Transportation, Opportunity, and Equity

Jason Sartori, NCSG
Baltimore Data Day 2013
July 12, 2013

• Four schools at the University of Maryland
  – Agriculture and Natural Resources
  – Architecture, Planning, and Preservation
  – Engineering
  – Public Policy
• Five subunits
  – Transportation Policy Research Group
  – Environmental Finance Center
  – Center for the Use of Sustainable Practices
  – Housing Strategies Group
  – Planning & Design Center
Two Recent Data Intensive Projects

- SEED Initiative
- Opportunity Mapping
Maryland’s One Percent

Importance of Economic Centers

- 1.2% of land
- 42.3% of all jobs
- Compared to the rest of the state, the centers feature:
  - Higher employment densities
  - Higher industrial diversity
  - Higher wages
  - Higher employment growth
  - Higher transit share
  - Larger share of total trips
  - Shorter trip lengths

<table>
<thead>
<tr>
<th>Share of Land Area</th>
<th>Share of Households</th>
<th>Share of Employment</th>
<th>Share of Trips Produced</th>
<th>Share of Trips Attracted</th>
<th>Share of Auto Trips</th>
<th>Share of Transit Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Centers</td>
<td>1.22%</td>
<td>17.04%</td>
<td>42.28%</td>
<td>21.35%</td>
<td>28.76%</td>
<td>20.75%</td>
</tr>
<tr>
<td>Remainder of State</td>
<td>98.78%</td>
<td>82.96%</td>
<td>57.72%</td>
<td>78.65%</td>
<td>71.24%</td>
<td>79.25%</td>
</tr>
</tbody>
</table>
Determinants of Job Growth in Maryland’s Economic Centers

- # firms in the same industry (+)
- # firms in different industry (+)
- Average firm size (-)
- Property Value (-)
- Average Peak Hour Speed (+)
- Distance from Highway ramp (-)
- Distance from Nearest Bus Stop (-)
- Within half mile of transit station (+)
### Potential Baltimore Opportunity Mapping Indicators

<table>
<thead>
<tr>
<th>Education</th>
<th>Housing and Neighborhood Quality</th>
<th>Social Capital</th>
<th>Public Health and Safety</th>
<th>Employment and Workforce</th>
<th>Transportation and Mobility</th>
</tr>
</thead>
</table>
| • MSA and MHSA Performance  
• Teachers Highly Qualified  
• Attendance Rate  
• School Progress Index  
• AP Course Enrollment  
• AP Exam Scores  
• SAT Scores  
• High School Dropout Rate | • Median Home Value  
• Median Gross Rent  
• Change in Housing Units  
• Single Family vs. Multi-Family  
• Owner Costs as % of Income  
• Gross Rent as % of Income  
• Median Gross Rent to FMR  
• Cost Burden  
• Housing Affordability Index  
• Housing + Transportation Index  
• High Cost Loan Rate  
• Foreclosure Rate  
• Vacancy Rates  
• Housing Capacity | • Density of Religious & Social Organizations  
• Density of Public Institutions  
• Population 25 to 44  
• Racial Diversity  
• High School Diploma  
• Bachelor’s Degree  
• Median Income  
• Households in Poverty  
• Labor Force Participation Rate  
• Unemployment Rate  
• Population Density  
• Homeownership Rate  
• Single Parent Households | • Cancer, Neurological, Respiratory Disease Risk  
• Infant Mortality  
• Teen Births  
• Late/No Prenatal Care  
• Low Birth Weight  
• Access to:  
- Emergency Services  
- Social Services  
- Hospitals  
- Surgical and Emergency Centers  
- Outpatient Care Centers  
- Food Swamps  
- Parks  
• Park Coverage  
• Watershed Failure  
• Crime Risk Index | • Job Density  
• Jobs Accessible by Auto  
• Jobs Accessible by Transit  
• Transit/Auto Accessibility Gap  
• Change in Jobs  
• Workers by Skill  
• Job Access Ratio by Skill | • Travel Time Index  
• Driving Commute Length  
• Transit Commute Length  
• Access to Transit  
• Transit Connectivity Index  
• Occupied Units with No Vehicle  
• Walk Score  
• Transportation Trail Miles  
• Per Capita VMT for Home-Based Trips  
• Per Capita VHT for Home-Based Trips |
EMERGENCY SERVICES LOCATIONS (count)
Region 212
Anne Arundel 45
Baltimore 69
Carroll 20
Harford 25
Howard 12
Baltimore City 41

RELATIONSHIP TO OPPORTUNITY
Direct

DATA SOURCES
Quarterly Census of Employment and Wages, 2007; Maryland PropertyView, 2010

DEFINITION
The percent of each census tract’s land area that falls within a 10 minute drive from an emergency ambulance service provider (NAICS Code 621910) or fire station (identified in Maryland PropertyView).

METHODOLOGY
Estimated 10 minute service area using MSTM network, then calculated the percent of census tract land area that falls within a service area (can be larger than 100%).

