



**Report on the Cyber Ninjas Review of the 2020 Presidential and
U.S. Senatorial Elections in Maricopa County, Arizona**

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Table of Contents

Executive Summary	1
Introduction	1
Background	3
A Baseline of Official Best Practices	4
Transparency	4
Hand Recounts	5
Machine Audits	6
Other Practices	7
The Cyber Ninjas Review	8
Problematic Contracting	8
Lack of Impartiality	10
Faulty Ballot Review Process	12
Inconsistent Procedures	13
Unacceptable Error Built into the Process	15
Insufficient Security	18
False Public Allegations	20
Conclusion	20
Author Biographies	22

Executive Summary

The ongoing review of ballots from the November 2020 general election in Maricopa County as ordered by the Arizona State Senate and executed by their inexperienced, unqualified contractor, Cyber Ninjas, does not meet the standards of a proper election recount or audit. Although the scope of the undertaking is notable, the private firms conducting it are ill-equipped to conduct it successfully and produce meaningful findings about the 2020 election. In contrast to official procedures in Arizona and best practices around the country, the Cyber Ninjas review suffers from a variety of maladies: uncompetitive contracting, a lack of impartiality and partisan balance, a faulty ballot review process, inconsistency in procedures, an unacceptably high level of error built into the process, and insufficient security. A general lack of transparency and communication also makes it difficult to evaluate the review fully as one would an official recount or audit, and it undermines rather than establishes confidence in the election system and the review itself. Because it lacks the essential elements of a bona fide post-election analysis, the review currently underway in Maricopa County will not produce findings that should be trusted.

Introduction

This report provides our independent evaluation of the current review of ballots and voting equipment from the November 3, 2020, General Election in Maricopa County, Arizona taking place in the Veterans Memorial Coliseum in Phoenix. The review, ordered by the Arizona State Senate, began in April of 2021 and is being conducted by several private firms led by the company Cyber Ninjas. Having missed the original May 31st deadline to complete the review and publish a report, the review is ongoing at the time of this writing.¹

We base our opinions on our analysis of relevant materials including federal statutes and Arizona state statutes, state contracts with the firms conducting the review, presentation materials and manuals developed by the firms, legal documents such as court filings, public letters between state and county officials, media coverage including newspaper and television coverage, video briefings by spokespeople for the review and experts who observed the review, live streamed video from the Coliseum, and our expertise in election administration practices.

The review has been conducted without the usual requirements of transparency that govern the standard review of election ballots in all 50 states. Limited and inconsistent communication about the review, evolving practices over the course of the operation, and insufficient transparency has made our assessment more difficult than it should be. A lack of public information and adherence to standard practices in the field of election

¹ See AZ Senate President's March 31, 2021 Press Release, "Arizona Senate hires auditor to review 2020 election in Maricopa County," *available at* <https://twitter.com/AZSenateGOP/status/1377321595518083074> ("Because it is an independent audit, leadership will not be directly involved, and members do not expect to comment on any of the processes of the audit until the report is issued in about 60 days.").

administration means that not all relevant questions about the review can be answered confidently. This lack of transparency and information will also mean that any of the review's final conclusions will be suspect.

Conducting an election review such as the one desired by the Arizona State Senate is more difficult than it seems to a casual observer. Establishing adequate standards of review, chain of custody procedures, training, communication, and transparency for 2.1 million ballots requires thoughtful planning and organization. The multifaceted, unprecedented undertaking in Maricopa County is more sweeping than most election reviews, so some tolerance for imperfections in the operation would be understandable in a transparently conducted audit.

On the other hand, the long lead time available for the review and its focus on only one county should more than compensate for the additional dimensions of review being undertaken. The operation itself is occurring entirely within one physical site, thus making coordination easier due to the single authority and geographic containment. In addition, those advocating for the review had roughly five months to prepare, whereas most audits and recounts happen in the days immediately after the election, thus requiring officials to establish the operation quickly and conclude it before election results are certified. The lack of transparency, combined with the unexplained flaws that we have been able to observe so far in this review, will call into question the review's conclusions.

This report was commissioned by the States United Democracy Center, a nonpartisan organization advancing free, fair, and secure elections.

Background

According to the official State of Arizona canvass from the 2020 general election, Democrats Joe Biden and Kamala Harris defeated Republicans Donald Trump and Michael Pence 1,672,143 votes to 1,661,686, a margin of 10,457 votes, or about 0.3% of the total ballots cast for president.² A simultaneous special U.S. Senate election saw Democrat Mark Kelly defeat Republican Martha McSally 1,716,467 to 1,637,661, a margin of 78,806 votes or 2.4% of the total.

A full accounting of legal and administrative events that have taken place in Arizona since election day is beyond the scope of this report; they have been reported widely in the media.³ At a high level, we note that the period since November 3 involved Arizona's standard post-election statutory practices such as equipment testing and selective hand recounts. It has also been marked by multiple lawsuits and legal proceedings, strident allegations about election problems, and two additional forensic audits by Maricopa County. The chain of events ultimately led the Arizona State Senate to commission a review of election materials from Maricopa County. That review, led by a firm called Cyber

² The presidential contest also included a Libertarian Party ticket and several write-in candidates.

³ See "Arizona audit: Shedding light on two mysteries at Veterans Memorial Coliseum," *Arizona Republic*, available at <https://www.azcentral.com/story/news/politics/arizona/2021/05/13/arizona-election-audit-whats-happening-today-inside-coliseum/5068227001/>.

Ninjas, began on April 23 at the Arizona Veterans Memorial Coliseum in Phoenix and is ongoing at that time of this report.

A note about terminology is in order. The operation taking place at the request of the Arizona State Senate has been called an “audit,” a “recount,” and a “forensic analysis,” among other things. These terms have specific meanings in the field of election administration. For example, an audit typically involves a small number of ballots—a fixed percentage of either precincts or devices—to verify initial tabulations that were often done by machine.⁴ There are sub-types of audits, such as the “risk-limiting audit” that are even more tightly prescribed. The activities taking place in the Coliseum include counting of ballots, scanning and photographing of ballots, and inspecting ballots and a variety of equipment. To avoid misuse of terms, we describe the multifaceted operation initiated by the Arizona State Senate as a “review” of the election—hereinafter referred to as the “Cyber Ninjas review.”

A Baseline of Official Best Practices

Handing over all election materials to a third party—especially one with no experience or accreditation in election administration—is highly unorthodox and contrary to Arizona law and national standards. Yet this is what the Arizona Senate did for the Cyber Ninjas review.

To understand the unusual approach of the Arizona State Senate, it is helpful to compare it to how the State of Arizona and other jurisdictions around the country conduct election reviews. Each state has somewhat different policies and procedures in place for equipment testing, retabulations, recounts and audits, but Arizona’s practices are in line with what is done in many if not most states. Compilations by the National Conference of State Legislatures (NCSL)⁵ and the U.S. Election Assistance Commission (EAC), the official federal clearinghouse for such information, demonstrate this.⁶

Transparency

Transparency is the most important ingredient for any election review that wishes to have integrity and build public confidence. As the Election Management Guidelines summarize, “Transparency is a key to a successful recount.”⁷ Transparency means providing access to observers, communicating clearly about what is happening, and

⁴ See “Post-Election Audits,” *U.S. Election Assistance Commission*, October 23, 2020, available at https://www.eac.gov/sites/default/files/electionofficials/postelection/Post_Election_Tabulation_Audits.pdf.

