Report on Congressional Plan C2333

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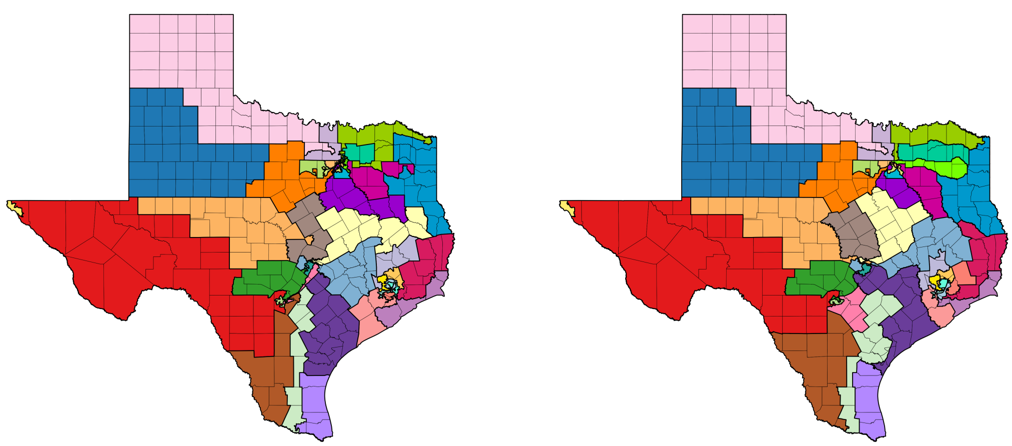
I am a Professor of Data Science and Computer Science and the Director of the Data and Democracy Research Initiative at the University of Chicago. I refer to my previous reports for a discussion of my qualifications and prior testimony as an expert in the field of redistricting. I have submitted an updated CV with this extended report.

1 Summary

In this report, I offer metrics and analysis for Texas Congressional Plan C2333, recently signed into law.[1] I have examined evidence relating to the claims of overriding partisan motives for changes to the map, particularly as partisan aims relate to opportunity-to-elect for minority groups. I find that the map is dilutive of minority voting strength. I also find strong evidence that race data was used by the line-drawers in a manner consistent with demographic targets—aiming for particular shares of minority population— and/or as a proxy for partisanship. In my analysis, the changes are not consistent with the race-neutral pursuit of pure partisan aims.

Figure 1: Plan C2193 (left) and Plan C2333 (right). Though most of the map looks similar at a glance, nearly every district has been changed.



[1]This report builds on my earlier Declaration of August 25, 2025, and is meant to be self-contained. The findings of the previous report are confirmed and extended using simpler district clusters, adding more electoral data from 2022-2024, and adding a fuller description of robustness checks. I am not aware of any errors in the previous Declaration, and the current report is intended to address the same topics more comprehensively.

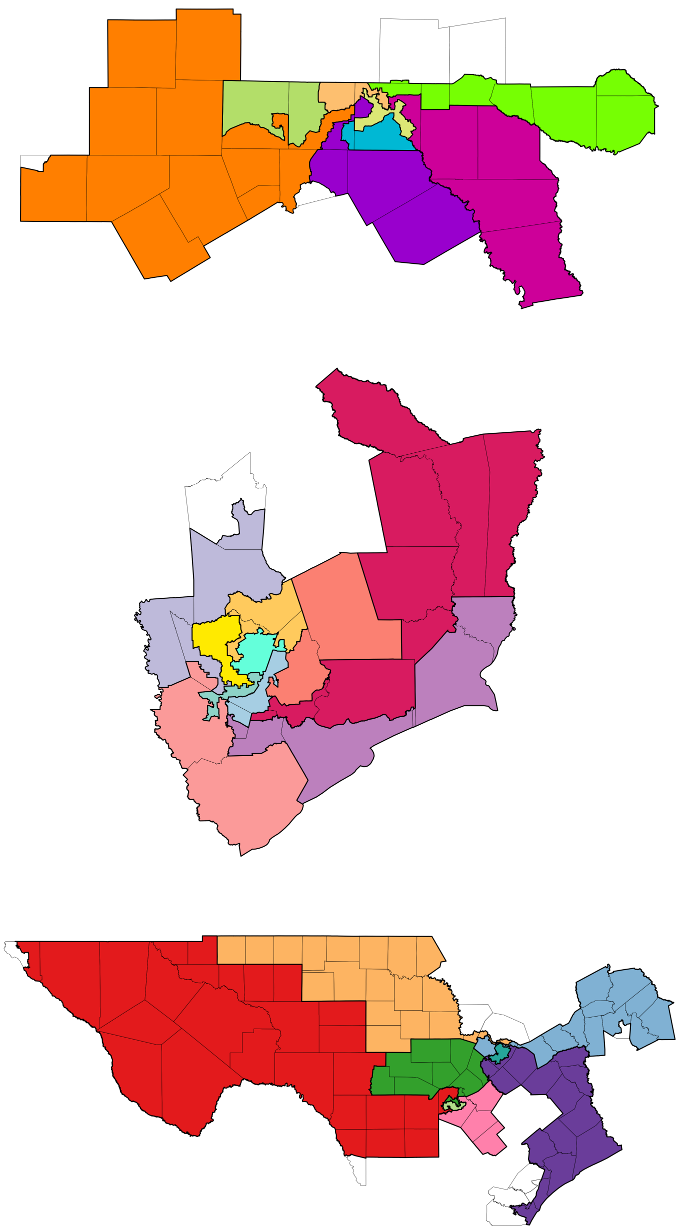
Below, I reprise my previous use of regional district clusters formed by groupings of the State's districts. In addition to clusters in Tarrant/Dallas and Harris/Fort Bend, I have added a third cluster in Travis and Bexar Counties.[2] The purpose of these clusters is to allow for localized analysis, including the comparison of C2333 districts to randomly generated alternative districts that span the same land area (§5.2).

Figure 2: The three district clusters C1, C2, C3.

C1
Tarrant/Dallas
5, 6, 12, 24, 25, 30, 32, 33

C2
Harris/Ft Bend
2, 7, 8, 9, 14, 18, 22, 29, 36, 38

C3
Travis/Bexar
10, 11, 20, 21, 23, 27, 35, 37



[2]I tested nine different choices of district grouping in these areas, and the results are always materially the same. For simplicity and clarity, the clusters that are set in this extended report are made up of *exactly* those districts in C2333 that touch the named counties.

2 Population shifts

Population growth was steady at 5-7% in the six Texas anchor counties in a recent five-year span, and in any event population growth could not be a valid justification for this mid-decade redistricting: the new map is population-balanced with respect to the 2020 data, just as the previous map was.[3]

Across the areas of Texas covered by this report, nearly all of the population growth in the recent past is accounted for by minority groups. People of color ("POC")—defined as those Texans who are either Hispanic or selected a non-White race in the Census or ACS—make up large majorities of the VAP and CVAP growth in each of the six urban counties that anchor the district clusters; in some cases, the POC growth actually exceeds the total growth, because non-Hispanic White population has declined over the same period.[4]

Table 1: Shifts in population according to American Community Survey 5-year rolling averages from five years apart, so that the survey years do not overlap. Statewide, people of color account for at least 94% of the growth, whether using voting age population or citizen voting age population. In clusters C1 and C2, the growth of POC communities has driven overall increases despite the decline of non-Hispanic White population. In cluster C3, POC make up about four-fifths of the growth.

Texas	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	27,885,181	—	29,640,343	—	1,755,162	—
VAP	20,592,495	—	22,157,813	—	1,565,318	—
NH White	9,483,944	46.1	9,571,408	43.2	87,464	5.6%
POC	11,108,551	53.9	12,586,404	56.8	1,477,853	94.4%
Black	2,482,337	12.1	2,706,261	12.2	223,924	14.3%
Hispanic	7,323,498	35.6	8,070,575	36.4	747,077	47.7%
Asian+PI	1,026,506	5.0	1,250,462	5.6	223,956	14.3%
AMIN	100,468	0.5	144,320	0.7	43,852	2.8%
CVAP	17,859,482	—	19,470,070	—	1,610,588	—
NH White	9,317,648	52.2	9,413,882	48.4	96,234	6.0%
POC	8,541,834	47.8	10,056,187	51.6	1,514,353	94.0%
Black	2,371,995	13.3	2,585,888	13.3	213,893	13.3%
Hispanic	5,243,696	29.4	6,088,062	31.3	844,366	52.4%
Asian+PI	664,736	3.7	846,133	4.3	181,397	11.3%
AMIN	88,931	0.5	115,161	0.6	26,230	1.6%

[3] Using the Census Bureau's Annual Estimates of the Population for Counties, we see a growth from 2020 to 2024 on the following scale, in millions: Tarrant 2.12 → 2.23; Dallas 2.61 → 2.66; Harris 4.74 → 5.01; Fort Bend 0.83 → 0.96; Travis 1.30 → 1.36; and Bexar 2.02 → 2.13.

