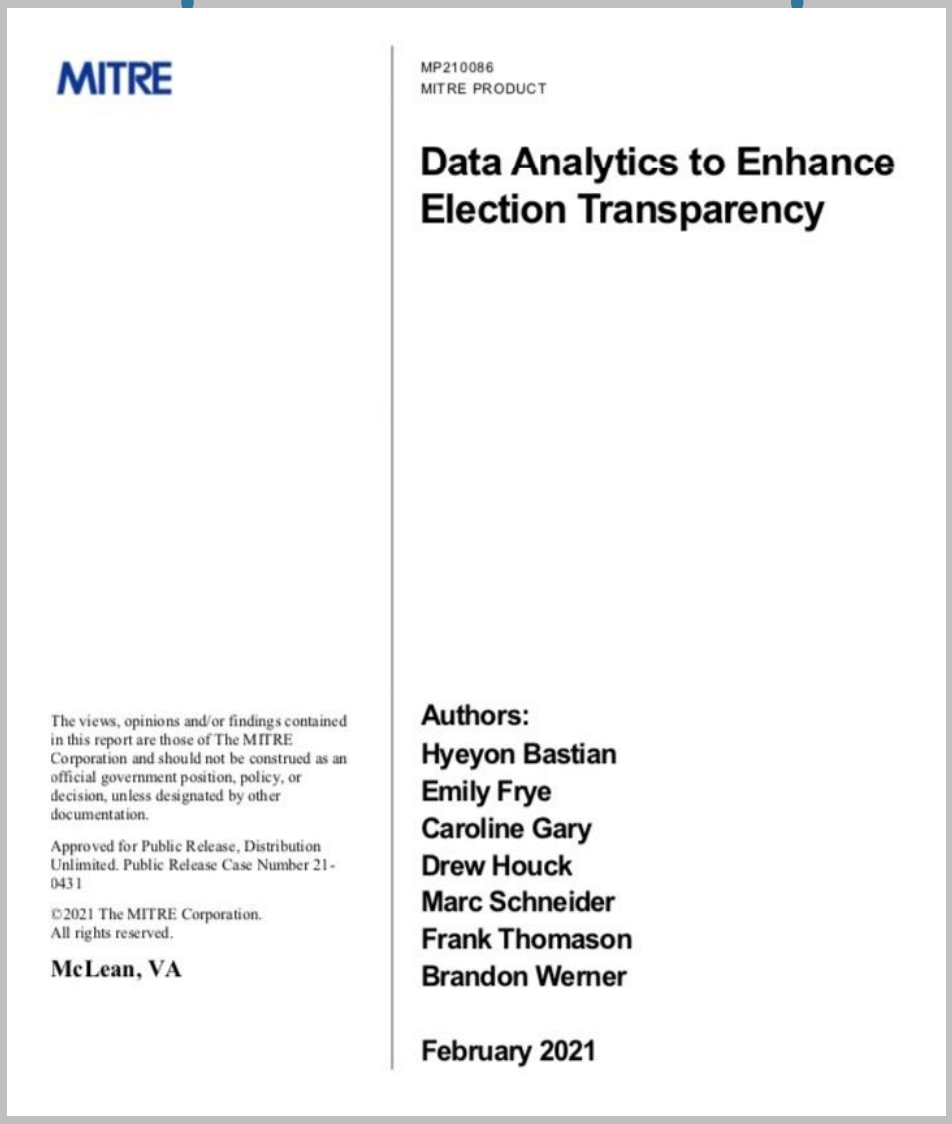
Critique of MITRE Report:



MITRE

MP210086
MITRE PRODUCT

Data Analytics to Enhance Election Transparency

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McLean, VA

Authors:
Hyeyon Bastian
Emily Frye
Caroline Gary
Drew Houck
Marc Schneider
Frank Thomason
Brandon Werner

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Contributors:
Jared Black
Ray Bleharw
John Droz
Alex Kossovsky
Steve Miller
Eric Quinnell
Michael Sheliga
Stan Young
Et. Al

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Critique on MITRE Report's Executive Summary

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

The authors of this *Critique* are unpaid volunteers, whose expertise covers a wide range of fields (Cyber Security, IT, Statistics, Physics, Economics, etc.). Our main interest is in assuring election integrity when American citizens legally express their preferences for their representatives. In the last few months we have generated multiple election-related reports — e.g. see Appendix.

As such we were quite interested when we heard that MITRE people had just released an election Report. Based on its title, we were hopeful that this would be a thorough and objective analysis of the 2020 election, as transparency has been desperately needed. Unfortunately, the content was a disappointment — so much so that we decided that it was worth our time to put together a *Critique* of the MITRE Report.

Before wading into a Report like MITRE's, it's good to get an understanding of who are the authors, and what are their professed values. We start with MITRE's stated principles, and then observe whether that public commitment carries through in practice here. MITRE's Mission Statement includes such aspirations as:

> "MITRE is dedicated to solving problems for a safer world. We work in the public interest to discover new possibilities, create unexpected opportunities, and lead by pioneering together for the public good to bring innovative ideas into existence.
>
> "Objective Insight: We provide a conflict-free perspective with trusted access to bring proprietary data to decisions.
>
> "Technical Know-How: We combine applied science and systems thinking with deep domain expertise to define the right problems and create solutions.
>
> "Integrity Above all Else. Exercising the highest possible ethical and professional standards is fundamental to how MITRE operates."

MITRE's Mission Statement sounds exemplary, but is it actually accurate in this Report? Of particular importance in this national matter is **objectivity** and **comprehensiveness**. An organization purporting to present "election data" to enhance "transparency," would seemingly leave no stone unturned in doing an **objective** and **comprehensive** analysis of this extraordinarily important issue — i.e. for the public good. Regretfully, as explained in the subsequent chapters, we didn't find that to be the case.

Another general observation before we get into the nitty-gritty: the MITRE Report ("Report") frequently uses the word "fraud" in their document. We choose to rarely use that term for two reasons:

1) Analysis of election integrity is a *legal* matter. The *legal* definition of "fraud" is not the same as is understood by the public when they use that word. In other words, the *legal* word fraud is a subset of the public's meaning of the word fraud — so it is disingenuous to use a key term that could be misunderstood.

2) "Fraud" is too narrow a description of the documented election irregularities anyway.

For example, if election officials "correct" an incomplete ballot, is that fraud? They claim to be (and maybe believe they are) acting within their rights — even though that is disputable and the subject of some lawsuits. Further, if they truly believed that such corrections were on the up-and-up, to assure transparency they would have gone to lengths to carefully document all such alterations. Unfortunately, that rarely happened. Worse, there is ample evidence that government officials blocked investigator's access to election systems and deleted logs to *prevent* effective audits (and transparency). So, again, were their actions and omissions fraud?

Another example is in Central New York where they likely had the most closely contested election in the country. In the House of Representatives race, out of 300k± ballots cast there was a difference of 20± votes. This resulted in one of the extremely rare situations where a judge actually looked closely at the election process, and how ballots were handled, tabulated, etc. In a damning ruling he determined that in this one district (NY-22), that election officials had engaged in **nine (9) different illegal actions!** That said, he took pains to say that none of them (*legally*) amounted to fraud.

As a result we try to use broader, more inclusive, non-legal terms, like "irregularities," "anomalies" and "malfeasance." So let's get onto our *Critique*…

We are in unison with the first sentence in the Report's Executive Summary that: *the 2020 Presidential election brought an unprecedented and intense focus on the issue of election integrity.* We applaud that development. One outgrowth of this concern is that there were more election-related reports by independent experts than ever done in the history of our country. For example, here **are over a dozen (12) major reports done about various aspects of the 2020 Presidential elections.**

The Report assures us that: "To help ensure public trust and confidence by providing some additional transparency, MITRE's National Election Security Lab gathered and analyzed a wide range of relevant data." Inexplicably, **not a single one of these well-documented expert reports is utilized in the MITRE Report** — or even mentioned.

Instead of considering the conclusions of independent experts, the Report says: "The team obtained data from several election and state government websites…" So, it appears that the authors are trying to verify election integrity by heavily relying on possible guilty parties for information. Additionally, the Report has multiple references to journalists who purport to "fact check" election anomalies — by using unsupported statements, again from the parties who may be guilty (e.g. election officials and the companies that provided the election systems).

What's missing here are any **independent forensic audits**, or investigations, pertaining to the 2020 election. Surprisingly the term "forensic" doesn't even appear in the Report. As a result, the readers of the MITRE Report are no more informed about election integrity than if they followed mainstream media.

There were more 2020 election-related lawsuits than ever in our history. The Report (on page 1) claims that "the team maintained situational awareness of legal and media events occurring between October–December 2020…". Since their Report was filed in February, why wouldn't they have the same awareness in January?

Furthermore, as researchers, why would they arbitrarily only start looking at legal events in October, when several lawsuits pertaining to the 2020 Presidential election were filed before then (e.g. see here). In any case, using the Report authors' artificially reduced time period of "legal awareness," some **fifty-five (55) lawsuits** were filed from the beginning of October to the end of December, 2020 (see here). Stunningly, **not a single one of these is discussed or even mentioned!**

Both of these unexpected significant omissions would lead a knowledgeable person to conclude that the MITRE Report has no genuine interest in objectivity, and/or that they lack the technical competence to comprehensively analyze a national matter of this importance.

The rest of the Executive Summary outlines a few areas where the Report authors did a rather superficial analysis. As mentioned before, in numerous reports by independent experts, there are over a hundred anomalies listed — so checking out a half-dozen is hardly a scientific basis for dismissing the other 95+%. Further, the methodology for even dismissing the handful of cases they selectively chose, would not be considered to be rigorous.

Here's a thought: attorney Jesse Binnall publicly (on TV) testified under oath before Congress about election improprieties. In that testimony he identified numerous documented examples of major irregularities in Nevada — from some **130,000 unique voters!** These included the same person voting twice (42,000+), the voting person being officially listed as deceased (1,500±), the voting person not being registered in the state (19,000+), the voting person not being a citizen (4,000±), the voting person using a non-existent residential address (8,000+), etc. (Note Donald Trump lost Nevada by less than 35K votes, essentially all in one county.)

Binnall's testimony was on December 16, 2020, well inside the window where the Report authors were researching the election integrity issue. His report was about a group of scientists who had carefully researched hard numbers for significant examples of voting irregularities. *Why didn't the Bald Eagle people take that data, and double-check it?*

Binnall states: "Our data scientists made these calculations not by estimations or statistical sampling, but by analyzing and comparing the list of actual voters with other lists, most of which are publicly available… Our determined team verified these irregularities without any of the tools of law enforcement, such as grand jury subpoenas or FBI agents. Instead, we had less than a month to use critical thinking and elbow grease to compile our evidence… To put it simply, they explained their methods so that others could check their work. Our evidence has never been refuted…"

It's a shame that the Bald Eagle authors didn't follow this stellar example. If they had, their Report could have done some real good regarding election integrity — rather than be a deflecting diversion as to what actually transpired.

In short, their assertion (Page ii): "In summary, multiple types of analysis found no evidence of fraud, manipulation, or uncorrected error in the eight states included in this research" is misleading and disingenuous, especially considering the MITRE Mission Statement, and the purported objective of this Report.

* * * * * * * * * * *

For any questions about this critique, suggestions for improvements, documented errors, please email physicist John Droz, who was editor.

Please proceed to our more detailed commentaries of the major parts of the MITRE Report. If you don't have the time to read the details about each aspect of their Report, skip to our last chapter: Conclusions*.*

— Chapter 1 —

Critique of Report Section 1: Background

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

MITRE Summary:
The MITRE report team stated that the Bald Eagle research team analyzed a "wide range of relevant data" to address "the anomaly allegations" in eight swing states. Its "research focused on the Republican Candidate, President Donald Trump, and the Democratic Candidate, Joseph Biden, Jr." and utilized "unfolding public perceptions and new headlines" to determine its areas of focus. The team stated it analyzed data from all the swing states however the report's conclusion of "no fraud or compromise" is based only "on a handful of anomalies" that are characterized as "five key areas."

