

2020 Census Redistricting Study: Portland Public Schools

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PRC's mission is to be a world-class center of training and knowledge for solutions to problems in applied demography, including population estimates, projections, geospatial analysis, and census-taking.



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Background

ORS 332.132 provides that, if a school district is zoned, it “shall divide the district into the necessary number of zones as nearly equal in population, as shown by the latest federal census, as practicable, taking into account attendance areas where possible.” Portland Public Schools (PPS) requested from the Population Research Center (PRC) a proposal for two scenarios for new boundaries for its board member electoral districts (“zones”) that meet these requirements. This summary report describes the data and methodology used to conduct the redistricting analysis, along with final results.

Data

ORS requires use of the latest federal census data, which motivated the use of the Public Law 94-171 Redistricting Data File from the 2020 Census, released during August, 2021.^[1] Digital boundaries of the current board member zones were obtained via correspondence from CKESD. The redistricting analysis was conducted during census tabulation block level geography, which is the smallest geographic unit at which population and housing counts are available. Block boundaries for the 2020 Census were obtained from the US Census Bureau.^[2] Building footprints from the Oregon Department of Geology and Mineral Industries (DOGAMI) Statewide building footprints for Oregon (SFBO) dataset were also used to model spatial population distribution.^[3]

Methodology

PRC developed a Geographic Information System (GIS) workflow to accomplish the following tasks:

- Determine the current population of each board member zone and the total population of the district;
- Adjust boundaries of the current districts so as to make zones as equal in population as feasible, and such that the spread between the lowest and highest population zones is under 10 percent.

These goals were accomplished by adjusting boundaries inside the perimeter of the district by following existing geographic and political boundaries such as major roads, parks or public spaces, neighborhood association and coalition boundaries, city and UGB boundaries, and school attendance zones.

In some cases, census blocks do not align with the boundaries of PPS’s jurisdiction. When this occurred, the total population of a census block was allocated into building footprints within the block, in proportion to the square footage of the building footprints. Then, the population on either side of a line drawn through a block was included with the population of the other blocks wholly contained on either side (Figure 1). This methodology yields more accurate estimates of population than simpler methods.^[4]

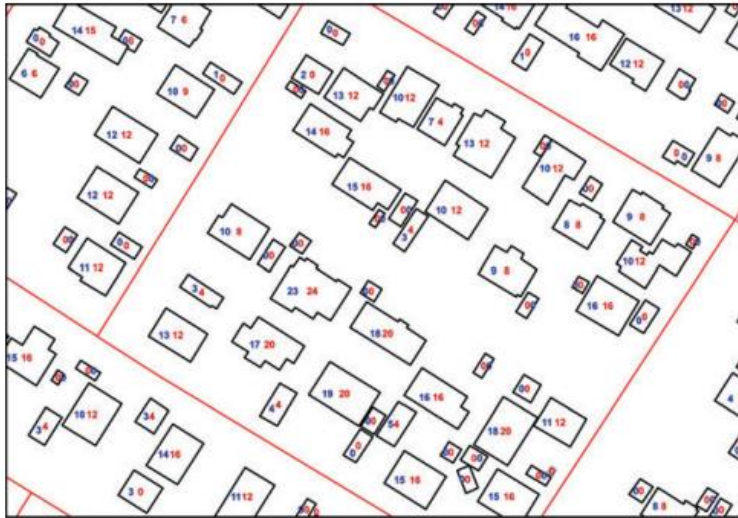


Figure 1: Example population estimation per building footprint within a block. Red boundaries indicate a census block. Black boundaries indicate a building. Numbers indicate an actual (if known) or estimated population per building within the block (summing to the block population as reported from the 2020 Census). Figure adapted from [4].

Results

In the current boundaries, the 2020 Census found that Zones 1 and especially 2,3 grew more quickly than average, and as a result would need to contract. Zones 4,5,6,7 grew less than average and would need to add population (Table 1). The total population of the PPS district is 519,967, translating to a target population (average) of 74,281 persons per district.

