Seattle Homeless Deaths and Shelter Suitability Analysis

Purpose

While Seattle homelessness has worsened in recent years, the depth of the problem, in the form of homeless deaths, is not well recognized. The Seattle/KC Public Health Department, in collaboration with the KC Medical Examiner Office reported that homeless deaths have grown each year unimpededly since 2014 (Figure 1.). In 2017, 169 homeless people were reported dead; that number in 2018 was 191. Most of the deaths occur in the Seattle area, characterized as natural or accidental. It is crucial the city makes any efforts to reduce mortality in its homeless population.

Objective

This project seeks to show a) the spatial distribution of Seattle homeless deaths, b) factors related to areas with varying densities of homeless deaths, and c) optimal areas for establishing a homeless shelter.

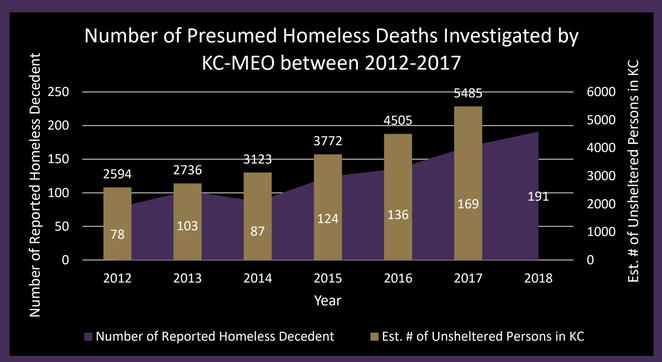


Figure 1. Frequency of KC homeless deaths from 2012-2017

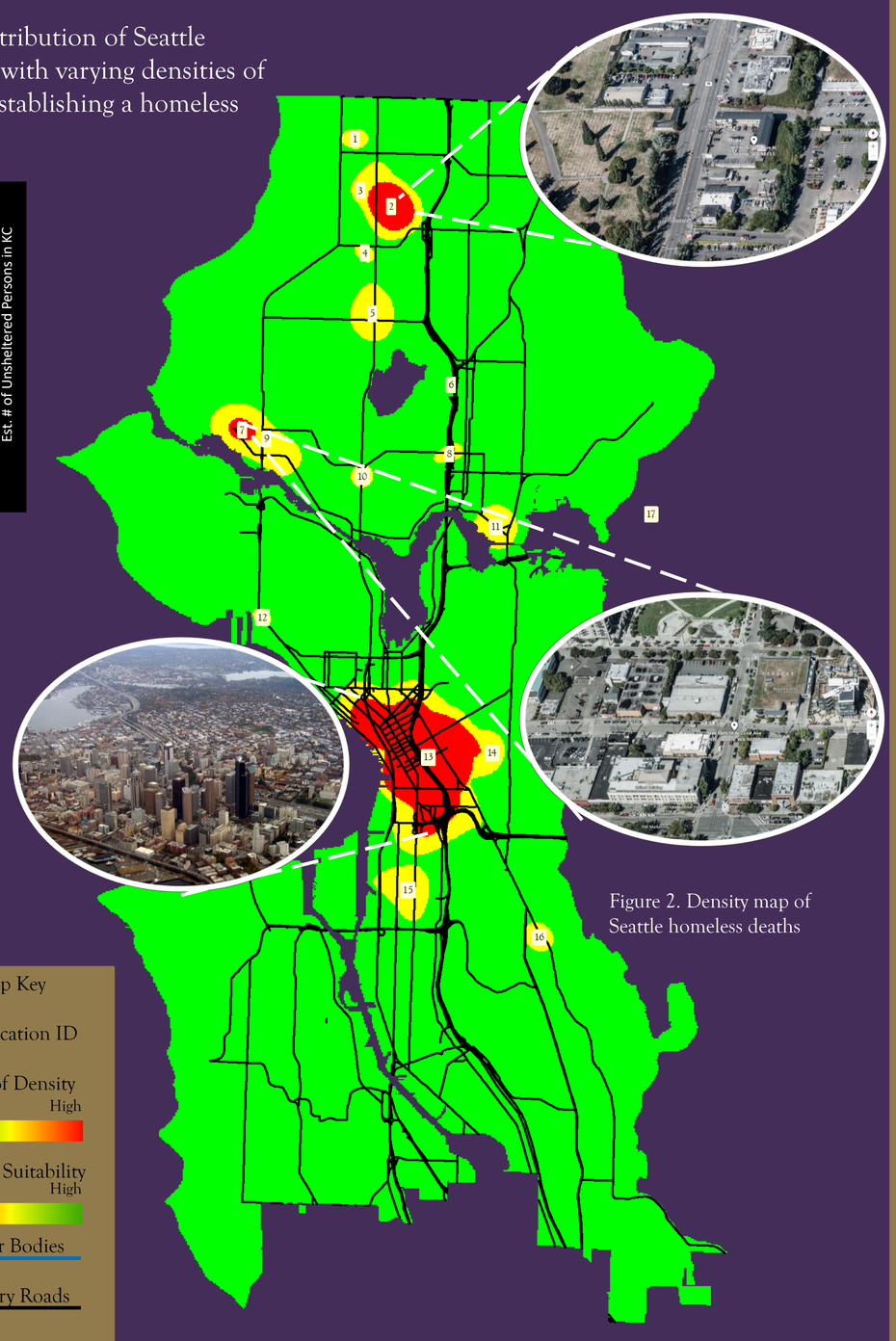


Figure 2. Density map of Seattle homeless deaths

Methods

Data collection consisted of two parts: turning tabular data into features via X/Y coordinates and geocoding, or collecting data from various sources. Kernel Density was used to determine various magnitudes per unit area for homeless deaths. After converting the density layer into a shapefile, search tools were used to tabulate and categorize deaths (Table 1.)

