concentration of minority populations. The purpose of this analysis is to qualitatively assess the spatial distribution of projects for any apparent systematic exclusion of CoCs or minority populations at a regional level, or for any apparent systematic imbalances between the distribution of projects between CoCs and the remainder of the region, or between minority and non-minority populations. This assessment is intended to provide a regional-level analysis of the Draft Plan's investments. Individual projects will be subject to their own Title VI and environmental justice analyses during implementation, as required under federal and state laws.

Results for Communities of Concern

Transit and Roadway projects that can be mapped are included in Maps 43 and 44. For a list of all transit and roadway projects, see the Draft Plan. Each map is also overlaid with CoCs. Projects that represent transit stations or freeway interchange are mapped as dots, and transit routes or roadway corridors as lines.

Since the Draft Plan emphasizes a focused growth approach that calls for a majority of future housing and jobs growth to be located in transit-accessible areas, and since a majority of all CoCs are located in the region's urban core, with the exception of CoCs in Napa, Solano and Contra Costa counties, there is significant overlap between the projects included in the Draft Plan and the region's CoCs.

Based on this limited and qualitative assessment, there does not appear to be any systematic exclusion of CoCs from the benefits of the Draft Plan, nor imbalance in the spatial distribution of projects in the region. It is important to note that a significant number of projects could not be mapped, even when they represent a significant share of the funding in the Draft Plan, such as maintenance and operation of the region's transportation system. The maps also do not distinguish between the relative magnitudes of investments in terms of project costs.

Results for Minority Populations

For the analysis of minority populations, the project layers from maps 43 and 44 are overlaid with census tracts in the region that have a higher-than-regional-average (>59 percent) concentration of minority populations. As with the CoC analysis, there is a significant overlap between the spatial distribution of investments in the Draft Plan and minority tracts. Based on this assessment, there does not appear to be any systematic exclusion of communities from Plan investments on the basis of minority status, or imbalances in the distribution of projects between minority and non-minority communities.

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Chapter 6. Title VI and Environmental Justice

This chapter summarizes the results of the Title VI and Environmental Justice analyses. While both of these analyses are part of the overall equity analysis framework (see Chapter 2 for more details on the equity framework), they are called out separately in this chapter since this report is in part intended to satisfy federal requirements related to nondiscrimination and environmental justice in the metropolitan planning process. For more information on the legal, regulatory and policy framework underlying these analyses, see Chapter 1.

Title VI Analysis and Results

The purpose of this analysis is for MTC to demonstrate compliance with federal laws and regulations related to Title VI of the Civil Rights Act of 1964. The U.S. Department of Transportation's (DOT's) Title VI regulations prohibit recipients of federal transportation funds from utilizing criteria or methods of administration that have the effect of subjecting persons to discrimination based on their race, color or national origin. As an operating entity within DOT, the Federal Transit Administration (FTA) provides more specific guidance to metropolitan planning organizations on how to demonstrate Title VI compliance (see Chapter 1 for more details).

The first step in the analysis is to identify the combined share of federal and state transit investments in Plan Bay Area (PBA) 2040 (see Table 6-1). The investments included in the plan total \$303.5 billion over a 24- year period, for a wide range of projects that include express lanes, freight improvements, active transportation programs and transit operations. Of the total plan investments, \$203.5 billion are allocated to transit operations, maintenance, modernization and expansion. Transit is by far the largest investment made in PBA 2040. Of the total transit investments, 18 percent (or \$53.4 billion) comes from various federal and state sources (see Chapter 2 for a list of sources). The Title VI analysis in this report is conducted on this amount (i.e., \$53.4 billion).

Table 6-1: Sources of Funding by Mode of Transportation, Plan Bay Area 2040

	Total	Federal and State		Local / Other	
	\$ million	\$ million	%	\$ million	%
Roadway / Bridge	\$88,701	\$29,220	33%	\$59,482	67%
Bicycle and Pedestrian	\$5,150	\$1,325	26%	\$3,825	74%
Freight	\$2,743	\$1,938	71%	\$805	29%
Other Programs	\$3,401	\$1,072	32%	\$2,329	68%
Public Transit	\$203,449	\$53,362	26%	\$150,087	74%
Plan Bay Area 2040 Investments	\$303,445	\$86,917	29%	\$216,528	71%

Source: MTC Analysis of Plan Bay Area 2040 Investments

Since this analysis relies on ridership data by race/ethnicity for each transit operator,¹⁶³ the assessment is further limited to only those operators for whom this information is available through a transit passenger survey (either conducted by the transit operator or MTC). This subset of the total federal and state transit funding for which data is available is \$43.6 billion, or 82 percent of the total.

Next, federal and state investments in transit are allocated to minority and non-minority populations using the same methodology used in the transportation investment analysis (the population/use-based analysis) outlined in Chapter 5. Essentially, federal and state investments are broken out by transit operator and allocated to minority or non-minority populations based on their respective shares of ridership on that particular transit system. The allocations by transit operator are then added to provide the total federal and state funding that is allocated to minority and non-minority populations. This allocation of funding to minority and non-minority populations based on their use of various transit systems constitutes “benefit.” The results for each subgroup are compared to estimate the relative benefit accrued to minority and non-minority populations (see Table 6-2).

Table 6-2: Summary of Population/Use-Based Analysis for Federal and State Transit Funding

Population	Share of Population	Share of Transit Ridership	Investments (\$ million)		Share of Investments (%)	
			PBA 2040	Federal/State Transit	PBA 2040	Federal/State Transit
Minority	59%	62%	\$117,386	\$25,797	61%	59%
Non-Minority	41%	38%	\$76,557	\$17,850	39%	41%

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, MTC's Analysis of Plan Bay Area Investments

Finally, investments are distributed on a per capita and a per-rider basis, so that investment benefits allocated to the region's minority populations and riders can be compared to investment benefits allocated to the region's non-minority populations and riders. The results from this analysis are summarized in Tables 6-3 and 6-4 below.

Following FTA guidance, MTC's disparate impact analysis of plan investments reveals that, on a per-capita basis, minority populations in the region would receive 59 percent of PBA 2040's investment benefits for public transit using federal and state sources, compared to 41 percent for non-minority populations. The share of investment benefits based on a per capita basis is proportional to the share of minority (59 percent) and non-minority (41 percent) populations in the region. On a transit-ridership basis, minority transit riders would again receive 59 percent of the benefit, compared to 41 percent for non-minority transit riders. The share of investment benefits based on a per-rider basis is proportional to the share of minority (62 percent) and non-minority (38 percent) transit ridership.

Table 6-3: Disparate Impact Analysis Results, Population-Based

	Population (2014)		Federal and State Transit Investments		Per capita Benefit
	#	%	\$ millions	%	\$
Minority	4,305,728	59%	\$25,797	59%	\$5,991
Non-Minority	3,033,324	41%	\$17,850	41%	\$5,885

Source: 2010-2014 American Community Survey, 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, MTC investment analysis

¹⁶³ Ridership data by race/ethnicity is available for 24 of the 27 transit operators in the Bay Area. Data is not available for Amtrak (\$92 million), City of Dixon (\$17 million) and the Sonoma-Marín Area Rail Transit (SMART) (\$623 million). Data is also not available for the California High Speed Rail project (\$8.5 billion). These amounts are therefore not included in the population/use-based analysis.

Table 6-4: Disparate Impact Analysis Results, Ridership-Based

	Ridership		Federal and State Transit Investments		Per-Rider Benefit
	#	%	\$ millions	%	\$
Minority	998,992	62%	\$25,797	59%	\$25.82
Non-Minority	616,075	38%	\$17,850	41%	\$28.97

Source: 2012-2015 MTC Transit Surveys, Multiple Transit Operator Surveys, MTC investment analysis

Based on the results presented in Tables 6-3 and 6-4, MTC concludes that the Draft Plan is in compliance with Title VI of the Civil Rights Act of 1964 for the distribution of federal and state transit funds.

Environmental Justice Analysis and Results

Under Executive Order 12898 and the associated DOT Order on Environmental Justice, MTC must assist DOT, FTA and the Federal Highway Administration (FHWA) in their mission “to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects” on environmental-justice (EJ) populations. For this analysis, adverse effects are determined using the results for the six equity measures, described in Chapter 2. EJ populations are either low-income households or communities of concern (CoCs), also described in Chapter 2. The analysis must determine if EJ populations share in the benefits of the plan’s investments without bearing a disproportionate share of the burdens.

As noted in Chapter 2, to make this determination, this report uses the DOT definition of a “disproportionately high and adverse effect,” which relies on meeting the following two conditions:

- An adverse impact is predominately borne by minority and/or a low-income populations, and
- An adverse impact on minority and/or low-income populations is significantly more severe or greater in magnitude than the adverse effect on non-minority and/or non-low-income populations.

Table 6-5 below summarizes the EJ analysis results for each of the six equity measures. Although none of the measures analyzed found both a disproportionately high *and* adverse effect on EJ populations, this analysis confirms broad regional trends related to housing affordability for lower-income households in PDAs, TPAs and HOAs. Chapter 7 identifies a number of policies and programs that address these concerns, though fully recognizing that solving the housing affordability crisis in the Bay Area requires a more concerted effort on behalf of local governments as well as state and federal agencies, and stronger partnerships and collaboration between the public and private sectors. MTC finds no disproportionately high and adverse impact on EJ populations from the Draft Plan for any of the six equity measures.

Table 6-5: Summary of Environmental Justice Analysis Results for the Draft Plan

Equity Measures	Does the Draft Plan have an Adverse Effect on EJ Populations? *	Is the Adverse Effect Disproportionately High? **
	Draft Plan vs. No Project Alternative for Low-Income and CoCs (see Table 5-1)	Low-Income and CoCs vs. Non-Low-Income and Remainder of the Region (see Table 5-1)
3. Reduce adverse health impacts (+)	Same	Same
5. Decrease H+T *** for lower-income households (+)	No	No ¹⁶⁴
6. Increase the share of affordable housing	No	No ¹⁶⁵
7. Do not increase the risk of displacement	No	No ¹⁶⁶
8. Increase share of jobs accessible in congested conditions	No	No
9. Increase jobs in middle-wage industries	Same	Same

Notes:

(+) Compares results for lower-income vs. higher-income households instead of communities of concern vs. remainder of the region. Low- and lower-income households, as well as communities of concern, are considered EJ populations for this analysis.

* Compares the analysis results for the No Project Alternative and the Draft Plan to determine whether the measure is moving in the right direction for EJ populations (low-income households or communities of concern).

** Compares the analysis results for the Draft Plan relative to EJ and non-EJ populations. An EJ population is determined to experience “disproportionately high adverse effect” when the Draft Plan has an adverse effect on EJ populations AND when the adverse impact from the Draft Plan is greater than the adverse impact of the No Project Alternative.

*** Housing and transportation costs

Cumulative Benefits of the Draft Plan

Though not a federal requirement for Title VI or EJ compliance, or mandated by other state or local laws, MTC has conducted a qualitative analysis that tests whether the Draft Plan contributes to a *reduction in existing disparities* between communities of concern and the remainder of the region. A similar analysis was also conducted in the equity report for Plan Bay Area 2013.

¹⁶⁴ The Draft Plan does not have a disproportionately high adverse effect on EJ populations since the second of the two conditions is not met (see ** notes under Table 6-5 for more detail). While for the Draft Plan, the share of household income spent in the combined cost of housing and transportation for low-income residents increases by 13 percentage points for low-income households and 5 percentage points for higher income households, the impact is still smaller when compared to the No Project Alternative, which would increase the share by 15 percentage points

¹⁶⁵ The Draft Plan does not have a disproportionately high adverse effect on EJ populations since the second of the two conditions is not met (see ** notes under Table 6-5 for more detail). While for the Draft Plan, the share of affordable units remains about the same within CoCs and increases by 3 percentage points in the remainder of the region, the impact is less when compared to the No Project Alternative. Also, overall, the share of affordable units within CoCs remains almost twice as high as in the remainder of the region in 2040 (23 percent compared to 11 percent).

¹⁶⁶ The Draft Plan does not have a disproportionately high adverse effect on EJ populations since the second of the two conditions is not met (see ** notes under Table 6-5 for more detail). While the risk of displacement for the Draft Plan increases by one percentage point within CoCs and by 7 percentage points in the remainder of the region, the impact is still smaller when compared to the No Project Alternative, which would increase the risk of displacement by 25 percentage points within CoCs.

Table 6-6 below summarizes the results of this analysis, which answers the following two questions:

- Do disparities currently exist between communities of concern and the remainder of the region; and
- Does the Draft Plan reduce any existing disparity?

Table 6-6: Summary of Cumulative Benefits Analysis Results for the Draft Plan

Equity Measures	Do disparities currently exist between CoCs and the RoR? *	Does the Draft Plan reduce any existing disparity? **
3. Reduce adverse health impacts (+)	Yes	Marginally ¹⁶⁷ Reduces
5. Decrease H+T for lower-income households (+)	Yes	Increases
6. Increase share of affordable housing	Yes	Marginally Increases
7. Do not increase the risk of displacement	Yes	Marginally Increases
8. Increase share of jobs accessible in congested conditions	Yes	Marginally Reduces
9. Increase jobs in middle-wage industries	No (++)	Reduces

Notes:

See Table 5-1 in Chapter 5 for more detailed results for the Baseline, No Project Alternative and EIR Alternatives. (+) Compares results for lower-income vs. higher-income households instead of CoCs and remainder of the region.

(++) The measure does not lend itself to a spatial or population-based assessment of disparate impacts. For example, both the location of middle-wage jobs and lower-income workers is dispersed across the region. In addition, an increase in the number of middle-wage jobs will largely benefit lower-income workers.

** Compares low-income households or CoCs with high-income households or remainder of the region in the baseline year (2005/2010).*

*** Compares the Base Year to the Draft Plan for low-income households or CoCs.*

Existing Disparities

Five of the six equity measures show existing disparities in the region between low-income households or CoCs and high-income households or the remainder of the region. These measures include adverse health impacts; combined cost of housing and transportation; share of affordable housing in PDAs, TPAs and HOAs; risk of displacement; and share of jobs accessible in congested conditions. None of these findings should be surprising.

Household income is the strongest predictor of individual and family health outcomes,¹⁶⁸ so it follows that lower-income households in the region will experience worse health outcomes compared to higher-income households. High housing costs are also more burdensome on lower-income households, who spend a much higher share of their income on rent or the cost of owning a home compared to higher-income households. This has direct implications for both a household's budget and its vulnerability to being priced out of a neighborhood as costs rise faster than wages.

It is important to note that a lack of existing disparity is not a sign of prosperity for disadvantaged populations in the Bay Area. For example, by definition, there is a higher concentration of low-income

¹⁶⁷ The impact on low-income households or CoCs is considered marginal if the Draft Plan results in a change of up to + or – one percentage point compared to the Base Year.

¹⁶⁸ For more information on the social determinants of health, see: <http://www.acphd.org/media/144727/lduc-part1.pdf> or http://publichealth.lacounty.gov/epi/docs/sociald_final_web.pdf.

and minority populations within a CoC compared to the rest of the region (even though a larger share of all low-income and minority populations live in the remainder of the region). CoCs are therefore likely to have a high share of lower-priced homes, both renter- and owner-occupied. This is likely the primary reason why the share of affordable housing in CoCs is higher than the remainder of the region.

CoCs are also more likely to be located in the urban core, where transit and access to a broad range of services and amenities is better than in the suburbs. And even though a growing share of low-income populations are now living in suburban communities, the relative concentration of poverty is still higher in urban cores like Richmond, East Oakland, East Palo Alto and East San Jose. The same factors that increase the risk of displacement, i.e., proximity to transit and jobs, also increase the access for low-income and minority populations to job centers. This is likely the primary reason why the share of jobs accessible in congested conditions is higher in CoCs.

Benefits of the Draft Plan

When compared to base year conditions, the Draft Plan improves or marginally improves conditions for low-income households or CoCs for three equity measures. These measures include: Adverse health impacts, share of jobs accessible in congested conditions and middle-wage jobs. For two of these measures (health and job access), disparities currently exist between low-income households or CoCs and high-income households or remainder of the region.

These results suggest that the land use and transportation policies included in the Draft Plan are contributing to a reduction in some existing disparities in the region. An emphasis on transit, transit-oriented development and active transportation in the Draft Plan is contributing to improving health outcomes for lower-income households, by increasing opportunities for physical activity. More investment in affordable housing in the urban core, close to transit and jobs, is contributing to improved access to jobs and potentially other services.

On the other hand, the Draft Plan may cause worse or marginally worse conditions for low-income households or CoCs on three measures, including the combined cost of housing and transportation; share of affordable housing in PDAs, TPAs and HOAs; and risk of displacement. For each of these measures, disparities currently exist between low-income or CoCs and high-income or remainder of the region.

Despite small gains, much more work is needed to make real progress in improving health outcomes, housing and transportation affordability, and neighborhood stability for disadvantaged communities in the Bay Area.

Chapter 7. Next Steps

This chapter summarizes some of the next steps for MTC and ABAG, which build upon the findings from the equity analysis. These next steps refer to implementation of the Draft Plan as well as refinements to the equity analysis for the next update.

Transportation Plans, Programs and Investments

The Draft Plan allocates almost 64% of the total plan revenue, or about \$194 billion of \$303 billion,¹⁶⁹ to transit operations, modernization and expansion over a 24-year period. This investment reflects the region's commitment to transit sustainability and transit-oriented development, which has the potential to deliver significant environmental and economic benefits. This investment also supports the region's commitment to equity.

Low-income residents were about 25% of the region's total population in 2014,¹⁷⁰ but they accounted for about 52% of all transit trips in the region. Transit investments therefore disproportionately benefit low-income populations in the Bay Area. Similarly, minority residents are about 59% of the region's population and take 62% of all transit trips. They too, like low-income populations, benefit from transit investments. The agency's commitment to meeting the mobility and access needs of low-income, minority and other transportation-disadvantaged populations such as seniors and people with disabilities is reflected in MTC's programs and planning efforts, listed below.

Community-Based Transportation Planning Program

In 2002, MTC created the Community-Based Transportation Planning (CBTP) Program to provide planning grants for low-income communities to identify and prioritize transportation projects, programs and services that would best meet residents' mobility and access needs. Funding is provided to county congestion management agencies (CMAs) to implement a collaborative planning process involving residents, community- and faith-based organizations, transit operators, local jurisdictions, and MTC, among other stakeholders.

As of December 2016, more than 35 CBTP plans have been completed across the region.¹⁷¹ The second round of the One Bay Area Grant (OBAG) program, adopted in 2016, includes \$1.5 million to develop plans for new CoCs identified in the Draft Plan and to update the plans that are no longer current.

Lifeline Transportation Program

In 2005, MTC created the Lifeline Transportation Program (LTP) to fund projects and programs that meet mobility and access needs of low-income populations in the region. Since 2005, MTC has awarded over \$255 million in LTP funds to more than 280 projects, across all nine counties. LTP projects are administered by CMAs and involve determining the eligibility of grant proposals and appointing local review teams to evaluate outcomes. LTP projects must address transportation gaps or barriers identified in CBTP or other local planning efforts in low-income neighborhoods.¹⁷²

¹⁶⁹ The total plan revenue does not include project costs and funding that occurred before fiscal year 2016-2017. The amounts are in year-of-expenditure dollars.

¹⁷⁰ 2010-2014 American Community Survey 5-year average.

¹⁷¹ For a list of completed Community-Based Transportation Plans, see: <http://mtc.ca.gov/our-work/plans-projects/other-plans/community-based-transportation-plans>.

¹⁷² For more information about the Lifeline Transportation Program, see: <http://mtc.ca.gov/our-work/plans-projects/equity-accessibility/lifeline-transportation-program>.

The type of projects funded through LTP include: fixed-route bus service, transit stop improvements, pedestrian and bicycle access improvements, transportation services for seniors and children, community shuttles, and auto loan programs.

Regional Means-Based Transit Fare Study

In 2015, MTC launched a study to evaluate the feasibility and effectiveness of implementing a transit fare subsidy program based on household income. The Regional Means-Based Transit Fare Study includes three main objectives: make transit more affordable for low-income residents, move toward a more consistent regional standard for fare discounts, and avoid worsening transit operators' service levels or financial performance. MTC formed a technical advisory committee, composed of transit operators, community groups, and other stakeholders, to advise staff on the scope and methodology for the analysis.

Key areas of focus for the study include identifying the following: possible fare structures and payment methods, eligible recipients, overall program costs, potential funding sources, impact on transit agencies' fare revenue, relationships to existing discounts, and any anticipated technical challenges. The final report is expected to be completed by mid-2017.¹⁷³

Coordinated Public Transit–Human Services Transportation Plan

MTC's Coordinated Public Transit–Human Services Transportation (Coordinated) Plan seeks to improve transportation coordination in the region to address the mobility needs of low-income populations, seniors, persons with disabilities and veterans. Consistent with requirements established by the Fixing America's Surface Transportation (FAST) Act¹⁷⁴, MTC is currently updating the Coordinated Plan to coincide with the adoption of Plan Bay Area 2040. MTC's current Coordinated Plan was last adopted in 2013.¹⁷⁵

Federal law requires that projects selected for funding under the Elderly Individuals and Individuals with Disabilities (Section 5310)¹⁷⁶ be derived from a locally developed, coordinated public transit-human services transportation plan. Federal law also requires that the plan be developed through a process that includes representatives of public, private, and non-profit transportation and human services providers. Participation by members of the public is additional requirement. Plans must identify the transportation needs of low-income populations, seniors and persons with disabilities; provide strategies for meeting these needs; and prioritize transportation services for funding and implementation.

This report is consistent with the 2013 Coordinated Plan as well as the current update, which is anticipated to be adopted at the same time as Plan Bay Area 2040.

One Bay Area Grant Program

MTC's OBAG program supports California's smart-growth goals (as defined by Senate Bill 375) by incentivizing local agencies to fund transportation projects in Priority Development Areas (PDAs)—areas designated by local jurisdictions for higher-density, walkable and mixed-use communities.¹⁷⁷ OBAG funds may be used by local jurisdictions for complete streets projects, including: stand-alone bicycle and pedestrian paths, bicycle lanes, pedestrian bulb-outs, lighting, new sidewalks, and Safe Routes to Transit and Safe Routes to School projects.

¹⁷³ For more information on the Means-Based Transit Fare Subsidy Study, see: <http://mtc.ca.gov/our-work/plans-projects/other-plans/means-based-fare-study>.

¹⁷⁴ For more details on the FAST Act, see: <https://www.fhwa.dot.gov/fastact/legislation.cfm>.

¹⁷⁵ For more information about the Coordinated Plan, see: <http://mtc.ca.gov/our-work/plans-projects/other-plans/coordinated-public-transit-human-services-transportation-plan>.

¹⁷⁶ Formula funding to states for the purpose of assisting private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities. See: <https://www.transit.dot.gov/grants>.

¹⁷⁷ For more information on the OBAG Program, see: <http://mtc.ca.gov/our-work/invest-protect/focused-growth/one-bay-area-grants>.

To be eligible for OBAG funds, each jurisdiction in the region is required to adopt a complete streets policy and obtain state-certification for its housing element, consistent with state law. Many low-income households, seniors and people with disabilities reside within PDAs and will benefit from street improvements that expand access and mobility. But the same communities set to benefit from such projects may also be at risk of displacement, especially in the absence of tenant protections and investments in affordable housing. The program provides an incentive to local jurisdictions to produce more housing (including affordable housing) by including it as a funding criteria. These requirements were strengthened in the recently adopted OBAG program.

