Expert Report of Dr. Loren Collingwood

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Executive Summary

I have been retained by plaintiffs as an expert and have been asked to analyze whether there is racially polarized voting (RPV) in the Yakima Valley and surrounding areas; to analyze demographic data and examine maps proposed or drafted during the 2021 redistricting process, the Enacted Plan, and Plaintiffs' demonstrative plans; and to conduct electoral performance analyses for a number of plans.

RPV refers to a sustained pattern of voting decisions where race or ethnicity determines electoral outcomes in whole or in part. RPV occurs when white voters cast ballots for the same set of candidates and minority voters cast ballots for a different set of candidates. Specifically, in order to determine the extent of RPV, I was asked to examine whether Latino voters in the Yakima Valley and surrounding areas are politically cohesive and whether white voters vote sufficiently as a bloc to usually prevent Latino voters from electing their candidates of choice.[1]

Across 25 elections in and around the Yakima Valley and surrounding areas, featuring statewide elections, state legislative elections, and county elections, several involving Latino candidates, I find very clear patterns of RPV between Anglo and Latino voters in 23 out of 25 (92%) contests. I describe the methods I used to examine RPV and findings in further detail below in my report.

I also conducted what is referred to as a performance analysis (or reconstituted elections analysis). An electoral performance analysis reconstructs previous election results based on new district boundaries to assess whether a minority-preferred or white preferred candidate is most likely to win in different district configurations (i.e., a newly adopted legislative district vs. a demonstrative plan). I only examined previous elections held in jurisdictions (i.e., statewide) that can cover the new enacted map or Plaintiffs' demonstrative plans because district boundaries change from one redistricting cycle to the next. I conducted a performance analysis for Legislative District 15 (LD 15) in the Enacted Plan, as well as three demonstratives for Legislative District 14 (LD 14) provided by Plaintiffs.

[1] Throughout the report I refer to white, Anglo, and non-Hispanic white voters interchangeably. I refer to Latino and Hispanic voters interchangeably.

Additionally, I analyzed redistricting criteria, like compactness, of the LD 15 Enacted and LD 14 demonstrative district plans. Across all criteria, the Demonstrative plans perform comparatively to the Enacted plan. I also reviewed a timeline of the draft maps from the Washington State Redistricting Commission. The timeline shows that several of the maps considered by the Commission would have produced a district in the Yakima Valley that would very likely provide Latino voters the ability to elect legislative candidates of choice.

Moreover, I conducted a voter turnout analysis by race/ethnicity. The results show that white voters gain a turnout advantage in off years (i.e., 2018) vs. in presidential years (i.e., 2020). Thus, the labeling of the district as LD 15 vs. LD 14 reduces Latino voters' ability to elect a candidate of choice. I also analyzed the precincts with large Latino populations that the Commission included in Adams and Grant Counties and those it excluded in Yakima County and find that the included precincts have lower Latino voter registration and disproportionately whiter electorates (relative to voter registration) than the excluded Yakima County precincts.

Based on my analysis, I conclude the following:

- RPV between white and Latino voters is present in 23 of 25 elections I analyzed across 5 election cycles.
- I analyzed votes in elections spanning the whole region as well as elections in specific parts of the region, including county district offices and relevant parts of legislative districts. The results are consistent: RPV is present.
- Latino voters are politically cohesive. Latino voters consistently vote as a group for the same candidates, regularly casting ballots between 75-80% for the Democratic candidate in the partisan contests I analyzed. Meanwhile, a similar share of white voters consistently cast ballots for the Republican candidate.
- I also analyzed a variety of contests featuring Spanish-surname candidates. Latino voters consistently vote as a group for the same candidates, regularly casting ballots between 65-90% for the Spanish-surname candidate. Meanwhile, a similar share of white voters consistently cast ballots for the non-Spanish-surname candidate.
- In the enacted Legislative District 15, white voters voted with sufficient cohesion to defeat the minority-preferred candidate in 7 out of 10 contests that I analyzed, for a block rate of 70%.[2] Thus, I conclude that white voters usually defeat Latino voters' candidates of choice.

[2] Between my initial declaration and the drafting of this report, I updated my methodology for evaluating split precincts. I discuss the approach at length further into the report. The result is that one contest, the presidential 2020, switched from narrowly preferencing Trump to narrowly preferencing Biden. My updated approach produces almost identical performance results as those observed in Dave's Redistricting software – a free online

- In Plaintiffs' Demonstrative Map 1, Latino voters' preferred candidate prevailed in 10 of 10 contests that I analyzed.
- In Plaintiffs' Demonstrative Map 2, Latino voters' preferred candidate prevailed in 10 of 10 contests that I analyzed.
- In Plaintiffs' Demonstrative map 3; Latino voters' preferred candidate prevailed in 9 of 10 contests that I analyzed.
- Plaintiffs' demonstrative maps perform similarly on redistricting criteria as compared to the enacted map, including on compactness scores, contiguity, population deviation, and county and precinct splits. All three of Plaintiffs' demonstrative maps contain a Legislative District 14 with over 50% Latino Citizen Voting Age Population (CVAP).
- A review of the Commission timeline shows that several of the maps considered by the Commission would have produced a district in the region that would very likely provide Latino voters the ability to elect legislative candidates of choice. Instead, the Commission chose a district that maximally reduces Latinos' ability to elect candidates of choice.
- Anglo voters vote at higher rates than Latino voters in both the 2020 and 2018 general elections. However, the voter turnout gap between the two groups widens in 2018 (when LD 15 would be up for election) relative to 2020 (when LD 14 would be up). Further, the Commission failed to include several high-density Latino precincts into the plan, instead opting to include precincts with fewer Latinos who also vote at a lower rate.

My opinions are based on the following data sources: Washington State general election precinct returns from 2012-2020; individual-level voter file data produced from the Secretary of State's (SoS) office capturing voters who cast ballots in the 2012, 2014, 2016, 2018, and 2020 general elections; the 2012 and 2020 individual voter file capturing voting in those years' primary elections; 2010 and 2020 US Census block data; the 2010 Census surname database; the shape files for the Enacted Plan; and geojson, block assignment, or shape files for the Commission's draft maps and Plaintiffs' demonstrative maps provided by Plaintiffs' counsel. My opinions are also based upon my general expertise and experience. My work is ongoing in this matter, and my opinions are based on the information available to me as of the date of this report. I reserve the right to supplement or amend my findings based on additional information.

I am being compensated at a rate of $400/hour. My compensation is not contingent on the opinions expressed in this report, on my testimony, or on the outcome of this case.

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database analysts used to evaluate redistricting plans. The very minor change does not alter my overall opinions.

The rest of the report explains my methods and presents my results, including: 1) a review of the method I used to estimate precinct racial demographics; 2) a list of the elections analyzed, 3) 5-County RPV analysis using statewide contests and one congressional contest; 4) Spanish-surname candidate analysis; 5) electoral performance analysis of both enacted and alternative maps; 6) compactness and district characteristics analysis; 7) analysis of the redistricting commission's timeline; and 8) voter turnout analysis by race.

Background and Qualifications

I am an associate professor of political science at the University of New Mexico. Previously, I was an associate professor of political science and co-director of civic engagement at the Center for Social Innovation at the University of California, Riverside. I have published two books with *Oxford University Press*, 39 peer-reviewed journal articles, and nearly a dozen book chapters focusing on sanctuary cities, race/ethnic politics, election administration, and RPV. I received a Ph.D. in political science with a concentration in political methodology and applied statistics from the University of Washington in 2012 and a B.A. in psychology from the California State University, Chico, in 2002. I have attached my curriculum vitae, which includes an up-to-date list of publications, as Exhibit 1 to this report.

In between obtaining my B.A. and Ph.D., I spent 3-4 years working in private consulting for the survey research firm Greenberg Quinlan Rosner Research in Washington, D.C. I also founded the research firm Collingwood Research, which focuses primarily on the statistical and demographic analysis of political data for a wide array of clients, and lead redistricting, map-drawing, and demographic analysis for the Inland Empire Funding Alliance in Southern California. I was the redistricting consultant for the West Contra Costa Unified School District's independent redistricting commission in California, where I was charged with drawing court-ordered single-member districts. I am contracted with the Roswell, NM, Independent School District to draw single member districts.

I served as a testifying expert for the plaintiff in the Voting Rights Act Section 2 case *NAACP v. East Ramapo Central School District*, No. 17 Civ. 8943 (S.D.N.Y.), on which I worked from 2018 to 2020. In that case, I used the statistical software eiCompare and WRU to implement Bayesian Improved Surname Geocoding (BISG) to identify the racial/ethnic demographics of voters and estimate candidate preference by race using ecological data. I am the quantitative expert in *LULAC v. Pate* (Iowa), 2021, and have filed an expert report in that case. I am the BISG expert in *LULAC Texas et al. v. John Scott et al.*, No. 1:21-cv-0786-XR, 2022. I filed two reports and have been deposed in that case. I was the RPV expert for the plaintiff in *East St. Louis Branch NAACP, et al. v. Illinois State Board of Elections, et al.*, and filed two reports in that case. I was the Senate Factors expert for plaintiff in *Pendergrass v. Raffensperger* (N.D. Ga. 2021), and filed a report in that case. I served as the RPV expert for plaintiff in *Johnson, et al., v. WEC, et al.*, No. 2021AP1450-OA, and filed three reports in that case. I was the RPV expert for plaintiff in *Faith Rivera, et al. v. Scott Schwab and Michael Abbott*. I filed a report, was deposed, and testified at trial in that case. I served as the RPV expert for the intervenor in *Walen and Henderson v. Burgum and Jaeger*, No 1:22-cv-00031-PDW-CRH, where I filed a report and testified at trial. I am the RPV expert in *Lower Brule Sioux Tribe v. Lyman County*, where I filed a report and testified at trial.

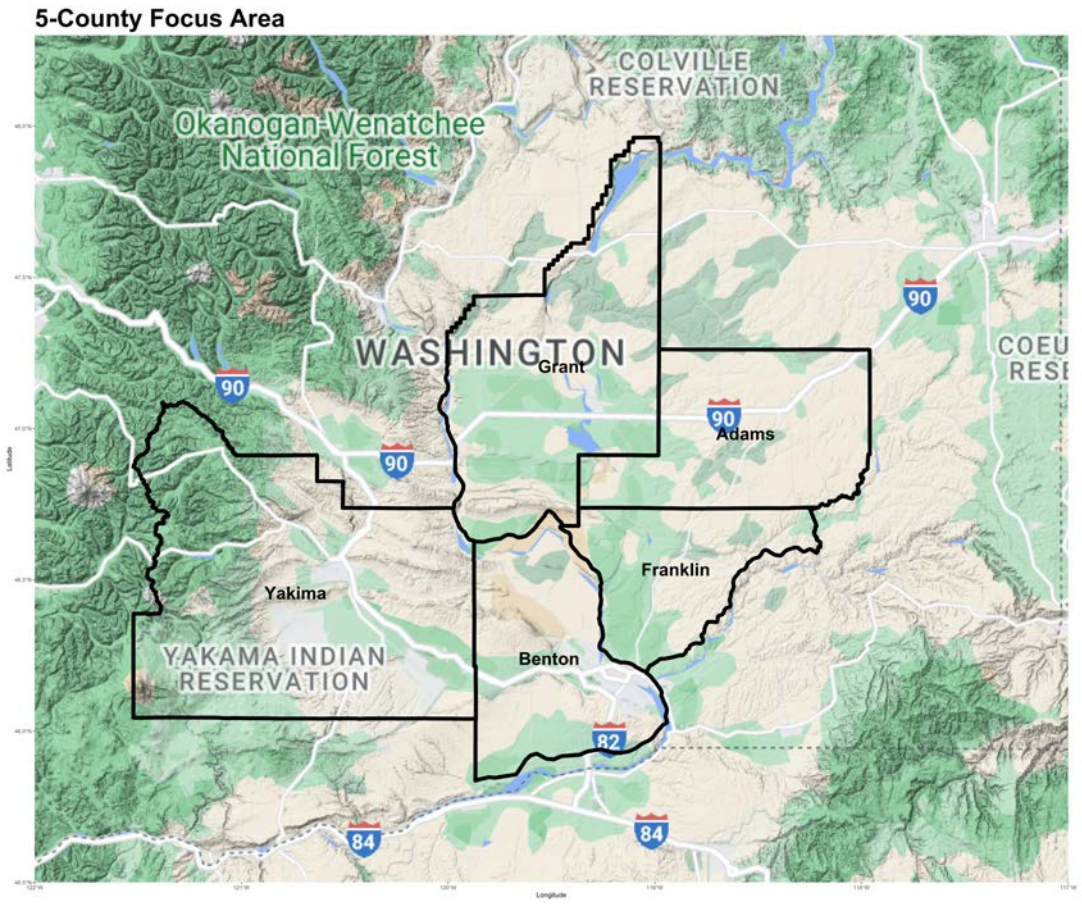
I. Racially Polarized Voting

RPV occurs when minority voters regularly vote for one candidate or set of candidates, and white voters regularly vote for another candidate or set of candidates. The favored candidate of minority voters is called a "candidate of choice." To assess RPV in the present case, we test whether Hispanic voters back the same candidate and whether Anglo voters favor a different candidate.

