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Re: PICO NEIGHBORHOOD ASSOCIATION et al.,  
Plaintiffs and Respondents, v. CITY OF SANTA MONICA  
(No. B295935; S263972)

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## BRIEF OF AMICUS CURIAE

### INTRODUCTION

We are supporting both parties to the current dispute because we see our proposed remedy for the votes currently diluted in Santa Monica as having the potential to satisfy both. Our remedy guarantees that every citizens' vote will continue equally to count in the council through the voice of the elected candidate they are likely to see as representing their hopes and concerns most accurately. This should satisfy both parties because candidates mainly focused on serving the needs of their local community, and candidates focused mainly on serving the common good of the whole city as they see it, have an equal opportunity to be proportionally elected to the council.

Concisely put, my co-authors and I argue that electing the seven members of Santa Monica's Council by at-large evaluative proportional representation (EPR) provides the most democratic remedy. EPR does not dilute any citizen's vote. That fact makes it certain that no vote by a member of any protected class will be diluted.

As an example, we describe next how the election of the current Council of Santa Monica needlessly diluted an average of about 47% of all the votes cast when electing the council in 2018 and 2020. We assert that either of two alternative voting methods would clearly dilute many fewer

citizens' votes. In the first method, when seven members are elected at-large by "proportional ranked-choice voting" (PRCV), only about 12% of all the votes cast would be diluted. This method is described and supported by the FairVote BRIEF OF FAIRVOTE AS AMICUS CURIAE IN SUPPORT OF PETITIONERS (*Pico Neighborhood Association v. City of Santa Monica* (2021) B295935M).

Expressed positively, in contrast to the 53% of all the votes cast in the existing 2018 and 2020 at-large plurality elections not diluted, seven-seat PRCV would enable about 88% of all the votes cast to help elect a favored council member.

Unfortunately, many people are blind to the fact that plurality voting can lead to extensive vote-wasting, and thus members of certain classes have less opportunity to elect members of their choice, as guaranteed by United States Code 52, Chapter 103.01:

**“Denial or abridgement of right to vote on account of race or color through voting qualifications or prerequisites; establishment of violation**

(a) No voting qualification or prerequisite to voting or standard, practice, or procedure shall be imposed or applied by any State or political subdivision in a manner which results in a denial or abridgement

of the right of any citizen of the United States to vote on account of race or color, or in contravention of the guarantees set forth in section 10303(f)(2) of this title, as provided in subsection (b).

(b) A violation of subsection (a) is established if, based on the totality of circumstances, it is shown that the political processes leading to nomination or election in the State or political subdivision are not equally open to participation by members of a class of citizens protected by subsection (a) in that its members have less opportunity than other members of the electorate to participate in the political process and to elect representatives of their choice. The extent to which members of a protected class have been elected to office in the State or political subdivision is one circumstance which may be considered: *Provided*, That nothing in this section establishes a right to have members of a protected class elected in numbers equal to their proportion in the population.”

Structurally, plurality voting enables a majority of voters, intentionally or not, to prevent everyone else from being represented in a legislative body. This truth is exemplified by Santa Monica’s elections.

In 2018, the three winning candidates were elected by a combined total of 62.84% of all the votes cast. In 2020, the

four winning candidates were elected by a combined total of 44.04%.

Santa Monica: total combined percentage of votes received by:

	<b>All Winners</b>	<b>All Losers</b>
2018	62.84%	37.15%
2020	44.04%	55.96%

When compared with EPR as the available alternative, this means that all seven members of the Santa Monica council were elected by an average of 53%, needlessly diluting 47% of the voters. The above 2020 example also shows that plurality voting can sometimes allow a minority to exclude a majority from being represented.

We prefer evaluative proportional representation (EPR) because it is an improved version of multi-seat PRCV. It dilutes no citizen's vote (0%). It guarantees that every citizen's vote will add to the voting power in the council of the member they are likely to see as representing their scale of values most faithfully.