Critique:
The Bald Eagle team's reliance on media headlines – that typically drive public perception — resulted in a report of limited value because of its focus on **five irregularities** from the states of **Georgia, Michigan, and Pennsylvania**. The irregularities in those states comprise only a small portion of the wide range of election anomalies that surfaced after the 2020 election.

The Navarro Report Volume III is one of the more comprehensive documents summarizing alleged voter fraud and it provides quantitative data for 26 different categories of voting irregularities/illegalities. It is notable that one of the focuses of the MITRE report was ballot harvesting in Georgia that is not among the allegations in the Navarro Report. In fact, the MITRE report **cited no specific allegation of ballot harvesting in Georgia,** therefore one has to question the merits of including that specific analysis in the report.

Next, by focusing only on the election data related to Trump and Biden, the MITRE research **ignored election data related to Minor Party candidates, write-in candidates, and down-ballot candidates in state-wide races.** Other research conducted after the 2020 election pertaining to those categories of candidates revealed significant anomalies in voting results that cannot be explained by chance and are strong indicators, if not proof in some instances, of wide-spread vote manipulation.

Aside from the data source deficiencies noted above, the MITRE analysis **did not utilize election time-series data from Edison Research** in its analysis of vote switching. The report references a tweet from former President Donald Trump, but did not subsequently investigate the source of Trump's tweet that would have led them to the time-series data. The vast majority of data analysts who have alleged vote switching and other anomalies have done so based on the Edison Research data. It is important to note that the Edison Research data is public, and matches the certified election results in almost every battleground state. (Note: Pennsylvania's certified result was slightly different due to a correction made in Allegheny County.)

Although two of the Bald Eagle team members possess extensive experience in cyber-security, the Report did not address repeated **post-election allegations of hacking and/or vulnerabilities of the 2020 election system**. The Report team could have covered this topic in its analysis of the Antrim County, Michigan anomaly or in its analysis of Dominion voting systems.

The Report cited five legitimate data sources of election related data from the Pennsylvania, Michigan, and Georgia state governments, however the **vast majority of sources used in the Report are unreliable (biased) and often irrelevant (e.g. from the media and government officials)**. For example, the sources used in the analysis of Butler County, Pennsylvania included one legitimate government data source while the remainder were irrelevant and questionable media reports that included a reddit.com bulletin board that contained memes and member comments, an irrelevant media report alleging the problem was related to mail delivery, and a misleading media report on the cause of the delay in mailing ballots.

While the Report states that analyses of voting/election data were performed in eight battleground states, there are **no summary tables, graphics, or narratives** for four of the five key themes in the Report. For example, summary graphics could have been included for the analysis for ballot harvesting, vote spikes, vote switching, and delays in processing of mail-in ballots, for the eight battleground states. The exception to the rule was the analysis of vote switching by Dominion systems that utilized results from all eight states.

In summary, the MITRE Report was narrowly focused on a few anomalies and just the major party candidates in the 2020 election and therefore it relied on a very limited set of data and analyses.

Rewrite Suggestions:
The main suggestion is that the authors recognize and address the numerous allegations of voter fraud and, necessarily, expand their sources to include Edison Research time series data, government and non-profit sources of election related data (e.g., tracking of mail-in ballots, changes to election deadlines, etc.) and numerous affidavits alleging voting irregularities with election systems used in the 2020 election.

— Chapter 2 —

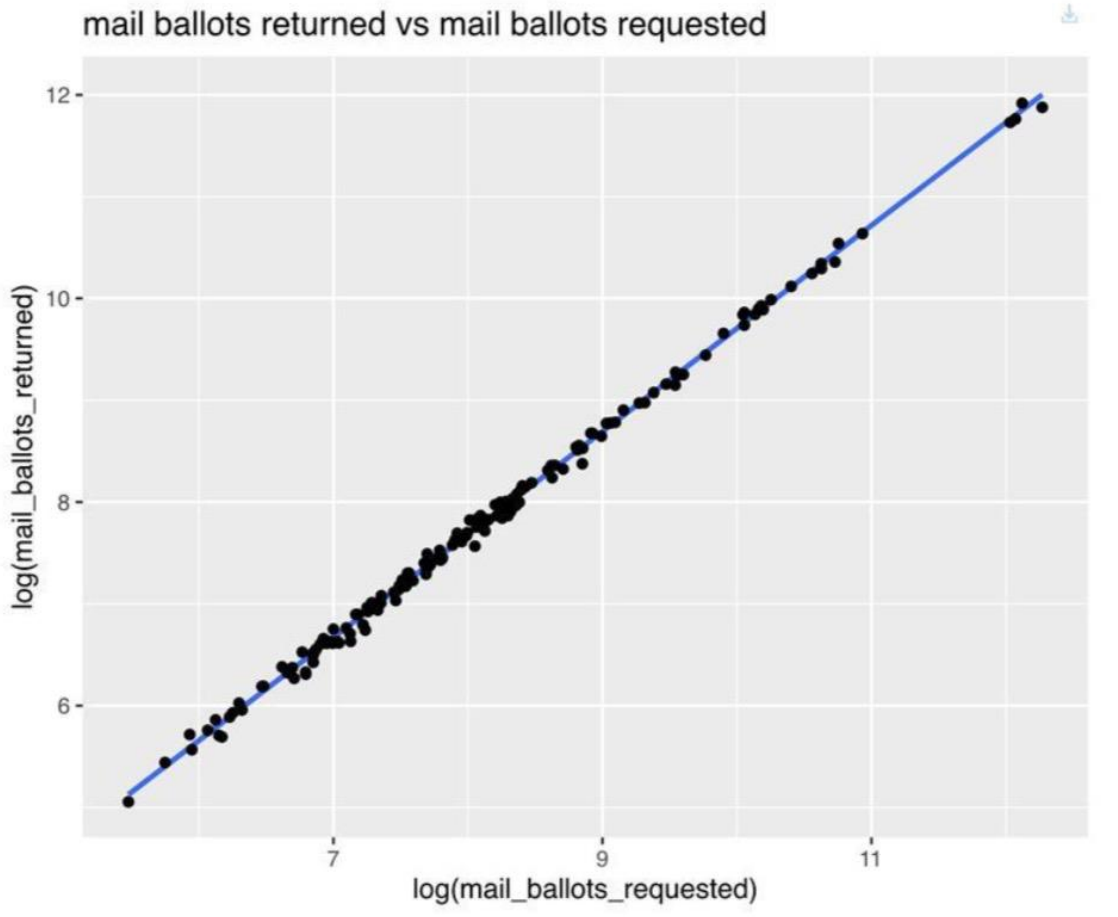
Critique of Report Section 2.1: Alleged Ballot Harvesting in Georgia

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

This is a brief review of the MITRE Report claim that:

no unusual mail-in-ballot manipulations were found in the Georgia vote count.

The MITRE team focused on Georgia mail-in-ballots (evidently as a representative test) to assess whether ballot harvesting occurred. This assessment was made by plotting the logarithm of the requested ballots versus the logarithm of the returned ballots for each of the 159 Georgia counties. These values will plot as a straight line if there are no unusual addition or reduction of ballots. The following plot is Figure 1 from the MITRE Report.

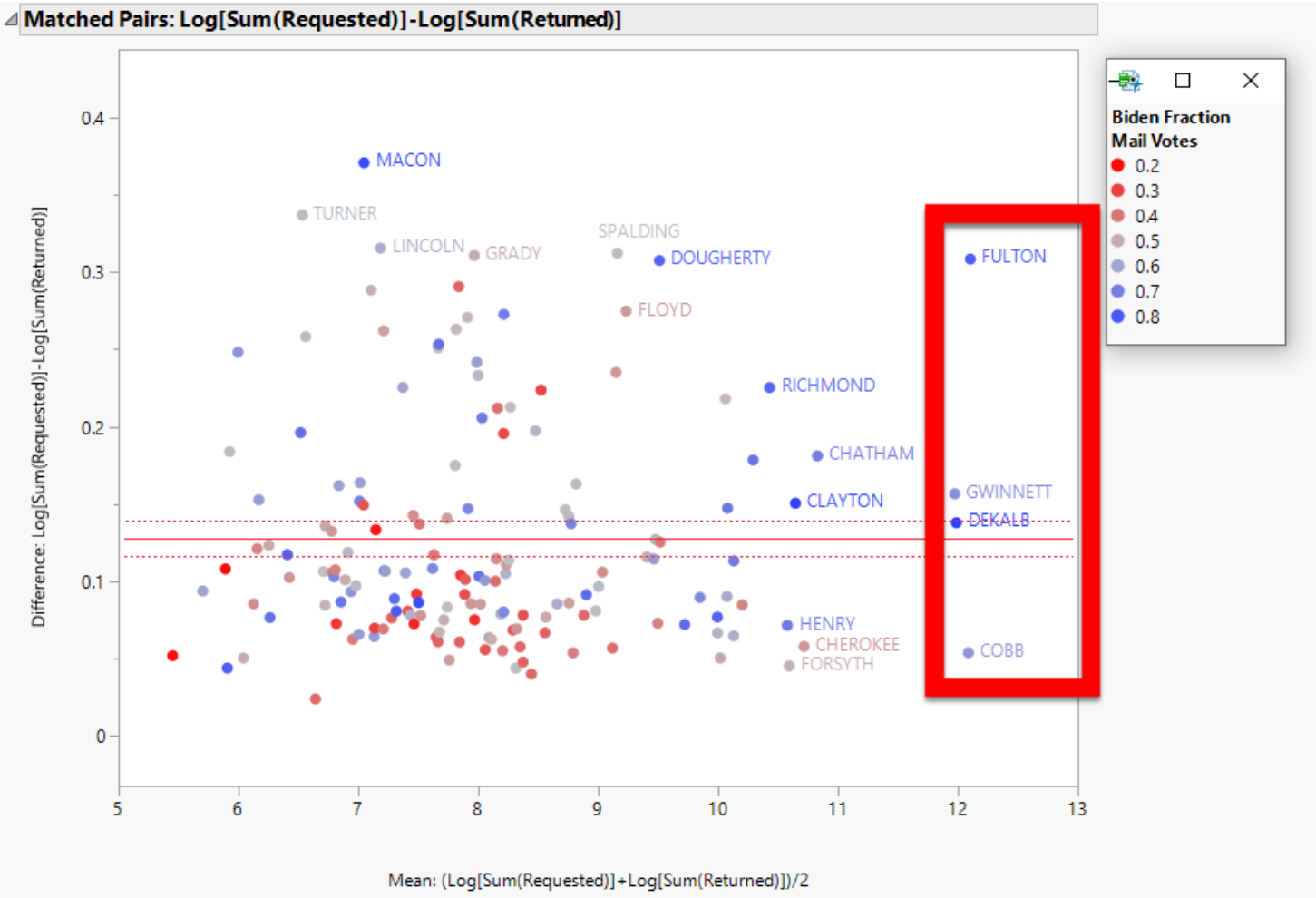


The county data generally falls on or near the blue trend line, which the MITRE team interprets to mean that no unusual ballot harvesting took place. They note that if a consequential amount of county's ballots had been deleted, the data point for that county would fall well below the trend line. Conversely, if a sizeable number of ballots had been added (harvested), the data point would place well above the trend line.

In general, the data along the trend line indicates that about 72% of the mailed ballots were returned. But there are four outliers shown at the far upper right of the plot. These values are from the highly populated counties of **Fulton**, **DeKalb**, **Cobb** and **Gwinnett**.