Table 1: Population of PPS Board Member Zones as of 2020 Census

Baseline: Current Zones	1	2	3	4	5	6	7
TOTAL Population	75,048	79,330	79,540	72,145	70,934	71,346	71,624
Deviation:	767	5,049	5,259	-2,136	-3,347	-2,935	-2,657
Percent	1.0%	6.8%	7.1%	-2.9%	-4.5%	-4.0%	-3.6%
Non-Hispanic, by race:							
White	58,295	56,596	57,356	44,825	50,907	48,637	48,353
Black	1,752	5,455	2,395	6,545	3,916	2,728	2,135
American Indian/Alaska Native (AIAN)	495	447	520	511	376	380	425
Asian	3,635	3,185	6,622	2,941	3,253	7,170	6,919
Native Hawaiian or Pacific Islander (NHPI)	183	185	155	672	153	316	342
Other	513	584	583	462	425	533	422
Two or more races	5,288	5,839	5,524	5,494	4,863	5,128	5,285
Hispanic:							
(Any race)	4,887	7,039	6,385	10,695	7,041	6,454	7,743

To generate the redistricting proposal, two alternatives were generated:

- Plan A attempts to preserve the current boundaries as much as possible.
- Plan B reconfigures board member zones more significantly along high school attendance zones and neighborhood boundaries.

As expected, Plan A maintains most of the features of the current population distribution by race/ethnicity, while Plan B looks somewhat different (Table 2). In particular, Plan B has three zones with 5,000 or more Black residents, compared to two in Plan A. Zone 7 in Plan B has lower Asian and Hispanic populations, while Zone 5 in Plan B has higher Asian and Hispanic populations.

In addition, PPS provided the locations of current board zone members, and PRC determined that under both plans, the proposed zones did not cause any current board member to be moved into a different zone from that in which they currently reside.

Table 2: Population of PPS Board Member Zones under 2020 Census Redistricting Proposals

Plan A: "Preservation"	1	2	3	4	5	6	7
TOTAL Population	73,994	74,373	74,142	74,460	74,303	74,631	74,064
Deviation:	-287	92	-139	179	22	350	-217
Percent	-0.4%	0.1%	-0.2%	0.2%	0.0%	0.5%	-0.3%
Non-Hispanic, by race:							
White	57,219	52,568	53,045	45,189	54,075	52,488	50,385
Black	1,767	5,492	2,324	7,165	3,603	2,500	2,075
American Indian/Alaska Native (AIAN)	476	433	512	565	404	334	430
Asian	3,693	3,001	6,387	2,951	3,906	6,573	7,214
Native Hawaiian or Pacific Islander (NHPI)	182	198	151	695	166	246	368
Other	490	537	560	492	446	553	444
Two or more races	5,327	5,474	5,081	5,599	5,189	5,441	5,310
Hispanic:							
(Any race)	4,840	6,670	6,082	11,804	6,514	6,496	7,838
Plan B: "Realignment"	1	2	3	4	5	6	7
TOTAL Population	74,061	74,466	74,075	74,012	74,513	74,266	74,574
Deviation:	-220	185	-206	-269	232	-15	293
Percent	-0.3%	0.2%	-0.3%	-0.4%	0.3%	0.0%	0.4%
Non-Hispanic, by race:							
White	57,330	54,108	52,934	46,634	46,581	51,477	55,905
Black	1,760	4,936	2,331	6,104	6,236	2,141	1,418
American Indian/Alaska Native (AIAN)	473	380	515	535	504	432	315
Asian	3,692	2,955	6,388	3,040	6,421	6,545	4,684
Native Hawaiian or Pacific Islander (NHPI)	178	155	155	675	369	306	168
Other	493	481	557	504	468	540	479
Two or more races	5,281	5,517	5,127	5,589	5,171	5,226	5,510
Hispanic:							
(Any race)	4,854	5,934	6,068	10,931	8,763	7,599	6,095

A basic map of the proposed zones is provided below (Figure 2). Additional maps are included as attachments with additional detail in higher resolution.