Bay Area Transit-Oriented Affordable Housing Fund

In 2011, MTC committed \$10 million in seed funding to the Transit-Oriented Affordable Housing (TOAH) fund, which provides flexible, affordable loans to developers for the purchase of properties near transit for the development of affordable housing, retail space, and other critical services such as child care centers, fresh food outlets and health clinics. By supporting growth along transit corridors in Priority Development Areas, TOAH promotes compact land use patterns, which aligns with the region's Sustainable Community Strategy. MTC committed an additional \$10 million to the fund in 2014.¹⁷⁸

Active Transportation, Complete Streets and Safe Routes to School Programs

MTC's bicycle and pedestrian planning program supports multiple initiatives. These include: bike to work, complete streets, Bay Area Bike Share, the Bay Trail, and connectivity across the region's bridges. PBA 2040 commits \$5.1 billion to bicycle and pedestrian improvements in the region over the plan period. PBA 2040 also makes a significant commitment to improving bicycle and pedestrian safety by supporting complete streets policies. MTC's complete streets efforts include regular trainings and workshops for residents as well as the development of an online checklist. Bicycle and pedestrian networks and safety improvements could benefit transportation-disadvantaged communities that rely on this mode for a higher share of essential trips.¹⁷⁹

The Bay Area Bike Share will offer a \$5 first-year membership and cash transactions for low-income residents, and will broaden community outreach when the expansion program launches in spring 2017. After the first year, low-income members will pay only \$5 per month to keep riding. The Safe Routes to School (SRTS) program, part of OBAG, provides ~\$5 million annually in grants to cities, counties and congestion management agencies to fund projects such as: bicycle and pedestrian paths to schools; on-street bike lanes; bicycle racks or other secure parking facilities; traffic calming on streets around schools; bike safety training; and education and outreach for students and families. Bicycle and pedestrian networks and safety improvements around neighborhood schools could benefit transportation-disadvantaged communities by encouraging more active lifestyles and reducing road-traffic injuries.

San Francisco Bay Area Goods Movement Plan

In early 2016, MTC published the San Francisco Bay Area Goods Movement Plan, which is closely integrated with the Alameda County Transportation Commission's countywide planning efforts. The plan identifies five key goals, many of which benefit communities of concern. These include: increasing economic growth and prosperity; reducing environmental and community impacts and improving the quality of life in communities most affected by goods movement; providing safe, reliable, efficient and well-maintained freight movement facilities; promoting innovative technology strategies to improve efficiency; and preserving and strengthening the multi-modal transportation system that supports freight movement.¹⁸⁰

¹⁷⁸ For more information on the TOAH Program, see: <http://bayareatod.com/>.

¹⁷⁹ For more information on the region's active transportation program, see: <http://mtc.ca.gov/our-work/invest-protect/investment-strategies-commitments/protect-our-climate/active-transportation>.

¹⁸⁰ For more information on the Bay Area Goods Movement Plan, see: <http://mtc.ca.gov/our-work/plans-projects/economic->

Regional Climate Initiatives

The Draft Plan commits \$794 million for climate initiatives to reduce greenhouse gas emissions and other pollutants. Examples of initiatives include: commuter benefits (a pre-tax commute program), car-sharing, vanpooling, a Clean Vehicle Feebate Program, smart driving strategies, a vehicle buy-back and purchase incentive program, a regional electric vehicle charger network, and the climate initiatives innovative grants. Since low-income people of color may be most vulnerable to impacts of climate change. If structured well, efforts to reduce emissions could benefit all residents in the region, including vulnerable populations.¹⁸¹

Other Federal Programs

FTA's Section 5307 program funds up to 80 percent of project costs for a wide range of transit investments, including: operating assistance; construction of maintenance and passenger facilities; vehicle replacement and rehabilitation; rehabilitation of tracks, signals, communications and computer systems; planning, engineering design and project evaluation; and crime prevention and security equipment.

Funding through Section 5307 is based on formulas established by Congress that incorporate population, transit ridership, revenue-service mileage and other factors. Section 5307 funds can be used to cover up to 90 percent of costs for bicycle-related projects and investments to comply with the Americans with Disabilities Act (ADA) and the Clean Air Act.

MTC sets aside 10% of Section 5307 funds for ADA paratransit service. The program provides approximately \$20 million annually to eligible paratransit service in urbanized areas. In addition to 5307 funds, State Transit Assistance (STA) Program sets aside 15.6% of its population-based formula allocations for paratransit service. STA provides approximately \$8 million annually to eligible paratransit service.

MTC partners with Caltrans to administer the Section 5310 funds to meet the mobility needs of seniors and people with disabilities in the Bay Area. The program provides approximately \$4.5 million annually to eligible projects in the region. Section 5310 funds are distributed to states to provide grants for nonprofit agencies that provide transportation services to seniors and people with disabilities. In the last cycle of funding (fiscal years 2013 and 2014), 56% of Section 5310 funding was used for mobility management, 32% for purchasing vehicles, and 12% for operations.

Section 5311 provides funds for transit capital projects and operations in non-urbanized areas. These funds are also eligible for paratransit service. The program provides approximately \$1.5 million annually to eligible projects in rural communities.

State and Federal Support

In order to meaningfully address the region's key challenges such as housing affordability, displacement and underfunded transit needs, ABAG and MTC will continue to advocate for legislative changes at both the state and federal levels. These initiatives, detailed further in the Draft Plan, include:

- *Local funding tools and mechanisms* – MTC and ABAG will continue to advocate for a replacement for redevelopment funding that was lost in 2011. Redevelopment Agencies (RDAs) had the authority to assemble parcels and pay for infrastructure improvements necessary to promote infill development. RDAs were the largest source of funding and financing for these improvements as well as affordable housing in the state. With the demise of RDAs, the Bay Area lost about \$1 billion in annual tax-increment financing for affordable housing projects, critical infrastructure improvements, and economic development projects in designated areas.

[vitality/san-francisco-bay-area-goods-movement-plan](http://www.vitality/san-francisco-bay-area-goods-movement-plan).

¹⁸¹ For more information on the Regional Climate Initiatives, see: <http://mtc.ca.gov/our-work/plans-projects/climate-change-clean-vehicles/climate-initiatives-program>.

- *Federal funding for housing and community development programs* – MTC and ABAG will continue to advocate for stabilizing and potentially growing housing-related programs and funding at the federal level, including the HOME Investment Partnership Program and the Community Development Block Grants, which help local jurisdictions increase the supply of a variety of workforce housing opportunities. In recent decades, though, funding for both programs has fallen drastically.
- *State funding for transportation* – MTC will continue to urge the Bay Area’s state delegation to create new permanent revenue sources for transportation to achieve PBA 2040’s financial assumptions, increase funding to sustain transit service, and increase the efficiency of the existing network.

Next Equity Analysis

In response to input received from the Regional Equity Working Group (REWG), MTC and ABAG will continue to refine the methodology, data collection and modeling capabilities for the equity analysis.

Some of the enhancements suggested by the REWG include:

- Revisiting the criteria for designating communities of concern (CoCs) – the current definition is based in part on the presence of a significant concentration of both low-income and minority populations. Since many low-income areas in the North Bay do not satisfy the minority criteria, these communities are underrepresented in the regional designation;
- Revisiting the geography for analysis – the current analysis is conducted at a census tract level, which may not capture the neighborhood level variations, especially in suburban communities;
- Refining the methodology for estimating displacement risk – the current approach does not directly account for the loss of low-income residents in PDAs, TPAs, and HOAs between the baseline and plan horizon years to estimate the share of low-income residents at displacement risk. Instead, the methodology uses this information only to identify at risk zones, relying instead on the presence of the remaining low-income residents in PDAs, TPAs, and HOAs in the plan horizon year to estimate the risk of displacement;
- Developing a new methodology for the middle-wage jobs measure – the current performance target does not capture sub-regional variability in the distribution of middle-wage jobs across the region;
- Developing a new methodology for designating high-opportunity areas (HOAs) – the current methodology and designations were developed by the Kirwan Institute in 2010-2011 using data that was available at the time. The methodology also does not disaggregate the measure into its three sub-categories: education, economics and neighborhood quality;
- Developing county-specific profiles that can be used by the respective congestion management agencies when conducting an equity analysis for sub-regional planning (county transportation plans); and
- Investigating key regional trends that affect low-income and minority communities in greater detail.

Specific to FTA requirements for Title VI analysis, MTC will continue to assess the feasibility of upgrading future regional transportation plan project databases to allow for mapping transit projects that receive state or federal funds, and developing modeling sub-networks to be able to use the regional travel model for Title VI analysis.

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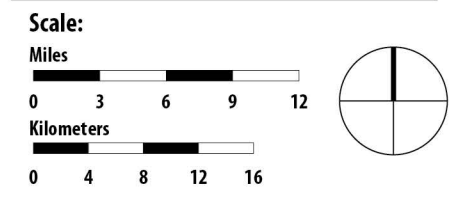
Map 1
Communities of Concern
American Community Survey 2014

- Communities of Concern
- The Communities of Concern (tract geography) dataset is based upon eight demographic variables:
- 1. Minority (70% threshold)
 - 2. Low-Income (less than 200% of Fed. poverty level, 30% threshold)
 - 3. Limited English Proficiency (20% threshold)
 - 4. Elderly (10% threshold)
 - 5. Zero-Vehicle Households (10% threshold)
 - 6. Single Parent Families (20% threshold)
 - 7. Disabled (25% threshold)
 - 8. Rent-Burdened Households (15% threshold)

If a tract exceeds both threshold values for Low-Income and Minority shares OR exceeds the threshold value for Low-Income AND also exceeds the threshold values for three or more variables (#3 to #8), it is a COC.

Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000





Level of Disadvantage

- The “High” Level of Disadvantage identifies those Census Tracts that are designated as Communities of Concern (COCs). The “Higher” and “Highest” Levels of Disadvantage identifies those Census Tracts that have an even higher concentration of disadvantaged populations.

- | | Population |
|------------------|-------------------|
| Oakland | Over 350,000 |
| Sunnyvale | 50,000 to 350,000 |
| Albany | Below 50,000 |



Map 3
Low-Income and
Minority Population
Decennial Census 2000

- Low-Income Tracts**
Includes tracts with a share of low-income population at or above the Regional Mean (21%)
- Minority Tracts**
Includes tracts with a share of minority population at or above the Regional Mean (48%)
- Low-Income and Minority Tracts**
- Communities of Concern**
- Urbanized Areas**

Oakland

Sunnyvale

Albany

Population

Over 350,000

50,000 to 350,000

Below 50,000

Scale:

Miles

0

3

6

9

12

Kilometers

0

4

8

12

16

Source: Census, American Community Survey
Map Author: KS November 2016

The map displays the San Francisco Bay Area and surrounding regions, including parts of California, Nevada, and Oregon. It highlights tracts with low-income and minority populations based on the 2000 Census data. The map uses a color-coded system to represent different population categories: pink for low-income tracts, brown for minority tracts, dark blue for low-income and minority tracts, green for communities of concern, and grey for urbanized areas. Major cities and counties are labeled, and a legend on the left provides a key for the symbols and colors. A scale bar and north arrow are located at the bottom left of the map.



Map 4

Low-Income and Minority Population

American Community Survey 2014

- Low-Income Tracts**
Includes tracts with a share of low-income population at or above the Regional Mean (26%)
- Minority Tracts**
Includes tracts with a share of minority population at or above the Regional Mean (57%)
- Low-Income and Minority Tracts**
- Urbanized Areas**
- Communities of Concern**

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

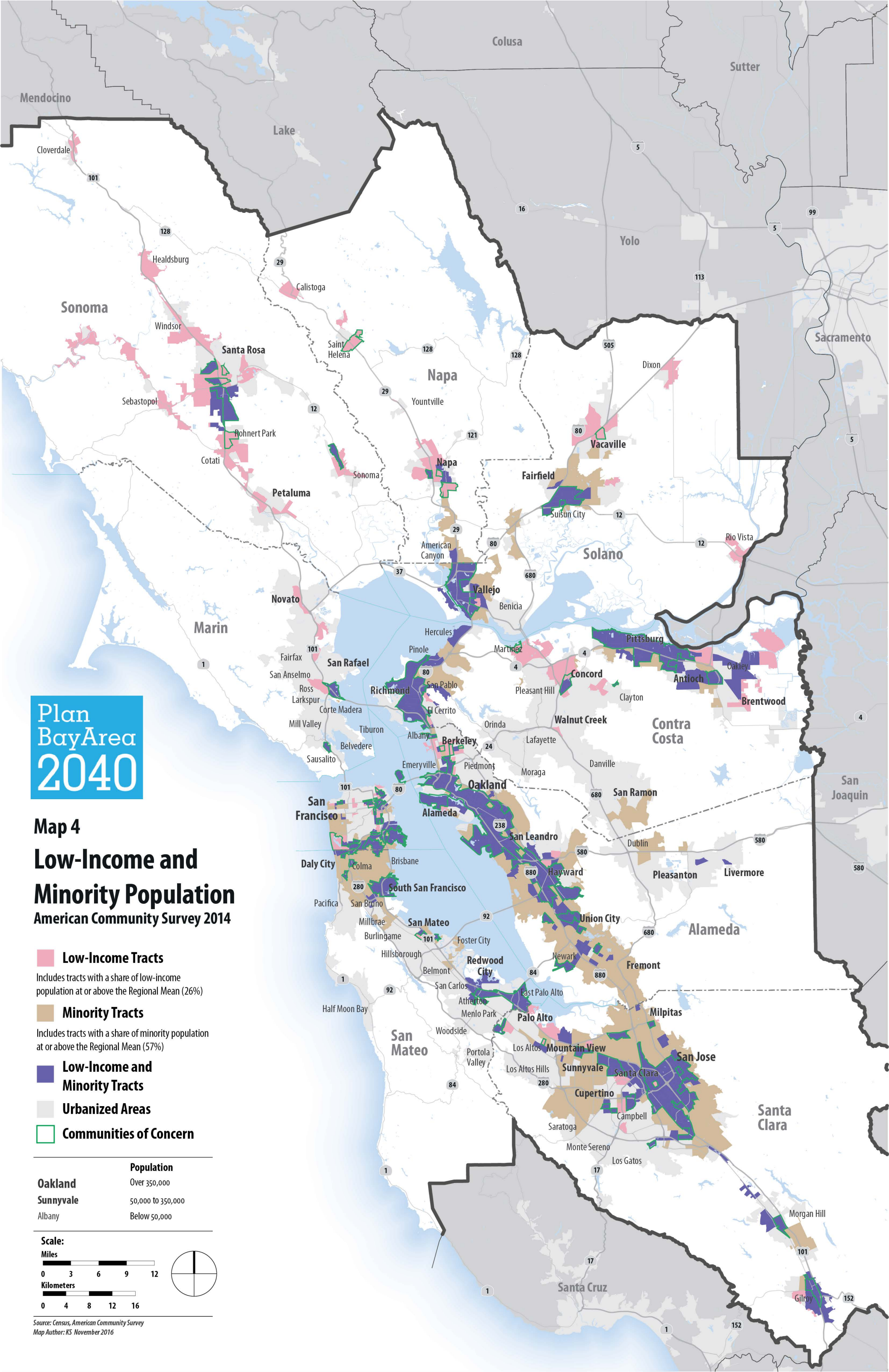
Scale:

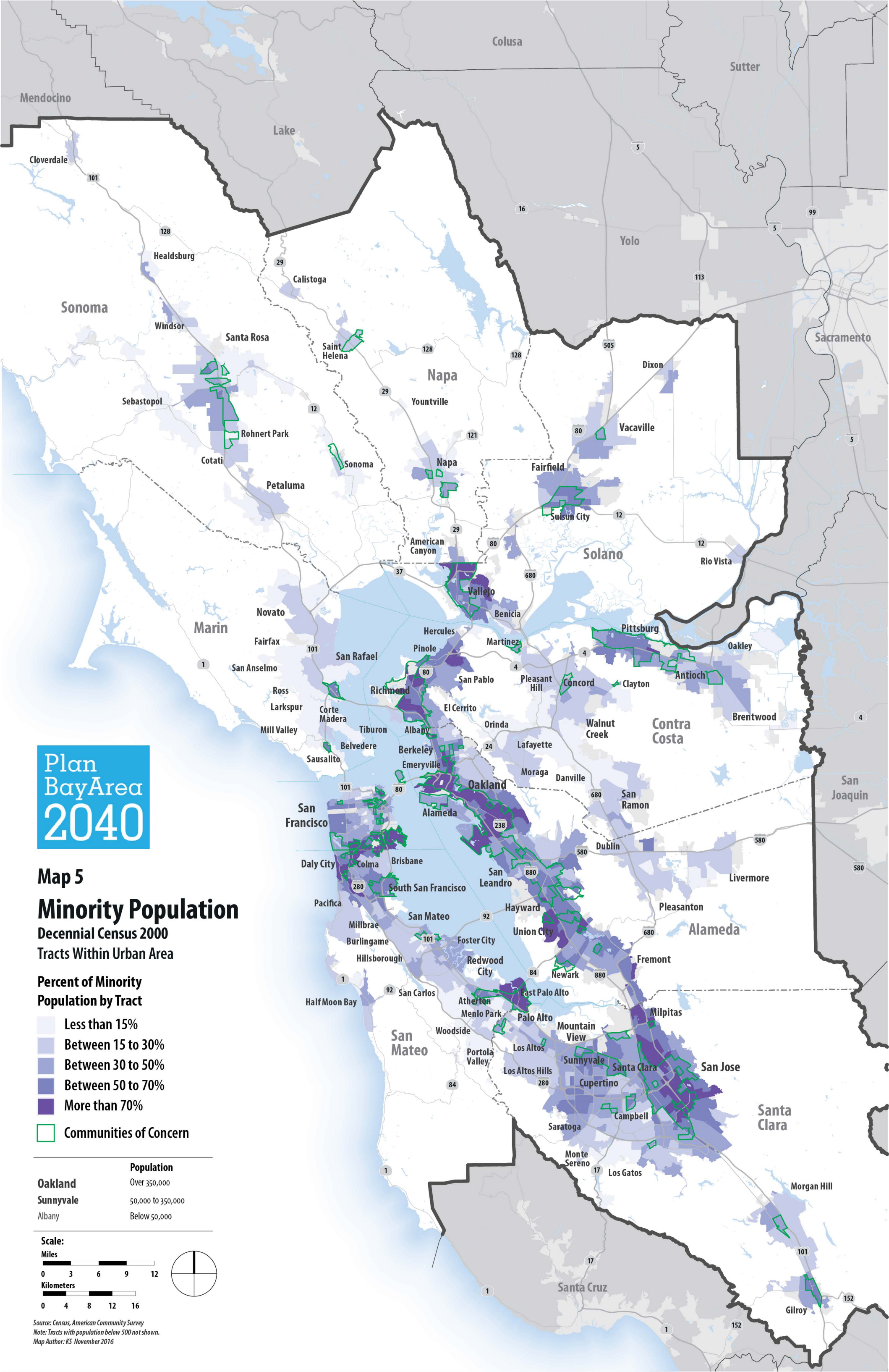
Miles

0 3 6 9 12

Kilometers

0 4 8 12 16





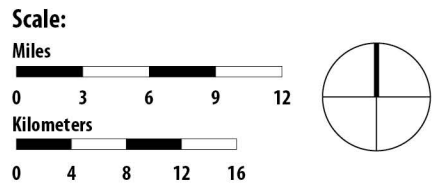
Plan
BayArea
2040

Map 5
Minority Population
Decennial Census 2000
Tracts Within Urban Area

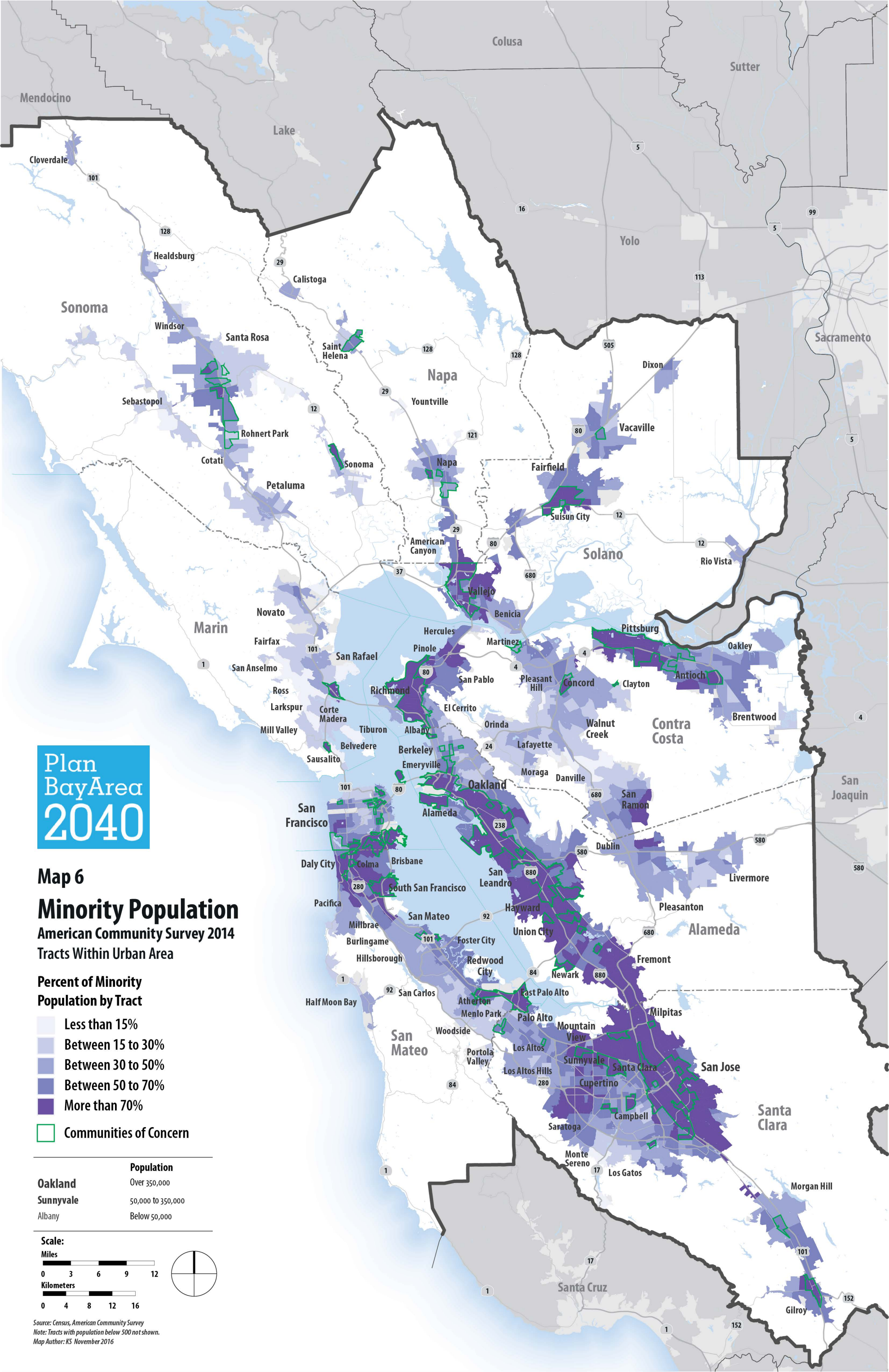
Percent of Minority
Population by Tract

- Less than 15%
- Between 15 to 30%
- Between 30 to 50%
- Between 50 to 70%
- More than 70%
- Communities of Concern

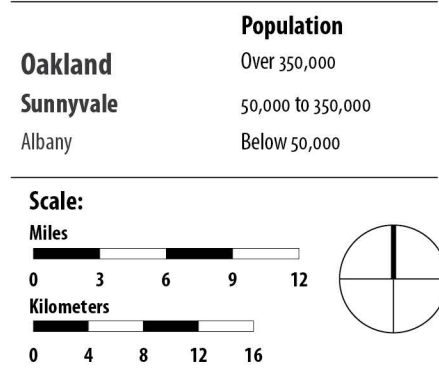
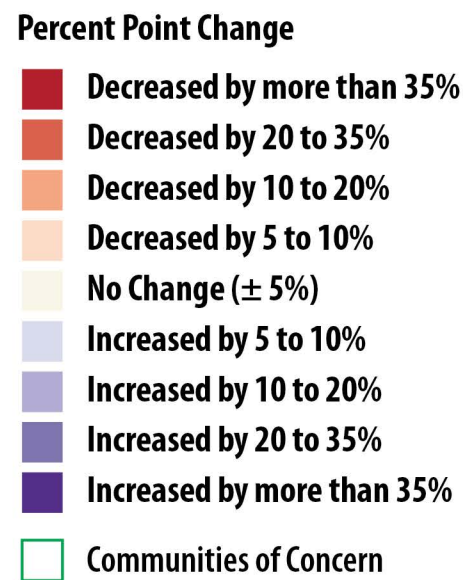
	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

