



PIMA COUNTY

Pima County Elections Department

Security Plan

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Introduction

Security of the voting process is paramount to ensuring the public's confidence in elections. The Pima County Elections Department Security Plan is intended to provide a general overview of tasks as well as roles and responsibilities of selected offices and agencies in maintaining the security of the voting process.

In general, election systems are almost universally composed of two (2) major independent systems that provide functionally for election tabulation and voter registration. In Pima County, the responsibility for maintaining the voter registration system belongs to the County Recorder. The responsibility for election tabulation rests with the Pima County Elections Department. This security plans primary focus is on security concerns involving election tabulation. The Election Management System (EMS) used in Pima County is comprised of two programs: Elections Systems & Software' ElectionWare and Elections Systems & Software's Election Reporting Manager.

The Elections Director or his designee is responsible for the overall coordination of security concerns during elections. That position will be clearly identified to all employees as the primary point of coordination of security issues. In addition, it is crucial that every eligible ballot is counted and that the voting process is secure.

Effective security does not depend nor rely on a single process, feature, or policy. Effective security requires a number of interrelated processes, systems, and policies that compliment and build on each other. The systems, processes and policies that comprise the layers of security for Pima County Elections are represented on page 5 in figure 1.

These multiple layers of security systems, processes, and procedures ensure that election results are not inappropriately influenced. Involving external stakeholders such as the media, political party observers, the Arizona Secretary of State and the public provide the transparency that is integral to the detection of problems with the elections process. The physical and personnel security measures which have been implemented ensure that only authorized individuals are allowed to access critical election spaces, materials, technical systems and ballots. Elections staff and seasonal employees are trained in elections processes and procedures designed to ensure the security and integrity. The layered approach ensures that if a layer is compromised, bypassed or proven ineffective the security and integrity of the election process is preserved. It also provides a mechanism to detect such failures so that more effective procedures may be adopted. The contents of this Plan are structured to parallel the layers of security from outside in: 1. open and transparent election environment, 2. physical and 3. personnel security, legal and procedural security and technical and systems security.

This Plan is a dynamic, living document that will be reviewed and updated as significant security issues arise or situations change. After every election, Pima County Elections Staff review the lessons learned from that election and make adjustments to the processes, procedures and systems to improve the effectiveness of operations and security. The Pima County Elections Staff also monitors the experiences in other jurisdictions and examines studies and reviews by third parties. They then adjust policies and procedures in order to avoid weaknesses experienced or identified by others.

All employees who work in elections or who have a role in elections security share a responsibility to ensure that our elections remain secure and that they are conducted with the utmost integrity. To this end, all new employees are required to read and become familiar with the Security Plan as well as any implementation procedures that are relevant to their work areas. All employees will be briefed periodically with the key aspects of this plan. All employees, not just supervisors, are encouraged to suggest ways to improve the security of the election process.

Election Integrity is the responsibility of everyone. Pima County Elections welcomes suggestions from political parties, organizations, other observers and the public on ways to enhance system security.

Guiding Laws, Procedures, Policies and Studies

Laws, procedures, policies and studies that apply to elections include:

- Help America Vote Act of 2002 (HAVA): 42 U.S.C. 15301 to 15545
- Arizona Revised Statutes Title 16
- Arizona Electronic Voting System Instructions and Procedures Manual
- The American Voting Experience: Report and Recommendation of the Presidential Commission of Election Administration January 2014
- Quick Start Management Guide for Voting System Security, United States Election Assistance Commission
- Center for American Progress: Election Security in All 50 States February 2018
- Belfer Center for Science and International Affairs: The State and Local Election Cybersecurity Playbook February 2018

