

**COUNTY OF**



**ALLEGHENY**

**RICH FITZGERALD**  
COUNTY EXECUTIVE

# **2017 Municipal Election Experience Report**

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## Overview

Of the 922,080 registered voters in Allegheny County, 217,600 – 23.60%, voted at the past November 7, 2017 Municipal Election. This level of voter participation is consistent with turnout levels in recent past elections of this type.

A total of 5,454 absentee ballots were issued and 153 provisional ballots were cast. Of the provisional ballots, 19 were fully counted, 74 partially counted and 60 were not counted. The majority of those not counted were due to the fact that the provisional voter was not a registered voter.

Over 185,000 “emergency” paper ballots were supplied to this County’s 1,322 polling places in the event that at least one-half of the voting machines in a precinct were non-functional. 31 emergency ballots were used in 3 voting districts, primarily due to difficulties in printing a “zero tape” prior to the opening of the polls. All of the affected districts successfully printed their zero tapes that morning.

1,776 candidates appeared on the ballot and a total of over 300 distinct ballot configurations were created to accommodate the State, County and local municipal office contests. 3,303 individuals were notified that they were elected to the office of Judge or Inspector of Election by write-in vote. A proposed amendment to the Pennsylvania Constitution and Home Rule Charter amendment referendum questions appeared on the ballot in Bethel Park, Monroeville and the City of Pittsburgh.

## Accessibility

All 1,322 polling places in this County have been classified as “accessible” pursuant to the standards promulgated by the Secretary of the Commonwealth of Pennsylvania.

## Firmware Verification

Allegheny County employed the services of “GRP Consulting Group, LLC” to verify that the software resident on the iVotronic voting devices contain the “trusted build” version certified by the Pennsylvania Department of State. As has been the case since 2008, no instance of uncertified software has been detected. Copies of the reports prepared for the November 7, 2017 Municipal Election are posted on the Allegheny County Elections Division website.

### Logic and Accuracy Testing

Extensive automated and manual Logic and Accuracy Testing (L&A) was performed. Automated L&A was performed on all 4,226 iVotronic voting machines deployed on Election Day. Manual L&A was also performed for each of the approximately 300 different ballot configurations. Those parties and organizations permitted by Pennsylvania law to be present during this process were duly notified.

The “test deck” comprised of over 13,800 ballots, containing ballots for every candidate and question, was used to verify that the 7 ES&S Model 650 high-speed ballot counters would accurately count the absentee, provisional and emergency optical scan paper ballots to be used at the election. This test was conducted prior to Election day as well as before final certification of the election results. In both tests, the ballot scanners produced an accurate count. Public notice of the pre-election test was given, as required by law.

### Network Security

Also following past practice, an independent third-party review was conducted both prior to and after the past Election to assure that our election network was isolated and not connected to any external network. Copies of the report produced by “Solutions 4 Networks” is posted on the Allegheny County Elections Division website.

### Parallel Testing

Since the November 2006 Election, Allegheny County has employed a Certified Public Accounting firm to ensure that the functionality of the iVotronic voting machine devices have not been compromised. The parallel testing performed at the November 7, 2017 Municipal Election indicated that the randomly-selected voting devices recorded and counted all votes completely and correctly. A copy of the report issued by “Baker Tilly” is posted on the Allegheny County Elections Division website.

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## GRP Consulting Group, LLC

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*ALLEGHENY COUNTY PRE NOVEMBER 7, 2017  
MUNICIPAL ELECTION  
ES&S iVOTRONICS FIRMWARE VERIFICATION  
STUDY*

### **EXECUTIVE SUMMARY**

Developed for:

*ALLEGHENY COUNTY  
DIVISION OF ELECTIONS  
STATE OF PENNSYLVANIA*

Document Number GCG-AC-iVo-FRPT-000232

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# 1. INTRODUCTION: ALLEGHENY COUNTY ES&S iVOTRONICS FIRMWARE VERIFICATION STUDY

The Allegheny County, Pennsylvania Division of Elections requested GRP Consulting Group to audit and verify the firmware source code on twenty (20) ES&S iVotronic DRE voting machines before conducting the November 7, 2017 Municipal Election. The devices to be audited were randomly selected from the counties 4700 devices. The purpose was to verify that the samples have in residence on the U1 designated Electronic Erasable Programmable Read Only Memory (EEPROM) chip the firmware version 9.1.4.1 and that all applied firmware versions are accurate and true to the State of Pennsylvania's Trusted Build as held in escrow by the Secretary of State's Office in Harrisburg. The study was accomplished by applying the *'Allegheny County iVotronic Firmware Verification Protocol'* and was performed on location at the Allegheny County Division of Elections warehouse; located at 901 Pennsylvania Ave., Pittsburgh, Pennsylvania. GRP Consulting Group and Allegheny County staff performed this firmware audit on September 11, 2017.

