



Texas Secretary of State  
ELECTIONS DIVISION



# Logic and Accuracy (L&A) Testing



## Agenda

- Pre-Election Testing Requirements
- Conducting the Public Logic and Accuracy Test
- Hash Validation
- Electronic Pollbook Testing



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# Pre-Election Testing Requirements



# Testing Requirements

- **Public Logic and Accuracy Test / First Tabulation Test**
  - Conducted after ballot programming and printing
  - Verify that the ballots are programmed and printed correctly
  - Verify that the system is correctly marking and correctly counting the ballots
  - Open to the public
  - Involves each type of equipment used in the election and each type of ballot used in the election



# Public L&A Test and First Tabulation Test

**Consists of three tests conducted together at the same time:**

- Public L&A Test
- Tabulation Test for Polling Place Equipment (Precinct Scanners)
- Tabulation Test for CCS Equipment (Central Scanners + Central Accumulator)

**All three tests are performed by the testing board:**

- Consists of at least two people appointed by general custodian
  - At least one from each political party
- Presiding and alternate judge of CCS **not** required to be part of testing board
  - However, they can be appointed by the general custodian



# Testing Requirements

- **Second Tabulation Test of Central Counting Station Equipment**
  - Conducted immediately before each time ballots are counted at CCS
  - Verifies that the system is still tabulating results correctly before the official tabulation begins
- **Third Tabulation Test of Central Counting Station Equipment**
  - Conducted immediately after each time ballots are counted at CCS
  - Verifies that the system is still tabulating results correctly after the official tabulation is completed



## Second and Third Tabulation Tests

### Timing

Central Scanners and Central Accumulators must be tested immediately before and immediately after **each time** that ballots are counted at the CCS

### Responsibility

Presiding judge, tabulation supervisor, CCS manager, and programmer are responsible for performing these tests

### Materials

The electronic media generated during the Public L&A Test/First Tabulation Test is used to perform these tests at the CCS



# Testing Requirements

- **Logic and Accuracy Test of Electronic Pollbooks**
  - Conducted before early voting begins in an election
  - Can be conducted at the same time as the voting system Public L&A Test, but it is not required
  - Designed to verify that the electronic pollbooks are programmed correctly and functioning properly





# Electronic Pollbook L&A Testing

## Electronic Pollbook Testing Requirements:



Voter database is loaded correctly



Peripheral devices function as expected



Ballot styles correctly assigned to voters



Ballots issued by peripheral devices correctly read by voting system



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# Conducting the Public Logic and Accuracy Test



# Public L&A Test and First Tabulation Test

- Must be conducted no later than the 48th day before election day
- If it is not possible to meet this deadline, must perform test as soon as practicable
  - Must also provide notice to SOS within 24 hours of the determination that the deadline will not be met
- Must provide notice 48 hours before the test on the county/entity's website
  - Newspaper notice is **no longer** required



## Public L&A Testing Requirements




### Existing Requirements:

✓	Zero public counter
✓	Include testing board in vote casting
✓	Verify each contest position, precinct, and ballot style can be voted and is accurately counted
✓	Include overvotes, undervotes, write-ins, and provisionals
✓	Test all disability features using a two-person team
✓	Compare expected vs. actual results
✓	Hash validate representative sample of equipment



# Public L&A Testing Requirements

## New Requirements: Codifying Existing Best Practices for Voting System Testing

	Test all equipment types (e.g., BMDs, Scanners, DREs)
	Include all ballot types (e.g., mail, BMD ballots)
	Clearly mark test ballots



# Public L&A Testing Requirements

- If the test is unsuccessful:

Identify  
Cause

Prepare  
and Publish  
Explanation

Retain  
Testing  
Materials

Conduct a  
New Public  
Test



# Availability of Test Materials

**Sealed container for test materials may only be unsealed for these specific reasons:**

- To perform another voting system test (e.g., Second and Third Tabulation Tests)
- For a criminal investigation
- For an election contest
- For another official proceeding under the Election Code
- **To respond to a public information request (NEW LAW)**

**Test materials are now available for public inspection beginning on the first day after the final canvass of the election**