[4] In order to present changes across five years, we compare ACS totals by race from the 5-year 2014–2018 tabulation and the 5-year 2019–2023 tabulation. The 2024 results are due to be released in September 2025. See Appendix A for more information on the use of ACS data.

Cluster C1 Tarrant/Dallas	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	5,894,695	—	6,218,577	—	323,882	—
VAP	4,351,844	—	4,648,999	—	297,155	—
NH White	2,150,102	49.4	2,124,567	45.7	−25,535	−8.6%
POC	2,201,818	50.6	2,524,541	54.3	322,723	108.6%
Black	724,257	16.6	797,856	17.2	73,599	24.8%
Hispanic	1,181,838	27.2	1,338,585	28.8	156,747	52.7%
Asian+PI	225,932	5.2	264,711	5.7	38,779	13.0%
AMIN	21,453	0.5	28,081	0.6	6,628	2.2%
CVAP	3,716,257	—	4,019,715	—	303,458	—
NH White	2,119,809	57.0	2,095,539	52.1	−24,270	−8.0%
POC	1,596,570	43.0	1,924,325	47.9	327,755	108.0%
Black	689,400	18.6	756,591	18.8	67,191	22.1%
Hispanic	697,446	18.8	876,997	21.8	179,551	59.1%
Asian+PI	143,859	3.9	172,906	4.3	29,047	9.6%
AMIN	18,764	0.5	21,124	0.5	2,360	0.8%

Cluster C2 Harris/Ft Bend	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	7,331,287	—	7,795,496	—	464,209	—
VAP	5,379,626	—	5,769,492	—	389,866	—
NH White	2,232,040	41.5	2,187,174	37.9	−44,866	−11.5%
POC	3,147,567	58.5	3,582,363	62.1	434,796	111.5%
Black	950,499	17.7	1,023,138	17.7	72,639	18.6%
Hispanic	1,718,818	32.0	1,939,710	33.6	220,892	56.7%
Asian+PI	414,779	7.7	478,939	8.3	64,160	16.5%
AMIN	21,063	0.4	38,925	0.7	17,862	4.6%
CVAP	4,475,743	—	4,876,543	—	400,800	—
NH White	2,167,162	48.4	2,131,396	43.7	−35,766	−8.9%
POC	2,308,553	51.6	2,745,166	56.3	436,613	108.9%
Black	905,833	20.2	976,150	20.0	70,317	17.5%
Hispanic	1,063,611	23.8	1,288,440	26.4	224,829	56.1%
Asian+PI	281,742	6.3	346,991	7.1	65,249	16.3%
AMIN	17,426	0.4	28,095	0.6	10,669	2.7%

Cluster C3 Travis/Bexar	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	5,834,341	—	6,232,214	—	397,873	—
VAP	4,409,405	—	4,771,099	—	361,694	—
NH White	2,035,540	46.2	2,113,665	44.3	78,125	21.6%
POC	2,374,066	53.8	2,657,330	55.7	283,264	78.3%
Black	313,118	7.1	337,079	7.1	23,961	6.6%
Hispanic	1,858,576	42.2	2,018,991	42.3	160,415	44.4%
Asian+PI	144,816	3.3	176,664	3.7	31,848	8.8%
AMIN	24,445	0.6	38,316	0.8	13,871	3.8%
CVAP	3,969,569	—	4,350,870	—	381,301	—
NH White	2,005,105	50.5	2,083,266	47.9	78,161	20.5%
POC	1,964,593	49.5	2,267,488	52.1	302,895	79.4%
Black	301,189	7.6	325,752	7.5	24,563	6.4%
Hispanic	1,518,130	38.2	1,701,950	39.1	183,820	48.2%
Asian+PI	89,461	2.3	118,500	2.7	29,039	7.6%
AMIN	21,755	0.5	32,157	0.7	10,402	2.7%

The tables for the six urban counties that anchor the district clusters are shown in the Appendix B.

3 Metrics

Next, we turn to metrics that relate to the traditional districting principles (TDPs). All districts are contiguous. Regarding one-person-one-vote population balance (with respect to total population from 2020), all plans have *de minimis* population deviation: one person top-to-bottom difference between districts. In the newest enacted plan (C2333), every district has 766,987 people according to the Decennial Census enumeration, except for CD 38, which has 766,986.

3.1 Compactness, political boundaries, and core retention

The new C2333 (2025) is significantly more compact than the prior enacted plan C2193 (2021). With respect to C2308 (2012), it is more compact by two measures but not by a third measure known as the Reock score. The newest plan splits one more county than its predecessor but several fewer than the benchmark from last decade. However, the new plan splits hundreds of precincts (discussed below in §3.2).

For the compactness scores, Polsby-Popper and Reock are contour-based scores that were computed in the EPSG:32614 projected coordinate reference system and averaged over the districts in the plan. Cut edges is a measure of the "scissors complexity" of the plan: it counts the number of pairs of neighboring census blocks that receive different district assignments. Higher scores are considered better for Polsby-Popper and Reock, while lower scores are better for cut edges.

Table 2: Compactness, splitting, and core retention are presented through common quantitative metrics. Polsby-Popper and Reock are district-level scores; cut edges is a plan-wide score. Of the 254 counties in Texas, we first report the number that are split across multiple districts; then, the total number of pieces the counties are cut into. Splitting numbers for precincts at the time of plan adoption are highlighted. Core retention is calculated through population: it is the share of people in the 2020 Census that have the same district assignment in a given pair of plans.

	2012 Enacted	**2021 Enacted**	**Plan C2333**
Avg Polsby-Popper	0.1968	0.1886	0.2218
Avg Reock	0.3599	0.3322	0.3444
(Block) Cut Edges	20,976	21,355	17,618
County splits	36	30	31
County pieces	323	313	310
2024 Precinct splits	162	7	291
2022 Precinct splits	162	7	288
2020 Precinct splits	35	205	264
Core retention vs 2012	—	64.5%	54.2%
Core retention vs 2021	—	—	66.8%

Note on district numbers. A standard practice when issuing a new plan is to number the new districts so as to have maximum population overlap with the ones they are replacing. That way, an incumbent running in a certain district faces familiar voters.

C2333 uses optimal numbering in 35 of its 38 districts. However, the numbering of CD 9, CD 18, and CD 29 has been shifted around in a cycle, as follows:

C2333 (2025)	*max overlap*	C2193 (2021)
New CD 9	$\longleftrightarrow$	Prior CD 29
New CD 18	$\longleftrightarrow$	Prior CD 9
New CD 29	$\longleftrightarrow$	Prior CD 18

That is, former CD 18 has its largest population overlap with current CD 29, and so on. The reasons for this permutation of district numbers are not clear, but one effect is to make it somewhat harder to talk clearly about the changes to a particular district. The reconfiguration of CD 18 is explored further below in Appendix F.

3.2 Precinct splits

As far as I am aware, the State has disclosed no use of partisan data below the precinct level, while race data comes at the block level. Therefore the high number of precinct splits seen in Table 2 is more indicative of a focus on race than on partisanship.

It is important to note that precincts can and do change at between-census intervals; it is common practice for a districting plan to split precincts, and then for the precincts to be adjusted after the fact to better nest within districts. This is why the 2021 enacted plan splits a large number of 2020 precincts (205), but a much smaller number of 2022 precincts (7). However, the high level of precinct splitting in C2333 (291 splits) is notable because it is at odds with the stated goal of precision-targeted partisanship.

In the *Guide to 2021 Redistricting*, the Texas Legislative Council describes Election Data provided to the legislature within the Redistricting Data section of the report. They write: "Because election information is also required for analyzing a redistricting plan, a statewide election database compiled by legislative council staff provides county voting precinct boundaries, the results of statewide and many local primary, runoff, and general elections, and voter registration information by precinct for all counties. This election data is allocated to each census block within each voting precinct to allow for election data to be estimated for any district."

