INTERNAL REVIEW REPORT
FOR THE
IOWA DEMOCRATIC PARTY

2020 IOWA CAUCUSES

November 10, 2020

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Introduction

A. Engagement

The Iowa Democratic Party ("IDP") engaged Bonnie Campbell of the Campbell Law Firm and Nick Klinefeldt of Faegre Drinker Biddle & Reath LLP to conduct an internal review of the 2020 Iowa Caucuses. They were joined by David Yoshimura of Faegre Drinker Biddle & Reath LLP. The purpose of the internal review was to identify and determine the cause of problems that occurred during the 2020 Iowa Caucuses.

B. Process

The internal review consisted of the collection and review of thousands of documents and dozens of interviews. We, the authors of this report, started with the review of some initial documents and the interviews of six IDP staff: Kevin Geiken (then-Executive Director); Melissa Watson (CFO); Blair Lawton (Party Affairs Director); Eva Mitchell (Data Director); Seth Cohen (then-Caucus to Convention Director); and Troy Price (then-Chair). We then collected and reviewed documents from the IDP, consisting of Democratic National Committee ("DNC") regulations and reports; IDP plans and reports; internal IDP communications, including emails, Slack messages, and text messages; the IDP's G Suite platform; documents regarding the reporting app developed by Shadow Inc. ("Shadow"); training documents; documents and data regarding the boiler room on caucus night; as well as various public documents. After reviewing these documents, we conducted interviews with numerous individuals, including: representatives from the Biden, Sanders, and Buttigieg campaigns; current and former consultants; Shadow; current and former IDP staffers; County and Precinct Chairs from urban and rural counties; and members of the IDP State Central Committee. We attempted to interview staff from the DNC, but the DNC refused to participate.[1] This report represents the findings and conclusions of the internal review.

Background

A. History of the Iowa Caucuses

Iowa has been conducting caucuses for a long time. The modern Iowa caucuses date back to 1972. After the protests and controversy surrounding the 1968 Democratic National Convention, the Democratic Party created a commission to address changes in the nominating process, including making the process more open. One of the results of the commission was that the state presidential nominating contests were spread out. Iowa's nominating process was one of the more complex—starting at precinct caucuses and then proceeding through county conventions to district conventions to the state convention—so Iowa wanted to get started early. In 1972, Iowa was the first presidential nominating contest. In 1976, the Republican Party of Iowa ("RPI") began holding their caucuses on the same day. This was also the year the Iowa Caucuses began receiving a lot of attention because then-presidential candidate Jimmy Carter won and used his victory to propel himself to the Democratic nomination.

[1] We worked with the IDP on the timing of this report. A part of that timing was attempting to interview staffers at the DNC. We worked with the IDP to start initial reach-out to the DNC starting in June. Eventually, that culminated in us reaching out directly to the DNC near the end of July. We then spoke with DNC counsel, who eventually confirmed on September 2 that the DNC was not going to allow us to speak with their staffers even with DNC counsel present. However, we believe we achieved sufficient perspective on these issues to accomplish the internal review.

The Iowa caucuses continued to receive national attention through the years. Recently, in 2008, then-Senator Barack Obama defeated fellow Senator Hillary Clinton and ultimately went on to win the Democratic nomination. In 2012, on the Republican side, Mitt Romney was declared the winner on caucus night over Rick Santorum with Ron Paul in a close third. However, two weeks later, Rick Santorum was declared the winner. But the race was ultimately determined to be a split decision due to missing results from some precincts. Then, several months later, Ron Paul overtook both of them in the final delegate count at the district and state conventions as a result of the delegates being unbound from the precinct caucus results. In 2016, the caucuses were closely contested in both parties. On the Democratic side, Hillary Clinton barely defeated Bernie Sanders. On the Republican side, Ted Cruz won with then-candidate Donald Trump in a close second.

The 2020 Iowa Caucuses took place on February 3, 2020. At that time, there were twelve Democratic candidates in the field. On February 6, the IDP declared Pete Buttigieg to be the winner by two state delegates over Bernie Sanders with Bernie Sanders winning the popular vote.

B. How the Iowa Democratic Caucuses Work

The Iowa Democratic caucuses have four major priorities: (1) conduct party business, including providing updates from state and county parties, introducing local candidates, and fundraising for state and local parties; (2) determine presidential preference groups as well as allocate and elect county convention delegates and alternates; (3) elect precinct leaders to county convention planning committees and county central committees; and (4) discuss and develop resolutions to recommend to the County Platform Committee.

All caucus participants must be registered to vote as Democrats in the caucus precinct; however, they can register when they show up to caucus that night. Others, including media and individuals who will not be 18 years of age by election day, are allowed to attend as observers.

After caucus participants check in and register, the temporary caucus chair calls the caucus to order, and there is a brief presentation from the IDP and the county party. The caucus then elects a permanent caucus chair and secretary—with the temporary caucus chair typically being elected as the permanent caucus chair. It is at this point that the caucus breaks up into preference groups and allocates delegates. That process is led by the caucus chair and breaks down as follows:

Determine Viability – The caucus chair counts the total number of participants as he or she hands out the Presidential Preference Cards (which are numbered). Based on the total number of participants, the caucus chair then calculates the viability threshold for preference groups based on the total number of participants and the number of delegates to be awarded from that precinct. Specifically, the caucus chair must divide the total number of participants by a number that is variable (depending on whether there are two delegates, three delegates, or four or more delegates to be awarded) and then round up. Precincts with only one delegate to award have separate rules.

1st Alignment – The caucus chair then announces the 1st alignment period for participants to break into preference groups based on Presidential candidate and elect a preference group chair. Caucus chairs are instructed to allow at least 15 minutes for small and medium caucuses and at least 30 minutes for large caucuses. The caucus chair counts and records the number of participants in each preference group and instructs them to fill out Side 1 of their Presidential Preference Cards. The caucus chair then instructs all viable groups to turn in their Presidential Preference Cards to their preference group chair.

2nd Alignment – For nonviable groups, there is then a period of realignment. Only participants in nonviable groups may realign. Those participants may realign into a currently viable group, combine with other nonviable group participants to make a nonviable group viable, or combine with other nonviable group participants to create a new viable group. Participants who were in viable groups after the 1st alignment may not realign. The caucus chair then counts and records those preference groups again and instructs the participants who realigned to fill out Side 2 of their Presidential Preference Cards. The caucus chair then instructs all of those participants to turn in their Presidential Preference Cards to their preference group chair. The caucus secretary then collects all of the Presidential Preference Cards and places them in a sealed envelope.

Award Delegates – At this point, the caucus chair calculates the number of delegates each preference group is awarded. In general, this is done by multiplying the number of participants in a viable preference group by the total number of delegates to be elected and then dividing that result by the total number of caucus participants. (The result is rounded up at 0.5 and above and rounded down at less than 0.5.) If the calculation works out such that the total number of delegates awarded is less than the number of delegates that are supposed to be elected in that precinct, an additional delegate is awarded to the group with the highest decimal below 0.5. If the delegate calculation works out so that the total number of delegates awarded is more than the number to be elected, a delegate will be subtracted from the preference group with the lowest decimal above 0.5; however, this subtraction cannot cause a viable group to lose its only delegate. In either case, where two or more preference groups are tied to gain or lose a delegate, a coin toss determines which group gains or loses the delegate.

Final Reporting – Finally, the caucus chair reports the delegate results to the IDP.

Following the final reporting, caucus participants, having been counted toward their preference for President, are free to leave. Those participants who choose to stay conduct the following business: election of delegates and alternates to the county convention; election of county convention committee representatives; ratification of the slate of delegates and alternates; election of precinct committee members; discussion and adoption of resolutions for submission to the county platform; and any new business. The caucus then adjourns.

Findings of Fact

A. The IDP Delegate Selection Plan

1. Unity Reform Commission Report

At the 2016 Democratic National Convention, the DNC created the Unity Reform Commission ("Commission") to study and address concerns that arose during the 2016 presidential nominating process and to ensure the nominating process is accessible, transparent, and inclusive. The Commission was comprised of twenty-one members: a chair and a vice-chair; nine members appointed by Secretary Hillary Clinton; seven members appointed by Senator Bernie Sanders; and three members appointed by the National Chair of the DNC.

The DNC adopted the Commission's report at its meeting held on December 8–9, 2017. The Commission reviewed four areas of concern. One of those four areas was making "the caucus process less burdensome and more inclusive, transparent, and accessible to participants." In its report, the Commission expressed a preference for primaries over caucuses: "The Democratic National Committee and the Party at all levels shall use all means, including

encouraging legislation and changing Party rules, to expand the use of primaries, wherever possible." With respect to the continued use of caucuses, the Commission set forth new requirements for state delegate selection plans, including: (1) the availability of absentee voting; (2) the state party's demonstration of financial and technical ability to run a caucus; (3) the public reporting of vote counts based on the first expression of preference; and (4) a requirement that votes be cast in writing for purposes of any recount or recanvass. Lastly, the Commission recommended that the DNC explore technology resources to support the states in the tracking and reporting of results.

