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Producing a 'Walkability' Index for Bellingham Neighborhoods Using Municipal Spatial Data

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Bellingham Walkability Index

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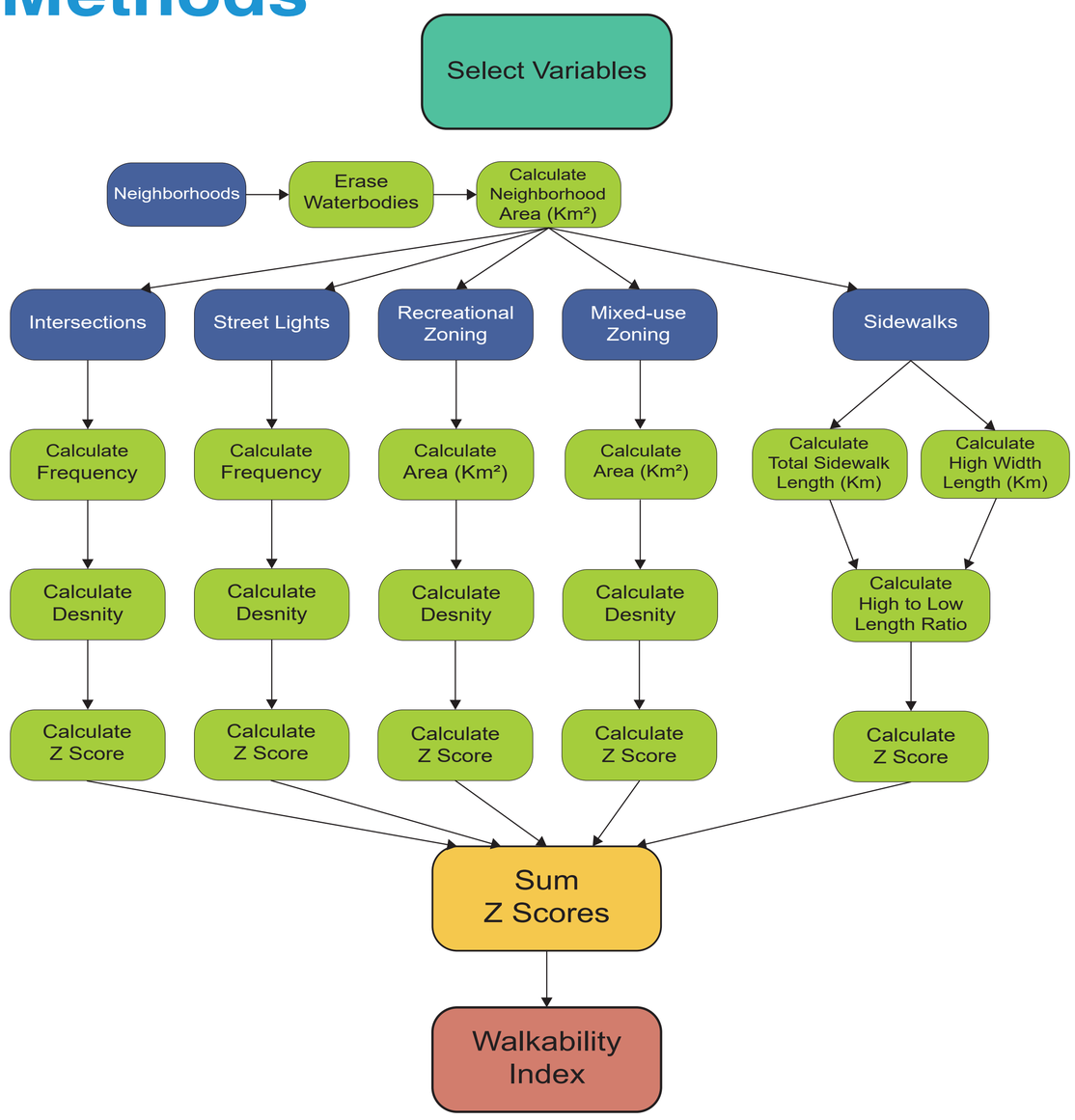
Abstract

Pedestrians have been somewhat overlooked in the United States' automobile dominant transportation paradigm. The ability to be able to walk anywhere in an urban setting is very important for accessibility, agency, and community health. One goal of Bellingham planning is to create a more bike friendly and walkable place. Producing an index, which rates one's ability to navigate an area by foot, allows for smarter planning and directing of city planning resources to improve pedestrian agency in different parts of the city. In this study, I applied geographic information systems (GIS) and statistical methods to calculate a 'walkability' index using publicly available data from the city of Bellingham. Each variable was given a specific weight based on its importance to pedestrians and then compiled into one formula. The results show interesting patterns in the overall 'walkability' of different neighborhoods in Bellingham. Tighter spatial distribution and higher density of street intersections tends to return the greatest levels of 'walkability'. Because of this, population centers such as the downtown neighborhood end up allowing pedestrians higher levels of 'walkability'. These patterns suggest that increasing 'walkability' is more dependent on projects that increase density and connecting areas of higher density.

