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LWVBC Voting Methods Report:
February 2017

Voting Methods in Colorado and Beyond
Fourth Edition – April 2017

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Statement of Purpose

The 2016 election heightened interest in better voting methods locally, statewide and nationally in order to get results that more accurately represent the voters' preferences. LWVCO and LWVUS lack a program position on Voting Methods (VM). Several other state and local LWVs, however, have adopted positions generally supporting alternative voting methods or even a specific alternative.

The LWVBC, with encouragement from LWVCO board members, would like the LWVCO to adopt a position on Voting Methods so that the League can effectually advocate at the state and local levels for voting methods which are better than the current plurality voting method.

LWVCO is recommending concurrence with LWV of Boulder County's new position on Voting Methods at LWVCO Convention in May. There will be two convention caucuses entitled *Better Voting Methods for Better Results.*

Approved LWVBC Voting Methods Program Position

The League supports authorizing and implementing alternatives to plurality voting that allow people to express their preferences more effectively. The League supports gaining on-the-ground experience with alternative voting methods in order to ascertain whether a voting method results in outcomes that match voters' preferences as recorded on their ballots. The League supports voting methods that improve the election experience, that encourage honest voting rather than tactical voting, and that consider ease of implementation.

Considerations:

- Some voting methods are intended for single-winner elections, others for multi- winner elections. It is important that the intended use of a voting method match its actual application. Multi-winner voting methods can promote proportional representation that fosters diversity of our elected officials.

- Election officials should conduct post-election analysis to evaluate the voters' usage of the voting method and the election's reflection of voters' stated preferences. There should be sufficient data transparency – for example, access to ballot records in anonymous form – for an independent analysis to be conducted by other interested groups.

Executive Summary

Our current plurality voting method works well when there are only two candidates for one position. However, when there are more candidates, plurality limits the voice of the voter and can allow for a "spoiler" candidate. There are two main categories of more expressive voting methods: ranking (such as instant-runoff voting) and rating (such as approval and score voting). In ranking, voters get to name their 1st, 2nd, and 3rd (and sometimes more) candidate choices. In rating, voters get to score all the candidates with a whole number within a certain range specified on the ballot; for approval voting the range is binary (1 or X for approve and 0 or "blank" for disapprove), while for score voting the range consists of more options.

How votes are tallied in these different methods isn't necessarily a concern of the average voter but is of great interest to candidates and some citizens. Ideally, the outcome of an election clearly reveals the expressed preference of the voters.

No voting method (VM) is perfect. Each has its strengths and weaknesses. For instance, except for the absence of a voting method (aka, a dictatorship), plurality is probably the simplest method to understand and implement. In this study and at our consensus meetings, we'll discuss the impact of voting methods on 1) honest vs tactical voting, 2) improving the election experience, and 3) ease of implementation. We will drill down into specific criteria within each of the three broad categories. Which criteria do you think are most important?

There are two big-picture philosophies that are worth keeping in mind as we consider specific criteria. Some VM activists argue that the sole, important criterion is the overall quantified satisfaction of the population with the voting method. Another camp argues that a primary criterion in assessing voting methods should be people's natural psychological and emotional state: their desire to vote honestly, to be loyal to candidates and to use a method which doesn't seem so very different from the common plurality method with runoff elections.

Some voting methods are designed to be used in single-winner elections, others in multi-winner elections, but there are instances where a single-winner method is used in a multi-winner race. At our consensus meetings we will discuss whether or not the LWV should encourage integrity between a voting method's intended use and its actual application.

It behooves governments that use alternative voting methods to analyze the process and results of such elections in light of pre-considered criteria and a stated perspective on what constitutes a successful election.

In addition to information about how voting methods work, this report also includes information on the use and legislation of voting methods, our study process, the positions of other Leagues, and useful resources.

Main Types of Voting Methods: Plurality, Rating and Ranking Methods

A voting method defines the form of the ballot, what constitutes a valid vote, and how to tally the votes in order to determine the outcome of the election. A voting method is not to be confused with an election system, which is concerned with whether or not to have early voting, all-mail elections, electronic ballots, etc. A voting method is also a somewhat different topic from voting rights, on which we have a strong LWVUS position. Educating the public about various voting methods and/or having elections with an alternative voting method may further the exercise of voting rights.

Our current plurality voting method works well when there are only two candidates for one position. However, when there are more candidates, plurality limits the voice of the voter. There are two main categories of more expressive voting methods: ranking (such as instant-runoff voting) and rating (such as approval and score voting). Ranking is also sometimes referred to as an ordinal voting method. Rating is sometimes referred to as a cardinal voting method.

A voter primarily encounters the form of the ballot. How votes are actually tallied using these different methods isn't necessarily a concern of the average voter but is of great interest to candidates and some citizens. Ideally, the outcome of an election clearly reveals the expressed preference of the voters.

No voting method (VM) is perfect. Each has its strengths and weaknesses. For examples of different ballots, see Figure 1: Sample Single-Winner Ballots.

Plurality: Plurality voting's primary advantage is its simplicity. The directions to the voter and the tallying are very simple. You vote for one candidate. The candidate with the most votes wins. Plurality voting is also called winner-take-all or first-past-the-post.

What plurality voting gives us in terms of ease of implementation, it withholds in terms of expressiveness.

Plurality with a runoff election at a later date is the most common alternative to simple plurality elections. The main critiques of plurality with runoff are that runoffs are costly and that voter turnout usually drops off considerably for a smaller follow-up election.

Approval Voting – A Rating Voting Method: Approval voting allows you to vote for any and all candidates you approve of. You don't have to choose between two candidates you like. You can vote for both of them. The candidate with the most votes wins.

In rating methods, voters get to score all the candidates with a whole number within a certain range specified on the ballot; for approval voting the range is binary (1 or X for approve and 0 or "blank" for disapprove).

Score Voting – A Rating Voting Method: Score voting allows you to rate each candidate on a scale – for example: 0 to 9. You may give different candidates the same rating. In one version

Sample *Single-Winner* Ballots
LWVBC Consensus Meetings 2017

Plurality Voting

- Vote for one dessert candidate by clearly filling in the box next to the candidate of your choice.

- If you vote for more than one candidate, your ballot will be invalidated.

- The candidate with the most votes wins.

☐ brownie

☐ banana split

☐ sugar cookie

☐ lemon bar

Score (or Range) Voting

- To vote, rate each choice by clearly circling one rating in that candidate's row.
    - Worst rating = 0.
    - Best rating = 3.

- You MAY give EQUAL ratings to different desserts.

- To determine a winner, add up the scores for each dessert. The dessert with the highest total wins.

brownie   Circle One →   0   1   2   3

banana split   Circle One →   0   1   2   3

sugar cookie   Circle One →   0   1   2   3

lemon bar   Circle One →   0   1   2   3

Approval Voting

- Vote for one or more dessert candidates.

- To vote, clearly fill the box next to the candidate(s) of your choice.

- The candidate with the most votes wins.

☐ brownie

☐ banana split

☐ sugar cookie

☐ lemon bar

Instant Runoff Voting (IRV)

- To vote, rank some or all of the desserts.
    - Write 1 in the box next to your favorite.
    - If you have a 2nd favorite, write 2 next to it.
    - If you have a 3rd favorite, write 3 next to it.
    - If you have a 4th favorite, write 4 next to it.
    - You MAY leave a box blank.

- Counting the votes in rounds or "runoffs"

1st Round – If a dessert receives a majority of 1st-choice votes, it wins. Otherwise, begin the 2nd round.

2nd Round – The dessert with the fewest 1st-choice votes is eliminated, and the 2nd-choice votes on those ballots are counted and added to the first-round tally. If a dessert now has a majority of the votes counted, it wins. If not, round 3.

3rd Round – The dessert with the fewest votes is once again eliminated and the next available favorite on those ballots is counted in the tally. After two desserts are eliminated, the remaining dessert with the greatest number of votes wins.