A suitability analysis was conducted to determine optimal locations for a homeless shelter. The analysis takes to consideration: walking distance to libraries, WIC retailers, food banks; drive times away from hospitals and EMS stations; density of homeless deaths; transportation noise; regional slope; proximity to KC HMIS service provider properties; zoning; and proximity to toxic release sites. Processing data is more complicated for some than others. For instance, multiple ring buffers were used to determine the extent of walkability to destinations (.33, .66, and 1 mile). Service area analysis was used to determine the extent vehicles travelled away from facilities. The final goal is to have each individual raster file reclassified, using appropriate standards, then combined and weighted (Table 2.) using raster calculator to produce a suitability map.

Results

(Table 1) Homeless deaths from 2012-2017 have been organized based on a) type of death, b) areal density, and c) location ID. Accidental and natural deaths are recognized as the most frequent type of death. (Figure 2) Varying densities of homeless deaths are reflected in a red-green color ramp. Areas with notable densities can be found a) near 1550 N 115TH ST and 11746 AURORA AVE N, b) an intersection of NW 56TH ST and 22ND AVE NW, and c) in Central Seattle, where homeless shelters, providers, and medical facilities congregate the most. (Figure 3) Areas of suitability are also reflected in a red-green color ramp.

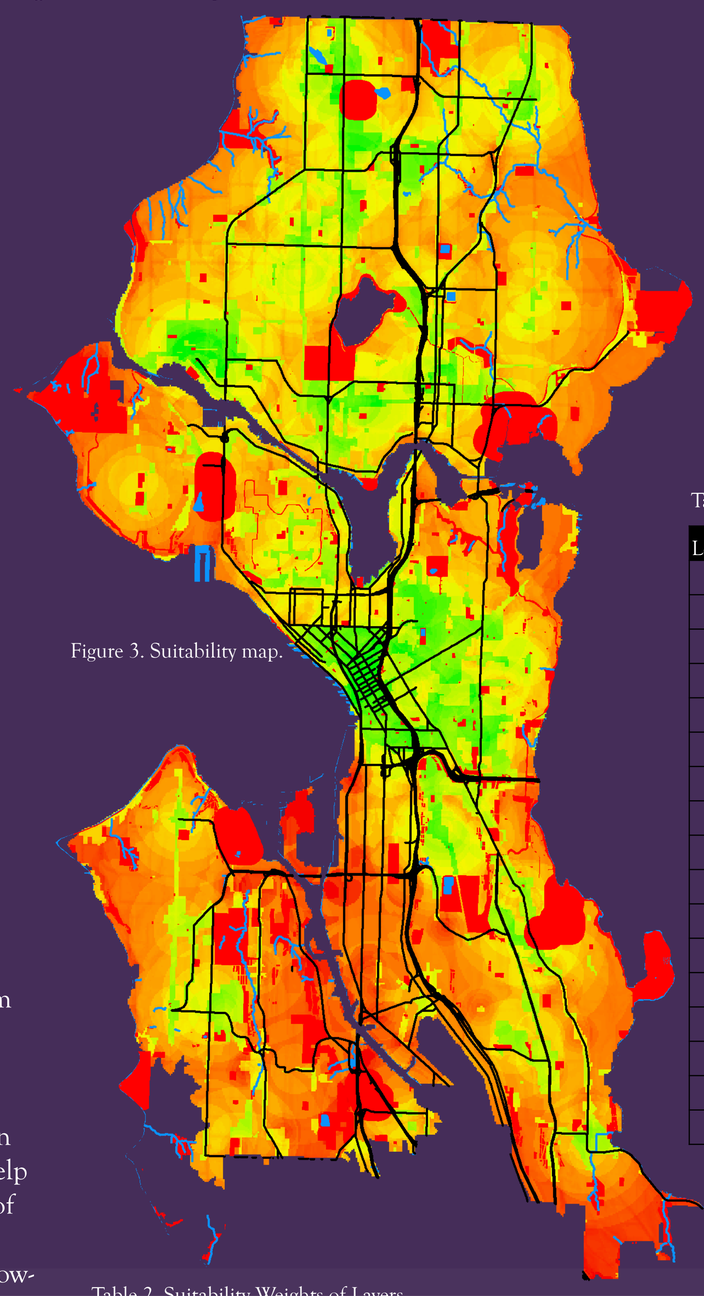


Figure 3. Suitability map.