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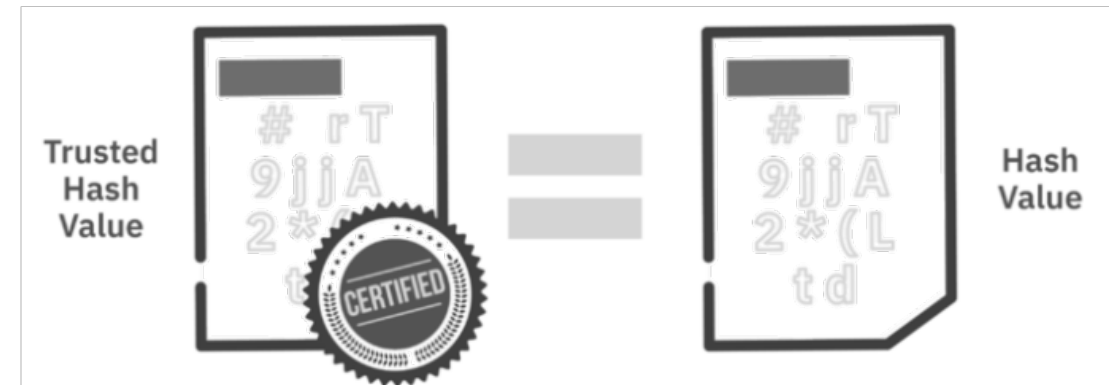
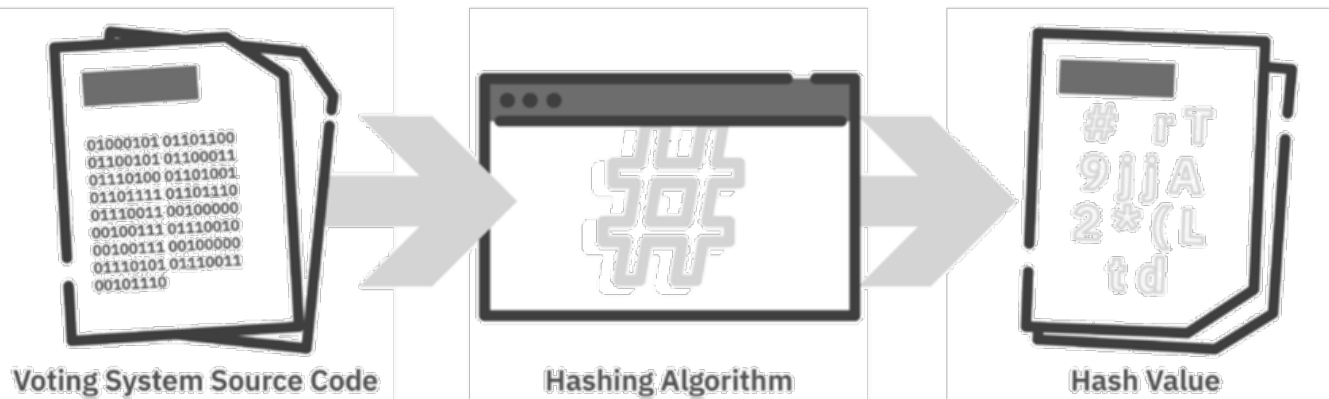
# Hash Validation





## Hash Validation

- *Hash* – A string of characters that represent a package of files.
- During certification, a hash is generated during federal testing.
  - Every type of device has its own unique hash in every system.
- During pre-election testing, a hash is generated the same way by the county.
  - The trusted hash is compared to the county's hash.
  - If they match, then the files in the system match the certified version.





# Hash Validation Requirements

- Must be conducted as part of the public L&A test
- Must test a "representative sample" of each type of voting system equipment used in the election
- A representative sample is defined as:
  - Ten (10) of each type of voting device **OR** 5% of each type of voting device (whichever number is smaller)



## Hash Validation

- Every voting system has a slightly different process for how hashes are generated from the EMS workstations and the voting devices and for how the generated hashes are compared to the trusted hashes
- Consult your vendor for specific procedures on how to conduct the hash validation process for your system
- Please contact our office at [ElectionSecurity@sos.texas.gov](mailto:ElectionSecurity@sos.texas.gov) to obtain the trusted hashes for your voting system
  - Email should include:
    - Your entity's name
    - The voting system you use, including the version number
      - e.g. ES&S EVS 6.1.1.0 / Hart Verity 2.7



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# Electronic Pollbook Testing



## Senate Bill 2166

- Requires Logic and Accuracy Testing for electronic pollbook systems
- Test must be performed not later than 48 hours before early voting begins
- Notice must be posted on county/entity's website 48 hours before test
- Not explicitly required to be a public test, though general custodian may choose to allow the public to be present