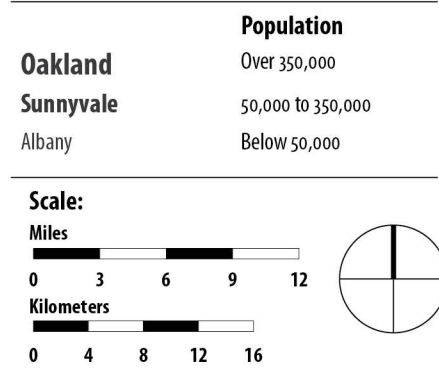
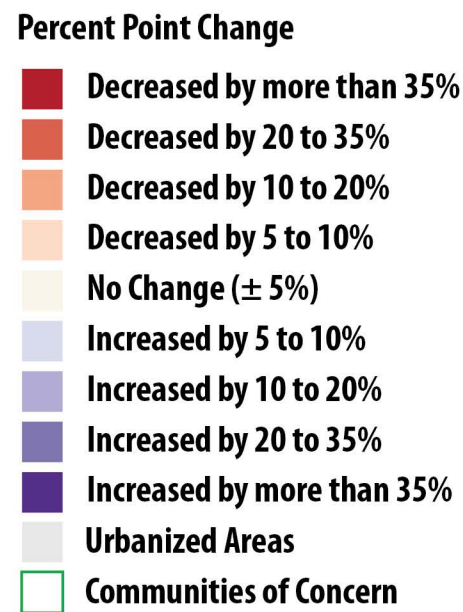


Map 7
Change in
Minority Population
American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

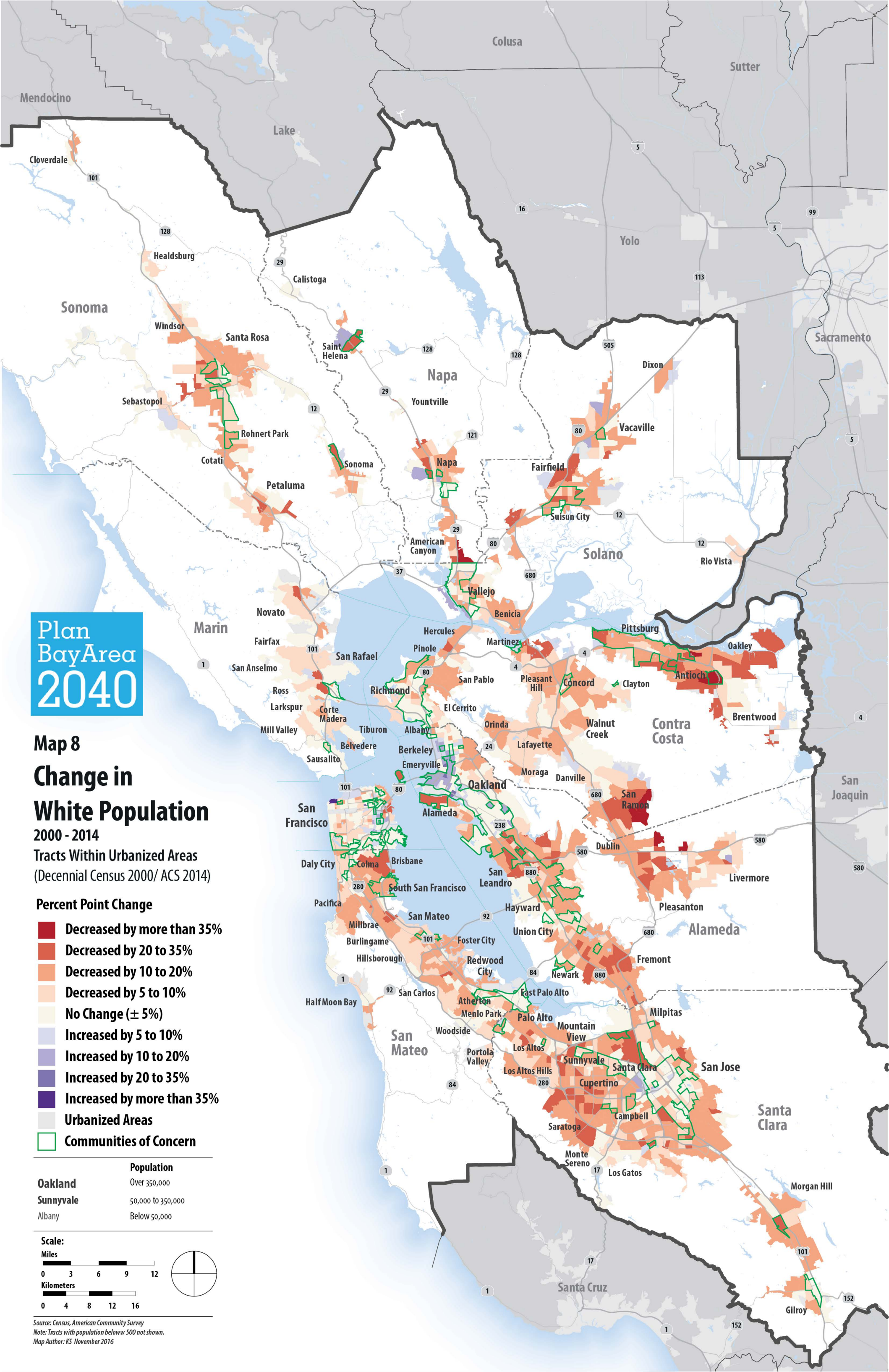


Map 8 Change in White Population 2000 - 2014

Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

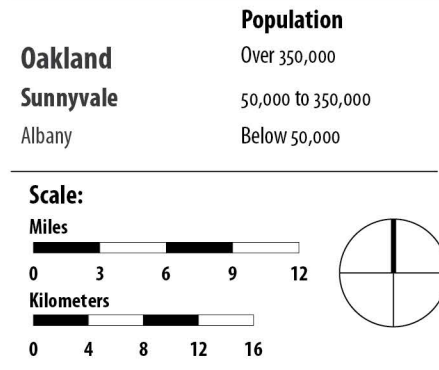
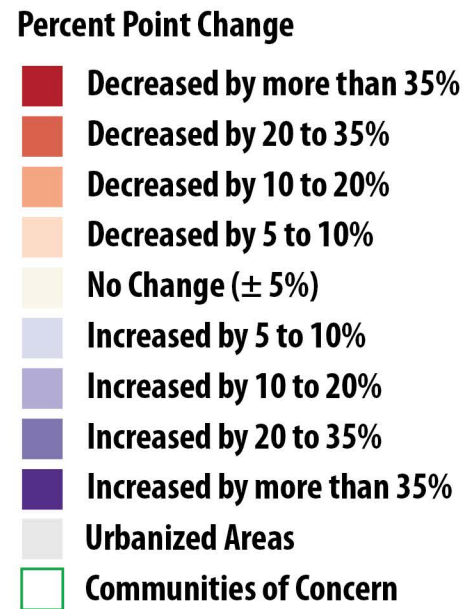


Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Map 9
Change in African American
or Black Population
2000 - 2014

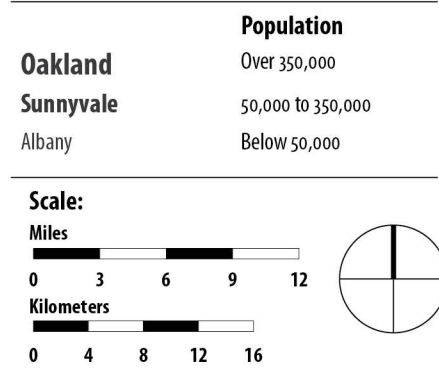
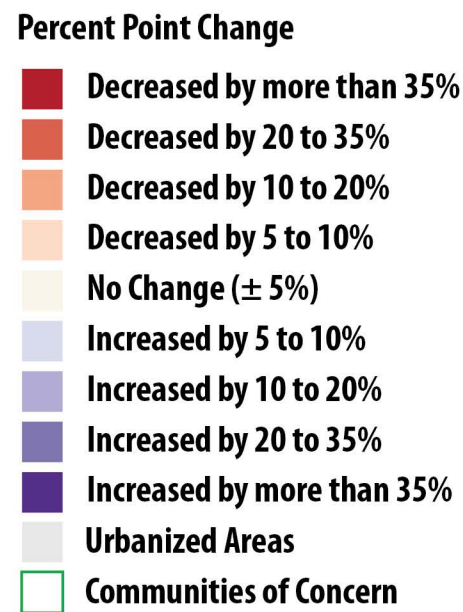
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)



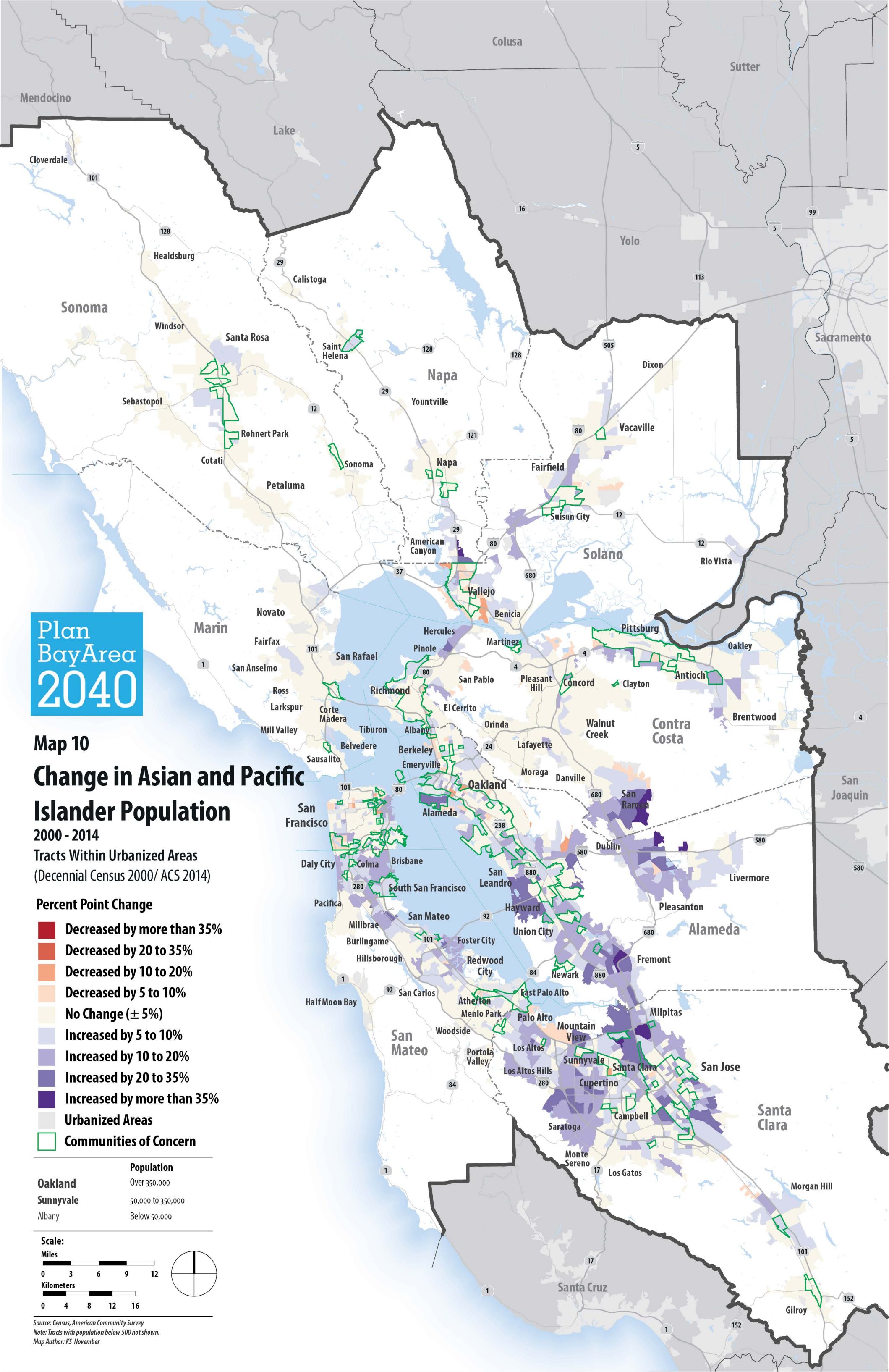
Source: Census, American Community Survey
Note: Tracts with population below 500 not shown
Map Author: KS November 2016

Map 10
Change in Asian and Pacific
Islander Population
2000 - 2014

Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

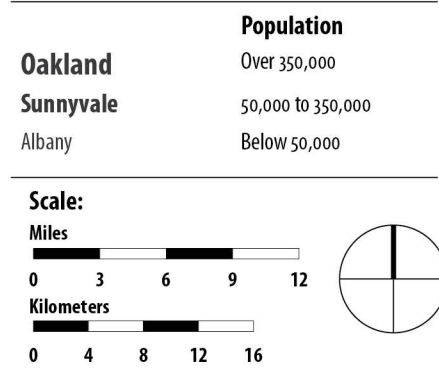
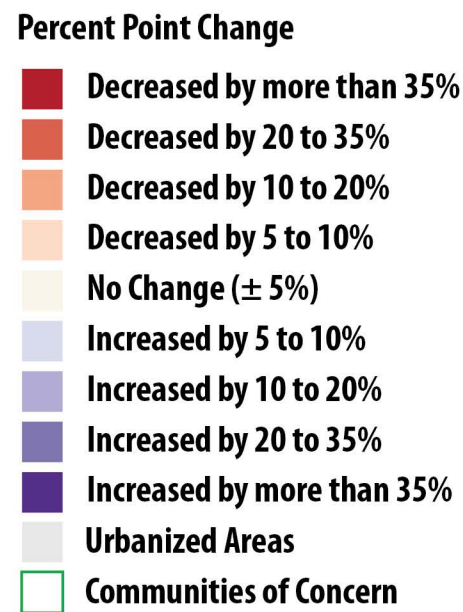


Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November

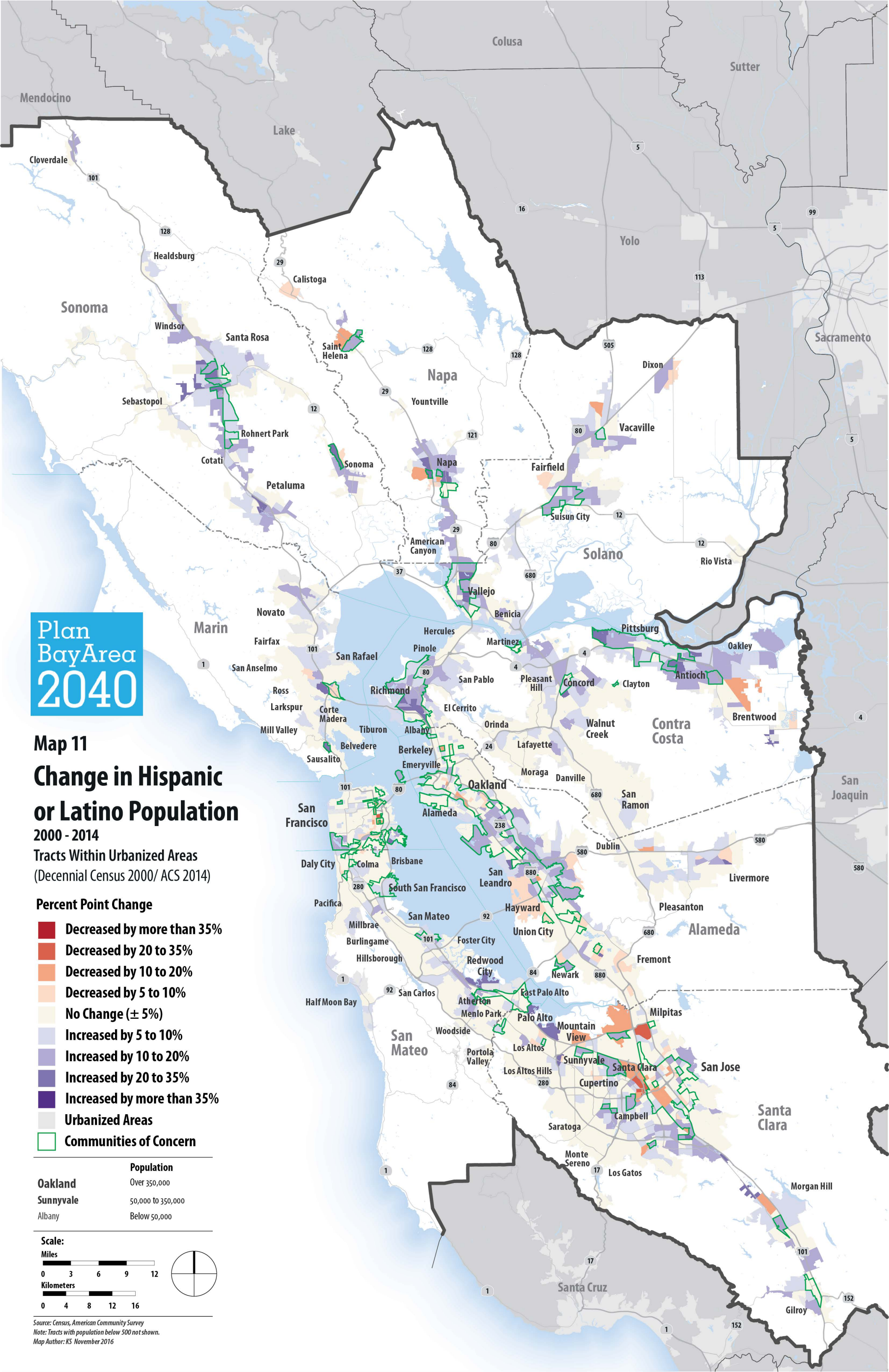


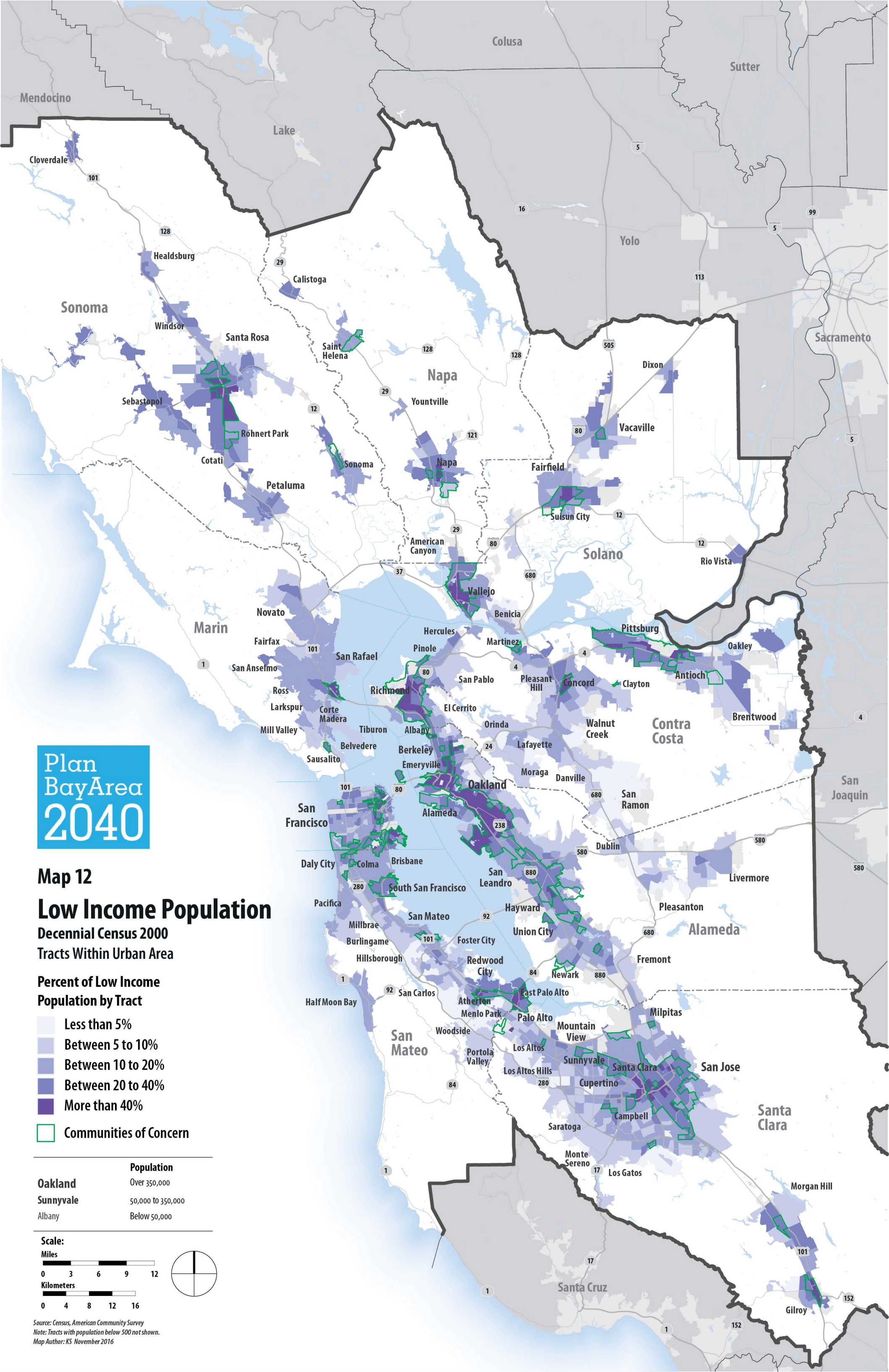
Map 11
Change in Hispanic or Latino Population
2000 - 2014

Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016





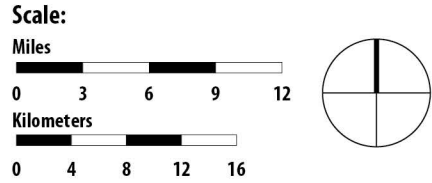
Plan BayArea 2040

Map 12
Low Income Population
Decennial Census 2000
Tracts Within Urban Area

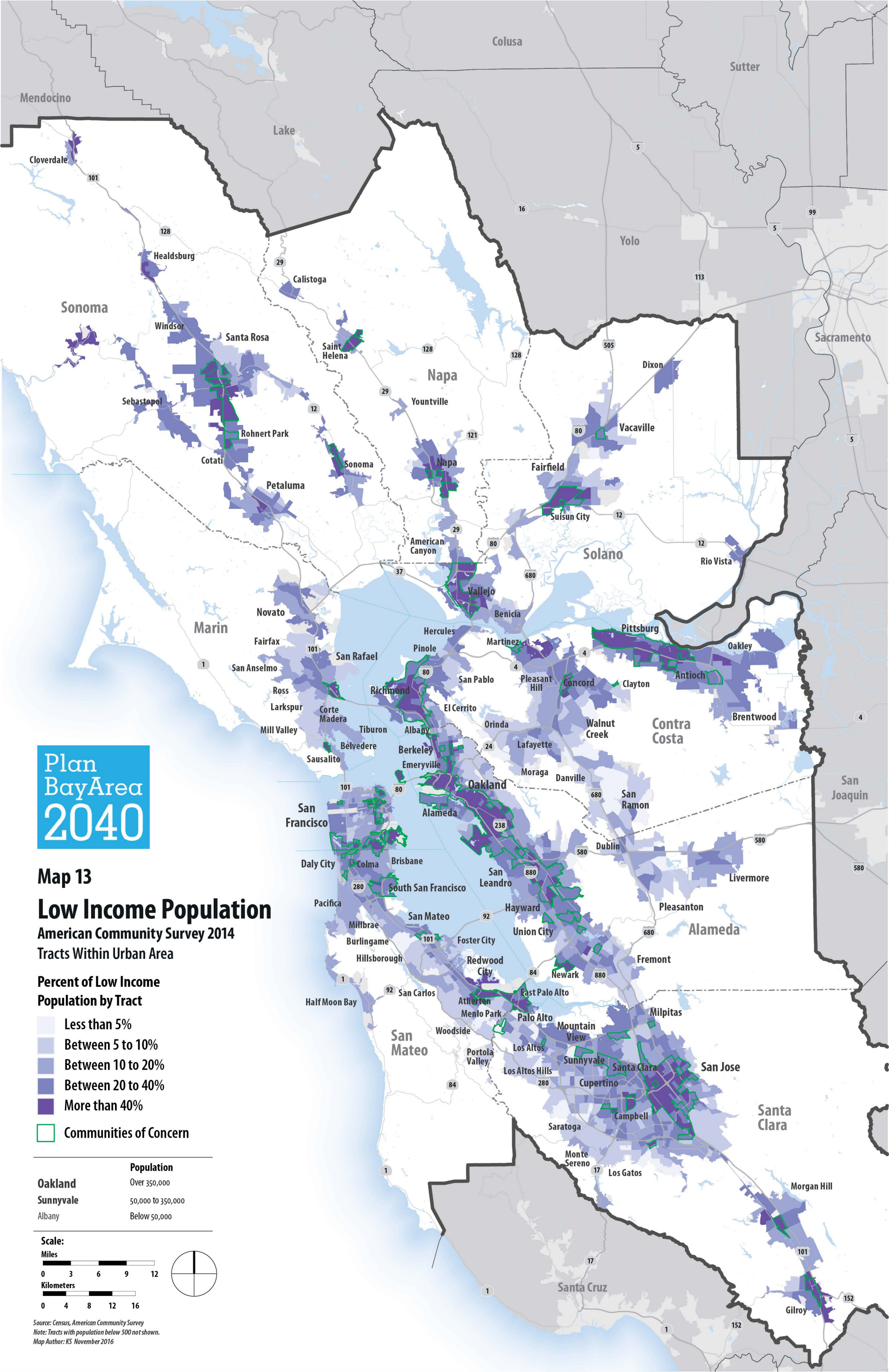
Percent of Low Income
Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Map 14
Change in
Low-Income Population
American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

