Portland City Park Site Suitability

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GEOG 492 Winter 2011

Background

• The City of Portland and its residents have planned, protected, and treasured its parks and recreational facilities since 1852
  • First city parks
  • Olmsted brothers
• Today, Portland's park system comprises over 10,000 acres making it one of the largest park systems in the Pacific Northwest
Hypothesis

Employing a multi-criteria evaluation model in conjunction with analytic hierarchy process will yield ideal park site suitability within Portland.

Scope of Project

To meet public demand the Portland Parks department enacted the Parks 2020 Vision plan:

• 20 acres of parks per 1000 people
• 3,000 acres needed to achieve 2020 goal
• 427 acres have been acquired
• 2,573 acres remaining
Criteria

Ideal park locations are:
- Available lands within the City Limits
  - Vacant land > .25 acre
- Placement next to outdoor recreational areas
  - Parks
  - Open spaces
  - School grounds
  - Trails or paths
  - < 25% slope
- Availability to well traveled transportation corridors
  - Bus and Bike routes

Datasets Used
RLIS February 2011

Bus Stops
Existing Parks
Bicycle routes
Datasets Used
RLIS February 2011
Continued...

DEM (Oregon 10m)  Vacant Land

Methods

• Analytic Hierarchy Process was used to establish variable weights
• Use of a multi-criteria model to determine site suitability based on:
  • Slope DEM
  • Vacant Land
  • Distance to current parks
  • Distance to bike routes
  • Distance to bus routes
Analytic Hierarchy Process

<table>
<thead>
<tr>
<th>How important is A relative to B?</th>
<th>Preference index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equally important</td>
<td>1</td>
</tr>
<tr>
<td>Moderately more important</td>
<td>3</td>
</tr>
<tr>
<td>Strongly more important</td>
<td>5</td>
</tr>
<tr>
<td>Very strongly more important</td>
<td>7</td>
</tr>
<tr>
<td>Overwhelmingly more important</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1/3</td>
<td>1/3</td>
<td>1/9</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1/3</td>
<td>1/3</td>
<td>1/9</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1/5</td>
<td>1/5</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>5</td>
<td>5</td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Geometric Mean</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>A    Bus Stops (distance from)</td>
<td>(1<em>1</em>1/3<em>1/3</em>1/9) = 0.4152</td>
<td>0.053359829</td>
</tr>
<tr>
<td>B    Bicycle Routes (distance from)</td>
<td>(1<em>1</em>1/3<em>1/3</em>1/9) = 0.4152</td>
<td>0.053359829</td>
</tr>
<tr>
<td>C    Existing Parks (distance from)</td>
<td>(3<em>3</em>3<em>1/5</em>1/5) = 0.8152</td>
<td>0.104754317</td>
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<tr>
<td>D    Slope</td>
<td>(3<em>3</em>5<em>1</em>1/7) = 1.5518</td>
<td>0.199415969</td>
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<tr>
<td>E    Vacant Land</td>
<td>(9<em>9</em>5<em>1</em>1) = 4.5844</td>
<td>0.589120056</td>
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<td>Sum</td>
<td>7.782</td>
<td>1</td>
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</tbody>
</table>

Model
Find Parks Tool

Euclidean Distance Results
Considerations

- Zoning
  - Industrial
  - Commercial
- Land ownership
  - Land acquisition costs
- Not all vacant land is created equal
  - Ross Island is not suitable for park development
  - Vacant sites close to airport are not suitable
References


Friends For Our River Front. *Portland_waterfront_pk2*. JPG.


Metro Regional Land Information System (RLIS) Data I:\Students\Data\GIS\RLIS\2011_Feb