EVALUATION OF MICHIGAN HOUSE OF REPRESENTATIVES DISTRICT MAP: "SZETELA PLAN OCT 26 V4 13_50"

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To the attention of:
-Professor Matthew Grossman, Director of the *Institute of Public Policy and Social Research* at Michigan State University; and
-Commissioner Rebecca Szetela, Michigan Citizens Redistricting Commission

I. INTRODUCTION

In December 2023, a federal court ruled that the 2022 map of electoral districts for the Michigan House of Representatives (henceforth "the 2022 MI House map", which had been adopted in December 2021 by the Michigan Independent Citizens Redistricting Commission (henceforth, "the Commission"), is unconstitutional, and that districts 1, 7, 8, 10, 11, 12, and 14 must be redrawn (see *Agee v Benson*).

The analysis in this memorandum evaluates a revision to the 2022 MI House map, named "Szetela House Plan Oct 26 V4 13_50" (henceforth "the Szetela map"), according to five quantitative criteria:

1. Fidelity to the 2022 MI House map in the 103 districts that were not found to be in violation of the Law by the *Agee v Benson* ruling.
2. Its distribution of districts of opportunity for voters who identify as members of an ethnic minority.
3. Partisan fairness.
4. Respect for county boundaries.
5. Compactness.

The Szetela map was drawn by Commissioner Szetela in 2023, and it is available at:

https://davesredistricting.org/join/0939d850-4540-4961-96d3-81b2c4d7d846

II. DEPARTURES FROM THE 2022 MI HOUSE MAP

A principle of minimal intervention to remedy the violations identified by the Court in the 2022 MI House map, and of maximal deference to the work of the Commission, determines a preference for maps that alter the boundaries of as few as possible of the 103 districts in the 2022 MI map that are not directly affected by the *Agee v Benson* ruling.

I assign a score based on the number of additional districts, besides districts 1, 7, 8, 10, 11, 12, and 14, whose boundaries change in this map, relative to the 2022 MI House map. Scores thus range from a perfect score of 0, to a worst-possible score of 103.

The Szetela map edits the boundaries of **sixty-two (62) additional districts**, besides these seven.

In particular, it changes the boundaries of districts: 2, 3, 4, 5, 6, 9, 13, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 34, 39, 40, 41, 42, 43, 45, 46, 47, 48, 54, 56, 57, 58, 59, 62, 67, 68, 69, 70, 71, 72, 78, 79, 80, 81, 82, 83, 84, 85, 90, 92, 93, 94, 95, 96, 97, 99, and 100, most of which are not even adjacent to the districts (1, 7, 8, 10, 11, 12 and 14) directly affected by the *Agee v Benson* ruling.

III. DISTRIBUTION OF DISTRICTS OF OPPORTUNITY

In the *Agee v Benson* ruling, the Court faulted the 2022 MI House map for drawing districts 1, 7, 8, 10, 11, 12, and 14 "*predominantly on the basis of race*", in violation of the Equal Protection clause in the Fourteenth Amendment to the U.S. Constitution.

In maps drawn with little or no attention to race, the distribution of ethnic minority voting age population in each district is likely to be (as in, in more than nine out of ten such maps, it will be) such that there are:

Between "___"	and "___"	districts in which at least "___ " of voting-age residents identify as "Black" (alone).
6	9	50%
6	9	48%
6	10	45%
8	11	40%

Table 1 Typical range of number of opportunity districts in MI House maps (MGGG Lab data).

Table 1 is meant to be read by row. For instance, the first row says that in most maps, there are between six (6) and nine (9) districts in which at least 50% of voting-age residents identify by race as "Black" exclusively 2020 U.S. Census. If the number of districts with such shares of residents who identify by race exclusively as "Black" (including those who also identify as "Hispanic" by ethnicity) in the 2020 Census departs much from these values, such departure is statistical evidence indicative that the drawing of district boundaries was probably influenced by race.

The definition of the set of voters who identify as "Black" in the 2020 Census varies by database, depending on whether one includes or excludes those who also identify with another race, besides "Black" and/or those who identify as "Hispanic" by ethnicity.

Depending on whether we use the most restrictive definition ("Black" only, with no other racial or ethnic identification) or the most inclusive definition ("Black" as one of possibly many racial or ethnic identifications), the number of districts in the Szetela map in which at least a certain share of voting-age residents identifies as "Black" is as follows.

at least ___ of voting-age residents identify as "Black"	only, not including "Hispanic" is ____	"Black" including "Hispanic" and multiple races
50%	13	13
48%	13	13
45%	13	13
40%	14	15

Table 2. Number of districts of opportunity in the Szetela MI House map.

