Travis County Facts

- 1,022 SQ MILES
- 1.121M POPULATION
- 652,000+ REGISTERED VOTERS
- 247 PRECINCTS
- 144 CONTRACTING JURISDICTIONS
2002
ALL ELECTRONIC
VOTING

VOTE CENTER COUNTY
SINCE 2011
AGING VOTING SYSTEM CHALLENGES

* FEELING OVERWHELMED
* EQUIPMENT FAILURES
* LIMITED RESOURCES
ACTIONS

- DOCUMENT PROBLEMS
- RECORD PROCESSES
- SEEK OUT BEST PRACTICES
- WRITE PROCEDURES
- ASSESS YOUR RESOURCES
- DEVELOP A PLAN
- BE PREPARED TO ACT WHEN OPPORTUNITY APPEARS
DOCUMENT PROBLEMS

Avoid problems & you'll never be the one who overcame them.

- Richard Bach
Logic and Accuracy Overview

General
- Spreadsheets listing every ballot style for each position are prepared, and then split into equal parts to be handed out to the testing teams. Each part is labeled with a letter that corresponds to the section of the spreadsheet being voted.
- Teams are divided between teams of testers and auditors.
  - Auditors check the ballot content, to make sure every ballot style has the correct names and candidates.
  - Testers cast ballots for every ballot style on their spreadsheet. They will vote for every "correct" on each ballot style and for the same position throughout the ballot, voting undercuts when there is no candidate running in that position.
- Proofing teams will get a distinct association report with ballot styles and the contexts that appear on those ballot styles.
- Each testing team will get two copies of a spreadsheet, a placard, and an MBR. The MBR will be labeled with team 0, location code, position, spreadsheet part, and the election code. The placard will tell the team which position they are voting for. When possible, each team will vote for the same position throughout testing to prevent mistakes and confusion.

Testing
- The JBC Operator issues codes according to the ballot styles listed on their spreadsheet. This job is unchanged from previous LiA tests.
- The Auditors check the ballot styles on the second copy of the spreadsheet, to make sure a ballot style is not issued twice.
- The ballot Operator votes for every contest on each ballot style. They will either be voting for the same position in each case, depending on their assigned place. This means that the available names change throughout the spreadsheet, depending on the ballot style. The ballot Operator should think in terms of voting for a position, rather than a candidate.
- The auditors will look at each page on the ballot to make sure the right position was chosen. At the summary screen, the Auditors will check that each contest has a candidate selected, then look at each page of the ballot to verify selections. Some ballot styles do not have candidates in the second position; these cases will be underwritten. The Auditors does not need to verify candidate names.
- Once the spreadsheet is finished, materials are turned into the precinct as usual.

Tallying
- Cards are run by position.
- As the cards are run, the tally is checked to make sure that no votes were cast for the wrong position.
- If a card does have a vote in the wrong position, it is treated as an error and removed.
- Once all of the cards for a position are completed, the tally is checked for each case.
- If a number does not match, a report is made of ballot style totals and the missing vote is found.
  - This case, the original card can be kept, and a new card will be made with votes cast for any missing ballot styles.
- After the position vote totals are confirmed, the same procedure is used for the position two cards, and so on. Cascades, stagger votes, and provisionals cards are run last.
SEEK OUT BEST PRACTICES

ATTEND AND PARTICIPATE IN PROFESSIONAL ASSOCIATIONS LIKE IACREOT, NACRC & ELECTION CENTER
WRITE PROCEDURES

- TESTING
- TRAINING
- OPERATIONS
Assess your resources

Good ideas are more valuable than money

Strategic Partnerships can increase resources
Develop a plan
BE READY TO ACT WHEN OPPORTUNITY ARISES
NOT THIS KIND OF ACTION