A closer examination of these four counties shows that two had ballot returns near the expected average return of all counties. But of the other two, one had a remarkably high ballot return of 82% while the second had a relatively low ballot return of 67%. These two outliers represent significant deviations in the number of expected ballots. Numerically, one represents 9,800± more ballots returned than expected. The other represents 19,000± fewer returned ballots than the trend would predict. To put these amounts into perspective, note that the Biden statewide margin of victory in Georgia was 11,800± votes.

These differences can be seen graphically by rotating the MITRE Report's Figure 1 clockwise 45 degrees and then flipping the y-axis top to the bottom. The four highly populated counties are outlined in red:



Fulton County especially stands out as having a large discrepancy between requested and returned ballots when compared with other counties of similar size (note both axes are still on a log scale). Points here are colored by the fraction of mail votes Biden won in the election. Contrary to the MITRE Report's quick conclusion, the same plot when viewed with increased resolution leaves open the clear possibility that harvesting did in fact occur — and with sufficient magnitude to change the Georgia 2020 Presidential election results.

To summarize, the MITRE team concludes that since county mail-ballot data fall on or near the trend line based on simple visual inspection, the ballots were not mis-handled. A more detailed analysis shows there are in fact outliers of sufficient magnitude to influence the election outcome. How those occurred justifies further investigation.

While reviewing the Georgia voter data posted on various sites, an additional unsettling concern arose regarding the four most populous counties. 1,654,500± absentee ballots were mailed to voters in those four counties. Of those receiving a mail-in-ballot, 922,000± voters chose to vote in person. There is no mention of how those 732,000± purportedly unused mailed-out ballots were handled.

Another aspect noticed, was the rejection rate of mail-in-ballots in those four counties. Voter data shows three counties rejected about 15% of the mail-in-ballots. Cobb County, however, rejected just 5%. For techies, we created the following three tables to provide additional details for the preceding data analysis.

Trend Line equation, ln(y) = 1.0126*ln(x) - 0.4239				
Ballot sent ln(X)	**Ballot return ln(Y)**	**Ballots sent X**	**Ballots Return Y**	**% return**
6	5.652	403	285	70.6
7	6.664	1,097	784	71.5
8	7.677	2,981	2,158	72.4
9	8.690	8,103	5,940	73.3
10	9.702	22,026	16,352	74.2
11	10.715	59,874	45,013	75.2
12	11.727	162,755	123,909	76.1

The table above shows the general trend of ballots send and returned as defined by MITRE. It is noted that the MITRE Report doesn't note how many returned ballots were superseded by the citizen voting in person. Nor is there any mention of the 25%± of mailed ballots not returned.

The next table shows how accepted mail-in-ballots voted. The average return, as noted in the prior table, is about 74%. By comparison, the Fulton County return is low at 67.5%, and the Cobb County return is a high 81.6%. This result doesn't support the MITRE claim of negligible vote harvesting.

	ln(x), ln(y) based on GA Sec of State Data				
	Ballot sent ln(X)	**Ballot return ln(Y)**	**Ballots sent X**	**Ballots Return Y**	**% return**
Fulton	12.2701	11.8768	213,223	143,890	67.5
Gwinnett	12.0318	11.7313	168,015	124,400	74.0
DeKalb	12.0707	11.7647	174,683	128,634	73.6
Cobb	12.1207	11.9171	183,634	149,811	81.6

The table below shows the deviation from the expected ballot return for the four counties. Fulton County shows 18,995 fewer ballots than expected, while the Cobb ballot return is 9,794 more than expected.

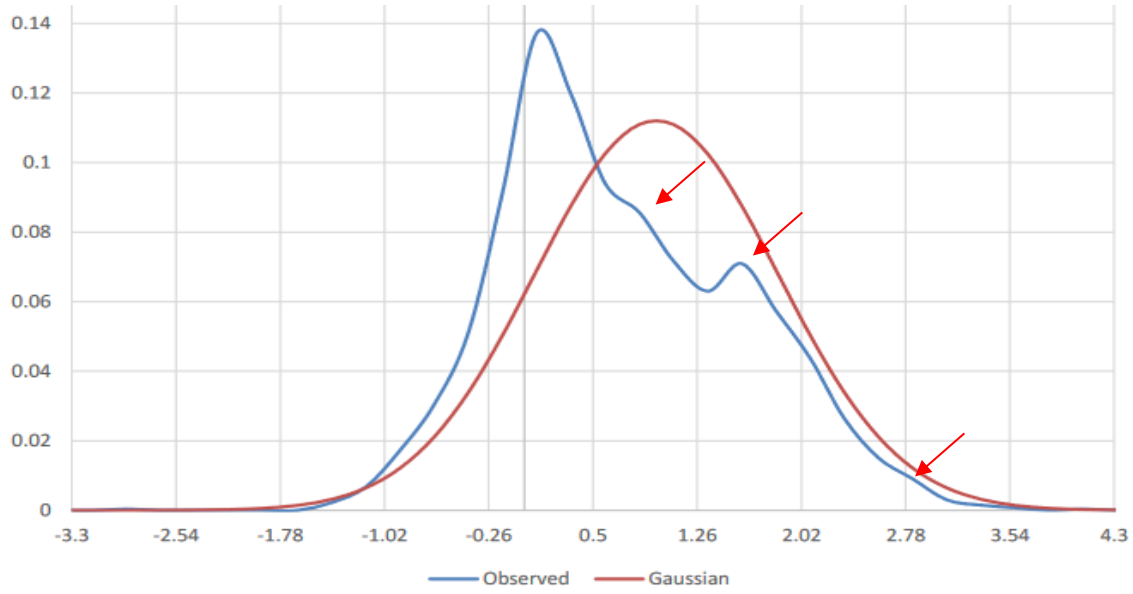
	Ballot Deviation from Expected Return					
	Ballot sent ln(X)	**Expected Return ln(Y)**	**Ballots sent X**	**Expected Ballot Return Y**	**% return**	**Deviation***
Fulton	12.2701	12.001	213,223	162,885	76.4	-18,995
Gwinnett	12.0318	11.760	168,015	127,965	76.2	-3,565
DeKalb	12.0707	11.799	174,683	133,108	76.2	-4,474
Cobb	12.1207	11.850	183,634	140,017	76.2	9,794
	*Deviaton is the ballot return less the expected return					

— Chapter 3 —

Critique of Report Section 2.2/A.1/A.2: Election Fingerprinting

Ref MITRE Report # MP210086: Data Analytics to Enhance Election Transparency (February 2021)

The Report cites and uses a method by Klimek et al. The method is conceptually simple. It assumes that the vote count ratios across voting units, e.g. counties, districts, after suitable mathematical transformation follow a standard normal distribution. See MITRE Report Figure 3 below.



The shape of the Georgia distribution (blue) is decidedly unlike the normal distribution (red). There are three obvious shoulders/bumps indicating a four-component mixture. The Klimek methods assumes the data comes from a single population, each geographic unit is made up of a similar mixture of people. Here we have a mixture. Each shoulder/hump on the right of the Georgia distribution reflects a component of the mixture.

Klimek noted that voting in Canada (Figure 21 in Report, below), exhibited what looked like fraud, but then noted that the voting was a mixture of English-speaking and French-speaking regions, so fraud was dismissed. MITRE instead cited the picture as what a "fair election should look like" in their appendix – rather than the oddity it represented to the original authors requiring further explanation.

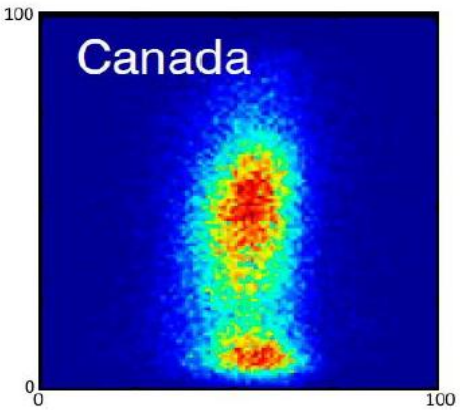
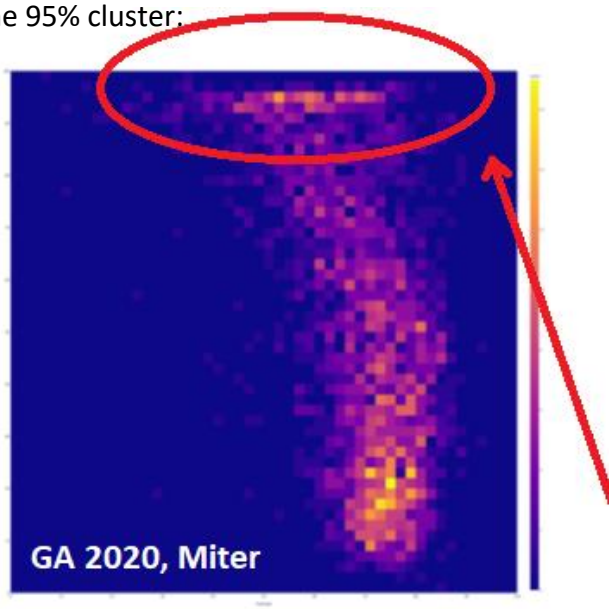


Figure 21 – Example of a Fair Election

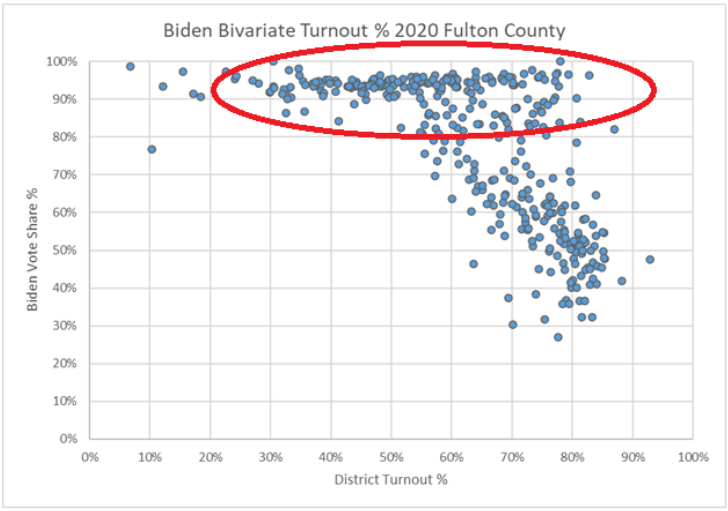
Now we apply Klimek, et al, regarding the MITRE graphs. Looking at the statewide fingerprint shown in Figure 4, we see two clusters: one is centered around 20% of votes for Biden, with 75% turnout; the other cluster is spread along a line at 95% of votes for Biden, with a center of around 60% turnout. The Figure 4 from the Report is shown below, circling the 95% cluster:

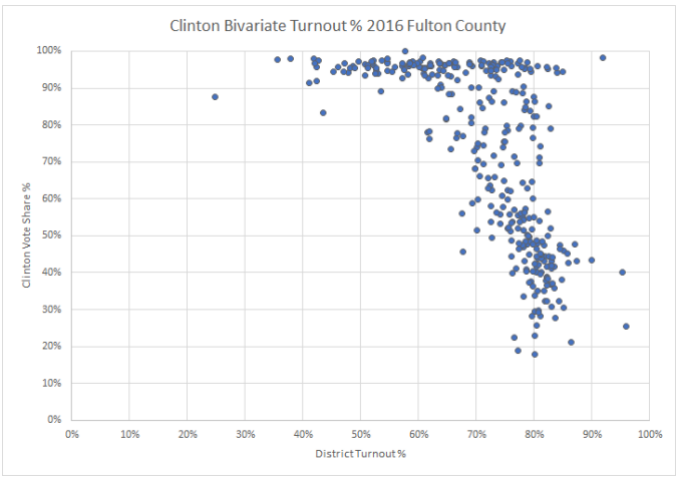


One could use the two groups to say, serious voters (75% turnout), favor Trump (80/20) and more indifferent voters (60% turnout), favor Biden (95/5). ***Now a 95%-100% vote for any candidate can be taken as prima facia evidence of election malfeasance, and is a keystone of the Klimek analysis***. Jewish Americans vote typically 80/20 Democrat/Republican. Black Americans vote typically 90/10 Dem/Rep. In 2020, the ratios are said to have moved more to Trump's favor: 70/30 and 85/15 respectively. The ratio 95/5 is a highly unusual anomaly. The MITRE Report should have noted it.

