

M E M O R A N D U M



Attachment A

TO: FILE  
FR: Bobby Lu and Paul Fassinger  
RE: Plan Bay Area 2050: Regional Growth Forecast

DATE: July 1, 2020

### Introduction

The Regional Growth Forecast is an important input to Plan Bay Area 2050, the San Francisco Bay Area’s long-range plan developed by Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). The Plan Bay Area 2050 Regional Growth Forecast identifies how much the Bay Area might grow between the Plan baseline year (2015) and the Plan horizon year (2050), including population, jobs, households, and associated housing units. The forecast also includes important components of that growth, including employment by sector, population by age and ethnic characteristics, and households by income level. During the Blueprint planning phase, the Regional Growth Forecast is being used to identify the total amount of growth. These figures are then integrated into the Bay Area UrbanSim 2.0 land use model; UrbanSim explores how Blueprint planning strategies might affect the local distribution of growth in households and employment.

This memo focuses on the projections associated with the Regional Growth Forecast; local area forecasts have been released as part of the Blueprint process. It should be noted that the housing unit forecast presented in this technical memorandum will serve as the Regional Housing Control Total (RHCT) for Plan Bay Area 2050, in compliance with legal settlement agreements.

### Setting the Stage: The Context for Plan Bay Area 2050

For decades, developing a Regional Growth Forecast has been a key element of the long-range transportation planning process for the Bay Area. However, in recent years, it has become apparent that critical issues need to be better addressed in the context of developing such a forecast.

The first is related to **regional affordability**. In Plan Bay Area 2040, it was estimated that the average share of lower-income household income spent on housing would rise by approximately 13 percentage points; this was due in part to the fact that regional housing strategies were limited in nature and affected only the geographic distribution of forecasted growth rather than overall level of housing growth in the Regional Growth Forecast itself. As part of this planning process, policymakers specifically asked “what it would take” to move the needle on affordability, but solutions for these affordability shortcomings were not identified in time for integration into that Plan. Plan Bay Area 2050 presents an opportunity to integrate new housing strategies specifically designed to increase supply for all income levels - consistent with

policymaker direction for the Draft Blueprint - which will in turn contribute to a more affordable region and a slightly higher Regional Growth Forecast.

The second is related to **uncertainty**. While required by statute, the creation of a single Regional Growth Forecast in prior cycles did not provide the opportunity to explore how different trajectories for regional growth would affect critical environmental, economic, and other goals. To address this gap, MTC and ABAG staff undertook the Horizon initiative in 2018 and 2019, which explored not only how different growth trajectories would affect the region but also how the region could respond to those different trajectories through new strategies.

Both of these factors mean that developing the Regional Growth Forecast is a more policy-conscious effort, equally focused on contextual uncertainties as well as policy linkages and implications. Upon the kickoff of the Plan Bay Area 2050 cycle, staff accordingly worked with technical stakeholders to make methodological refinements to incorporate lessons learned from both efforts. The methodology adopted by the ABAG Executive Board in September 2019 enables the Regional Growth Forecast to incorporate changes in strategies that would affect the level of growth in the region, while also affecting affordability, equity, economic mobility, and other critical outcomes.

This memo first introduces the economic and demographic assumptions underlying the Regional Growth Forecast. This presents a reasonable baseline for the future of the Bay Area. After that, the memo delves into how a selection of key strategies from the Draft Blueprint were incorporated into this forecast. Note that while the proposed strategies were approved for integration into the Plan Bay Area 2050 Draft Blueprint for further analysis by MTC and ABAG, these strategies may be further refined before being included in the Final Blueprint.

### **Methodology and Assumptions**

Similar to Plan Bay Area 2040, the Regional Growth Forecast was primarily developed using the REMI (Regional Economic Modeling Inc.) model<sup>1</sup>. version 2.3. The REMI model integrates into one package a dynamic accounting of the core components of the economy, which are listed below. The population is explicitly connected to industry growth and demand for labor, with migration increasing in times of strong employment growth.

- Industry structure and competitiveness relative to other regions
- Propensity to export
- Population and labor market structure

To generate other key components of the Regional Growth Forecast, staff also developed a household model and a household income distribution model, built around the projections from

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<sup>1</sup> Plan Bay Area 2050 was developed with REMI Bay Area version 2.3, whereas Plan Bay Area 2040 was developed with REMI Bay Area version 1.7.8.

the REMI analysis. The REMI model produces population and total income but does not estimate households or a household income distribution.<sup>2 3</sup>

Working with the Technical Advisory Committee<sup>4</sup>, staff has reviewed REMI data, assumptions and its default results, and made some changes to both national demographic data and regional economic data to get a better baseline picture of the region's future. In particular, staff factored in more recent historical trends where slowing Hispanic international migration and birth rates have been observed, in alignment with the most recent U.S Census Bureau projections, as well as observations and assumptions of California Department of Finance.