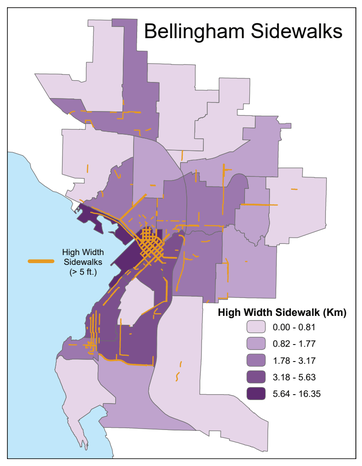
Introduction

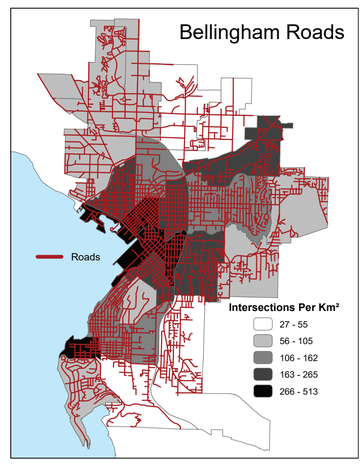
Walkability concerned with how pedestrian friendly an area is. It can be measured by a person's ease of access to basic necessities (parks, work, businesses, and education) in their neighborhood by foot. There are many important variables that play into neighborhood walkability such as sidewalk width, trails/walking trails, street intersections, stop lights/cross walks, and slope (etc.). People also find neighborhoods more walkable if they have mixed use buildings, public space, schools, and a center. Bellingham, situated in northwestern Washington State, has an abundance of publicly available spatial data which makes it the perfect place to run a walkability analysis. This sort of spatial analysis can aid city planners in determining where planning efforts should focus their resources to improve pedestrian access to essential neighborhood features (Duany, 2010).

