



**PIMA COUNTY**

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**ELECTIONS**

**2018  
SECURITY  
PLAN**

State of Arizona

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## INTRODUCTION

Security of the voting process is critical to ensuring the public's confidence in elections. The Security Plan provides a general overview of tasks as well as roles and responsibilities of selected offices and agencies in maintaining the security of the voting process.

Nearly all election systems involve two major independent systems that provide the functionality for election tabulation and voter registration. In Pima County, the responsibility for maintaining the voter registration system belongs to the Recorder's Office while the responsibility for election tabulation rests with the Elections Department. This Security Plan will focus primarily on security concerns involving election tabulation. To manage election tabulation, Pima County uses the Election Management System (EMS), which is an operating system comprised of two programs: Elections Systems & Software's ElectionWare and Elections Systems & Software's Election Reporting Manager.

The Elections Director or his designee is responsible for coordinating security concerns during the elections. That individual is identified to employees as the primary point of contact for security issues.

Effective security does not depend nor rely on a single process, feature, or policy. It 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 4 in figure 1.

These multiple layers of security systems, processes, and procedures ensure election results are not inappropriately influenced. By involving external stakeholders such as the media, political party observers, the Arizona Secretary of State and the public, the Elections Department offers a level of transparency that is integral to the detection of problems

with the elections process. Current security measures ensure only authorized individuals can access critical election areas, materials, technical systems and ballots. In addition, the Elections Department trains staff and seasonal employees on the processes and procedures to ensure the security and integrity of the election process is preserved if a layer becomes compromised, bypassed or proven ineffective. 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 living document that will be reviewed and updated as significant security issues arise or situations change. After every election, Elections staff will review and modify the current process, procedure and systems as needed to improve the effectiveness of the operation and its security. In addition to reviewing local outcomes, staff will monitor outcomes from other jurisdictions and examine studies and reviews by third parties. Staff will adjust policies and procedures as needed to avoid weaknesses experienced or identified by others.

All employees directly involved in elections and elections security share the responsibility of ensuring the County election process remains secure and conducted with the utmost integrity. To this end, all new employees must read and become familiar with the Security Plan as well as any implementation procedures relevant to their work areas. Additionally, all employees will be briefed periodically with the key aspects of this plan.

Election Integrity is the responsibility of everyone. Pima County Elections welcomes input from all employees on ways to improve the security of the election process. Similarly, political parties, organizations, other observers and the general public can suggest 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

