HO#1 SB 217 Walter Dowdy for Senator Carley

February 11, 2025

Dear Senators and Representatives,

I am writing in support of Senate Bill 217, an Act to prohibit the use of automatic tabulating equipment, specifically, ballot-on-demand printers, ballot-marking devices (BMD's), and the corresponding scanner/tabulators.

As a Senior Lecturer Emeritus in the Department of Computer Science and Engineering at Texas A&M University, I am very familiar with electronic voting systems (which after all consist of computer hardware, software, and networks), and have served as an expert witness in numerous cases related to elections, electronic voting machines, and election data, in multiple states plus the U.S. Supreme Court.

The foundation of our constitutional republic is that we citizens democratically elect our public servants to carry out those functions of government which "we the people" assign to them. Such elections must be accurate and trustworthy, and also believed to be accurate and trustworthy.

The widespread introduction of electronic voting systems roughly 25 years ago, intended to support these goals, was motivated by the "hanging chad" debacle of 2000. Unfortunately, this has not proven to be a wise choice, for the following reasons:

1. LOSS OF TRANSPARENCY. An election with hand-marked, hand-counted paper ballots is essentially 100% transparent. Voters mark their ballots in secret and deposit them in locked boxes. Then, at the conclusion of voting, the ballots are counted in public by bipartisan teams who check each other's work.

   Contrast this with an electronic scanner/tabulator, which is essentially 0% transparent: ballots go into the machine, and election result numbers come out, but you have no way of knowing if your ballot was counted correctly, or altered, or even just ignored. For an example of ballots' not being correctly processed by an electronic election management system, please see *Mesa Report 3* which I co-authored with Jeffrey O'Donnell.

   If the ballots are voted on using a ballot-marking device which prints bar codes (such as in South Dakota) or QR codes, the voter has no way to know if the bar code or QR code (which is what the tabulator counts) actually matches the printed text the voter selected. So even though voters can verify the text correctly records their choices, they cannot verify the bar code or QR code, since humans don't read bar codes or QR codes!

2. LOSS OF ACCURACY. I am also familiar with research (e.g., by J. Alex Halderman and Matthew Bernhard) demonstrating a simple way to hack an election by inserting a scanner driver which "cuts and pastes" the image of a ballot to swap the bubble positions for two candidates. A different problem actually occurred here in Texas (and elsewhere) when an excessive delay in a poorly-designed system printing "ballots on demand" at county-wide polling places resulted in many voters' getting the wrong ballot.

3. LOSS OF ACCOUNTABILITY. Electronic voting systems marketed today are manufactured by privately-held companies with unknown owners or possible foreign influences and no accountability to the voters. In contrast, elections using hand-marked, hand-counted paper ballots are conducted by locally-elected county officials such as a county auditor (or county clerk or county recorder, depending on the state).

Thus, on all three counts, a return to hand-marked, hand-counted paper ballots greatly benefits the public with more transparent, more accurate, and more accountable elections, which in turn greatly enhances voter confidence in the results.

Your bold leadership in South Dakota will serve as an example to other states in this regard.

Sincerely,

Walter C. Daugherity

Dr. Walter C. Daugherity

RÉSUMÉ

Dr. Walter C. Daugherity is a computer consultant and also Senior Lecturer Emeritus in the Department of Computer Science and Engineering at Texas A&M University. He graduated from Oklahoma Christian University with a degree in mathematics, and then earned master's and doctor's degrees from Harvard University, which he attended on a Prize Fellowship from the National Science Foundation.

As a computer expert he has consulted for major national and international firms, and for government agencies, including classified work. He helped develop the national computer keyboard standard and invented integrated user training within computer applications as well as various electronic computer interfaces.

As a computer science and engineering teacher and researcher, he has published 26 research articles from over $2.8 million in funded research projects, plus conference papers and other publications. He taught many areas of computer science and engineering for 37 years (32 years at Texas A&M University), including artificial intelligence, quantum computing, programming and software design, and cyberethics.

Since his retirement in 2019 he has served as an expert witness in numerous cases related to elections, electronic voting machines, and election data, in multiple states plus the U.S. Supreme Court.

At Harvard he received the Bowdoin Prize and medal for writing, and in 2015 was named a Distinguished Alumnus of Oklahoma Christian University. He is a life member of the Association for Computing Machinery and American MENSA.

Subject: Senate Bill No 217 – Proponent

Date: 11 February 2025

Dear Members of the Senate State Affairs Committee,

Please support Senate Bill 217, eliminating the use of electronic voting systems within your great state. This will resolve multiple legal issues your county officials now face by not being compliant with South Dakota law. The current use of these highly vulnerable, noncompliant voting systems only puts your county officials and the integrity of South Dakota elections at risk. The acceptance and passage of this bill will eliminate these risks.