☐ brownie

☐ banana split

☐ sugar cookie

☐ lemon bar

Figure 1

of tallying, the candidate with the highest average score wins. In a different, simpler version, the candidate with the highest cumulative score wins.

Score voting allows for more expressiveness than approval voting. The question of what range to use has generated a lot of discussion.

Instant-Runoff Voting – A Ranking Voting Method: In instant-runoff voting (IRV), you rank the candidates: 1 for your first choice, 2 for your second choice and so on. If a candidate receives a majority of 1st-choice votes, that candidate wins. Otherwise, the candidate with the fewest 1st-choice votes is eliminated. If your first choice gets eliminated, your vote will be transferred to your next-higher choice that has not yet been eliminated. The elimination process continues in sequential rounds until one candidate remains.

Instant-runoff voting is the most complex to count of the four methods discussed here, but in the United States IRV is also the most well-known and widely used of the alternatives to plurality.

Multi-Winner Elections

The four single-winner voting methods listed above each have their own multi-winner version. However, there can be "crossover" among voting methods activists from single-winner to multi-winner elections. For instance, some approval voting advocates are supportive of single transferable vote, the multi-winner version of IRV.

Plurality: You are usually allowed to vote for as many candidates as there are seats to be filled and the candidates with the highest numbers of votes win the election.

Multi-winner versions of the other three voting methods:

Single-winner version	*Multi-winner version*
Approval	Sequential Proportional Approval Voting (SPAV)
Score	Reweighted Score Voting
Instant-Runoff Voting (IRV)	Single Transferable Vote (STV)

For these other three methods, you vote the same way as for single-winner elections, but the tallying is more complicated because these other methods strive for proportional representation and deal with fractions of a vote. For instance, under single transferable vote (STV), even though you may rank 5 candidates, you only get one full vote even if there are 5 seats to be filled. Your full vote in STV can be split fractionally up among the candidates you rank once your top winning candidate reaches the needed threshold to get elected.
.
The goal of proportional representation is to have the percentage of elected representatives from each group – typically a political party – closely match the percentage of the vote for each group. Proportional representation may include other aspects in addition to the voting method.

Variations can be found within a multi-winner version. Under STV, most jurisdictions use a modern fractional allocation method to deal with surplus votes above the threshold or quota, but older methods were often named after a town that used them. Cambridge, Massachusetts uses the Cincinnati method. The city of Boulder conducted elections with STV from 1917 to 1941 using, as far as we know, the Boulder method the entire time.

We did not formally study or present information on multi-winner voting methods, but we are familiar enough with the variances between single-winner and multi-winner design to see the significance of appropriate application. One of the consensus questions addresses this topic. Two examples follow:

Aspen, Colorado – 2009: Aspen was preparing to use IRV in a 2009 city council election when they realized they had a two-winner race while IRV was designed for a single-winner race. Aspen eventually chose a creative accounting system to address the problem, but there was confusion surrounding the problem. There was also contention around the idea that some of the people designing a fix to the problem were the people who were going to be involved in the election. To the credit of FairVote, the national organization advocating for ranked-choice

voting, FairVote has become more diligent about explaining the difference between IRV and the multi-winner version, single transferable vote or STV.

<u>University of Colorado, Boulder – 2013</u>: Multi-winner voting methods tend to result in more balanced representation. In 2013 Clay Shentrup, a founder of the Center for Election Science which advocates for approval voting, pointed this benefit out in regard to CU student elections. In this case, the single-winner approval voting method was used for a 5-winner election. The Unite party won all five seats, despite earning only about 55% of the votes. The Inspire party got about 45% of the votes, but won zero seats. An arguably fairer outcome would have been three seats for Unite and two seats for Inspire, the result one would get under [sequential] proportional approval voting, which is designed for multi-winner elections.

Videos showing tallying for STV, SPAV, and reweighted range (or score) voting are listed in the Resources section of this study under Election Models and Explanation of Criteria on Websites.

Criteria for Evaluating Voting Methods

There are two big-picture philosophies that are worth keeping in mind as we consider specific criteria. Some VM activists argue that the sole, important criterion is the overall quantified satisfaction of the population with the voting method, usually referred to as minimizing Bayesian regret or maximizing Voter Satisfaction Efficiency; because this statistic requires *knowing* the voters' satisfaction or happiness and we can't read people's minds, this statistic can never be actually known. When voters' candidate preferences are pre-determined (e.g., in a computer simulation), we can know *relatively* for different voting methods, if they yield different results, which result would be preferred by voters. Bayesian regret has been calculated for different voting methods via computer simulations of elections. It would certainly be harder to evaluate Bayesian regret in real-world situations, though IRV and score ballots give you more of the basic data necessary.

One aspect of a voting method that can affect a population's Bayesian regret is the election of a Condorcet winner. A Condorcet winner is the one who would win against any other candidate in a head-to-head match-up. However, the Condorcet winner does not necessarily produce the happiest outcome. Finally, not all elections have a Condorcet winner; some elections can be like the hand game Rock, Paper, Scissors.

A real-world example of an alternative voting method not producing the Condorcet winner is the 2009 IRV mayoral race in Burlington, Vermont. We know from the ranked ballots that the Democrat would have beaten both the Republican and the Progressive candidate in a head-to-head match-up, but the Democrat lost. The eliminated candidates in order of elimination were the write-in candidates, the Green candidate, the Independent, the Democrat, and then the Republican.

The two charts below are from http://rangevoting.org/Burlington.html

Candidate(Party)	1st Rd	2nd Rd	Final
Bob KISS(Progr)	2585(29%)	2981	4313 (wins)
Kurt WRIGHT(Repub)	2951(33%)	3294	4061
Andy MONTROLL(Dem)	2063(23%)	2554	
Dan SMITH(Indpt)	1306(15%)		
James SIMPSON(Green)	35 (0.4%)		
(Write-ins)	36 (0.4%)		

A table of the ranked ballots using only the top-three candidates is below:

#Voters	Their Vote
1332	M>K>W
767	M>W>K
455	M
2043	K>M>W
371	K>W>M
568	K
1513	W>M>K
495	W>K>M
1289	W

Montroll is the Condorcet winner.

> Montroll beats Kiss in a head-to-head contest 1332 + 767 + 455 + 1513 = 4067
> Montroll beats Wright in a head-to-head contest 1332 + 767 + 455 + 2043 = 4597

Not everyone agrees that Bayesian regret is better than using specific criteria when evaluating voting methods, but it is an important perspective to be aware of.

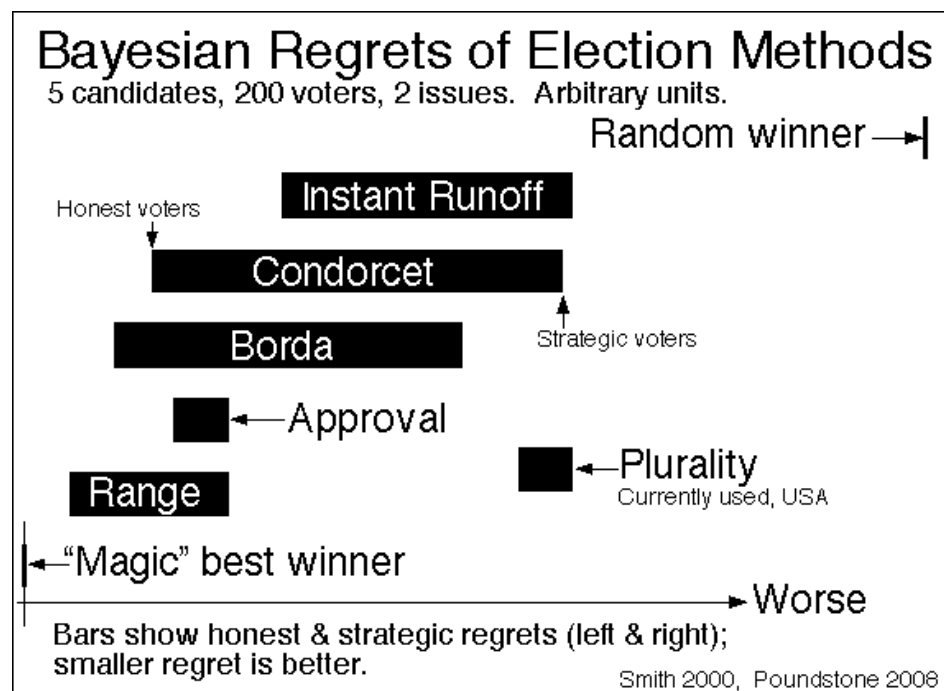Figure 2: Chart of Bayesian Regrets (http://rangevoting.org/BR52002bw.png)]

Another camp argues that a primary criterion in assessing voting methods should be people's natural psychological and emotional state: their desire to vote honestly, to be loyal to candidates

and to use a method which doesn't seem so very different from the common plurality method with runoff elections.

