

Kentucky State Board of Elections

RLA Pilot Report for the
House Standing Committee on Elections,
Constitutional Amendments, and
Intergovernmental Affairs

Our Working
Group
Members:

Special Thanks to:



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Henderson County Clerk, Renesa Abner and Staff

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Kentucky Secretary of State's Office



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Jennifer Morrell is a former local election official and recognized expert in election audits. As a partner at [The Elections Group](#), she consults on election administration and auditing. Jennifer works as a consultant with Democracy Fund leading the Election Validation Project, aimed at increasing trust in elections through rigorous audits, standards, and testing.

As the deputy of elections in Arapahoe County, Colorado, Jennifer was instrumental in Colorado's successful implementation of the first statewide risk-limiting audit (RLA). She has successfully overseen RLA pilot programs in several states and local jurisdictions, and authored a series on election audits titled, "Knowing It's Right." Jennifer also serves as a subject matter expert for CISA.

She was an election official for nine years (2009-2018) in Utah and Colorado, is an Election Center CERA graduate, holds a Master of Arts in Management from Webster University, and is a veteran of the United States Air Force.

Bio provided by: Hubert H. Humphrey School of Public Affairs

[Jennifer Morrell | Hubert H. Humphrey School of Public Affairs \(umn.edu\)](#)

RLAs 101

- **What is a Risk-Limiting Audit? What is its purpose? ***
- A risk-limiting audit (RLA) is a post-election tabulation audit in which a random sample of voted ballots is manually examined for evidence that the originally reported outcome of the election is correct. As its name suggests, an RLA limits the risk of certifying a contest with the wrong winner. (Note: Kentucky's RLA Pilot was performed after certification.)
- An RLA gives statistical evidence that the machine-tabulated results are consistent with what a full hand count of ballots would reveal. Unlike fixed percentage audits, an RLA limits the risk that the wrong election result will be certified due to a tabulation error. These audits also allow jurisdictions to strategically allocate resources to check more ballots when needed in close contests, and fewer ballots in contests with wider margins.

*Information provided by **The Election Group**

The Working
Groups Decision
on What Type of
RLA would work
best for the
Commonwealth...

	Ballot Comparison	Ballot Polling	Batch Comparison
Where do ballots get scanned?	Central location	Individual polling locations or a central location	Individual polling locations or a central location
Ballot information needed from the voting system	Cast vote records generated by the election management system (EMS)	None	Batch sub-total reports generated by the election management system (EMS)
Ballot batch size	The smaller the better. 100 ballots are a good average size	Not so large that a person cannot hold them on their own	The smaller the better
Ballots need unique, printed identifier	Yes	No	No
How are ballots validated?	RLA software	RLA software and/or manual tally sheets	RLA software and manual tally sheets

The Working Group Chose to have...

a *Ballot Polling Audit* where individual ballots are retrieved.

The audit team examines the ballot and records the voter markings for the audited contest(s) on a tally sheet. Once all the ballots have been examined and voter markings recorded, the votes are totaled and the margin of victory for the winner(s) is compared to the margin of victory originally reported. The audit is looking for a similar or greater margin.

Random Dice
Roll Results
Held at State
Board
Meeting on
Tuesday,
January 17th



Ballot Manifests were created for each of the county's scanners and the number of ballots voted on each device.

Once the RLA Random Generator Tool had the Ballot Manifest Information, a Random Sampling of Ballots was created based on the 15-digit seed that originated based on the public dice roll

These were the ballots pulled, hand counted, and tallied for the pilot.

Sample Ballot Manifest

County	Batch Name	Number of Ballots
FAYETTE	ABSENTEE MAIL-IN #1A	1921
FAYETTE	ABSENTEE MAIL-IN #1B	1231
FAYETTE	ABSENTEE MAIL-IN #2A	1867
FAYETTE	ABSENTEE MAIL-IN #2B	1636
FAYETTE	ABSENTEE MAIL-IN #3	1125
FAYETTE	IN-OFFICE ABSENTEE WITH EXCUSE	521
FAYETTE	NO EXCUSE ABSENTEE #1A	1231
FAYETTE	NO EXCUSE ABSENTEE #1B	1184
FAYETTE	NO EXCUSE ABSENTEE #2	2016
FAYETTE	NO EXCUSE ABSENTEE #5	2044
FAYETTE	NO EXCUSE ABSENTEE #6	2071
FAYETTE	ANCHOR BAPTIST CHURCH GROUP 1	790
FAYETTE	ANCHOR BAPTIST CHURCH GROUP 2	921
FAYETTE	ARLINGTON ELEMENTARY SCHOOL	973
FAYETTE	ASHLAND ELEMENTARY SCHOOL	932
FAYETTE	ATHENS CHILESBURG ELEMENTARY SCHOOL	1396
FAYETTE	BEAUMONT BRANCH LIBRARY	313
FAYETTE	BEAUMONT MIDDLE SCHOOL	1031
FAYETTE	BLUEGRASS COMM & TECHNICAL COLLEGE	233
FAYETTE	BOOKER T. WASHINGTON ELEMENTARY	379
FAYETTE	BOONES CREEK BAPTIST CHURCH	591
FAYETTE	BRECKINRIDGE ELEMENTARY SCHOOL	425
FAYETTE	BRENDA COWAN ELEMENTARY	672
FAYETTE	BRYAN STATION HIGH SCHOOL	914
FAYETTE	CALVARY CHURCH OF THE NAZARENE	461
FAYETTE	CARDINAL VALLEY ELEMENTARY SCHOOL	345
FAYETTE	CARVER CENTER	539
FAYETTE	CASSIDY ELEMENTARY SCHOOL	755
FAYETTE	CENTENARY UNITED METHODIST CHURCH	835
FAYETTE	CENTERPOINTE CHRISTIAN CHURCH	1355