# Electronic Pollbook L&A Testing

## Electronic Pollbook Testing Requirements:



Voter database is loaded correctly



Peripheral devices function as expected



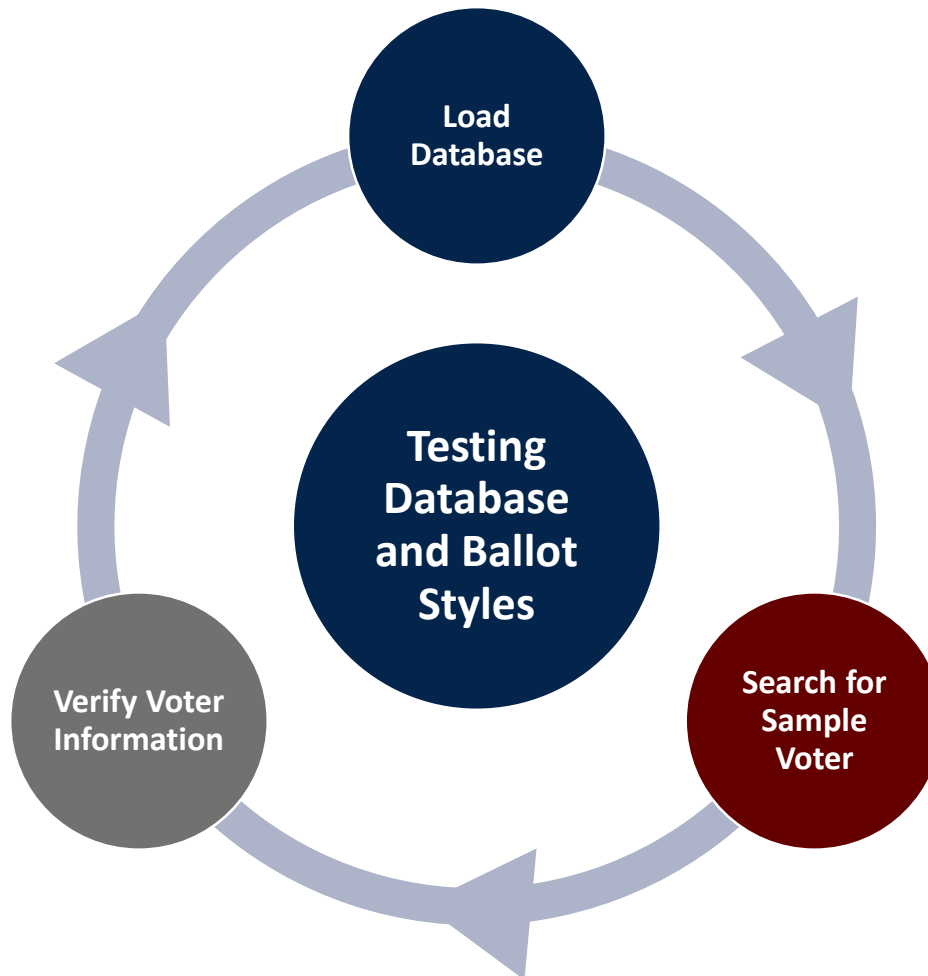
Ballot styles correctly assigned to voters



Ballots issued by peripheral devices correctly read by voting system



## Electronic Pollbook L&A Testing

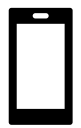


**Identify Random Sampling of Voters**



# Electronic Pollbook L&A Testing

## Testing Peripheral Devices



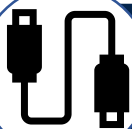
Test Check-Ins with all Peripheral Equipment Setup



Confirm Printers Print Correct Information



Scan Barcodes or IDs to Verify Information Captured



Test all Possible Peripheral Configurations





## Electronic Pollbook L&A Test Requirements

### Testing with the Voting System

Generate

- Perform Test Check-Ins and Generate Test Ballots from System and/or Peripheral Devices

Verify

- Verify Test Voter Information is Correct on Test Ballot

Activate

- Use Test Ballots With the Voting System Devices (e.g., BMDs, Scanners)

Verify

- Verify Voting System Identifies Correct Ballot Style and Correctly Marks and Tabulates Test Ballots



**Tip:** Run EPB and Voting System L&A Together Using Same Test Deck



## Available Support



**WEBINARS**



**TRAINING**



**RESOURCES**

[elections@sos.texas.gov](mailto:elections@sos.texas.gov)

800-252-VOTE • 512-463-5650

[sos.texas.gov](http://sos.texas.gov)