Against this benchmark, a Council elected by at-large EPR would be supported by 100% of all the votes cast, and by 88% if elected by at-large seven-seat PRCV. This contrasts with the 53% support received by the existing council. This is why we see the adoption of at-large EPR as

the optimal remedy for the current needless dilution of many citizens' votes. The fact that EPR does not dilute any citizen's vote makes it certain that no vote by a member of any protected class will be diluted. Only EPR is entirely skin-color blind.

## ARGUMENT

REPRESENTATIVE DEMOCRACIES CAN BE IMPROVED BY  
VOTERS GRADING CANDIDATES: AN ALGORITHM BY STEPHEN  
BOSWORTH, ANDERS CORR AND STEVAN LEONARD

### INTRODUCTION

The Court invites us to answer the following question: “What must a plaintiff prove in order to establish vote dilution under the California Voting Rights Act?” We answer that the plaintiff must prove that votes cast by members of a “protected class” are being needlessly “diluted” by the existing electoral system in question. That such dilution exists in Santa Monica hinges on our acceptance of Justice Wiley’s opinion:

“One cannot speak of the dilution of the value of a vote until one first defines a standard as to what a vote should be worth. Justice Frankfurter made this point in his long and bitter dissent from the landmark decision in *Baker v. Carr* (1962) 369 U.S. 186, 300 (dis. opn. of Frankfurter, J.). Frankfurter thought his point was a reason to reject that decision, but the case law in

its wake accepted his wisdom and built it into a standard litigation practice. (E.g., *Reno v. Bossier Parish School Bd.* (1997) 520 U.S. 471, 480 [plaintiffs must postulate an alternative voting practice to serve as the benchmark undiluted voting practice, because the concept of vote dilution necessitates the existence of an undiluted practice against which the fact of dilution may be measured].)” (*Pico Neighborhood Association v. City of Santa Monica* (2020) B295935, page 30.)

Needlessly, many city and state legislative bodies in the US and elsewhere have been elected by less than half of the votes cast by citizens – resulting in more than half the votes being wasted (“diluted”) – leaving citizens feeling unrepresented and disenfranchised. Such waste is needless because a new voting method called evaluative proportional representation (EPR) guarantees what each citizen presumably wants: their vote equally to increase the voting power of the elected candidate they see as likely to represent their hopes and concerns most faithfully. EPR also helps to elect a higher quality council, a council seeking the common good by making decisions after discussions and debates between all the many perspectives represented. Every member of an EPR city council is elected proportionally to represent any citizen who grades at least one candidate’s

suitability for office as either Excellent, Very Good, Good, or Acceptable. The same grade can be given to more than one candidate. Each winner has a different weighted vote in the council exactly equal to the number of citizens' votes counted for them. The council is supported by 100% of the votes cast so that no citizen's vote is wasted.

In this brief we explain how vote dilution is avoided by having citizens vote by grading candidates' suitability for office as either Excellent, Very Good, Good, Acceptable, Poor, or Reject. We call this voting method evaluative proportional representation (EPR). The EPR counting method guarantees that each citizen's vote equally adds to the voting power in the legislative body of the elected candidate they see as likely to represent their hopes and concerns most accurately. Consequently, each legislative body elected by EPR is likely to be seen by the electorate as the most wise and skilled available. How these benefits are provided by EPR is explained below, but first we describe how plurality voting, the commonly used and least democratic voting method, needlessly wastes citizens' votes. Most of the legislative bodies in the US are chosen in plurality elections.

#### PLURALITY VOTING

As an example of plurality voting, in 2018 and 2020, the current seven-member city council of Santa Cruz, California was elected by an average of 46% of all the votes

cast. This means that about 54% of the votes cast by citizens can be said to be wasted because they are not represented in the council. Like many other cities, this council is elected at-large by plurality voting.

Many cities use plurality voting to elect their councils from districts. However, these elections can waste even more citizens' votes. This is illustrated by candidate C being elected from a district when candidates A, B, and C received the following percentages of all the votes cast in that district: 33%, 33%, and 34%. Therefore, 66% of the votes are wasted – these citizens can rightly feel disenfranchised.

This means that a council elected by simple plurality by the above mentioned 47%, either at-large or from seven districts, its 4-to-3 “majority” in the council supported by only 26% of all the votes cast (four sevenths of 47%). This is not “majority rule.”

