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Indiana
Risk-Limiting Audit (RLA) Pilots

A Report to
the Indiana Secretary of State
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by

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(VSTOP)
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Executive Summary

In January 2017, the U.S. Department of Homeland Security designated elections in the United States as critical infrastructure. Indiana Secretary of State Connie Lawson has been at the forefront of discussions concerning election security and has been proactive in addressing real and perceived threats to elections. In Indiana, many initiatives have been launched to address election security. One of these initiatives is the use of post-election Risk-Limiting Audits (RLAs), which can help meet the overall goal of enhancing the integrity of elections and increasing public confidence in election outcomes.

Since early 2018, the Voting System Technical Oversight Program (VSTOP) has engaged in several activities related to RLAs, working in collaboration with the Indiana Secretary of State, the U.S. Election Assistance Commission (EAC), election experts in academia, and representatives of voting system vendors and county election officials to carry out RLA pilots in Indiana. In the 2019 legislative session, Senate Bill 405 was passed and signed into law by Governor Eric Holcomb. SB 405 allows a county to request, with the approval of the county election board, that the Indiana Secretary of State designate it as an RLA pilot county.

RLAs provide statistical assurance that election outcomes are correct by manually examining paper ballots or voter-verifiable paper records. RLAs do not guarantee that the electoral outcome is right, but they have a large chance of correcting the outcome if it is wrong.

The number of ballots required to conduct an RLA will vary based on the smallest margin of the contest selected and the risk limit. The smaller the margin and risk limit, the more ballots to audit.

The Indiana RLA pilot program aims to train counties to independently conduct RLAs. Since 2018, VSTOP has completed pilot programs in six counties. This program will expand to many other counties over the next decade.

Risk-Limiting Audits

Risk-limiting audits (RLAs) provide statistical assurance that election outcomes are correct by manually examining paper ballots or voter-verifiable paper audit trails (VVPATs). RLAs do not guarantee that the electoral outcome is correct, but they have a large chance of correcting an outcome if it is wrong. If an original election outcome is incorrect, there is a chance the audit will not correct it. Thus, the "risk limit" is the largest chance that an incorrect outcome escapes correction. For instance, if the risk limit is 10% and the outcome is incorrect, there is at most a 10% chance (and typically much less) that the audit will not correct the outcome. Correspondingly, there would be at least a 90% chance (and typically much more) that the audit will correct the outcome. Thus, if the risk limit is 1%, in the long run at least 99 out of 100 incorrect outcomes would be corrected by the audit.

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The number of ballots required to conduct an RLA will vary based on the smallest margin of the contest selected and the risk limit. The smaller the margin, the more ballots one must audit based on the "diluted margin" principle. The smaller the diluted margin and the risk limit, the more ballots one must audit.

Computer software is imperfect, so voting systems should be software-independent. This means that an undetected change or error in voting system software should be incapable of causing an undetectable change or error in an election outcome. An RLA leverages software independence by checking the audit trail strategically and statistically. Efficient RLAs do not require complicated calculations or in-house statistical expertise.

An RLA software program is used to calculate the number of ballots to audit, randomly select the ballots, provide a ballot lookup table, and notify the user when the audit is complete. RLAs depend on sampling methodology as well as statistical methodology. There are four types of sampling methodologies: ballot polling, ballot comparison, batch polling and batch comparison.

Indiana RLA Activities

Since early 2018, VSTOP has engaged in several activities related to RLAs. One of the deliverables for the Indiana Executive Council on Cybersecurity (IECC) Elections Committee was to create a post-election risk-limiting audit protocol proposal. As a component of this activity, VSTOP proposed conducting a pilot RLA in certain counties. VSTOP began discussing the RLA process with Jerome Lovato of the U.S. Election Assistance Commission. Subsequently, VSTOP conducted a pilot RLA in Marion County on May 29-30, 2018. In addition to VSTOP personnel, the RLA Team included Jerome Lovato, Professor Ronald Rivest of MIT, Mayuri Sridhar of MIT, and Marion County Election Administration personnel. A full report of this pilot can be found in Appendix A.

