

2015-2040 PROJECTIONS METHODOLOGY

UPDATED 08/28/15



The 2040 growth projections are based on land use “zoning capacity” and growth rate assumptions. The Boulder Valley Comprehensive Plan (BVCP) has a planning timeframe of 15 years but calls for growth projections to extend 25 years out from the most current update of the plan.

Background

The growth projection model has been continually improved over the past 15 years. In 2002, as part of the Jobs to Population project, the city developed a new projections methodology. Growth projections before 2002 were done by identifying vacant land, opportunity sites and areas of anticipated growth. At that time, a review of the method determined that it was not very accurate. One of the defined roles of the Jobs to Population Task Force was to examine the growth projections, methodology and assumptions, and to offer advice on how to improve the accuracy and quality of the projections. The task force reviewed and provided guidance on developing a new method of projections, using a combination of a “land use model” and an “economic model.” They requested examination of the total non-residential development that could occur under existing zoning. This zoning capacity (or buildout) number is useful to determine whether building under our current zoning regulations results in the amount and mix of development that is desired for the future, and has no time frame associated with it. This land use and economic model method has been used in our growth projections since the Jobs to Population Task Force recommended this approach. The 25-year projections are based upon this zoning capacity information supplemented by growth assumptions and input from DRCOG, the State Demographer’s Office, and local and state economists.

In 2015, the city slightly refined its methodology and began to use CommunityViz software to enhance the capacity calculations. The refinements include:

1. A more accurate estimate of current employment using refined source data and calculations
2. A more accurate estimate of future residential zoning growth capacity and future growth of mixed use zones due to the modeling capability of CommunityViz

Projections results are published at the BVCP Planning Area level, with additional detail on zoning capacity at the subcommunity level. Geographic areas smaller than subcommunities are not appropriate for publication because the mathematical calculations as described in this report are based on averages for entire zoning districts. When the calculations are used for smaller geographic areas the accuracy and confidence in the numbers quickly drops.

Estimating Current (2015) Population and Employment Methodology

The projections begin with establishing an accurate estimate of existing dwelling units, population, and employment. This is done on an annual basis and is summarized below:

Current Dwelling Units

Dwelling Units are maintained on a yearly basis in the city's GIS. Boulder County Assessor data is used for Area II dwelling unit numbers. Each year the map of dwelling units is audited using building permit data to account for new units constructed and units demolished. Any dwelling units added via annexations are mapped/verified. Mobile home counts are audited using data provided by the Boulder County Assessor. Unit counts are verified when possible to the rental license and accessory unit databases.

Group quarters population is taken from the city's annual census of group quarter facilities. Group quarters include dormitories, sororities and fraternities, jail, skilled nursing facilities, and group home shelters.

Current Population - Census Bureau Method Applied to City Data

1. An occupancy rate is applied to the existing dwelling units (based on the latest Colorado State Demographer's Office estimate. For 2015 projections the rate used was 97.59%). A persons per household factor is then applied to the occupied dwelling unit number. The current factor is 2.16 persons per household (2010 U.S. Census). These factors are revised and verified with every decennial census.
2. The population living in group quarters facilities is then added, to give a total current population estimate.

Current Employment

Current employment is comprised of the total number of wage and salary jobs occurring geographically inside the city limits and Area II plus an estimate of self employed jobs based on a percentage of the employed labor force.

Wage and Salary Jobs

The city uses Bureau of Labor Statistics data from the Colorado Department of Labor and Employment to establish the base employment. This data is from the Quarterly Census on Employment and Wages (QCEW, formerly ES-202), which is reported by 98% of all businesses. The data is mapped using the supplied latitude/longitude values and basic Q/C is performed for the historically known employers for which the map coordinates are incorrect. For the most part this geographic correction constitutes the Federal Labs. For firms that do not have latitude/longitude values supplied the address is geocoded in the GIS to garner a coordinate pair. Firms that do not have an address that can be geocoded are discarded. This constitutes about 1.4% of distinct firm locations for Boulder County. The employment numbers are aggregated as a 12 month average for each distinct firm location. This 12 month average is used to summarize the current employment for each geography reported.

In 2015, as a result of the city's effort to refine estimates, the existing employment estimate is lower than the previous methodology would have reported. It was determined that some jobs with "Boulder" addresses are actually outside of the city limits. Prior year estimates have not yet been revised to reflect this new methodology. Revision to previous year estimates will be completed in 2015.

