

Supply Chain Performance in the 2020 Election

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Abstract:

The coronavirus pandemic prompted concerns regarding the material and products necessary to ensure a safe and accessible election. In response, election officials and other stakeholders coordinated efforts to prevent large-scale supply chain issues with respect to personal protective equipment for poll workers and mail ballot supplies for absentee voters. Although many states addressed these concerns before Election Day, supply chain issues exacerbated by the pandemic placed unique stresses on election administrators throughout the country.

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This report builds on research published in a prior memo by the Healthy Elections Project:

- [“Election Supply Chains in a Pandemic,”](#) Anne Warnke, Mikaela Pyatt, Grace Scullion, Sarah Maung, Frances Schroeder, William Howlett, Valeria Rincon (June 17, 2020)

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I. Introduction

The coronavirus pandemic imposed unprecedented strain on the supply chain of election equipment and materials throughout most of the 2020 election cycle. The election supply chain included all materials, processes, and resources necessary to administer and participate safely and efficiently in an election within the framework of state and federal election regulations. In the case of the coronavirus pandemic, the 2020 election supply chain adapted to the unique circumstances of maintaining a free and fair election while simultaneously considering the vulnerability of public health. The coronavirus pandemic prompted a variety of [concerns for the safety of voters and poll workers](#). Driving these concerns were early reports of scarcities in personal protective equipment (PPE) and inconsistencies, both within and among states, in regulations responding to the pandemic (such as mask and social distancing requirements). Election officials were tasked with protecting voters and poll workers with the limited resources available—all while facilitating a legitimate and timely election.

The coronavirus pandemic also prompted [significant increases](#) in the number of mail/absentee ballots used across the country, which put strain on printing and distribution resources. There were numerous [pre-election concerns](#) that the election supply chain would be unable to scale up to meet the unique demands of the 2020 election, including fears of ballot shortages and the complication of new regulations surrounding ballot drop boxes, vote-by-mail, and social distancing.

Though some precincts did face ballot shortages, supply issues, and issues finding facilities large enough to accommodate social distancing, these issues were largely isolated. While minor supply chain problems occurred in precincts across the country, few atypical problems arose, and most were quickly resolved, causing no significant delays in election procedures or election results. Thus, despite pre-election concerns of supply chain issues, the United States election supply chain performed well, and the 2020 general election occurred without [significant delays or widespread issues](#).

II. Election Supply Chain

This report builds on a prior Healthy Elections Project memorandum, "[Elections Supply Chain in a Pandemic](#)" (June 2020), and analyzes issues within the election supply chain during the November election. As in the June memorandum, this report focuses on eight potential breakdowns in the election supply chain: Ballot Packages; Ballot Tracking and Election Services

Software; Polling Place Equipment; Ballot Storage; Ballot Drop Boxes; Polling Place Safety; Polling Place Locations; and Miscellaneous Supply Chain Issues. The most common issues among precincts included large-scale ballot printing errors, technical glitches in voting machines and e-poll books, and delays in ballot tracking software. Each category is further defined below and includes reports of relevant issues.

A. Ballot Packages

Ballot packages are envelopes containing all the materials a voter needs to cast their ballot from home. They vary from state to state but have similar attributes, typically including the ballot, an envelope in which to return the marked ballot, and additional voting materials. Most ballot packages also include instructions for completing and returning ballots; some include a second, inner envelope or “secrecy sleeve” (to place the ballot into before putting it in the return envelope), and some include information about candidates and propositions. Given the various components of a ballot package, a number of issues can arise in the printing and mailing process, including printing errors, duplicate ballots being included in one ballot package, delayed mailing of ballot packages, and material shortages.

Absentee ballot *application* materials can also be affected by printing errors or supply shortages. Application materials can include absentee ballot application forms or voter registration forms. For a more detailed explanation of ballot package parts and processes, please refer to [Election Supply Chains in a Pandemic](#). Ballot-related issues reported by election officials during the 2020 election are listed below.

a. Printing Error—Ballots

Most reports concerning ballot printing issues occurred prior to Election Day. Voters requested and returned a record-high quantity of mail ballots in many states during the 2020 general election. While errors in the ballots were sometimes realized prior to ballot packages being sent to voters, in some precincts, they were discovered only after voters alerted election officials.

In Los Angeles County, California, for instance, 2,000 absentee ballots, which had already been mailed to voters, contained [printing errors](#) that left out the presidential race. In Pennsylvania, a [printing glitch](#) resulted in ballot vendor Midwest Direct sending the wrong ballot to 29,000 voters throughout Allegheny County, the state’s second most populous county. Allegheny County officials created an [online search feature](#) for voters to see if their ballots were affected, and they mailed [new ballots](#) to all affected voters two weeks before the general election. In Utah’s Sanpete County, an Integrated Voting Systems [printing error](#) affected 13,500 absentee

ballots, causing widespread confusion among voters. The ballot vendor subsequently had to mail instructions to address [the error and offer a solution](#). In Outagamie County, Wisconsin, a tiny [printing error](#) affected 24,600 ballots—5,000 of which were sent out prior to discovering the error. The error, an incomplete inking of a black square that ballot counting equipment uses to properly line up ballots for reading, also affected some [Calumet County ballots](#). [Replacement ballots](#) were printed and redistributed. Ohio's Franklin County sent approximately 50,000 [incorrect absentee ballots](#) to voters, listing races that were not in their voting districts. The county sent out corrected ballots in early October. Additionally, a [printing error](#) in Park County, Montana, left random ink splotches on at least one ballot, covering an oval next to a candidate's name. The affected voter was provided a new ballot.

b. Printing Error—Voter Materials

In addition to printing errors on ballots, some precincts reported printing errors on voter materials, such as registration forms, ballot envelopes, ballot instructions, and mail ballot applications. These errors were typically resolved through the distribution of corrected materials and a formal statement with instructions by election officials.

For example, printing errors in Nevada's Lyon and Humboldt counties resulted in [incorrect instructions being printed on mailing materials](#). In a press release, Secretary of State Barbara Cegavske clarified the instructions and assured voters that their ballots would be counted despite the printing error. Some voters in New York's Monroe County reported receiving [mail ballot applications](#) for persons who did not live at their addresses. The county commissioner said that the incorrect information would be corrected and sent back to the Board of Elections. Additionally, about 100,000 voters in Queens and the Bronx in New York City [received absentee ballots with the wrong information printed on the return envelopes](#). The error was attributed to a mistake on the part of the printing vendor; voters with affected envelopes were [encouraged to contact the NYC Board of Elections](#) and receive new ballots with correct information on the envelopes.

