

USING REMI IN FORECASTING AND PROJECTIONS FOR THE SAN FRANCISCO BAY AREA

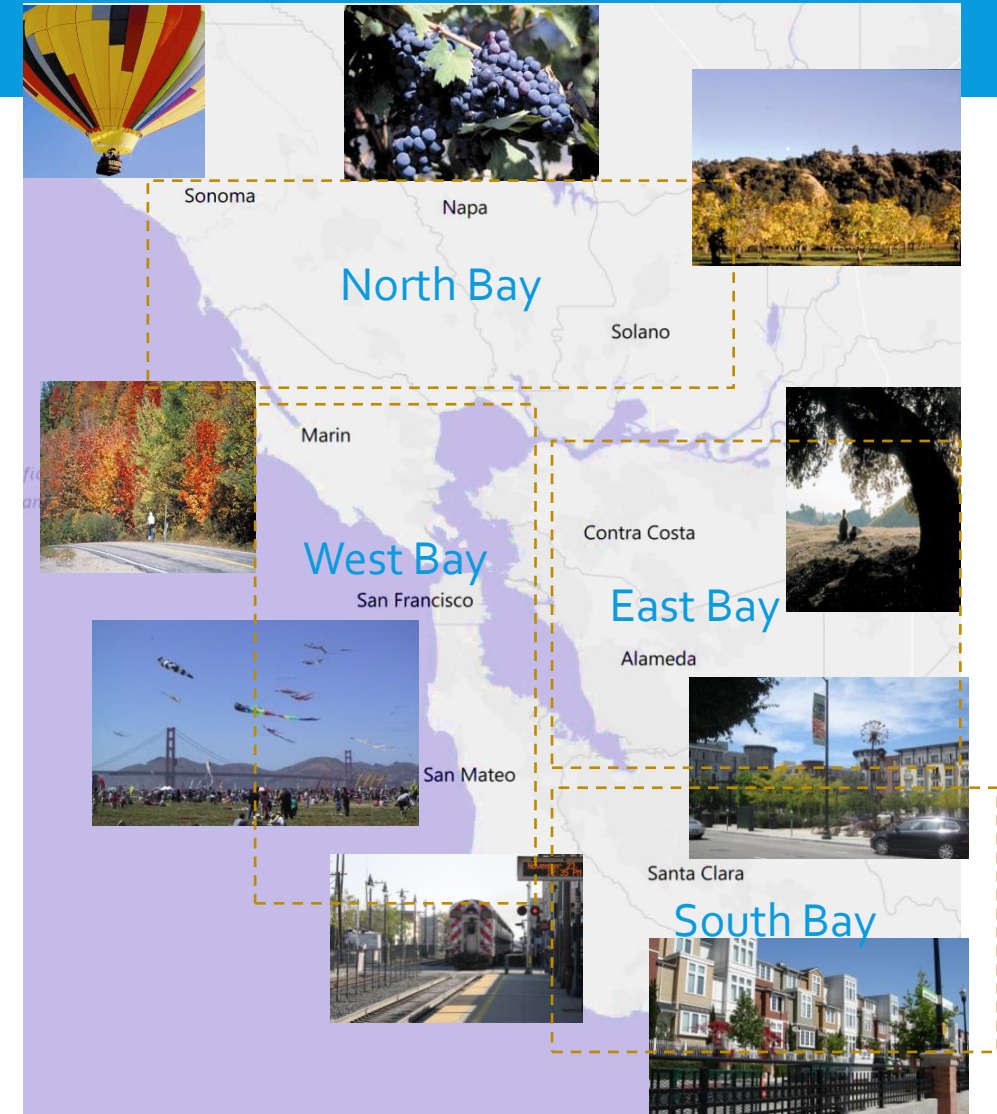
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INTRODUCING THE SAN FRANCISCO BAY AREA

- 9 counties (7.6 M People)
- 101 cities
 - San Jose (1.0 M)
 - San Francisco (0.9M)
 - Oakland (0.4M)
- Diverse economy (4.1 M Jobs)
 - Multimedia and social networking
 - High tech manufacturing
 - Health and education
 - Leisure and tourism
 - Agriculture and wineries