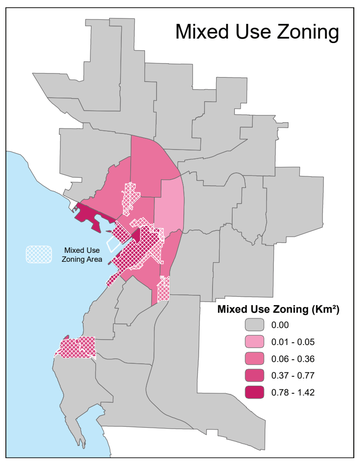
Methods



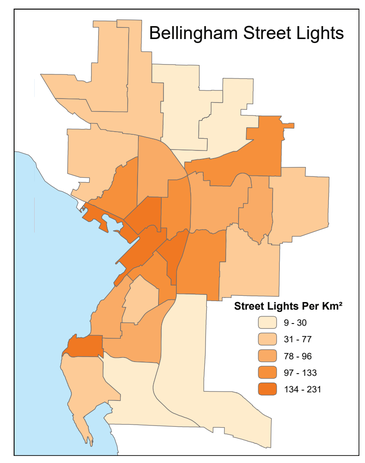
Results

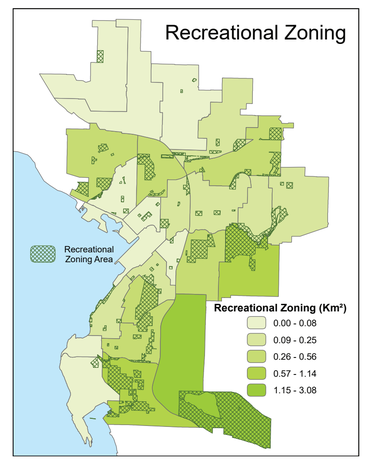


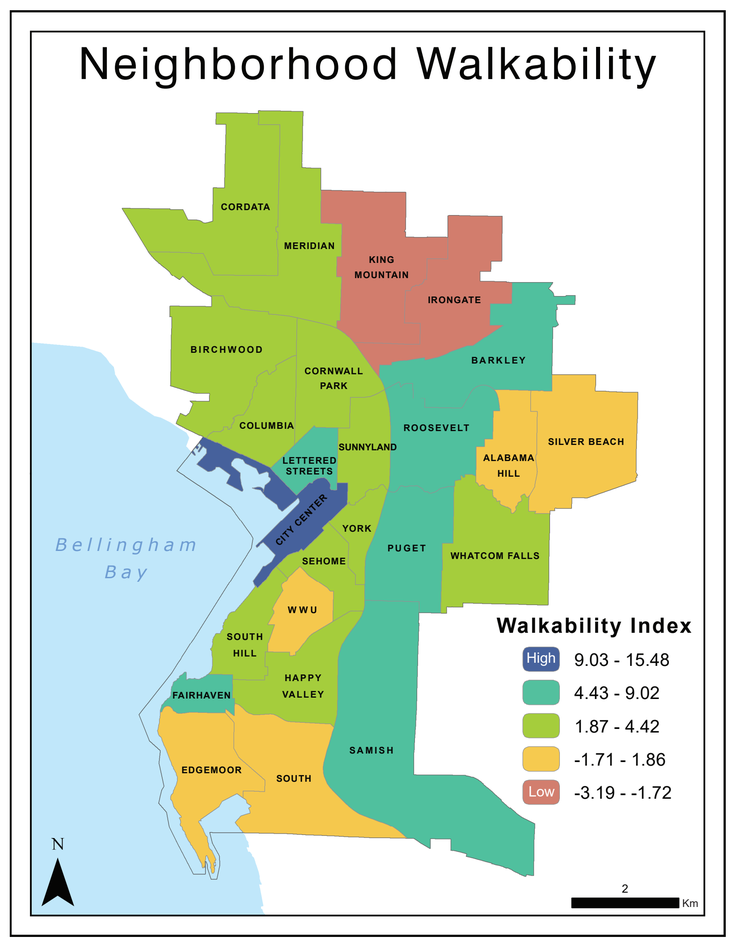




NEIGHBORHOOD NAME	Z Score Sum	Ranking
ALABAMA HILL	1.00	21
BARKLEY	6.42	3
BIRCHWOOD	2.31	18
CITY CENTER	15.48	1
COLUMBIA	4.01	10
CORDATA	2.92	13
CORNWALL PARK	2.32	17
EDGEMOOR	0.13	23
FAIRHAVEN	9.02	2
HAPPY VALLEY	4.42	8
IRONGATE	-1.72	24
KING MOUNTAIN	-3.19	25
LETTERED STREETS	5.41	5
MERIDIAN	2.81	15
PUGET	5.12	6
ROOSEVELT	4.83	7
SAMISH	6.23	4
SEHOME	4.35	9
SILVER BEACH	1.48	20
SOUTH	1.86	19
SOUTH HILL	2.63	16
SUNNYLAND	3.01	12
WWU	0.95	22
WHATCOM FALLS	3.62	11
YORK	2.87	14







Discussion / Conclusion

A Walkability index was produced based on a Z score range of 18.67 (-3.19 to 15.48). Z scores for each of the variables – street intersections, street lights, sidewalk width, mixed use zoning, and recreational zoning – were summed to display which neighborhoods had a higher density of the variables. As predicted, the Bellingham City center neighborhood returned the highest value, 15.48, deeming it the most walkable neighborhood in Bellingham. Fairhaven scored second highest at 9.02. The two lowest scoring neighborhoods were King Mountain (-3.19) and Irongate (-1.72). Nine out of twenty-five (or 36%) neighborhoods scored in the ranges from 1.87 to 4.42, or very average relative walkability. Neighborhoods with mixed-use zoning scored no lower than 2.32 overall however, out of 25 neighborhoods, only 8 contained mixed-use zoning. Because of this, many neighborhoods earned Z scores closer to -1. The same was true for recreational zoning, only eight out of twenty-five neighborhoods earned positive Z scores. This analysis points towards some variables being much more important to neighborhood walkability, namely street lights and street intersections. Many of the neighborhoods contain little to no mixed-use zoning which works to pull down their scores. The city center scored highest overall, over 6 points higher than the next neighborhood, Fairhaven. Results might improve in accuracy if census block groups or similar / smaller jurisdictions were used to normalize variables.

References

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Data Source: City of Bellingham GIS Data | Map Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

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