Some errors involved formatting mistakes that did not affect the voting process but did cause confusion among voters. For example, in August, a [printing error](#) in Virginia caused by a misaligned spreadsheet affected 500,000 absentee ballot applications mailed by a nonprofit. The nonprofit worked with election officials to [reduce voter confusion](#). Similarly, Oregon's Washington County reported a [formatting error](#) in the mail ballot explanation, though the issue did not affect the voting or counting of ballots. Additionally, a printing vendor mailed out 11,000 voter registration forms in North Carolina with [incorrect voter information](#). The State Board of Elections instructed people to discard the incorrect forms.

c. Printing Error—Processing, Scanning, Tabulating

In some cases, ballot printing errors caused problems only when ballots were scanned by election officials. For example, in Texas’s Tarrant County, up to 25,000 ballots could not be read by a scanner because of a [printing error](#) with the ballot’s barcode, forcing election officials to duplicate ballots in order to be scanned. In Indiana, a laser printer error resulted in printed ballots that [were millimeters too narrow](#) to be tabulated properly by tabulation machines. Additionally, in Morris County, New Jersey, election workers had to enter barcode numbers into scanners by hand because of [blurry ink on about 20% of the ballots](#), causing “massive delays.”

In this type of instance, officials quickly assured voters that all ballot affected by the error would be counted. Dorchester County, Pennsylvania, was unable to start counting absentee votes because of a [printing error](#) that prevented 13,500 ballots from correctly scanning. Officials assured voters that all votes would be counted despite the error. In South Carolina, a scanner in Dorchester County failed to read 14,600 absentee ballots because of a [printing error](#) on the ballot; election officials assured voters that all affected ballots would be counted through a [hand-count](#).

d. Delayed Printing and Mailing of Absentee Ballots

In some precincts, various issues caused absentee ballots to be sent out late, thus delaying the anticipated election timeline. For example, in Missouri’s Pulaski County, a printer was [late in printing and delivering ballots](#) to polling sites, causing in-person absentee voting in the county to start a day or two later than the rest of the state. Nevada’s Washoe County sent out absentee ballots a few days late because of [printer delays](#). Meanwhile, printing and delivery problems at Midwest Direct, a Cleveland-based ballot vendor, [delayed absentee voting](#) in 16 Ohio counties. While the exact number of delayed ballots remains unclear, Ohio election officials said that the number of affected ballots was well into the thousands. Because of those printing delays, [nine Ohio counties](#) opted to instead print their ballots in-house.

e. Duplicate Ballots

In some precincts, voters reported receiving multiple ballots, though in each incident, election officials assuaged any concerns of potential double-voting. For example, in Idaho’s Bonneville County, several voters [received duplicate ballots](#) because of a software glitch. The Idaho secretary of state’s office said that no Idaho voters would be disenfranchised because of the error. Similarly, in Pennsylvania’s Blair County, 78 voters received [two ballot packages](#) each because of a printing malfunction. Ballot vendor NPC was able to identify which voters received two ballots, enabling county officials to [prevent double-voting](#). In Richmond, Virginia, a jammed

printer in suburban Henrico County and the rush to mail out ballots in Richmond City resulted in 400 voters receiving [duplicate ballots](#). Officials in Fairfax County, Virginia, [accidentally sent](#) duplicate ballots to 1,000 voters. But state election officials assured voters that a statewide voter verification program tracked when voters have cast ballots and thus [prevents](#) duplicate ballots from being counted twice.

f. Shortages—Ballots, Ink

Because of the large quantity of mail ballots needed throughout the 2020 election, some worried about [widespread ballot shortages](#). Although no incidents of widespread ballot shortages occurred in 2020, some precincts did report shortages of provisional ballots, ink to print ballots, and ballots for Election Day voting. For example, on Election Day, some Alabama counties reported [shortages of provisional ballots](#); voters in affected counties were asked to return later in the day once more provisional ballots had been printed. Similarly, in Illinois, three Woodford County precincts [ran out of provisional ballots](#) shortly before polls closed on Election Day. In California, a voting center in Manteca [ran out](#) of standard ballots because of high voter turnout. In Pennsylvania, several [York County](#) polling sites and two [Mercer County](#) polling sites ran out of ballots. In Mercer County, officials admitted they underestimated the number of ballots needed by Sharpesville voters and that they ordered the wrong number of ballots for Jackson Township, resulting in shortages. Pennsylvania election officials [picked up and delivered more ballots](#) prior to polls closing in affected precincts. In contrast, and contrary to a local news report, Wyoming's Wood County did [not run out of ballots](#).

In Arizona, several polling locations [ran out of the ink](#) to print ballots on Election Day, including in Fountain Hills and [Maricopa County](#). Similarly, an [ink shortage](#) in Green Bay, Wisconsin, delayed absentee vote counting. Though not reflective of a ballot or ink shortage, an Idaho polling place reported [running out of voter registration cards](#) leading up to Election Day.

g. Miscellaneous Ballot Issues

Although the vast majority of ballot-related issues are reflected in the categories above, some precincts reported miscellaneous incidents, typically affecting a small number of voters. In some cases, voters did not receive their ballots. For example, in Tuscaloosa County, Alabama, some voters reported [never receiving mail ballots](#) and, instead, had to vote in person. In Florida, a few voters were [wrongly denied provisional ballots](#), though the mistake was quickly fixed. At West Virginia's Ruthlawn Elementary in Kanawha County, poll workers incorrectly informed several voters that [they had already voted absentee](#) when they had not.

Some voters encountered issues regarding ballots provided on Election Day at polling sites. One voter in the Town of Wilton, Maine was [accidentally given an absentee ballot that had already been filled out](#). After bringing the issue to an election clerk's attention, the voter was issued a blank ballot. In South Dakota, a precinct at a church in Sioux Falls handed out 38 [wrong ballots](#). An auditor found there to be “no remedy” for such error.