Layers of Election Security

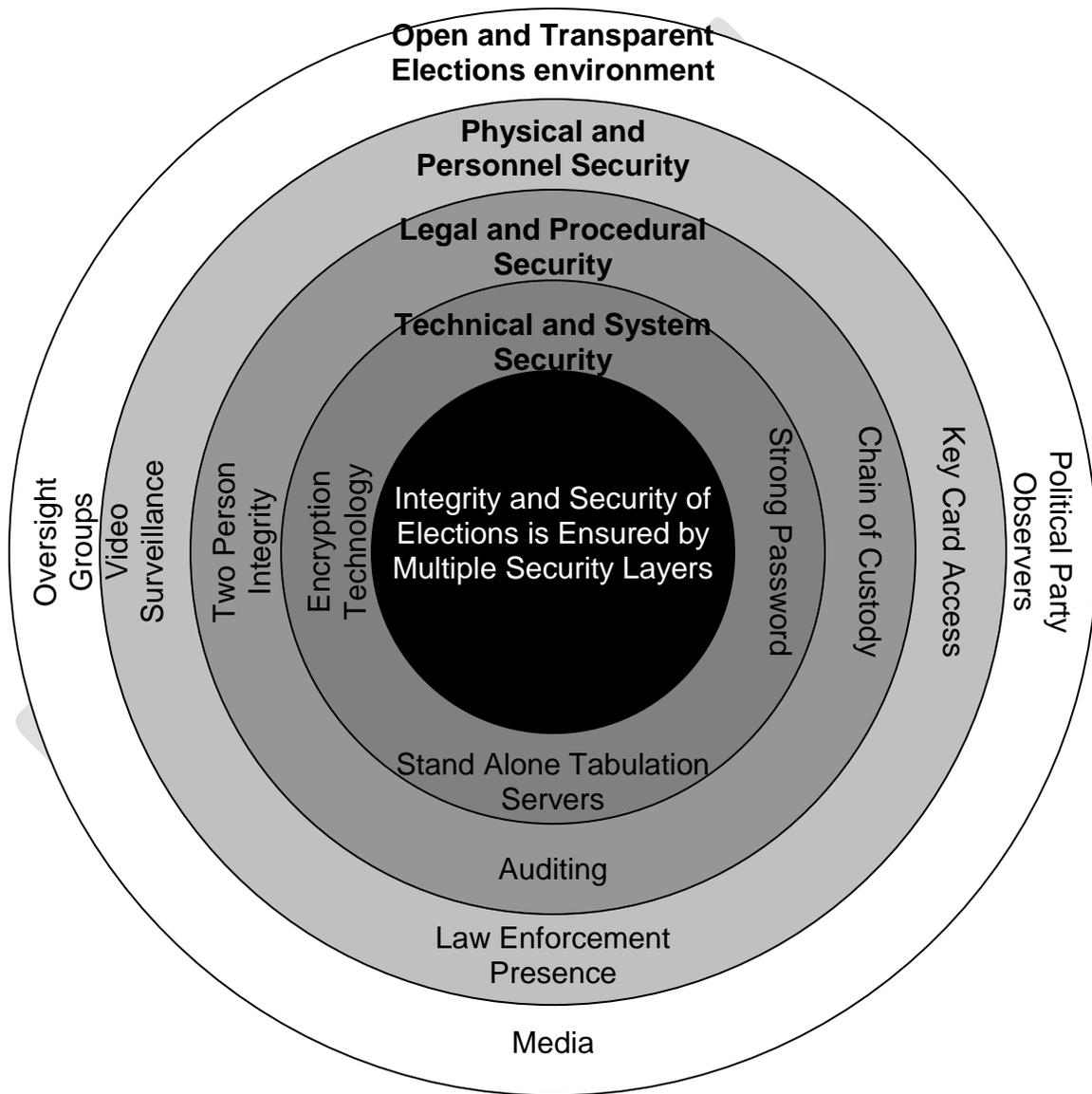


Figure 1

Open and Transparent Election Environment

Administering elections is a monumental responsibility and one which openness and transparency are essential to gaining and retaining public trust in government. It is the process by which citizens of a democratic republic choose their political leaders, and in the State of Arizona, it is a system in which the electorate through the process of initiative and referenda can directly make law. In any other system or process, it would be considered contradictory to require openness and transparency while at the same time restricting access and ensuring strong security, but this is exactly what election administrators across the nation must accomplish. For election administrators, openness and transparency are defined literally. They involve a variety of concepts that combine accountability, accuracy, access, openness, to preserve the integrity of the process. In Pima County, this is achieved through:

Building Infrastructure Design and Access

Open floor plans, viewing windows, public monitors, exposed and color coded network wiring, surveillance cameras and viewing areas are all design elements that facilitate transparency. These elements allow everyone physical access to the building and to view the inner workings of the Elections Department.

