



Oregon Department of Transportation

Research Notes

RSN 05-07

March 2005

GIS Mapping of Environmental Justice Populations

A New Tool for Meeting EJ Requirements

As part of the requirements for receiving federal funds, ODOT is responsible for successfully integrating environmental justice (EJ) into its program and planning activities. Environmental justice requires ODOT to avoid, minimize, or mitigate disproportionately high and adverse effects of its activities on minority populations and low-income populations; ensure their full and fair participation; and prevent the denial of benefits to them.

ODOT Research recently completed a project to assemble a Geographic Information System (GIS) database which would identify census tracts and block groups statewide where low-income and minority populations reside.

Maps showing the basic census data related to the presence of low-income and minority populations can give ODOT a general indication of whether a given planning area or transportation improvement project may be in or near these communities. Such maps can thus serve as a screening tool for providing an initial look at potential EJ issues for the project. Additional on-site analysis would likely be needed to confirm the EJ status of a given area.

Steps in the Process

The research team reviewed the approaches that other jurisdictions have taken in mapping EJ characteristics and researched related materials at the national level and within Oregon. In addition to the federally required categories, some transportation agencies have identified other census characteristics, including the elderly, people with disabilities, people with language

barriers, and households with no access to vehicles.

Census tract and block group data were compiled from the 2000 U.S. Census using Summary File 3 datasets. The census block group data for the EJ categories were assembled to display the percent population of minority, those below the poverty level, and those below two times the poverty level for each block group. The same database was also created at the census tract level.

In addition to these required categories, the project also assembled census data on the elderly, linguistically isolated, people dependent on public transportation, and people with go-outside-the-home disabilities.

Focusing on the Relevant Areas

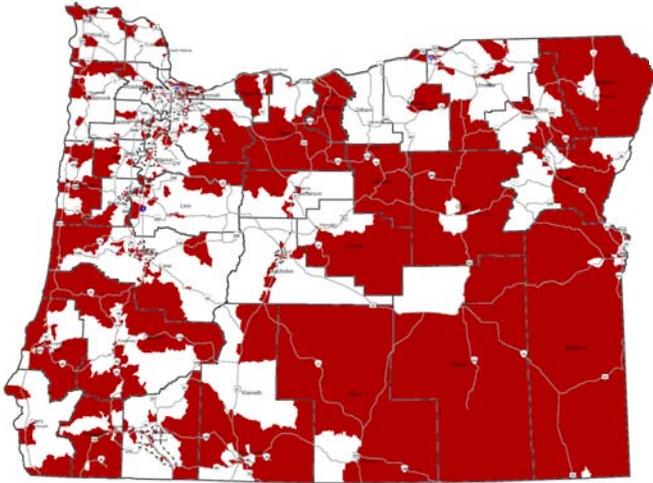
Since census boundaries must comprise all land area, not all census blocks contain population. Thus the block file from the 2000 Census was used to identify blocks that contain zero population. These blocks were then overlaid on the block group maps of EJ characteristics to mask the zero population blocks, leaving only populated areas displayed.

The sample maps on the next page show how the masking of zero population blocks can make a difference in displaying census characteristics.

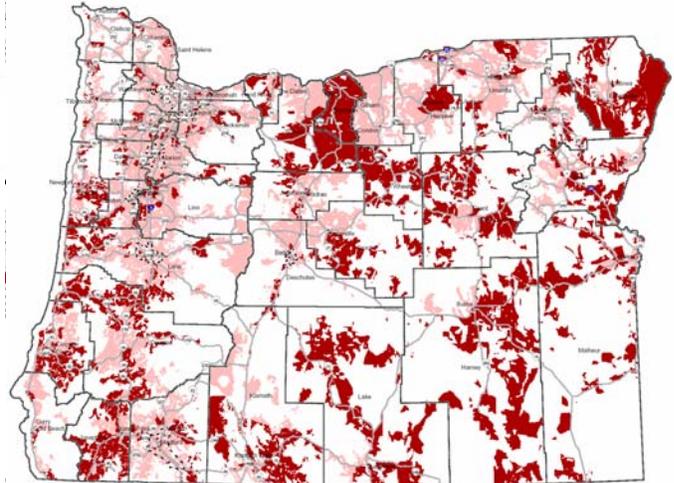
The map on the left side shows two categories:

- Block groups in which the percent of people in poverty is at or above the state average (shaded dark), and
- Block groups in which the percent of those in poverty is below the state average (white).

The map on the right, with zero population blocks masking the block groups, shows three categories:



(a) Dark shading: % in poverty exceeds state average
White: % in poverty falls below state average



(b) Dark shading: % in poverty exceeds state average
Light shading: % in poverty falls below state average
White: Census Blocks with zero population

GIS Mapping of Poverty Levels in 2000 Census Block Groups

- Block groups in which the percent of people in poverty is at or above the state average (shaded dark),
- Block groups in which the percent of those in poverty is below the state average (shaded light), and
- zero population blocks (white).

The resulting maps thus achieved a higher resolution, especially in rural areas where vast areas of large block groups contain zero population.

Serving Oregon Better

The mapping of EJ characteristics can be a useful tool in assisting ODOT to more effectively fulfill its responsibilities to Oregon citizens. Identification of EJ communities is important in enhancing the public involvement process, involving people early in the process, and avoiding disproportionately high and adverse impacts of transportation projects and programs. The ODOT GIS Unit now houses the map and census databases and makes them available for examination of any area of the state.

*For more information, contact Alan Kirk at 503-986-2843,
or via e-mail at Alan.R.Kirk@odot.state.or.us*

To request a copy of the report "GIS Mapping of Environmental Justice Census Characteristics" contact the ODOT Research Unit by phone, or view the report on the Research Unit web page listed below



Oregon Department of Transportation

Research Unit

**200 Hawthorne Ave. SE, Suite B-240
Salem, OR 97301-5192**

**Telephone: 503-986-2700
FAX: 503-986-2844**

***For more information on ODOT's Research Program and Projects,
visit the website at***

http://www.oregon.gov/ODOT/TD/TP_RES/