Lastly, a Texas Supreme Court ruling allowing Green Party candidates on the ballot, prompted the counties that had already sent out mail ballots to send [corrected ballots](#) along with a written notice explaining the change and instructions to destroy “defective” ballots that had not yet been returned.

B. Ballot Tracking and Election Services Software

In many jurisdictions, voters were able to track the status of their general election ballot through online ballot tracking systems. While these tracking systems were particularly useful for voters using mail ballots, some states enabled voters who cast a ballot at the polls to similarly track the status of their ballot online. Many states used third-party ballot tracking systems, such as [Ballot Scout](#) or [BallotTrax](#), whereas other states offered ballot tracking software through governmental sites, most commonly the secretary of state's website. [Only six states](#) did not offer comprehensive ballot tracking software: Illinois, Missouri, New York, Texas and Wyoming provided ballot tracking software only for military and overseas voters, while Mississippi provided no ballot tracking software.

Ballot tracking software is included in this discussion for three reasons: Ballot tracking software can flag certain supply chain breakdowns for election officials and voters, such as glitches in voter services platforms and delays in the U.S. Postal Service; ballot tracking software offers voters in some states the opportunity to correct certain errors, which can in turn prevent further supply chain breakdowns; and ballot tracking software offers an accountability mechanism, providing voters with visibility into the status of their ballot and a glimpse at the efficacy of the election supply chain.

Some states encountered glitches in the ballot tracking system, causing frustration and confusion to their voters. The primary issues in ballot tracking software that were reported in 2020 included technological glitches, software delays in updating ballot status, software crashes, and delays in USPS scanning and tracking as needed to update ballot status. Comprehensive information on ballot tracking systems provided within each state and further information on USPS performance in the 2020 election can be found here:

- [How to Track Your Ballot in Each State](#)
- [USPS Performance Reports and Election Statements](#) (USPS.com)
- [USPS and the 2020 Elections](#)

a. Ballot Tracking Software

Ballot tracking services typically track the unique identifying numbers or barcodes given to each ballot. These barcodes are scanned by USPS during delivery to the voter and on return to election officials. The scans in turn trigger messages to the voter on the tracking software letting them know if their ballot is in transit or has arrived. Concerns about postal delays during the pandemic drove voter interest in ballot tracking during the 2020 elections cycle.

There were some issues with ballot tracking software leading up to the general election. Inconsistencies in Pennsylvania's [ballot tracking software](#) concerned voters and drew criticism from Philadelphia City Commissioner Al Schmidt. In October, Virginia voters reported a [variety of issues with Virginia's ballot tracking software](#), Ballot Scout. Officials substantiated such reports and assured voters they could check the status of their ballot through the Virginia Department of Elections voter portal. Additionally, some Florida counties [did not provide](#) voters with a means to check whether their mail ballot had been counted, despite the availability of statewide ballot tracking services.

Following Election Day in Oklahoma, [delays in ballot tracking software](#) caused concern among voters who were concerned that the tracking had yet to indicate their ballots had been received and counted. State officials said voters' concerns were caused by delays in officials' ability to input data into the ballot tracking and did not reflect a problem in the processing or counting of ballots.

b. Election Services Software

Software-related issues are not unique to ballot tracking systems, as some states also faced problems with software used to operate voting machines, register voters, document who had cast ballots, and provide voter information for ballot printing and processing. Software used for these purposes is known as "election services software."

Crashes in election services software typically occur because of system overload or technological errors, and often cause voter confusion and concern. Several hours before the deadline to register for the general election, [Florida's online voter registration system](#) was down because of the system's inability to handle the traffic load at the deadline. The state extended the deadline to midnight to remedy the lost time and quell voter concern. Pennsylvania's [voter](#)

[services website also crashed](#) for 40 hours the weekend of October 4, causing concern among voters as ballot deadlines loomed. On the last day to register to vote in the state, Virginia's [voter system crashed](#) but was [restored](#) by late afternoon.

Glitches in election services software also affected in-person voting and processing. At the polls, they caused delays for voters during check ins and delays for poll workers counting votes. In Park County, Wyoming, voting machines suffered a software [glitch](#) because of a failure to program an automatic time-change for Daylight Savings Time on November 1. In Georgia, a record voter turnout overloaded [the electronic pollbook system](#) and caused delays during early voting, while on Election Day, software issues in Gwinnett County slowed the [Georgia ballot count](#). Similarly, in Christian County, Missouri, [issues with electronic poll books](#) used to sign in voters caused delays and long lines at the beginning of Election Day, though the software problem was fixed within an hour. In New Jersey, electronic signatures made with styluses did not match voters' names, forcing affected ballots to be cured and causing counting delays. In Rhode Island, some precincts experienced [syncing issues](#) with their poll pads, because of the high volume in-person absentee ballots—which Rhode Island refers to as "[emergency mail ballots](#)." In Riverside County, California, voters experienced delays because of a [computer glitch](#) spanning some of the county's 130 polling sites in October. On Election Day in Ohio, Franklin County switched from electronic to [paper pollbooks](#) because of problems uploading voter data the day before. The switch, combined with higher than expected voter turnout in the county, caused some delays and confusion at Franklin County polling sites. Similarly, in Michigan, an issue with an e-poll registration system caused some delays and long lines, though the glitch was resolved. Additionally, initial reports of software issues in Michigan's Antrim County on Election Day were incorrect; [delays in counting were actually caused by human error](#), which resulted in ballots being counted by hand.

Texas faced a variety of technical glitches. In Dallas County, at least two voters found that someone else had voted using their names because of a [pollbook system error](#). The issue prompted an [investigation and swift resolution](#). On Election Day, Comal County election officials received three reports of [local races missing from electronic ballots](#), prompting an investigation into the technological issue. In Hidalgo County, new laptops resulted in a [technical glitch](#) that delayed voting by 90 minutes; affected polling sites remained open for an extra hour to make up for the delays.

Because some states' ballot tracking software is integrated with its election services software, a glitch could create widespread issues. In Minnesota, on October 31, a website hosting both ballot tracking and voter registration went down for an hour, causing delays in early voting. The issue was caused by [hardware problems](#) and, while the database was restored in part, delays continued throughout the afternoon until the site was fully restored. Additionally, New Jersey

poll workers experienced issues with the Motor Vehicle Commission [voter registration system](#) blinking in and out of operation on November 3 during counting.