In this study we discuss the impact of voting methods on 1) honest vs tactical voting, 2) improving the election experience, and 3) ease of implementation.

Honest Vs Tactical Voting

Tactical voting occurs when a voter supports one candidate more strongly than her favorite candidate, aka sincere preference. For instance, in a plurality election with more than two candidates, voters sometimes choose the "lesser of two evils" rather than vote for their honest favorite. This tactic seems inherently undesirable, but simultaneously strategically wise.

Any single-winner voting method is subject to tactical voting according to the Gibbard–Satterthwaite Theorem. However, it may be harder for an average voter to see how to game the system under IRV than under rating systems, making IRV perhaps more "strategy-resistant" than approval and score voting.

Bullet voting is when a person votes for only one candidate even though the voter is allowed to vote for more than one candidate. This can occur in any race where a voter may choose more than one candidate, e.g, multi-winner plurality races, approval voting, and even ranked voting. IRV advocates describe bullet voting as a problem with approval voting although bullet voting is technically not considered tactical voting since you presumably vote for your sincere preference. It is always safe to vote for your favorite candidate under approval voting. Meanwhile, historical election results show that bullet voting under IRV is rare.

Under approval voting, a voter may help a less preferred candidate win by giving support to the less preferred candidate in addition to the preferred candidate. Here is an example with candidates A, B and C and 10 million voters.

> 5 million voters approve of A and B, but prefer A to B
> 2 million voters approve of A (bullet vote)
> 3 million voters approve of B (bullet vote)

B is the winner with 8 million votes even though 70% of the voters prefer A to B. All of the candidates' vote tallies appear in the final count so at least a more honest picture of the preferred candidate's support is visible than under tactical plurality voting. Additionally, the less preferred winning candidate is presumably still a candidate with broad appeal.

Strategic voting is present in every voting method. In our study we are focusing on three desirable criteria for honest voting:

(a) Favorite-safe: It is safe to vote for your favorite candidate. For example, if you vote for Nader who is your favorite, you don't hurt Gore who is your 2nd choice or help Bush who you like the least. Plurality voting doesn't meet this criterion because you may get your least favorite candidate if you vote for your favorite candidate over an acceptable candidate.

Approval and score are favorite-safe. IRV is better than plurality, but not always favorite-safe. Putting your favorite first in IRV is only safe when your candidate is very strong or has no chance of winning at all. Favorite-safe is also known as the favorite-betrayal criterion. Figure 3: Favorite-Safe Criterion Example as well as a "Favorite Betrayal in Plurality and IRV" video at https://www.youtube.com/watch?v=JtKAScORevQ provide specific illustrations.

Example: Favorite-safe criterion is not met.

Favorite-safe means that it is always safe to vote for your favorite candidate.

Original Scenario

# Voters	Ranking		A	B	C
2	A > B > C	First Round	6	6	5
6	B > A > C	No one has a majority, and C is eliminated in the first round.			
5	C > B > A	Changes		+5	
4	A > C > B	Second Round	6	11	■
17 voters	Total			B wins.	
Majority = 9		**Voters whose first choice was C had their votes distributed to their second choice B.**			

Revised Scenario

The first two voters are convinced before the election that B is a better candidate than A. They change their vote, ranking B first.

# Voters	Ranking		A	B	C
8	B > A > C	First Round	4	8	5
5	C > B > A	No one has a majority, and A is eliminated in the first round.			
4	A > C > B	Changes			+4
17 voters	Total	Second Round	■	8	9
Majority = 9				C wins.	
		Voters whose first choice was A had their votes distributed to their second choice C.			

It was not safe for the 2 voters to vote for their favorite candidate under IRV. IRV is not favorite-safe.

Adding first-rank votes under IRV to Candidate B did not help B. Rather, it hurt B! IRV is not monotonic.

Figure 3

(b) Clone-safe: In a race with 3 or more candidates where candidates A and B are "identical," there is no vote splitting between A and B and no incentive to push one clone to leave the race. Plurality voting doesn't meet this criterion; under plurality vote splitting between the clones sometimes results in the least preferred candidate winning. One could argue that several of the 2016 Republican primary candidates were clones of each other, especially when compared to Trump. IRV, approval and score are all clone-safe.

(c) Monotonic: There are two parts to monotonicity: First, voting for a candidate helps the candidate. In this way, it's similar to the favorite-safe criterion. Secondly, not voting for or voting against a candidate doesn't help the candidate. Monotonicity avoids the situation where a voter is more satisfied not voting than voting honestly – "no-show paradox." Plurality, approval and score voting are all monotonic. IRV is not monotonic. See Figure 4: No-show paradox.

Example: No-Show Paradox
-- You'd be happier with the election result if you had not voted.

Everyone Votes -->	500 voters vote for candidates A, B and C as follows:			
Number of Votes				
200	A	These 200 voters bullet vote for A, declining to show support for other candidates.		
60	B > A	The remaining voters show some support for 2 candidates and rank them accordingly.		
60	B > C			
180	C > B			
		A	B	C
IRV:	1st Round	200	120	180
	No one has a majority, and B is eliminated in the first round.			
	Changes	+60		+60
	2nd Round	260	■	240
	A wins.			
	Note: The winner got NO support from voters who ranked C as their 1st choice.			
	These C voters aren't happy with the outcome.			

What if 80 C Voters Stay Home?	420 voters vote for candidates A, B and C as follows:			
Number of Votes				
200	A			
60	B > A			
60	B > C			
100	C > B			
		A	B	C
IRV:	1st Round	200	120	100
	No one has a majority, and C is eliminated in the first round.			
	Changes		+100	
	2nd Round	200	220	■
	B wins.			
	Note: B is the C voters' 2nd choice.			
	C voters would have been happier (in this race) if some of them had not shown up to vote.			

Figure 4

Improving the Election Experience

The LWV is dedicated to encouraging citizens to exercise their right to vote. A positive election experience can lead to greater voter turnout. Higher voter turnout should lead to a more representative government. In our study we are focusing on four desirable criteria for improving the election experience:

(d) Allows for expressive voting: Voters can clearly express preferences. Plurality is terrible; voters can only choose one candidate. Approval is better; voters can choose more than one. Ranking lets you put your choices in order, but you don't get to distinguish how close or how far your rankings are from each other. Score is the most expressive, but some voters tend to give high scores, others low scores. Perhaps to broaden the range, score voting directions sometimes encourage voters to give the highest score to their favorite and the lowest score to their least favorite. Alternatively, score voting could have a tight range of scores like 3-2-1 voting: Good, Acceptable or Rejected.

People often prefer expressive voting, but a voter's expressiveness may or may not be registered in the tallying of the votes. For instance, the extra information on an IRV ballot ranked below the winning candidate is effectively discarded, while the information on an exhausted ballot is only registered in the early rounds.

(e) Conducive to positive campaigning: Plurality's first-past-the-post principle promotes negative campaigning and discourages candidate conversations with voters who support viable opponents. With ranking and rating methods, candidates ask for high rankings or ratings even if they don't receive the voter's highest. Candidates who denigrate their opponents will tend to alienate the opponents' supporters and receive very low ratings or rankings from them.

(f) Nursery for third parties rather than two-party domination: As Americans know from experience, plurality is not good at encouraging the growth of third parties.

