Seattle On Foot

A Walkability Analysis

The Project

There are many good reasons to drive less—cars cause pollution, they use fossil fuels, and nobody likes to sit in traffic. Likewise, there are numerous good reasons to walk instead. Walking promotes physical fitness, brings communities closer together, and simplifies life. Unfortunately, not every city is walkable. The grocery store may be too far away, or the roads to fast to be safe, or there may simply not be enough housing in the areas where stores are. The aim of this project is to determine what are the most walkable areas of Seattle.

The criteria used are listed to the right. Most of the factors are destinations that many people like to visit on a regular basis. The average speed limit of all walkable roads (that is, all non-highways) in each US Census Block was included as well, because faster roads are considered by many to be unpleasant, or unsafe to walk along. Housing density was also calculated—an area cannot be said to be walkable if you cannot live there.

Elementary schools and high schools were listed separately to create different buffer distances for the different age groups. All factors have a maximum buffer of 3,000 feet, except for elementary schools, which have a buffer of 1,500 feet.

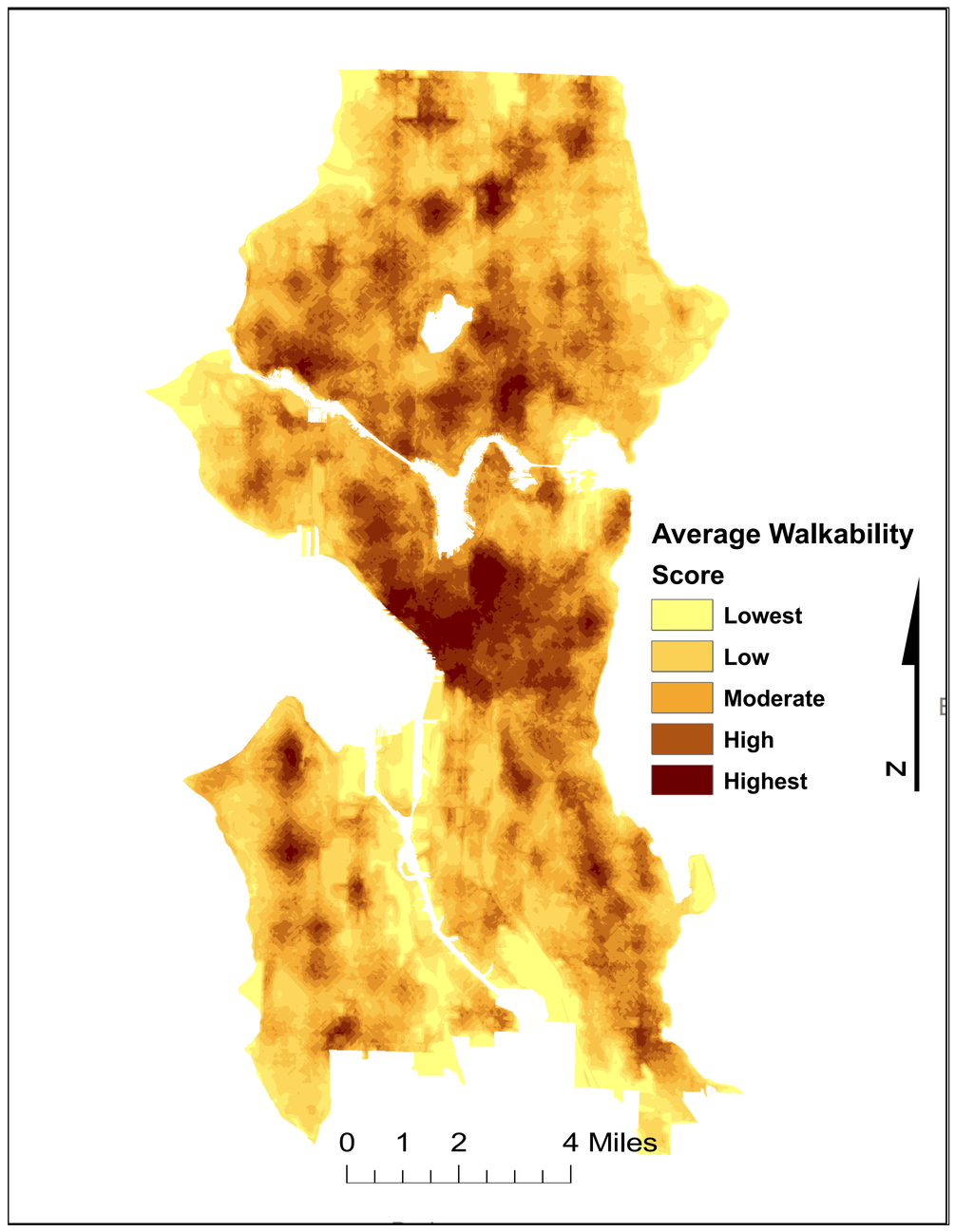
Each of these factors was given a weight based on its relative importance to walkability. The factors were then converted to raster layers and combined into the map to the right (see Methods for details). Several areas near the center of the city showed very high walkability, while more peripheral areas were less walkable. The list of factors is subjective, of course, and there are doubtless many more that could have been included. The purpose of the map is to provide a general sense of walkability across the city, and not to make complex decisions like purchasing housing.

