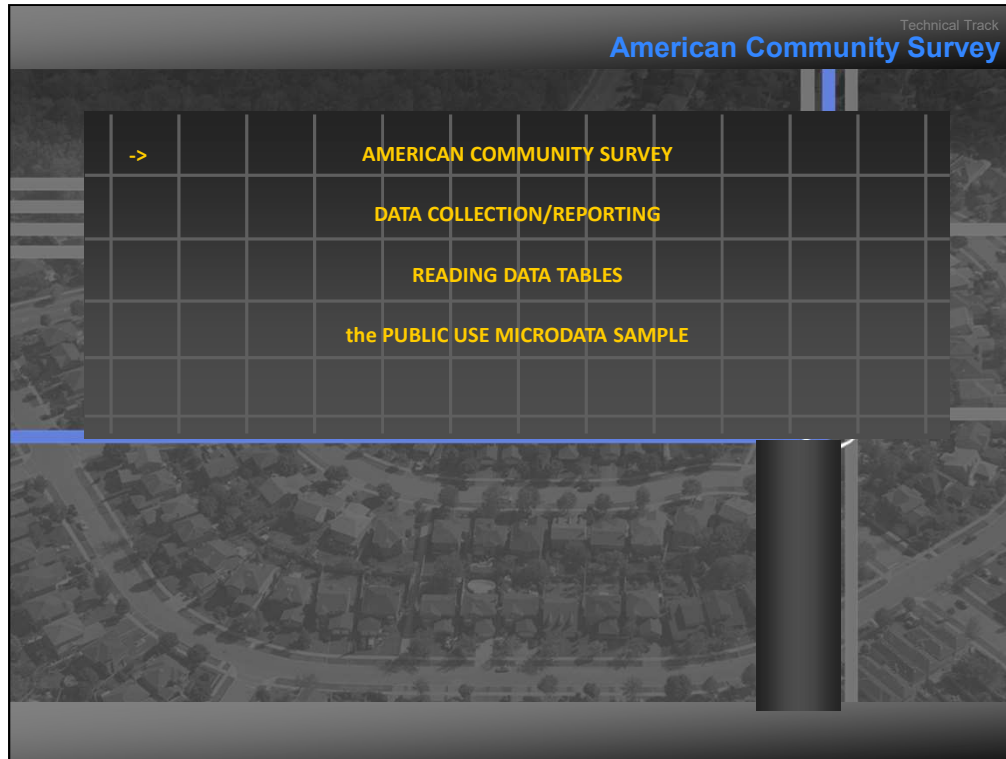


In this module you'll learn about the American Community Survey, or ACS. You are viewing the Technical Track. This module will require about 30 minutes to complete.



This module is presented in four different sections:

- The American Community Survey
- Data Collection and Reporting
- Reading Data Tables, and
- the Public Use Microdata Sample

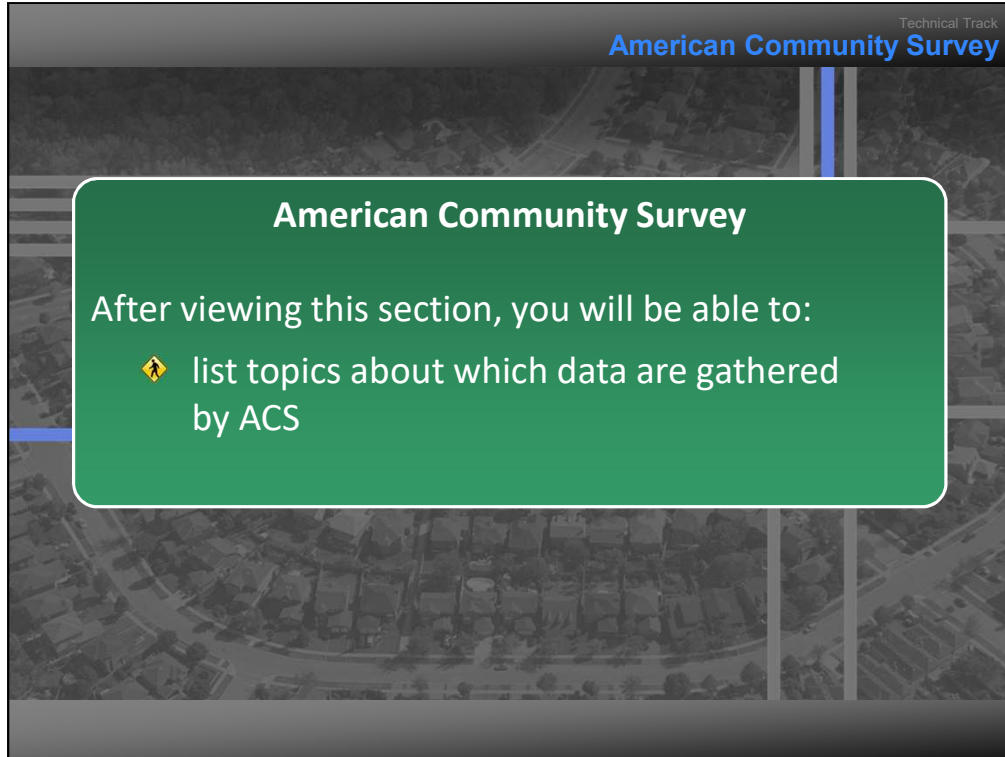
Let's begin by looking at the types of data gathered by the American Community Survey.

