

**Metropolitan Transportation Commission
Policy Advisory Council**

June 12, 2019

Agenda Item 5

Plan Bay Area 2050: Regional Growth Forecast Methodology

- Subject:** Presentation on the approach, tools and assumptions underlying the Regional Growth Forecast of total jobs, population, and households for Plan Bay Area 2050.
- Background:** Policy Advisory Council Agenda Item 5, Plan Bay Area 2050: Regional Growth Forecast Methodology, is attached. This report was presented to the Regional Advisory Working Group on June 4, 2019.
- Staff will be at your June 12 meeting to discuss this report. The Council's input is requested.
- Attachments:** Agenda Item 2 from the June 2019 Regional Advisory Working Group Packet

Metropolitan Transportation Commission and the Association of Bay Area Governments
Regional Advisory Working Group

June 4, 2019

Agenda Item 2

Plan Bay Area 2050: Regional Growth Forecast Methodology

- Subject:** Presentation on the approach, tools and assumptions underlying the Regional Growth Forecast of total jobs, population, and households for *Plan Bay Area 2050*.
- Background:** In preparation for crafting the growth pattern for *Plan Bay Area 2050*, it is necessary to first understand how much the region will likely grow over the next 30 years. Building upon the work from *Horizon* which explored three different futures and associated growth trajectories, *Plan Bay Area 2050* will require a likely Regional Growth Forecast for use in the development of the regional plan. The Regional Growth Forecast estimates of jobs, population, and households will serve as a key input to the UrbanSim 2.0 land use model, which will identify likely locations for future growth based on the ultimate Plan's strategies. This presentation will focus on the methods used for creating the Regional Growth Forecast, putting it in the broader context of the Plan Bay Area 2050 development process.
- Issues:**
- How will *Plan Bay Area 2050* be analyzed?**
Each iteration of Plan Bay Area (officially the Regional Transportation Plan / Sustainable Communities Strategy) has started with a Regional Growth Forecast of how total levels of employment, population, and households will change across the nine-county region over the Plan lifespan and at what income levels. Further analysis of the Plan is conducted using a land use model (UrbanSim 2.0) to identify where growth will locate inside the region, and a transportation model that will explore the travel patterns and transportation demand generated by this growth.
- What tools are used?**
The Regional Growth Forecast makes use of the Regional Economic Modeling Inc. Bay Area REMI 2.2 model. Additional analysis of household, income and in-commute patterns are done using analytic techniques created in-house. Ultimately, the results are used in tandem with UrbanSim 2.0 and Travel Model 1.5.
- How are the underlying assumptions determined?**
A technical advisory committee of economic, demographic, real estate, and model experts provides feedback on the Regional Growth Forecast methodology. Economists and demographers from the California Department of Finance are consulted.

What is new for *Plan Bay Area 2050*?

There will be more attention to how the information provided by one model can inform other parts of the analysis, so that the Regional Growth Forecast of population, jobs and households takes into account the impacts of strategies for housing, economic development, and beyond. Furthermore, the Regional Growth Forecast will for the first time extend through the year 2050 – the horizon year for this planning cycle.

Next Steps:

This early presentation of the forecasting methodology gives staff time to incorporate suggestions and address unanticipated concerns. The methodology is anticipated to be presented to the ABAG Executive Board with input from the public in July. Between June and September, staff will work on improving the method of iterating results between REMI 2.2, UrbanSim 2.0 and Travel Model 1.5, to produce a preliminary Regional Growth Forecast in September 2019. Further testing of strategies will be done in fall 2019 and early 2020, with a final Regional Growth Forecast adopted in April 2020.

Attachments:

Attachment A: Plan Bay Area 2050: Regional Growth Forecast – Draft Methodology
Attachment B: Presentation

Plan Bay Area 2050: Regional Growth Forecast - Draft Methodology

The Regional Growth Forecast is an important element of the Plan Bay Area 2050 long-range planning process. It sets expectations for how much the Bay Area might grow between today and 2050, and for characteristics of that growth. These include total employment and employment by major industrial sectors, total population and population by age and ethnic characteristics, and the number, size, demographic characteristics and income of households. This information in turn informs *where* growth (employment and households) may go and the nature and amount of travel demand associated with it, as well as expectations for housing production. The Regional Growth Forecast is a key analytical underpinning of much of the policy work associated with the regional planning process.

Tools and Talent

The Plan Bay Area 2050 Regional Growth Forecast is produced by Planning staff with consultant and technical advisory committee input. The Regional Growth Forecast makes use of multipurpose tools that can be used to describe future possibilities and to test the effects of different assumptions and events on future projections.

Talent

The Regional Growth Forecast is being developed in consultation with Stephen Levy from the Center for Continuing Study of the California Economy, with input and review by a technical advisory committee of experts as well as from ABAG and MTC advisory committees.

The technical advisory committee (list and affiliation attached) includes:

- 6 Bay Area economists
- 3 California Department of Finance experts (*chief economist, senior economist and demographer*)
- 3 megaregion representatives (*SACOG, SJCOG, University of the Pacific*)
- 3 experienced REMI users (from Atlanta, a Michigan think tank, and a Colorado nonprofit)

Input is also sought from other experts, including California Department of Finance (DOF) and Housing and Community Development (HCD) staff working on developing accurate counts of housing units and occupancy.

Tools

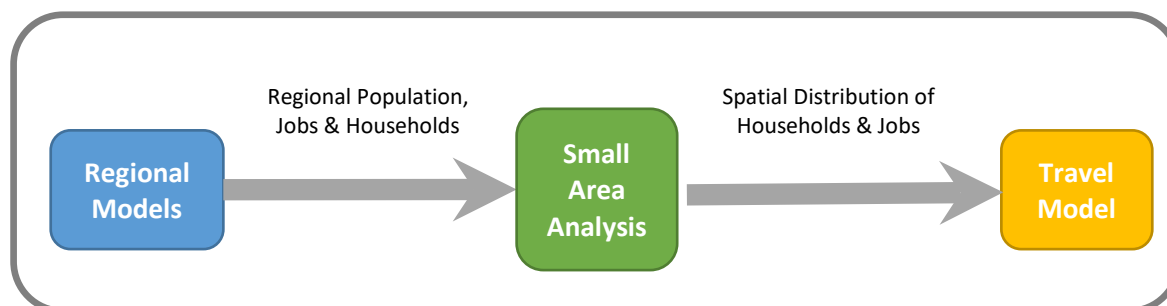
Central to the Regional Growth Forecast development is the REMI (Regional Economic Modeling Inc.) model for the San Francisco Bay Area, Version 2.2. The Bay Area REMI model represents the regional economy, its trading relationships, labor force, population and migration and recognizes the relationships to the state, nation, and surrounding metropolitan planning areas. Downstream, separate staff modules are used to compute households, income distribution, and in-commute levels. The Regional Growth Forecast then serves as an input into the small-scale distribution of land uses (including employment, population and households) using UrbanSim 2.0. The local allocation in turn informs the modeling of travel patterns and investments using Travel Model 1.5. The relationship among these models is described further below. Detailed descriptions of the versions of these tools used for *Plan Bay Area 2040* can be found in <http://2040.planbayarea.org/reports> (Land Use and Transportation sections).

Adjustments to the Overall Forecast Methodology from Plan Bay Area 2040

This will be the first Plan Bay Area done with a consolidated regional planning team for ABAG and MTC, the two regional agencies responsible for crafting the long-range plan. While the overall suite of models is similar to the Plan Bay Area 2040 approach, staff proposes to make use of the model output in a more iterative fashion between models to better capture feedback mechanisms in the economy. This will ideally create stronger bridges among the different technical elements of the forecast for Plan Bay Area 2050, including the Regional Growth Forecast, the small area distribution of the forecast, and forecasts of travel investments and flows.

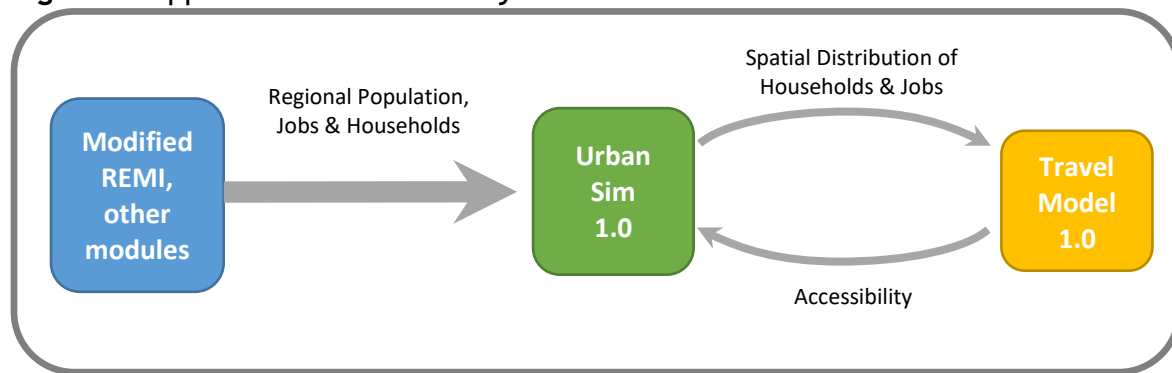
For decades, the general approach to forecasting proceeded in a linear fashion consisting of the steps outlined in Figure 1, although the specific tools used at each step changed over time. The Regional Growth Forecast of employment, population and households fed directly into the small area analysis, which then provided data used by the travel model.

Figure 1: Historic Approach to Regional, Spatial and Transportation Forecasts



With a changeover of tools for the Plan Bay Area 2040 forecast, the land use and travel modelers added additional feedback loops between the small area analysis (estimated using UrbanSim 1.0) and Travel Model 1.0, as shown in Figure 2. We have long known that land use impacts transportation demand, but it has also been recognized that transportation, through accessibility, in turn impacts land use patterns. The model system was modified to include this two-way connection, so that the location of growth can be influenced by improved accessibility following planned transportation investments. At the same time, growth and location affect congestion, access and transportation investment decisions. This coupling of land use and transportation was reflected in the modeling approach for the first time in *Plan Bay Area 2040* but did not include a feedback loop to the forecasts at the regional level.