As a general rule, RPV scholars turn to precinct vote returns and estimates of racial demographics in the same geolocation to assess the presence or absence of RPV. I analyze multiple elections across five election years (2012, 2014, 2016, 2018, and 2020) to determine whether a pattern of RPV is present in the Yakima Valley region and surrounding areas and within specific electoral districts (i.e., previous legislative district 15). I look at these five years of elections because Secretary Hobbs provided historical voter files for those same years, which is my source of demographic voting data, and because these years feature Latino or Spanish-surname candidates.

RPV does not necessarily mean voters are racist or intend to discriminate. However, in situations where RPV is present, majority voters may often be able to block minority voters from electing candidates of choice by voting as a broadly unified bloc against minority voters' preferred candidate. At issue in this report, however, is whether the enacted state legislative map dilutes Latino voters' votes in and around Legislative District 15 in the Enacted Plan. Figure 1 highlights the specific counties in which I conduct an RPV analysis: Adams, Benton, Franklin, Grant, and Yakima.

Figure 1. Yakima Valley and surrounding areas, WA 5-County Focus Area.



A. Racially Polarized Voting Estimation Approach

To determine if RPV exists in different geographic areas, it is generally necessary to infer individual level voting behavior from aggregate data – a problem called ecological inference. The analysis attempts to observe how groups of voters (i.e., Latinos or non-Hispanic whites) voted in a particular election based on precinct vote returns and the demographic composition of the people who live in those precincts.

There are several methods for analyzing whether RPV exists: homogeneous precinct analysis (i.e., taking the vote average across high density white precincts vs. high density Hispanic precincts), ecological regression (ER), ecological inference (EI), and ecological inference Rows by Columns (RxC). In this report, I rely on the ecological inference (EI) and the Rows by Column (RxC) methods to assess whether voting is racially polarized, using functions in the eiCompare R package (Collingwood et al. 2020). I focus my attention on the two top-of-the-ticket candidates in each contest. I present vote-choice estimates for Latino and non-Hispanic white voters.

My assessment is based on 21 general election contests and four primary contests using two different types of statistical analyses, each producing vote choice by race. The results of

my analysis show that RPV between Latino and non-Hispanic white voters is clearly present in 23 of the 25 contests I analyzed (92%).

B. List of General Elections Analyzed

Tables 1 and 2 list the 21 general and four primary elections I analyzed, with columns indicating year, contest, type (general or primary), whether the contest is partisan, Democratic and Republican candidate names in the context of partisan contests, Spanish-surname and non-Spanish surname in the case of non-partisan contests, and whether RPV is present. I focus on contests between 2012-2020 because those are the years for which I have historical voter file data that I use to generate precinct demographic estimates and because these are the most probative elections. I analyze the statewide contests subset to the 5-county region, but in some of the local contests I only analyze the results in one county (i.e., county supervisor). In my discussion of the results, I note the geography subsets explicitly.

Table 1. List of partisan contests analyzed, between 2012-2020.

Year	Contest	Type	Partisan	DemCandidate	GOPCandidate	RPV
2020	President	General	YES	Biden	Trump	YES
2020	Governor	General	YES	Inslee	Culp	YES
2020	Attorney General	General	YES	Ferguson	Larkin	YES
2020	Treasurer	General	YES	Pellicciotti	Davidson	YES
2018	U.S. Senate	General	YES	Cantwell	Hutchinson	YES
2018	U.S. Rep D4	General	YES	Brown	Newhouse	YES
2018	LD 15 State Senate	General	YES	Aguilar	Honeyford	YES
2016	U.S. Senate	General	YES	Murray	Vance	YES
2016	President	General	YES	Clinton	Trump	YES
2016	Governor	General	YES	Inslee	Bryant	YES
2012	LD 15 Position 2	Primary	YES	Gonzalez	Taylor	YES
2012	LD 15 State Rep.	General	YES	Gonzalez	Taylor	YES
2014	LD-15 State Senate	Primary	YES	Munoz	Honeyford	YES
2014	LD-15 position 2	Primary	YES	Martinez-Chavez	Taylor	YES
2014	LD 15 State Senate	General	YES	Munoz	Honeyford	YES
2014	LD 15 State Rep.	General	YES	Martinez-Chavez	Taylor	YES
2016	LD-14 Position 1	General	YES	Soto Palmer	Johnson	YES
2020	LD-13 Position 1	Primary	YES	Castaneda Diaz	Dent	YES
2020	LD 13 Position 1	General	YES	Castaneda Diaz	Dent	YES

Table 2. List of non-partisan contests analyzed, between 2012-2020.

Year	Contest	Partisan	SpanishSurname	NonSpanishSurname	RPV
2020	Franklin County Commish D2	NO	Peralta	Mullin	YES
2020	State Supreme Court, Seat 3	NO	Montoya-Lewis	Larson	YES
2020	Sup. of Public Instruction	NO	Espinoza	Reykdal	NO
2018	State Supreme Court, Seat 8	NO	Gonzalez	Choi	NO
2018	Yakima County Board D3	NO	Soto Palmer	Childress	YES
2016	Yakima County Board D2	NO	Manjarrez	Anderson	YES

C. Data Preparation

To conduct the RPV analysis, I gathered precinct election returns from the Washington Secretary of State election results website[3] and the Redistricting Data Hub.[4] I also downloaded precinct shape files from the Secretary of State's website,[5] and the Redistricting Commission's website.

Beginning with the precinct vote returns, for each election contest I analyze, I divide each candidate's vote by the total number of votes in that election, as well as the total number of estimated voters in that precinct. For example, in a precinct with 1,000 voters, if Biden scored 800 votes and Trump 200, I produce a Percent Biden value of 0.8 (80%) and a Percent Trump value of 0.2 (20%). However, my approach also lets me capture possible voter drop off for different election contests. Thus, while 1000 people might have voted in the presidential contest, maybe just 850 cast ballots for another contest in the same election year. Thus, I further account for no vote in these down-ballot races. In the statistical model, I then weight each precinct by its total vote size to account for variation in precinct population size.

Next, I generate the demographic statistics of each voting precinct. Analysts can generate precinct demographics in a variety of ways all containing some degree of estimation. One common approach is to use citizen voting age population (CVAP) data from the American Community Survey (ACS) 5-year estimates. The ACS is a roughly 2% sample of all American households per year. Thus, by stacking the ACS across five years, a mid-point estimate captures roughly 10% of American households. The advantage of the ACS over the U.S. Census is that it is ongoing instead of only every 10 years, and the ACS includes questions about citizenship status. This latter advantage is crucial in estimating Latino voting since

[3] https://www.sos.wa.gov/elections/research/election-results-and-voters-pamphlets.aspx

[4] https://redistrictingdatahub.org/state/washington/

[5] https://www.sos.wa.gov/elections/research/precinct-shapefiles.aspx

many U.S. Latinos are not citizens and thus using voting age population as a demographic indicator can vastly over-estimate the size of the Latino electorate.

Using ACS data requires statisticians to estimate precinct demographics using spatial interpolation methods from block group to the precinct. This is because precinct lines and block groups do not overlap completely and/or are not nested.

Another method is to gather voter file data, which provides information about who actually voted in each election and in which precinct each voter lives. Because both the vote return data and the voter file contain precinct information, this method of precinct demographic composition does not suffer from the spatial interpolation challenge posed with ACS or Census demographic data. In some states, each voter's race is listed as a column in the voter file; however, this is not the case in Washington. Therefore, in order to generate an estimate of a precinct's racial demographics, I estimate each voter's racial distribution then aggregate all voters' racial distributions within a precinct together. I opt for this latter approach because it provides greater demographic composition precision – especially in the context of lower turnout primary elections. When estimating RPV across groups who vary significantly in population size and voter turnout (as is the case between whites and Latinos here, as I will show in the report's section on voter turnout), greater precision in who voted enables a more precise vote choice estimate by racial group.

To generate my demographic estimates, I gathered voter file data from the Secretary of State for general election years 2012, 2014, 2016, 2018, and 2020, and for the 2012, 2014, and 2020 August primaries. The files include all registered voters recorded shortly after that fall's general election (or the primary). The file includes first name, surname, address, and a column recording the date of each individual voter's last recorded vote. I subset each file to the relevant 5-county region, and further subset to people who cast a ballot in each general election contest. I then geocoded these data using Geocodio to extract each unique household's latitude and longitude (coordinates).[6] Geocodio is a leading geocoding service that interfaces with various statistical software programs for relatively straightforward individual record geocoding. Experts in my field can select a variety of geocoders (e.g., Geocodio, Google, Opencage). I have used all these services and they produce highly similar results.

I then forward geocoded these lat/long coordinates into the appropriate Census blocks, using 2010 blocks for 2012 and 2014, and 2020 blocks for 2016-2020. This entails a geospatial points-to-polygons approach where I locate each coordinate in its appropriate Census block by overlaying a spatial points layer onto a spatial polygons layer. This process adds the 13-digit Census block FIPS code to each record, which I need to conduct Bayesian Improved Surname Geocoding (BISG) – which is a straightforward method for

[6] https://www.geocod.io/

probabilistically estimating an individual's race based on surname and neighborhood racial composition.[7]

The data now contain all the ingredients necessary to use the BISG algorithm to estimate individual-level race probabilities, including: surname, residential address, latitude, longitude, county, precinct, and vote history.

BISG is a widely used and reliable method researchers use to estimate individual-level race prediction. The California Secretary of State uses the method to help them better understanding voter turnout by race, and the Washington State Auditor's office recently used the approach in a performance audit. Furthermore, BISG uses publicly available data (publicly available lists of voters in this case, and Census block population counts) to transparently estimate individual-level race estimation. At a very basic level, for each voter in the voter file, the BISG formula combines information about that voter's surname and where that voter lives. We can do this because many surnames are indicative of race. This is especially the case for people with Spanish surnames. For instance, a surname such as Hernandez is much more likely to be held by a person of Hispanic descent, whereas a surname like Collingwood is more likely to be held by a non-Hispanic white person. The 2010 Census tabulated the racial distribution of all surnames occurring at least 100 times in the United States, and thus, this surname list serves as one data point as to each voter's race probability.[8]

The second bit of information draws on where each voter lives. I locate each voter within a Census block, which is the smallest geographic unit in which the Census provides demographic counts. Thus, if that same voter with the Hernandez surname lives in a block that is 97% Hispanic, the probability of them being Hispanic will increase. However, if that same voter with the surname Hernandez lives in a block that is just 25% Hispanic, then the probability that they are Hispanic will decrease. The BISG formula will provide five probabilities for each voter: the probability they are non-Hispanic white, Black, Hispanic, Asian/Pacific Islander, or Race Other.