It is the finding of GRP Consulting Group that the firmware verification audit applied to the resident code on the sample population was found to be unaltered versions of the 9.1.4.1 firmware.

## 1.1 Approach

### 1.1.1 Study's Focus

The focus of the exercise was:

1. Implementation of a fair and statically correct random selection process.
2. Deploy the verification protocol, known as the *'Allegheny County iVotronic Firmware Verification Protocol'*, to verify on twenty (20) randomly chosen ES&S iVotronics DRE voting devices that they hold in residence on the U1 designated EEPROM chip the exact, true and unaltered version of the 9.1.4.1 certified firmware source code as held in escrow at the Secretary of State's office.

### 1.1.2 Study's Concentration

The GRP Consulting Group analyst was tasked to independently apply a repeatable and validated verification protocol to verify that the ES&S firmware version 9.1.4.1 that resides in escrow by the Secretary of State's office and is resident on the Allegheny County iVotronic Direct-Recording Entry (DRE) - touch screen voting devices – are exact, true and unaltered versions of the certified firmware source code.

### 1.1.3 Study's Phases

GRP Consulting Group organized the project primary phases, each incorporating the flexibility to accommodate additional requirements, as they may have become known. The general strategy employed was comprised of the following aspects:

1. Setup, configure and control the verification environment and the parameters associated with each verification cycle;
2. Apply the SHA256 algorithm to verify that before the November 7, 2017 Municipal Election the 9.1.4.1 firmware on the iVotronic DREs is the true and certified version of the firmware and has not been altered;
3. Execute twenty (20) verification cycles;
4. Conduct reviews and analyses of all verification results and anomalies obtained during the twenty (20) verification execution cycles;
5. Advise the County on possible root cause(s) of any and all anomalies; and
6. Prepare and deliver a report of the verification activities, the results of all verification executions, and conclusions and recommendations in Executive Summary and Final Report formats.

## 2. FINDINGS

GRP Consulting Group was engaged by the Allegheny Division of Elections on site at 901 Pennsylvania Ave., Pittsburgh, PA on September 11, 2017; the purpose of the engagement was to apply the '*Allegheny County iVotronic Firmware Verification Protocol*' to verify the ES&S iVotronic firmware version 9.1.4.1 is resident on the Allegheny County iVotronic population.

On September 11, 2017, the GRP Consulting Group analyst completed the verification process of the firmware on twenty (20) Allegheny County iVotronics chosen at random from the population of approximately 4700 machines. It is the findings of GRP Consulting Group that the firmware version 9.1.4.1 residing on the twenty (20) randomly chosen machines, do represent the population, and furthermore, that the firmware version as resident on the U1 designated Electronic Erasable Programmable Read Only Memory (EEPROM) chip is an exact, true, and unaltered version of the NVLAP federally certified trusted build as held in archive at SysTest Labs and in escrow by the Pennsylvania Secretary of State in Harrisburg, PA.

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***ALLEGHENY COUNTY PRE NOVEMBER 7, 2017  
MUNICIPAL ELECTION  
ES&S iVOTRONICS FIRMWARE VERIFICATION  
STUDY***

**FINAL REPORT**

Developed for:

***ALLEGHENY COUNTY  
DIVISION OF ELECTIONS  
STATE OF PENNSYLVANIA***

Document Number GCG-AC-iVo-FRPT-000233

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## 1. INTRODUCTION: ALLEGHENY COUNTY ES&S iVOTRONICS FIRMWARE VERIFICATION STUDY

The Allegheny County, Pennsylvania Division of Elections requested GRP Consulting Group to audit and verify the firmware source code on twenty (20) ES&S iVotronic DRE voting machines before conducting the November 7, 2017 Primary Election. The devices to be audited were randomly selected from the counties 4700 devices. The purpose was to verify that the samples have in residence on the U1 designated Electronic Erasable Programmable Read Only Memory (EEPROM) chip the firmware version 9.1.4.1 and that all applied firmware versions are accurate and true to the State of Pennsylvania's Trusted Build as held in escrow by the Secretary of State's Office in Harrisburg. The study was accomplished by applying the *'Allegheny County iVotronic Firmware Verification Protocol'* process and was performed on location at the Allegheny County Division of Elections warehouse; located at 901 Pennsylvania Ave., Pittsburgh, Pennsylvania. GRP Consulting Group and Allegheny County staff performed this firmware audit on September 11, 2017.