In June 2018, VSTOP co-directors Jay Bagga and Bryan Byers delivered a presentation at the State Certification Testing of Voting Systems in Raleigh, NC on *Post-Election Audit Pilots, and New Physical and Cyber Security Requirements in Indiana Election Code*. A copy of this presentation can be found in Appendix B.

In August of 2018, the Michigan Bureau of Elections and the City Clerks of Kalamazoo, Lansing, and Rochester Hills partnered with the Brennan Center for Justice, MIT, the University of California, Berkeley, the U.S. Election Assistance Commission, Verified Voting, and VSTOP to conduct the first multi-municipal jurisdiction RLA pilot in the country. A full report of this pilot can be found in Appendix C.

The Secretary of State authorized VSTOP to conduct an RLA for Porter County, Indiana after the 2018 general election. That RLA was completed in late January of 2019. Working with the VSTOP personnel were Jerome Lovato and the Porter County Clerk. A full report of this pilot can be found in Appendix D.

In December 2018, Jay Bagga and Bryan Byers were invited to deliver a presentation at the Multidisciplinary Conference on Election Auditing, or the "Election Audit Summit," at MIT.

This conference was hosted by the Caltech/MIT Voting Technology Project. A copy of the Report of the Summit, including the VSTOP presentation, can be found in Appendix E.

In order to expose county election officials to the RLA process, an RLA demonstration was conducted for participants in the Certificate in Election Administration, Technology and Security (CEATS) program on June 10, 2019. This demonstration was held in Indianapolis at the Marion County Election Service Center using data from the 2018 General Election.

In the 2019 legislative session, Senate Bill 405 was passed and signed into law by Governor Eric Holcomb. Part of this legislation pertains to RLAs. The relevant code directly germane to RLAs is IC 3-12-13. This code includes a provision for a county election board to request that a county be designated as an RLA Pilot County by the Secretary of State.

Conducting RLAs in Pilot Counties

RLAs can present challenges regardless of the location or jurisdiction. These challenges are manageable with the right amount of planning and organization. One must be cognizant of the type of voting system or systems in use within a jurisdiction in order to successfully carry out an RLA. Below, we address potential challenges that may be encountered in Indiana.

In order to carry out an RLA, a county must employ a ballot card voting system (IC 3-5-2-4.5) or an electronic voting system (IC 3-5-2-21) which includes a voter-verifiable paper audit trail (VVPAT). We call such a county an *RLA-eligible* county. Thus, counties employing certified ballot card voting systems, commonly referred to as OpScan Systems, are RLA-eligible. However, there are fifty-two counties which use MicroVote DREs. These DREs will be fitted with a VVPAT device over time following last year's approval by the Indiana Election Commission. Current Indiana legislation provides funding to equip 10% of the state's DREs with VVPATs.

The MicroVote VVPAT does not convert their DRE to a paper ballot system. Rather, it provides a VVPAT which a voter can review and verify before a ballot is cast. The official ballot will still be the electronic record within the DRE cast by a voter. Paper ballots are ideal for risk-limiting audits, so the MicroVote DRE presents a challenge when implementing the audit methodology. One cannot conduct the traditional RLA sampling with the MicroVote VVPAT since the paper record is on a roll of paper and not ballot cards. Rather, a creative alternative must be employed, such as a systematic sampling approach for the random selection of paper records to audit. VSTOP anticipates conducting a comparative study of paper ballot systems to the MicroVote VVPAT to determine if the different sampling methods matter in the final outcomes of RLAs. MicroVote has developed a rewinder device, which is a high-speed scanning mechanism that is able to randomly select paper records from the VVPAT roll for purposes of an RLA. This tool was utilized during the Bartholomew County RLA and is discussed in the current report.

A key to a successful RLA is ballot organization. In order to carry out an RLA, the current practice is that all of the ballots in a county be organized by precinct. This includes remade ballots, absentee ballots and regular ballots. Given the variety of ballot organization one sees in

different vote center counties, VSTOP recommends performing RLAs only on County, State and Federal contests unless vote center counties organize the ballots by precinct. To perform an RLA on other local races, the ballots should be organized by that locality. These factors could impact the budget for the pre-RLA preparation process. Concerning Batch Polling/Batch Comparison RLAs, VSTOP believes that performing RLAs for local races in DRE vote center counties with VVPATs would present additional, though navigable, challenges.

