7-2012

Use of Demographic Weights to Automate the Selection of Public Involvement Strategy Tools

Jennifer Fu
Florida International University, Fujen@fiu.edu

Dan Mcgillicuddy
Florida International University

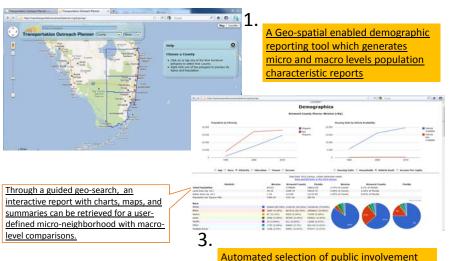# Use of Demographic Weights to Automate the Selection of Public Involvement Strategy Tools

Jennifer Fu, Dan Mcgillicuddy

GIS Center, Florida International University

ABSTRACT

This poster demonstrates a geo-spatial enabled Transportation Outreach Planner by FIU for South Florida Tri-County MPOs, Florida *(see also* http://itis.fiu.edu*)* for the purpose of assessment of demographic profile and recommending the appropriate outreach methods for transportation planning. We utilized demographic weights to automate the selection of Public Involvement Strategy Tools based upon community characteristics.

TRANSPORTATION OUTREACH PLANNER

Currently there are three main components of the Transportation Outreach Planner:

1.

A Geo-spatial enabled demographic reporting tool which generates micro and macro levels population characteristic reports

Through a guided geo-search, an interactive report with charts, maps, and summaries can be retrieved for a user-defined micro-neighborhood with macro-level comparisons.

3.

Automated selection of public involvement strategies for transportation planners based upon the demographic profile provided by 1

2. A set of pre-compiled community background reports

The Community Background Reports supplement the quantitative demographic reports with qualitative information such as community history, business landscape, community dynamics, transportation trends, etc.

PROBLEM STATEMENT

The Transportation Outreach Planner interface uses demographic weights to determine the predominant characteristics of a user-defined geography or a community. As not all compiled public involvement strategies are recommended to all communities, some are more suitable for elderly, or economically depressed population groups, while other are for working age people. In addition, time and cost were taken in consideration as transportation planners often are working with a budget and timeline.

SOLUTION

Demographic Weights

The demographic weight W for a sub-category is calculated as:

$$W = \frac{\text{demographic statistic for area of interest}}{\text{demographic statistic for county}}$$

so for the sub-category "Seniors":

$W_{Seniors}$ = (% of population Age 65 and up, for area of interest) / (% of population Age 65 and up, for county)

and for the sub-category "Low Income":

$W_{LowIncome}$ = (% of population with income below 1.25 Poverty level, for area of interest) / (% of population with income below 1.25 Poverty level, for county)

Strategy Scoring

The total possible demographic value D_p is the sum of the demographic weights for all sub-categories:

However, no single strategy is recommended for every possible target group. The demographic value for a particular strategy is the sum of the demographic weights for all sub-categories listed in the strategy's "recommended target groups".

$$D_p = \sum_{i=1}^{N} W_i$$

Then, the unadjusted score S_u for this strategy would be 100 times the demographic value for this strategy divided by the total possible demographic value:

$$S_u = 100 \frac{D_s}{D_p}$$

Adjusting Scores for Cost and Time

The cost C for a strategy is rated from 1 to 4, and the time T from 1 to 3. The time factor F_t defaults to 0.5, but can be set anywhere from 0 to 1 by moving the Time slider between the bottom and top of its range. Similarly, the cost factor F_c defaults to 0.5, but can be set anywhere from 0 to 1 by moving the Cost slider between the bottom and top of its range.

The adjusted score S_a for a particular strategy is then:

$$S_a = 100(1 - CF_c - TF_t)\frac{D_s}{D_p}$$

CONCLUSION

This method in its current implementation has proven to be effective in assisting the decision making process for transportation outreach planners. This web project has won the 2011 award best tool for "Public Outreach" by American Planning Council, Golden Coast Section.