While this employment forecast recognizes the region's continued economic competitiveness compared to the rest of the United States, staff assumes that the Bay Area will face increasing challenges. Therefore, the region's share of national employment is assumed to stabilize by the last decade of the forecasting horizon. Without strategies and policies in place to address issues such as high housing costs and economic disparity, it would be difficult for the Bay Area to grow at the current rate. The following section describes how Blueprint strategies are included in the analysis.

### **Syncing the Regional Growth Forecast with Approved Draft Blueprint Strategies**

The regional agencies agreed to investigate the impacts of a set of strategies, and with them, different revenue assumptions, that have implications for the Regional Growth Forecast. These strategies impact all of the models used, but in this memo, the focus is on the Regional Model shown in the lower left of **Error! Reference source not found.**

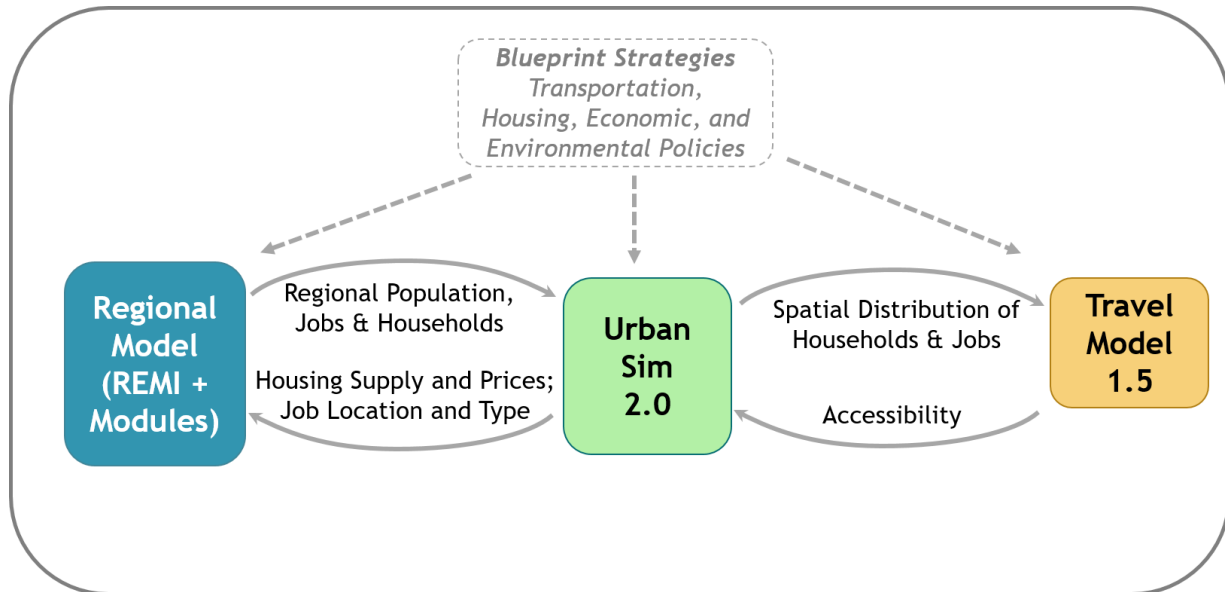
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<sup>2</sup> Household projections are generated through a headship rate analysis. The household module uses the projected age and racial/ethnic composition of the adult population and an accounting of the percent of people in different age categories that are "heads of household" to project the expected number of households formed given the future composition of the population

<sup>3</sup> The household income distribution analysis estimates the share of households in each of four mutually exclusive income groups, to coincide with analysis required in the transportation model. The share of households in low, middle-low, middle-high, and high-income categories is estimated using a regression analysis which ties the share in each wage category with ethnic and age distribution, industry and occupational characteristics, relative housing prices, and per capita income.

<sup>4</sup> The technical advisory committee included: 6 Bay Area economists, 3 California Department of Finance experts, 3 megaregion representatives (Sacramento Area Council of Governments, San Joaquin Council of Governments, University of the Pacific), and 3 experienced REMI users (from the Atlanta Regional Commission, a Michigan think tank, and a Colorado nonprofit).

