System Reliability Analysis: Impact of Structural Anomalies in State Voter Registration Systems

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Abstract: This analysis examines fundamental reliability issues in state voter registration systems stemming from structural database anomalies and record reconciliation failures. Research reveals systemic inconsistencies that impair basic database functionality, including: irreconcilable discrepancies between state and county voting records, widespread record duplication (cloning), retroactive historical modifications, and algorithmically obscured data relationships. These issues create mathematical uncertainties in both individual and aggregate voter participation records that cannot be resolved through standard auditing procedures. The cumulative effect renders these systems incapable of reliably performing their core function of accurately tracking voter participation, independent of the original causes of these anomalies.

Keywords: Election integrity, Database reliability, Voter registration systems, Algorithmic manipulation, System security

1. Introduction

Voter registration databases serve as the authoritative record of electoral participation in the United States. Their primary function is to maintain accurate records of eligible voters and their participation in specific elections. This function requires consistent, traceable relationships between voters, their identification numbers, and their voting histories. Recent analysis of state voter registration systems has revealed structural anomalies that fundamentally compromise this basic functionality.

The reliability issues stem from four primary sources: irreconcilable disparities between state and county records, extensive duplication (cloning) of voter identification information, retroactive modifications to historical voting records, and the use of sophisticated voter ID assignment algorithms capable of covert tracking and manipulation of records. In one state's system alone, over 250,000 voting records differ between state and county databases for the same election and ID numbers, while maintaining nearly identical total vote counts through apparent vote reassignment between IDs (Paquette, 2023). Additionally, approximately 1.5 million cloned identification numbers have been documented in NY, with algorithmic evidence of 500,000 more deleted duplicates whose original voter associations remain recoverable.

These structural issues create cascading effects throughout the system that transcend questions of cause or intent. When state and county databases disagree on hundreds of thousands of voting records while reporting similar totals, or when millions of cloned IDs exist in the system, basic mathematical certainty becomes impossible. The system can no longer provide reliable answers to fundamental questions like "Who voted in this election?" or "How many unique voters participated?"

This analysis examines the technical implications of these anomalies and their impact on system reliability, focusing solely on functional outcomes rather than causes. The goal is to understand how these structural issues affect the system's ability to perform its core functions, regardless of how they originated.

1.1 Database Integrity Theory and Fitness for Use

Database consistency theory establishes that reliable systems must maintain fundamental ACID properties (Atomicity, Consistency, Isolation, Durability) to perform their core functions (Haerder and Reuter, 1983). These properties form the theoretical foundation for database consistency and reliability. Atomicity requires that a transaction must be treated as a single, indivisible unit - it either completes entirely or has no effect at all. Consistency ensures that a transaction can only transition the database from one valid state to another, preserving all defined rules and constraints. Isolation mandates that concurrent transactions execute as if they were running sequentially, preventing interference between operations. Durability guarantees that once a transaction is committed, its changes will persist even in the case of system failures.

The concept of "fitness for use" provides a framework for evaluating whether a system can reliably serve its intended purpose (Wang & Strong, 1996). While some applications can tolerate partial degradation while remaining functional, certain systems - like banking, telecommunications, and voter registration databases - require complete data integrity. In such zero-trust environments, where stakeholders require absolute confidence in system outputs, any unresolvable data inconsistencies render the system unfit for use.

The documented violations of these principles in voter registration systems - such as extensive record duplication and irreconcilable inter-database disparities - indicate fundamental integrity issues that prevent the system from performing its core functions. These issues create mathematical uncertainties that cannot be resolved through standard auditing procedures, regardless of their original causes.

2. Methodology

This study presents findings from an ongoing multi-state analysis of voter registration system reliability. The investigation employs three complementary analytical approaches: systemic pattern detection, cross-database validation, and document verification. Rather than attempting to determine causes, the methodology focuses solely on identifying and validating reliability issues that prevent these systems from performing their core functions.

Pattern detection begins with systematic examination of voter registration databases, focusing on three key areas: record integrity, ID number distribution, and algorithmic patterns. Record integrity assessment examines duplicate records, registration dates, and field consistency. ID number analysis evaluates distribution patterns and relationships between state and county identifiers. Algorithmic pattern detection identifies systematic variations from expected random or sequential numbering.

Findings undergo multiple validation steps to ensure accuracy. Internal validation includes statistical testing where appropriate, cross-referencing of multiple data fields, and verification through alternative analytical approaches. External validation compares patterns across different jurisdictions and validates against established database management principles. For documentary evidence, such as registration forms and signatures, physical examination provides additional verification.

The analysis encompasses several primary data sources, including state voter registration databases, county-level registration records, and historical database versions. Access to specific data types varies by jurisdiction, creating methodological constraints that shape analytical depth. While some jurisdictions provided comprehensive data access, others limited available fields or historical records. The methodology adapts to these constraints while maintaining consistent baseline analyses that enable cross-state comparison where appropriate.