This account of allocating election data from precincts to blocks is typically referred to in spatial statistics as *proration*; the standard method would be to assign votes to blocks in proportion to their population (either TOTPOP, VAP, or CVAP). Thus, for instance, if a particular block has ten percent of the population of the precinct, it will be assigned ten percent of the vote totals. Thus every block within the precinct will have partisan shares equal to that of the precinct as a whole.[5]

When the allocation is proportional, no sub-precinct specificity is provided. This means that a redistricting plan created with overriding partisan intent would have no particular reason to split precincts. (In fact, each time a precinct is split, the plan faces a *loss* of precision in its partisan balance.) By contrast, race data does have block-level granularity coming from the Census, so a redistricting plan aiming to hit demographic targets (such as a particular share of Black or Hispanic CVAP) would have a clear reason to split precincts.

4 Effective minority representation

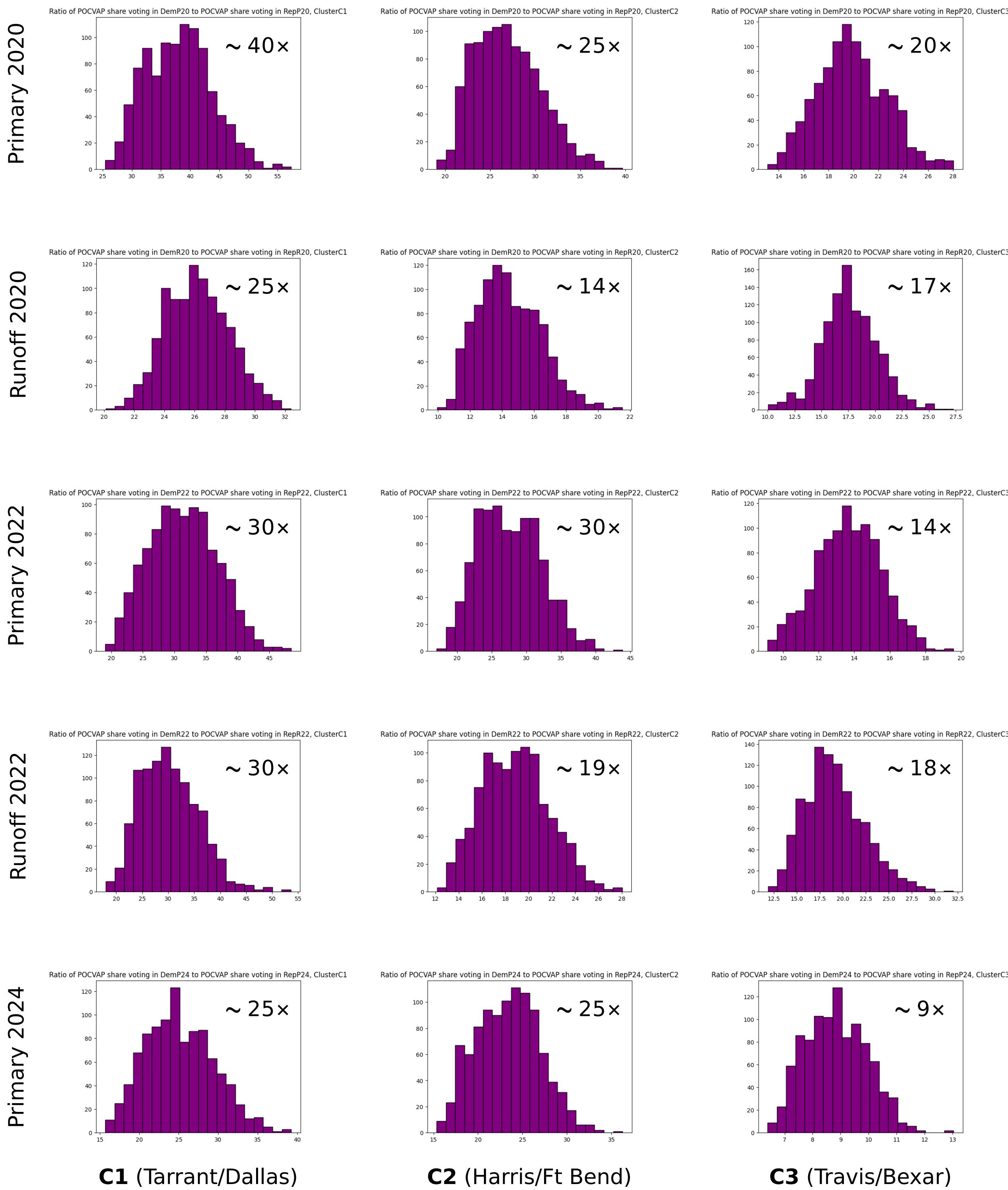
Some advocates for the new map have pointed to the creation of new majority-minority districts as a signal of increased electoral opportunity. However, I perform an analysis of opportunity-to-elect through the use of electoral history rather than demographic targets, and this analysis makes it clear that these new majority-minority districts do not provide increased electoral opportunity. Instead, the new plan effects a **net loss of three districts** that could previously reliably elect minority candidates of choice.

4.1 Focus on Democratic primaries

Effectiveness analysis makes crucial use of primary elections in order to disentangle racial/ethnic group preference from party. I first confirm that the opportunity to elect candidates of choice for minority groups in the three cited areas runs through the Democratic rather than Republican primaries and runoffs. I find that this remained clearly true in 2024, despite conventional wisdom holding that minority voters in Texas have moved sharply in a Republican direction. Using leading statistical inference techniques—namely the hierarchical Bayesian model of ecological inference that has been the preferred RPV tool for twenty years—I conclude that Black voters, Hispanic voters, and non-White voters overall consistently chose Democratic primaries and runoff elections over the Republican options. Minority voters turned out in Democratic nominating contests by an estimated **factor of nine to forty times** more than in concurrent Republican nominating contests. This is independent of the question of partisanship in general elections and is used here to confirm that the Democratic nominating contests remain the most relevant ones to assess minority electoral opportunity in Texas.

[5] Beyond this interpretation of the TLC allocation process, this analysis assumes that the line-drawers used TLC electoral data and not ancillary sources like voter registration, commercial voter files, and so on.

Figure 3: Estimated turnout ratios for minority voters in Democratic versus Republican nominating contests. For instance, the top-left plot shows that in the primary elections conducted in March 2020, the statistical methods estimate that roughly 40 times as many minority-group voters turned out for the Democratic primary as the Republican primary in Tarrant/Dallas. In the March 2024 primary in the Tarrant/Dallas cluster, the factor was roughly 25.



4.2 Electoral alignment

The opportunity to be represented by candidates of choice has two components: minority groups must be able to both *nominate* preferred candidates through the primary/runoff process, and then to *elect* those preferred candidates in the general. To that end I am using the same scores of electoral alignment defined and explained in previous reports. Previously, I conducted a serial analysis of electoral opportunity using a bundle of primary, runoff, and general elections from 2012-2020. Here, I have updated the collection of elections that comprise the scoring to include elections from 2022 and 2024 in order to provide the clearest picture of current conditions.

Table 3: In each cluster, we use a mix of primary/runoff and general elections in which people of color had a clear candidate of choice. This table summarizes how many would have had that candidate of choice advance from the primary or get the most votes in the general.