Goals of the Indiana Risk-Limiting Audit Program

We believe that RLAs can enhance the integrity of elections and increase public confidence in election outcomes. Indiana's new RLA law has come at an opportune time, as many states are moving quickly toward the adoption of RLAs.

One goal of the RLA program is to train counties to independently conduct post-election audits. VSTOP, in collaboration with its established RLA expert partners, can conduct RLAs once the Secretary designates pilot counties as they are requested. County personnel must be active participants in order to (a) handle the ballots and (b) to be sufficiently trained in RLA methodologies, software applications and the interpretation of findings.

A second goal is to provide counties with an efficient option to examine particularly close contests at a fraction of the time and cost of an official recount. A full recount may follow if necessary.

Another important goal of the Indiana RLA pilot program is to demonstrate confidence in DREs equipped with VVPATs. Since the initial plan by the State is to equip a proportion of DREs with VVPAT in several counties, we propose to accomplish this goal by conducting RLAs on this set of VVPAT DREs. In this scenario, DREs with VVPATs would be treated as a sample for purposes of generalization. The next section discusses the principles of sample, populations and confidence for the purpose of describing how inferences are made from samples to populations in order to demonstrate the above scenario.

RLA Training

The RLA program can leverage virtual training, how-to guides, step-by-steps, checklist-based procedures, reports of RLAs conducted, existing written resources and videos to help facilitate the program. A variety of such materials are available.

VSTOP believes the most efficient initial way of training counties on RLA methods is for our team to travel to designated individual pilot counties (much like VSTOP did in Marion and Porter counties). Eventually, our goal is to train groups of multiple counties in regional or centrally-located sessions. When training groups of counties, VSTOP would like to leverage regular conference attendance at various conferences (e.g., clerk conferences, IVRA, etc.). This plan would involve shepherding the RLA process with pilot counties as part of the training initiative. VSTOP would also like to involve some RLA technical consultants as part of this effort.

Due to the restrictions related to COVID-19, VSTOP has considered the possibility of virtual RLA training. At this time, a formal RLA pilot has not been completed virtually. However,

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VSTOP is in the process of creating an RLA Manual, which will serve as a "how to" guide for conducting an RLA. The RLA Manual will take the form of a website platform, and will be available to county election personnel and other members of counties' RLA teams.

County Selection and RLA Cadence

County election boards (CEBs) may request designation as an RLA pilot county and must pass a resolution in order to initiate this process. For the RLA pilots discussed in the current report, the RLA program focused on RLAs taking place after the 2020 Primary Election. On June 4, 2020 VSTOP submitted to the State the Risk Limiting Audit Program Proposal (Appendix F). On June 8, 2020 the State approved the submitted Risk Limiting Audit Program Proposal.

The State began contacting RLA-eligible counties to describe the RLA process and invite those counties to participate as designated counties through CEB resolutions. On June 10, 2020, the State organized two separate calls to initiate separate RLAs, one with Jay County and another with Brown County. A similar pair of calls occurred on June 15, this time with Bartholomew and Elkhart counties.

The VSTOP team began holding conference calls with the Secretary's Office and election personnel from the confirmed RLA pilot counties. These meetings focused on explaining the RLA process and outcomes, providing resources from previously conducted RLA pilots, and coordinating the pre-work needed to conduct the RLA pilots. In addition to working with the county election officials, the VSTOP team also had the assistance of the Election Assistance Commission and representatives from vendors whose election equipment would be part of the RLA pilots.

RLA Pilots in Indiana Counties

Elkhart County (July 13-14, 2020)

On July 13-14, 2020, the VSTOP team successfully completed an RLA pilot in Elkhart County, Indiana. This activity was carried out in collaboration with the Election Assistance Commission, the Elkhart County Clerk's Office, and an Elkhart County Intern from Ferris State University. Also participating were three members of the VSTOP CEATS cohort: Bernadette Manuel, Joel Rodriguez, and Sundae Schoon, Porter County Director of Elections and Voter Registration.