Key limitations include:

- Variable data access across jurisdictions
- Inconsistent historical record availability
- Database size constraints on analysis
- System documentation gaps
- Time constraints on pattern validation

The methodology emphasizes reproducible analysis techniques while maintaining analytical neutrality regarding causation. This approach allows for systematic identification and validation of reliability issues across different jurisdictions, even with varying data availability.

3. Evidence

This analysis presents four intersecting categories of evidence that demonstrate fundamental reliability failures in state voter registration systems. First, systematic analysis reveals widespread unauthorized record duplication, with millions of duplicate IDs persisting across multiple election cycles. Second, cross-database reconciliation attempts expose mathematical impossibilities between state and county records that cannot be explained by normal administrative processes. Third, examination of registration documents shows physically impossible duplicated signatures across multiple active voter IDs. Finally, sophisticated algorithms discovered across multiple states enable systematic record manipulation while bypassing normal database controls.

Before examining these categories in detail, historical analysis of clone records across states provides crucial context for understanding these system failures.

3.1 Clone Registration Growth Patterns Across States

A comparative analysis of voter registration records from 1990-2024 reveals two distinct patterns of system compromise. The New York pattern demonstrates progressive degradation from an initially functional state, while the Georgia pattern suggests a system that likely never achieved basic data integrity (Paquette, 2024c).

New York's progression shows clear evidence that clone-free operation is technically possible (Table 1). Starting from near-zero clone rates (0.25% in 1990), the system experienced systematic degradation:

- 1990-1995: Below 2%
- 1996-2000: Increased to 3-4% range
- 2001-2006: Climbed to 5-6%
- 2007-2015: Rose to 8-12%
- 2016-2022: Escalated to 13-17%

Table 1: Clone growth by year, NY state, 1990-2022

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Clones	514	925	4,699	1,896	5,792	6,202	13,185	9,171	11,790	14,705	27,442	16,114	19,605	21,667	56,262	19,059	21,840
Total	206,895	270,123	844,021	312,375	336,611	471,808	797,165	439,670	368,352	375,976	710,394	388,004	419,772	406,860	1,008,143	323,087	373,464
Percent Clones	0.25%	0.34%	0.56%	0.61%	1.72%	1.31%	1.65%	2.09%	3.20%	3.91%	3.86%	4.15%	4.67%	5.33%	5.58%	5.90%	5.85%
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Clones	34,893	99,556	33,377	43,487	42,266	101,843	43,941	46,448	45,660	177,523	56,832	86,765	75,090	178,755	59,354	87,626	
Total	391,201	1,150,253	333,032	379,390	350,186	908,300	383,187	380,551	434,755	1,191,531	380,659	687,298	574,203	1,130,608	454,017	504,868	
Percent Clones	8.92%	8.66%	10.02%	11.46%	12.07%	11.21%	11.47%	12.21%	10.50%	14.90%	14.93%	12.62%	13.08%	15.81%	13.07%	17.36%	

In contrast, Georgia maintained consistently high clone rates (6-8%) over multiple decades, a pattern also seen in Arizona (Table 2). While this stability might appear preferable to New York's increasing rates, it actually represents a more concerning scenario - these systems likely never achieved basic data integrity.

Table 2: Clone growth by year, Georgia, 1990-2024

	<1990	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Clones	31,607	3,270	1,651	8,959	1,501	5,386	5,892	8,934	3,992	5,168	3,876	8,735
Total	394,287	38,822	19,735	107,032	17,587	64,044	71,563	109,418	50,672	65,010	51,806	112,583
Pct Clones	8.02%	8.42%	8.36%	8.37%	8.53%	8.41%	8.23%	8.16%	7.88%	7.95%	7.48%	7.76%
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Clones	3,875	5,645	5,726	13,482	6,415	8,391	8,515	18,631	5,082	7,533	7,482	16,815
Total	51,480	74,848	77,656	174,821	85,535	116,584	117,284	245,209	70,705	106,053	106,818	239,711
Pct Clones	7.53%	7.54%	7.37%	7.71%	7.50%	7.20%	7.26%	7.60%	7.19%	7.10%	7.00%	7.01%
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Clones	7,796	12,395	10,538	30,959	23,834	35,005	30,246	44,785	17,490	32,159	25,682	22,116
Total	115,661	181,888	164,142	461,959	360,224	527,839	470,504	691,020	281,128	552,869	465,976	377,385
Pct Clones	6.74%	6.81%	6.42%	6.70%	6.62%	6.63%	6.43%	6.48%	6.22%	5.82%	5.51%	5.86%

Most states follow New York's pattern of increasing clone rates, with two distinct acceleration periods: one in the mid-1990s and another, more dramatic increase in the early 2000s. These system-wide changes affected multiple states simultaneously, suggesting broad structural shifts rather than isolated anomalies (Paquette, 2024d).

3.2 Record Duplication: Systematic Analysis

3.2.1 Definitional framework

The analysis distinguishes between duplicate records (identical in all fields) and clone records (sharing core identifying traits while varying in other fields). Clone records represent a more significant system reliability issue as each possesses a unique voter ID number, enabling independent function within the voting system. Under HAVA Section 303(a)(1)(A), the presence of multiple unique identifiers for a single voter constitutes an illegal multiple registration, distinct from harmless duplicate records.

