

# **EXHIBIT B**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF ILLINOIS  
EASTERN DIVISION**

DAN MCCONCHIE, in his official capacity as  
Minority Leader of the Illinois Senate and individually  
as a registered voter, JIM DURKIN, in his official  
capacity as Minority Leader of the Illinois House of  
Representatives and individually as a registered voter,  
JAMES RIVERA, ANNA DE LA TORRE,  
DOLORES DIAZ, FELIPE LUNA JR., SALVADOR  
TREMILLO, CHRISTOPHER ROMERO, the  
REPUBLICAN CAUCUS OF THE ILLINOIS  
SENATE, the REPUBLICAN CAUCUS OF THE  
ILLINOIS HOUSE OF REPRESENTATIVES, and  
the ILLINOIS REPUBLICAN PARTY,

Plaintiffs,

vs.

IAN K. LINNABARY, CASANDRA B. WATSON,  
WILLIAM J. CADIGAN, LAURA K. DONAHUE,  
CATHERINE S. MCCRORY, WILLIAM M.  
MCGUFFAGE, and RICK S. TERVEN, SR., in their  
official capacities as members of the Illinois State  
Board of Elections, EMANUEL CHRISTOPHER  
WELCH, in his official capacity as Speaker of the  
Illinois House of Representatives, the OFFICE OF  
SPEAKER OF THE ILLINOIS HOUSE OF  
REPRESENTATIVES, DON HARMON, in his  
official capacity as President of the Illinois Senate, and  
the OFFICE OF THE PRESIDENT OF THE  
ILLINOIS SENATE,

Defendants.

Case No. 1:21-cv-03091

Circuit Judge Michael B. Brennan  
Chief District Judge Jon E. DeGuilio  
District Judge Robert M. Dow, Jr.

Three-Judge Court  
Pursuant to 28 U.S.C. § 2284(a)

**EXPERT REPORT OF DR. JOWEI CHEN**

I, Dr. Jowei Chen, upon my oath, declare and say as follows:

1. I am over the age of eighteen (18) and competent to testify as to the matters set forth herein.

2. I am an associate professor in the Department of Political Science Research and associate professor at the Center for Political Studies of the Institute for Social Research at the University of Michigan, and a research associate at the Spatial Social Science Laboratory at Stanford University. I have a Bachelor of Arts in Ethics, Politics, and Economics from Yale University, a Master of Science in Statistics from Stanford University, and Doctor of Philosophy in Political Science from Stanford University.

3. I have published academic papers on legislative districting and political geography in several political science journals, including the American Journal of Political Science and the American Political Science Review, and Election Law Journal. My academic areas of expertise include redistricting, racial politics, legislatures, legislative elections, political geography, geographic information systems (GIS) data, and spatial statistics. I perform computer simulations for legislative districting and to analyze political geography, elections, and redistricting.

4. In the past four years, I have testified at deposition or at trial in the following cases: *Common Cause v. Rucho*, No. 16-cv-01026 (M.D.N.C. filed Aug. 5, 2016); *City of Greensboro v. Guilford Cty. Bd. of Elections*, No. 15-cv-00559 (M.D.N.C. filed July 13, 2015); *League of Women Voters v. Commonwealth*, No. 261. MD 2017 (Pa. Commw. Ct. filed June 15, 2017); *Georgia State Conference of the NAACP v. Georgia*, No. 17-cv-01397 (N.D. Ga. filed Apr. 20, 2017); *League of Women Voters of Michigan v. Johnson*, No. 17-cv-14148 (E.D. Mich. filed Dec. 22, 2017); *Whitford v. Gill*, No. 15-cv-421 (W.D. Wis. filed July 8, 2015); *Common Cause v. Lewis*, 18-CVS-014001 (N.C. Sup. Ct. filed Nov. 13, 2018); *Baroody v. City of Quincy*, No. 20-cv-00217 (N.D. Fla. filed Apr. 28, 2020).

5. I have been retained by Plaintiffs in the above-captioned matter. My Curriculum Vitae is attached to this Declaration. I am being compensated \$500 per hour for my work.

6. I performed the following analyses:

- Analyzed the racial and ethnic demographics and the geographic compactness of the Illinois General Assembly's August 31, 2021 Enacted House Plan.
- Analyzed the racial and ethnic demographics and the geographic compactness of the Plaintiffs' Remedial Plan districts in Cook County, around Aurora (DuPage and Kane Counties), and around Metro East (East St. Louis).
- Produced maps identifying the portions of Cook County, Aurora, and Metro East in which the block-group-level Latino share of Voting Age Population exceeds 25%, based on the 2020 Decennial Census.
- Using ecological inference (EI), analyzed the racial and ethnic breakdown of electoral support for Latino-preferred candidates in Cook County and for Black-preferred candidates around Metro East (East St. Louis).
- Using these ecological inference (EI) analyses, predicted the electoral performance of a Latino-preferred candidate in the Plaintiffs' Remedial Plan districts in Cook County.
- Using these same EI analyses, predicted the electoral performance of a Latino-preferred candidate in the challenged Cook County House districts in the August 31, 2021 Enacted Plan (Specifically: HD-1, 2, 3, 4, 19, 21, 22, 23, 24, 39, and 40).

7. **Summary of Findings:** I found that every district within the Plaintiffs' Remedial Plan exhibits compactness scores that are within the range of district-level compactness scores of the 2021 Enacted Plan. The overall compactness scores of the Plaintiffs' Remedial Plan are comparable to those of the Enacted Plan. Using estimates produced by ecological inference (EI) analyses of the 2018 Cook County Assessor Primary Election, I found that the Plaintiffs' Remedial Plan contains ten districts in Cook County that would have favored the Latino-preferred candidate. By contrast, in these same regions of Cook County, the Enacted Plan contains only four comparable districts that would have favored the Latino-preferred candidate.

8. **Plaintiffs' Remedial Plan and the Enacted Plan:** Plaintiffs' counsel provided me with a Remedial Plan in the form of a block assignment file. I analyzed this block assignment file to produce the maps and the various demographic and compactness calculations described in

this report. Plaintiffs' counsel also provided me with a shapefile of the Illinois General Assembly's August 31, 2021 Enacted House Plan (the "Enacted Plan"), which I similarly analyzed in this report. For each district in Plaintiffs' Remedial Plan and in the Enacted Plan, I calculated the Latino and the single-race Black share of the Voting Age Population (VAP) and of the Citizen Voting Age Population (CVAP).

9. The Plaintiffs' Remedial Plan contains a total of 14 House districts. Twelve of these districts are in Cook County, one district covers the Aurora area (DuPage and Kane Counties), and one district covers Metro East (Madison and St. Clair Counties). I found that all 14 of the House districts in the Plaintiffs' Remedial Plan are within 0.17% of the ideal district population (108,580.6), as measured using the 2020 Census total population. Therefore, all 14 districts in the Plaintiffs' Remedial Plan are within the population deviation range exhibited by the General Assembly's August 31, 2021 Enacted House Plan.

10. **2020 Census P.L. 94-171 Redistricting Data:** The racial and ethnic breakdowns of the VAP in this report are calculated from block-level 2020 Census data. After each decade's Census, the Bureau releases redistricting data summary files per Public Law (PL) 94-171 (the "PL 94-171 redistricting data"). These data files report each Census block's population count, and various racial and ethnic breakdowns of each block's population. The PL 94-171 redistricting data report these racial and ethnic counts for the Voting Age Population, but not for the Citizen Voting Age Population.

11. **American Community Survey (ACS) 5-Year Estimates:** The ACS is a continually ongoing survey that samples a small percentage of the US population. For each 5-year period (e.g., 2015-2019), the Census Bureau releases ACS estimates based on survey responses collected during the period. ACS estimates are often used to measure various population characteristics, such as a racial minority's share of the total population or Citizen

Voting Age Population (CVAP). The ACS 5-Year estimates are released only at the level of Census block groups. I thus disaggregate the ACS 5-Year estimates down to the block level, to estimate the racial and ethnic breakdown of the CVAP in each district. It is common for experts to disaggregate ACS 5-Year block group population estimates in this manner.

12. Table 1 reports the district-level populations and racial and ethnic characteristics of the Plaintiffs' Remedial Plan districts in Cook County, around Aurora, and around Metro East. Specifically, each row reports the calculations for one district within the Plaintiffs' Remedial Plan. Within each row, the second column reports the district's total population, the third and fourth columns report the Latino and the Black shares of the district's total population, the fifth and sixth rows report the Latino and the Black shares of the district's VAP, and the seventh and eighth rows report the Latino and the Black shares of the district's CVAP. Within Table 1, the districts in the Plaintiffs' Remedial Plan are grouped by county or region. The Cook County districts (1, 2, 3, 4, 21, 22, 23, 24, 32, 39, 40, and 77), are listed first. Next, district 50 is around Aurora (DuPage and Kane County). Finally, district 114 is in Metro East (Madison and St. Clair Counties).

13. Overall, Table 1 reports that the Plaintiffs' Remedial Plan contains 11 districts in Cook County with a Latino CVAP over 50% and a Latino VAP over 55%. Additionally, the Plaintiffs' Remedial Plan contains an Aurora district with a 62% Latino VAP and a Metro East district with a majority-Black district.

14. Table 2 reports all of the same population calculations and racial and ethnic characteristics of all 118 House districts in the Enacted Plan.

**Table 1: Racial and Ethnic Demographics  
Of Districts in Plaintiffs' Remedial Plan:**

<b>District:</b>	<b>Total Population (2020 Census)</b>	<b>Latino Share of 2020 Census Population:</b>	<b>Single-Race Black Share of 2020 Census Population:</b>	<b>Latino Share of 2020 Census VAP:</b>	<b>Single-Race Black Share of 2020 Census VAP:</b>	<b>Latino Share of 2015-2019 ACS CVAP:</b>	<b>Single-Race Black Share of 2015- 2019 ACS CVAP:</b>
<b>Cook County Districts:</b>							
1	108,538	65.5%	5.7%	61.9%	5.8%	51.0%	7.9%
2	108,564	65.5%	3.2%	61.7%	3.3%	50.9%	4.6%
3	108,473	63.8%	7.6%	60.2%	7.7%	50.8%	9.3%
4	108,674	62.5%	2.9%	58.6%	2.8%	51.6%	2.5%
21	108,592	62.9%	6.3%	59.7%	6.2%	50.6%	6.3%
22	108,544	64.6%	4.0%	60.4%	4.0%	51.4%	5.1%
23	108,576	69.6%	8.2%	66.0%	9.3%	51.5%	17.3%
24	108,568	61.0%	4.7%	57.9%	4.7%	51.0%	5.7%
32	108,578	68.0%	10.1%	64.1%	10.7%	51.1%	15.8%
39	108,602	58.6%	10.2%	55.8%	9.8%	50.3%	11.1%
40	108,615	22.4%	5.1%	21.1%	4.7%	19.1%	5.2%
77	108,529	63.3%	3.6%	58.7%	3.7%	51.4%	3.0%
<b>Aurora District (DuPage and Kane Counties):</b>							
50	108,634	66.5%	8.5%	62.0%	8.5%	46.8%	11.3%
<b>Metro East District (Madison and St. Clair Counties):</b>							
114	108,395	5.9%	55.1%	4.9%	52.2%	2.5%	51.3%

**Table 2: Racial and Ethnic Demographics  
Of Districts in August 31, 2021 Enacted House Plan:**

<b>District:</b>	<b>Total Population (2020 Census)</b>	<b>Latino Share of 2020 Census Population:</b>	<b>Single-Race Black Share of 2020 Census Population:</b>	<b>Latino Share of 2020 Census VAP:</b>	<b>Single-Race Black Share of 2020 Census VAP:</b>	<b>Latino Share of 2015-2019 ACS CVAP:</b>	<b>Single-Race Black Share of 2015- 2019 ACS CVAP:</b>
1	108,418	79.1%	5.5%	76.1%	5.9%	64.8%	9.6%
2	108,632	68.3%	3.8%	64.6%	3.8%	55.3%	4.1%
3	108,636	58.0%	4.8%	54.1%	4.6%	47.7%	4.9%
4	108,533	56.1%	12.9%	52.6%	12.6%	45.3%	15.9%
5	108,665	5.2%	56.8%	5.0%	52.8%	4.4%	54.2%
6	108,689	30.0%	46.7%	26.2%	46.5%	13.9%	58.4%
7	108,592	25.7%	42.5%	22.5%	43.4%	14.6%	48.4%
8	108,552	16.7%	49.4%	15.1%	50.4%	10.2%	54.7%
9	108,687	9.9%	46.3%	9.3%	41.6%	8.0%	46.1%
10	108,647	12.4%	43.0%	11.4%	40.1%	7.8%	43.3%
11	108,793	9.8%	4.4%	9.4%	4.4%	8.2%	3.6%
12	108,656	6.8%	5.4%	6.4%	5.3%	5.3%	5.4%
13	108,814	15.1%	12.9%	14.2%	12.0%	11.4%	9.7%
14	108,411	18.9%	21.3%	17.0%	20.1%	12.4%	19.2%
15	108,709	15.9%	3.3%	14.5%	2.9%	12.6%	2.4%
16	108,861	15.4%	10.4%	14.4%	9.7%	11.7%	8.4%
17	108,432	7.8%	4.6%	6.7%	4.3%	5.0%	3.7%
18	108,339	10.2%	14.3%	9.2%	14.1%	7.5%	13.4%
19	108,549	29.9%	3.0%	27.3%	2.8%	24.0%	2.1%
20	108,620	21.4%	1.6%	19.0%	1.4%	16.1%	1.1%
21	108,781	55.6%	6.8%	51.7%	6.8%	42.7%	7.2%
22	108,518	67.1%	2.1%	62.8%	2.1%	52.7%	2.6%
23	108,507	86.6%	6.1%	84.4%	7.3%	71.1%	16.5%
24	108,608	51.4%	4.0%	48.5%	3.9%	43.8%	3.8%
25	108,487	19.8%	56.3%	18.1%	55.5%	16.6%	56.9%
26	108,741	5.8%	51.5%	5.5%	47.6%	4.1%	52.6%
27	108,605	7.6%	53.5%	6.5%	52.9%	4.9%	53.2%
28	108,557	17.6%	46.5%	15.5%	46.3%	11.0%	49.9%
29	108,520	7.1%	59.9%	6.1%	58.4%	3.9%	58.0%
30	108,525	18.6%	52.8%	15.7%	52.6%	9.2%	55.7%
31	108,638	12.8%	52.5%	11.2%	53.0%	8.8%	57.0%
32	108,536	34.4%	49.7%	31.2%	51.6%	19.3%	61.6%
33	108,624	23.6%	63.1%	20.8%	63.9%	15.8%	66.0%
34	108,429	10.0%	68.9%	8.6%	68.5%	5.0%	68.1%
35	108,568	10.4%	21.6%	8.7%	21.8%	7.0%	21.9%
36	108,750	16.2%	13.7%	14.1%	13.7%	11.4%	14.1%