Technical Track
American Community Survey

American Community Survey

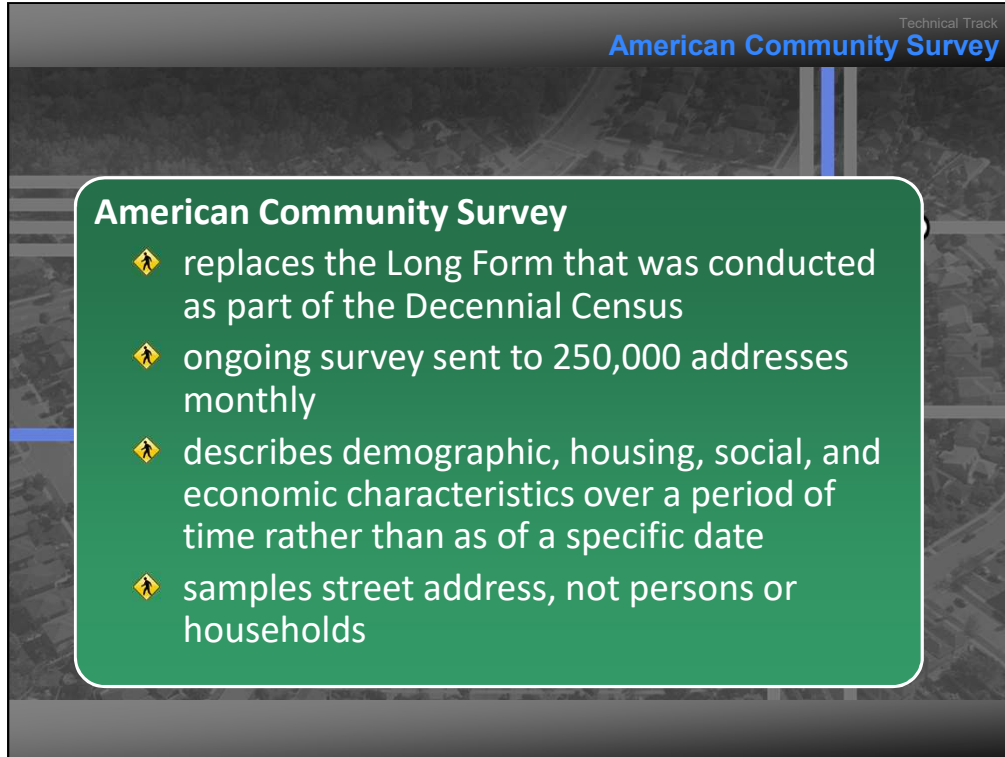
After viewing this section, you will be able to:

- 🚶 list topics about which data are gathered by ACS



After viewing this section, you will be able to list the topics about which the American Community Survey gathers data.

Technical Track
American Community Survey



American Community Survey

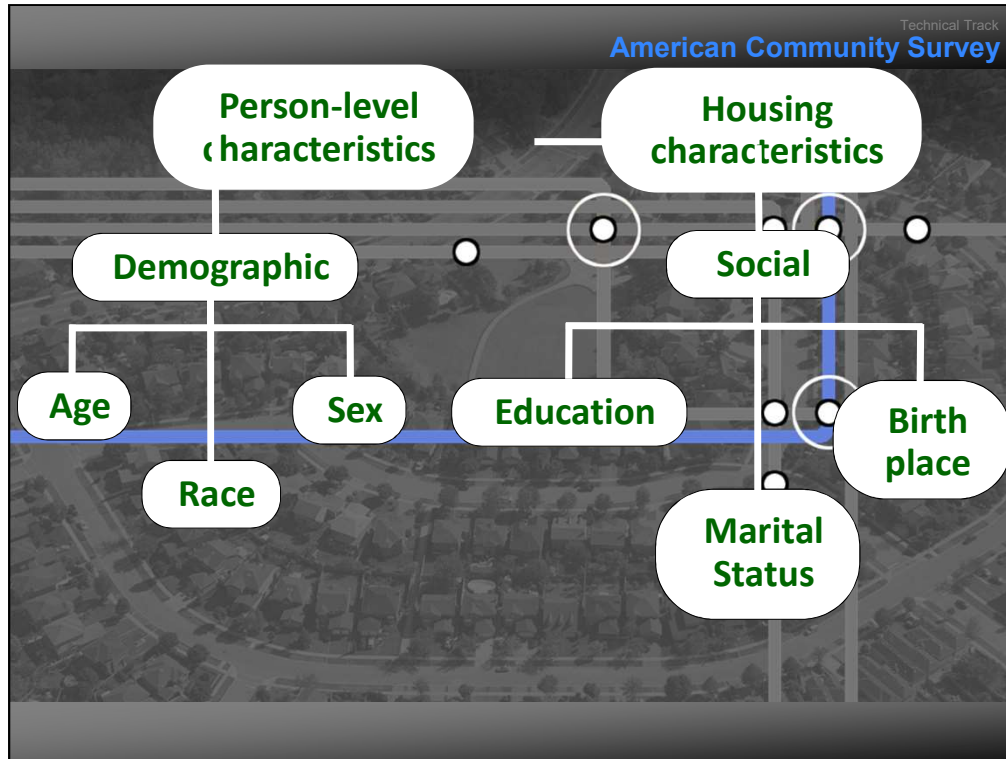
- replaces the Long Form that was conducted as part of the Decennial Census
- ongoing survey sent to 250,000 addresses monthly
- describes demographic, housing, social, and economic characteristics over a period of time rather than as of a specific date
- samples street address, not persons or households

The American Community Survey, or ACS, is a product of the U.S. Census Bureau and replaces the Long Form that was conducted as part of the Decennial Census.