CONTEXT

- ABAG and MTC jointly produce a Sustainable Communities Strategy (SCS) and Regional Transportation Plan as *Plan Bay Area*
- Plan for 25 to 30 years in the future
- The SCS includes specific policy requirements
 - **House all of the population**
 - **Reduce GHG emissions**



ABAG/MTC FORECASTING PROCESS – 3 STAGES

REGIONAL TOTALS

ABAG Regional Forecasts

- Population*
- Economy*
- Households (*)
- Income Distribution (*)
- Commute(*), Regional Housing Control Total

GEOGRAPHIC DISTRIBUTION

ABAG; MTC

ABAG:

- Subregional Analysis
- Local Policy Input

MTC:

- UrbanSim Calibrations

TRAVEL DEMAND, GHG PRODUCTION

MTC Travel Model

- *Travel demand*

- *GHG Estimates*

Parcel and TAZ projections

REMI ROLE

* direct output

(*) input to other modules

WHY REMI FOR THE REGIONAL FORECAST?

- Integrated structure to examine employment, population, labor force, income and output growth
- Provided in-house capacity to test sensitivity to different assumptions
- Model could be used in the future for impact analysis

Forecast based on REMI ABAG version 1.7.8 for 9 counties aggregated into 4 “regions” plus region 5, the “rest of California.”



ADJUSTING REMI TO PRODUCE A SFBA FORECAST

- **Adjust national control for construction, transportation and warehousing, information, trade (Adjusted National Control 1.6% > REMI 1.7.8 , 1.7% < REMI 2.1)**
- **Adjust regional control**
 - Residential and nonresidential investment—Capped at highest historic level
 - Relative real estate prices—Adjusted based on measured actual levels
 - Employment 2014-2015 levels—Policy adjustment rather than update
- **Translate employment results from BEA jobs to BLS + self-employed equivalent**