Based on decades of election results in the Australian House of Representatives, IRV is not a nursery for third parties either. (The Australian Senate uses an STV proportional-representation method to elect its members.) Not enough on-the-ground data exist to determine how this criterion would fare under other single-winner voting methods. Approval voting and score voting give more visibility to third parties than plurality. Visibility in IRV is dependent on how many rounds of data are shared with the general public. Many IRV applications only let you rank three candidates even if there are fifteen candidates, also hindering visibility. Keep in mind that visibility of third-party support is not synonymous with being a nursery and actually helping the smaller parties grow. In fact, more visibility could lead to more tactical voting.

(g) Integrity and fairness of the voting method produce overall voter satisfaction. People may not be happy with the result of an election, but if they feel that the voting method is consistently fair and has integrity, then people will be more likely to be satisfied with the election and accept the results. On the other hand, if the voting method doesn't seem fair, then voters may be dissatisfied with the process even if they like the election outcome.

IRV was repealed in Burlington, VT, in Aspen, CO and in Pierce County, WA because the voting method was seen to be problematic – not electing the Condorcet winner in the first case, not used with integrity in the second case, and confusing in the third case with voters receiving separate ballots for the IRV and the plurality elections. Approval voting was repealed by the Institute of Electrical and Electronics Engineers (IEEE) because, according to the Executive Director Daniel Senese, "few of our members were using it and it was felt that it was no longer needed." In the cases cited, elections went back to the plurality method.

Score voting may not elect the "first choice" of most of the people, as shown in Figure 5: Score Voting and the Preferred Candidate, but analysts would say that the voters will accept the outcome because the winner, a second choice for many, was held in close esteem to their first choice.

Example: Score voting doesn't elect most preferred candidate

10 MILLION VOTERS		Candidate A	Candidate B	Candidate C
1 million	A>B>C	10	9	1
1 million	"	10	9	
1 million	"	10	8	1
1 million	"	10	7	1
1 million	"	10	6	
1 million	"	10	5	1
1 million	"	10	3	1
1 million	B>A	1	10	
1 million	"	1	10	
1 million	"	1	10	
Total		73	77	5

B is the winner even though 70% of the voters prefer A over B.

Figure 5

Ease of Implementation

The United States continues to have a hodgepodge of different voting machines and voting laws. The Help America Vote Act of 2002 required upgrades to voting machines, but not standardization, in response to the 2000 presidential election. Within each state, election administrators in rural counties and urban counties have different needs and different budgets. Within each county, there are usually single-winner and multi-winner races. County election administrators often oversee elections in municipalities and also need to coordinate elections in multi-county jurisdictions. How easy a new voting method is to implement often plays a large part in its success or failure. In our study we are focusing on three desirable criteria for ease of implementation:

(h) Voting directions are easy to understand, resulting in fewer incidents of ballot spoilage: If voters don't understand the voting directions, then they may just revert to plurality, the simplest voting method, when they would prefer to be more expressive, or the voters may unintentionally spoil their ballot. Ballot spoilage means that a ballot is rendered invalid and the vote is not counted. In plurality, voting for more candidates than there are winners is an example of ballot spoilage.

Analysts of San Francisco elections found that non-native English speakers, racial minorities and less educated voters did not understand the ranked-choice voting method as well as other demographic groups. Similarly in Minneapolis, there was more ballot spoilage in wards with lower average household incomes. The 9-minute "Instant Runoff Voting—Voting Civil Rights" video at http://www.youtube.com/watch?v=qvwXzQyGgQM&feature=channel details the lack of understanding in these two communities. Continuous voter education is probably necessary until the new voting method becomes "standard."

In Aspen's version of IRV, the only way to spoil a ballot was by over-voting in the first ranking of a race. Voting machines can be set up to avoid ballot spoilage, but in Colorado most people vote on paper, mail-in ballots. Approval voting avoids ballot spoilage because a voter cannot over-vote.

(i) Can use existing machines and inexpensive software for voting and tallying: If existing machines can be used for voting and tallying votes, then a new voting method can be implemented immediately. If not, then implementation needs to wait until new voting or tallying machines are purchased. Plurality and approval voting are particularly easy to implement. Score voting using the sum of scores rather than the average is also easy to implement.

Some single-winner methods require all ballots to be processed together so larger jurisdictions would have to coordinate tallying in a central location. Different counties in Colorado currently use different tallying machines so some standardization of machines is probably necessary for machine counting. Maine will provide a very interesting case study of IRV in a small state. Colorado has talked about standardizing vote-tallying machines, but it hasn't happened yet.

IRV and multi-winner proportional-representation races typically require multiple rounds of tallying with transferring votes or reweighting votes to determine the election results. Would

there have to be a separate ballot for each different jurisdiction or would the largest jurisdiction (probably the state) have to count all the races in that jurisdiction? If you live in House District 13, you might live in Senate District 18 or Senate District 16. What jurisdiction would count the votes?

Ireland counts its STV ballots by hand. Would manual counts be an option in the United States? All electronic voting machines would have to produce a paper ballot. In Ireland, any surplus votes over the threshold or quota are redistributed randomly, a decision which might not go over well in the US. Using fractions of votes (see the next criterion) increases the necessity for machine counting, but some voting watchdogs contend that manual counts of paper ballots are the gold standard and point to the number of industrialized countries that are using manual counts.

(j) Tallying of votes is transparent and easy for the voter to understand: Perhaps the most important issue is giving voters confidence in the tallying process. Tallying should not be a black box. Interested parties should be able to replicate the results mathematically.

Plurality, approval voting and summation score voting are all straightforward. Score voting using averages requires dividing two numbers but is also manageable. In IRV, the multiple steps create an added complexity, but with a spreadsheet or other tabulation framework, the steps can be followed.

During tallying in multi-winner races, single transferable vote, sequential proportional approval voting and reweighted score voting all use fractions, an added complexity for some voters. In addition, different jurisdictions use different tallying methods for STV's transferred votes with the result that not all votes are treated equally. The threshold or quota required for election in an STV race may change during the tallying because some votes become non-transferable. Rather than use a threshold, SPAV and reweighted score voting just declare the highest vote-getters the winners. Videos showing tallying for STV, SPAV, and reweighted range (or score) voting are listed in the Resources section of this study under Election Models and Explanation of Criteria on Websites.

A number of charts have been compiled that reflect a voting method's performance relative to various criteria. Below is our comparison chart followed by FairVote's and the Center for Range Voting's charts:

*VOTING METHODS for SINGLE-WINNER ELECTIONS	Encourages Honest Voting			Improves the Election Experience				Easy to Implement		
	Favorite-safe: You can vote your favorite without worry that vote might help your last-choice candidate	Clone-safe: There is no vote splitting between clone candidates	Monotonic: Adding votes to your candidate can only help your candidate; not voting for a candidate doesn't help the candidate	Allows for expressive voting	Conducive to Positive Campaigning	Nursery for 3rd Parties	Integrity and fairness of the voting method produce overall voter satisfaction	Voting directions are easy to understand, reducing ballot spoilage	Can use existing machines and inexpensive software	Tallying of votes is transparent; easy for voter to understand
Plurality ...requires each voter to choose one										
PLURALITY	BAD	BAD	GOOD	BAD	BAD	BAD	BAD	GOOD	GOOD	GOOD
[TOP TWO RUNOFF, when used]	N/A	N/A	GOOD	N/A	BAD	N/A	FAIR	GOOD	GOOD	GOOD
Rating ...allows voters to score their choices along a scale. Voters **may give equal scores to different choices.**										
APPROVAL	GOOD	GOOD	GOOD	FAIR	GOOD	FAIR	FAIR	GOOD	GOOD	GOOD
SCORE also called Range	GOOD	GOOD	GOOD	GOOD	GOOD	FAIR	FAIR	FAIR	FAIR	FAIR
Ranking ...allows voters to rank at least two choices whenever there are 3 or more candidates. These methods typically require voters to **not rank any choices equally**										
INSTANT RUNOFF	FAIR	GOOD	BAD	GOOD	GOOD	FAIR	FAIR	FAIR	BAD	FAIR

chart updated Feb 2017   It can be difficult to give an accurate rating to some of these criteria because there are different possible interpretations and/or aspects to consider under each criterion.

