Bikesharing the “last mile” in Washington, DC

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The Last Mile Problem
How effective is Capital BikeShare at extending the reach of the DC metro system?
What would a good system look like?

1. A high percentage of metro stops have a bike share station within walking distance

2. There are many bike share stations outside of walking distance from the metro but inside of biking distance

3. These peripherally located bike share stations are within walking distance of high population density areas that are not served by the metro
Data

- Demographic data from the US Census Bureau
- BikeShare system data from CapitalBikeshare.com
- Metro system data from District of Columbia Open Data

Assumptions

From “The half-mile circle: Does it best represent transit station catchments?” by Guerra, Cervero, & Tischler (2012):

- Walking distance is 0.5 miles
- Straight line distance suffices for transit access analysis

From Capital BikeShare usage data:

- Biking distance is 2 miles
Metric 1: A high percentage of metro stops have a bike share station within walking distance

- 61% of metro stations have a bike share location within walking distance (56 out of 91 stations)
- On average, metro stations have 4.5 bike share locations within walking distance (standard deviation = 5.6)
- The max number of bike share locations within walking distance of a metro stop is 22
- 35 metro stations have zero bike share locations within walking distance
Metric 1: A high percentage of metro stops have a bike share station within walking distance

Most metro stations are served by bikeshare locations.

However, only one terminal station has a bike share location within walking distance!

Therefore, bike share locations fail to increase the radius of the combined metro-bikeshare system.
Metric 2: There are many bike share stations outside of walking distance from the metro but inside of biking distance

- 111 of 355 bike share locations meet this standard (31%)
- 66 of 91 metro stations have their range extended by such a bike share location (73%)
What’s the impact?

Metric 2: There are many bike share stations outside of walking distance from the metro but inside of biking distance.

<table>
<thead>
<tr>
<th>Metric 2:</th>
<th>Without Bike Sharing</th>
<th>With Bike Sharing</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Coverage</td>
<td>59 mi²</td>
<td>214 mi²</td>
<td>155 mi²</td>
</tr>
</tbody>
</table>

[Map showing Metro System Coverage Expansion due to Bike Share]
Metric 3: These peripherally located bike share stations are within walking distance of high population density areas that are not served by the metro.
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Recommendations

1. **Add bikeshare locations** to peripheral metro stations
2. **Add bikeshare locations** between 0.5 miles and 2 miles of non-peripheral metro stations
3. **Add bikeshare locations** to population centers currently underserved by both metro and bikeshare
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Components

5. Bicycle icon by Maxim Kulikov