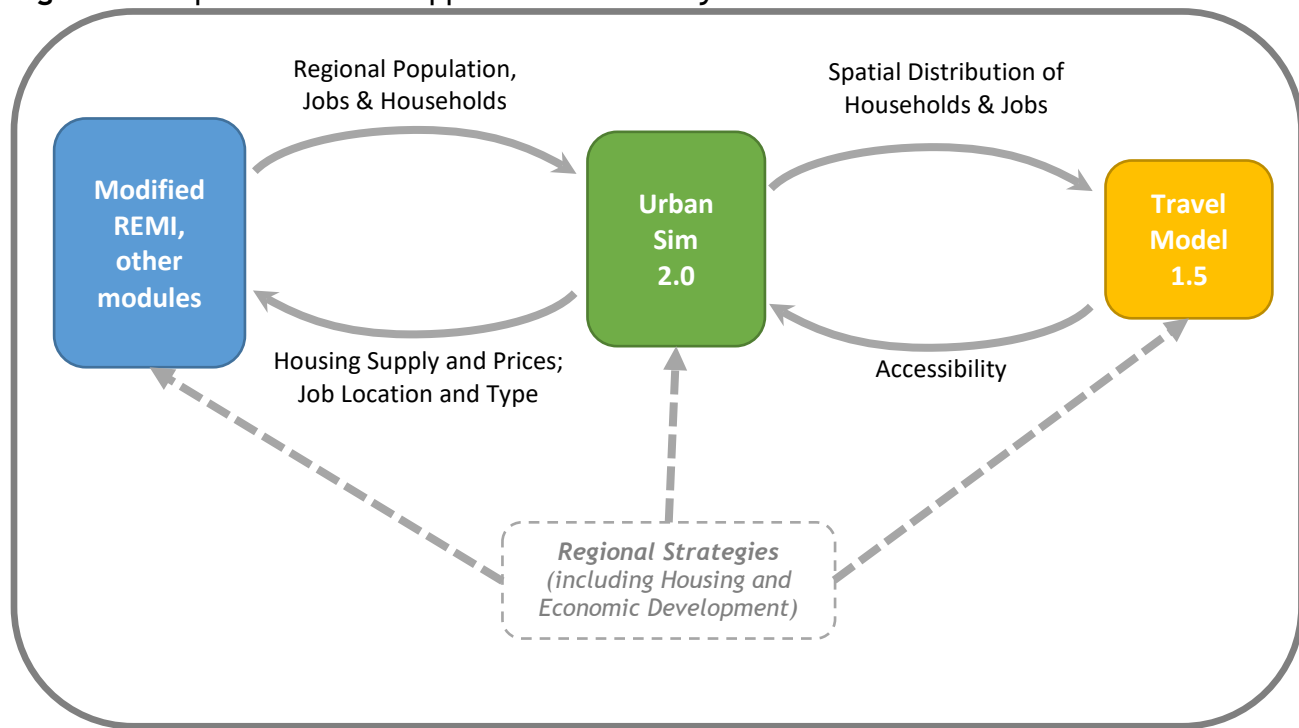
Figure 2: Approach Used in *Plan Bay Area 2040*



Land use and transportation are not the only connected systems, however. Local land markets may have regional implications. For example, economists have pointed to constrained housing markets as in turn reducing the overall size of the economy. When preparing a Regional Growth Forecast for Plan Bay Area 2050, we intend to consider how model results from the UrbanSim 2.0 and Travel Model 1.5 could be entered into the modified REMI model, altering the forecast at the regional level. For example, where and how much housing is built could change the cost of housing, as well as the cost and demand for labor. Similarly, a change in housing prices and location overall could further change the number and types of jobs that can be generated in the region as well as the labor force that can live in the region (see Figure 3). The first aim of this integration is to seek a fuller representation of these types of effects. The second aim is, by having a better accounting of housing markets across the model systems, to better capture effects of policy interventions (i.e., strategies) addressing housing and labor markets. If we are successful in incorporating housing changes into the regional employment and population analysis, we may also be better positioned to then analyze the effects of other strategies, such as economic development strategies like workforce training programs and Priority Production Areas, which could affect the ability of middle-wage jobs to remain in the region.

The remainder of the memo focuses on the first of the three elements of the Regional Growth Forecast: the projection of jobs, population, and households at the *regional level*.

Figure 3: Proposed Iterative Approach for *Plan Bay Area 2050*



What Does the Regional Forecast Do?

The Regional Growth Forecast projects total employment, population, households, income distribution and in-commute change for the region as a whole. As part of the iterative process, we will begin with a “realistic” baseline employment and population forecast that will be consistent with likely national economic and demographic trends.

Table 1 summarizes the approach this cycle and how this was done in the last cycle.

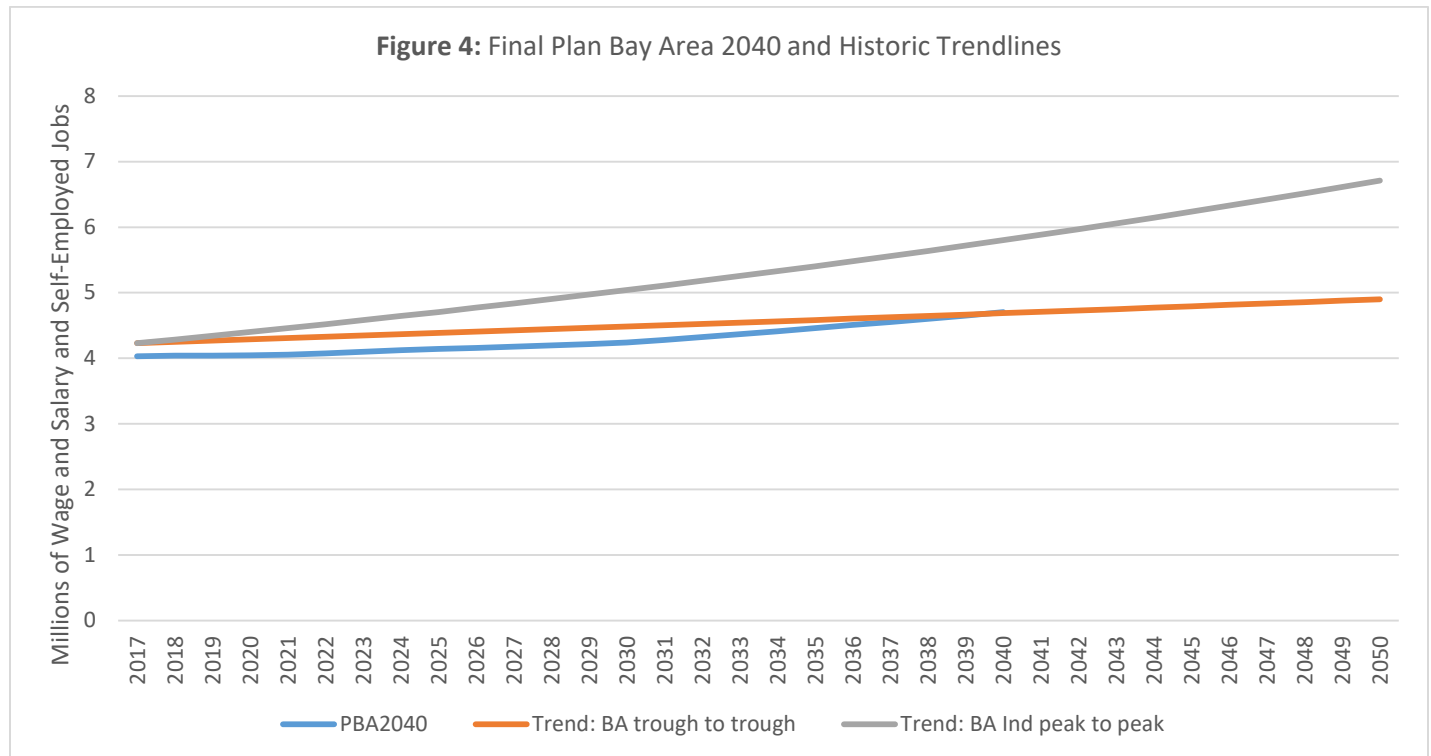
Table 1: Summary of Approach to Regional Growth Forecast

Forecast Element	Plan Bay Area 2040	Plan Bay Area 2050 (Draft)
Employment	Adjustments to REMI, with input from CCSCE and TAC	Update - different base compared to <i>Plan Bay Area 2040</i> , CCSCE and TAC recommended adjustments
Population	Minor REMI adjustments only	Update - REMI adjusted to some DOF fertility assumptions and to match labor force requirements.
Households	Average headship rates for the most recent 5 years, some decrease over time for seniors and multigenerational households	Work in progress - Methodology has changed over last 3 cycles. Goal in this cycle is to provide a more detailed accounting of households by size, number of workers, and income level categories as well as age and race of household head. Headship, or household formation rates in consultation with TAC and CCSCE, applied to population age and race estimates. Specific method of disaggregating to income and workforce categories remains to be developed.
Income distribution	Econometric equations for each of four categories based on national cross-sectional data by income category. Reconciliation of numbers to total household control.	
In-commute change	Took the larger of two alternative estimates drawn from REMI data on residence workforce, labor force and jobs	No change in method, but further informed by iterations with other models and by multiregional results of REMI model.

The assumptions underlying the adjustments to the REMI model and the other elements of the Regional Growth Forecast are summarized below, by element of the forecast.

Employment

Baseline employment for the Bay Area is driven by national trends in population growth and employment, by the Bay Area employment mix by sector and by the competitiveness of Bay Area sectors relative to the equivalent sectors in the US. The forecast for *Plan Bay Area 2040* is quite low compared to recent experience or to continuation of trends. While a recession could readjust to this level, the employment future is more likely to lie somewhere between a low extension of recent trends (calculated from the overall rate of growth across business cycle troughs) and a higher extension of trends (calculated from growth by sector across business cycle peaks), as shown in Figure 4. Note that as in the last forecast, there is a great deal of uncertainty about how the region will fare in the near future. A national recession or a reversal of fortunes in the social media sector (due to aging of their customer base or changing regulations) could lead to an extended period of stagnant growth or job loss in that sector. In the last three decades, new industry formation of new industries has led to strong surges of growth in the region following downturns. Will we continue to have this capacity over the next 30 years?



PBA40 = Plan Bay Area 2040; BA = Bay Area
Source: ABAG/MTC Analysis, 2019

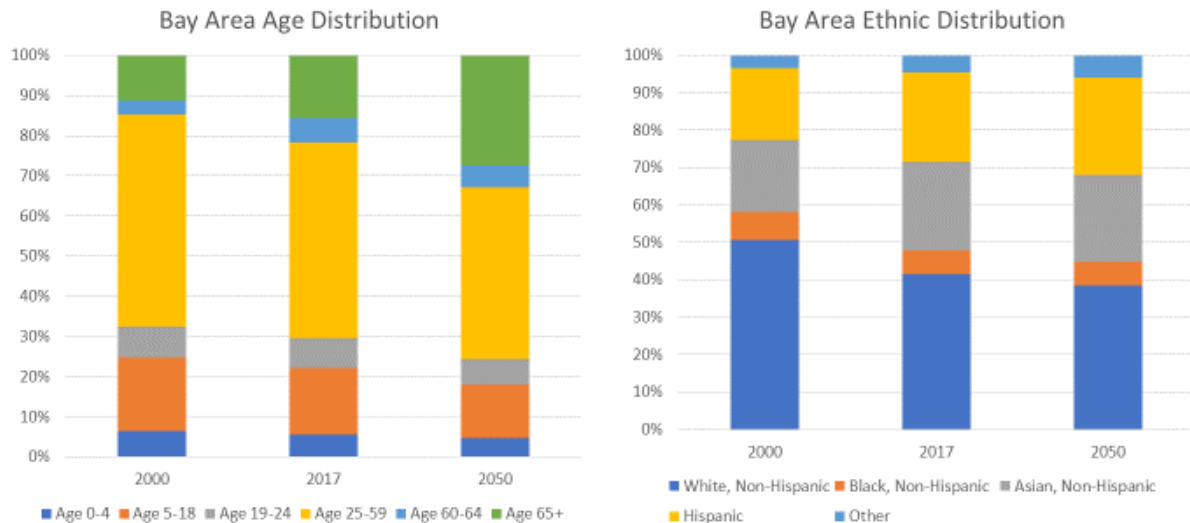
At the iterative stage, strategies that may be tested before reaching a final employment figure could include:

- Improved access to housing in the region can change the cost of labor, affecting rates of growth of middle and lower wage sectors.
- Workforce training could have complex effects, improving productivity, allowing higher output without necessarily more jobs, although a more skilled workforce could also attract additional employers.

Population

Bay Area population growth will be driven by natural increase (based on birth and mortality rates of the population by age and race/ethnicity) and by migration. Migration includes economic migration in response to job opportunities, international migration for family reasons, and retirement migration. Apart from the population level, there are age and ethnic differences between the REMI standard control forecast and the California Department of Finance 2017 forecast that need to be better understood. We are examining how assumptions about trends in birth and mortality rates and immigration levels and composition are affecting the REMI levels. This will help us create a population forecast that is both consistent with expected growth levels and reflective of our understanding of the composition of the California population.