JOBS COUNT
Region 1,800,375
Anne Arundel 410,239
Baltimore 526,892
Carroll 75,058
Harford 142,323
Howard 136,904
Baltimore City 517,958

RELATIONSHIP TO OPPORTUNITY
Direct

DATA SOURCES
Maryland Statewide Transportation Model; LEHD, 2010

DEFINITION
Shows the number of jobs that can be accessed within 30 minutes auto travel time, using MSTM street network data.

METHODOLOGY
Calculate the number of jobs accessible within a 30 minute auto commute during AM peak for each state modeling zone (SMZ). Aggregate SMZ level data census tract.
**JOBS COUNT**

Region | 1,800,375
Anne Arundel | 410,239
Baltimore | 526,892
Carroll | 75,058
Harford | 142,323
Howard | 136,904
Baltimore City | 517,958

**DEFINITION**

Shows the number of jobs that can be accessed within 30 minutes of travel time.

**METHODOLOGY**

Calculate the number of jobs accessible within a 30 minute transit trip during AM peak for each state modeling zone (SMZ). Aggregate SMZ level data census tract.

**JOB ACCESS RATIO – LOW SKILL**

Region | 2.29
Anne Arundel | 2.55
Baltimore | 2.29
Carroll | 1.85
Harford | 2.04
Howard | 4.09
Baltimore City | 1.60

**DEFINITION/METHODOLOGY**

This measure compares the percentage of low skill workers (age 25 and older) in the census tract to the percentage of low skill jobs that are accessible from the census tract within a 30 minute commute. A value of 1 would suggest that the tract's workforce is in balance with the accessible jobs. Higher values suggest imbalance in the ratio, though do not indicate whether there is a higher share of jobs or workers.
JOB ACCESS RATIO – MIDDLE SKILL*

Region 2.13
Anne Arundel 2.56
Baltimore 2.09
Carroll 2.42
Harford 2.74
Howard 1.86
Baltimore City 1.79

RELATIONSHIP TO OPPORTUNITY
Inverse

DATA SOURCES
Maryland Statewide Transportation Model; U.S. Census Bureau, American Community Survey 5-year Estimates, 2011; LEHD, 2010

* Summary data indicate the average of census tract values in each jurisdiction.

DEFINITION/METHODOLOGY
This measure compares the percentage of middle skill workers (age 25 and older) in the census tract to the percentage of middle skill jobs that are accessible from the census tract within a 30 auto commute. A value of 1 would suggest that the tract’s workforce is in balance with the accessible jobs. Higher values suggest imbalance in the ratio, though do not indicate whether there is a higher share of jobs or workers.

JOB ACCESS RATIO – HIGH SKILL*

Region 2.32
Anne Arundel 2.20
Baltimore 2.07
Carroll 1.86
Harford 1.93
Howard 3.07
Baltimore City 2.63

RELATIONSHIP TO OPPORTUNITY
Inverse

DATA SOURCES
Maryland Statewide Transportation Model; U.S. Census Bureau, American Community Survey 5-year Estimates, 2011; LEHD, 2010

* Summary data indicate the average of census tract values in each jurisdiction.

DEFINITION/METHODOLOGY
This measure compares the percentage of high skill workers (age 25 and older) in the census tract to the percentage of high skill jobs that are accessible from the census tract within a 30 auto commute. A value of 1 would suggest that the tract’s workforce is in balance with the accessible jobs. Higher values suggest imbalance in the ratio, though do not indicate whether there is a higher share of jobs or workers.
JOB ACCESS RATIO – AVERAGE*

<table>
<thead>
<tr>
<th>Region</th>
<th>2.24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Arundel</td>
<td>2.43</td>
</tr>
<tr>
<td>Baltimore</td>
<td>2.15</td>
</tr>
<tr>
<td>Carroll</td>
<td>2.04</td>
</tr>
<tr>
<td>Harford</td>
<td>2.23</td>
</tr>
<tr>
<td>Howard</td>
<td>3.01</td>
</tr>
<tr>
<td>Baltimore City</td>
<td>2.07</td>
</tr>
</tbody>
</table>

RELATIONSHIP TO OPPORTUNITY
Inverse

DATA SOURCES
Maryland Statewide Transportation Model; U.S. Census Bureau, American Community Survey 5-year Estimates, 2011; LEHD, 2010

* Summary data indicate the average of census tract values in each jurisdiction.

TRAVEL TIME INDEX*

<table>
<thead>
<tr>
<th>Region</th>
<th>1.36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Arundel</td>
<td>1.36</td>
</tr>
<tr>
<td>Baltimore</td>
<td>1.29</td>
</tr>
<tr>
<td>Carroll</td>
<td>1.23</td>
</tr>
<tr>
<td>Harford</td>
<td>1.23</td>
</tr>
<tr>
<td>Howard</td>
<td>1.26</td>
</tr>
<tr>
<td>Baltimore City</td>
<td>1.34</td>
</tr>
</tbody>
</table>

RELATIONSHIP TO OPPORTUNITY
Inverse

DATA SOURCE
Maryland Statewide Transportation Model, 2007

* Summary data indicate the average of census tract values in each jurisdiction.
**Driving Commuters: Percent Driving Less Than 30 Minutes**