Figure 1: Integrating Strategies into the Regional Growth Forecast for Plan Bay Area 2050



Ultimately, not every strategy is anticipated to have significant impacts on the Regional Growth Forecast; many strategies only need to be incorporated in UrbanSim 2.0 and/or Travel Model 1.5. After reviewing the 25 strategies integrated into the Plan Bay Area 2050 Draft Blueprint, staff determined that the following strategies would likely influence the total amount of growth envisioned for the Bay Area, with impacts ranging widely across strategies (Table 1).

Table 1: Strategies Incorporated in Regional Growth Forecast

<b>Category</b>	<b>Strategy</b>	<b>Model Adjustments</b>
<b>Transportation</b>	Operate and Maintain the Existing System	Increase Construction, Admin
	Advance Low-Cost Transit Projects	Increase Construction, Admin
	Build a Complete Streets Network	Increase Construction, Admin
	Build New Transbay Rail Crossing	Increase Construction, Admin
	Reform Regional Transit Fare Policy	Increase Disposable Income (Consumer Spending)
	<i>Fund Projects with Remaining Capacity (placeholder for Final Blueprint strategies/investments)</i>	Increase Construction, Admin
<b>Housing</b>	Allow a Greater Mix of Housing Types and Densities in Growth Areas	Decrease Housing Cost, Increase Construction
	Reduce Barriers to Housing Near Transit and in Areas of High Opportunity	Decrease Housing Cost, Increase Construction
	Transform Aging Malls and Office Parks into Neighborhoods	Decrease Housing Cost, Increase Construction
	Fund Affordable Housing Protection, Preservation, and Production	Increase Disposable Income (Consumer Spending)
<b>Economy</b>	Expand Childcare Support for Low-Income Families	Increase Disposable Income (Consumer Spending)
	Create Incubator Programs in Economically-Challenged Areas	Increase Manufacturing & Education
<b>Environment</b>	Adapt to Sea Level Rise	Increase Construction Spending
	Modernize Existing Buildings with Seismic, Wildfire, Drought, and Energy Retrofits	Increase Construction Spending

### Transportation Strategies

The economic impact of transportation investments generally fits into two categories: (1) direct effects from spending -- in operation and maintenance (O&M)<sup>5</sup> and construction of new projects -- as well as multiplier effects; (2) enhanced economic competitiveness through improved network efficiency and congestion reduction (which reduces cost for businesses), as well as improved air quality and quality of life. While staff recognizes the importance of capturing the

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<sup>5</sup> O&M is where the majority of the forecasted transportation revenues will be spent. Staff considers current level of operation and maintenance spending to meet existing demand and to maintain existing conditions of the region’s transportation assets will continue. Therefore, we do not simulate the impacts of these baseline investments separately. However, in cases where there are additional revenues to improve the condition beyond today’s levels, reaching a full state of good repair, or to fund operation and maintenance demand necessitated by new projects, staff would make explicit assumptions of these investments.

comprehensive effects of the proposed transportation strategies, the forecast included in this memo only considers the impact in the first category due to limited model capacities. Therefore, the forecast reflects a more conservative estimate of the transportation spending in the Plan.

Four of the transportation strategies include transportation investment: *Operate and Maintain the Existing System*, *Advance Low-Cost Transit Projects*, *Build a Complete Streets Network*, and *Build New Transbay Rail Crossing*. These strategies are represented in the Regional Growth Forecast as increased demand within the construction industry. For the transportation strategy to *Reform Regional Transit Fare Policy*, staff expects that a \$10 billion means-based fare discount, funded through existing transportation revenues, would increase transit subsidy and allow for consumer spending reallocation (i.e., money saved would be spent on other commodities).

### Housing Strategies

Housing strategies are designed to spur housing production as well as to protect and preserve affordable housing. Boosting housing capacity is addressed through both strategic zoning changes, seeking to support the development of housing throughout the region where appropriate. Staff assumes these zoning change related strategies would allow and encourage private construction investment for market rate housing, which would significantly increase total jobs and population during the forecast period. This is modeled in REMI by changing the Bay Area housing cost relative to the nation and increasing the level of residential construction investment based on expected housing development. Staff expects the effect of the strategy to *Fund Affordable Housing Protection, Preservation, and Production* will be to increase disposable income and increasing consumer spending.

### Economic Strategies

Economic strategies are primarily focused on improving economic mobility and shifting the location of jobs. Two of the strategies that are designed to improve economic mobility are included in the regional models: (1) *Expand Childcare Support for Low-Income Families*; and (2) *Create Incubator Programs in Economically Challenged Areas*. Other strategies designed to shift location of jobs are represented in the land use and travel models, but not the Regional Growth Forecast.