⁵ See “Post-Election Audits,” *NCLS*, October 25, 2021, available at <https://www.ncsl.org/research/elections-and-campaigns/post-election-audits635926066.aspx>.

⁶ See “Post-Election: Audits and Recounts,” *U.S. Election Assistance Commission*, n.d., available at <https://www.eac.gov/election-officials/post-election-audits-recounts>.

⁷ See “Chapter 15: Conducting a Recount,” *U.S. Election Assistance Commission*, p. 151, available at https://www.eac.gov/sites/default/files/eac_assets/1/28/EMG%20chapt%2015%20august%2026%2010.pdf.

following replicable procedures. The EAC advises that to provide the necessary “transparency, meaningful observation and public notices,” a post-election audit should, among other things, have a “rigorous security and chain of custody procedure” by which individuals’ participation is logged, and “information on your state’s voter intent laws [is distributed] to those conducting the audit and the observers.”⁸

Beyond these best practices recommended nationwide, Arizona state law specifically requires the recounting of a discrete number of ballots as well as auditing voting equipment before and after each election. Each of these checks is done in full public view and is overseen by representatives of the major political parties.

Beyond these usual protocols, Maricopa County voluntarily undertook additional examinations of voting equipment to address questions raised about the integrity of the 2020 general election. Following the election, the Maricopa County Board of Supervisors—comprised of four Republicans and one Democrat—authorized two additional forensic audits of the county’s voting equipment. This equipment included samples or entire suites of ballot tabulators, workstations, and ballot adjudication stations. The county hired two firms to conduct the forensic audits: Pro V&V Laboratory and SLI Compliance. Both companies are accredited by the EAC as approved voting system testing laboratories. Their tests checked voting equipment to verify that (1) the intended certified software was installed, (2) no malicious software was installed, that tabulators were not connected to the Internet, and (3) “vote switching” was not possible (by examining ballot positions on a test desk of ballots). The two firms’ audits were conducted sequentially and separately in February 2021. Their final reports indicated no system failures or identifiable concerns.⁹

We now describe the details of how recounts and audits are conducted under Arizona law.

Hand Recounts

Consider first the recount process. Arizona state law requires a limited hand count of both *precinct ballots* and *early ballots* after each presidential election. Each hand count is compared to the machine count in that precinct to verify the accuracy of the electronic tabulation equipment, using a “designated margin” to determine whether the initial electronic tabulation was sufficiently accurate. The most recent “designated margins” set by the Secretary of State are five votes or 2% (whichever is greater) for early ballots and

⁸ See “6 Tips for Conducting Election Audits,” *U.S. Election Assistance Commission*, n.d., available at https://www.eac.gov/sites/default/files/eac_assets/1/6/EAC_6TipsForConductingElectionAudits_508_HiRes.pdf.

⁹ See Pro V&V’s Field Audit Report (February 23, 2021), available at <https://www.maricopa.gov/DocumentCenter/View/66844/Post-Audit-Report>; SLI Compliance’s Forensic Audit Report (February 23, 2021), available at <https://www.maricopa.gov/DocumentCenter/View/66843/SLI-Compliance-Forensic-Audit-Report?bidId=>.

three votes or 1% (whichever is greater) for precinct ballots.¹⁰ Up to five contested races are recounted.

Members of a county's hand count board are registered Arizona voters who are selected before election day by the officially recognized political parties.¹¹ Each count board must include members from at least two recognized parties. These boards follow specific provisions to ensure transparency and accountability. The board members take an oath swearing they will support the U.S. and Arizona constitutions and will impartially follow the law. Observation by party representatives and members of the public is permitted, as is recording by those observers.

Counties that utilize precinct-based voting are required to hand count ballots from at least 2% of precincts or two precincts, whichever is greater. Counties that utilize vote centers must hand count ballots from at least 2% of the vote centers, or two vote centers, whichever is greater.¹² The precincts or vote centers are selected at random.¹³ To conduct the early ballot hand count, the county must count 1% of ballots or 5,000 ballots issued (whichever is less). The ballot batches are selected at random.¹⁴

If the hand count differs from the official machine count by less than the designated margin, then the latter remains the official result. If it exceeds the margin, a second hand count takes place. If the designated margin is exceeded again, an expanded hand count takes place that doubles the number of ballots or polling places. If this count also exceeds the margin, then a hand count of the entire precinct takes place. The recount is repeated until identical results are achieved twice, at which point the hand count becomes the new official result. A similar process is followed for hand counts of early ballots. Any count that escalates to become a jurisdiction-wide hand count also requires appointment of a "special master" to review the election management software.

The state permits two methods for hand counting, depending on the type of machine on which the ballots were cast.

For paper ballots that are fed into scanners for tabulation and those from accessible ballot marking devices, counters use the "stacking method." Following this method, a designated counter lifts one ballot at a time, declares who it was cast for, and then places it in one of two piles based on this determination. The other judges view each ballot as it is placed on a pile to ensure agreement about the votes. The stacks are periodically counted by multiple judges and their counts are compared, typically in groups of 10 or 25

¹⁰ See "Voting Equipment," *State of Arizona Secretary of State*, n.d., available at <https://azsos.gov/elections/voting-election/voting-equipment>.

¹¹ The current "recognized parties" in Arizona are the Democratic, Libertarian, and Republican parties.

¹² Maricopa County opted to use vote centers for in-person voting during the 2020 general election.

¹³ The precinct ballot recount must also include at least one batch from a central count machine and one accessible voting machine, if tabulated separately from other ballots.

¹⁴ The early ballot recount must also include at least a batch for each tabulation machine.

ballots. The totals are then entered on shared tally sheets. This is repeated for each candidate or option in each of the contests being recounted.¹⁵

For ballots from touchscreen voting machines¹⁶ or other accessible machines that automatically tabulate ballots, judges use the “three-person call-out method.” Using this method, a counter announces the name of the candidate each voter selected according to the machine’s “audit tape,” which reports votes cast on the machine. The other counters visually verify the announced choices and track them on shared tally sheets. The counters’ tally sheets are periodically compared after each set of 25 ballots. This is repeated for each candidate or option in each of the contests being recounted.

Both methods follow the best practices used in election offices around the country. In particular, we note that each method requires that multiple counters from *different parties* view the *same ballot simultaneously* and *agree* on how it should be counted *before moving on* to the next ballot. The consensus judgement is entered on a single tally sheet *shared* by the counters. This approach guarantees that the disposition of each ballot is determined as it is considered, rather than burying back into a batch without knowing if the counters agree. When the hand count differs from the machine count, it is expanded to more ballots and repeated until it matches official results or a new set of results is produced by consensus of the counters.