Continuing the Klimek analysis: "We investigated the cluster with the high percentage of votes for Biden and found that all of the precincts were in areas where conventional wisdom indicates there are large numbers of Democrats, thus Biden's percentage of the total vote would be high at any turnout level."

To showcase this specifically using the same method as MITRE, the missing fingerprint from their analysis is Fulton County shown below – where MITRE decided to exclude any figure and not report on any statistical analysis. Does the circled mass in Fulton County prove that fraud occurred using the fingerprint method then? As always, the devil is in the details. Those precincts, are South Fulton precincts, which demographically and historically are overwhelmingly Democratic – and can be seen in 2020. A similar odd pattern was seen in 2016 (see figure below, on the right).





Using the logic above, any level of vote irregularities in a Democratic geographic unit can be dismissed as the expected voting pattern. The Klimek test is not definitive for the question at hand so the MITRE analysis should be dismissed as unable to address the question or allegations.

Finally, the Report cited an analysis using a distribution of votes against the winner, divided by the registered voters, then normalized logarithmically. One particular grievance against this equation is the denominator – which is registered Georgia voters. Georgia passed the motor-voter law after 2016, so the denominator's magnitude is significantly inflated – and any references to regular turnout is false by definition. This is the first real data point with such a registration pool. The turnout in Georgia was incredibly higher (in raw numbers of voters) over 2016, even if the turnout as a percent of registered is unremarkable.

Moving forward, to quote the Report authors:

> "A value vi=1 occurs when exactly half of the registered voters in a precinct voted for the winner; since the logarithm of 1 is 0 ($\mathbf{ln}(1)=0$), this is the boundary between precincts where the winner of the election received votes from more than half of all registered voters $\mathbf{ln}(vi)<0$, and the precincts where the winner did not receive more than half of all registered voters $\mathbf{ln}(vi)>0$."

Then the Report shows the four moments of distribution as follows, in their Table 3:

Table 3 – Statewide Rescaled Normal Distribution

μ	0.84
σ	0.88
Skew	0.36
Kurtosis	2.69

With the lack of labels, we must carefully study if this table is ln(v) or simply "v". Careful reading suggests it is ln(v). Therefore, as correctly shown by the graph, the mean and skew are in excess of ln(v) of 0, meaning that both the mass of the tails and the distribution itself ***describe that the majority of all precincts voted against Biden by MITRE's own metrics***. How then did Biden win the state? Such superficial analysis merely scratches the surface of such a question, and provides no clear way to test or validate any statistical findings.

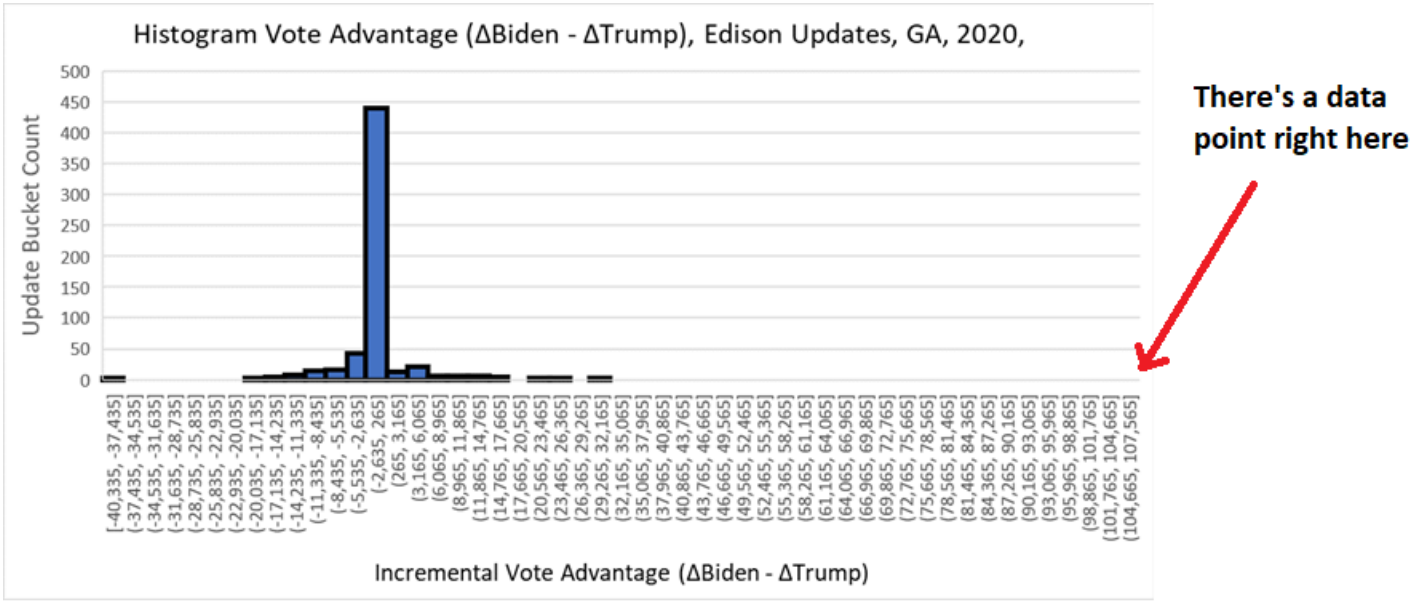
What should have been reported in Georgia

What can lead to a 95/5 ratio? A court-approved forensic examination of the specific Antrim County (Michigan) situation found that the voting machine placed well over 50% of the votes into an adjudication file. This file allocated votes (likely via an algorithm), without adequate bipartisan supervision.

The "hand recounts" that MITRE cites are alleged to be merely printouts of the post-adjudicated votes – not the originals. The Antrim forensic report was dismissed out of hand by MITRE. Any machine/computer fraud can scale, so it can be used anywhere — e.g. Georgia. To a skeptical researcher, the Antrim, Michigan results should have pointed the way to request additional forensic examinations.

Many claims of fraud in Georgia were simply not covered by the MITRE Report: out of state voters, dead voters, under-age voters, voters registered after the registration deadline, etc. The video of egregious, mid-night unsupervised ballot counting (at Fulton County, Georgia) was not mentioned in the MITRE Report.

Most egregiously, no analysis was provided on time-series data at all, which at the least begins to identify places to look to validate or dismiss any of the anomalies that were identified. As an example, they could use time series differential analysis (linear or logarithmic, both work) on public NYT Edison data (such as the below) to help identify why a mean and skew ln(v) plot in Trump's favor resulted in a Biden win. The answer may possibly lie in data points well outside the histogram such as this, seen below:



In short, the MITRE Report applied the Klimek method where it is obviously inappropriate — which we confirmed by careful reading of Klimek, et al. Additionally, the logarithmic histograms are not easily parsed at best, as well as suggesting the opposite of what is claimed. In general, the MITRE Report was superficial in that it did not cover the many known problematic aspects of the 2020 presidential election.

— Chapter 4 —

Critique of Report Section 2.3: Alleged Irregularities in Dominion Machines

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

The Report begins their counter to the multiple assertions against Dominion, by saying that "no evidence has been provided to national media outlets". It is useful to pause and consider that such a reply is egregiously sophomoric, as the media is ***not*** the arbitrator for evidence-based decision-making (and note that Dominion has been threatening large media outlets for even mentioning irregularities and evidence such as the Antrim County [Michigan] report.) The authors of this section engage in a logical fallacy by using an *appeal to authority*, while explicitly choosing to not investigate actual primary data sources of allegations – namely thousands of affidavits; including eye-witness testimonies, confessions, videos, forensic audits, judicial hearings, and court proceedings. Statistics are precursors to look for evidence, and are of little relevance when appearing after actual court evidence is available from investigation.

Citing sources of allegations from "social media" and served up "media outlets" is by far the most outrageous part of the MITRE Report. An academic journal would instantly reject this review with such willful ignorance outright, as would an undergraduate professor in an entry level course. Yet the section will be given credence because it satisfies a selection bias to feed a narrative. So be it, we will rebuke.

We respond first to the flawed premise the statistical analysis is based upon, and follow up with an acknowledgement of the real source of allegations – actual evidence. In actual allegations from real primary sources, the claims are not against just Dominion, but all computerized voting machines in the system. This alone already undercuts the assumption from the analytical results presented.

Statistical Analysis

The MITRE analysis is fundamentally flawed because it centers around **subtracting percentages that were based on a different number of votes**. This is an elementary fatal flaw which would be caught by any external reviews of mathematical rigor. A second major flaw is the lack of citing omitted variables. **Omitted variables bias is a central issue in the social sciences**. These controls are vital because areas that tend to vote for Biden differ in many ways from those that vote for Trump and are less likely to have Dominion machines. The MITRE Report authors do not even mention the presence of omitted variables or endogeneity, which implies that their team either lacks the technical know-how or is intentionally deceiving readers

To be complete, we begin our analysis with the cross-sectional evidence and present two diagnostics. First, using 3,108 counties, we regress the Biden to Trump vote margin on an indicator for whether the county has Dominion, controlling for county demographics, including: population, median household income, the share that are male, the age distribution (under age 5, age 5-9, 10-14, etc., 85+), the share that are White, the share that Black, the share that are married, and the education distribution. This produces a coefficient of 2.68 (p-value = 0.001). (Importantly, this same analysis, when failing to control for demographic differences produces a coefficient of -3 (p-value = 0.169). MITRE omitted many important variables.)

> Note: These p-values are integral for making statistical claims with any degree of confidence. For example, a p-value under 0.05 effectively means that, if you were to resample the same specification 100 times, 95% of the time you would obtain a result that is within the previously obtained number. Best practices in social sciences are that p-values above 0.10 imply that the estimated coefficient is **not** statistically significant.

Second, to examine whether our results are driven by states that are not in contest, we restrict our sample to the set of battleground states (AZ, MI, WI, PA, GA, NV). We found an even higher coefficient on the Dominion indicator of 6.08 (p-value = 0.007). Moreover, these results are qualitatively similar even if we include larger counties more (e.g., weighting by population). This produces a coefficient of 3.92 (p-value = 0.092).

We then replicate the Report's analysis as closely as we can based on their description. In particular, we collect Democratic votes for 2016 and 2020 at the county-level. We subsequently regress the growth in these votes between 2016 and 2020 on an indicator for whether the county in 2020 has Dominion, controlling for the usual demographic characteristics. We find a coefficient of 0.025 (p-value = 0.037) on the Dominion indicator, implying that **counties that have Dominion experienced a 2.5 percentage point increase in Democratic votes, relative to their counterparts**. Moreover, that coefficient is obtained from regressions on the restricted sample of battleground states. (However, if we do not control for demographics, then we obtain a coefficient of -0.0019 (p-value = 0.86). No political scientist would ever ignore a demographics control or similar confounding factors, so why did MITRE?)