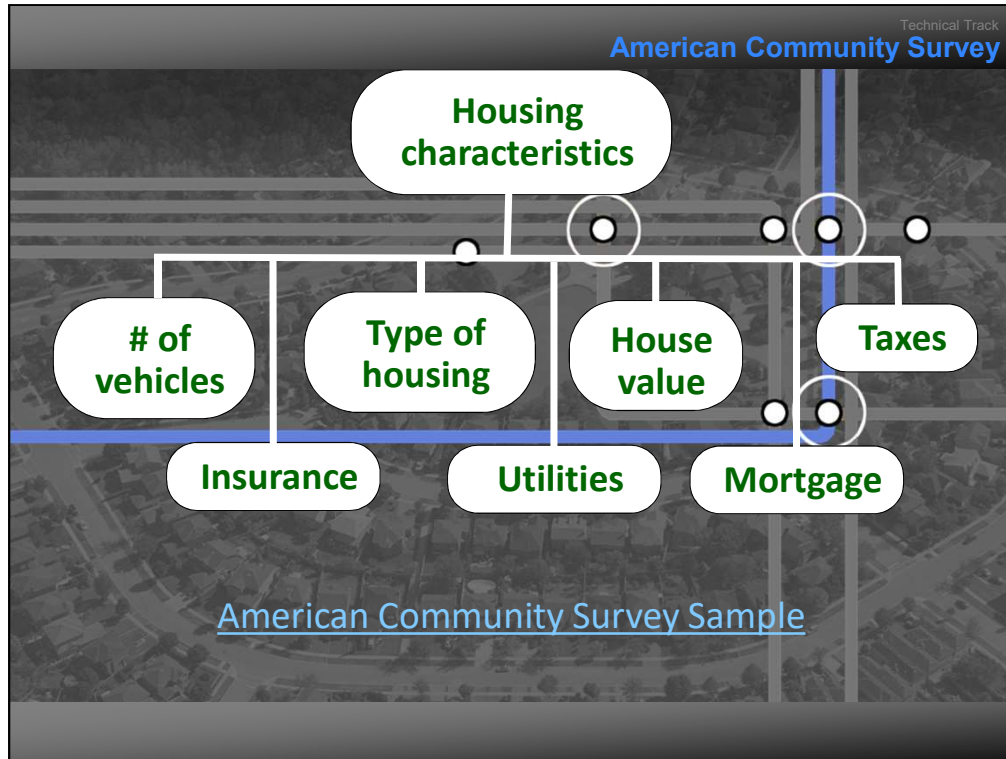
Because the ACS is an ongoing survey, sent to approximately 250,000 addresses monthly, the information gathered by the ACS is more current than information obtained by the previous long form, which was administered once every ten years.

The ACS describes demographic, housing, social, and economic characteristics over a specific period of time rather than as a snapshot on a specific date.

ACS samples street addresses, not persons or households. As a result, if a person or household moves, they could conceivably be included in the sample more than once.



Let's take a closer look at the types of information the ACS collects. The two main parts of the ACS are person-level and housing characteristics. Person-level characteristics fall under two main groupings, demographic and social. Demographic characteristics include age, race, and sex, where social characteristics include data about education level, marital status, and place of birth.



Housing characteristics include data such as vehicles available at the household, whether it is a detached house or an apartment building, the value of the house, the amount of taxes, insurance, utilities, and mortgage paid.

To view a sample of the American Community Survey, and see more about the types of data the survey collects, go to

- (Original, Outdated) <http://www.census.gov/acs/www/Downloads/questionnaires/2010/Quest10.pdf>
- (Relinked) <https://www.census.gov/programs-surveys/acs/methodology/questionnaire-archive.html>

ACS and CTPP

- 🚶 commuting to work:
- 🚶 means of transportation
- 🚶 number of occupants per vehicle
- 🚶 travel-to-work time
- 🚶 workplace location



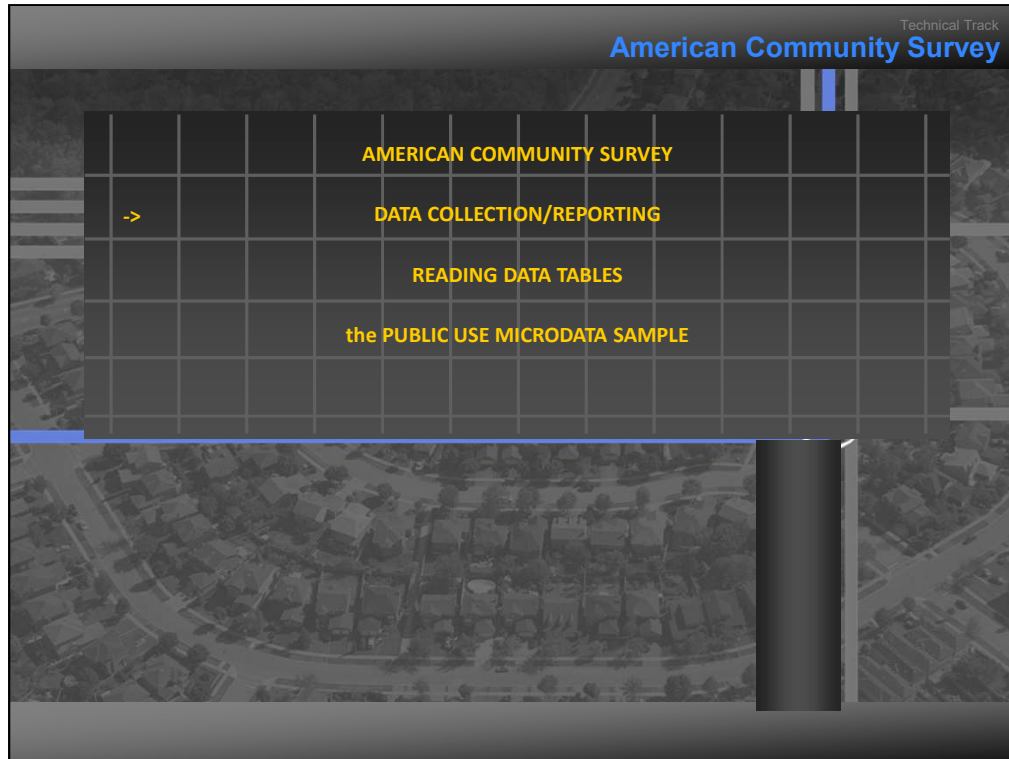
The ACS also collects commuting to work data for individuals, which include their means of transportation to work, the number of occupants per vehicle, the amount of time it takes to travel to work, and the location or place of work.