Sources:

All data for maps Courtesy of King County (www5.kingcounty.gov/gisdataportal/), Reference USA (www.referenceusa.com), and Washington State Department of Ecology (http://www.ecy.wa.gov/services/gis)

Maps by Andrew Smyth, May 2011, Tufts University.

Walkability Scores



Factors

Walkability Factor	Weight (out of 100)
Grocery Stores	14
Bus Stops	14
Shopping Centers	12
Parks and Recrea-	10
Restaurants	8
Movie Theaters	8
Public Libraries	6
Elementary Schools	3
Middle and High	3
Housing Density	12
Average Speed	10

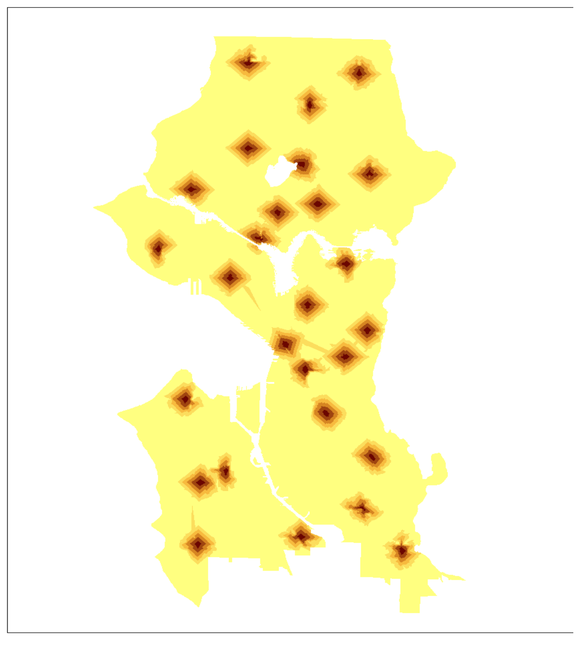
The Method

This walkability map is an overlay of 11 different raster layers—one for each walkability factor used. The process over creating this overlay is outlined here:

1. A buffer zone of 3,000 feet is created around each destination using a network of walkable roads—that is, any road which is not a freeway, highway or similar.

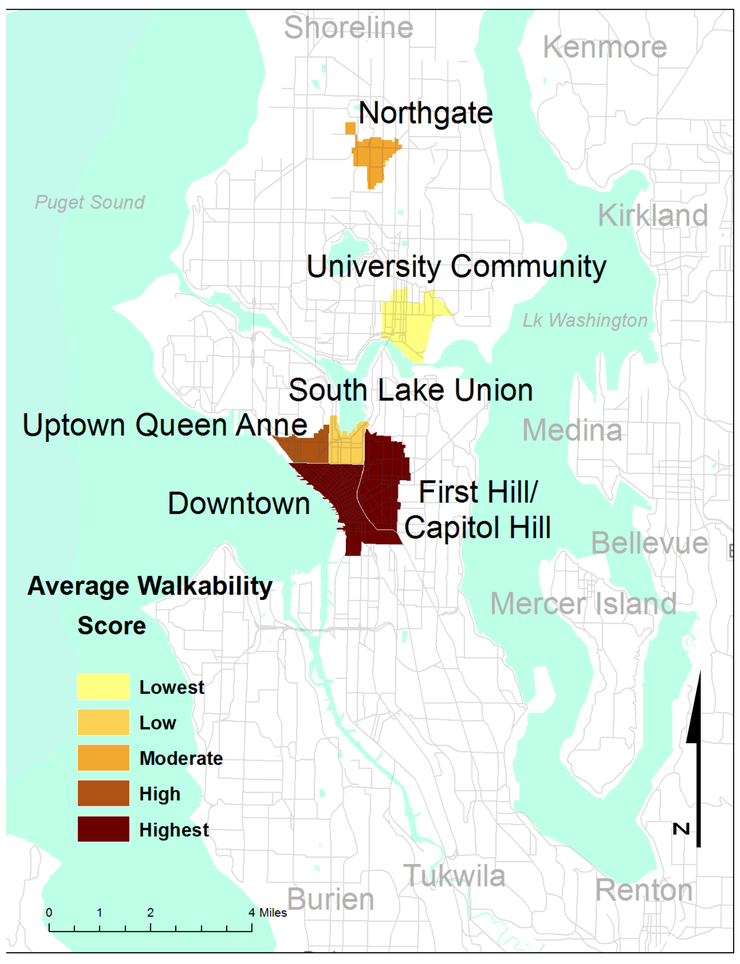
In this example, the *Network Analyst* extension takes into account an eccentric street layout to find the walkable radius around the Magnolia Public Library.