In light of our results that there is an economically and statistically significant difference in votes for Biden for the counties with Dominion machines, we now comment on a misleading presentation of the Report's results in Table 7. There, they calculate the overall average, rather than the change between 2016 and 2020, in votes for a given county. That approach is not only inconsistent with their presentation of within-county changes in their following plots, but also overlooks the fact that there is a great deal of **composition effects across counties that they are failing to control for** when they average across all counties to produce the national average. They also provide no discussion of the weighting approach. These are not mere details: we have just shown that controlling for demographic characteristics is important and that failure to do so produces statistically insignificant results.

We have far more analysis on this topic – but in the interest of brevity and addressing the actual allegations via real evidence we move forward.

Acknowledgement of Evidence

This part of the rebuttal is, like the statistical section, cut down significantly for brevity. Expansion of the full response is available, and all affidavits are available in public court dockets – of which there are *thousands*, but we'll keep it to the machines specifically for this particular section.

In the 2020 General Election, forensic, statistical and affidavit-based evidence demonstrate all three sources of vulnerabilities were accessed by unknown actors, machine programming errors were introduced from sources unknown, and network security vulnerabilities exploited by sources domestic and foreign. In short, there were widespread problems of machine-altered results across multiple voting company's platforms.

While citing Dominion to explain the basics of machine vote manipulations, it must be recognized that **ES&S, Hart, Smartmatic and others face similar problems and are equally compromised**. They all share a common GEMS–based software core that allows, among other things, for algorithms to distribute votes resulting in fractionalized voting as opposed to simply counting whole votes. This opens the door to enormous capabilities to shift votes using various programmed algorithms by either inside or outside threat actors. And the Dominion logs from the already cited ASOG Antrim MI forensic investigation shows such an algorithm was turned on.

The adjudication rates found by the same Antrim investigation showed *enormous rate of errors* (68%) generated by the machines, allegedly by "human error" but clearly intrinsic to the machine software. In Georgia, the Secretary of State Brad Raffensperger was forced to admit during a Georgia Senate election hearing on December 30, 2020 that of 137,134 ballots, 132,272 (96.45%) of them had to be adjudicated. At the same hearing, Kathy Latham (a Republican County chair), testified that "election officials discovered that ballots could be altered during the adjudication process." Latham added that: "officials couldn't see from their end who had adjudicated which ballots".

This confirms that the problems uncovered in Antrim (Michigan) also existed in Georgia, where massive numbers of ballots were sent to adjudication from whence unknown operators voted them as they pleased. As elsewhere all over the country, strenuous efforts have been made to keep truly independent teams from doing forensics and paper ballot examinations as exemplified by Fulton Co., Ga. and **Maricopa Co., Az. where Legislative subpoenas** have been issued to the counties to accomplish such and the counties have resorted to the courts to stop them. The AZ subpoenas have roots in the countless eye-witness affidavits filed in the state.

In Texas, based on a tip from cyber experts who examined and were alarmed by the Dallas County central server logs from the 2018 election, in 2020 cyber experts from Openrecords.org captured a computer hack (they believe there were at least 3 hacks) in real time in the Dallas General Election. They did it by capturing the daily downloads of the Daily Vote Roster posted by Dallas County that uses ES&S equipment, managed by Barcelona-based Scytl and tied into Clarity Elections/Scytl election reporting network (Dominion, Smartmatic and Hart are also tied into Clarity Elections/Scytl). The Open Records people had a simple methodology that proved beyond any doubt that a massive computer hack(s) with vote tampering took place in Dallas.

Between October 6th and October 30th, Open Records saw the county actually purge 56,974 votes (absentee and early voting in-person) after they were cast and then create 50,529 new votes using previously purged state voter id numbers. In one case, 10 full blocks of a street in Highland Park had their votes purged and then selectively replaced at random over the following days. Overall 5,690 votes with state voter id numbers were purged and never re-appeared.

Cybersecurity evidence is filed in SCOTUS dockets on the vulnerabilities inherent in these machines, showing that Edison Research used an unencrypted VPN and that their platform was accessed by foreign adversaries, namely the Chinese Communist Party (CCP) and Iran. The statistical evidence is also corroborated by whistleblowers, including Eric Coomer who unintentionally admitted on video rigging the election for Biden – perhaps the catalyst for getting Dominion more attention above the other platforms.

This goes on and on, yet the MITRE authors cited "social media" as the source of machine voting allegations. Perhaps this decision was reinforced by their cited media outlets claiming no evidence has been supplied due to the lawsuits dismissed, yet we have data showing that is also a myth.

Ultimately, any efforts to use data analysis to improve the transparency or integrity of elections should at the very basic level address and investigate the primary sources of the allegations – especially if they are rooted in thousands of fellow countrymen risking perjury charges in courts of law. Such a source carries far more weight than scanning tweets.

— Chapter 5 —

Critique of Report Section 2.4: Voting Anomaly in Michigan

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

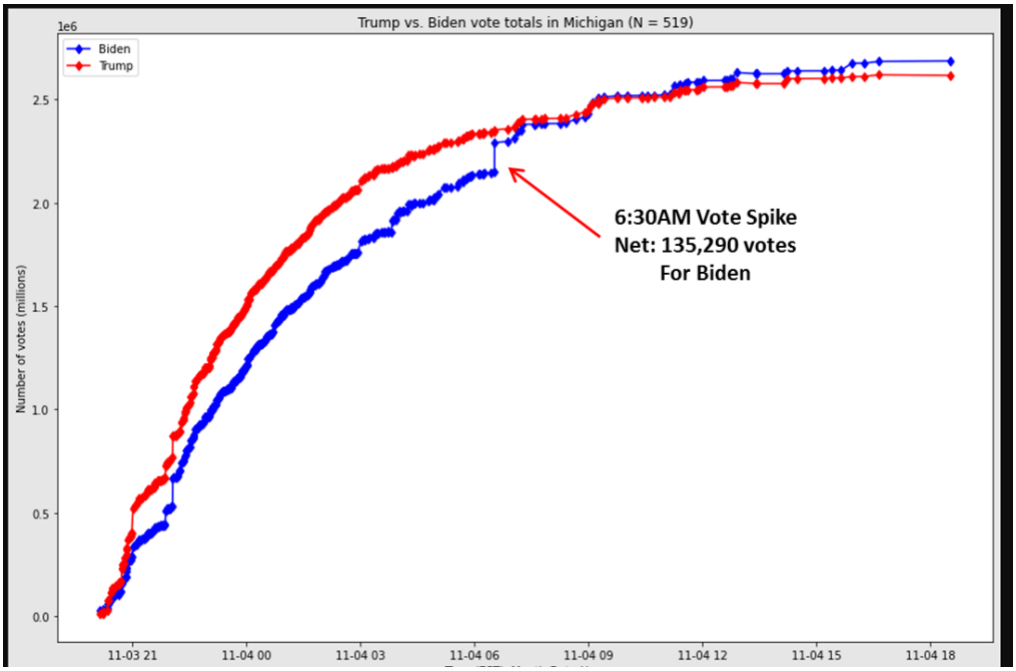
MITRE Report 2.4.1:
On the morning after the election, a SQUINT™ report described allegations that more than 100,000 votes had been fraudulently dumped for Biden in Michigan in the middle of the night. The Bald Eagle team downloaded preliminary results from the Michigan Secretary of State's website and determined Antrim County was an outlier. After investigating Antrim County in Michigan for data anomalies that created temporary unusual increases in votes for Mr. Biden, the team found that the issues were caused by user error, which was discovered and corrected quickly and did not have an impact on the official election results.

Comments:
The vote spike of 133,339 for Biden observed by social media users at 5:04 AM EST on November 4, 2020 was **not** related to Antrim County, Michigan therefore the analysis related to **Antrim County's election tabulation error is irrelevant** (though it is considered relevant for other reasons: see below).

A team of experts that analyzed the Michigan election results could not find this alleged spike in the time-series data reported by Edison Research. To be clear, social media and mainstream media reports of this vote spike were not based on the actual election data. It is almost certain that Decision Desk made a transcription error in its Twitter post and blamed the error on Michigan election officials. Michigan Secretary of State Jocelyn Benson **did not confirm the alleged error**, **or the alleged correction**.

In summary, the MITRE team appears to have relied upon a media report from *Politifact* to support the analysis that the vote spike existed, was the fault of Michigan election officials, and was subsequently fixed. None of those points are supported by the evidence. (Based on our personal experience with *Politifact*, they are a political agenda-promoting source disguised as a fact-checker.)

Then there was this major Michigan spike that the MITRE Report inexplicably did **not** address:



That was **a vote spike of 149,772** votes that occurred on November 4, 2020 at 6:30 AM EST. Biden received an abnormally high 94% of the votes (141,258) while Trump received just 4% (5,968), for a net gain of 135,290 votes for Biden. This result is clearly anomalous and that particular vote spike was never corrected and remained as part of the official election results.

The MITRE Report's conclusion on page 25 that vote spikes didn't impact the outcome is based on an event that didn't occur, but worse yet, **ignores eight (8) other instances of vote spikes of over 100,000 votes in the battleground states** (see red items in following table, and go here for full report).

STATE	BIDEN VOTES ADDED	TRUMP VOTES ADDED	BIDEN NET VOTE DUMPS	TIME (Local)
Arizona	363,014	254,499	108,515	(Nov 3) 8:05 PM
	798,568	655,467	143,101	(Nov 3) 8:06 PM
Florida	369,751	247,008	122,743	(Nov 3) 7:28 AM
	435,219	243,092	192,127	(Nov 3) 7:32 AM
	367,539	227,312	140,227	(Nov 3) 7:38 AM
Georgia	162,133	42,322	119,811	(Nov 4) 1:32 AM
Michigan	141,258	5,968	135,290	(Nov 4) 6:31 AM
Pennsylvania	70,565	4,218	66,347	(Nov 3) 8:15 PM
	73,945	8,543	65,402	(Nov 3) 8:26 PM
	88,865	23,713	65,152	(Nov 3) 8:38 PM
	62,445	1,159	61,286	(Nov 4) 9:16 AM
Wisconsin	38,989	14,004	24,985	(Nov 3) 9:27 PM
	143,379	25,163	118,216	(Nov 4) 3:42 AM

Although the MITRE team performed numerous analyses regarding voting patterns in Antrim County, Michigan (and correctly found that there were not enough votes in the county to account for the fictional data spike), the Report **did not address the serious allegations of voting system errors found in a forensic investigation**. The forensic investigation found that 10,667 of 15,676 ballots (68%) could not be automatically tabulated by the election system and required adjudication.

The investigators stated that ballots sent to adjudication "can be altered by administrators…with no audit trail of which administrator actually adjudicates (i.e. votes) the ballot batch. This demonstrated a significant and fatal error in security and election integrity because it provides no meaningful observation of the adjudication process or audit trail of which administrator actually adjudicated the ballots."

In summary, MITREs analysis of Michigan voting irregularities is misinformed and woefully incomplete as it does not address the key issues. Worse yet, the Report's **conclusion that vote spikes didn't impact the outcome of the election was based on an event that didn't happen**.

Rewrite Suggestions

The main suggestion is that the authors investigate not only the eight other vote spikes of over 100,000 in the battleground states, but also examine the multitude of anomalous vote spikes that occurred in non-battleground states.

— Chapter 6 —

Critique of Report Section 2.5: Butler County (PA) Lost Ballots

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

MITRE Summary: "…the mail-in ballot return rate for Butler County, PA was significantly lower than the other counties in Pennsylvania. This can be partially explained by a computer glitch…The team conducted iterative and daily analysis of the return rates, and although many requested mail-in ballots were lost in Butler County, PA, the overall return rate of ballots leading up to Election Day fell in the expected range of all other counties in Pennsylvania. No evidence of nefarious or fraudulent activities was identified."