Field follow-up

- used for people who do not mail the survey back
- Census first tries to reach non-respondents by telephone
- Census sends workers to visit non-respondents in person when telephone correspondences fail



Because the ACS is a mail-out/mail-back survey, a field follow-up is required for the portion of people who don't mail the survey back in a timely manner. If the Census Bureau does not get a response after several mail and phone notices, Census Bureau workers visit a portion of the non-respondents in person.



Now that you know some basics concerning what data are collected by the American Community Survey, let's look at how those data are gathered and reported.

Data Collection and Reporting

After viewing this section, you will be able to:

- 🚶 Explain multi-year data collection and reporting
- 🚶 Briefly explain the process for calculating the ACS multi-year estimates, data weighting, and other controls
- 🚶 Explain the importance of the data universe to the study objective
- 🚶 Explain the tradeoff between data currency and data reliability

After viewing this section, you will be able to:

- explain the ACS multi-year data collection and reporting scheme;
- briefly explain the process for calculating the ACS multi-year estimates, including data weighting and other controls applied;
- explain the importance of the data universe to the study objective; and
- explain tradeoffs between data currency and data reliability that occur when considering the different period estimates.

Technical Track
American Community Survey

ACS period estimates

- 🚶 all ACS estimates are period estimates
- 🚶 ACS reports period estimates for:
 - 🚶 1-year
 - 🚶 3-year
 - 🚶 5-year

2008

January	February	March	April
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
6 7 8 9 10 11	6 7 8 9 10 11	6 7 8 9 10 11	6 7 8 9 10 11
12 13 14 15 16 17	12 13 14 15 16 17	12 13 14 15 16 17	12 13 14 15 16 17
18 19 20 21 22 23	18 19 20 21 22 23	18 19 20 21 22 23	18 19 20 21 22 23
24 25 26 27 28 29	24 25 26 27 28 29	24 25 26 27 28 29	24 25 26 27 28 29

2008

May	June	July	August
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
6 7 8 9 10 11	6 7 8 9 10 11	6 7 8 9 10 11	6 7 8 9 10 11
12 13 14 15 16 17	12 13 14 15 16 17	12 13 14 15 16 17	12 13 14 15 16 17
18 19 20 21 22 23	18 19 20 21 22 23	18 19 20 21 22 23	18 19 20 21 22 23
24 25 26 27 28 29	24 25 26 27 28 29	24 25 26 27 28 29	24 25 26 27 28 29

2008

September	October	November	December
S M T W T F S	S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5	1 2 3 4	1 2 3 4	1 2 3 4 5
6 7 8 9 10 11	6 7 8 9 10 11	6 7 8 9 10 11	6 7 8 9 10 11
12 13 14 15 16 17	12 13 14 15 16 17	12 13 14 15 16 17	12 13 14 15 16 17
18 19 20 21 22 23	18 19 20 21 22 23	18 19 20 21 22 23	18 19 20 21 22 23
24 25 26 27 28 29	24 25 26 27 28 29	24 25 26 27 28 29	24 25 26 27 28 29

All ACS estimates are period estimates that describe the typical household and population characteristics over a specified period of time. Currently, the ACS reports period estimates for one year, three year, and five year periods.

In the case of ACS one-year estimates, the period is the calendar year. For example, the 2008 ACS data describe the population and household characteristics of an area for the period of January 1, 2008 through December 31, 2008, not for any specific day or month within the year.

ACS period estimates

- ✚ contains data for more than one calendar year
- ✚ represent the entire period over which the data are collected
 - ✚ three calendar years (36 months)
 - ✚ five calendar years (60 months)

A multi-year estimate is a period estimate that contains data for more than one calendar year.

Multi-year estimates do not represent any one year or the midpoint of a period, but the entire period over which the data were collected. An ACS multi-year estimate is either three calendar years, representing data collected from independent samples over a 36-month period; or five calendar years, including data collected over a 60-month period.

Technical Track
American Community Survey

- ⚠ one- and multi-year estimates produce different data sets
- ⚠ use caution when choosing which set to use when comparing against another

2007			2008			2009		
January	February	March	January	February	March	January	February	March
1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	1	2	3	4	5
6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31	1
2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28
29	30	31	1	2	3	4	5	6
7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	1	2
3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29
30	31	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	1	2	3
4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21
22	23	24	25	26	27	28	29	30
31	1	2	3	4	5	6	7	8

For example, the 2007-2009 ACS 3-year estimate will report the population and household characteristics of an area for the period January 1, 2007 through December 31, 2009. They do not describe any specific day, month, or year within that time period.