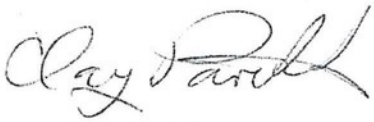
My recommendation is based off my over 20 years of cyber security experience, with a nine-year time span of working in multiple Voting System Test Labs (VSTL), conducting a review of South Dakota Statutes, Election Rules and the ES&S voting systems used in South Dakota. Your vendor ES&S, as well as other voting system vendors, does not keep their systems in compliance with U.S. Election Assistance Commission (EAC) standards. The EAC requires all systems be current with protection against malware, etc. and to keep Operating Systems (OS) and applications updated as part of this protection. In my evaluations of ES&S systems I have seen a "new" system come with an OS and applications at end-of-life. On one system I conservatively counted over 300 vulnerabilities just between the Operating System and the database server. This appears to be a trend with new or updated voting systems, they seem to come "pre-loaded" with hundreds of vulnerabilities.

Another trend is with the antivirus protection. In the VSTL I had seen ES&S systems come in for certification testing with out-of-date antivirus scan engines and out of date antivirus definitions. The definitions one time were two years out of date. This is not the way to present a "new" system for certification. Funny thing is that even now, I review field audit, forensic reports and see that ES&S is still failing to keep antivirus updated. And yes, still up to 2 years behind. These examples by no means are in keeping with IT Best Security Practices. Lastly on this subject I have reviewed ES&S Engineering Change Orders (ECO) and found none addressing updates to the antivirus software.

I would like to cover one last topic, and that is Ballot Marking Devices violate HAVA and EAC requirements. TITLE III Subtitle A SEC 301 (a)(1)(A)(i) states that the system shall "permit the voter to verify (in a private and independent manner) the votes selected by the voter on the ballot before the ballot is cast and counted;" ES&S uses a barcode to evaluate votes cast on a ballot. These are not readable by a human being. A recent Northampton County, PA election is an example. The printed text did not reflect the voter's intent, yet the county claimed the barcode was correct.

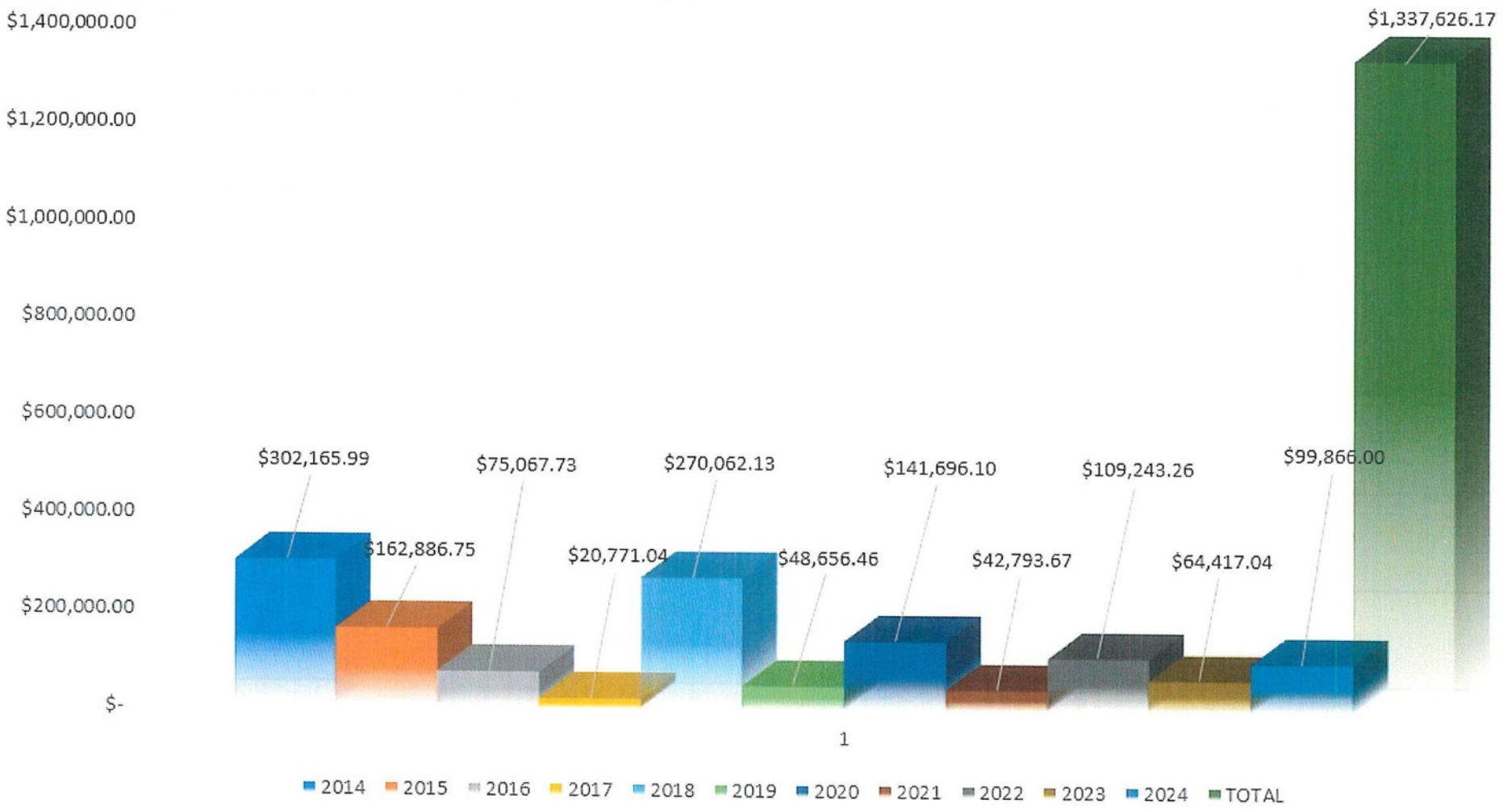
Please consider what I have presented in this letter and support Senate Bill 217. South Dakota needs to eliminate the overcomplicated, vulnerable and untrustworthy electronic voting systems and utilize a hand count system.

