



Office of Health Equity

Healthy Communities Data and Indicators Project

Short Title: Mode of transport to work.

Full Title: Percent of residents aged 16 years and older mode of transportation to work.

1. Healthy Community Framework:

Meets basic needs of all.

2. What is our aspirational goal?

Safe, sustainable, accessible and affordable transportation options.

3. Why is this important to health?

a. Description of significance and health connection.

Commute trips to work represent 19% of travel miles in the United States. The predominant mode – the automobile - offers extraordinary personal mobility and independence, but it is also associated with health hazards, such as air pollution, motor vehicle crashes, pedestrian injuries and fatalities, and sedentary lifestyles. Automobile commuting has been linked to stress-related health problems. Active modes of transport – bicycling and walking alone and in combination with public transit—offer opportunities for physical activity, which is associated with lowering rates of heart disease and stroke, diabetes, colon and breast cancer, dementia and depression. Risks of injury in traffic collisions are greatest for motorcyclists, pedestrians, and bicyclists and lowest for bus and rail passengers. Minority communities bear a disproportionate share of pedestrian-car fatalities; Native American male pedestrians experience 4 times the death rate Whites or Asian pedestrians, and African-Americans and Latinos experience twice the rate as Whites or Asians.

b. Summary of evidence.

Emissions from motor vehicles account for approximately 1/3 of California's annual emissions of air pollutants. Among them, fine particulates and precursors of ozone have established links to increased mortality, hospital admissions, and other adverse health effects in numerous epidemiologic studies. The risk of road traffic injuries is strongly related with the mode of transportation: motorcyclists, pedestrians and bicyclists experience 2-20 times the fatal injury rate as car occupants. Numerous epidemiological studies have documented that physical activity decreases risks of cardiovascular disease and stroke, colon and breast cancer, and dementia and depression. Active transport increases opportunities for physical activity. Several recent studies associated populations with long commutes in automobiles (>60 minutes) decreases in aggregate



health-related activities and encroached on time for sleep, physical activity, and food preparation.

c. References.

1. California Air Resources Board. [Estimated Annual Average Emissions \(http://www.arb.ca.gov/app/emsinv/emssumcat.php\)](http://www.arb.ca.gov/app/emsinv/emssumcat.php). Sacramento, CA: California Air Resources Board; 2008. Accessed July 19th, 2013.
2. Tran HT, Alvarado A, Garcia C, Motallebi N, Miyasato L, Vance W. [Methodology for Estimating Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California \(http://www.arb.ca.gov/research/health/pm-mort/pm-mort_final.pdf\)](http://www.arb.ca.gov/research/health/pm-mort/pm-mort_final.pdf). Sacramento, CA: California Air Resources Board; 2009. Accessed August 16th, 2012.
3. Drechsler D, Garcia C, Tran H, Mehadi A, Nystrom M, Propper R, et al. [Review of the California Ambient Air Quality Standard For Ozone. Vol 4 \(http://www.arb.ca.gov/carbis/research/aaqs/ozone-rs/rev-staff/vol4.pdf\)](http://www.arb.ca.gov/carbis/research/aaqs/ozone-rs/rev-staff/vol4.pdf). Sacramento, CA: California Environmental Protection Agency, Air Resources Board; 2005. Accessed January 4th, 2013.
4. Centers for Disease Control and Prevention. [CDC Recommendations for Improving Health through Transportation Policy \(http://www.cdc.gov/transportation/docs/final-cdc-transportation-recommendations-4-28-2010.pdf\)](http://www.cdc.gov/transportation/docs/final-cdc-transportation-recommendations-4-28-2010.pdf). National Center for Environmental Health; 2008. Accessed November 2nd, 2013.
5. Beck LF, Dellinger AM, O'Neil ME. Motor vehicle crash injury rates by mode of travel, United States: using exposure-based methods to quantify differences. *Am J Epidemiol*, 2007; 166(2): 212-218.
6. Santos A, McGuckin N, Nakamoto HY, Gray D, Liss S. [Summary of Travel Trends: 2009 National Household Travel Survey \(http://nhts.ornl.gov/2009/pub/stt.pdf\)](http://nhts.ornl.gov/2009/pub/stt.pdf). Washington, DC: Federal Highway Administration; 2011. Accessed November 2nd, 2013.

4. What is the indicator?

a. Detailed Definition.

Percent of resident's mode of transportation to work.

b. Stratification.

Race/Ethnicity (8 Census groups) and mode of transportation (5 groups).

c. Data Description.

- i. Data source: U.S. Census Bureau, Census 2000 , 2005-2007 American Community Survey, 2008-2010 American Community Survey (ACS), 2006-2010 American



Community Survey ([American Fact Finder](http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml) <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>, accessed 7/2013).

- ii. Years available: 2000, 2005 through 2007, 2008-2010, 2006 through 2010.
- iii. Updated: 1, 3, and 5 year intervals.
- iv. Geographies available: census tracts, cities/towns, counties, regions (derived), and state.

Data from the Census 2000 (table PCT055) and the ACS (tables DP03 and B08301) were downloaded from <http://factfinder2.census.gov>. The modes of transportation included: 1) bicycle, 2) car-truck-van, 3) public transportation, 4) walked, and 5) worked at home. Car-truck-van was subdivided into carpooled or drove alone. The denominator was the total population aged 16 years and older that had a paid job in the week previous to the survey, and the numerator was the number of people within that population using each mode. For 2005-2007, 2008-2010, and 2006-2010, Table B08301 was used for the car-truck-van and bicycle modes, and Table DP03 was used for other modes. The percent of residents mode of transportation and its standard error was calculated from population counts of the numerator and denominator ($\frac{\text{numerator}}{\text{denominator}} \times 100$) using binomial approximation or abstracted directly from Table DP03. Relative standard errors, 95% confidence intervals, and decile ranking of places were also calculated. Regions were based on counties of metropolitan transportation organizations (MPO) as reported in the [2010 California Regional Progress Report](http://www.dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning/Files/CARegionalProgress_2-1-2011.pdf) (http://www.dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning/Files/CARegionalProgress_2-1-2011.pdf).

5. Limitations.

The denominator of the indicator is limited to individuals with paid work. Commute trips to school were not included. Only the principal mode based on daily frequency or longest distance was used in the case of multi-modal trips on the same day or during the sample week.

Commute trips to work tend to be longer distance and more likely to be made by automotive means, thus this indicator might depict a higher automotive mode share than if other type of trips were included. Race/ ethnicity data was not available for census tracts. Margin of error was not available for the year 2000. Taxicab was included in public transportation in 2000, but not for other years.

6. Projects using this indicator.

[Public Health-Seattle & King County Assessment Policy Development & Evaluation Unit. Communities Count, 2008 - A Report on the Strength of King County's Communities. Seattle,](#)



[WA: Seattle & King County Assessment Policy Development & Evaluation Unit; 2008.
http://communitiescount.org/.](http://communitiescount.org/)