2. The buffer zones are converted from polygons to raster layers using *Spatial Analyst*.
3. The buffer zones are reclassified from 1 to 5 with *Spatial Analyst*, with 5 being the most walkable.



4. Layers are multiplied by their weights (see table) in the *Raster Calculator* and combined into the final map.

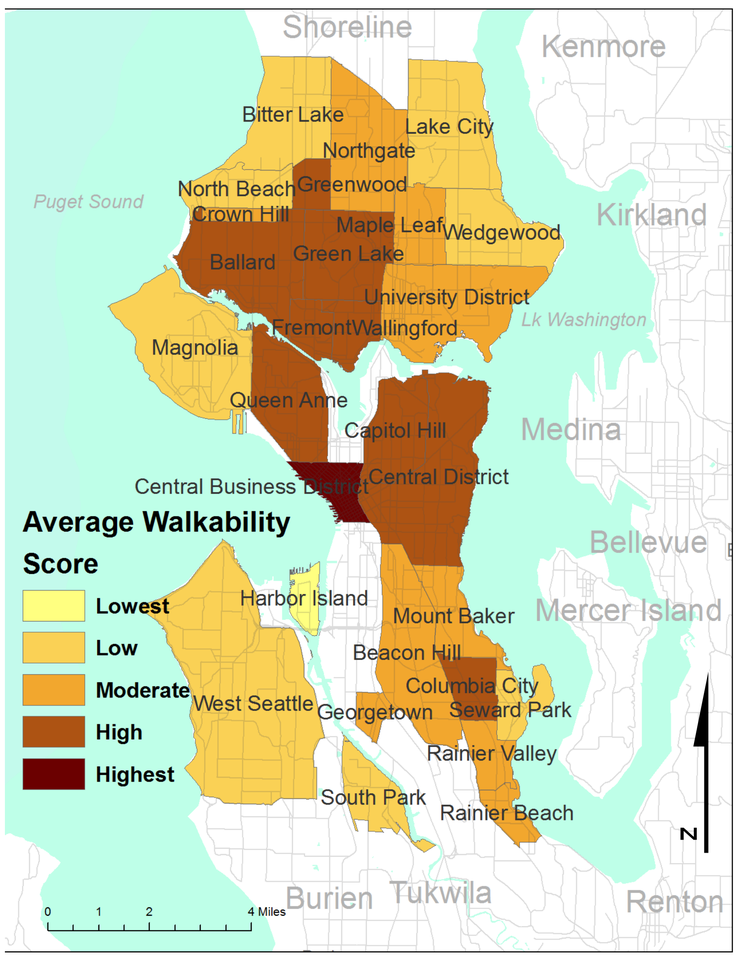
Urban Centers



Five zones in Seattle have been designated as "Urban Centers" by King County. These are special planning areas intended to include a rich variety of business, commercial, and residential activity within an area of less than 1.5 square miles. They should also include excellent transportation options and experience a high rate of residential and job growth. Many of these traits also characterize high walkability.

As the above map shows, only two of the five Urban Centers met the criteria for high walkability, and the University Community received the lowest rating. This is in part due to relatively low bus access. A small core of the University Community did receive a high rating, but this map shows only an average across the entire zone.

Neighborhoods



Above we see the average walkability rating of each major neighborhood in Seattle. Not surprisingly, the downtown area, or Central Business District, received the highest relative rating. Other high-rating neighborhoods are Greenwood, Ballard, Green Lake, Fremont, Wallingford, Queen Anne, Capitol Hill, the Central District, and Columbia City. In general, the further a neighborhood is from the downtown area, the lower the score. The downtown area of any city is likely the densest part of the city in terms of businesses, transportation options, and multifamily residences.

One factor which may have affected results that was not taken into account is elevation. For example, both the Capitol Hill and Queen Anne neighborhoods are on hills, and would likely have received lower scores if elevation were taken into account.