Figure 5: Bay Area Age and Ethnic Distribution, 2000, 2017 and DOF 2050 Projection



Source: ABAG/MTC from US Census and California Department of Finance.

Possible effects to be captured in iterations:

- Lower housing prices and greater availability of subsidized housing may help retain lower and middle wage earners and encourage economic in-migration, increasing the working aged population.
- Rental subsidies would also help to retain lower- and middle-income households.
- Lower housing prices could also discourage cashing in by seniors, by reducing expected returns from home sales, increasing the number of senior households that stay in the region and increasing the overall demand for housing.

Households

The headship rate is the share of adults in a particular age group (e.g., 25 to 29 years old) who are heads of households. This share can be applied to population projections by age and race/ethnicity to estimate the number of households by these demographic characteristics. A higher headship rate would imply lower average household sizes.

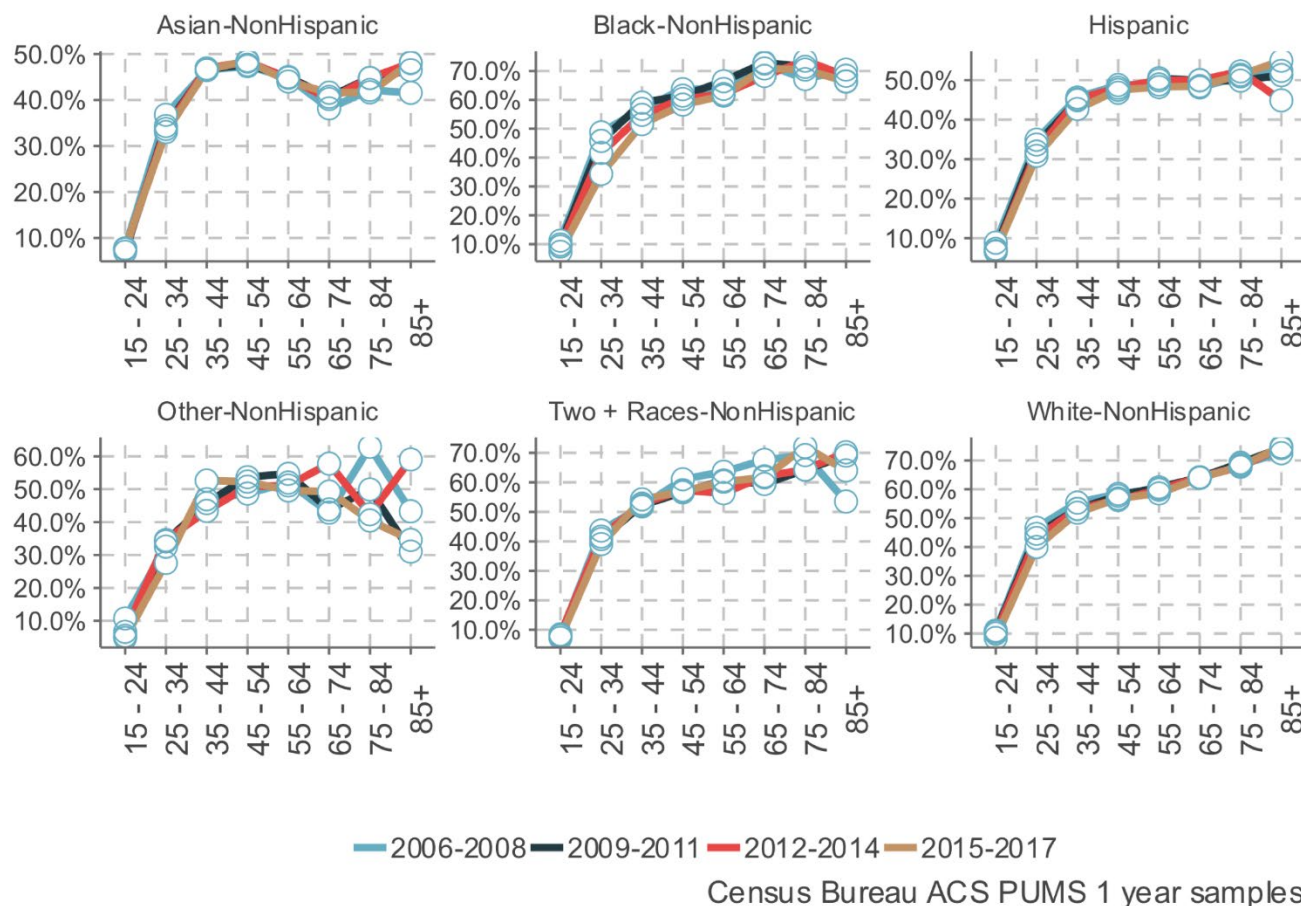
The household estimate for *Plan Bay Area 2040* was built using exponentially weighted moving average headship rates for the 2006 to 2014 period, with additional marginal adjustments. The *Plan Bay Area 2050* headship estimate will begin with headship rates by age and ethnicity for the most recent 5-year average from ACS (2013-2017) and gradually rise over time to the previous 2005-2009 rate if higher, with Hispanic and Asian/Other rates gradually converging to the average rate of the remaining non-Hispanic groups. This is based on two assumptions:

- i) The current headship rate is compressed due first to the Great Recession and then to the high cost of housing. The 2005 to 2009 average will capture both an economic peak and a downturn.

- ii) Hispanic and Asian/Other headship rates will converge, though not reach, toward the average headship of the two other ethnic categories, as the native-born share of households in those groups increases and the household characteristics of immigrants move towards those in the US.

We will compare this headship rate approach with one in which we use averages for a full economic cycle, from 2010-2017 and assess which is preferable.

Figure 6: Comparative Headship Rates by Ethnicity, Age Group and Time Period



Housing strategies may affect overall household formation leading to lower or higher household sizes, changing costs, and changing locations of new households. Possible effects of strategies to test in the models include:

- Lower housing costs, through increased building around transit or housing subsidies may make it possible for new households to form, for example increasing headship rates among young adults who otherwise would live with their parents.
- Higher density rental housing may target young adult and senior families, again increasing headship rates and leading to greater household formation.

Income Distribution by Household

The method for this calculation will link age of head of household and number of working household members with income levels. Other factors that may also influence overall household income categories will include the overall change in the economy between high and low wage sectors, the relationship of output to employment (e.g., is value added rising, dropping or remaining constant in the growing sectors), and any changes between the proportions of wage income with other income sources. There are two general ways to approach this part of the forecast. Over the next 6 weeks we will be exploring both.

Approach 1: Project total households in each income category, use recent ACS household profiles to disaggregate into the detailed categories needed for UrbanSim. For *Plan Bay Area 2040*, the household numbers in each income bin were estimated using separate econometric equations that predicted the number of households in each income category (one predictive equation per household income quartile). UrbanSim 1.0 and Travel Model 1.0 then synthesized the types of households in each income category. This approach could be used again, or the income quartile analysis could then be disaggregated to households based on recent ACS profiles.

Approach 2: Define the full array of the 2017 baseline household categories needed for UrbanSim using ACS data, and “grow” these categories for each five-year increment of time based on how the economy, total income, occupations, and age profiles change over time. The detailed approach to this remains to be determined.

A number of strategies could affect the income mix of the region.

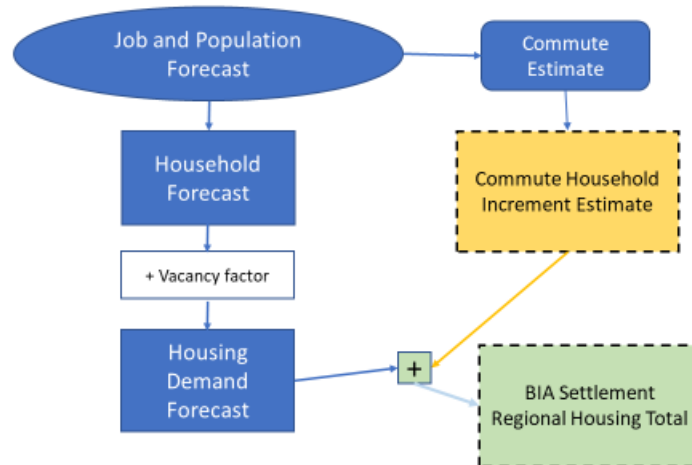
- Strategies aiming to preserve middle wage jobs such as incentivizing jobs to locate in housing rich areas and priority production areas could change the mix of sectoral growth, expanding the low-middle and high-middle household categories.
- Affordable housing programs may help lower income households stay in the region.
- Transit subsidies can have complex effects, making it easier to recruit a workforce for lower wage jobs, but also perhaps making it easier for those workers to commute in from outside the region.

In-Commute

The in-commute analysis was conducted in *Plan Bay Area 2040* as diagrammed in Figure 7. We propose doing a more nuanced in-commute analysis compared to the approach used for *Plan Bay Area 2040*. Rather than simply estimating the overflow, we will examine how the distribution of *employment location* may change for some sectors between the Bay Area and its neighboring MPOs in the REMI model, possibly reducing the need for in-commuting. In the iterative process, we will look at how housing availability may change based on policies affecting the amount of housing built and the cost-mix of housing between market rate and subsidized housing. Through this iterative process, we can test to what extent a larger housing stock may decrease in-commuting versus increasing employment growth.

Apart from these efforts, if adjustments are needed to reduce the in-commute, we will follow the method used in *Plan Bay Area 2040*.

Figure 7: Schematic for Adding In-Commute Housing to the Regional Housing Total, Plan Bay Area 2040



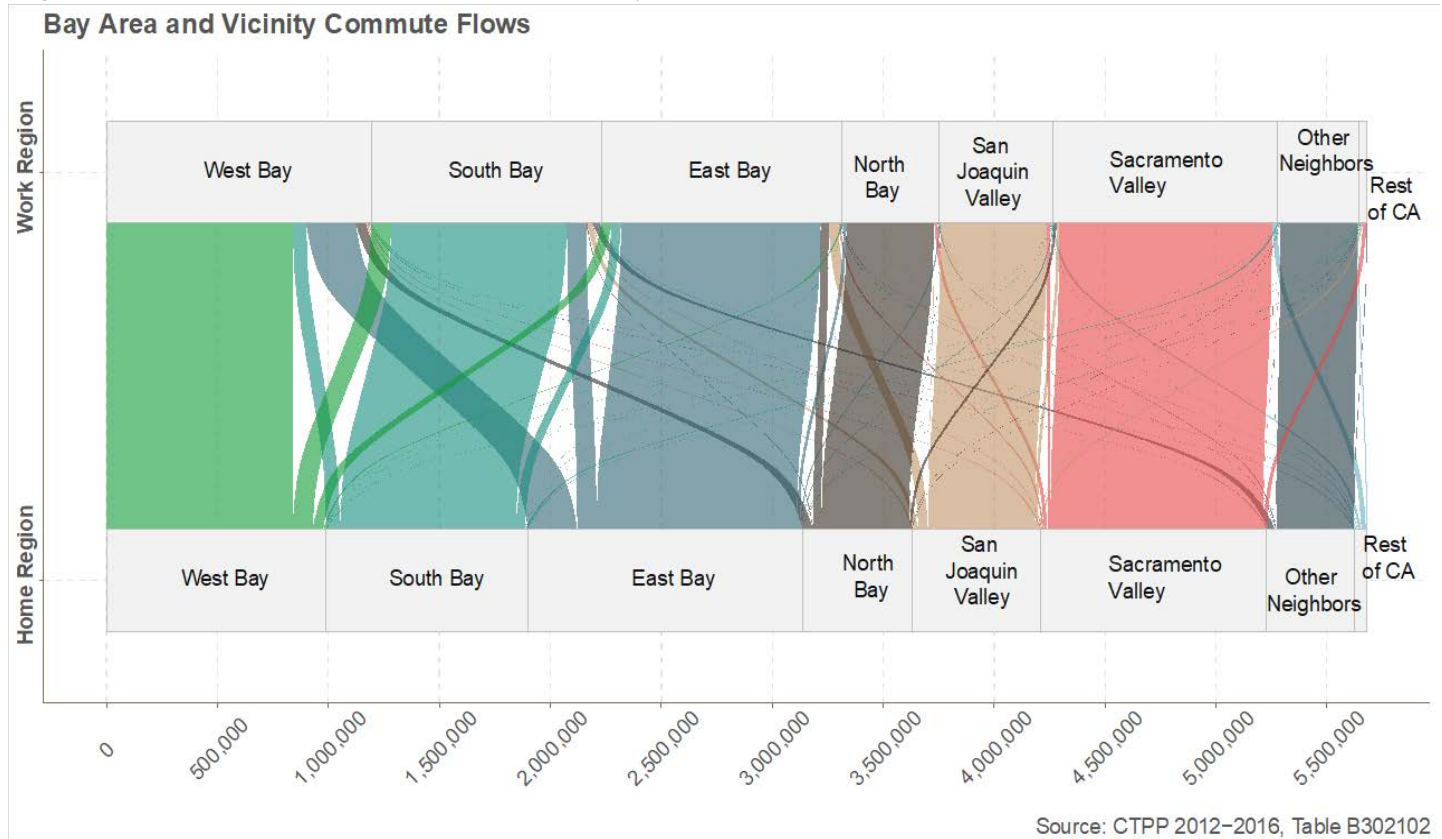
Source: ABAG Regional Forecast Approach, Presentation to the ABAG Executive Board, July 2015.