		C2193 (2021)			C2333 (new)		
		Primary	General	Effect	Primary	General	Effect
C1	CD 5	13/14	0/14	Republican	10/14	0/14	Republican
	CD 6	13/14	0/14	Republican	13/14	0/14	Republican
	CD 12	12/14	0/14	Republican	13/14	0/14	Republican
	CD 24	7/14	0/14	Republican	7/14	0/14	Republican
	CD 25	13/14	0/14	Republican	14/14	0/14	Republican
	CD 30	14/14	14/14	POC-preferred D	14/14	14/14	POC-preferred D
	CD 32	8/14	14/14	**White D**	9/14	0/14	**Republican**
	CD 33	13/14	14/14	**POC-preferred D**	9/14	14/14	**White D**
C2	CD 2	10/14	0/14	Republican	9/14	0/14	Republican
	CD 7	7/14	14/14	White D	7/14	14/14	White D
	CD 8	11/14	0/14	Republican	12/14	0/14	Republican
	CD 9	11/14	14/14	**POC-preferred D**	13/14	0/14	**Republican**
	CD 14	11/14	0/14	Republican	11/14	0/14	Republican
	CD 18	11/14	14/14	POC-preferred D	11/14	14/14	POC-preferred D
	CD 22	10/14	0/14	Republican	11/14	0/14	Republican
	CD 29	13/14	14/14	POC-preferred D	12/14	14/14	POC-preferred D
	CD 36	10/14	0/14	Republican	11/14	0/14	Republican
	CD 38	6/14	0/14	Republican	7/14	0/14	Republican
C3	CD 10	10/14	0/14	Republican	8/14	0/14	Republican
	CD 11	12/14	0/14	Republican	11/14	0/14	Republican
	CD 20	13/14	14/14	POC-preferred D	13/14	14/14	POC-preferred D
	CD 21	10/14	0/14	Republican	10/14	0/14	Republican
	CD 23	13/14	0/14	Republican	11/14	0/14	Republican
	CD 27	13/14	0/14	Republican	10/14	0/14	Republican
	CD 35	11/14	14/14	**POC-preferred D**	12/14	0/14	**Republican**
	CD 37	6/14	14/14	White D	7/14	14/14	White D

There is no ambiguity about the partisan character of the districts in Table 3, as each one examined here either went for Democratic candidates in each of the 14 general elections or went for Republicans every time. The use of primaries to decide whether minority groups have an opportunity to nominate preferred candidates is more gradated. When 11-14 of the fourteen primaries went to POC-preferred candidates, that indicates reasonably clear ability to nominate. When only 6-9 of the fourteen do, that correlates better with control by White Democrats.[6]

The clear conclusion of the effectiveness analysis shown here in Table 3 is that each of these three district clusters sees a net loss of one district that can reliably nominate and elect a POC-preferred candidate. The number of districts likely to elect White-preferred Democrats does not change: one in Tarrant/Dallas, one in Harris/Ft Bend, and a possible one in Travis/Bexar.

5 Racial vote dilution vs. partisanship

5.1 Dot density diagrams

In this section, I present dot density plots similar to those from earlier reports. To achieve the best visibility at the needed resolution, I have placed a dot for every 25 people from the Decennial Census data (TOTPOP). A green dot represents 25 people designated as Hispanic in the Census; amber dots show Black people; red dots show Asian and Pacific Islander people; and lavender dots show non-Hispanic White people. When district lines carve cleanly along racial lines in residential patterns, you can see one dot color predominate on one side of the line and a different set of colors on the other. This is visible, for instance, in CD 24, which dips down to encompass the heavily White enclaves of University Park and Highland Park while neatly avoiding Black and Latino neighborhoods of Dallas.

[6]This kind of analysis builds on peer-reviewed work such as Becker et al., *Computational Redistricting and the Voting Rights Act*, Election Law Journal, December 2021. By comparing performance history in both Congressional and legislative districts with alignment scores in primary elections in Texas, one can create rough thresholds for electoral opportunity. In particular, though all of the 14 primary and runoff contests selected in the clusters have a clear minority candidate of choice, some of them have a shared candidate of choice between White and POC voters. This means that a threshold over half may be needed to indicate likely performance for minority-preferred candidates in polarized conditions.

Figure 4: Dot density from Cluster C1 in Tarrant/Dallas shows that CD 24 is carefully designed to include White population and avoid pockets of minority groups.

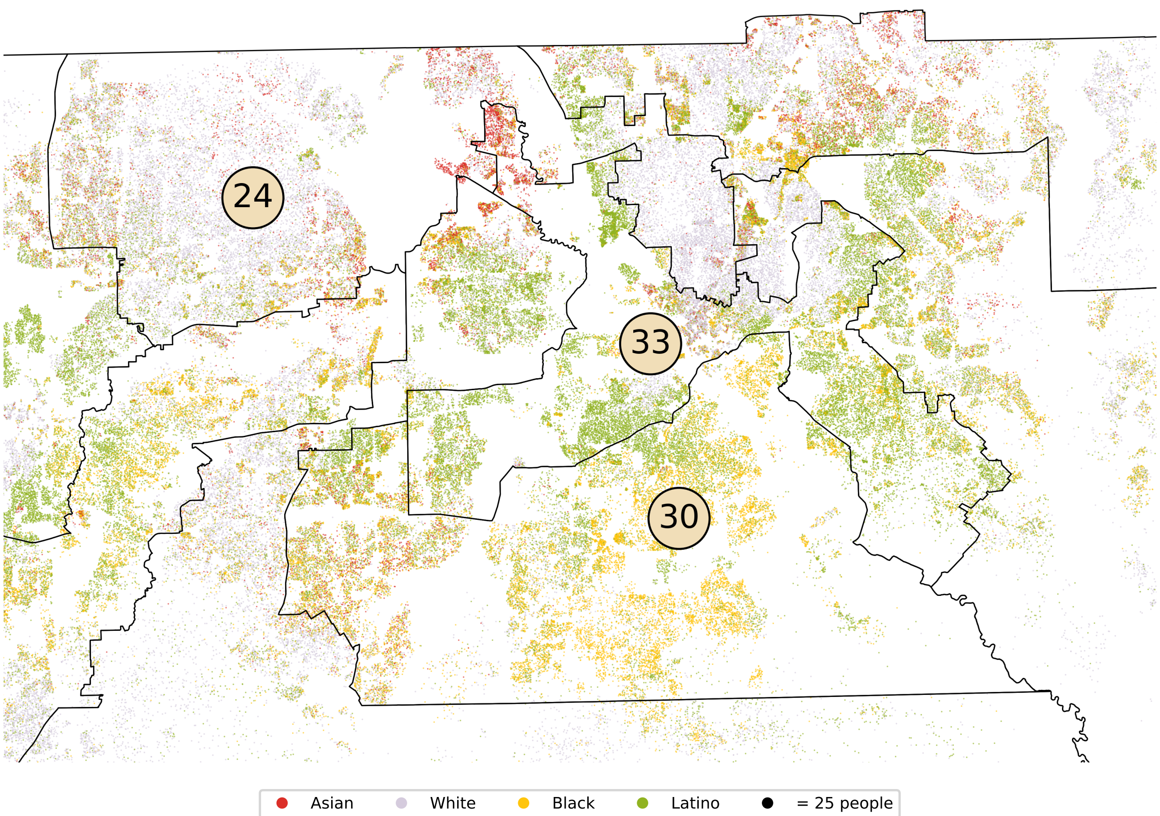
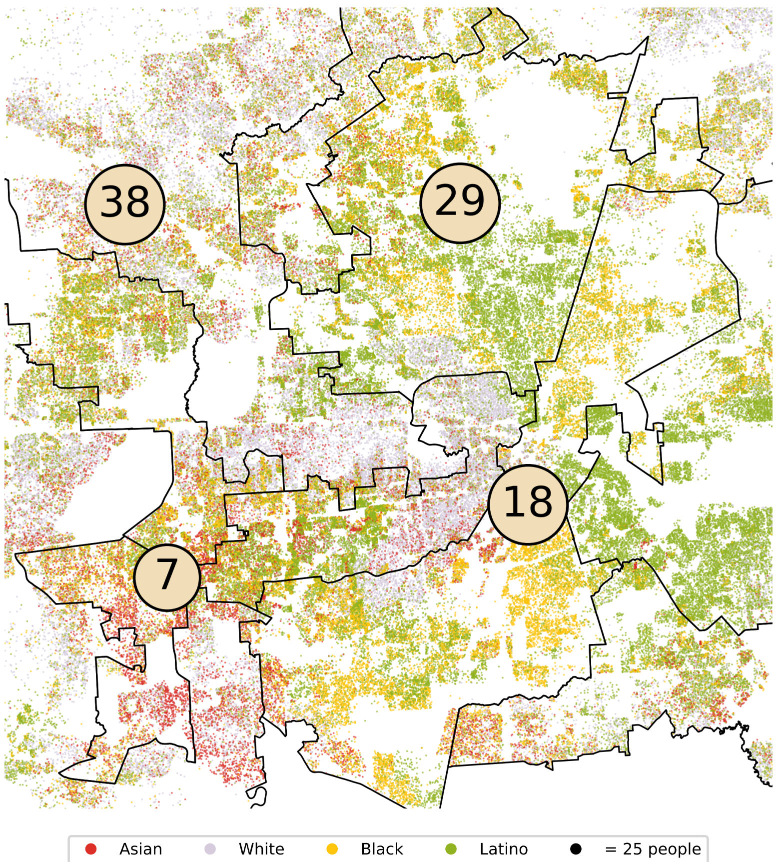


Figure 5: Dot density from Cluster C2 in Harris/Ft Bend shows patterns of sorting by race.