3.2.2 Legal controls and system requirements

State and federal regulations establish specific validation protocols to prevent multiple registrations. For instance, New York law mandates a systematic verification process using:

- Primary matching: first name, last name, and date of birth
- Secondary validation: driver's license or last four SSN digits When these matches occur, the system should prevent the creation of a new voter ID, making clone record creation technically impossible under compliant operations.

3.2.3 Cross-State analysis findings

Systematic analysis across multiple state databases revealed significant clone record populations:

Major System Anomalies:

- New York: 1.47 million excess voter IDs (6.9% of 21.37M total records)
- Wisconsin: 437,228 minimum estimated clones (5.6% of 7.74M total) (Paquette, 2024h)
- Arizona: 590,530 minimum estimated clones (8.6% of 6.85M total) (Paquette, 2024a)
- Georgia: 588,323 minimum estimated clones (8.1% of 7.22M total)

Moderate System Anomalies:

- Texas: 57,952 confirmed excess IDs (0.3% of 18.38M total) (Paquette, 2024g)
- Pennsylvania: 9,947 excess IDs (0.1% of 8.85M total) (Paquette, 2024f)
- New Jersey: 9,105 excess IDs (0.1% of 6.46M total) (Paquette, 2025)

The scale and consistency of these findings across multiple jurisdictions indicates a systemic reliability issue rather than isolated anomalies or technical limitations. This pattern of clone records fundamentally compromises the system's ability to maintain unique voter identification - a core functional requirement for electoral record integrity.

Analysis reveals specific, mathematically verifiable correlations between certain ID patterns and clone records. In New York's Shingle algorithm records, for example, clone status can be predicted with high accuracy in the upper range of County ID numbers, where nearly 100% are clones. However, such predictive capability varies significantly by algorithm and ID range, and cannot be generalized across all records. The key finding is not the ability to identify individual clones, but rather the existence of systematic patterns that should not appear in properly functioning voter registration systems.

3.3 Cross-Database Reconciliation Failures in New York

Analysis of New York's state and county voter registration databases revealed systemic reconciliation failures that fundamentally compromise the system's ability to provide accurate voter participation records. In New York City's five counties (Bronx, Kings, Queens, New York, and Richmond), 254,713 voter ID numbers show 2020 General Election participation in county records but no corresponding vote in state records. These discrepancies persist in databases generated well after the election, eliminating timing differences as a potential explanation.

Further analysis revealed 225,517 voter IDs containing multiple recorded votes for the 2020 General Election, with different voting methods indicated for each instance (e.g., early voting and in-person voting for the same ID). The majority of these multiple vote histories - 206,205 cases - are concentrated in Nassau County. Notably, these duplicate votes were absent from the database dated 10/20/2021 but appeared in the 12/22/2022 version, indicating retroactive modification of historical voting records.

Vote count reconciliation across different reporting systems reveals additional mathematical inconsistencies. While certified results show 3,039,376 total votes across NYC's five counties, the state database records only 2,804,872 votes, and county databases show 2,878,108 votes. The county number is particularly interesting because the counties didn't provide purged records but the state did. This would suggest a higher state count due to purged records at the county level, not the reverse.

Individual county disparities are particularly stark - the Bronx shows 425,883 certified votes but only 382,672 in state records, while Richmond County reports 216,278 certified votes compared to 172,350 in state records. In Queens County a count of voters who voted that compares ID numbers, reveals 55,055 votes missing from state records (Table 3). These discrepancies are not merely clerical variations; they represent fundamental inconsistencies in how votes are recorded and tracked across different parts of the system.

Table 3: Missing 2020 GE votes, Queens County, NY based on matching ID numbers

	Certified	Precincts	State	County	Diff S/C	State only	ounty onl
Count	788,262	789,973	737,986	739,885	1,899	8	55,063
Matching			737,978	684,822	53,156		
Difference			8	55,063	55,055		

These findings demonstrate critical database reliability issues that prevent accurate determination of voter participation. The presence of irreconcilable vote histories for identical voter IDs, significant variations in vote totals between state and county systems, and evidence of retroactive record modifications create mathematical uncertainties that cannot be resolved through standard auditing procedures (Table 4).

Table 4: Example individual record, missing vote in state records and double vote despite purged status

6	State	County	State	County
CID	413,748,568	413,748,568	413,757,275	NYC/no
SBOEID	58,924,130		58,949,450	county
Type	Orig	Orig	Clone	purged
RegDate	6/23/2020	6/23/2020	6/23/2020	records
Status	Active	Active	Purged	Purged
PurgeDate	NONE	NONE	1/26/2021	
First N	Nora	Nora	Nora	
Last N	Antwi	Antwi	Antwi	
DOB	4/2/2002	4/2/2002	4/2/2002	
Elec Date	NONE	11/3/2020	11/3/2020	NONE
Res NUM	905	905	905	
Res Street	Summit Ave	Summit Ave	Summit Ave	
City	Bronx	Bronx	Bronx	
County	Bronx	Bronx	Bronx	
Explanation	This person has same RegDate/address clone. Clone is purged after voting in 2020. Double vote. County vote for original missing from state.			