#### EVALUATIVE PROPORTIONAL REPRESENTATION

EPR invites you to vote most expressively by grading at least one candidate's suitability for office as either Excellent, Very Good, Good, or Acceptable. You can grade Poor or Reject for any candidates you find unacceptable to hold office. You can award the same grade to more than one candidate. You are guaranteed that your one EPR vote of at least Acceptable will quantitatively increase the voting power (weighted vote) in the council of the elected candidate

who you awarded the “highest possible grade”. This candidate is discovered by following the rules of the count.

#### HOW EPR COUNTS GRADES

For an EPR at-large election of a seven-member council, each of the seven elected candidates must have received one of the seven largest numbers of grades of at least Acceptable from all the ballots cast. Your vote and every other citizen’s vote is added to one of the different weighted votes that will be held by one of the elected members of the council. The council represents 100% of the votes cast – no vote is wasted or “diluted.”

Except in two circumstances, your one vote adds to the weighted vote in the council of the highest-graded candidate on your ballot. If you awarded this highest grade to more than one candidate, it is exclusively added to the candidate who will have the largest number of these grades as a result. This is justified by the democratic assumption that, other things being equal, the candidate with a larger number of votes is probably better.

The first exception is when that candidate has received too few grades of at least Acceptable from all the ballots cast to be elected. In this event, your ballot is automatically transferred to the candidate on your ballot to whom you awarded your remaining highest grade. If no such eligible candidate is graded on your ballot, your ballot automatically

becomes your proxy vote. This proxy vote is finally added to the weighted vote of the elected candidate publicly judged by your highest-graded candidate to be most fit for office. You can prohibit this use of your proxy vote by specifying this on your ballot.

The second exception can result from your highest-graded candidate having received too many highest grades from all the ballots cast. To avoid the remote but anti-democratic possibility of an elected candidate being able to dictate to the council by retaining more than 50% of all the weighted votes in the council, our EPR algorithm does not allow a member to retain more than 20% of all the votes cast. This requires at least three members to agree before any majority decision can be made in the council. If the candidate to whom you gave your highest grade received more than 20% of the votes, your ballot could be selected by lot as one of the surplus ballots to be automatically transferred to the remaining highest-graded candidate on your ballot. If no such eligible candidate is graded on your ballot, your ballot automatically becomes your proxy vote and is transferred to the weighted vote of one of the eligible winners as described earlier. As a result, your EPR vote equally adds to the weighted vote of the winner who finally receives your highest grade, remaining highest grade, or proxy vote – the winner you see as likely to represent your

hopes and concerns most faithfully. As a result, each EPR council member has a different weighted vote in the council, exactly equal to the total number of ballots counted for them. [See the Supplemental Materials: Appendix A for a full description of the EPR count; the EPR algorithm, and the report of the output for the count of the simulated EPR election.]

#### EPR IS DEMOCRATICALLY SUPERIOR TO PROPORTIONAL RANKED-CHOICE VOTING (PRCV)

Thankfully, electing city councils by plurality voting has been replaced in some locales by at-large elections using proportional ranked-choice voting (PRCV – <https://www.fairvote.org/>). This method is used in Cambridge, Massachusetts (<http://vote.cambridgecivic.com/>), and planned to be used in November 2022 in California in Albany, Eureka, and Palm Desert. Also, PRCV (called single transferable voting (STV) has been used in the Republic of Ireland, Australia, and Malta for many years (Types of Voting System (2019) . PRCV invites citizens to vote by ranking the candidates, 1st preference, 2nd preference, 3rd preference, etc.

While PRCV is not as good as EPR, it is much better than plurality for electing a city council. EPR is best because PRCV still wastes some citizens' votes both quantitatively and qualitatively. Its qualitative wasting results from the

fact that grades are more meaningfully and informatively expressive of each voter's judgments about the candidates which produced their PRCV rankings of the candidates. For example, a first preference does not reveal whether the voting citizen judged that candidate to be excellent or least bad (a plurality vote is even less informative in this regard). At the same time, some quantitative loss stems from PRCV's assumption that each elected member of the council must have the same voting power in the council: one-member one-vote. To help justify this practice, PRCV tries to count all the ballots so each winner receives the same total number.