Reducing the cost of childcare is likely to increase labor force participation, primarily for mothers, but also for fathers. Providing childcare subsidy would also increase demand for the child care industry through increased spending, as well as reallocate consumer spending. Staff captures these changes by adjusting appropriate policy variables in REMI. The strategy to *Create Incubators in Economically Challenged Areas* is represented by increasing investment in the manufacturing and education industries.

### Environmental Strategies

Adaptation to sea level rise focuses on protecting the shoreline as well as critical transportation infrastructure in areas at risk. To the extent that there would be increases in capital projects spending such as building levees and infrastructure enhancements (more likely in Blueprint Plus), staff increased demand for construction industry using REMI model.



The strategy to provide means-based subsidy for retrofitting existing building assumes an additional \$20 billion in revenue, which is applied to the construction industry. This is not modeled as increased consumer spending because it is assumed that without the subsidies, homeowners would not be incentivized to retrofit existing building at all.

### Revenues to Fund Plan Strategies

Plan Bay Area 2050 currently is exploring two potential revenue levels: 1) Blueprint Basic, with funding levels for transportation, housing, economic development, and environmental resilience remaining in line with historical trends (a total of \$608 billion for the 30 years of the Plan), and 2) Blueprint Plus, which includes a sizable influx of new revenues for all four areas of the Plan. Blueprint Plus assumes additional fiscal capacity for increased levels of investment in regional strategies to create a more aspirational plan, and these strategies are expected to further impact the economic growth and demographic changes of the region. There are two variants of Blueprint Plus: (a) Blueprint Plus Crossing, where \$50 billion would be allocated to fund the construction of a new Transbay Rail Crossing, and (b) Blueprint Plus Fix It First, where greater share of transportation funding would be spent towards system operation and maintenance.

Staff assumed that the current levels of government funding for programs, including transportation operations, maintenance, and investment will continue. Although staff expects existing levels of forecasted revenues will fund the strategies proposed for Blueprint Basic, additional revenues are needed for Blueprint Plus to fund more ambitious regional strategies; this funding gap would be filled from additional taxes.

For the purposes of this forecast, staff assumed that:

- Additional transportation revenues would be funded by a sales tax increase;
- Additional housing revenues would be funded by a business tax increase;
- Additional economic revenues would be funded by a personal income tax increase; and
- Additional environment revenues would be funded by a property tax increase.

Staff analyzed the strategies in Blueprint Basic along with the effects of these additional taxes and the additional strategies included in Blueprint Plus. In doing so, staff determined that the set of housing strategies aimed at increasing housing production (at all income levels) had the largest impact to the region's demographics and economy, and these strategies are included in both Blueprint Basic and Blueprint Plus. Further, the effects of the taxes and strategies only in Blueprint Plus had a marginal impact on the Regional Growth Forecast. As a result, the total population, households and employment for Blueprint Basic as well as the two variants of Blueprint Plus do not significantly differ from each other, and only Blueprint Plus numbers will be presented in the following section for the sake of simplicity.

### **How was the COVID-19 Pandemic and Subsequent Recession Integrated?**

With the declaration of a public health emergency by the federal government on January 31, and shelter-in-place, and social distancing orders from many state governments beginning in March, it became clear that the virus would have a widespread health impact. The economic impact was recognized in February and March with stock markets declining and unemployment ticking upwards. Congress responded by passing several stimulus measures amounting to trillions of dollars.

MTC/ABAG staff worked to revise the forecast in April and early May. While there was limited data because of the speed of the pandemic, staff used the available information and consulted with, or reviewed, the work of other forecasters. Staff determined, while employment totals would be impacted significantly in the near term, the direct impact on population and households would be more limited as COVID-19 impacts are both nationwide and global.

Economically, staff analysis informed changes to employment should focus on the years 2020 to 2030. The regional forecast is meant to represent a moderate growth trend over a thirty-year period and does not typically represent economic cycles. However, it is clear we are in a recession during 2020 and possibly part of 2021. Even recognizing the unprecedented stimulus measures that have been put into place, the recovery from this event is likely to go on for several years. Over in the longer term, the Bay Area is expected to return to the previously forecasted trend line by 2030. The Regional Growth Forecast used for the Blueprint planning process, as shown below, integrates these near-term economic impacts.

### Regional Growth Forecast Results

The Regional Growth Forecast starts from the baseline assumptions about the demographic and economic trend of the region as described at the beginning of last section. For the Plan Bay Area 2050 Draft Blueprint, staff has been directed to propose and implement bold and ambitious strategies for the Bay Area’s transportation, housing, economy, and the environment -- including moving the needle on regional housing affordability.

