# Residential Population within 300m of Busy Roadway

This EnviroAtlas community map estimates for each census block group the number of residents within 300m of one or more busy roadways, defined as interstates, arterial roads, and collector roads, for each census block group.

## Why are near road populations important?

Harmful air pollutants such as airborne particles, nitrogen dioxide, and carbon monoxide are found in high concentrations along busy roadways. Elevated levels of these pollutants, relative to community averages, can persist as much as 300 meters or more from the road edge. Tree cover near busy roadways may act as a buffer from these pollutants, helping to reduce their concentrations.

When compared with the rest of the population, people who live, work, and go to school near roads are at a greater risk for adverse health effects associated with near-road air pollution, such as respiratory and cardiovascular symptoms, asthma, poor birth outcomes, and premature mortality. Low-income and other socially disadvantaged populations are typically located disproportionately in this near-road zone. Therefore, near-road air pollution is a subject of concern for reasons of environmental justice as well as general public health. Additional research is needed focused on health effects, cleaner transportation technologies, and roadway and urban design options.

Tree cover adjacent to busy roadways has been shown to alter concentrations of ultrafine particles and other hazardous air pollutants emitted by traffic. This buffering capacity is highly dependent on tree type, height and density, wind speed and direction, and elevation of the roadway in relation to adjacent land. Studies show that the tree canopy is capable of filtering air pollutants and diverting the polluted airstream upwards and laterally, where it can mix with cleaner air and become diluted.

Near-roadway tree cover provides additional benefits that can improve quality of life in the surrounding area. It may reduce traffic noise, increase the aesthetic enjoyment and value of homes and other buildings, and lower ambient temperatures. The benefits that trees provide may also encourage people who live in these areas to spend more time outdoors than they might otherwise.

While near-road tree buffers are not a substitute for clean technologies and multi-modal transportation choices, they

may represent healthful design solutions for existing roads and nearby buildings and for new projects and expansions.

## How can I use this information?

The map, Residential Population within 300m of Busy Roadway, can be used to assess the numbers of near-road residents across a community and find disparities in benefits between neighborhoods. When overlaid with this map, socio-economic layers within EnviroAtlas can highlight specific age groups and other sensitive populations who may be differentially exposed to near-road air pollution and for whom tree buffers could be especially beneficial.

## How were the data for this map created?

This map is based on the 2010 U.S. Census of the Population and the best available local road layer that included either surface width or number of lanes as an attribute. The population estimate was calculated by creating a 300 meter buffer on each side of the roads and extracting the modeled population values by block group from EPA's dasymetric population product (mapped to 30m resolution from 2010 census block-level data). Dasymetric modeling attempts to distribute population across a census block group in a more accurate way by excluding water bodies, vacant land, and other areas where people are not likely to live. The buffers were corrected for overlap prior to calculating the population.

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## What are the limitations of these data?

The roads underlying this map were selected to capture heavy diesel, commuting, and other through-traffic across the area. However, they do not account for all community hot spots of vehicular pollution such as busy stoplights along local streets. EPA's dasymetric population estimates exclude unpopulated areas such as public land, steep slopes and water, but may allocate population incorrectly within pixels, including within private parcels of undeveloped land.

This map is not meant to be used for inferring numbers or types of residents that are at risk for developing specific health conditions. For more information on the limitations of the underlying population data, please see the metadata associated with the EnviroAtlas national dasymetric population map.

## How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. To find the EnviroAtlas 1-meter land cover grids created for each community, enter *land cover community* in the interactive map search box.

## Where can I get more information?

Numerous resources are available on the relationships among proximity to roads, traffic-related air pollution, and human health and well-being; a small selection of these publications is listed below. In-depth information on the relationships between urban tree cover and human health and well-being can be found in EPA's Eco-Health Relationship Browser.

For additional information on data creation, access the metadata found in the drop-down menu for each map layer selected from the EnviroAtlas table of contents. To ask specific questions about these data, contact the EnviroAtlas Team.

## Acknowledgments

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## Selected Publications

American Lung Association. 2019. Public policy position: Energy and transportation. Accessed October 2020.

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Health Effects Institute. 2010. Traffic-related air pollution: A critical review of the literature on emissions, exposure, and health effects. Special Report 17. Accessed October 2020.

Houston, D., J. Wu, P. Ong, and A. Winer. 2004. Structural disparities of urban traffic in southern California: Implications for vehicle-related air pollution exposure in minority and high-poverty neighborhoods. *Journal of Urban Affairs* 26: 565–592.

Karner A.A., D.S. Eisinger, and D.A. Niemeier. 2010. Near-roadway air quality: Synthesizing the findings from real-world data. *Environmental Science and Technology* 44 (14):5334–5344.

USEPA. 2019. How mobile source pollution affects your health. Accessed October 2020.