3.4 Document Authentication Failures

Examination of original registration documents reveals fundamental issues with record authentication that extend beyond simple database inconsistencies. In cases where county boards of elections provided registration documents in response to FOIL requests, clone records frequently contained photographically identical signatures despite having different voter ID numbers and remaining simultaneously active through multiple election cycles. This signature duplication definitively proves these are not independent registration applications, as it is physically impossible for a person to produce exactly identical handwritten signatures on separate occasions.

The time dimension of these findings is particularly significant. While clone records were typically purged shortly after FOIL requests brought them to official attention, many had remained simultaneously active in the system for years. For example, the Herkimer County cases show identical-signature clone records that remained active from their 2020 creation until 2022, spanning multiple elections. These records were only marked as duplicates after external inquiry, indicating a systemic failure of internal auditing processes.

This pattern of findings from smaller counties that cooperated with records requests raises serious concerns about larger jurisdictions that did not provide documentation. The counties with the highest numbers of identified clone records - New York City's five counties and Nassau County - declined to provide registration documents for examination. Given that proof of unauthorized record duplication was found in most smaller counties that provided records, the implications for jurisdictions with hundreds of thousands of potential clones are significant.

The authentication crisis extends beyond database anomalies to the fundamental relationship between electronic records and their paper documentation. Voter registration systems rely on original signed documents as the authoritative source for voter records. When electronic records show impossible duplications of original signatures while maintaining separate active voter IDs, it compromises the entire chain of documentation needed for registration verification. This creates an irreconcilable situation where neither the electronic records nor their paper documentation can be relied upon to determine legitimate voter registrations.

3.5 Registration Date Patterns

A critical anomaly emerged in California's District 28 when 60,376 voter records suddenly appeared during the vote counting period between November 10-15, 2024 (Paquette, 2024b). These records exhibited an unnaturally perfect distribution of registration dates spanning 124 years, from 1900 to present. The temporal distribution appeared statistically natural at first glance - showing minimal activity through the 1970s, increasing volume through the 1980s (3,467) and 1990s (7,459), peaking in the 2000s (10,699) and 2010s (21,679), with 16,521 from 2020 forward. However, the records appeared sometime within a narrow five day period in 2024. The appearance of such precisely distributed historical registrations during active vote counting raises serious concerns about data manipulation.

3.6 Record Disappearance

In Ohio, a comparison between 2020 and 2024 databases revealed an alarming pattern of record disappearance in Cuyahoga County. Of 172,201 voters registered between January-October 2020, only 96,397 remained in the 2024 database - meaning 75,804 records (44.02%) vanished in less than four years. This pattern defies normal administrative processes, as Ohio requires a minimum of four years of inactivity before records can be marked inactive, let alone deleted. The scale of deletion cannot be explained by normal factors like death or relocation, particularly given the short timeframe and the fact these were all recently registered voters.

3.7 Activity and Status Issues

The Ohio analysis revealed systemic problems with voter activity tracking. In District 28, out of 397,828 total records, 126,302 showed no voting activity across all three federal elections from 2020-2024. While 4,680 of these were registered after 2019, the remaining 121,622 records showed no activity despite being registered before 2020. Under federal and state voter list maintenance laws, these inactive records should have been flagged for removal after missing two federal elections. Their continued presence as active records, particularly through three consecutive federal election cycles, represents a clear deviation from statutory requirements for maintaining voter roll accuracy.

These patterns share a common theme: they represent deviations from both statistical probability and legal requirements that cannot be explained through normal administrative processes or human behavior. The mathematical precision in some cases, and the scale of unexplained discrepancies in others, suggests systematic manipulation rather than random error or normal database maintenance activities.

These distinct patterns of clone record generation across states provide essential context for understanding the systematic mechanisms revealed through ID number analysis, discussed in the next section.

4. Systematic Mechanisms

A pervasive finding across all but one of the ten states examined, (Oklahoma) (Paquette, 2024e), is the presence of sophisticated ID number assignment systems that go far beyond standard database requirements. These systems create mathematically predictable relationships between IDs that enable specific capabilities while raising significant reliability concerns.

In New York (Paquette, 2023), three distinct algorithms demonstrate different aspects of system vulnerability:

1. The Spiral algorithm mathematically transforms relationships between County IDs (CID) and State Board of Elections IDs (SBOEID) using a base-10 repunit structure (Table 5). Analysis proves this creates a third, derivable identifier (AID) through CID-SBOEID mapping. While this mathematical capability suggests possible linkage to undocumented record systems, such links cannot be proven from available data.
2. The Shingle algorithm shows specific, provable correlations with clone records in certain ID ranges. In the upper 50% of CID numbers, nearly 100% of records are clones, while lower ranges show approximately 20% clone rates. This creates mathematically predictable patterns within a defined subset of records.
3. The Tartan algorithm contains the majority of clone records and coincides temporally with increased clone rates starting in 2007. While this correlation is clear, causation cannot be established from available data.