Additionally, one-year and multi-year estimates produce significantly different data sets, different enough that caution must be exercised both in choosing which set to use and when comparing one set to another. Nevertheless, the methods used to produce them are similar.

Multi-year estimates and weighting

- ✦ data are updated with geographic boundaries
- ✦ data are weighted to expand the sample to represent the full population
- ✦ weights are adjusted at the county level
- ✦ from 2009, ACS total population estimates of incorporated places and minor civil divisions were adjusted so that they are closer to PEP estimates

[Census Bureau Population Estimates Program](#)

After the data are pooled together, they are updated with the geographic boundaries of the last year of the period and then assigned the appropriate weights to produce estimates for person-level and household characteristics so that the sample represents the full population. Weights are adjusted using the population and housing totals derived from the Census Bureau's Population Estimates Program at the county level. From 2009, ACS estimates of the total population of incorporated places and minor civil divisions were adjusted so that they are closer to the Census Bureau's Population Estimate Program estimates.

To learn more about the Population Estimates Program, go to

- (Original, Outdated) <http://www.census.gov/popest/overview.html>
- (Relinked) <https://www.census.gov/programs-surveys/popest.html>

Multi-year estimates

- ✦ NOT calculated as an average of monthly or yearly estimates
- ✦ average all individual data collected over the time period

[When To Use 1-, 3-, and 5-year Estimates](#)

[Understanding Multiyear Estimates from the American Community Survey](#)

It is important to remember that multi-year estimates are not calculated as a simple average of monthly or annual estimates but rather they average all of the individual data collected over the time period.

To learn more about when to use 1-, 3-, and 5-year estimates, as well as their distinguishing characteristics, go to:

- [Original, Outdated] [http://www.census.gov/acs/www/guidance for data users/estimates/](http://www.census.gov/acs/www/guidance%20for%20data%20users/estimates/)
- [Relinked] <https://www.census.gov/programs-surveys/acs/guidance/estimates.html>
- [Original, Outdated] [http://www.census.gov/acs/www/guidance for data users/training presentations/](http://www.census.gov/acs/www/guidance%20for%20data%20users/training%20presentations/)
- [Relinked] <https://www.census.gov/programs-surveys/acs/guidance.html>

Technical Track
American Community Survey

- 1-year samples are small
- confidentiality rules prevent data from being released for every place every year
- Census Bureau combines ACS data for small geographical units over multiple years to protect privacy and improve reliability

*Public Use Microdata Area

Because 1-year samples are relatively small, in order to protect personal privacy, confidentiality rules have been established to prevent data from being released for every place every year. The Census Bureau combines ACS data for small geographic units over multiple years before releasing the data to the public to protect privacy and to improve the reliability of the data reported for small geographic levels, where the smaller annual sample sizes are associated with large standard errors.

Estimated Population of Geographic Area	Type of ACS Estimates Released	Geography Included
65,000 or more	1-year, 3-year, and 5-year	State, County, Place, PUMA*
20,000 to 64,999	3-year and 5-year	State, County, Place, Urbanized Area
Less than 20,000	5-year	State, County, Place, Tract, Block Group

🚧 5-year sample = about 120 un-weighted addresses per tract

*Public Use Microdata Area

This table shows the estimated population of a geographic area, the type of ACS estimates released for that area, and the geography included. After five years, the sample includes about 120 un-weighted addresses per tract.

Currency vs. Reliability

- ⚠ ACS response rate is lower
- ⚠ After 5 years of data collection, ACS had ½ the unweighted data of the 2000 long form
- ⚠ Decennial long form data is more reliable
- ⚠ ACS data is more current, but the margin of error is higher

An important consideration when deciding between period estimates is the trade-off between currency and reliability. The different data sets will have different characteristics.

The decennial long form sample size was 1 in 6 households, about 17% of the population. This information was collected once every 10 years and reported for a single point in time, April 1st of the census year. By contrast, the ACS polls a very small sample every single month. Approximately 1 in 40 households, or 2.5% of the population, in one year. Over the course of 5 years, the ACS sample size is 1 in 8, or 12.5%.

Because the ACS does not have the publicity campaign that the decennial Census has, the response rate is lower, and after 5 years of data collection, the ACS had ½ the un-weighted data of the long form effort for the year 2000. So while the decennial long form data was more reliable, the data is not as current as the ACS. The ACS data is significantly more current, but because the sample size is smaller, the margin of error is higher, so the reliability is compromised.

Currency vs. Reliability

- ⚠ further complicated when deciding between 1-, 3-, and 5-year estimates
- ⚠ users must decide which data set is appropriate for their needs

Choosing between currency versus reliability is further complicated when deciding between one-year or multi-year estimates, because for many areas there is also the choice of which multi-year estimate to use; 3-year or 5-year. Users need to decide which is the most appropriate for their needs.

Currency vs. Reliability

- 🚧 one-year estimates:
 - 🚧 quickest availability
 - 🚧 reflect most current data
 - 🚧 sensitive to current trends
 - 🚧 smaller sample = higher margin of error

Let's review the pros and cons of currency and reliability for different data sets. One-year estimates for an area are available in a shorter time frame, reflect the most current data and are relevant to current trends or rapidly changing variables, like fuel or housing prices, but they tend to have higher margins of error than the three- and 5-year estimates for the same area because they are based on a smaller sample.