In reality, commute flows occur across MPOs for many reasons, going in two directions, a function of the size and pull of job centers, the resident labor force in the subregions, as well as the difference in housing costs and the relative ease of transportation. For a large region such as the Bay Area, it is expected that the concentration and diversity of specialized functions will attract workers from beyond the region's labor force. Further, a strong job node in the edge of the region, such as parts of the Tri-Valley, is much closer to the resident labor force of Tracy and Stockton. This draw will continue, even with more housing added west of the Altamont Pass. This is evident in Figure 8, where most commute flows into and outside the region are very small, but the most significant inflows are to Santa Clara County from its southern neighbors and to Alameda County from the Central Valley. Using the multiregional REMI model will allow us to examine further how Bay Area strategies may affect the net in- or out- commute flows the different regions experience as well as possible changes in job mix that occur because of the different strategies.

A number of strategies may affect in-commuting:

- Improved rail networks and bus rapid transit could reduce this number of current in-commuters by auto, although the net effects on total in-commuting would be more complex.
- Higher tolls on freeways and subsidies for transit ridership would reduce the number of in-commuters in private vehicles, but not necessarily in-commuting overall.

Figure 8: Commute Flows to and from the Bay Area 2015



Next Steps

The methodology is still under development. Staff are currently taking feedback and incorporating suggestions over the next few weeks and will continue to improve the analytic methods as the iterative process is put in place during the summer. The methodology will be presented to the joint MTC Planning/ABAG Administrative Committees in July. The ABAG Executive Board meeting in July will take public comment, as required by the agreement among MTC, ABAG and the Bay Area Building Industry Association. The ABAG Executive Board will be asked to approve the methodology at that time.

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Technical Advisory Committee for the Regional Growth Forecast

Organization	Title	Name
City of San Francisco	Chief Economist	Ted Egan
Center for Business and Policy Research, University of the Pacific	Director	Jeffrey Michael
Trulia	Chief Economist	Issi Romen
SPUR	Regional Planning Director (alternate: Research Manager)	Egon Terplan (Sarah Jo Szambelan)
Bay Area Council Economic Institute	Executive Director (alternate: Acting Executive Director)	Micah Weinberg (Jeff Bellisario)
San Joaquin Council of Governments	Senior Regional Planner	Kim Anderson
California Department of Finance	Chief Economist	Irena Asmundson
Atlanta Regional Commission	Principal Planner	Colby Lancelin
Sonoma State University	Dean	Robert Eyler
Common Sense Policy Roundtable	Director, Policy and Research	Chris Brown
Economic Growth Institute, University of Michigan	Senior Research Area Specialist	Don Grimes
Sacramento Council of Governments	Senior Regional Planner	Garett Ballard-Rosa
California Department of Finance	Researcher	Ethan Sharygin
Indeed.com	Chief Economist	Jed Kolko
MTC/ABAG Staff Advisors	Assistant Director	Matt Maloney
	Principal Planner	Dave Vautin
	Principal Planner	Mike Reilly

Consultant: Stephen Levy, President, Center for Continuing Study of the California Economy



PLAN BAY AREA 2050

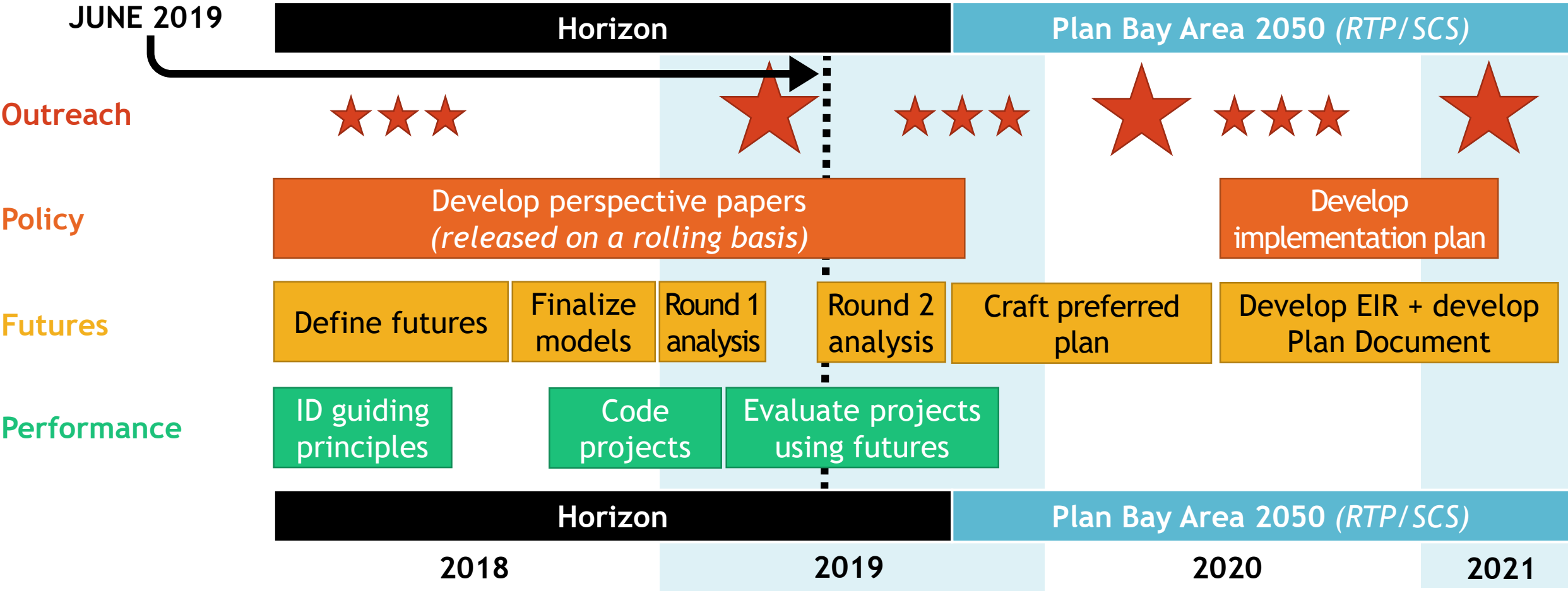


Regional Growth Forecast Methodology (*Draft*)

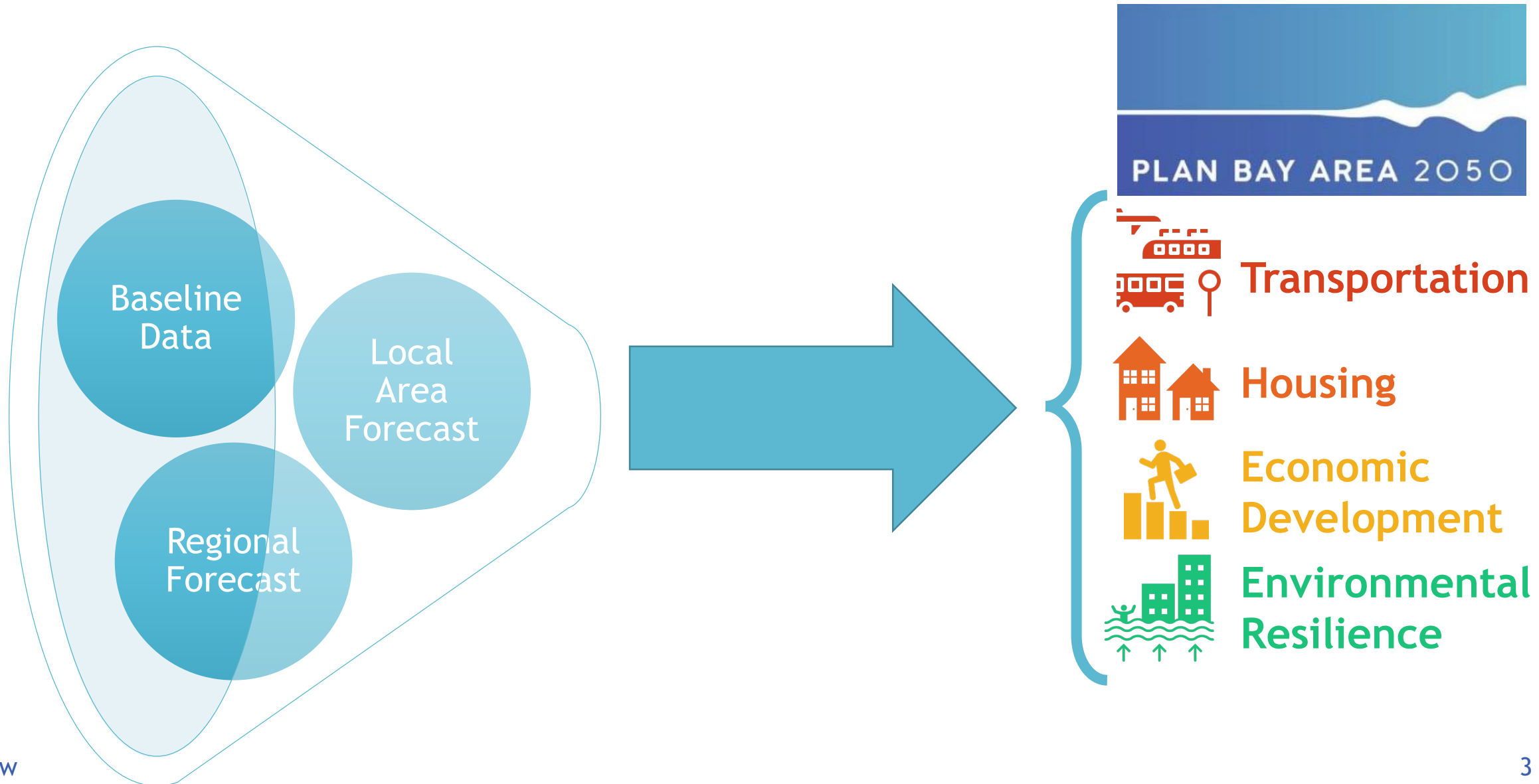
Setting the Stage for Crafting Plan Bay Area 2050's
Growth Pattern

Cynthia Kroll and Bobby Lu - ABAG/MTC
Regional Advisory Working Group - June 2019

Preparing for Plan Bay Area 2050



How Will We Forecast the Growth Pattern?



