Visualizing Transit Need

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Introduction/Background

Transit network

GIS shape files

ACS data

STS BUS ROUTE MAP
ST. MARY'S COUNTY, MARYLAND

* Bus Routes Effective October 1, 2012
Analysis by Population Segment

- Extract 5-year ACS estimates of potentially transit-dependent population segments.
  - **Older adults** – 65+. May choose not to drive or can no longer drive due to age.
  - **Individuals with disabilities** – 18+. Disability status based on 6 aspects (hearing, vision, cognitive, ambulatory, self care, or independent living difficulty).
  - **Low-income individuals** – Purchasing/maintaining a personal vehicle may be difficult.
  - **Autoless households** – Lack of a vehicle is a significant factor for transit need.
  - **Youth** - 10 – 17. Most likely must rely on others for transportation.
## ACS Data Sources

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Table Source/Number</th>
<th>Table Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>US Census – AREALAND</td>
<td>Area (meters)</td>
</tr>
<tr>
<td>Population</td>
<td>ACS - B01003</td>
<td>Total Population</td>
</tr>
<tr>
<td>No Vehicle Households</td>
<td>ACS - B25044</td>
<td>Tenure by Vehicles Available</td>
</tr>
<tr>
<td>Older Adults</td>
<td>ACS - B01001</td>
<td>Sex by Age (65 yrs +)</td>
</tr>
<tr>
<td>Youth</td>
<td>ACS - B01001</td>
<td>Sex by Age (10 - 17 yrs)</td>
</tr>
<tr>
<td>Individuals with Disabilities*</td>
<td>ACS - S1810</td>
<td>Disability Characteristics (18 - 64 yrs; 65 yrs +)</td>
</tr>
<tr>
<td>Individuals Below Poverty</td>
<td>ACS - B17021</td>
<td>Poverty Status of Individuals in the Past 12 Months by Living Arrangement</td>
</tr>
</tbody>
</table>

* Available at the Census Tract level
## ACS Data Sources

- For equity analyses under Title VI of the Civil Rights Act.

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<tr>
<th>Population Category</th>
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<tbody>
<tr>
<td>Race</td>
<td>ACS - B02001</td>
<td>Minorities - Not “White Alone”</td>
</tr>
<tr>
<td>Individuals Below Poverty</td>
<td>ACS - B17021</td>
<td>Poverty Status of Individuals in the Past 12 Months by Living Arrangement</td>
</tr>
</tbody>
</table>
Classification

- Rank geography based on the average for the study area.

<table>
<thead>
<tr>
<th>Number of Vulnerable Persons/Households</th>
<th>Rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; Study Area Average (SAA)</td>
<td>Very Low (1)</td>
</tr>
<tr>
<td>&gt; SAA and &lt; 1.33 times the SAA</td>
<td>Low (2)</td>
</tr>
<tr>
<td>&gt; 1.33 times the SAA and &lt; 1.67 times the SAA</td>
<td>Moderate (3)</td>
</tr>
<tr>
<td>&gt; 1.67 times the SAA and &lt; 2.00 times the SAA</td>
<td>High (4)</td>
</tr>
<tr>
<td>&gt; 2 times the SAA</td>
<td>Very High (5)</td>
</tr>
</tbody>
</table>
Analysis by Population Segment

Transit network + GIS shape files + ACS data = Transit Need Visualization
Analysis by Population Segment

- Frederick County, Maryland
- Older Adult Classification
- Block Group Summary Level
Analysis by Population Segment

- Frederick County, Maryland
- Autoless Households
- Block Group Summary Level
Analysis by Population Segment

- Frederick County, Maryland
- Low Income
- Block Group Summary Level
Analysis by Population Segment

- Frederick County, Maryland
- Youth
- Block Group Summary Level
Analysis by Population Segment

- Frederick County, Maryland
- Persons with Disabilities
- Tract Summary Level
Aggregate Analysis

- Combine the variables to calculate a transit dependence index (TDI).

- TDI framework based a 2004 National Cooperative Highway Research Program (NCHRP) report.

- The report presented an Environmental Justice Index that could be modified to include other populations (beyond low income and minority).

Aggregate Analysis

Population Category Inputs

- Pop. Density (PD)
- No Vehicle Households (NVH)
- Older Adults (OA)
- Youth (Y)
- Below Poverty (BP)

Aggregate Index Outputs

TDI = PD x [NVH + OA + Y + BP]

Amount of Potential Need

TDIP = [NVH + OA + Y + BP]

Degree of Potential Need
Aggregate Analysis

- Minnesota Statewide TDI
- Amount of Vulnerability
- Identifies needs in more dense, urban areas
Aggregate Analysis

- Minnesota Statewide TDIP
- Degree of Vulnerability
- Identifies needs in more rural areas
Aggregate Analysis
Equity Analysis

- St. Mary’s County, Maryland—Minority Classification
Equity Analysis

- St. Mary’s County, Maryland—Below Poverty Classification
ACS Considerations/Issues

- Excel Retrieval Tool uses too much memory/crashes
- Difficult to navigate through FactFinder - block groups not available?
- Limit of 250 geography per download on FactFinder
- Disability Status only available at tract level
- Unclear how geographies in the 5 year sample are reconciled