Of the files I received from the Secretary of State's office, I rely on eight files of registered voters containing information on who voted (and who did not vote) in the last general election – or in the last primary election. Each file contains all registered voters in the state as of the date listed, and is the first file to list vote history for the previous relevant election. Thus, the 2016 file captures individual level behavior for the 2016 general election; the 2018 file captures individual level behavior for the 2018 general election; and the 2020 file captures individual level behavior for the 2020 general election. I gather the historical voter file closed to each date because it best captures what the electorate looked like at the time. It is not sufficient, for instance, to gather the latest Washington registered voter file,

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[7] Later in the report I conduct a voter turnout analysis on 2020 and 2018 general election registrants. For this part, I geocoded and performed BISG for all registered voters in the 5-county region.

[8] https://www.census.gov/topics/population/genealogy/data/2010_surnames.html

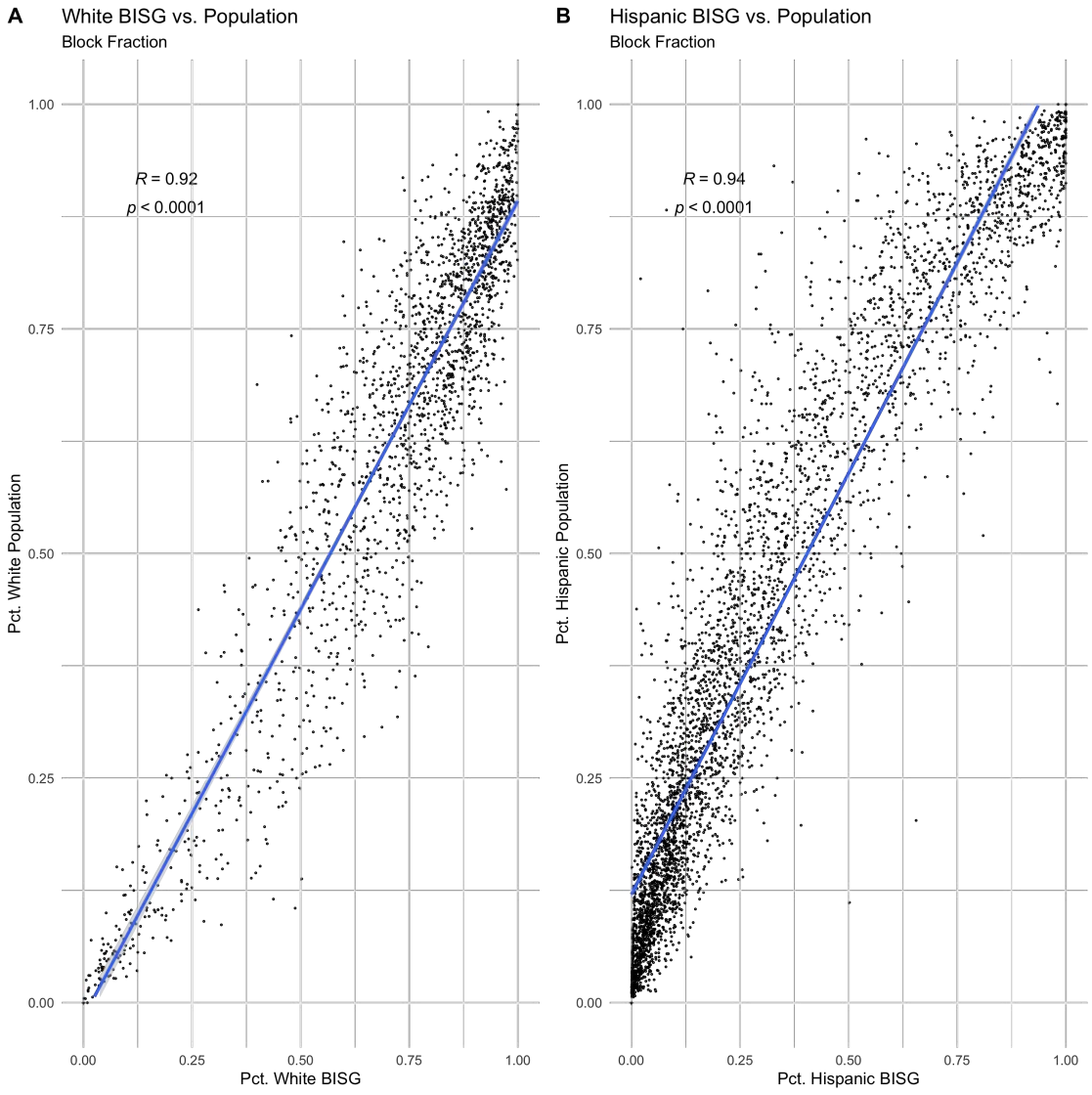
then subset to people who cast ballots in the requisite elections because people have since moved within and outside of the state, and within and outside of the various focus counties.

I use the bisg R package (Decter-Frain and Sachdeva 2021) – an extension of the eiCompare software suite–to estimate the race probability of all voters because I can use 2020 Census population data rather than 2010 Census counts. I also attach these Census counts onto each individual voter record so that I can validate BISG prediction accuracy. I loaded either 2010 or 2020 Census block level population estimates into my statistical software using the U.S. Census data file known as P.L. 94-171 data, which the U.S. Census Bureau created from the 2010 and 2020 Census data. These files contain population (i.e., demographic) counts for all Census blocks in the United States. The P.L. 94-171 data is the main dataset used in redistricting every 10 years. If, for instance, we want to know how many people live in Block X we must turn to the P.L. data for the answer. Because I am only interested in Washington voters, I narrow the P.L. data to Washington.

Using the P.L. 94-171 data, I develop block-level demographic counts for non-Hispanic single race white, Hispanic, non-Hispanic single race AAPI (Asian American Pacific Islander), non-Hispanic single race Black, and race other. These counts are then sent into the BISG algorithm and used as the geographic probability side of the BISG formula.

By way of validation, I aggregated the 2020 voter file with BISG probabilities attached by race to the Census Block by summing each racial group's probability. We should observe a robust positive relationship between BISG and population data at the aggregate level. To apply this to the subject data set, I calculated the percentage of individuals from each racial group per block and did the same at the population level. Figure 2 plots out the relationship between percent race by BISG and percent race by population (for non-Hispanic white and Hispanic). The correlation for the two ethno-racial population groups hovers between 0.92-0.94, the regression line (blue) is positive and statistically significant. This result indicates that the BISG formula worked correctly in this case and as we would expect, with a high correlation.

Figure 2. BISG vs. population scatterplots at the block level by classified non-Hispanic white and Hispanic voters.



To enter the surname race probabilities, the BISG package incorporates the 2010 U.S. Census surname database. This database includes race probabilities for the same five racial categories of every name occurring in the United States at least 100 times. Names that are uncommon are imputed to the surname racial probability average. With these two bits of information, the BISG method uses Bayes' Theorem to produce a race estimate for the five aforementioned racial groups for every voter. The BISG Bayes formula in the Appendix provides the details of the formula.

The final step is to aggregate each racial probability to the precinct then join with the election data using unique county precinct identifiers. For example, in a precinct with 1,000 2020 voters, each voter will have a probability between 0-1 for white, Black, Hispanic,

AAPI, and other. For instance, there might be a Collingwood who lives in a block within this precinct. BISG might assign this voter a 0.917 probability of being white, a 0.059 probability of being Black, a 0.006 probability of being Hispanic, a 0.002 of being Asian, and a 0.015 probability of being race: other. To generate the percentage of voters in the precinct that are Hispanic, for instance, I sum each voters' probability of being Hispanic then divide by 1,000. That percentage is then my racial Hispanic demographic estimate in that precinct.

Finally, and as noted, I opt for the BISG method as my source of demographic input into the ecological model instead of using voting age population (VAP) or CVAP counts for reasons of turnout variation by race. According to U.S. Census estimates, 77% of eligible whites in Washington State cast ballots in 2020 general election, whereas 54% of eligible Hispanics cast ballots in the same election.[9] In the United States as a whole, 53.7% of citizen voting age Hispanics reported to have voted in the 2020 general election. Meanwhile, 70.9% of citizen voting age non-Hispanic whites reported to have voted in the same election. Further, as my turnout analysis later in the report demonstrates, this turnout gap between white and Hispanic voters grows further in off-year midterm elections. Thus, by relying on VAP or CVAP as my demographic input, I would not be able to account for this gap in racial turnout as cleanly.

D. Racially Polarized Voting

Once all the precinct data are cleaned and joined, for each contest, I subset the precincts to the appropriate geographic unit – either all five counties in the case of statewide contests and legislative seats fully contained in the 5-county region, or relevant portions of legislative seats within the region. I use two methods to estimate racially polarized voting between non-Hispanic whites and Latinos: 1) Ecological Inference (EI); and 2) Rows by Columns (RxC). These are two of the commonly used and reliable methods to estimate vote choice by race using precinct data. Both approaches produce very similar estimates: Out of the 25 contests, both methods produce RPV in 23 contests for a rate of more than 92%.

Figure 3 presents the EI results of the contests that do not feature Spanish-surname candidates. The colored bar and number represent the point estimate – the most likely vote estimate given the underlying data. The little black bars represent the statistical uncertainty inherent in the model, in this case the 95% confidence or credible interval. In short, with the confidence interval, we can be 95% confident that the true vote estimate lies somewhere in between the low and high point represented by the error bar. The top row presents the RPV results for the 2020 Treasurer contest. Column one reports results for the Democratic candidate, Column 2 results for the Republican candidate.

[9] https://www.census.gov/data/tables/time-series/demo/voting-and-registration/p20-585.html

For example, EI estimates that in the 2020 Treasurer contest, Latino voters preferred Pellicciotti (77% - 23%) whereas white voters preferred Davidson (79% - 21%). In the 2020 presidential election, EI estimates that 78% of Latino voters backed Biden, whereas just 27% of whites did so. Turning to Column 2, the pattern is reversed with just 22% of Latinos backing Trump and 73% of whites backing Trump. These results are consistent with a pattern of racially polarized voting.

The gubernatorial contest (Row 3) reveals a similar pattern of RPV: 75% of Latino voters backed Inslee, whereas just 24% of white voters did so. Instead, white voters gave 76% of their support to Culp, whereas just 25% of Latinos did. A similar pattern emerges for attorney general: Bob Ferguson notched 79% of the Latino vote but just 25% of the white vote. Instead, white voters backed Larkin with 75% of their vote, and Latinos voted 21% for Larkin. Again, these results demonstrate racially polarized voting.

The 2018 statewide contests show once again a similar pattern: About 80% of Latino voters backed Senator Cantwell in her re-election contest against Hutchinson. White voters, however, preferred Hutchinson with about 74% of their vote. The Congressional District 4 contest also shows significant racial polarization: 78% of Latinos backed Brown, whereas 74.3% of white voters backed the Republican Newhouse.

Finally, the 2016 statewide contests subset to the 5-county region reveals strong Latino support for the Democratic candidates of Murray for U.S. Senate (84%), Clinton for U.S. President (79%), and Inslee for Governor (82%). White voters, however, backed the Republican candidate, respectively, 69% for Vance, 71% for Trump, and 73% for Bryant.

Figure 3. Racially Polarized Voting assessment in statewide contests subset to the Yakima Valley 5-county region: Adams, Benton, Franklin, Grant, Yakima. Ecological Inference (EI) method.