BASIS: Working to Improve Baseline Data



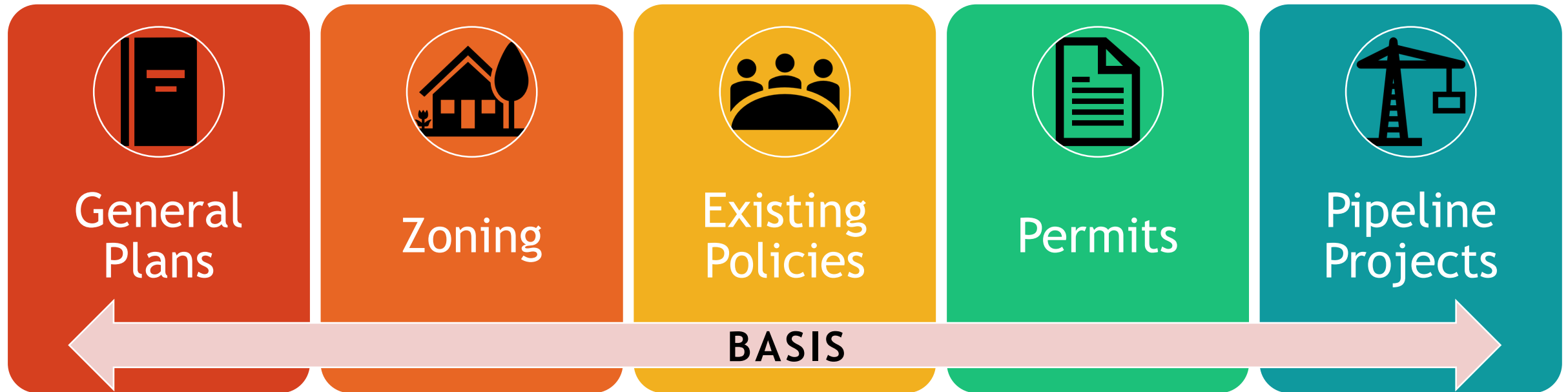
Baseline
Data

- In tandem with developing a Regional Growth Forecast, MTC/ABAG has been **working to improve data on existing land use conditions** in concert with local jurisdictions.
- This work is being conducted as the **first step of the Bay Area Spatial Information System (BASIS) initiative**, a staff-driven effort to bring key regional datasets onto an industry-standard Data as a Service (DaaS) Platform that supports greater collaboration with external partners.
- Key BASIS datasets are expected to be **ready in time for the Plan Bay Area 2050 kickoff** this fall - and will be used for UrbanSim 2.0 model runs.

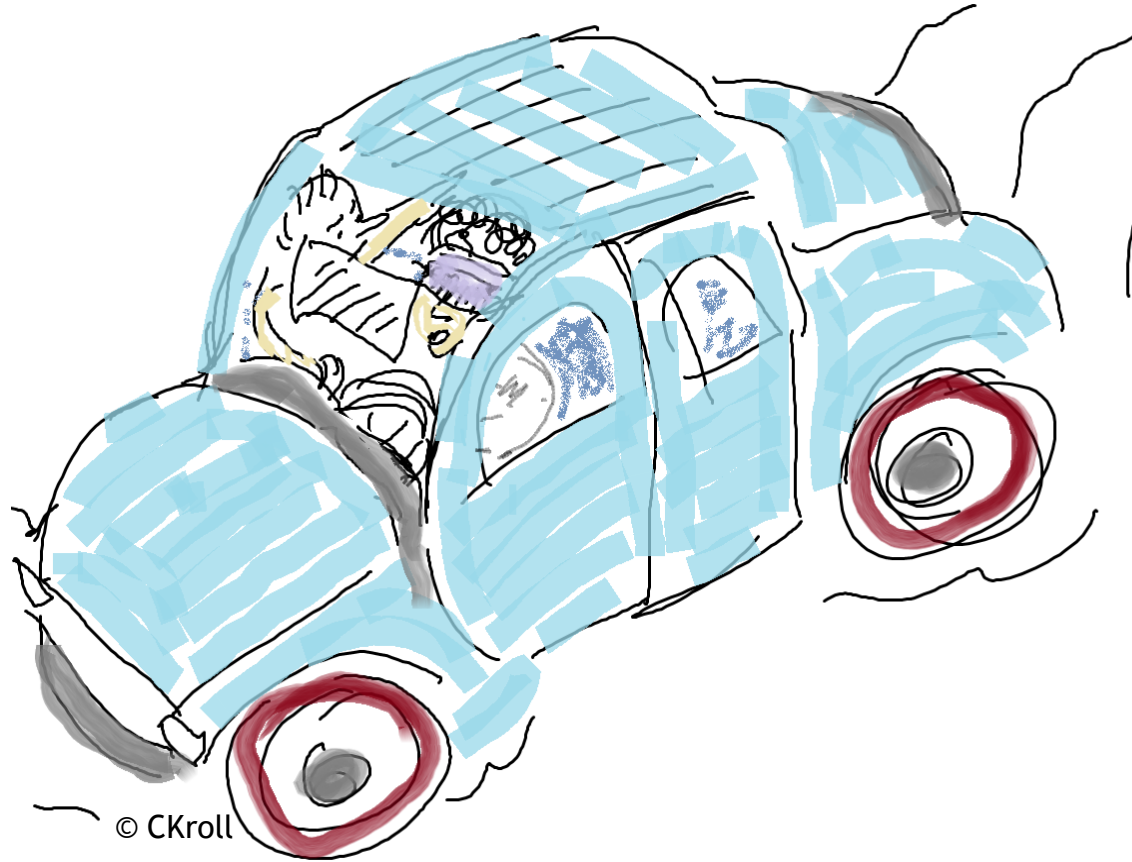
BASIS: Working to Improve Baseline Data

Baseline
Data

What datasets are specifically being updated at this time?



How do we know what the future will bring?



A forecast is like
driving blindfolded,
while directed by
someone looking
through the rear
window.

["Don't we have something better than this old car to navigate ahead?"]

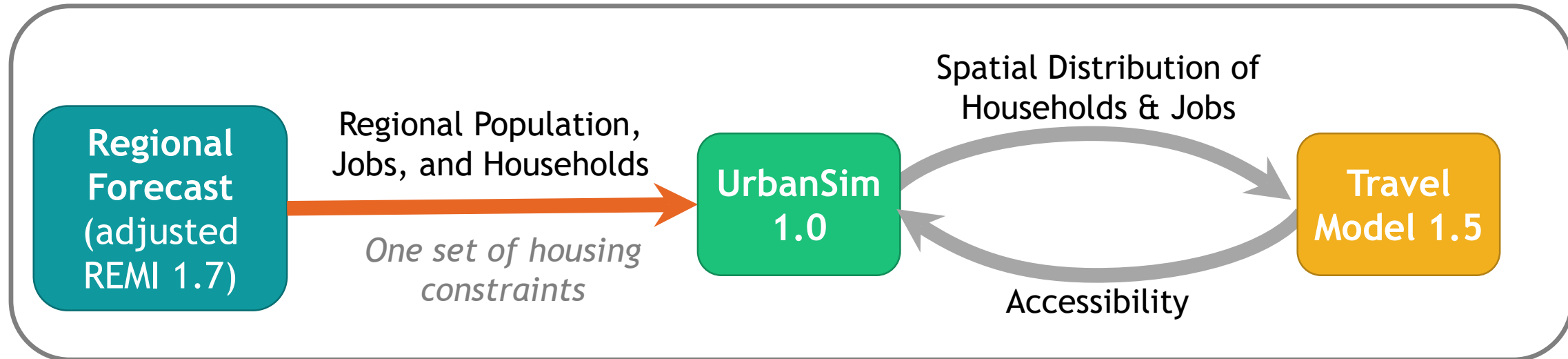
Developing the Regional Growth Forecast

Regional
Forecast

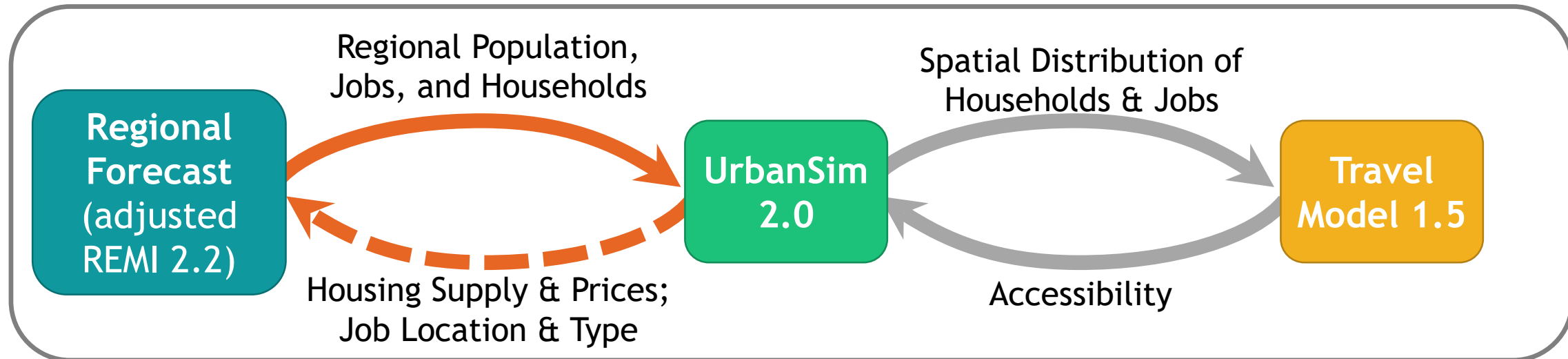
- Consulting with Center for Continuing Study of the California Economy (CCSCE) and a Technical Advisory Committee
- Tools to craft the Regional Growth Forecast
 - Regional Economic Models, Inc. (REMI) version 2.2 - for the San Francisco Bay Area
 - Household + Income Model (*developed in-house*)
 - In-Commute Assessment (*developed in-house*)
- In general, our approach **builds upon the REMI model**, making adjustments when supported by further data analysis by ABAG/MTC or CCCSE.
- Additional technical information is available in **Attachment A**, which documents the draft methodology under development.