37	108,575	7.6%	2.6%	6.4%	2.3%	5.5%	1.2%
38	108,601	7.0%	49.2%	5.8%	48.2%	4.2%	49.2%
39	108,434	55.3%	4.0%	51.6%	3.8%	45.7%	3.1%
40	108,660	45.6%	4.8%	42.8%	4.8%	34.7%	4.9%
41	108,579	9.2%	6.0%	8.0%	5.7%	5.7%	5.7%
42	108,677	8.7%	5.4%	7.6%	5.2%	5.9%	4.2%
43	108,591	56.4%	7.2%	51.2%	6.6%	35.0%	7.7%
44	108,540	30.2%	6.1%	26.9%	5.5%	19.6%	5.8%
45	108,585	11.1%	3.4%	9.9%	3.2%	7.6%	2.8%
46	108,562	27.0%	6.7%	23.8%	6.1%	15.1%	6.9%
47	108,621	9.1%	4.4%	7.8%	4.0%	4.8%	3.9%
48	108,568	14.3%	2.7%	12.4%	2.4%	9.0%	2.3%
49	108,753	27.0%	5.1%	23.9%	4.5%	16.4%	3.8%
50	108,660	53.2%	8.3%	48.8%	8.3%	36.8%	9.5%
51	108,489	7.1%	1.9%	6.2%	1.7%	3.8%	1.6%
52	108,647	11.4%	1.9%	9.6%	1.5%	6.2%	1.4%
53	108,563	16.3%	3.3%	14.2%	3.1%	8.4%	2.9%
54	108,589	16.7%	2.8%	14.0%	2.6%	8.8%	1.9%
55	108,686	13.5%	3.1%	12.1%	2.9%	10.2%	3.3%
56	108,413	19.7%	4.2%	16.9%	3.8%	11.8%	3.5%
57	108,417	16.3%	1.9%	14.1%	1.7%	8.8%	1.9%
58	108,398	10.4%	4.3%	9.7%	4.6%	6.5%	3.3%
59	108,549	21.3%	2.8%	18.9%	2.7%	11.9%	2.5%
60	108,705	54.5%	19.7%	50.3%	19.9%	31.2%	26.7%
61	108,652	26.6%	14.1%	23.2%	12.8%	14.3%	11.7%
62	108,565	30.6%	5.2%	27.3%	4.5%	16.9%	4.2%
63	108,529	16.1%	1.9%	13.6%	1.5%	8.2%	1.3%
64	108,575	11.1%	2.4%	9.0%	1.9%	6.3%	1.4%
65	108,537	11.5%	2.5%	9.8%	2.2%	7.2%	2.3%
66	108,650	19.8%	4.1%	16.9%	3.6%	11.8%	2.4%
67	108,458	19.4%	24.4%	16.5%	21.5%	10.2%	20.2%
68	108,450	20.9%	13.0%	17.5%	10.7%	11.3%	10.2%
69	108,538	16.3%	2.4%	13.7%	1.9%	9.0%	2.1%
70	108,589	10.8%	2.9%	9.0%	2.4%	6.6%	2.3%
71	108,735	7.3%	9.7%	6.1%	8.2%	4.5%	5.7%
72	108,580	16.2%	15.1%	13.7%	12.7%	10.6%	10.1%
73	108,553	3.4%	2.1%	2.7%	1.5%	1.7%	0.9%
74	108,476	14.7%	3.8%	12.2%	3.4%	9.2%	2.8%
75	108,653	14.5%	5.2%	12.3%	4.8%	9.5%	4.6%
76	108,628	13.9%	9.2%	11.7%	7.8%	7.7%	6.8%
77	108,704	57.9%	3.4%	52.7%	3.4%	43.6%	3.0%
78	108,415	16.5%	31.2%	14.8%	32.0%	10.5%	32.6%
79	108,475	10.7%	27.3%	8.8%	25.3%	5.7%	23.3%

80	108,843	17.9%	27.8%	15.4%	27.4%	11.1%	27.6%
81	108,489	8.0%	5.1%	6.8%	4.8%	5.8%	4.5%
82	108,661	8.8%	3.9%	7.5%	3.4%	6.4%	4.0%
83	108,736	23.5%	7.4%	20.6%	6.8%	14.3%	6.1%
84	108,422	20.7%	11.9%	18.7%	11.5%	15.4%	12.1%
85	108,384	26.9%	15.6%	23.3%	15.2%	14.9%	15.8%
86	108,572	34.7%	17.3%	30.4%	16.9%	18.5%	19.4%
87	108,650	2.6%	2.8%	2.1%	2.5%	1.8%	2.6%
88	108,513	3.6%	5.4%	2.9%	4.5%	1.8%	4.0%
89	108,566	5.6%	2.0%	4.4%	1.7%	2.3%	0.6%
90	108,525	6.6%	8.0%	5.1%	6.4%	3.1%	5.1%
91	108,488	6.8%	12.7%	5.8%	10.8%	3.7%	8.4%
92	108,499	7.2%	32.6%	6.2%	27.8%	3.8%	25.1%
93	108,708	3.8%	3.2%	3.1%	2.5%	1.9%	2.1%
94	108,580	2.0%	2.0%	1.8%	1.8%	1.2%	1.7%
95	108,730	2.6%	11.1%	2.2%	8.9%	1.5%	7.1%
96	108,426	3.4%	33.9%	2.9%	28.8%	2.0%	23.8%
97	108,719	17.5%	9.9%	15.8%	9.2%	13.7%	9.3%
98	108,505	25.7%	15.8%	22.6%	14.9%	17.2%	14.2%
99	108,582	4.7%	7.5%	4.0%	6.6%	2.3%	6.2%
100	108,707	1.5%	1.8%	1.2%	1.4%	0.8%	1.1%
101	108,583	4.7%	3.3%	4.0%	2.8%	2.6%	2.1%
102	108,586	1.9%	2.8%	1.7%	2.8%	1.3%	2.9%
103	108,553	10.1%	21.8%	9.2%	18.1%	5.8%	17.1%
104	108,612	6.7%	17.8%	5.5%	14.7%	3.3%	14.5%
105	108,658	3.7%	2.8%	2.9%	2.4%	2.1%	2.3%
106	108,394	7.5%	1.9%	5.9%	1.4%	3.8%	0.8%
107	108,548	2.3%	1.2%	2.1%	1.0%	0.7%	0.9%
108	108,600	1.6%	2.2%	1.3%	1.9%	0.9%	1.7%
109	108,548	3.0%	2.8%	2.7%	2.6%	1.8%	2.3%
110	108,564	2.2%	4.2%	2.0%	3.8%	1.1%	3.7%
111	108,642	4.1%	11.8%	3.4%	9.9%	1.7%	8.0%
112	108,602	6.8%	16.8%	5.7%	15.5%	3.4%	13.6%
113	108,474	5.5%	34.0%	4.6%	30.9%	3.7%	25.4%
114	108,384	3.1%	36.5%	2.4%	34.7%	1.5%	38.0%
115	108,630	2.8%	5.9%	2.4%	5.8%	1.7%	6.6%
116	108,536	1.8%	3.9%	1.4%	3.1%	1.3%	3.1%
117	108,516	2.1%	4.6%	1.9%	4.3%	1.0%	3.8%
118	108,520	4.4%	12.4%	3.8%	10.9%	2.7%	11.8%

15. **Measuring District Compactness:** For each district within both the Plaintiffs' Remedial Plan and the Enacted Plan, I measured the district's compactness using two commonly-used quantitative measures. I first measure each district's Polsby-Popper score. The Polsby-Popper score for each individual district is calculated as the ratio of the district's area to the area of a hypothetical circle whose circumference is identical to the length of the district's perimeter; thus, higher Polsby-Popper scores indicate greater district compactness. Additionally, the Polsby-Popper score for an entire districting plan is calculated as the average score of the individual districts within the plan.

16. Second, I calculate the Reock score of the districts within each plan. The Reock score for each individual district is calculated as the ratio of the district's area to the area of the smallest bounding circle that can be drawn to completely contain the district. Much like the Polsby-Popper score, a higher Reock score indicates a more geographically compact district. Similarly, the Reock score for an entire plan is calculated as the average Reock score of the individual districts within the plan.

17. Table 3 reports all of the district-level calculations for the Plaintiffs' Remedial Plan districts in Cook County, around Aurora, and around Metro East. Specifically, each row reports the calculations for one district within the Plaintiffs' Remedial Plan. Within each row, the second and third columns report the Polsby-Popper and Reock compactness scores for the district. This Table reports that all 14 of the districts in the Plaintiffs' Remedial Plan exhibit a Reock score ranging from 0.194 to 0.463 and a Polsby-Popper score ranging from 0.187 to 0.409.

18. Table 4 reports the same compactness calculations (Reock score and Polsby-Popper score) for all 118 House districts in the Enacted Plan.

**Table 3: Compactness Scores of Districts in Plaintiffs' Remedial Plan:**

<b>District Number:</b>	<b>Reock Score:</b>	<b>Polsby-Popper Score:</b>
<b>Cook County Districts:</b>		
1	0.206	0.206
2	0.235	0.277
3	0.240	0.187
4	0.240	0.241
21	0.204	0.301
22	0.207	0.242
23	0.459	0.409
24	0.194	0.290
32	0.328	0.400
39	0.353	0.248
40	0.388	0.241
77	0.245	0.223
<b>Aurora District (DuPage and Kane Counties):</b>		
50	0.276	0.278
<b>Metro East District (Madison and St. Clair Counties):</b>		
114	0.463	0.370
<b>Plan Average:</b>	0.288	0.280

**Table 4: Compactness Scores of Districts in August 31, 2021 Enacted House Plan:**

<b>District:</b>	<b>Reock Score:</b>	<b>Polsby-Popper Score:</b>
1	0.151	0.147
2	0.315	0.295
3	0.095	0.124
4	0.127	0.179
5	0.111	0.132
6	0.181	0.149
7	0.366	0.307
8	0.129	0.104
9	0.214	0.208
10	0.293	0.186
11	0.278	0.202
12	0.362	0.292
13	0.269	0.195
14	0.333	0.335
15	0.235	0.168
16	0.275	0.246
17	0.291	0.294
18	0.255	0.231
19	0.386	0.262
20	0.498	0.24
21	0.303	0.126
22	0.45	0.535
23	0.311	0.286
24	0.498	0.197
25	0.143	0.128
26	0.079	0.069
27	0.102	0.097
28	0.137	0.137
29	0.238	0.235
30	0.372	0.199
31	0.105	0.099
32	0.075	0.1
33	0.134	0.138
34	0.167	0.175
35	0.159	0.198
36	0.184	0.246
37	0.495	0.452
38	0.369	0.37
39	0.167	0.21
40	0.314	0.225

41	0.437	0.237
42	0.412	0.362
43	0.338	0.214
44	0.514	0.507
45	0.347	0.195
46	0.257	0.223
47	0.446	0.251
48	0.266	0.29
49	0.355	0.146
50	0.6	0.451
51	0.519	0.327
52	0.288	0.228
53	0.217	0.282
54	0.388	0.332
55	0.484	0.216
56	0.153	0.145
57	0.278	0.152
58	0.444	0.33
59	0.257	0.16
60	0.381	0.176
61	0.452	0.293
62	0.31	0.209
63	0.405	0.35
64	0.393	0.366
65	0.517	0.378
66	0.347	0.253
67	0.372	0.181
68	0.196	0.13
69	0.336	0.288
70	0.331	0.328
71	0.274	0.313
72	0.206	0.299
73	0.391	0.269
74	0.328	0.302
75	0.602	0.483
76	0.207	0.179
77	0.273	0.21
78	0.462	0.336
79	0.297	0.274
80	0.168	0.168
81	0.446	0.326
82	0.467	0.331
83	0.291	0.192

84	0.42	0.405
85	0.429	0.333
86	0.42	0.471
87	0.614	0.572
88	0.515	0.366
89	0.191	0.2
90	0.231	0.268
91	0.131	0.173
92	0.49	0.247
93	0.369	0.336
94	0.37	0.194
95	0.188	0.104
96	0.112	0.124
97	0.545	0.299
98	0.4	0.232
99	0.209	0.231
100	0.366	0.43
101	0.285	0.199
102	0.442	0.293
103	0.401	0.313
104	0.273	0.204
105	0.519	0.342
106	0.35	0.293
107	0.552	0.489
108	0.418	0.302
109	0.422	0.272
110	0.352	0.368
111	0.398	0.22
112	0.353	0.17
113	0.239	0.166
114	0.441	0.237
115	0.417	0.421
116	0.321	0.35
117	0.496	0.313
118	0.451	0.303
<b>Plan Average:</b>	<b>0.327</b>	<b>0.258</b>

19. For each of the three regions (Cook County, Aurora, and Metro East), Figures 1 through 6 compare the compactness of the Plaintiffs' Remedial Plan districts to the Enacted Plan districts in that same geographic area. Specifically, Figure 1 compares the Cook County districts in the two plans with respect to their Polsby-Popper scores.

20. Within Figure 1, the left column contains in red 12 numbers depicting the district numbers of the 12 Cook County districts in the Plaintiffs' Remedial Plan. These 12 districts are aligned along the vertical axis according to their Polsby-Popper scores, with more compact districts placed higher in the Figure. Overall, these 12 Cook County districts in the Plaintiffs' Remedial Plan have an average Polsby-Popper score of 0.27.

21. Next, the middle column of Figure 1 visualizes the Polsby-Popper scores for the comparable Cook County districts from the Enacted Plan. Specifically, this middle column contains the 12 Cook County districts from the Enacted Plan identified by the following criteria: 1) The district contains at least 100,000 residents in Cook County; 2) The district contains a Latino VAP of 25% or higher (2020 Census); and 3) The district has a higher Latino VAP than its Black VAP (2020 Census). These three criteria led me to identify the following 12 Enacted Plan districts, which are listed in the middle column of Figure 1: HD- 1, 2, 3, 4, 19, 21, 22, 23, 24, 39, 40, and 44. These 12 districts are aligned vertically in the middle column according to their Polsby-Popper scores. Finally, the right column in the Figure contains all 118 districts in the Enacted Plan, aligned according to their Polsby-Popper scores.

