Annual SDC Population Estimates Methodology

The production of population estimates for all cities and townships in the state is a statutory requirement shared by the State Demographic Center (SDC) and the Metropolitan Council (Minnesota Statutes 2023, 4A.02). The Metropolitan Council produces estimates for all cities and townships within the seven-county Twin Cities metropolitan area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington counties) and the State Demographic Center produces estimates for the balance of the state. The estimates refer to the total number of households and total population as of April 1 to align with the decennial census count. The methodology described here pertains to the estimates produced by the SDC; the Metropolitan Council uses a different methodology for its estimates.

Steps in the Estimates Process, in Brief

Collect data inputs

1. For years ending in zero, e.g. 2020, the U.S. Census Bureau's decennial census count is used as the population estimate. No adjustments are made to the decennial census count for these years. For years ending in one, the most recent census count serves as the base. For years ending in two through nine, the previous year's population estimate serves as the base.
2. Building permit data are obtained from the U.S. Census Bureau's Building Permit Survey (BPS). The BPS is an annual survey of local governments in the U.S. and gathers information on new residential construction.
3. The SDC requests building permit data from local governments in the BPS sample frame, if their data are missing or incomplete in the U.S Census Bureau's BPS.
4. Data are obtained from the Office of Administrative Hearings documenting all municipal boundary changes that have occurred in the past year.
5. The SDC surveys all local governments that have gained territory through annexation to collect the number of housing units and population gained.
6. Data from the Minnesota Department of Revenue's Property Record Information System of Minnesota (PRISM) are obtained for any city or township that did not have complete data in the U.S. Census Bureau's BPS, was not part of the BPS universe, did not respond to the SDC's request for information, or are areas that do not issue building permits.
7. The SDC collects the total population living in group quarters from large individual group quarters facilities. For years in which facilities do not respond to SDC requests, the previous year's total population is used.
8. The average number of persons living in each household—persons per household (PPH)—is obtained from the U.S. Census Bureau for each geographic area at the beginning of each decade.
9. The housing vacancy rate is obtained from the U.S. Census Bureau for each geographic area. This is used through the decade to adjust the number of housing units added through the BPS and other sources.

Data processing

10. The data received from local governments (steps 3 and 5 above) are combined with data from the U.S. Census Bureau's BPS and added to the estimates base from the previous year. The estimate of the total number of households is equal to the estimate from the previous year's base plus the results of the BPS and any annexation data received.
11. The PPH figure from the previous year's estimate is applied to the new household estimate to get a new total population living in households.
12. The total population living in group quarters is added to the total population living in households to arrive at the new total population for an area.
13. Local areas are summed to the county level and that result is compared to the annual Census Bureau's county population estimates. Local area populations are adjusted such that their sum equals or is close to the Census Bureau's county estimate. This can result in an increase or decrease of the population. This adjustment helps account for the effects of population dynamics that are muted by a pure housing unit estimates method.
14. Estimates of each area's population and household totals are provided to each entity's clerk or administrator by June 1st. Each area has until the statutory deadline of June 24th to appeal the estimates. Appeals are processed and final estimates are sent to the Department of Revenue by the statutory deadline of July 15th.

Detailed Steps in the Estimates Process

The Population and Household Base

The first step in the estimation process is to bring the previous set of estimates forward as the base for the current set of estimates. Using the previous set of estimates preserves improvements that would not be retained if the estimates were produced anew each cycle.

The first element that is preserved by bringing the previous estimates forward is any adjustments that are made through challenges that were successfully submitted by local governments in the previous year(s). The challenge process occurs annually and provides local governments the opportunity to supply supplementary documentation to be considered prior to publication of the finalized estimates. These adjustments are permanent until the next decennial census, so bringing them forward annually ensures that these adjustments do not need to be revisited on an annual basis.

Another consideration in bringing forward the base from the previous year's estimate is the preservation of the previous year's persons per household (PPH). Generally, the PPH and occupancy/vacancy rates from the most recent decennial census are used over the course of the entire decade. However, when there are adjustments made through the challenge process, because of building/demolition, due to changes in municipal boundaries, or due to indicators of larger population movements, those adjusted ratios should be preserved.