List of Ballots Generated from the RLA Tool

County	Batch	Ballot #
FAYETTE	ABSENTEE MAIL-IN #1A	61
FAYETTE	ABSENTEE MAIL-IN #1A	493
FAYETTE	ABSENTEE MAIL-IN #1A	511
FAYETTE	ABSENTEE MAIL-IN #1A	1598
FAYETTE	ABSENTEE MAIL-IN #1A	1821
FAYETTE	ABSENTEE MAIL-IN #1A	1824
FAYETTE	ABSENTEE MAIL-IN #1A	1885
FAYETTE	ABSENTEE MAIL-IN #1B	290
FAYETTE	ABSENTEE MAIL-IN #1B	346
FAYETTE	ABSENTEE MAIL-IN #1B	390
FAYETTE	ABSENTEE MAIL-IN #1B	506
FAYETTE	ABSENTEE MAIL-IN #1B	686
FAYETTE	ABSENTEE MAIL-IN #1B	905
FAYETTE	ABSENTEE MAIL-IN #1B	1146
FAYETTE	ABSENTEE MAIL-IN #2A	418
FAYETTE	ABSENTEE MAIL-IN #2A	598
FAYETTE	ABSENTEE MAIL-IN #2B	263
FAYETTE	ABSENTEE MAIL-IN #2B	563
FAYETTE	ABSENTEE MAIL-IN #2B	656
FAYETTE	ABSENTEE MAIL-IN #2B	900
FAYETTE	ABSENTEE MAIL-IN #2B	1578
FAYETTE	ABSENTEE MAIL-IN #3	95
FAYETTE	ABSENTEE MAIL-IN #3	126
FAYETTE	ABSENTEE MAIL-IN #3	329
FAYETTE	ABSENTEE MAIL-IN #3	366
FAYETTE	ABSENTEE MAIL-IN #3	688
FAYETTE	ABSENTEE MAIL-IN #3	825
FAYETTE	ANCHOR BAPTIST CHURCH GROUP 1	18
FAYETTE	ANCHOR BAPTIST CHURCH GROUP 1	324
FAYETTE	ANCHOR BAPTIST CHURCH GROUP 1	367
FAYETTE	ANCHOR BAPTIST CHURCH GROUP 1	616

RLA Spreadsheet Tool used to:

Decide on an estimated sample size based on the votes garnered from the winner and runner-up, the chance of finishing after one round of counting, the risk limit, and the total number of ballots voted in the county from each device.