The following information was gathered as part of the pre-work and planning phases of the Elkhart county RLA pilot. This information was considered and entered in the Stark Tool, which assisted the VSTOP team and county election officials in deciding which race should be audited during the RLA pilot. Elkhart County is a vote center county that uses the ES&S EVS 5.2.4.0 Ballot Card Voting System. According to the VSTOP inventory, there are 36 DS 200 (OpScan) units and 316 ExpressVote (Ballot Marking Device) units. There are 117 precincts in Elkhart County and the county stores the absentee mail-in ballots by precincts. There are 33 vote centers in Elkhart County and the county stores the Walk-in absentee and Election Day ballots by vote.

center. All the ballots are separated by the party.

The RLA Team audited the following races:

- Republican races (R): President of the U.S., U.S. Representative, Superior County No.1 Judge, Superior County No.5 Judge, District 2 County Commissioner
- Democrat races (D): President of the U.S., U.S. Representative, State Representative DST 4

Each of the above contests was audited with a risk limit of 10%. There were a total of 25,243 ballots, of which 8,788 were Democrat ballots and 16,455 were Republican ballots.

President of the U.S. (R): The RLA tool instructed the RLA Team to audit a sample of 7 ballots for ballot polling with a diluted margin of 79.05%. The RLA team reviewed the ballots for ballot polling. The Stark method functioned as expected and confirmed the "Donald J. Trump" outcome in the Elkhart County precincts with high levels of statistical assurance (98% for the Ballot Polling RLA).

U.S. Representative (R): The RLA tool instructed the RLA Team to audit a sample of 12 ballots for ballot polling with a diluted margin of 63.28%. The RLA team reviewed the ballots for ballot polling. The Stark method functioned as expected and confirmed the "Jackie Walorski" outcome in the Elkhart County precincts with high levels of statistical assurance (99% for the Ballot Polling RLA).

Superior County No.1 Judge (R): The RLA tool instructed the RLA Team to audit a sample of 74 ballots for ballot polling with a diluted margin of 22.37%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 83 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Christopher J. (Chris) Spataro" outcome in the Elkhart County precincts with high levels of statistical assurance (96% for the Ballot Polling RLA).

Superior County No.5 Judge (R): The RLA tool instructed the RLA Team to audit a sample of 1,647 ballots for ballot polling with a diluted margin of 5.20%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 5,858 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Kristine Osterday" outcome in the Elkhart County precincts with high levels of statistical assurance (100% for the Ballot Polling RLA).

District 2 County Commissioner (R): The RLA tool instructed the RLA Team to audit a sample of 168 ballots for ballot polling with a diluted margin of 16.57%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 1,331 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Bradley D. Rogers" outcome in the Elkhart County precincts with high levels of statistical assurance (100% for the Ballot Polling RLA).

President of the U.S. (D): The RLA tool instructed the RLA Team to audit a sample of 11 ballots for ballot polling with a diluted margin of 64.09%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 29 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Joseph R. Biden" outcome in the Elkhart County precincts with high levels of statistical assurance (92% for the Ballot Polling RLA).

U.S. Representative (D): The RLA tool instructed the RLA Team to audit a sample of 18 ballots for ballot polling with a diluted margin of 50.40%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 21 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Patricia (Pat) Hackett" outcome in the Elkhart County precincts with high levels of statistical assurance (95% for the Ballot Polling RLA).

State Representative DST 4 (D): The RLA tool instructed the RLA Team to audit a sample of 43 ballots for ballot polling with a diluted margin of 19.54%. The RLA team reviewed the ballots for ballot polling. The Stark method functioned as expected and confirmed the "Amanda Qualls" outcome in the Elkhart County precincts with high levels of statistical assurance (92% for the Ballot Polling RLA).

Jay County (July 15, 2020)

On July 15, 2020, the VSTOP team successfully completed an RLA pilot in Jay County, Indiana. This activity was carried out in collaboration with the Election Assistance Commission, Jay County Clerk's Office, and MicroVote. Also participating were two members of the VSTOP CEATS cohort: Tara Pegg and Julie Roush.