While we do not have readily available a number for the share of residents who identify as "Black" exclusively by race (but may also identify as "Hispanic" by ethnicity), since this number is in between the number under the most restrictive and most inclusive definition, the number of districts in the Eguia map in which the share voting-age residents who identify by race as "Black" only is between the values in the middle and right columns of Table 2 above.

Number of districts in which at least ___ of voting-age residents identify as "Black" (alone)	Szetela map	Range in most maps
50%	13	6 to 9
48%	13	6 to 9
45%	13	6 to 10
40%	Either 14 or 15	8 to 11

Table 3. Comparison between the Szetela map and the typical number of districts of opportunity.

Districts with more than 50% of voting-age residents who identify as "Black" are districts of opportunity for these voters. Districts with share of such voters below but close to 50%, may also be districts of opportunity, depending on the precise patterns of polarized voting in the district. For reference, in the 2022 MI House map, the equivalent comparison is as follows.

Number of districts in which at least ___ of voting-age residents identify as "Black" (alone)	2022 MI House map	Range in most maps
50%	7	6 to 9
48%	7	6 to 9
45%	7, 8 or 9	6 to 10
40%	13, 14, 15 or 16	8 to 11

Table 4. Comparison between the 2022 MI House map and the typical number of districts of opportunity.

The Szetela plan creates many more districts of opportunity for voters who identify as "Black" than the 2022 MI House plan, or than would be probable by any map drawn without attention to race. The highest share of voters who identify as "Black" in any district is between 58% (defining "Black" exclusively) and 60% (defining it inclusively). In contrast, in most maps drawn without attention to race, this share is over 85%.

While generating fewer districts of opportunity than in most other maps raises concerns about compliance with the Equal Protection clause in the U.S. Constitution and with the Voting Rights Act (henceforth, VRA), generating *more* districts of opportunity, up to a number proportional to the share of the minority group in the state's population may be justified or even required by the VRA, depending on the compactness of the districts and on the polarization of the voting patterns across racial groups.

The proportion of voting-age residents in Michigan who identify as "Black" is approximately 14%. The proportional number of districts for a population of this size is thus approximately fifteen (15).

The extremely high number of districts of opportunity for citizens who identify as "Black" in Szetela's map (at least 13, and perhaps one or two more) could thus be justified if the "Gingles conditions" are met in these districts, namely:

a) The groups of voters who identify as "Black" in these districts constitute a majority in a compact geographic area of size big enough to constitute a district; and
b) Voting patterns are sufficiently racially polarized that outside a district of opportunity, the candidates preferred by (a cohesive majority of) the citizens who identify as "Black" would lose.

IV. PARTISAN FAIRNESS

The Michigan Constitution requires that "*Districts shall not provide a disproportionate advantage to any political party"* (MI Const. Art IV §6 (13d), and it specifies that: "*A disproportionate advantage to a political party shall be determined using accepted measures of partisan fairness.*"

There are two competing normative principles on partisan fairness. One, is that partisan fairness requires maps to be "neutral" in the sense that the partisan seat outcome is similar to the outcome if maps were drawn without attention to partisan considerations. A contrasting view is that fairness requires the seat share of any party to be some proportion of its statewide vote share, as in Ohio, where maps must deliver seat outcomes in the legislature proportional to vote share, or in Missouri, where maps must ensure that seat outcomes do not deviate much from a "twice-proportional" rule by which the margin of victory for the winning party in terms of seat share should be double its margin of victory in vote share.

We evaluate the map according to two measures for each of these two principles:

1. **The Outlier Test**. The MGGG Redistricting Lab at Tufts created 100,000 possible MI House district maps, and computed the number of seats that each party would get according to those maps, if each Michigan precinct voted as in the 2016 Presidential election, 2018 US Senate election, and 2018 MI Governor election. We obtain a distribution of maps, from those most favorable to Democrats, to those most favorable to Republicans. The "Outlier" test requires that a map not be an extreme one among the most favorable to either party, but rather, that it must lie with the 9 out of 10 maps in the middle.

2. **Deviations from Proportional Rule.** This compares the seat outcome under a given map, to the seat outcome if seats were exactly in proportion to the votes for each party in the election.