Table 2 shows the Plan Bay Area 2050 Regional Growth Forecast. Staff forecasts that between 2015 and 2050, the region’s employment is projected to grow by 1.4 million to just over 5.4 million total jobs. Population is forecasted to grow by 2.7 million people to 10.3 million. This population will comprise over 4.0 million households, for an increase of nearly 1.3 million households from 2015. The number of housing units<sup>6</sup> plans for no net growth in the in-commute into the region, consistent with state law and MTC/ABAG legal settlements.

*Table 2: Plan Bay Area 2050 - Regional Growth Forecast (Millions)*

	2015	2020	2025	2030	2035	2040	2045	2050
Total Population	7,660,000	7,930,000	8,230,000	8,550,000	9,000,000	9,490,000	9,930,000	10,330,000
Total Employment	4,010,000	4,080,000	4,150,000	4,640,000	4,830,000	5,050,000	5,230,000	5,410,000
Total Households	2,680,000	2,760,000	2,950,000	3,210,000	3,500,000	3,710,000	3,890,000	4,040,000
Total Housing Units	2,710,000	2,840,000	3,060,000	3,370,000	3,670,000	3,900,000	4,080,000	4,250,000

<sup>6</sup> Consistent with the legal settlement with the Building Industry Association, this housing unit projection includes housing for all projected households plus the number of units that would be needed to house the increased number of workers estimated to commute into the region. The in-commute change is estimated using REMI output for employment, and “residence adjusted employment”. After adjusting for workers per household, an in-commuter household number is added to the base for estimating the regional housing control total. The regional housing control total is the sum of the households estimated for the projected population plus households equivalent to the maximum estimated in-commute number, plus a vacancy factor.



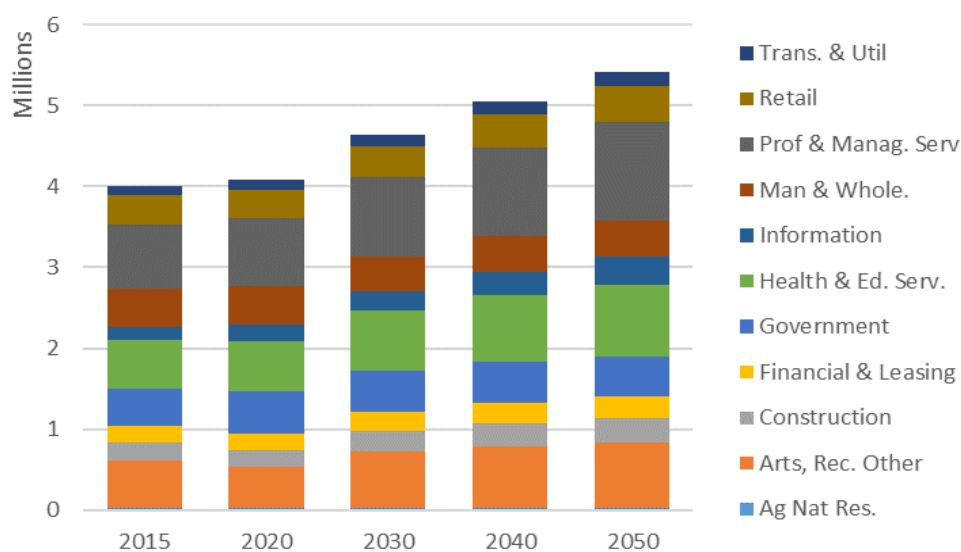
Source: MTC/ABAG from U.S. Bureau of Labor Statistics, U.S. Bureau of the Census, American Community Survey, and modeling results from ABAG REMI 2.3.1; 2020 and 2025 forecasts to be integrated later this month

The Regional Growth Forecast projects approximately 400,000 more jobs, 200,000 fewer people, 300,000 more households and 300,000 more housing units in 2040 compared to the Plan Bay Area 2040 forecast. There are several reasons for the difference in the forecasts between Plan Bay Area 2040 and this latest forecast for the Bay Area. Differences in population are largely due to the assumption that the recent observed decline in Hispanic international migration and birth rates would continue, which is consistent with U.S. Census Bureau and California Department of Finance assumptions. Second, recent strong employment growth has caused us to adjust the early years of the forecast, and as a result the endpoint of the trend is also higher. Meanwhile, comparing the age composition of the population in these two forecasts, this forecast has a higher number of older adults, who usually have higher headship rates, forming more households. Finally, this forecast integrated housing strategies that would encourage more housing production and investment, resulting in higher household and housing unit numbers, as well as creating more jobs.