22. Overall, Figure 1 illustrates that in Cook County, the Plaintiffs' Remedial Plan districts have Polsby-Popper scores that are overall similar to the comparable Cook County districts in the Enacted Plan. The average Polsby-Popper score of the 12 Cook County districts in the Plaintiffs' Remedial Plan is slightly higher than the comparable 12 districts in the Enacted

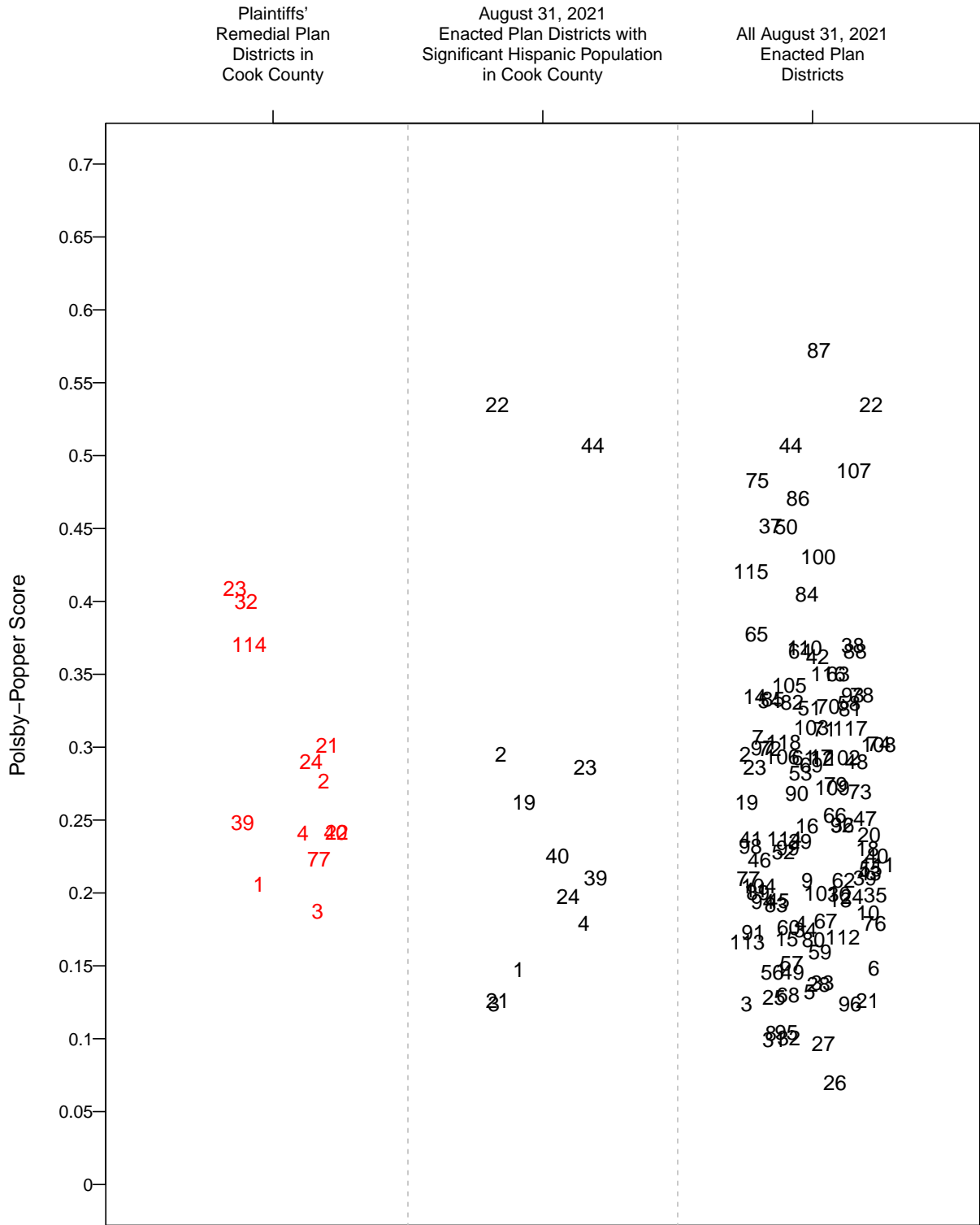


Plan (0.27 versus 0.26), and none of the Remedial Plan districts have a lower Polsby-Popper score than the lowest score among the Enacted Plan districts.

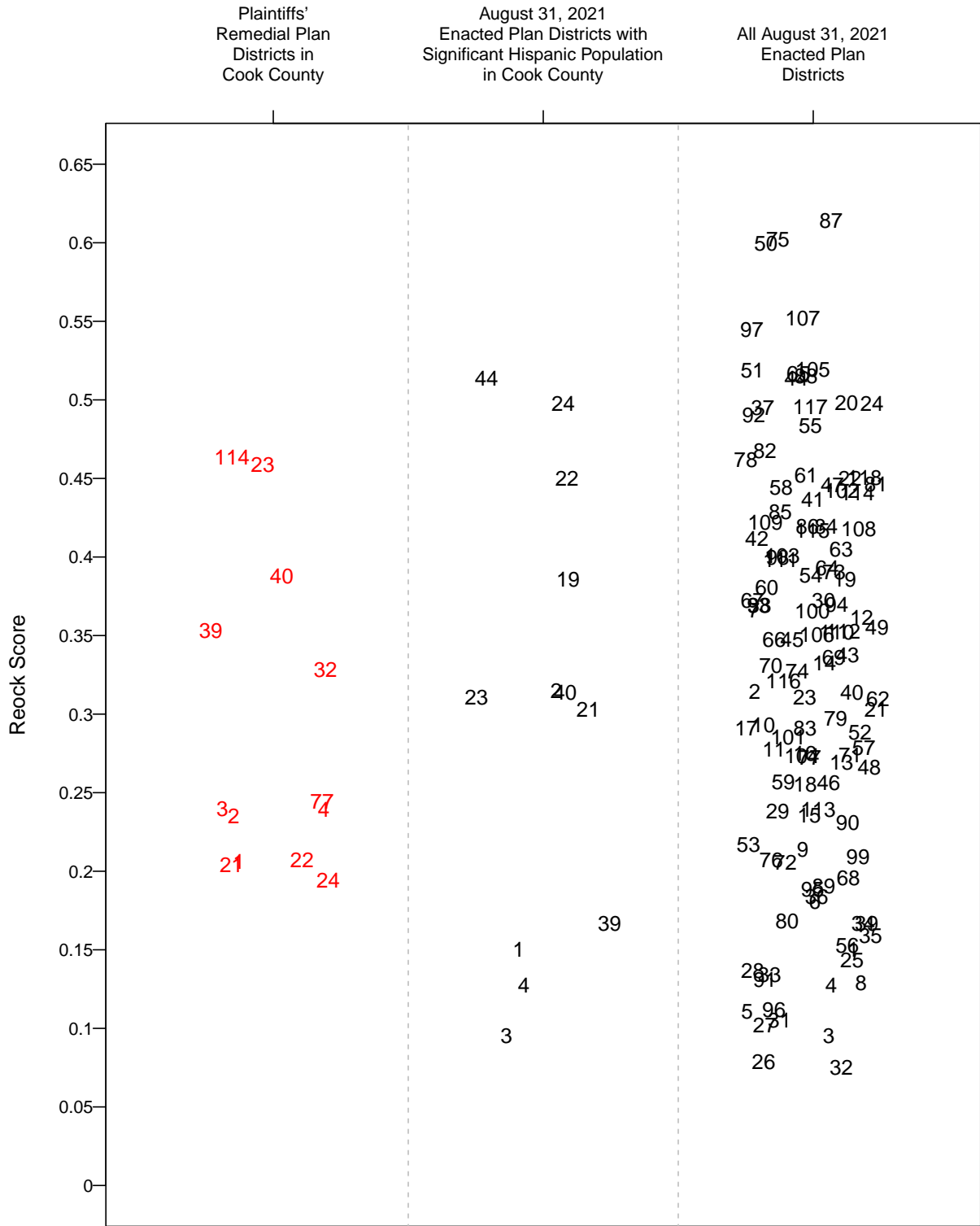
23. Figure 2 presents similar comparisons of the Plaintiffs' Remedial Plan and the Enacted Plan, except that in this Figure, district compactness is measured using the Reock score, rather than the Polsby-Popper score. Overall, Figure 1 and Figure 2 illustrate that the Plaintiffs' Remedial Plan districts within Cook County are comparable to the Cook County districts in the Enacted Plan. Using either the Polsby-Popper or the Reock measure of compactness, every single one of the 12 Cook County districts in the Plaintiffs' Remedial Plan is more geographically compact than least-compact district from the Enacted Plan.

24. Figures 3 and 4 present similar comparisons for the Aurora-area districts in the Plaintiffs' Remedial Plan and the Enacted Plan, while Figures 5 and 6 present similar comparisons for the Metro East districts in the Plaintiffs' Remedial Plan and the Enacted Plan. Although the Aurora-area district (District 50) in the Plaintiffs' Remedial Plan has lower compactness scores than some of the Aurora-area districts in the Enacted Plan, it is nevertheless still comparable to and within the range of compactness scores of the 118 districts in the Enacted Plan. Finally, Figures 5 and 6 reveal that District 114 (Metro East) of the Plaintiffs' Remedial Plan is more compact than the Metro East-area districts in the Enacted Plan (HD-113 and HD-114).

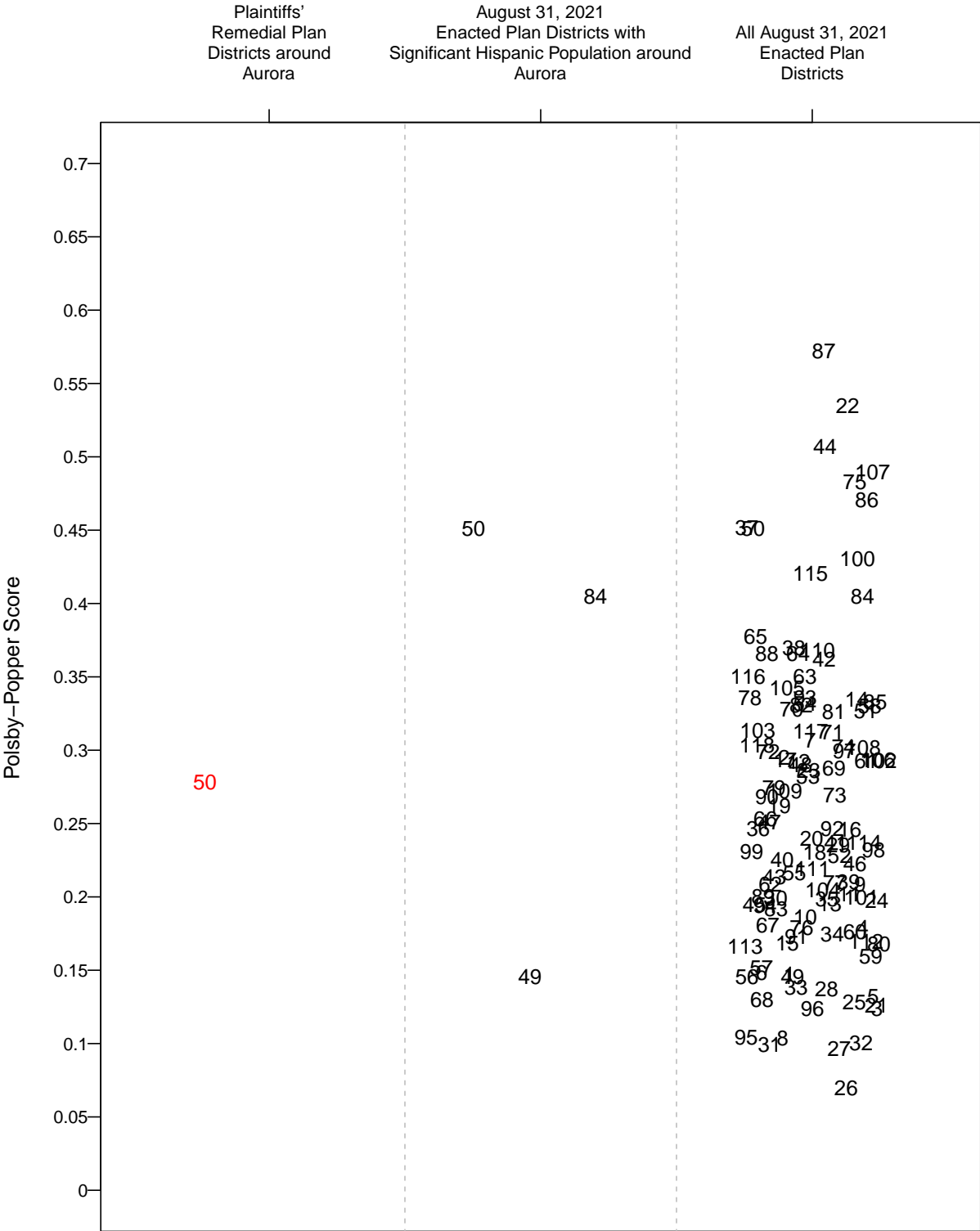
**Figure 1: Comparison of Enacted Plan Districts to Plaintiffs’ Remedial Plan Districts in Cook County on Polsby-Popper Score:**



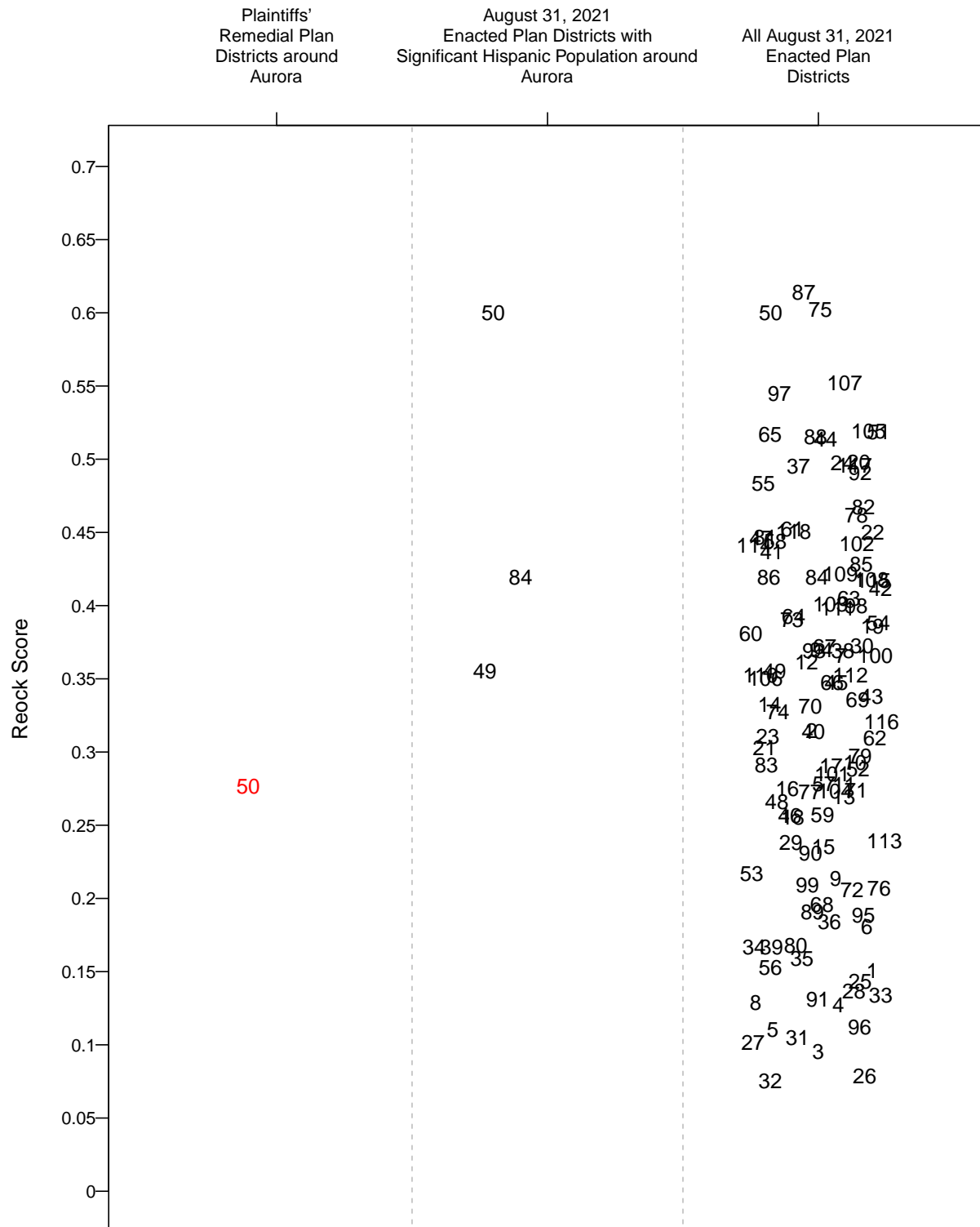
**Figure 2: Comparison of Enacted Plan Districts to Plaintiffs' Remedial Plan Districts in Cook County on Reock Score:**