2. DNC Delegate Selection Rules

On August 25, 2018, the DNC adopted its Delegate Selection Rules for the 2020 Democratic National Convention. The DNC Delegate Selection Rules set forth the requirements state parties must meet when submitting their delegate selection plans to the DNC for approval. In particular, the Delegate Selection Rules required: (1) demonstration by the state party that it has the financial and technical ability to successfully run the process; (2) public reporting of results for each candidate based on the first expression; (3) preservation of the final expression for recount/recanvass purposes; and (4) the opportunity for "non-present participation" in a caucus, akin to absentee voting in a primary. The Delegate Selection Rules also stated a preference for state-run primaries. The DNC required states to submit their Delegate Selection Plans by May 3, 2019.

3. The IDP Delegate Selection Plan

On April 6, 2019, the IDP submitted its Delegate Selection Plan to the DNC for caucuses to be held on February 3, 2020. The IDP Delegate Selection Plan proposed that the IDP would fulfill the requirements of reporting the first expression and preserving the final expression by recording those preferences on physical Presidential Preference Cards. To fulfill the non-present participation requirement, the IDP proposed holding six sessions of virtual caucuses. The virtual caucuses would be moderated live by the IDP, and sessions would be held throughout the five dates leading up to February 3rd for those who could not be available to participate in the caucuses on February 3rd. Another virtual caucus session would be held on February 3rd for those who could not make it to their caucus site that evening. The IDP would allow virtual caucus participants to connect via teleconference, online, or other secure method and rank up to five candidates. The IDP would then do the math to allocate delegates from the virtual caucuses and include the results with the regular caucus results.

At a DNC meeting on June 28, 2019, the DNC expressed concerns regarding the virtual caucuses and provided only conditional approval of the IDP Delegate Selection Plan. Apparently, the DNC did not believe or was not confident that the IDP could conduct virtual causes in a secure manner. On July 22, 2019, the IDP submitted a revised Delegate Selection Plan. The revised Delegate Selection Plan did not reflect any significant changes, and the proposal for virtual caucuses remained generally the same. Eventually, at the DNC's meeting held August 22–24, 2019, the DNC rejected the IDP's proposal for virtual caucuses.

On September 19, 2019, the IDP submitted a second revised Delegate Selection Plan replacing virtual caucuses with satellite caucuses. The satellite caucuses would be available by application at sites where Democrats who could participate in a satellite caucus—but might not otherwise be able to participate at their precinct caucus—may convene. Satellite caucuses would be held on the same day and at the same time as the precinct caucuses unless the proposed satellite caucus site could demonstrate the need to convene at a different time on the date of the precinct caucuses. Satellite caucuses could also take place outside of Iowa. This second revised version of the Delegate Selection Plan was approved by the DNC on September 20, 2019.

B. The Shadow Reporting App

1. Procurement of the App

The IDP's proposal for the virtual caucuses was only one of several technology-related projects it intended to undertake in connection with the caucuses. The IDP also intended to develop an online tool for caucusgoers to register early. And most importantly, the IDP planned to develop a mobile smartphone app (a "reporting app"), which the precinct chairs could use to automatically calculate the awarded delegates and submit their caucus results to the IDP. The IDP had used a similar reporting app for the 2016 caucuses, which was developed by Microsoft. For the 2020 caucuses, however, Microsoft declined to take on the development role again. Therefore, the IDP had to identify another third-party vendor and solicit development of a new reporting app.

As the IDP searched for the right vendor for the task, the Nevada State Democratic Party ("NSDP"), with whom the IDP had a positive and cooperative relationship, recommended a young political tech company called Shadow Inc. ("Shadow"). The NSDP had already engaged Shadow to develop a reporting app for the 2020 Nevada caucuses, so the IDP believed that Shadow would be a good fit. On June 20, 2019, the IDP contacted Shadow and submitted a request for proposal ("RFP") setting out the scope of the development project. On June 24, 2019, Shadow responded with a written proposal, which recommended a five-month development period to begin in July and to be completed in November. This proposal would have left two full months (December and January) for users' testing, training, and installation of the app.

At the June 28, 2019 DNC meeting, four days after Shadow submitted its proposal, the DNC expressed reservations about the IDP's digital security. The IDP became concerned that any contracts with technology vendors could be vetoed by the DNC—after the IDP had already spent operating capital on the contract. The IDP decided, therefore, to freeze technology vendor solicitation and contracting until it resolved the security issues with the DNC. The proposal from Shadow to begin development of the reporting app was put on hold as a result.

After the virtual caucuses were ultimately rejected by the DNC, the IDP formally requested permission from the DNC on September 5, 2019, to contract with Shadow for the development of the reporting app. The DNC did not approve the request right away. The DNC met with Shadow directly and also required Shadow to submit lengthy written responses to very detailed questions about Shadow's intended development and security parameters. This vetting process took approximately one month. By early October, the DNC was willing to approve the IDP's request to contract with Shadow.

On October 14, 2019, the IDP and Shadow signed a contract, called the "Master Services Agreement," which set out the terms under which Shadow would develop the reporting app for the IDP. At this time, there were only three and a half months remaining before the 2020 caucuses, considerably less than the seven months for development and roll-out initially contemplated in the June 28, 2019 proposal. The IDP attributed the significant delay to the lengthy virtual caucuses negotiations and the additional time needed for the DNC to approve Shadow as a vendor. Despite the late start, Shadow reported it was confident it could complete development on time because it had already been working on the Nevada reporting app—which was substantially similar to the IDP reporting app—for several months.

2. Development of the App

The IDP and Shadow immediately began to focus on development of the app. The IDP had limited resources—both in time and personnel—to work directly with Shadow on the app. The IDP had only one employee focused on technology: Eva Mitchell, its Data Director. To assist Mitchell with the IDP's technology needs in the lead-up to the caucuses, the IDP hired a consultant as "Senior Advisor for Technology," Robin Ahnen-Cacciatore, whose salary was paid by the DNC.

Mitchell, Ahnen-Cacciatore, and Seth Cohen held regular meetings with Shadow to discuss the status of the app development, to review "wireframes" of the app (prototypes of the user interface), and to discuss anticipated end-user needs. At the DNC's direction, Shadow participated in multiple election security exercises and penetration testing exercises hosted by two different third-party groups: NCC Group and Harvard's Defending Digital Democracy Project (D3P). The IDP and Shadow ran three "dry runs" to test the app internally in December. The DNC regularly interjected itself into Shadow's development process and required Shadow to provide assurances as to certain security concerns or perform additional security exercises. Shadow believed these interjections were unnecessary, unhelpful, time-consuming, and the cause of further development delays.

The IDP intended to release the app to end users (*i.e.*, the temporary caucus chairs) for installation and testing in December 2019. But the app ultimately was not ready and would not be rolled out until mid-January 2020. One of the reasons for the delays was that Shadow had difficulty getting the attention it needed from IDP personnel to direct the development. Because the app development did not start in earnest until late 2019, development significantly overlapped with other time- and labor-intensive tasks in which IDP personnel were involved leading up to the caucuses. The IDP was stretched thin during these last few months; the IDP's only two in-house technology personnel were busy with multiple projects related to the upcoming caucuses.

At the same time, there were delays in the app development process over which the IDP had no direct control. For example, the app was developed for Apple's iOS first, but an Android version of the app was also planned. Shadow expected the Android version to be completed quickly because the app's code could be repackaged wholesale to operate on Android devices. However, Shadow and the IDP did not create the Android version until very late in the development process. The first usable version of the Android app was not completed by Shadow until the day before the app's launch. Nevertheless, Shadow's position was that they would have been working on improving the app up until the day of the caucuses under any circumstances and that the date for the app's launch was ultimately the IDP's decision.

After these lengthy delays, the reporting app—both iOS and Android versions—was first launched and rolled out to end users on January 18, 2020, just two weeks before the 2020 caucuses.

3. Caucus Training and Troubled App Rollout

By all accounts, the IDP executed an excellent training program for the 2020 caucuses for all volunteers and temporary chairs. The IDP provided over 180 in-person and remote virtual trainings, multiple information sessions, and around 30 mock caucuses throughout the state, held in both rural and urban settings. The module-based training sessions were for the most part universally praised by those who attended, including the temporary/precinct chairs,

volunteers, and campaign staffers. The training modules thoroughly explained all procedural facets of running a caucus of any size.