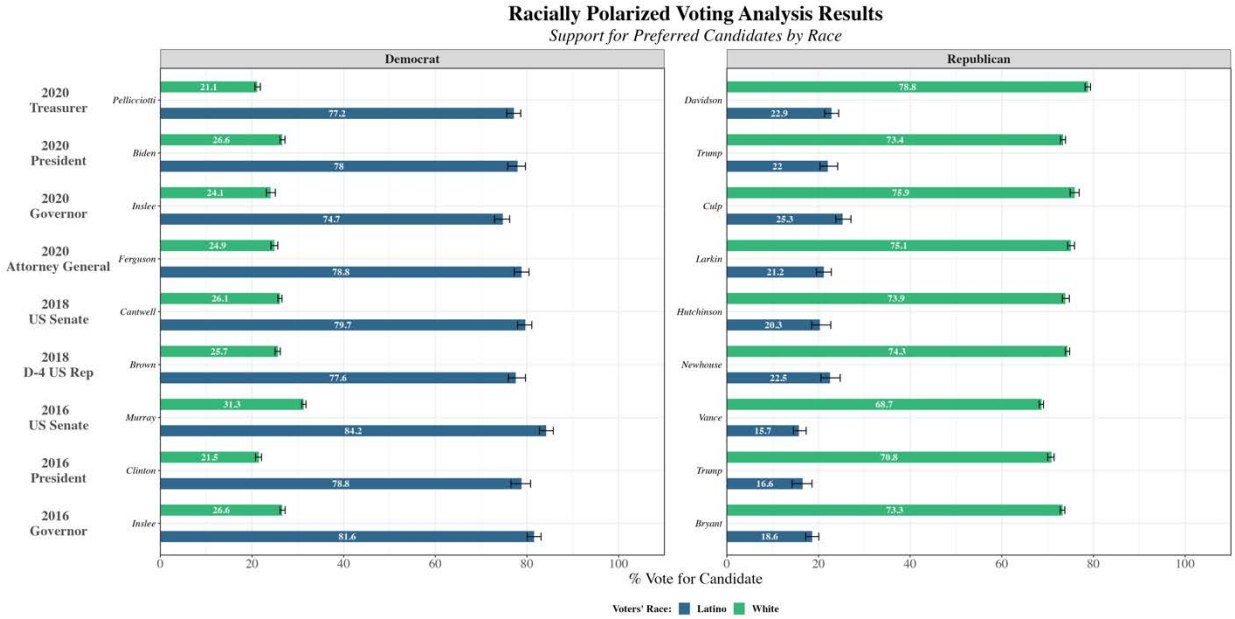
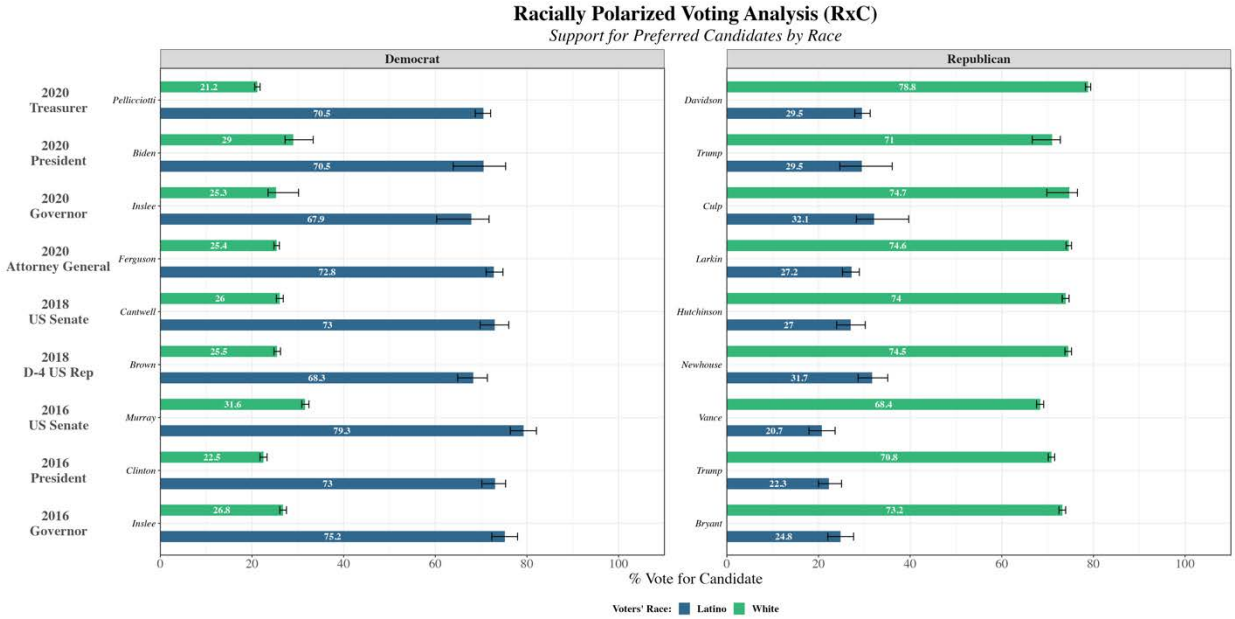


Figure 4 presents the same contests but analyzed with the RxC method. In the model, I incorporated variables for "other candidates" (often a smattering of candidates or write-ins achieving maybe 2% of the vote), no votes, and a catch-all "race other." For presentation, I only show the white and Latino estimates for the top two candidates. The results are exceedingly consistent with the ecological inference approach presented above and show high levels of racially polarized voting between Latino and white voters in the 5-County area.

Figure 4. Racially Polarized Voting assessment in statewide contests subset to the Yakima Valley 5-county region: Adams, Benton, Franklin, Grant, Yakima. Rows by Columns (RxC) method.



I then analyzed 16 contests featuring Spanish-surname candidates. Each of these candidates are Latino except for Manjarrez (Yakima County District 2), who is married to a Latino individual thereby taking his surname. Because we know that voters often proxy ethnicity based on surname (Barreto 2010), I include that candidate as well. Four of these contests are primary contests which are denoted "primary" in the left-hand contest label.

RPV exists in 14 of these 16 contests, with Latino voters strongly backing the Spanish-surname candidate in each contest. In just one contest do white voters also back the Spanish-surname candidate (Gonzalez in the 2018 non-partisan State Supreme Court Seat 8). However, in the 2018 state supreme court election, neither candidate was white, and the challenger (Choi) was not considered to be a serious challenger due to Choi's lack of fundraising, lack of endorsements, late start in campaigning, and a prior lawsuit where the Attorney General sued him for not making required campaign disclosures.[10] In the 2020

[10] For example, see https://www.spokesman.com/stories/2018/sep/17/two-of-three-incumbents-unchallenged-in-state-supr/

Superintendent of Public Instruction election, whites nearly evenly split their vote. Specifically, in the 2020 contest for Superintendent of Public Instruction, 67.8% of Latinos backed the Latino candidate Espinoza, whereas 49.6% of whites did so.

Analyzing the elections with Spanish surname candidates, in the 2020 State Supreme Court Position 3 contest, 73% of Latinos backed Montoya, whereas Anglos preferred Larson by a margin of 66%. In the 2020 Legislative District 13 Position 1, 70% of Latino voters supported Castañeda Diaz whereas white voters backed Dent with 87% of their vote.[11] The 2020 Legislative District Position 1 primary produced fairly similar RPV results: 89% of white voters backed Dent, with 61% of Latino voters backing Castañeda Diaz. Note how the primary contest has larger statistical uncertainty (observed by the wider confidence bands) due to lower turnout which has the statistical effect of reducing the size of the Latino population across the precinct distribution.

In the 2020 Franklin County District 2 contest, Latino voters supported Peralta by a margin of 89%, with only 11% for Mullen. Anglo voters, however, backed Mullen by a margin of 87%, with only 13% for Peralta.

Turning next to three 2018 contests, I analyzed Yakima County District 3, State Supreme Court Position 8, and State Senate Legislative District 15. In Yakima D3, 83% of Latino voters backed Soto Palmer, whereas 77% of non-Hispanic white voters backed Childress. In the State Supreme Court contest, 75% of Latino voters preferred Gonzalez, but so did 51% of Anglo voters (see additional analysis above). Finally, in the State Senate 15 contest, Latinos preferred Aguilar (81%), whereas Anglos preferred Honeyford (82%).

In 2016, I analyzed Yakima County District 2, where 74% of Latino voters supported Manjarrez while 62% of whites preferred Anderson. In Legislative District 14 Position 1 (Yakima County only), 88% of Latino voters preferred Soto Palmer, but 83% of white voters preferred Johnson.

I analyzed four 2014 contests and two 2012 contests. In the 2014 State Senate District 15 primary election contest, Munoz received 69% of Latino support, whereas Honeyford attracted 86% of white support. In the 2014 State Representative District 15 primary election, Martinez Chavez notched 79% of the Latino vote, whereas the white vote preferred Taylor with 88%.

In the 2014 State Senate District 15 general election contest, Munoz received 65% of Latino support, whereas Honeyford attracted 86% of white support. In 2014 State Representative District 15 general election, Martinez Chavez notched 68% of the Latino vote, whereas the white vote preferred Taylor with 85%.

Finally, in the 2012 State Representative District 15 contest, Gonzalez received 89% of the Latino vote, whereas Taylor scored 85% of the white vote. In the primary that same year,

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[11] In this analysis I include only precincts located in Grant County, because that region is included is part of the 2021 enacted and/or plaintiff's demonstrative map.

RPV is present between the same candidates: Latino voters supported Gonzalez (92%) while Anglo voters supported Taylor (85%).

Together, these results show that Latino voters at high levels prefer the same candidates for political office, and white voters consistently prefer different candidates. Further, white voters are politically cohesive with one another and vote as a bloc against the Latino preferred candidates, leading to the defeat of the Latino candidates of choice, at least within the subset 5-county area.

Figure 5. Racially Polarized Voting assessment in contests featuring Spanish-surname candidates. Ecological Inference (EI) method.

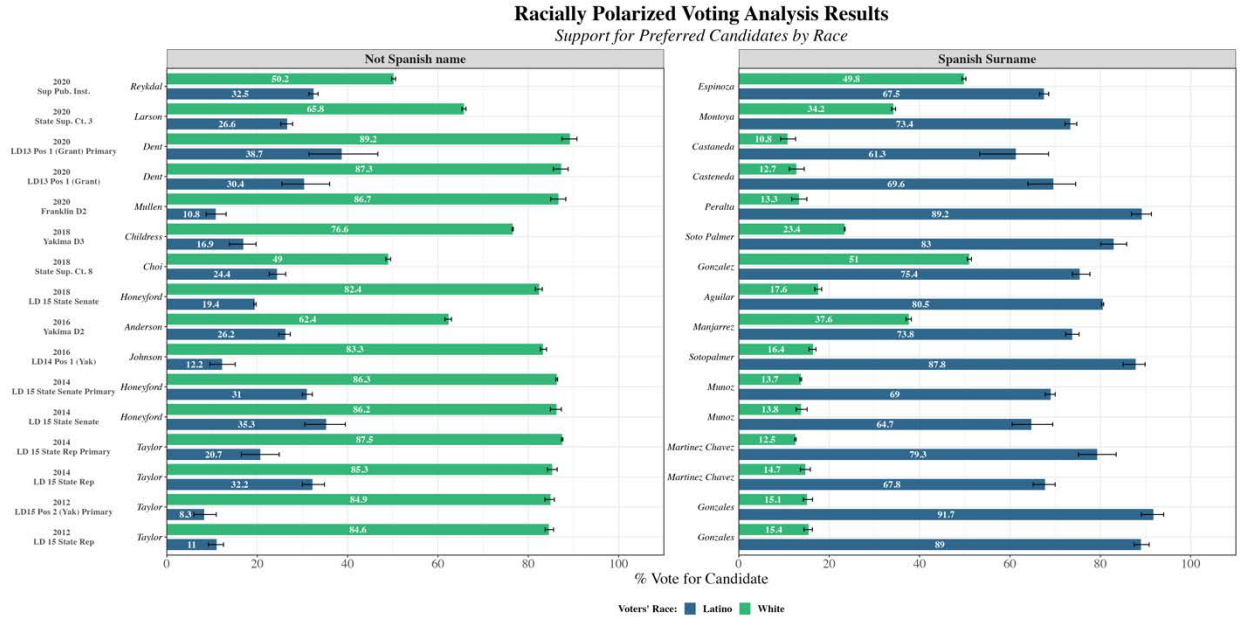
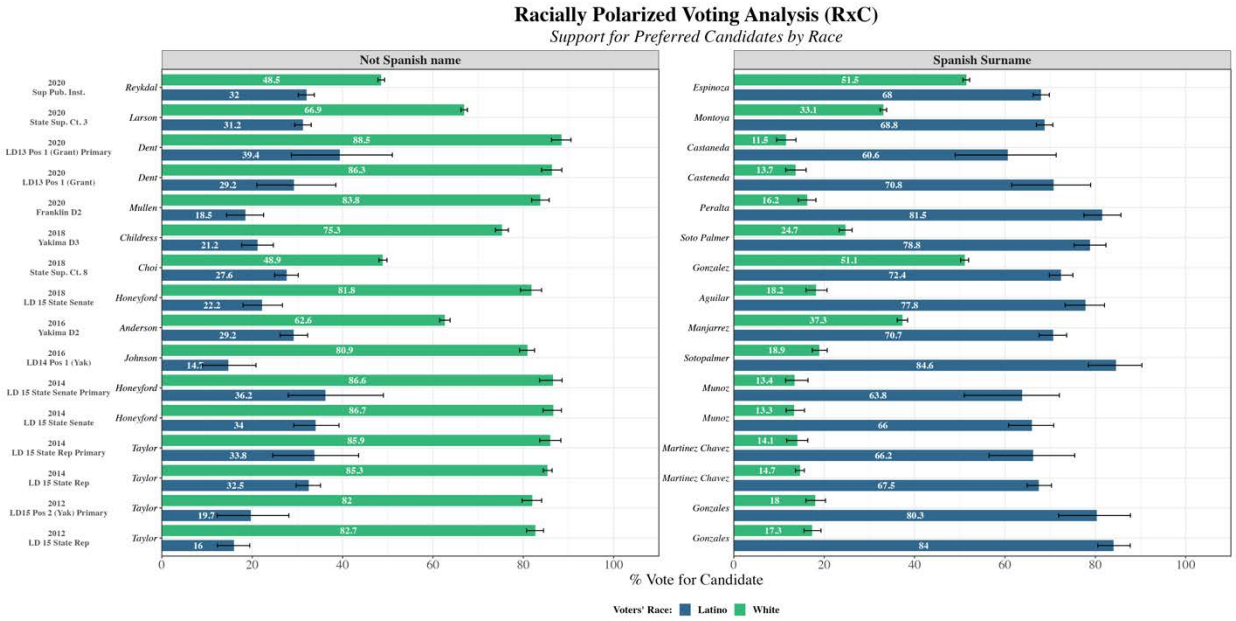