FORECAST RESULTS

Figure 4: Employment by Sector, 2010, 2015E, 2040P

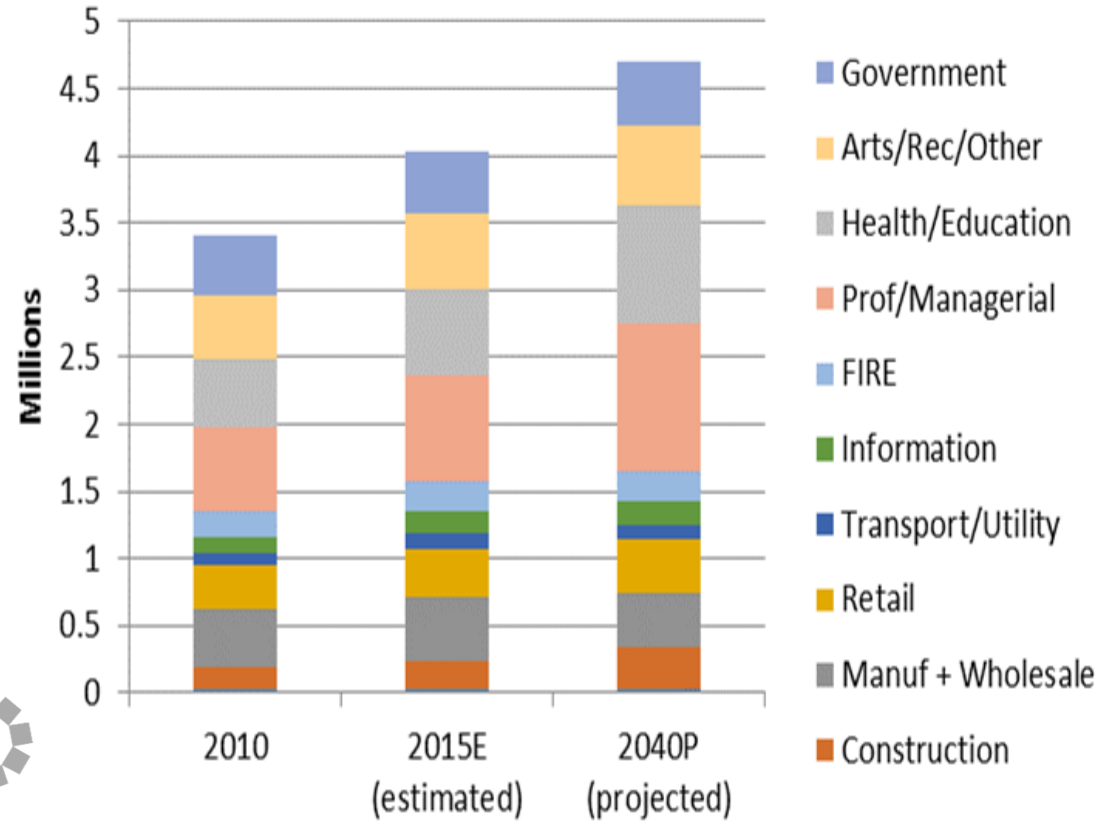
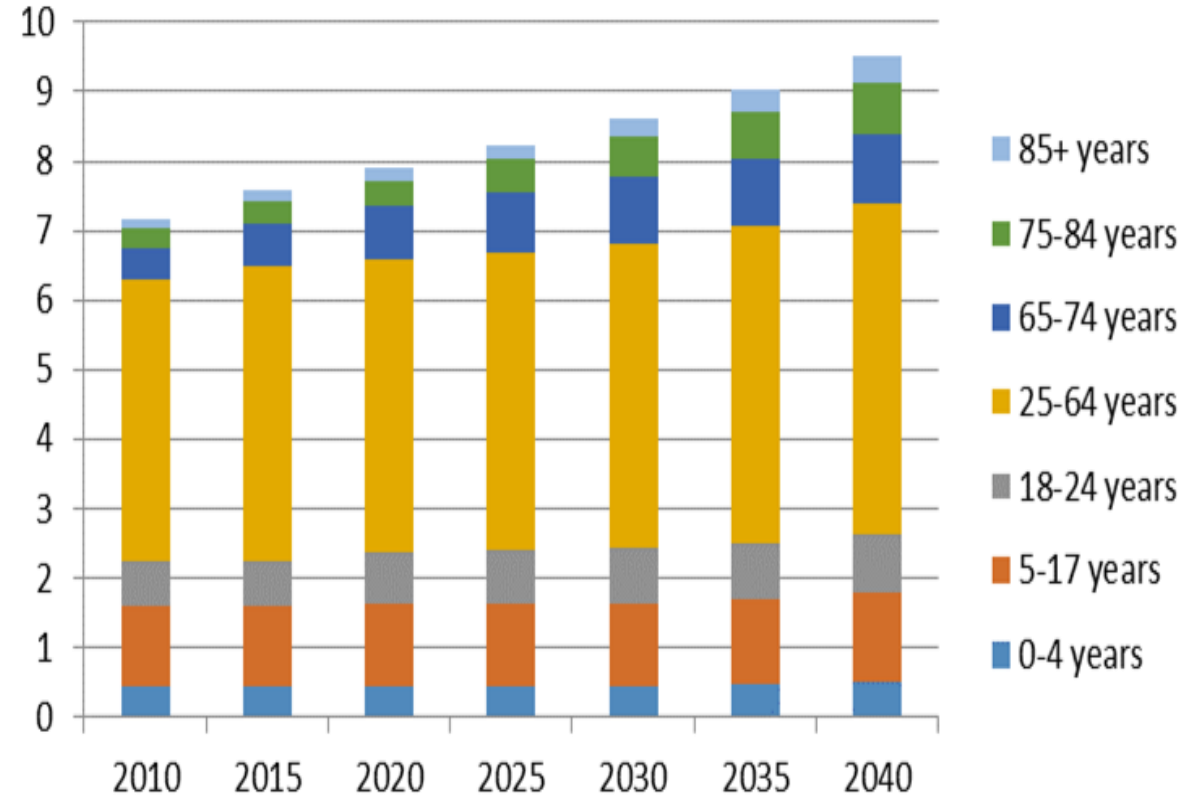


