

Census Explorer lets you map out neighbourhood statistics

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How do you make 11 billion estimates detailing every neighborhood in the world's third largest nation accessible to the general public? You give them eight of the most sought-after topics on a map. Let them search by their address or postal code, zoom in, zoom out and pan across the map to compare neighboring areas. Then throw in a bonus and let them click a button to reflect the 10 and 20 years prior.

"Census Explorer" was the U.S. Census Bureau's solution to making the United States' largest statistical treasure trove about its people, easier for the people to access.

Background

Annually, the U.S. Census Bureau collects data through the American Community Survey and releases rolling, five-year averages for every community in the nation, amounting to more than 11 billion individual estimates. The American Community Survey is the United States' most comprehensive survey, giving even the nation's smallest communities the current information they need to plan business and infrastructure investments as well as public services. The survey is also the only source of local statistics for most of the 40 topics it covers, such as employment, language spoken at home, education and selected housing costs.

For the public, accessing this wealth of statistical information has traditionally meant consuming packaged products in the form of tables and reports. While appropriate for many expert audiences, the published tables have limited utility for novice users, particularly in exploring the statistics at the hyper-local level. If users wanted to browse statistics for their neighborhood, the closest approximation is usually a "census tract." Census tracts are small, relatively permanent statistical subdivisions of U.S. counties that contain approximately 4,000 people. Users would need to know their census tract number, which they could learn by carefully squinting at static reference maps for their county and then looking up that tract number in the Census Bureau's primary table-finding tool, American FactFinder. However, FactFinder then requires users to navigate a series of menus to select the topic, geography and table title that might contain the data points of interest. Once they find an appropriate table, to compare the table's

results with additional neighboring geographies would require the user to restart his or her search. Comparing results further back than the 2000 Census is not even possible.

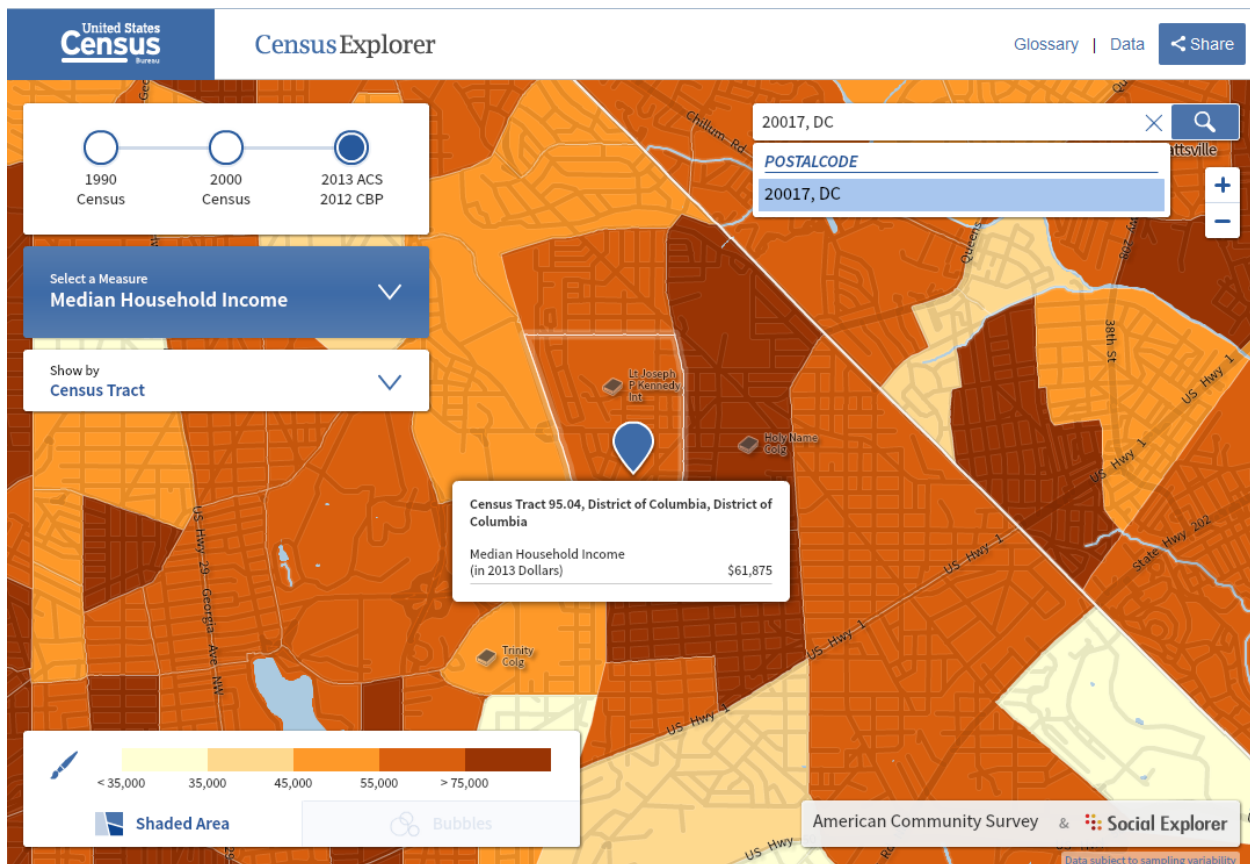
In short, while the Census Bureau has touted the availability of “neighborhood-level” statistics, these statistics have not been particularly easy for the general public to casually examine. To expand access to these powerful statistics, the Census Bureau launched Census Explorer in December 2013. Since 2013, the Census Bureau has updated the original tool and launched four other editions of the map.