Similar mathematical patterns appear across multiple states. New Jersey implements reversible number transformations that can encode additional data channels. Texas uses an intricate modulus-8 system with layered patterns (Table 6). Ohio employs similar mathematical structures but only in three counties (Table 7).

These systems demonstrably enable:

- Mathematical frameworks for hidden record attributes
- Predictable relationships between certain ID types
- Recovery of deleted records through ID relationships (in specific cases)
- Record segregation by mathematical properties

The sophistication and similarities of these systems across states indicates deliberate design rather than administrative error. While specific uses cannot be proven in most cases, these mechanisms fundamentally compromise system transparency and reliability by creating mathematical capabilities that bypass normal database controls.

Table 5: Example Spiral algorithm details, organized by power of 10 columns (1, 11, 111, 1,111)

Short ID	SBOEID Gap	CID Alpha	CID Num	Reg Date RF	Short ID	SBOEID Gap	CID Num	Reg Date RF	Short ID	SBOEID Gap	CID Num	Reg Date RF	Short ID	SBOEID Gap	CID Num	Reg Date RF
20,462,690	122,587	A	54,878	06/14/1996	20,462,697	122,577	1,014,135	07/25/2000	20,462,772	122,477	29,057	10/14/1967	20,463,522	121,477	21,766	10/02/1971
20,462,691	1	A	54,879	06/17/1996	20,462,708	11	1,014,136	07/25/2000	20,462,883	111	29,132	10/06/1975	20,464,633	1,111	21,796	10/02/1972
20,462,692	1	A	54,880	06/14/1996	20,462,719	11	1,014,137	07/25/2000	20,462,994	111	29,141	10/15/1977	20,465,744	1,111	21,812	10/02/1972
20,462,693	1	A	54,881	06/14/1996	20,462,730	11	1,014,138	07/25/2000	20,463,105	111	29,148	10/15/1977	20,466,855	1,111	21,815	10/02/1972
20,462,694	1	A	54,883	06/14/1996	20,462,741	11	1,014,139	07/25/2000	20,463,216	111	29,154	10/02/1976	20,467,966	1,111	21,816	10/02/1972
20,462,695	1	A	54,885	06/14/1996	20,462,752	11	1,014,140	07/25/2000	20,463,327	111	29,174	10/02/1976	20,469,077	1,111	21,849	10/02/1972
20,462,696	1	A	54,887	06/14/1996	20,462,763	11	1,014,142	07/25/2000	20,463,438	111	29,175	10/02/1976	20,470,188	1,111	21,855	10/02/1972
20,462,698	2	A	54,888	06/14/1996	20,462,775	12	1,014,143	07/25/2000	20,463,550	112	29,182	10/02/1976	20,471,300	1,112	21,866	10/10/1972
20,462,699	1	A	54,890	06/14/1996	20,462,786	11	1,014,144	07/25/2000	20,463,661	111	29,187	10/02/1976	20,472,411	1,111	21,873	10/11/1973
20,462,700	1	A	54,891	06/14/1996	20,462,797	11	1,014,146	07/25/2000	20,463,772	111	29,191	10/02/1976	20,473,522	1,111	21,874	10/11/1973
20,462,701	1	A	54,893	06/14/1996	20,462,808	11	1,014,147	07/25/2000	20,463,883	111	29,219	09/28/1974	20,474,633	1,111	21,879	10/13/1973
20,462,702	1	A	54,895	06/14/1996	20,462,819	11	1,014,148	07/25/2000	20,463,994	111	29,223	09/28/1974	20,475,744	1,111	21,884	09/28/1974
20,462,703	1	A	54,898	06/14/1996	20,462,830	11	1,014,149	07/25/2000	20,464,105	111	29,261	10/05/1976	20,476,855	1,111	21,898	10/04/1975
20,462,704	1	A	54,901	06/17/1996	20,462,841	11	1,014,150	07/25/2000	20,464,216	111	29,263	10/15/1977	20,477,966	1,111	21,901	10/04/1975
20,462,705	1	A	54,902	06/17/1996	20,462,852	11	1,014,151	07/25/2000	20,464,327	111	29,266	10/11/1980	20,479,077	1,111	21,933	10/15/1977
20,462,706	1	A	54,905	06/17/1996	20,462,863	11	1,014,152	07/25/2000	20,464,438	111	29,276	10/11/1980	20,480,188	1,111	21,943	09/29/1979
20,462,707	1	A	54,907	06/17/1996	20,462,874	11	1,014,153	07/25/2000	20,464,549	111	29,278	10/16/1982	20,481,299	1,111	21,951	10/10/1981
20,462,709	2	A	54,908	06/17/1996	20,462,886	12	1,014,155	07/25/2000	20,464,661	112	29,361	10/11/1980	20,482,411	1,112	21,954	10/10/1981
20,462,710	1	A	54,909	06/17/1996	20,462,897	11	1,014,156	07/25/2000	20,464,772	111	29,362	10/11/1980	20,483,522	1,111	21,955	10/10/1981
20,462,711	1	A	54,912	06/17/1996	20,462,908	11	1,014,157	07/25/2000	20,464,883	111	29,363	10/11/1980	20,484,633	1,111	21,956	10/16/1982
20,462,712	1	A	54,914	06/17/1996	20,462,919	11	1,014,158	07/25/2000	20,464,994	111	29,365	10/11/1980	20,485,744	1,111	21,957	10/16/1982
20,462,713	1	A	54,916	06/18/1996	20,462,930	11	1,014,162	07/25/2000	20,465,105	111	29,369	10/11/1980	20,486,855	1,111	22,016	10/03/1967
20,462,714	1	A	54,917	06/18/1996	20,462,941	11	1,014,163	07/25/2000	20,465,216	111	29,381	10/11/1980	20,487,966	1,111	22,018	10/03/1967
20,462,715	1	A	54,918	06/18/1996	20,462,952	11	1,014,164	07/25/2000	20,465,327	111	29,388	10/10/1981	20,489,077	1,111	22,023	10/03/1967
20,462,716	1	A	54,919	06/18/1996	20,462,963	11	1,014,165	07/25/2000	20,465,438	111	29,391	10/10/1981	20,490,188	1,111	22,035	10/03/1967
20,462,717	1	A	54,920	06/18/1996	20,462,974	11	1,014,166	07/25/2000	20,465,549	111	29,392	10/10/1981	20,491,300	1,112	22,040	10/03/1967
20,462,718	1	A	54,921	06/18/1996	20,462,985	11	1,014,170	07/25/2000	20,465,660	111	29,403	10/15/1983	20,492,411	1,111	22,050	10/03/1967
20,462,720	2	A	54,922	06/18/1996	20,462,997	12	1,014,172	07/26/2000	20,465,772	112	29,405	10/15/1983	20,493,523	1,112	22,061	10/03/1967

