

Portland City Park Site Suitability



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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



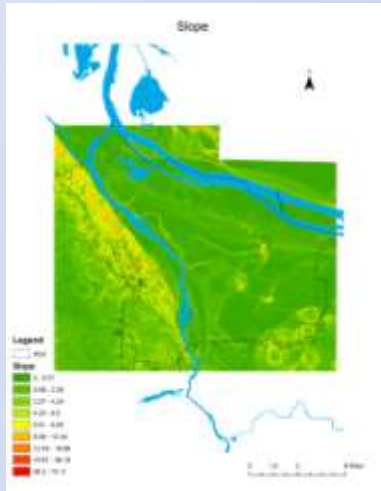
Bicycle routes



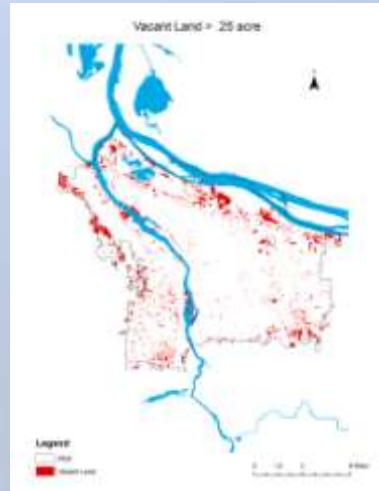
Datasets Used

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



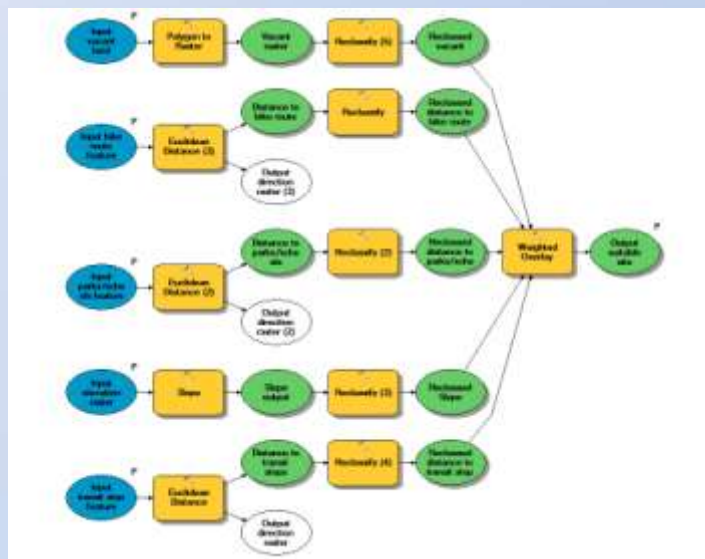
Analytic Hierarchy Process

How important is A relative to B?	Preference index
Equally important	1
Moderately more important	3
Strongly more important	5
Very strongly more important	7
Overwhelmingly more important	9

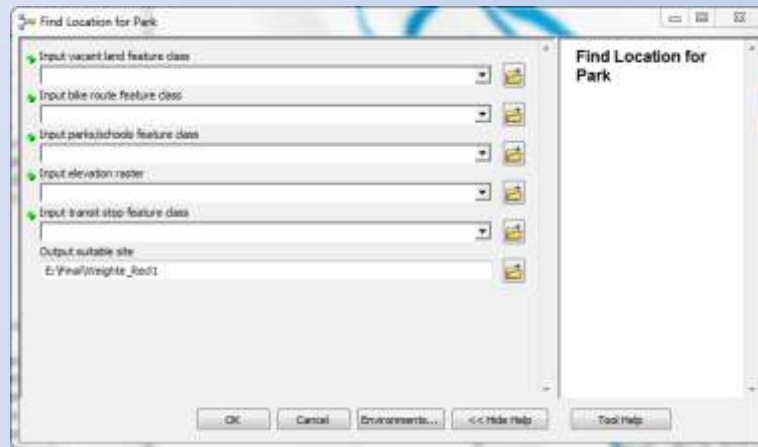
	A	B	C	D	E
A	1	1	1/3	1/3	1/9
B	1	1	1/3	1/3	1/9
C	3	3	1	1/5	1/5
D	3	3	5	1	1/5
E	9	9	5	5	1

	Criterion	Geometric Mean	Weight
A	Bus Stops (distance from)	$(1*1*1/3*1/3*1/9)^{1/5} = 0.4152$	0.053359829
B	Bicycle Routes (distance from)	$(1*1*1/3*1/3*1/9)^{1/5} = 0.4152$	0.053359829
C	Existing Parks (distance from)	$(3*3*1*1/5*1/5)^{1/5} = 0.8152$	0.104754317
D	Slope	$(3*3*5*1*1/7)^{1/5} = 1.5518$	0.199415969
E	Vacant Land	$(9*9*5*7*1)^{1/5} = 4.5844$	0.589110056
	Sum	7.782	1