The hand recounts in Maricopa County following the 2020 general election took place between November 4 and November 9. Using the “stacking method” described above, a total of 26 hand count boards were established and the results of their work were posted publicly on the Secretary of State’s website, as required by law.¹⁷ For both the precinct ballot and early ballot recounts—a total of about 47,000 ballots—zero discrepancies were discovered for any of the five races in any of the sampled batches. The recounted ballots represent approximately one out of every 45 ballots cast in the 2020 general election. To our knowledge, there were no objections or dissents by any of the political party representatives who took part in the Maricopa County recount.

Machine Audits

Consider next how voting equipment audits are conducted in Arizona. State law requires that election officials conduct what are known as “logic and accuracy” (L&A) audit tests both before and after each election. The pre-election tests take place weeks before election day; the post-election tests take place between the report of the official vote count and the county canvass, which formally certifies the county’s official vote count. For a federal election such as the 2020 general election, such tests must be conducted by both county

¹⁵ Note that write-in votes are set aside and considered separately because they might not have been tabulated when the hand recount takes place.

¹⁶ Touchscreen machines are also known as Direct Recording Electronic (DRE) machines, and all Arizona DREs are equipped with voter-verified paper audit trail (VVPAT) capabilities.

¹⁷ See “General Election Hand Count/ Audit Report,” *Maricopa County*, November 3, 2020, *available at* https://azsos.gov/sites/default/files/2020_General_Maricopa_Hand_Count.pdf.

officials and the Secretary of State.¹⁸ The L&A tests must be publicized in local newspapers and are open to observation by representatives from political parties, journalists, and the public. All aspects of the tests are observed by election inspectors of different parties.

As with recounts, the L&A audit tests require numerous steps and protocols, so we provide a high-level description here. The tests involve marking a set of “pre-audited” ballots with known totals for each candidate or option. The test ballots are submitted into the vote tabulation equipment to verify that the tabulations match. At least one ballot must include an intentional “overvote” (in which an excessive number of candidates or options has been selected) to verify that the voting system catches such mistakes. If any of the pre-election L&A tests fail, the cause of the errors must be determined and corrected before the voting system can be approved for use. A nearly identical array of L&A audit tests take place in the post-election period before the county canvass. All the certificates of accuracy verifying the correct functioning observed in pre-election and post-election L&A tests in Maricopa County were signed by the observers of both parties.¹⁹

Other Practices

In addition to its standards for transparency, hand recounts, and machine audits, the State of Arizona has other precautions in place to ensure the integrity of each election. Strict protocols govern the chain of custody of ballots and voting equipment. Ballot handling procedures are guided by official state policies that carefully regulate security to reduce risk of tampering or mishaps. The state’s *Election Procedures Manual* states:

“for security reasons, official ballots must be: (i) properly inventoried; (ii) accessible only by elections staff to the extent necessary to perform their authorized task; (iii) stored in a locked, secured location that prevents unauthorized access; (iv) access to the ballot storage location must be documented with a written log or with electronic keycard access that indicates the date, time, and identity of the person accessing the ballots; and (v) must be witnessed by two or more elections staff members when moved or transferred” (page 157).

It is worth noting that the more than 500-page *Election Procedures Manual* describes state election practices in a transparent way in keeping with state and federal laws. The *Manual* is a publication of the Secretary of State and is approved by the Governor and Attorney General of Arizona. The current version was published December 2019, nearly a year before the 2020 general election, so that all stakeholders know exactly how events will unfold.

¹⁸ The Secretary of State tests a sample of equipment from across the state while county officials test every piece of deployable election equipment in their jurisdictions.

¹⁹ In one case a Republican Party representative signed a post-election L&A test certificate but also wrote the words “certification denied” as a way “to help our president [Trump] get back into office.” That objection carried no legal significance and was outweighed by the affirmative signatures of four other observers including Arizona Republican Party Chair Kelli Ward. See Laura Gomez, “Maricopa County GOP chair rejects accuracy tests to help Trump ‘get back into office,’” *AZ Mirror*, November 20, 2020, available at <https://www.azmirror.com/2020/11/20/linda-brickman-rejects-accuracy-test-to-help-trump-get-back-into-office/>.

Arizona’s pre- and post-election practices are among the most thorough in the country.²⁰

The Cyber Ninjas Review

The review of ballots and voting equipment being undertaken in Veterans Memorial Coliseum by Cyber Ninjas and other contractors deviates in significant ways from the procedures outlined in Arizona state law and best practices adopted around the country. As the contractors, who have little or no experience with election administration, have rapidly scaled up procuring equipment, establishing procedures, and hiring staff, significant problems have appeared. They include processing errors caused by a lack of basic knowledge, partisan biases of the people conducting the audit, and inconsistencies of procedures that undermine the reliability of the review and any conclusions they may draw. In particular, the operation lacks the consistency, attention to detail and transparency that are requirements for credible and reliable election reviews.

Problematic Contracting

The Arizona State Senate entered into a contract with the firm Cyber Ninjas to conduct the election review. Notably, Cyber Ninjas was selected by the Arizona Senate even though they did not submit a formal bid.²¹ Under the contract, Cyber Ninjas, as the lead contractor, would be paid \$150,000 in public funds. Cyber Ninjas would subcontract to at least three other firms. Specifically, vote counting and tallying would be the responsibility of Wake TSI while evaluating voting systems would be the responsibility of CyFIR and Digital Discovery.

The contract calls for a “full and complete audit of 100% of votes cast within the 2020 November General Election within Maricopa County, Arizona” along with other forensic reviews of equipment and data.²² Both the cost of the contract and the timeline reveal a lack of understanding of how proper recounts and audits are conducted.

First, the amount of \$150,000 awarded to a contractor and three subcontractors is far too low. Ken Bennett, a former Arizona Secretary of State and the review’s formal spokesperson, and Cyber Ninjas readily acknowledged this strange fact before the review had even started.²³ Leasing the Coliseum, hiring hundreds of employees, and procuring

²⁰ See “Post-Election Audits,” *NCLS*, Oct. 25, 2019, available at <https://www.ncsl.org/research/elections-and-campaigns/post-election-audits635926066.aspx>.

²¹ See Nicholas Riccardi, “Experts or ‘grifters’? Little-known firm runs Arizonian audit,” *Associated Press*, May 23, 2021, available at <https://apnews.com/article/donald-trump-arizona-business-technology-election-recounts-c5948fid2ecdf9e93d4aa27ba0c1315>.

²² The review is only focused on votes for president and U.S. senator, two statewide contests narrowly won by Democratic candidates. It does not cover the other statewide contest, the two statewide ballot measures, the six countywide contests, Board of Supervisors contests, mayoral and councilor races within the county, or the many congressional and state legislative contests held entirely or partially within the county.

