Improving Walkability and Liveability by Finding the Open Space Needle in the Dense Suburban Haystack

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Neighborspace of Baltimore County, Inc.
Where Am I?
1908  The Model T
The Mortgage Interest Deduction
Suburban growth overtakes that of cities in the 1920s.

<table>
<thead>
<tr>
<th>Decade</th>
<th>Central-city growth rate</th>
<th>Suburban growth rate</th>
<th>Percent total SMSA growth in suburbs</th>
<th>Suburban growth per 100 increase in central-city population</th>
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<td>48.5</td>
<td>76.2</td>
<td>320.3</td>
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</tbody>
</table>

*SMSA, Standard Metropolitan Statistical Area, constituted by the central city and county-level political units of the surrounding suburban ring.

Source: U.S. Census of Population.
Euclid v. Ambler Realty (U.S. Supreme Ct)

- Small suburban town (Euclid, Ohio) wanted to forestall big-city industry;
- Ambler wanted some residential property it owned in town to be used for industry;
- Euclid said “NO,” Ambler sued, and Supreme Court upheld Euclid’s use of its police power through zoning to keep these uses separate.
Walk Scores of Baltimore County’s Inner Suburbs
1929

Stock Market Crash

$100 WILL BUY THIS CAR
MUST HAVE CASH
LOST ALL ON THE
STOCK MARKET
1934

Federal Housing Administration
The GI Bill

1944 The GI Bill
The Baltimore Beltway
The Plan for the Valleys
Types of Values  Measuring Value  Inside the URDL  Retrofitting

1967  Urban Rural Demarcation Line (URDL)
Suburban Malls Take Root

Mall in Inner Suburb of Woodlawn, Baltimore County, MD (Sept. 2011)

The Dominance of Suburban Malls

1970's

The Dominance of Suburban Malls
Lack of open space is a **HUGE** problem, particularly in the 1st tier suburbs.
Water running off of roofs, driveways, lawns and parking lots picks up trash, motor oil, grease, excess lawn fertilizers, pesticides, dog waste and other pollutants and washes them into the streams and rivers flowing through our communities. This pollution causes a multitude of problems, including toxic algae blooms, harmful bacteria, extensive dead zones, reduced dissolved oxygen, and unsightly trash clusters. (Chesapeake Bay Foundation, http://www.cbf.org/document.doc?id=1866)

“Stormwater runoff is the primary cause of pollution of the County’s urban water resources including the Chesapeake Bay. (Baltimore County FY2014 Adopted Operating Budget Supporting Detail, page 582).
Impaired Watersheds

Source: Baltimore Metropolitan Council (2014)
(http://www.baltometro.org/phocadownload/Maps/Environmental/ImpairedWatershedsMax2040.pdf)
“Without a doubt, Baltimore County ... [has] reached a crossroads. The road to more decline may be an easy path to follow. It requires doing nothing and maintaining the status quo. The road to success depends on the political and social willingness to confront the decline of its suburbs. Ultimately, the fate of first-tier suburbs rests with the people who call them home.” p. 170
Types of Values

Measuring Value

Inside the URDL

Retrofitting
Definitions of Open Space

• Legal
  – Baltimore County
  – New development
  – From engineering drawings
    • Active
      ▪ >20,000 ft² with slope < 4% ...
    • Passive
      ▪ Slope < 10% ...
  • 1,000 ft² / dwelling unit
  • In addition to existing open space

• Practical
  – Neighborspace / Cicada
  – Existing
  – Baltimore County’s parcels:
    GIS_LU_COD =
    • cemetery
    • private (e.g. HOA/COA), county or state owned
      ▪ open space
      ▪ park
      ▪ golf course
    • reservoir property
8.3%, or 16.9 square miles, of the land inside of the URDL can be classified as open space.
Access to Open Space, Part 1

• Balto. County Standard for new Development:
  – 1,000 ft² / dwelling unit

• Dwelling Unit
  – Maryland State Dept. of Assessment & Taxation
    • MD Property View
      – ATDATA
        » BLDG_UNITS
        » RESIDENT
        » APRTMENT
        » TRAILER

• 1/4 mile
  – 5 minute walking distance
Access to Open Space, Part 2

• Calculation steps:
  1. Add up how many dwellings use each open space
  2. Divide the open space area by the number of dwellings (fraction)
  3. Add up the fractions for all open spaces a dwelling has access to.
Access to Open Space, Part 2

- Calculation steps:
  1. Count how many dwelling units use each open space
  2. Divide the open space area by the number of dwell. units (fraction)
  3. Add up the fractions for all open spaces a dwelling unit has access to.