C. Polling Place Equipment

Once ballots are cast, precincts must process, scan, and tabulate all voted ballots through polling place equipment. Mail ballots are [processed](#) through state-required steps, including verifying signatures and removing ballots from envelopes. Mail ballots are then [scanned](#) by a scanner that stores information on a memory card, and votes are then [tabulated](#) by machine. In-person voters either vote on paper or use a voting machine to mark their ballots. Their votes are later tabulated either by the same machine or through a tabulator. Equipment, procedures, and regulations vary widely by state; more detailed information can be found in the following external resources:

- [Voting Methods and Equipment By State](#) (Ballotpedia.org)
- [Registered Voting System Manufacturers](#) (Election Assistance Commission)
- [When States Can Begin Processing and Counting Absentee/mail Ballots, 2020](#) (Ballotpedia.org)

Common supply chain issues concerning ballot processing, scanning, and tabulating in the 2020 election typically stemmed from equipment glitches or malfunctions. In some cases, these issues were promptly resolved with the original equipment; in other cases, the malfunctioning equipment was entirely replaced.

Minor glitches or malfunctions in polling place equipment were not unique to the 2020 election; while such issues cause temporary frustrations, they are typically isolated incidents. For example, in Nevada County, Nevada, voting in the 2020 general election went smoothly and [only small routine technical issues](#) came up, such as printers needing their settings readjusted. A few [minor voting machine issues](#) occurred throughout the state of Virginia, but all were resolved. Below are reports of polling place equipment issues concerning voting machines, scanners, tabulators, and other items:

a. Voting Machines

Voting machine issues often arise from technological glitches or human errors (such as poll workers not plugging the machines in correctly or placing ballots into the machine incorrectly). In precincts in which voting machine glitches occurred, reports indicated that election officials resolved issues promptly. For example, on Election Day in Florida, Lake County reported [a](#)

[minor glitch in voting computers](#) shortly after polls opened. Alan Hays, supervisor of elections, said “the problem was isolated immediately, and corrective action was initiated.” Similarly, in Maine, Secretary of State Matt Dunlap reported a [few minor voting machine glitches](#) that were quickly fixed by technicians. When counting votes, Joe Gloria, Registrar of Voters in Nevada’s Clark County, said [voting machines had some issues](#) “centered around connectivity to our poll books” and “a small number of issues with the functionality of signing in our poll books” but, overall, the issues “were very small.” Clark County was able to respond to all issues and continue counting ballots.

Georgia faced a number of technical issues on Election Day. A [voting machine glitch](#) slowed the [Georgia ballot count](#). Spalding County experienced countywide voting machine shutdowns because of [incorrect information loaded](#) into the machines. The issue was resolved before 10 a.m. on Election Day. Four of seven polling sites in Georgia’s Morgan County experienced [technical difficulties](#), though all were resolved by afternoon. At Morris Brandon Elementary School in Atlanta, voters initially had to cast [paper ballots instead of voting by machines](#) because of technical difficulties, though the machines were fixed later that day.

Other reports reflected broken voting machines or errors affecting voting machines. Days before the election, West Virginia’s Cabell County reported [problems with several voting machines](#). Because candidates on the affected ballots were running unopposed, county officials [opted not to fix](#) the machines rather than delay the election. On Election Day in New York, there were a few reports of [broken or locked voting machines](#) in New York City and Flatbush. Meanwhile in Franklin County, Ohio, some [voting machines](#) at a polling site at Maranatha Baptist Church [stopped working](#), forcing some voters to use provisional ballots; additionally, voting machines at Thomas Worthington High School were [down for 30 minutes](#) at some point in the day. And in Wisconsin’s Milwaukee County, officials [found 65 missing ballots](#) in a voting machine in late November during the state recount.

b. Scanners

Similar to voting machines, scanners are vulnerable to technological glitches and breakdowns. In Mississippi, a polling place in Pisgah had long delays because [a vote scanner stopped working](#). In West Virginia, a [broken scanner](#) at Greenmont Elementary School in Wood County was quickly replaced. Meanwhile, a [broken scanner](#) in Westmoreland County, Pennsylvania, temporarily delayed some voters who opted to wait for the machine to be fixed rather than leave their ballots in a secure lockbox; the scanner was fixed by election technicians around 10 a.m. In Texas’s Travis County, four polling sites—Austin Oaks Church, George Morales Dove Springs Recreation Center, South Austin Recreation Center, and Virginia Brown Recreation

Center—experienced [malfunctioning ballot scanners](#). The issue did not prevent voting and was [quickly resolved](#).

A Cranston, Rhode Island, [scanner failed](#) to count 9,000 emergency ballots, prompting a hand-count by election officials; Cranston was the only city among Rhode Island's 39 cities and towns to [not digitally transmit](#) election results on election night. At Rhode Island's Knights of Columbus Hall in Central Falls, a scanner [rejected ballots](#) on election night. The machine was one of three that had been delivered to the polling site to [replace other broken scanners](#). Ballots rejected by the machine were placed in an auxiliary ballot box to be hand-counted. Similarly, in Oklahoma City, the Church of the Redeemer's only voting booth rejected poorly and/or partially marked ballots on several occasions, prompting poll workers to [reset the machine](#) multiple times. And on Election Day in Arkansas, a DS200 scanner was [unable to read absentee ballots](#) from a new printer in Carroll County, leading election workers to spend Wednesday "putting information from 1,843 absentee ballots into voting machines so new ballots could be printed out and then run through a tabulator to be counted."

Another common issue among scanners concerned jammed ballots, which temporarily delayed scanning processes. In Tennessee, a few unnamed precincts reported [ballots stuck](#) in voting machines, though the cause was unclear; all issues were promptly resolved by election officials over the phone. At the Expo Center in Texas's Orange County, a [voting box jammed](#) temporarily. In Hennepin, Minnesota, jammed ballot machines caused [some minor delays](#); one machine was replaced, and the other was promptly fixed.