Currency vs. Reliability

- 🚶 multi-year estimates:
 - 🚶 larger samples = smaller margins of error
 - 🚶 less current
 - 🚶 increased reliability

The 3-year and 5-year estimates for a comparable large area have larger samples and thus smaller margins of error than the one-year estimates. Small areas also represent small sample sizes, so margins of error may be large in multi-year estimates for small areas.

However, multi-year estimates are less current because the larger samples include data which are as old as five years. The main advantage of using multi-year estimates is the increased reliability or the availability of data for smaller geographic areas and small population groups.

Period	Currency	Reliability
1-year	Information based on the last year	Larger sample sizes produce estimates that are more statistically reliable
3-year	Information based on the last year and the 2 years before that	3X the sample cases as 1-year estimates
5-year	Information based on the last year and the 4 years before that	5X as many sample cases as 1-year estimates

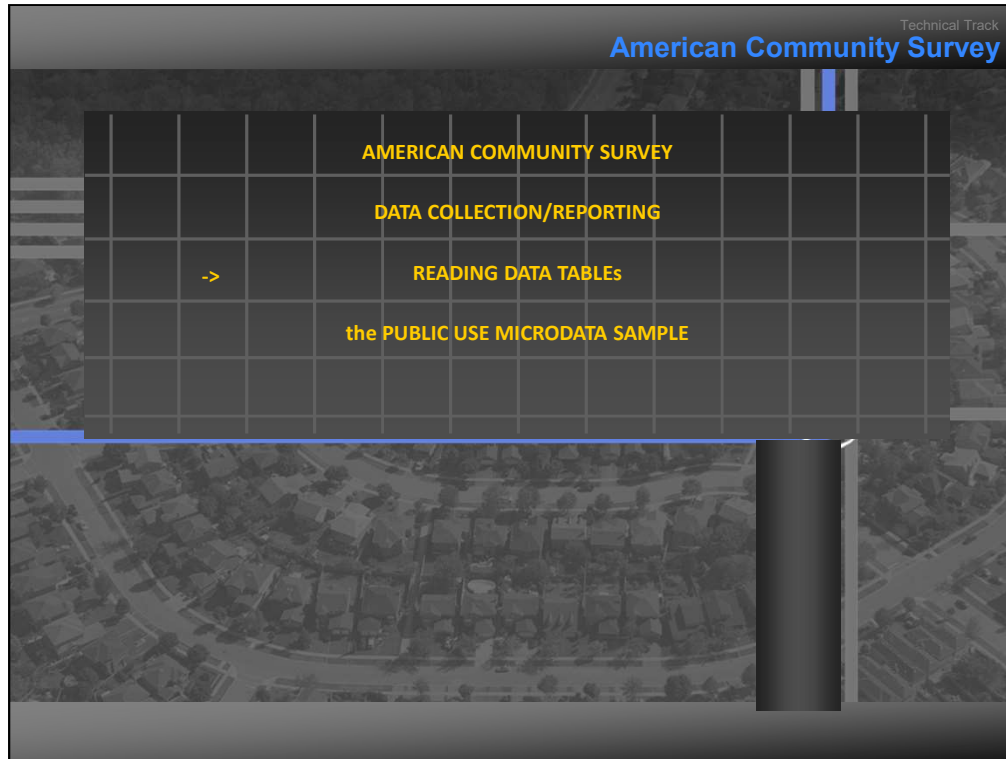
There are no hard-and-fast rules on choosing between one-year and multi-year estimates, but the margins of error provided with ACS data can help data users decide on the tradeoff between currency and reliability.

However, choosing consistent data sets is important when comparing characteristics of separate geographical areas. You should use the same period estimate data sets when comparing more than one area, even if some areas have several data sets from which to choose. If you are comparing areas for which one of the areas has only one data set available, you should use that data set for all areas.

Comparing Data from Different Areas

2006	2007	2008	2006-2008
Chicago	Chicago	Chicago	Chicago
—	—	—	Berwyn

For example, if there is annual data for Chicago, but only 3-year data for Berwyn, then you must use the same 3-year data for each area to make comparisons between the two.



You now know what kinds of data are gathered by the ACS, and how it is collected and reported. Next, we'll turn to how these data are organized and tabulated.

Reading Data Tables

In this section you will learn how to:

- 📍 Explain the organization of the ACS table list
- 📍 Locate additional ACS-related information

In this section, you will learn how to explain the organization of ACS table lists and locate additional ACS-related information.

Universes:

- 🚶 Tables are further broken into different universes
- 🚶 Universe = population about which the data reports characteristics
- 🚶 17 universes

The heading for each Census table identifies the universe for that table. The “universe” is the population about which the data reports characteristics. For our purposes, there are 17 different universes. For instance, the “total persons” universe includes the total population for the entire area, including people living in group quarters, such as college dormitories and military barracks. The universes also include data about the groups within populations, like workers in households, or workers who commute by car, van, or truck, as well as those who are workers versus non-workers. When accessing data tables, be sure the universe for the table is the group about which your study is concerned.



