EVIDENCE-BASED SUMMARY

IMPACT OF BALLOT HAND COUNTING

Accuracy • Reliability • Timeliness • Cost • Manpower

Prepared: November 2, 2025

EXECUTIVE SUMMARY

The evidence from controlled tests, academic research, and real-world implementation consistently demonstrates that hand counting ballots is significantly less accurate, more time-consuming, substantially more expensive, and far more labor-intensive than machine tabulation—especially for elections with complex ballots containing multiple races.

Key Finding: Machine tabulation has error rates below 0.5%, while hand counting error rates range from 8% to 25%.

1. ACCURACY: HAND COUNTING IS SIGNIFICANTLY LESS ACCURATE

Campbell County, Wyoming Test Results (October 2024)

- Accuracy could not be determined because the second count was never completed
- Test was halted before reconciliation could occur
- Even with trained personnel, the process broke down before accuracy verification

National Research Findings

Error Rate Comparisons:

- Machine tabulation: Error rate below 0.5% (Brennan Center)
- Hand counting: Error rates of 8% to 25% (multiple studies)
- Wisconsin Studies (2011, 2016): Hand-counted ballots showed error rates twice as high (2011) and one-third higher (2016) than machine-scanned ballots
- Rice University Study: Hand-count teams made errors more than 30% of the time when counting just two races on 120 ballots

Recent Real-World Examples:

Gillespie County, Texas (March 2024):

- Math and transcription errors in 12 of 13 precincts
- Arithmetic mistakes: 197 voters cast ballots, but officials reported 160 votes for one race, 157 for another, 207 for a third
- Numeral transposition: Poll workers wrote 451 instead of 415
- Addition errors throughout the count

Nye County, Nevada (2022):

- 25% error rate on day one
- Required more than 200 volunteers
- Batches of 50 ballots took three hours to count

Maricopa County, Arizona (2020):

- Cyber Ninjas hand count awarded Donald Trump 12.4% more votes in analyzed samples than official results showed
- County officials found nearly 80 claims from the audit were misleading or false
- Inconsistent methodology: "Sometimes they counted by 50, sometimes by 100, sometimes they marked totals, sometimes they didn't"

Contributing Factors to Hand Count Inaccuracy:

- Human fatigue during extended counting periods
- Arithmetic errors in tallying and transcription
- Inconsistent application of counting standards
- Difficulty maintaining focus during repetitive tasks
- No ability to 'test' human counters before counting begins (unlike machines that undergo pre-election testing)

2. RELIABILITY: HAND COUNTING CANNOT BE CONSISTENTLY REPRODUCED

Campbell County Test Findings:

- First trial (less experienced team): Counted 240 ballots with 23 races in 6.75 hours
- Second trial (highly experienced team): Counted 249 ballots with 12 races in 4 hours
- Second count never completed in either trial
- Reconciliation never achieved
- No way to verify accuracy without completed second count

Consistency Problems Documented Nationally:

Lack of Standardization:

- No uniform counting methods across teams or jurisdictions
- Subjective interpretation of voter intent varies by counter
- Training variance creates inconsistent results

Inability to Verify Results:

- Machines can be tested before elections with known test decks to verify accuracy
- Machines produce identical results when processing the same ballots multiple times
- Humans cannot be 'pre-tested' and produce varying results on repeated counts
- No objective way to determine which count is correct when humans disagree

3. TIMELINESS: HAND COUNTING CREATES MASSIVE DELAYS

Campbell County Projections for 2024 General Election:

Test Trial #1 (Less Experienced Team):

- Rate: 204.44 races per hour per team of 4
- To count 19,735 ballots × 23 races = 453,905 total race counts
- At this rate: Would require 2,220 people working 4 hours
- Cost range: $360,018 to $1,378,998 depending on training

Test Trial #2 (Highly Experienced Team):

- Rate: 747 races per hour per team of 4
- To count the same election: Would require 608 people working 4 hours
- Cost range: $98,874 to $377,946 depending on training

National Comparison Data:

- **Georgia 2020 Presidential Recount:**
- Largest hand recount in U.S. history, took nearly 8 days
- Cost counties hundreds of thousands of dollars

- **Esmeralda County, Nevada (June 2022):**
- More than 7 hours to count only 317 ballots

- **York County, Pennsylvania:**
- Counting 1,842 ballots with two races took 4 hours
- Extrapolation: 184,594 ballots would require 17 days of continuous 24-hour counting

4. COSTS: HAND COUNTING IS EXPONENTIALLY MORE EXPENSIVE

Campbell County Cost Projections:

- **Using Test Trial #1 Data (Less Experienced):**
- Total range: $360,018 to $1,378,998
- Hourly cost: $29,970 per hour

- **Using Test Trial #2 Data (Highly Experienced):**
- Total range: $98,874 to $377,946
- Requires 42.5 average hours of training per person

National Cost Comparisons:

- **Mesa County, Colorado (2021):**
- 523,988 votes from two ballot styles: $80,000 (one week of work)

- **Shasta County, California (Projected):**
- Primary election: $658,925 (requiring 375 extra workers)
- General election: Approximately $1.3+ million

Equipment Comparison:

- Optical scanner: Approximately $2,500 per machine (one-time cost, serves thousands of voters)
- Hand count: $98,000 to $1,378,000 per election (recurring cost)

5. MANPOWER: HAND COUNTING REQUIRES MASSIVE STAFFING

Campbell County Requirements for 2024 General Election:

- **Scenario #1 (Less Experienced Counters):**
- Required: 2,220 people (4.7% of county population)
- Total commitment: 21,978 person-hours (including training)

- **Scenario #2 (Highly Experienced Counters):**
- Required: 608 people (1.3% of county population)
- Total commitment: 28,272 person-hours (including 42.5 hours training per person)

Practical Impossibilities:

- Campbell County test couldn't complete even with recruited volunteers
- No Wyoming county has successfully demonstrated ability to hand count full election
- Test environment with motivated volunteers still failed to complete count
- Real election environment would face even greater challenges

CONCLUSION

The evidence is unambiguous: hand counting ballots for initial tabulation in any jurisdiction larger than a small rural precinct is less accurate, less reliable, more time-consuming, dramatically more expensive, and logistically unsustainable compared to machine tabulation with paper ballots and post-election audits.

Campbell County's test—conducted under optimal conditions with motivated volunteers—could not even complete a count of 1,110 sample ballots. Scaling this to Wyoming's actual elections would require mobilizing thousands of workers at costs ranging from hundreds of thousands to over a million dollars per county, with no ability to verify accuracy and no improvement in security.

The current system of machine tabulation using paper ballots, combined with pre-election testing and post-election audits, provides the security, accuracy, efficiency, and reliability that hand counting cannot deliver.

Key Numbers Summary:

- **ACCURACY: Machine <0.5% error rate vs. Hand count 8-25% error rate**
- **TIME: Machine (minutes to hours) vs. Hand count (days to weeks)**
- **COST: Current system (manageable) vs. Hand count ($98,000 to $1,378,000 per election)**
- **MANPOWER: Current system (small staff) vs. Hand count (608 to 2,220 workers per election)**

SOURCES

Primary Sources:

- Campbell County Clerk Hand Count Test Trial Report (October 4, 2024)
- Brennan Center for Justice: Hand Counting Ballots
- Verified Voting: Hand-Counted Paper Ballots Research
- MIT and Rice University Studies on Hand Count Accuracy
- National Conference of State Legislatures Research
- Cybersecurity and Infrastructure Security Agency (CISA)

Case Studies:

- Gillespie County, Texas (2024)
- Nye County, Nevada (2022)
- Shasta County, California (2023-2024)
- Maricopa County, Arizona (2020-2021)
- Georgia Statewide Presidential Recount (2020)
- Wisconsin Election Studies (2011, 2016)

Academic Research:

- Ansolabehere & Reeves: New Hampshire comparison study
- Stewart, Burden & Mayer: Wisconsin analysis

- Rice University: Human counting accuracy study
- UC Berkeley: Ballot complexity research