Some issues were unique to an election held in the midst of a pandemic. [Hand sanitizer rubbing off voters' hands and onto ballots jammed scanners](#) in Des Moines, Iowa, and [Derry, New Hampshire](#). The broken machine in Des Moines was fixed within the hour. To address this unique issue, Des Moines poll workers moved the "sanitizing station farther back in the line so voters' hands would be dry when they first touched the ballots."

c. Tabulators

When tabulating votes, many precincts experienced glitches in machinery, resulting in minor delays in reporting election results. There were [delays in reporting votes](#) from Maryland's five largest jurisdictions because of technical issues with ballot scanners and their thumb drives. The delays were due in part to voters' ability to vote in any precinct, requiring election officials to "answer a set of repetitive questions for every thumb drive they import into the state's vote tallies." On November 4, Nikki Charlson, deputy administrator of the Maryland State Board of Elections, said that the State Board of Elections aimed to [fix the issue](#) and finish reporting within a few days.

In Michigan, some [scanners caused delays in Wayne County](#), all of which were quickly resolved. When counting votes in New Hampshire, election officials in Londonderry had to run 16,000 votes through the counting machine a second time because of [a technical issue with the SIM card](#). In North Carolina's Washington County, [outdated machinery duplicated ballots](#) during tabulation and, in one Robeson County precinct, results from an early voting site were mistakenly not uploaded. Both errors were corrected during North Carolina's 10-day election audit. On Election Day in Oregon, a [tabulation machine error](#) required retabulation of ballots in Ogle County, delaying county results. In Milwaukee, Wisconsin, a tabulator flash drive was [mistakenly left](#) in a voting machine when poll workers delivered flash drives to the Milwaukee County Election Commission for counting. The flash drive was [quickly retrieved](#) by another poll worker and delivered by police. Meanwhile, in Clay County, Missouri, a [programming error in tabulation machines](#) resulted in incomplete election results on Tuesday night; the affected votes were recounted on Thursday.

Some precincts experienced problems with multiple types of polling place equipment, such as in Connecticut, where Fairfield, Wallingford, and Branford counties reported several broken [polling and tabulating machines](#) on Election Day, all of which were quickly fixed. On Election Day in North Carolina, three precincts in Sampson County, three in Warren County, and one in Cabarrus County were flagged by election officials because of "a range of issues, from [tabulators not accepting ballots to printers not working](#) and poll workers not being able to log in to machines." In Texas's Upshur County, [technical difficulties with polling equipment](#) at St. James Baptist Church and Big Sandy School required extended voting hours.

d. Unspecified Equipment Issues

In Alabama, some polling locations reported [machine crashes and shortages](#), including at Jefferson County Courthouse and polling sites in Pleasant Grove, Bessemer, and [Baldwin County](#). On Election Day in Arizona, Mesa Community College [reported a broken machine](#), causing delays and frustrations among voters in line. During Texas early voting, [glitches](#) in Fort Bend County voting machines resulted in hours-long delays and calls for an investigation. [Similar issues](#) were reported at Four Corners Recreation Center and Smart Financial Centre, though issues were quickly resolved in both precincts. Similarly in Massachusetts, a few broken machines were [fixed within the hour](#).

e. Lack of Necessary Equipment

Though some precincts faced frustrating machine glitches and breakdowns, some precincts lacked the appropriate machinery altogether. In Indiana, Madison County reported [needing](#)

[twice the number of voting machines](#) it originally had (originally 170 machines) to accommodate the voters that showed up on Election Day, causing long lines and delays. Rhode Island's Warwick, Cranston, and Providence communities received [incorrect voting machines](#), which were quickly replaced by correct machines. At VanDevender Middle School in Wood County, West Virginia, [missing election equipment](#) caused a short delay until found.

f. Misc. Equipment Issues

While voting machines encompass the majority of polling place equipment issues, the Port Arthur Sub-Courthouse in Jefferson County, Alabama, reported a [malfunctioning judge booth controller](#), which connects all voting machines together electronically, which caused voting delays.

D. Ballot Storage

Potential ballot storage issues included supplies necessary to transport and store ballots, including warehouses, trucks, containers, and methods of securing ballots in storage. Because the 2020 election utilized far greater quantities of absentee ballots than past elections, concerns prior to the general election included a [need for more physical space](#) to store ballots. Despite concerns that higher quantities of absentee ballots required more physical space, there were no reports of ballot storage issues impacting the general election.

E. Ballot Drop Boxes

Because of the increased use of absentee ballots, many states and jurisdictions opted to provide or expand throughout voter precincts the number of ballot drop boxes into which voters could drop off their ballots. There were few reports of supply chain issues related to ballot drop boxes, though issues and challenges concerning the implementation of ballot drop boxes occurred for reasons unrelated to the supply chain. Please refer to our prior reports, [The Use of Ballot Drop Boxes During COVID-19](#), [Ballot Drop-Off Options in All 50 States](#), and [Ballot Drop Boxes in the 2020 Elections](#) for more detailed information on ballot drop box regulations in each state.

The use and implementation of ballot drop boxes varied widely by state, as did reports concerning ballot drop box supply chain issues. In October, California Republicans placed [unofficial drop boxes](#) falsely labeled as "official" throughout Los Angeles, Orange, and Fresno counties, causing voter confusion and concern for election security in the state. Additionally, in Wisconsin, election officials reported voters dropping off their ballots in the [drop boxes](#) outside

their voting jurisdiction. All ballots dropped off at incorrect ballot drop boxes were mailed to the correct jurisdiction by county officials. Potential supply chain issues regarding ballot drop boxes also concerned [supervision](#), whether by a 24-hour camera or a specified individual, if required by state law. The fulfillment of state regulations that required such supervision posed challenges for some precinct officials, most notably in Florida, where [stricter regulations prompted concern](#) among voting rights activists.

F. Polling Place Safety

Personal protective equipment (PPE) and other safety supplies constituted perhaps the most notable supply chain concern unique to the November 2020 election. Running an election during a pandemic of a serious respiratory illness with high transmission rates put pressure on state governments and precincts. Jurisdictions needed to protect poll workers and voters with the limited financial and medical resources available. [Potential supply chain concerns](#) included challenges estimating the necessary quantities of PPE for each precinct, determining who was responsible for purchasing and distributing PPE, and coordinating distribution of PPE to all polling sites.