The problem was that the training modules and sessions began in late 2019. Because the reporting app was still incomplete and deep in the development phase, the IDP personnel in charge of creating the training materials and hosting the training sessions could not include any training on the use of the app. Instead, the temporary chairs who attended the training sessions were told that more information on the reporting app was "coming soon." Trainees and temporary chairs voiced their concerns to the IDP that the lack of information about the app and the delays in rolling it out could make it impossible to learn how to use the app and get comfortable with its interface prior to the caucuses. Notably, if the IDP had begun development in June and completed development by November as Shadow initially suggested, it would have been able to include training on the reporting app during the many general training sessions in late 2019.

The app finally launched on January 18, 2020. On that date, users received information about the app for the first time via email. For their first exposure to the app, they were met with a convoluted installation and login process set out in a 34-page "user manual." Following an analysis of that 34-page user manual, we understand that the installation and login process involved at minimum the following steps:

1) Request App: Users had to fill out an online request form, providing information to IDP and Shadow, including their phone number, email address, and device type (*i.e.*, Apple or Android).
2) Onboarding: IDP and Shadow used the submitted information to "onboard" the user on the back end, which meant creating a profile for each user that is unique to them along with their own individual test PIN.
3) Installation Email: Onboarded users would then receive an IDP-branded email with directions to install the app.
    a) If the user was on an Apple device, they were required to use Apple's App Store to install TestFlight. TestFlight is an app that software developers can use to allow users to download and install beta versions of apps for testing purposes. Shadow used TestFlight as a way to ensure that the only users who could install the app were users that had been manually onboarded by them. As a result, users had to install TestFlight and then use TestFlight to install the Shadow app on their devices.
    b) If the user was on an Android device, they had to manually install the application using TestFairy, a similar testing platform to TestFlight. Installation usually required the user to disable the default security settings on their Android device because by default, Android devices do not allow installation of apps from "unknown sources," *i.e.* Shadow.
4) Password Email: Separately from the app installation email, onboarded users would receive an IDP-branded email from Auth0, a service that controlled the two-factor login process for the app. Users had to follow a link in the email to the Auth0 platform to set up their password for the first time. Until they had done this, they could not use the app even if they had already installed it.
5) First Login: The user would then log into the app by the following steps:
    a) Launch the app
    b) Enter their Auth0 username and password
    c) Set up 2-factor authentication (2FA) by providing their mobile phone number
    d) Verify their login and password with a 6-digit 2FA code sent to their mobile number by text message
    e) Enter a precinct ID

f) Enter a precinct PIN (or a test PIN if logging in prior to the actual caucus night)

The IDP and Shadow began onboarding users on January 18, 2020, when the app launched. The IDP provided users with "test PINs" that would allow them to log in to the app and explore the user interface without actually submitting any reporting information. The true "precinct PINs" that would be used to submit results would not be given to users until the day of the caucus.

The app was immediately met with very mixed reactions from users. Particularly for those temporary chairs with less experience with or interest in technology and secure login systems, the installation was a cumbersome and sometimes inscrutable process. Even for the more tech-savvy users, the process was not always smooth. The few users who successfully gained access to the app for testing purposes on January 18 immediately found app-breaking bugs, which were reported back to Shadow. Shadow rolled out quick "hot-fixes" based on this feedback. There were issues *outside* of the app as well. One of the early users noted that the onboarding email included "reply-to" metadata to deliver replies to "feedback@shadowinc.io." This was notable because the IDP had intentionally kept the identity of the developer a secret, so when this user saw the domain name "shadowinc.io" in the reply-to field, it made the app and the onboarding email appear "suspicious" to him, like a phishing scam.

Over the next two weeks, throughout the ongoing onboarding process, many temporary chairs were complaining amongst themselves about the app installation process and the app's functionality. A group of temporary chairs in Polk County created a private Facebook group, which they used as a community message board to discuss their caucus preparations. One member of the group posted an informal internal poll on January 30, asking its members about their experiences with onboarding and installing the app. Out of 39 respondents, only 10 said they had successfully been able to set up the app. Among those who successfully installed the app, they reported it was "awesome" and encouraged other temporary chairs to install the app and explore its interface. But the group also shared many complaints about the app and installation process. We found that these same complaints were expressed by temporary chairs from all corners of the state.

On balance, the temporary chairs throughout the state with complaints and concerns outnumbered those who had positive experiences with the installation process. The most common complaints included:

- Emails with installation instructions were being automatically routed to spam or junk mailboxes;
- Installation and registration were "confusing" and "a pain";
- Some chairs who filled out the online request form for the app never received the installation email;
- Users could not find their precinct ID or PIN;
- Users were confused about the difference between their "test PIN" and their "real PIN"—they received an "Incorrect PIN" error when putting the PIN into the app if they tried to use the real PIN instead of the test PIN (or vice versa);
- Users who emailed IDP's app support email address would frequently receive no response; and
- The IDP was informing users that it would not grant "day-of access to the app for reporting," so if chairs were not onboarded and installed by February 3, they could not use the app.

In the last few days before the caucuses, some temporary chairs began to indicate that they had "given up on trying to get the reporting app" and that they would instead "be calling in [their] caucus results" by telephone. Temporary chairs from around the state were told that it was not a problem if they could not use the app or if they chose not to use the app—it was acceptable to call the results in to the IDP's hotline the night of the caucuses.

4. DNC's Late Demand for Access to Raw Reporting Data

In mid to late January, the last few weeks leading up to the caucuses, the DNC decided that it would require Shadow to provide it with real-time access to the raw results reporting data in the DNC's own systems on the night of the caucus. The reason the DNC wanted independent and real-time access to the raw data so late in the process was that it had become concerned that Shadow's app was inaccurately calculating caucus results based on first and second expression inputs. The DNC determined that it wanted to double-check all caucus math for quality control purposes before any results were released because of the extremely high-profile nature of the event.

The DNC required that Shadow build a "database conversion tool" to convert the reporting data into a different format that the DNC's own system could interpret. The database conversion tool was necessary because the Shadow reporting app and the DNC used incompatible database formats in their respective systems' back-ends. Shadow used Firestore (No-SQL) and the DNC used BigQuery (SQL). The DNC's demand for real-time data required Shadow to create a script or software tool in a matter of a few days that would convert the app's Firestore data into usable data for the DNC's BigQuery system on a rolling basis. This tool was not necessary for the reporting app to function or for the reporting app to work with any of the IDP's systems. The tool was needed exclusively for the DNC's use to quality-check the incoming results in real time. The IDP was planning to have staff check the results prior to releasing them. The DNC's quality-check was an extra step that was not part of the IDP's plan for caucus night.

The DNC sent its own technology personnel to Des Moines on January 31, 2020. On February 1 and 2, the DNC technology personnel and DNC software engineers (working remotely) were troubleshooting the conversion tool with Shadow. The tool was buggy, and there were many errors in converting the data from one format to the other. But after several days of corrective work, the DNC and Shadow believed they had the tool in working order in the hours leading up to the start of the caucuses on February 3, 2020.

5. App Usage on Caucus Night

On the night of the caucuses, multiple problems with the app occurred.

First, a majority of the precincts did not even attempt to use the app. This was certainly related to the fact that users had an inadequate amount of time and training before the caucuses to get comfortable using the app and to become familiar with the user interface.

In the final tally, the IDP reported results from 1,765 total precincts. Only 624 users logged into the app on the night of the caucuses. And only 439 precincts' results were submitted through the Shadow platform.

These low usage figures should not be surprising in light of the very late app rollout and resultant lack of training on the app. By way of comparison, the reporting app used for the 2016

caucuses was developed by Microsoft. It performed roughly the same functions as the Shadow app in 2020. In 2016, Microsoft rolled out the app in September or October. This gave the IDP months of lead time to train users on the app functions and to let users get comfortable with the interface. Microsoft representatives attended caucus training sessions throughout the fall/winter of 2015 and gave direct, in-person support to the app users. Anecdotally, witnesses recalled that even with that much lead time and proactive training, only about 50% of the precincts in 2016 used the app. It is unsurprising, then, that in 2020, *less than 30%* of precincts used the app—because users received no app training whatsoever and had only two weeks (or less, depending on individual circumstances) to register for and install the app.

Furthermore, the IDP—both in 2016 and 2020—did not take a firm stance with precinct chairs that use of the app was mandatory. In fact, temporary chairs and precinct chairs were encouraged to simply call their results into the IDP's telephone reporting line if they didn't want to deal with the hassle of requesting and installing the app. Witnesses contrasted the IDP's tendency to characterize the app as optional against the RPI's 2016 caucuses. Iowa Republicans presented the use of their reporting app as mandatory, and their usage rate of the Microsoft app was anecdotally reported to be between 80%–90%.

