

I recommend that Secretary of State Wayne Williams not adopt Rule 26, regarding ranked choice voting (RCV), until a better rule is proposed after being revised and validated with a much stronger process of quality assurance. Improvements are needed to ensure greater clarity, completeness, consistency, and correctness.

Colorado will benefit from greater use of quality implementations of RCV. However adopting a Rule 26 based on the current proposal would be a disservice to Colorado voters, candidates, and local election officials.

Rule 26 attempts to specify, among other things, how votes for a Colorado RCV contest are to be counted. Unlike many things that Secretary Williams regulates, counting RCV votes can be a very well-defined algorithm conducted in a rather well defined context.

Rule 26 will be the basis for significant longer-term investments and other spending to enable use of RCV. Vote counting can also be an area that can have rather high costs of failure in the field. Election failures are not always repairable. Resolving problems with the regulations should not be left to comparatively expensive litigation. Because it specifies how votes are counted, Rule 26 will also likely have a higher level of public exposure than many other regulations for which Secretary Williams is responsible.

For these and other reasons, it would be worthwhile to target a high level of quality in Colorado's RCV regulations as the basis for part of Colorado's critical election infrastructure.

I encourage Secretary Williams to not assume that his staff have the necessary, specialized skills to adequately draft and provide sufficient quality assurance for Rule 26. I recommend that Secretary Williams lead his office with more constructive engagement with domain-specific experts, with people who have expertise with the design and verification of algorithms more generally, and with people with strong expertise in technical writing.

Secretary Williams should set as one of the goals for the Rule 26 vote counting specification that independently developed, but conforming implementations of the vote counting algorithm will always identify the same winners for any given record of adjudicated voter selections, the results of any tie-breaking by lot, and the use of any regulation-defined tabulation options. Put another way, if two implementations of vote counting produce different winners, it should be because at least one of them clearly does not conform to the RCV regulations. That goal should also encompass the round-by-round vote totals for candidates.

Do not let collaboration be constrained to only the legally required modes of public

feedback. As an example of a less traditional way of getting supplemental feedback, Secretary Williams should consider sponsoring a hack-a-thon that focuses on interpretation, implementation, and testing of the specified procedures. The goal of such an event would not be to produce software that would be used in a production voting system, rather it would be to find where weaknesses in the specification are. The test cases that would be generated would also likely be helpful for certification testing of production implementations.

Rule 26 calls for third rounds of IRV and STV vote counting. However Rule 26 still has no specification of how third or later rounds should be conducted. This represents a fundamental quality assurance failure. It indicates that those responsible for drafting Rule 26 have not attempted to even minimally test the specification by using it to hand count small test elections or to write and validate software that does such tabulation. It indicates that what needs adjustment is not just Rule 26 itself, but also the quality assurance goals and processes for producing proposed rules.

The June 29 revision to Rule 26 added an exception to the handling of skipped rankings. That addition to Rule 26 serves as an example of the pitfalls of not subjecting even seemingly small changes to a comprehensive process of quality assurance. While the added exception has its own problems with ambiguity, it also adds to the problems that other parts of the specification have, for example, adding to the ambiguity of what is a "first-choice rank".

Such unintended consequences are much more likely to be detected and remedied with a stronger program of quality assurance. It is why Rule 26 should not be adopted with any changes that have not be subjected to a much stronger process of quality assurance and additional public review.

I will also note that the need for an added exception was because the base provision for skipped rankings is a classic example of over-regulation. As is typical, such over-regulation created additional problems that may be as large as the problem it tries to fix. However as is also typical, fixes to the over-regulation result in even more regulation that is just as badly ineffective yet creates its own additional problems.

The better solution is not to pile patches of regulations on top of each other. The better solution is to not unduly place restrictions on voters, i.e. prohibit skipped rankings, in the first place.

I also include by reference, the June 22 comments that I submitted for the earlier June 15 draft Rule 26. Comments #1 and #9 have been resolved. The other comments still indicate needed changes. Comments that have been partially addressed in the August 3 revision are the following:

Comment #2: The definition of "rank" was changed to be a definition of "ranking" instead, as recommended. However "rank" is now undefined, but continues to be used as a noun where "ranking" would be appropriate and use of a defined term would be better. A better second sentence of the definition of "ranking" would be:

The number one is the highest ranking, the number two is the next-highest ranking, and so on.

It is acceptable that "rank" is not defined as a noun, as long as it is also not used as such, which it does not need to be.

Comment #7: The definition of "winning candidate" now correctly acknowledges that a candidate can be elected without reaching the threshold. The other concerns still apply.

My Background

I have provided pro bono advice about how to specify and conduct elections for RCV contests, including both IRV and STV contests, for over 10 years. My advice covers both issues of policy choices as well as more technical issues. My advice and recommendations are sought from across the country, from San Francisco and Oakland to Maine and Maryland. I have experience conducting STV elections for non-governmental organizations as well as helping local governmental election administrators make practical improvements to their conduct of elections for RCV contests.

I have served on the Board of Californians for Electoral Reform (CfER). I was principle drafter of [California Senate Bill 1288 \(2016\)](#), co-sponsored by CfER and California Common Cause and passed by the California Legislature to enable the use of IRV and STV in local elections. Portions of that bill, the provisions that added specifications of IRV and STV in a new Division 22 of the California Elections Code, are particularly similar to what Rule 26 is attempting to do for Colorado. That work was subject to similar quality assurance processes that I recommend for Rule 26. I have also served in NIST working groups that are developing VVSG 2.0.

I have also worked on issues related to auditing RCV election contests, including the conduct of risk-limiting audits. Some of my earlier work in that area includes the paper "[Estimating the Margin of Victory for IRV](#)" which broke through what some risk-limiting audit advocates were identifying at the time as barriers to doing risk-limiting audits for RCV.

My educational background is in areas of mathematics, accounting, and finance. My vocational background is in the development and implementation of business software, especially in areas of regulated financial services.