Similar dot density plots show detailed demographics for district clusters C2 (Figure 5) and C3 (Figures 6 and 7).

Figure 6: Dot density from Cluster C3 shows districts extending from rural surrounding counties to take strips of Travis County.

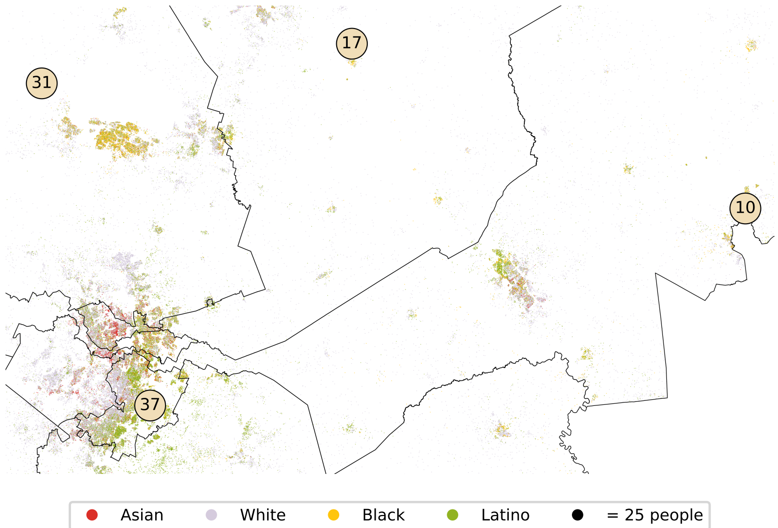
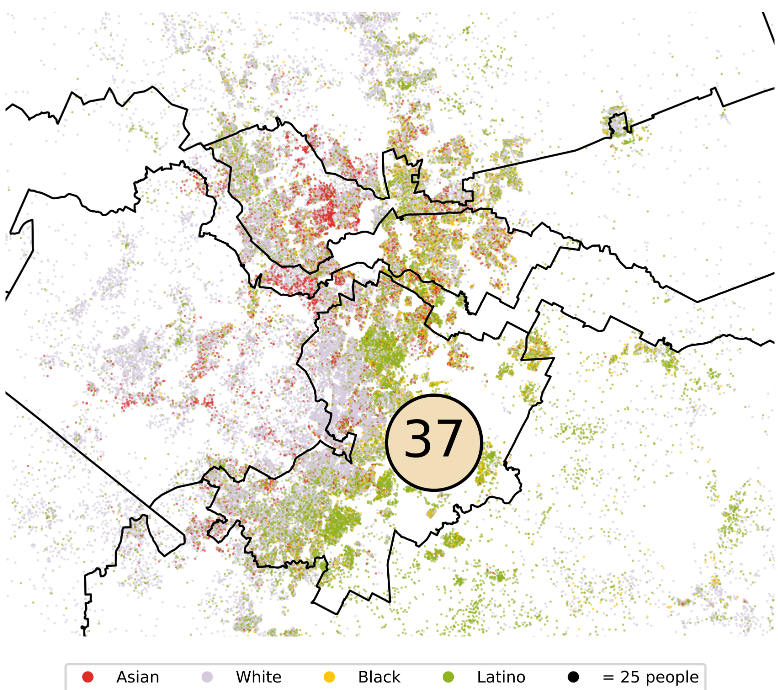


Figure 7: Close-up on Travis, showing the skinny layers of numerous districts that cut through the diverse areas in north Austin.



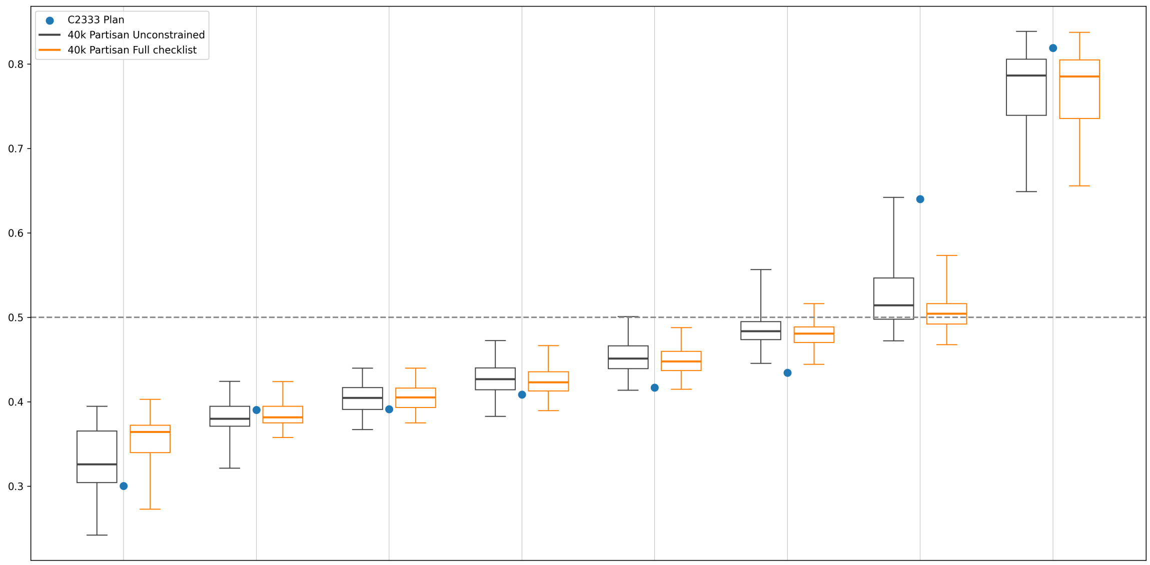
5.2 Assessing "packing and cracking" through outlier analysis

The use of algorithmically-generated alternative plans to assess the effects (and illuminate the intents) of proposed plans is an important emerging technique in redistricting analysis.[7] In this section I present evidence through the creation of comparison ensembles that race was heavily used by the line-drawers—possibly as a proxy for partisanship—in the creation of Plan C2333.

Figures 8–10 show that the racial composition of the districts is highly atypical of random plans whose partisan performance is at least as favorable to Republicans generally and to Donald Trump in particular. A checklist of traditional districting principles is incorporated into the methodology, and it only strengthens the finding that C2333 is an outlier in its racial composition. Details are provided in Appendix E.

Across the three clusters, the pattern is clear: as the expected demographic composition of the districts nears 50% POC CVAP share, the State's plan has far lower levels of minority citizens than is found in the comparison plans. Where districts would be expected to be near even, one or more districts have sharply decreased minority share—this is what is informally known as *cracking*. In each case, one or more districts that would be expected to have majority-POC CVAP has notably elevated minority share—consistent with *packing*. This strongly suggests the use of race in crafting plans, above and beyond the mere consequences of pursuing partisan aims.

Figure 8: Cluster C1 (Tarrant/Dallas): The eight columns show the POC CVAP in districts of this cluster in C2333 as blue dots. The results of the algorithmic runs are shown in the boxplots in black, where the whiskers span from the 1st to the 99th percentile in each case. The orange boxplot shows the statistics once we have filtered the ensembles to only include plans that meet the full checklist of districting principles. We see that two of the eight districts—both where we would expect districts near the 50% mark—show that the POC CVAP is outlyingly low. In the next district, it is outlyingly high. This is true of the entire unfiltered set of partisan-preferring plans, and is more stark when filtering for the full checklist.



[7] My research group has created pioneering methods in this field—namely the use of a mathematical construct called *spanning trees* to divide districts—that are now used by experts on all sides of redistricting cases.

Figure 9: Cluster C2 (Harris/Ft Bend): This time, four of ten districts—again, all with expected POC CVAP near 50%—have outlyingly low levels of minority citizens, while one district far above 50% is elevated to an outlying degree. Filtering by the full checklist of TDPs (orange) does not change this finding.