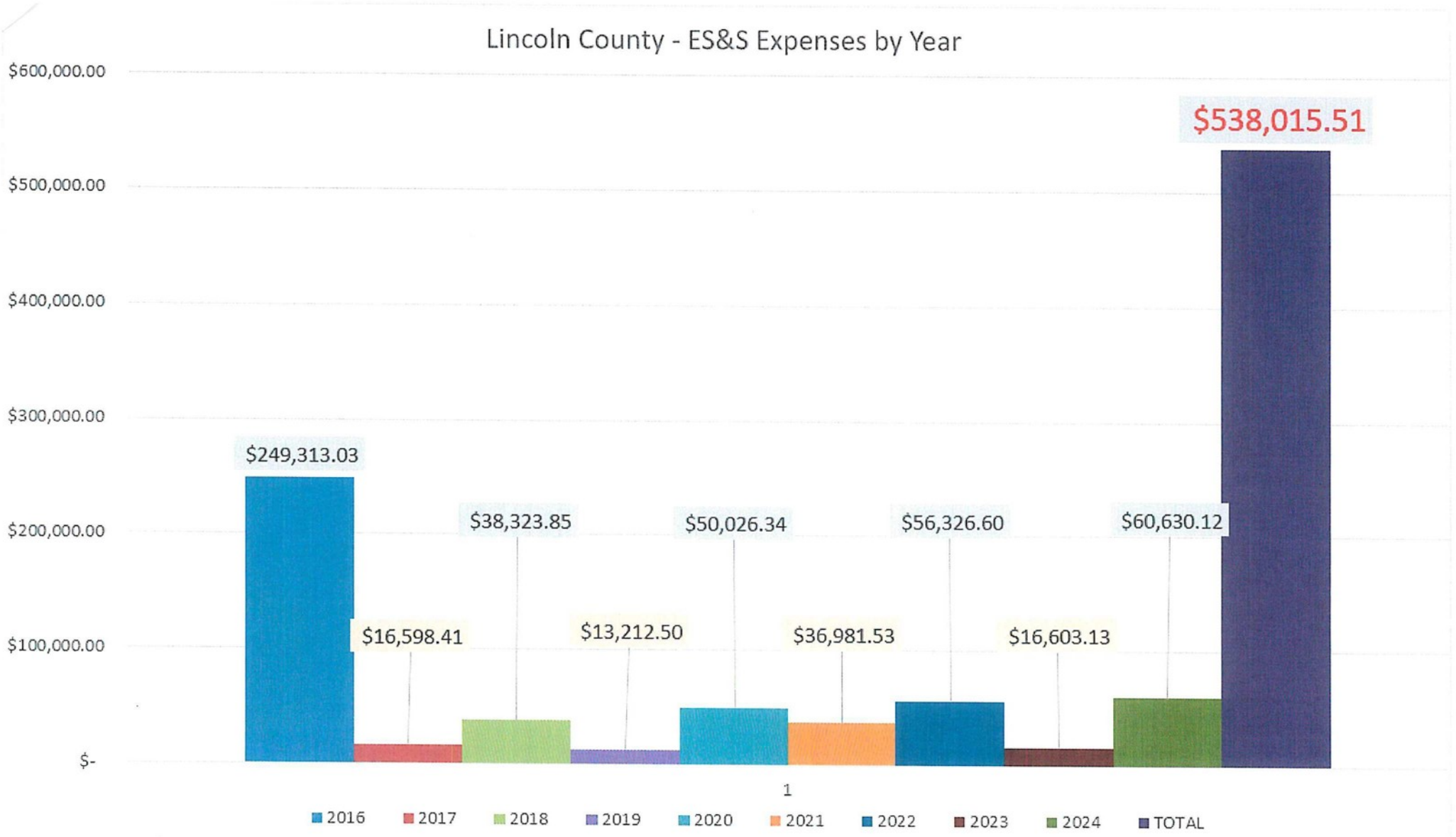
Respectfully,

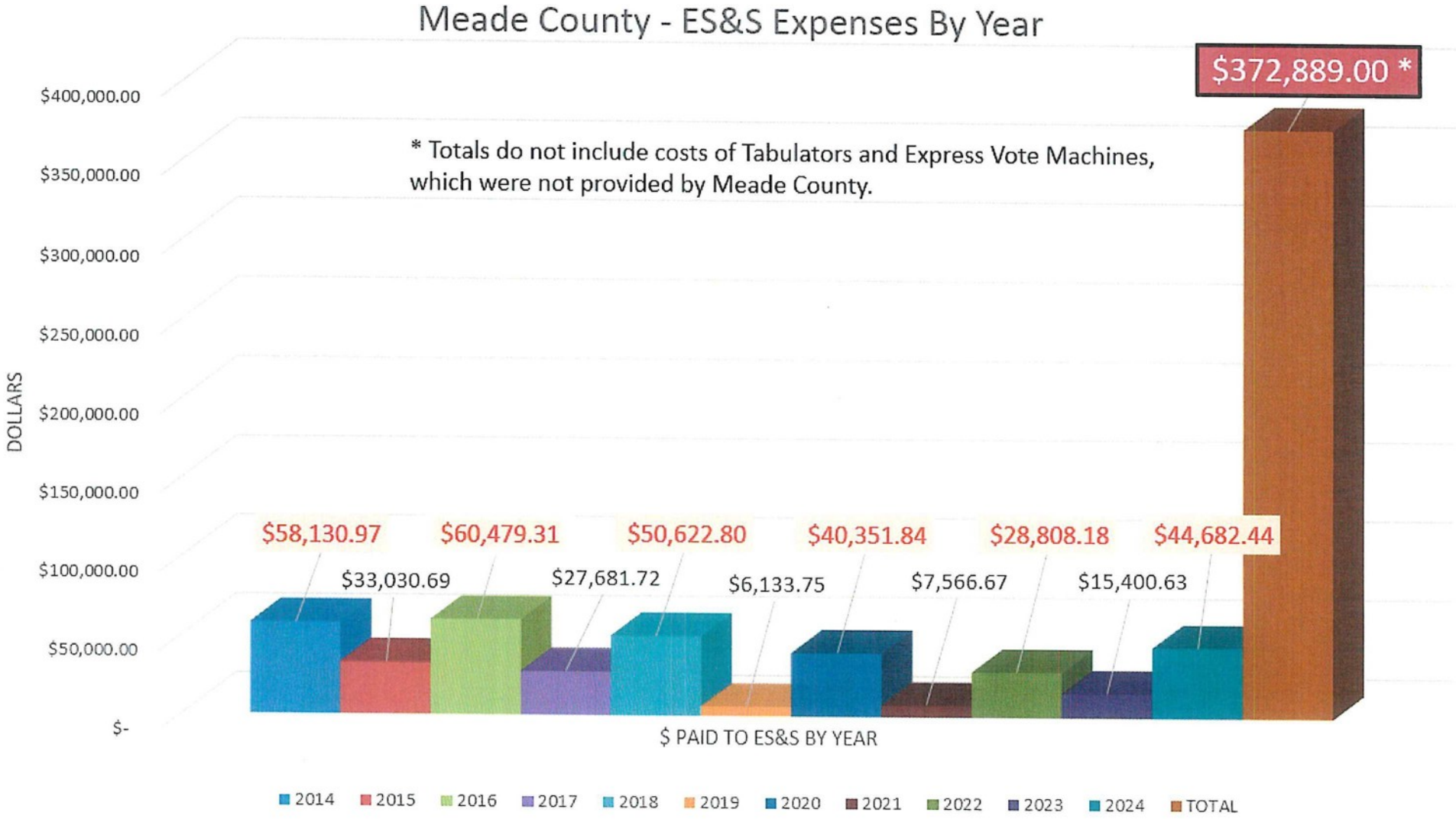


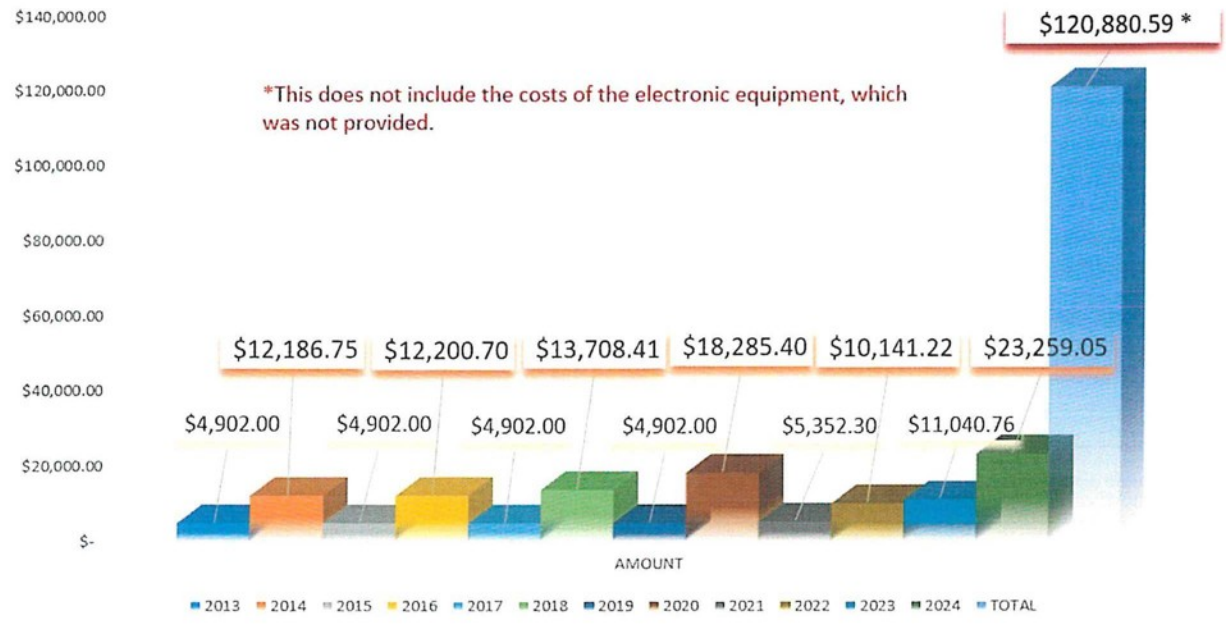
Clay Parikh
Cyber Security Professional
Electronic Voting Systems, Subject Matter Expert (SME)

PENNINGTON COUNTY - ES&S EXPENSES BY YEAR




Lincoln County - ES&S Expenses by Year
$600,000.00
$500,000.00
$400,000.00
$300,000.00
$200,000.00
$100,000.00
$-
$249,313.03
$16,598.41
$38,323.85
$13,212.50
$50,026.34
$36,981.53
$56,326.60
$16,603.13
$60,630.12
$538,015.51
1
2016
2017
2018
2019
2020
2021
2022
2023
2024
TOTAL


Meade County - ES&S Expenses By Year
$372,889.00 *
* Totals do not include costs of Tabulators and Express Vote Machines, which were not provided by Meade County.
$400,000.00
$350,000.00
$300,000.00
$250,000.00
$200,000.00
$150,000.00
$100,000.00
$50,000.00
$-
DOLLARS
$58,130.97
$33,030.69
$60,479.31
$27,681.72
$50,622.80
$6,133.75
$40,351.84
$7,566.67
$28,808.18
$15,400.63
$44,682.44
$ PAID TO ES&S BY YEAR
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
TOTAL



OTHER PERTINENT ELECTION FACTS

HAND COUNTING IN THE PRECINCTS: Charles Mix County has 13 precincts with an average of 242 ballots cast each general election. It is proven that 4 trained vote counters can count 250 ballots with 11 races on them in 1 hour.

So 13 precincts X 5 counters (4 counters and 1 supervisor) per precinct = 65 vote counters. Let's say our **vote counters** are more meticulous than average and count for 2 hours in each precinct instead of one hour.