Public/Political Party Observers

The ability for observation of the tabulation process is grounded in State law and fully embraced by the Pima County Elections Department. The general public is encouraged to observe ballot processing and tabulation. Security concerns restrict them to the Public Viewing Area/Hallway.

Political Party Observers are nominated by the Chair of the county political parties who vouch for their integrity. They are granted greater access. Since Pima County Elections Department is responsible for the security and integrity of the election, The Pima County Elections Director has the final approval of the assignment of the observers and can designate where the observers are to be stationed.

Public Disclosure of NON PROTECTED RECORDS

Pima County Election Department tries to anticipate the information the public wants and posts it on its website

(http://webcms.pima.gov/government/elections_department/).

Other Departmental records are available through a Public Records Request sent to the Pima County Clerk of the Board's Office.

Not all documents/records handled or created by the Pima County Elections Department are available to the public. The public's interest must be balanced by the voter's rights.

Media access

Who act as additional eyes and ears for the public.

Video broadcast of ballot tabulation on the web

Pima County Elections Department provides streaming video of its ballot tabulation room 24/7/365 via a link on the departments website.

Physical and Personnel Security

Physical Security is a layer of defense against unauthorized individuals, tampering with or trying to harm the election process/personnel. Personnel Security starts with selecting highly trustworthy individuals and is enhanced through checks and balances, which ensure they do not have the opportunity or inclination to create harm to the process.

Physical

Access Control:

With the exception of processes necessary to get the ballots to the voters, the majority of the duties performed by the Pima County Elections Department are conducted in one building. This allows the Pima County Elections Department to restrict access and segment work areas. The Lobby and Public Viewing Corridor is open to the public but access to the election office and work areas are limited. Most doors can only be opened with electronic key cards that log the time, date and card number of the person who gained access to restricted areas. The doors to some restricted areas sound an alarm when the door is left open too long.

The servers that contain the election management software receive extra security and are housed in a secured environment, a locked and sealed cabinet inside the Tabulation Room. When not in use, the keyboard and mouse are locked and sealed within the cabinet, and the network cables for the servers are disconnected. A log is maintained to record seal numbers and access to the interior of the cabinet.

This secured, locked room serves as the location where the election database is prepared and where ballot layout and design is performed. Access is given only to qualified and authorized personnel. All persons (with the exception of select Pima County Elections Employees) entering the Tabulation area must sign a manual log stating time in and out and the purpose of their visit.

Accessible voting devices are stored in a secured limited access room within the facility. Voter access, supervisor and administrator cards for the accessible voting units in addition to memory cards containing the programs for each unit are secured in a locked safe until they are installed into the device. The outer case of each of these units is sealed with a minimum of two uniquely numbered, tamper-evident seals. Each of the units, in addition to the associated components is tracked with an electronic inventory system to maintain a documented chain of custody.

Servers and Electronic Media:

All sensitive equipment, media and supplies are secured in locked cabinets and/or fire proof safes contained in a controlled access room, under 24/7 video surveillance.

Uniformed Security Presence: Working in cooperation with the Pima County Sheriff's Office, commissioned law enforcement officers in uniform are assigned to the Elections Center at times of heightened security. Stationed at key locations they protect access points and act as additional observers of the processes, staff, and visitors.

Surveillance:

Forty-seven video surveillance cameras are set up at strategic locations to provide staff with the ability to observe restricted areas inside and outside of the facility. Video recordings are archived for five months, one year or two years depending on the cameras location/function. The more secure the location, the longer the video will be archived. Streaming video of the Tabulation Room is available through a link on the Pima County Elections Department website.

Security cameras continuously monitor the front and rear of the Election Management System's server cabinet to record any access, attempted access or attempt to shut down the system.

Each level of security generates a log of activity. If a level of security fails, the log can be used to detect who may have tampered with a device and when it would have likely occurred.

Personnel

Only authorized personnel with a specific need for access are to be allowed in sensitive areas. All personnel, observers and visitors in the Elections Center are required to wear visible credentials at all times. Pima County Elections Department personnel are instructed to stop and question anyone is not wearing the proper credentials. Non Pima Counties Employees will be accompanied by an escort at all times.

Employee and observers who work during elections must practice a high level of security. Pima County Employees must read and agree to follow Pima County polices and procedures when they are hired or reactivated. Upon the implementation of this plan, criminal background checks will be required for all employees and observers who work in areas of heightened security. The Elections Director identifies and designates heightened security areas.

