Connecting Communities through Walkable Station Areas

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GIS in Transit Conference
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Agenda

- Metro Background
- Land Use, Connectivity and Ridership
- Analyzing Station Walksheds with GIS
About Metro

- Governed by Compact of DC/MD/VA/Federal Govt
- Service area covers 8 local jurisdictions, 3.9M people

Metrorail

- 91 Stations
- 117 Track Miles
- ~750,000 daily trips
  #2 in North America
- Initial 5-line system built 1969-2001
Station Contexts + Access Patterns
Transit-Oriented Development vs. Park and Ride

Bethesda

- Daily Ridership: 11,500
- Daily Revenue: $33,000

Suitland

- Daily Ridership: 6,300
- Daily Revenue: $18,000
Land Use and Ridership Connection: Making the Case

- Land use near transit directly results in walk ridership at Metrorail stations

10 Households in walkshed = 7 Peak Walk-Rail Trips
Connectivity and Ridership

Source: 2012 Metrorail Rider Survey
Connecting Communities

Grow Near Transit
- Transit-oriented development
- Zoning
- Planning

Expand Transit
- Expand bus routes
- Build new Metrorail lines and stations

Improve Access to Stations
- Fix pedestrian barriers
- Build paths and sidewalks
Why Connecting Communities Matters

• Concentrating growth near transit maximizes use of regional infrastructure
• Connecting communities to transit attracts more ridership
• More ridership contributes to lower carbon footprints
• Access to Metro means access to opportunity
GIS for Transit 101: Half Mile Buffers

- Basic estimate of rail station access, ridership
- Assumes direct, unimpeded pedestrian access
- Actual conditions depend on street grid, pedestrian infrastructure
- Most applicable to dense urban street grids
Buffer vs. Actual Walking Paths

- Suburban street grids:
  - Large blocks
  - Meandering streets
  - Disconnected grids

- ½ Mi from station, but actual walking distance much greater

- Missing pedestrian infrastructure
Station Walkshed

- Area within a ½ mile walk using the actual pedestrian network
- Generated by Service Area function of ArcGIS Network Analyst
- Trip generators in buffer but not walkshed = potential ridership
Build the Network

- OpenStreetMap streets
  - exclude tags: 'motorway,' 'motorway link,' etc
- Other sources if available
  - eg, Fairfax Co sidewalk.shp
- Create Manual layer
  - paths not in OSM
- Create Barriers layer
Network Considerations

- Street centerline vs. actual sidewalks
Network Considerations

• Crosswalks and signals (or lack thereof)
Network Considerations

- Informal paths
Network Considerations

- Routes through private property, secured areas, parking lots
Walkshed Ratio

<table>
<thead>
<tr>
<th>Location</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Heights</td>
<td>0.73</td>
</tr>
<tr>
<td>Landover</td>
<td>0.17</td>
</tr>
</tbody>
</table>
Opportunities to Expand Access: Jobs

- 4,000 jobs cut off from Greensboro Station
- Potential lost ridership:
  - 500 entries/day
  - $625,000 fares/year
- Missing pedestrian infrastructure
Opportunities to Expand Access: Households

Southern Avenue

Existing Conditions

Potential Future Path?

>1200 HHs!

Potential Fare Revenue

~$300,000 / year
Applications of Walkshed Analysis

- Identify projects to improve access, grow walkshed
- Prioritize
- Implement projects on WMATA property
- Incorporate into Joint Development
- Advocate with local governments
Advocating for Access: Rhode Island Avenue

Existing Barrier

Potential to Expand Walkshed
Thank You