In addition to the generally low log-in numbers on 2020 caucus night, roughly 180 of the users who *were* able to log in nevertheless did not submit results with the app. This is consistent with many precinct chairs' experiences that night. Users reported abandoning attempts to submit their results mid-process due to problems with the user interface. Some reported they could not backtrack in the reporting process to correct simple input errors. For some, the app froze and crashed completely while trying to input results. One user reported the app returned an error that refused to allow him to submit results because a particular candidate was not viable at his precinct.

Second, even for the 439 precincts that successfully submitted their results through the app, an issue arose with the DNC's Firestore-to-BigQuery conversion tool that caused the DNC to believe there was a discrepancy in the reporting app's recorded data or its delegate calculations. This issue was the source of the widely reported "irregularities" in the caucus data. In other words, the "irregularities" were not actually within the reporting app data itself or in the caucus results; rather, the "irregularities" came from the DNC's late-created conversion tool. The IDP would later inform the press that the "underlying data" collected from the app on the night of the caucuses was unaffected; this was true. The raw data collected from the app in the Firestore database *accurately* reflected the reported results and the app's delegate calculations. The affected—or "irregular"—data was related to the data converted for the DNC's use. When the DNC observed these irregularities in their BigQuery data, they put a stop to any reporting of results until the discrepancy could be explained. Shadow and the DNC's engineers were able to identify and correct the issue late that night. After the conversion issue was corrected, it was clear that the underlying data collected in the app was sound and accurate.

As a result of these various overlapping complications with the app on the night of the caucuses, however, the IDP's boiler room was overrun trying to keep up with the deteriorating situation.

C. Boiler Room

1. The Plan

The IDP set up its headquarters for the caucuses at the Iowa Events Center. There were four rooms: a “boiler room”; a “strategy room”; an IDP green room; and a DNC green room. The green rooms provided a separate space for party leadership to work or meet with people. In addition, there was a separate room provided by the IDP for the campaigns’ representatives, which was supposed to provide a place for the IDP to interact and communicate directly with the campaigns.

The strategy room consisted of essentially three areas: one quarter of the room was the communications area; one quarter of it was the data area; and the remaining half was a general working area. The data area consisted of staff from the IDP, the DNC, and Shadow. Specifically, the staff there included: Eva Mitchell, IDP Data Director; Gerard Niemera, Shadow CEO; James Hickey, Shadow COO; Nellwyn Thomas, DNC Chief Technology Officer; Kat Atwater, DNC Deputy Chief Technology Officer; Catherine Tarsney, DNC Analytics Director; and Lawrence Gohar, DNC Director of Information Technology. The communications area consisted of staffers monitoring internet activity as a check on any dissemination of false information. The staff in the general working area included Seth Cohen, IDP Caucus-to-Convention Director; Kevin Geiken, IDP Executive Director; and Robin Ahnen-Cacciatore, the IDP’s technology consultant funded by the DNC. IDP Chair Troy Price was in the IDP green room, though he and others circulated among the various rooms. Several DNC personnel—from its political team, party affairs, communications, and digital/misinformation tracking team—were also present that night.

The boiler room was set up to handle inquiries and results reporting from around the state. The room had two doors, one of which was locked so that there was only one point of entry and exit. Right next to the open door was a long table where the Political Affairs Director and his four direct reports sat as well as another labor staffer and the staffers responsible for accessibility and satellite caucuses. There was a table for one staffer from Shadow. And there was a table for Melissa Watson, the IDP’s Chief Financial Officer (CFO), who was the person put in charge of the boiler room. Though she was the CFO, Watson was also a veteran staffer who was well-regarded with a good reputation for leadership. Finally, in the middle of the boiler room were tables filled with volunteers staffing the phones. These volunteers were to field the incoming phone calls regarding questions, problems, and the reporting of results where the precinct chair did not use the app. Whenever they could not address a question or problem, the volunteers would transfer the call to one of the IDP staffers.

Each boiler room volunteer had in front of him or her a VOIP telephone, a landline telephone, and a Google Chromebook provided by the IDP. The boiler room had back-up landlines in case there was a problem with the VOIP phone system. The Chromebooks were supposed to be used to not only look up information, but also input caucus results.

2. Inability to Input Results into Shadow Webtool

One of the problems the IDP faced in the boiler room was that IDP volunteers were unable to log into a web portal provided by Shadow to input caucus results for caucus chairs who did not use the app. Shadow had created a tool as part of its app development that would allow boiler room volunteers to input caucus results directly into an administrator panel of the reporting app through a web-based form. This web portal would give boiler room volunteers write-only access to the relevant part of the results database to permit them to enter caucus

results in real time whenever a precinct chair called results into the boiler room by phone. But there were a couple of problems that prevented volunteers from being able to use this tool.

First, the IDP did not train or prepare for the use of the Shadow webtool. Shadow had provided this tool to the IDP approximately three weeks prior to the caucuses. Shadow also created a lengthy user manual for the tool at that time with the expectation that the IDP would provide copies of the manual to the boiler room volunteers and train the volunteers on how to use the tool. While the IDP conducted a training for boiler room volunteers the afternoon before the caucuses, it did not include the webtool as part of that training. The volunteers were seeing the tool for the first time when they arrived at the boiler room on caucus night. There may not have been much training necessary because the tool was designed to be very simple and straightforward. But Shadow's personnel noted that some of the volunteers were unhappy to discovery on caucus night that they were expected to learn how to use this technology tool on the fly. Some volunteers suggested that they had not even been informed that this would be part of their duties in the boiler room.

Second, most volunteers were ultimately not able to access the tool at all for several reasons. As an initial matter, logging into the tool required each user to have their own user profile, just like each temporary chair had to have their own user profile through the onboarding process. But the IDP had failed to onboard the boiler room volunteers, so none of them had user profiles to be able to log in.

In addition, while the IDP provided Chromebooks to the volunteers to access the tool, it also instructed the volunteers not to bring their personal cell phones into the boiler room due to security concerns. Therefore, even if Shadow had onboarded the boiler room volunteers on the day of the caucuses, those users could not use the mandatory two-factor authentication (2FA) system, which, as discussed above, was a security measure to confirm the user's identity by requiring the user to enter a confirmation code sent to the user's personal cell phone by text message. Because the boiler room volunteers did not have their cell phones, they were unable to receive the 2FA text message or log into the reporting tool on their Chromebooks.

Also, as a security measure, the Chromebooks automatically logged out of the tool periodically, requiring the user to log in again to confirm their identity. When Shadow's on-site support staff realized that the volunteers had not been onboarded and did not have their phones for 2FA, they began to manually log in each Chromebook using Google Authenticator instead of text messages to satisfy the 2FA requirement. But when the tool automatically logged out, the volunteers had no way to log back in. Notably, if the IDP had trained the volunteers on the webtool during the training session, it likely would have uncovered these various access problems in advance.

The fallback system—to have boiler room volunteers write down on paper the results that were called in and to then have those results manually entered by someone else—also failed. Boiler room volunteers were able to submit a handful of call-in results through the boiler room reporting tool, but as the night went on, the volunteers gave up on trying to use the tool. Since the volunteers were largely unable to access and use the reporting tool, they were forced to record results using pen and paper. This was separate from the standard "yellow sheet" forms they were given to record the contents of their incoming calls. The volunteers still were able to confirm the identity of any caller trying to report results by requiring the precinct captains to provide their individual PIN or security code. This ensured any incoming results were from the actual precinct chair. However, there seemed to be a miscommunication or lack of foresight regarding for the potential failure of the Shadow webtool to be able to input results. Watson

would collect the pen-and-paper results from volunteers, walk them into the strategy room, and leave them there in a drop box for incoming results; however, there was confusion about who received the paper reports or how those results would then be entered into the results database and reported.

In sum, there was a lack of buy-in on having boiler room volunteers use the Shadow webtool to input caucus results directly into the system. This resulted in a disjointed process whereby the planned technology tools were not used, and the fallback—a more traditional way of reporting results (*i.e.*, pen and paper)—was not planned for but was ultimately used anyway.

3. Failure to Handle Call Volume

There were not enough volunteers and phone lines to handle the number of incoming calls on the night of the caucuses.

Though there were 50 total VOIP phone lines set up in the boiler room, there were only 48 available lines for volunteers and staff to use because 2 of the 50 lines were required for purposes of setting up the system. Of those 48 usable lines, only 40 lines were staffed by volunteers taking incoming calls. The other 8 lines went to the IDP staff in the boiler room who would accept transferred calls from the volunteers when the volunteers could not resolve an issue themselves. Specifically, those 8 lines went to four field staffers, a labor staffer, an accessibility staffer, a satellite caucuses staffer, and a Shadow representative.