- Percent Point Change
- Decreased by more than 35%
 - Decreased by 20 to 35%
 - Decreased by 10 to 20%
 - Decreased by 5 to 10%
 - No Change (\pm 5%)
 - Increased by 5 to 10%
 - Increased by 10 to 20%
 - Increased by 20 to 35%
 - Increased by more than 35%
 - Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

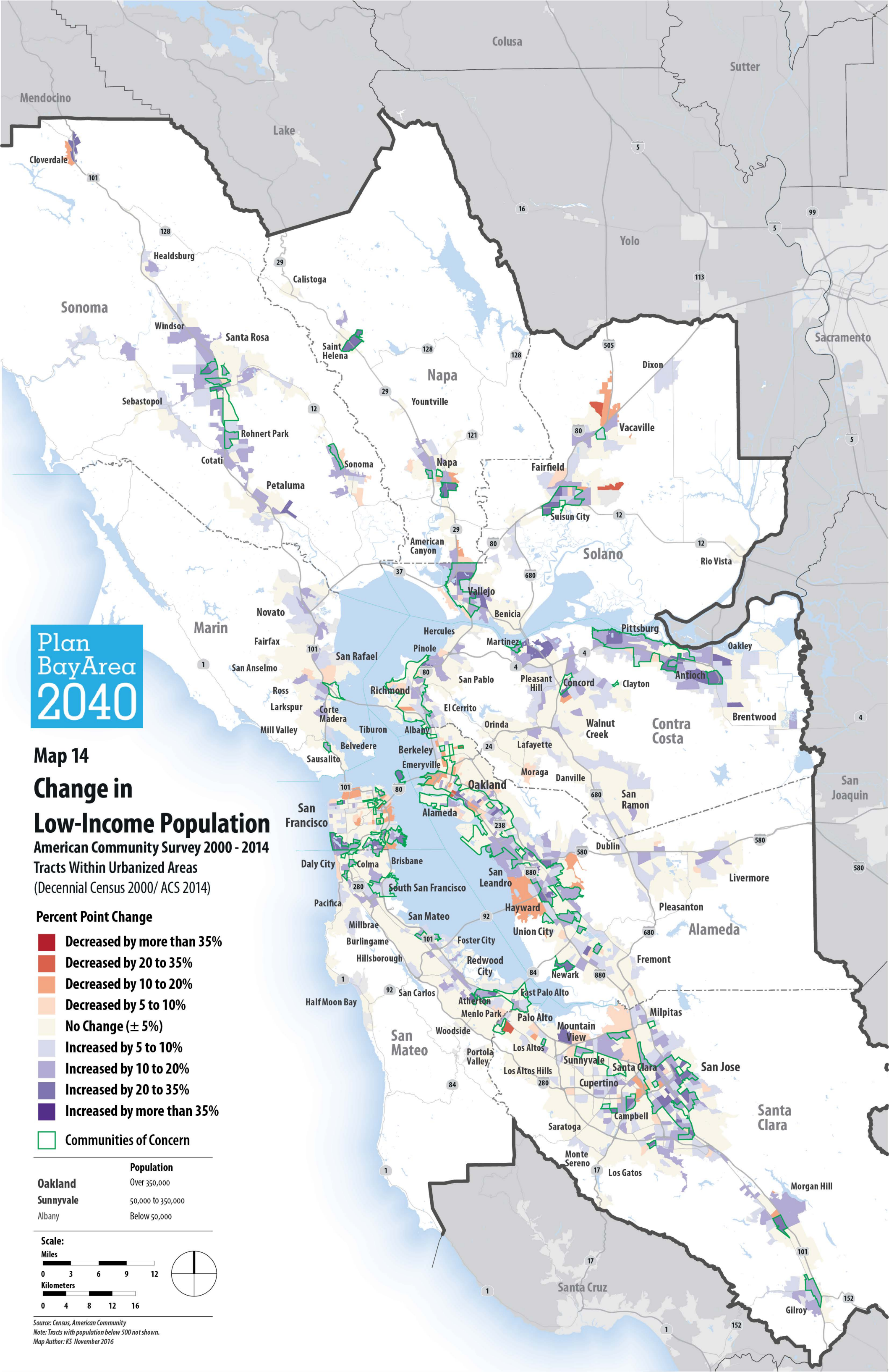
Miles

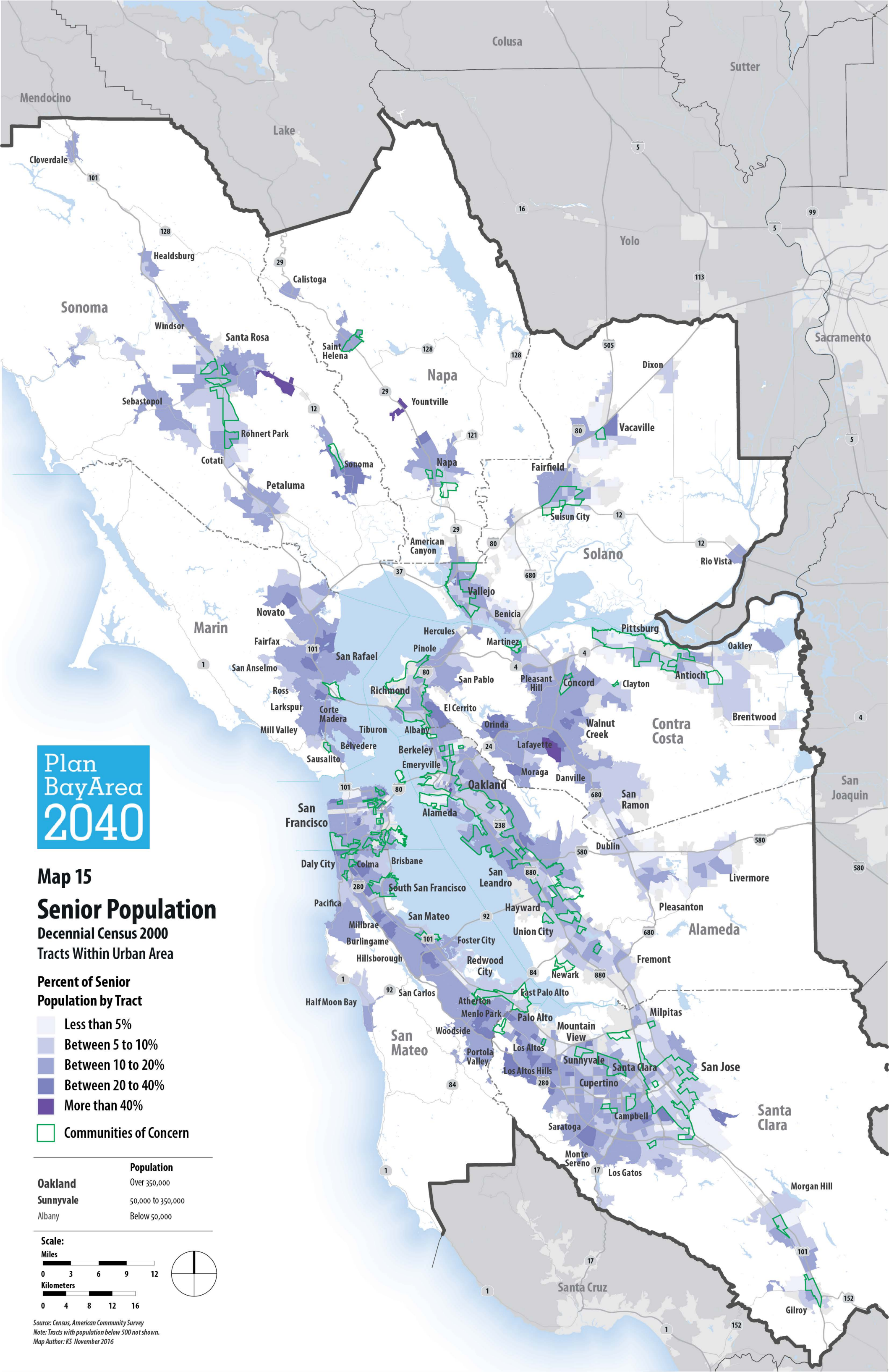
0 3 6 9 12

Kilometers

0 4 8 12 16

Source: Census, American Community
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016





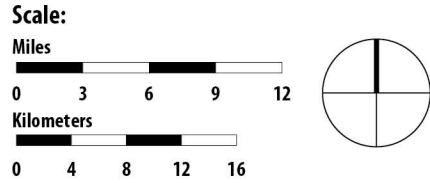
Plan BayArea
2040

Map 15
Senior Population
Decennial Census 2000
Tracts Within Urban Area

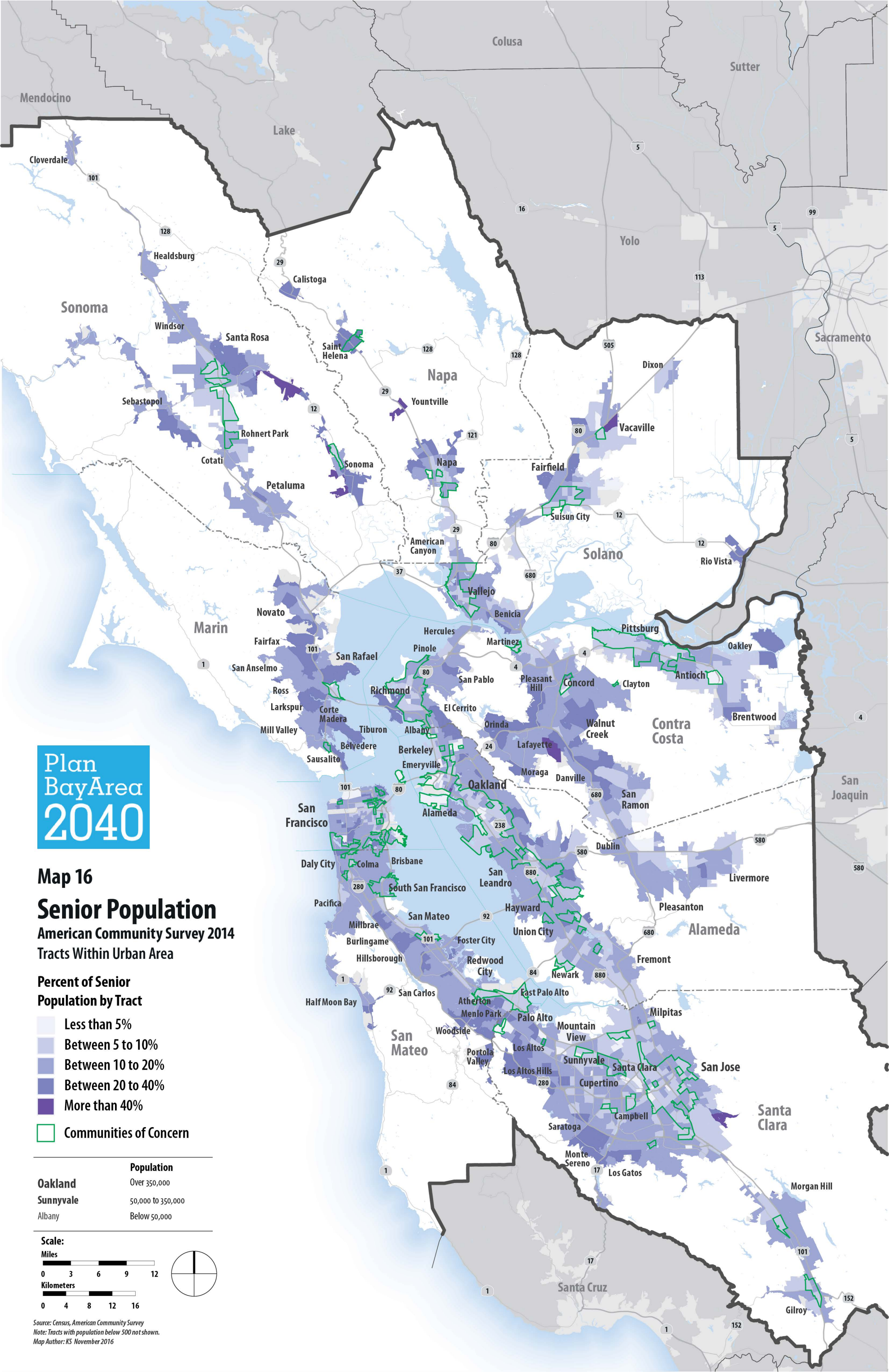
Percent of Senior
Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

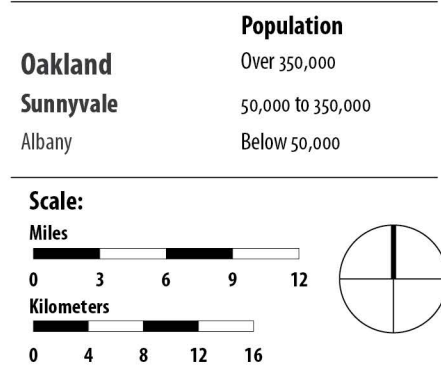
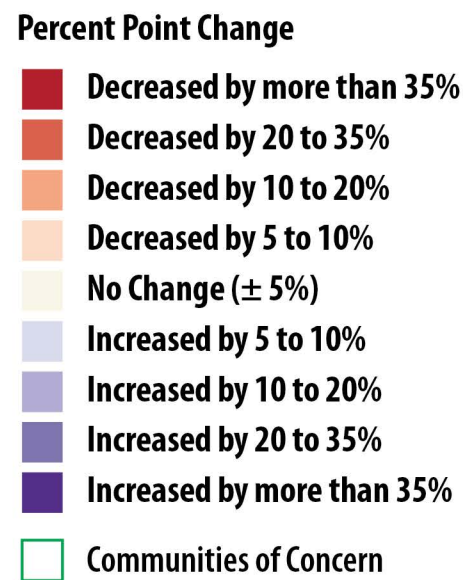


Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

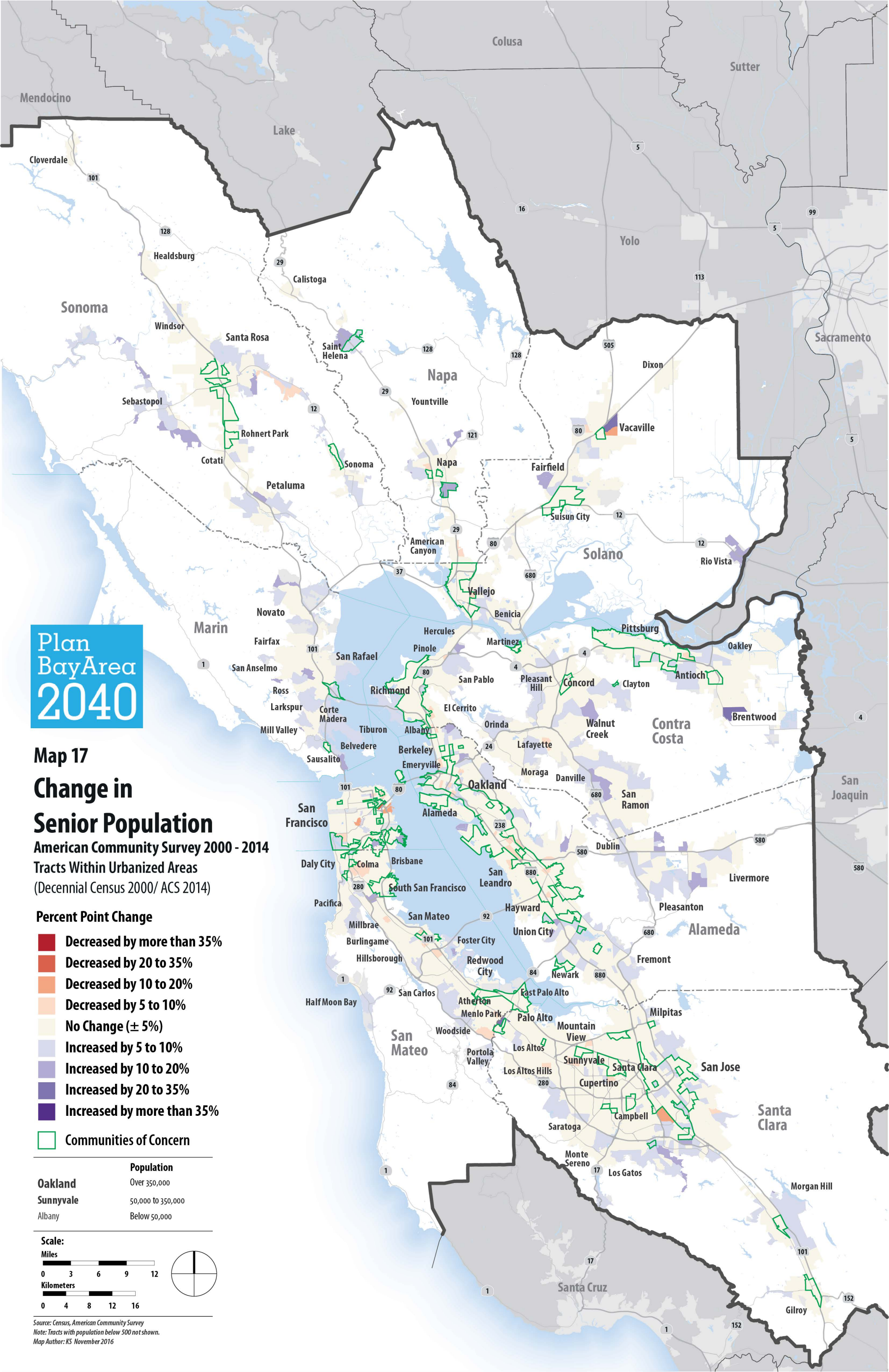


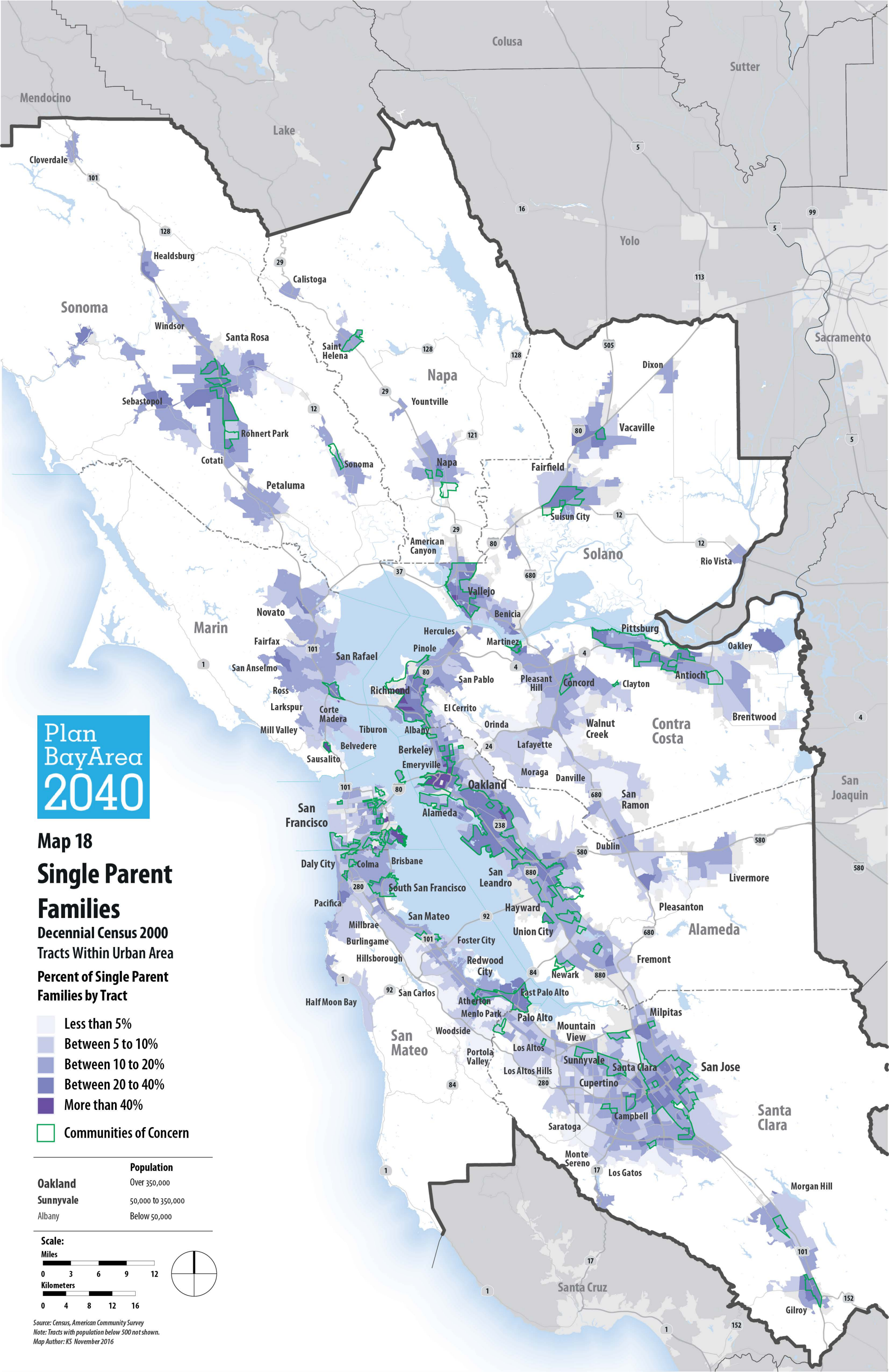
Map 17
Change in
Senior Population

American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016





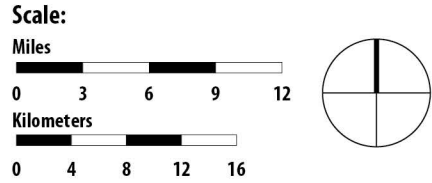
Plan
BayArea
2040

Map 18
Single Parent
Families

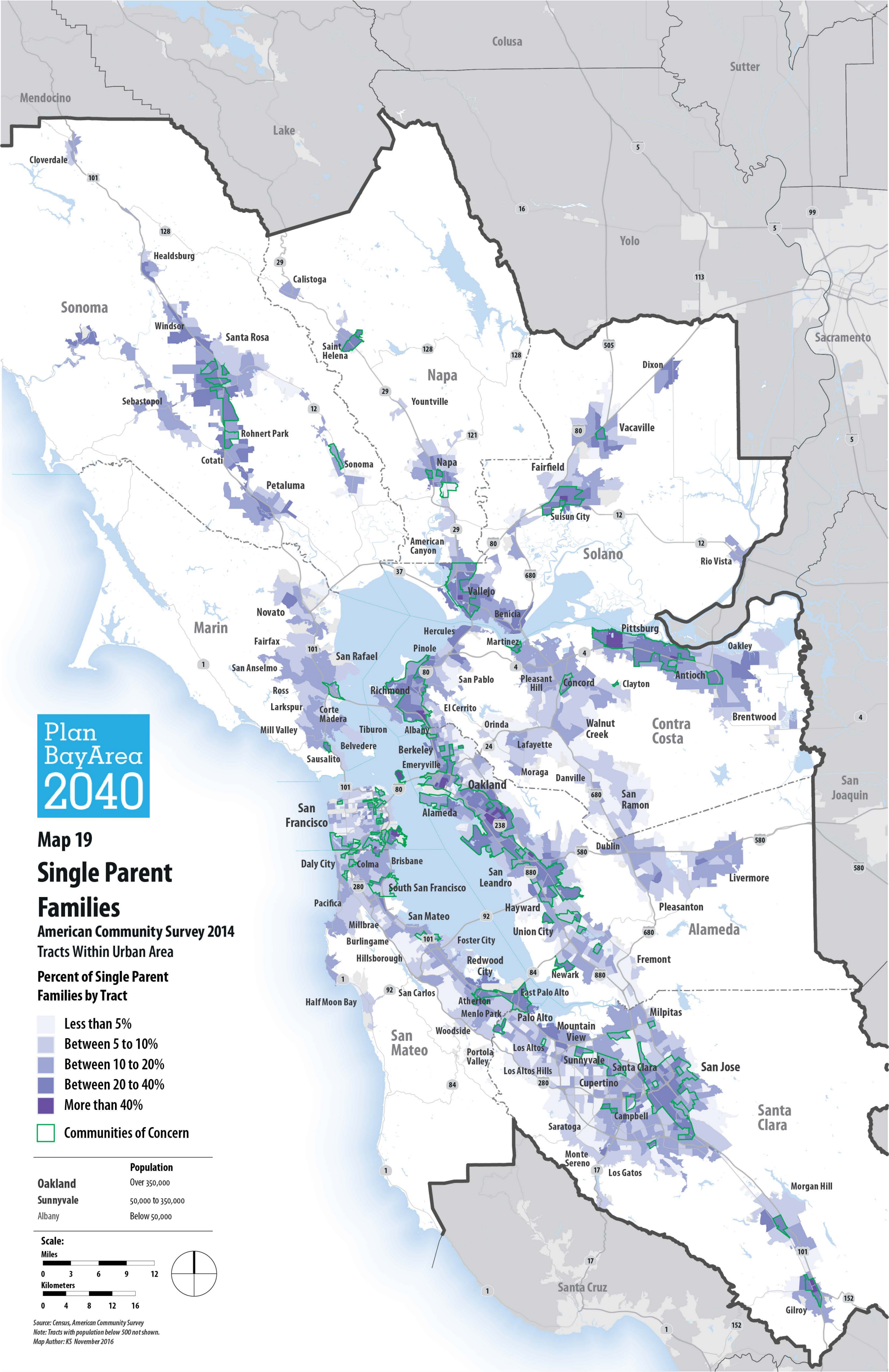
Decennial Census 2000
Tracts Within Urban Area
Percent of Single Parent
Families by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Plan BayArea
2040

