APPENDIX C-3

Equitable Target Areas (ETA)

Technical Analysis Methodology

Contents

Introduction

The Equitable Target Area (ETA) Index was developed to identify environmental justice (EJ) communities in the Atlanta region. EJ communities are protected by national EJ Policies, including Title VI of the Civil Rights Act of 1964 and Presidential Executive Orders 12898 and 13166. The Atlanta Regional Commission (ARC) complies with EJ policies and has in place several programs that address EJ issues, including the Social Equity Advisory Committee and the Regional Transportation Participation Plan.

The ETA index intends to further ARC's efforts in addressing EJ communities. A literature review was conducted to draw from best practices in addressing EJ issues. The ETA index compiles EJ characteristics to measure the impacts of regional plans such as PLAN 2040 to ensure the proportionate distribution of programs and investments.

ETA Index Methodology

ETA Index Development

The following steps outline the methodology used to develop the ETA index:

- Step 1: Data for the analysis was obtained from the SF3 data tables of the 2005-2009 American Community Survey (ACS). The data was aggregated at the census tract level. The index was based on 5 parameters:
  1. Age (seniors 65 years and older).
  2. Education (25 years and older with no high school degree).
  3. Median housing values.
  4. Poverty rates (poverty thresholds calculated by the ACS based on household size and household composition).
  5. Race (distributions of minorities).
- Step 2: In Excel, after downloading the raw data from the ACS download tables, the regional average was calculated for each parameter:
  1. Age (seniors 65 years and older):

$$\textbf{Age}\ RA = [\sum(Sen)/\sum(Pop)]*100$$

Where,

RA = the regional average for the parameter
Sen = Total senior population for the census tract
Pop = Total population for the census tract

  2. Education (25 years and older with no high school degree):

$$\textbf{Education}\ RA = [\sum(25NoHsl)/\sum(25Pop)]*100$$

Where,

25NoHsl = total population over 25 years old with no high school degree for the census tract
25Pop = total population over 25 years old for the census tract

3. Median housing values:

$$\textbf{Median Housing Value } RA = \sum(MHV)/\sum(CT)$$

Where,

MHV = the census tract's owner-occupied median housing value
CT = census tract count

4. Poverty rates:

$$\textbf{Poverty } RA = [\sum(PovPop)/\sum(Pop)]*100$$

Where,

PovPop = Population under the poverty line whose poverty status is determined at the census tract level
Pop = Total population for the census tract

5. Race:

$$\textbf{Race } RA = [\sum((NHispPop\text{-}W)+(HispPop))/\sum(Pop)]*100$$

Where,

NHispPop = total population for the census tract that is not Hispanic or Latino
W = White population that is not Hispanic or Latino per census tract
HispPop = total Hispanic or Latino population per census tract
Pop = total population for the census tract

- Step 3: In Excel, the parameter categories were calculated. Each parameter includes 4 categories: one category representing below average areas for that parameter, interpreted as a low EJ concern, and the 3 above average categories represent increasing levels of potential EJ communities. The 3 above average categories were distributed evenly between the average value and the maximum value for the parameter:

$$Inc = (Max - RA)/3$$

Where,

Inc = the increment value for the 3 above average categories of the parameter.
Max = maximum data value for the parameter
RA = regional average value computed for the parameter

- Step 4: The ranges for the 4 categories are then calculated as follows:

Cat 1 Range = (Min) to (RA)
Cat 2 Range = (RA) to (RA+Inc)
Cat 3 Range = (RA+Inc) to (RA+Inc+Inc)
Cat 4 Range = (RA+Inc+Inc) to (Max)

Where Cat = category

Note: the categories for the median housing value parameter were determined in a reverse manner, such that the lower the median housing value, the more of an EJ concern it is. Thus for median housing value map:

Cat 1 = (RA) to (Max)
Cat 2 = (RA) to (RA-Inc)
Cat 3 = (RA-Inc) to (RA-Inc-Inc)
Cat 4 = (RA-Inc-Inc) to (Min)

- Step 5: In GIS, the 5 parameters were mapped based on their regional averages and 4 calculated categories.
- Step 6: To calculate the ETA, each census tract's parameter entry was assigned a score based on its category using Excel's ***IF THEN*** analysis, such that:

Cat 1 score = 1, Cat 2 score = 2, Cat 3 score = 3, Cat 4 score = 4

- Step 7: The parameter scores for each census tract are summed up:

Total census tract score = Cat 1 score + Cat 2 score + Cat 3 score + Cat 4 score

Hence, the lowest possible score is 4 and the highest possible score is 20. The resulting composite, unweighted score is called the Equitable Target Area (ETA) index:

Total census tract score = Equitable Target Area (ETA) index

- Step 7: as in the parameter method, the regional average for the ETA Index (score) is calculated.
- Step 8: Based on the methodology, areas with an ETA index higher than the regional average are determined to be an ETA Community:

Cat 1 Range = (Min) to (RA) **= *NON-ETA***
Cat 2 Range = (RA) to (RA+Inc) **= *ETA***
Cat 3 Range = (RA+Inc) to (RA+Inc+Inc) **= *ETA***
Cat 4 Range = (RA+Inc+Inc) to (Max) **= *ETA***

- Step 9: In GIS, the ETA index is mapped according to the categories.