Figure 6 presents the RxC estimates. The results are consistent with the EI model, and show that a high level of RPV is present in 14 of the 16 contests considered.

Figure 6. Racially Polarized Voting assessment in contests featuring Spanish-surname candidates. Rows by Columns (RxC) method.



E. Performance Analysis of Enacted Plan vs. Plaintiffs' Demonstrative Plans

I was also asked to determine whether the white majority usually blocks Latino voters from electing candidates of choice. I assess this in two ways.

First, I assess whether the white- or Latino-preferred candidates win in the aforementioned Spanish-surname local contests. If the white-preferred candidate wins that means that white voters are blocking Latino voters' ability to elect candidates of choice. However, if on average, Latino voters' preferred candidate usually wins, that means white block voting is not present. I conduct this analysis for the local contests that cover only part of the jurisdiction.

Table 3 lists the results. For each row, I present the election year, the contest, the type (primary or general), whether the contest is partisan, the Spanish-surname candidate and their vote percent, the non-Spanish-surname candidate and their vote percent, and whether white voters blocked the Latino-preferred candidate. In every single contest, white voters voted as a bloc to defeat the Latino-preferred candidate, providing strong evidence for Gingles III.

Table 3. List of legislative or county/local elections featuring contests with Spanish Surnames, between 2012-2020, candidate vote totals, and whether White voters blocked the Latino-preferred candidate from winning.

Year	Contest	Type	Partisan	SpanishSur	PercentSp	NonSpanishSur	PercentNsp	Blocked
2020	LD-13 Position 1	Primary	YES	Castaneda Diaz	22.81	Dent	74.35	Yes
2020	LD 13 Position 1	General	YES	Castaneda Diaz	28.57	Dent	71.33	Yes
2020	Franklin Commish D2	General	NO	Peralta	40.79	Mullen	59.07	Yes
2018	LD 15 State Senate	General	YES	Aguilar	39.41	Honeyford	60.59	Yes
2018	Yakima Board D3	General	NO	Soto Palmer	40.29	Childress	59.71	Yes
2016	LD-14 Position 1	General	YES	Soto Palmer	33.95	Johnson	66.05	Yes
2016	Yakima Board D2	General	NO	Manjarrez	48.22	Anderson	51.78	Yes
2014	LD-15 State Senate	Primary	YES	Munoz	24.49	Honeyford	75.51	Yes
2014	LD-15 position 2	Primary	YES	Martinez-Chavez	24.67	Taylor	75.33	Yes
2014	LD 15 State Senate	General	YES	Munoz	27.24	Honeyford	72.76	Yes
2014	LD 15 State Rep.	General	YES	Martinez-Chavez	27.59	Taylor	72.41	Yes
2012	LD 15 Position 2	Primary	YES	Gonzalez	38.92	Taylor	61.08	Yes
2012	LD 15 State Rep.	General	YES	Gonzalez	29.97	Taylor	70.03	Yes

Second, I examine whether the minority-preferred candidate wins in contests featuring racially polarized voting in statewide/exogenous elections subset to the enacted LD 15 and to several demonstrative plans. Specifically, I test whether majority-bloc voting is sufficient to prevent minority voters from electing their candidate of choice by analyzing whether alternative district maps can be drawn that are more likely to result in minority voters electing their preferred candidates of choice than under the enacted district map.

To do so, I conducted electoral performance analyses on Legislative District 15 in the Enacted Plan, as well as a set of demonstrative alternative plans provided to me by counsel for the Plaintiffs. An electoral performance analysis reconstructs previous election results based on new district boundaries to assess whether a minority or white preferred candidate is most likely to win in a given jurisdiction under consideration (i.e., a newly adopted legislative district).

This type of inquiry informs a RPV analysis in districts that have not yet had elections because it tests whether different plans would provide a more equal ability for minority voters to participate in the electoral process and to elect candidates of choice. Thus, the performance analysis shows that a remedy is possible.

I gathered precinct results across the same set of statewide elections (and the 4th congressional district) in which I conducted my RPV assessment.[12] To examine how a candidate performs in the enacted District 15, I then subset the precincts to only those falling within the new District 15 boundary. I use the same method to assess Plaintiffs' demonstrative districts with different boundaries.

This approach often results in a generally small number of precincts being split across district boundaries, leaving the choice as to whether to allocate all votes in that precinct to

[12] Note, I do not include the two statewide contests in which RPV is not present because blocking is not possible in those instances.

District 15, none, or some. This concern is resolved by taking an additional step with regard to precincts that are split across district boundaries. I overlaid the voting tabulation district (vtd) polygon shape file with the 2020 block polygon shape file and join population-level data including voting age population (VAP). Because blocks are fully nested inside vtds in this instance, I can make adjustments to precinct vote totals by weighting split precinct votes by total voting age population. In precincts that split between districts, I take blocks on the one side of the district boundary to estimate the share of the VAP that is inside/outside of the district.[13] This helps to improve the vote estimate.

As a point of comparison, one way to address this issue may be to turn to geographic distribution instead of population distribution. For example, a precinct might be geographically split 50-50 between a hypothetical District 4 and District 8. If there are 100 votes in the precinct, I could assign 50 votes to the part of the precinct in the district, and divide all candidate votes in half. If Trump had received 70 of the precinct's initial 100 votes, and Biden 30, I would assign Trump 35 votes (70*0.5) and Biden 15 (30*0.5) totaling 50 votes.

A more appropriate method is to take account of where the population lives within the precinct by using blocks – a much smaller and more compact geographic unit. Each block contains a tally for voting age population (VAP); therefore, I can sum the VAP for all blocks for the part of the precinct falling inside of District 4, and for the part of the precinct outside of D4. This method more adequately accounts for population distribution within the precinct instead of relying on geographic area alone. It could be the case that 70% of the VAP resides in the part of the precinct falling into D4, and 30% in a neighboring district. So instead of multiplying the initial 100 votes by 0.5, for District 4, I multiply the precinct's initial 100 votes by 0.7. In this scenario, Trump would receive 49 of the 70 votes and Biden 21 votes. While the candidate vote share ratio might be the same the Trump net differential moves from plus 20 (35-15) to plus 28 (49-21).

Once I have accounted for split precincts, I combine all precincts and their candidate votes together. For each contest, I then sum votes for candidate 1 and candidate 2, respectively, and divide by total votes cast. I replicate this procedure for the enacted and three Plaintiff demonstratives maps.

Summary of Electoral Performance Results

This section presents electoral performance plots showing comparisons between the Enacted Plan (Legislative District 15) and the three demonstrative plans Plaintiffs provided for an alternative Legislative District 14. The question I am examining is whether the enacted plan and alternative demonstrative plans provide Latino voters a greater ability to elect candidates of choice in the Yakima Valley and surrounding areas.

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[13] https://www.census.gov/cgi-bin/geo/shapefiles/index.php?year=2020&layergroup=Blocks+%282020%29; https://redistrictingdatahub.org/dataset/washington-block-pl-94171-2020/

I found that the enacted LD 15 does not provide Latino voters in the district an equal opportunity to elect candidates of choice, while the Plaintiffs illustrative maps do provide Latino voters with an ability to elect such candidates.

To determine the competitiveness of the district, I examined eight elections subset to the district boundaries. The maps of the district boundaries I analyzed are shown below in Figures 7 - 10.

Figure 7. Enacted Washington House Legislative District 15.

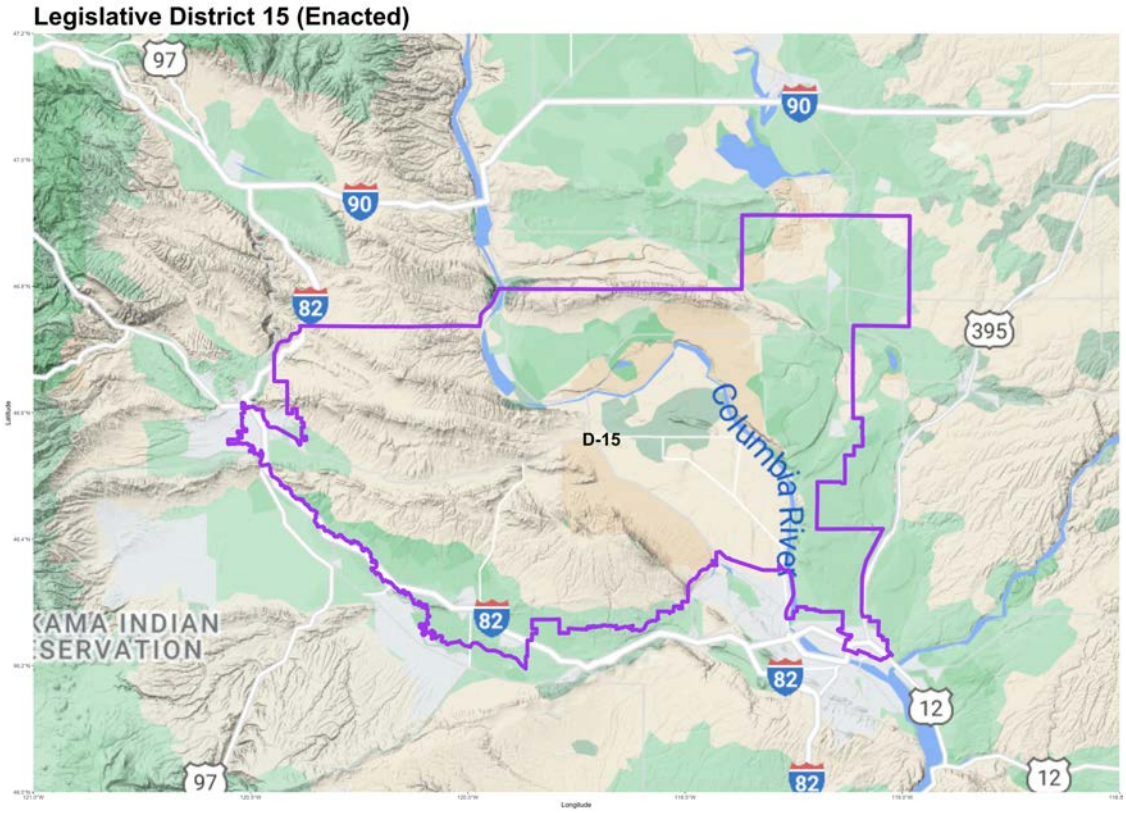


Figure 8. Washington House Legislative District 14, Plaintiffs' Demonstrative 1.

