



Education Job Density

This map estimates the number of education jobs per unprotected acre within each census block group in 2010.

Why is education job density important?

Education job density is one of many measures or variables used by city planners to examine the proportions of residents, jobs, and services in urban areas and to guide development planning for efficient city design. Besides indicating the number of jobs per unprotected acre, the metric also suggests a level of economic activity in the block group. Job densities in particular job classes may be compared with overall employment density to highlight job distributions within and among block groups.

The education employment classification includes jobs in institutions that offer education and training in a school, workplace, or home through personal interaction with a teacher or remotely via electronic means. Education jobs in this category may be provided by privately-owned or publicly-owned institutions.¹ Post-secondary education is required for most education jobs. In 2012, over 5,000,000 workers served as teachers' aides, education administrators, or elementary, secondary, and post-secondary teachers.¹ The wages within the class range from entry-level wages to managerial salaries. In 2010, the average secondary education teacher salary in the U.S. ranked twelfth among 37 countries worldwide. Within the U.S., teacher salaries tend to be lower than those earned by other workers with higher (postsecondary) education. For example, a secondary education teacher can expect to earn just 72% of the salary of other workers with similar education.²

Service jobs of all types presently make up about 84% of the overall economy.³ The education category in the Smart Locations database is one of a group of job categories that are often listed in the service sector in the economics literature. In 2010, about 7 percent of the U.S. gross domestic product was dedicated to education.⁴ In 2011, the U.S. spent almost \$12,000 per student in primary and secondary education.⁵ Because the majority of education jobs provide a personal service and rely on direct customer contact, they are not as subject to offshoring as are office, service, and manufacturing jobs.

The education services sector lost over 300,000 jobs in the recent recession. Public education fared worse than private education during the recession as public school districts laid



Photo: Graduate student, Wikimedia Commons

off teachers, froze or cut teacher pay, increased class sizes, and cut early education or summer school programs.⁶ As of 2015, recovery has been slow in the education sector, with many states still not increasing education budgets.⁷

In urban metropolitan areas, the map pattern shows block groups with higher education job densities embedded in a low density matrix, reflecting the distribution of block groups containing schools. Knowing the distribution of various job densities is prerequisite to planning for transportation networks and affordable housing developments that are accessible to jobs of all wage classes.

Smart Growth planning programs promote the development of a diversity of residences, employment opportunities, and services within compact, mixed-use, and walkable neighborhoods. These planning strategies promote housing in job-rich areas and new employment centers in dense residential zones. Resident workers with easy accessibility to a diversity of job types in various wage classes can reduce not only vehicle miles traveled (VMT) but fuel consumption and [greenhouse gas emissions](#) (GHGs) associated with employee commuting trips.⁸

How can I use this information?

This map, Education Job Density, allows users to evaluate various block groups by the number of education jobs per unprotected acre relative to other characteristics. Comparing this map to areas of relatively high-, low- and middle-wage worker residential density may indicate the effectiveness of community design and road networks to link potential

workers with job opportunities. Planners may want to promote increased affordable housing in block groups with high education employment density and a low resident working population. They may identify neighborhoods with optimal densities of jobs and housing that can support new or enhanced transit service. Economic development agencies in regions with limited transit service may use this map to encourage the siting of new education centers in areas that are highly accessible to the regional workforce.

This data layer may be compared to other EnviroAtlas demographic and Smart Location data layers. The aerial-image base map (seen by increasing the transparency of the map layers) can be used to show the spatial distribution of the built environment within the block groups.

How were the data for this map created?

The 2010 [Census LEHD](#) (Longitudinal Employer-Household Dynamics) database gave the total number of education jobs (NAICS sector 61) by U.S. Census block group in every state except for Massachusetts. EPA then isolated areas of the block group that were not protected from development. NAVTEQ data (2011) provided the location of federal, state, and local parks, zoos, cemeteries, public beaches, and water bodies. The Protected Area Database (PAD-US v1.3) provided the locations of parks and protected natural areas as well as privately-owned land area with restrictions on development (such as conservation easements). The relevant portions of each protected area dataset were intersected and dissolved into a single polygon layer that represented all areas in which development was restricted. The resulting protected areas layer was then integrated with the block group areas in GIS. EPA used this block group unprotected acreage as the denominator to calculate entertainment employment density. The metric, listed as D1c8_Ed10, may be found in the [Smart Location Database User Guide](#).

Selected Publications

1. U.S. Bureau of Labor Statistics. 2015. [Educational services: NAICS 61](#). Accessed June 2015.
2. Schleicher, A. 2012. [Education at a glance: OECD Indicators 2012, United States](#). Accessed June, 2015.
3. Hacksever, C., and B. Render. 2013. [Service management: An integrated approach to supply chain management and operations](#). FT Press, Upper Saddle River, New Jersey. 528 p.
4. CBS News. 2013. [U.S. education spending tops global list](#). Accessed June 2015.
5. National Center for Education Statistics. 2015. [Education expenditures by country](#). Accessed June 2015.
6. Office of the President. 2012. [Investing in our future: Returning teachers to the classroom](#). Report prepared by the Council of Economic Advisors, Domestic Policy Council, and National Economic Council. Accessed June 2015.
7. Black, D. 2015. [New national funding fairness report: Education budgets have not been replenished post-recession](#). Education Law Prof Blog, accessed June 2015.
8. National Research Council. 2009. [Driving and the built environment: The effects of compact development on motorized travel, energy use, and CO₂ emissions](#). Special Report 298, The National Academies Press, Washington, D.C. 240 p.

What are the limitations of these data?

It is important to remember that jobs or residences are not distributed evenly throughout the area of a block group. A diversity of land uses or activities may be sparsely distributed in large census block groups. On the other hand, a small block group may be uniform and low in diversity, but it may be located within easy access to a more diverse block group. Using the aerial-image base map will give an indication of the proportions of developed and undeveloped land in each census block group.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. Data from the [2010 U.S. Census](#) may be viewed on and downloaded from the census website.

Where can I get more information?

A selection of resources on the relationships among education jobs, city planning, and environmental quality is listed below. In addition, EPA's [Smart Growth Program](#) provides tools, resources, and technical assistance to communities seeking to pursue compact and transit-oriented development strategies to protect public health and the environment. For additional information on the data creation process, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

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