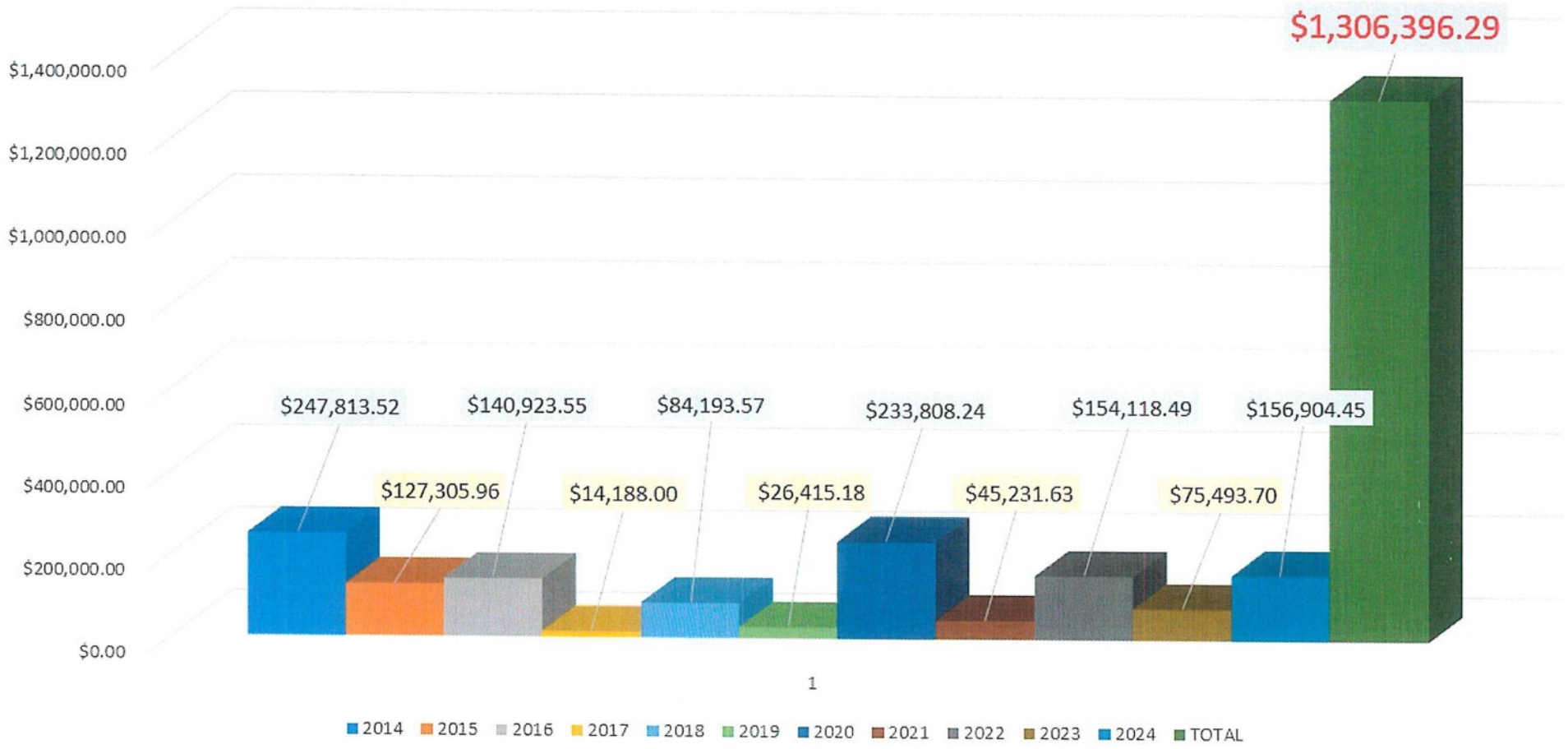
65 vote counters x $20 per hour x 2 hours = **$2600** vote counter cost per election. Add in $106 for tally sheets, set up and ink = **$2706** x 2 (primary and general elections) = **$5412**

The cost of hand counting ballots in the precincts is roughly **$5412** in an election year. This includes both the primary and general election. **It costs nothing to hand count in a non-election year.**