Rebuttal: The MITRE Report conclusions that there was no evidence of nefarious activities and that Butler County fell within the range of all other Pennsylvania County is incorrect. The late ballot issue was caused by human "error," not a computer glitch, according to government officials. Butler County Commissioner Leslie Osche stated the opposite (my ***emphasis*** added):

> *"…someone at the state level **entered the wrong information** into the SURE system last Thursday [October 8], changing the ballot status for voters across Pennsylvania. It tells you that your ballot was mailed back in mid or early September before we even had a certified ballot…there was a challenge with the Green party and until that challenge was resolved in the courts, we couldn't even print ballots…**the issue is widespread."***

In the Report, page 24, Butler County (orange dot) was identified as an outlier or in the first quartile (17 counties) in 7 of the 9 box and whisker plots. On Election Day, Butler County was among those counties in the first quartile or otherwise at the lower end of counties that returned mail-in ballots.

The MITRE Report did not identify the other outlier counties, nor did it identify the counties that were in the lower (first) quartile. A closer examination of the lower quartile and outliers (in yellow, below) reveals that all of the outliers (except Bucks County and Montgomery County) are counties that Trump won easily in 2016. Republican Counties also consistently dominate the lower quartile.

16-Oct	Pct. Return	23-Oct	Pct. Return	28-Oct	Pct. Return	30-Oct	Pct. Return	31-Oct	Pct. Return	1-Nov	Pct. Return	3-Nov	Pct. Return
WESTMORELAND	6.80%	ERIE	48.40%	WESTMORELAND	63.70%	FRANKLIN	66.90%	WESTMORELAND	73.04%	LYCOMING	74.00%	BUCKS	79.30%
LEHIGH	6.50%	CENTRE	47.00%	MONTGOMERY	63.40%	LEHIGH	66.50%	POTTER	72.67%	MERCER	73.90%	CLINTON	79.20%
MERCER	5.60%	WESTMORELAND	45.90%	HUNTINGDON	63.20%	PHILADELPHIA	66.40%	FRANKLIN	72.60%	YORK	73.80%	PHILADELPHIA	79.20%
CENTRE	2.90%	FULTON	43.40%	NORTHUMBERLAND	62.30%	LEBANON	66.00%	ERIE	72.30%	BUCKS	73.50%	WESTMORELAND	79.20%
BUTLER	2.80%	YORK	39.90%	FULTON	61.30%	ARMSTRONG	65.90%	CAMBRIA	71.81%	CLINTON	73.20%	YORK	79.00%
NORTHUMBERLAND	2.60%	FAYETTE	37.20%	LEBANON	60.80%	COLUMBIA	65.90%	WASHINGTON	71.12%	ARMSTRONG	73.00%	NORTHUMBERLAND	78.80%
CAMERON	2.20%	LEHIGH	37.10%	MONROE	58.40%	PERRY	65.40%	CUMBERLAND	70.96%	BERKS	72.80%	ARMSTRONG	78.70%
YORK	1.90%	DELAWARE	36.90%	PERRY	57.60%	NORTHUMBERLAND	65.00%	BLAIR	70.68%	PERRY	72.60%	LYCOMING	78.40%
FULTON	1.80%	MONTGOMERY	36.00%	ARMSTRONG	57.30%	FULTON	64.10%	CLARION	70.36%	FULTON	72.40%	BUTLER	77.70%
MONROE	1.80%	MONROE	35.70%	LUZERNE	55.00%	LUZERNE	63.60%	CAMERON	69.82%	WESTMORELAND	72.10%	FULTON	77.40%
PERRY	1.70%	PERRY	35.40%	LEHIGH	54.90%	MONROE	62.90%	BRADFORD	69.27%	NORTHUMBERLAND	71.80%	LUZERNE	76.60%
DELAWARE	1.50%	ARMSTRONG	29.80%	YORK	54.80%	DELAWARE	62.10%	MIFFLIN	68.82%	LUZERNE	71.40%	MERCER	76.50%
MONTGOMERY	1.00%	LEBANON	29.60%	SCHUYLKILL	53.80%	YORK	60.50%	DELAWARE	68.79%	MONROE	70.80%	MIFFLIN	76.20%
ARMSTRONG	0.70%	LUZERNE	29.20%	BUCKS	52.00%	SCHUYLKILL	60.20%	YORK	67.16%	SCHUYLKILL	69.30%	DELAWARE	73.10%
BUCKS	0.60%	SCHUYLKILL	28.10%	DELAWARE	51.50%	BUCKS	59.70%	SOMERSET	66.63%	DELAWARE	67.30%	BERKS	72.90%
LUZERNE	0.30%	BUCKS	19.60%	FAYETTE	49.60%	FAYETTE	56.70%	VENANGO	62.68%	BUTLER	66.40%	SCHUYLKILL	71.80%
CLARION	0.00%	BUTLER	15.70%	BUTLER	24.20%	BUTLER	24.50%	WARREN	46.57%	FAYETTE	65.00%	FAYETTE	71.70%

Return rates by political party (by Election Day) show that Democrat return rates were approximately 10% higher than Republicans. **That translates to approximately 78,800 votes in a state that was decided by 80,555 votes.**

While this evidence doesn't prove something nefarious took place, it adds to other evidence and numerical coincidences that raise serious questions about the integrity of mail-in voting in Pennsylvania.

For example, we compared Trump's Election Day performance to his mail-in vote performance with his GOP associates in statewide races. One would reasonably expect that GOP voters would vote in similar patterns in-person as they would by mail. Interestingly, that was not the case – by 64,500± votes — to a not very well-known Auditor General candidate, Timothy DeFoor.

GOP Cohort	President	Attorney General	Auditor General	Treasurer	Margin
Election Day 2020	2,731,230	2,530,207	2,626,111	2,603,048	105,119
Mail In Votes 2020	595,538	574,052	660,030	636,780	-64,492

This pattern cannot be explained by chance. Our analysis of the time series data confirmed that 64,492 votes were removed from Trump, laundered through the "Third Party," and then eventually moved to Biden.

VOTE SWITCHING DETAILS							
	Trump to Biden	Trump to Third	Biden to Third	Biden to Trump	Adjudicated Votes	Third to Biden	Third to Trump
Prior to 3AM	-17,877	-2,141	-9,675	-2481	49,623	26,835	24,871
After 3AM	-13,820	-62,352	-19,694	0	110,363	176,626	5,284
Total	-31,697	-64,492	-29,369	-2,481	159,986	203,461	30,155

After performing computations of the puts and takes, Biden's net gain from vote switching was 203,508 votes and Trump's net loss was 63,553 votes. Obviously, Biden received votes from other sources and those sources most definitely included write-in votes. Interestingly, there was an inexplicably low number of write-in votes cast in the 2020 election (7,672), and only 452 of them were by mail-in ballot.

Our review of the official election results found that absentee write-in votes were counted in just 9 of 67 counties -- Adams, Allegheny, Chester, Clearfield, Delaware, Lancaster, Lebanon, Montour, Northampton, and Westmoreland counties. Philadelphia County is conspicuously absent from this list.

We agree with the MITRE Report that "…there were an unknown number of mail-in ballots lost." This admission of an "unknown number of "lost ballots" is a serious indictment in the way mail-in voting was conducted in Pennsylvania and other states, **with no chain of custody on the ballots**. Tens of thousands of ballots for Trump and other candidates could have easily been destroyed with no direct way of determining that it ever occurred. In addition, the lack of meaningful observation of ballot adjudication also could have resulted in "lost" votes – or more correctly – switched votes.

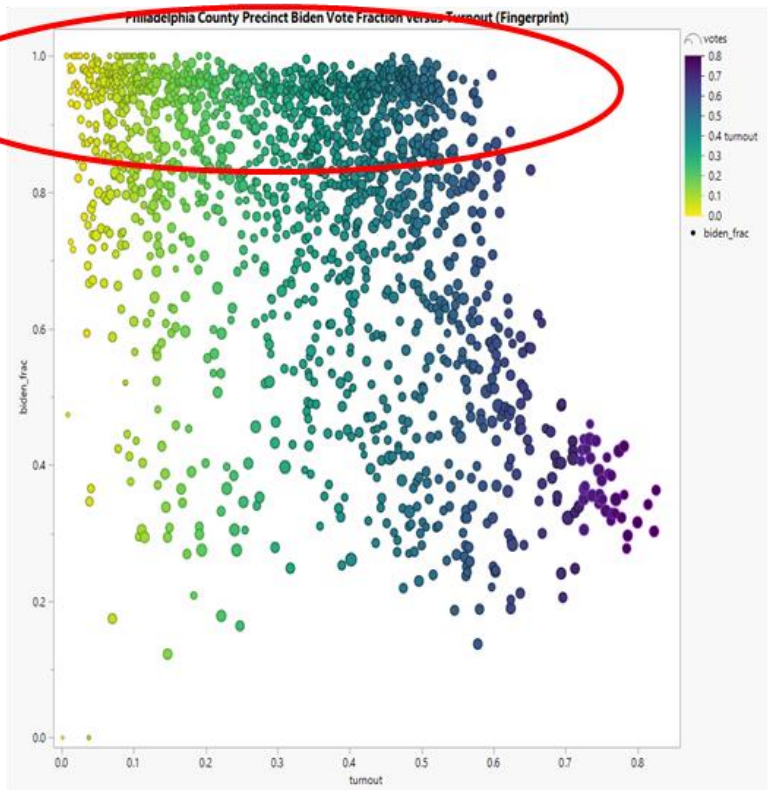
The plot on the next page provides statistical evidence that something along these lines happened in Philadelphia County, Pennsylvania.

Each point in this plot is a Philadelphia County precinct with its size proportional to the total number of votes, and its color scale by reported voter turnout. The y-axis is the fraction of votes reported for Biden and the x-axis is the fraction of registered Democrats in that precinct. The circled points along the top are precincts exhibiting a disproportionally high fraction for Biden compared to what is expected based on voter registration.

Republican and moderate low turnout areas go 95-100% Biden?!?

Heavy Democratic areas vote heavy Democrat

Clustering at 95-100%: strong evidence of fraud (Klimek)



A rough estimate for the number of **votes transferred to Biden from this analysis is 115,000**. This was computed by fitting a spline to only the main cluster of data below the 45-degree line, predicting what the Biden fraction should have been in the suspicious points in the upper and left part of the graph, and then taking the difference in predicted votes for Biden from what was actually reported.

To connect this back to those from Chapter 2, here is the same data shown as fingerprint graph, changing the x-axis from fraction of registered democrats to turnout fraction.

This is an actual example where the Klimek analysis should apply. The numerous points showing 95-100% indicate fraud.

— Chapter 7 —

Critique of Report Appendices B.1 & B.2: Duplicate Votes & Elapsed Time to Send Ballots

Ref MITRE Report # MP210086: *Data Analytics to Enhance Election Transparency* (February 2021)

Appendix B Analysis:
This analysis concerns: (1) double voting in Georgia, and (2) the elapsed time to send out mail-in ballots. We find the basic analysis of double voting in Georgia accurate, although not well sourced. We also find the minimal analysis of main-in ballot response plausible, although not sourced.

On the other hand, it is felt that the Report's lack of analysis of related issues suggested by the Report's data, is disappointing. In particular, the Report's data suggests that further analysis of "advanced voting sites" (AVS) (also known as early in-person voting), is warranted. A cursory analysis reveals that majority Democratic counties enjoyed a multiple (X) to 1 ratio in AV site-days per county, and a different multiple (Y) to 1 ratio when excluding the mandatory election office advanced voting site. Further analysis suggests these extreme inequities were created using substantial amounts of money from CTCL funded Mark Zuckerberg.