Figure 6

Voting Methods Comparison Chart

	Vote-for-one plurality	Two-round runoff	Ranked choice voting (single winner)	Approval voting	Range voting	Condorcet methods	Borda count
resistance to "spoilers"	low	medium	high	medium	medium	high	low
later-no-harm criterion	yes	yes	yes	no	no	no	no
resistance to strategic voting	low	high	high	low	low	high	low
majority-favorite criterion	yes	yes	yes	no	no	yes	no
mutual-majority criterion	no	no	yes	no	no	yes/no	no
prospects for U.S. adoption	high	high	high	medium	low	low	low
Condorcet-loser criterion	no	yes	yes	no	no	yes/no	yes
Condorcet-winner criterion	no	no	no	no	no	yes	no
independence of clones criterion	no	no	yes	yes/no	yes/no	yes/no	no
monotonicity criterion	yes	no	no	yes	yes	yes/no	yes

Ranked choice voting compared to alternative reforms. See www.fairvote.org/alternatives for more detail.

FairVote

Share

Figure 7: FairVote comparison chart http://www.fairvote.org/alternatives

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Range Voting versus other voting systems

SUMMARY CHART of voting system properties

Please view widescreen.

Voting system	Expressive	Participation (avoids "no show paradoxes")	Favorite-Safe	Clone-Safe	Monotonic	Remove-Loser-Safe	Precinct-Countable	Dumb-Machines	Extremist/ Centrist Bias	Enactability	Simplicity
Plurality	The Worst	yes	FAILS!	FAILS!	yes	FAILS!	yes	yes	Extremist	(already enacted)	good
Approval	or on each canddt	yes	yes	partial	yes	yes	yes	yes	voter-behavior-dependent (pro-centrist or unbiased)	good	best (excellent for meetings)
Condorcet systems	rank order	FAILS! (2.5%?)	FAILS!	yes & no (some obey it)	yes & no (some obey it)	FAILS! 9%	yes & no (some obey it)	FAILS!	unbiased	probably bad	complex
Borda	rank order	yes	FAILS!	FAILS!	yes	FAILS!	yes	FAILS!	ok	?	medium
Instant Runoff (IRV)	rank order	FAILS! 16.2%	FAILS! 19.6-100%	yes	FAILS! 14.7%	FAILS! (13%?)	FAILS!	FAILS!	Extremist	bad	complex
Range	The Best	yes (if no "blanks")	yes	yes	yes	yes	yes	surprisingly yes	ok (bias, if any, small)	best	surprisingly good

Figure 8: Range Voting comparison chart http://rangevoting.org/CompChart.html

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Use and Legislation

Use and Legislation in Colorado

In 1917 the city of Boulder adopted STV with a Hare quota for city council elections, one of the first cities in the US to do so. A conservative faction pushed to get rid of STV in the 1940s. It was repealed in 1947 and replaced by plurality voting which is still in use.

The Bucklin method, a ranking method also known as the Grand Junction method, was also used in Colorado in the early 20th century.

More recently, Basalt adopted IRV for mayoral elections in 2002 but has yet to have more than two candidates run for mayor. In 2008 Telluride adopted IRV for the 2011, 2015 and 2019 mayoral elections; the instant-runoff feature was triggered in 2015. Aspen used IRV in 2009 then rejected its use in 2010. In 2011 IRV was promoted by initiative for mayor and city council in Fort Collins, but the initiative was defeated. The University of Colorado - Boulder student government elections have used approval voting since 2013.

With regard to Colorado law, a 2007 Colorado Voter Choice Task Force Final Report prepared the way for passage of HB08-1378 that allows local governments the option of using IRV or STV for their elections.

Representative Jonathan Singer has proposed bipartisan bills over the past few years to allow local governments the option of using approval voting in non-partisan elections, but his bills have not yet passed. LWVCO supported Rep Singer's bill in 2014 because alternatives to plurality voting may increase voter turnout—a national League goal. We expect proposals for expanded use of non-plurality voting methods will continue to be introduced in the Colorado General Assembly and to emerge from citizen groups.

In 2013 Colorado Law School Professor Richard Collins gave us his insight as to where new voting methods stand, legally, in terms of the Constitution and Colorado Revised Statutes:

> The Colorado Constitution assures a form of secret ballot and the "purity" of elections, but it does not enshrine plurality voting--that is a matter of statute. If the Legislature were to adopt a different form, it would be valid. The ranked voting law [of 2008] applies directly only to statutory local governments and indirectly to home-rule local governments. It allows any local government to adopt the kinds of elections the statute covers. By implication it excludes others. So methods outside its scope are not permitted for statutory local governments unless and until the statute is amended to allow them. A home-rule entity could by charter amendment adopt another method. A challenger could argue that state law forbids this. The issue would depend on the scope of home rule. I would bet on home-rule prevailing, though I am not certain.
>
> To simplify, for one of the alternatives you listed to be used: (1) The Legislature could adopt it for state elections and/or impose it for local elections by statutory entities; or (2)

The Legislature could allow local statutory entities to adopt it, as does the ranked voting law; or (3) a home-rule entity could adopt it and survive a legal challenge.

In addition to the activist group promoting approval voting in Colorado, another group is working toward a citizen initiative to permit the expanded use of IRV and STV in Colorado.

Use in Other States or Nationwide

Many organizations hold elections, from governments to political parties to professional organizations. Awards such as the Heisman Trophy and the Oscars are chosen via a wide variety of voting methods.

Currently, instant-runoff voting is the most popular alternative to plurality voting in the United States. It is currently used in the California San Francisco Bay Area in San Francisco, Oakland, Berkeley and San Leandro, in Minnesota's Twin Cities of Minneapolis and St Paul, in Takoma Park, Maryland and in Portland, Maine. Other municipalities have adopted IRV but are awaiting equipment or programming updates. In 2016 Maine adopted IRV for future Congress, US Senate and all state elections. Several states, particularly in the southern part of the United States, use IRV for military and/or overseas voters, using one ranked-choice ballot for both the first election and the runoff.

In 1975 Ann Arbor, MI elected its first-ever black mayor in a 3-way IRV race, and the losing Republicans led a successful repeal effort to return to plurality. Burlington, VT, Pierce County, WA and Cary, NC are all jurisdictions outside of Colorado that have tried IRV in this century and then gone back to plurality voting. In 2015 voters in Duluth, MN defeated a measure to adopt ranked-choice voting to elect city leaders.

In 2002 Alaska voters were offered but rejected IRV for most state and federal elections. The first known statewide usage of IRV was a 2010 North Carolina Court of Appeals election with thirteen candidates, but the 2006 law allowing IRV for state elections was repealed in 2013 as part of a voter ID bill. In 2003 Texas Attorney General Greg Abbott (currently Governor) issued an opinion that the state constitution prohibits home-rule municipalities from adopting instant-runoff voting.

Cambridge, Massachusetts has used single transferable vote (STV) to elect its city council and school board since 1941. Minneapolis is the only known US location using both IRV and STV for single-winner and multi-winner elections respectively.

An election task force in Fargo, North Dakota recently recommended that approval voting be used to elect its mayor and four other city commissioners. Fargo would be the first US city to use approval voting. The mayor is elected in a single-winner race and the other commissioners in a multi-winner race.

Approval voting is favored by professional associations such as the Mathematical Association of America, the American Mathematical Society, the Institute for Operations Research and the Management Sciences, and the American Statistical Association. Approval voting was repealed

by the Institute of Electrical and Electronics Engineers (IEEE) in 2002. It was also rescinded by the Dartmouth Alumni Association in 2009, but the Dartmouth College student elections replaced IRV with approval voting in 2011.

Most political parties in the US use plurality elections or plurality with runoffs, but both ranked-choice voting and approval voting claim political parties among their adherents.