About the Tool

With Census Explorer, the Census Bureau endeavored to use mapping functionality that people are familiar with, such as zooming in and out with the mouse and clicking and dragging the map to pan to nearby geographies. The map also uses the simplicity of choropleth and bubble maps and even allows the user to change the colors in the color progressions and adjust the size of the bubbles.

To search the map, users can type in the name of a geography in the search bar. The system recognizes a variety of types of names, such as a town, state, street address and even a postal code. Users can then change the zoom level from a menu, selecting whether to show the characteristics by state, county or census tract.

For example, if a user types in his or her postal code “20017” and selects “Show by Census Tract,” the map zooms right to that area and the surrounding neighborhoods. The user can scroll over the shaded sections, recognizing the streets and landmarks within their neighborhood and view a pop-up box that shows the selected characteristic for each tract. The user does not need to know that the neighborhood’s tract number is 95.04 or that the tract directly south of it is 93.01. The user is instantly accessing hyper-local information without having to navigate table-driven barriers.



To populate the map, Census Explorer pulls in information from the Census Bureau's API, an [application programming interface](#) that allows developers to take data sets and reuse them to create online and mobile apps.

The Topics

At its launch, Census Explorer allowed users to map eight social, economic and housing characteristics from the 2008-2012 American Community Survey:

- Total population
- Percent 65 and older
- Percent foreign-born
- Percent of the population with a high school degree or higher
- Percent with a bachelor's degree or higher
- Labor force participation rate
- Home ownership rate
- Median household income

The tool also allowed users to toggle to the same characteristics from the 1990 and 2000 censuses.

Business Statistics Added

Just two months later, in February 2014, the Census Bureau added statistics from the County Business Patterns program, which covers the number of establishments in the U.S., number of employees and average pay. The February update added technology workforce and payroll data to the interactive maps so that entrepreneurs and business leaders could see where tech workers were geographically concentrated — and see them right alongside other statistics like education, labor-force participation and homeownership rates.