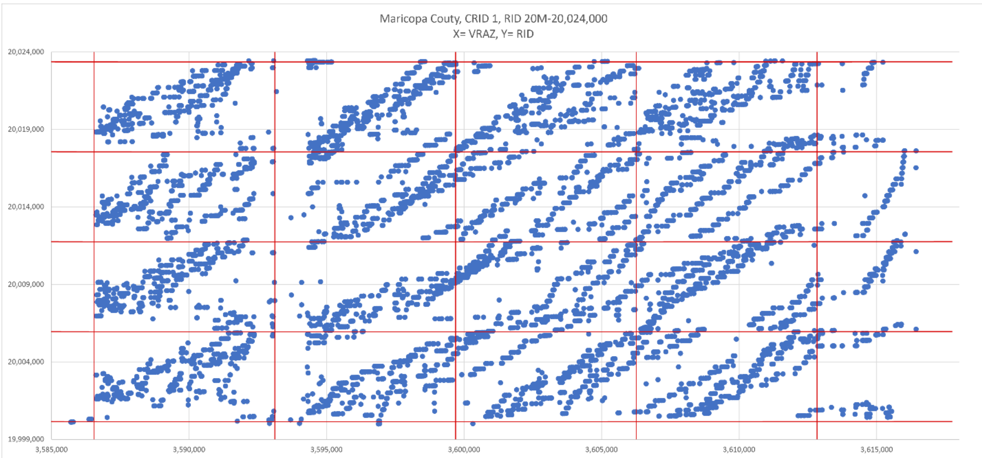

Figure 1: Maricopa County, AZ Braid pattern closeup shows cyclic pattern similar to NY's Shingle