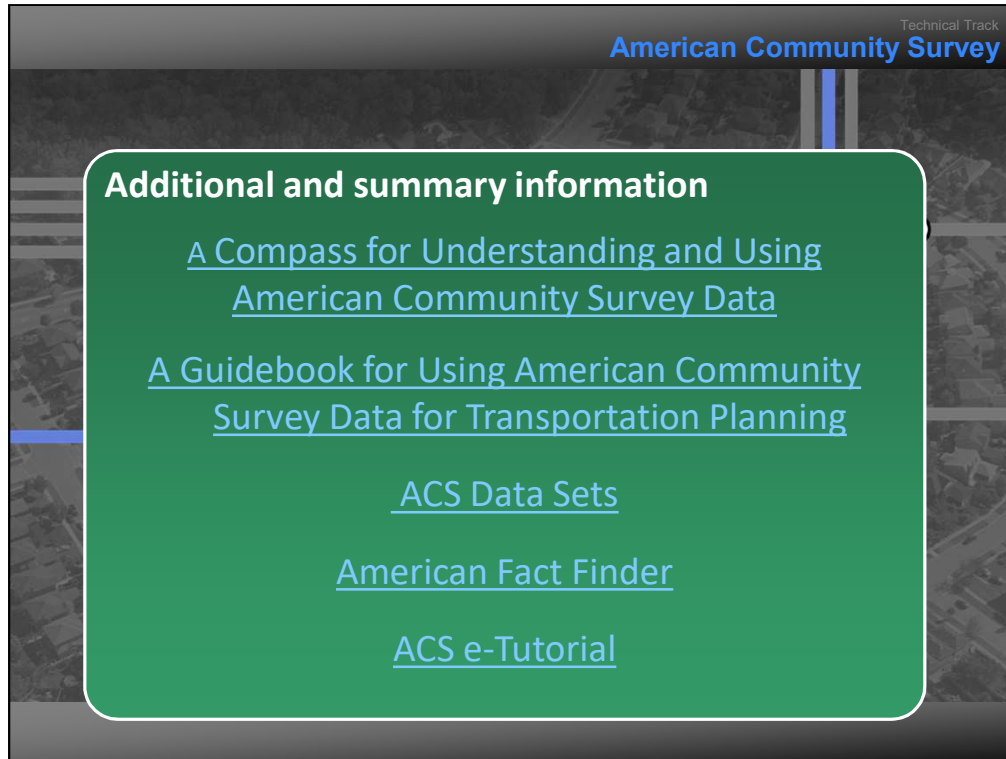
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Technical Track
American Community Survey

ACS table list

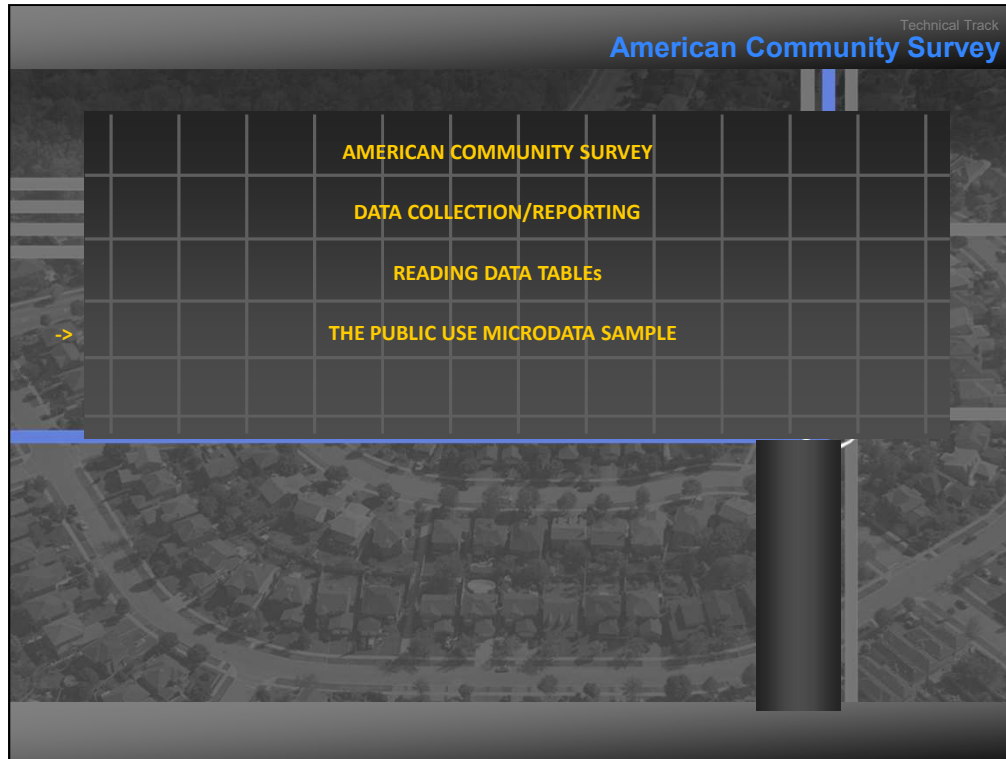
Journey to Work; Workers; Commuting (08)				
Place of Work	P26	PLACE OF WORK FOR WORKERS 16 YEARS AND OVER--STATE AND COUNTY LEVEL	B08007	SEX OF WORKERS BY PLACE OF WORK--STATE AND COUNTY LEVEL
Place of Work	P27	PLACE OF WORK FOR WORKERS 16 YEARS AND OVER--PLACE LEVEL	B08008	SEX OF WORKERS BY PLACE OF WORK--PLACE LEVEL
Place of Work	P29	PLACE OF WORK FOR WORKERS 16 YEARS AND OVER--MINOR CIVIL DIVISION LEVEL FOR 12 SELECTED STATES (CT, ME, MA, MI, MN, NH, NJ, NY, PA, RI, VT, WI)	B08009	SEX OF WORKERS BY PLACE OF WORK--MINOR CIVIL DIVISION LEVEL FOR 12 SELECTED STATES (CT, ME, MA, MI, MN, NH, NJ, NY, PA, RI, VT, WI)
Private Vehicle Occupancy	P35	PRIVATE VEHICLE OCCUPANCY FOR WORKERS 16 YEARS AND OVER	B08301	MEANS OF TRANSPORTATION TO WORK
Time Leaving Home	P34	TIME LEAVING HOME TO GO TO WORK FOR WORKERS 16 YEARS AND OVER	B08302	TIME LEAVING HOME TO GO TO WORK
Travel Time to Work	P31	TRAVEL TIME TO WORK FOR WORKERS 16 YEARS AND OVER	B08303	TRAVEL TIME TO WORK