### Employment Growth and Change

Figure 2 compares the level and distribution of employment in 2015 to projected employment in future years 2050. Professional & management and health & education industries are forecasted to continue dominating future employment in the San Francisco Bay Area, and the information sector more than doubles its current job numbers. Meanwhile, despite increases in both output and demand in all sectors as well as stimulus strategies proposed, the forecast shows declining employment in a few sectors, due to both technologically induced higher productivity and changes in economic structure, particularly in the manufacturing and wholesale industries. Finally, job forecasts both for construction as well as transportation and warehousing are boosted by the infusion of investments.

Figure 2: Employment by Sector in the Regional Growth Forecast

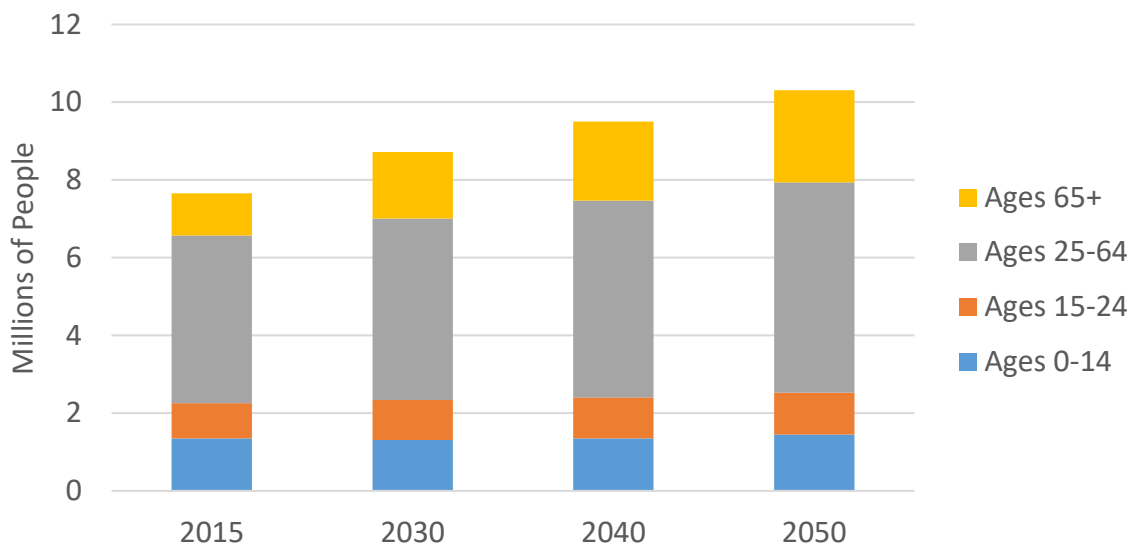


Source: MTC/ABAG from U.S. Bureau of Labor Statistics, U.S. Bureau of the Census, American Community Survey, and modeling results from REMI Bay Area 2.3.1

### Population Growth and Change

Figure 3 compares the population by age group in 2015 with that of the projections for future years 2050. Between 2015 and 2050, the number of working-age adults is forecasted to grow by 25 percent, but the share declines by four percent (from 56 percent to 52 percent). The growth in the share of people in the 65+ age group is anticipated to continue in the decades ahead, more than doubling between 2015 and 2050, from 14 percent of the total population to 23 percent. While the 2050 total population is projected to be 35 percent higher than in 2015, growth will differ widely by age group.

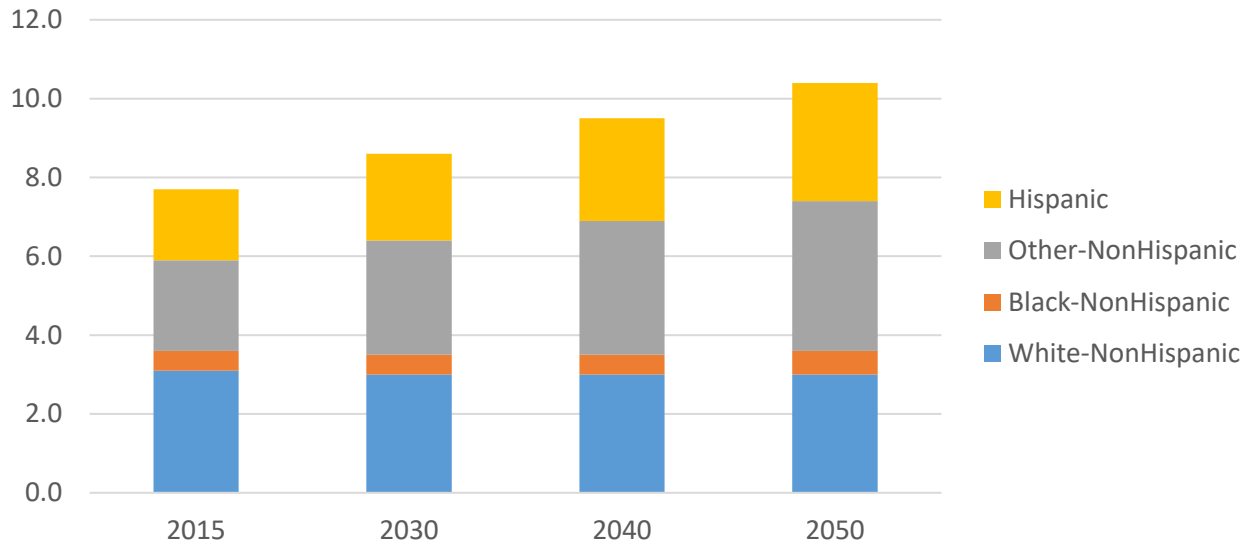
*Figure 3: Population by Age Group in the Regional Growth Forecast*