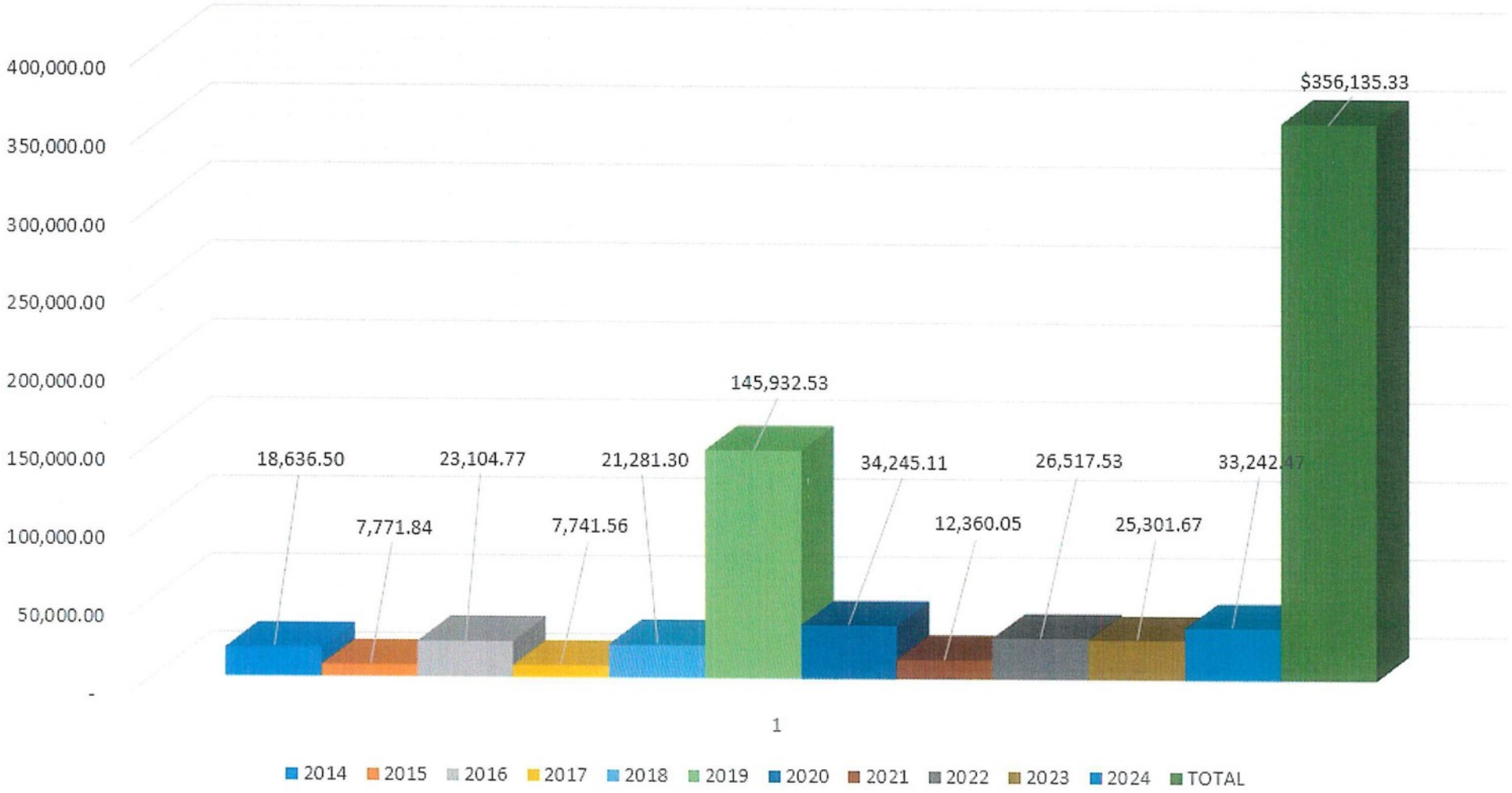
TABULATOR/MACHINE COUNTING IN A CENTRAL LOCATION: In the machine election cost chart above if you combine the 2024 costs of **$23,259** and the non-election year 2023 costs of **$11, 040,** the 2 year total cost is **$34,299**. This averages **$17,150** every year for maintaining and using tabulators whether there is an election or not.

Yearly cost to Hand Count = $2706 **Versus** **Yearly cost to Machine Count = $17,150**

Minnehaha County - ES&S Expenses By Year



Lawrence County - ES&S Expenses by Year



Letter to Submit for Elimination of Tabulators

From davidkclements13 <davidkclements13@protonmail.com>

To sdcanvass@protonmail.com

Date Monday, February 10th, 2025 at 10:56 PM

To Members of the South Dakota Legislature:

I write to you in support of eliminating the use of automatic tabulating equipment. The major legal arguments are as follows:

I. **The Tabulators used in South Dakota violate HAVA**

States receiving HAVA funds must comply with specific requirements outlined in the Help America Vote Act (HAVA). For instance, states must certify compliance with the requirements of Title III of HAVA, which includes standards for voting systems, provisional voting, and voter information.

South Dakota has received funding from HAVA. According to South Dakota Codified Laws, the Governor is authorized to accept and administer funds appropriated or allotted to the state by the United States, which includes funds from acts of Congress such as **HAVA 4-8-17. "Receipt and disbursement of federal funds."** When a state takes federal funding, they must abide by "the strings," i.e. legal obligations, attached to that funding.

Section 231 of HAVA mandates that certain parts of the election system be certified by an accredited lab - they call the "voting system." There are other parts of the election system called the "non-voting" system, which do not have to be certified (things like ballot tracking and voter registration).

The "Voting System" is defined in HAVA Section 301.6.B and in Section 1.1 of the VVSG, which states:

> ***all system hardware, software,*** *telecommunications, and documentation intended for use to: prepare the voting system for use in an election, produce appropriate ballot formats, test that the voting system and ballot materials have been properly prepared and are ready for use, record and count votes,* ***consolidate and report election results****, display results on-site or remotely,* ***produce and maintain comprehensive audit trail****.*

The tabulators, which are considered hardware, are part of an integrated system. In South Dakota, the tabulators are integrated with "TotalVote" election software. TotalVote is not certified, and therefore illegal under HAVA for the following reasons.

TotalVote's integration with tabulators falls afoul of the legal requirements as part of the "voting system" because it claims to be an election management system and an election night reporting system.