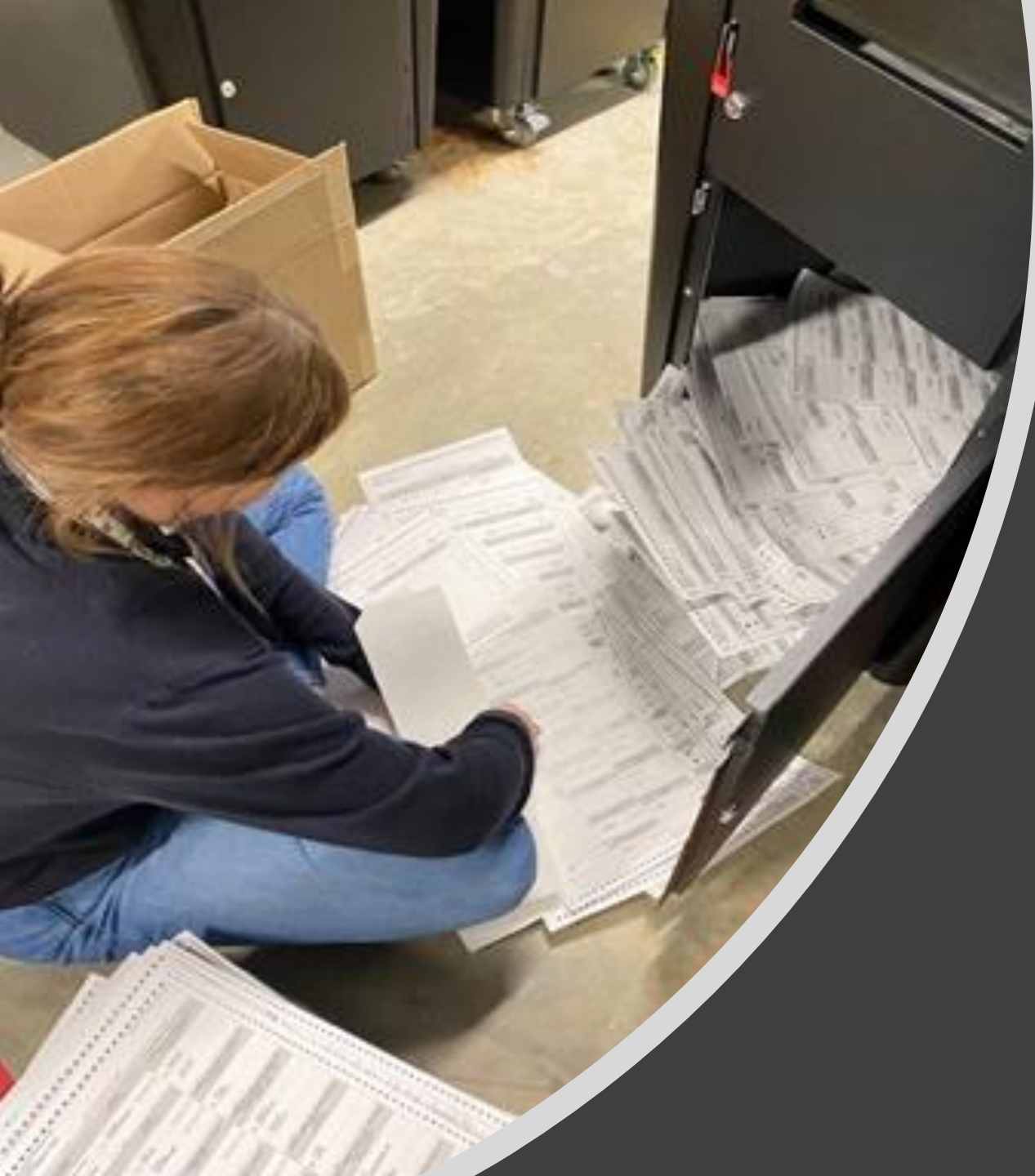
Take the estimated sample size and the random 15-digit seed number which creates the sequence for the random sample list of ballots to be pulled for the RLA pilot

Sample size estimate	
Votes for reported winner	64467
Votes for reported runner-up	42041
Desired chance of 1st-round completion risk limit	90%
	1%
Total <i>ballots</i> (from manifest)	107791
Diluted margin	0.208050765
BRAVO sample size (est.)	466
P value estimate	
Sample votes for reported winner	275
Sample votes for reported runner-up	182
BRAVO p value	0.007%

Enter sample size:	466	
Enter random seed:	089268122289305	<i>up to fifteen digits</i>



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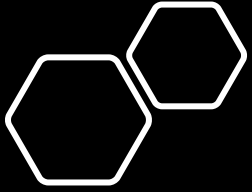


The Greatest Challenges; Lessons Learned...

- Organization of the Ballots
- Space to Perform the RLA
- More Workers Needed
- More Discussion and Planning for:
 - Using an RLA with Kentucky's Closed Primaries
 - Holding an RLA prior to Certification

Pulling, Hand Counting, and Tallying of the Random Selected Ballots





The Results:

- Fayette was run as a County Only RLA pilot
- The other 5 Counties were combined for their pilot
- Percentage Results were compared between Election Night and the RLA Sample Ballots
- Results proved that who won in each case was correct; Percentages were very similar

Vote % Received of Candidates (Fayette ONLY)		Election Day							
Paul		39.00%							
Booker		59.81%							
Results from RLA Tally	Fayette County	Paul	Booker	Write-In	Blank				
	Batch #1	35	65	0	5				
	Batch #2	30	42	0	0				
	Batch #3	23	33	0	0				
	Batch #4	35	37	0	2				
	Batch #5	22	45	0	1				
	Batch #6	37	53	0	0				
		182	275	0	8	465			
		39.14%	59.14%	0.00%	1.72%				

Vote % Received of Candidates (5 Counties Combined)		Election Day							
PAUL		61.6%							
BOOKER		37.2%							
Results from the RLA Tally		PAUL	BOOKER	WRITE-IN	BLANK				
	ANDERSON	37	12		1				
	HENDERSON	37	30		4				
	JOHNSON	19	6		1				
	KENTON	168	110	0	4				
	MADISON	99	70		2				
		360	228	1	11	600			
		60%	38%	0.17%	2%				

Recommendations and Questions

- SBE would recommend that the Commonwealth hold another pilot program to include more counties to implement changes to improve the process and continue to strengthen trust in Kentucky's Integrity in Elections.