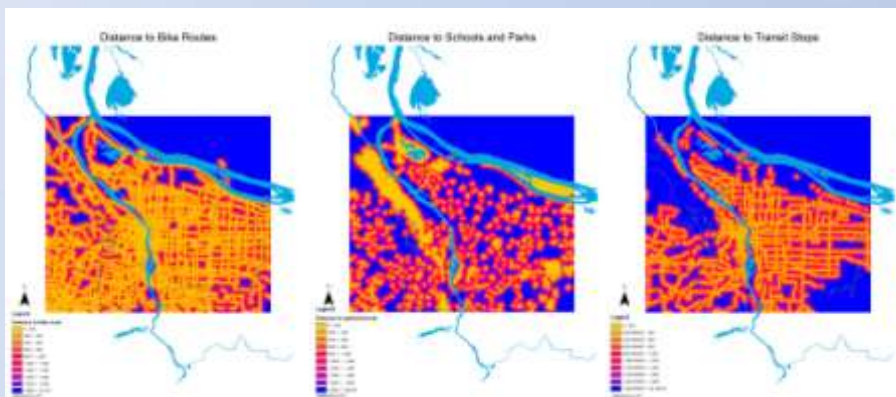
Model

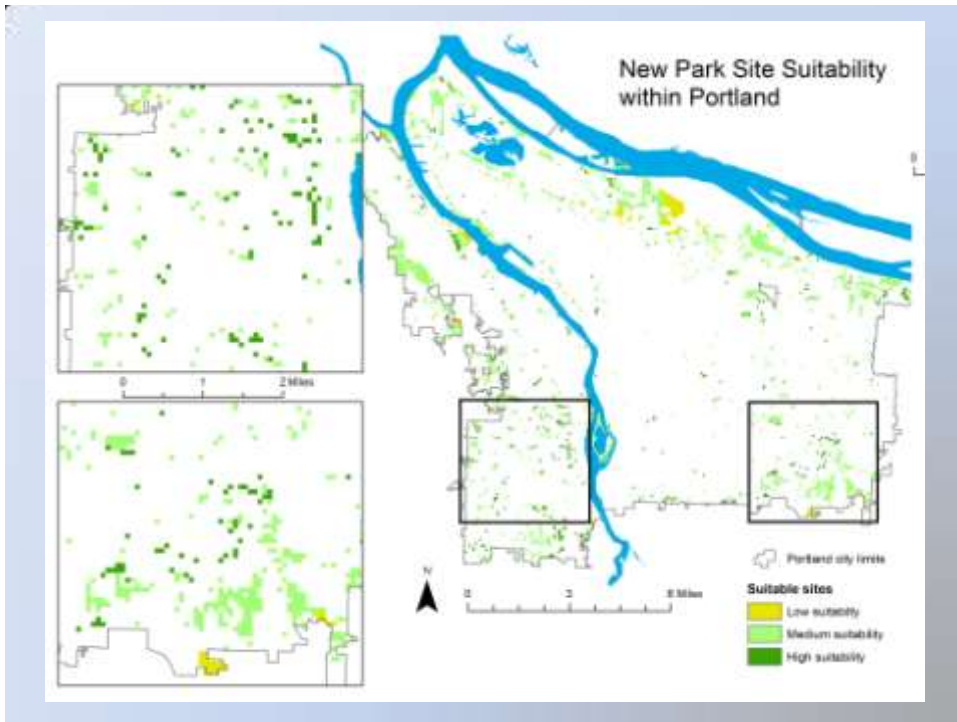


Find Parks Tool



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

- Crane, William. *East Entrance to Mount Tabor Park*. Digital image. *Hello Portland*. Web.
 <http://www.helloportland.com/articles/attraction/2320/mount_tabor_portlands_urban_volcano.cfm>.
- Friends For Our River Front. *Portland_waterfront_pk2*. JPG.
- Portland Audubon Society. "Metropolitan Greenspaces, A Grassroots Perspective." *Metropolitan Greenspaces, A Grassroots Perspective*. Web. 9 Mar. 2011.
 <http://web.archive.org/web/20061003201150/http://www.audubonportland.org/conservation_advocacy/urbanconservation/metro_greenspaces>.
- Metro Regional Land Information System (RLIS) Data
 I:\Students\Data\GIS\RLIS\2011_Feb
- USA. City of Portland. Portland Parks and Recreation. *Land Acquisition Strategy*. City of Portland, 2001. Web. 9 Mar. 2011.
 <<http://www.portlandonline.com/shared/cfm/image.cfm?id=130675>>.