Legal and Procedural Security

Ballot Programming and Election Administration

Pima County Elections Department is responsible for all the programming of elections administered by Pima County. Pima County Information Technology staff and Vendors may be asked to resolve problems with hardware or software but only Pima County Elections Staff may program the election or know the election specific passwords. The process of election programing and ballot layout takes place in the Tabulation Room under camera surveillance with controlled and tracked access to the room.

Logic and Accuracy Tests

Before every election, the entire vote tabulation system undergoes rigorous logic and accuracy testing. The process checks that each machine properly counts, records and tabulates results correctly. The tabulation system must pass logic and accuracy testing before it is "set" for the election. Typically, the tabulation system undergoes three Logic and Accuracy (L&A) tests: In-house, Party, and SOS.

In the In-house L&A, Pima County Elections Department Employees mark enough ballots so that every candidate/option in every race is marked at least once. Each race is over voted and under voted. Ballots are processed through the tabulation system and a results report is printed. The test results are compared with the expected results. If the test results match, the test is successful.

In the Party L&A political party observers mark test ballots. The ballots are processed and the results reported. The political party observers compare the test results with their expected results. The test is successful if the political party observers determine that the ballots were tabulated correctly.

In the SOS L&A, the Arizona Secretary of State's technical staff mark ballots. These ballots are processed and the results reported. The Arizona Secretary of State's technical staff compare the test results with the expected results. The test is successful if the test results match. If the election includes candidates for

federal or state offices or a statewide ballot question, the SOS L&A is the Official L&A.

After passing the official L&A, a copy of the election definition and database is saved onto portable media device and given to the Arizona Secretary of State's Office as a backup of the election at the time of testing.

Two Person Rule

To ensure against the possibility of the illegal manipulation of voted ballots, any time voted ballots are not in a sealed container, they shall be in the presence of no fewer than two observers who shall not be of the same political party.

Additionally, the two person rule is extended to operations in the tabulation room. Anytime the server is unlocked and unsealed there must be at least two Pima County Elections Department Employees in the room. If there are voted ballots in the room then the political party observers must be present as well.

The Pima County Elections Director may assign pairs of observers at times other than prescribed above when in his opinion it is warranted. (Ballot processing shall not be curtailed if the requested observers have not been provided.)

Security of Voting Equipment and Ballots to and from the Polls

Pima County utilizes numbered tamper-evident seals on all voting equipment and ballot storage devices. Tamper-evident numbered seals are affixed across the seam of the two halves of the exterior case of the ADA Accessible Voting Device. The slots/doors for the flash memory cards are also sealed. The condition of the seals and seal numbers shall be verified by at least two election officials at the polls prior to the start of voting. Pima County shall maintain a written log that records each seal number that is assigned to each voting unit. Any breach of control over a sealed item shall require the immediate notification of Pima County Elections.

After the polls close, the poll workers, one from each party, shall return the tablet from the ADA Accessible voting equipment and voted ballots in sealed/numbered containers to a receiving center. At each receiving center, the numbered seals shall once again be checked and a receipt is issued to the poll workers. If the seals have been damaged or the numbers do not match, the poll workers must make a statement explaining the discrepancy. That statement will be added to the receipt before it is issued to the poll workers.

From the receiving centers, the equipment is returned to the Election Department where the seals shall be checked again, under political party observation. Election Department employees assigned to tabulate votes will also check the seals before processing the votes from the machines.

Early Ballot Tabulation

The tabulation of early ballots can begin no sooner than seven days prior to Election Day. Early ballots are tabulated under public and/or political party observation. Political parties will be notified as to the date and time of early ballot processing. Unless approved by the Elections Director or their designee, only one observer from each political party is allowed in the counting room at any time.

During the administration of partisan elections, political party representatives designate batches of early ballots subject to hand count audit prior to official canvass of the election. By law, summary reports are generated for each batch of ballots selected by the political parties. The generation of summary reports, other than those prescribed by law, is prohibited. A brightly colored sheet of paper is placed on the printer before and after each summary is printed so that the equipment operator will not see any election results.

Post-Election Audits

Audits are performed to check the accuracy of the system and to catch fraud or mistakes.