²³ See Brahm Resnik, “Promoter of false election fraud claims is raising money for Arizona Senator GOP’s election audit. Is that even legal?,” *12 News*, April 11, 2021, available at

dozens of cameras, scanners, and computers would almost certainly cost many times that amount. The two companies who did submit bids to the Arizona Senate estimated the cost at between \$450,000 and \$8 million.²⁴ By comparison, a post-election 2020 hand count of paper ballots in Wisconsin's two most populous counties cost \$2,645,000. It was a review only of the presidential contest on only 800,000 ballots and did not involve a forensic analysis of ballot paper, machines, or other equipment as is being undertaken in Maricopa County.²⁵

The Arizona Senate's contracting and funding arrangements have come under a cloud because they outsourced the entire project and handed over ballots and equipment to a firm with little to no experience in the field without any direct oversight by the Senate. Although state and local election officials around the country frequently rely on contractors to provide, program, and service voting equipment and software, those arrangements result from established public procurement processes and partnerships with election officials rather than outsourced operations with no direct oversight. Moreover, the Arizona State Senate failed to follow a competitive or transparent bidding process by failing to issue a request for proposals (RFP) and rejecting without stated reasons formal proposals from two other more experienced firms in favor of Cyber Ninjas, which did not even submit a formal proposal.

The \$150,000 amount awarded appears to assume that its outside contractors would also be receiving private funding, which may not be discoverable under state public records laws. Given the highly political nature of the proceedings this raises questions about the objectivity of the audit and any conclusions it might draw. This contracting and funding model is ironic, as the legislature passed, and Governor Doug Ducey recently signed, a law banning use of private funds for administering elections in Arizona. In signing the bill, Governor Ducey argued that "the mechanics of elections cannot be in question, and therefore, all third-party money must be excluded going forward to avoid any possible allegations of wrongdoing."²⁶ Yet that is precisely what the Arizona Senate did here.

Second, the timeline for completing the review has already been ruptured, casting doubt upon the competency of the process. A March 31 press release issued by the Arizona State Senate claimed that a final report would be issued "in about 60 days" (i.e., May 30), a timeline similar to the one outlined in the Cyber Ninjas' Statement of Work. This projection has proven to be unrealistic. At least one key subcontractor—Wake TSI—was

<https://www.12news.com/article/news/politics/sunday-square-off/promoter-of-false-election-fraud-claims-is-raising-money-for-arizona-senate-gops-election-audit-is-that-even-legal/75-a00e4e89-20d8-4588-b91d-50a32abb9e8>.

²⁴ Riccardi, *supra* note 21.

²⁵ See Alison Dirr, "Milwaukee, Dane counties presidential recounts come in about \$355,00 less than projected," *Milwaukee Journal*, December 22, 2020, available at <https://www.jsonline.com/story/news/local/milwaukee/2020/12/22/trump-recounts-milwaukee-dane-counties-cost-less-than-projected/4006662001/>.

²⁶ See Maria Polletta, "Arizona Gov. Doug Ducey signs bill to bar private funding of elections," *Arizona Republic*, April 9, 2021, available at <https://www.azcentral.com/story/news/politics/arizona/2021/04/09/arizona-gov-doug-ducey-signs-bill-bar-private-funding-elections/7165585002/>.

only hired through May 14. At that point the company stopped working (a problematic disruption discussed further below). An updated report from a spokesperson indicated that 680,000 ballots—or approximately one-third of the total—had been reviewed by that time. At the time of this report, the review has taken about eight weeks. The extended timeline stands in contrast to official recounts in other states. For example, a statewide manual recount of the 2020 presidential vote in Georgia took only six days despite the fact that it involved approximately five million ballots, more than twice the number from Maricopa County.²⁷

The extreme underestimation of the time required casts doubt upon the overall competency of the review, as well as the contractors’ (and perhaps the Arizona State Senate’s) lack of preparation to execute a proper review or their understanding of the process they were reviewing. It may also explain why the process of counting individual ballots we describe below is moving at an unacceptably fast pace for accurate counting.

As the (Republican-controlled) Maricopa County Board of Supervisors, Recorder, and Sheriff wrote in response to questions from the Cyber Ninjas posed by Senate President Karen Fann:

“We implore you to recognize the obvious truth: your ‘auditors’ are in way over their heads. They do not have the experience necessary to conduct an audit of an election. They do not know the laws, nor the procedures, nor the best practices. It is inevitable that they will arrive at questionable conclusions.”²⁸

Lack of Impartiality

As described above, official audits and recounts—including those conducted in Maricopa County before and after the 2020 general election—have established requirements in statutes and regulations so that reviews of elections are fact-based and designed to provide transparency and balanced participation by representatives from opposing political parties to foster impartiality. This is not how Cyber Ninjas is conducting its review.

As an initial matter, Cyber Ninjas’ chief executive officer (CEO) Doug Logan is an overt partisan who has publicly supported claims from Donald Trump and others that the 2020 presidential election was “stolen” due to fraud.²⁹ In addition to his social media posts, Logan authored documents designed to help members of Congress promote conspiracy

²⁷ The recount was technically a risk-limiting audit that was expanded by the Secretary of State to cover the entire state because of the narrow margin in the presidential contest. See Richard Fausset, “Hand Tally of Georgia Ballot Reaffirms Biden’s Win,” *New York Times*, November 19, 2021, available at <https://www.nytimes.com/2020/11/19/us/georgia-recount-biden-trump.html>.

²⁸ See “Response Letter to Senate President Karen Fann,” *Maricopa County Board of Supervisors*, May 17, 2021, p. 13, available at <https://www.maricopa.gov/DocumentCenter/View/68972/20210517-Response-Letter-to-Senate-President-Fann---FINAL>.

²⁹ See Doug Logan, “Arizona Senate hires a ‘Stop the Steal’ advocate to lead 2020 election audit,” *Arizona Mirror*, March 31, 2021, available at <https://www.azmirror.com/2021/03/31/arizona-senate-hires-a-stop-the-steal-advocate-to-lead-2020-election-audit/>.

theories and object to the January 6 certification of electoral votes from Arizona and other states.³⁰

A second concern is who the Cyber Ninjas or its subcontractors hired as auditors and counters. The Statement of Work claims the counters will be “[n]on-partisan” and “validated to not have worked for any political campaigns.” The document does not explain how either of these criteria would be met. Cyber Ninjas CEO Logan stated that workers were screened to see “there was nothing on their social media or other details that showed strong opinions one way or the other.”³¹

If that was their goal, they failed. One example is Anthony Kern. Kern, a former Arizona Republican State Representative who ran unsuccessfully for reelection in 2020, whose name appeared on some of the very ballots being reviewed in Maricopa County, who served an elector for President Donald Trump in the 2020 election cycle, and who was photographed as part of a crowd storming the U.S. Capitol on January 6. He posted on social media about his presence at the “Stop the Steal” Trump rally that preceded the insurrection. He was photographed reviewing ballots at the Coliseum on April 30 and acknowledged the January 6 photo the same day. His social media posts belie the assertion that the workers hired do not have “strong opinions one way or the other.” For example, his public Twitter account included a May 13 post alleging that “Leftists and media will stop at nothing in their attempts to lie and deceive the public while Republicans push to make it easier to vote and harder to cheat!” Using public social media posts, journalists have also identified other workers employed in the Coliseum who are advocates of QAnon conspiracy theories about the 2020 election.³² Failing to weed out workers such as these completely undermine the claims that the people doing the review are non-partisan.