Score voting has the least amount of formal implementation, but multi-winner reweighted score voting has been used since 2010 to choose the five nominees for the Academy Award in Best Visual Effects.

Use in Other Countries

Australia has used IRV in the national House of Representatives and STV in the national Senate for over a century. Papua New Guinea also uses an IRV-variant called Limited Preferential Voting to elect its parliament. Irish citizens elect their president using IRV and their representatives using STV. IRV is used in some local New Zealand elections and for state legislatures in India. A top-two IRV is used to elect the mayor of London and officials in Sri Lanka. Due to the number of elections around the world, this list is not comprehensive.

Approval voting is used to select the Secretary-General of the United Nations. Historically, approval voting was used in Venice, Sparta, Russia, and to elect the pope in Rome. Venice and Sparta are reported to have used score voting as well.

Multi-winner proportional-representation voting methods are common in other countries.

Post-Election Analysis

While various countries, states, municipalities, and organizations have utilized non-plurality voting methods, the evaluation of election results with regard to various criteria is still sporadic — sometimes conducted in depth and other times conducted in a more cursory fashion. Analysis is often the result of an expert's or journalist's concerted efforts instead of an organized post-election government review.

It behooves governments that use alternative voting methods to analyze the process and results of such elections in light of pre-considered criteria and a stated perspective on what constitutes a successful election.

Study Process

Timeline

Highlighted dates indicate events directly involving Voting Methods Team members.

2007 Colorado General Assembly session: Rep John Kefalas and Sen Ken Gordon introduce HB 1162 to pilot ranked voting in Colorado and to establish a voter choice study group. Bill is postponed indefinitely (aka "killed") but a Voter Choice Task Force is created.

2007 June-December: Voter Choice Task Force meets. In March of 2008 the final report of the task force recommends a pilot program with ranked voting in Colorado.

2008 Colorado General Assembly session: Rep John Kefalas, Sen Ken Gordon and several other legislators introduce HB 1378 to allow cities and special districts to use IRV and STV in elections. The bill is signed into law.

2011 April 5: Fort Collins voters reject a citizen initiative to elect the mayor and city council members using a ranked voting method.

2011 December 10: Eric Fried of Fort Collins Ranked Voting speaks at the LWVBC's holiday party about instant-runoff voting.

2012 May 5: At the annual meeting, LWVBC members approve a Board-recommended "study and concurrence or consensus on the concepts and implementation of Ranked Voting." As a result, the existing position on Elected Municipal Offices and/or Voting Procedures in Boulder County would be subject to revision.

2012 October: The University of Colorado (Boulder) Student Government passes 77LCB08 to change from plurality voting to approval voting.

2012-3 winter: The LWVBC team changes its focus and name from the narrow "Ranked Voting" to the inclusive "Voting Methods" and prepares for unit meetings.

2013 Colorado General Assembly session: Sen David Balmer and Rep Jonathan Singer introduce SB 65 to allow approval voting by local governments in nonpartisan elections. Bill is postponed indefinitely.

2013 April and May: The Voting Methods Team holds five non-consensus, informational meetings on single-winner alternative voting methods, their history, criteria used to judge the voting methods, and their pros and cons. Attendees vote using four different voting methods. The VM Team does not recommend any particular voting method, but rather encourages experimentation with various voting methods in order to get more on-the-ground data and experience.

2013 Colorado General Assembly session: Rep Jonathan Singer and Sen David Balmer introduce HB 1062 to allow approval voting by local governments in nonpartisan elections. Bill is postponed indefinitely.

2014 November 15: VM Team leader Celeste Landry attends the Voting Methods and Election Integrity Symposium sponsored by Free and Equal in Glendale, CO. Other VM Team members are at a celebration for VM Team founder Pat Johnson and her long history of work for the League.

2015 January: Program Planning meetings – The LWVBC Voting Methods Team propose a statewide study on voting methods. Only the Behavioral Health Study is approved.

2015 September 19: Colorado League Day – LWVBC Voting Methods Team members present "Examples of Voting Methods for Single-Seat Elections," a voting and tallying interactive presentation.

2015 November 14: VM Team leader Celeste Landry attends the 2nd annual Voting Methods and Election Integrity Symposium sponsored by Free and Equal in Glendale, CO.

2015-16 election season: The Republican Party has more than a dozen candidates vying for their party's nomination – an excellent, but missed, opportunity to use a non-plurality voting method.

2016 November 8: Maine passes Question 5, a citizen-initiated referendum to elect all state legislators, the governor, and members of the US Congress and Senate using instant-runoff voting.

2016 November 19: VM Team leader Celeste Landry attends the 3rd annual Voting Methods and Election Integrity Symposium sponsored by Free and Equal in Glendale, CO.

2017 January: Program Planning meetings – Given the heightened interest in voting methods, the extensive research of the VM team, and the desire for the LWV to have a position from which to advocate on voting methods, the LWVBC Voting Methods Team proposes a local study on voting methods with a possible state concurrence at the May LWVCO convention.

2017 February 1: Rob Richie, Executive Director of FairVote, and VM Team member Celeste Landry are interviewed on KGNU Radio.

2017 February 2: Rob Richie, Executive Director of FairVote, is the speaker for "More Choices for Voters - Part 1: Implications of Maine's decision on instant-runoff voting for Colorado and the nation"

2017 February 16: The LWVBC Board approves the questions for the consensus meetings.

2017 February 21: State Representative Jonathan Singer and Center for Election Science board member Neal McBurnett are the speakers for "More Choices for Voters – Part 2: Colorado's Approval Voting bill and the use of this method by CU student government"

2017 February 27 and March 2: LWVBC consensus meetings on voting methods lead to a position statement on voting methods approved by the LWVBC Board.

2017 March 9: LWVCO Board meeting where the board votes to recommend state concurrence with the LWVBC position at the LWVCO convention.

2017 March to May: The LWVBC Voting Methods Team will be reaching out to local Leagues to present information and answer questions about alternative voting methods.

2017 April 18 (tentative): "More Choices for Voters – Part 3: Proportional Representation"

2017 May 20-21: LWVCO Convention in Fort Collins. Two caucuses entitled "Better Voting Methods for Better Results" are scheduled.

LWVCO and LWVUS (Lack of) Positions on Voting Methods

LWVBC, LWVCO and LWVUS all lacked a program position on Voting Methods as of February 2017. Some related positions are listed below:

LWVUS Position on Citizen's Right to Vote: *The League of Women Voters of the United States believes that voting is a fundamental citizen right that must be guaranteed.* (March 1982)

Summary of LWVUS Public Policy Position
REPRESENTATIVE GOVERNMENT: Promote an open governmental system that is representative, accountable and responsive.
Citizen's Right to Vote. Protect the right of all citizens to vote; encourage all citizens to vote.

LWVCO: Refers to the LWVUS position.

LWVBC Position on Voting Procedures in Boulder County: *Voting procedures in Boulder County should provide for accuracy, reliability, security and privacy. Methods should be voter friendly and should encourage voter participation.* (Adopted April 1996, amended 1997, 2002 with Longmont League concurrence)

LWV Positions on Voting Methods

We attempted to create a comprehensive list, but there may be some missing positions.

Arizona: support changing the present election systems so that they more accurately represent the wishes of voters: Adopting the Instant Runoff Voting (IRV) system for single seat races; adopting proportional representation for multi-seat races, specifically Ranked Choice Voting. (undated)

California: support election systems for executive and other single seat offices, both at the state and local levels, that require the winner to receive a majority of the votes, as long as the majority is achieved using a voting method such as Instant Runoff Voting, rather than a second, separate runoff election. (2001, amended 2003 and 2011)

Florida: recommend instant runoff voting as an alternative to Florida's present system of plurality voting. (2007)

Colorado
Larimer County: support IRV in single-seat elections. (Wanda Mayberry helped write the position. She passed away on Dec 18, 2012.)