Other EJ Measures

The Limited English Proficiency (LEP) Population

Limited English Proficiency (LEP) populations are protected by EJ policies:

- Step 1: Data for LEP populations was obtained from the 2005-2009 ACS survey at the census tract level. The ACS defines LEP as people who speak English "less than well".
- Step 2: the regional average of the LEP population relative to the total population in the census tract is calculated:

$$\textbf{\textit{LEP}}\ RA = [\sum(LEPPop)/\sum(Pop)]*100$$

Where,

LEPPop = LEP Population at the census tract level
Pop = Total population for the census tract

- Step 3: similar to the ETA parameter calculations, the ranges for the 4 categories of the LEP population concentrations are calculated as follows:

Low = Cat 1 Range = (Min) to (RA)
Medium = Cat 2 Range = (RA) to (RA+Inc)
High = Cat 3 Range = (RA+Inc) to (RA+Inc+Inc)
Very High = Cat 4 Range = (RA+Inc+Inc) to (Max)

- Step 4: The distribution of the LEP population is mapped in GIS, overlaying the ETA index base map.
- Step 5: Using GIS analysis, the percentage of LEP populations located in ETA communities was calculated.

The Disabled Population

The disabled population is also protected by EJ policies:

- Step 1: 2009 County-level disability data was obtained from the ACS. 5-year estimates for disability was not available for the 2005-2009 timeframe, because the Survey's questions relating to disability substantially changed in 2008, thereby preventing consistent data compilation over the 5-year period.
- Step 2: The data obtained was categorized into 2 categories: the disabled population above and below the poverty line.
- Step 3: In Excel, a chart representing the 2 disability categories at the County level is drawn.

Impacts of PLAN 2040 on ETA Communities

The ETA index map was used as a base map to overlay elements of PLAN 2040 and measure the impacts of the PLAN on ETA Communities.

Zero-Car Households

The relationship of the ETA Index map to zero-car households was calculated as follows:

- Step 1: In Cube, the Travel Demand Model's Trip Generation Zonal Data Script for the base year 2010 and the financially constrained 2040 model year is run.
- Step 2: The total number of zero-car households per traffic analysis zone (TAZ) was obtained from the output results of the script runs. From the output file for each model year run, the field "STR1HSHLDS" represents "total zero auto households".
- Step 3: The distribution of zero-car households in 2010 and 2040 was then mapped in GIS, overlaying the ETA Index map. The distributions were categorized into 4 categories:

Low = Cat 1 Range = (Min) to (RA)
Medium = Cat 2 Range = (RA) to (RA+Inc)
High = Cat 3 Range = (RA+Inc) to (RA+Inc+Inc)
Very High = Cat 4 Range = (RA+Inc+Inc) to (Max)

- Step 4: Using GIS analysis, the percentage of zero-car households in ETA communities is calculated for 2010 and 2040.

Accessibility

The accessibility of ETA communities was measured by applying the multimodal accessibility (MMA) measure to the ETA communities:

- Step 1: The MMA for 2010 and 2040 was calculated for each TAZ in the region by measuring the ability to access employment centers by walking within 15 minutes, driving within 30 minutes and taking transit within 45 minutes. A composite score (0-300) is calculated for each TAZ, where a higher score denotes a higher accessibility area. The MMA score categories are as follows:
    - High and Very High categories represent high accessibility to employment centers, and the ability to access these centers with all 3 modes of travel.
    - The Medium category represents moderate accessibility to employment centers.
    - The Low and Very Low categories represent low accessibility to employment centers relative to the region. Accessibility to employment centers in these areas is primarily by car.
- Step 2: the ETA communities identified by the ETA index are overlaid on top of the 2010 and 2040 MMA maps in GIS.
- Step 3: Using GIS analysis, the percentage of ETA communities located in high accessibility areas is calculated.

Unified Growth Policy Map (UGPM)

The impacts of elements of the Unified Growth Policy Map (UGPM) on ETA Communities are measured:

- Step 1: In GIS, the UGPM is overlaid with the ETA communities identified by the ETA Index.
- Step 2: The regional and local centers defined by the PLAN 2040 land use network are also overlaid.
- Step 3: Using GIS analysis, the percentage of regional and local centers located within ETA communities is calculated.

Transportation Investments

The impacts of PLAN 2040 transportation investments in ETA Communities are measured:

- Step 1: In GIS, the financially constrained list of PLAN 2040 transportation investments, both the corridor (line) and intersection/interchange (point) project shapefiles are overlaid on top of the ETA communities identified by the ETA Index.
- Step 2: Using the GIS Symbology feature, line and point projects are broken down by project type: Roadway, transit and bike and pedestrian projects.
- Step 3: Using GIS analysis, the number of projects and total investments by project type is calculated for ETA communities versus non-ETA areas.

Jobs-Housing Balance

The change in jobs-housing balance from 2010 to 2040 was calculated for ETA communities and non-ETA areas:

- Step 1: Using the ARC population and employment 2010 estimates and 2040 forecasts, total jobs and total households were obtained for each TAZ.
- Step 2: In Excel, the jobs housing balance for each TAZ was then calculated:

$$J/H = TE/HH$$

Where,

J/H = the jobs-household ratio for the TAZ
TE = total employment at the TAZ level
HH = total households at the TAZ level

- Step 3: The population and employment spreadsheets were linked to corresponding TAZ layers in GIS.
- Step 6: Using GIS analysis, the J/H ratios are calculated for ETA communities versus non-ETA areas in 2010 and 2040. The analysis results are drawn in a chart in Excel.

Livable Centers Initiative (LCI) Projects

The relationship of ETA Communities with Livable Centers Initiative (LCI) Projects is calculated as follows:

- Step 1: In GIS, the LCI shapefile, showing LCI projects programmed between 2000 and 2010, is mapped in GIS.
- Step 2: The LCI shapefile is then overlaid by the ETA Index shapefile.
- Step 3: Using GIS analysis, the percentage of LCI projects that are within or adjacent to ETA communities is calculated.