Self Employment

Self employment is estimated using the U.S. Census Bureau American Community Survey (ACS) methodology applied to city numbers. The self employed number is obtained by multiplying each year's self employed percentage to the resident employed labor force. The city uses the annual unemployment rate for Boulder County published by the Colorado Department of Labor and Employment. This is the smallest geography for which the rate is published. The assumption is as follows: $((\text{Population} \times \text{Percent of Population 16 and older}) \times \text{Percent of 16 and Older In Labor Force}) \times \text{Percent of Labor Force Employed} \times \text{Percent Self Employed}$

The city is using the definition of self employed as used in the American Community Survey (for more information please see <http://www.census.gov/programs-surveys/acs/> referenced on 6-25-2015) The number arrived at may not include all self employed jobs for which a person conducts business inside the city limits or Area II nor does this number account for residents who are self employed but conduct all of their business outside the city limits or Area II. By default all self employed jobs are tied geographically to the address for which the person resides regardless of where the business is conducted. This is one limitation on estimating self employed jobs. For projections purposes the city has determined that the ACS methodology is statistically solid and reproducible over time (forward and backward).

An important note on the self employed estimate is that the city does not include all "non-employer" jobs in the self employment estimate. These are jobs that generate income for which an individual is required to file federal income taxes (such as a sole proprietor or someone who files a Schedule C with their taxes). The limitation on this data is that it includes all jobs for which receipts of \$1,000 or greater are reported (greater than \$1 for construction jobs) and the data is only available at the county level. One cannot add non-employer numbers to wage and salary numbers, as it will result in an inaccurately high estimate. For additional information on non-employer jobs please see the Census Bureau's web page (<http://www.census.gov/econ/nonemployer/index.html> referenced on 6-25-2015).

Estimating Future Population and Employment Methodology

Projecting future population and employment uses a detailed set of assumptions and methodologies, based off of the existing estimates, current property information, development constraints, historic growth rates, zoning districts and land use code.

Dwelling Unit and Population Projection Methodologies

Zoning Capacity Methodology for Dwelling Units

Future dwelling unit potential is identified by examining properties where residential use is allowed under current land use regulations, approved area plans and anticipated development projects. For BVCP Area II, future land use is converted to equivalent city zoning districts. A dwelling unit per acre factor and residential to commercial/industrial development mix factors for zones that allow residential uses is then applied to each area where residential use is allowed. These factors are based on the city Land Use Code and historic development patterns. These site-specific and geographic estimates are then used to give an estimate of the total number of additional dwelling units possible taking into account existing dwelling units and existing commercial/industrial development where there is a mix of uses. Additional on-campus student housing planned by the University of Colorado Boulder as identified in the campus master plan is included in this estimate. This establishes the assumed total capacity for future dwelling units under current land use policies and facility plans.

25-year (2040) Projection Methodology for Dwelling Units

The city uses a historic growth rate average (0.6%, roughly 268 units per year) to project additional dwelling units into the future, until the zoning district capacity is reached as described above. For the 2015-2040 projections, this maximum number of units is anticipated to be reached within the 25 year projections timeframe. The total population count is developed using the same occupancy rate and persons per household factor as current population estimates.

Employment Projection Methodologies

Zoning Capacity Methodology for Employment

Future employment potential is identified by examining properties where commercial or industrial use is allowed under current zoning regulations. For BVCP Area II, future land use is converted to equivalent city zoning districts. The zoning capacity is generally developed using the following process:

1. Attribute all parcels where projections should not be made (public land, parks, open space, rights-of-way, etc).
2. Add development constraints into model. Assumption is the conveyance and high hazard flood zones, regulatory wetlands and outlots where no development will occur.
3. Attribute unique parcels which require individual assessment and calculation based on individual property assumptions developed by the city and others.
4. Calculate the existing square footage based on Boulder County assessor data.
5. Calculate existing dwelling units using existing mapping.
6. Calculate remaining capacity. Square footage is calculated using an assumed future floor area ratio (FAR) by zone. FAR assumptions are based on zoning district standards and recent development trends. In areas where redevelopment trends are close to the maximum FAR allowed in the zoning district (e.g., downtown), a figure close to the maximum FAR is used for zoning capacity. In other

areas where redevelopment trends vary (e.g., the Boulder Valley Regional Center), the assumed FAR for zoning capacity is significantly reduced, based on city assumptions developed in 2002. For example, in the BVRC the maximum FAR allowed under existing zoning is 2:1, whereas the projections assume redevelopment up to a maximum of only 0.7:1.

7. Factor the percentage of properties that will redevelop over time (city typically assumes 95%).
8. Calculate an assumed square footage per employee, which was developed with consulting resources and field-verified by city staff (varies from 285 to 600 square feet/employee). (This factor is not used for special projection sites, see #2)
9. Factor in a vacancy rate.

This process results in the zoning capacity (buildout) of employment and dwelling units. This is the “land use model” portion of the projections.

25-year Projection Methodology for Employment

To establish our 25-year projections the city uses an “economic model.” An annual growth rate is applied to the existing employment to project into the future. This growth rate is developed as an economic model with input and information from state economists, the State Demographer’s office, and DRCOG’s regional model. For estimating growth between 2015 and 2040, the assumed annual average growth rate is 0.7%.