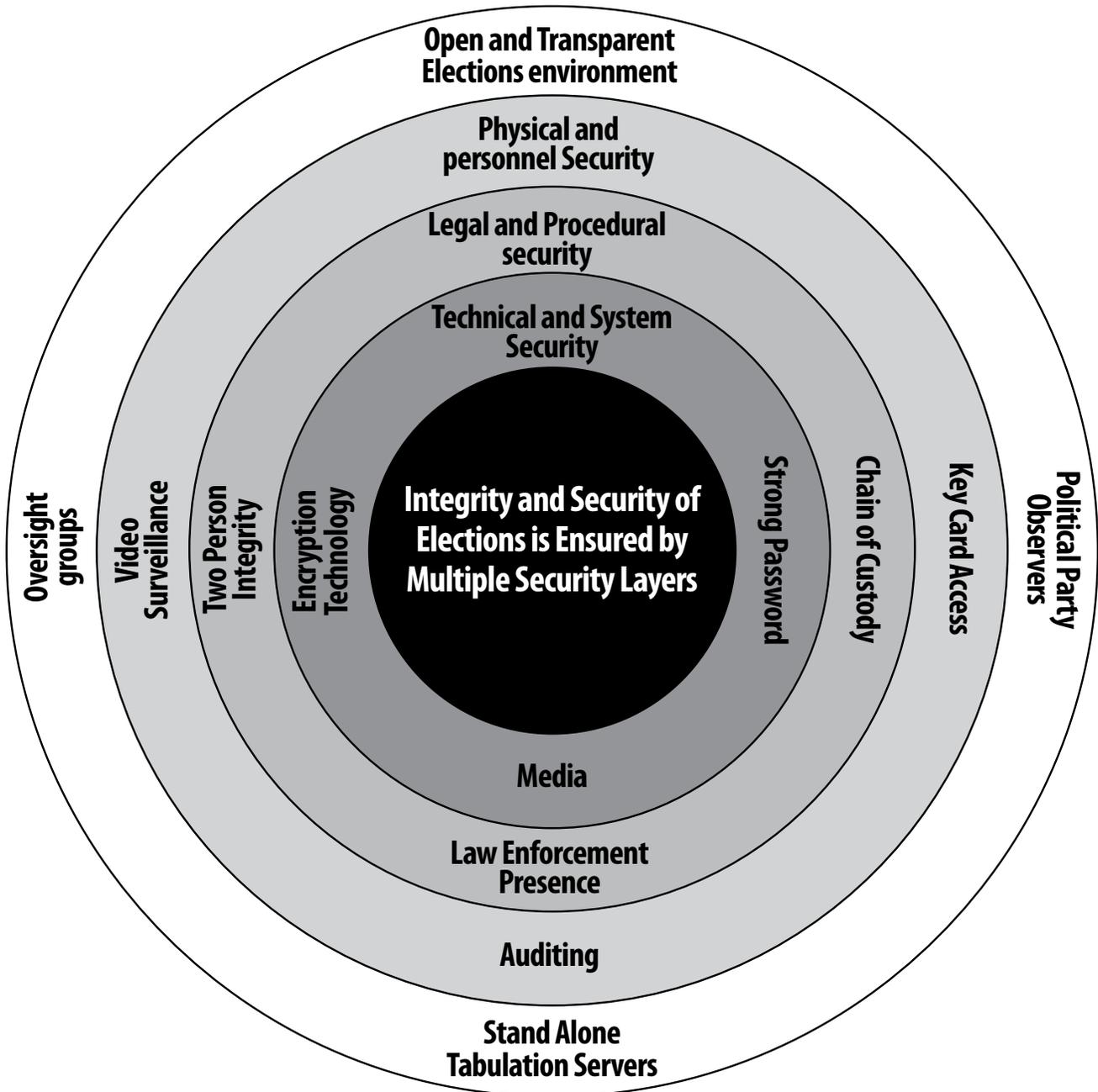


Figure 1

## **OPEN AND TRANSPARENT ELECTION ENVIRONMENT**

Administering the elections is a monumental responsibility and one in which openness and transparency are essential to gaining and retaining the public's 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. Pima County, achieves this by:

### **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 the public physical access to the facility and the ability 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 County's Elections Department. The general public is encouraged to observe ballot processing and tabulation. However, for security reasons, this must happen from the public viewing area.

The chair of the County's political parties can each nominate observers for their political parties to vouch for the integrity of the process. These individuals receive greater access than the general public. Because the Elections Department is responsible for the security and integrity of the election, County's Elections Director has final say on the assignment of the observers and can designate where the observers are stationed.

## **Public Disclosure of NON-PROTECTED RECORDS**

The Elections Department does its best to post information relevant to the general public on its **website at [www.pima.gov/elections](http://www.pima.gov/elections)**.

Other departmental records may be requested through a Public Records Request sent to the Pima County Clerk of the Board's Office.

### **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 hours-a-day, seven days a week, year-round via a link on the department's website.

## **PHYSICAL AND PERSONNEL SECURITY**

Physical Security is a layer of defense against unauthorized individuals who may attempt to tamper with or harm the election process/personnel. Personnel Security starts with selecting highly trustworthy individuals and is enhanced through checks and balances, which ensure these individuals do not have the opportunity or inclination to harm 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 Elections Department are conducted in one building. This allows the department to restrict access and segment work areas. The lobby and public viewing corridor is open to the public. The election office and work areas, however, have restricted access. Most doors require electronic key cards that log the time, date and card number of the person who gained access to the restricted area. In addition, the doors to some restricted areas will 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 County Elections employees, entering the tabulation area must sign a manual log stating time in/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 and the associated components are 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, which is under video surveillance 24 hours-a-day, seven days a week.

### **Uniformed Security Presence:**

Pima County Elections works with the Pima County Sheriff's Department to assign commissioned law enforcement officers in uniform to the Elections Center at times of heightened security. Officers are stationed at key locations where they can 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 remain archived for five months, one year or two years depending on the cameras location and/or function. In most cases, the length of the archive depends on the level of security of the location. Streaming video of the tabulation room is available through a link on the 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 detect who may have tampered with a device and when it likely occurred.

### **Personnel**

Only authorized personnel with a specific need for access can enter sensitive areas. All personnel, observers and visitors in the Elections Center must wear visible credentials at all times. Elections Department personnel are trained to stop and question anyone without proper credentials. Non-county employees must be accompanied by an escort at all times.

Employee and observers who work during elections must practice a high level of security. County Employees must read and agree to follow Pima County policies and procedures when hired or reactivated.

Upon the implementation of this plan, 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**

The Elections Department is responsible for the programming of all elections administered in Pima County. Information Technology staff and vendors may be asked to resolve problems with hardware or software but only elections staff may program the election or know the election specific passwords. The process of election programming 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 verifies 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 Secretary of State (SOS).

In the In-house L&A, a test deck of ballots is marked 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. Political party observers then compare the test results with their expected results. The test is successful if the political party observers determine the ballots 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 State's technical staff compares the test results with the expected results. If the results match, the test is successful. If the election includes candidates for federal or state offices or a statewide ballot question, the SOS L&A is the official logic and accuracy test used.