The following information was gathered as part of the pre-work and planning phases of the Jay County RLA pilot. This information was considered and entered in the Stark Tool, which assisted the VSTOP team and county election officials in deciding which race should be audited during the RLA pilot. Jay County is a non-vote center county that uses the MicroVote 4.3 Direct Recording Electronic Voting System. According to the VSTOP inventory, there are 50 Infinity VP-1 (DRE) units and 1 Chatsworth Scanner (Absentee Scanner) unit. There are 18 precincts in Jay County and the county stores absentee mail-in ballots by precincts and party.

At the time of the Primary Election of 2020, VVPAT units were not yet available to the county. Hence the RLA was carried out for the paper mail-in absentee ballots.

- Republican races (R): State Representative District 33, County Surveyor, County Council At-Large, and Superior Court Judge
- Democrat races (D): United States Representative District 3 and State Representative District 33

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Each of the above contests was audited with a risk limit of 10%. There were 1204 mail-in absentee ballots of which 389 were Democrat ballots and 815 were Republican ballots.

State Representative District 33 (R): The RLA tool instructed the RLA Team to audit a sample of 35 ballots for ballot polling with a diluted margin of 36.56%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 127 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "John (J.D.) Prescott" outcome in the Jay County precincts with high levels of statistical assurance (99% for the Ballot Polling RLA).

County Surveyor (R): The RLA tool instructed the RLA Team to audit a sample of 22 ballots for ballot polling with a diluted margin of 46.75%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 127 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Bradley A. Daniels" outcome in the Jay County precincts with high levels of statistical assurance (100% for the Ballot Polling RLA).

County Council At-Large (R): The RLA tool instructed the RLA Team to audit a sample of 409 ballots for ballot polling with a diluted margin of 11.66%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 573 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Jeanne Houchins", "Matt Minnich" and, "Larry (Ray) Newton Jr." outcome in the Jay County precincts with high levels of statistical assurance (91% for the Ballot Polling RLA).

Superior Court Judge (R): The RLA tool instructed the RLA Team to audit a sample of 327 ballots for ballot polling with a diluted margin of 11.90%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 440 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Gail M. Dues" outcome in the Jay County precincts with high levels of statistical assurance (100% for the Ballot Polling RLA).

United States Representative District 3 (D): The RLA tool instructed the RLA Team to audit a sample of 98 ballots for ballot polling with a diluted margin of 17.48%. The RLA team reviewed the ballots for ballot polling. The Stark method functioned as expected and confirmed the "Chip Coldiron" outcome in the Jay County precincts with high levels of statistical assurance (99% for the Ballot Polling RLA).

State Representative District 33 (D): The RLA tool instructed the RLA Team to audit a sample of 27 ballots for ballot polling with a diluted margin of 39.85%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 57 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Julie Snider" outcome in the Jay County precincts with high levels of statistical assurance (93% for the Ballot Polling RLA).

Bartholomew County (August 5-6, 2020)

On August 5-6, 2020, the VSTOP team successfully completed an RLA pilot in Bartholomew County, Indiana. This activity was carried out in collaboration with the Election Assistance Commission, Bartholomew County Clerk's Office, and MicroVote. In addition, two other members of the VSTOP CEATS cohort participated: Reagan Higdon and Bernadette Manuel. Also present was Clerk Chris Anderson of Elkhart County. The VSTOP Team members who participated are: Jay Bagga and Bryan Byers, VSTOP Co-Directors, Molly Owens, Project Specialist, Mani Kilaru, IT Specialist, Jordan Jarnagin, Certification Specialist, Chad Kinsella, VSTOP Faculty Fellow, and Sajal Sheel, Graduate Assistant.