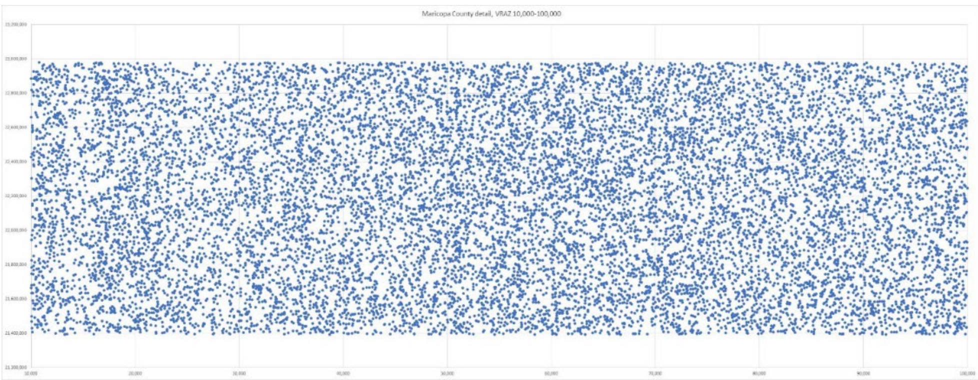

Figure 2: Detail, Arizona's Metronome Pattern, Maricopa County

Table 6: Harris County, TX Modulo /8 ID number pattern

Mod 0	Freq Mod 0	Mod 1	Freq Mod 1	Mod 2	Freq Mod 2	Mod 3	Freq Mod 3	Mod 4	Freq Mod 4	Mod 5	Freq Mod 5	Mod 6	Freq Mod 6	Mod 7	Freq Mod 7
8	167106	1	0	2	0	3	1	4	6	5	121	6	1253	7	16477
16	79230	9	0	10	0	11	0	12	4	13	104	14	1224	15	16777
24	34619	17	7066	18	41933	19	0	20	0	21	21	22	629	23	11058
32	12725	25	16766	26	52266	27	0	28	0	29	1	30	48	31	4006
40	3213	33	25558	34	48868	35	0	36	0	37	2	38	27	39	334
48	2370	41	32521	42	40629	43	0	44	0	45	0	46	13	47	228
56	1130	49	30638	50	30705	51	0	52	0	53	5	54	55	55	594
64	516	57	21985	58	15859	59	3410	60	0	61	1	62	36	63	524
72	256	65	14284	66	7539	67	9269	68	3811	69	0	70	1	71	190
80	188	73	8598	74	3113	75	13816	76	4467	77	0	78	0	79	15
88	190	81	3858	82	970	83	17425	84	3682	85	0	86	4	87	13
96	152	89	1831	90	236	91	20287	92	2004	93	0	94	0	95	14
104	151	97	1435	98	43	99	18774	100	0	101	0	102	0	103	12
112	107	105	881	106	1118	107	11111	108	0	109	2095	110	0	111	5
120	2	113	471	114	1395	115	6596	116	719	117	4694	118	0	119	0
128	6	121	182	122	1077	123	3552	124	1762	125	5609	126	0	127	0
136	5	129	48	130	484	131	1690	132	3019	133	5855	134	0	135	2
144	2	137	45	138	418	139	948	140	4382	141	5293	142	0	143	0
152	1	145	36	146	346	147	646	148	3896	149	3869	150	0	151	0
160	0	153	38	154	277	155	405	156	3121	157	2285	158	948	159	397
168	0	161	7	162	151	163	194	164	2412	165	1327	166	1890	167	875
176	0	169	0	170	9	171	121	172	1668	173	672	174	2854	175	946
184	0	177	1	178	4	179	85	180	180	181	294	182	3899	183	793
192	0	185	1	186	5	187	90	188	188	189	118	190	4837	191	479
200	0	193	0	194	3	195	60	196	653	197	40	198	3894	199	12

Table 7: Franklin County, OH Modulo 8 ID number pattern is a vertical mirror image of Harris, TX

Group A Gap	Group A Frequency	Group B Gap	Group B Frequency	Group C Gap	Group C Frequency	Group D Gap	Group D Frequency	Group E Gap	Group E Frequency	Group F Gap	Group F Frequency	Group G Gap	Group G Frequency	Group H Gap	Group H Frequency
1	0	2	0	3	1456	4	29	5	0	6	0	7	353	8	38771
9	377	10	0	11	623	12	41	13	34	14	2883	15	314	16	16865
17	285	18	414	19	4800	20	0	21	22	22	5423	23	213	24	7347
25	235	26	538	27	9930	28	19	29	0	30	7578	31	84	32	2535
33	160	34	670	35	10234	36	33	37	0	38	6296	39	71	40	0
41	99	42	801	43	9796	44	56	45	0	46	4545	47	79	48	72
49	723	50	935	51	8295	52	82	53	0	54	3005	55	87	56	87
57	2552	58	639	59	5303	60	146	61	0	62	1401	63	84	64	67
65	4158	66	429	67	2528	68	100	69	130	70	0	71	73	72	84
73	5427	74	293	75	1003	76	97	77	303	78	825	79	7	80	77
81	6491	82	110	83	256	84	47	85	388	86	812	87	23	88	0
89	6132	90	83	91	8	92	22	93	464	94	501	95	33	96	0
97	4373	98	73	99	83	100	8	101	576	102	2	103	35	104	43
105	2340	106	61	107	76	108	1389	109	441	110	13	111	498	112	39
113	1051	114	60	115	131	116	1978	117	230	118	5	119	715	120	18
121	280	122	39	123	171	124	2221	125	148	126	4	127	754	128	69
129	14	130	3	131	240	132	2211	133	81	134	3	135	594	136	132
137	12	138	204	139	257	140	1977	141	37	142	4	143	332	144	144
145	17	146	515	147	195	148	1177	149	62	150	0	151	128	152	137
153	16	154	795	155	140	156	589	157	47	158	84	159	130	160	101
161	15	162	1006	163	75	164	228	165	25	166	139	167	274	168	53
169	0	170	1346	171	34	172	66	173	20	174	196	175	322	176	35
177	0	178	1011	179	27	180	0	181	15	182	194	183	288	184	33

4.1 Algorithmic Evidence

The algorithms reveal themselves through consistent mathematical patterns. New York's Spiral algorithm produces regular gaps of 1,111, 111, and 11 between ID numbers. Texas demonstrates modulus-8 based groupings with secondary modulus-99 patterns. New Jersey shows systematic number transformations that can be reversed to reveal original values. Cross-state analysis finds shared characteristics like modular arithmetic, number segregation, and hidden indexing systems. The algorithms enable both attribute tagging and recovery of deleted records through mathematical relationships.