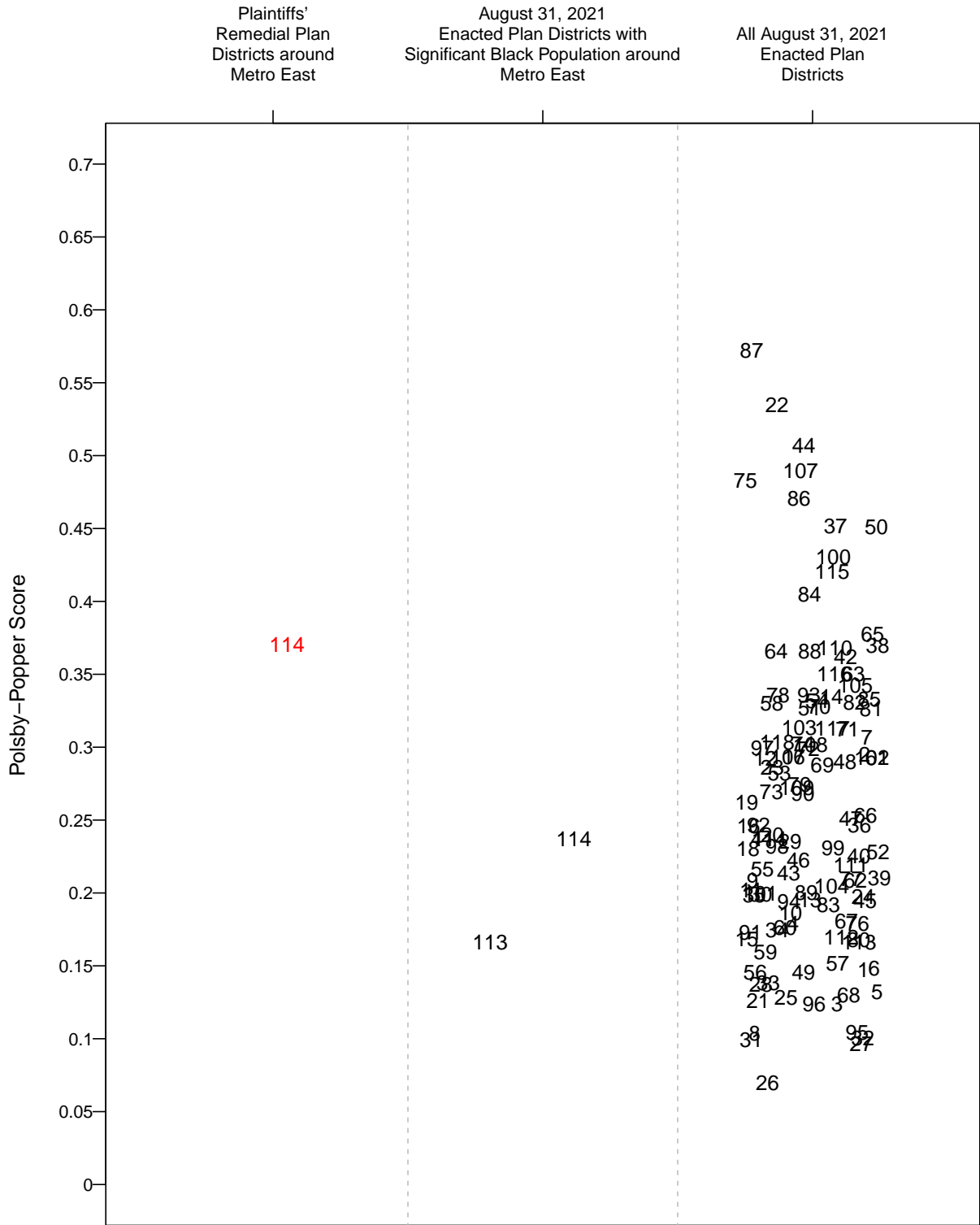
**Figure 3: Comparison of Enacted Plan Districts to Plaintiffs' Remedial Plan District around Aurora on Polsby-Popper Score:**



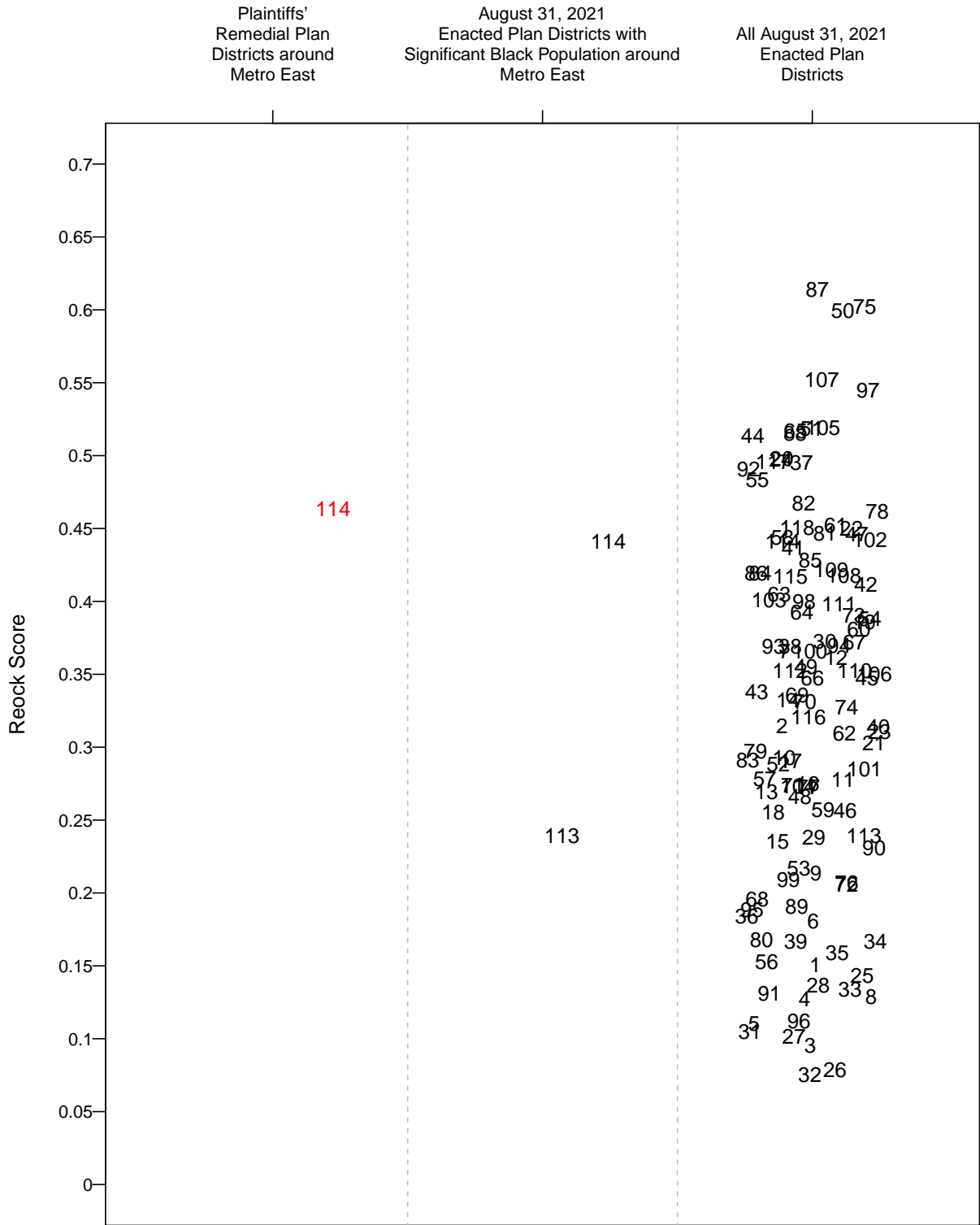
**Figure 4: Comparison of Enacted Plan Districts to Plaintiffs' Remedial Plan District around Aurora on Reock Score:**



**Figure 5: Comparison of Enacted Plan Districts to Plaintiffs’ Remedial Plan Districts in Metro East on Polsby-Popper Score:**



**Figure 6: Comparison of Enacted Plan Districts to Plaintiffs’ Remedial Plan Districts in Metro East on Reock Score:**



25. Figures 7 through 11 present a series of maps identifying the areas of Cook County and Aurora (DuPage and Kane Counties) in which the block-group-level Latino share of Voting Age Population exceeds 25%, based on the 2020 Decennial Census. Figures 12 and 13 present similar maps identifying the block groups around Metro East in which the Black share of Voting Age Population exceeds 25%.

26. Specifically, Figure 7 presents a block-group-level map of Cook County in which orange shading identifies block groups in which Latino VAP exceeds 25%. This map generally illustrates that the Latino population in Cook County is geographically concentrated in a number of regions, including Northwest and Southwest Chicago and Western Cook County.

27. Figure 8 presents the same map identifying block groups with over 25% Latino VAP. However, the red lines and red numbers in this map identify the ten Cook County districts in the Plaintiffs' Remedial Plan. This map demonstrates that the 12 districts in the Plaintiffs' Remedial Plan largely cover the three main areas geographically concentrated Latino population in Cook County.

28. Figure 9 presents the same block-group-level map of Cook County. However, in this map, the red lines and red numbers in this map identify the August 31, 2021 Enacted Plan's districts identified using the criteria described earlier: 1) The district contains at least 100,000 residents in Cook County; 2) The district contains a Latino VAP of 25% or higher (2020 Census); and 3) The district has a higher Latino VAP than its Black VAP (2020 Census).

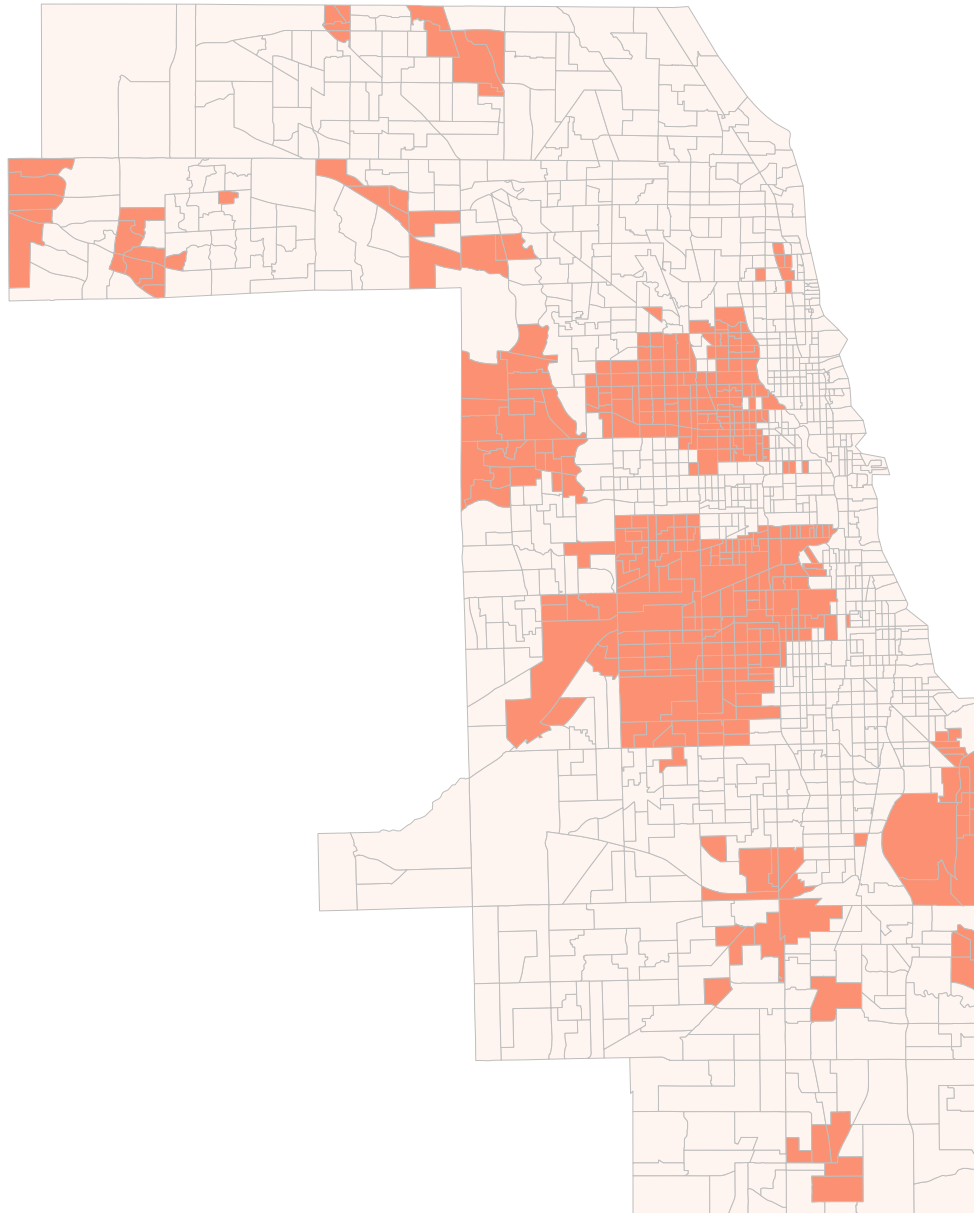
29. Figures 10 and 11 present a map of Aurora identifying block groups with over 25% Latino VAP. In Figure 11, the red lines identify the Aurora district (District 50) in the Plaintiffs' Remedial Plan. In Figure 12, the red lines and red numbers identify the various districts from the August 31, 2021 Enacted Plan around Aurora.



30. Finally, Figures 13 and 14 present a map of Metro East (East St. Louis) identifying block groups with over 25% single-race Black VAP. In Figure 14, the red lines indicate the boundaries of District 114 in the Plaintiffs' Remedial Plan.