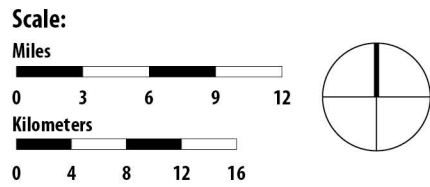
Map 19
Single Parent
Families

American Community Survey 2014
Tracts Within Urban Area

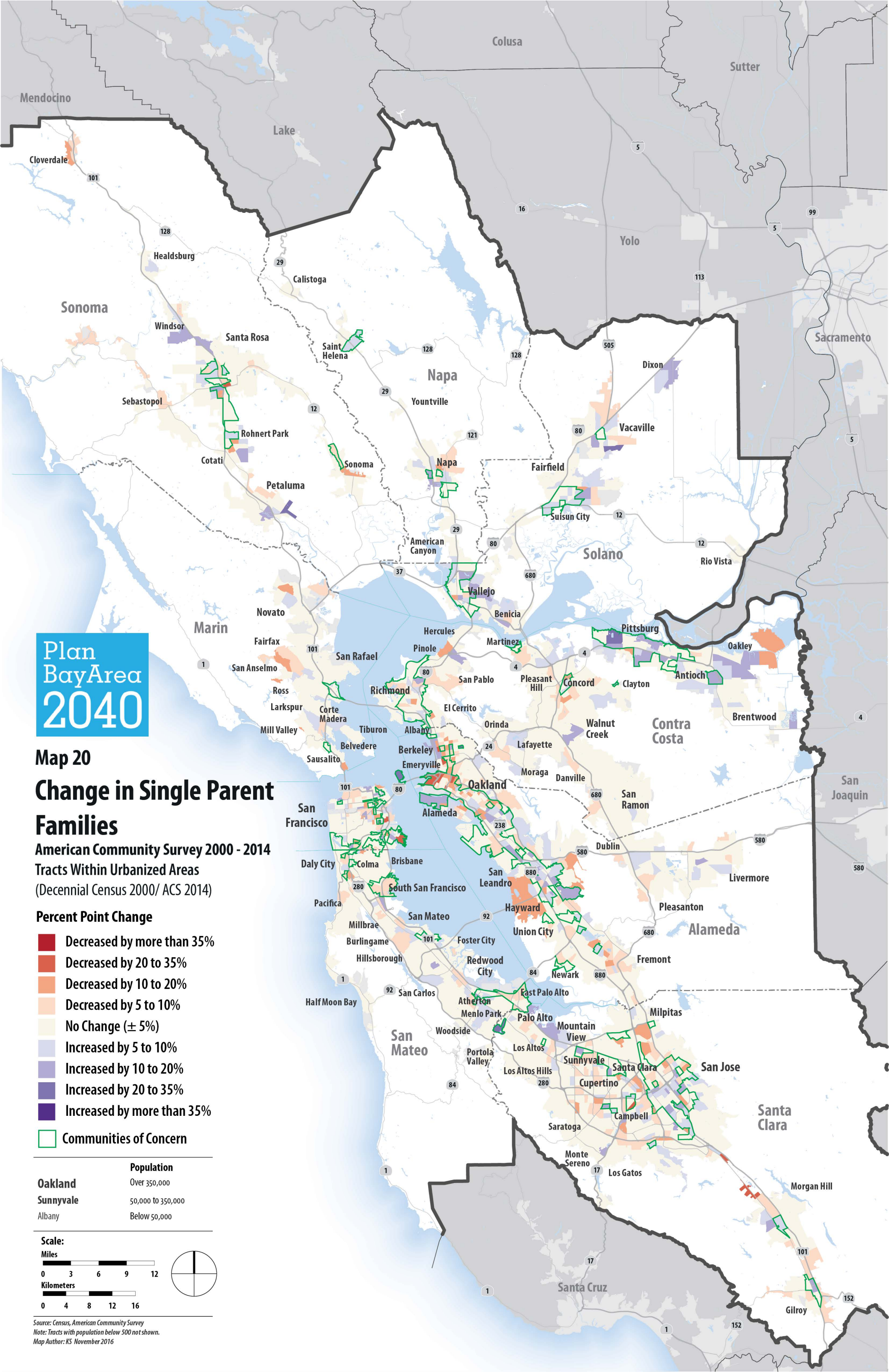
Percent of Single Parent
Families by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Plan
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Map 20

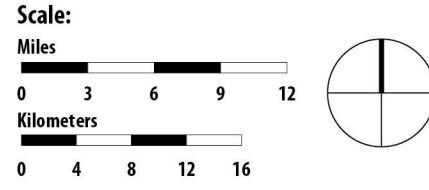
Change in Single Parent Families

American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

Percent Point Change

- Decreased by more than 35%
- Decreased by 20 to 35%
- Decreased by 10 to 20%
- Decreased by 5 to 10%
- No Change (\pm 5%)
- Increased by 5 to 10%
- Increased by 10 to 20%
- Increased by 20 to 35%
- Increased by more than 35%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Plan BayArea
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Map 21

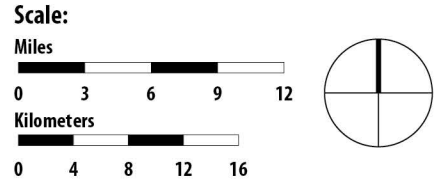
Zero Vehicle
Households

Decennial Census 2000
Tracts Within Urban Area

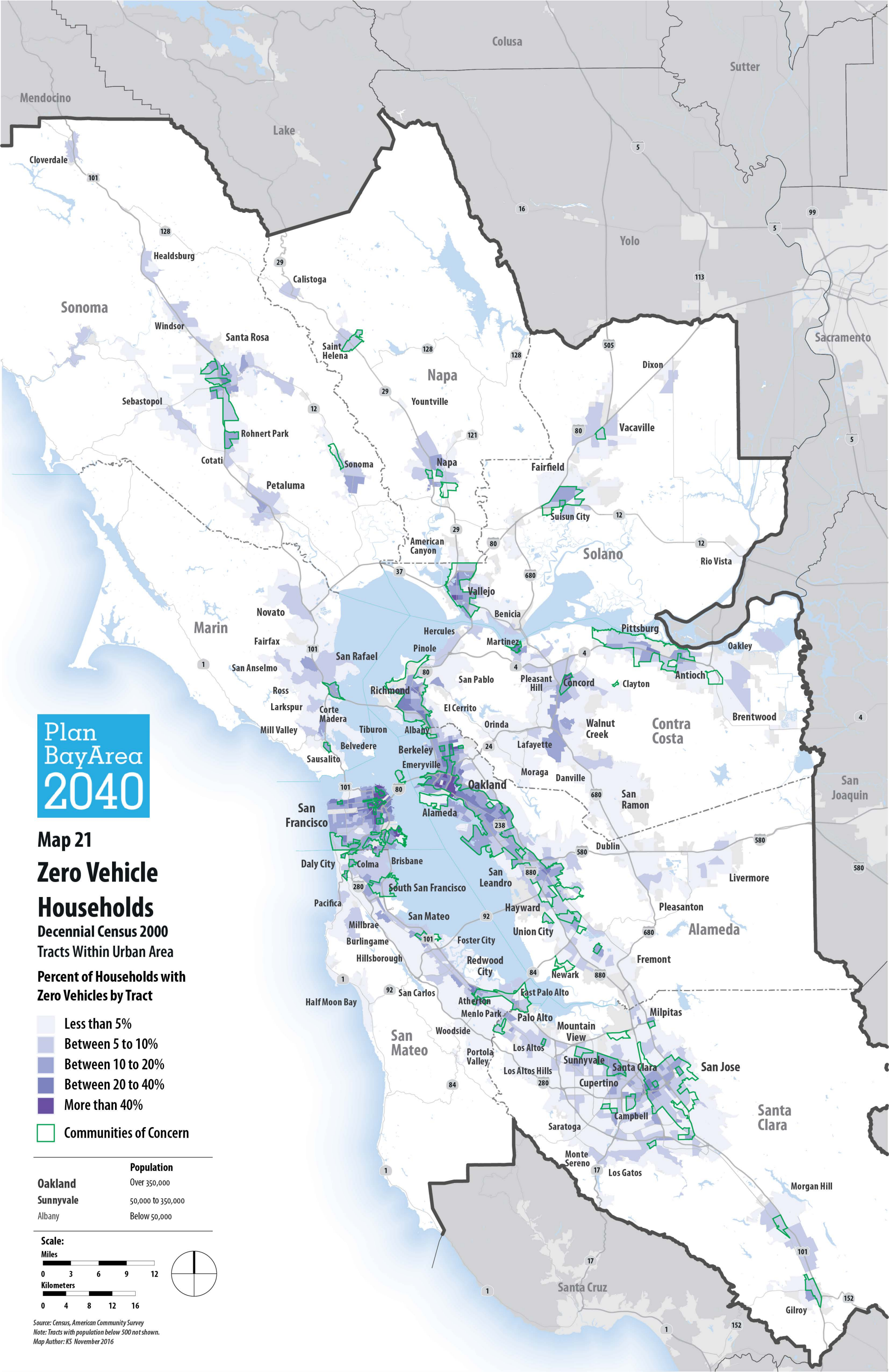
Percent of Households with
Zero Vehicles by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Plan BayArea
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Map 22

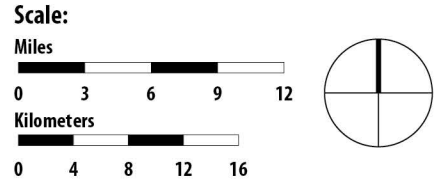
Zero Vehicle
Households

American Community Survey 2014
Tracts Within Urban Area

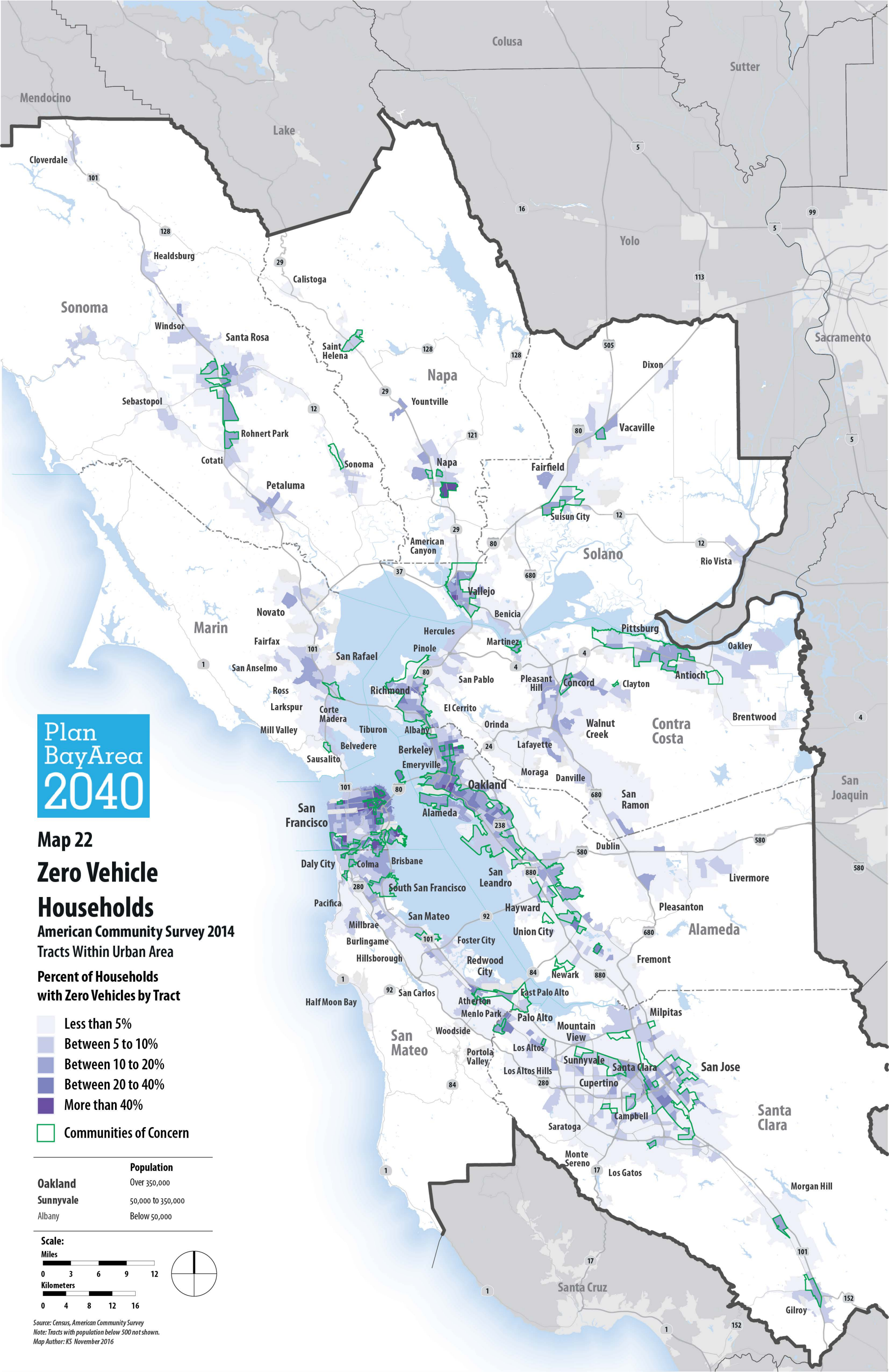
Percent of Households
with Zero Vehicles by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Map 23
Change in Zero
Vehicle Households

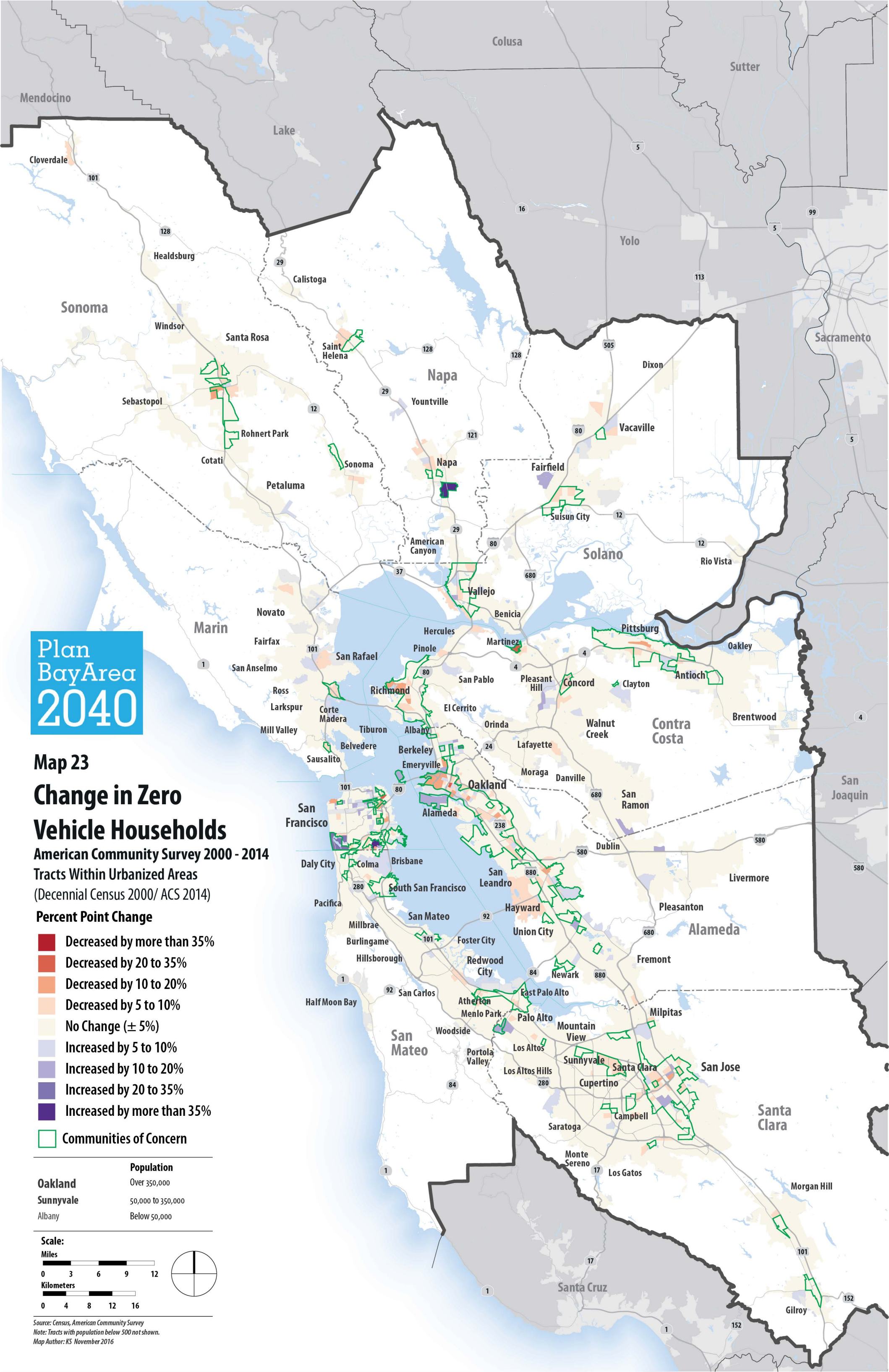
American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

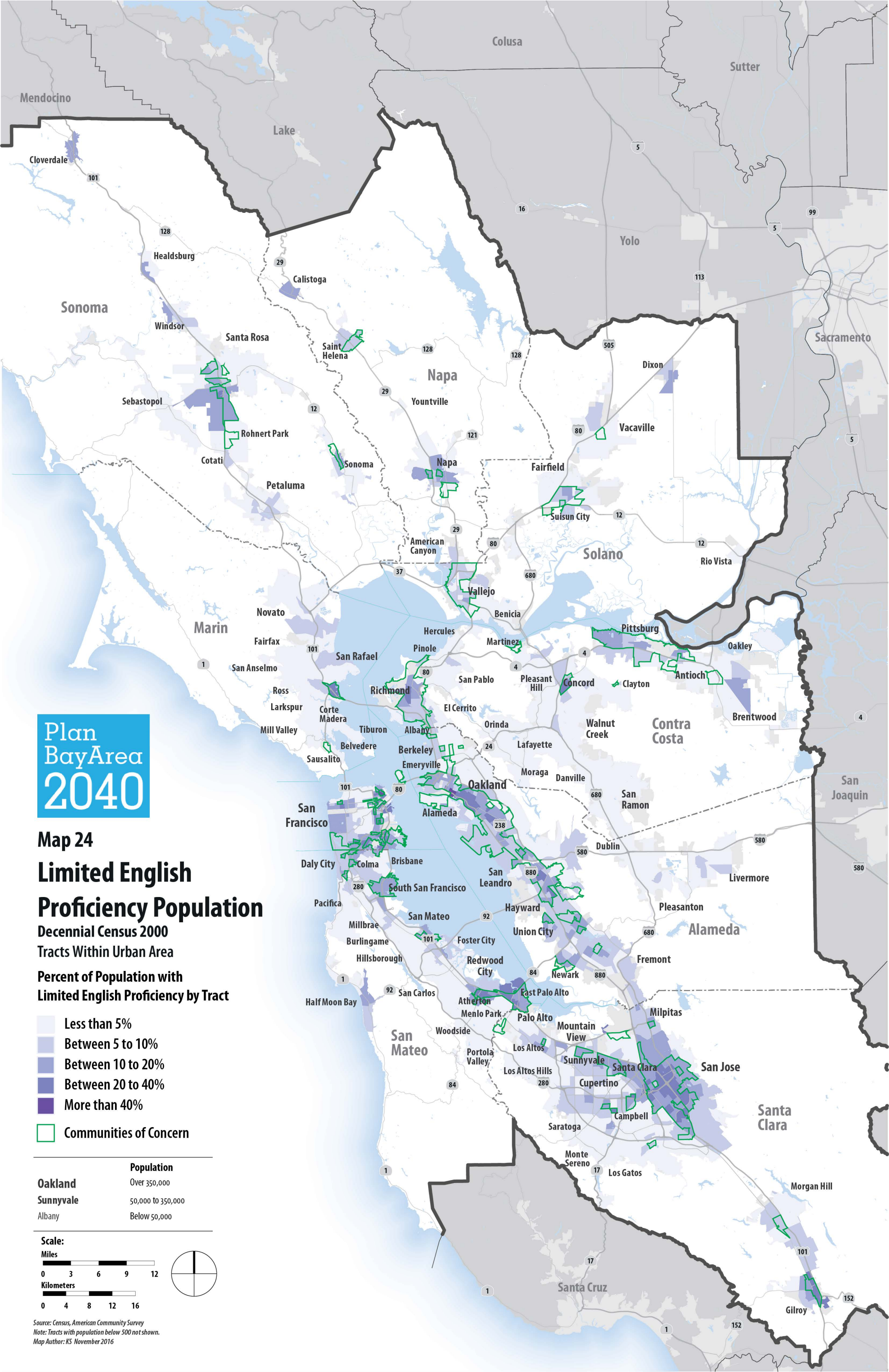
- Percent Point Change
- Decreased by more than 35%
 - Decreased by 20 to 35%
 - Decreased by 10 to 20%
 - Decreased by 5 to 10%
 - No Change (\pm 5%)
 - Increased by 5 to 10%
 - Increased by 10 to 20%
 - Increased by 20 to 35%
 - Increased by more than 35%
 - Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:
Miles
0 3 6 9 12
Kilometers
0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016