The following information was gathered as part of the pre-work and planning phases of the Bartholomew county RLA pilot. This information was considered and entered in the Stark Tool, which assisted the VSTOP team and county election officials in deciding which race should be audited during the RLA pilot. Bartholomew County is a vote center county that uses the MicroVote 4.3 Direct Recording Electronic Voting System. According to the VSTOP inventory, there are 137 Infinity VP-1 (DRE) units, 58 Voter Verifiable Paper Audit Trail (VVPAT) units, and 1 Chatsworth Scanner (Absentee Scanner) unit. There are 123 precincts in Porter County and the county stores ballots by precincts. There are 66 precincts in Bartholomew County and the county stores the absentee mail-in ballots by precincts. There are 57 machines utilized for the vote centers in Bartholomew County and the county stores the Walk-in absentee and Election Day ballots by VVPAT rolls. These ballots were not separated by Party.

The RLA Team audited the following races using ballot polling and ballot comparison sampling methods:

- Public Question
- Republican races (R): President of the U.S. and U.S. Representative District 6
- Democrat races (D): President of the U.S. and U.S. Representative District 6

Each of the above contests was audited with a risk limit of 10%. There were 8,311 paper mail-in absentee ballots and 8,333 walk-in absentee ballots and Election Day ballots.

The ballots captured on the VVPAT rolls were sampled using the ballot comparison sampling method using the newly developed MicoVote rewinders. The Bartholomew County RLA made history as it was the first time this technology had been used for a Risk-Limiting Audit. The rewinders were successfully deployed and utilized during this RLA.

Public Question: The RLA tool instructed the RLA Team to audit a sample of 57 ballots for ballot polling with a diluted margin of 27.95% and 40 ballots for ballot comparison with a diluted margin of 13.58%. The ballot polling audit was inconclusive after the initial sample of ballots. The team randomly sampled an additional 24 ballots. This brought the total number of sampled ballots to 81, which included 51 "Yes" votes, 30 "No" votes. During ballot comparison, no discrepancies were found after reviewing the initial sample of 40 ballots. The Stark method

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functioned as expected and confirmed the "Yes" outcome in the Bartholomew County precincts with high levels of statistical assurance (93% for the Ballot Polling RLA, 100% for the Ballot Comparison).

President of the U.S. (R): The RLA tool instructed the RLA Team to audit a sample of 20 ballots for ballot polling with a diluted margin of 34.46% and 9 ballots for ballot comparison with a diluted margin of 60.60%. The RLA team oversampled the ballots for ballot polling and reviewed 33 ballots. For ballot comparison, no discrepancies were found after reviewing the initial sample of 9 ballots. The Stark method functioned as expected and confirmed the "Donald J. Trump" outcome in the Bartholomew County precincts with high levels of statistical assurance (100% for both the Ballot Polling and Ballot Comparison RLA's).

U.S. Representative District 6 (R): The RLA tool instructed the RLA Team to audit a sample of 24 ballots for ballot polling with a diluted margin of 31.98% and 11 ballots for ballot comparison with a diluted margin of 52.11%. The RLA team oversampled the ballots for ballot polling and reviewed 33 ballots. For ballot comparison, no discrepancies were found after reviewing the initial sample of 11 ballots. The Stark method functioned as expected and confirmed the "Greg Pence" outcome in the Bartholomew County precincts with high levels of statistical assurance (100% for both the Ballot Polling and Ballot Comparison RLA's).

President of the U.S. (D): The RLA tool instructed the RLA Team to audit a sample of 19 ballots for ballot polling with a diluted margin of 31.15% and 44 ballots for ballot comparison with a diluted margin of 12.30%. The RLA team reviewed all the 19 ballots for ballot polling. For ballot comparison, no discrepancies were found after reviewing the initial sample of 9 ballots. The Stark method functioned as expected and confirmed the "Joseph R. Biden" outcome in the Bartholomew County precincts with high levels of statistical assurance (98% for the Ballot Polling RLA, 100% for the Ballot Comparison).

U.S. Representative District 6 (D): The RLA tool instructed the RLA Team to audit a sample of 23 ballots for ballot polling with a diluted margin of 26.82% and 53 ballots for ballot comparison with a diluted margin of 10.08%. The RLA team reviewed all the 23 ballots for ballot polling. For ballot comparison, no discrepancies were found after reviewing the initial sample of 9 ballots. The Stark method functioned as expected and confirmed the "Jeannine Lee Lake" outcome in the Bartholomew County precincts with high levels of statistical assurance (93% for the Ballot Polling RLA, 100% for the Ballot Comparison).