3. **Efficiency Gap.** This compares the seat outcome under a given map, if the difference in seats were such that the seat share advantage for a party were exactly twice its vote share margin of victory. If turnout is equal across districts, this measure is identical to the measure, also called "Efficiency Gap" used by the Commission to evaluate its maps for fairness; if turnout varies across districts, the two measures differs, and the easier computation here is preferable, as it avoids some undesirable paradoxes that arise with the computation used by the Commission.

4. **The Jurisdictional Advantage.** This measure compares the seat outcome under a given map, to a benchmark "neutral" seat outcome if representation were by jurisdiction (counties and cities), with the party that obtained most votes in each jurisdiction gaining representation proportional to the population of the jurisdiction. The list of jurisdictions used contains the 72 counties with population below 193,224 residents (twice the size of a MI House district), 84 cities in the 11 larger counties treated as independent jurisdictions, and the remainder of these largest 11 counties.

For the computation of the deviation from proportionality, the efficiency gap, and the jurisdictional advantage, we use data from the 2016 and 2020 U.S. Presidential election, the 2018 and 2020 MI Senate election, and the 2018 MI Governor election.

These are the hypothetical results in each of these elections, if votes were aggregated using the Szetela map, together with the range of Democratic seats acceptable according to the Outlier test, and the ideally fair number of Democratic seats according to each of the other three measures.

	Szetela map seats		Acceptable DEM Range	Proportional benchmark	Twice-proportional	Jurisdictional benchmark
	DEM	GOP				
2020 PRES	56	54	n.a.	56.6	58.1	52.4
2016 PRES	45	65	41 to 47	54.9	54.7	44.6
2020 U.S. SEN	53	57	n.a.	55.9	56.9	48.5
2018 U.S. SEN	63	47	54 to 60	58.7	62.3	58.5
2018 GOV	66	44	59 to 65	60.4	65.8	61.8
Average	56.6	53.4		57.3	59.6	53.2

Table 5. Szetela map partisan outcomes compared to Partisan fairness benchmarks.

We compare the Democratic seats under Szetela's map to each of the benchmarks in the next table. Positive numbers indicate that under this map, the Democratic party gets more seats than is fair according to the measure, and negative ones that it gets fewer seats. The Outlier test has a built-in acceptable range with three seats up or down from its midpoint, so any positive or negative value outside this range is indicative of a map deemed to advantage a party according to this measure. The other three measures proscribe an exact ideally fair number of seats that is unattainable in practice, so they are better interpreted to mean that the map is fair according to these measures if it is within some range (perhaps, again within three seats) of the value deemed ideally fair by the measure.

	Outlier Test	Deviation from Proportional	Efficiency Gap	Jurisdictional Advantage
2020 PRES	-	-0.6	-2.1	3.7
2016 PRES	Acceptable (45)	-9.9	-9.7	0.4
2020 U.S. SEN	-	-2.9	-3.9	4.5
2018 U.S. SEN	Extreme +3 DEM	4.4	0.7	4.5
2018 GOV	Extreme +1 DEM	5.6	0.2	4.2
Average	Extreme +0.7 DEM	-0.7	-2.9	3.4

Table 6. Szetela's map Partisan fairness scores.

The Szetela map obtains opposite scores depending on the measure. This is to be expected: the map is drawn conscious of partisan considerations, seeking to minimize the Efficiency gap. But to nullify the Efficiency Gap is almost impossible given the political geography of Michigan, so the Outlier test identifies the map as an extreme Pro-Democratic outlier, relative to the maps that can be drawn, and likewise, the map exhibits a pro-Democratic jurisdictional advantage relative to a benchmark in which pre-existing jurisdictions were used to aggregate votes into representation. The Szetela map ends up almost perfectly matching the Proportional benchmark of fair representation.

In any case, most of this Democratic partisan advantage (relative to any neutral benchmark), or equivalently, most of this reduction of the “Efficiency Gap” against Democrats in the Szetela map, is inherited the 2022 MI House map. Table 7 shows the partisan fairness scores of the 2022 MI House map. The revisions in the Szetela map only make the map a little bit (half a seat) more favorable to Democratic candidates.

	Outlier Test	Deviation from Proportional	Efficiency Gap	Jurisdictional Advantage
2020 PRES	-	-2.6	-4.1	1.7
2016 PRES	Acceptable (46)	-8.9	-8.7	1.4
2020 U.S. SEN	-	-2.9	-3.9	4.5
2018 U.S. SEN	Extreme +2 DEM	3.4	-0.3	3.5
2018 GOV	Extreme +1 DEM	5.6	0.2	4.2
Average	Extreme +0.7 DEM	-1.1	-3.3	3.0

Table 7. 2022 MI House map's Partisan fairness scores.