Diagram:

- Open Space A
  - Area: 2 kft²
  - Dwellings: 1

- Open Space B
  - Area: 1 kft²
  - Dwellings: 2

- Open Space C
  - Area: 3 kft²
  - Dwellings: 3

- Fractions:
  - 1/2
  - 1/2
  - 1/2

- Total: 1.5
Access to Open Space, Part 2

• Calculation steps:
  1. Count how many dwelling units use each open space
  2. Divide the open space area by the number of dwell. units (fraction)
  3. Add up the fractions for all open spaces a dwelling unit has access to.

1. Open Space Area = 2 kft²
   Dwellings = 1
   \( \frac{2}{1} = 2 \)

2. Open Space Area = 3 kft²
   Dwellings = 3
   \( \frac{3}{3} = 1 \)

3. Open Space Area = 1 kft²
   Dwellings = 2
   \( \frac{1}{2} = \frac{1}{2} \)
Access to Open Space, Part 2

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  Dwellings = 1
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  \frac{2}{1} = 2
  \]

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  \frac{1}{2} = \frac{1}{2}
  \]

- Open Space Area = 3 kft$^2$
  Dwellings = 3
  \[
  \frac{3}{3} = 1
  \]

\[
\frac{2 + 1 + \frac{1}{2}}{1} = 3 \frac{1}{2} \text{ kft}^2/\text{DU}
\]

\[
\frac{1 + \frac{1}{2}}{2} = 1 \frac{1}{2} \text{ kft}^2/\text{DU}
\]
Access to Open Space, Part 2

- **Calculation steps:**
  1. Count how many dwelling units use each open space
  2. Divide the open space area by the number of dwell. units (fraction)
  3. Add up the fractions for all open spaces a dwelling unit has access to.

Open Space Area = 2 kft²  
Dwellings = 1  
2/1 = 2

Open Space Area = 1 kft²  
Dwellings = 2  
1/2 = ½

Open Space Area = 3 kft²  
Dwellings = 3  
3/3 = 1

Sufficient Access by County’s Standard
63% of residences inside the URDL have insufficient access to open space. 6.7% have no access at all. This is based on applying the 1,000 square feet of open space per dwelling unit standard to all existing residential area within Baltimore County's Urban Rural Demarcation Line.

Data Sources:
- Maryland Department of Planning:
  - Maryland Property View: parcel points
- Baltimore County Department of Information Technology:
  - URDL, Parcels, Road Centerlines
- US Census: TIGER Water Area
Prepared: 09/16/2015
Analysis & Cartography by:
- Thayer Young, Gray to Green Intern
- Neighborspace of Baltimore County, Inc.
Pair Wise Comparison Model

- Existing model combines 28 indicators
  - Strager, et al. West Virginia University
- Into 3 categories:
  - Economic, Social, Environmental
  - Combined into an Overall score
  - Value of open space

- Lots of great information
- But it’s hard to understand
- Need a way to filter
- And to validate it
Model Calibration Part I, What and Why?

• Get a sense of reality
  – “Ground truth”
• How well does the model predict open space value?

• Three uses for calibration:
  – Test the existing model
  – Evaluate parcels offered to Neighborspace
    • e.g. by developers or landowners
    • reactive
  – Prioritize parcels for acquisition/easement
    • active solicitation by Neighborspace
Model Calibration, Part II, Where?

• Greater Towson

• Why?
  – High density
  – Low availability of open space
  – Rapid pace of development
  – Tension over setting aside OS
  – Popular desire for OS

• Greater Towson Boundaries derived from neighborhoods provided by
  – Greater Towson Council of Community Associations
  – Towson University Center for GIS
Model Calibration, Part III, How?

• Parcels with: GIS_LU_COD = ‘VACANT’
• Two efforts
  – First: “Towson Ground Truth”
    • Top overall score
    • “Desktop survey” of 100 parcels
      – to find 10 worth field surveying
    • Biases
      – Selected mostly large parcels
      – Only the top end of the range
  – Second: Random sample
    • Began by combining neighboring vacant parcels
    • Excluding parcels that SDAT says have buildings
    • Desktop survey of 30 parcels
      – to find 3 worth field surveying
What about the other 90%

• Front, side and back yards. Two randomly chosen examples are shown in pink
What’s wrong with just looking at large parcels?

- Some of Neighborspace’s most successful properties are small
  - Greenbrier Memorial Garden, ~1,300 ft² (0.030 acres)
  - Gwynn Oak Avenue, ~12,000 ft² (0.28 acres)
Lots of Data

<table>
<thead>
<tr>
<th>Parcel Count</th>
<th>Area in Acres</th>
<th>Max Overall Score</th>
<th>Min Overall Score</th>
<th>Social</th>
<th>Environment</th>
<th>Economic</th>
<th>Unmet OS Need, Quarter Mile, % of parcels</th>
<th>Can satisfy unmet OS Need, Quarter Mile, %</th>
<th>Unmet OS Need, Half Mile, % of parcels</th>
<th>Can satisfy unmet OS Need, Half Mile, %</th>
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</table>

A table with columns for Parcel Count, Area in Acres, Max Overall Score, Min Overall Score, Social, Environment, Economic, Unmet OS Need, Quarter Mile, % of parcels, Can satisfy unmet OS Need, Quarter Mile, %, Unmet OS Need, Half Mile, % of parcels, Can satisfy unmet OS Need, Half Mile, %, and Connectivity.

