USING GEOGRAPHIC INFORMATION SYSTEMS TO IDENTIFY POPULATIONS AND EVALUATE SPATIAL PATTERNS OF BENEFITS AND BURDENS

Effective Practices:

- Taking full advantage of the capabilities of geographic information systems to advance needs identification and the assessment of benefits and burdens throughout all decision-making stages.

Participants:

- State Departments of Transportation
- Metropolitan Planning Organizations
- Transit Service Providers
- Community-Based Organizations
- Academic Institutions and Students
- Partnering Government Agencies

Description

Geographic Information Systems (GIS) are an excellent tool for comparing spatial data on the relative concentrations of low-income and minority populations and evaluating whether disproportionately high and adverse impacts or burdens fall upon areas more greatly concentrated by protected populations. The GIS will require Census TIGER/Line files that contain important digital data about the street network as well as key boundaries for reporting socioeconomic characteristics such as counties, municipalities, census tracts, block groups and blocks. TIGER files can be translated and imported as geographic files using GIS software such as Mapinfo, Arc/Info, ArcView, Maptitude, Atlas, and TransCAD. The Census of Population and Housing reports demographic and socioeconomic characteristics by ge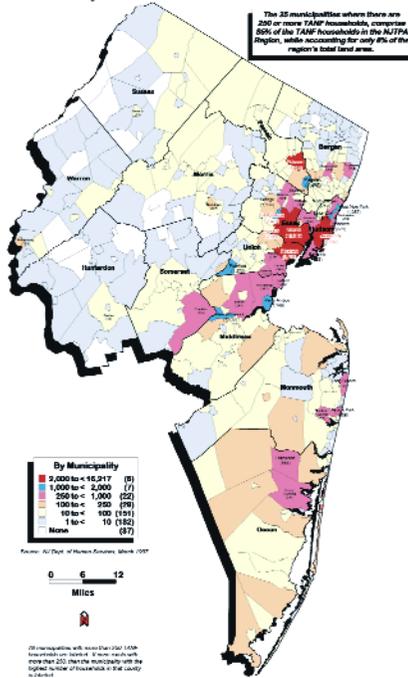ographic areas and also provides latitude and longitude information, thereby enabling a GIS to join the data with corresponding census boundaries from TIGER. TIGER files include critical data on street addresses which GIS mapping tools rely upon to facilitate the pinpointing or geo-coding of critical household destinations.

During the transportation planning stage, planners may be geo-coding and measuring accessibility (i.e., time and distances) to child care facilities, job training centers, social service agencies, retail stores, employment establishments, school facilities, hospitals, rail transit stations, bus stops, park and ride facilities, etc. GIS provides an excellent tool for the transit service planner laying out routes by analyzing population densities and key originating/destination node locations.

GIS tools support the importing and digitizing and overlaying of other relevant geographic boundaries. This essential capability facilitates consideration of traffic analysis zones, crime reporting units, school districts, neighborhoods, and planning districts. Investments and other resource allocation decisions can be improved when information is compiled about such factors as:

- Environment – air quality "hot-spots", sensitive receptors for noise, known toxic and hazardous waste sites.

- Community – crime incidence, property values, building code violations, capital improvement investments, capital facility locations such as sewer treatment, jails, transfer facilities for solid waste, intermodal transfer facilities.

- Poverty – schools with children receiving free and reduced price lunches.

- Health – reported cases of asthma, and other health concerns.

Map 2: *Number of Temporary Assistance to Needy Families (TANF) Households in the NJTPA Region*

Making better use of the data systems already in hand is an essential element of environmental justice. GIS systems are important tool for assessing how programs, policies, plans and existing activities are affecting low-income and minority populations. There is a wealth of information stored in the management information systems created by transportation agencies for operations and maintenance. Community-based organizations and environmental justice advocates work in communities where existing deficiencies in operating services, facility conditions and health and safety are paramount concerns. Agency transportation planners and decision makers face a very real challenge to better use GIS systems to clearly understand how benefits and burdens are distributed not only in future plans, but also in current operations.

Benefits

For the Agencies:

*   States, MPOs and transit service providers who invest in GIS should be better informed about the current allocation of benefits and burdens and whether particular communities experience a disproportionate share of facilities that are detrimental to a community's livability and attractiveness.

*   Transportation planners using GIS should be in an excellent position to observe whether standards are uniformly applied to the delivery of operating services and maintenance expenditures.

For the Community:

*   GIS provides a platform for assessing the spatial patterns of human health, environmental and socioeconomic conditions as well as the distribution of current investment patterns, so as to avoid, minimize and mitigate disproportionately high and adverse effects on low-income and minority neighborhoods.

Contacts/Resources

The Bureau of Transportation Statistics website is a valuable resource for those interested in GIS: http://www.bts.gov/gis/

*   Streets, Traffic and Public Works – key accident locations, major congestion locations, maintenance yards, and maintenance investments for pavement, lighting, etc.

*   Transportation Investments – locations of capital grant expenditures for system preservation and transportation enhancement projects.

Agencies interested in building and maintaining a comprehensive library of mappable data sets will find it beneficial to develop data-sharing partnerships with other government agencies. States and MPOs that maintain GIS systems can be of invaluable assistance for improving the quality of data available for consideration of environmental justice as projects move from the Planning to the Project Development stage. The availability of such central repositories of data offers community impact analysts a better starting platform for assessment of direct, indirect and cumulative effects in environmental studies required under the National Environmental Policy Act (NEPA).