While [mask requirements](#) varied widely by state, general precautions included providing personal protective equipment for poll workers, sanitizing voting materials (such as pens, styluses, voting booths); maintaining social distancing; and preserving the right to vote for those who had contracted COVID-19, the respiratory disease caused by the coronavirus. The primary limiting factors in implementing such precautions were obtaining funds to provide and distribute PPE and obtaining the PPE itself, as PPE supply chains were [severely strained](#) at various times in 2020.

Election officials forged creative partnerships to procure hand sanitizer for the 2020 elections. In Wisconsin, [officials partnered](#) with [local distillers](#) to procure hand sanitizer for the state's April primary. Nationally, the National Association of State Election Directors (NASED), the National Association of Secretaries of State (NASS), and the Cybersecurity and Infrastructure Security Agency (CISA) partnered with [Anheuser-Busch](#) in August 2020 to distribute hand sanitizer to state election offices for the general election. The company donated more than eight million ounces of hand sanitizer to officials as part of its "Brew Democracy" initiative.

Despite concerns regarding the funding and procurement of PPE for polling sites, there were few reports of PPE supply chain issues and none that caused significant delay in election procedure. On Election Day in California, a few voters [refused to wear masks](#) at a Sacramento polling place, prompting poll workers to create a secluded voting booth to maintain polling

place safety. Similarly, on Election Day in Utah, some voters reported poll workers [not wearing masks](#), though all reported issues were [investigated and resolved](#) by county officials. In Clarksdale, Mississippi, [record voter turnout and long lines](#) resulted in reports of limited space for social distancing as voters waited for just six voting machines at a polling place. Similar reports in New Hampshire of [insufficient social distancing](#) at some crowded polling places did not appear to impede voting.

G. Polling Place Locations

Polling place locations posed unique challenges to election officials as unintended delays arose from polling site relocations, staffing shortages, inadequate signage, voting hour extensions, and polling site reductions. This category encompasses polling place location issues reflective of supply chain gaps but does not provide detailed information on [poll worker recruitment](#) or shortages.

Most common among polling place location issues were unanticipated delays or the need to extend voting hours due to various polling site issues. In Georgia, a Spalding County glitch prompted [extended voting hours](#) in at least one polling place in Cherokee, Cobb, DeKalb, Fulton, Gwinnett, and Houston counties. Similarly, in North Carolina, a range of machine errors in Sampson, Warren, and Cabarrus counties resulted in the [delayed opening](#) of some precincts and the [extension of voting hours](#) in others. A [technical glitch](#) in Texas's Hidalgo County prompted polling sites to remain open for an extra hour to make up for delays.

Some polling sites faced delayed openings, such as in Nevada, where several [Clark County polling places opened late because of technical issues](#). At Birchwood Middle School in North Providence, Rhode Island, poll workers [did not show up](#) for their shifts, delaying precinct opening until 7:20 a.m. On the first day of Texas early voting, the Eules Senior Center in Tarrant County remained [unopened](#) because a poll worker had recently been exposed to the coronavirus. Poll workers in the same training class were directed to [stay home](#), affecting Keller Town Hall and the Villages of Woodland Springs precincts, though both were still able to open.

While some polling locations faced delayed openings, others had to be combined with functioning polling locations, moved to new locations, or shut down as a result of various precinct issues. In Illinois's Cook County, a [polling place had to be moved](#) upon the building owner's request. In a polling place located in [a Chicago-area school](#), the sprinklers went off unexpectedly, dousing poll workers and voters and forcing officials to redirect voters to another nearby polling place. Similarly, in West Virginia's Kanawha County, a [relocated polling place](#) confused some voters. On Election Day in Oklahoma, a [polling site in Noble expanded](#) from

four voting booths to 11 after moving to a larger room around 2 p.m., reducing wait times by half. South Dakota poll worker shortages resulted in some [precincts being combined](#), leading to longer lines on Election Day. Similarly, a coronavirus outbreak forced the Western Wyoming College election center to [reduce capacity](#) by half. In late October, the Nitro Police Department in West Virginia [shut down](#) because of a poll worker testing positive for the coronavirus; meanwhile, some poll workers [called in sick](#) across Wood County, though the absences did not prevent the continuation of standard election procedures.

Other polling place location issues varied widely. In Alaska, for example, [logistical challenges](#) related to geographic barriers (namely that some polling locations are not accessible by road) caused delays in vote counts. Such issues—when combined with Alaska’s [unique vote counting system](#) that delays the counting of absentee ballots until a week after the election—are not unique to the 2020 election, but rather a recurring issue in Alaskan elections. In Florida, some relocated polling place locations were [not updated](#) on the state website, frustrating voters. An Orlando polling site [shut down temporarily](#) because of a nearby SWAT raid. In California’s Orange County, activists reported a [fake polling site](#), confusing voters. On Election Day, a voting rights group, Civic Nebraska, [reported a lack of adequate signage](#) at a handful of polling places in Lincoln and Omaha and brief difficulty with special-needs access at a north-central Lincoln polling site, which eventually was corrected." The League of Women Voters of Ohio reported similar [complaints](#) with curbside voting access and signage in Worthington, Grove City, and Blacklick, though county officials did not substantiate these concerns.

H. Miscellaneous Supply Chain Issues

All other supply chain issues related to miscellaneous voting supplies are included in this category. For example, a handful of southern states had to acquire generators for polling places that lost power during Hurricane Zeta. Alabama faced [power outages](#) at polling locations in several counties; however, Secretary of State John Merrill reported that all 1,980 polling locations would have power on Election Day, either through restored electrical grids or generators. Meanwhile, in Georgia, two or three polling places faced [power outages](#) on the Monday before the election, according to statewide voting system implementation manager, Gabriel Sterling. Hurricane Zeta also caused [power outages at polling places](#) across Louisiana. Where power was unable to be restored, officials either relocated the polling place to a building with power or supplied [generators to polling places without power](#). Mississippi polling places experienced similar [power outages](#); polling place locations where power was unable to be restored by Election Day ran on generators.