Appendix B.1 Coverage of Double Voting:
The first section of Appendix B concerns double voting as shown in Table 9 of the Report. The section's main claim that "In the Georgia data, we detected a total of seventeen voters who appeared to have multiple ballots accepted" does not seem to be referenced. Further, the sources that the Report does reference in this Appendix include media commentary — not conclusions from independent parties doing a thorough and objective investigation (e.g. #34 is a *Time* news story). While it would be reassuring to believe that this extraordinarily low number is accurate, the results from other independent investigations — that did not rely on election officials for data — makes it extremely unlikely to be even remotely accurate.

For example, consider the public sworn testimony of attorney Jesse Binnall about the independent investigation done in Nevada, following the 2020 elections. He states (under oath):

> "Over 42,000 people voted more than once. Our experts were able to make this determination by reviewing the list of actual voters and comparing it to other voters with the same name, address, and date of birth. This method was also able to catch people using different first name variations, such as William and Bill, and individuals who were registered both under a married name and a maiden name."

Note 1: When a true forensic examination is done (as with Binnall's team), they do **not** rely on state election officials to give them data of voting irregularities. As stated above, they get data *independently*. It would seem to be obvious that state election officials have a vested interest in claiming that there is no consequential malfeasance, as otherwise it would directly reflect on them and their job performance.

Note 2: Nevada has 2.0± million registered voters, while Georgia has 7.6± million. If there were the same percentage of people in Georgia that voted twice (as apparently did in Nevada), that would amount to 150,000± people who voted more than once in Georgia. Clearly, saying that there are only 17 strains credulity.

Note 3: The official Georgia election count says that Biden narrowly defeated Trump, by about 12,500 votes.

Note 4: That the Report spent 2+ pages on discussing 17 duplicate Georgia votes, is quite telling.

Appendix B.2 Coverage of Time to Send Mail-In Ballots

Appendix B.2 is a hefty two paragraphs that analyzes the elapsed time to send out mail-in ballots by local Georgia election bureaus. This section suffers from the same deficiency as the prior, as it also fails to provide a documented source, or a method to duplicate the alleged results.

As we stated above, when a true **objective** examination is done, researchers do **not** rely on state election officials to give them election process data — they get such data *independently*. It would seem to be intuitively obvious that state election officials have a vested interest in claiming that they are responsive to voter requests for absentee ballots, as otherwise it would directly reflect on them and their job performance.

With that said, it is pleasing to find that the claimed time to send out mail-in ballots was only roughly 1.9 days. Of course, this short time (which clerks should strive to achieve), generally helps mail-in voters who broke roughly 3 to 1 for President Biden (see here). On the other hand, we submit (aka conjecture without proof) that no matter how soon tax bills (for example) are sent out, roughly 6% will be returned after the deadline because procrastination is a common human trait.

— Chapter 8 —

Critique of Report Appendix C: Benford's Law and Elections

Ref MITRE Report # MP210086: Data Analytics to Enhance Election Transparency (February 2021)

We have decades of experience in the theory and application of Benford's law, and don't have any major disagreement with the Report's comments on Benford's law application to elections.

Benford's law has been used to indicate the possible presence of fraud in many cases, and these indications then lead to more detailed analysis being performed. Before using a test based on Benford's law, however, one must first justify the assumption that the output should be Benford. There is extensive literature on why first digit tests to Benford's law are not valid for election data, though second digit tests may be. We discuss these and other issues below, as well as a new test, looking at the data in base 3 instead of base 10.

The advantage of switching to base 3 is that the data is spread over many more orders of magnitude (a factor of 81 is not even two orders of magnitude base 10, but corresponds to 10000 base 3). We looked at some statewide and some precinct level data from the 2020 presidential election. A preliminary analysis using base 3 showed good fits to Benford. A more detailed analysis, as well as theoretical analysis of both base 3 and other metrics to replace the standard chi-square tests, are planned for Summer '21.

Benford's Law is a mathematical result that describes many data sets and is often used to detect if a data set has been modified. As there has been a lot of mixed discussion on the internet as to whether or not Benford's law is applicable to detect possible fraud in the 2020 election, we analyzed some of the data. **The standard base 10 test, as well as a new base 3 test of Benford's Law, do not appear to have the ability to identify fraud in the 2020 election results for the states, counties, and precincts that we examined.**

Benford's law (originally conjectured by Newcomb) states there is a tendency in many data sets to have more numbers with low rather than high leading digit (the leading digit of 2020 is 2, of .0341 is 3). Specifically

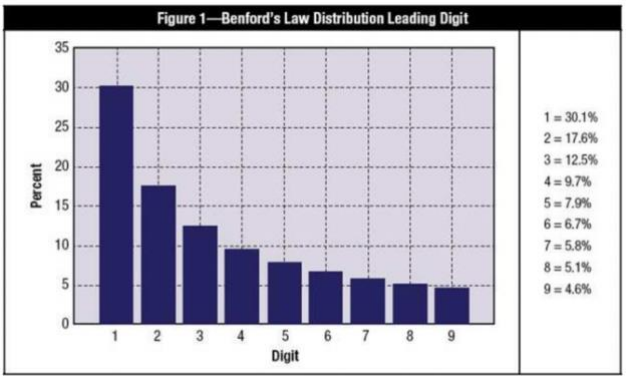
$$\text{Prob(First digit is d)} = \log\left(1+\frac{1}{d}\right), \text{ and } \text{Prob(Second digit is d)} = \sum_{k=1}^{9}\log\left(1+\frac{1}{10k+d}\right),$$

The table below gives the probability of a first or second digit being d base 10; it is possible to adjust these formulas for other bases. For example,

$$\text{Prob(First digit is d base B)} = \log\left(1+\frac{1}{d}\right) / \log(B).$$

d	Probability first digit d	Probability second digit d
0		0.1197
1	0.3010	0.1139
2	0.1761	0.1088
3	0.1249	0.1043
4	0.0969	0.1003
5	0.0792	0.0967
6	0.0669	0.0934
7	0.0580	0.0904
8	0.0512	0.0876
9	0.0458	0.0850

Table 1.1 Newcomb's conjecture for the probabilities of observing a first digit of d or a second digit of d; all probabilities are reported to four decimal digits.



Not all data sets should follow Benford's law; for example, if most of the precincts have approximately the same population and each candidate's support is the same in each precinct, there will be a clustering of leading digits. One solution is to look at second digits. Our ***new approach*** is to write the number of votes in base 3 instead of base 10; the advantage of this is that our numbers are now spread out over several more magnitudes (81 is a two-digit number in base 10, but in base 3 it is 10000_3, five digits, and this spreads out clumped data).

Our goal was to look at a variety of statistics and the results of the two major candidate (Biden and Trump) in several settings. This was done to see if it is reasonable to expect Benford's law to hold, and if so if the data in Pennsylvania follows Benford's law. In the table below the number in parentheses by the candidate indicates the base used for the comparison. Below the data by county (or whatever the grouping is called). The higher the chi-square value, the further the observed distribution is from Benford's law.

(----------QUICK DIGRESSION ON CHI-SQUARE VALUES----------)

When we test to see if data follows Benford's law, it is important that we have something better than 'it looks like a good fit' and 'it looks like a bad fit'. A common test is to compute the chi-square statistic, and compare it to the 95% and 99% values. If E(d) is the expected number that have a first digit of d base B, and O(d) is the observed number, then the chi-square statistic is

$$\sum_{d=1}^{B} \frac{(O(i) - E(i))^2}{E(i)}.$$

If we work base B=10 then as we have 9 digits and the probabilities sum to 1, we only have 8 degrees of freedom (the probability of the last digit is forced from the other 8, and zero is never a first digit). If the digit distribution is drawn from Benford's law, then 95% of the time we should have a chisquare value of 15.5 or less, and 99% of the time it should be 20.1 or less. To put it another way, if your data follows Benford's law and you observe a value greater than 20.1, there is only a 1% chance of that happening *given that your data is Benford;* if you observe values larger than 20.1 the probability falls rapidly.

(----------END OF QUICK DIGRESSION ON CHI-SQUARE VALUES----------)

Below are the results for several states; similar results were found at the county and precinct level.

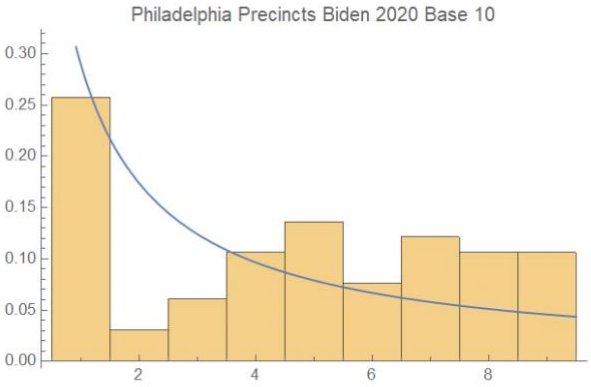
Locale	# Points	Biden (10) chi-square	Biden (3) chi-square	Trump (10) chi-square	Trump (3) chi-square
PA in person	67	9.3	2.1	12.0	0.3
PA mail	67	15.7	3.8	12.9	1.2
Texas	254	4.5	0.4	4.6	0.2
Arkansas	75	9.5	0.1	15.9	2.3
California	58	12.5	0.0	10.6	3.2
Georgia	159	13.1	1.2	10.4	0
Illinois	102	4.4	1.1	13	10.9
Indiana	92	16.8	0.7	15	0.4
Kentucky	120	7.5	1.4	21.8	0.3
Michigan	83	10.5	0.3	9.1	1.1
Minnesota	87	6.2	0	10.8	0.2
North Carolina	87	10.8	0.2	9.8	1.5
South Carolina	65	10.9	5.1	18.2	0.1
Wisconsin	72	11.4	0.4	4.4	4.2
95%		15.5	3.8	15.5	3.8
99%		20.1	6.6	20.1	6.6

Our data was drawn from not just PA but also several battleground states, as well as a few uncontested states. The data is, for the most part, consistent with Benford's law. The first digits base 10 typically had values below the 95% threshold. As expected, the fit to Benford was better when we shifted to base 3, as there the data covers more orders of magnitude.

The analysis supports election data is consistent with Benford at this scale; however, if a party were to modify only a few precincts, that would not be detectable by such analysis. Additionally, if a small fixed number of votes were added across precincts, that also would not be detected (as it would almost surely not change the first two digits).

There was only one place above the 95% threshold for both the base 10 and base 3 test: the Biden PA mail in vote, but the two chi-square values are below the 99% cutoff threshold. The largest chi-square base 10 was Trump in Kentucky, the largest base 3 was Trump in Illinois. We have similar data at the precinct level for many of these states, indicating similar behavior (though the clustering effects are a bit stronger base in 0).

For example, below are data for Philadelphia. Note that before one uses Benford's law one must prove that Benford's law is applicable. As remarked by many, there is good reason to believe data at the precinct level should not follow Benford's law. If most precincts are between 1000 and 2000 people and between 70% and 80% of the people vote and one candidate gets between 75% and 85% of the vote, then their vote totals range from 525 to 1360, never having a first digit of 2, 3, or 4 (among other issues). To deal with such issues, people often look at the second digits, or our new trick is to look at the totals base three (base 10 there is barely a factor of 2 between the low and the high, while base 3 it is almost a full order of magnitude).



Data for Philadelphia Precincts Biden 2020 Base 10

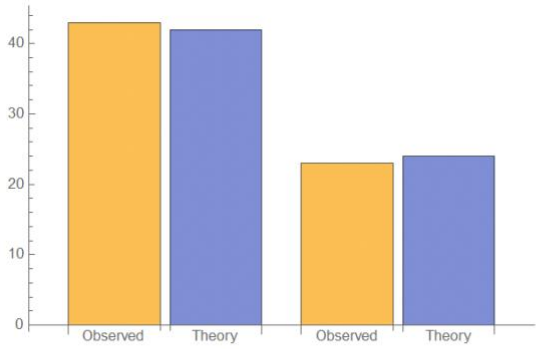
Chisquare first digit: 27.1094. Chisquare second digit: 6.81388.

