

#### **IV. Forecast Development**

The development of the 2004 population, housing units and employment forecasts started with the formation of a Technical Advisory Committee. The Forecast Technical Advisory Committee (FTAC) held its first meeting in December 2002. Each city and county in the Monterey, San Benito and Santa Cruz County region was invited as were special districts in the region and individuals and community groups who had participated in the 1997 forecast process. The FTAC was tasked by the AMBAG Board of Directors with four responsibilities:

1. Review the options for developing county level forecasts and provide a recommendation to the AMBAG Board of Directors as to which option should be selected;
2. Select and implement a standard methodology to disaggregate the forecasts to local levels;
3. Collect and proof local data needed to disaggregate the forecasts; and
4. Develop consensus on the final disaggregated forecasts.

Several options to develop the new county level forecasts were reviewed and discussed by the FTAC. Three of the options were selected for further consideration; they were: the 1997 AMBAG Forecast methodology; the Association of Bay Area Governments (ABAG) "Projections 2002" methodology; and the use of forecasts from Woods & Poole Economics, a commercial forecasting firm.

Each of the three forecast options used similar methodologies to forecast population and employment. The accuracy of past forecasts was reviewed. Historical forecasts covering Monterey, San Benito and Santa Cruz Counties were available for AMBAG and Woods & Poole Economics. The historical accuracy of ABAG's forecasts was available for the 9-county San Francisco Bay area. The 1997 AMBAG forecast was the most accurate with a 2.27% difference between the forecast for year 2000 and the 2000 U.S. Census results for the region. Woods & Poole Economics' 1997 forecast had a 6.5% variation from the 2000 U.S. Census making the Woods & Poole forecasts the least accurate of the three options. The accuracy of the county level forecast from all three options was decided to be acceptable for the purposes of this effort. The forecasts available from Woods & Poole Economics had two significant advantages over the other two options. The first advantage was they were already complete and available at the county level, allowing the allocation process to proceed. The Second advantage was the considerable cost savings from using commercially available forecasts vs. hiring a forecasting consultant freed up funds and staff time to focus on developing more accurate local forecast allocations. At the recommendation of the FTAC, the AMBAG Board of Directors elected in February 2003 to proceed using the forecasts from Woods & Poole Economics. The forecast methodology supplied by Woods & Poole Economics is attached as Appendix A.

Housing units were not directly forecasted as part of the Woods & Poole Economics' commercial forecast. The final housing unit forecasts included in the 2004 AMBAG regional forecasts was produced using a combination of data from Woods & Poole Economics and the 2000 U.S. Census. Woods & Poole Economics provided forecasts for numbers of households and persons per household. Housing units, numbers of households, persons per household, housing vacancy rates, and seasonal ownership data is available from the 2000 U.S. Census. The relationship of households and other housing related data to the actual number of housing units in a given area was calculated using the 2000 U.S. Census data. The resulting calculations were used to convert Woods & Poole Economics' forecast of the number of households into a forecast of housing units. The final AMBAG forecast of housing units was further adjusted to reflect revisions to population forecasts in various jurisdictions.

As part of the allocation and adoption process the initial county level forecasts from Woods & Poole Economics were revised. In 2003, U.S. Census Bureau data reported lower than forecasted employment in Santa Cruz and San Benito Counties. The year 2005 forecast period in the AMBAG 2004 regional employment forecast was reduced for Santa Cruz and San Benito Counties to reflect the U.S. Census Bureau's data. Forecasts for the 2010 through 2030 period remained unchanged. Monterey County's employment forecasts as produced by Woods & Poole Economics were consistent with the new Census Bureau data, so weren't altered. The population and housing unit forecasts were revised as a result of the constraints analysis and requests from individual jurisdictions. The final forecasts numbers received the consensus of the FTAC and were approved by the AMBAG Board of Directors on April 14, 2004.

## **V. Forecast Allocation Process**

Although the 1997 AMBAG Forecast was exceptionally accurate in predicting the region's population in the year 2000, the 1997 AMBAG Forecast allocation to the city level and to the Transportation Analysis Zone level was significantly less accurate. (See Appendix A: Accuracy of Past Forecasts.) At the city level the difference between the 1997 AMBAG Forecast and the 2000 U.S. Census ranged from 1% to over 16%. At the Transportation Analysis Zone level, the absolute average error region wide was 142%. The trend for less accuracy as the forecasted area becomes smaller is expected and is considered a fundamental rule of forecasting. The intent of the FTAC in recommending an off-the-shelf commercial forecast was to devote more time and effort towards improving the process of allocating the forecast to smaller geographic areas.

The Forecast Technical Advisory Committee considered three options to allocate the county level forecasts down to Transportation Analysis Zone (TAZ) levels. The three options were: to follow a revised 1997 forecast allocation process, to use commercially available urban planning "visioning" software products that included tools to allocate growth in land use scenarios, or to develop an in-house growth allocation modeling

process. The revised 1997 forecast allocation process would use the FTAC as an expert panel in a "Delphi" process that follows iterative steps to achieve consensus on the allocated forecasts. The commercially available urban planning "visioning" software products such as "What If" or the "Urban Landuse Allocation Model" include tools to allocate growth in land use scenarios. All of the commercial products reviewed would have required modifications and/or consultant assistance to meet the needs of the AMBAG forecast allocation process.

The FTAC elected to develop an in-house growth allocation modeling process. This option took advantage of the extensive land use and general plan data available locally using Geographic Information System (GIS) software. A location choice decision making process was developed by AMBAG staff that allowed the FTAC to identify and weight the variables that affect growth. These variables were used to calculate the likelihood of development being attracted to available land. Variables include: existing land uses, general plan designation, vacant land, existing employment, transportation accessibility, and land value. These variables were calculated for every parcel of land in the three counties using Geographic Information System (GIS) software. Parcel level data was summarized into Transportation Analysis Zones (TAZs.) A compilation of the variables creates a utility factor that allows the relative attractiveness of one Transportation Analysis Zone to be compared to the other Transportation Analysis Zones in the county or region. Model results for population, housing units and employment allocations to Transportation Analysis Zones were printed and distributed to jurisdictions for review. Changes were made to the forecasts to reflect additional information provided by jurisdictional representatives. Revised versions were distributed to jurisdictions for final review and consensus. Appendix D provides a more detailed overview of the forecast allocation process.

The first complete allocation of the Woods and Poole Economics forecasts to all forecast periods (2000, 2005, 2010, 2015, 2020, 2025, and 2030) were unconstrained by facilities, resources, or growth control policy limitations. Each jurisdiction and special district in the three-county region was surveyed about the potential for growth constraints. A summary of the growth constraints affecting various jurisdictions is attached as Appendix E. The second version of the allocated forecasts was constrained by the reported limitations such as lack of water, sewer treatment plant capacity, and growth control policies. In the case of Santa Cruz and San Benito Counties, the original Woods & Poole Economics forecasts were reduced to match growth limitations. In Monterey County growth was shifted from the Monterey Peninsula, an area with very limited water supplies, to other areas in the county which have excess capacity for growth.

The final products of the forecast allocation process are the following variables for each Transportation Analysis Zone:

- Total population

- Total number of housing units
- Farm employment
- Industrial employment
- Retail employment
- Service employment
- Construction employment
- Government/Military employment
- Total employment

These variables are required as data input into the trip generation component of the Regional Travel Demand Model. The AMBAG Board of Directors adopted constrained population, housing units and total employment forecasts summarized at the jurisdiction level at their April 14, 2004 meeting.