Maine: support election systems for elected offices in single seat elections that require the winner to receive a majority of the votes, as long as the majority is achieved by Instant Runoff Voting/Ranked Choice Voting, rather than a second, separate runoff election (2011)

Maryland: support the option to use Instant Runoff Voting (IRV): to fill vacancies in any single seat or executive office elections, at the local, county or state level. This would require the winner to receive a majority of the votes, instead of conducting both special political party primaries and a special general election. (2015)

Massachusetts: support voting systems that are easy to use, administer and understand, encourage high voter turnout, encourage real discussion on issues, promote minority representation, and encourage candidates to run. When electing someone to a single executive office at the state level, …the voting system should require the winner to obtain a majority of the votes. The League supports instant runoff voting. Cost and complexity make two-round runoff not acceptable. (2005)

Minnesota: support the option to use Instant Runoff Voting to elect State or Local Officials in single seat elections. LWVMN also supports the continued use of the plurality voting system in our elections. The LWVMN Board reserves the right to decide the appropriateness of legislation proposing to replace the plurality voting system with the Instant Runoff System at the state level… Voters need to understand how votes in an election are tabulated and how a candidate actually wins an election…. LWVMN does not support Approval, Borda Count, or Condorcet as alternative voting systems. (2005)

Ohio

Greater Cleveland, Bay Village Chapter: support nonpartisan elections for City of Bay Village offices. If more than two candidates file petitions for a given office, a primary election should be held to narrow the field to two candidates, ensuring a majority vote. Write-in candidates should not be allowed in the general election. (9/6/2014)

Oregon: support enabling legislation to allow local jurisdictions to explore alternative election methods… Only after experience and evaluation at the local level should the state consider alternative election methods for statewide adoption. (2009)

South Carolina: support eliminating the 50%-plus-1 rule that is now required to win a primary in South Carolina. (Holding second run-offs effectively disenfranchises absentee voters…) (undated)… Adopting election systems that ensure better proportional representation of the varied segments of our voting population… Our present "winner-take-all" system in many instances fails to achieve a goal of fair representation of minorities and women. … Systems which may be considered include Instant Runoff Voting (IRV), Limited Voting, Cumulative Voting, and others. (2005)

Vermont: support instant runoff voting (IRV) for all statewide elections. (1999)

Washington: support election methods that promote "representative-ness," citizen participation and accountability and that produce proportional representation. Support a majority vote requirement if achieved through a mechanism such as Instant Runoff Voting. (undated)

Consensus Questions

Introduction

Our current plurality voting method works well when there are only two candidates for one position. However, when there are more candidates, plurality limits the voice of the voter. Various voting methods have been used around the world, across the span of history and via computer simulations, but plurality predominates at present in the United States, Colorado and Boulder County. LWVBC, LWVCO and LWVUS all lack a program position on voting methods.

There are two main categories of more expressive voting methods: **ranking** (such as instant-runoff voting) and **rating** (such as approval and score voting). In ranking, voters get to name their 1st, 2nd, and 3rd (and sometimes more) candidate choices. In rating, voters get to score all the candidates with a whole number within a certain range specified on the ballot; for approval voting the range is binary (1 for approve and 0 for disapprove) while for score voting the range consists of more options.

How votes are tallied in these different methods isn't necessarily a concern of the average voter but is of great interest to candidates and some citizens. Some ranking voting methods use scores (such as the Bucklin method) and some rating methods use a ranking system (such as 3-2-1 voting) to do the tallying. In any case, ideally the outcome of an election clearly reveals the expressed preference of the voters.

The purpose of these consensus questions is to gather direction from our members and, if a consensus is reached, to create a program position from which we can advocate for new laws and for implementation of voting methods other than plurality.

By the way, LWV uses a rating method for consensus questions ranging from "strongly agree" to "strongly disagree" and includes a "no consensus" option.

VOTING METHODS CONSENSUS QUESTIONS

Present question #1 at the outset of the meeting and then repeat it after the other questions have been answered.

1. Currently most jurisdictions use plurality voting. The League should actively support legalizing and implementing alternative voting methods that allow people to express their preferences more effectively. The League should actively support gaining on-the-ground experience with alternative voting methods in order to ascertain whether a voting method results in outcomes that match voters' preferences as recorded on their ballots.
___Strongly agree   ___ Agree   ___ Disagree   ___ Strongly disagree ___ No consensus

2. Some voting methods are intended for single-winner elections, others for multi-winner elections. How important is it for the intended use of a voting method to match its actual application?
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

3. CRITERIA FOR ASSESSING ALTERNATIVE VOTING METHODS

A)   Criteria

1) Method encourages honest voting rather than tactical voting - Specifics:
   • (a) Favorite-safe: Voting for your favorite candidate won't help another candidate.
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (b) Clone-safe: In a race with 3 or more candidates where candidates A and B are "identical,"
     there is no vote splitting between A and B and no incentive to push one clone to leave the race.
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (c) Monotonic: Voting for a candidate helps the candidate. Not voting for or voting against a
     candidate doesn't help the candidate.
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

2) Method improves the election experience - Specifics:
   • (d) Allows for expressive voting
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (e) Conducive to positive campaigning
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (f) Nursery for third parties rather than two-party domination
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (g) Integrity and fairness of the voting method produce overall voter satisfaction
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

3) Method is easy to implement - Specifics:
   • (h) Voting directions are easy to understand, resulting in fewer incidents of ballot spoilage
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (i) Can use existing machines and inexpensive software for voting and tallying
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

   • (j) Tallying of votes is transparent and easy for the voter to understand
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

B)   Criteria Categories

Now please consider each broad category.

Method encourages honest voting rather than tactical voting
___Very important   ___ Somewhat Important   ___ Not important   ___ No consensus

Method improves the election experience

___Very important ___ Somewhat Important ___ Not important ___ No consensus

Method is easy to implement
___Very important ___ Somewhat Important ___ Not important ___ No consensus

C)   Analysis

Election officials should conduct post-election analysis in order to evaluate the voters' usage of the voting method and the election's reflection of voters' stated preferences.

___Strongly agree ___ Agree ___ Disagree ___ Strongly disagree ___ No consensus

4. (Question #1 presented again.) Currently most jurisdictions use plurality voting. The League should actively support legalizing and implementing alternative voting methods that allow people to express their preferences more effectively. The League should actively support gaining on-the-ground experience with alternative voting methods in order to ascertain whether a voting method results in outcomes that match voters' preferences as recorded on their ballots.
___Strongly agree ___ Agree ___ Disagree ___ Strongly disagree ___ No consensus

Appendix A: Notes on the Second, Third and Fourth Editions

Very few changes were made in the second edition. We corrected the spelling of one gentleman's name. We corrected an error in our description of the Gibbard-Satterthwaite Theorem. We rewrote part of the paragraph about Bayesian regret and Condorcet winners. Unfortunately, we also added some incorrect information about approval voting in the city of Gunnison which we took out in the third edition.

In the third edition, we included the LWVBC board–approved program position which has been recommended for concurrence at the LWVCO convention. We added the voting methods position for the Florida LWV and reported on the Duluth 2015 election to adopt ranked-choice voting. We noted that a 2003 ruling in Texas determined that the state constitution prohibits home-rule municipalities from adopting instant-runoff voting. Proportional approval voting as we refer to it in this report is more accurately called sequential proportional approval voting (SPAV) so we made that change where appropriate. Other voting methods which readers may want to consider are score runoff voting for single-winner elections and cumulative voting for multi-winner elections; we only included information about them in the Vocabulary section.

Keeping up with all the developments and the variations in the world of voting methods is a daunting task; we don't claim to have a comprehensive list of all efforts to adopt alternative voting methods outside of Colorado, but interesting cases that we hear about are included.

When LWVBC migrated our webpage to a new location, we needed to note that information in a fourth edition. We also included recently found LWV positions for Vermont and South Carolina which led us to update the vocabulary list. We add new information to the Uses in Other States and Nationwide section. We updated our VM members list with a new, active member. We also added rankedchoicevoting.org and the 2011 Colorado Secretary of State report required by the 2008 RCV law to the sources in Appendix D.