In unrelated incidents, a number of states reported minor power outages at some precincts. On Election Day in central Florida, construction workers accidentally severed cables to a polling site in Kissimmee, causing an [internet outage](#) and delaying election results from Osceola County. In Idaho, officials reported a [minutes-long power outage](#) at a polling site. Similarly, a [blown transformer](#) at a voting site in Linden, Ohio, temporarily knocked out power. Meanwhile, at a polling site in Oklahoma City's Church of Christ, a three-hour [power outage](#) prompted the use of emergency ballot storage until power was restored around 10:30 a.m. via a power generator. Similarly, [intermittent power outages](#) at Oklahoma's Mayflower Congregational Church-UCC caused some delays, though voting continued uninterrupted. A [power outage](#) temporarily delayed voting at some Richland County precincts in South Carolina. In Sissonville, West Virginia, a [power outage](#) was quickly fixed before the voting machines ran out of battery power and a Raleigh County polling place used a generator to continue election procedures following a [power outage](#).

Issues not related to power outages affected some polling stations across the country. For example, a broken water pipe in Fulton County's State Farm Arena slowed the [Georgia ballot count](#). In Illinois, [fire sprinklers went off](#) at the Otis School in Cook County, though no ballots were damaged. The Kansas secretary of state's office received [reports of robocalls](#) encouraging voters to stay home. In response, the secretary of state publicly reiterated voters' right to vote before poll closure. Meanwhile, in Montana, [Flathead County experienced vote counting delays](#) because of WiFi delays and machines counting ballots more slowly than expected. Montana officials provided a final tally in the afternoon of November 4. At Maranatha Baptist Church in Franklin County, Ohio, poll workers [misplaced the key to voting materials](#), delaying the start to Election Day. A Franklin County election official arrived around 7:20 a.m. with a spare key, enabling the polling site to open. In Portsmouth, Rhode Island, a supply box was delivered to the [wrong precinct](#). And in Iowa, a vote counting error [put a Democratic candidate ahead](#) in the Iowa U.S. House Race, though the mistake was corrected.

Following the election, a DeKalb County, Georgia, elections manager [was fired](#) after a series of errors as a county-run "state-ordered audit of ballots cast in the presidential race" found that the VRE manager "failed to follow [...] established protocols and blatantly disregarded the required processes [utilized] to account for and record all legal and verified ballots." Similarly in Oregon, Elections Director Stephen Trout was [fired by text](#) after pointing out the state's outdated election technology, shocking many in the agency.

III. Funding for Election Materials and Procedures

Many states relied on additional funding from government and private entities to operate a safe election during the coronavirus pandemic. Coronavirus-related expenses included PPE for poll workers; postage, envelopes, and drop-boxes for mail voting; sanitation for polling places; drive-through voting set-ups; additional training for poll workers; and increased pay to attract and retain more poll workers. These expenses were in addition to ordinary election-related expenses and system upgrades, such as new voting machines and software.

A. HAVA Funding

In early 2020, Congress authorized [\\$425 million in Help America Vote Act \(HAVA\) funds](#) to be used for [election security purposes](#) throughout 2020. States could apply for and use 2020 HAVA funds for [coronavirus-related expenses](#), such as “the protection of the health and safety of poll workers, staff, and voters during federal elections as well as those resulting from unanticipated increased demand for vote-by-mail costs (e.g. printing ballots, postage, etc.), equipment, temporary staff, and similar costs.” Participating states sent request letters early in the year, detailing the anticipated amount of HAVA funds needed to operate a successful election. Each state was required to match 20% of the federal aid awarded.

For further information regarding HAVA funding by state, please refer to the following resources:

- [Breakdown of HAVA Fund Awards by State](#) (Politico)
- [Election Security Funds](#) (EAC.gov)

B. CTCL and CEIR Grants

[Some states still struggled to meet the costs](#) of administering a safe election. To help relieve cost burdens, the nonprofits [Center for Tech and Civic Life \(CTCL\)](#) and [The Center for Election Innovation and Research \(CEIR\)](#), after receiving a \$300 million donation from Priscilla Chan and Mark Zuckerberg among other donors, offered grants to states, cities, and counties for coronavirus-related election expenses. CTCL allocated some of these funds toward a [rural grant program](#). About [half the states applied for CEIR grants](#), and about 10 percent of local election agencies applied for CTCL grants. Some conservative organizations, such as the Thomas More Society, took [legal action to block the grants](#) in some local jurisdictions. They claimed that allocation of private money towards an election could [create partisan disparities](#) in voting opportunities between different jurisdictions. For example, in a Wisconsin case, plaintiffs

requested an order restricting use of CTCL funding by the Wisconsin Election Commission under Wisconsin Statute 12.11 which prohibits election bribery that induces a voter to refrain from voting. [Judges did not issue injunctions](#) in any of these cases. Further details of cases challenging CTCL funding can be found through the [Healthy Elections COVID Election Litigation Tracker](#).

C. HAVA and CTCL Funding by State

The following table indicates the amount of HAVA funding awarded to each state—not including the 20% state match—and the intended use of such funding if provided by state documentation. Awarded funds may be used for election purposes throughout the year—including the 2020 primaries, run-offs, and general election—thus, the amount indicated in the table is reflective of the amount awarded for the 2020 year. The table also includes the amount of CTCL funding awarded to each city, county, or state as applicable as reported in October 2020:

State	HAVA Funding	Intended Use	CTCL Funding
Alabama	\$6.5 million	Upgrade voting equipment, electronic poll books, and GIS software for service voter geographic ID	Montgomery County : \$534,489 grant for a high-count vote tabulator machine, touch screen voting machines, and a new cargo van
Alaska	\$3 million	Enhance election security, advance voter registration anomaly detection, and improve election system controls	N/A
Arizona	\$7.8 million	Increase election security at the state, county, and local level	Navajo County : \$615,000 grant to expand early voting opportunities, including more polling places, ballot drop-boxes, drive-through voting, PPE, and translation services
Arkansas	\$4.7 million	Equipment purchases, cybersecurity measures, training, connectivity/communications, and voter registration”	Craighead County : \$59,856 grant for hiring and training poll workers and setting up a drive-through ballot drop-off site