V. RESPECT FOR COUNTY BOUNDARIES AND COMPACTNESS

The Szetela map splits 50 counties, generating a total of 205 county pieces assigned to a different district. Since the 2022 MI House map split 48 counties, generating a total of 202 county pieces, the Szetela map splits an additional 2 counties, generating an additional 3 county pieces.

For compactness, we use two standard measures, as computed by DRA 2020.

The Polsby-Popper compactness score measures the ratio of the area of the district to the area of a circle whose circumference is equal to the length of the boundary of the district. A score of 1 is maximally compact (a circle attains this score), while a score of 0 is minimally compact (a straight line). We report the minimum and the average score across all districts. A map's score is the average over district scores. The Szetela map's Polsby-Popper compactness score is 0.37, worse than the 0.38 of the 2022 MI House map.

The Reock compactness score of a district is the ratio of the area of the district to the area of the smallest circle that would completely enclose the district. Values range from a minimum of zero to a maximum of 1 (attained by a circle). The Szetela map's Reock compactness score is 0.400, similar to the 0.402 of the 2022 MI House map.

VI. SUMMARY

The Szetela map revises the borders of many more additional districts than a minimal revision narrowly tailored to provide the remedy required by the Court would require. In doing so, it creates more districts of opportunity –in which voters who identify as "Black" can see their candidate of choice elected— than the number we would expect from most maps drawn without attention to race, but no more to the number proportional to the size of the population who identifies as "Black" in the state.

It also produces partisan results more favorable to the Democratic party than most maps drawn without attention to partisan considerations, but these results are still not sufficiently favorable to the Democratic party to nullify the Efficiency gap; while it worsens scores on respect to county boundaries, and compactness.

Because the Szetela map, which was drawn before the *Agee v Benson* ruling was released on 12/21/2023, edits the borders of sixty-nine (69) districts, and not just the seven (7) found unconstitutionally drawn, the map is not narrowly tailored to provide the remedy required by this ruling, and therefore, in its totality, it does not appear suitable for consideration by the Commission as a basis to use to start its redrawing work.

VII. METHODOLOGY

The MI House map under evaluation was obtained by email from Commissioner Szetela to the *Institute for Public Policy and Social Research* (henceforth "IPPSR") Director Matt Grossman, for review and evaluation. It is now uploaded to the online redistricting application DRA 2020, and is publicly available at:

https://davesredistricting.org/join/0939d850-4540-4961-96d3-81b2c4d7d846

The 2022 MI House map is available at https://www.michigan.gov/micrc/mapping-process/final-maps

The election data we use is Michigan election data from the 2016 and 2020 U.S. Presidential elections, the 2018 and 2020 U.S. Senate elections in Michigan, and the 2018 Michigan Governor election. Election results by precinct for each of these elections, are publicly available from each County Clerk's Office (or the City of Detroit Clerk's Office). We obtain them from tertiary sources: The Voting and Elections Science Team (VEST) compiled files of these results. DRA 2020 and the MGGG Redistricting Lab at Tufts University then used VEST data files to produce and evaluate maps. We use MGGG results, and both DRA 2020 results and DRA 2020's functionality to evaluate users' maps and to produce our own new results, in this analysis.

The relevant legal framework includes:

- *Agee v. Benson*, No. 1: 22-cv-272 (W.D. Mich. Dec. 21, 2023). The federal court ruling invalidating the 2022 MI House map.
- *MI CONST. Article IV §6 (13)*. The redistricting criteria in the Michigan Constitution.
- *U.S. CONST. Amendt XIV.* The explicit statement of the Equal Protection clause.
- *Thornburg v. Gingles*, 478 U.S. 30 (1986). The ruling explaining the "Gingles conditions."

The data in Table 1 is obtained from the MGGG Redistricting Lab at Tufts University. The MGGG lab created 100,000 computer-generated maps of Michigan House districts, and then evaluated the distribution of demographic characteristics across districts in each map, and the partisan seat outcomes (how many seats each party won) in each map, finally generating a distribution across maps for each of these variables of interest. Their algorithm for generating maps, and its properties, are explained in:

-DeFord, Daryl, Moon Duchin, and Justin Solomon. "Recombination: A family of Markov chains for redistricting." *Harvard Data Science Review* 3.1 (2021): 3.