There were three phone numbers that the IDP planned to have ring through into the boiler room: (1) the main IDP office telephone number, which was forwarded into the boiler room system that day; (2) the caucus hotline that was posted on the IDP website; and (3) the number provided to precinct chairs for questions, problems, and results reporting. The calls that came into the boiler room were not differentiated, grouped, or separated in any way to reflect which of the three phone numbers the caller had dialed. Rather, each call would route to the longest inactive line or, if all lines were full, the next available line. When the lines were completely full, the caller would be placed on hold.

The IDP first gained access to the Iowa Events Center to set up its caucus headquarters on January 31, 2020, the Friday before the caucuses. The phone systems vendor the IDP used was called “Communication Innovators” (“CI”). It appears that the IDP used CI for other internal phone services throughout the year as well. When the IDP gained access to the Iowa Events Center on January 31, they asked CI to come to the boiler room location and begin setting up the phone system. The setup and modifications of the phone system were done on site and managed in person. A representative from CI was going to be on site during the caucuses to provide assistance and make adjustments to the phone system as necessary, including to make sure there were enough “pads” to ensure callers were able to remain on hold until a line opened up.

The IDP tested the phone system to ensure that calls to the three numbers would successfully patch through to the boiler room, but it did not do anything like a stress test to ensure that the system could handle a high volume of simultaneous calls. However, it appears the phone system was set up “correctly” and could have handled the call volume properly if there were enough volunteers and available lines.

The boiler room started taking calls first thing in the morning on Monday. Though the call volume was higher than expected, the boiler room phone systems were functioning as intended

in the early parts of the day. However, in the evening, as the caucuses were beginning and as precinct chairs began calling in their results, the phone system became overloaded with a high volume of calls. As planned, CI had a representative on site on caucus night, and he was adjusting and revising the system on the fly during the night of the caucuses to try to improve call handling and to ensure that all calls would be accepted and put on hold until a volunteer was able to answer the next call. However, the 40 VOIP phone stations were unequipped to deal with the very high volume of calls that began to come in on caucus night.

The Shadow reporting app was intended to be the primary method by which precinct chairs would report their results. Reporting caucus results by telephone call to the boiler room's phone bank was intended to be the "back-up" plan. As the back-up system, the boiler room's phone bank should have been staffed to handle 100% of capacity of the primary system in the event the reporting app failed completely. Further, the IDP was aware of the problems with the app leading up to caucus night. As of the Friday before the caucuses, the IDP knew there were only approximately 400 temporary precinct chairs who had successfully downloaded and accessed the app. The IDP should have taken aggressive steps to scale up its telephone back-up reporting system at that time.

Ultimately, there were a total of 5,816 incoming calls to the boiler room on February 3. Of those, 2,097 calls were neither answered nor picked up by the system before the caller hung up. And 2,593 incoming calls were abandoned (*i.e.*, the caller gave up on getting through and hung up the phone while they were on hold). This suggests that 1,126 calls were actually patched through to the boiler room and answered by staff or a volunteer.

4. Reasons for Problems with High Call Volume

There were several reasons that the IDP experienced problems with a high volume of calls on caucus night.

a. Published Phone Numbers

The main reason for the high call volume appears to have been that there were three numbers coming into the boiler room that night, and two of them were published to the general public. The IDP issued two separate phone numbers for the day and night of the caucuses. The first was the "caucus hotline": 800-325-8602. It was presented as a hotline that was available to anyone, including members of the public, with any question about the caucuses. The hotline was intended to be used only before the caucuses began. The second was the "precinct chairs" line: 515-974-1708. This number was listed on the cover sheet of the caucus materials for each precinct location. It was presented as the number for chairs to submit the results of the caucuses by phone as needed. It was intended to be used only after the caucuses began. In addition, the main IDP office telephone number, which was publicly available on the IDP's website, was forwarded to the boiler room for the day of the caucuses. The caucus hotline number and the IDP office number were publicly available.

b. No Segregation of Incoming Calls

Relatedly, another problem was that the incoming calls from the three numbers were not segregated or grouped in any way. Within the boiler room, there was in fact no distinction between these numbers, and they were all forwarded to and answered by the general boiler room phone bank. In other words, dialing any one of these three numbers was exactly the same as dialing any of the others. All three numbers forwarded the caller to the general boiler room

queue no matter which number was dialed or when the number was dialed. This meant the boiler room was unable to prioritize precinct chairs calling in results.

Starting at around 9:00 p.m., the IDP started to direct half of the volunteers to make outgoing calls to precinct chairs asking for results reports. While to some extent this focused volunteers' efforts on getting results from precinct chairs in the way segregated lines would have accomplished, there was a lack of coordination that made it ineffective. The results that were recorded on paper were not being updated and entered into the Shadow app and database, so the boiler room did not know exactly which precinct chairs had not yet reported results. This no doubt resulted in multiple calls to individual precinct chairs, some of whom may have already reported their results. This also resulted in a significant decrease in the number of lines available to take incoming calls.

c. Disruptive Calls & Delay in Reporting Results

There were reports of people calling into the boiler room just to disrupt the process. Specifically, there were reports of posts through message boards and social media channels directing users to call in with prank calls to intentionally interfere with the IDP's ability to receive results reports over the phone. Some media outlets specifically reported on a 4chan thread encouraging other users to "clog the lines." But that thread saw relatively low levels of engagement, and it is unlikely to have produced a significant volume of disruptive calls. Also, the 4chan thread simply identified the "caucus hotline" phone number that was already publicly available on the IDP's website.

There is no clear indication of how many calls were made to the boiler room with the intention of disrupting or interfering with the process, but there is not sufficient evidence to suggest that this was a significant problem. One could speculate that receiving almost 6,000 calls with only roughly 1,700 precincts (and about 400 of those using the app) may indicate that there was a significant number of extra calls; however, there appear to have been many other calls that day and night that were not intended to be disruptive as well as some issues with callers dialing in, hanging up, and then calling again after not getting through to anyone in the boiler room the first time. The boiler room also received typical calls from people wanting information about the results and other innocuous calls. In addition, the boiler room received many calls about issues with trying to use the app. In any event, having publicly posted a phone number to the boiler room itself, the IDP should have probably expected a much higher volume of calls than it had actually prepared for.

d. Inability to Scale Up

Lastly, the IDP's boiler room did not have the ability to scale up when it received the unexpected high call volume, as it would have had with a professional call center. There were only a finite number of lines available in the boiler room, so it did not matter how many volunteers the IDP could have recruited at the last minute. While at some point the next day, the DNC took over and started tracking the missing results and calling precinct chairs, that effort was too little and too late.

In contrast, the boiler room setup for the 2016 caucuses was quite different. In 2016, the IDP's back-up plan to the Microsoft reporting app had two components: a hotline for calls regarding various questions and problems; and an IVR (Interactive Voice Response) call line that used an automated calling system for reporting caucus results. Part of the point of the IVR line was to take humans (and human error) out of the call-in reporting process. Reports indicate

that this system worked well. One additional advantage of having an automated or professional phone service act as the back-up reporting system would have been the ability to scale the system up as necessary. The 2020 system prevented the IDP from being able to scale up when the boiler room started receiving an unexpectedly high volume of calls. The IDP was locked at a maximum number of 48 lines for incoming calls. It also prevented the IDP from being able to focus on precinct chairs calling in to report results.

Apparently, the IDP had looked into a paid hotline system at an earlier stage in its caucus preparations, but it never identified a vendor for such a system. The IDP also looked at having more phone lines, but it reported that there was a significant price break in getting additional lines. Ultimately, the IDP reported that the number of lines and volunteers it chose was based on past experience, which suggested to the IDP that the 48 VOIP lines should have been sufficient.

D. Communications with Campaigns, Press & Public

Communications with the campaigns, press, and public were generally good with two major exceptions. First, the IDP appeared to *not* have been good about communicating out regarding the reporting app. Neither the campaigns nor the press seemed to have been given much information about the app leading up to the caucuses. The press also criticized the IDP for a lack of transparency about the app.

Second, there was the delay in reporting results and a lack of explanation as to the reasons for the delay. On caucus night, there was a room that the IDP had set up at the Iowa Events Center for campaigns. There was no set plan to provide the campaigns with results separately from the public, but this appeared to be a good attempt at providing an open communications line with the campaigns on caucus night. However, as the IDP started experiencing problems that night, it did not provide much in the way of information to those campaign representatives. Relatedly, the media clearly had expectations of results coming in early, and the IDP failed to manage those expectations. This resulted in much public criticism by the media during the period of time that the IDP had appeared to allot for the reporting of results.