In sum, bringing forward the estimates base from the previous year helps to provide consistency and improve accuracy of the estimates. It also ensures that the concerns of local governmental units are addressed, and the results are preserved in the estimates process.

U.S. Census Bureau Building Permit Data

The U.S. Census Bureau conducts and publishes data from its Building Permit Survey (BPS). Details on the BPS can be found here: U.S. Census Building Permits Survey.

The SDC obtains the data for one year prior to the estimates year for use in the estimates process. These data are available through the link above and are provided for both monthly and annual timeframes. The annual data are used for cities and townships that reported a full 12 months of data. Those data are calendar year, January to December. The lag in the data works out such that the estimates that were produced in 2024, which estimated the 2023 population, used the 2022 building permit data.

The data from the BPS represent the number of building permits that were issued by the governmental unit in the reporting year. These data are used to modify the household estimate for the reporting locality in the new estimates year. We assume that housing units for which building permits are issued will be completed and ready to be occupied with new residents by April 1st of the new estimates year. This assumption allows the SDC to update the estimate of total households without determining a building completion rate, which would be impossible for many areas across the state.

Local Building Permit Data

Since the U.S. Census Bureau's BPS does not have universal response, there are data gaps that must be filled by requesting data from local officials. Generally, the Clerk or Administrator are contacted and asked to provide building permit data for the reference period for places in the BPS universe. Letters and forms are sent to any local official who has either no data in the BPS data or whose area has less than 12 months of data in the BPS.

The contact information for the local officials is purchased annually from the League of Minnesota Cities and the Minnesota Association of Townships. These organizations maintain up-to-date lists of local contacts that have proven to be comprehensive.

Data on Boundary Changes

Data on municipal and township boundary changes for the estimates period are obtained from the Office of Administrative hearings at: Municipal Boundary Adjustments

Governmental units that had a boundary change in the previous calendar year are identified.

Housing Unit and Population Data from Annexed Areas

Data are collected from the Clerk or other local administrator for areas that gained territory due to a boundary change in the past year. Administrators are asked to report the number of housing units and population that were affected by the boundary change. Those data are used to shift households and population to the correct geography later in the process. The contact information of local administrators is taken from the purchased lists described above.

Annexation and BPS Data are Combined

Data from local administrators regarding building permits and annexations are combined into a file that provides the number of households that have been added or subtracted from an area in the past year. Annexations occur every year, but to a relatively small number of cities or townships. If an annexation occurred in an area, the number of households reported by the local administrator is added to the vacancy adjusted number of building permits to arrive at the total household change for an area.

PRISM Data

A file is requested annually from the Minnesota Department of Revenue's Property Record Information System (PRISM). These data contain the total number of homestead exemptions reported to the Department of Revenue (DOR), which are used as a proxy for the total number of households by local governmental unit. They are used to account for the change in households for areas that do not have reported building permit data or do not respond to the SDC's requests for information. These data are also used for jurisdictions that do not issue building permits or do not have functioning governments (e.g. unorganized territories).

The total number of homestead exemptions is compared to the number of exemptions in the previous calendar year. The numeric difference in the number of homestead exemptions is assumed to reflect a change in the number of households since the previous year.

Being that these are used as a proxy for households, they are not adjusted for vacancy. If an area requires the use of the PRISM data but also has an annexation change, those changes would be summed and applied without adjustment as a change to the number of households in an area.

More information on PRISM is available here: PRISM - Property Record Information System of Minnesota

Data on Group Quarters Facilities

Each year the SDC collects data from large group quarters (GQ) facilities. These facilities include prisons, college dormitories, certain clerical residences, and mental health facilities. Administrators are asked to report the total number of residents living in their GQ. For GQs that do not respond, the population from the previous year is used.

These data are collected and analyzed for year over year change. The observed numeric change is applied to the group quarter population for each municipality that contains one of these large GQ facilities.

The change is summed with the previous year's GQ population by locality to determine the current year's GQ population.

Carrying forward or rebasing the estimates

For a year ending in zero, e.g. 2020, the most recent decennial data are used, and the estimates are not carried forward from the previous year. This is the once a decade rebasing of the estimates that realigns them with most federal and state guidelines, and provides the starting point for estimates produced for years ending in one.