After passing the official L&A, a copy of the election definition and database is saved onto a 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 prevent the possibility of 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 from different political parties.

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 Elections Department employees present in the room. If there are voted ballots in the room, political party observers must be present as well.

The County Elections Director may assign observers in pairs at times other than prescribed above as the director deems necessary. 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 must be verified by at least two election officials at the polls prior to the start of voting. In addition, Pima County maintains a written log that records each seal number assigned to each voting unit. Any breach of control over a sealed item requires immediate notification to Pima County Elections.

After the polls close, one poll worker from each party returns 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 get checked once more

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's issued to the poll workers.

From the receiving centers, the equipment is returned to the Election Department where the seals are checked again under political party observation. Election 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 in advance on the date and time of early ballot processing. Unless approved by the Elections Director or 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 preformed 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 precincts and early ballot 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 to 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 the County may choose to perform other audits 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, and prevent unauthorized access into election systems by using 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 intending 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**

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. A maximum of two staff members know the first part and a maximum of two staff members know the second. The complete password must be at least sixteen characters long and 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 designed 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 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 the file is accepted as unaltered. Hash code testing validates the ballot tabulation executable software is exactly the same software tested and analyzed in the federal and state certification process.

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

Before installing or upgrading software on any system involved with collection and tabulation of votes, Pima County Elections verifies the software received matches the one certified at the federal and state levels by hash code testing.

Prior to each election, additional hash code testing is conducted on the ballot tabulation executables software to verify 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 hours-a-day, seven days a week, at the Election Center to detect signals.

Additionally, 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 heightened security features. Access to this room is significantly restricted. ElectionWare is the software used to define the election, design ballots and program software for the central count tabulators. Election Reporting Media is the software used to aggregate results of early ballots, polls and provisional ballots counted by the central count tabulators. It’s also used to generate reports. This software is installed on two servers (one primary and one backup) and is solely administered by Elections Department personnel.

The EMS software is installed on a wired local area network that is physically contained within the tabulation room. This network connects the two servers, two workstations, six tabulators and one printer. Connecting to any outside network or wireless device is prohibited. This “air gapped,” “closed” system has no connectivity to the Internet. Because of that, there is no way the County voting tabulation system can be hacked without having physical access to the system. Data sharing with other networked devices is through use of pristine 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 occurs. Prior to the start of tabulation, a zero report is produced from each of the ballot tabulators and the reporting software. This ensures all races start at zero and certifies no ballots have been processed. When breaking for lunch or the day, each tabulator and the reporting software produces a report on the ballots processed. Before resuming the ballots process again, another set of reports is generated. Elections staff and political party observers compare the reports to ensure no additional ballots were processed during the break. Party observers must sign and date the reports to certify there was no change.

When possible, the ballot tabulators get cleared at the end of each day’s tabulation so that zero reports can be produced at the end and beginning of each day’s tabulation. Additionally, the election database on the server gets backed up. A copy of the database

is stored on the secondary server and on an encrypted USB thumb drive, which gets stored in the tabulation room safe.

### **Audit Logs**

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

A copy of the workstation's audit log is 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 is provided to the party observers so they can verify there was no activity on the workstations while on break during 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 continuous sheets of paper. If there is a break in the paper, both the end of the old page and start of the new page must be signed by the available party observers and at least one County employee. These logs are available for inspection by the party observers at all times while in the tabulation room. These logs are detached from the printers at the end of each calendar year and stored for six to 24 months depending on the type of election administered during that year.

### **Power Supply**

Each major component of the Election Management System, which includes servers, workstations and tabulators, is protected by an uninterruptible power supply (UPS) to ensure 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 gets 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.

**U.S. Government** – Provides certification of voting tabulation systems.

**Arizona Secretary of State** – Provides procedures and advisories; state certification of voting tabulation systems; and performs pre-election testing of the tabulation system.

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

**Pima County Recorder's Office** – 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 Department** – 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 in Pima County facilities used for election tabulation.

**Pima County Information Technology** – Assists with hash code check(s), video surveillance and provides cyber security.

**Pima County Attorney's Office** – 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 election 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 only authorized individuals have access to critical election spaces, materials, technical systems and ballots. Election staff members receive trained in election processes and procedures designed to protect the security and integrity of the election process. Additionally, the elections processes are audited and reviewed throughout with many check points for accuracy. The layered approach ensures the security and integrity of the election process is preserved if one or two layers are compromised, bypassed or proven ineffective.

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 and are deployed throughout election agencies across the state and country. Many of the safeguards in place today were implemented before they became recognized as 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 proven beneficial and been adopted into the process. The Elections Department is receptive to recommendations made by all interested parties that 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.



# **PIMA COUNTY**

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## **ELECTIONS**

6550 S. Country Club Road  
Tucson, AZ 85756  
(520) 724-6830  
[www.pima.gov/elections](http://www.pima.gov/elections)