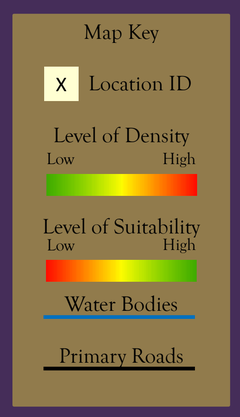


Table 1. Categorized Seattle homeless deaths from 2012-2017

Location ID	Density	Accidental	Fetal Death	Homicide	Natural	Suicide	N/A	Count
2	3	8	0	0	12	0	2	22
7	3	3	0	0	6	0	0	9
13	3	114	1	11	84	13	15	238
1	2	0	0	0	3	0	0	3
3	2	0	0	0	0	0	0	0
4	2	1	0	0	0	0	0	1
5	2	5	0	0	2	1	0	8
6	2	0	0	0	0	0	0	0
8	2	2	0	0	0	1	0	3
9	2	5	0	0	5	0	1	11
10	2	4	0	0	0	0	0	4
11	2	4	1	0	2	0	0	7
12	2	0	0	1	0	1	0	2
14	2	9	0	2	8	0	0	19
15	2	7	0	0	2	0	0	9
16	2	1	0	0	3	0	0	4
17	1	67	0	3	53	8	5	136
Total:		230	2	17	180	24	23	476

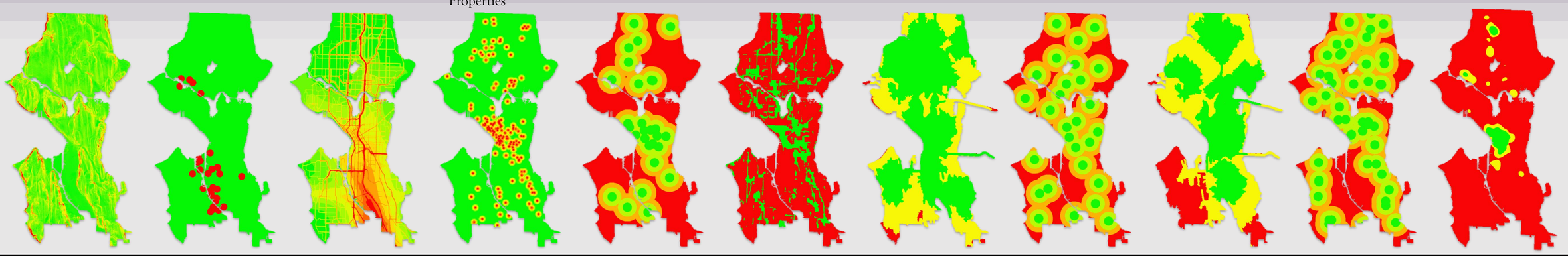
Discussion and Conclusion

It cannot be stressed enough that a) the results from the MEO cannot be generalized to the broader homeless population, and b) any assumptions this project make should be taken lightly. Tackling homelessness requires proper resource coordination and having additional resources of any kind may help to mitigate the issue. Because much of the impact of homelessness is usually due to a lack of permanent housing, it is crucial solutions focus on providing low-barrier housing in addition to resource allocation tailored to the specific needs of individuals.

Table 2. Suitability Weights of Layers

Layer:	Slope	Toxic Release Sites	Transportation Sound	KC HMIS Provider Properties	Distance to Food Banks	Zoning	Service Map – EMS Stations	Distance to Libraries	Service Map - Hospitals	Distance to WIC Retailers	Homeless Death Density
Assigned Weight:	.06	.06	.06	.09	.09	.16	.09	.09	.09	.09	.12

Least Suitable — Most Suitable



References/Resources • **Name:** Kevin Tran • **Date Created:** 5/5/2019 • **Software Used:** ArcMap 10.6.1 and Publisher • **Geographic Coordinate System:** GCS North American 1983 HARN • **Projected Coordinate System:** NAD 1983 HARN StatePlane Washington South FIPS 4602 Feet • **Data:** Seattle/KC Public Health Department, Seattle GIS, KC HMIS, USGS, US DOT, US EPA, and WA DOH

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