



Percent of Workers Who Carpool to Work

This EnviroAtlas map estimates the percentage of workers residing within each U.S. Census block group who commute to work by carpool.

Why is commuter transport choice important?

City planners use metrics that examine commuting modes of travel to evaluate the accessibility of workplaces, the diversity of land use, and the usage of alternative forms of transport. Three out of 4 people in the U.S. drive to work.¹ A travel study from 1999 estimated that 92% of all cars driven to work had just one occupant.² The percentage of commuters who [carpool](#) has declined from almost 20% in 1980 to slightly less than 10% in 2010. Recent entrepreneurial efforts aim to reverse that trend through the use of cell phone [apps](#) to promote employer programs for ridesharing. Commuters carpool for social, environmental, and economic reasons. By carpooling, passengers reduce overall vehicle miles traveled, avoid driving in heavy traffic, and gain the opportunity for some relaxation and social interaction during their commute time. The driver and passengers may share any toll costs and they save travel time with access to High Occupancy Vehicle (diamond) lanes.³

In recent decades, car-oriented commuting has generated a number of environmental and mobility problems worldwide, highlighting the need to develop and encourage more environmentally sustainable modes of transportation. Harmful air pollutants such as ultrafine airborne particles, nitrogen dioxide, and carbon monoxide are found in high concentrations along busy roadways. Elevated levels of these pollutants can persist as much as 200m or more from the road edge.⁴ People who live, work, and go to school near busy roads are at a greater risk for adverse health effects such as respiratory and cardiovascular symptoms, poor birth outcomes, and premature mortality. The strongest research evidence of health effects from vehicular pollution documents the development of asthma and reduced lung function in children living and attending school near busy roadways.⁴ Disproportionately high numbers of low-income residents often live and work in this near-road zone.⁵

From a city planning perspective, it is most efficient to have concentrations of jobs near a large working age population. Locating residences and services in development centers that also offer jobs helps reduce commuting time to work. A regional balance of jobs and housing not only reduces fuel consumption and congestion but it also benefits the local



economy and standard of living. Workplaces that are centrally located and accessible to more households can reduce vehicle miles traveled, energy use, and [greenhouse gas emissions](#) (GHGs) associated with commuting trips.

Communities that pursue compact growth patterns and mixed use development facilitate workplace accessibility by automobile, transit, biking, and walking. Research indicates that people who live in compact neighborhoods walk, bike, and use transit more (and drive less) than people living in lower density neighborhoods.⁶ A travel survey study of traffic generated by mixed-use development in 6 metropolitan regions found that about 1/3 of the trips from the surveyed developments resulted in very few vehicle miles traveled, suggesting the use of alternate travel modes.⁷ On the other hand, a recent study on commuter mode choice found that parking cost and transit travel time had a bigger influence on mode choice than land use variables such as proximity to a transit station or pedestrian-friendly street connectivity.² The study's model projected that a daily parking fee of \$6 would result in 21 fewer cars driven for every 100 commuters or an annual reduction of 39,000 vehicle miles traveled per 100 commuters.² It is likely that land use variables and economic incentives act in a complementary fashion by affecting different segments of the commuting population.

How can I use this information?

This map allows users to evaluate various census block groups by the percentage of workers who carpool to work. Federal, state, and local policymakers can use commuting information to understand workers' transportation choices and make

suggestions for improving future transportation infrastructure. Employers can use this information to help workers to adopt alternative transport options. Communities seeking to decrease vehicle miles traveled may encourage new employment in areas already supporting a large working age population.

This information may be useful when marketing the availability of areas for development. Planners can use the information to help evaluate whether proposed commercial development may improve or exacerbate regional imbalances between the location of job centers and residential areas. New employment in areas with poor accessibility to residential neighborhoods would likely result in longer commutes and additional traffic on regional highways. New employment in areas of high accessibility, on the other hand, can provide residents with opportunities to live closer to jobs, shopping, and services and to take alternate means of travel to work.

How were the data for this map created?

The metric, Percent of Workers Who Carpool to Work, was compiled from U.S. Census [American Community Survey \(ACS\)](#) 5-year Summary Data for 2008–2012. ACS obtained the data (Table B08301) at the census block group scale through survey questions related to commuting mode. The ACS data are collected every month through statistical sampling of the total population; estimates are published on an annual basis. The data cover workers older than 16 years of age and younger than 64 years who were employed during the week prior to the ACS reference week and did not work at home. Respondents answered questions about the means of transportation used to get to work as well as the number of workers riding in a carpool. The percentage of workers using a specific travel mode was obtained by dividing the number of workers in that category by the total population of workers. However, the percent of workers driving alone was initially

calculated as a percent of drivers rather than percent of total workers. Subtracting this percentage from the percent of commuters who drive gave the percent of workers who carpool.

What are the limitations of these data?

The accuracy of this data layer depends on the accuracy of the ACS Survey, which could be limited by its multiple data collection agencies, methods, and calculations. Accuracy of ACS data increases with the use of multiple-year summary data and the use of *percentages* of household characteristics rather than *numbers*. Estimates for rural areas with low populations should be interpreted with caution.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. American Community Survey [annual](#) and [summary file](#) data may be downloaded from the ACS websites. Commuting data may be found on the U.S. Census Bureau website [American Fact Finder](#), enter ID number B08301.

Where can I get more information?

A selection of resources on the relationships among city planning, commuting modes, and environmental quality is listed below. For additional information on data creation, access the [metadata](#) for the data layer. To ask specific questions about this data layer, please contact the [EnviroAtlas Team](#).

Acknowledgments

Yan Jiang, EPA Student Services Contractor, generated the data. The fact sheet was created by Yan Jiang, Yongping Yuan, and Anne Neale, U.S. EPA, and Sandra Bryce, Innovate!, Inc.

Selected Publications

1. Kramer, M. 2013. [Our built and natural environments: A technical review of the interactions among land use, transportation, and environmental quality, Second edition](#). Environmental Protection Agency, Washington, D.C. 139 p.
2. Hess, D.B. 2001. [The effects of free parking on commuter mode choice: Evidence from travel diary data](#). Working Paper Series, The Lewis Center for Regional Policy Studies, UCLA, Los Angeles, California. 25 p.
3. Li, J., P. Embry, S.P. Mattingly, K.F. Sadabadi, I. Rasnidatta, and M.W. Burris. 2008. [Who chooses to carpool and why? Examination of Texas carpoolers](#). *Transportation Research Record* 2021:110–117.
4. Brugge, D., J.L. Durant, and C. Rioux. 2007. [Near-highway pollutants in motor vehicle exhaust: A review of epidemiologic evidence of cardiac and pulmonary health risks](#). *Environmental Health* 6. Accessed August 2015.
5. Apelberg, B.J., T.J. Buckley, and R.H. White. 2005. [Socioeconomic and racial disparities in cancer risk from air toxics in Maryland](#). *Environmental Health Perspectives* 113: 693–699.
6. 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.
7. Ewing, R., M. Greenwald, M. Zhang, J. Walters, M. Feldman, R. Cervero, L. Frank, and J. Thomas. 2011. [Traffic generated by mixed-use developments: Six-region study using consistent built environmental measures](#). *Journal of Urban Planning and Development* (September): 248–261.