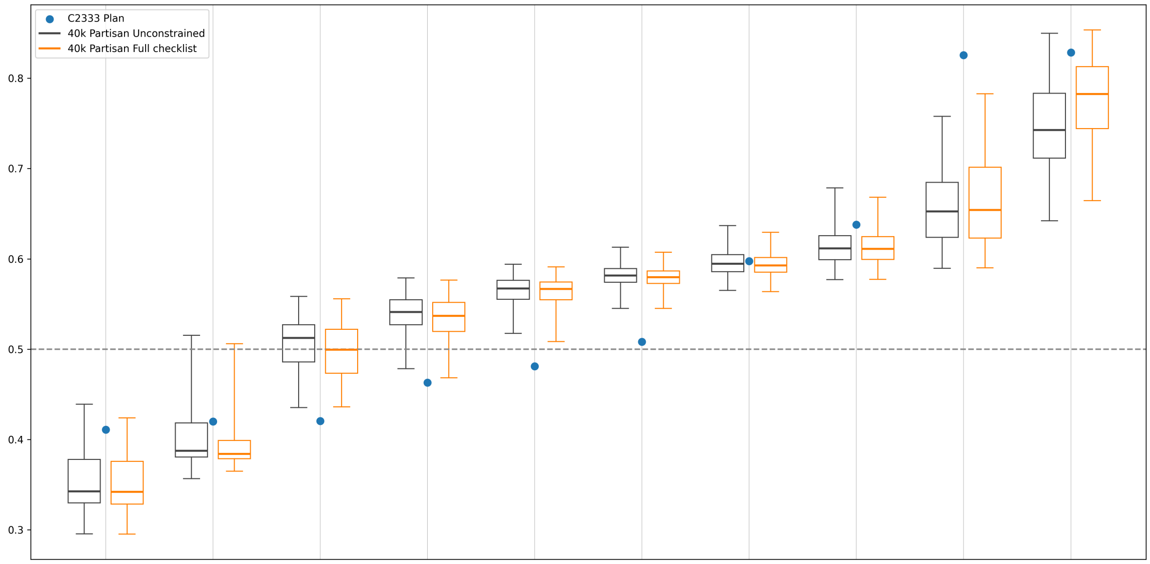
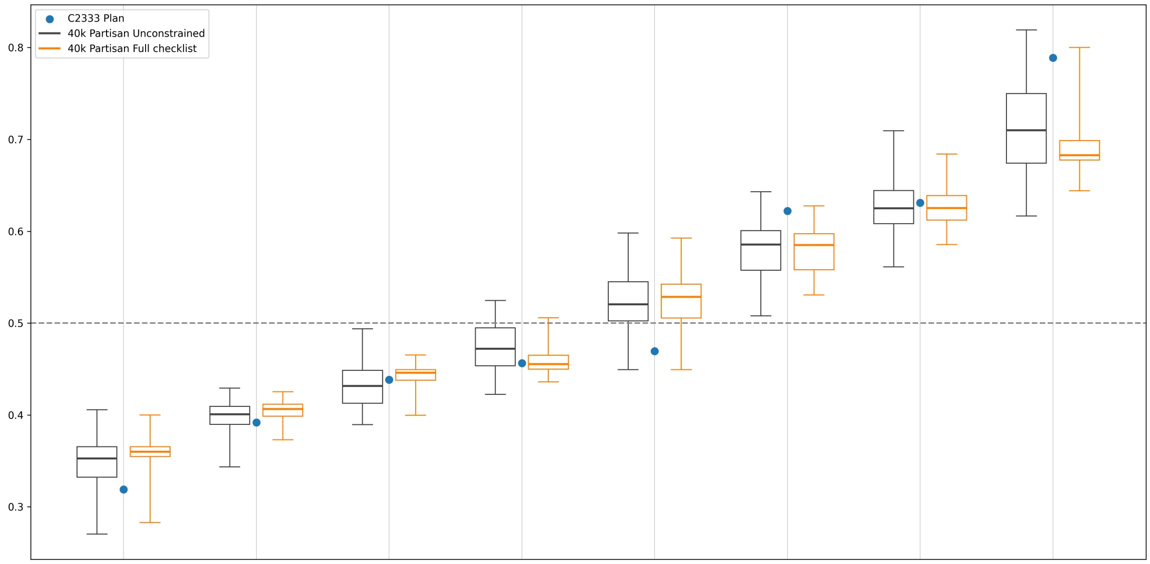


Figure 10: Cluster C3 (Travis/Bexar): The signs of packing and cracking are less severe in this cluster, but the characteristic pattern is still present: one district near an expected 50% POC CVAP status has markedly diminished minority citizen share, while the next district is elevated to over 60%.



6 Conclusion

After presenting basic statistics for population shifts and plan metrics, this report offers tools for a localized study to disentangle the racial and partisan elements of the line-drawing decisions in Plan C2333. The main findings are as follows.

- **Population shifts.** In each of the three district clusters studied here, the population growth is driven by people of color. (§2)
- **Precinct splitting.** Precincts are split at a level nearly 50% higher than in the previous plan. As far as the State has disclosed, this precinct splitting can serve no partisan purpose and is consistent with primary attention to race data. (§3.2)
- **Effective opportunity-to-elect**. Meaningful electoral opportunity requires the ability to both nominate and elect candidates of choice, irrespective of whether demographic targets have been hit. Each of the three clusters sees the net loss of one district whose electoral history demonstrates a record of success for POC-preferred candidates. (§4) Thus, despite driving the population growth, minority groups will see their voting strength further diluted by the new map. In particular, people of color make up an outright majority in each of the three regional clusters (over 54% of adult population in Tarrant/Dallas, 62% in Harris/Ft Bend, and 55% in Travis/Bexar, per Table 1), but they will have reliable opportunity to elect candidates of choice in only four out of 26 districts across these clusters (about 15% of representation).
- **Outlier analysis.** Patterns characteristic of packing and cracking include depression of minority CVAP in districts where around 50% share would be expected, accompanied by elevation of minority CVAP in districts expected to have well over 50% share. These patterns are present in each of the three clusters, especially in clusters C1 (Tarrant/Dallas) and C2 (Harris/Ft Bend). This is true when comparing to sets of tens of thousands of plans that match or exceed the partisanship of C2333, and it remains true whether or not a long checklist of traditional districting principles is incorporated in map generation. (§5.2)

Taken together, this evidence suggests that the C2333 plan uses race to achieve its ends and is dilutive of minority voting strength, beyond the mere consequences of intensified partisan gerrymandering.

A ACS data

In most parts of this report (particularly Table 4 and §5.2), CVAP is created by applying citizenship rates obtained at the tract level to the VAP in each census block. Details of this construction can be found in a white paper at `https://mggg.org/VAP-CVAP`.

In order to facilitate a comparison at a shorter interval than Decennial, §2 above and the supplemental tables in Appendix B below use the race categories native to the ACS because they cannot take advantage of the finer classification available in the Decennial data. Those values come directly from the 5-year ACS ending in 2018 and the 5-year ACS ending in 2023.

B County population shifts

Tarrant	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	2,020,691	—	2,135,743	—	115,052	—
VAP	1,480,163	—	1,587,266	—	107,103	—
NH White	765,692	51.7	745,943	47.0	−19,749	−18.4%
POC	714,457	48.3	841,323	53.0	126,866	118.4%
Black	233,890	15.8	270,440	17.0	36,550	34.1%
Hispanic	369,559	25.0	426,679	26.9	57,120	53.4%
Asian+PI	85,671	5.8	101,298	6.4	15,627	14.6%
AMIN	7,585	0.5	8,858	0.6	1,273	1.2%
CVAP	1,300,114	—	1,401,301	—	101,187	—
NH White	755,037	58.1	733,670	52.4	−21,367	−21.1%
POC	545,055	41.9	667,631	47.6	122,576	121.1%
Black	219,969	16.9	253,785	18.1	33,816	33.4%
Hispanic	242,431	18.6	302,533	21.6	60,102	59.4%
Asian+PI	59,201	4.6	71,000	5.1	11,799	11.7%
AMIN	6,636	0.5	6,713	0.5	77	0.1%