Figure 5: Population Growth and Changing Age Mix



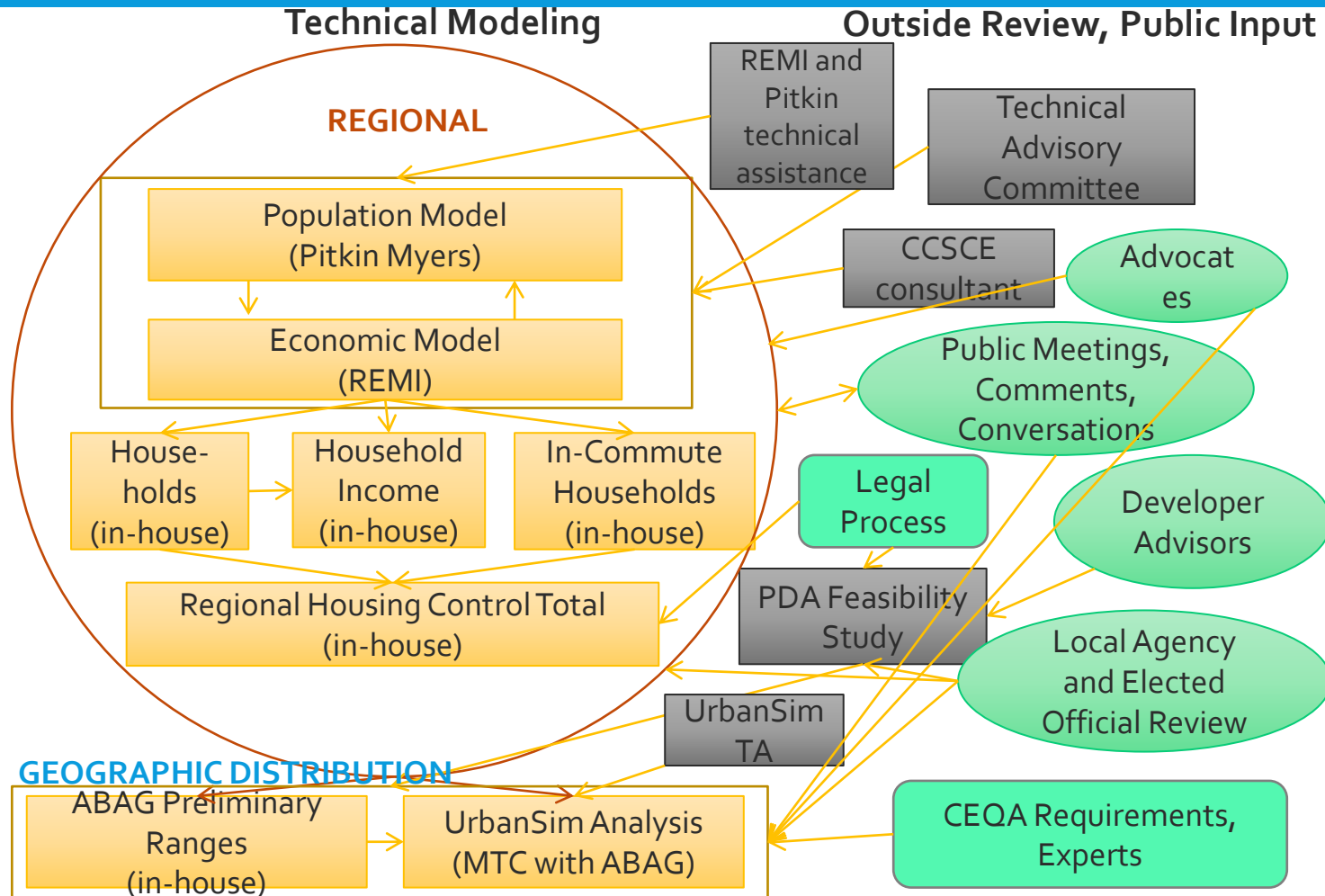
Source: ABAG analysis using ABAG REMI model version 1.7.8.