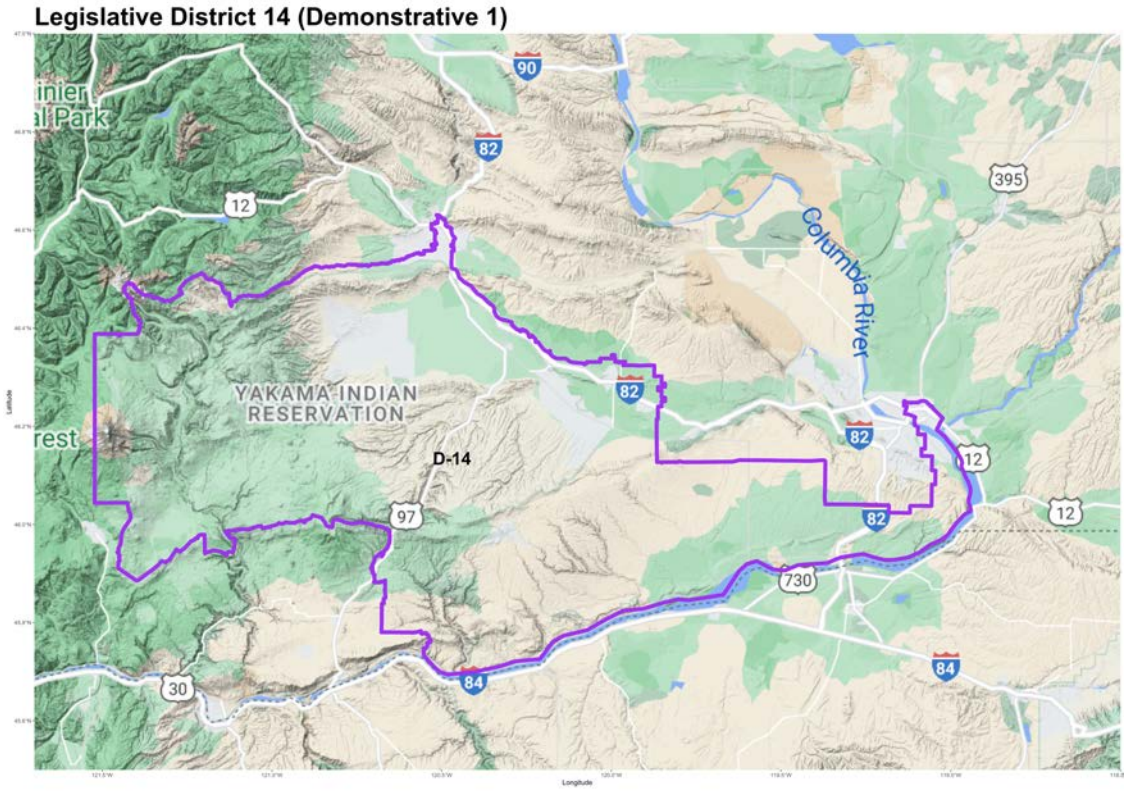


Figure 9. Washington House Legislative District 14, Plaintiffs' Demonstrative 2.

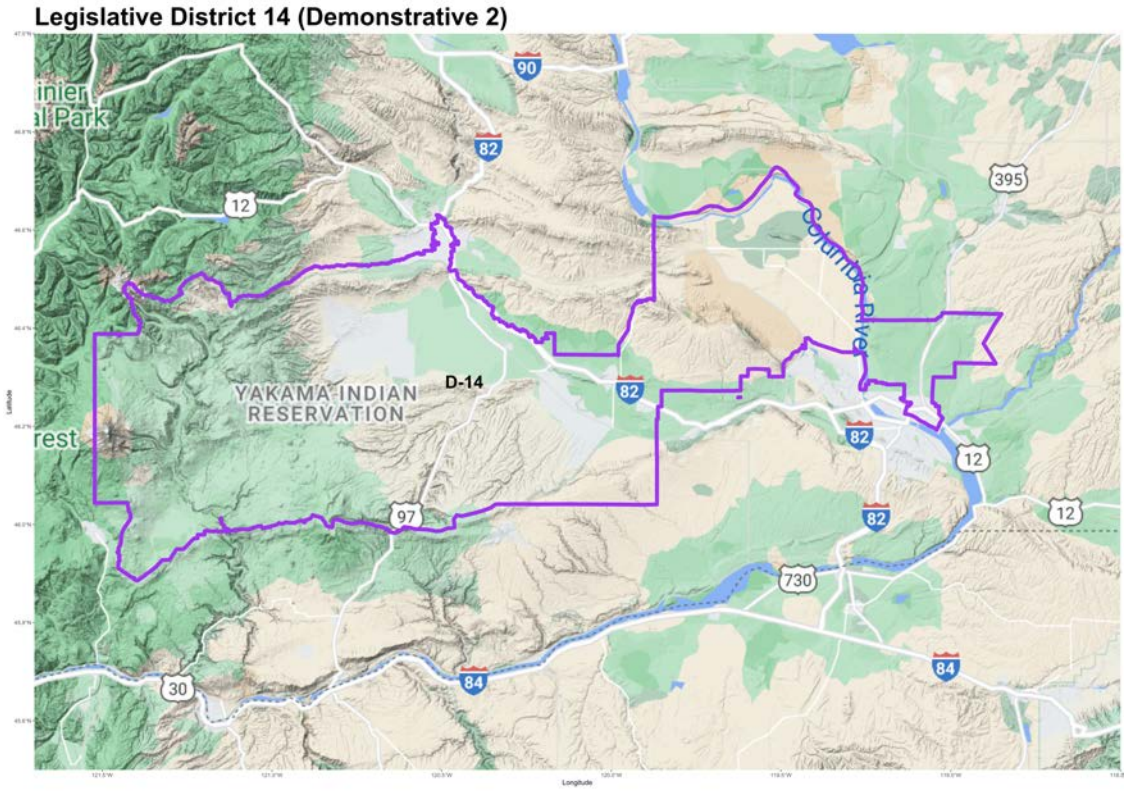
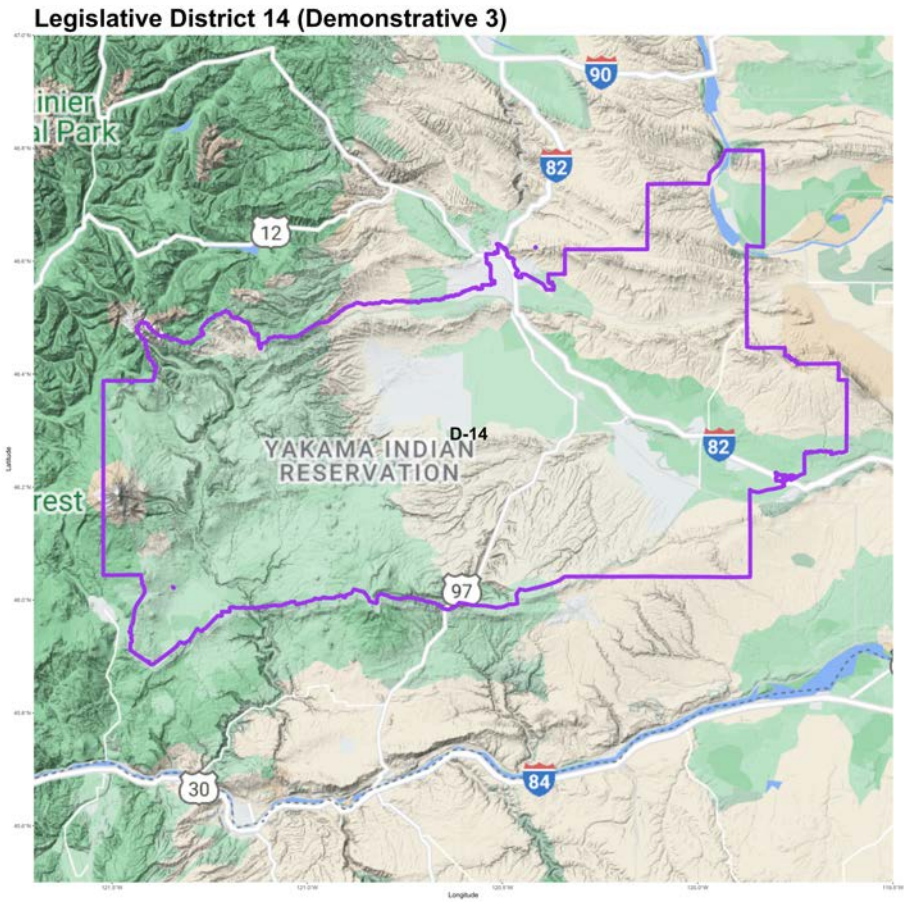


Figure 10. Washington House Legislative District 14, Plaintiffs' Demonstrative 3.

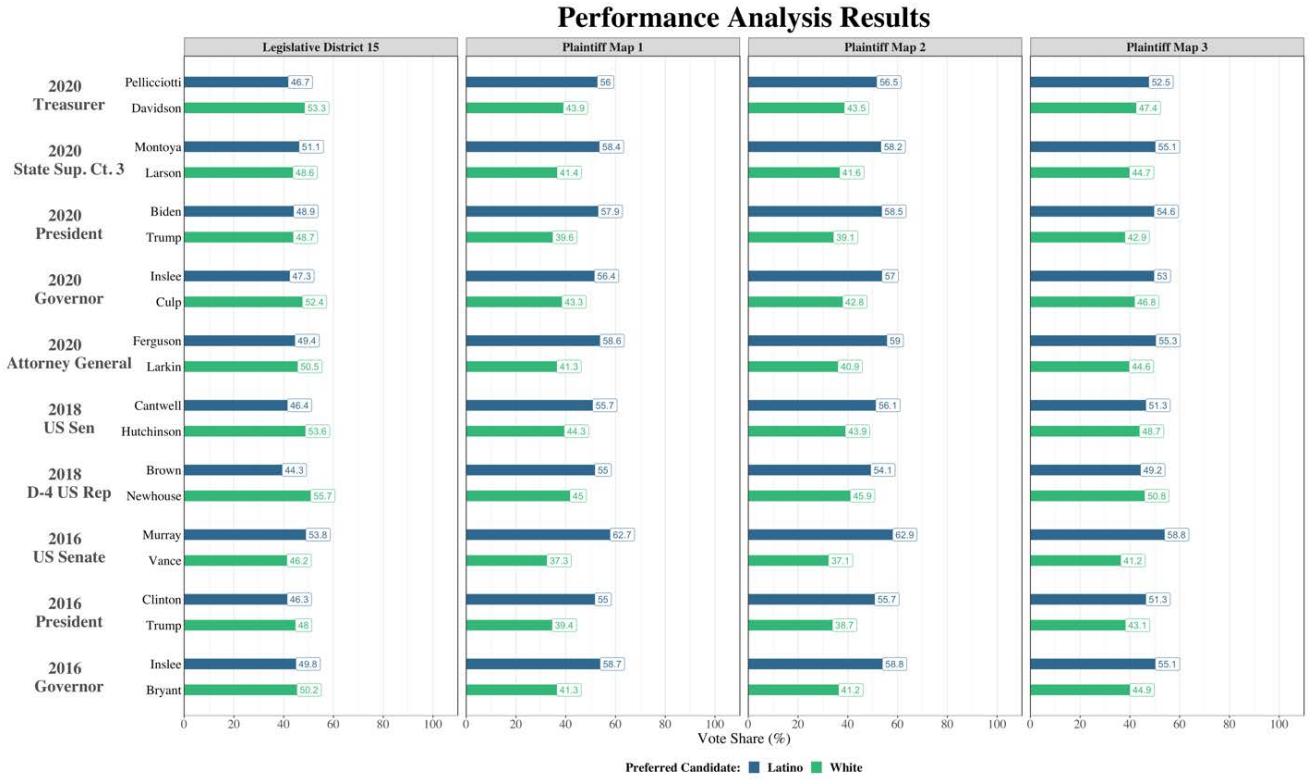


Turning to the results, Figure 11 shows four columns: Column 1 presents results subset to the enacted map, Column 2 is Plaintiffs' Demonstrative map 1, Column 3 is Plaintiffs' Demonstrative map 2, and Column 4 is Plaintiffs' Demonstrative map 3.