As a further strike against transparency, those working for Cyber Ninjas are required to sign nondisclosure agreements (NDAs) that prevent them from sharing information. The NDAs prohibit individuals “participating” in the operation from disclosing information

“including but not limited to ballots or images of ballots..., tally sheets, audit plans and strategies, reports, software, data..., trade secrets, operational plans, know how, lists, or information derived therefrom.”

³⁰ See Jeremy Duda, “Election auditor wrote ‘election fraud facts’ report for GOP senator who tries to overturn the 2020 election,” *AZ Mirror*, April 9, 2021, available at <https://www.azmirror.com/2021/04/09/arizona-audit-leader-doug-logan-wrote-fraud-claims-on-kraken-lawyers-website/>.

³¹ See Mary Papenfuss, “Former GOP State Lawmaker at Capitol on Jan. 6 is photographed auditing Arizona votes,” *Huffington Post*, May 1, 2021, available at https://www.huffpost.com/entry/anthony-kern-arizona-maricopa-county-capitol-riot_n_608cd3d3e4b046202707b08e.

³² See Jerod MacDonald-Evoy, “Auditors promised to screen workers, but QAnon promoters and Capitol rioters were hired,” *AZ Mirror*, June 17, 2021, available at <https://www.azmirror.com/2021/06/17/auditors-promised-to-screen-workers-but-qanon-promoters-and-capitol-rioters-were-hired/>.

In an April 25 court filing, Cyber Ninjas attempted to keep its audit policy and procedures documents under seal. Such secrecy undermines the purported purpose of ballot review processes, which should be transparent and replicable.³³ The lack of impartiality and transparency about selection of workers violates best practices designed to make the ballot review process credible.

Faulty Ballot Review Process

Recounting approximately 2.1 million paper ballots is a laborious process under any circumstances. The Cyber Ninjas recount process makes it more so. In this section we describe how the design of the process departs from best practices by not having counters view ballots simultaneously and operating at a speed that prevents the most accurate assessments.

To understand this recounting operation, one or more of the authors observed on multiple occasions the live streamed video from the Coliseum on the website azaudit.org. Several of the video streams showed the vote counting process. Round tables were arranged on the floor of the Coliseum. At each table, five people were gathered. On the table was a spinning carousel with two stands to hold ballots for viewing.³⁴ One person placed a ballot on the stand and then rotated the carousel so that the ballot passed sideways in front of three counters. Each counter had a tally sheet or sheets on which they made marks after observing the ballots pass by. The final person at the table then removed the ballot from the stand when it arrived in front of them after circulating around the table. This process was repeated for each ballot in a batch.

Although this process seems efficient and potentially standardized,³⁵ it has fatal flaws. The most serious concern is that counters are asked to inspect ballots that are in motion, often moving at high rates of speed. In standard recounts, the ballot remains still, and counters handle each ballot and take the time needed to observe and discern voter intent in a single contest. As noted above, Arizona's "stacking method" used in its hand recounts follows this best practice, allowing counters to take the time needed to view ballots clearly and reach consensus about each voter's intent.

In contrast, in the Cyber Ninjas review, the ballot is moving sideways on a spinning device. The device is operated by a worker who places the ballots on the stand rather than the counters who are actually discerning votes. In the counting operations we observed, it usually took between two and six seconds for the ballot to move from appearing in front of the first counter for viewing to appearing in front of the third counter for viewing. This

³³ The only "trade secrets" acknowledged by the EAC are for voting equipment manufacturers, but that equipment is tested by a certified laboratory and further scrutinized with public "logic and accuracy" tests both before and after election day, as described elsewhere in this report.

³⁴ Cyber Ninjas documents refer to a table as a "module" but describes the five people who staff it as being comprised of five "counters," one "manager" (for a group of four pods), and one "scanner" (page 7 of Cyber Ninjas slide presentation titled "Maricopa County Audit Orientation"). A later slide also refers to a "pod manager" (page 9).

³⁵ Expert observers who were granted access to the floor of the Coliseum have reported that counting practices in fact vary from table to table.

means that each of the three counters had between a fraction of a second and two seconds to observe and discern voter marks in both the presidential and senatorial contests. This is an unrealistic speed for accurate review of ballots. Indeed, on multiple occasions we witnessed counters who apparently could not keep up with the process reach out and stop or reverse the spinning carousel to have a better view of the ballot that had just passed by.

Observers who have watched the process at length report that this review of spinning ballots was done continuously for 50 or 100 ballots. This large number in each batch facilitates error because of the fatigue and monotony of the process. Standard recounts typically process ballots in batches of 10 to 25 to reduce errors. For example, Maricopa County's post-election hand recount used batches of 10 while the EAC recommends batches of 20.³⁶

In addition to the fact that ballots are in motion and that counters have insufficient time to review the ballots carefully, the approach violates the principle that counters should observe ballots simultaneously. As explained above, the best practices used nationwide and in official Arizona hand counts require that each ballot is viewed simultaneously by counters who either agree or disagree on how it should be counted before advancing to the next ballot. In contrast, all the Cyber Ninjas procedure will be able to determine whether the totals for the counters agree for a particular batch. Even when the totals match, counters might in fact disagree on individual ballots within a batch. And any disagreement is not easy to resolve because the counters' assessments are aggregated by batch. Because counters are not coming to agreement on ballots simultaneously, this system perpetuates rather than alleviates any inconsistencies in the standards used by the counters.

Inconsistent Procedures

Observed inconsistencies in the Cyber Ninjas' operation raise serious doubt about the trustworthiness of their review. Expert observers such as Jennifer Morrell who were given limited access to the floor of the Coliseum have reported that procedures appeared to be changing from one day to the next.³⁷ Observers from the Secretary of State's office have also posted notes on the frequent changes in policy and process.³⁸

One example is the use of colored pens by individuals inspecting the ballots. In the early days of the review, workers used black or blue pens to make notations on ballots. Election administration experts know this is a serious mistake because ballots marked with black or blue pens will alter how the ballots are subsequently read by tabulators, scanners, and even human counters. Workers are instead instructed to use a color such as red that will not be detected by scanning equipment and is distinguishable from the voter's original

³⁶ *Supra* note 7.

³⁷ See Jennifer Morrell, "I watched the GOP's Arizona election audit. It was worse than you think," *Washington Post*, May 19, 2021, available at <https://www.washingtonpost.com/outlook/2021/05/19/gop-arizona-election-audit/>.