The chronology of communications from the IDP was as follows: On caucus night, no results were reported. The IDP's plan for reporting results to the public was that the IDP Caucus Director would review results in the Shadow administrator panel as they were coming in, spot check the reported results to ensure they were credible and accurate, and then approve the results to be released immediately. At first, the Caucus Director was reviewing the incoming results with the intent to approve and release the results publicly. But the DNC began to see discrepancies between the IDP's results reporting and the data the DNC was receiving from its database conversion tool. The DNC then required the IDP to shelve its intended results announcement processes, so the IDP was prevented from reporting the results as it had intended.

As the night went on with no results reported publicly, media reports began to speculate that the reporting app itself was either faulty or even compromised by outside actors. In reality, the reporting app was secure and operating normally (even though it was not being widely used by the precinct chairs). The app was not compromised by any outside actors, it was not hacked, and there is no indication that any outside actors even attempted illicit access to the app. Rather, the only technology error that existed was in the data output from the DNC's database

conversion tool, which was created and implemented by Shadow and the DNC without the input of the IDP.

At 10:26 p.m., the IDP issued a press release stating:

> We found inconsistencies in the reporting of three sets of results. In addition to the tech systems being used to tabulate results, we are also using photos of results and a paper trail to validate that all results match and ensure that we have confidence and accuracy in the numbers we report. This is simply a reporting issue, the app did not go down and this is not a hack or an intrusion. The underlying data and paper trail is sound and will simply take time to further report the results.

Then, at 1:00 a.m. on Tuesday, February 4, the IDP held a press call. That call lasted less than two minutes, and in it, IDP Chair Price said that results would come at some point on Tuesday.

On Tuesday, at 8:09 a.m., the IDP issued another press release essentially stating:

- There was not a cyber intrusion;
- As results started coming in, the IDP ran them through an accuracy and quality check, and it became clear there were inconsistencies with the reports;
- The underlying cause of the inconsistencies was not immediately clear and required investigation;
- As they investigated, the IDP staff activated pre-planned back-up measures and entered data manually;
- The IDP determined with certainty that the underlying data collected via the app was sound;
- While the app was recording data accurately, it was reporting out only partial data;
- This was due to a coding issue in the reporting system;
- The issue was identified and fixed;
- The application's reporting issue did not impact the ability of precinct chairs to report data accurately;
- Because of the paper documentation, the IDP was able to verify that the data recorded in the app was accurate; and
- Precinct level results were still being reported to the IDP.

At 12:18 p.m., the IDP issued another press release that stated the IDP would be releasing a majority of the caucus results by 4:00 p.m. At 3:45 p.m., IDP Chair Price held a press conference. Then, at 4:00 p.m., the IDP began reporting results. By the end of the day on February 4, the IDP had released 71% of the results.

By 8:00 p.m. on February 6, the IDP had reported 100% of the caucus results. Over the next few days, the IDP issued various statements regarding reporting discrepancies and recanvass requests. Ultimately, on February 12, Price issued his resignation as chair of the IDP.

E. The Caucus Results

1. Initial Results

The IDP determined early on it would not release results on the night of the caucus and would instead take deliberative steps to manually confirm all reported results on the paper Caucus Math Worksheets that were filled out and signed by each precinct's caucus chair and secretary. The information on the Caucus Math Worksheets should have been consistent with the results reported through the app or over the phone. The signature of each precinct's chair and secretary on the Caucus Math Worksheets served to formally "certify" the results of each caucus. By collecting and analyzing the certified paper Caucus Math Worksheets, the IDP planned to confirm whether the results that were reported through the app or over the phone were accurate.

On February 4, the morning after the caucuses, IDP personnel drove to all corners of the state to collect the physical paper materials from every precinct. The IDP began a labor-intensive process of cross-checking all reported results against the paper Caucus Math Worksheets. The IDP team created several spreadsheets and manually checked each precinct's reported results against the paper Caucus Math Worksheets. At the same time, the DNC requested access to the IDP's records and ran its own confirmatory cross-checks of the same data to ensure the IDP's results were accurate before they were reported. As these cross-checking processes proceeded, the IDP began to release to the public the results for confirmed precincts.

Through this cross-checking process, the IDP was able to confirm that all results submitted through the Shadow app were accurately reported; that the reporting app had correctly calculated the results of the caucuses based on the raw first and second expression counts; that the app had not been compromised, hacked, or exposed to interference from outside parties; and that the "coding issue" and the data errors identified by the DNC on the night of the caucuses flowed from the DNC's Firestore-to-BigQuery database conversion tool rather than the Shadow app itself.

Ultimately, the results that the IDP had received on caucus night through the app and over the phone were accurate and were in fact the same as the results that were finally reported several days later. The coding error in the DNC's database conversion tool caused the DNC to interject itself into the IDP's intended reporting process and prevent the IDP from reporting out its results on caucus night. Without the DNC's intervention in that process, the IDP may have reported the results in real time as it intended, even accounting for the low usage rate of the reporting app. Furthermore, the DNC's decision to stop the IDP from announcing results had a ripple effect, causing further compounded delays throughout caucus night and the subsequent days. Because the DNC called the accuracy of the results into question, the IDP was forced to undertake substantial steps to confirm all reported results by collecting and crosschecking all of the physical Caucus Math Worksheets over the course of several days. That exercise simply revealed that the results that were being reported on caucus night were generally accurate. If the IDP had announced the results on caucus night, the campaigns still could have exercised their right to request recounts or recanvassing as necessary.

The IDP publicly reported the preliminary results on February 6, 2020.

2. Requests for Corrections

The precinct chairs who had used the Shadow app had the benefit of the app calculating the results of the caucuses based on the raw expression counts. However, because the

Shadow app was not used in the majority of precincts, most precinct chairs were left to perform the "caucus math" calculations themselves. The caucus math calculations, as set out in the Delegate Selection Plan, were relatively complex. Because many precinct chairs did the calculations manually, some of them introduced simple human error into the process, and some precincts' final certified results on the paper Caucus Math Worksheets were incorrectly calculated.

In years past, calculation errors of this type were not visible to the public because the final certified Caucus Math Worksheet was the only outward-facing reflection of the results of each precinct's caucus, and until 2020, they did not contain raw first and final expression counts. However, with the introduction of first-expression and final-expression reporting in 2020, it was possible for the first time to check each precinct's math after the fact. The IDP, through its cross-check process, generally confirmed that the certified Caucus Math Worksheets were consistent with the results that were reported by phone from the precincts that did not use the app. But when outside observers recalculated some precincts' results from the now-public raw expression counts, it became clear that mathematical errors may have affected the outcome of several precincts' final reported results.

The IDP began releasing results as soon as they could be confirmed to be consistent with the certified Caucus Math Worksheets throughout the week. As reports of mathematical errors reached the public, however, DNC Chair Tom Perez posted a statement on Twitter on Thursday, February 6, 2020: "In light of the problems that have emerged in the implementation of the delegate selection plan and in order to assure public confidence in the results, I am calling on the Iowa Democratic Party to immediately begin a recanvass."

The IDP's procedures for recanvassing caucus results were set out in the Iowa 2020 Caucus Recanvass and Recount Manual (the "Manual"). According to the Manual, a "recanvass" is a "hand audit" of the reported caucus results to ensure that they were reported correctly. Recanvassing the results would involve comparing the certified Caucus Math Worksheets against the reported results. A "recount," on the other hand, is a full audit of a precinct's Presidential Preference Cards to ensure that the results appearing on the Caucus Math Worksheets were calculated correctly. A recount can only occur after a recanvass is completed. According to the Manual, only a candidate can request a recanvass, and only a candidate who requested a recanvass can then request a recount after the recanvassing is complete.

Based on the procedures stated in the Manual, the IDP could not unilaterally initiate a full recanvass. As such, it declined to do so in response to Perez's statement. However, the IDP sent an email to all campaigns on February 7, 2020, stating that the IDP would "accept documentary evidence from the presidential campaigns of inconsistencies between the data reported and the records of results for correction." The IDP explained that if "there is a difference between the caucus math worksheet and the publicly reported number, the IDP will correct the public report." This course was based on the IDP's legal determination that the Caucus Math Worksheets were the final and official results of each caucus under Iowa law and could not be recalculated or revised after the fact. Therefore, the IDP could only "correct" an error if the error was a simple inconsistency between the final public reporting for a precinct and that precinct's certified Caucus Math Worksheet. The IDP determined it could *not* correct a mathematical error and change the certified results of a caucus as part of this process. The IDP's official position was that Iowa law actually prevented the party from correcting any mathematical errors made by precinct chairs as part of this "corrections" process.

The campaigns were given until noon on February 8 to submit a request for such corrections. Notably, the solicited corrections that were subject to the February 8 deadline were *not* part of the formal recanvass and recount procedures set out in the Manual. In other words,

the IDP would accept requests for simple clerical "corrections" by February 8, but the recanvass and recount procedures would still need to move forward separately as planned and as described in the Manual. Therefore, the IDP further informed campaigns on February 7 that the IDP was extending the deadline to file a formal request for recanvass pursuant to the Manual to Monday, February 10.