Arizona State Law requires a hand count/audit of ballots from randomly selected precinct and early ballots batches for the presidential preference, primary and general elections. By law, the audited ballots and contests are randomly selected by the political parties and the entire auditing process is open to political party observation and participation.

State law does not provide for the hand count/audits for local elections. However, Pima County may choose perform hand count/audits for local elections to increase voter confidence. The political parties and civic groups will be encouraged to observe and participate in the process. Additionally, state law does not provide for other post-election audits but Pima County may choose to perform other auctions to increase voter awareness and confidence in the election process.

Technical and System Security

Technical security features include the computer security components necessary to ensure data integrity and security of technical systems, as well as prevent unauthorized access into election systems through the use of best practice tools, processes, procedures and policies. Proper management of the technical security environment of the system is critical to prevent any unauthorized access to elections systems and data, even if an unauthorized individual has circumvented other layers of security. Technical security is the last barrier to someone intent on malicious action, though the other layers of security would facilitate detection (e.g. armed Sheriff's deputy security, camera surveillance, and key card access records).

Split passwords

Pima County Election Staff members responsible for election programming cannot access the tabulation computer without a proper password. The password is in two parts and no staff member knows both parts. A maximum of two staff members know the first part and a maximum of two staff members know the second part of the password. The complete password shall be at least sixteen characters long as comprised of a mix of case sensitive letters, Numbers and symbols.

Once staff members gain access to the election program they must enter an additional password to access the Election Management System. A maximum of four staff members know the password. The password shall be at least sixteen characters long and may be comprised of a mix of case sensitive letters, numbers and symbols.

Passwords are changed at least once a year. As best practices for passwords change so will the password requirements.

Hash Codes

A hash code is a large number called a "message digest". The large number is computed using a standard algorithm that is applied to the entire string of bits that makeup a file. The algorithm is design so that the changing of one bit in the file will result in a completely different message digest.

Hash Code Testing involves applying the algorithm to the file being tested and generating a message digest. This test value is compared to the original value generated when the algorithm was applied to the certified file. If the values match, the file has passed the test and file is accepted as unaltered. Hash code testing validates that the ballot tabulation executable software is exactly the same software tested and analyzed in the federal and state certification process.

Pima County Information Technology Department conducts the hash code testing and certifies the software as unaltered for the Elections Department.

Before installing or upgrading any software on any system involved with collection and tabulation of votes, Pima County Elections will verify the software received is the same as that certified at the federal and state levels by hash code testing.

Prior to each election additional hash code testing will be conducted on the ballot tabulation executables software to verify that the software has not been altered.

Restrictions

No wireless devices will be used or attached to any component of the Election Management System including tabulation devices, workstations or servers. Pima County employs wireless sniffers 24/7 at the Election Center to detect signals.

Pima County Elections does not use precinct scanners. Voted ballots are placed in a secured/sealed ballot box. The ADA Accessible device is only used as a ballot-marking device. The voter verified tape is used to duplicate ballots for tabulation. Ballot tabulation is restricted to the central count facility; no tabulation is conducted at the polling place.

Election Management System (EMS) Specific Restrictions:

The ballot tabulation equipment and software are the most secure systems used by Pima County Elections and are housed in a single room with hardened security features. Access to this room is significantly restricted.

ElectionWare is the software used to define the election, design ballots, program software for the central count tabulators. Election Reporting Media is the software used to aggregate results of early, polls and provisional ballots counted by the central count tabulators and to generate reports. They are installed on two servers (one primary and one backup) and is solely administered by Pima County Elections Department personnel.

The EMS software is installed on a Wired Local Area Network that is physically contained within the tabulation room. This Local Area Network connects the two servers, two workstations, six tabulators, and one printer. Connecting to any outside network or wireless device is prohibited. Data sharing with other networked devices is through use of CD, DVD or Blu-Ray disks burned as read only devices.

To ensure the security and integrity of tabulated results, additional steps are taken when interruption in tabulation occur. Prior to the start of tabulation, a Zero Report is produced from each of the ballot tabulators and from the reporting software. This ensures that all races are starting at zero and that no ballots have been processed. When breaking for lunch or the day, a ballots processed report will be produced from each tabulator and the reporting software. Before starting to process ballots again, the reports will again be generated. Elections Staff and

Political Party Observers will compare the reports to ensure that no additional ballots have been processed during the break. Party Observers will sign and date the reports attesting to the fact that there was no change.

