Colors of Segregation: A Livability Index of Redlining in Tacoma

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The Home Owners' Loan Corporation

As shown by recent conversations surrounding loan debt and affirmative action, it is important that we reflect on the actions from our past as a nation as we move towards the future. This wealth and race discussion form has changed many times, and each form has had lasting effects.

These ideals were visited when the Home Owners' Loan Corporation starting making redline "security maps" (Ryan, 2018). The Home Owners' Loan Corporation (HOLC) was established in 1933 as part of the New Deal to relieve the stress of foreclosures during the Great Depression (Jacoby, Dong, Beard, Wiebe, & Morrison, 2018). Neighborhoods were graded by their potential to default on a loan and categorized by color, with "redlined" districts designated as the highest risk Although these other factors were included in their survey, the determination was heavily race based. Areas received low grades based on the number of immigrants and people of color. Because low grade areas were not eligible for financial assistance this "perpetuate systematic segregation of minority groups in the United States" (Mcclure, et al., 2019). The aim of this research is to investigate the effects of this social divide over time and the extent that it has or has not been erased.

Although the HOLC was shut down in 1954, this research examines if there have been long term effects on positive neighborhood growth and livability of "Hazardous" (Red) and "Definitely Declining" (Yellow) neighborhoods. Do areas previously graded red or yellow receive a lower livability score than those that were historically marked "Best" (Green) or "Still Desirable" (Blue)?

Color theme taken from original HOLC map

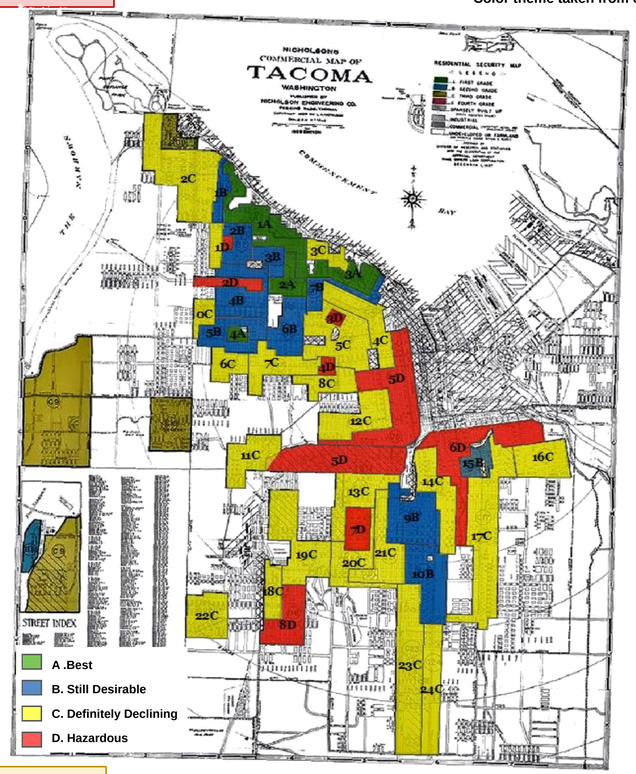


Figure1: Georeferenced original redlined map of Tacoma. Overlaid with digitized polygons. Labeled. Retrieved from: *Mapping Inequality dsl.richmond.edu/panorama/redlining*

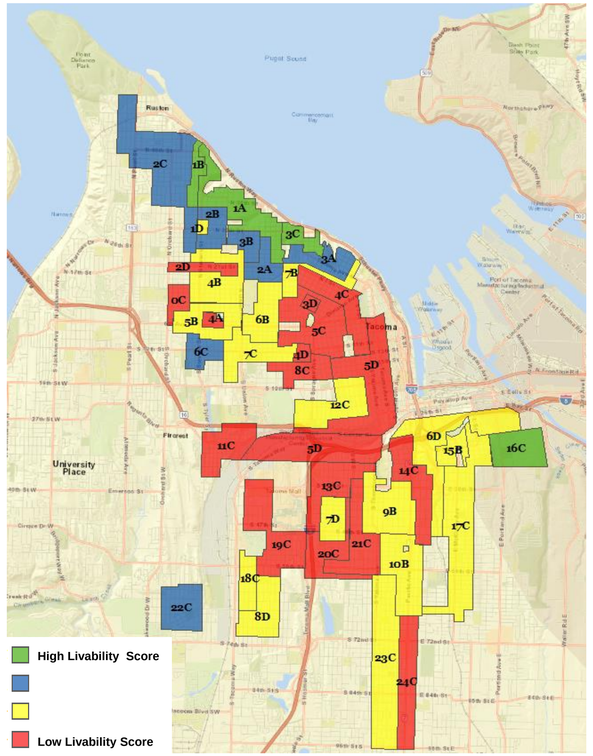


Figure2: Indexed redline polygon by city factors, not race. Using 2018 data.

Methods

An index was created using several factors related to the health and growth of a neighborhood.

