



Service Job Density

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

Why is service job density important?

Service 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 and transit networks. Besides indicating the number of jobs per unprotected acre within a census block group, 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 service employment classification includes jobs in professional, scientific, and technical services (e.g., legal, accounting, engineering, consulting, research, and veterinary); administrative support and waste management (e.g., office administration, hiring, payroll, security, and waste disposal); and other services (e.g., repair and maintenance, laundry, pet care, and grant writing). The wages within the class range from entry-level wages to managerial salaries. Higher education is a prerequisite for many of the jobs in this services category.¹

Since the mid-1950s the U.S. economy has been evolving toward a post-industrial service economy. Service jobs of all types presently make up about 84% of the overall economy.¹ The service category in the Smart Locations database is a subset of the job categories that are often listed in the service sector in the economics literature. Some of the jobs more broadly considered service-oriented, such as financial services or warehousing, are included in Smart Location office and industrial jobs, respectively. The service jobs described here comprise about 18% of U.S. gross domestic product.¹

The professional, scientific, and technical services sector has recovered well from the recent recession, with the number of jobs in the U.S. increasing by 7% between 2010 and 2012.² However, the continued offshoring of services jobs has contributed to the insecurity of the services worker. As with manufacturing and office jobs, services jobs with little personal customer contact are subject to offshoring. In 2007, the Bureau of Labor Statistics estimated that 30 million people, or one-fifth of the total employed, worked in jobs



Photo: Veterinary services, Tim1965, Wikimedia Commons

that could be offshored to other countries.³ In the early 2000s, two published predictions of the number of service jobs vulnerable to offshoring estimated that 3.4–6 million service jobs would be lost in the U.S. between 2005 and 2015.⁴ However, any quantitative estimates have high levels of uncertainty because there are no official statistics on service job losses.

Service job density tends to be higher in downtown central business districts and in outlying suburban subcenters. Service jobs may be embedded in large companies in the form of administrative support or research and development; while smaller businesses may be dedicated to providing specific services.⁵ 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 neighborhoods. 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.

How can I use this information?

This map, Service Job Density, allows users to evaluate various block groups by the number of service 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 service employment density and a low resident working population. They may identify neighborhoods with optimal numbers 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 service 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 service jobs (NAICS sectors 54, 56, and 81) by U.S. Census block group. 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 service employment density. The metric, listed as D1c8_Svc10, may be found in the [Smart Location Database User Guide](#).

Selected Publications

1. 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.
2. Sentz, R. 2012. [The emerging professional, scientific, and technical sector](#). Economic Modeling Specialists International (EMSI), accessed June, 2015.
3. Levine, L. 2012. [Offshoring \(or offshore outsourcing\) and job loss among U.S. workers](#). Report 7-7500, Congressional Research Service, Washington, D.C. 12 p.
4. Garner, C.A. 2004. [Offshoring in the service sector: Economic impact and policy issues](#). *Economic Review* (Fourth Quarter):5–37.
5. Marlay, M., and T.K. Gardner. 2010. [Identifying concentrations of employment in metropolitan areas](#). Presented at the 2010 Annual Meeting of the American Sociological Association, August 14–17, 2010, Atlanta, Georgia.

What are the limitations of these data?

A block group is a collection of census blocks, the smallest area mapped by the U.S. Census Bureau. 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. The U.S. Census Bureau maintains a website on methodology and [reliability of data](#).

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 and downloaded from the census website.

Where can I get more information?

A selection of resources on the relationships among service jobs, city planning, and environmental quality is listed below. More details about this metric are available in the [Smart Location Database User Guide](#). In addition, EPA's [Smart Growth Program](#) provides tools, resources, and technical assistance to communities seeking to pursue compact, mixed-use, walkable, 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](#).

Acknowledgments

Kevin Ramsey, former EPA ORISE Fellow, developed the metric. Alexander Bell, Renaissance Planning Group, generated the data. The fact sheet was created by Sandra Bryce, Innovate!, Inc. and reviewed by Ted Cochin, EPA Office of Sustainable Communities.