End of the days tabulation. When possible, the ballot tabulators will be cleared at the end of each day's tabulation so that zero reports can be produced at the end and beginning of each days tabulation. Additionally, the election database on the server will be backed up. A copy of the database will be stored on the secondary server and on a USB thumb drive (which will be stored in the Tabulation Room safe).

Audit Logs

Continuous audit logs are produced by each of the ballot tabulators, workstations.

A copy of the workstations audit log will be printed and provided to the party observers. This will act as a baseline for activity on the workstation. At the beginning and end of each day's tabulation a copy of the audit log will be provided to the party observers so that they can verify that there was no activity on the workstations during the break in tabulation.

The audit logs created by the ballot tabulators are printed on line printers that update the logs in real time. The line printers are loaded with tractor fed continues sheet of paper. If there is a break in the paper both the end of the old page and start of the new page will be signed by the available party observers and at least one Pima County Employee. These logs are available for inspection by the party observers at all times while they are in the tabulation room. These logs will be detached from the printers at the end of each calendar year and stored for 6 to 24 months depending on the type of election administered during the year.

Power Supply

Each major component (servers, workstations, and tabulators) of the Election Management System is protected by an uninterruptible power supply (UPS) to insure an orderly shutdown of the equipment. If the power to the tabulation room is interrupted, the UPS will provide enough power to produce the required reports and safely turn off the equipment. The UPS will be tested a minimum of two times per year.

RESPONSIBILITIES

Elections require participation and responsibility at all levels of government. A list of responsibilities below is not intended to be exhaustive but does provide an overview for various aspects of the election process.

US Government – Provides certification of voting tabulation systems

Arizona Office of Secretary of State – provides procedures and advisories; provides state certification of voting tabulation systems Performs pre-election testing of tabulation system.

Pima County Government – Oversees federal, state and local elections for Pima County.

Pima County Recorder

Maintains the Pima County List of Registered Voters, administers Early Voting and validates early ballots

Pima County Elections

On behalf of the Pima County Board of Supervisors, administers all federal, state and local elections in Pima County.

Pima County Sheriff's

Provides security at Pima County Election Facilities and provides deputies to act as couriers for election material(s) on Election Night.

Pima County Facilities Management

Provides security enhancements for Pima County facilities used for election tabulation.

Pima County Information Technology

Assists with Hash Code Check(s), Assists with Video Surveillance, and provides cyber security.

Pima County Attorney

Provides legal counsel

SUMMARY

Effective security does not rely on a single process, feature or policy. Effective security requires a number of interrelated processes, systems and policies to compliment and build on each other. The systems, processes and policies that comprise layers of security for Pima County Elections are represented in detail throughout this plan, and illustrated graphically on page 5, Figure 1.

These multiple layers of security systems, processes and procedures ensure that elections results are not inappropriately influenced. External stakeholders such as the media, candidates, political parties, the Arizona Secretary of State and members of the public provide transparency and are integral to the detection of problems with the election process. The physical and personnel security measures which have been implemented ensure that only authorized individuals are allowed access to the critical election spaces, materials, technical systems and ballots. Election staff members are trained in election processes and procedures designed to ensure the security and integrity of the election process. The elections processes are audited and reviewed throughout with many check points for accuracy. The layered approach ensures that if one or two layers are comprised, bypassed or proven ineffective, the security and integrity of the election process is still preserved.

This Security Plan details many safeguards in place to protect elections in Pima County. Many of the safeguards are not unique to Pima County Elections; they are deployed throughout election agencies across the state and country. Many of the safeguards in place today were implemented before they became recognized best practices; they are based on lessons learned internally, through observation of others, or through legal requirements.

The security of elections in Pima County is also the result of a genuine commitment by election officials to cooperate with outside stakeholders. Local stakeholder recommendations for improvement have proved beneficial and many have been implemented. The Elections Department continues to be receptive to recommendations made by all interested parties in so much as they positively contribute to election security, election integrity, public trust, openness, transparency and accountability.

Election administrators and public officials continue to implement and improve safeguards to protect the integrity of elections, as all share responsibility for protecting the process. A key element to improving election security is the participation of voters, state and local officials, political parties and other stakeholders working in tandem with election officials to identify threats and areas of opportunity for improvement.