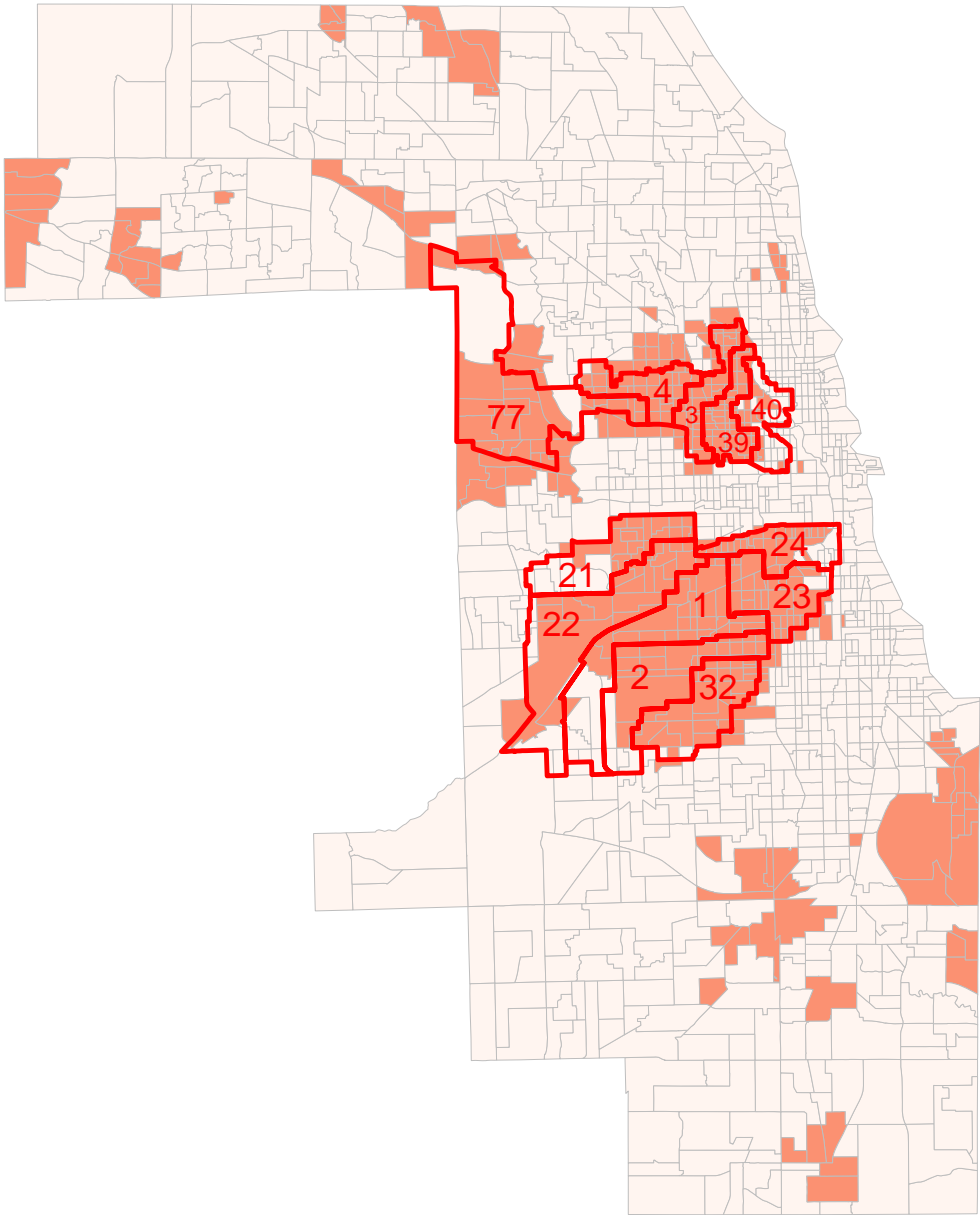
**Figure 7:**

**August 31 Enacted Plan Districts in Cook County  
(Light red shading indicates block groups with over 25% Hispanic VAP)**



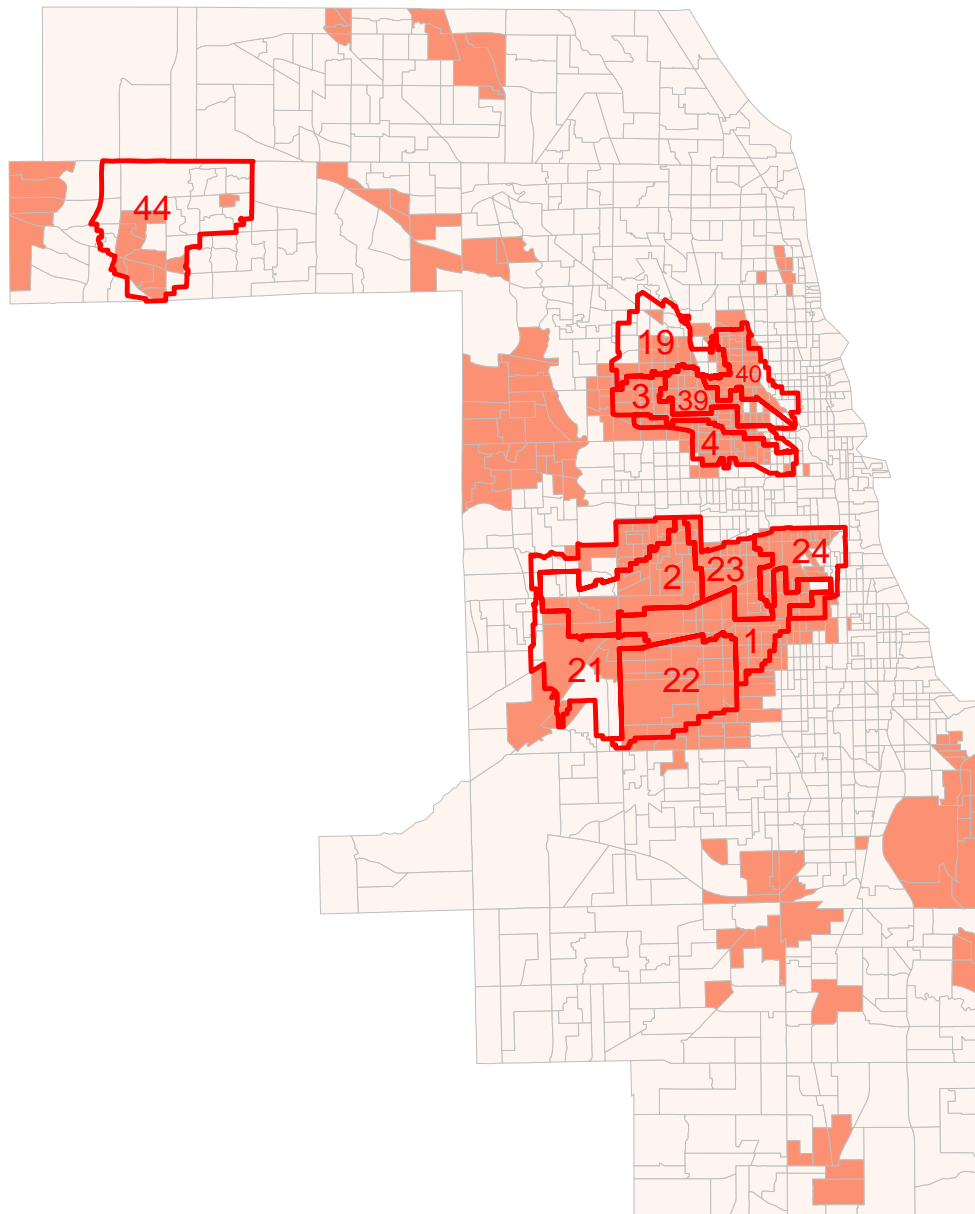
**Figure 8:**

**Plaintiffs' Remedial Plan Districts in Cook County**  
**(Light red shading indicates block groups with over 25% Hispanic VAP)**

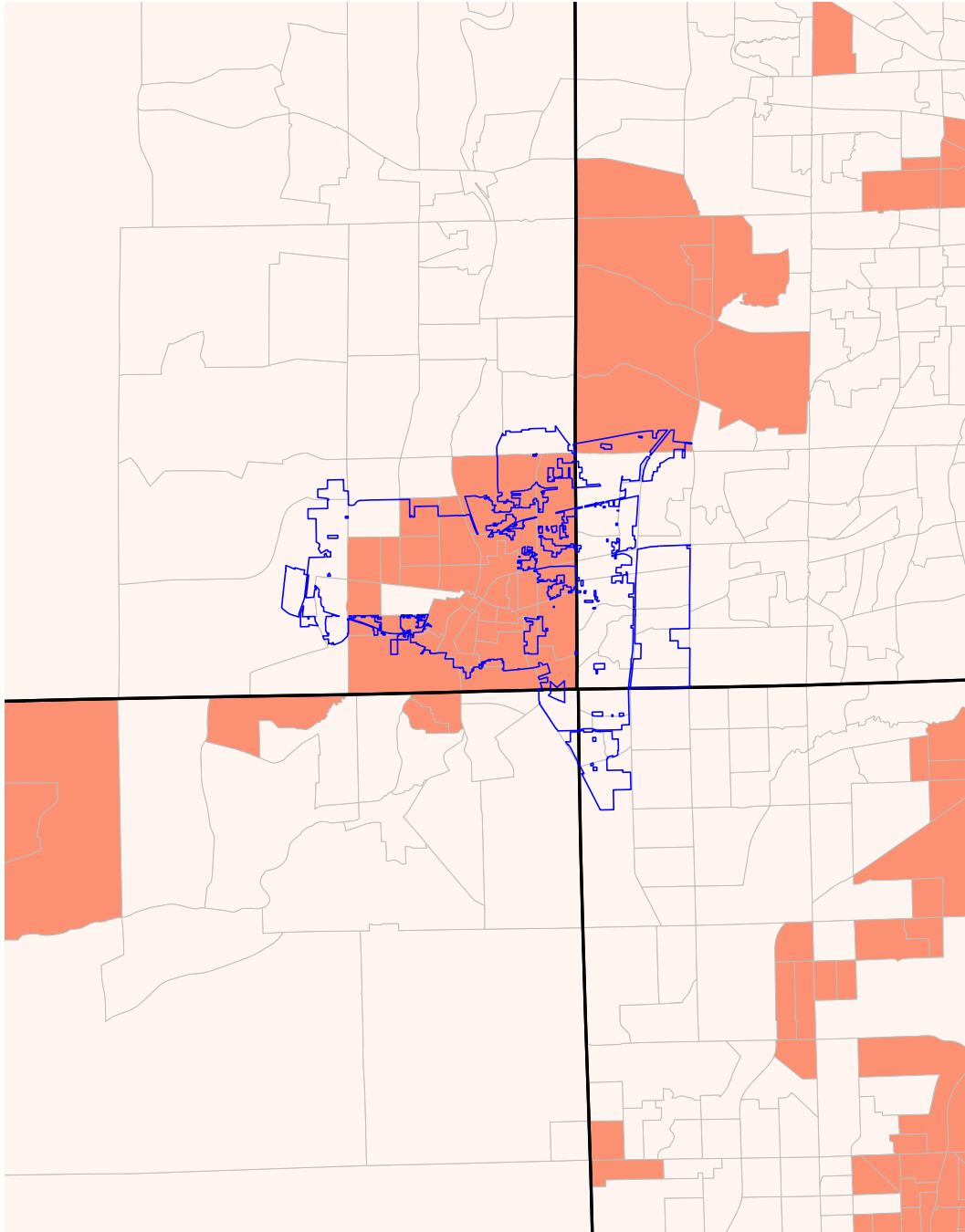


**Figure 9:**

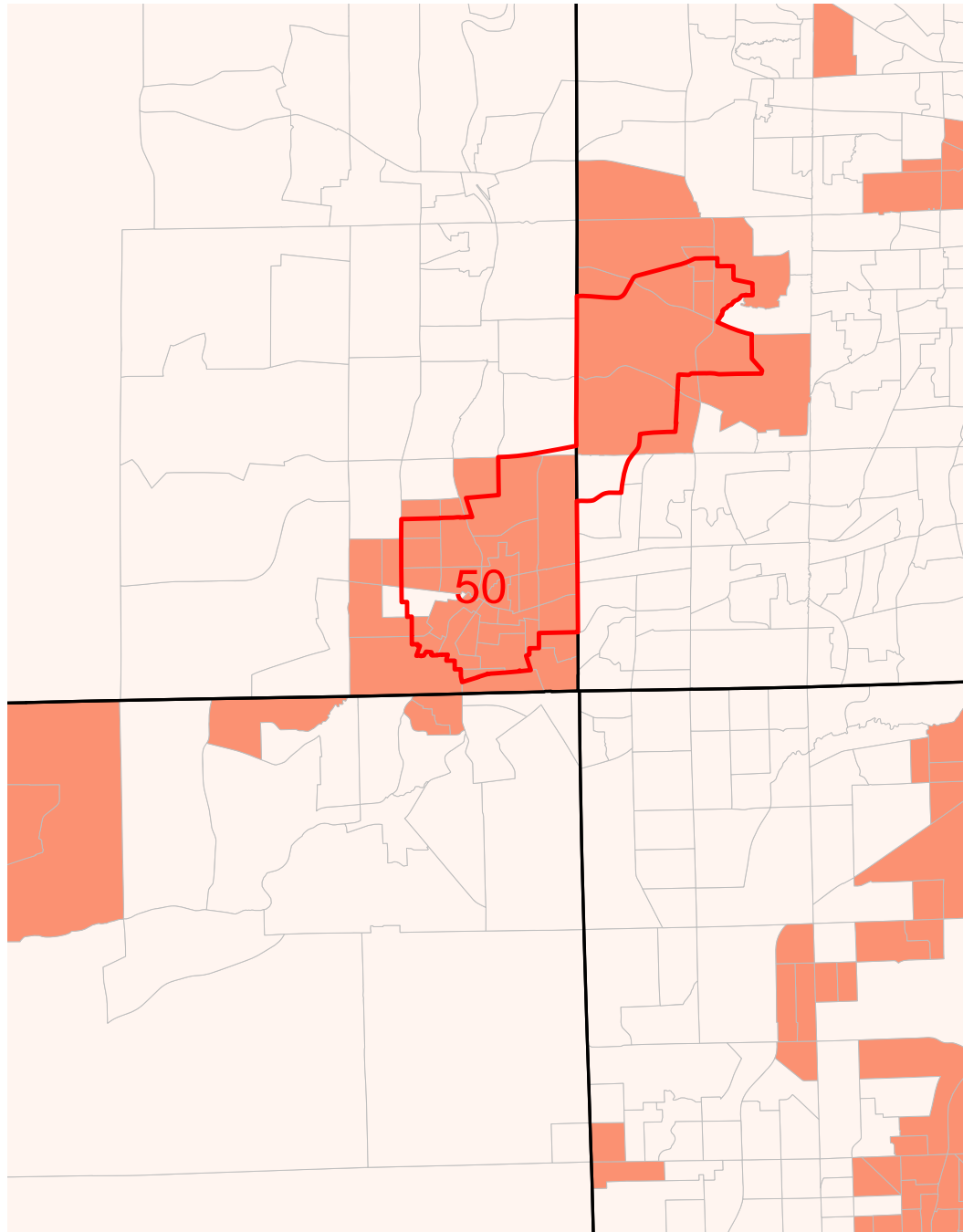
**August 31 Enacted Plan Districts in Cook County**  
**(Light red shading indicates block groups with over 25% Hispanic VAP)**



