Metropolitan Mayors Coalition Regional Housing Task Force Housing Production Target

Methodology

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Metropolitan Area Planning Council

METHODS

The regional housing production target is informed by MAPC projections of employment growth, labor force, and demographic change. The Metropolitan Mayors Regional Housing Demand Projections were used to develop a range of scenarios of the number of housing units needed in 15 study municipalities between 2015 and 2030. The fifteen municipalities included in this housing target are: Arlington, Boston, Braintree, Brookline, Cambridge, Chelsea, Everett, Malden, Medford, Melrose, Newton, Quincy, Revere, Somerville, and Winthrop and from here on out will be referred to as Metropolitan Mayors Communities (MMC).

The projections of total housing demand are a combination of the demand associated with the net change in working households, demand associated with the net change in non-working households, and the amount of units needed to create and maintain a healthy vacancy rate. The three components of the projection are described separately, below.

Working Households

Working households are defined as those with at least one wage earner, and in which the principal wage earner is not a student currently enrolled in school. In this analysis, the number of working households in the MMC is a function of both employment growth (by industry and occupation) and change in commuting patterns. We developed three employment scenarios and three commuting scenarios which can be combined for a total of 9 composite scenarios.

The employment scenarios were all based on historic average yearly employment growth by industry sector. The first scenario includes two Massachusetts recessions and includes the change in employment from 2001-2002 through 2015-2016. The second scenario includes one Massachusetts recession and includes the change in employment from 2007-2008 through 2015-2016. The last scenario reflects the most recent economic boom in the Inner Core and includes the change in employment from 2009-2010 through 2015-2016. The growth rates by industry under each scenario are in the table below.

Industries	**Average Yearly 2002-2016**	**Average Yearly 2008-2016**	**Average Yearly 2010-2016**
Construction	-1.2%	1.7%	4.7%
Education and Health Services	2.3%	2.2%	2.4%
Financial Activities	-0.5%	-0.4%	-0.1%
Public Administration	-0.9%	-0.7%	-1.3%
Information	-1.4%	1.3%	2.1%
Retail, Leisure, and Hospitality	1.2%	2.0%	2.8%
Manufacturing	-4.1%	-2.6%	-1.5%
Other Services	0.6%	0.1%	-0.8%
Professional and Business Services	0.9%	1.9%	3.4%
Trade, Transportation, and Facilities	-1.2%	-0.2%	0.6%

These growth rates by sector were applied the 2015 employment base and compounded for a 15 year period to yield projected 2030 employment by industry. To determine employment by occupation for 2030, MAPC applied an industry-occupation matrix custom tabulated for the MMC municipalities by the Executive Office of Labor and Workforce Development. This matrix was used to determine the future year employment by occupation.

2015 ES-202 Data was used to as the base year employment count by industry. The same matrix was applied to this employment to determine 2015 employment by occupation. The difference between the future scenario and the 2015 base was used to estimate the net change in workers by occupation from 2015 to 2030.

In-commuting by occupation was the other dimension of the scenarios. We used 2000 Census Public Use Microdata Sample[1] (PUMS) data and 2007-2011 ACS PUMS data to estimate the percent of jobs in the MMC filled by MMC resident workers for each year. We then calculated the percentage point change in in-commuting for the decade between 2000 and 2010 (using the 2007 – 2011 PUMS data as a proxy for 2010). Overall, the share of MMC jobs filled by MMC workers increased by 1.7 percentage points between 2000 and 2010. Changes for each occupation varied, but 17 out of 25 occupations analyzed saw a decrease in incommuting shares. With this in mind, we created three scenarios for future incommuting/resident worker share, all of which assume some continued increase in the share of jobs filled by resident workers. With the 2007-2011 share of resident workers as the base, the three scenarios were created by adding a specified percentage point increase in resident workers, per decade, to each occupation. The first scenario assumes a .5 percentage point increase per decade (slower than the 2000 – 2010 period), the second assumes a 1.7 percentage point increase per decade (same as the 2000 – 2010 period), and the third assumes a 2.5 percentage point increase per decade (faster than the 2000 - 2010 period.)

Once the future shares of resident workers/incommuters, by occupation, were calculated, they were applied to the both the base year (2015) employment and the future year (2030) employment to estimate the total number of workers, by occupation, living in the MMC. Estimates for the two years were compared to determine the estimated change in resident workers, by occupation, over the 15 year forecast period.

Based on the 2007 – 2011 data, MAPC estimates that 363,000 workers, or 40% of the total resident workers, commute from home locations in MMC to job sites elsewhere. We assumed that the number of MMC residents who commute to jobs outside of the MMC area will remain constant between 2015 and 2030. (Since the total resident workforce increases under any scenario, this translates to a declining share of resident workers outcommuting, with the specific decline contingent on the resident worker increase.)