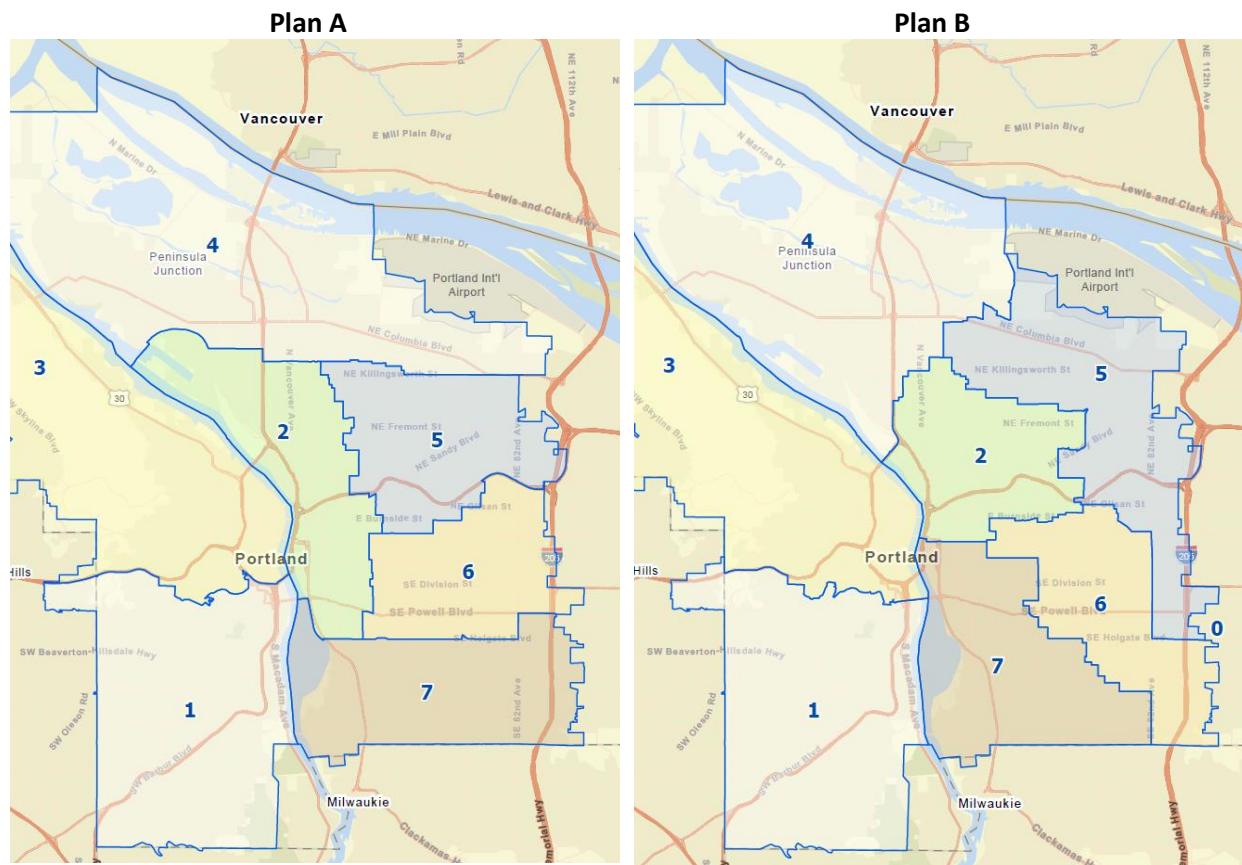


Figure 2: Proposed PPS Board Member Zones (see attachments for further detail).

Enclosures

1. GIS format (shapefile) boundaries
2. PDF format maps
3. 2020 Census PL94-171 data for census blocks in the State of Oregon are available in repackaged form at <https://pdx.edu/prc/census-data-oregon>

References

- [1] U.S. Census Bureau. 2020 Census: P.L. 94-171 Redistricting Data File. August 16, 2021. URL: <https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files.html>
- [2] U.S. Census Bureau. 2020 Census: P.L. 94-171 Redistricting Data Shapefiles. January 25, 2021. URL: <https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.2020.html>

[3] Williams, M. "Statewide building footprints for Oregon: Release 1.0 (SFBO-1)". Oregon Department of Geology and Mineral Industries (DOGAMI), 2021. URL: <https://www.oregongeology.org/pubs/dds/p-SBFO-1.htm>

[4] Lwin, K and Murayama, Y. "A GIS Approach to Estimation of Building Population for Micro-spatial Analysis". *Transactions in GIS*, 2009, 13(4): 401-414. doi: 10.1111/j.1467-9671.2009.01171.x