It is the finding of GRP Consulting Group that the firmware verification audit applied to the resident code on the sample population was found to be unaltered versions of the 9.1.4.1 firmware.

### 1.1 Approach

#### 1.1.1 Study's Focus

The focus of the exercise was:

1. Implementation of a fair and random selection process.
2. Deploy the verification protocol, known as the *'Allegheny County iVotronic Firmware Verification Protocol'*, to verify on twenty (20) randomly chosen ES&S iVotronics DRE voting devices that they hold in residence on the U1 designated EEPROM chip the exact, true and unaltered version of the 9.1.4.1 certified firmware source code as held in escrow at the Secretary of State's office.

#### 1.1.2 Study's Concentration

The GRP Consulting Group has been tasked to independently apply a repeatable and validated verification protocol to verify that the ES&S firmware version 9.1.4.1 that resides

in escrow by the Secretary of State's office and is resident on the Allegheny County iVotronic Direct-Recording Entry (DRE) - touch screen voting devices – are exact, true and unaltered versions of the certified firmware source code.

### **1.1.3 Study's Phases**

GRP Consulting Group organized the project primary phases, each incorporating the flexibility to accommodate additional requirements, as they may have become known. The general strategy employed was comprised of the following aspects:

1. Setup and configure the verification environment and the parameters associated with each verification cycle;
2. Apply the protocol to verify that before the November 7, 2017 Municipal Election that the 9.1.4.1 firmware on the iVotronic DREs is the true and certified version of the firmware and has not been altered;
3. Execute twenty (20) verification cycles comprised of verification on performed one (1) ADA (American Disabilities Act) compliant iVotronic and nineteen (19) non-compliant DRE units;
4. Conduct reviews and analyses of all verification results and anomalies obtained during the twenty (20) verification execution cycles;
5. Advise the County on possible root cause(s) of any and all anomalies; and
6. Prepare and deliver reports of the verification activities, the results of all verification executions, and conclusions and recommendations in Executive Summary and Final Report formats.

## **1.2 Purpose**

This document is the Allegheny County pre-November 7, 2017 Municipal Election ES&S iVotronic Firmware Verification Study Final Report. This report was developed as a review of the specific technical details, the project's results, and findings.

## **1.3 Statement of Independence**

As an election validation and verification business practice, GRP Consulting Group is technically, managerially, and financially independent from all electronic voting systems vendors as specified in *IEEE 1012-2004 Annex C*.

The consultants of GRP Consulting Group shall maintain an independent decisional relationship between its clients, affiliates, or other organizations so that GRP Consulting Group's capacity to perform services objectively and without bias is not adversely affected.

GRP Consulting Group shall maintain independence in fact and in appearance. The validation and verification environment, whether on-site at GRP Consulting Group facilities or partner organizations or at a client's site, shall be organized so that staff members are not subjected to undue pressure or inducement that might influence their judgment or the results of their work.

## 1.4 References

1. iVotronic Software Verification Protocols: Allegheny County Proposals; Collin Lynch, President, VoteAllegheny; 9/28/2008
2. Firmware vs. Uploaded Firmware Chip Data Comparison Procedure; Election Systems and Software, Inc.; 1/18/2008
3. Allegheny County iVotronic Firmware Verification Protocol; Geoffrey R. Pollich, SysTest Labs, 10/14/2008

## 1.5 Systems Information

Items identified in Table 1 reflect firmware deployed at the Allegheny County Division of Elections warehouse on September 11, 2017:

**Table 1 - Matrix of Firmware**

Vendor	System	Description	Software/ Firmware Version
ES&S	iVotronic	Direct Record Entry	9.1.4.1
ES&S	iVotronic	ADA Compliant DRE	9.1.4.1

Equipment identified in Table 2 reflects iVotronic hardware selected at the Allegheny Division of Elections warehouse on September 11, 2017:

**Table 2 - Matrix of Hardware**

iVotronic Serial Number	Microchip Manufacturer	Microchip Part Number
->V5185558	Spansion	0612FBE
->V5179784	Spansion	0612EBA
->V5184055	Spansion	0612FBE
->V5184249	Spansion	0612FBE
->V5183044	Spansion	0612FBE
->V5186610	Spansion	0612FBE
->V5182447	Spansion	0612EBA
->V5183430	Spansion	0609BRB
->V5183239	Spansion	0612GBA