4.2 Manipulation Capabilities

These systems enable several concerning capabilities:

- ID relationship control through algorithmic mapping of numbers
- Record segregation via mathematical grouping
- Data opacity through complex transformations
- Disruption of normal audit trails by obscuring record relationships
- Consistent patterns suggesting coordinated implementation

The systems allow covert record tracking while maintaining surface-level compliance with public database requirements. The sophistication and similarities across states indicate deliberate design rather than administrative error. Technical analysis reveals capabilities for:

- Creating hidden record attributes without visible database fields
- Recovering supposedly deleted records through ID relationships
- Segregating records by mathematical properties
- Obscuring relationships between related records
- Maintaining consistency across different implementations

The consistency of these patterns across multiple states, sophisticated mathematical foundations, and clear capabilities for covert record manipulation present significant concerns for the utility and reliability of these critical election infrastructure databases.

5. System Reliability Impacts

The algorithmic manipulation of voter identification numbers, combined with documented record anomalies, fundamentally compromises these voter registration systems' ability to perform their intended functions. Unlike systems that might be repaired or repurposed, the nature of these compromises precludes even basic reliability.

In standard database design, sequential ID assignment provides transparent chronological tracking, enables straightforward auditing, and ensures visible relationships between records. Most critically, it ensures one-to-one correspondence between voters and ID numbers. The algorithms discovered in these systems actively work against these requirements, creating ID assignments that deliberately obscure record relationships and enable the creation of duplicate records that appear unique under normal database operations.

This technical compromise creates cascading failures throughout the system. When state and county databases disagree on over 250,000 voter participation records while maintaining similar total counts through apparent vote reassignment, basic mathematical certainty is lost. Document authentication failures compound this weakness - the presence of identical signatures across multiple active registrations with different algorithmically-generated IDs means neither electronic records nor paper documentation can reliably verify legitimate registrations.

These systems demonstrably cannot:

- Uniquely identify individual voters
- Track voter participation accurately
- Maintain consistent historical records
- Enable effective auditing
- Prevent or detect duplicate registrations

For election administrators tasked with maintaining accurate voter rolls, these systems no longer provide a reliable foundation. The combination of algorithmically obscured relationships, cross-database inconsistencies, and compromised authentication creates a situation where even basic questions about voter eligibility and participation cannot be answered with certainty. This represents a fundamental failure that cannot be mitigated through procedural changes or partial repairs. Furthermore, the fundamental nature of these system compromises extends beyond observable failures to the core architecture of the systems themselves.

The presence of sophisticated ID algorithms creates fundamental reliability issues regardless of their intended purpose or actual use. In properly functioning voter registration systems, relationships between records should be transparent and traceable through standard database operations. These algorithms instead create:

- Mathematically provable capabilities for hidden attributes
- Demonstrable third-party ID generation (as in the Spiral algorithm's AID)
- Verifiable patterns of record segregation
- Recoverable relationships between supposedly deleted records

Even if never exploited, these capabilities mean the systems cannot provide the transparency and reliability required for their core functions. Just as a banking system with built-in capability to hide transactions would be considered unreliable regardless of whether that capability was used, these voter registration systems are fundamentally compromised by the mere presence of these mathematical frameworks.

6. Conclusion

The materiality standard in regulatory oversight provides a useful framework for assessing these findings. In financial systems, evidence of intentional manipulation or control system bypass is automatically considered material, regardless of scale, because it compromises system integrity. Applied to voter registration systems, the sophisticated algorithmic manipulation of ID numbers documented here represents a material compromise of system integrity.

The presence of these algorithms alone would raise concerns, but the discovery of widespread clone records with algorithmically-coordinated ID assignments, systematic manipulation of birthdates, and retroactive modification of voting histories provides concrete evidence of active exploitation. The combination of deliberately engineered mechanisms for hiding and tracking records with proof of their use to create unauthorized duplicate registrations demonstrates comprehensive system compromise.

Based on this analysis, these voter registration systems cannot be reliably used for their intended purpose. The sophisticated mechanisms for manipulating record relationships have fundamentally compromised the systems' ability to provide trustworthy data about voter registration and participation. More critically, the existence of anomalies that should have been prevented by legally mandated data validation measures demonstrates that basic database integrity controls were either bypassed or never implemented. The only viable remedy is complete reconstruction using transparent, standard database practices that implement all legally required data validation measures and ensure full administrative visibility of authentic record relationships.

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