Source: MTC/ABAG from U.S. Bureau of the Census, American Community Survey, and modeling results from ABAG REMI 2.3.1

Ethnically, the region continues to diversify over time, as shown in Figure 4. Growth takes place mainly in Hispanic and Asian racial/ethnic groups (the largest group within the Other Non-Hispanic category in the figure). There is a small growth of the Black Non-Hispanic population, while the White Non-Hispanic population decreases steadily over time. By 2050, Asian, Native American, Pacific Islander, and More than One Racial group will reach 4 million people, while the Hispanic population will grow to the same level as White Non-Hispanics, to around 3 million people.

Figure 4: Population by Race/Ethnicity in the Regional Growth Forecast (in millions)



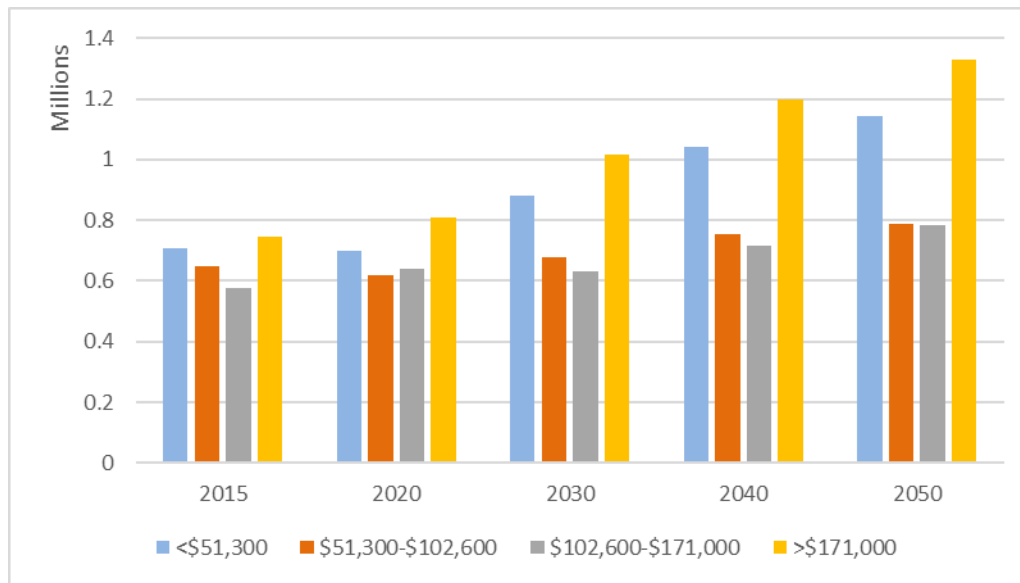
*Other Non-Hispanic includes: individuals that are Asian-American, Native American, or Pacific Islander, as well as those of two or more races.*

Source: MTC/ABAG from U.S. Bureau of the Census, American Community Survey, and modeling results from ABAG REMI 2.3.1

### Household Income Distribution

Figure 5 compares the household income distribution in 2015 with the projected income distribution for future years. The amount of household growth projected (1.3 million new households between 2015 and 2050) reflects strategies that encourage both market rate and affordable housing development, increasing the number of housing units produced.

Figure 5: Projected Income Distribution of Households  
(in millions; Bay Area, 2019 dollars<sup>7</sup>)



Source: MTC/ABAG household income distribution analysis

While the number of households in all four income categories are expected to grow, the greatest growth is expected in the lowest and highest income groups, despite strategies designed to strengthen the middle class in the Draft Blueprint. Household growth is anticipated to be strongest in the highest income category, reflecting the expected strength of growth in high-wage sectors combined with non-wage income (interest, dividends, capital gains, transfers). Household growth is also anticipated to be high in the lowest-wage category, reflecting possible occupational shifts, wage stagnation, the retirement of seniors without pension assets, as well as the proposed affordable housing strategies.