Plan
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Map 24

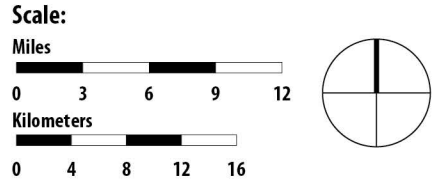
Limited English Proficiency Population

Decennial Census 2000
Tracts Within Urban Area

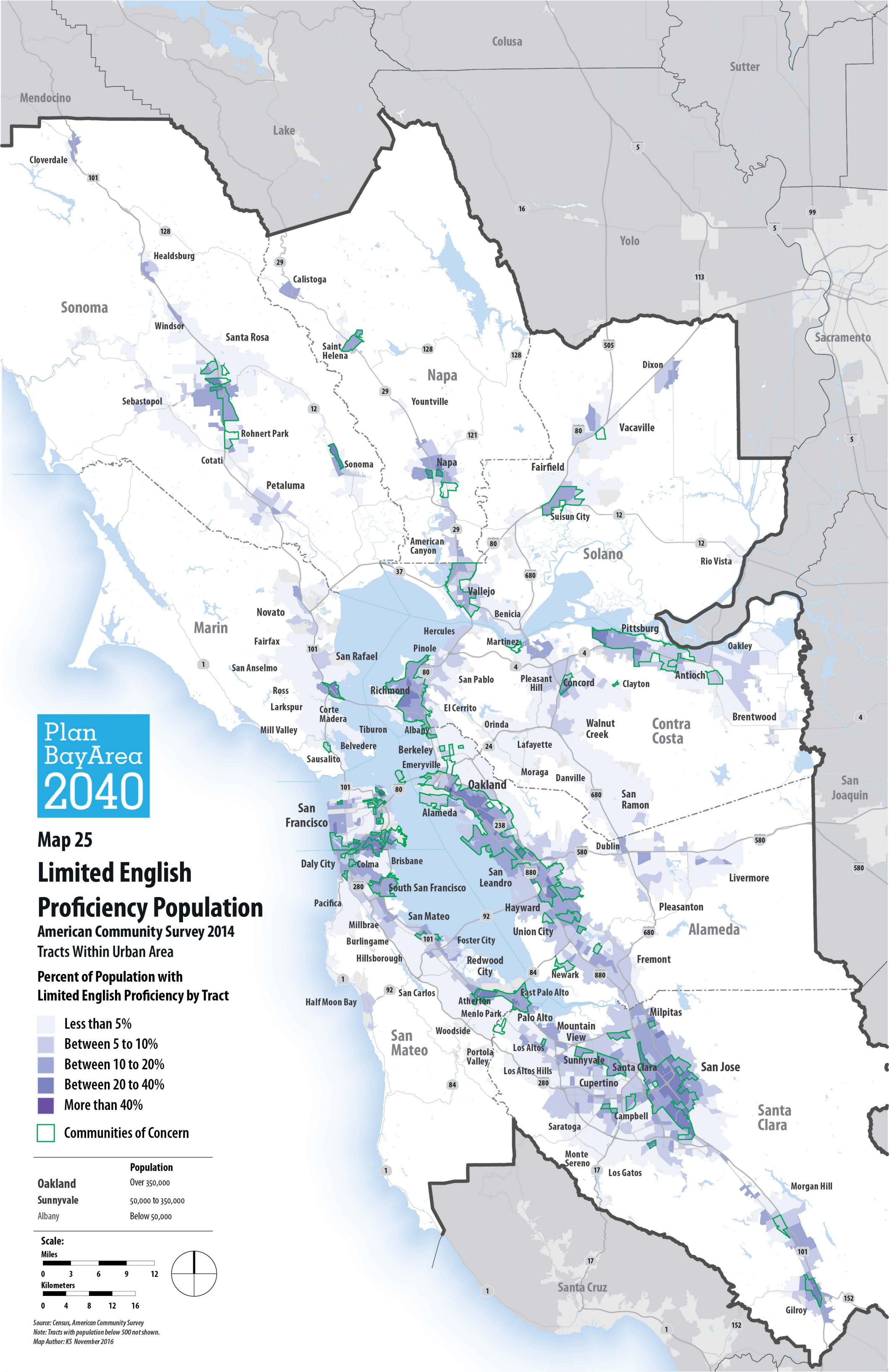
Percent of Population with
Limited English Proficiency by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



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Map 25

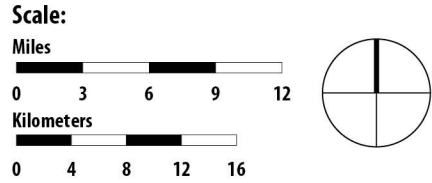
Limited English Proficiency Population

American Community Survey 2014
Tracts Within Urban Area

Percent of Population with
Limited English Proficiency by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Map 26
Change in Limited English Proficiency Population

American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)

- Percent Point Change
- Decreased by more than 35%
 - Decreased by 20 to 35%
 - Decreased by 10 to 20%
 - Decreased by 5 to 10%
 - No Change (\pm 5%)
 - Increased by 5 to 10%
 - Increased by 10 to 20%
 - Increased by 20 to 35%
 - Increased by more than 35%
 - Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

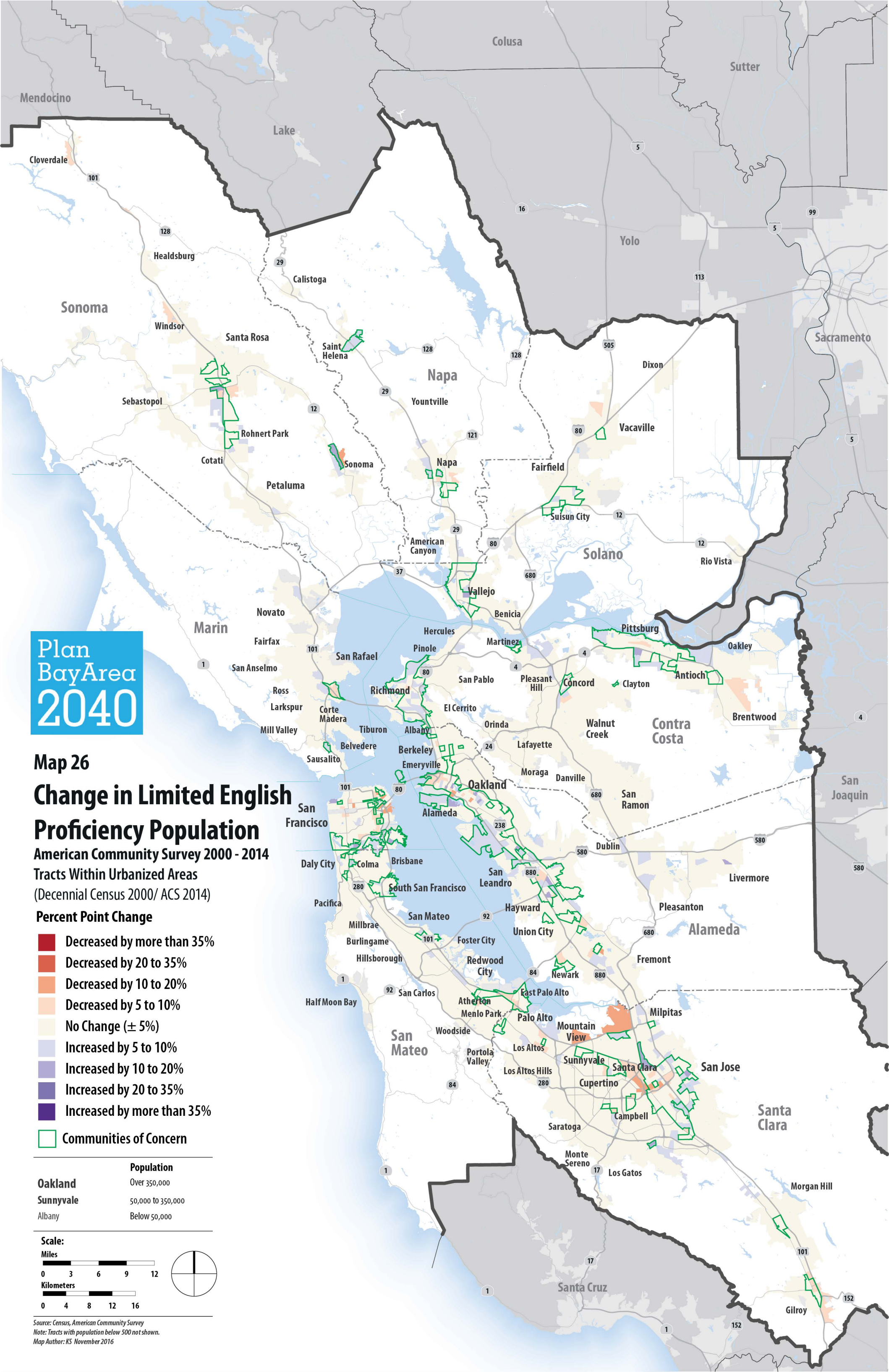
Miles

0 3 6 9 12

Kilometers

0 4 8 12 16

Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016



Map 27
Severely Rent-Burdened Households

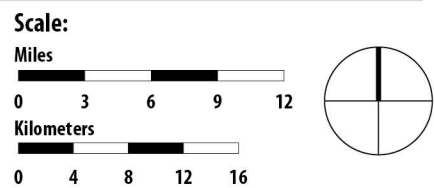
Decennial Census 2000
Tracts Within Urban Area

Percent of Households with Severe Rent Burden by Tract

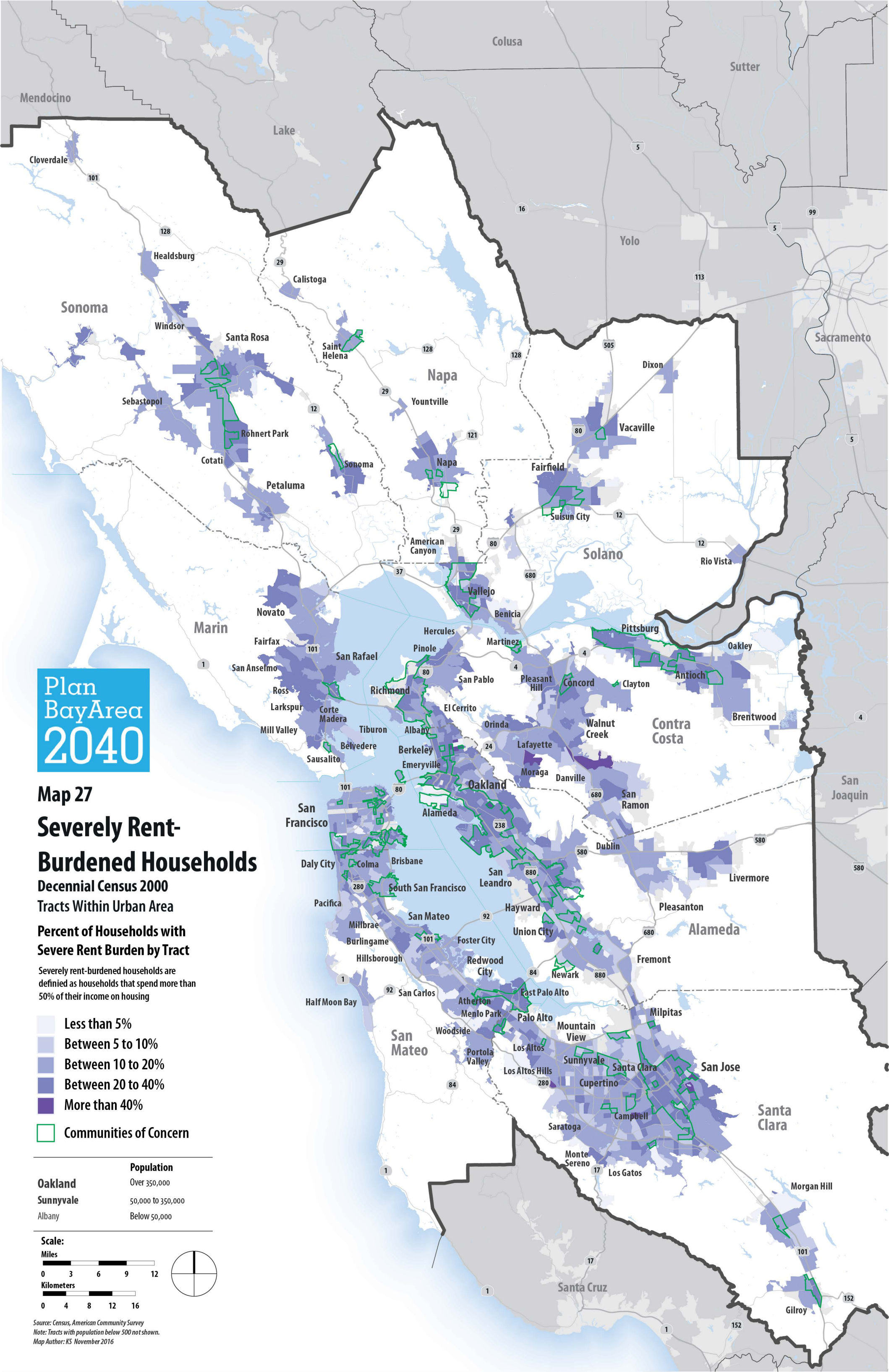
Severely rent-burdened households are defined as households that spend more than 50% of their income on housing

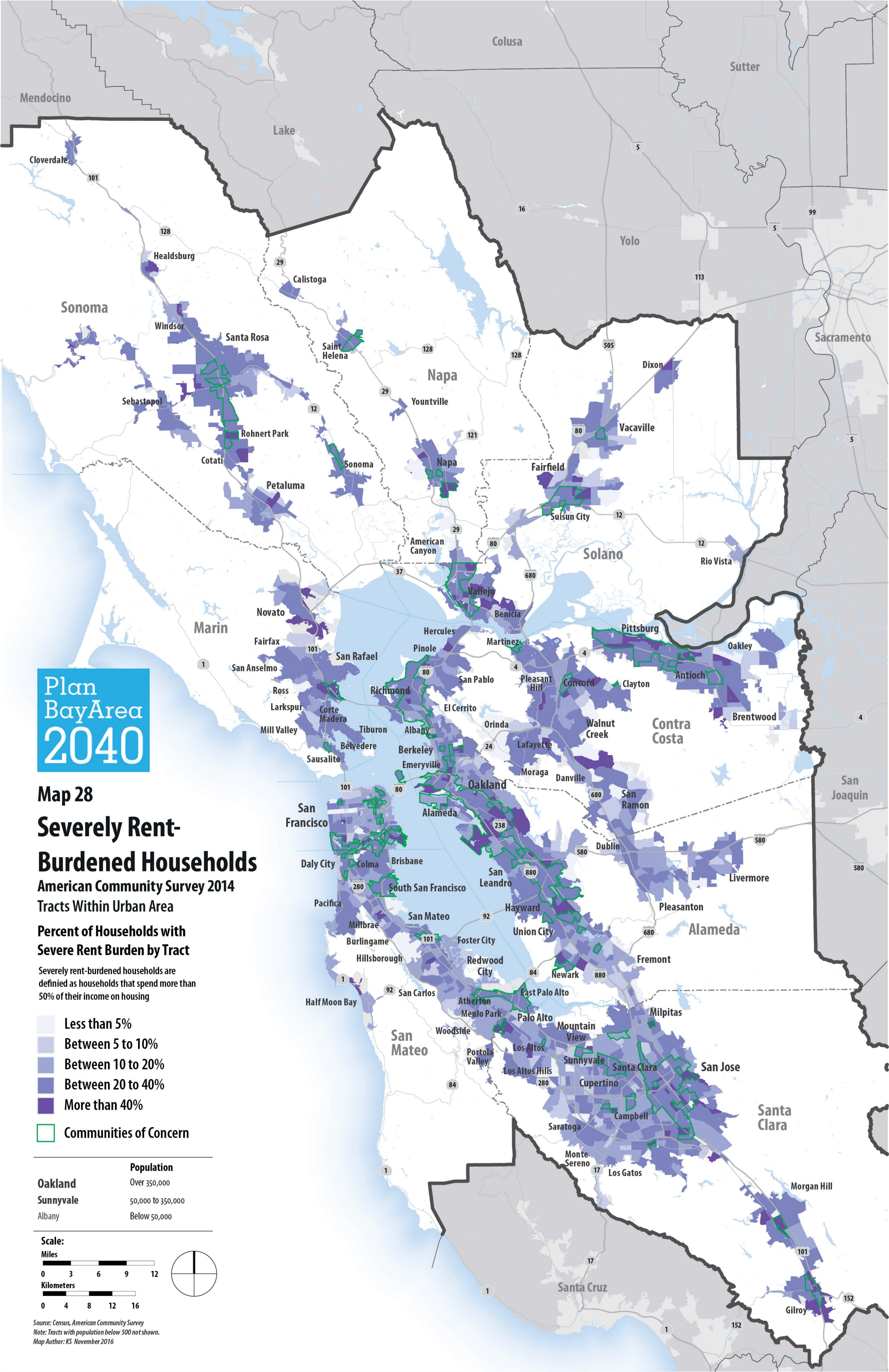
- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016





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Map 28
Severely Rent-Burdened Households

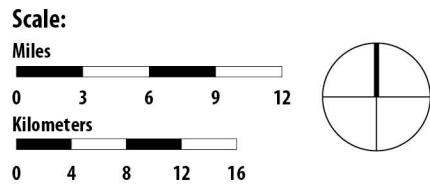
American Community Survey 2014
Tracts Within Urban Area

Percent of Households with
Severe Rent Burden by Tract

Severely rent-burdened households are defined as households that spend more than 50% of their income on housing

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

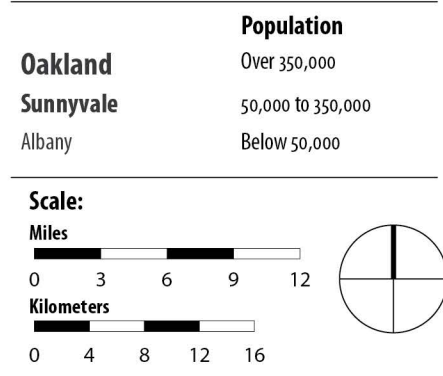
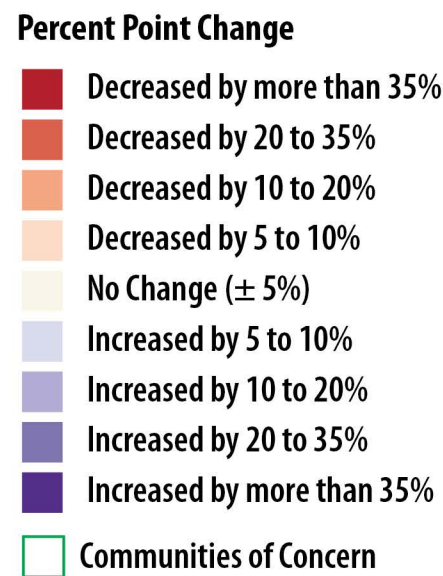
	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



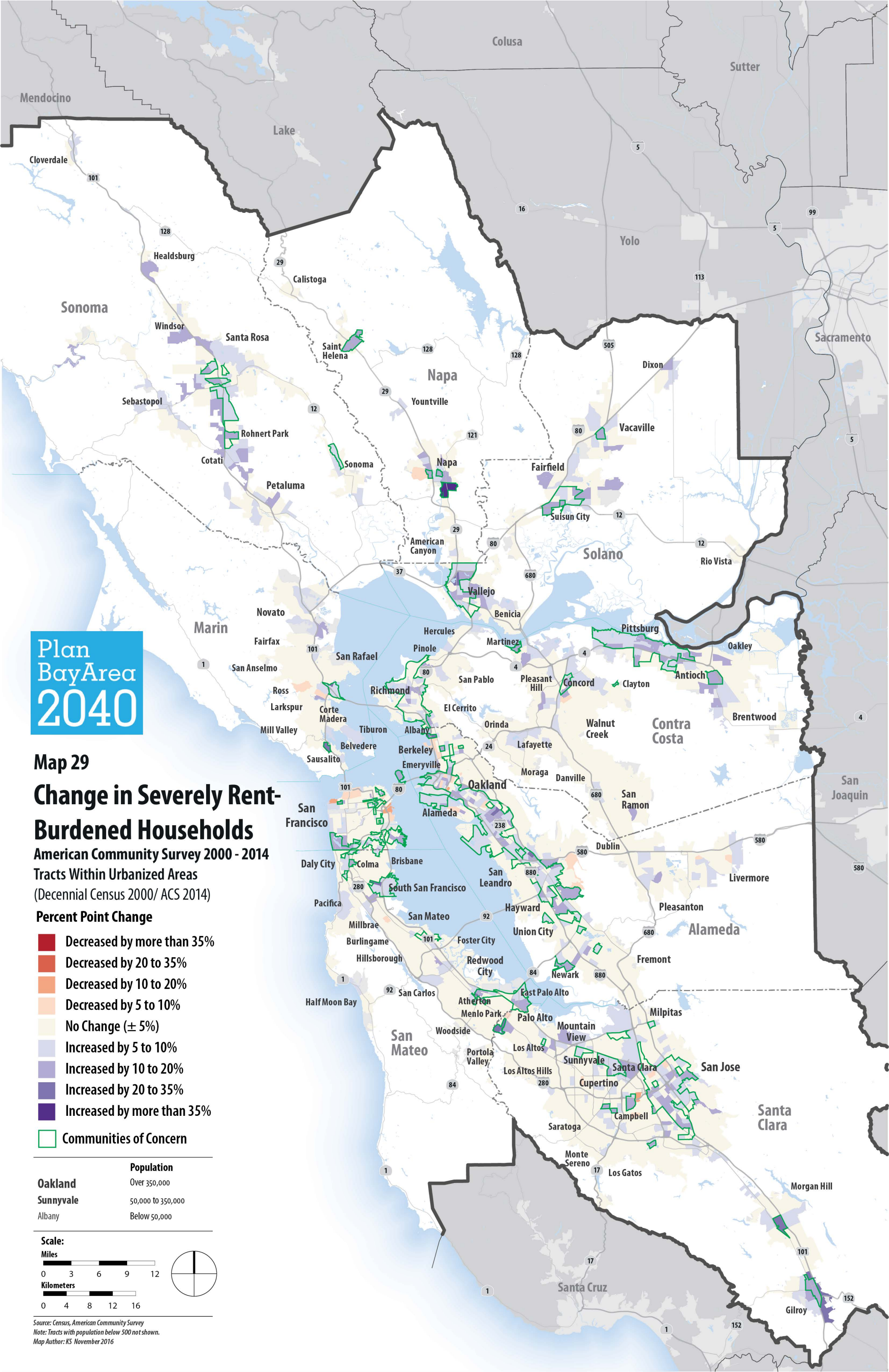
Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