Model Flow Chart: Moving from 2040 to 2050

Plan
Bay
Area
2040

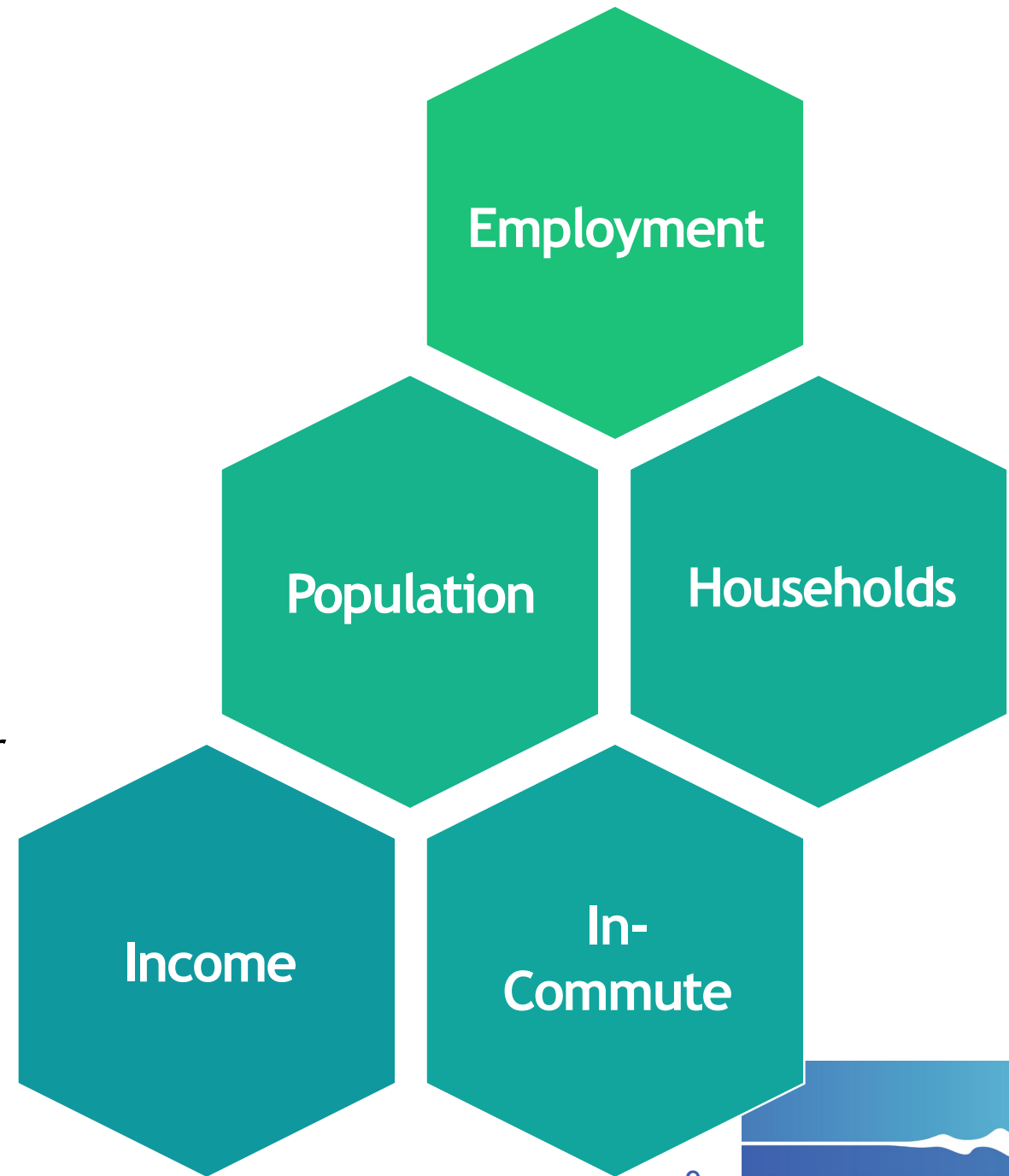


Plan
Bay
Area
2050
(draft)



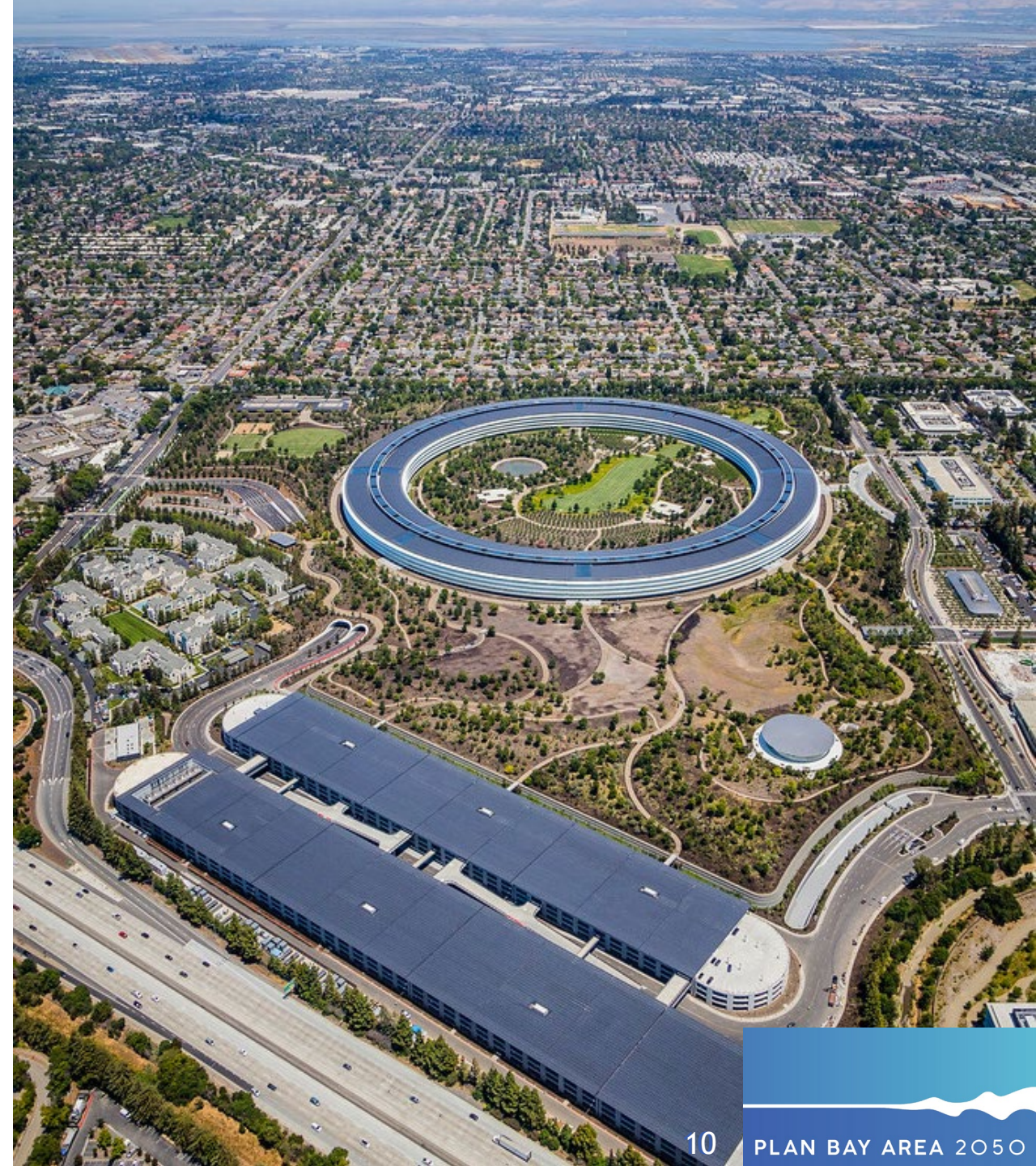
Elements of the Regional Forecast

- **Five core components to the Regional Growth Forecast**, as shown to the right.
- **Key underlying assumptions:**
 - Bay Area employment is driven by national trends in population growth and employment.
 - Overall U.S. population growth is slowing over next three decades.
 - Competitiveness of Bay Area sectors relative to the equivalent sectors in the U.S. will also affect how fast the region's economy grows.



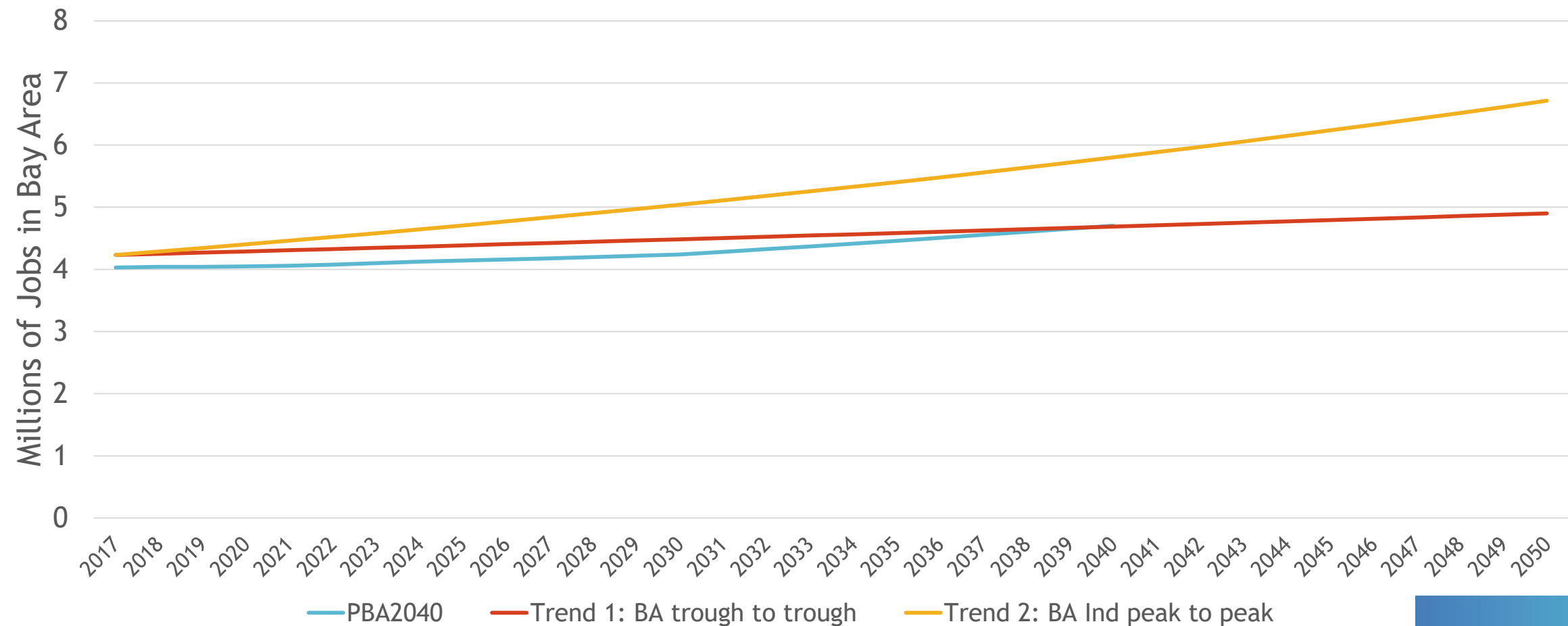
Key Factors in the Employment Forecast

- Will the sectors driving growth today continue to be tomorrow's drivers?
- What factors will affect industry competitiveness?
- How do we balance short terms shifts and long term trends?
- How do we balance what the models tell us with what our research and experts say?