We provide a brief (and simpler) description of their method in Part I of the 2021 IPPSR Report "Michigan Redistricting Map Analysis", available at https://ippsr.msu.edu/REDISTRICTING .

The data for Table 2 and Table 3 is our computation, using DRA 2020 analysis tools to evaluate the Szetela map. Table 2 shows that there are thirteen (13) districts in Szetela's map in which at least 50% of the voting-age population identifies as "Black", and there are fourteen (14) in which at least 40% of the population identifies as "Black" exclusively and not as "Hispanic", and fifteen (15) in which at least 40% of the population identifies as "Black", including those for whom this identification is not exclusive of other racial or ethnic identities. Table 4 is similarly obtained using DRA 2020, this time evaluating the 2022 MI House map.

The Outlier test consists of computationally generating a large sample of redistricting maps (an "ensemble") and computing the distribution of a variable of interest across all maps in the ensemble. Maps with the most extreme (lowest or highest) values of the variable of interest are suspect and are deemed "outliers." Relevant academic references developing this approach include:

-Chen, Jowei, and Jonathan Rodden. "Unintentional gerrymandering: Political geography and electoral bias in legislatures." *Quarterly Journal of Political Science* 8.3 (2013): 239-269.

-DeFord, Daryl, Moon Duchin, and Justin Solomon. "Recombination: A family of Markov chains for redistricting." *Harvard Data Science Review* 3.1 (2021): 3.

In our case, as a test of partisan fairness, our variable of interest is the number of seats won by each party. Courts have accepted the outlier test as a valid measure to identify partisan gerrymanders in cases including the seminal:

-*League of Women Voters vs Commonwealth of Pennsylvania* 178 A.3d 737, 645 Pa. 1 (2018).

The main academic reference on the Efficiency Gap is

-Stephanopoulos, Nicholas O., and Eric M. McGhee. "Partisan gerrymandering and the efficiency gap." *The University of Chicago Law Review* (2015): 831-900.

The Efficiency Gap can be computed in terms of percentages, and that is the way the Commission used the measure. However, it is more transparent to report it in terms of seats. There are alternative definitions of measures of partisan fairness, all named the "Efficiency Gap." If turnout is equal across districts, they all coincide. If turnout varies across districts, they do not. We use the simplest definition of this measure, and the one preferred by the authors (as stated to us in email communication), by which, if a party wins the statewide vote share by, 52% to 48% (a 4% majority), then it should enjoy a 54%-46% majority of seats (a 2 times 4% = 8% majority), and likewise for any other vote share margin of victory, up to a 75%-25% margin of victory, for which a party should win all seats.

The alternative definition of the Efficiency Gap, used by the Commission, has conceptual problems (well analyzed and discussed in the academic literature) that arise if turnout varies across districts. See for instance:

- Chambers, Christopher P., Alan D. Miller, and Joel Sobel. "Flaws in the efficiency gap." *JL & Pol.* 33 (2017): 1.

- McGhee, Eric. "Measuring efficiency in redistricting." *Election Law Journal: Rules, Politics, and Policy* 16.4 (2017): 417-442.

The Jurisdictional Partisan Advantage is developed in

- Eguia, Jon X. "A measure of partisan advantage in redistricting." *Election Law Journal: Rules, Politics, and Policy* 21.1 (2022): 84-103.

It relies on comparing how many seats each party wins with a given map, to a jurisdictional benchmark number of seats it would obtain, if the state used a fixed map of jurisdictions, to grant representation in proportion to the population of each jurisdiction, to the party that wins most votes in the jurisdiction. The list of jurisdiction includes all counties with population lower than 193,224 residents (twice the size of a MI House district). For each county with larger population, the list of jurisdictions adds each of the county's largest cities until the population of the remainder of the county without these cities drops below the cutoff, and it also adds to the list of jurisdictions this "Remainder of the County".

In Table 5, the "Acceptable Range" is the range of results given by the Outlier test, such that at least 9 out of 10 maps have results in this range, and fewer than 1 in 20 have results below that range, or above that range. In Table 6, the Outlier test is computed by averaging the results of the test in each election. For instance, the Szetela map is 2 seats short of being an outlier in one election, so this election adds "minus 2", summed to +1 and +3 in the other two elections, the total is "plus 2", which divided by 3 and rounding yields 0.7. This is a laxer way to compute it -one classifying fewer maps as "extreme"- than first generating average values for each map in the ensemble, computing the distribution of averages, and finding a range of such that at least 9 out of 10 maps have average values in this range.