PRCV starts its count by calculating the smallest total number that each of the target number of winners must receive both to be elected and to exclude the possibility of any additional candidate being elected by the votes that have not yet been counted for any of the winners. This number is called the quota. The Droop Quota is equal to one vote more than the quotient resulting from dividing the total number of ballots cast (the dividend) by one more than the target number of winners. Therefore, when electing a seven-member council, the divisor is 8. This also means that not all the votes cast are used in order to elect the seven winners. These left-over ballots are said to be "exhausted" – wasted in the sense that they are not represented in the council. Any ballot that happens not to rank any of the winners are also

said to be exhausted. This is why about 12% of all the PRCV ballots cast to elect a seven-member election are wasted quantitatively.

Note that if all PRCV's preferences were instead counted like EPR counts its grades (and also including EPR's way of distributing proxy votes to winners), this modified PRCV would not waste any votes quantitatively. However, every citizen's qualitative judgments when completing such a modified PRCV ballot are partly wasted, not as fully revealed as when an EPR citizen grades the candidates.

Readers may also want to consider the needless democratic deficits that would be caused by modifying EPR's algorithm so that each of the elected candidates would have only one vote in the council. We accept that such an arrangement is a practical possibility, but it is not as democratic. To make each winner instead receive the same number of grades of at least Acceptable, many more ballots would have to be needlessly transferred according the same principles outlined in our earlier description of EPR's count. The same total number of proxy votes would need to be publicly distributed to the winners, but only to ensure that each winner receives the same final total number.

All the democratic deficits resulting from this modified EPR would follow from all the different degrees of qualitative waste of any of the ballots having to be

transferred from higher to lower graded winners. For example, a ballot grading one winner to be Excellent might have to be transferred to a winner judged by that ballot to be only Acceptable (three ordinal grades below Excellent), or as a Reject (five ordinal grades below Excellent). This is still better than the greater quantitative and qualitative waste already shown to be inherent both in plurality and standard PRCV elections.

The extra democratic benefits offered by our unmodified EPR proposal are also enhanced by the additional information provide by EPR's post-election reports. Each such report should report all the grades anonymously awarded to each candidate by every voter. This enables analysts to help educate the public most comprehensively and reliably by informing every citizen about the ordinal intensity and number of citizens who are pursuing each of the many different agendas in their society. The more candidates an EPR voter grades, the more fully complete and exact will be the qualitative information communicated to others anonymously by such post-election reports. Of course, some understanding of the guiding sets of political values held by each plurality or PRCV voter can also be extracted from their similar post-election reports. However, the understandings that could be gained from

these reports cannot have the same clarity and depth as those revealed from EPR reports.

Finally, we want to stress that the way a citizen marks their EPR ballot can be similarly as simple as voting by plurality or PRCV. Completing a plurality ballot requires you to vote for no more candidates than the number that must be elected. At the same time, no plurality vote guarantees to help elect a candidate. PRCV only requires you to prefer at least one candidate, although the more you rank, the more likely it is that one of your preferred candidates will be elected. Only EPR assures you that your one vote will strengthen the weighted vote in the council of the winner you see as likely to represent your aims and worries most faithfully and skillfully.

## CONCLUSION

Unfortunately, all multi-winner voting systems in use today structurally and needlessly ignore or waste some citizens' votes. Everyone in a representative democracy is upset when they see their elected representatives fail to give voice to their concerns—and rightfully so. As a corrective measure, we have shown how every citizen's graded EPR ballot equally adds to the voting power of the city council member they see as likely to give voice and more weight to their hopes and concerns. Grading candidates from Excellent to Reject rather than voting by simple plurality or PRCV allows citizens to express more discerning, meaningful, and informative choices.