TaxID of Max Overall Score: 0913920906, 19000003435, 0903474001, 0908001911, 2100111116, 0903000120, 2500008380, 2400013002
TaxID of min Overall Score: 0913920387, 19000003435, 0903474001, 0908001912, 2100111116, 0903000120, 2500008384, 0908200840
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<th>Shepherd Pratt</th>
<th>York Rd</th>
<th>Towson Green</th>
<th>Goucher Blvd, Glenmont</th>
<th>Tenbury Rd &amp; Greenridge Rd</th>
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# Towson Ground Truth Results: Shepherd Pratt

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Good balance
# Towson Ground Truth Results: York Rd

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Gray to green opportunity
Towson Ground Truth Results: Towson Green

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</table>

Old data, has since been developed.
### Towson Ground Truth Results: Loch Raven Blvd.

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Already has enough OS
Towson Ground Truth Results: Edgewood Rd

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<td>23.8</td>
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</tr>
</tbody>
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Mostly too steep. Already has a pocket park.
Towson Ground Truth Results: Lutherville Light Rail

<table>
<thead>
<tr>
<th></th>
<th>Shepherd Pratt</th>
<th>York Rd</th>
<th>Towson Green</th>
<th>Goucher Blvd, Glenmont</th>
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<tr>
<td>Max Overall Score</td>
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<td>70.6</td>
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<td>Area in Acres</td>
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<td>1.26</td>
<td>2.97</td>
<td>11.41</td>
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<td>0.24</td>
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Good balance, but scored low
Towson Ground Truth Results:
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- Good balance
- Old data, has since been developed
- Gray to green opportunity
- Mostly too steep. Already has a pocket park.
- Already has enough OS
- Good balance, but scored low
Filtering Part I: Filtering Should Remove

• Parcels with poor or no access
• Parcels too close to residential buildings
  ▪ Less potential for resistance from neighbors?
    ➢ Not In My Side Yard

• Examples:
  – Internal parcels
  – Pan handle parcels
  – Narrow parcels
Filtering Part II: The 4 Filters

- Four criteria
  1. Length that a parcel parallels a street
     - Wider parcels have freer access
       - Not In My Side Yard
     - 40 ft seems like a minimum to keep
  2. Find and keep parcels at a dead end
     - They are perpendicular not parallel to the street
       - They fail the first test
     - But they still have good access
  3. Find parcels without steep slopes
     - 10% slope or less
  4. How much of the parcel is not too close to a residential building?
     - Remove the part that is within 50 or 100 ft.
       - Not In My Side Yard
     - Redo the above tests with the smaller parcel.
Applying the Filters

For:
1. The full parcel
2. Part of parcel not in 50ft of a residential building
3. Part of parcel not in 100ft of a residential building

Keep parcels that meet the following requirements:

Length parallel to street > 40 ft
OR A street end parcel

AND

Slope < 10%
Filter Results

The number of parcels to consider

Drops from:

- 376 before filtering
- 232 full parcel
- 199 not in 50 ft of resi. bldg.
- 130 not in 100 ft of resi. bldg.

Next need to evaluate scores
New Frontiers a Walking and Green Networks

Walking Network with Weights
Lower number is easier to walk

1 Pedestrian paths (Open Street Map)
99 Greenways (BaCo Rec & Parks)
Roads (From Baltimore County DoIT)
2 Local Streets, Alleys, Dirt Roads
3 Minor Collectors
4 Major Collectors
5 Minor Arterial
6 Major Arterial
8 Freeway or Principal Arterial

greater_towson_boundary
Lessons Learned

• Work in progress

• Hard to do, but we are getting better.

• Unbiased has value but,

• Have to put your thumb on the scale
  To get something useable
Lessons Learned, Continued

- Methods for finding open space for parks may not do so well for finding OS for connectivity
  - Accounting for Not In My Side Yard may break up long thin parcels
Acknowledgements

• National Park Service, Rivers and Trails Conservation Assistance Program
  • Americorps Environmental Stewards Program
  • Internship stipend and education award

• Wink Hastings, National Park Service RTC

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  – Tunde Oyinloye and Jon Curtis in GIS Services
  – Courtney Franklin Bush in Economic and Workforce Development
  – Patrick McDougall in Recreation and Parks