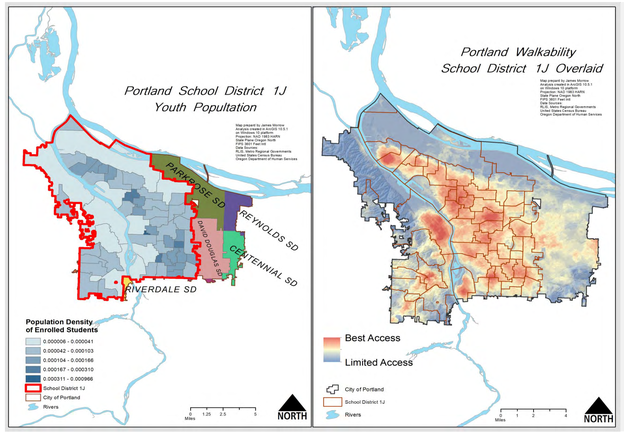
Walking in Our Built Environment:
An Investigation of the City of Portland Walkability Model

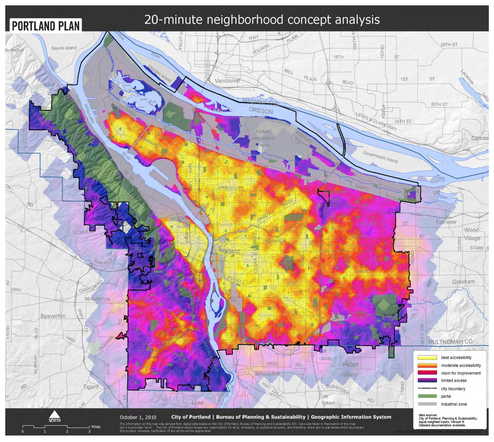
Portland State University, Geography Department, GEOG 592, Winter 2018
Presented by James Morrow

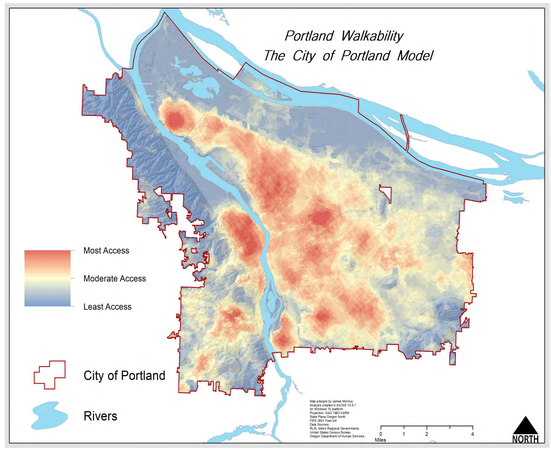


Background:

In October of 2010 the City of Portland, OR published a map that aimed to identify areas of the city that meet the characteristics of a 20 – minute neighborhood. The result of the analysis was a Hot-spot map showing areas of the city where it is relatively easy to access commercial services and amenities by foot. The analysis from the City of Portland was inspired by the Walk Score Program, which takes into consideration access to services and amenities while also including the ease of traveling a transportation network by accounting for the presence of sidewalks, street connectivity and the slope of the landscape. The objective of this project is to recreate the model used by the City of Portland and draw conclusions abut the demographics of varying levels of accessibility. The conclusion of this analysis is a discussion about the benefits and drawbacks of this model.

School District 1J, American Community Survey	2016
Population under 18 years	69,414
With an ambulatory difficulty	271





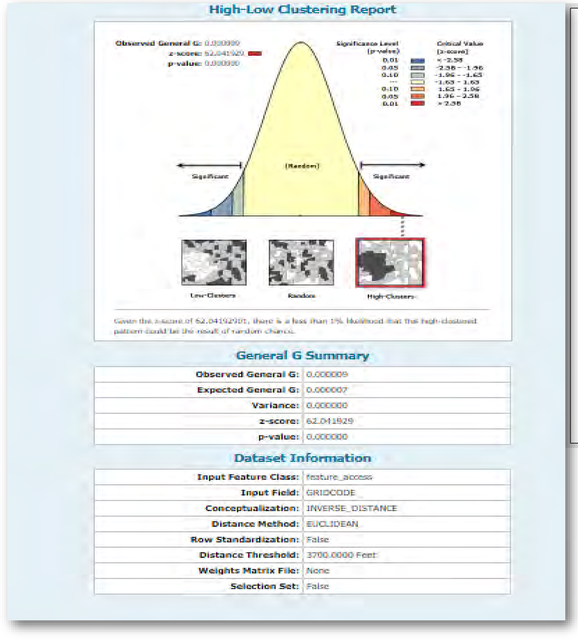
Analysis:

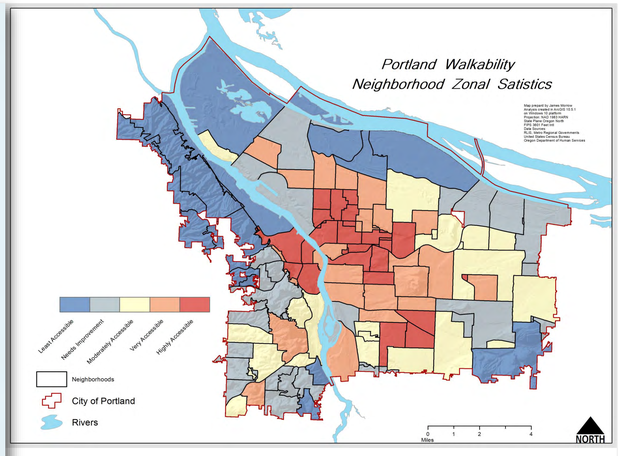
Analysis was conducted in ArcGIS 10.5.1 on a Windows 10 platform. All layers used are in the NAD 1983 HARN State Plane Oregon North FIPS 3601 Feet Intl. projected coordinate system. First: create a network dataset from a streets shape file provide by RLIS. All roads labeled as a Highway, Freeway or Ramp were removed from the network dataset. Second: using Network Analyst, create service area polygons in areas of 1-mile, ½ mile and ¼ mile for point features. The point features are: schools, parks(centroid), community centers, grocery stores, intersections, town centers, libraries and farmer markets. Additional layers created were line density raster of sidewalks and a slope raster derived from a DEM. All raster analysis was conducted using a 200 ft by 200 ft cell size and a boundary of City of Portland as an analysis mask. Service Area polygons were combined using union tool and then converted to raster. All raster were reclassified to have pixel values ranging from 0 (no access) to 3 (best access). The raster layers were combined in the raster calculator, the map presented here is using equal weights for each layer.

Top:
Comparison of walkability to School District 1J in Portland.

Middle:
A comparison of the City of Portland 2010 map to the results of my recreation of the process.

Bottom:
Zonal statistics of walkability map using Portland neighborhoods as zones. Mean used as statistic type.





Results and Discussion:

When compared to the 2010 map published by the City of Portland, the output created here highlights centers of the city where there is easy access to amenities. My analysis did not use the same data for commercial amenities. I used a town center data set that creates the concentrations of high valued pixels. The High-Low clustering report generated by the Getis-Ord General G tool indicates that there is clustering of high and low values of scores calculated.

The benefits of this model is that is can be preformed with out of the box functionality in ArcGIS and most of the data used can be accessed from Metro' s Regional Land Information System. This model is not appropriate for neighborhood scale analysis of walkability. This model also does not take into consideration the varying levels of mobility that the residents of Portland experience.

Sources:
American Community Survey
City of Portland, OR
Senville, Wayne. "Distance, Destinations, Density." *PlannersWeb*, 29 July 2013, plannersweb.com.