EPR improves representative democracy and optimally promotes the common good by making it as likely as possible that the highest quality legislative bodies and candidates will be elected. It does this by helping to educate all citizens by enabling its most informative post-election reports to be analyzed; by satisfying any citizen's desire honestly and clearly to express their own judgments about issues and candidates; and by enabling each citizen to be confident that their one vote will equally add to the voting power of the elected candidate they see as likely to represent their hopes and concerns most faithfully.

Dated: April 6, 2022

Stephen Bosworth

## CERTIFICATE OF COMPLIANCE

I hereby certify that this brief has been prepared using proportional 14-point Century Schoolbook typeface.

According to the "Word Count" feature in Microsoft Word for Windows software, this brief contains 5260 words. I declare under penalty of perjury that this Certificate of Compliance is true and correct and that this declaration was executed on April 6, 2022.

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Stephen Bosworth

## SUPPLEMENTAL MATERIALS

Appendix A: A Full Explanation of the EPR Count (see below)

EPRv3.r (available upon request)

Simulated Election Output from EPRv3.r (available upon request)

### APPENDIX A. EVALUATIVE PROPORTIONAL REPRESENTATION DETAILED COUNT

#### SUMMARY OF STAGES IN THE EVALUATIVE PROPORTIONAL REPRESENTATION COUNT

The four stages in the evaluative proportional representation (EPR) count are summarized as follows.

Stage 1 performs the same steps repeatedly that examine all remaining unassigned ballots to determine the candidates with the most votes at the current grade level, starting with Excellent and continuing with Very Good, Good, and finally Acceptable. At the end of Stage 1, all ballots have been examined. One vote, called an affirmed evaluation, from each valid ballot is assigned to one of the candidates who received the highest grade on that ballot.

Stage 2 applies a limit on the percentage of total votes that a candidate can retain. This limit avoids the otherwise anti-democratic possibility of one elected candidate being able to dictate to the legislative body by retaining at least

50% plus 1 of all the votes in the assembly. We suggest a limit of 20% so as to require at least three members of the assembly to agree before a majority decision can be made. The excess number of ballots counted for such a super-popular candidate in Stage 1 are selected randomly to transfer to the remaining highest graded (Acceptable or higher) candidate marked on each ballot who does not exceed the vote limit. Any ballot that cannot be transferred is marked as a proxy vote that will be handled in Stage 4 by the candidate that currently holds it.

Stage 3 determines the elected candidates to fill the number of open positions. These are the candidates that have the largest number of affirmed evaluations (votes). The losing candidates will have their ballots transferred to the highest graded elected candidate marked on each ballot who also must not exceed the vote limit. Any ballots that cannot be transferred are marked as proxy votes that will be handled in Stage 4 by the candidate (trustee) that held this ballot in Stage 1. Stage 3 concludes the programmatic vote count by printing a table that reports for which candidate each citizen's ballot was finally counted, or which candidate is the trustee for its proxy vote to be handled in Stage 4.

Stage 4 is a public event where the proxy votes held by both elected and losing candidates are transferred to elected candidates who must not exceed the vote limit. Each

candidate that holds one or more proxy votes transfers them to the elected candidates they judge most fit for office. The final total of votes each elected candidate receives defines the weighted vote they will have in the legislative body.

The details of each stage in the EPR count are described below.

#### STAGE 1 OF THE EPR COUNT

The Single Round Algorithm is used repeatedly at each grade level in the steps for Stage 1 of the EPR count.

#### SINGLE ROUND ALGORITHM

- (1) For the first round at this grade level, make all candidates eligible.
- (2) Set the single round vote counts to 0 for each eligible candidate.
- (3) For each uncounted ballot, add one to the single round vote count for each eligible candidate that is marked with the current grade.
- (4) Select the candidate with the most single round votes as the winner of this round. If there is a tie, randomly select the winning candidate.
- (5) Add the single round vote count to the count of affirmed evaluations for the winning candidate.
- (6) Mark the ballots assigned to the winning candidate as counted.

- (7) Mark the winning candidate as ineligible for the remainder of rounds at this grade level.