Chisquare thresholds (8 degrees of freedom): 15.5 (95%), 20.1 (99%)

Chisquare thresholds (9 degrees of freedom): 16.9 (95%), 21.7 (99%)

First digit test fails Benford at the 99% level.

Second digit test passes at the 95% confidence level.



Data for Philadelphia Precincts Biden 2020 Base 3

Chisquare first digit: 0.120108. Chisquare second digit: 1.57438.

Chisquare thresholds (1 degrees of freedom): 3.84 (95%), 6.63 (99%)

Chisquare thresholds (2 degrees of freedom): 5.99 (95%), 9.21 (99%)

First digit test passes at the 95% confidence level.

Second digit test passes at the 95% confidence level.

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6. S. J. Miller (editor): Theory and Applications of Benford's Law Princeton University Press, 2015.
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— Chapter 9 —

Conclusions about the MITRE Report

The MITRE Report is an incomplete, uninformed, and flawed analysis of the 2020 Presidential election. While various experts identified and quantified nearly thirty categories of 2020 election irregularities (e.g. here), the MITRE Report discussed only five. As such, it is clearly deficient. How could any serious analysis about election malfeasance, not address that nearly 4 million votes were deleted from the system during the 2020 election (see here and table to right)?

Negative Votes	Trump	Biden	Total
USA	-1,352,912	-2,643,604	-3,996,516
AZ	-4,763	-15,754	-20,517
FL	-28,430	-126,129	-154,559
GA	-33,372	0	-33,372
MI	-36,465	-46,284	-82,749
NV	0	-2,343	-2,343
NY	-130,292	-566,779	-697,072
PA	-420,530	-677,736	-1,098,266
VA	-169,818	-694,859	-864,677
WI	-5,286	-18,757	-24,043

Our review of MITRE's statistical analyses found some instances of correct application, but in those cases the conclusions were incorrect and/or the analysis was incomplete. The remaining analyses by the MITRE team were either fundamentally flawed or misapplied.

It is our opinion that the MITRE Report does not reflect a serious attempt at evaluating 2020 voting integrity. The paper lacks the basic necessary details, research, and citations required for such a complex and important issue. There were no apparent attempts for consulting experts in statistical fields.

Furthermore, there is not even an acknowledgement in the MITRE Report of the thousands of eye-witness, forensic, and expert affidavits filed in court – or whether such evidence was even heard by a judge or explained. Any "proof" of no consequential irregularities requires more than statistics. So far, the "fraud" column has all the testimonies and forensics – and procedural dismissals don't nullify the truth of evidence.

The MITRE effort seems non-genuine in the pursuit of what actually transpired in 2020, but rather appears to be an effort to support the prevailing media narrative by providing "an opposing statistical study" that the 2020 election was legitimately conducted, with inconsequential irregularities.

We can expect more voting anomalies in 2022, because without meaningful reforms, **this will happen again**. Without verifiable, transparent vote integrity, citizens become untethered from their government.

Brief summaries of each MITRE Report topic, and our commentaries, follow:

1. **Ballot harvesting in Georgia.** This topic was seemingly chosen out of thin air. Unlike other sections of the MITRE Report, there are no references to legal cases, social media posts, and/or media coverage about ballot harvest allegations in the Peach state. While the statistical technique was applied correctly, the interpretation of the data was not entirely correct.

   MITRE Analysis: The MITRE analysis determined the average for mail-in ballot return rates was 74% and there were no anomalous counties.

   Our Analysis: Our review of the same situation found that there were two outlier counties, one with a 68.8% return rate and the other with a rather high 81.3% return rate. Those values translate to 11,733 fewer returns from the former county and 13,371 more ballots from the latter. The margin of victory in the Georgia 2020 presidential contest was only 12,670 votes, therefore the combination of **the two outliers could possibly have swung the Georgia election**.

2. **Election Fingerprinting/Fraud Detection in Georgia**. The MITRE Report cites and uses a method by Klimek, et al, that assumes that the vote count ratios across voting units, e.g. counties, districts, after suitable mathematical transformation follow a bell curve and homogeneous demographic. The Report utilizes a related vote-cluster analysis (or fingerprinting) to determine if there were indications of fraud.

   MITRE Analysis: The group applied a fingerprint of GA in whole, a second fingerprint using 6 selected counties, and finally an analysis of the GA vote-distribution curve. MITRE found no evidence of fraud or abnormalities.

   Our Analysis: The MITRE group bypassed identifying or using the required assumptions of the Klimek analysis in both clustering of groups as well as investigating repeated datapoints pushing 100% for a single candidate. Our group followed the paper's methodology, investigated the details as suggested, and found that demographics explains some clustering. This renders the Georgia fingerprint graphic indeterminate for detecting (or in MITRE'S case proving lack of-) fraud. Finally, our evaluation of the last technique found that MITRE misinterpreted their own ln(v) analysis, which actually proved **the majority of precincts in GA voted against Biden**. This latter point is rather well established – Biden "won" the 2020 election by winning fewer counties (and therefore precincts) than any other candidate in recent history.

3. **Dominion Voting Systems**. The MITRE Report analyzed the presence of vote switching/manipulation by comparing counties that used Dominion systems counties to those that used non-Dominion systems. The primary hypothesis was that vote switches would be readily identified as spikes in heavily Democrat counties.

   MITRE Analysis: To determine the spike counties following the hypothesis, MITRE identified the counties that had the greatest percent difference between 2016 and 2020 based on Democrat percentage of vote. The formula subtracted Clinton's 2016 percent of vote from Biden's 2020 percent of vote. MITRE performed a follow-on analysis of sixteen (16) "outlier" counties to determine if any of them fell outside two standard deviations of the mean. MITRE determined that neither technique identified vote manipulation by Dominion machines.

   Our Analysis: MITRE incorrectly assumed Dominion was the only system being used to manipulate votes. Legal filings after the 2020 election alleged all systems were used to manipulate votes, not just Dominion. All of the voting systems used in the United States possess an adjudication function that can be utilized to fraudulently reassign votes. Forensic and eye-witness testimonies are prolific and didn't seem worthy of mention?

   Next, MITRE's analysis had a flaw from the start as **it is mathematically incorrect to subtract percentages that are based on different populations –** a peer review of such a calculation in a mathematical community outside the group would instantly point out this error. Furthermore, no social science controls for the dataset seem to be present at all.

   Our analysis rebuts the MITRE conclusion as there is statistically and economically significant evidence that counties that used Dominion machines had systematically higher margins for Biden—margins that easily would have turned the results of the election, particularly given the swing states (and counties) that they were concentrated in. The statistical evidence is corroborated by cybersecurity evidence, eyewitness testimonies, forensic evidence, video evidence, and the thousands of affidavits filed under penalty of perjury in a court of law. Such sources are far superior to MITRE's source of allegations from "social media".

4. **Voting Anomaly in Michigan**. The MITRE Report focused on a spike that advantaged Joe Biden by 138,339 votes in Michigan. This spike was alleged to have occurred at 5:04 AM EST on November 4, 2020 *based on a tweet by Decision Desk HQ*. This section of the Report also performed a historical comparison of election results in Antrim County, Michigan in response to reports of the flipping of votes in that county.

   MITRE Analysis: The MITRE team's conclusions were that both the Decision Desk HQ tweet and Antrim vote flipping instances were caused by human error, corrected, and didn't impact 2020 election results.

   Our Analysis: Using **official election results, there was not a spike** in Michigan that advantaged Biden by 138,339 votes at 5:04 AM EST on November 4, 2020. It logically follows that there was not a correction to that spike in the official vote total. This spike was not confirmed by any Michigan election official. It is almost certain that this "spike" was the result of a typographical error by Decision Desk HQ.

   Meantime, our team **found a vote spike in Edison data** that advantaged Biden by 135,290 votes that occurred at 6:31 AM EST on November 4, 2020. This vote spike was **never corrected and is nearly the margin of difference in the 2020 Michigan election**. In addition, our team found eight other (8) spikes of over 100,000 votes in the key battleground states. None of those spikes were corrected — or logically explained — and clearly impact the outcomes in those states.

   The MITRE analysis of the Antrim County vote switching confirmed what everyone already understood – that an error was found and corrected. However, the MITRE analysis ignored the very significant findings from that very audit that determined nearly 68% of ballots were sent to adjudication and that fraudulent reassignment of votes was the cause of the original flip of votes in Antrim County.

   MITRE provided no evidence that such adjudication isn't widespread. Without more well-chosen forensic audits, no one really knows the extent of this disturbing, non-transparent manipulation of votes.

5. **Missing Mail-in Ballots in Butler County, PA**. The MITRE team analyzed data pertaining to the lag in returning mail-in ballots and potential ballots lost in the mail from Butler County, PA. The analysis determined that the late returns originally were the result of a computer glitch. The follow-on analysis used a box and whisker technique to track the ballot return percentages in all 67 PA Counties.

   MITRE Analysis: While the statistical analysis identified outliers during several of the iterations, the MITRE team concluded there was no evidence of nefarious or fraudulent activities. The analysis relies on media reports to conclude the low return rates in Butler County in mid-to-late October were caused by a computer glitch.

   Our Analysis: Election officials in Butler County stated that an individual had wrongly entered data into Pennsylvania's SURE system and that the ballots in question were not mailed out to voters – rendering the assumption that the cause was a computer glitch **provably false**. The MITRE analysis of the rates of return over time did not go into detail regarding the counties that had lagging rates of return.

   Our analysis determined that approximately 13 of the 17 laggard counties were predominantly GOP counties. Pennsylvania records show that Democrat return rates were 10 percentage points higher than GOP rates – that translates to **77,800 votes or nearly the margin of victory in Pennsylvania**. Our additional analysis of the mail-in voting patterns in Pennsylvania found evidence that over 64,000 votes were removed from Trump. In summary, not only was there sufficient evidence of probable nefarious activities shown in MITRE's box and whisker analysis of mail-in votes, but the evidence of mail-in voting irregularities was everywhere our group looked.

— Appendix —

Some other 2020 election integrity reports, etc. our team of independent experts have put together are:

a) Pennsylvania Report,

b) Michigan Report,

c) Election Spikes Report,

d) Edison Timeseries Distribution Analysis,

e) List of 2020 Presidential-related Election Lawsuits,

f) Claudia Tenney Report (NY-22),

plus other less formal reports on Georgia, Wisconsin, etc.

Since the media hasn't done a good job of publicizing material they consider "contrarian," we often get asked: *what are some other quality 2020 election-related reports?* Although we haven't done exhaustive research on other reports, here are some of our favorites:

1 - The Nevada Report by attorney Jesse Binnall.

2 - The Antrim Michigan Report done by Russ Ramsland.

3 - Three reports by Peter Navarro: Immaculate Deception, Art of the Steal and The Case, Evidence, etc.

4 - Three technical studies by Edward Solomon: Georgia, Pennsylvania, and Michigan.

5 - A study about absentee ballots by Dr. John Lott.

6 - Election Fraud and Foreign Interference report by Colonel Phil Waldron.

7 - Mathematician Bobby Piton's Arizona and Pennsylvania analyses.

8 - A *Judicial Watch* Study that concluded that 353 US counties have more registered voters than people eligible to vote.

9 - Interesting compendiums of 2020 election-related actions and claims: here, here, and here.

10-Lastly you might want to do searches over the *Energy and Environmental Newsletter* 2020 archives, where over a hundred articles and reports about the election situation are referenced.

If you are aware any other quality 2020 election studies and reports, feel free to email us here.