

## **COMPASS Population Estimate Methodology**

### **Background/Summary:**

Local population estimates have a multitude of uses and importance to policy makers, planners, and the public. The estimates are used as indicators of economic conditions, for planning and evaluating various government programs, for land development impacts on the transportation network, and to establish COMPASS member dues.

COMPASS develops population estimates for city and county jurisdictions in Ada and Canyon Counties. Since 1990, COMPASS has used a "Housing Unit Method" estimation model to update population estimates. This method is based on the premise that changes in the number of occupied housing units reflect changes in the population. This estimation process is broken into three distinct parts: housing unit estimation, household population estimation, and geographic boundary modification.

### **Calculation:**

Population estimates are calculated as:

$$\text{Population} = [(h + r) * s * o] + q$$

Where:

- h = decennial census households
- r = new residential units permitted
- s = household size
- o = residential occupancy rate
- q = group quarters population

### **Data Sources:**

Decennial census households (h): provided by the 2010 decennial census, includes actual counts, conducted by Census Bureau employees.

Net new residential units permitted (r): provided by local building permit agencies, including all cities and counties within Ada and Canyon counties.

Household size (s): provided by the 2010 decennial census. Household sizes for new residential units are calculated from household sizes from the same geographic area (demographic area).

Residential occupancy rate (o): provided annually by Idaho Power based on observed behavioral changes in individual residential meters from historical non-vacant use. Since usage varies by dwelling type and installed appliances (e.g. electrical vs. gas heat), the methodology models individual historical monthly average use and defines "vacant" as usage below a threshold value. Given normal variations in residential usage, a threshold range is established to minimize false positives while capturing inherent uncertainty (e.g. new appliances, HVAC operational during vacancy). Vacancy, while heuristically developed, are intended to

capture deviation from normal behavior and within the context and purposes of long term planning.

Group quarters population (q): provided by the 2010 decennial census and kept constant between decennial censuses.

## **Population Estimate FAQ**

### **Why does COMPASS publish population estimates?**

COMPASS publishes them as a service to its members. The estimates are useful in understanding current socioeconomic conditions and in planning for municipal services. COMPASS membership dues are based on municipal populations.

### **What are the estimates based on?**

COMPASS population estimates are based, in large part, on the community's housing stock. Information on new construction, including residential building permits, is collected directly from each community and used to update its housing base. Demographic factors and trends, such as occupancy rates and changes in household size, are then applied to the data to produce the population estimates.

### **What method of population estimating technique does COMPASS use?**

Housing Unit. The estimate process is broken into four distinct processes: housing unit estimation, geographic boundary modification, estimating household sizes, and estimating occupancy rates. The estimates are rounded, so are not assumed to be a hard count. The process is run year by year, with each new estimate building off the prior year's estimate.

### **Why does COMPASS use this technique?**

- Housing data is widely available
- This method works well for small area estimates
- The area has experienced a high level of population growth from in-migration
- This method is most widely accepted

### **What community revenues are based on population?**

Many federal, state, and local programs use population estimates produced by other agencies as part of their funding mechanisms. For example, federal programs such as the Department of Housing and Urban Development's (HUD) Community Development Block Grant Program, the Home Investment Partnership Program, and U.S. Department of Education Title I funding (commonly referred to as the Improving America's Schools Act) use population estimates to help allocate funds to communities.

### **What are the differences between how COMPASS and the Census Bureau estimate populations?**

COMPASS uses a "Housing Unit" method. The basic premise is that changes in the number of occupied housing units reflect changes in the population. This method is strong in capturing high migratory and rapidly changing populations. Population

estimates are based on calculated housing units, geographic boundary changes, household sizes, and occupancy rates.

For cities and towns the Census Bureau uses a "Distributive Housing Unit" method, which uses housing unit estimates to distribute the county population to sub-county areas within the county. The Census Bureau uses building permits, estimates of construction where building permit data are unavailable, mobile home shipments, and estimates of housing unit loss to update housing unit change since the last census.