Exploring Employment Trendlines: Compared to Plan Bay Area 2040

Regional
Forecast

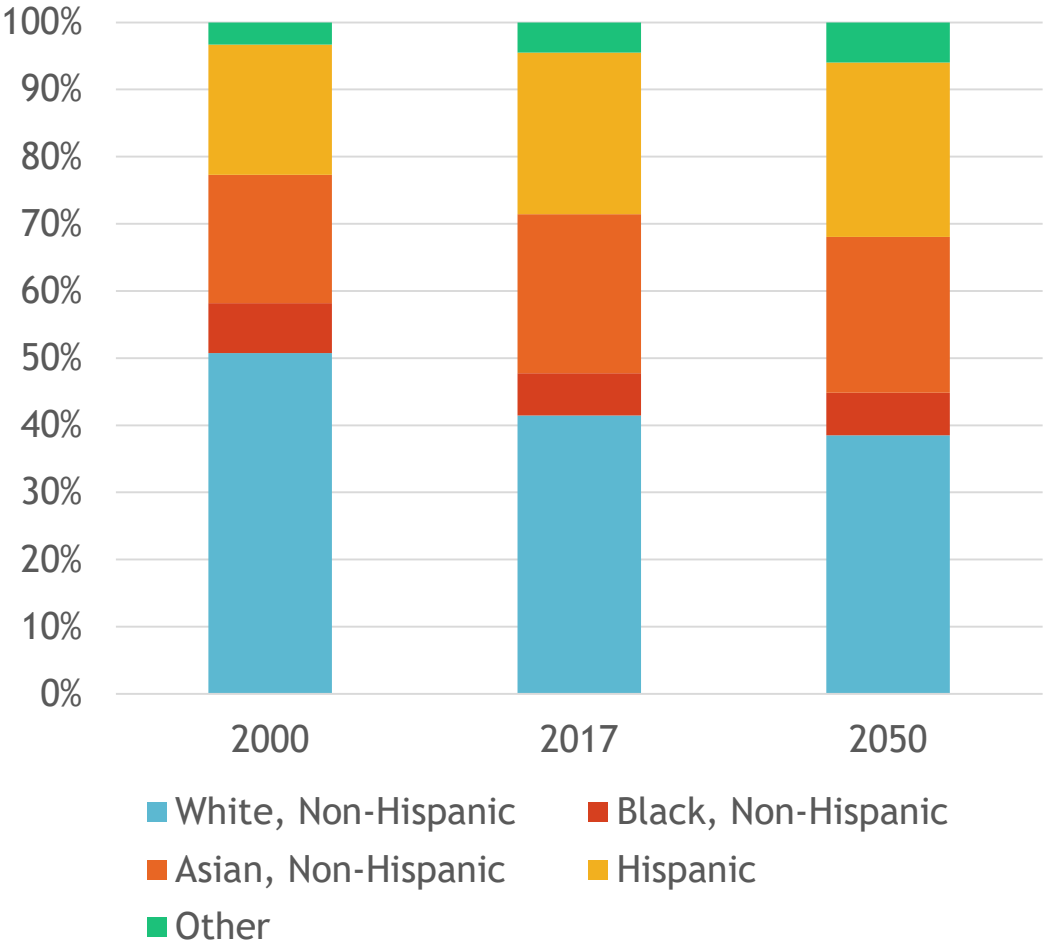
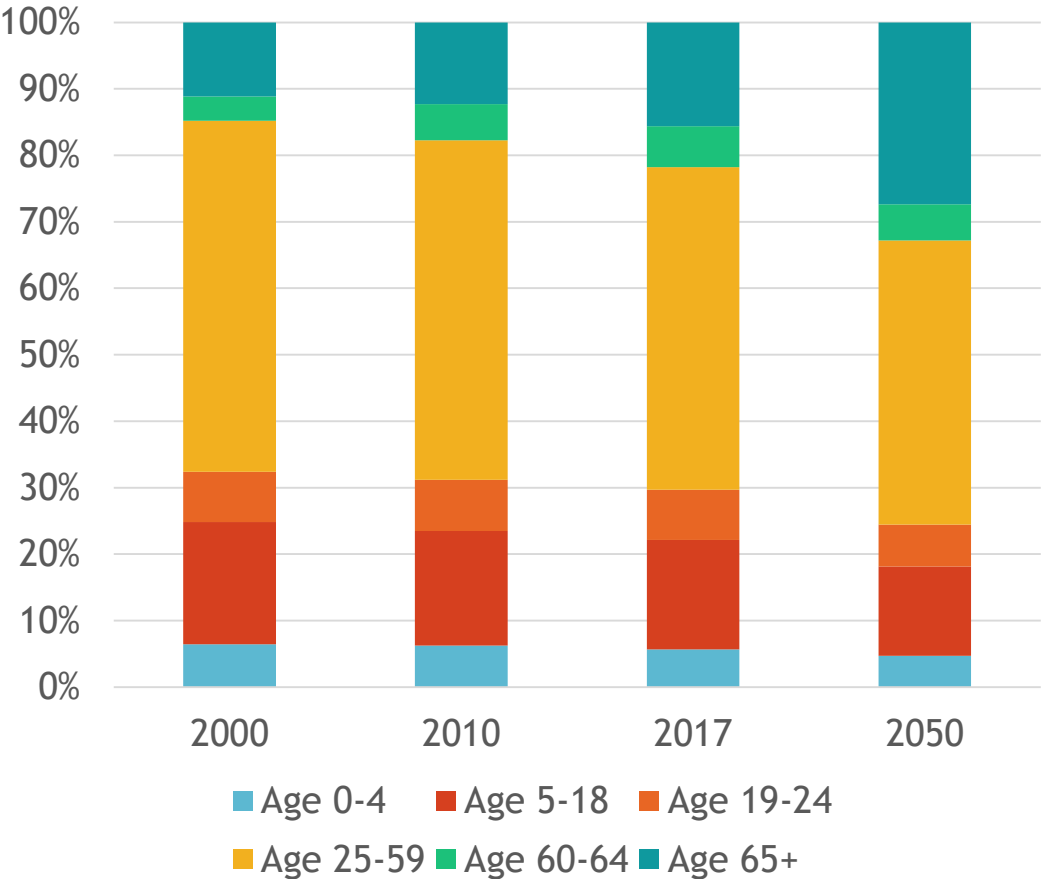


Key Factors in the Population Forecast

- How does the current demographic mix by age and ethnicity affect our population 30 years from now?
- How might people moving into or out of the region change our future?
- How do key age cohorts — baby boomers, millennials — shape labor supply and demand for housing?



Exploring Population Trendlines: How DOF Foresees a Changing Population



Source: California Department of Finance estimates and projection through 2050 (2017 vintage).

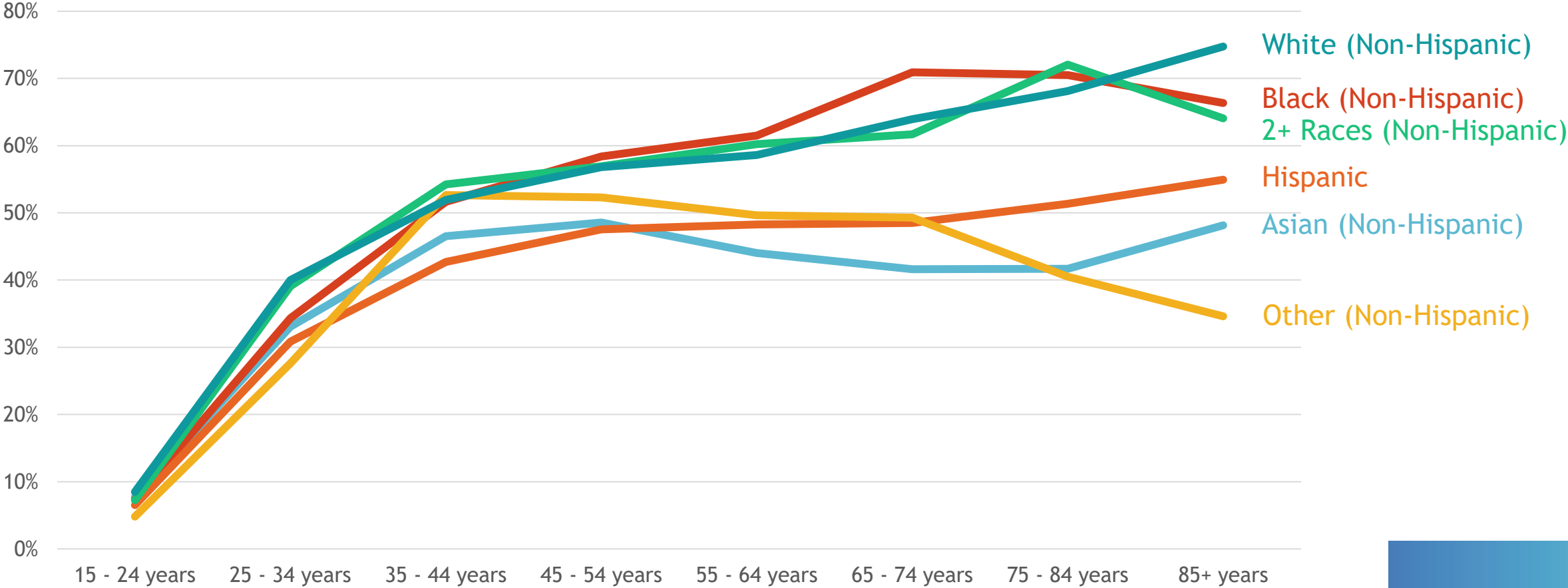
Key Factors in Estimating Households and Income

- Number, size of households is affected by age, ethnicity of the population.
- Household size, workers per household vary with economic conditions.
- What shapes multigenerational households? Immigration? Income levels and housing costs?
- How do economic and demographic factors affect household incomes?