"Election management" typically includes consolidation of precinct results into county results and county results into statewide results. These combined results are usually printed and given to the county commissions for "certification" - meaning the election management system also produces the canvass documents and the audit trail for the election. These are two functions that are clearly part of the "voting system" and require certification.

The other issue with "TotalVote" is that it handles election night reporting. HAVA has little to say about election night reporting except that the election night reporting files cannot be stored in the same place as the official election results - see screenshot below from Section 2.4.5 of the VVSG.

2.4.5 Election Night Reporting

Some voting systems offer the capability to make unofficial results available to external organizations such as the news media, political party officials, and others. Although this capability is not required, systems that make unofficial results available **shall**:

a. Provide only aggregated results, and not data from individual ballots
b. Provide no access path from unofficial electronic reports or files to the storage devices for official data
c. Clearly indicate on each report or file that the results it contains are unofficial

If TotalVote is handling election night reporting AND combining results and creating the canvass results, then there is certainly an access path between the two. The obvious reason you wouldn't want any such connections is that a bad actor could fabricate the election night reporting to display a false result and then the manipulated outcome could be backfilled into the "official results", so everything matches if anyone wanted to check.

The USB stick taken out of the tabulators that contains the "official election results" is plugged into an internet-connected computer so the results can be reported, and the audit documents can be created, then the same USB stick is plugged back into the supposedly "air-gapped" voting system computer. Obviously, this means that the "official election results" are fully exposed to the internet before anything is reported or any canvass documents made, leaving the door open to manipulate that data as needed and no one would know. If you have any "voting convenience centers" in South Dakota, then it is impossible to use even the paper tabulator tapes to reconcile the final numbers, and that is rarely, if ever done anyway. There is also no way to know if the paper tabulator tapes are programmed to print a fraudulent result or if it's really the result on the paper ballots - that is also rarely, if ever, checked.

TotalVote is, of course, internet-connected and the election and voter data is stored on the cloud, which opens up an enormous number of vulnerabilities - especially as the software touches all parts of the election system making the ability to cover up fraud very easy.

This seems to be the strongest argument against it, as people inherently understand that anything on the internet is vulnerable. We can all recall how public officials were falling all over themselves telling us that our election system isn't connected to the internet following the 2020 debacle - thought obviously any election using TotalVote or anything similar is almost completely run on the internet except for the act of running ballots through tabulators and printing out a tape - which is rarely if ever reconciled to the electronic, aggregated result that the software spits out.

II. The Tabulators used in South Dakota Violate FISMA

The Federal Information Security Management Act (FISMA) primarily applies to federal agencies and their contractors, mandating that they develop, document, and implement an information security program to protect their information and information systems **§ 3554. Federal agency responsibilities, § 3551. Purposes.** The act outlines responsibilities for federal agencies to ensure the security of their information systems, including compliance with specific standards and guidelines **§ 3554. Federal agency responsibilities, § 11331. Responsibilities for Federal information systems standards.**

As part of the nation's critical infrastructure, FISMA applies to election systems used in federal elections. As stated before, South Dakota is the recipient of federal funding for the running of its elections, specifically as it relates to use of tabulators, and prepares ballots with federal races on them.

FISMA mandates that the Secretary of Commerce, through the National Institute of Standards and Technology (NIST), develop standards and guidelines, including minimum requirements for information security. These standards are compulsory and binding to improve the security of federal information and information systems. The standards must include measures to protect against unauthorized access, use, disclosure, disruption, modification, or destruction of information **§ 11331. Responsibilities for Federal information systems standards.** To date, FISMA has not published any standards or guidelines as they pertain to the security of voting information relayed to and from the tabulators, or use of TotalVote. As to elections, FISMA is in a state of noncompliance with its own mandates.

Additionally, FISMA requires federal agencies to conduct annual reviews of their information security programs, perform risk assessments, and implement policies and procedures to reduce risks to an acceptable level. Agencies must also report on the adequacy and effectiveness of their information security policies, procedures, and practices to the Office of Management and Budget **(OMB) § 3551. Purposes.** To date, FISMA has not performed a single risk assessment of the voting system, or published policies or procedures to reduce risks. This violates the law.

In conclusion, FISMA sets forth mandatory requirements for federal agencies to establish and maintain robust information security programs, develop and implement security standards, and continuously monitor and report on the effectiveness of these measures to protect federal information and information systems **§ 3551. Purposes, § 11331. Responsibilities for Federal information systems standards.** The mandatory requirements have not been followed with respect to election equipment, including the tabulators and internet-based election system used in South Dakota.

These are the relevant mandatory laws being ignored. The examples of election system actually being subverted are too numerous to list in this letter but can easily be located. If you require any testimony, please do not hesitate to contact me.

For these legal reasons, the legislature should vote to prohibit the use of automatic tabulating equipment.

Sincerely,

Dr. David Clements
Election Systems Auditor, Former Law Professor
575-202-8001

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