Brown County (August 7, 2020)

On August 7, 2020, the VSTOP team successfully completed an RLA pilot in Brown County, Indiana. This activity was carried out by VSTOP in collaboration with the Election Assistance Commission, the Brown County Clerk's Office, and Brown County Commissioner Diana Biddle. Also participating were two members of the VSTOP CEATS cohort: Karen Wheeler and Beth Sheller. The VSTOP Team members who participated are: Jay Bagga and Bryan Byers, VSTOP

Co-Directors, Molly Owens, Project Specialist, Mani Kilaru, IT Specialist, Chad Kinsella, VSTOP Faculty Fellow, and Sajal Sheel, Graduate Assistant.

The following information was gathered as part of the pre-work and planning phases of the Brown County RLA pilot. This information was considered and entered in the Stark Tool, which assisted the VSTOP team and county election officials in deciding which race should be audited during the RLA pilot. Brown County uses the Unisyn 2.0A Ballot Card Voting System. According to the VSTOP inventory, there are 15 OVO (OpScan) units and 15 FVT (Ballot Marking Device) units. There are 12 precincts in Brown County and the county stores ballots by precincts. These ballots were not separated by Party.

The RLA Team audited the following races:

- Republican races (R): President of the U.S. and County Treasurer, and Jackson 2 Precinct Committeeman
- Democrat races (D): President of the U.S. and US Representative in Congress District 9

Each of the above contests was audited with a risk limit of 10%. There were a total of 3,143 ballots of which 1,258 were Democrat ballots and 1,885 were Republican ballots.

President of the U.S. (R): The RLA tool instructed the RLA Team to audit a sample of 6 ballots for ballot polling with a diluted margin of 85.52%. The RLA team oversampled the ballots for ballot polling and reviewed 104 ballots. The Stark method functioned as expected and confirmed the "Donald J. Trump" outcome in the Brown County precincts with high levels of statistical assurance (100% for the Ballot Polling RLA).

County Treasurer (R): The RLA tool instructed the RLA Team to audit a sample of 119 ballots for ballot polling with a diluted margin of 18.30%. After reviewing the initially sampled ballots, the risk limit was not met. RLA team sampled a total of 270 ballots to attain the risk limit. The Stark method functioned as expected and confirmed the "Andy Vasquez Bond" outcome in the Brown County precincts with high levels of statistical assurance (96% for the Ballot Polling RLA).

Jackson 2 Precinct Committeeman (R): All 110 ballots were sampled for the Jackson 2 Precinct Committeeman, a contest that was close. Results were verified but the winner received two additional votes in our count. After closely examining the ballots, the RLA team confirmed that the additional ballots might have been counted by the voting machine as undervotes or overvotes.

President of the U.S. (D): The RLA tool instructed the RLA Team to audit a sample of 12 ballots for ballot polling with a diluted margin of 61.21%. The RLA team oversampled the ballots for ballot polling and reviewed 73 ballots. The Stark method functioned as expected and confirmed the "Joseph R. Biden" outcome in the Brown County precincts with high levels of statistical assurance (100% for both the Ballot Polling).

US Representative in Congress District 9 (D): The RLA tool instructed the RLA Team to audit a sample of 43 ballots for ballot polling with a diluted margin of 24.74%. The RLA team oversampled the ballots for ballot polling and reviewed 73 ballots. The Stark method functioned as expected and confirmed the "Andy Ruff" outcome in the Brown County precincts with high levels of statistical assurance (100% for both the Ballot Polling).

Recommendations

Time Constraints

VSTOP recommends RLA pilot counties consider various time constraints when going forward with additional audits. For example, in an effort to gather all pre-work needed to create the ballot manifest, VSTOP began working with each county 2-3 weeks prior to the RLA. This timeframe allows the RLA team time to anticipate issues that may arise during the pilot.