The input datasets were analyzed in one of two ways:

1. Data relating to population was joined to census block groups then divided by the population to receive the rate of occurrences. The output was converted to points to preform an inverse distance weighted interpolation. Using zonal statistics, the grid was analyzed for average of occurrences within the HOLC graded areas (Figure 3).
2. For data based on proximity, a network analysis was used. Finding the total area covered by a service, the intersection was then tabulated and divided by the shape area of redlined zones to receive the percentage that was covered. This included parks, transit access, and water bodies

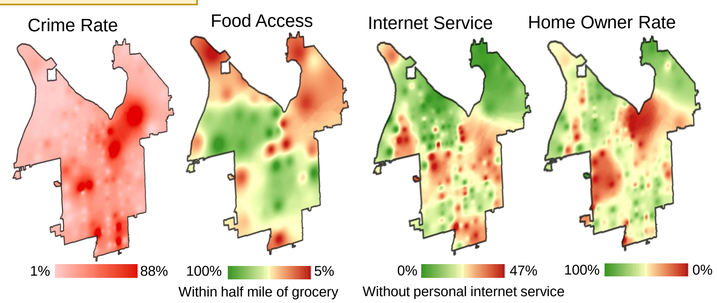
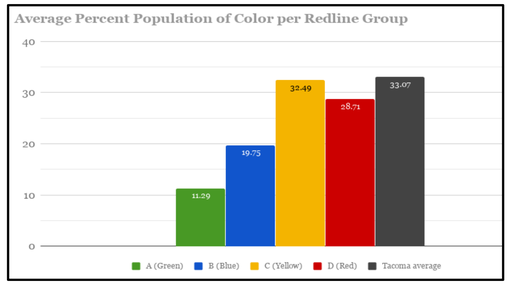


Figure 3: IDW Interpolation of selected variables for Tacoma

Finally, Z scores were created by dividing the mean of each indicator by the standard deviation for each zone. Livability was then symbolized in a similar manner to the HOLC to show change and contrast. These steps were repeated with the city of Tacoma's boundaries to receive a comparable average.

Moving Forward

Zones were symbolized in the same color system as the HOLC to assist in easily identifying HOLC area in their relation to the results of the index. Showing how these grades might have impacted future health, not to endorse or improve a redlining system. Neither race nor income were factors in creating the index used to score areas. However, it can not be ignored that there is a racial components to these results. Areas with the highest livability scores also have a much lower average population of people of color than Tacoma as a whole (Graph 1). Long term, people of color have been socially and economically restricted to areas without high quality recourses. The results speak to the areas which most opportunities and funding should be directed, such as improving items like food access, canopy cover and home buying loans in the South end of Tacoma.



Graph1: Racial distribution through zones.

Results

Indicators	Tacoma	Block B (Green)	Difference From Tacoma	Block A (Blue)	Difference From Tacoma	Block C (Yellow)	Difference From Tacoma	Block D (Red)	Difference From Tacoma
Industrial Parcels*	13.87	0.05	13.82	0	13.87	1.15	12.73	0.36	13.52
Residential Parcels*	57.9	69.14	11.24	70.89	12.99	67.58	9.68	66.36	8.47
Commercial Parcels*	2.67	2.24	0.43	3.48	0.81	3.37	0.70	0.75	1.92
Home Owner Rate	54.24	65.04	10.81	71.41	17.18	54.81	0.57	55.66	1.42
Fresh Food Access***	53.86	40.76	13.11	45.86	8.00	44.68	9.18	40.34	13.52
Without Internet Access	16.42	12.52	3.90	7.87	8.55	16.98	0.56	13.85	2.57
Crime Rate	12.37	7.88	4.48	6.37	5.99	11.76	0.60	11.67	0.70
Undeveloped Parks**	37.09	59.95	22.86	70.89	33.81	53.42	16.34	54.56	17.48
Local Parks**	54.18	69.14	14.96	70.89	16.71	67.45	13.26	66.34	12.16
Community Centers**	35.78	33.25	2.53	13.09	22.69	43.78	8.00	36.7	0.92
Canopy Cover	21.92	20.38	1.54	26.98	5.07	18.16	3.75	18.5	3.42
Transit Stops***	54.66	97.03	42.36	94.61	39.94	89.3	34.64	92.27	37.61
Water Bodies Access*	4.41	0.22	4.19	2.94	1.47	1.16	3.26	0	4.41

Table 1: All indicators used for index are listed in the left hand column. Livability rankings were symbolized by color, green being highest and red being the lowest scoring zones. The average percent is shown for each indicator by ranked zones and by Tacoma as a whole. Differences are shown to compare each zone to Tacoma as a whole to see any differences from what would be expected for the city.

* Percent Per Area
**Percent Per Residential Parcels
***Access Per 1/2 Mile

Previously "Hazardous" (Red) graded areas showed the lowest overall scores, while "Best" (Green) zones had the highest overall scores. This implies a large gap in services and neighborhood improvements in the area. Visually the data show a clear clustering and divide in livability in the north and south ends of the city. All but two, 80%, high scoring zones are North of the I-5/ SR 16. Similarly roughly 85% of all "Best" (Green) and "Still Desirable" (Blue) original HOLC grades being clustered within the same North area.

Historical redlining appears to be a predictor of future livability. There are noticeable differences between livability scores in districts with higher grades. After calculating each areas score they were contrasted with original grading. Least livable areas, within the lowest standard deviation, were within 52% of all HOLC "Definitely Declining" (Yellow) areas and 50% of all "Hazardous" (Red). While all "Best" (Green) areas included only 25% lowest rated zones and "Still Desirable" (Blue) had no instances of low scoring areas.

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Citations: Mcclure, E., Feinstein, L., Cordoba, E., Douglas, C., Emch, M., Robinson, W., . . . Aiello, A. E. (2019). The legacy of redlining in the effect of foreclosures on Detroit residents' self-rated health. Health & Place, 55, 9-19 | Jacoby, S. F., Dong, B., Beard, J. H., Wiebe, D. J., & Morrison, C. N. (2018). The enduring impact of historical and structural racism on urban violence in Philadelphia. Social Science & Medicine, 199, 87-95. Ryan, H. (2018). : Were the HOLC Residential Security Maps the Origin of Redlining? Oregon Historical Quarterly, 119(4), 538.