Performance analysis of the enacted map shows the white-preferred candidate winning 7 of 10 contests. Latino-preferred candidates win in only three contests: the 2020 Presidential election, the 2020 State Supreme Court Position 3, and the 2016 U.S. Senate race. Thus, the Latino-preferred candidate loses 70% of the time.

Plaintiffs' demonstrative plans provide Latino voters with a much greater chance of electing candidates of choice and gaining representation in this geographic area. Both Plaintiffs' demonstratives 1 and 2 show the Latino-preferred candidates winning all 10 contests for a win-rate of 100%. Plaintiffs' Demonstrative map 3 shows the Latino-preferred candidates winning 9 of 10 contests for a win-rate of 90%.

Figure 11. Electoral Performance analysis, 2016-2020 statewide general elections, paneled by enacted LD 15, LD 14 Plaintiff Demonstratives 1-3.



The performance analyses of the enacted and demonstrative plans provide strong evidence of white bloc voting – that is, the enacted LD 15 map will enable the white majority to block Latino voters' ability to elect candidates of choice. However, Plaintiffs' alternative districts provide Latino voters with an opportunity to elect candidates of their choice.

II. District Characteristics Analysis

Using Dave's Redistricting software,[14] I gathered statistics about the enacted LD 15 as well as the Plaintiffs' three demonstrative plans showing their level of adherence to traditional redistricting criteria. Table 3 outlines several statistics about each plan, including: total population, population deviation, percent white CVAP, percent Latino CVAP, district compactness (Reock and Polsby), overall plan compactness (Reock and Polsby), county-district and district-county splits, and precinct splits.

Compactness scores range from 0-1, with 1 being perfect compactness, like a circle. County-district splits measure how much the map splits counties across districts and vice

[14] Dave's Redistricting is a free and publicly available software and database map drawers use to develop redistricting plans. Washington's own Redistricting Commission employed this software during the map drawing process.

versa for district-county splits. In both cases, for splits the smaller the number, the more desirable from a mapping perspective.

Overall, on measures of population deviation, demographics, compactness, and splits, the Plaintiffs' demonstrative maps perform similarly to or better than the enacted LD 15. The population deviation of the enacted LD 15 and Plaintiffs' demonstratives are all very close to zero and virtually identical.

Table 4. Enacted and Demonstrative map statistics.

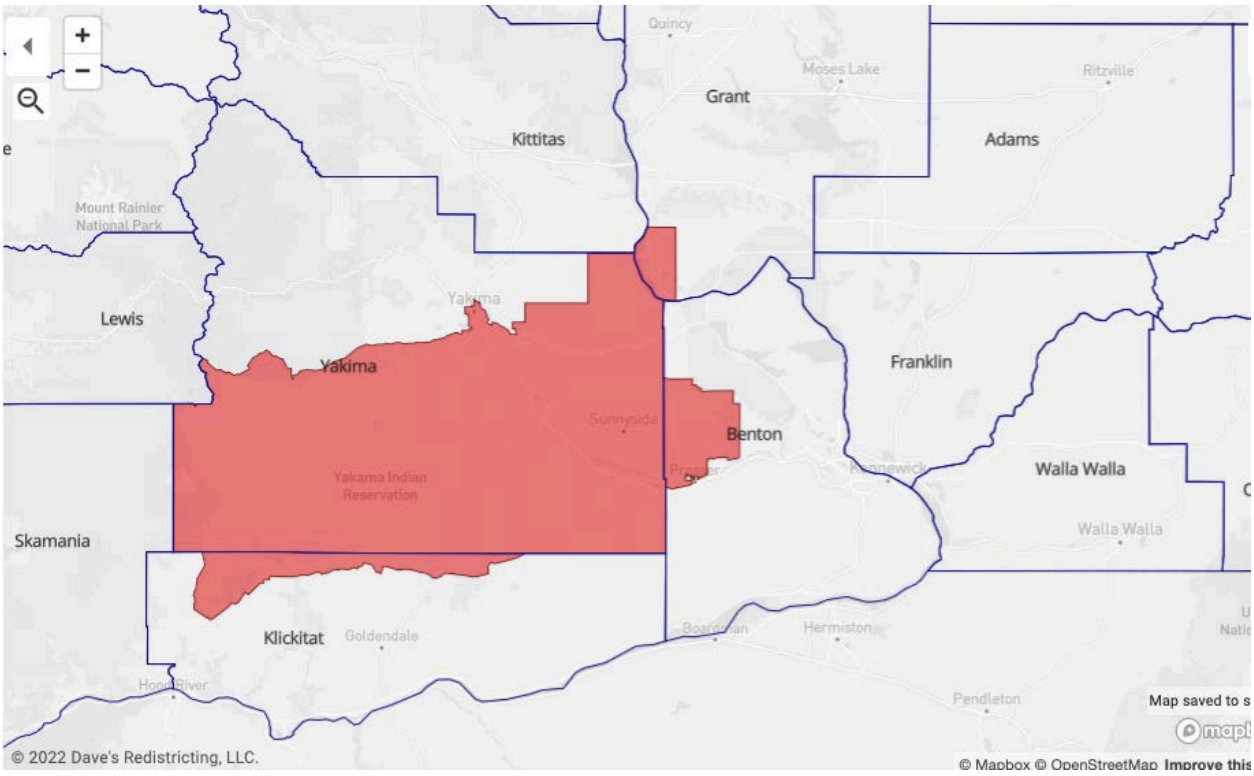
Statistic	Enacted	Alt 1	Alt 2	Alt 3
Population	157253	157247	157269	157223
Pop. Dev.	-0.0001	0	0.0001	-0.0002
WCVAP20	43.2	37	35.7	40.1
LCVAP20	51.5	52.5	53.6	50.2
District Reock	0.3226	0.2142	0.1766	0.3312
District Polsby	0.2372	0.2131	0.1812	0.3168
Map Reock	0.3993	0.3883	0.3918	0.395
Map Polsby	0.3204	0.3119	0.3114	0.3189
County-District	1.61	1.56	1.6	1.61
District-County	1.25	1.21	1.25	1.25
Precinct Splits	284	279	280	280

As Table 4 demonstrates, LD 14 in all three of Plaintiffs' demonstrative maps has a Latino CVAP of over 50%. Demonstrative 1 has LD 14 with a 52.5% Latino CVAP, Demonstrative 2 has LD 14 with 53.6% Latino CVAP, and Demonstrative 3 has LD 14 with a Latino CVAP of 50.2%.

On population deviation, all three of Plaintiffs' demonstrative plans match or beat enacted LD 15. For compactness scores for the relevant district, Plaintiffs' Demonstrative 3 has a higher Reock and Polsby-Popper score than the Enacted LD 15. Plaintiffs' Demonstrative 1 and 2 have slightly lower Reock scores, but Polsby-Popper scores that are very similar, and all of the demonstrative districts' compactness scores are reasonable. Further, all of the statewide demonstratives provided by Plaintiffs have higher or very similar Reock and Polsby-Popper scores for the overall map.

In terms of splits, all three of Plaintiffs' demonstrative districts contain the same or fewer county-district or district-county splits as the enacted map. And as shown in Figure 12, LD 14 in Demonstrative 3 splits only 4 counties (Yakima, Benton, Franklin, and Grant), while enacted LD 15 splits 5 (Benton, Yakima, Franklin, Adams, and Grant). Plaintiffs' demonstrative districts include a portion of Klickitat County to match the boundary of the Yakama Nation Reservation. Finally, all three of Plaintiffs' demonstratives contain fewer precinct splits.

Figure 12. County View of Plaintiffs' Demonstrative 3, LD 14.



III. Commission's Draft Maps and Decision Timeline

The Washington State Redistricting Commission consisted of five people: 1 independent non-voting chair, Sarah Augustine; two Democratic appointees, April Sims and Brady Walkinshaw; and two Republican appointees, Paul Graves and Joe Fain. In the redistricting process, the commissioners and/or their staff drafted and considered a number of maps, including various configurations of LD 14 and LD 15. Plaintiffs' counsel provided me with the links and shapefiles/block assignment files for these maps.

Table 5 compares these LD 14 and 15 drafts, including the name of each draft, the district numbering (whether 15 or 14), the Latino CVAP according to the 2019 5-Year ACS data (the data considered by commissioners during their map-drawing process), the Latino CVAP according to the most recent 2020 5-Year ACS data, and the Latino-preferred candidate's vote share across eight statewide election contests. These eight election contests are drawn from the statewide contests that I used to assess performance above, and for which I have identified a Latino-preferred candidate, and thus they allow us to see whether the draft maps perform for Latino voters.

Table 5. Decision Timeline.

Map	Dist #	'19 5-Yr ACS Latino CVAP %	'20 5-Yr ACS Latino CVAP %	Vote Share of Latino-Preferred Candidate (shaded if > white-preferred candidate's vote share)							
				2020 Pres% Biden	2020 Gov% Inslee	2020 AG% Ferguson	2020 Treas.% Pellicciotti	2018 U.S. Senate% Cantwell	2016 Pres% Clinton	2016 Gov% Inslee	2016 U.S. Senate% Murray
9.8 LD Draft Dominique Meyers to Sims	15	44.9	46.4	53	51.5	53.6	50.9	50.1	49.4	53.4	56.8
9.21 Fain Proposal Fain public release	15	33.8	35.5	46.2	44.4	46.2	43.3	43.7	41.9	46.7	49.8
9.21 Graves Proposal Graves public release	15	34.2	36.3	40.6	38.8	40.7	37.7	38.8	37.3	42.1	45.7
9.21 Sims Proposal Sims public release	15	44.7	46.1	54.1	52.5	54.6	51.9	51.4	50.4	54.4	58
9.21 Walkinshaw Prop Walkinshaw public release	14	40.4	41.5	55.4	53.7	55.8	53.1	53.7	51.5	55.3	59.4
10.25 Sims Proposal Sims public release	14	51.6	53	56.1	54.4	56.8	54.1	53.5	53.3	56.8	60.7
10.25 Walkinshaw Prop Walkinshaw public release	14	51.6	53	56.1	54.4	56.8	54.1	53.5	53.3	56.8	60.7
11.3 Graves LD 14 (2) Graves proposal	14	50.6	52.0	55.6	53.9	56.3	53.6	53.2	52.8	56.4	60.3
11.7 New leg proposal Anton Grose to Paul Graves	14	50.9	52.6	50.7	49.3	51.3	48.7	48.2	48.3	51.7	55.7
11.8 Fain V2 Fain proposal	15	50.6	52.0	52.4	50.8	52.9	50.2	50.0[15]	50.0	53.4	57.4
11.10 BW 11.10 new VRA Walkinshaw proposal	14	52.6	54	58.8	57.3	59.5	56.9	56.8	56.0	59.6	63.6
11.11 Base proposal Brady Walkinshaw	14	51.6	53	56.1	54.4	56.8	54.1	53.5	53.3	56.8	60.7
11.11 Graves1110LD Anton Grose to Graves, Sims	14	50.3	52	49.7	48.2	50.3	47.6	47.3	47.4	50.8	54.8
11/12[16] April Sims to Paul Graves	15	49.2	50.6	47.9	46.3	48.3	45.7	45.4	45.4	48.9	52.8
11.12 Graves Draft Nov12 (1) Paul Graves and staff	15	50.2	51.6	49.0	47.4	49.5	46.8	46.5	46.5	50.0	53.9
11.13 BW leg proposal Ali O'Neil to Fain staff	14	51.6	53	56.1	54.4	56.8	54.1	53.5	53.3	56.8	60.7
11.15 Copy of 11/14 7:30pm Merged D Map Walkinshaw/Sims	15	49.2	50.5	47.9	46.3	48.4	45.7	45.5	45.4	48.9	52.8
11.15 R Prop Rebalanced Osta Davis to Ali O'Neil	15	50	51.5	48.9	47.3	49.4	46.7	46.4	46.3	49.8	53.8
Enacted Plan	15	50	51.5	48.9	47.3	49.4	46.6	46.3	46.3	49.8	53.7

[15] Light shade indicates a percentage tie (50%-50%).