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California	\$36.3 million	“ Technical and security enhancements, security training, infrastructure needs, equipment costs, polling place administration, auditing, and improving the administration of elections” at the state and local level	N/A
Colorado	\$6.7 million	Not Specified	N/A
Connecticut	\$5.4 million	Enhance election security via local voting systems and training programs	Hartford : \$350,000 grant for “additional scanners, printers, and ballot workers needed for absentee ballot process, personal protective equipment and hazard pay for poll workers and extra ballot counters.”
Delaware	\$3 million	Improve security at all offices and warehouses, improve cyber security, and continue funding security enhancements for new voting system	N/A
Florida	\$20.1 million	Not Specified	N/A
Georgia	\$10.8 million	Not Specified	Cobb County : \$5.6 million for partitioned voting system carriers, hazard pay for poll workers, ballot mailing, PPE, and sanitation. Dougherty County : \$300,000 for installing and monitoring ballot drop-boxes Fulton County : \$6 million for staff and ballot postage Gwinnett County : \$4.2 million for technological support and PPE Macon-Bibb County : \$557,000
Hawaii	\$3.3 million	Not Specified	N/A
Idaho	\$3.4 million	Not Specified	N/A

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Illinois	\$13.9 million	Not Specified	Law County : \$885,475, about half of which was used to sanitize polling places (including misting the air prior to Election Day) through a contract with Purcell Facilities Management.
Indiana	\$8 million	Purchase "voter-verifiable paper audit trail voting equipment" and "voter-verifiable paper audit trail retrofit equipment"	N/A
Iowa	\$4.8 million	Not Specified	Woodbury County : \$155,000 to help provide PPE for poll workers
Kansas	\$4.6 million	Not Specified	Sedgwick County : \$800,000 for election purposes, including cleaning polling places, ballot drop box installation, and voting material in other languages Johnson County : \$856,000 , including \$130,000 for a mail Ballot Verifier System from Election Systems & Software
Kentucky	\$6.1 million	Not Specified	N/A
Louisiana	\$6.2 million	Not Specified	N/A
Maine	\$3.3 million	Not Specified	Bangor, Augusta, Union, Scarborough , and the Town of Brunswick all received grants. Bangor : \$272,000 for COVID-19-related supplies such as solo voting booths and sanitation Town of Brunswick : \$200,000 for supplies such as PPE, postage for absentee ballots, and a \$500 ballot drop box

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Maryland	\$7.4 million	Replace and upgrade voting equipment, election auditing, voting registration systems, cyber vulnerabilities and communication program categories	N/A
Massachusetts	\$8.3 million	Not Specified	N/A
Michigan	\$11.2 million	Not Specified	Various cities in Michigan received grants for administration costs including new ballot drop boxes, envelopes, postage, and a vote tabulator. Ann Arbor : \$417,000 Flint : \$475,625 Pontiac : \$405,564 Muskegon : \$433,580
Minnesota	\$6.9 million	Not Specified	N/A
Mississippi	\$4.7 million	Not Specified	Hinds County : \$1.5 million to buy PPE equipment, extra voting machines, and electronic poll books
Missouri	\$7.6 million	Not Specified	St. Louis County : \$2 million
Montana	\$3 million	Not Specified	Lewis and Clark County : \$215,000 for election worker PPE, ballot drop boxes, and a drive-through ballot drop-off site Cascade County: \$294,128 for running a secure election, including buying PPE and sanitizing polling locations Glacier County : \$263,830 for PPE and drive-through voting locations
Nebraska	\$3.7 million	Not Specified	N/A
Nevada	\$4.5 million	Execute top-down voter registration system	N/A
New Hampshire	\$3.3 million	Not Specified	N/A

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New Jersey	\$10.3 million	Not Specified	Burlington County : \$2.9 million to cover vote-by-mail costs, including new computers, scanners, printers, envelopes, and postage Atlantic County : received \$150,000 for administering a largely vote-by-mail election
New Mexico	\$3.9 million	Not Specified	Doña Ana County : \$206,000
New York	\$20.5 million	Not Specified	Onondaga County : \$280,000 to buy postage and a new van to transport items between polling places Cortland County : \$37,500 Cayuga County : \$37,500
North Carolina	\$10.9 million	Not Specified	N/A
North Dakota	\$3 million	Not Specified	N/A
Ohio	\$12.8 million	Not Specified	N/A
Oklahoma	\$5.5 million	Not Specified	N/A
Oregon	\$3.3 million	Assist in essential election systems availability, system security and capacity, and ballot tracking	N/A
Pennsylvania	\$14.2 million	Not Specified	Delaware County : \$2.2 million grant for administering a safe election, including hiring poll workers and providing ballot drop boxes
Rhode Island	\$3 million	Not Specified	N/A
South Carolina	\$6.3 million	Assist in securing the state election infrastructure and improving election administration	N/A
South Dakota	\$3 million	Not Specified	N/A
Tennessee	\$7.9 million	Not Specified	N/A

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Texas	\$24.4 million	Not Specified	Dallas County : \$15 million grant for additional ballot sorting equipment, more early voting locations, PPE, and sanitation for voting equipment. Harris County : \$9.6 million Hays County : \$298,000 Hopkins County : \$19,952
Utah	\$4. million	Provide "additional security measures for both the counties and the state [...], security training for both the counties and the state [...], and improved audit procedures."	N/A
Vermont	\$3 million	Not Specified	N/A
Virginia	\$9.5 million	Not Specified	N/A
Washington	\$8.3 million	Not Specified	N/A
West Virginia	\$3.8 million	Improve "cyber and physical security" and upgrade "voting equipment including e-pollbooks"	N/A
Wisconsin	\$7.3 million	Not Specified	Milwaukee, Madison, Green Bay, Racine and Kenosha counties : \$6.3 million altogether to pay for "ballot drop boxes with security cameras, high-speed tabulators, and more workers to count mail ballots, as well as masks, gloves, face shields, disinfectant and other supplies"
Wyoming	\$3 million	Not Specified	N/A

IV. Conclusion

Remarkably, supply chain interruptions and challenges were limited to relatively isolated incidents during the 2020 general election. The sudden spread of the coronavirus pandemic in early 2020 initially prompted deep concerns regarding election safety, accessibility, and administration, but election officials and other stakeholders worked diligently to resolve most pipeline issues before November. Printing errors and other issues surrounding ballot packages were largely resolved ahead of the election and resulted in minimal disruptions for voters. Equipment issues, while leading to isolated delays, were either fixed quickly or resolved through a fallback method such as hand-counting. And states and precincts were able to access additional public and private funding to improve outstanding challenges. Despite record turnout and an overwhelming shift towards mail ballots in many states, the supply chain effectively scaled up before the election to meet the unique demands of a pandemic election.