Region | Percentage
--- | ---
Anne Arundel | 56.9%
Baltimore | 57.2%
Carroll | 42.0%
Harford | 49.1%
Howard | 54.9%
Baltimore City | 61.6%

**Relation to Opportunity**
Direct

**Data Source**
U.S. Census Bureau, American Community Survey 5-year Estimates, 2011

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**Commuters: Percent Taking Transit Less Than 45 Minutes**

Region | Percentage
--- | ---
Anne Arundel | 0.7%
Baltimore | 1.6%
Carroll | 0.3%
Harford | 0.2%
Howard | 0.7%
Baltimore City | 9.6%

**Relation to Opportunity**
Direct

**Data Source**
U.S. Census Bureau, American Community Survey 5-year Estimates, 2011

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**Definition/Methodology**
This is the percent of all driving commuters that drive less than 30 minutes to work. Mapped as reported by Census.

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**Definition/Methodology**
This is the percent of all commuters that take public transit to work for less than 45 minutes. Mapped as reported by Census.
### TRANSIT ACCESS BUFFER*

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Arundel</td>
<td>19.9%</td>
</tr>
<tr>
<td>Baltimore</td>
<td>34.2%</td>
</tr>
<tr>
<td>Carroll</td>
<td>9.1%</td>
</tr>
<tr>
<td>Harford</td>
<td>14.0%</td>
</tr>
<tr>
<td>Howard</td>
<td>36.4%</td>
</tr>
<tr>
<td>Baltimore City</td>
<td>82.8%</td>
</tr>
</tbody>
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**RELATIONSHIP TO OPPORTUNITY**

Direct

**DATA SOURCES**

NCSG; Maryland Transit Administration

*Summary data indicate the average of census tract values in each jurisdiction.*

### TRANSIT CONNECTIVITY INDEX*

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Index</th>
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</thead>
<tbody>
<tr>
<td>Anne Arundel</td>
<td>0.038</td>
</tr>
<tr>
<td>Baltimore</td>
<td>0.203</td>
</tr>
<tr>
<td>Carroll</td>
<td>0.000</td>
</tr>
<tr>
<td>Harford</td>
<td>0.039</td>
</tr>
<tr>
<td>Howard</td>
<td>0.071</td>
</tr>
<tr>
<td>Baltimore City</td>
<td>0.402</td>
</tr>
</tbody>
</table>

**RELATIONSHIP TO OPPORTUNITY**

Direct

**DATA SOURCE**

Maryland Statewide Transportation Model, 2007

*Summary data indicate the average of census tract values in each jurisdiction.*

**DEFINITION/METHODOLOGY**

#### TRANSIT ACCESS BUFFER *

Percent of the census tract located within a ¼ mile of a transit stop (rail and bus).

#### TRANSIT CONNECTIVITY INDEX *

Based on a graph theoretical approach for all levels of transit service coverage integrating routes, schedules, socio-economic, demographic and spatial activity patterns. The index shows the performance of large-scale multimodal transit networks to quantify the measures of connectivity at the node, line, transfer center, and regional level.

**WALK SCORE**

<table>
<thead>
<tr>
<th>County</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Arundel</td>
<td>10.20</td>
</tr>
<tr>
<td>Baltimore</td>
<td>15.45</td>
</tr>
<tr>
<td>Carroll</td>
<td>1.42</td>
</tr>
<tr>
<td>Harford</td>
<td>6.66</td>
</tr>
<tr>
<td>Howard</td>
<td>8.56</td>
</tr>
<tr>
<td>Baltimore City</td>
<td>61.81</td>
</tr>
</tbody>
</table>

**DEFINITION/METHODOLOGY**

Street Smart Walk Score calculates a score by mapping out the walking distance to amenities in 9 different amenity categories. In amenity categories where depth of choice is important, we count multiple amenities in a given category. Categories are also weighted according to their importance (details below).

The distance to a location, counts, and weights determine a base score of an address, which is then normalized to a score from 0 to 100. After this, an address may receive a penalty for having poor pedestrian friendliness metrics, such as having long blocks or low intersection density.

**RELATIONSHIP TO OPPORTUNITY**
Direct

**DATA SOURCE**
Quarterly Census of Employment and Wages, 2008

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**TRAIL MILES**

<table>
<thead>
<tr>
<th>County</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Arundel</td>
<td>2,327.3</td>
</tr>
<tr>
<td>Baltimore</td>
<td>2,891.8</td>
</tr>
<tr>
<td>Carroll</td>
<td>760.1</td>
</tr>
<tr>
<td>Harford</td>
<td>1,599.9</td>
</tr>
<tr>
<td>Howard</td>
<td>4,948.3</td>
</tr>
<tr>
<td>Baltimore City</td>
<td>1,579.1</td>
</tr>
</tbody>
</table>

**DEFINITION/METHODOLOGY**

The total number of transportation trail miles in each census tract.

**RELATIONSHIP TO OPPORTUNITY**
Direct

**DATA SOURCE**
Maryland Department of Transportation, 2010
Thank you!

For more information visit:
http://smartgrowth.umd.edu/
http://www.opportunitycollaborative.org/

Or email:
jsartori@umd.edu