³⁸ See "Coliseum Observation Notes," *Arizona Secretary of State*, May 24, 2021, available at <https://azsos.gov/about-office/media-center/documents/coliseum-observer-notes-2021>.

marks. A reporter who happened to notice the problem of pen color pointed it out to Cyber Ninjas workers and it was eventually ended.³⁹

Other inconsistencies in the review are also apparent. An initial plan to compare voter signatures on early ballot envelopes with those on file was abandoned after others highlighted the legal problems of doing so. Another example comes from the Wake TSI document labeled “Counting Floor Policies,” which states counters will view paper ballots on a turntable and that an image of the ballots will be displayed on a monitor above the counter’s desk area. Those monitors were apparently abandoned in the first couple of weeks of the operation. Workers were initially subjecting ballots to ultraviolet (UV) lights to look for watermarks, but that apparently stopped in April.⁴⁰

It is clear that contractors are changing their processes in response to warnings from others about their administrative mistakes and legal transgressions. For example, on May 5, Principal Deputy Assistant U.S. Attorney General Pamela S. Karlan wrote to Senate President Karen Fann about concerns that (1) ballots were not kept under the control of and safeguarded by election officials as required by federal law and (2) Cyber Ninjas’ statement of work entails “knocking on doors” of registered voters that could result in intimidation of voters that is prohibited by federal law. The letter apparently also prompted yet more changes to the process.

In another example, the original process was for tally sheets to be brought to the aggregation area and entered by one only person with no verification for mistakes or intentional manipulation.⁴¹ In response to concerns raised by observers about this risky process, Cyber Ninjas was reportedly planning to implement checks of some kind, although this has not been verified.⁴² This shows how procedures are apparently being made up on the fly as shortcomings and inconsistencies become apparent, and it calls into question the accuracy of all work before the changes were made and process corrected.

The principle of consistency is also at risk in the manner counters are determining voter intent, a primary focus in official recounts and audits. Clear standards and thorough training are needed to provide as much consistency in ballot review as possible. In

³⁹ This issue was first identified by Jen Fifield of the Arizona Republic. See posts from April 23, 2021, available at <https://twitter.com/JenAFifield/status/1385646569052020737?s=20>. Cyber Ninjas subsequently acknowledged having blue pens on the counting floor, but denied that those pens were ever near actual ballots. See May 17, 2021 Arizona Senate Hearing (Logan: “[W]e had blue pens out on the table to be used as part of the counting process. And that was a mistake and it was an error.”), available at <https://www.youtube.com/watch?v=iXoUllUPCjQ>. Despite acknowledging this serious error, Cyber Ninjas nevertheless still permitted black pens on the counting floor. See “Coliseum Observation Notes,” Arizona Secretary of State, May 25, 2021 (“a black pen was brought onto the counting floor”) and May 27, 2021 (“State Senator Wendy Rogers was on the counting floor and was provided a black pen to take notes by Cyber Ninjas”), available at <https://azsos.gov/about-office/media-center/documents/coliseum-observer-notes-2021>.

⁴⁰ See Jen Fifield, “How Arizona election auditors are inspecting Maricopa ballots,” *Arizona Republic*, June 15, 2021, available at <https://www.azcentral.com/story/news/politics/elections/2021/06/15/how-arizona-election-auditors-inspecting-maricopa-ballots/7643248002/>.

⁴¹ States United Democracy Center press call, May 6, 2021.

⁴² Morrell, *supra* note 37.

Arizona, the Secretary of State provided detailed guidance to counties ahead of the 2020 election in a 17-page “Voter Intent Guide for Arizona Elections.” The document explains how election workers should handle stray marks, incomplete filling of ovals and other inconsistencies in the marking of ballots. The state’s *Elections Procedures Manual* (Chapter 11) also outlines standards for a Hand Count Board to determine voter intent. In contrast, none of the hundreds of pages of material provided by contractors in a response to a court filing mention the voter intent standards that should be used by the dozens of workers reviewing approximately 2.1 million hand-marked ballots.⁴³

Turnover in personnel has been another source of inconsistency. On May 14, the key subcontractor that designed and was conducting the ballot review, Wake TSI, ended its work when its contract period expired. A spokesperson for the review team reported that Wake TSI was replaced by a cybersecurity firm called StratTech Solutions. This is a serious disruption that displaces the personnel who were in executing the central task of recounting ballots. It is unclear if the replacement firm has any experience with elections or is even following the protocols developed by Wake TSI. At best, it certainly compromises consistency in review.

Meanwhile, the Arizona Senate is planning to hire yet another firm to conduct a secondary recount.⁴⁴ Apparently operating parallel to the Cyber Ninjas’ review of paper ballots, the additional review would be conducted electronically using digital images of ballots by an organization called Citizens Oversight.

Citizens Oversight describes itself as delivering “education and training for citizen activists” and it plans to use a tool it developed called AuditEngine to review ballot images. Documentation about AuditEngine does not show that it has been validated and certified by any trusted election authorities.⁴⁵ The organization has never done an official audit or recount; the technology it plans to use has never been deployed in an official audit or recount. Here again is another modification made to the review midway through the process that may generate more data, but without a transparency and consistent foundation in place to do so in a convincing manner.

Unacceptable Error Built into the Process

The process by which the ballots are being recounted includes such a high error rate that its results will not be credible. It was designed by a sub-vendor, Wake TSI, that is no longer participating in the review. Although the firm described the ballot counting process

⁴³ See Jeremy Duda, “Cyber Ninjas releases its election audit policies after court order,” *AZ Mirror*, April 29, 2021, available at <https://www.azmirror.com/2021/04/29/cyber-ninjas-releases-its-election-audit-policies-after-court-order/>.

⁴⁴ See Jen Fifield and Robert Anglen, “Arizona senate considers using new technology for second Maricopa county election audit,” *Arizona Republic*, April 29, 2021, available at <https://www.azcentral.com/story/news/politics/elections/2021/05/28/arizona-senate-considers-using-new-technology-2nd-audit-maricopa-county-election/7478902002/>.

⁴⁵ See “Audit Engine,” *Citizens’ Oversight Projects*, n.d., available at <https://copswiki.org/Common/AuditEngine>.

as being “accurate to within .03%,”⁴⁶ that is not a correct description of how much error the process allows. The review actually allows for a difference among the counters at each table of up to two ballots for every 100 counted so that the system permits inaccuracy rates of at least 2%, or 67 times what the Wake TSI document asserts.

According to documentation from Cyber Ninjas and Wake TSI, the three counters tally each batch of ballots independently as they review them on a spinning carousel. Their tallies are summed at the end of each batch. If two of the counters agree on the totals for each candidate but the third counter differs by one or two votes, then the agreed value becomes the tally for aggregation.⁴⁷ In other words, accuracy in terms of agreement among counters is assured only within 2%.

This calculation assumes that each batch is 100 ballots. One version of the Wake TSI document called “Counting Floor Policies” says batches will be comprised of 100 ballots and subtotaled after 50 ballots are counted. But another version says that tally sheets are only totaled after 100 ballots have been counted.⁴⁸ Observer Jennifer Morrell, a former election official and nationally recognized expert on recounts and audits, reported that each table appeared to be reviewing ballots in arbitrary batch sizes, 50, 100 or other amounts.⁴⁹ A document from Wake TSI states that counting should continue until tally sheets are full, a ballot batch is complete, or a ballot cart has been completely emptied.⁵⁰ If, for example, batches were comprised of 50 ballots rather than 100 ballots, then an accepted disagreement of up to two ballots would translate to an error rate of 4% rather than 2%.