3. Requests for Recanvass

On February 10, 2020, the Sanders and Buttigieg campaigns submitted formal requests for recanvassing of a joint total of 82 unique precincts, two in-state satellite caucuses, and one out-of-state satellite caucus. The Buttigieg campaign also requested that all 60 in-state satellite caucuses be recanvassed as a group. Per the Manual, the IDP constituted a Recanvass/ Recount Committee (the "Committee"), which consisted of the IDP's Chair, Vice Chair, 2nd Vice Chair, Secretary, Treasurer, and Rules Committee Chair. The IDP's Executive Director, Caucus Director, and Data Director were also advisory, non-voting members of the Committee. The Committee's task was to evaluate the campaigns' recanvass requests and then perform the recanvass if necessary.

The Committee decided to grant both campaigns' requests in full and appointed three Recanvass Administrators to perform the recanvass with Committee oversight. The recanvass occurred at Drake University in Des Moines on February 16 with representatives from the Sanders, Buttigieg, and Warren campaigns present. Prior to the start of the recanvassing, the Sanders campaign waived one of its requests for recanvassing, so the joint total of unique precincts recanvassed by the Recanvass Administrators was 81 instead of 82.

On February 18, 2020, the IDP released the results of the recanvass. Of the 81 unique precincts recanvassed, the Recanvass Administrators identified 29 sets of results that required correction. In 26 of these cases, the Committee corrected the results because the precinct chair "misapplied the rules" of the Delegate Selection Plan. In the other 3 cases, the Caucus Math Worksheets were inconsistent with the reported results. The remaining 52 caucus results were not changed either because they did not require correction or because changing the results would have disenfranchised caucusgoers. Additionally, the Recanvass Administrators determined that the Buttigieg campaign's request to review all 60 in-state satellite caucuses as a group was "outside the scope of a recanvass" and declined to perform a group review. Ultimately, after accounting for the 29 revised precinct results, the final National Delegate allocation was unchanged.

4. Requests for Recount

On February 19, 2020, the Sanders and Buttigieg campaigns each submitted requests for a full recount of a subset of the recanvassed precincts and satellite caucuses. The Sanders campaign requested recounts of 8 precincts and 2 satellite caucuses. The Buttigieg campaign requested recounts of 28 precincts and 26 satellite caucuses. On February 20, 2020, the Committee informed the Buttigieg campaign that its recount request did not comply with the requirements of the Manual and gave the campaign approximately 10 hours to supplement its request. The Buttigieg campaign submitted a revised recount request that evening, which added the reasons for each requested recount and reduced its requested recounts to 20 precincts and 17 satellite caucuses.

On February 21, 2020, the Committee informed the Sanders campaign that it would accept its recount requests in full and informed the Buttigieg campaign that it would accept its recount requests in part. The Committee accepted 14 of the Buttigieg campaign's 20 precinct recount requests, one of which overlapped with the Sanders campaign's recount requests. The

Committee likewise rejected 6 of the Buttigieg campaign's precinct recount requests either because they concerned one-delegate precincts or the recount sought to divest a candidate of their only delegate from the precinct. Under the Delegate Selection Plan, such results could not be changed regardless of the result of a recount. The Committee further rejected all 17 of the Buttigieg campaign's requests to recount satellite caucuses because those satellite caucuses had been rejected for recanvassing by the Recanvass Administrators and were therefore not eligible for a recount under the Manual.

Ultimately, the Committee agreed to perform recounts of 23 total precincts and satellite caucuses. It appointed four Recount Administrators to perform the recounts with Committee oversight. The recounts occurred at Drake University in Des Moines on February 25 and 26, 2020, with representatives from the Sanders and Buttigieg campaigns present. The Recount Administrators manually hand-counted all the Presidential Preference Cards that were collected at the 23 caucus sites. The Presidential Preference Cards were used to recount both the raw first and second alignment counts, which were recorded by the Administrators on "Recount Math Worksheets" (versions of Caucus Math Worksheets specifically for recounting the results). The Recount Administrators then calculated from scratch the correct final results for those caucuses and compared the recounted results against the recanvass results.

On February 27, 2020, the IDP issued the results of the recount. Ultimately, 19 of the 23 recounts revealed errors in the results reflected on the original Caucus Math Worksheets that required correction. The corrections resulted in minor changes to the allocation of county delegates. But in the end, the corrections did not have an effect on the allocation of national delegates. In sum, the recanvass and recount procedures did not affect the previously reported top-level results of the 2020 Iowa Caucuses.

5. Final Results

Following the February 27, 2020 corrections and recalculations, the results of the 2020 Iowa Caucuses were finalized and are now settled. In the final count, Iowa awarded 41 pledged delegates to the Democratic National Convention in 2020. Of these, 27 delegates were allocated based on results at the congressional district level, and 14 were allocated based on results at the statewide level.

Iowa held caucuses in 1,678 precincts across the states plus an additional 87 satellite caucuses (60 in-state, 24 out-of-state, and 3 at international sites). According to the raw first expression counts, approximately 176,000 Iowans participated in the 2020 Iowa Caucuses. This was a higher turnout than the 2016 Iowa Caucuses, in which approximately 171,500 Iowans participated; and it fell well short of the record turnout for the 2008 Iowa Caucuses, in which approximately 239,000 Iowans participated.

Conclusions & Recommendations

1. The IDP Started Development of the Reporting App Too Late

The very late development and rollout of the reporting app caused significant problems for the IDP. The IDP believed it was compelled to wait to sign a contract with Shadow because it needed assurances from the DNC that the DNC would accept Shadow as a vendor. The DNC did arguably contribute to the delay in the development of the app by withholding its final determination on virtual caucuses until August 2019 and by taking over a month to then approve Shadow as the IDP's app development vendor. However, the IDP—not the DNC—is ultimately responsible to ensure that its caucus tools and infrastructure are in place prior to the caucuses. In this case, that would entail contracting with Shadow in June 2020 and beginning the

development process immediately—even if the IDP was uncertain whether the DNC would approve of Shadow as a vendor. The risk of loss for the IDP in contracting with Shadow in June 2020 was a few thousand dollars in wasted development costs. But the risk of loss for the IDP in waiting until October 2020 to contract with Shadow was much greater: a rushed and very late app rollout.

Recommendations: The IDP should consider implementing a policy under which it independently and proactively engages with necessary vendors whenever it deems necessary, exerts supervisory control over that project, and does not put necessary development projects "on hold" if it might jeopardize the project.

2. The Reporting App Delays Resulted in Lack of Training and Usage of App

Because the reporting app was rolled out a mere two weeks before the caucuses, users received no training on the installation or usage of the app. They were left to stumble their own way through a convoluted installation process, which was too demanding on the many users who lacked tech expertise. Emails sent to the IDP's app support email address frequently went unanswered. Most temporary chairs and precinct chairs simply gave up on using the app and decided to call their results into the IDP's boiler room without even attempting to report through the Shadow app. The IDP did not encourage them to use the app and instead confirmed that users should simply call in results if they didn't want to use the app. Without sufficient training and implementation, the IDP's caucus software tools, such as the reporting app, will be vulnerable to the type of confusion and abandonment seen in the 2020 caucuses.

Recommendations: The IDP should consider (1) setting hard internal deadlines for all technology and software projects to complete development with sufficient advance time to test, debug, and secure the software; (2) ensuring all users will receive training and assistance with securely installing the app on their devices; and (3) prioritizing buy-in and commitment to the use of the app in all circumstances barring the need for emergency backup reporting methods.

3. The App Development Delays Were Not All Attributable to the IDP and Shadow

The DNC aggressively interjected itself in all of the IDP's technology endeavors related to the 2020 Iowa Caucuses, primarily for purposes of ensuring the cybersecurity of the process. The DNC's involvement, however, played a role in the delayed development of the reporting app. First, the DNC withheld final approval for the IDP's technology proposals for many months from early 2019 through August 2019, when it formally rejected the IDP's proposed virtual caucuses. The IDP believed (rightly) that the DNC would demand authority over any technology projects associated with the caucuses, and therefore, the IDP determined it had to wait for the DNC to approve the app vendor before beginning development. Second, after Shadow was selected to develop the app, the DNC involved itself directly in the development process, requiring Shadow to divert its attention from its actual development tasks to satisfy the DNC's security requirements many times throughout the development period.

Recommendations: The IDP should consider implementing a policy under which it (1) maintains ownership and exerts supervisory control over technology projects; (2) where necessary, builds in time for any potential delays; and (3) continues important and necessary consultation with the DNC and other third parties on matters of security.