Other differences between COMPASS and Census Bureau estimates include:

- COMPASS produces and releases estimates for cities and counties in the current year dated April 1, the enumerated Census date. The Census Bureau's estimates for the previous year and are dated July 1.
- The COMPASS method relies on building permit data provided by the local governments, whereas the Census Bureau's county estimates use estimates of housing units (estimating new construction, manufactured housing, and demolition).
- The COMPASS methodology allows for sub-county estimates down to the census block level. The Census methodology does not allow for the development of census tract or block level estimates.
- The Census Bureau makes assumptions regarding demolition of housing units based on the relationship between the age of housing and housing loss. These assumptions may not be appropriate for many older cities because of the availability of land to build and an increase in the density of new construction. Research on housing depreciation and loss has shown that age alone is not a good predictor, and that tenure, type of structure, and housing market conditions must be included.
- COMPASS assumes a 90-day lag time between the issuance of a building permit and the creation of units ready for occupancy. The Census Bureau employs a six-month lag time between the issuance of permits and completion of construction. Determining an appropriate lag-time is difficult because lag times can vary from jurisdiction to jurisdiction or depending on the market.
- COMPASS updates occupancy rates by using Idaho Power electrical load rates; therefore, it is assumed when residential units meet a threshold for electrical use then they are occupied, if not, they are considered vacant. The Census Bureau updates estimates of average household size and occupancy rates, which allow for the translation of housing unit changes into population changes. With the one-year samples, the Census Bureau produces estimates of household size and occupancy rates for geographic areas with populations of 65,000 and more.
- The Census Bureau assumes 98% of permitted buildings are completed and available for occupancy. COMPASS assumes all permitted buildings are completed and available for occupancy.

**When will there be a new census performed?**

Every 10 years the United States Census Bureau conducts its decennial survey. For more information about how COMPASS and local governments are participating in the decennial census visit <http://www.compassidaho.org/prodserv/luca.htm>.

**POPULATION ESTIMATE METHODOLOGY  
COMPASS AND CENSUS BUREAU COMPARISON**

	<b>Census</b>	<b>COMPASS</b>
<b>Methodology</b>	Component of Change Method. The Census Bureau produces state-level estimates based on the latest census population (2010) using administrative records data on births, deaths, and domestic and international migration then models county and city-level population estimates based on migration flows by age cohort and building permits.	Housing Unit Method. COMPASS produces local and county estimates based on the latest census population (2010) and evaluates population changes based on actual new residential building permitting (construction, demolition, and conversions) then applies household size and occupancy rates based on demographics within proximity (Traffic Analysis Zone).
<b>Housing Estimation</b>	Housing starts are based on the Building Permits Survey (BPS) which surveys permit offices' new housing units and models a percentage of demolitions by national trends.	Housing starts are received from local building permit offices. Actual demolitions are also received from local building permit offices (not modeled).
<b>Vacancy Rates</b>	Not used.	Based on Idaho Power electrical load rates.
<b>Household Size</b>	Modeled based on state administrative records (births and deaths).	2010 Census persons per household, reviewed by local experts (see "Reviewing/Vetting").
<b>Geographic Boundaries</b>	January 1, 2015, city limits.	December 31, 2015, city limits.
<b>Group Quarters</b>	Census uses 2010 census counts of group quarters, then collects survey data at the state level and allocates to counties and cities because "there is an insufficient group quarters sample to produce estimates for these smaller areas." <sup>1</sup>	COMPASS also uses 2010 census counts of group quarters population, then adds actual building permit data for group quarters.
<b>Date of Estimate</b>	July 1 of estimate year	April 1 of estimate year, based on annexations and building permits occurring in previous year.

<sup>1</sup> [http://www.census.gov/acs/www/Downloads/user\\_notes/GQSAE\\_User\\_Note.pdf](http://www.census.gov/acs/www/Downloads/user_notes/GQSAE_User_Note.pdf)

	<b>Census</b>	<b>COMPASS</b>
<b>Reviewing/Vetting</b>	Internal review only.	COMPASS Demographic Advisory Committee comprised of local government land use planners, realtors, builders, and other stakeholders with local knowledge of building trends.
<b>Final Product</b>	City and county population estimates.	Population estimates at many geographic level to match local political boundaries, including city limits, City Area of Impacts, highway district boundaries, and others.
<b>National and State Data</b>	Census provides national, state, and city population estimates for the entire 50 states.	COMPASS only estimates for cities and counties