A process that permits a deviation of two ballots out of each batch of 100 is tolerating an error rate of at least 2%. For the full 2.1 million ballots, that translates to a potential error of approximately 42,000 ballots. That is four times as large as the margin between Biden and Trump statewide and almost the full margin in Maricopa County. This process is so obviously imprecise—and could produce anything from a substantial Biden victory to a substantial Trump victory—that this recount will not provide a statistically valid confirmation or refutation of the official canvassed results.

The Arizona state law described above, under which the limited 2020 recount has already been conducted, includes procedures mandating expanding and repeating recounts with participants from opposing political parties until all discrepancies have been resolved. By contrast, the Cyber Ninjas/Wake TSI plan for resolving differences in counts among its paid employees is not credible and reflects the overall amateur design of the recount.

⁴⁶ See “Counting Floor Policies,” *Wake TSI*, April 29, 2021, p. 6, available at <https://www.cyberninjas.com/static/20210429155650/Wake-TSI-Counting-Floor-Policies.pdf>.

⁴⁷ See Jeremy Stahl, “What if the Unorthodox Arizona audit declares Trump won?,” *Slate*, May 23, 2021, available at <https://slate.com/news-and-politics/2021/05/arizona-audit-recount-claiming-trump-won.html>.

⁴⁸ *Supra* note 45.

⁴⁹ States United Democracy Center press call, May 6, 2021.

⁵⁰ *Supra* note 45, p. 5.

To illustrate further, the Statement of Work executed by the firm and the Arizona State Senate describes the following procedure for resolving discrepancies:

“If, at the end of the hand count, the discrepancies between counting personnel aggregate to a number that is greater than the margin separating the first and second place candidates for any audited office, the ballots with discrepant total [sic] from the Contractor’s counting personnel will be re-reviewed until the aggregate discrepancies within the hand count are less than the margin separating the first and second place candidates.”⁵¹

This description of how to modify the count is problematic on two fronts. First, it is not clear if this correction is supposed to be applied at the “end” of a batch of ballots, at the “end” of the entire Cyber Ninjas review, or at the end in some intermediate step of the hand count. Second, because the recount was imprecisely designed around aggregate tallies for batches rather than having counters review ballots simultaneously, it is not actually possible to identify the “ballots with discrepant total [sic].” All that is known is the tallies for a batch of ballots differ. These procedures are ambiguous and so difficult for workers to follow that inconsistencies and inaccuracies will occur.

In addition to the built-in error tolerated in ballot counting, the equipment lacks the validation that ensures its accuracy. The equipment used by the Cyber Ninjas and its subcontractors does not satisfy the requirements of Arizona law. According to the Secretary of State’s *Election Procedures Manual*, a “voting system” includes all physical equipment, software, and firmware used to define ballots, count ballots, report results to “maintain and produce any audit trail information” (chapter 4). Under state law, such systems must be certified by an accredited laboratory, the EAC, and the Secretary of State. All such equipment must be labeled, inventoried, secured in a locked location where access is logged, sealed after programming, and witnessed by at least two election staff members when relocated.

The Cyber Ninjas review does not meet these standards. For example, the so-called forensic review uses cameras to capture ballot image and additional LED microscope cameras to further capture ballot papers in greater detail. None of these pieces of equipment are certified ballot scanners that meet industry standards or Arizona law.⁵²

Part of the forensic analysis is a review of material that involves checking for variation in the thickness or feel of ballots, looking for presence or absence of folds in ballots, and placing ballots under ultraviolet lights (specifically UV-A and UV-B lights) to detect irregularities. Setting aside the fact that these unorthodox techniques are never used by true election auditors and have an unclear value and purpose, each of these methods for identifying suspicious ballots is problematic in additional specific ways.

⁵¹ See “Statement of Work,” *Cyber Ninjas*, March 31, 2021 available at, <https://www.documentcloud.org/documents/20536950-arizona-senate-cyber-ninjas-statement-of-work-executed-033121>.

⁵² Morrell, *Supra* note 37.

In addition, Cyber Ninjas handling of the ballots itself has almost certainly affected the humidity of the paper, causing unnecessary variations in the ballots that could be mistakenly interpreted as troubling inconsistencies. After several weeks of storage in the Coliseum, the ballots were relocated in late May to a different location on the fair grounds to accommodate high school graduations and then returned to the Coliseum one week later to resume the review. Whereas the Coliseum used a familiar HVAC air conditioning system that removes humidity from the room, the temporary site used evaporative “swamp coolers” that actually add humidity to the room. These differing humidity conditions mean that the thickness of the ballot paper will vary. Ryan Macias, former director of certification and testing for the EAC, has noted that ballots may be submitted on several kinds of paper that differ in thickness and that the best forensic audits in which he participated also utilized hydrometers to consider humidity in the paper as a factor affecting thickness.⁵³

Like changes in humidity, shining UV lights on ballots also changes the character of the paper being examined. The light could also lead to permanent damage to the ballots. The State Archivist and Records Officer, Dennis Preisler, has submitted a report under oath to explain that important papers should be shielded from UV light.⁵⁴ Preisler noted that “exposing records like the Maricopa County ballots to UV light could cause damage to the record and prevent proper preservation.” As noted above, Cyber Ninjas finally realized the problems with using UV lights and have now abandoned that approach.

Insufficient Security

Sufficient security is always necessary to comply with legal requirements for safekeeping of election materials, to prevent any tampering with those materials, and to ensure the public that the process is trustworthy. The Cyber Ninjas review is failing to meet these standards in several ways.

In an amicus brief filed on April 25, Secretary of State Katie Hobbs charged that the Cyber Ninjas inadvertently revealed glaring lapses in the safekeeping of ballots and equipment in a press conference the company had held three days prior. Hobbs said:

“...once Cyber Ninjas began speaking, it became clear that Cyber Ninjas had few answers regarding how it would comply with Arizona or the United States’ regulatory, statutory, and constitutional law that governs the handling, security, and safety of ballots and voting equipment. Among other things, Cyber Ninjas appeared unaware that Arizona requires ballots to be handled by teams that include representatives of major parties and actively opposed to ensuring it would comply with this requirement” (page 4).

⁵³ States United Democracy Center press call, May 6, 2021; see also Ian MacDougall, “What went wrong at New York City polling places? It was something in the air. Literally.” *ProPublica*, November 6, 2021 <https://www.propublica.org/article/new-york-city-polling-places-midterms-2018-humidity> (noting that high humidity caused significant issues with ballot scanners during the 2018 New York City election).

⁵⁴ Declaration of Dennis Preisler in the case of *Arizona Democratic Party et al. v. Karen Fann et al.* (CV2021-006646).