Once the change in the number of workers by occupation has been estimated, MAPC estimated the number of associated households based on the likelihood that a worker in a given occupation is the principal earner in his/her household. These rates were based on 2009-2014 PUMS data, using methods MAPC has used in prior efforts[2]. Net new households were further disaggregated using household income category

[1] The geography used for all analysis of PUMS data is slightly different than the MMC. 12 of the 14 Metropolitan Mayors Cities are captured in the PUMA data, excluding Melrose and Braintree for all three time points. Using these geographies also includes data from Milton, which is not a Metropolitan Mayors community.

[2] Urban Land Institute. *Building for the Middle: Housing Greater Boston's Workforce*. Boston: Urban Land Institute, 2016. https://boston.uli.org/building-for-the-middle/

distributions for each principal earner by occupation. The distributions were created using PUMS 2010-2014 data in which households were tabulated by principal earner occupation, size, and income (dollar value) and then assigned an income classification using income-size specific breaks determined by the US Department of Housing and Urban Development for 2014. An assumption inherent in this method is that the principal earner rates, household income, and household size characteristics by occupation remain constant over time.

Non-Working Households

Non-working households are defined as those with no wage earner, or households in which the principal wage earner is also a student currently enrolled in school. The first step of understanding non-working households was to determine the number of all households by age that were in the MMC in 2015. We used 2012-2016 ACS 5-year estimates at the municipal level to create an estimate of households by householder age in 2014 (the mid-point of the five year estimate period.) We then used the Census Population Estimates for 2014 and 2015 to determine a percentage growth in population. That percentage growth was applied to all households by householder age in 2014 to come up with an estimated households by householder age in 2015. The change in households between this 2012-2016 ACS estimate of 2014 and the adjusted 2015 number was compared to the number housing units permitted in 2014 according to the Census Building Permit Survey and the estimated change in households using this method was 2.1% higher than the number of units permitted in 2014.

To estimate the number of non-working households in 2015 and 2030 we used the 2012-2016 PUMS and MAPC's Stronger Region Projections published in 2014. 2012-2016 PUMS data was used to determine the percentage of non-working households by householder age and their associated likelihood to be in a particular AMI category (using the 2014 income/size breaks published by HUD.) These shares were applied to the estimated 2015 households by householder age estimated in the previous paragraph. These shares were also applied to MAPC's Stronger Region Projections of households by householder age in 2030 for the MMC. The difference between the two estimates allowed us to create an estimate of the change in nonworking households by AMI category between 2015 and 2030.

Vacant Units

The 2012-2016 ACS 5-year estimates were used to develop a 2015 estimate vacancy rates for owner and rental units. Vacancy rates are calculated as the percent of units that are vacant and for sale or for rent, divided by the total number of units either occupied or for sale or for rent. Units that are sold or rented but not occupied, units for seasonal or occasional use, and other vacant units are not included in the calculation. This share of owner and renter occupied housing units was applied to the total household estimate created for 2015 to estimate the number of additional vacant units needed, by tenure, in 2015 to achieve a healthy vacancy rate. The 2012-2016 ACS data indicates the 2015 vacancy rates for the MMC are .85% for owner units and 3.0% for rental units. At MAPC's recommendation, the Housing Task Force agreed to set target vacancy rates of 1.5% and 6% for rental and owner units, respectively. These rates were developed based on consultation with academic and industry experts, and are consistent with the vacancy rates used for the City of Boston's 2030 Housing Plan Update. Using this method, we estimate that the number of additional vacant units needed, by tenure, to achieve the target vacancy rate for the existing stock would be 9,900 rental units and 1,600 ownership units.

MAPC also estimated the additional vacant units that would be needed over time to maintain the target vacancy rate as the housing stock grows. We used the owner/rental mix identified in the 2014 Stronger

Region Projections for the MMC to determine a weighted average vacancy rate of 3.5% for all housing growth between 2015 and 2030. This vacancy rate was applied to household demand of every AMI equally.

Total Unit Demand

Using the methods outlined above created a Housing Unit demand for working households, non-working households, and future vacancy needs by AMI for the MMC between 2015 and 2030. The units needed to create a healthy vacancy rate in 2015 are not broken out by AMI. The Metropolitan Mayors Housing Commission working group chose a scenario of future employment growth and in-commuting based on the recommendations from MAPC staff to come up with the final target. This scenario assumes the average yearly employment growth from 2008-2016 persists and there will be a 2.5 percentage point increase in resident workers as a share of all MMC workers per decade.