We appreciate the feedback from our readers. In an effort to keep the topic manageable, we did not incorporate all the suggestions that we received. There is so much we can talk about when it comes to elections!

Appendix B: Acknowledgements

Appendix C: LWVBC Voting Methods (VM) Team Members

Jennifer Bales – New member of the VM Team, helped during the More Choices for Voters series and participated in the practice run-through of the consensus meeting

Eric Cornell – New member of the VM Team. As a child growing up in Cambridge, MA, Eric remembers witnessing with his poll-worker parents the counting of single transferable votes used since 1941 to elect the Cambridge city council and school board.

Diana Haskell – Member of the VM Team since 2015. As a League member in Cary, NC, Diana worked with FairVote on the pilot IRV election in 2007 and later, when living in Maryland, she would frequently run into Rob Richie, the executive director of FairVote. Diana handled most of the logistics of the More Choices for Voters series which included Rob Richie as the first speaker.

Deborah Hayes – Co-presenter during the 2013 VM unit presentations, helper at 2015 League Day, and primary webmaster for VM webpage

Patricia Johnson – Founder of the VM Team in 2012 and first team leader

Celeste Landry – Current leader of the VM Team, co-presenter during the 2013 VM unit presentations, co-presenter at 2015 League Day, attendee and vote counter at the 2014, 2015, and 2016 Free and Equal Electoral Reform Symposiums

Neal McBurnett – New member of the VM Team and expert in data science and election integrity, particularly audits. Board member of the Center for Election Science

Grace Peng – New member of the VM Team, participated in the practice run-through of the consensus meeting. Data specialist/scientist at NCAR

Ceal Ruffing – Leader of the VM Team after Pat Johnson and prior to Celeste Landry, co-presenter during the 2013 unit presentations, and co-presenter at 2015 League Day

Frank Venturo – New member of the VM Team and participant in the practice run-through of the consensus meeting. Frank was previously a member of the Gunnison Area League where he participated in the Alternative Voting Methods program by reviewing *Gaming the Vote* by William Poundstone.

Pat Venturo – New member of the VM Team, helped during the More Choices for Voters series and participated in the practice run-through of the consensus meeting. Pat was previously a member of the Gunnison Area League where she replicated the interactive voting methods presentation that she saw at 2015 League Day.

Gaythia Weis – New member of the VM Team, participated in the practice run-through of the consensus meeting

Appendix D: Sources

Individuals

Atwood, Frank. Presidential Candidate on Colorado ballot for Approval Voting Party, Co-organizer of Annual Electoral Reform Symposium, Member of LWV of Arapahoe and Douglas Counties. 2013-2017 email, phone and in person.

Billman, Christopher. Founder of RCV for Colorado. 2016-2017, email and in person.

Collins, Richard B. Professor of University of Colorado Law School. 2013, email and in person.

Forthofer, Ron. Green Party candidate for US Congress in 2000 and for governor in 2002, Member of 2007 Voter Choice Task Force. 2017 email

Huber, Blake. Vice Presidential Candidate on Colorado ballot for Approval Voting Party. 2014-2017 email and in person.

Kefalas, John. Colorado State Senator, D – SD 14 (Fort Collins) and Sponsor of Approval Voting Bill 2017, Colorado State Representative, D – HD 52 (Fort Collins) 2007-2012, Member of the 2007 Voter Choice Task Force, Sponsor of HB 08-1378. 2017 email.

Kok, Jan. Former Vice President and Board Member of the Center for Election Science, Member of 2007 Voter Choice Task Force. 2013-2017 in person and email

Kumin, Jesse. Founder of Facebook group Best Democracy, Advocate of proportional representation. 2015-2017, in person and email.

McBurnett, Neal. Board Member of Center for Election Science. 2015-2017, in person and email.

Richey, Joe. Member of Colorado Secretary of State's 2009-2013 Best Practices and Vision Commission (along with League member Carol Tone), 2013 in person.

Richie, Rob. Executive Director of FairVote. 2013 email, 2014 – 2016 Skype presentations, 2017 in person

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Appendix E: Vocabulary for Advanced Voting Methods Topics

3-2-1 voting: a 3-step single-winner rating method whereby you rate candidates *good*, *acceptable* or *rejected*. Of the three candidates with the most *good* votes, the two with the fewest *rejected* votes are matched head-to-head to see who is rated above the other on more ballots.

Arrow's Impossibility Theorem: a social choice theory demonstrated by economist Kenneth Arrow which states that, when there are three or more candidates, no ranking voting method can meet all of a certain set of desirable criteria: unrestricted domain, non-dictatorship, Pareto efficiency, and independence of irrelevant alternatives. The Gibbard–Satterthwaite Theorem further expands on Arrow's Theorem by showing that all non-dictatorial voting methods are subject to tactical voting.

Borda Count: a single-winner ranking voting method named after the 18th-century French mathematician and political scientist Jean-Charles de Borda. Each candidate gets a certain number of points based on her ranking on each ballot. The candidate with the most points is declared the winner.

Bucklin voting (aka Grand Junction method): a ranking voting method promoted by James Bucklin of Grand Junction, Colorado. If no candidate gets a majority of first-choice rankings, then the second-choice rankings are added. If any candidates have a majority, then the candidate with the most votes wins. Lower rankings are added as necessary to determine a winner.

block approval voting: a multi-winner method where you vote for as many candidates as you approve of, and the candidates with the most votes win. This method does not provide for proportional representation.

bullet voting: voting for only one candidate even though the voter is allowed to vote for more than one candidate. Bullet voting can occur in multi-winner plurality races, approval voting, and even ranked voting.

cardinal: another term used for a rating voting method

Condorcet winner: A Condorcet winner is the one who would win against any other candidate in a head-to-head match-up. The Marquis of Condorcet was an 18th-century French philosopher, mathematician and political scientist.

cumulative voting: a multi-winner voting method that allows voters to give a candidate more than one vote. In a 3-winner race, for instance, one version allows voters to cast their three votes for one candidate or to distribute the votes among two or three candidates.

Droop quota: a minimum number of votes that a candidate must receive under a single transferable vote voting method to win one of the multiple seats, equivalent to 1 vote more than 1/(# of winners +1) of all the valid votes. The Droop quota is the most widely

used STV quota and was devised in 1868 by the English lawyer and mathematician Henry Richmond Droop.

Duverger's Law: a tendency which states that plurality voting in single-winner districts will favor two-party dominance. Only proportional representation in multi-winner elections will nurture third parties. Its discovery is attributed to the French sociologist Maurice Duverger.

exhausted ballot: a ballot in a ranked voting method which is no longer considered in the tally because all of the candidates listed on the ballot have been eliminated in previous rounds. An exhausted ballot is sometimes called an inactive ballot.

first-past-the post: another name for plurality voting

Hare quota: a minimum number of votes that a candidate must receive under a single transferable vote (STV) voting method to win one of the multiple seats, equivalent to 1/(# of winners) of all the valid votes. The Hare quota was used in Boulder from 1917 to 1947 and was devised by the British lawyer Thomas Hare who is generally credited with conceiving of STV. The Droop quota has largely replaced the Hare quota.

later-no-harm criterion: a voter cannot cause a more preferred candidate to lose by also giving support to a less preferred candidate.

limited voting: a multi-winner voting method in which voters must cast fewer votes than there are positions. When voters are only allowed to vote for one candidate in a multi-winner race, limited voting is also called single non-transferable vote or SNTV.

ordinal: another term used for a ranking voting method

proportional representation: a characteristic of a multi-winner electoral system in which the elected representatives and the groups they represent – typically political parties – are elected in proportion to the number of votes cast for them

score runoff voting (SRV): a 2-step voting method where step one is voted and tallied the same as score voting and step two is a runoff between the two candidates with the top scores. In step two, the runoff candidate who has a higher score on each ballot receives one vote for that ballot irrespective of the scores given to the two candidates. Whichever of the runoff candidates receives the most votes in the second round wins.

winner-take-all: another name for plurality voting