FROM THE REGIONAL FORECAST TO SMALL AREA AND TRAVEL PROJECTIONS

- REMI output uses, regional level:
 - Household module: # based on headship rates
 - Income distribution module: Linked to REMI income, employment by sector, and age mix
 - In-Commute Estimate: Net increase from outside the region
 - Regional Housing Control Total: Households, in-commuters, vacancy
- REMI output uses, geographic distribution and transportation
 - Urban Sim: Population, households, jobs by sector, income mix
 - Travel Model 1: Population, jobs, income mix



ALL OF THE PLAYERS IN THE FORECAST



NEXT STEPS

- Impacts of an earthquake on the Hayward Fault
- Revised forecast for Plan Bay Area 2021



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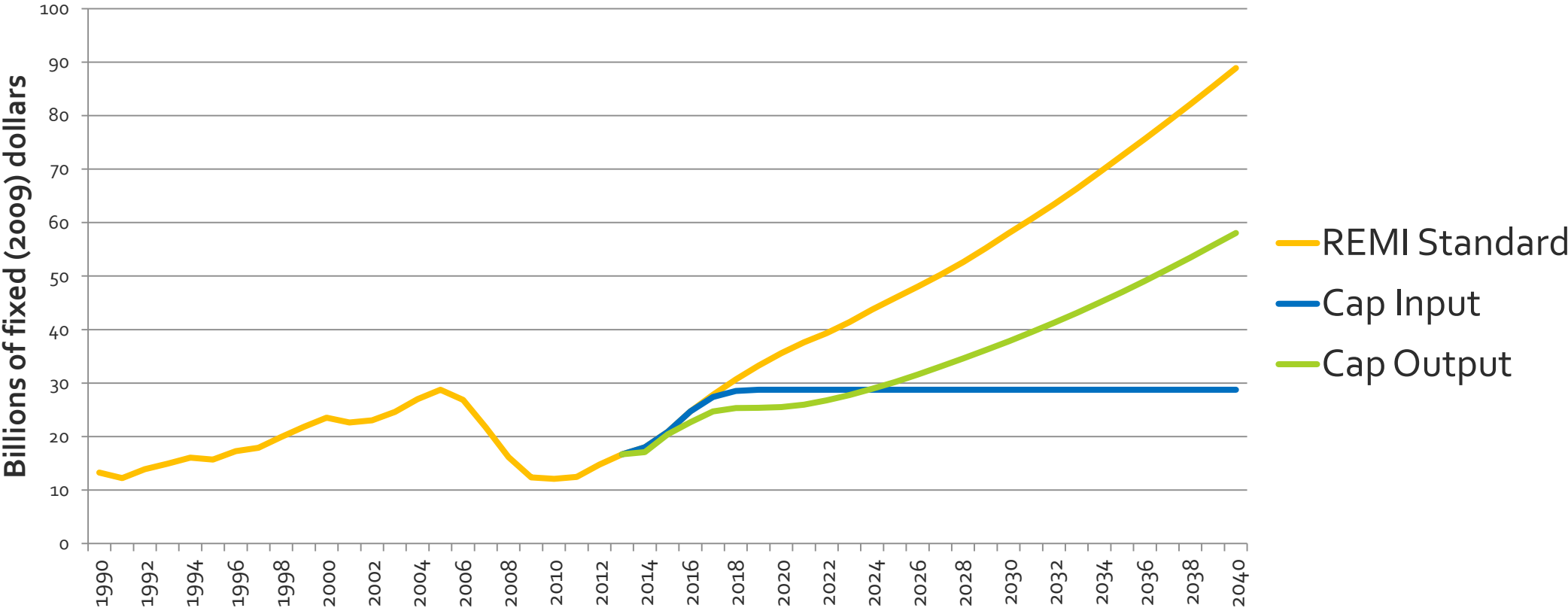
ADJUSTMENTS TO NATIONAL CONTROL

Sectors	Update with BLS Growth Rates	Apply BLS ROG forecast to 2022	Return to REMI projected ROG	Extend BLS ROG	Calculated new growth path	Tapered over time
Construction	2013, 14, 15		√			
Information						
internet	2013, 14, 15	√		√		√
publishing	2013, 14, 15	√		√		
telecomm	2014, 2015	√		√		
motion pics	2013, 14, 15	√	√			
Retail					√	√
Wholesale					√	√
Transport / Warehouse					√	

Result: Adjusted national control (NC3) 2040 employment is 1.6% higher than REMI national standard control for 1.7.8, 1.7% lower than REMI 2.1 National Standard Control.

