STATE ENVIRONMENTAL HEALTH INDICATORS COLLABORATIVE (SEHIC) AIR QUALITY INDICATORS
Indicator: AQ3: Traffic
Measure(s):   AQ3.1: Percentage of Population Living Near Busy Roads (by County)

MEASURE DESCRIPTIONS

AQ3.1: Percentage of Population Living Near Busy Roads	
Last updated :	June 30, 2008
Description:	Percentage of population living within 300 m of busy roads (>10,000 cars/day).
Measurement units:	Percentage of population
Geographic scale:	County
Time scale:	2006
Significance/background:	Residence near busy roads has been associated with an increased risk in a variety of health outcomes, including heart disease, asthma, and reproductive outcomes. Distance from busy roads has been found to be a proxy for exposure to traffic related pollutants.
Rationale:	This measure will provide an indication of exposure to pollutants such as PM2.5, NO2, and other air contaminants
Measure limitations:	Upwind and downwind of roadway, and other meteorological conditions will affect the accuracy of this measure.
Data resources:	U.S. Department of Transportation Highway Performance Monitoring System; 2000 U.S. Census
Data limitations:	The Highway Performance Monitoring System (HPMS) data is intended more for national analyses and is, therefore, not geographically precise. As a result, county level numbers (which are based on block group data) should be used with care. It should also be noted that HPMS doesn't capture all roads, but includes only major roads. Percentage of population will be an approximation based on overlays of census block groups.
Related sets of data:	
Related SEHIC measures:	Asthma and other respiratory diseases
Related indicators from other projects:	Cancer; reproductive outcomes; heart disease
Recommendations:	
Additional data elements:	

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HOW-TO GUIDE: AQ3.1

Obtain Data from the U.S. Census Website:

1. Obtain 2000 U.S. Census Data with census block group polygons, a traffic segment layer with an average annual daily traffic attributes, and a county layer. (assumes that all layers have the same projection and datum, and the projection preserves distance and area {e.g. Mercator}).

2. Intersect county layer with traffic segment layer maintaining county text ID and daily traffic coding attributes.

3. Select all road segments in a county having >10,000 cars/day (average annual daily traffic).

4. Calculate area of each block group in the county. This is the total area of each block group.

5. Buffer selected road segments by 300m.

6. Intersect buffered road segments with block group layer maintaining block group unique identifier.

7. Dissolve (or collapse) resulting intersected polygons on block group unique identifier so that there is no more than one polygon per block group unique identifier.

8. Calculate area of resulting dissolved polygons; this is the area of each block group that is within 300m of busy roads.

9. Join in the total area and total population attributes from original block group attribute table in (3) with the dissolved layer attribute table created in (8).

10. Divide the area of block group near busy roads by the total block group area; this is the proportion of block group area within 300m of busy roads.

11. Multiply the population of the block group by the percentage calculated in (10); this is the total population of block group living within 300m of busy roads.

12. Sum the population figure calculated in (11) by county unique identifier to give the within 300m of busy roads.