

**Risk-Limiting Audit Pilot
of the 2020 Michigan Presidential Primary**



**Michigan Department of State
Bureau of Elections**

Background

In April 2018, the Michigan Bureau of Elections (BOE) began developing a robust post-election audit program that included auditing the results of elections. While Michigan election officials have been conducting post-election audits since 2012, these audits were procedural. They did not specifically audit the *results* of elections – that is, they did not purport to verify that the outcome of any given election was actually correct; rather, they verified that election equipment in given precincts was properly programmed.

As a first step, BOE added a “ballot tally” as part of the process of auditing each precinct selected randomly for audit while exploring other options. That allowed the audit to determine, in addition to verifying procedure, that individual tabulators being audited had counted ballots accurately. This type of audit is commonly referred to as the “traditional audit.” Traditional audits are valuable in examining specific precincts in great detail, but they are not practical for auditing statewide election results because of the time required for each individual precinct.

A different type of audit, which can be used to audit election results statewide, is the “risk-limiting audit.” Risk-limiting audits are designed to determine, within a set statistical level of certainty, that an election outcome was correct. They sample a subset of ballots, which are then compared with official election results to verify the outcome. There is extensive literature on risk-limiting audits, including recent publications [A Review of Robust Post-Election Audits](#) (Howard, Rivest, Stark) and [Knowing It's Right](#) (Morrell). By 2018, the risk-limiting audit process was becoming known as the “gold standard” of post-election audits. However, the process had only been implemented in the state of Colorado, which has a vastly different election architecture than the state of Michigan, and required several years for full implementation.

Early Pilots

After learning about the various types of risk-limiting audits, Michigan moved forward with piloting the risk-limiting audit process in August 2018. The cities of **Kalamazoo** (Clerk Scott Borling), **Lansing** (Clerk Chris Swope), and **Rochester Hills** (Clerk Tina Barton) were selected to participate following the November 2018 election. These three cities and their clerks were key selections in the pilot process. Each one represented one of the three voting equipment vendors used throughout the state and each used an absent voter counting board, allowing the Bureau to test the process on every piece of voting equipment used in the state.

These audit pilots, the first risk-limiting audit pilots in Michigan, were conducted in December 2018 and proved highly successful. Election staff learned valuable lessons while testing multiple processes, and ultimately the program was deemed worthy of continuing. Voters, in fact, had one month earlier enshrined “*The right to have the results of statewide elections audited, in such manner as prescribed by law, to ensure the accuracy and integrity of elections.*” into the state Constitution with the passage of Proposal 2018-3. For more details about the 2018 pilots, see [A Review of Robust Post Election Audits](#), cited above.

2019 Pilots

In 2019, the Bureau expanded pilots to include various local elections:

May:

Lansing School District Election — Delhi Township (Clerk Evan Hope), Lansing City (Swope), Lansing Township (Clerk Susan Aten), and Windsor Township (Clerk Lisa Rumsey)

Muskegon County Election (Clerk Nancy Waters, along with 23 local clerks)

Wyandotte City Election (Clerk Lawrence Stec), Wayne County (Clerk Cathy Garrett)

August:

Marquette County Election (Clerk Linda Talsma, along with 22 local clerks)

Washtenaw ISD Election — Jackson (Clerk Amanda Kirkpatrick), Livingston (Clerk Elizabeth Hundley), Washtenaw (Clerk Lawrence Kestenbaum), and Wayne (Garrett), counties, along with 33 local clerks).

November:

City of Clio Election (Clerk Linda Kingston), Genesee County (Clerk John Gleason)

Kalamazoo RESA — Barry (Clerk Pamela Palmer), Calhoun (Clerk Kimberly Hinkley), and Kalamazoo counties (Clerk Tim Snow), along with 27 local clerks.

City of Lansing Election (Swope)

Michigamme Township Election (Clerk Neil Hanson), Marquette County (Talsma)

St. Joseph ISD Election — Cass (Clerk Monica McMichael), Kalamazoo (Snow), and St. Joseph (Clerk Lindsay Oswald) counties, along with 25 local clerks.

Each pilot provided more lessons learned and allowed further experimentation with various processes. Unfortunately, in odd years, contests expanded beyond single jurisdictions were few and far between. Intermediate School District/Regional Educational Service Agency (ISD/RESA) elections were the largest opportunities to scale the process up.