RESIDENTIAL INVESTMENT ADJUSTMENT RESULTS

Figure A-1: Residential Investment
(Unconstrained and Capped at Historic Peak)

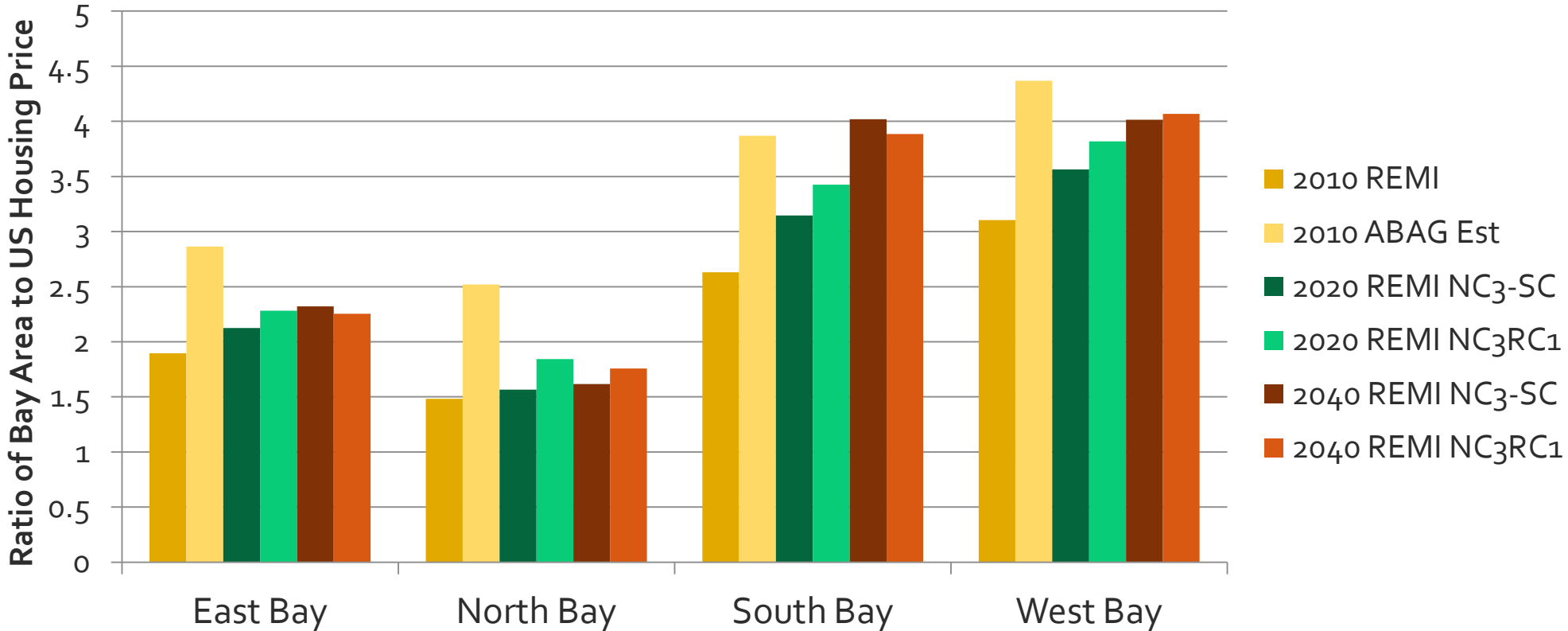


Source: Plan Bay Area 2040, Regional Forecast of Jobs and Housing, Appendix A



RELATIVE REAL ESTATE PRICES

Figure A-2: REMI and ABAG Estimated Relative Housing Prices
2010 and Projected 2020 and 2040



Source: Plan Bay Area 2040, Regional Forecast of Jobs and Housing, Appendix A



FROM BEA TO BLS PLUS SELF-EMPLOYED

- **Why adjust?**
 - BEA counts all jobs regardless of month
 - BLS averages across months – Closer map to job/person
- **Calculate ratio of BEA employment to BLS Wage and Salary Employment plus Census Self Employed for Base Year (2012)**
- **Representative ratios:**
 - Government 1.03
 - Professional and Managerial 1.3
 - Financial and Leasing 2.4
 - Arts/recreation/other 1.4



VALIDATING THE FORECAST

- Alternative population forecast (Pitkin-Myers)
- Employment trend analysis comparisons
- Technical advisory committee