MARVEL UNIVERSE
THIS KIND OF ACTION
BEING PREPARED
PUT TOGETHER PROGRAM COMPONENTS

Draft Concept for Voting System Software Design and Certification Process

The idea here is that the system be broken into modules representing key stages of the voting process. Most of the modules would be proprietary in design and have only general requirements. The key being that the finalized data set transported from one module to another must meet certified format requirements and allow for open source review. This design will give vendors maximum freedom and innovation in the design of their modules, encourage regular upgrades, allow them to maintain proprietary products, and reduce certification costs. This will give administrators a broader selection to choose from, allow them to have updated software, and select modules that best fit their jurisdiction's specific needs. Activists, regulators, and administrators will be able to have an open and transparent method of verifying that the most sensitive modules and that the output from all modules is accurate. Additional certification and requirements for the Ballot By-Mail, In-Person, Tabulation, and Post-Election Module would be established and would allow limited party or full open source review. The illustration below uses blue boxes to indicate areas with fewer certification requirements, red boxes to show areas with much higher requirements for certification, and red arrows to show "hot spots" or areas of intense review.

- **DATA COLLECTION MODULE**
  - Web-based application for ballot language submission
  - Entities submit ballot content within this application using a customizable template
  - Application administrator monitors submissions and provides live updates and feedback
  - Corrections and changes are sent between the entities and administrator through a message center that emails alerts to the recipients
  - The web-based application configures a proof of each entity's ballot and generates an audio ballot using text-to-speech
  - Entities review their ballots and make corrections by a specified deadline
  - Entities approve the stage-one ballot content

- **BALLOT CREATION MODULE**
  - Lock down ballot
  - Generate reports for final proofing
  - Burn data to media
  - Perform proofing L&A

- **GENERATE MEDIA MODULE**
  - Move data to storage media and devices
  - Perform L&A testing

- **BALLOT BY MAIL SYSTEM MODULE**
  - For Voting Regular and Email ballots by mail
  - Perform official L&A
  - Print to hard copy and PDF
  - Mail and Email ballots by mail
  - Receive voted ballots
  - Resolve voted ballots
  - Scan voted ballots
  - Generate ballot counts
  - Generate audit logs

- **TABULATION MODULE**
  - Ballot tabulation and report data
  - Tabulate all ballots
  - Accept write-ins
  - Accept provisional ballots
  - Generate unofficial master report in precinct and cumulative formats
  - Generate data for import to audit templates
  - Prepare data for audits
  - Generate audit logs

- **IN-PERSON VOTING MODULE**
  - Functional testing of all devices
  - Preparation of devices for deployment into the field
  - Hash code, parallel and other types of auditing
  - Voting/Generate ballot counts including limited, provisional, and emergency ballots
  - Generate audit logs

- **POST-ELECTION MODULE**
  - Back up and final canvass data collection
  - Generate a master data file of vote counts
  - Generate a master data file of audit logs
  - Generate an official master canvass report in precinct and cumulative formats
  - Perform recounts

- **ELECTION NIGHT REPORTING MODULE**
  - Live Internet reporting, customer reports, and reports using nationally set standards
  - Configure reports to accept master data
  - Proof reports against the master report
  - Post reports

- **POST-ELECTION AUDITS AND FINAL CANVASS MODULE**
  - Perform audits such as signature vs. votes and risk-limiting audits
  - Prepare Canvass Reports

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# Identify Challenges and Solutions