For a year ending in two through nine, the previous year's final estimates are used as the starting point for the new estimates. This leaves in place the most recent vacancy and person per household (PPH) data that were used/observed when previous years' estimates were created. This is done to account for any changes that may have been brought into the process through estimates challenges or other adjustments.

Producing an estimate for households and the household population

The total number of households is determined at the city or township level. The previous year's estimate of households is the starting point for the new estimate of the total number of households. The total number of households from the previous year is adjusted upward or downward by applying the numeric change in households from either the BPS, the local building permit data, or the PRISM system.

Following the addition or subtraction of units from the BPS/Local Building Permits/PRISM data, households are added to or subtracted from the appropriate localities for areas that have experienced boundary changes.

The result is the new estimate of the total number of households. This total is then multiplied by the locality's most recent estimate of the number of persons per household. In years ending with two through nine, the PPH is from the previous years' estimate. Note that in years two through nine, a locality's PPH may have changed compared to the most recent decennial PPH because of challenges or other adjustments made by the SDC. For years ending in zero and one, the PPH comes from the decennial census as no challenges are processed by the SDC for the census count. Any challenges to the census count are processed by the U.S. Census Bureau.

The products of the PPH and the total number of households is the new initial estimate of the household population.

Adding the Group Quarters to get a preliminary estimate of the total population

The group quarters data are used to determine the change in the total population living in large group quarters located within certain localities. The change in the group quarters population between the previous and current year and the previous year's estimate are added to get the new estimate of the group quarters population.

The sum of the initial household population estimate and the group quarters population estimate is the preliminary total population estimate.

Accounting for other factors in local area estimates

The housing unit method does a very good job of capturing change in housing units and estimating households. It also does a reasonably good job at estimating the household population, however there are issues that cannot be ignored. One issue with a pure housing unit estimate is it is biased toward stability and growth. The inputs are building permits, which are generally positive. Demolitions are often missing when these data are collected from local governmental units. This can be for a variety of reasons, e.g. different permitting requirements for builds versus demolitions. Regardless of the reason, the inputs are largely positive and offer no method of accounting for other dynamics that are at play, even when housing units are being added to the local stock.

Put simply, the housing unit method does not directly account for births, deaths, or people moving, which are the actual drivers of population change. The primary reason is the lack of quality granular data that can track those changes. To bring in data capturing those dynamics we must look to other sources.

The best way to bring in the actual dynamics of population change would be to use births, deaths, and migration as the drivers of change. While that is not possible due to data constraints, it is possible to make cohort-component estimates (accounting for births, deaths, and migration) at the county level, though getting quality county level migration data is still difficult. The Census Bureau's Population Estimates Program (PEP) does produce independent county level, cohort-component population estimates.

To account for the dynamics that are captured in the cohort-component estimates, the preliminary local SDC total population estimates are first summed by county. The new county-level total is divided by the Census Bureau's PEP county estimate. This ratio is then multiplied by the locality's preliminary population estimate to produce the total population estimate for each locality.

The description of this process may sound as though it is meant to limit or reduce the SDC estimates. In practice, the process produces both positive and negative adjustments in different places across the state.

Challenges are processed and estimates are finalized

Preliminary estimates of the total number of households, the household population, and the total population are sent to local officials by June 1 for their review.

Challenges are accepted for as long as is practical for them to be processed in time for their required submission to the Minnesota Department of Revenue (DOR). Generally, that means that they cannot be accepted after the statutory deadline of June 24th. Once the challenges are processed, the new final estimates are provided to DOR. Any locality that challenged their estimates is sent a challenge determination letter with the results. If a local challenge resulted in a change to their estimate, that change is relayed to the local official and the county clerk.

The challenge process is varied based on the data available to local leaders. While not every challenge can result in a change to the estimates, every challenge informs and makes the estimates program

stronger and more accurate. The SDC welcomes the opportunity to receive local input into the process through the challenge process.

Challenges to the estimates must be in writing and must meet the statutory deadlines for submission, however the processing and actual adjustments are myriad based on the interactions of the local governmental officials, the SDC, and the data provided. All challenges must be justifiable by the data provided and must relate to the specific period referenced by the estimates. The professional judgment of the demographic staff of the SDC will make the final determination on justifiable changes to the estimates and what is supported by the data.