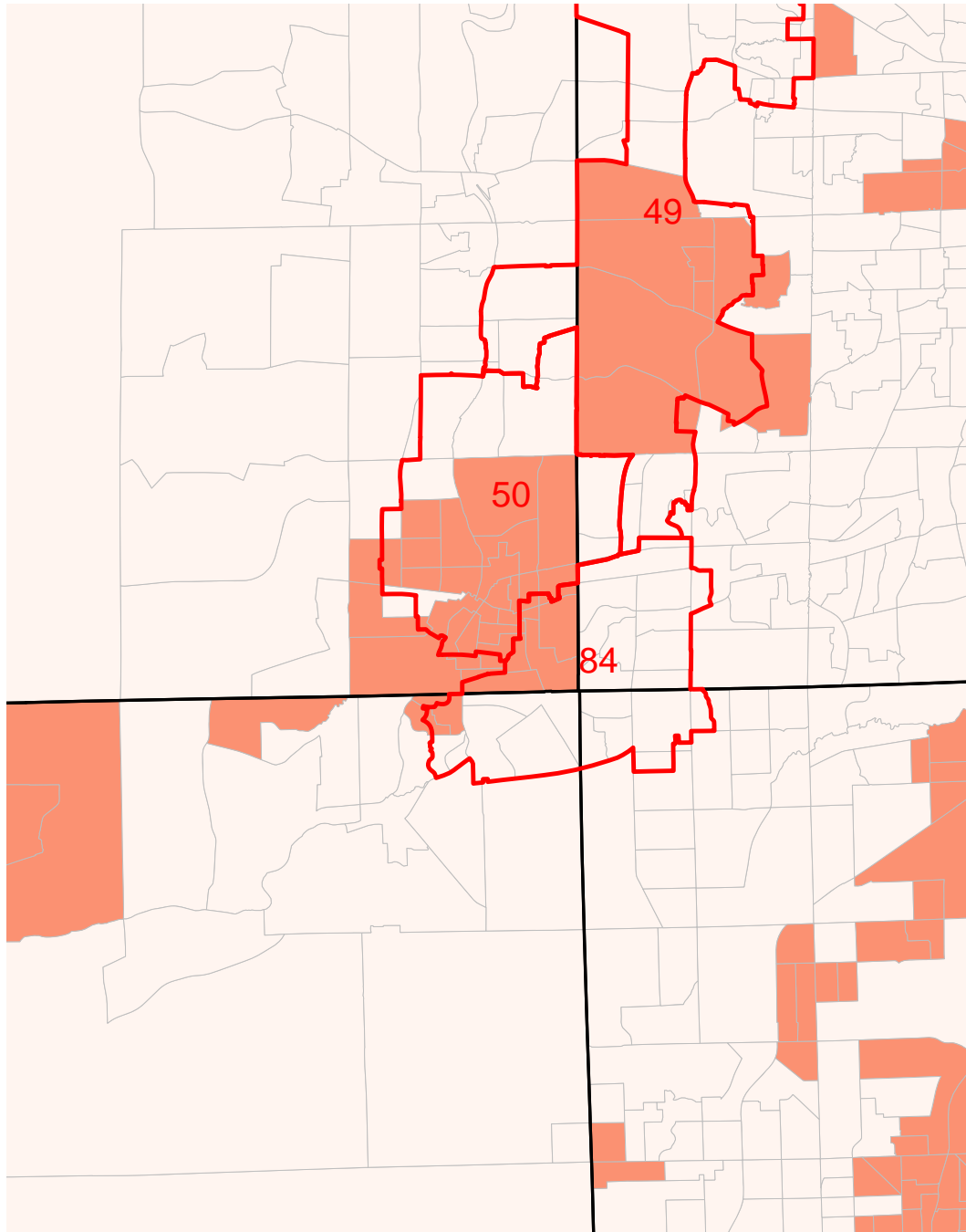
**Figure 10:**  
**Census Block Groups around Aurora**  
**(Light red shading indicates block groups with over 25% Hispanic VAP)**  
**(Blue lines indicate Aurora city boundaries)**



**Figure 11:**  
**Plaintiffs' Remedial Plan Districts around Aurora**  
**(Light red shading indicates block groups with over 25% Hispanic VAP)**  
**(Dark red lines indicate Plaintiffs' Remedial Plan District 50)**

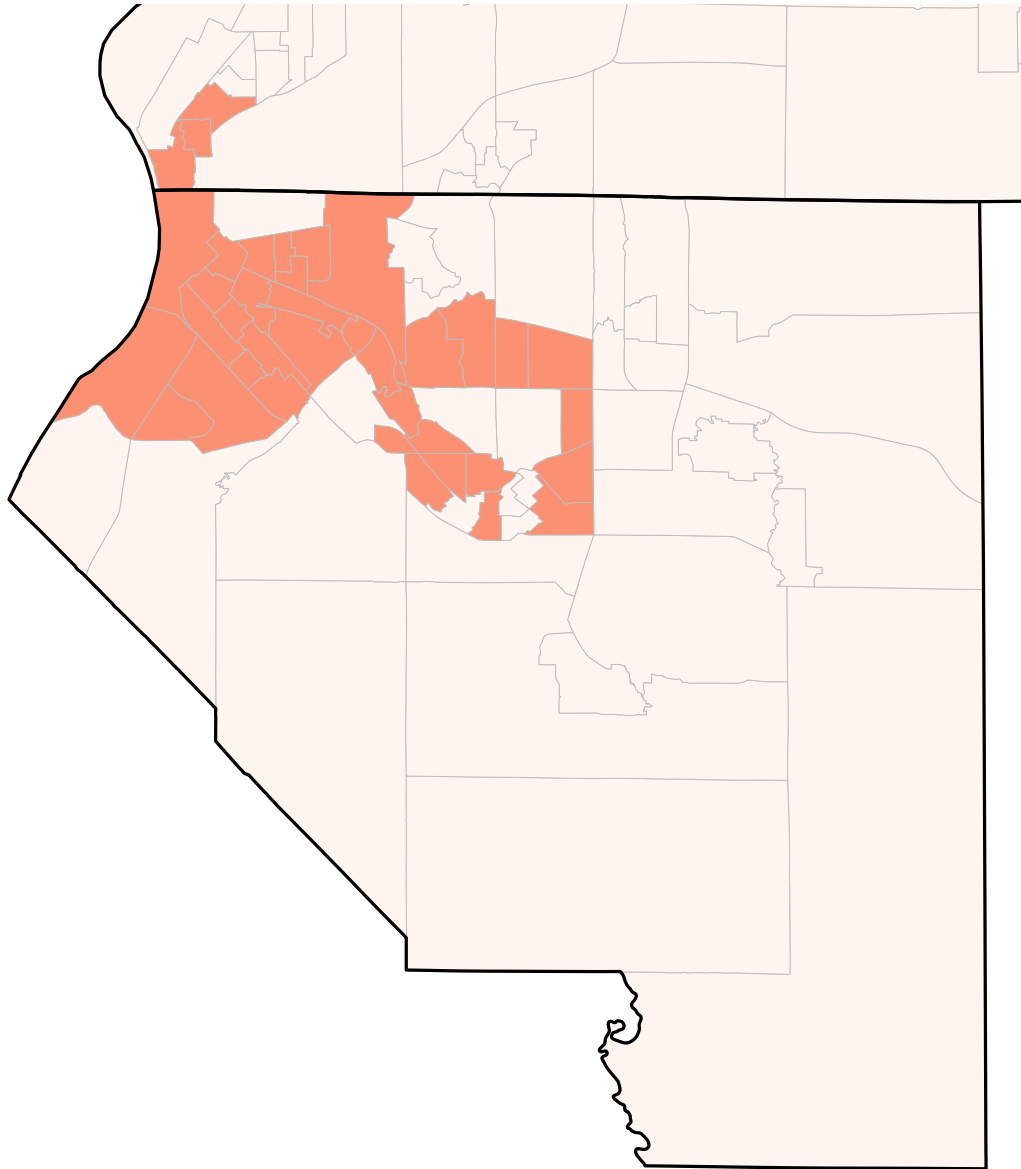


**Figure 12:**  
**August 31 Enacted Plan Districts around Aurora (DuPage and Kane County portions**  
**(Light red shading indicates block groups with over 25% Hispanic VAP)**  
**(Dark red lines indicate Enacted Plan Districts around Aurora)**



**Figure 13:**

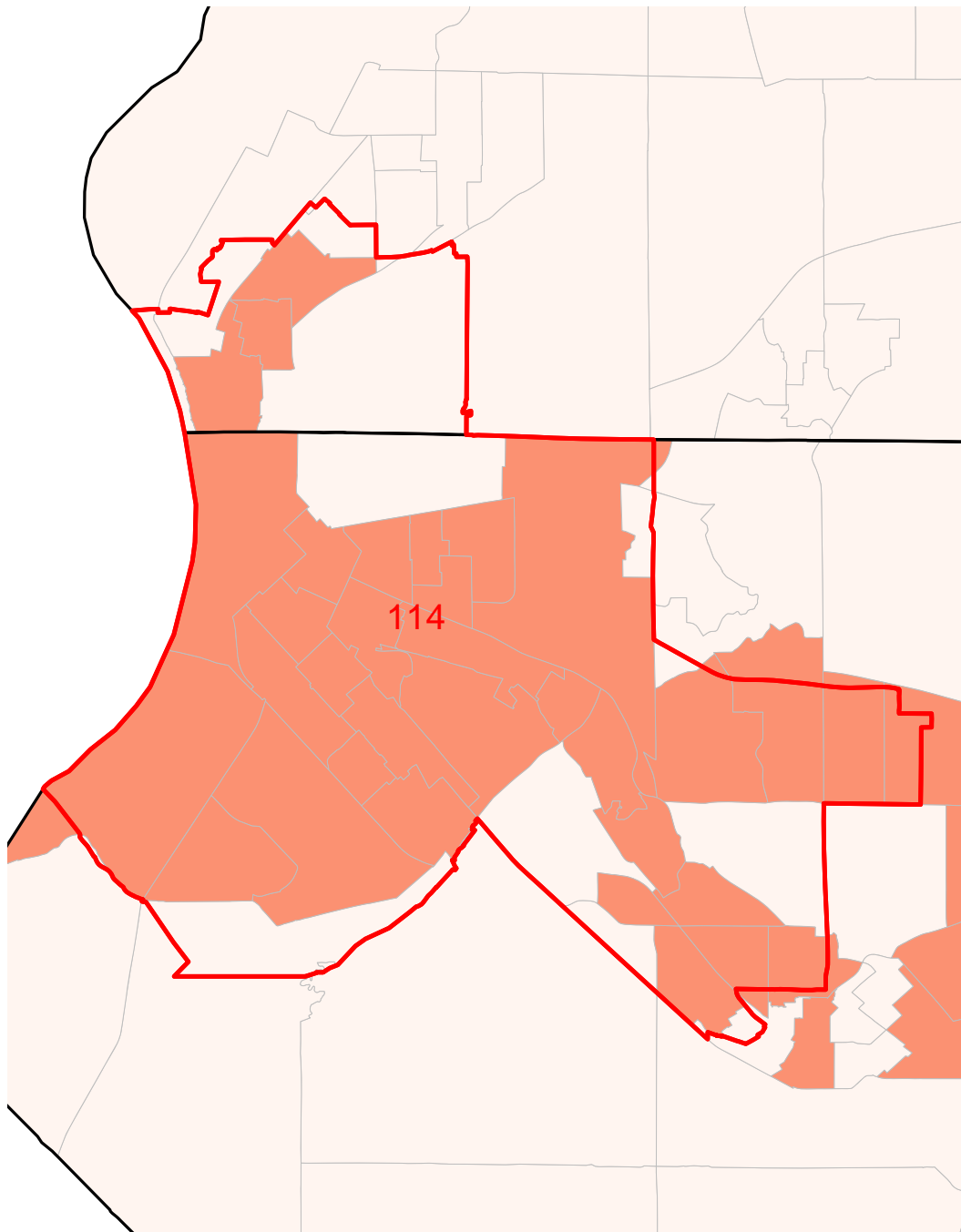
**Plaintiffs' Demonstration Plan District 113 in East St. Louis  
(Light red shading indicates block groups with over 25% Black VAP)**





**Figure 14:**

**Plaintiffs' Remedial Plan District 114 in East St. Louis  
(Light red shading indicates block groups with over 25% Black VAP)**



### **Voting Patterns by Race and Ethnicity in Illinois Elections**

31. For each of the elections listed in Table 5, Plaintiffs' counsel provided me with a data file reporting, for each precinct, the number of votes received by each candidate in the election, as well as the racial and ethnic breakdown of the precinct. Specifically, plaintiffs' counsel reported to me each precinct's 2020 Census Voting Age Population (VAP), Latino VAP, single-race White VAP, and single-race Black VAP. Some of these elections were endogenous State House or State Senate races for the Illinois General Assembly, while others were municipal or county-wide election contests.

32. For each set of election results in Cook County listed in Table 5, plaintiffs' counsel asked me to identify those elections satisfying all four of the following criteria:

- 1) The election was a primary election or a non-partisan municipal election;
- 2) For endogenous (State House or Senate) elections, the district is substantially within the region covered by the Plaintiffs' Remedial Plan;
- 3) Over 50% of Latino voters favored a single candidate; and
- 4) Over 50% of White voters favored a candidate other than the Latino-preferred candidate.

Among the set of elections satisfying all four of these criteria, plaintiffs' counsel asked me to count the number of elections in which the Latino-preferred candidate was defeated. In summary, I found that five total elections satisfy these four criteria, and three of these five elections resulted in the defeat of the Latino-preferred candidate.

33. For each of the elections listed in Table 5 occurring within Cook County, I first estimated each racial and ethnic group's level of support for each candidate in each election. Using these estimates, I then identified the candidate preferred by Latino voters in each election in Cook County. Table 6 (for endogenous elections) and Table 7 (for exogenous elections) report each racial group's level of support for these minority-preferred candidates, as well as the overall performance of the minority-preferred candidate.