Dallas	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	2,586,629	—	2,603,816	—	17,187	—
VAP	1,898,830	—	1,941,989	—	43,159	—
NH White	649,013	34.2	599,605	30.9	−49,408	−114.5%
POC	1,249,810	65.8	1,342,384	69.1	92,574	214.5%
Black	428,454	22.6	441,796	22.7	13,342	30.9%
Hispanic	667,201	35.1	713,554	36.7	46,353	107.4%
Asian+PI	124,963	6.6	139,870	7.2	14,907	34.6%
AMIN	7,219	0.4	13,567	0.7	6,348	14.7%
CVAP	1,494,377	—	1,558,943	—	64,566	—
NH White	633,838	42.4	587,592	37.7	−46,246	−71.6%
POC	860,530	57.6	971,351	62.3	110,821	171.6%
Black	408,678	27.3	420,104	26.9	11,426	17.7%
Hispanic	350,472	23.5	420,196	27.0	69,724	108.0%
Asian+PI	74,155	5.0	85,895	5.5	11,740	18.2%
AMIN	6,283	0.4	9,445	0.6	3,162	4.9%

Harris	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	4,602,652	—	4,758,579	—	155,927	—
VAP	3,362,261	—	3,515,154	—	152,893	—
NH White	1,121,829	33.4	1,059,575	30.1	−62,254	−40.7%
POC	2,240,423	66.6	2,455,578	69.9	215,155	140.7%
Black	640,438	19.0	674,901	19.2	34,463	22.5%
Hispanic	1,303,803	38.8	1,418,489	40.4	114,686	75.0%
Asian+PI	258,000	7.7	279,951	8.0	21,951	14.4%
AMIN	13,344	0.4	29,223	0.8	15,879	10.4%
CVAP	2,662,104	—	2,845,384	—	183,280	—
NH White	1,077,530	40.5	1,024,706	36.0	−52,824	−28.8%
POC	1,584,567	59.5	1,820,677	64.0	236,110	128.8%
Black	605,011	22.7	640,133	22.5	35,122	19.2%
Hispanic	774,189	29.1	902,084	31.7	127,895	69.8%
Asian+PI	171,859	6.5	200,519	7.0	28,660	15.6%
AMIN	11,119	0.4	19,981	0.7	8,862	4.8%

Fort Bend	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	739,133	—	859,721	—	120,588	—
VAP	533,693	—	628,018	—	94,325	—
NH White	188,623	35.3	195,500	31.1	6,877	7.3%
POC	345,074	64.7	432,518	68.9	87,444	92.7%
Black	109,692	20.6	130,531	20.8	20,839	22.1%
Hispanic	120,960	22.7	146,803	23.4	25,843	27.4%
Asian+PI	108,359	20.3	139,378	22.2	31,019	32.9%
AMIN	1,506	0.3	2,318	0.4	812	0.9%
CVAP	449,343	—	538,144	—	88,801	—
NH White	179,544	40.0	185,432	34.5	5,888	6.6%
POC	269,802	60.0	352,712	65.5	82,910	93.4%
Black	103,435	23.0	122,200	22.7	18,765	21.1%
Hispanic	85,223	19.0	112,735	20.9	27,512	31.0%
Asian+PI	75,797	16.9	103,601	19.3	27,804	31.3%
AMIN	1,422	0.3	1,900	0.4	478	0.5%

Travis	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	1,203,436	—	1,307,625	—	104,189	—
VAP	934,080	—	1,039,958	—	105,878	—
NH White	495,004	53.0	530,413	51.0	35,409	33.4%
POC	439,073	47.0	509,545	49.0	70,472	66.6%
Black	76,296	8.2	85,649	8.2	9,353	8.8%
Hispanic	281,757	30.2	307,907	29.6	26,150	24.7%
Asian+PI	65,208	7.0	82,345	7.9	17,137	16.2%
AMIN	5,257	0.6	7,309	0.7	2,052	1.9%
CVAP	806,571	—	921,600	—	115,029	—
NH White	482,741	59.9	516,314	56.0	33,573	29.2%
POC	323,822	40.1	405,286	44.0	81,464	70.8%
Black	71,686	8.9	81,030	8.8	9,344	8.1%
Hispanic	195,712	24.3	236,798	25.7	41,086	35.7%
Asian+PI	40,822	5.1	55,180	6.0	14,358	12.5%
AMIN	4,233	0.5	5,966	0.6	1,733	1.5%

Bexar	ACS 2018 Count	2018 Pct	ACS 2023 Count	2023 Pct	Diff	Share of Diff
TOTPOP	1,925,852	—	2,037,344	—	111,492	—
VAP	1,426,732	—	1,529,319	—	102,587	—
NH White	440,445	30.9	445,670	29.1	5225	5.1%
POC	986,287	69.1	1,083,649	70.9	97,362	94.9%
Black	109,912	7.7	119,779	7.8	9867	9.6%
Hispanic	814,132	57.1	874,254	57.2	60,122	58.6%
Asian+PI	45,142	3.2	54,064	3.5	8922	8.7%
AMIN	9,546	0.7	17,194	1.1	7648	7.5%
CVAP	1,287,758	—	1,392,898	—	105,140	—
NH White	431,330	33.5	438,465	31.5	7,135	6.8%
POC	856,428	66.5	954,433	68.5	98,005	93.2%
Black	106,462	8.3	116,886	8.4	10,424	9.9%
Hispanic	704,937	54.7	766,047	55.0	61,110	58.1%
Asian+PI	29,555	2.3	37,142	2.7	7,587	7.2%
AMIN	8,789	0.7	14,324	1.0	5,535	5.3%

C Details of primary/runoff turnout analysis

Datasets used in this analysis are drawn from the Texas Legislative Council. The site `data.capitol.texas.gov/dataset/comprehensive-election-datasets-compressed-format` includes shapefiles of `General VTDs Election Data`, which report the number of voters from 2020, 2022, and 2024 D and R primary and runoff elections. Turnout ranges from a low of roughly 300,000 people in a cluster on a given primary/runoff election day (across the two partisan contests) to a high of over a million.

The hierarchical Bayesian model of $R \times C$ ecological inference, as implemented in the open-source package PyEI (`github.com/mggg/ecological-inference`), is used to compare racial and ethnic shares of voting age population to a three-way choice of voting behavior: `DemContest`, `RepubContest`, or `DidNotVote`. I performed analysis both with $R = 2$ (White/POC) and $R = 4$ (White/Black/Latino/Other). Once an EI run has been executed with strong convergence diagnostics, I take 1000 draws from the posterior distribution and for each draw I tabulate the ratio `DemContest/RepubContest`. This properly takes uncertainty into account, whereas a simple ratio of point estimates could hide high variability. Figure 3 shows the output plots from the 2×3 runs, tabulating the 1000 ratios in a histogram for each choice of region and election day.

D Details of updated effectiveness analysis

I next conducted a large batch of ecological inference runs to identify minority candidates of choice and selected a set of six contests from the three most recent cycles (2020, 2022, 2024). Importantly, I use regionally specific results to do this analysis, carefully avoiding the assumption that members of a racial or ethnic group would have the same preferences in one part of Texas as they do in another.

As shown above in Figure 3, 90-97% of the minority-group voters who vote in a primary or runoff election do so in the Democratic nominating contests. This justifies the focus on Democratic primaries.

Selected elections and POC candidates of choice

General elections in all clusters (14): PresG12 (Obama) RRComm3G14 (Brown), RRComm1G16 (Yarbrough), CompG18 (Chevalier), GovG18 (Valdez), RRComm1G18 (McAllen), SenG20 (Hegar), PRSG20 (Biden), AGG22 (Garza), GovG22 (O'Rourke), LandCommG22 (Kleberg), PresG24 (Harris), SupCt2G24 (Jones), SenG24 (Allred).

C1 primaries and runoffs (14): GovP14 (Davis), AgCommP14 (Hogan), RRComm3P14 (Brown), AgCommR14 (Hogan), RRComm1R16 (Yarbrough), LtGovP18 (Cooper), CompP18 (Mahoney), SenP20 (West), ATGP22 (Merritt), ATGP22 (Garza), LandCommP22 (Lange), CompR22 (Dudding), RRComm1P24 (Culbert), SupCt2P24 (Jones)

C2 primaries and runoffs (14): GovP14 (Davis), AgCommP14 (Hogan), RRComm3P14 (Brown), AgCommR14 (Hogan), RRComm1R16 (Yarbrough), LtGovP18 (Cooper), CompP18 (Mahoney), SenP20 (West), ATGP22 (Garza), LandCommP22 (Lange), CompR22 (Dudding), LandCommR22 (Martinez), RRComm1P24 (Culbert), SupCt2P24 (Jones)

C3 primaries and runoffs (14): GovP14 (Davis), RRComm3P14 (Brown), RRComm1P16 (Yarbrough), RRComm1R16 (Yarbrough), SenP18 (O'Rourke), LtGovP18 (Cooper), GovP18 (Valdez), GovR18 (Valdez), LandCommP22 (Martinez), LandCommR22 (Martinez), AGR22 (Garza), CompR22 (Vega), RRComm1P24 (Culbert), SupCt2P24 (Jones)

As before, scoring is conducted by awarding a point if the candidate of choice would advance from a primary (by winning outright or by a top-two finish in a plurality setting) or would win a runoff or general contest in that district.