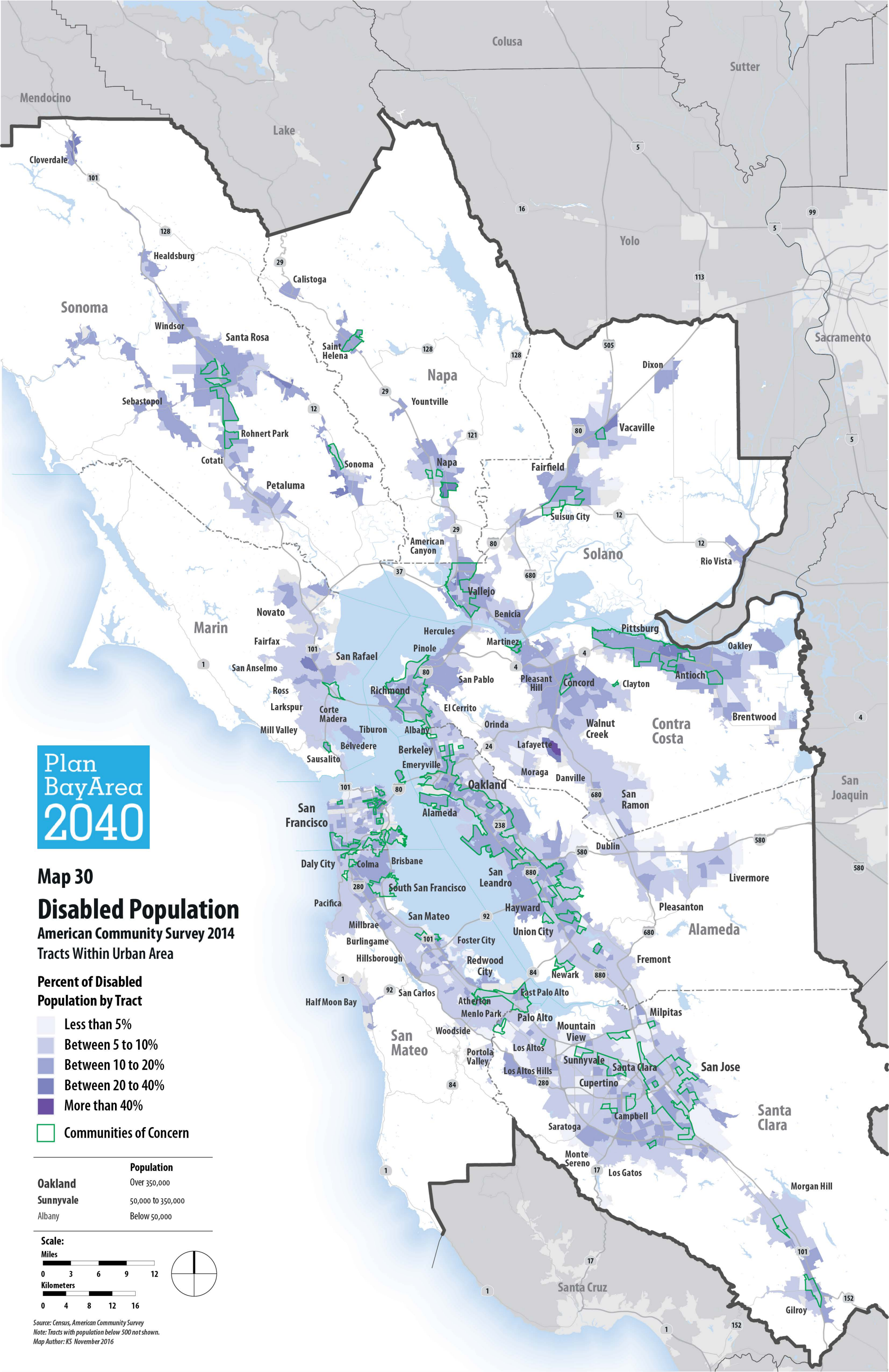
Map 29
Change in Severely Rent-Burdened Households

American Community Survey 2000 - 2014
Tracts Within Urbanized Areas
(Decennial Census 2000/ ACS 2014)



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016





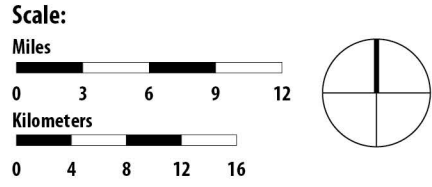
Plan
BayArea
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Map 30
Disabled Population
American Community Survey 2014
Tracts Within Urban Area

Percent of Disabled
Population by Tract

- Less than 5%
- Between 5 to 10%
- Between 10 to 20%
- Between 20 to 40%
- More than 40%
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Note: Tracts with population below 500 not shown.
Map Author: KS November 2016

Map 31
Jobs Housing Fit Ratio
Ratio of Low-wage Jobs
to Affordable Housing Units
University of California Davis 2014
Tracts Within Urbanized Areas

Jobs Housing Fit Indicator Ratio

- Less than 1
- 1 to 2
- 2 to 4
- Greater than 4

About this Data:
<http://mappingregionalchange.ucdavis.edu/roi/data.html>

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

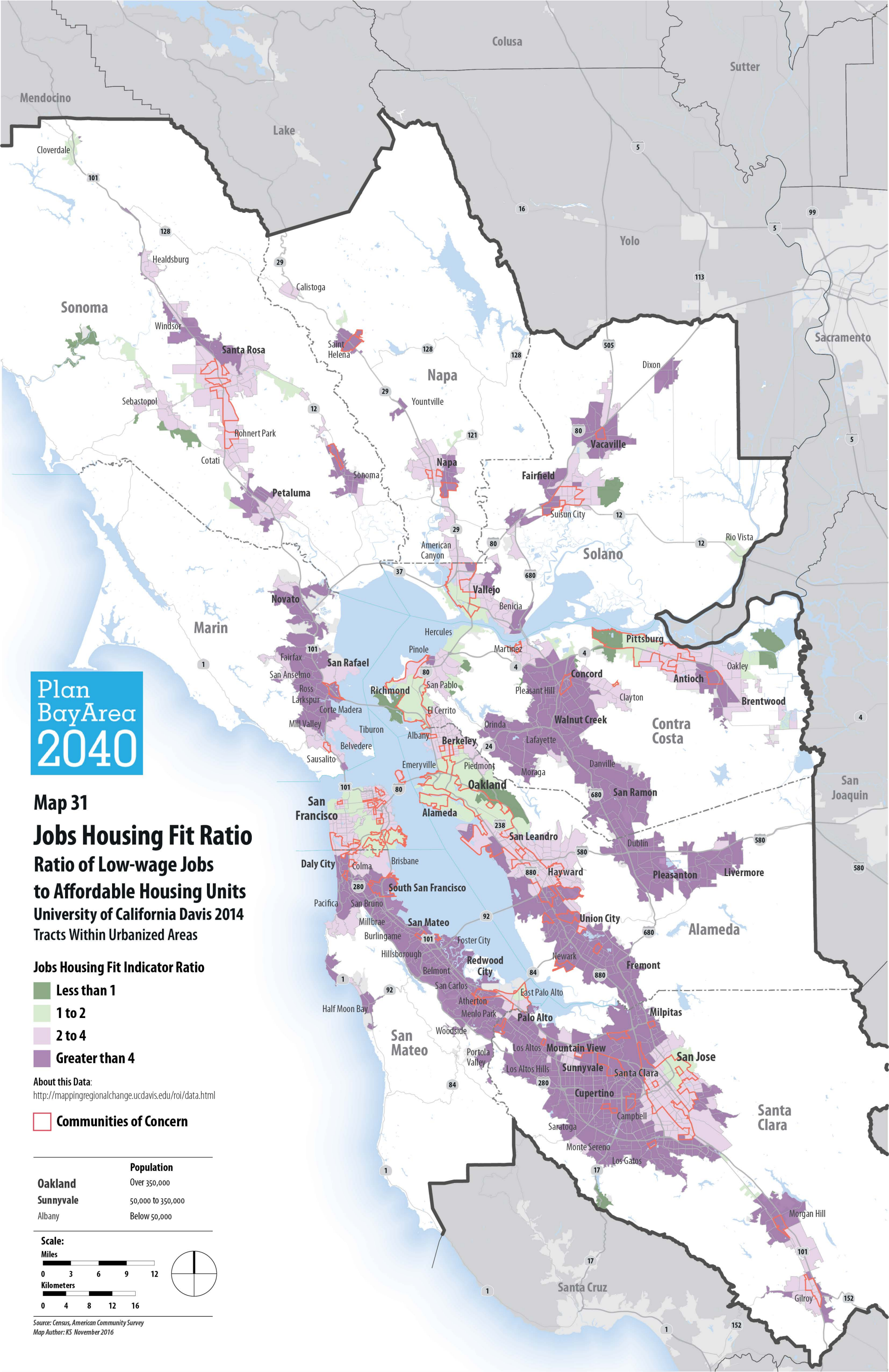
Miles

0 3 6 9 12

Kilometers

0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016





Map 32 Estimated Daily Truck Volume and Communities of Concern

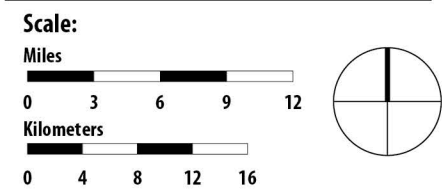
Trucks per Day by Route

- Less than 2000
- 2,000 to 5,000
- 5,000 to 10,000
- 10,000 to 15,000
- more than 15,000

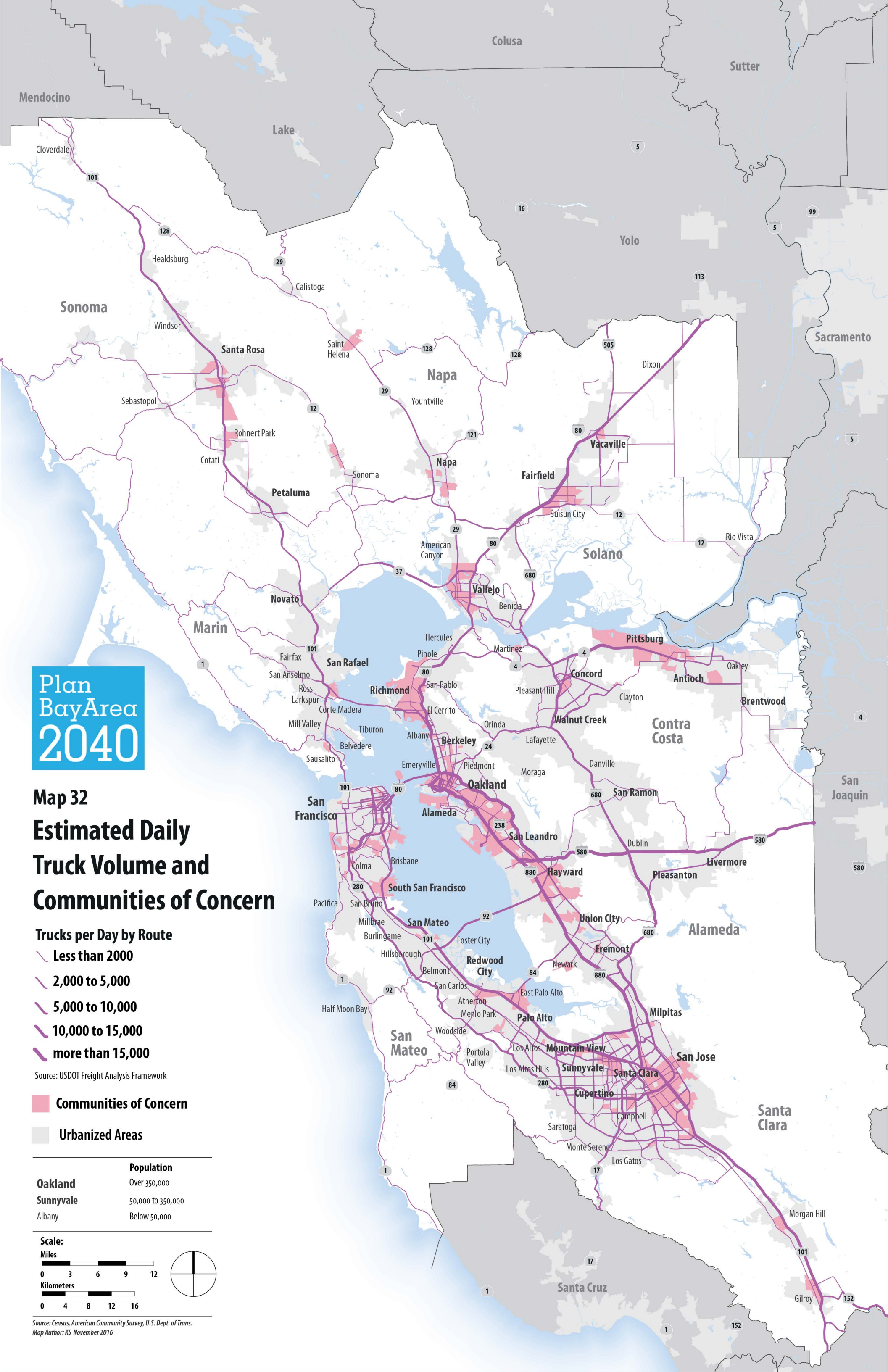
Source: USDOT Freight Analysis Framework

- Communities of Concern
- Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey, U.S. Dept. of Trans.
Map Author: KS November 2016



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Map 33
Other Disadvantaged Areas
Tracts Within Urbanized Areas

- CARE Communities
(Bay Area Air Quality Management District)
- Health Disadvantaged Areas
(California Public Health Alliance)
- Disadvantaged Communities
(EPA's CalEnviroScreen 3.0)
- Communities of Concern
- Urbanized Areas

Oakland

Sunnyvale

Albany

Population

Over 350,000

50,000 to 350,000

Below 50,000

Scale:

Miles

0 3 6 9 12

Kilometers

0 4 8 12 16

Map 34
High Opportunity Areas
Neighborhood Health & Housing,
Education, Economic and Mobility
Opportunity Indicators
Kirwan Institute for the Study of
Race and Ethnicity 2010
Tracts Within Urbanized Areas

Comprehensive Opportunity Index

- High Opportunity Areas
- Very High Opportunity Areas

Represents 18 different indicators in the following categories:
Neighborhood Health & Housing
Education
Economic and Mobility

About this Data:
<http://kirwaninstitute.osu.edu/researchandstrategicinitiatives/>

- Communities of Concern
- Urbanized Areas

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

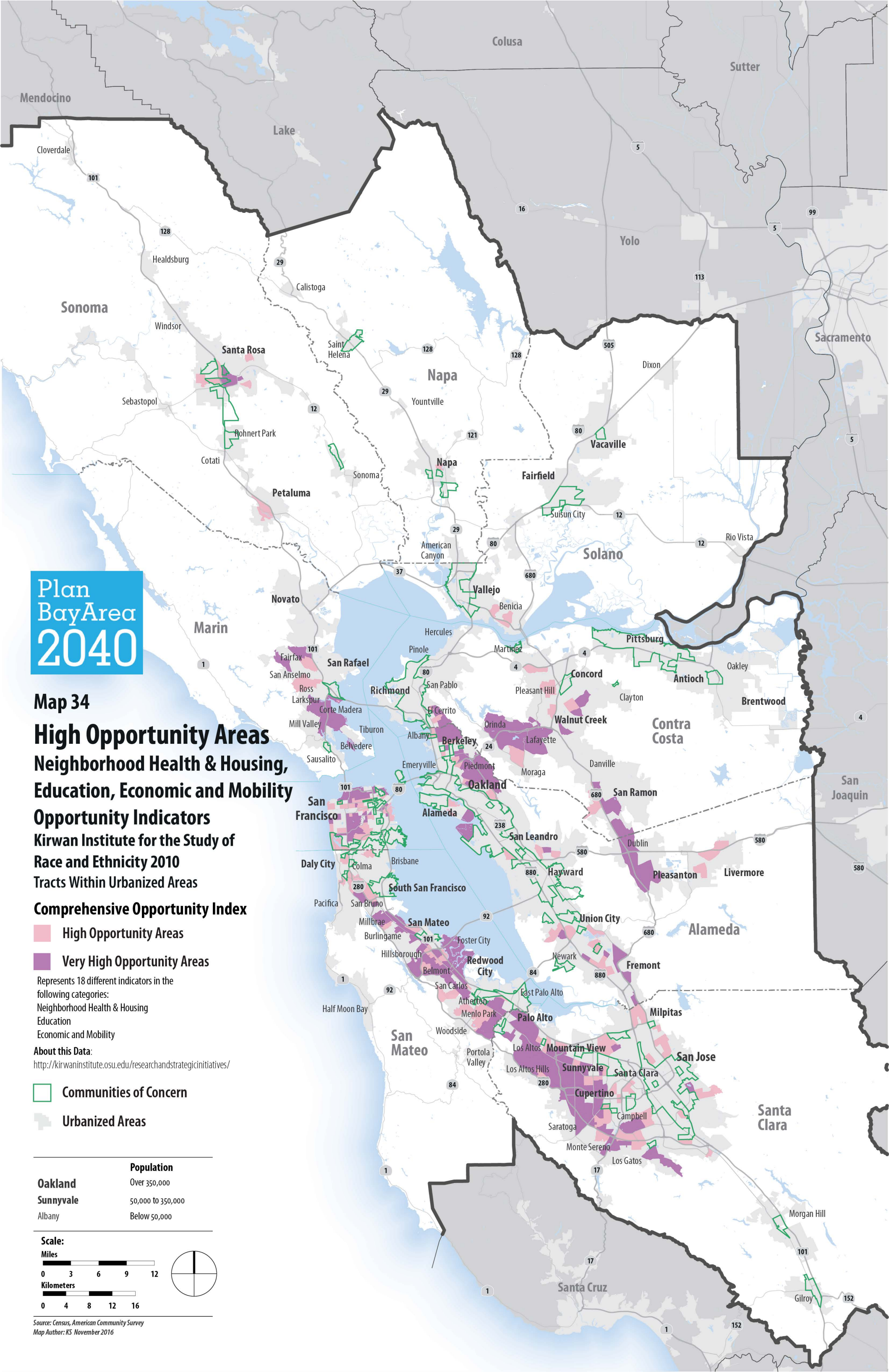
Scale:

Miles

0 3 6 9 12


Kilometers

0 4 8 12 16



Map 35
Low Income and Minority
Areas within Transit
Priority Areas in 2009

American Community Survey 2009
Tracts Within Urbanized Areas

 **Transit Priority Area**
Defined as half-mile buffer around the following geographies:
Existing rail stations
Planned rail stations in an adopted RTP
Existing ferry terminals with bus or rail service

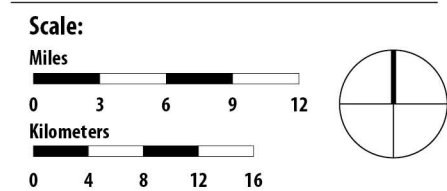
 **Low-Income Tracts**
Includes tracts with a share of low-income population at or above the Regional Mean (19%)

 **Minority Tracts**
Includes tracts with a share of minority population at or above the Regional Mean (42%)

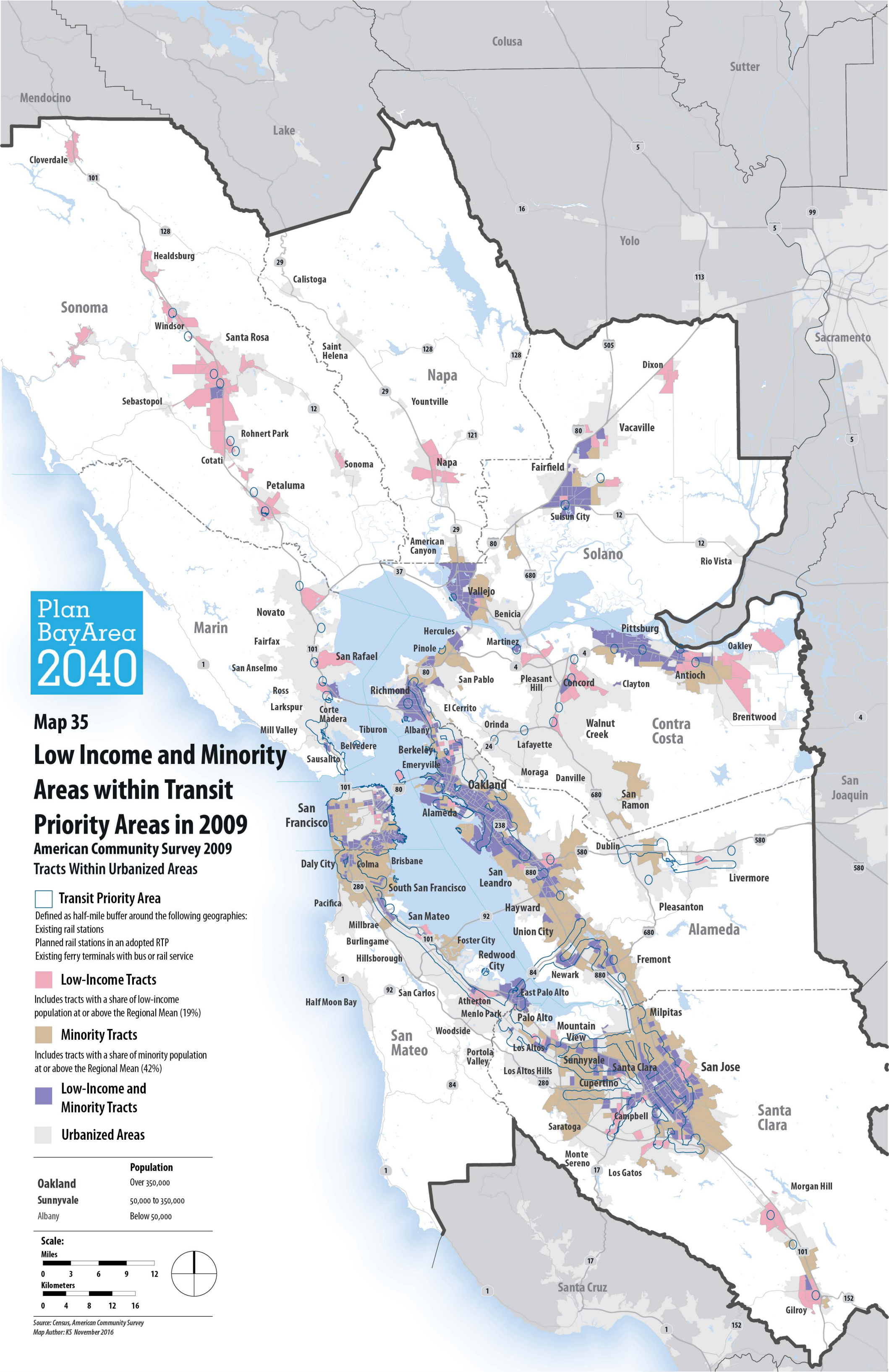
 **Low-Income and Minority Tracts**

 **Urbanized Areas**

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey
Map Author: KS November 2016






American Community Survey 2014
Tracts Within Urbanized Areas

Urbanized Areas


Scale:

Miles




0 3 6 9 12

Kilometers



0 4 8 12 16



Source: Census, American Community Survey
Map Author: KS November 2016

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Map 37
Communities of Concern
within Transit
Priority Areas in 2016

- Transit Priority Area
- Communities of Concern
- Urbanized Areas

Oakland

Sunnyvale

Albany

Population

Over 350,000

50,000 to 350,000

Below 50,000

Scale:

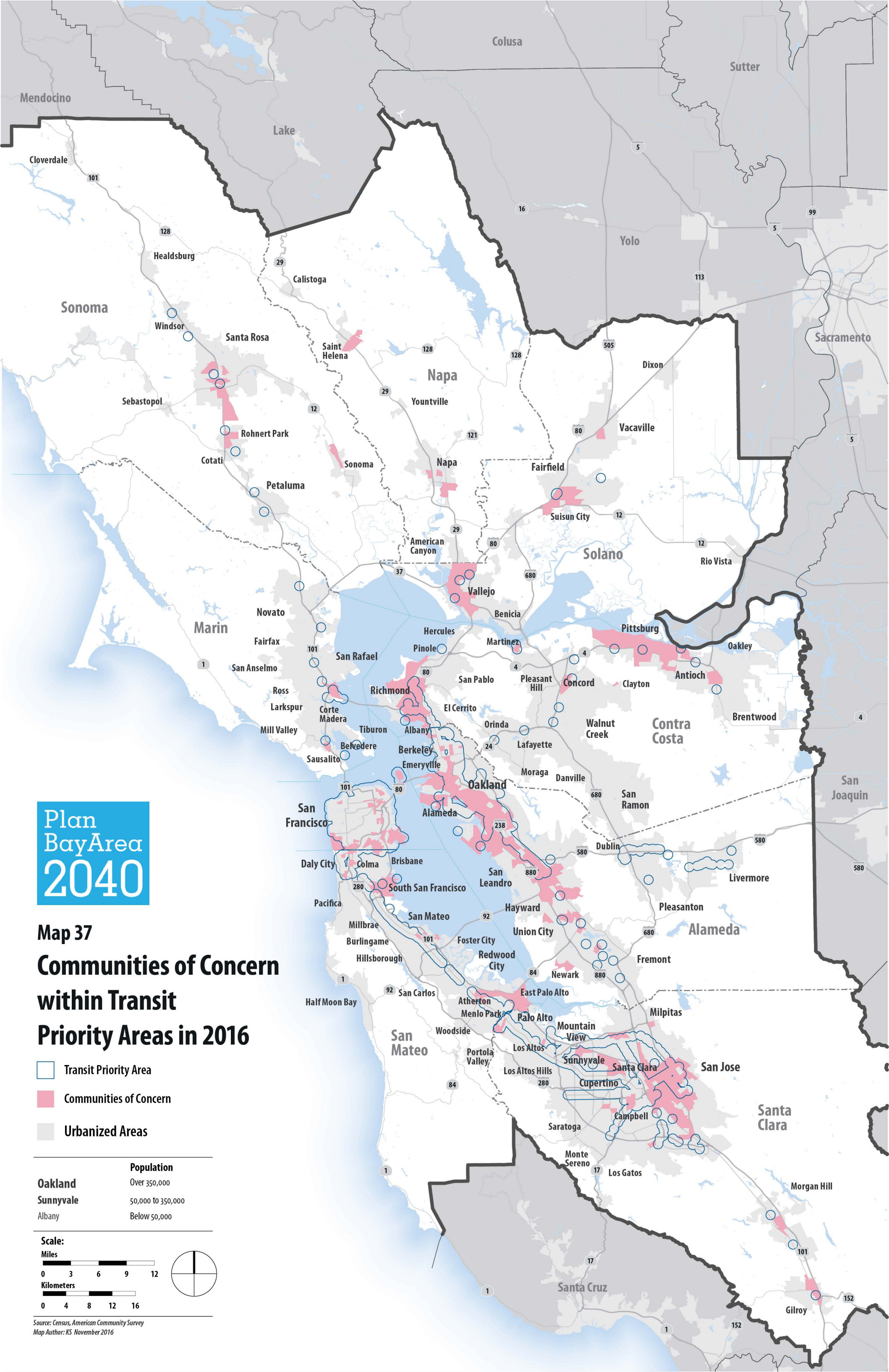
Miles

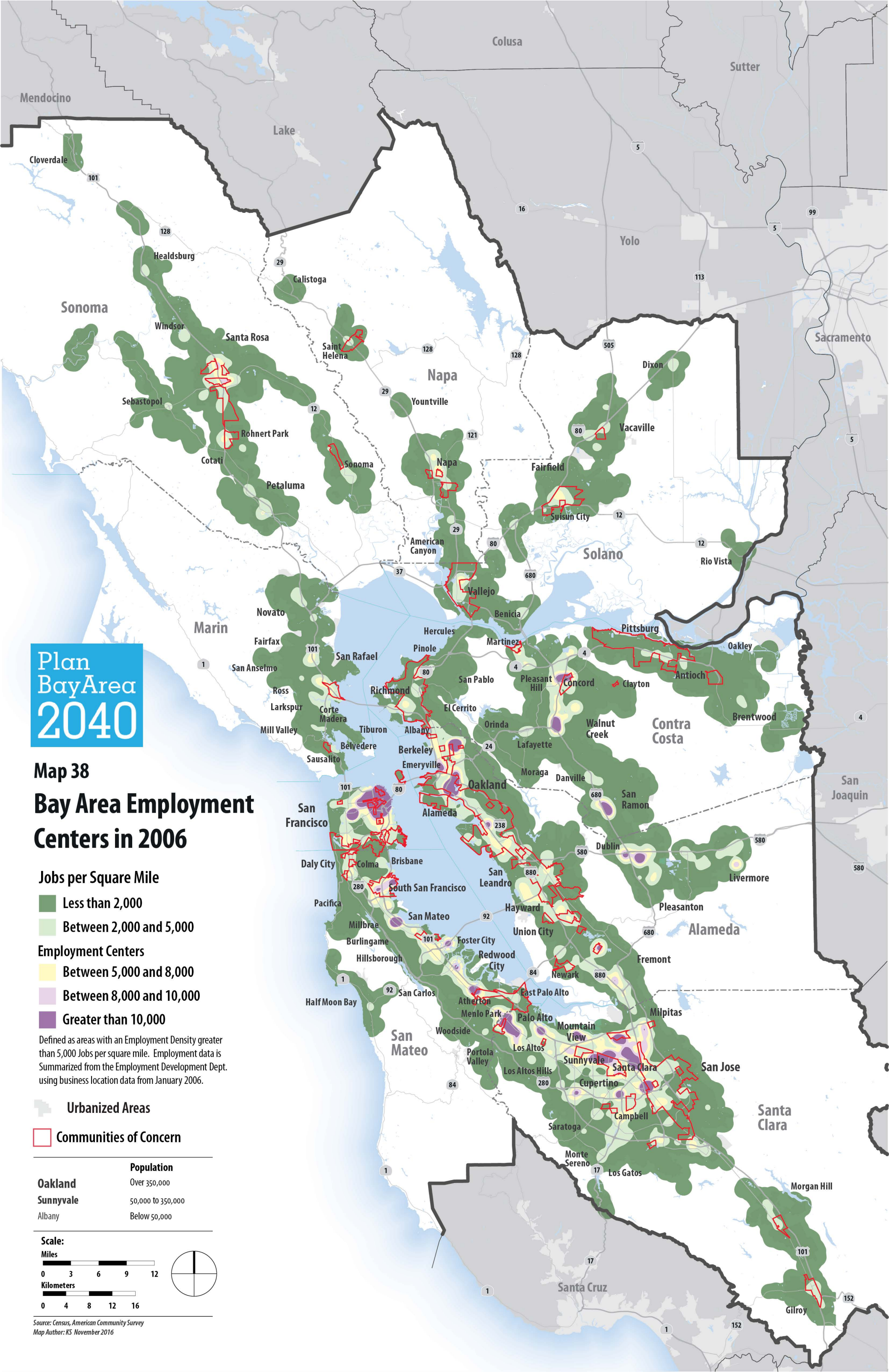
0 3 6 9 12

Kilometers

0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016





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Map 38
Bay Area Employment
Centers in 2006

- Jobs per Square Mile
- Less than 2,000
 - Between 2,000 and 5,000
- Employment Centers
- Between 5,000 and 8,000
 - Between 8,000 and 10,000
 - Greater than 10,000

Defined as areas with an Employment Density greater than 5,000 Jobs per square mile. Employment data is Summarized from the Employment Development Dept. using business location data from January 2006.

- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles

0 3 6 9 12

Kilometers

0 4 8 12 16

Plan BayArea 2040

Map 39
Bay Area Employment Centers in 2016

- Jobs per Square Mile
- Less than 2,000
 - Between 2,000 and 5,000
- Employment Centers
- Between 5,000 and 8,000
 - Between 8,000 and 10,000
 - Greater than 10,000

Defined as areas with an Employment Density greater than 5,000 Jobs per square mile. Employment data is Summarized from data obtained from ESRI's business location data for December of 2015.

- Urbanized Areas
- Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

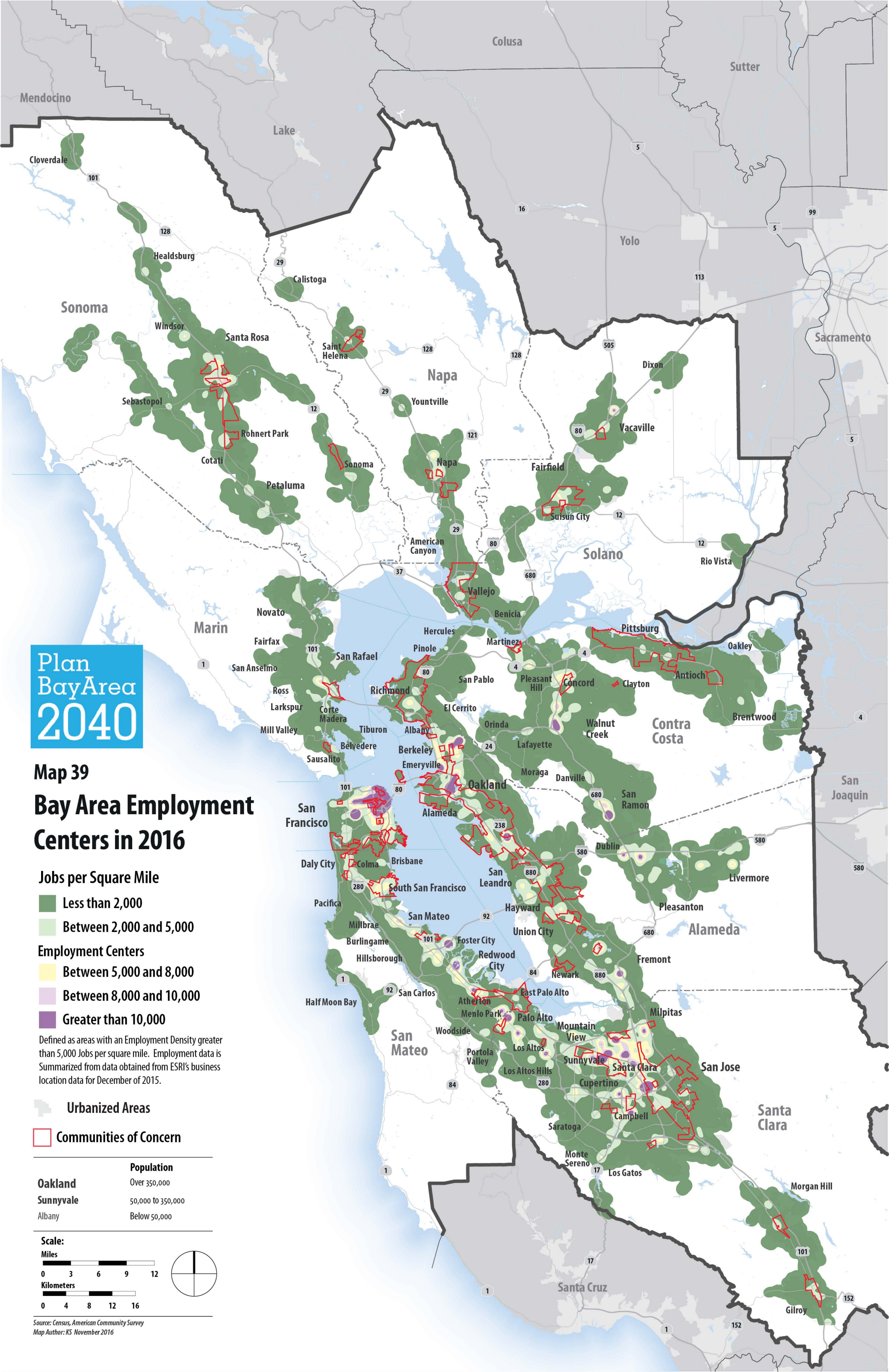
Miles

0 3 6 9 12

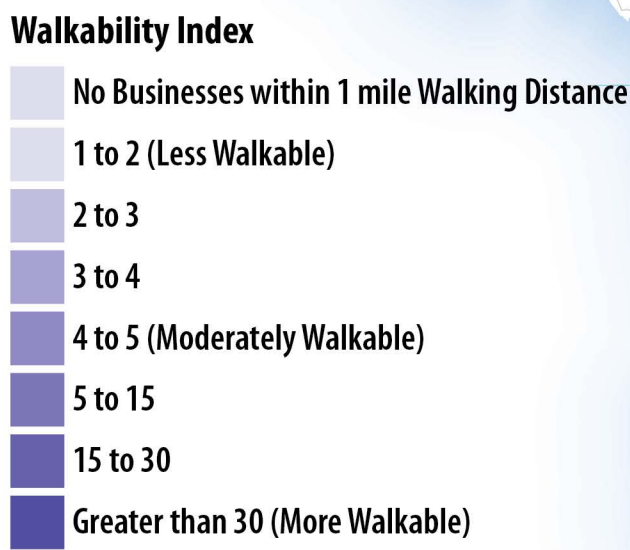
Kilometers

0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016



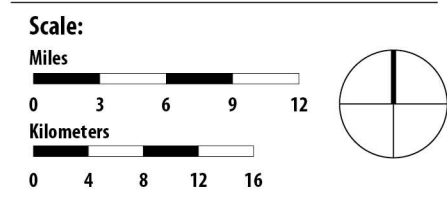
Map 40
Walkability in 2006
Weighted By Business Categories
and Distance to Destinations
Tracts Within Urbanized Areas



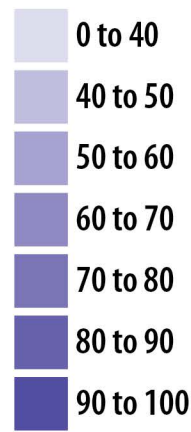
Note:
This map shows the density of attractions in five categories:
1. Religious, Educational Institutions and Libraries, 2. Health
Services, 3. Other Services, 4. Parks, and 5. Retail, Dining,
and Entertainment. Each intersection is ranked by the
number of businesses within a network distance of one mile.
The number of businesses that are within one half mile of an
intersection is weighted more heavily than the number of
businesses that are between one half and one mile. The type
of businesses are also weighted by category.

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



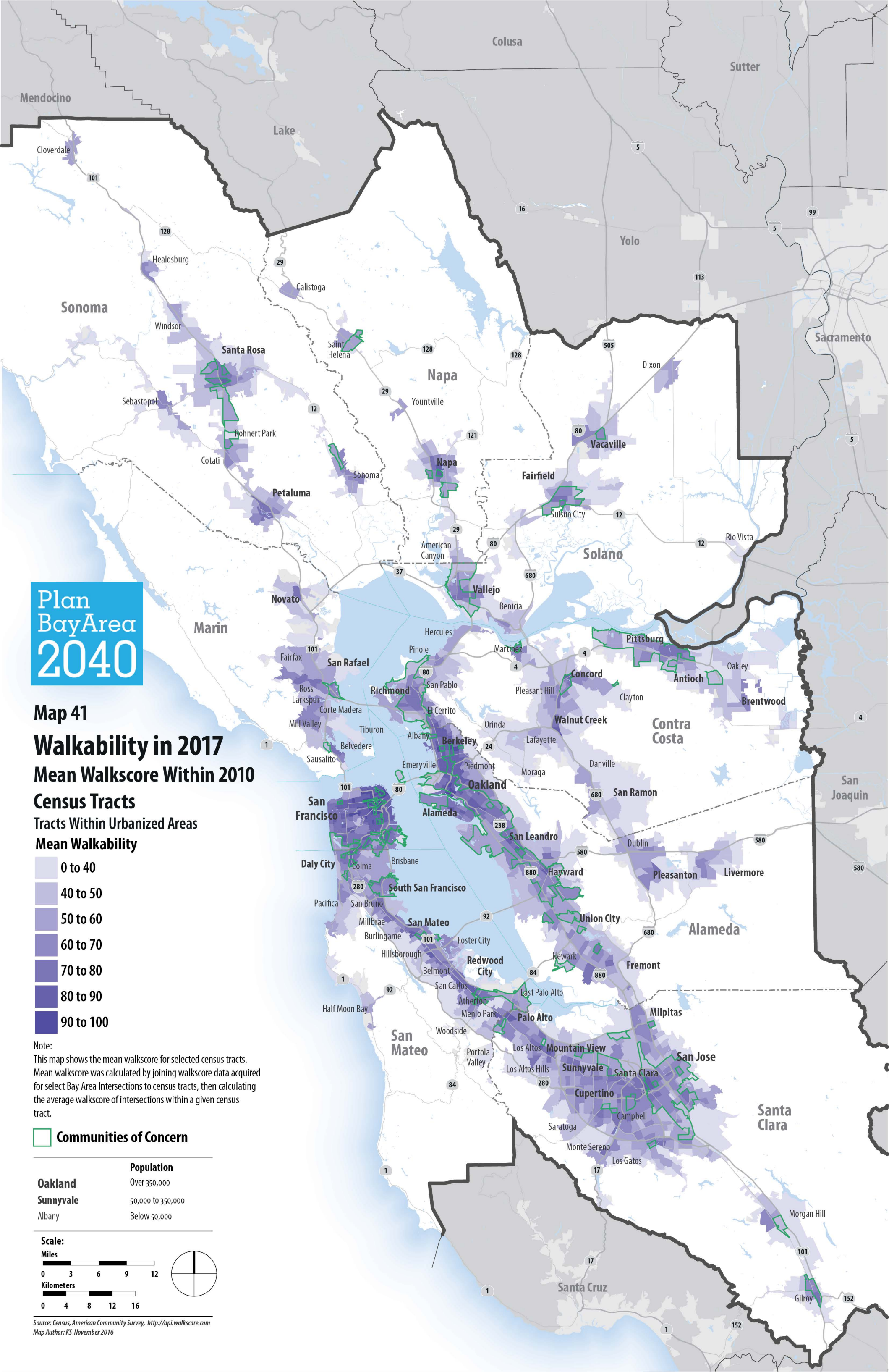
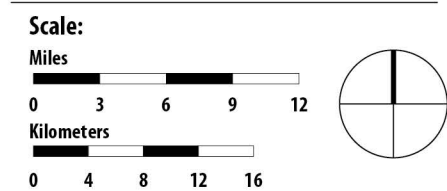
Map 41
Walkability in 2017
Mean Walkscore Within 2010
Census Tracts
Tracts Within Urbanized Areas
Mean Walkability



Note:
This map shows the mean walkscore for selected census tracts. Mean walkscore was calculated by joining walkscore data acquired for select Bay Area Intersections to census tracts, then calculating the average walkscore of intersections within a given census tract.

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Map 42
**Displacement Risk
Gentrification and
Displacement in the Bay Area**
University of California Berkeley
American Community Survey 2009 - 2013
Tracts Within Urbanized Areas

Lower Income Tracts
Greater than 39% of Households are considered Low Income.

- Not losing LI Households, or Very Early Stages
- At Risk of Gentrification or Displacement
- Undergoing Displacement
- Advanced Gentrification

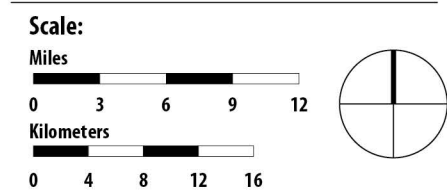
Moderate to High Income Tracts
Less than 39% of Households are considered Low Income.

- Not Losing LI Households, or Very Early Stages
- At Risk of Displacement
- Undergoing Displacement
- Advanced Exclusion

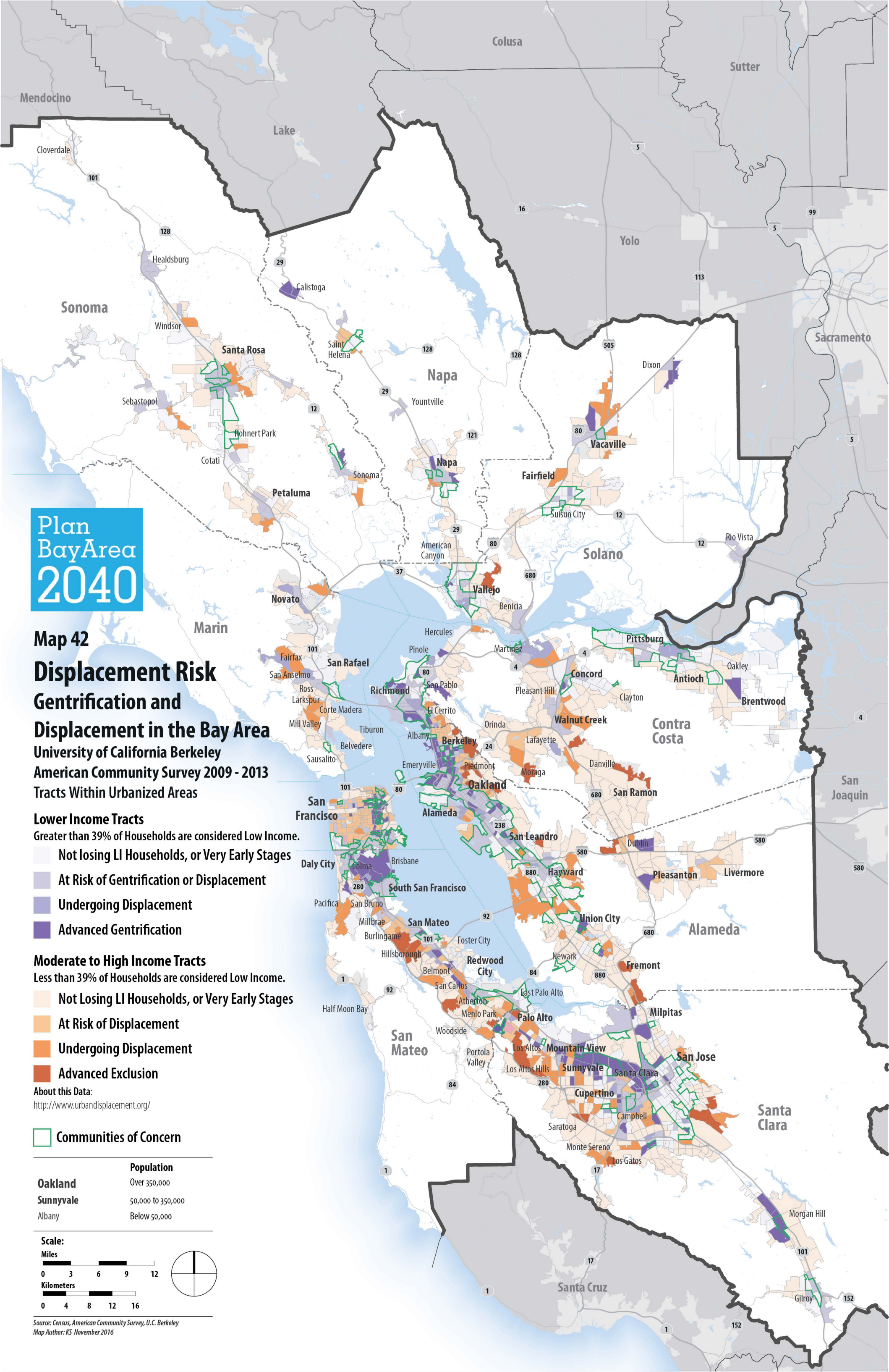
About this Data:
<http://www.urbandisplacement.org/>

Communities of Concern

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000



Source: Census, American Community Survey, U.C. Berkeley
Map Author: KS November 2016



Map 43
Transit Projects
and Communities of Concern

- Transit Projects**
General location of specific Plan Bay Area 2040 Transit projects.
- Communities of Concern**
- Minority Tracts**
Includes tracts with a share of minority population at or above the Regional Mean (59%)
- Urbanized Areas**

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:
Miles
0 3 6 9 12
Kilometers
0 4 8 12 16

Source: Census, American Community Survey
Map Author: KS November 2016



Map 44
Roadway Projects
and Communities of Concern

- Roadway Projects**
General location of specific Plan Bay Area 2040 Roadway projects.
- Communities of Concern**
- Minority Tracts**
Includes tracts with a share of minority population at or above the Regional Mean (59%)
- Urbanized Areas**

	Population
Oakland	Over 350,000
Sunnyvale	50,000 to 350,000
Albany	Below 50,000

Scale:

Miles

0 3 6 9 12

Kilometers

0 4 8 12 16