**Table 5: List of Elections Analyzed**

Elections in Cook County:  
2015 Chicago Mayoral General  
2018 Cook County Assessor Primary  
2016 Illinois Comptroller General  
2012 HD-35 General  
2012 HD-39 Primary  
2012 HD-40 General  
2014 HD-39 Primary  
2014 HD-40 Primary  
2014 HD-77 Primary  
2016 HD-10 General  
2016 HD-2 Primary  
2016 HD-22 Primary  
2016 HD-24 General  
2016 HD-4 Primary  
2016 HD-5 Primary  
2016 SD-22 General  
2016 SD-22 Primary  
2016 SD-5 Primary  
2018 HD-1 Primary  
2018 HD-5 Primary  
2018 SD-20 Primary  
2018 SD-25 Primary  
2020 HD-10 Primary  
2020 SD-11 General  
2020 SD-22 Primary  
2020 SD-40 Primary

Elections around Metro East (East St. Louis):  
2016 HD-114 General  
2018 SD-57 General  
2020 HD-114 General

34. To estimate the voting patterns of each racial and ethnic group in each election, I use ecological inference (EI), a commonly-used and widely-accepted statistical technique for estimating different racial groups' political behavior when racial breakdowns of such behavior is not directly reported in publicly-available data. EI uses a procedure known as maximum likelihood estimation, combined with Duncan and Davis' (1953) method of bounds, to estimate the level support for a particular party's candidate among members of different racial groups across the different precincts contained within a district. The key advantage of EI is that it uses observed election results and racial data from all precincts within a district (or an entire county or municipality) and estimates any differences across precincts in a particular racial group's voting behavior. Specifically, to generate all of the EI estimates reported in this section, I used the "ei\_iter" function in the "eiCompare" package,<sup>1</sup> which utilizes King's (1997) "eiPack" for ecological inference analysis.

35. Table 6 reports the EI estimates for Latino and White voters in each of the endogenous (State House and Senate) elections held in Cook County. Table 7 reports the EI estimates using precinct-level results from Cook County in the exogenous elections. Specifically, each row in these two Tables reports the analysis of a single election. The first column reports the year and the name of the office for which the election was held. The third column identifies the candidate in the contest most favored by Latino candidates. In analyzing these results, I identified the candidate receiving the highest estimated support from Latino voters as the Latino-preferred candidate, even if the candidate's estimated support among Latino voters was less than 50% (for example, in contests featuring three or more candidates). The fourth column reports the estimated percentage of Latino voters who supported the Latino-preferred candidate. The fifth column reports the estimated percentage of White voters who supported the Latino-preferred

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<sup>1</sup> Available at: <https://cran.r-project.org/web/packages/eiCompare/index.html>

candidate. The sixth column reports the support for the Latino-preferred candidate among all other voters (i.e., non-Latino and non-White voters). Finally, the last column reports the overall vote share received by the Latino-preferred candidate. For each EI estimate reported in this Table, a 95% confidence interval for the estimate appears in brackets directly underneath the estimate.

**Table 6: EI Analysis of Endogenous Elections in Cook County**

Endogenous Elections:	Latino-Preferred Candidate:	Latino Support for Latino-Preferred Candidate:	White Support for Latino-Preferred Candidate:	Support for Latino-Preferred Candidate Among Other Voters:	Overall Vote Share for Latino-Preferred Candidate:
2012 HD-35 General	Fernandez	96% [74.1%, 100%]	44% [43.9%, 44.1%]	1.80% [1.4%, 2.3%]	31.70%
2012 HD-40 General	Johnson	72.40% [33.8%, 97.8%]	18.80% [18.6%, 18.9%]	51.40% [20.6%, 75.2%]	18.40%
2012 HD-39 Primary	Berrios	64.90% [58.8%, 69.9%]	41.60% [38.9%, 45.3%]	0% [0%, 0.1%]	50.60%
2014 HD-40 Primary	Pasieka	35.50% [32%, 39.7%]	2.40% [2.3%, 2.5%]	5.60% [3%, 11.7%]	5.20%
2014 HD-39 Primary	Berrios	73.30% [69.5%, 77.4%]	3.50% [2.6%, 4.3%]	2.80% [2%, 4.5%]	39.60%
2014 HD-77 Primary	Willis	62.80% [54.8%, 67.7%]	98% [97%, 98.8%]	86.70% [69.1%, 92.5%]	74.10%
2016 HD-10 General	Conyears	95% [91.5%, 96.5%]	60.30% [58.9%, 61.6%]	97.70% [97.2%, 98%]	83.80%
2016 HD-24 General	Hernandez	97.70% [97.2%, 98.1%]	54.20% [51.2%, 57.2%]	72% [64.2%, 83.5%]	79.40%

**Table 6 (cont):**

Endogenous Elections:	Latino-Preferred Candidate:	Latino Support for Latino-Preferred Candidate:	White Support for Latino-Preferred Candidate:	Support for Latino-Preferred Candidate Among Other Voters:	Overall Vote Share for Latino-Preferred Candidate:
2016 SD-22 General	Castro	94.50% [92%, 96.2%]	53.60% [50.8%, 55.9%]	59.80% [50.7%, 67.3%]	62.30%
2016 HD-2 Primary	Acevedo	64.30% [61.4%, 67.4%]	55% [43.5%, 71.4%]	10.80% [7.6%, 13.4%]	48.80%
2016 HD-22 Primary	Madigan	59.10% [55%, 63%]	74.10% [70.9%, 77.4%]	67.40% [56.6%, 73.8%]	65.50%
2016 HD-5 Primary	Stratton	79.40% [73.4%, 86.8%]	78.10% [70%, 85.9%]	66.60% [65.5%, 67.9%]	68%
2016 SD-22 Primary	Castro	85.60% [81.1%, 91.1%]	53.50% [49.4%, 56.8%]	46.40% [36.4%, 55.9%]	62.10%
2016 SD-5 Primary	Vanpelt	76.30% [44.4%, 92.1%]	46.60% [43.1%, 49.3%]	73.60% [72.5%, 74.7%]	67.80%
2018 HD-1 Primary	Ortiz	68.70% [64.2%, 74.1%]	24.10% [17.8%, 29.8%]	47.60% [35.4%, 62.5%]	53.10%
2018 HD-4 Primary	Ramirez	70% [65.7%, 72.9%]	33.20% [29.9%, 35.8%]	2.20% [1.5%, 3.2%]	48%

**Table 6 (cont):**

Endogenous Elections:	Latino-Preferred Candidate:	Latino Support for Latino-Preferred Candidate:	White Support for Latino-Preferred Candidate:	Support for Latino-Preferred Candidate Among Other Voters:	Overall Vote Share for Latino-Preferred Candidate:
2018 HD-5 Primary	Sayeed	28.50% [22.1%, 36%]	27% [21.5%, 32.9%]	29.20% [27.8%, 30%]	25.50%
2018 SD-20 Primary	Martinez	96.70% [95.8%, 97.6%]	68.20% [66.9%, 69.8%]	65.10% [56.6%, 74%]	73.40%
2018 SD-25 Primary	Miles	29.90% [27.7%, 32%]	6.40% [5.4%, 7.5%]	6.90% [6.5%, 7.2%]	9.20%
2020 SD-11 General	Villanueva	97.10% [96.2%, 97.7%]	57.30% [55.2%, 59.6%]	74.80% [46.3%, 93.5%]	79.70%
2020 HD-10 Primary	Zuccaro	67% [58.1%, 75.5%]	29% [27.5%, 30.4%]	19.40% [18.5%, 20.2%]	23%
2020 SD-22 Primary	Castro	96.20% [94.5%, 97.3%]	78.30% [70.1%, 82.7%]	68.80% [61.4%, 73%]	81.50%
2020 SD-40 Primary	Wilcox	47% [32.1%, 58.7%]	10.10% [8.1%, 12.6%]	36.10% [34.7%, 37.7%]	26.60%

**Note:** Percentages in brackets report the 95% confidence interval for each EI-based estimate. Throughout this Table, the “Latino-Preferred Candidate” refers to the candidate in each election who received the highest estimate support from Latino voters, even if the estimated support was less than 50% (in contests with three or more candidates). “HD” refers to Illinois General Assembly House Districts, while “SD” refers to Senate Districts.



**Table 7: EI Analysis of Exogenous Elections in Cook County**

Exogenous Elections:	Geography:	Latino-Preferred Candidate:	Latino Support for Latino-Preferred Candidate:	White Support for Latino-Preferred Candidate:	Support for Latino-Preferred Candidate Among Other Voters:	Overall Vote Share for Latino-Preferred Candidate:
2016 Illinois Comptroller General	Cook County	Mendoza	84.10% [83.6%, 84.7%]	39% [38.6%, 39.4%]	90.60% [90.5%, 90.7%]	64.50%
2018 Cook County Assessor Primary	Cook County	Berrios	63.20% [62%, 64.3%]	18.30% [17.8%, 18.6%]	44.40% [44.1%, 44.8%]	33.90%
2015 Chicago Mayoral General	Chicago	Garcia	84% [83%, 84.9%]	28.80% [28.3%, 29.4%]	40.50% [40.2%, 40.9%]	43.80%

**Note:** Percentages in brackets report the 95% confidence interval for each EI-based estimate. Throughout this Table, the “Latino-Preferred Candidate” refers to the candidate in each election who received the highest estimate support from Latino voters, even if the estimated support was less than 50% (in contests with three or more candidates).

36. Of the 26 total endogenous and exogenous elections in Cook County listed in Table 5, I found that five of them satisfy all four criteria listed in Paragraph 32. These five elections are: The April 2015 Chicago Mayoral election, the 2018 Cook County Assessor Primary, the 2012 HD-39 Primary, the 2014 HD-39 Primary, and the 2018 HD-1 Primary.

37. Among these five primary election contests in Cook County, the Latino-preferred candidate lost in three of these five elections. These three elections were: the April 2015 Chicago Mayoral election, in which “Chuy” Garcia lost; the 2018 Cook County Assessor Primary, in which Joe Berrios lost; and the 2014 HD-39 Primary, in which Toni Berrios lost. Thus, there were five total elections in Cook County satisfying the four criteria listed in Paragraph 32, and three of these five elections resulted in the defeat of the Latino-preferred candidate. Table 8 reports the election outcomes for the Latino-preferred candidates in these five elections.

**Table 8: Election Outcomes for Latino-Preferred Candidate in Races in Cook County Satisfying the Paragraph 32 Criteria:**

<b>Election Contest in Cook County Satisfying the Paragraph 32 criteria:</b>	<b>Latino-preferred candidate</b>	<b>Election outcome for Latino-preferred candidate:</b>
2015 Chicago Mayoral election	“Chuy” Garcia	Defeated
2018 Cook County Assessor Primary	Joe Berrios	Defeated
2012 HD-39 Primary	Toni Berrios	Won
2014 HD-39 Primary	Toni Berrios	Defeated
2018 HD-1 Primary	Aaron Ortiz	Won

38. The Table 6 and Table 7 EI estimates describe in detail the racial and ethnic breakdowns of electoral support for Latino-preferred candidates in these various election contests. In the April 2015 runoff election to elect the Mayor of Chicago (Table 7), approximately 84% of Latinos favored Jesus “Chuy” Garcia. Meanwhile, White voters overwhelmingly favored Rahm Emanuel, and only about 28.8% of Whites supported Garcia.

Thus, White opposition to Garcia was sufficient to help defeat Garcia, as Garcia received only 43.8% of the vote in this two-candidate runoff election.

39. Similarly, in the 2018 primary election for Cook County Assessor (Table 7), an estimated 63.2% of Latino voters favored Joseph Berrios. Meanwhile, White voters overwhelmingly favored Fritz Kaegi, with only approximately 18.3% of Whites supporting Berrios. Thus, White opposition helped to defeat Berrios, who received only 33.9% of the overall vote in Cook County, compared to Kaegi's 45.6%.

40. In the 2014 primary election for House District 39 (Table 6), an estimated 73.3% of Latino voters favored Toni Berrios. Meanwhile, White voters overwhelmingly favored Will Guzzardi, with only about 3.5% of Whites supporting Berrios. This near-unanimous White opposition helped to defeat Berrios, who received only 39.6% of the overall vote in losing to Guzzardi.

41. The Table 9 EI results reveal a similar pattern in all three elections around Metro East, with Black and White voters strongly favoring opposing candidates in all three contests. In the 2016 and 2020 general elections for House District 114, estimated Black support for Democrat LaToya Greenwood was 83.9% and 98.7%, respectively. Meanwhile, White voters heavily favored the Republican candidate (Bob Romanik in 2016 and Dave Barnes in 2020) in these two elections, and White support for Greenwood was only about 30.1% in 2016 and 25.8% in 2020.

42. Similarly, in the 2018 general election for Senate District 57, an estimated 97.6% of Black voters favored the Democratic candidate, Christopher Belt. Meanwhile, White voters heavily favored Republican Tanya Hildenbrand, with only about 31.3% of Whites supporting Belt.

**Table 9: EI Analysis of Elections around Metro East (East St. Louis)**

Election	Geography:	Black-Preferred Candidate:	Black Support for Black-Preferred Candidate:	White Support for Black-Preferred Candidate:	Support for Black- Preferred Candidate Among Other Voters:	Overall Vote Share for Black- Preferred Candidate:
2016 HD-114 General	HD-114	Greenwood	83.9% [83.3%, 84.4%]	30.1% [29.8%, 30.5%]	43.1% [22.3%, 71.7%]	57.2%
2018 SD-57 General	SD-57	Belt	97.6% [97.1%, 98%]	31.3% [30.1%, 32.5%]	52.6% [27.1%, 74.6%]	59.2%
2020 HD-114 General	HD-114	Greenwood	98.7% [98.2%, 99%]	25.8% [25.5%, 26.2%]	69.3% [54%, 83.4%]	57.1%

**Note:** Percentages in brackets report the 95% confidence interval for each EI-based estimate. Throughout this Table, the “Latino-Preferred Candidate” refers to the candidate in each election who received the highest estimate support from Latino voters, even if the estimated support was less than 50% (in contests with three or more candidates). “HD” refers to Illinois General Assembly House Districts, while “SD” refers to Senate Districts.

43. Thus, in all three of these election contests around the Metro East region, Black voters strongly favored the Democratic candidate in the general election, while White voters strongly voted against the Black-preferred candidate.

**Performance of a Latino-Preferred Candidate Under the Enacted Plan and the Plaintiffs' Remedial Plan:**

44. I estimated the hypothetical performance of Latino-preferred candidates in the House districts in Cook County under both the Plaintiffs' Remedial Plan, as well as the August 31, 2021 Enacted Plan, using the EI estimates I calculated for the 2018 primary election for Cook County Assessor. Specifically, under the Enacted Plan, I analyzed the following challenged districts in Cook County: HD-1, 2, 3, 4, 19, 21, 22, 23, 24, 39, and 40.

45. As explained earlier in this report, for the 2018 Assessor primary election, I found that Joseph Berrios was the Latino-preferred candidate, while Whites heavily favored Fritz Kaegi. EI estimates of each racial and ethnic group's support for each candidate are produced at the precinct level. I thus use each precinct's EI estimates to generate Census block-level estimates of each racial and ethnic group's support for Berrios, the Latino-preferred candidate. I then apply these block-level EI estimates to each Cook County district in the Enacted Plan and the Plaintiffs' Remedial Plan, thus producing an estimate of each district's overall level of support for Berrios in a hypothetical Berrios-versus-Kaegi election within the district.