The pre-work should include details such as: whether the county is a vote center or precinct county, the type of voting system the county uses (vendor and model), the number of voting system units, the number of precincts in the county, how the county stores ballots (by precinct or another method), whether or not the ballots are separated by party, and information found in the election results summary. A more detailed description of the information needed to complete the RLA pre-work is presented in the RLA Checklist (Appendix G). This preparation will allow the RLA team to determine what races would be beneficial to audit, the sampling method that should be used, and to develop the ballot manifest, which determines specific sampling counts.

Additionally, and as part of the RLA Manual, VSTOP is developing a template for counties to use as a week by week timeline guide to follow during the weeks leading up to an RLA. This template would be useful during the preparation phase of an RLA.

Ballot Storage and Organization

During the four most recently completed RLA pilots, VSTOP observed how each county stored and organized the Election Day and absentee ballots. VSTOP recommends that counties store ballots in a manner similar to the method that Elkhart County stores ballots. In Elkhart County, election officials had a large space where bins were located and used to store ballots. Each bin contained ballots from a specific precinct, and ballots separated by Election Day and Absentee Ballots. This storing method allowed for a more convenient process for conducting an RLA (Appendix H).

VSTOP recommends pilot counties auditing primary elections to organize election ballots by precincts as well as by party. In this way, when sampling ballots for the different races audited, the ballots will already be separated by party. Completing this process prior to the audit will avoid adding an additional step in the process of conducting the RLA saving time and effort on the day of the pilot.

<u>Post-Election Activities</u>

VSTOP recommends the RLA pilot counties begin preparing for the audit well in advance of the RLA day. Counties should begin storing and organizing the election ballots in a way that would be conducive for an RLA pilot. The most effective and efficient time to begin organizing for an upcoming RLA is immediately following the county's election. This way, the county election officials will not be scrambling to prepare for an RLA site and later transfer ballots to the designated area. For example, storing ballots in a large space where the RLA could later be held, and in bins that easily accessible and organized by precinct, and party if the races audited were as part of a Primary Election.

The RLA Team

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Elkhart County:

> Chris Anderson (County Clerk)
> Chad Clingerman (Office Manager Voter Registration)
> Carol Smith (Deputy Clerk of Elections)
> An Elkhart County Intern from Ferris State University

Jay County:

> Jon Eads (County Clerk)
> Marilyn Acheson (Early Absentee Voting)
> Penny Roush (Election Deputy)

Bartholomew County:

    Jay Phelps (County Clerk)
    Shari Lentz (Voter Registration Supervisor)
    Taylor Seagraves (Voter Registration Deputy)

Brown County:

    Diana Biddle (County Commissioner)
    Mark Williams (Republican Representative to the Brown County Election Board)
    Amy Kelso (Democrat Representative to the Brown County Election Board)
    Michael Fulton (Democratic County Election Board Member)
    Doris Kinnaird, Julie Cauble, Deb Noe, and Michael Knox (Absentee Voting Board members)

CEATS Personnel:

    Bernadette Manuel (Stark County Clerk)
    Beth Sheller (Hamilton County Election Administrator)
    Joel Rodriguez (Lake County Voter Registration Administrator)
    Julie Roush (Tippecanoe County Clerk)
    Karen Wheeler (Monroe County Election Supervisor)
    Reagan Higdon (Johnson County First Deputy Clerk)
    Sundae Schoon (Porter County Director of Elections and Voter Registration)
    Tara Pegg (Wayne County Voter Registration Supervisor)

Appendices

The following appendices are shared through a box folder, which can be accessed at the following link: https://ballstate.app.box.com/folder/123206051975

Appendix A - Marion County Pilot RLA Report to State
Appendix B - VSTOP Raleigh Presentation June 2018
Appendix C - Michigan RLA Partnership Report
Appendix D - Porter County RLA Draft Report to State
Appendix E - Election-Audit-Summit
Appendix F - Final Risk Limiting Audit Program Proposal
Appendix G - VSTOP RLA Check List Final
Appendix H - Elkhart County Ballot Storage Images
Appendix I - Post-RLA Pilot Letters to Counties