#### STEPS FOR STAGE 1 OF THE EPR COUNT

- (1) Mark all ballots uncounted and set the count of affirmed evaluations for each candidate to 0.
- (2) While uncounted ballots remain at the Excellent grade level, repeat the Single Round Algorithm.
- (3) While uncounted ballots remain at the Very Good grade level, repeat the Single Round Algorithm.
- (4) While uncounted ballots remain at the Good grade level, repeat the Single Round Algorithm.
- (5) While uncounted ballots remain at the Acceptable grade level, repeat the Single Round Algorithm.

#### STAGE 2 OF THE EPR COUNT

- (1) Determine the candidates that exceed a chosen percentage of the votes cast, referred to as the vote limit. For this brief, we decided that no elected candidate is allowed to retain more than 20% of all the votes in the legislative body. This limit requires a minimum of three candidates to pass legislation.
- (2) For each candidate whose votes exceed the vote limit, and handling candidates in order of who holds the most votes (ties broken randomly), perform these steps:

- (a) Randomly select a number of ballots to transfer that brings this candidate's count of affirmed evaluations to the vote limit.
- (b) If possible, transfer each of these ballots and their associated affirmed evaluation to one of the highest graded (Acceptable or higher) candidates marked on the ballot (ties broken randomly), but only for a candidate that does not exceed the vote limit.
- (c) For each ballot that cannot be transferred, mark this ballot as a proxy vote that will be handled in Stage 4 by this candidate as its trustee.

#### STAGE 3 OF THE EPR COUNT

- (1) Determine the target number of candidates to elect as follows:
  - (a) Sort the list of all candidates starting with the candidate with the largest number of affirmed evaluations (votes).
  - (b) Provisionally select the number of candidates to elect who have the largest number of votes. If the selected candidate with the smallest number of votes is not tied with any candidates not selected, elect all the candidates selected.
  - (c) For the candidates that are tied with the candidate who has the smallest number of votes,

compute the sum of ordinal values on each of their ballots. These ordinal values correspond to the grades as follows: Excellent (6) down to Acceptable (4).

(d) Sort these initially tied candidates in order of their respective cardinally summed votes. If there are no ties between any of these candidates, elect those with the larger cardinal sums. If there remains a tie between a number of candidates in this list that is larger than the remaining number of candidates to be elected, select that remaining number of candidates randomly.

(2) Starting with the unelected candidate who holds the most votes (ties broken randomly), perform these steps:

(a) If possible, transfer the highest remaining grade (Acceptable or higher) on each of the ballots currently counted for this unelected candidate to the relevant elected candidate (ties broken randomly), but only to a candidate who does not exceed the vote limit.

(b) For each ballot that could not be transferred, mark this ballot as a proxy vote that will be handled in Stage 4 by its trustee: the candidate who received the highest grade on this ballot in Stage 1.

- (3) Print a table that reports for which candidate each citizen's ballot was finally counted, or which candidate is the trustee for its proxy vote (the candidate who received this vote in Stage 1).

#### STAGE 4 OF THE EPR COUNT

- (1) Print a summary of the ballots that will be transferred by the proxy vote holders at a public event. This concludes the programmatic vote count.
- (2) Though not carried out by the algorithm, the weighted votes of each elected candidate are finalized as follows: Each candidate that is a trustee of proxy votes, starting with the candidate with the largest number of affirmed evaluations (ties resolved by lot), publicly transfers their proxy votes to any of the eligible winners they judge most suitable for office.

STATE OF CALIFORNIA  
Supreme Court of California

**PROOF OF SERVICE**

STATE OF CALIFORNIA  
Supreme Court of California

Case Name: **PICO NEIGHBORHOOD ASSOCIATION v. CITY OF SANTA MONICA**

Case Number: **S263972**

Lower Court Case Number: **B295935**

1. At the time of service I was at least 18 years of age and not a party to this legal action.
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3. I served by email a copy of the following document(s) indicated below:

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This proof of service was automatically created, submitted and signed on my behalf through my agreements with TrueFiling and its contents are true to the best of my information, knowledge, and belief.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

4/7/2022

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Date

/s/Stephen Bosworth

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Signature

Bosworth, Stephen (Pro Per)

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Last Name, First Name (PNum)

University of Portsmouth, UK (retired)

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Law Firm