Shown here is a list of tabulations compiled by the US Census Bureau using ACS data. Each of these tables has a specific table number that allows you to identify the table. Let's take a look at how to decipher these numbers. Each table number has three components. The number always starts with a prefix letter that identifies the table type. For example the "B" here lets users know that the table is a Base Detailed Table. If this letter is a "C," it means that the table data categories are collapsed. The second position is a 2-digit number that identifies the topic or category of the table. If the number is 08, for example, it means that the table is transportation related. The last digits are the table reference number.



Several resources you can use to find information on data tables by going to:

- [Original, Outdated] <http://www.census.gov/acs/www/Downloads/handbooks/ACSGeneralHandbook.pdf>,
- [Relinked] <https://www.census.gov/programs-surveys/acs/guidance/handbooks.html>
- http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_588.pdf,
- http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=&_lang=en&_ts=,
- [Original, Outdated] http://factfinder.census.gov/home/saff/main.html?_lang=en
- [Relinked] <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- [Original, Outdated] http://www.census.gov/acs/www/guidance_for_data_users/e_tutorial/
- [Relinked] <https://www.census.gov/programs-surveys/acs/guidance/training-presentations.html>



The last topic in this module looks at the Public Use Microdata Sample, or the PUMS.

The Public Use Microdata Sample

After viewing this section, you will be able to:

- 🚶 describe the Public Use Microdata Sample and how it is used

After viewing this section, you will be able to describe the Public Use Microdata Sample and how it is used.

Technical Track
American Community Survey

ACS Public Use Microdata Sample (PUMS)

- sample of the population and housing unit individual records
- users create their own tabulations and regression models
- no limit to number of variables applied
- 1-year ACS PUMS file = 1% of the US population

The PUMS, or the Public Use Microdata Sample, is another useful data product provided by the US Census Bureau.

The PUMS is a sample of population and housing unit individual records that enables users to create custom tabulations and regression models that are not available through pre-tabulated ACS products. Most standard ACS tabulations are limited to 2-3 variables, but with the PUMS, users can apply as many variables as desired.

A 1-year ACS PUMS data set represents about 1% of the total US population.


The PUMS

- ◆ includes actual, but edited, responses from ACS questionnaires
- ◆ weighted to expand sample to estimate:
 - ◆ totals
 - ◆ percentages
 - ◆ means
 - ◆ medians

CONFIDENTIAL

The PUMS file includes the actual responses collected in ACS questionnaires, although the responses have been edited to protect confidentiality of respondents. The ACS PUMS file includes sample weights for each person and housing unit. You can apply this to the individual records to expand the sample to estimate totals, percentages, means, and medians of the full population.

Technical Track
American Community Survey



The PUMS

- available in 1-year and 3-year data sets
- useful for studying population groups with limited tables, such as:
 - bicycle commuters
 - households without vehicles outside of NYC


The PUMS is available in 1-year and 3-year data sets, so users can make their own multi-year files by averaging the weights for two or more years.

The PUMS file is especially useful for studying population groups for which published tables may be limited, such as bicycle commuters or households without vehicles outside of New York City.

Technical Track
American Community Survey

PUMA

- residential geographic detail in a PUMS record
- constructed based on:
 - county
 - neighborhood
 - city
- densely populated counties can have multiple PUMAs
- less populated areas may combine counties



[IPUMS Webinar](#)

To protect confidentiality, the PUMS data are reported for large geographic units called a PUMA, Public Use Microdata Area. Each PUMA has a minimum population of 100,000. PUMAs are generally constructed based on county, neighborhood, and city boundaries, but do not cross state lines. Counties with larger populations are subdivided into multiple PUMAs, while PUMAs in more rural areas are made up of groups of bordering counties.

The PUMS is a good resource and relatively easy to use. To learn more about the PUMS, or to try accessing the data yourself, go to

- [Outdated] <http://bcov.me/3u98phnt>
- [Relinked] <https://usa.ipums.org/usa/>

Summary

You should now be able to:

- ✦ name categories of data gathered by ACS
- ✦ describe multi-year data collection and reporting
- ✦ explain the process for calculating ACS multi-year estimates, data weighting, and other controls
- ✦ state the importance of data universe to the study objective
- ✦ explain the tradeoff between data currency and data reliability
- ✦ describe how tables in ACS are numbered
- ✦ describe how to locate additional ACS-related information
- ✦ use the Public Use Microdata Sample

You have completed this module on the American Community Survey. You should now be able to:

- name categories of data that are gathered by the ACS;
- describe multi-year data collection and reporting schemes; and
- explain the process for calculating the ACS multi-year estimates, data weighting, and other controls in general terms;

You should also be able to:

- state the importance of the data universe to the study objective;
- explain the tradeoff between currency of data and reliability of data for ACS period estimates;
- describe how tables in the ACS are numbered;
- describe how to locate additional ACS-related information; and
- how to use the Public Use Microdata Sample.

This concludes the module on the American Community Survey.