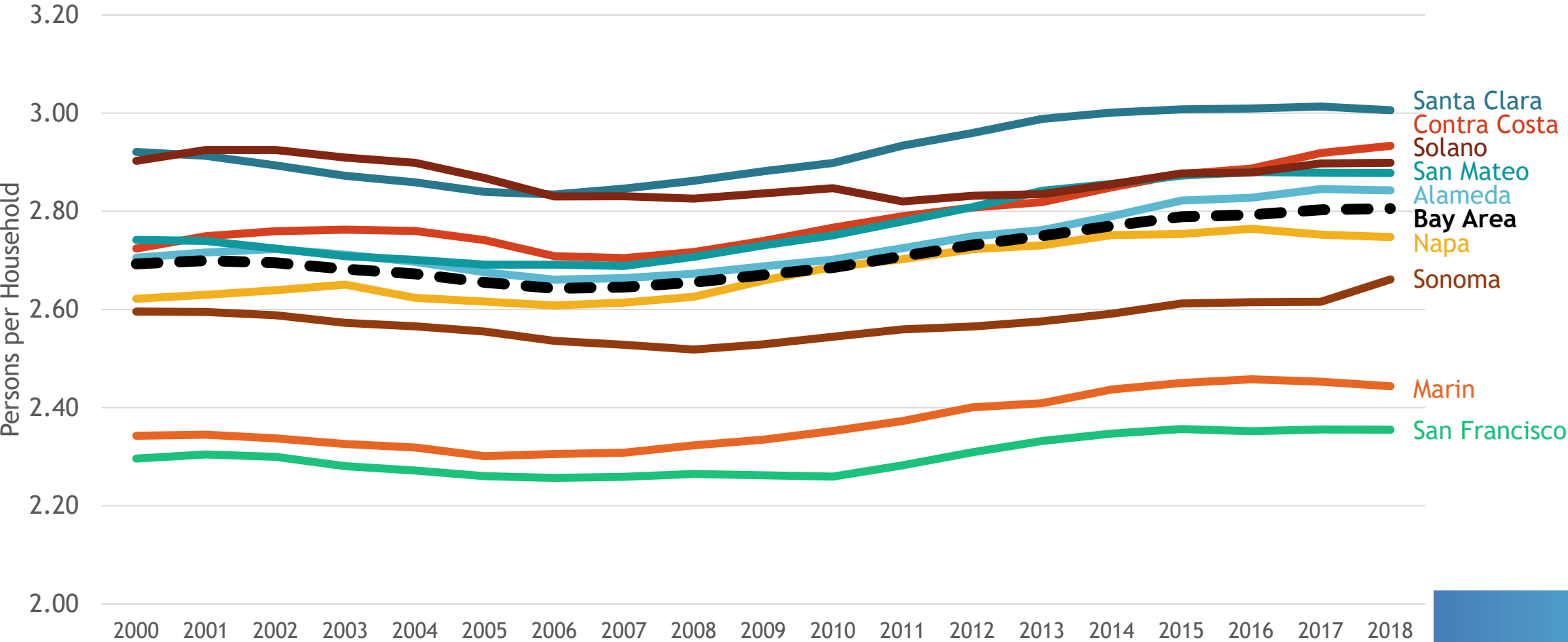


Exploring Household Formation: Differences by Race/Ethnicity

Regional
Forecast



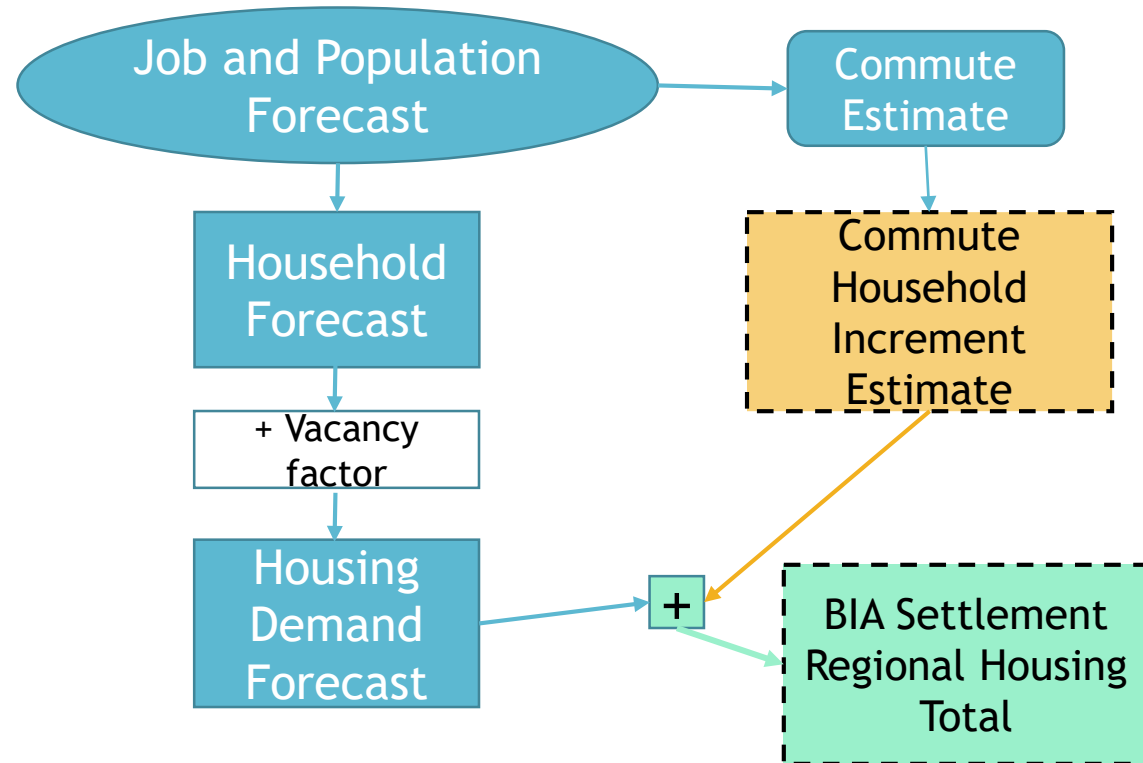
Exploring Household Trendlines: How Big is Your Household?



Incorporating Key Assumptions on In-Commuting

Regional
Forecast

How we did it for Plan Bay Area 2040:



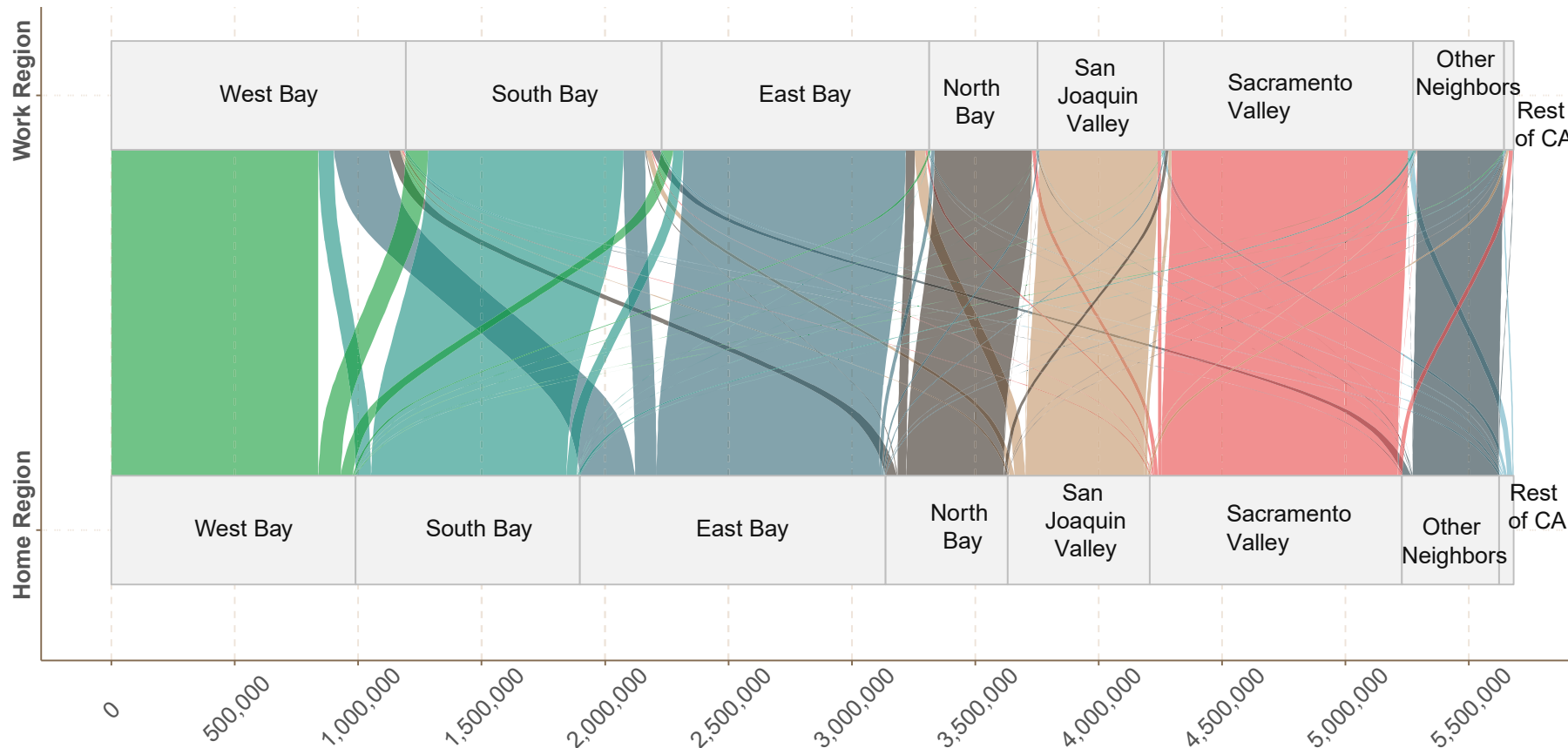
The Regional Growth Forecast for Plan Bay Area 2050 will be consistent both with Senate Bill 375 and the legal requirements of the BIA Bay Area legal settlement from Plan Bay Area (2013).

New tools may allow for further nuances in estimates.

Exploring In-Commuting: A Small but Growing Share of Trips

Regional
Forecast

Subregion-to-Subregion Commute Flow Chart



- Most workers commute *within* their county.
- The East Bay provides the most commuters working in other Bay Area counties.
- Of commuters leaving the San Joaquin Valley, the largest number goes TO the East Bay.
- 6% of Silicon Valley workers come from outside the region.

Building a Bridge between the Regional Growth Forecast & the Local Area Forecast

- Staff is working to consider how strategies included in Plan Bay Area 2050 could influence both the regional and local area forecasts in a consistent manner.
- For example:
 - A strategy to increase affordable housing production could influence both the location of housing and the total level of regional growth.
 - A strategy to advance Priority Production Areas (PPAs) could influence both the location and total number of industrial/PDR jobs.
- This requires developing a feedback loop between UrbanSim 2.0 and REMI, which staff is currently testing for feasibility.

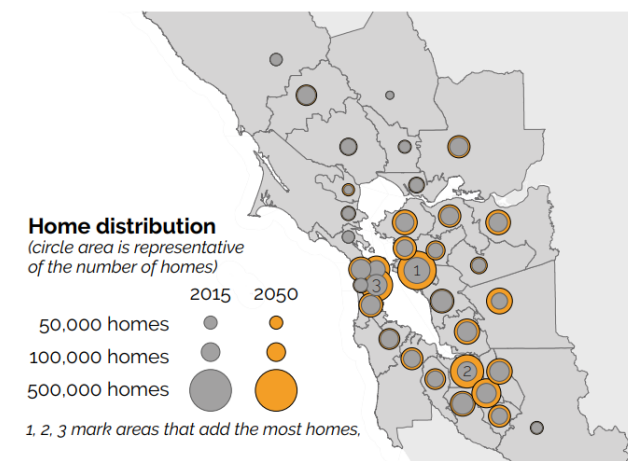
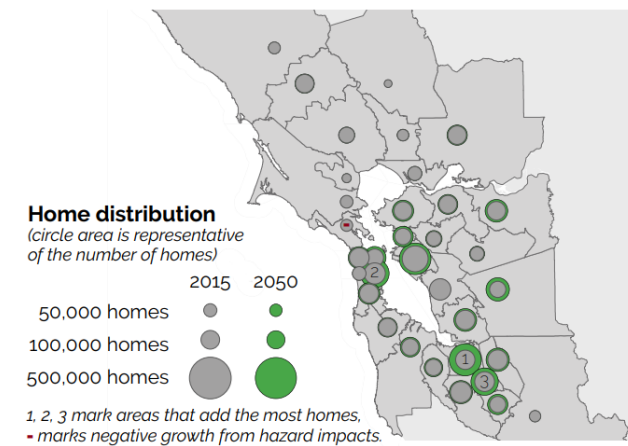
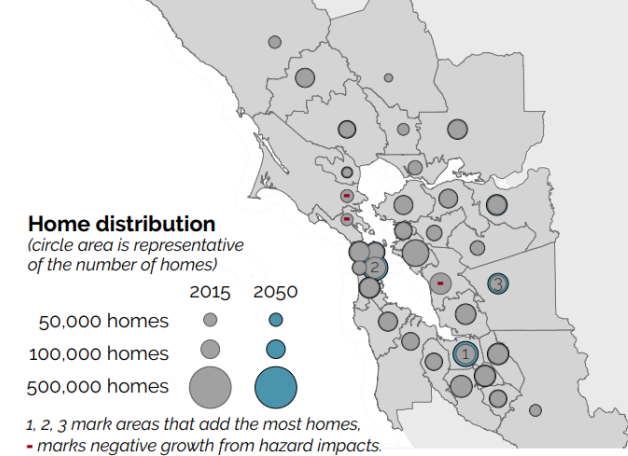
How Does Growth Get Forecasted on a Local Level?

Local
Area
Forecast

- MTC/ABAG is planning on using an upgraded version of the UrbanSim land use model - UrbanSim 2.0 - for Plan Bay Area 2050. Similar to past plans, key inputs include both the **baseline data** (BASIS) and the **Regional Growth Forecast** (REMI).
- Importantly, **strategies** ultimately included in the Preferred Plan influence the future location of growth; stakeholders interested in the ultimate growth pattern should provide input on those strategies as the Preferred Plan is developed this fall.

Building upon Horizon: Stress-Testing Strategies

- MTC/ABAG is already exploring some of these big questions through the **Horizon initiative**. Forecasts for three divergent Futures were showcased in the Futures Interim Report, released in March.
- Through Futures Round 2, further testing of a suite of housing and economic development strategies using UrbanSim 1.5 will take place this summer.



Questions? Comments?

Contact Cynthia Kroll at
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PLAN BAY AREA 2050

What's Next for the Regional Growth Forecast?

- Refine methodology for approval at ABAG Executive Board meeting - July 2019
- Draft Regional Growth Forecast - Fall 2019
- Final Regional Growth Forecast - Spring 2020