4. The DNC's Database Conversion Tool Contained a Coding Error

Shadow and the DNC's database conversion tool was created at the last minute and coded from scratch at the DNC's demand by a lone Shadow employee in a matter of only a few days. Shadow and the DNC ran some tests and tried to debug the database conversion tool, but the project was simply started too late to ensure that the tool would work reliably. Attempting to graft an entirely new software element onto the back-end reporting system at the proverbial eleventh hour is likely always going to be problematic, and it was ultimately the cause of a major problem on caucus night. Furthermore, the IDP was not involved in the development of this tool. The IDP simply permitted the DNC to direct the IDP's vendor.

Recommendations: The IDP should consider limiting or rejecting changes to technology infrastructure in the immediate time period leading up to the caucuses and exercising more direction and exerting supervisory control over the actions of its vendors.

5. The Coding Error Was Attributable to the DNC's Last-Minute Demand for Real-Time Access to the IDP's Database

In the last days or weeks leading up to the caucuses, the DNC demanded that it have access to the IDP's incoming reporting data in real time on caucus night in order to perform its own caucus results calculations and confirm the IDP's results before the IDP could report them to the public. In doing so, the DNC took control over the reporting of results. When the DNC's database conversion tool failed to work correctly, it caused the DNC to wrongly stop the IDP from reporting its results, and the IDP's entire planned reporting process was thrown into disarray. The DNC's interjection was the catalyst for the resulting chaos in the boiler room and in the IDP's attempts to manually collect and confirm caucus results by hand. If the DNC had not interjected itself into the results reporting process based on its erroneous data conversion, caucus night could conceivably have proceeded according to the IDP's initial plan.

Recommendations: The IDP should consider taking complete ownership and supervisory control over caucus results reporting systems; setting out—and sticking to—very clear processes for quality-check confirmations; and planning ahead for the possible effect of quality-check processes on the public reporting plan on caucus night.

6. The Reporting App Performed as Intended and Was Not Hacked or Compromised

Contrary to media and public speculation, the Shadow reporting app was not in any way hacked or compromised by outside actors on caucus night. To the contrary, apart from some individual users' difficulties using the interface, the reporting app largely worked as intended. All results that were successfully submitted through the app were recorded accurately and securely, and the app accurately performed all the necessary caucus math calculations, removing the risk of simple human error from the equation. However, when the DNC's database conversion tool failed to work correctly, the IDP's public statements on caucus night failed to clearly distinguish the faulty database conversion tool from the reporting app, causing large-scale confusion about the nature of the error and stoking concerns about non-existent cybersecurity failures.

Recommendations: Though there was no evidence of any cybersecurity issue relating to the caucuses, the IDP should nonetheless continue to consider prioritizing the development of its own internal technology expertise and experience, which is necessary to manage

technology projects and cybersecurity threats, and continuing to coordinate on cybersecurity measures and exercises with trusted third parties such as the DNC, the NCC Group, and D3P.

7. The Boiler Room Had Several Problems

The boiler room operation experienced several problems on caucus night. First, there were issues with the technology, including not being able to access the webtool for volunteers to input the caucus results into the Shadow database. This was the result of a failure to integrate the technology into the plan for the boiler room. Second, there was a high call volume and an inability to adequately handle that high call volume. Specifically, there were not enough telephone lines and volunteers; the IDP had two different public phone numbers that were ringing into the boiler room in addition to the phone number provided to caucus chairs; the incoming calls were not segregated by number; there was no ability to scale up; and, as the night wore on, call volume increased due to incoming calls from both well-intentioned and possibly some not-well-intentioned callers. Notably, these issues were all deficiencies in the IDP's general planning and preparations for the boiler room prior to caucus night. They were not problems that arose from the management or operation of the boiler room on caucus night.

Recommendations: The IDP should consider adopting an approach to its plans and preparations for the boiler room that (1) fully integrates, incorporates, and provides training on any technology; (2) provides a back-up system to any other manner of reporting that is capable of accounting for 100% of the capacity of the primary system; (3) segregates incoming calls to allow for reporting calls to get through via an unpublished telephone number; and (4) makes its phone bank scalable if necessary based on unanticipated high call volume.

8. There Were Multiple Reasons Why the Reporting of the Results Was Delayed

There was not just one reason why the IDP was unable to report the caucus results on caucus night. The initial cause of all results being held back was the faulty database conversion tool that the DNC directed Shadow to create and that malfunctioned. Once that failed, the IDP appeared to take direction from the DNC when it decided to not report results that night. The IDP may have been able to begin reporting results as otherwise planned but for the last-minute addition of the DNC's database conversion to the process. However, there were several other problems that night that may have delayed the IDP from being able to report results in a timely manner. The failure to roll out and implement the reporting app effectively also impacted the IDP's ability to receive results in a timely manner. The app and database conversion tool aside, the numerous problems in the boiler room would have also caused delays in reporting.

Recommendations: The IDP should consider taking a more integrated approach to caucus night, including improvements in the integration of technology into the process as well as more robust back-up systems. If the IDP is going to use technology, it must roll it out sooner, make it simpler to use, improve training, and prioritize buy-in from staff and users. Likewise, any back-up systems should be ready to address 100% of the capacity should the primary system fail and should ideally be scalable in the event additional problems arise. Those back-up systems should also be integrated into the process and be included in training programs as a part of a comprehensive plan.

9. Caucuses Present Some Unique Challenges and Those Challenges Were Highlighted by the DNC's New Requirements

It must be recognized that caucuses present some unique challenges and that those challenges were highlighted by the DNC's new Delegate Selection Plan requirements for 2020.

The DNC has certainly taken the position that there should no longer be caucuses in any state and has imposed requirements that make it even more difficult to carry out caucuses. Those requirements included mandatory reporting of the initial expression of the vote and the requirement that the final expression be preserved for recount/recanvass purposes. Further, Iowa faced an additional challenge in balancing the requirement to provide non-present participation opportunities while still maintaining its position as first in the nation in presidential election cycles. Specifically, Iowa had to avoid any process that looked like primary voting or a ballot; otherwise, it faced the threat of New Hampshire moving up its primary to take place before the Iowa caucuses. These circumstances created some limitations on what Iowa could do to both fulfill the non-present participation requirement and maintain its first-in-the-nation status.[2] The IDP tried first to implement virtual caucuses to satisfy both goals, and eventually ended up using satellite caucuses.

The bottom line is that the caucus process is complicated. Some criticize the complex nature of the calculations that need to be conducted by precinct chairs. Some criticize the fact that a candidate receiving less than 15% at a precinct caucus is considered non-viable and receives no delegates. Others criticize the lack of accessibility that can result from requiring everyone to participate on caucus day (and, for the most part, on caucus night) and from the length of time it takes to participate. However, it must be noted that the caucuses are also about party-building efforts and tradition. And of course, no process can be perfect.

Recommendations: The future of the Iowa caucuses should be the subject of discussion and debate amongst the members of the IDP. If the IDP determines it will continue to conduct caucuses, it should consider (1) simplifying the caucus process, similar to the caucuses held by the RPI and in other states; and (2) finding a way to increase early participation similar to Nevada's caucuses.

10. The IDP Failed to Manage Expectations with the Media

Lastly, the IDP appeared to contribute to expectations with the media that were not likely achievable—or it at least failed to effectively manage the media's expectations. There was a clear expectation by the media that they would have results to report on caucus night, even early on caucus night. When the results were not made available immediately, the media sharply criticized the IDP and the caucus process. Also, the media indirectly interfered with the results reporting process by reaching out to county chairs directly for information and calling the boiler room hotline, tying up the already busy phone bank. Even putting all other problems aside, a race that is likely to be as close as was the one on February 3, 2020, whether it is a primary or a caucus, will take time to be finally determined. While anticipation and pressure for results will be high, those expectations must be managed.

Recommendations: The IDP should consider proactively managing media expectations regarding the timing of caucus results reporting and overtly build into those expectations the

[2] When it came to alternative means of satisfying the non-present participation requirement, IDP personnel reported that they felt they were not able to conduct their caucuses the way Nevada conducted its caucuses out of concern that the system would look too much like it uses a "ballot." Nevada used a Caucus Presidential Preference Card and ranked candidates in an "early caucus" system to satisfy the non-present participation requirement. Approximately 60% of Nevada caucus participation happened via these early caucuses, which occurred over four days (from Saturday to Tuesday) starting the week before Nevada's Saturday caucuses. This was easier for Nevada to do because their caucuses occurred *after* New Hampshire's primary, and there was no concern of the New Hampshire Secretary of State moving up the date of its primary if Nevada used a tool that looked something that looked like a ballot.

possibilities of unexpected procedural or technical problems and difficulties arising from close races.