E Ensemble methods and "checklist" of factors

Some responses to the use of ensemble evidence in litigation have faulted expert work for using statewide analysis rather than focusing on particular districts; likewise, some ensemble analysis has been criticized for failing to take various relevant districting principles into account.

For instance, a fairly comprehensive list of possible principles to incorporate in comparative study of redistricting alternatives includes those mentioned by Justices Alito and Thomas in their *Alexander* opinions: compactness, contiguity, respect for political subdivisions, communities of interest, incumbency, partisanship, urban character, media sources, transportation networks, and least change from a preferred map.

With these remarks in mind, I have constructed extremely thorough methods in the current analysis to take nearly every one of this long list of principles into account in generating ensembles of comparator plans. Furthermore, those plans are not made on a statewide basis, but in clusters of Congressional districts that are regionally proximate to the district at hand. This is as close as one can reasonably get to studying districts individually: since redistricting is a fixed-sum game with respect to Census population, changing one district must necessarily change its the boundaries of its neighbors; manipulating a single district necessarily has consequences on those neighbors.

District generation parameters.

- Contiguity is enforced throughout runs of the Markov chain recombination algorithm.[8] Population balance is enforced by requiring each step to leave districts within 1% of ideal population.[9]
- Compactness is favored through the use of spanning trees to draw districts. Spanning trees are selected using a Kruskal-style minimum spanning tree (MST) algorithm where initial weights are drawn uniformly from $[0, 1]$.
- County integrity is favored through the use of a "surcharge" of 0.5 on the edge weights for edges whose endpoints lie in different counties.
- A additional surcharge of 0.2 is used to encourage integrity of COUSUBs, or county subdivisions. In Texas, these are Census County Subdivisions, loosely parallel to Minor Civil Divisions in states that are partitioned into townships. In general, COUSUBs will respect the boundaries of small municipalities to the extent possible, while dividing cities into pieces with "stable boundaries" and "recognizable names." This can help here as a proxy for municipality preservation, communities of interest, transit networks, and local media.
- Core retention with respect to the State's new plan is implemented with a surcharge of 0.2 on edges that span across two of the State's new enacted congressional districts.
- Partisanship favoring Republican candidates in general is accounted for with a score based on the number of Republican district wins across a set of 29 general elections: - SenG12 - PRSG12 - RRComm3G14 - GovG14 - AgCommG14 - SenG14 - LtGovG14 - RRComm1G16 - PRSG16 - RRComm1G18 - LandCommG18 - LtGovG18 - CompG18

[8] Daryl DeFord, Moon Duchin, and Justin Solomon, *Recombination: A Family of Markov Chains for Redistricting*, Harvard Data Science Review **3**(1) (Winter 2021).

[9] The adequacy of this level of population balance for ensemble generation has been discussed at length elsewhere, including in earlier reports filed in this case.

- AGG18 - GovG18 - SenG18 - RRComm1G20 - PRSG20 - SenG20 - AgCommG22 - ATGG22 - ComptrollerG22 - GOVG22 - LandCommG22 - LTGG22 - RRComm1G22 - PRSG24 - RRComm1G24 - SenG24

- Partisanship specific to the performance of Donald Trump is accounted for in two ways: counting the number of Trump district wins in three elections (2016, 2020, 2024) and by simply considering the most recent election, Pres2024.

I then perform heuristic optimization runs using the short bursts local search method studied by Cannon et al., launched from multiple starting points, where the objective function is either general Republican partisanship or specific Trump partisanship.[10] Hundreds of thousands of maps are generated in each congressional cluster. These are then combined into a single large collection, then reduced to a smaller set of maps by imposing the following filters.

Winnowing conditions.

- Republican performance: Republicans overall have at least as many wins in each cluster as in C2333. For instance, out of a total of $29 \cdot 8 = 232$ district-level contests in the C1 Tarrant/Dallas cluster, the number won by Republicans must be at least as high as in C2333.
- Trump performance: at least as many districts have a plurality win for Donald Trump from the 2024 election as in C2333. For instance, out of 8 districts in the C1 Tarrant/Dallas cluster, the number favoring Trump must be at least six, as in C2333.
- Urban/rural composition: no district differs by more than ten percentage points from its counterpart in C2333 in its urban vs. rural composition. This is accomplished by labeling each census block as urban or rural according to the block group it belongs to, which has that attribute assigned by the Census Bureau. The urban vs. rural balance is measured by the basis of the share of population belonging to urban block groups.
- Incumbency: the double-bunking of incumbents with respect to the address file provided by counsel is no greater than in C2333.

After filtering down to maps that meet all of these conditions, there are at least 40,000 maps left in each of the three district clusters. I finally sample 40,000 districting plans uniformly at random from the filtered ensembles and use those to generate the boxplots in Figures 8–10.

Robustness checks. Variations on the choices that define the ensemble analysis included the selection of districts to include in the clusters; the "surcharges" that promote the intactness of counties, county subdivisions, and prior districts; the starting points and random number seeds for the Markov chain runs; and the flavor of partisan advantage. In addition to the principal runs that optimize for Republican wins across a range of contests, I also executed a run seeking to match the number of districts with Trump's 2024 major-party vote share over 55%. The consistency of findings across these variations raises my confidence, based on my experience researching the sound interpretation of outlier tests, that the following results from Figures 8–10 are robust.

[10]Sarah Cannon, Ari Goldbloom-Helzner, Varun Gupta, J.N. Matthews, and Bhushan Suwal, *Voting Rights, Markov Chains, and Optimization by Short Bursts*, Methodology and Computing in Applied Probability **25** (1): 1–38 (2023).

C1: two cracked, one packed (all in most extreme 2 percent)
C2: four cracked, one packed (all in most extreme 0.5 percent)
C3: one cracked (most extreme 9 percent), one packed (most extreme 2 percent)

F Changes to CD 18

Of the 766,987 census-enumerated people who were assigned to CD 18 in the last election, only 25.8% are assigned to the district now labeled CD 18. Over half (58.1%) now live in CD 29, and the others are scattered across districts 2, 7, and 38 (see Figure 12 and Table 4).

Table 4: The population dispersion from prior CD 18 is shown here, with more than twice as much going to new CD 29 as to new CD 18. The CVAP here is from the 5-year ACS ending in 2022.

	TOTPOP	**VAP**	NH White	POC	**CVAP** 5-yr	NH White	POC
CD 2	59,105	43,558	8907	34,651	35,499.6	8589.7	26,909.8
CD 7	41,884	35,122	23,173	11,949	32,376.8	22,418.8	9957.9
CD 18	197,949	158,904	27,089	131,815	138,280.2	26,165.5	112,114.7
CD 29	445,987	322,052	52,116	269,936	253,806.4	50,865.3	202,941.1
CD 38	22,062	16,655	4277	12,378	11,563.9	4024.6	7539.3

Figure 11: New CD 18 (C2333) is shown in green, while prior CD 18 (2021 plan) is shown in gray.

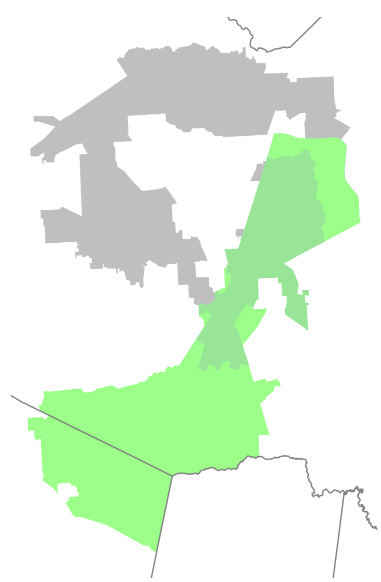


Figure 12: The contours of prior CD 18 (as used in the 2024 election) are shown as a black outline, while the new districts from C2333 are shown in color.