New Editions Launched

In May 2014, the Census Bureau launched its first separate edition of the map. This edition focused on 10 commuting-related statistics from the American Community Survey and the 1990 and 2000 censuses:

- Workers 16 Years and over
- Car, Truck, or Van:
 - Drove alone
 - Carpooled
- Public Transportation
- Bicycle
- Walked
- Worked at Home
- Commutes averaging 60 or More Minutes
- Average Commute to Work (in minutes)

The Census Bureau subsequently launched three other editions of the tool:

- Population Estimates Edition — provides population estimates for states and counties by age, race and Hispanic origin for 2000, 2010 and 2013.
- Retail Edition — includes statistics on retail trade in America, including the growing online market. Users can explore the number of business establishments, employment and average annual payroll for every county in the U.S., for retail as a whole, as well as online retailers, online auctions, and mail order businesses.
- Young Adult Edition — looks at multiple characteristics of the population age 18-34 in 1980, 1990, 2000 and today (using 2013 American Community Survey 5-year data).

New Opportunities

Census Explorer has provided a powerful opportunity to expand the audience of Census Bureau statistics, particularly from the annual American Community Survey.

For example, according to [Social Explorer's write-up](#) of the tool's initial launch, within

just three days [of its launch], [Census Explorer](#) has empowered thousands of users to create millions of data maps... Since the launch on Tuesday, over 55,000 users have created more than 2,200,000 maps... Journalists around the nation have also used Census Explorer to dig into demographic trends both nationally and locally.¹

(The Census Bureau contracted with the Social Explorer firm to provide the interactive Web interface for the Census Explorer map.)

In February 2015, the Young Adult edition saw a large spike in traffic following a Reddit user posting about it in the "Internet is Beautiful" subReddit. About 88 percent of these visits were from first-time visitors.

Taken as a group, the Census Explorer suite of maps has averaged about 7,000 visits per week during the past year.

New Challenges

In creating the Census Explorer tool, we encountered a few challenges that were important to think and work through.

Contracting

Although the Census Bureau has published both static and interactive maps before, we found that we did not have the in-house expertise or bandwidth to build the kind of dynamic, interactive map we were looking for. For us, it made sense to contract with Social Explorer to provide the Web interface.

One issue that came from using Social Explorer is that the map is based in Adobe Flash, which many Web and mobile users cannot use.

Representing Data Quality

Another challenge we worked through was balancing transparency about data quality with ease of use. We reasoned that if the novice or casual user encountered the

¹ "Census Explorer Update: Thousands of Users Creating Millions of Maps," Dec. 20, 2013. Social Explorer. <http://www.socialexplorer.com/blog/post/census-explorer-update-thousands-of-users-creating-millions-of-maps-3493>

statistics in a way that was difficult to understand, they would not use the statistics; it would not matter how “good” or “bad” the statistics were. Specifically, we debated whether and how to display the estimates’ margins of error.

The Census Bureau typically publishes margins of error alongside American Community Survey estimates when publishing in a tabular format. However, we did not publish margins of error alongside the estimates of such measures like income and labor force participation following the 1990 and 2000 censuses — even though those were asked of just a sample of the population. We considered adding the margins of error alongside the estimates in the pop-up boxes for the American Community Survey data. However, we would not have been able to offer the same treatment for the estimates from the prior census years. Ultimately, we decided to provide a general caveat informing the users that the statistics were based on a sample and subject to sampling variability. Rather than clutter the map, we provided information about sampling methodology on a general page and linked to the respective information on sampling and estimation methods, confidentiality protection, and sampling and nonsampling errors for each data product. Users could also click on the “Data” tab at the top of the map to navigate through the statistics (and their margins of error) in a tabular form.

Geographic Boundaries

Another consideration was determining which geographic boundaries to use, especially knowing that city and tract boundaries have in some cases changed dramatically since 1990. The Census Bureau decided to use the boundaries in existence in the year the data were collected. Therefore, the map for the 1990 Census uses the 1990 boundaries, the 2000 Census uses the 2000 boundaries, and so on. The American Community Survey statistics use the boundaries for the data year featured.

Conclusion

Through Census Explorer, we were able to take high value assets — statistics from the American Community Survey and recent censuses — and make them available in easier to access and understand formats. We removed the barriers of knowing tract numbers and how to navigate a table-based display, and leveraged familiar mapping functionality to give the American public quick, understandable, easy access to the United States’ wealth of information about its people, places and economy.