March 2020 Primary: Statewide Pilot

The March 10, 2020 Presidential Primary was the first election since the initial pilot that contained a statewide race. Since the initial pilots had been conducted, the Bureau had the opportunity to learn from clerks who had conducted 2018 and 2019 pilots; and a risk-limiting audit task force comprised of clerks, and members of the [Election Security Advisory Commission](#) (J. Alex Halderman and David Becker, co-chairs). The Bureau developed a pilot based on the recommendations of these bodies and consultants including Monica Childers and Ginny Vander Roest of [VotingWorks](#), and [Liz Howard](#) and [Matt Bernhard](#).

Because both presidential primaries had a large margin of victory, the Bureau determined that it would be possible to simulate an audit with a 10 percent risk limit while drawing fewer than 700 ballots statewide. Because the risk-limiting audit pilot could be conducted remotely, it was also possible to proceed with this audit even when other types of audits had to be postponed after March because of the COVID-19 pandemic.

BOE implemented the audit with the help of VotingWorks, a nonprofit, nonpartisan organization. VotingWorks helped manage and support the entire audit. Over three weeks, county and local clerks worked on the tasks of the risk-limiting audit as follows:

Week 1 - County clerks learned how to create a “ballot manifest,” a list of ballot containers in the jurisdiction and the number of ballots in each container.

Week 2 - County clerks uploaded the ballot manifest into Arlo, the audit software.

Week 3 - County clerks downloaded their ballot retrieval list and distributed to their local clerks, and local clerks retrieved the ballots selected, tallied the votes, and returned the tallies to the county clerks for entry back into Arlo.

Results

The first statewide pilot was an overwhelming success. Michigan clerks piloted the largest risk limiting audit ever in terms of number of jurisdictions and counties participating – 277 jurisdictions randomly pulled ballots as part of the audit. Participation among county and local clerks was extremely high, allowing for a very close simulation of an actual statewide audit.

Among county clerk offices, 80 out of 83 offices participated in the pilot. Local clerks in 78 counties retrieved ballots from their ballot retrieval list, and 73 counties retrieved every ballot from their list. Overall, 669 ballots were randomly selected statewide, and 591 were able to be retrieved. The remaining ballots randomly selected were from nonparticipating jurisdictions or clerks who were otherwise unable to retrieve the ballots under present circumstances.

Without full participation, calculating the risk-limit was not an option for this pilot. That was expected, as the goal of the pilot was not to conduct an actual statistical audit. Instead, the focus of the pilot was on state and local election staff practicing the procedure for conducting the audit and seeing if the process could be done at a statewide scale.

However, participation was high enough to suggest that if the full sample had been pulled, the risk limit would have been met. The sample pulled mirrored the results almost exactly. In the Republican Primary, Donald Trump received 154 votes out of 162 ballots pulled, or 95 percent of votes. In the official results, Trump received 94 percent of votes. In the Democratic Primary, out of 415 ballots pulled, Joe Biden and Bernie Sanders received 224 and 155 votes, respectively. This equates to 54 percent for Biden and 36 percent for Sanders. In the official results, Biden received 53 percent of votes and Sanders received 36 percent. In other words, for the three leading candidates in the two primaries, the randomly selected ballots *were all within one percent of the official outcome*.

The same was true when combining the Republican and Democratic primary results into one pool. Turnout in the more-competitive Democratic Primary was higher, but the three leading vote-getters in the primaries combined were Biden, Trump, and Sanders. When combining both primaries, Biden received 36 percent of all votes, Trump 27 percent, and Sanders 25 percent. Among randomly pulled ballots, Biden received 37 percent, Trump 26 percent, and Sanders 26 percent. Again, all within one percent of the official outcome.

Overall, the statewide risk-limiting audit of the Presidential Primary was a success and demonstrates that it is possible to scale this process up statewide in a precinct-based state like Michigan. As with all pilots, state and local election staff learned valuable lessons, but the process has become considerably more refined over the past two years. Only minor alterations are expected to be necessary going forward.

The state is indebted to election clerks for their hard work and commitment to accurate, secure election results even in the midst of a pandemic, and to the many advisors who have provided assistance throughout the process of piloting these audits. The [full data set of the Presidential Primary](#) is available for review and analysis.