I. Background/Objectives

- Access to places to be active is associated with greater physical activity (PA) and reduced obesity among children and adults [1-5].
- Using Baltimore City as a model, this study aims to: (1) generate cumulative neighborhood-level PA Location Availability Score (PALAS) using geographic information systems (GIS) data/techniques; (2) create city-wide PALAS map; (3) identify neighborhoods with low PA availability.

II. Data

- Shapefiles (Department of Recreation and Parks): parks, recreation centers, ball fields, multi-use fields, courts, playgrounds (school and park), ice rinks, soccer pavilions, pools, golf courses, horseshoe pits, outdoor fitness stations, skate parks, kayak/canoe launch points, multi-use trails, paths, and other government/city (gov/city) funded PA locations.
- Private (non-profit, for-profit, residential) physical activity locations were identified (218) by two independent reviewers and geocoded.
- Shapefile (Department of Planning): Land cover land use (LCLU)

III. Methods

- Nine unique constructs used to create PALAS
- Shapefiles of gov/city-owned PA site locations provided within neighborhood presence of (1) recreation centers, (2) parks (inclusion criteria ≥ 1 acre and having ≥ “feature”; n=96), (3) school grounds/playgrounds/other city-funded locations/facilities (skate parks, ice rinks, etc.)
- (4) Presence of private PA locations/facilities (for-profit, non-profit, or residential)
- (5) Presence of green space suitable for PA was identified from LCLU data
- Proximity of neighborhoods within a 0.25 mile buffer of (6) parks, (7) recreation centers, (8) school/other government/city owned PA facilities, (9) private PA facilities
- Nine variables converted into binary variables using the threshold definitions for each in Table 1
- Summed to create the PALAS

Table 1. PALAS Variables

<table>
<thead>
<tr>
<th>Layer</th>
<th>Threshold Definition – Y(1)/N(0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Recreation Center</td>
<td>Present In neighborhood</td>
</tr>
<tr>
<td>2 Parks (n=96)</td>
<td>Present In neighborhood</td>
</tr>
<tr>
<td>3 Other gov/city funded PA facility</td>
<td>Present In neighborhood</td>
</tr>
<tr>
<td>4 Private PA facility</td>
<td>Present In neighborhood</td>
</tr>
<tr>
<td>5 Green space</td>
<td>Present In neighborhood</td>
</tr>
<tr>
<td>6 Park Buffer</td>
<td>0.25 mile buffer intersects neighborhood</td>
</tr>
<tr>
<td>9 Recreation Center Buffer</td>
<td>0.25 mile buffer intersects neighborhood</td>
</tr>
<tr>
<td>Other gov/city owned PA facility</td>
<td>0.25 mile buffer intersects neighborhood</td>
</tr>
<tr>
<td>Private PA facility buffer</td>
<td>0.25 mile buffer intersects neighborhood</td>
</tr>
</tbody>
</table>

Table 2. Neighborhood Individual PALAS Variable Results

<table>
<thead>
<tr>
<th>N=278</th>
<th>Recreation Center</th>
<th>Park</th>
<th>Other gov/city funded PA facility</th>
<th>Private PA facility</th>
<th>Green Space</th>
<th>Park Buffer</th>
<th>Recreation Center Buffer</th>
<th>Other gov/city funded PA facility buffer</th>
<th>Private PA facility buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to at least one</td>
<td>57</td>
<td>53</td>
<td>171</td>
<td>77</td>
<td>155</td>
<td>261</td>
<td>158</td>
<td>158</td>
<td>167</td>
</tr>
<tr>
<td>Percent (%)</td>
<td>20.5</td>
<td>19.1</td>
<td>61.5</td>
<td>27.7</td>
<td>55.8</td>
<td>93.9</td>
<td>56.8</td>
<td>56.8</td>
<td>60.1</td>
</tr>
</tbody>
</table>

IV. Results

- Table 2 shows the number and percent of the 278 neighborhoods that have access to the individual variables that comprise the PALAS.
- The map shows the distribution of the PALAS throughout the neighborhoods of Baltimore City (range 0-8).
- The average PALAS is 3.95
- 112 neighborhoods (40.6%) have a PALAS less than or equal to 3, indicating limited availability of locations suitable for physical activity.

V. Conclusions

- New and publicly available GIS data was used to generate a PALAS for each neighborhood in Baltimore City.
- Five neighborhoods (Beverly Hills, Dundalk Marine Terminal, Keswick, Orangeville Industrial Area, and Four by Four) were identified as having a PALAS of 0 indicating no availability of the PA sites identified in this study.
- Twenty neighborhoods were identified as having a PALAS of 1 indicating the availability of only one PA site identified in this study.

VI. Future Work

- Associations between the PALAS and individual and/or neighborhood-level health outcomes should be investigated.
- Measures of physical activity could yield the most informative analysis with the PALAS if they are temporally equivalent.
- The map of the PALAS and the individual layers generated in the calculation of the PALAS may be used by academics and/or policy makers to target neighborhoods for interventions and future physical activity sites.

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References