## SOME OF THE CHALLENGES THAT CAN BE ADDRESSED WITH A NEW TYPE OF VOTING SYSTEM

<table>
<thead>
<tr>
<th>CHALLENGE</th>
<th>ISSUE</th>
<th>RESOLUTION</th>
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<tbody>
<tr>
<td>Voting system should allow for the use of early voting, mega-voting sites, and election day vote centers. At the same time, the system must minimize the use of paper which generates significant monetary and environmental waste. The creation and management of the paper ballots must minimize security risks and not significantly slow the flow through the voting process.</td>
<td>When a voter leaves a paper ballot at a polling place, a machine reads the ballot, and the results are transmitted electronically. This requires the use of hardware and software designed to handle paper ballots.</td>
<td>Design a system that has a lightweight, inexpensive thermal or ink jet printer at each voting booth. The system should print out only the voter’s selections with a corresponding number or 1-D bar code (instead of the entirety of the ballot) that contains only a simple number that can be easily read by a simple scanner on the ballot box. (1-D bar codes are required because they contain limited information and can be easily decoded – even using a smartphone.)</td>
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<td>Voting system should rely as little as possible on customized proprietary hardware and instead predominantly use commercial off-the-shelf (COTS) hardware.</td>
<td>Currently, voting system vendors sell both proprietary hardware and software. A better solution would be to allow election administrators to use off-the-shelf high-quality hardware that is less expensive and competitively bid. This will also allow a county to size-up or replace certain pieces of equipment when necessary, reduce maintenance costs, and enjoy product innovation without reliance on a voting system vendor’s decision to upgrade or apply for recertification.</td>
<td>Design a voting system that wherever possible uses COTS hardware.</td>
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<td>Voting system should provide proof that it is well designed, utilizes best practices for security, and allows a variety of tests to be done to verify the accuracy of the count.</td>
<td>The use of proprietary software and a difficult certification process has created a disincentive for vendors to maintain updated versions of software. Modularity with open source reference implementation could decrease the number of segments of a system that require certification. Open source reference allows full review of data as it moves from one module to another, while not revealing trade vendor product information within the modules. Security measures are predominantly based on limiting physical access and verification practices have evolved to better satisfy basic logic and accuracy testing. For example, encryption methods could be used to allow the performance of community-conducted live parallel testing. The software also needs to provide a means for reducing the change for tampering during the transportation process and a means for efficiently conducting risk limiting audits of the paper ballots.</td>
<td>Create specifications that go much deeper into technical requirements than before and require an independent (but nondisclosure protected) review of the product during and after development. Increase the types of audits that can be performed and increase modularity with open source reference implementations. Design a system that has an automated and secure method for issuing ballot formats to voters.</td>
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<td>Voting system must have a secure and transparent methods of ensuring voters are given the correct ballot format.</td>
<td>One of the most problematic areas of the voting process is ensuring that the election worker provides the voter with the correct ballot format. With overlapping jurisdictions and districts that sometimes do not conform to precinct boundaries; a single precinct can have multiple ballot formats (Precinct 30A1, 30B1, etc.) It does not take much for all these boundary lines to confuse the most experienced politician much less an average member of the community who is casually serving as an election worker. To maintain security most electronic voting systems separate the voter qualification system from the tabulation section to prevent the introduction of a computer virus into the voting system. This “air gap” requires the election worker to enter the ballot format information into the voting system so that the voter is given the proper ballot choices. This is where errors occur. Some voting systems are designed to scan a 2-D bar code that not only includes the ballot format information, but also programming code that tells the system what to do with that number. Going beyond a 1-D barcode and including command sets unnecessary security risks.</td>
<td>Design a system that has the ability for the voter to produce machine-marked ballots that can be verified by the voter before they are officially cast.</td>
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<td>Voting system must ensure the accurate tabulation and interpretation of voter intent on paper ballots.</td>
<td>Voters have a variety of ways of marking their choices on paper ballots. While instructions may say “put an x in the box.” Voters may instead use checks, circle their choices. “x” out all of the candidate names they do not want to select, or just accidentally make stray marks on the ballot. The goal of election officials is to make certain that every effort is made to correctly interpret voter intent and to have a fair way of resolving questions regarding these issues. Recounts and court challenges to election results often concentrate on whether or not specific ballots are properly interpreted. Current paper based systems use precinct ballot counters to scan a ballot and then to immediately notify a voter when an irregular marking is found. If set to its most sensitive level, backlogs at the ballot box can occur as voters may be repeatedly asked to clarify their selection. Some entities remedy this by reducing the review of the scanner (for example, to not question under votes – races where there appears to be no mark in the “square” for any candidate or race). While this may speed the process, it decreases accuracy in the determination of the intent of the voter.</td>
<td>Design a system with flexibility to produce reports that meet the specific needs of the administrator, are compatible to media reporting software, can be put into XML format, and conform to the soon-to-be national standards for providing election data.</td>
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<td>Voting system must create reports in formats that meet a wide variety of needs.</td>
<td>Current voting systems have limited capability in producing the types of return formats that are needed by our customers.</td>
<td>Design a system with the ability to produce machine-marked ballots that can be verified by the voter before they are officially cast.</td>
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IT’S NOT DONE UNTIL THE COWS COME HOME