In addition, Ben Cotton—founder of CyFIR, a Cyber Ninjas subcontractor—outlined in an April letter the steps his firm would take to provide enhanced protection for the ballot auditing area. The protection plan included a chain link fence at least six feet tall installed to encircle the entire storage and imaging areas aside from a single entry point, a security guard posted 24 hours a day to observe both areas, and a limitation on who could open the fences to only two people. Just days after publication of this letter, a local media outlet reported that its journalists had gained access to the Coliseum’s hallways, staircases, and the main floor near the ballots and equipment for four consecutive days without being asked to leave.⁵⁵ Similarly, a journalist reported that he and others were able to enter the Coliseum because “[n]o one was manning[sic] the metal detectors, so we just walked in.”⁵⁶ Observers on behalf of the Secretary of State’s office noted a security gate unattended and open as recently as May 24.⁵⁷ Such serious lapses in security deteriorate public trust in the ability and willingness of CyFIR and other contractors to maintain control over the venue and guarantee a strict chain of custody of county election materials.

Although the firm pledged to protect the election data it is reviewing, CyFIR founder Ben Cotton violated best practices when he copied multiple kinds of Maricopa County data onto hard drives and took them out of state.⁵⁸ According to media coverage of the incident, Cotton reportedly drove the material to a so-called “secure lab” in Montana, although that laboratory appears to be the site of his personal residence.

It is highly unusual for digital materials and a storage medium holding such data to be intentionally removed from the jurisdiction where the election took place. Neither Cyber Ninjas nor CyFIR is willing to reveal what data were taken to Montana, who has access to those data, or what is being done to keep the information secure. This troubling incident raises concerns about the care being taken to protect election materials and is likely to decrease rather than increase confidence in the integrity of the review of the Cyber Ninjas review.

Furthermore, Cyber Ninjas’ inadequate security measures have compromised the county’s election equipment. In a May 20 letter detailing security concerns about the custody of election equipment to the Maricopa Board of Supervisors, Secretary Hobbs noted that election security experts and the Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency (CISA) “each unanimously advised that

⁵⁵ See Morgan Loew, “Security lapses plague Arizona Senate’s election audit fairgrounds,” *AZ Family*, April 22, 2021, available at https://www.azfamily.com/news/investigations/cbs_5_investigates/security-lapses-plague-arizona-senates-election-audit-at-state-fairgrounds/article_b499aee8-a3ed-11eb-8f94-bfc2918c6cc9.html.

⁵⁶ See post from April 22, 2021 at 8:32 pm, available at https://twitter.com/Garrett_Archer/status/1385391174114897923.

⁵⁷ *Supra* note 38.

⁵⁸ See post from June 16, 2021 at 9:01 pm, available at <https://twitter.com/AC360/status/1405329769433022466>; Jane Fifield, “Maricopa County election data is in a ‘secure lab’ in Montana, or maybe a log cabin in the woods?,” *Arizona Republic*, June 3, 2021, available at <https://www.azcentral.com/story/news/politics/elections/2021/06/03/arizona-audit-maricopa-county-election-data-secure-lab-montana-log-home/7511886002/>

once election officials lose custody and control over voting systems and components, those devices should not be reused in future elections.”⁵⁹ Based on the details provided earlier in this report, the lack of clarity and transparency about the custody and control of voting systems and components is sufficient to put the continued electoral use of the equipment into question.

To ensure secure and accurate elections in the future, Maricopa County will likely need to decommission and replace the 385 precinct-based tabulators and nine central count tabulators used in the general election and subpoenaed by the State Senate for the Cyber Ninjas review.⁶⁰ The cost of replacement voting equipment to Arizona taxpayers is roughly \$6.5 million.⁶¹ Although election reviews sometimes reveal processing issues with election equipment that require fixes or adjustments, it is highly unusual for an election review itself to result in requiring the purchase of new equipment. However, traditional election reviews usually take great care to maintain clear chains of custody.

False Public Allegations

Although its purported purpose is to ensure that the 2020 election result is trustworthy, Cyber Ninjas has been undermining confidence by making false public allegations, often due to its own lack of knowledge about election administration in Maricopa County. Examples of incorrect claims are that a database was deleted and that ballots in storage boxes were not secure because seals from the bags in which they were previously contained were found in some boxes. A letter from the Maricopa County Board of Supervisors, Recorder, and Sheriff addressed each of these falsehoods and concluded about the allegations that, “None of this will cause our citizens to trust elections. In fact, it is having the opposite effect.”⁶²

Conclusion

The processes and procedures being used to conduct the Cyber Ninjas review deviate significantly from standard practices for election reviews and audits, as described in this report. Because of these untrustworthy practices and the partisan leanings of those doing the review, any findings by the review are suspect and should not be trusted. We base this

⁵⁹See Arizona Secretary of State Katie Hobbs, “RE: Subpoenaed Election Equipment,” *Washington Post*, May 20, 2021, available at <https://www.washingtonpost.com/context/hobbs-letter-advising-maricopa-county-to-replace-voting-equipment/ac02ffcf-d35a-47e9-b7d5-2aa1bf93b24f/>.

⁶⁰ See Jane C. Timm, “Maricopa County will need new voting machines after GOP’s audit, Arizona secretary of state says,” *NBC News*, May 20, 2021, available at <https://www.nbcnews.com/politics/elections/maricopa-county-will-need-new-voting-machines-after-gop-s-n1268090>.

⁶¹See “Secretary of State Katie Hobbs threatens to de-certify election equipment after audit,” May 20, 2021, available at <https://www.abc15.com/news/region-phoenix-metro/central-phoenix/hobbs-sends-letter-to-maricopa-county-threatening-to-de-certify-election-equipment-after-audit>.

⁶² See “Response to you May 12 letter to Chairman Sellers,” *Maricopa County Board of Directors*, May 17, 2021, p. 12-13, available at <https://www.maricopa.gov/DocumentCenter/View/68972/20210517-Response-Letter-to-Senate-President-Fann---FINAL>.

on our collective expertise in the study of election administration as well as legal documents, video of the operation, and contemporaneous media reports.

On June 25th, 2021, this report was updated to incorporate a footnote.

Author Biographies

Dr. Barry C. Burden is a Professor of Political Science and Director of the Elections Research Center at the University of Wisconsin-Madison. Burden is an expert on election administration and election laws. He is the co-editor of *The Measure of American Elections*, is a member of the editorial board of *Election Law Journal* and has testified as an expert witness in numerous election related lawsuits and hearings.

Trey Grayson is the former two-term Secretary of State in Kentucky. During his time in office, he served as chair of the Republican Association of Secretaries of States and as president of the National Association of Secretaries of State. From 2011-2014, Secretary Grayson served as the director of the Institute of Politics (IOP) at Harvard University's John F. Kennedy School of Government. President Obama appointed him to the bipartisan Presidential Commission on Election Administration following the 2012 presidential election. Secretary Grayson is currently an attorney in the Florence, Kentucky office of Frost Brown Todd.