[16] The numbers here are different than those presented in my initial report submitted in August. In discovery, Plaintiffs' counsel discovered that the Dave's Redistricting App file I previously used had been modified after November 12. Plaintiffs' counsel received the correct version of the file in a production from DRA in response to a subpoena and gave me the appropriate geojson file which I used to generate these numbers.

This analysis first shows that commissioners proposed and considered maps that would have provided Latino voters at least an equal opportunity to elect candidates of choice, although the commissioners ultimately did not select those. In addition, the drafts demonstrate that proposals making the Latino opportunity district LD 14, rather than LD 15, were considered and presented by commissioners. Finally, the drafts in the table, which are displayed chronologically, show that as the map-drawing progressed and negotiations continued, the performance for Latino preferred candidates was systematically reduced, ending with the Enacted Plan.

IV. Voter Turnout Comparison and Justification for Even District Number

The commission's decision to label the Latino opportunity district LD 15 versus LD 14 has ramifications for whether Latino voters will be able to elect candidates of choice in this seat. This is because Latino turnout in the 5-county region is lower than white turnout in non-presidential years (LD 15) compared to presidential years (LD 14), and LD 14 has more elections in the presidential election year.

For each LD in Washington, there are three seats (two house representatives, and one state senator). Each state representative is elected every two years, while state senators are elected every four years. But the election years vary by district. For instance, all three of LD 15's positions will be up for election in 2022 (off-year); the next state house election will then be in 2024, while the next state senate election will be in the off-year 2026. By comparison, only two of LD 14's positions will be up for election in 2022 (the house seats), but all three seats will then be up for election in 2024 (with the senate seat always lined up with the presidential and gubernatorial election).

Turnout as Percent of Voter Registration

Using BISG voter file calculations from the 2018 and 2020 general elections, Table 6 presents estimated voter turnout by race/ethnicity (Anglo, Latino) in the 5-county region. To calculate turnout, I split the voter file based on who voted in 2020 and who did not, then sum the probability white column across the region. I then divide the total estimated number of white voters by the total number of estimated white registrants. I then do the same for the probability Hispanic column.

The 2020 general turnout information is presented in the first two columns of Table 6, followed by the 2018 general turnout information in the third and fourth columns. Overall, the findings show that registered Anglos are more likely to vote in both the 2020 general and the 2018 general. The overall 2020 white advantage in turnout is 21%. Specifically, 80% of white registered voters voted in the 2020 general, whereas just 59% of Latino voters did.

Voter turnout for both groups declined in the 2018 general election. I estimate that 65.4% of white registrants voted in the 2018 general election compared to just 38.4% of Latino voters, resulting in a white advantage of 27 percentage points. Compared to the 2020

general, white voters have an additional 6.1% turnout advantage over Latino voters in the 2018 general. Thus, by labeling the district LD 15 rather than LD 14, regardless of the CVAP numbers, white voters will have a disproportionately larger electoral composition advantage than if the commission had chosen to label the district LD 14, given that LD 14 holds more elections in line with the presidential election year.

Table 6. Voter turnout comparison across 2020 and 2018 general elections by Anglo and Hispanic/Latino registrants. Data calculated using BISG on voter files for both years.

Race	Pct. Voted 20G	White - Hisp. 20G	Pct. Voted 18G	White - Hisp. 18G	Diff 18G - Diff 20G
White	0.798		0.654		
Hispanic	0.589	0.209	0.384	0.27	0.061

Turnout as a Percent of Citizen Voting Age Population (CVAP)

I also calculated voter turnout as a function of Citizen Voting Age Population (CVAP). To do so, I take the estimated number of white and Latino actual voters, respectively, and divide by the CVAP estimates for the same groups. I gathered county-level CVAP data from the Redistricting Data Hub Washington State page, which provides 2016-2020 CVAP estimates, and 2014-2018 CVAP estimates based on the 5-year American Community Survey (ACS).[17]

The results are similar to the voter registration results, although somewhat attenuated in terms of differences in turnout across the two groups and across the two years.

Table 7 shows the 2020 general election turnout differences across Anglo and Hispanic voters relative to 2020 CVAP in the 5-county region. The table also includes a relative turnout difference between the two racial groups across the two election years. In 2020, I estimate that 200,501 white and 51,596 Latino registrants, respectively, cast a ballot. Taking these numbers and dividing by each group's CVAP, I place white turnout at 74.3% and Latino turnout at 51.1%, for a white turnout advantage of 23.2%.

Table 7. Voter turnout comparison in 2020 general elections by Anglo and Hispanic/Latino, as percent of CVAP. Data calculated using BISG on voter files for both years and CVAP as denominator.

Total CVAP	White CVAP	Hispanic CVAP	White Vote	Hispanic Vote	White TO	Hispanic TO	Difference	Off Year Adv.
398735	269880	100960	200501	51596	0.743	0.511	0.232	0.022

Table 8 shows the 2018 general election turnout differences across Anglo and Hispanic voters relative to 2018 CVAP in the 5-county region. In 2018, I estimate that 154,316 white and 29,033 Latino registrants, respectively, cast a ballot. Taking these numbers and

[17] https://redistrictingdatahub.org/state/washington/.

dividing by each group's 2018 CVAP estimates, I place white turnout at 57.5% and Latino turnout at 32.1%, for a white turnout advantage of 25.4%.

Table 8. Voter turnout comparison in 2018 general elections by Anglo and Hispanic/Latino, as percent of CVAP. Data calculated using BISG on voter files for both years and CVAP as denominator.

Total CVAP	White CVAP	Hispanic CVAP	White Vote	Hispanic Vote	White TO	Hispanic TO	Difference
384995	268330	90365	154316	29033	0.575	0.321	0.254

Comparing Latino Electoral Composition in Included vs. Excluded Precincts

Finally, I analyzed Latino and white turnout rates and electoral composition in high-density Latino communities from Grant and Adams Counties that are included in the enacted LD 15, and compare that against other nearby high-density Latino communities in Yakima County that were excluded from the district. While these are all high Latino CVAP areas, my analysis shows that the included areas produce a higher white electoral composition than do the excluded regions of the map. In other words, while the high-density Latino communities from Grant and Adams Counties that were included in the district were necessary to achieve a bare HCVAP majority, those communities' electorates are disproportionately white compared to the Yakima County precincts that were excluded from the district.

The enacted map includes the following high-Latino precincts: Adams (413, 415, 511, 512) and Grant (26). These include parts of the communities of Othello and Mattawa. A 2018 general election voter file analysis reveals that these precincts contain about 633 registered Anglo voters, and 1,881 registered Latino voters.

However, due to turnout differential in the 2018 general election, (white = 64%, Hispanic = 37%), white voters made up 36% of election day voters despite being 25% of registrants. The pattern is replicated in the 2020 general election, where white voters were 28% of the electorate despite being 23% of registrants. This illustrates the deleterious effect of the decision to give the district the number 15 rather than 14: the electorate in these precincts is 8 points whiter in the off-year election than in the presidential election.

By contrast, the enacted plan excludes from the district the following neighboring high-density Latino precincts in Yakima County: 901, 2101, 2102, 2103, 2501, 2502. These include parts of the communities of Wapato, Toppenish, and Mabton. I estimate that as of the 2018 general election 428 white voters were registered in these precincts, while 4,579 Latino voters were on the rolls. Therefore, whites only comprised about 8% of registered voters. Accounting for turnout, the white composition of the 2018 electorate bumped up a bit to 11%. By 2020, the white share of registered voters dropped slightly to 7%, with electoral composition at 8%.

Table 9 below illustrates these findings.

Table 9. Comparison of included versus excluded precincts.

Precincts	Registered Voter Share (2018)	2018 Election Electorate Composition	Net White Advantage over Registration Share (2018)	Registered Voter Share (2020)	2020 Election Electorate Composition	Net White Advantage over Registration Share (2020)
Included Adams & Grant Latino Precincts	73% Latino, 25% white	61% Latino, 36% white	+23%	75% Latino, 23% white	70% Latino, 28% white	+10%
Excluded Yakima Latino Precincts	83% Latino, 8% white	80% Latino, 11% white	+6%	84% Latino, 7% white	83% Latino, 8% white	+2%

The commission's choice to include the Adams and Grant County precincts and exclude the Yakima County precincts has two notable effects. First, the Adams and Grant County precincts have lower shares of Latino registered voters compared to the Yakima precincts (73% v. 83%). Second, the Adams and Grant County precincts have disproportionately white *electorates* relative to their voter registration, whereas in the Yakima County precincts Latino vote share narrowly trails Latino registration. This is particularly pronounced in the 2018 off-year election, where the white advantage in the Adams and Grant County precincts is four times greater than in the Yakima County precincts.

The commission's decision of which high-density Latino precincts to include and exclude, coupled with the decision to label the district LD 15 with senate elections in off-years, thus helps explain why the district will not perform to provide Latino voters an equal opportunity to elect their candidates of choice.

Conclusion

In conclusion, racially polarized voting between white and Latino voters is present in the Washington Yakima Valley and surrounding 5-county region. The pattern is overwhelming. I examined 25 elections, and 23 demonstrate clear patterns of RPV using both the ecological inference and the rows by columns methods.

Further, in past elections, white voters voted sufficiently as a bloc to usually defeat minority voters preferred candidates in 7 of 10 statewide (plus congressional) elections analyzed in this report. When I examined white blocking of Latino preferred candidates, I observed 11 white voting blocks in 11 legislative or county/local elections. Despite this, the state drew legislative boundaries that affords these same minority voters fewer opportunities to elect candidates of choice than what their population and voting strength suggests.

In addition, Plaintiffs provided three demonstrative plans that contain majority-Latino configurations of LD 14, which compare similarly or superior to the enacted plan on redistricting criteria, and that allow Latino candidates an equal opportunity to elect their candidates of choice. In contrast, the enacted plan has produced a map that blocks minority voters' ability to elect candidates of choice, although draft maps proposed and considered during the redistricting process provided districts in the Yakima Valley and surrounding areas that would have provided Latino candidates with an equal opportunity to elect candidates of choice. Moreover, the choice to label the relevant district LD 15 rather than LD 14, especially given the number of elections in presidential years in each legislative district and lower Latino voter turnout especially in the off-year, further limits the ability of Latinos to elect candidates of their choice in LD 15. Finally, the nonperformance of the district is illustrated by the commission's decision to include Latino precincts with lower registration and turnout rates than neighboring Latino precincts that were excluded from the district.

Appendix

BISG Formula

Given the voter's surname $s \in \mathcal{S}$, geographic area $g \in \mathcal{G}$, and race $r \in \mathcal{R}$, the probability of a voter i being of race $R_i = r$ given their geographic area $G_i = g$ and surname $S_i = s$ is given by Bayes' Theorem as:

$$\Pr(R_i = r | S_i = s, G_i = g) = \frac{\Pr(G_i = g | R_i = r) \Pr(R_i = r | S_i = s)}{\sum_{r' \in \mathcal{R}} \Pr(G_i = g | R_i = r') \Pr(R_i = r' | S_i = s)}$$

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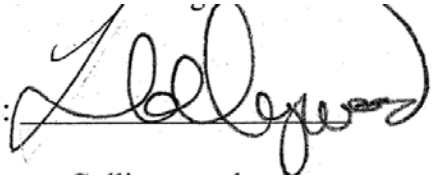
Pursuant to 28 U.S.C. § 1746, I, Loren Collingwood, declare that the foregoing is true and correct.



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Dr. Loren Collingwood
Dated: November 2, 2022