### Housing Production

To translate growth in households to the anticipated demand for housing units, staff assumed a healthy vacancy rate for the region of five percent beginning from 2030<sup>8</sup> - leading to a projected increase of housing units by 1.4 million through 2050<sup>9</sup>. The forecast implies an annual average rate of increase of between 35,000 and 56,000 units, depending on the time period; the level of demand for new housing units follows the formation of new households. As shown in Figure 6, this means a significant increase of production for the next three decades to a level of

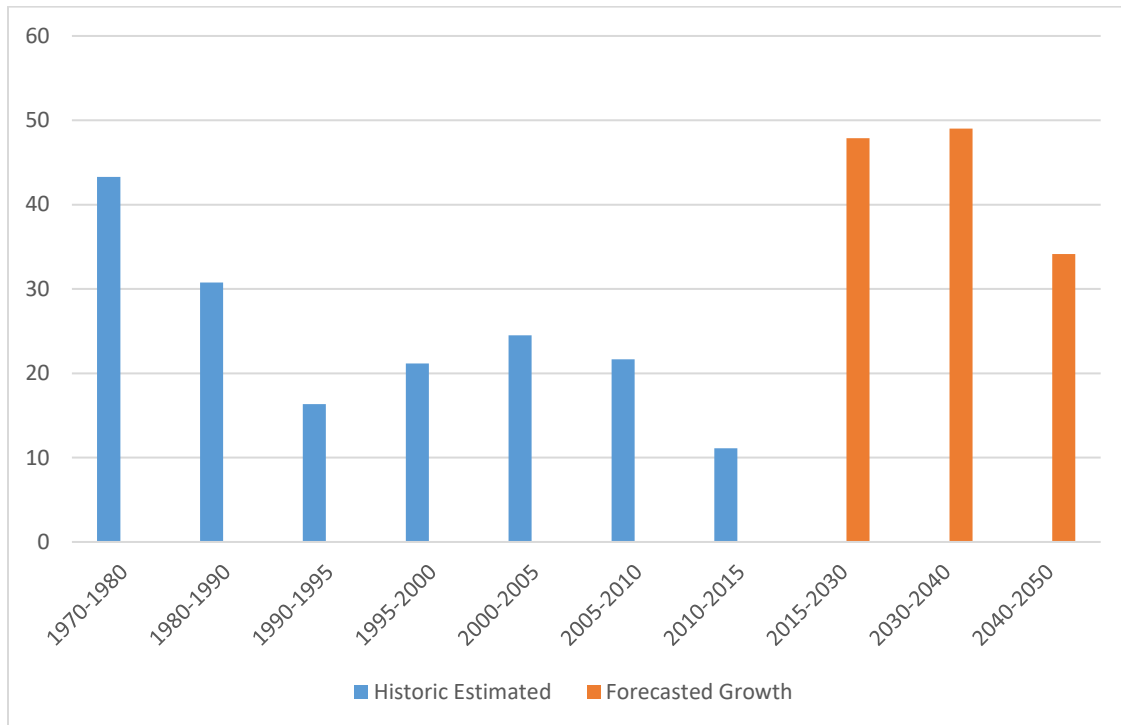
<sup>7</sup> The income categories were originally defined as approximate quartiles by MTC/ABAG in year 2000, but over the years as income inequality has risen, they have morphed into quantiles. Escalated to 2019 dollars and rounded to hundreds, the income thresholds are as follows: less than \$51,300; from \$51,300 to \$102,600; from \$102,000 to \$171,000; above \$171,000.

<sup>8</sup> California Department of Finance estimates of Bay Area vacancies have varied from 3.4 to 6.4 percent since 2000. Current vacancy rate stands around 3 percent.

<sup>9</sup> New housing units includes 39,000 units associated with preventing growth in the number of in-commuters between 2015 and 2050.

production above that of 1970s and 1980s, which requires the region successfully implement the housing strategies proposed in the Plan.

*Figure 6: Annual Housing Production, Historic and Projected  
(in thousands of housing units)*



Source: MTC/ABAG household and housing unit analysis

### Next Steps

The Regional Growth Forecast is a basic building block of the Blueprint analysis underway throughout 2020. Staff will seek feedback on the Draft Blueprint, including strategies, technical assumptions, and forecasted outcomes, throughout summer 2020.