46. For the August 31, 2021 Enacted Plan, these predictions regarding each district's support for Berrios appear in Table 10. This Table contains a separate row for each district in the Enacted Plan. The second and third column report the Latino and the non-Latino White percentage of the district's VAP. The fourth column reports the predicted Latino support for Berrios, as calculated using the EI estimates. The fifth column reports the predicted White

support for Berrios within the district. Finally, the last column reports the predicted overall vote share for Berrios within the district.

47. These Table 10 results illustrate that only four of the challenged Cook County districts in the Enacted Plan would be expected to support Berrios, the Latino-preferred candidate, over Kaegi, using EI estimates based on the 2018 Cook County Assessor primary election. These three challenged Cook County districts in the Enacted Plan are HD-1, 2, 22, and 23. All other Enacted Plan districts analyzed in Table 10 would be expected to favor Kaegi over Berrios.

48. The Plaintiffs' Remedial Plan contains 12 districts fully within Cook County, and I performed a similar analysis of whether these Remedial Plan districts would favor Berrios over Kaegi. As reported in Table 11, I found that ten of these 12 Cook County districts (Districts 1, 2, 3, 4, 22, 23, 24, 32, 39, and 77) in the Plaintiffs' Remedial Plan are predicted to favor Berrios over Kaegi in a hypothetical election contest.

**Table 10:**  
**Predicted Support for Latino-Preferred Candidate within Cook County Districts in the August 31, 2021 Enacted Plan**

<b>District:</b>	<b>Latino VAP:</b>	<b>Non-Latino White VAP:</b>	<b>Latino Support for Latino- Preferred Candidate (Berrios):</b>	<b>White Support for Latino-Preferred Candidate (Berrios):</b>	<b>Estimated Overall Vote Share of Latino- Preferred Candidate (Berrios):</b>
1	76.1%	13.6%	75.4%	22.3%	62.0%
2	64.6%	29.1%	82.5%	26.3%	55.4%
3	54.1%	35.6%	73.8%	22.7%	45.5%
4	52.6%	30.3%	76.7%	18.8%	48.7%
19	27.3%	59.2%	79.0%	23.0%	37.9%
21	51.7%	37.7%	76.8%	25.2%	48.1%
22	62.8%	32.6%	83.2%	22.8%	61.5%
23	84.4%	4.5%	66.0%	35.7%	63.0%
24	48.5%	19.2%	67.0%	24.6%	49.3%
39	51.6%	38.6%	76.6%	20.3%	43.1%
40	42.8%	40.5%	72.2%	24.2%	43.0%

**Note:** The predicted “Support for Latino-Preferred Candidate” percentages in this table are calculated using the precinct-level EI analysis of the 2018 Cook County Assessor primary election between Joseph Berrios and Fritz Kaegi. Berrios was the Latino-preferred candidate, and this table reports the predicted percentage of each group’s voters that are estimated to have supported Berrios within each district.

**Table 11:**  
**Predicted Support for Latino-Preferred Candidate within Cook County Districts in Plaintiffs' Remedial Plan**

<b>District:</b>	<b>Latino VAP:</b>	<b>Non-Latino White VAP:</b>	<b>Latino Support for Latino- Preferred Candidate (Berrios):</b>	<b>White Support for Latino-Preferred Candidate (Berrios):</b>	<b>Estimated Overall Vote Share of Latino- Preferred Candidate (Berrios):</b>
1	61.9%	29.2%	75.0%	27.0%	56.8%
2	61.7%	32.3%	79.4%	24.7%	57.2%
3	60.2%	23.4%	72.8%	27.6%	53.2%
4	58.6%	33.4%	73.5%	30.9%	52.6%
21	59.7%	30.9%	78.7%	24.9%	49.2%
22	60.4%	32.8%	81.3%	27.8%	56.2%
23	66.0%	12.4%	69.2%	23.3%	56.1%
24	57.9%	14.6%	63.9%	26.0%	50.6%
32	64.1%	23.1%	80.8%	30.2%	65.7%
39	55.8%	29.2%	76.8%	22.6%	50.1%
40	21.1%	65.2%	80.4%	16.8%	31.1%
77	58.7%	33.8%	72.0%	36.5%	56.2%

**Note:** The predicted “Support for Latino-Preferred Candidate” percentages in this table are calculated using the precinct-level EI analysis of the 2018 Cook County Assessor primary election between Joseph Berrios and Fritz Kaegi. Berrios was the Latino-preferred candidate, and this table reports the predicted percentage of each group’s voters that are estimated to have supported Berrios within each district.



I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

This 10th day of November, 2021.

A handwritten signature in black ink, appearing to read 'J. Chen', written over a horizontal line.

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Dr. Jowei Chen

**Jowei Chen**  
**Curriculum Vitae**

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**Academic Positions:**

Associate Professor (2015-present), Assistant Professor (2009-2015), Department of Political Science, University of Michigan.  
Research Associate Professor (2016-present), Faculty Associate (2009-2015), Center for Political Studies, University of Michigan.  
W. Glenn Campbell and Rita Ricardo-Campbell National Fellow, Hoover Institution, Stanford University, 2013.  
Principal Investigator and Senior Research Fellow, Center for Governance and Public Policy Research, Willamette University, 2013 – Present.

**Education:**

Ph.D., Political Science, Stanford University (June 2009)  
M.S., Statistics, Stanford University (January 2007)  
B.A., Ethics, Politics, and Economics, Yale University (May 2004)

**Publications:**

Chen, Jowei and Neil Malhotra. 2007. “The Law of k/n: The Effect of Chamber Size on Government Spending in Bicameral Legislatures.”

[\*American Political Science Review\*. 101\(4\): 657-676.](#)

Chen, Jowei, 2010. “The Effect of Electoral Geography on Pork Barreling in Bicameral Legislatures.”

[\*American Journal of Political Science\*. 54\(2\): 301-322.](#)

Chen, Jowei, 2013. “Voter Partisanship and the Effect of Distributive Spending on Political Participation.”

[\*American Journal of Political Science\*. 57\(1\): 200-217.](#)

Chen, Jowei and Jonathan Rodden, 2013. “Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures”

[\*Quarterly Journal of Political Science\*, 8\(3\): 239-269.](#)

Bradley, Katharine and Jowei Chen, 2014. "Participation Without Representation? Senior Opinion, Legislative Behavior, and Federal Health Reform."

[\*Journal of Health Politics, Policy and Law\*. 39\(2\), 263-293.](#)

Chen, Jowei and Tim Johnson, 2015. "Federal Employee Unionization and Presidential Control of the Bureaucracy: Estimating and Explaining Ideological Change in Executive Agencies."

[\*Journal of Theoretical Politics\*, Volume 27, No. 1: 151-174.](#)

Bonica, Adam, Jowei Chen, and Tim Johnson, 2015. "Senate Gate-Keeping, Presidential Staffing of 'Inferior Offices' and the Ideological Composition of Appointments to the Public Bureaucracy."

[\*Quarterly Journal of Political Science\*. Volume 10, No. 1: 5-40.](#)

Chen, Jowei and Jonathan Rodden, 2015. "Cutting Through the Thicket: Redistricting Simulations and the Detection of Partisan Gerrymanders."

[\*Election Law Journal\*. Volume 14, Number 4: 331-345.](#)

Chen, Jowei and David Cottrell, 2016. "Evaluating Partisan Gains from Congressional Gerrymandering: Using Computer Simulations to Estimate the Effect of Gerrymandering in the U.S. House."

[\*Electoral Studies\*. Volume 44 \(December 2016\): 329-340.](#)

Chen, Jowei, 2017. "Analysis of Computer-Simulated Districting Maps for the Wisconsin State Assembly."

[\*Election Law Journal\*. Volume 16, Number 4 \(December 2017\): 417-442.](#)

Chen, Jowei and Nicholas Stephanopoulos, 2020. "The Race-Blind Future of Voting Rights."

[\*Yale Law Journal, Forthcoming\*. Volume 130, Number 4: 778-1049.](#)

Kim, Yunsieg and Jowei Chen, 2021. "Gerrymandered by Definition: The Distortion of 'Traditional' Districting Principles and a Proposal for an Empirical Redefinition."

[\*Wisconsin Law Review, Forthcoming\*, Volume 2021, Number 1.](#)

Chen, Jowei and Nicholas Stephanopoulos, 2021. "Democracy's Denominator."

[\*California Law Review, Accepted for Publication\*, Volume 109.](#)

#### **Non-Peer-Reviewed Publication:**

Chen, Jowei and Tim Johnson. 2017. "Political Ideology in the Bureaucracy."

[\*Global Encyclopedia of Public Administration, Public Policy, and Governance\*.](#)

### **Research Grants:**

"How Citizenship-Based Redistricting Systemically Disadvantages Voters of Color". 2020 (\$18,225). Combating and Confronting Racism Grant. University of Michigan Center for Social Solutions and Poverty Solutions.

Principal Investigator. [National Science Foundation Grant SES-1459459](#), September 2015 – August 2018 (\$165,008). "The Political Control of U.S. Federal Agencies and Bureaucratic Political Behavior."

"Economic Disparity and Federal Investments in Detroit," (with Brian Min) 2011. Graham Institute, University of Michigan (\$30,000).

"The Partisan Effect of OSHA Enforcement on Workplace Injuries," (with Connor Raso) 2009. John M. Olin Law and Economics Research Grant (\$4,410).

### **Invited Talks:**

September, 2011. University of Virginia, American Politics Workshop.

October 2011. Massachusetts Institute of Technology, American Politics Conference.

January 2012. University of Chicago, Political Economy/American Politics Seminar.

February 2012. Harvard University, Positive Political Economy Seminar.

September 2012. Emory University, Political Institutions and Methodology Colloquium.

November 2012. University of Wisconsin, Madison, American Politics Workshop.

September 2013. Stanford University, Graduate School of Business, Political Economy Workshop.

February 2014. Princeton University, Center for the Study of Democratic Politics Workshop.

November 2014. Yale University, American Politics and Public Policy Workshop.

December 2014. American Constitution Society for Law & Policy Conference: Building the Evidence to Win Voting Rights Cases.

February 2015. University of Rochester, American Politics Working Group.

March 2015. Harvard University, Voting Rights Act Workshop.

May 2015. Harvard University, Conference on Political Geography.

October 2015. George Washington University School of Law, Conference on Redistricting Reform.

September 2016. Harvard University Center for Governmental and International Studies, Voting Rights Institute Conference.

March 2017. Duke University, Sanford School of Public Policy, Redistricting Reform Conference.

October 2017. Willamette University, Center for Governance and Public Policy Research

October 2017, University of Wisconsin, Madison. Geometry of Redistricting Conference.

February 2018: University of Georgia Law School

September 2018. Willamette University.

November 2018. Yale University, Redistricting Workshop.

November 2018. University of Washington, Severyns Ravenholt Seminar in Comparative Politics.  
January 2019. Duke University, Reason, Reform & Redistricting Conference.  
February 2019. Ohio State University, Department of Political Science. Departmental speaker series.  
March 2019. Wayne State University Law School, Gerrymandering Symposium.  
November 2019. Big Data Ignite Conference.  
November 2019. Calvin College, Department of Mathematics and Statistics.  
September 2020 (Virtual). Yale University, Yale Law Journal Scholarship Workshop

### **Conference Service:**

Section Chair, 2017 APSA (San Francisco, CA), Political Methodology Section  
Discussant, 2014 Political Methodology Conference (University of Georgia)  
Section Chair, 2012 MPSA (Chicago, IL), Political Geography Section.  
Discussant, 2011 MPSA (Chicago, IL) “Presidential-Congressional Interaction.”  
Discussant, 2008 APSA (Boston, MA) “Congressional Appropriations.”  
Chair and Discussant, 2008 MPSA (Chicago, IL) “Distributive Politics: Parties and Pork.”

### **Conference Presentations and Working Papers:**

“Ideological Representation of Geographic Constituencies in the U.S. Bureaucracy,” (with Tim Johnson). 2017 APSA.

“Incentives for Political versus Technical Expertise in the Public Bureaucracy,” (with Tim Johnson). 2016 APSA.

“Black Electoral Geography and Congressional Districting: The Effect of Racial Redistricting on Partisan Gerrymandering”. 2016 Annual Meeting of the Society for Political Methodology (Rice University)

“Racial Gerrymandering and Electoral Geography.” Working Paper, 2016.

“Does Deserved Spending Win More Votes? Evidence from Individual-Level Disaster Assistance,” (with Andrew Healy). 2014 APSA.

“The Geographic Link Between Votes and Seats: How the Geographic Distribution of Partisans Determines the Electoral Responsiveness and Bias of Legislative Elections,” (with David Cottrell). 2014 APSA.

“Gerrymandering for Money: Drawing districts with respect to donors rather than voters.” 2014 MPSA.

“Constituent Age and Legislator Responsiveness: The Effect of Constituent Opinion on the Vote for Federal Health Reform.” (with Katharine Bradley) 2012 MPSA.

“Voter Partisanship and the Mobilizing Effect of Presidential Advertising.” (with Kyle Dropp) 2012 MPSA.

“Recency Bias in Retrospective Voting: The Effect of Distributive Benefits on Voting Behavior.” (with Andrew Feher) 2012 MPSA.

“Estimating the Political Ideologies of Appointed Public Bureaucrats,” (with Adam Bonica and Tim Johnson) 2012 Annual Meeting of the Society for Political Methodology (University of North Carolina)

“Tobler’s Law, Urbanization, and Electoral Bias in Florida.” (with Jonathan Rodden) 2010 Annual Meeting of the Society for Political Methodology (University of Iowa)

“Unionization and Presidential Control of the Bureaucracy” (with Tim Johnson) 2011 MPSA.

“Estimating Bureaucratic Ideal Points with Federal Campaign Contributions” 2010 APSA. (Washington, DC).

“The Effect of Electoral Geography on Pork Spending in Bicameral Legislatures,” Vanderbilt University Conference on Bicameralism, 2009.

“When Do Government Benefits Influence Voters’ Behavior? The Effect of FEMA Disaster Awards on US Presidential Votes,” 2009 APSA (Toronto, Canada).

“Are Poor Voters Easier to Buy Off?” 2009 APSA (Toronto, Canada).

“Credit Sharing Among Legislators: Electoral Geography’s Effect on Pork Barreling in Legislatures,” 2008 APSA (Boston, MA).

“Buying Votes with Public Funds in the US Presidential Election,” Poster Presentation at the 2008 Annual Meeting of the Society for Political Methodology (University of Michigan).

“The Effect of Electoral Geography on Pork Spending in Bicameral Legislatures,” 2008 MPSA.

“Legislative Free-Riding and Spending on Pure Public Goods,” 2007 MPSA (Chicago, IL).

“Free Riding in Multi-Member Legislatures,” (with Neil Malhotra) 2007 MPSA (Chicago, IL).

“The Effect of Legislature Size, Bicameralism, and Geography on Government Spending: Evidence from the American States,” (with Neil Malhotra) 2006 APSA (Philadelphia, PA).