<u>iVotronic Serial Number</u>	<u>Microchip Manufacturer</u>	<u>Microchip Part Number</u>
->V5186753	Spansion	0612GBA
->V5183480	Spansion	0612FBE
->V5178389	Spansion	0603FRC
->V5181136	Spansion	0612EBA
->V5184581	Spansion	0612GBA
->V5186022	Spansion	0612EBA
->V5181821	Spansion	0609BRB
->V5178400	Spansion	0603FRC
->V5178460	Spansion	0603FRC
->V5183758	Spansion	0609BRB
->V5172799*	Spansion	0446EEE

\*American Disabilities Act (ADA)

**Table 3 - Matrix of Testing Hardware**

<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>
EEPROM Device Programmer	Logical Devices, Inc.	ChipMaster 6000XPu
Flash Module Programmer Adapter	Logical Devices, Inc.	Version 1
ESD Static Mat with wrist strap	N/A	N/A
#10 Tamper Proof Torx screwdriver	N/A	N/A
Small flathead screwdriver	N/A	N/A

**Table 4 - Matrix of Testing Software**

<u>Description</u>	<u>Manufacturer</u>	<u>Software Version</u>
Software- CHIPMASTER 6000 XPU for USB	Logical Devices, Inc	ChipMaster 6000Xpu for USB
WinLink2	Logical Devices, Inc	v. 01.51.00
Hex Editor	Xvi32	v. 2.5
Microsoft Visual C++, Binary Editor	Microsoft Corporation	Version 6.0
SHA_256 and other SHA segments Hash Code Identification	SlavaSoft Quick Hash Library. Tool:HashCalc	Version 2.0

## **2. ALLEGHENY COUNTY PRE NOVEMBER 7, 2017 MUNICIPAL ELECTION iVOTRONIC FIRMWARE VERIFICATION PROCESS; PREFORMED SEPTEMBER 11, 2017**

To establish a best practice protocol and verification procedure, Geoffrey Pollich, consultant with GRP Consulting Group, reviewed and analyzed the *VoteAllegheny: iVotronic Software Verification Protocols: Allegheny County Proposals*, the *ES&S Firmware vs. Uploaded Firmware Chip Data Comparison Procedure*, and NIST Standard Lab Procedures best practices. It was from these primary sources that the ‘Allegheny County iVotronic Firmware Verification Protocol’ was established.

### **2.1 Present during the September 11, 2017 Verification Process:**

#### GRP Consulting Group:

Geoffrey Pollich – GRP Consulting Group, Principle Consultant

#### Allegheny County Division of Elections:

Mark Wolosik – Elections Division Manager

John O’Brien – Manager of Voting Machines

Elizabeth Dell – Business Analyst, Division of Computer Services

#### Election Advocacy Observers:

Ron Bandes – VoteAllegheny

Dave Makanic – The Republican Party of Allegheny County, PA

### **2.2 Sample Size Randomization Procedure**

The sample size must be carefully selected due the need to open the warranty seal over the lower left chassis screw in order to conduct the firmware verification. When this seal is broken, the DRE must be inspected and tested by ES&S. If a larger sample of machines were inspected per election, the availability of certified election machines may not satisfy the needs of individual precincts for federal, state, county, municipal and special issue elections held over the calendar year. It is also unclear if a larger sample sizes would yield a more valid result than the present sample size appropriately randomized.

Dave Makanic of The Republican Party of Allegheny County, PA, escorted by Division of Election employees chose the DRE using a randomization method established by Dr. Leonard Mlodinow at Cal Tech University; Mr. Makanic walked the warehouse aisles randomly identifying the iVotronics to be employed during the verification process. Mark Wolosik, Elections Division Manager, John O’Brien, Manager of Voting Machines, Division of Computer Services, and Geoffrey Pollich of the GRP Consulting Group believed the selection was consistent with a valid random selection process and was free of any and all mathematical bias.

### **3. Allegheny County Pre November 7, 2017 Municipal Election ES&S iVotronic Firmware Verification Study Results**

#### **3.1 September 11, 2017 Results**

**08:30 – 9:00 am GRP Consulting Group and observers arrive at the Allegheny County warehouse facility to set up the verification work area; the Observer launches their randomization process**

1. GRP Consulting Group unboxed the CHIPMASTER 6000 XPU EEPROM Programmer; the analyst setup the device to a GRP Consulting Group laptop; County Employees, and the Observer brought 20 randomly picked iVotronics into the verification work area to begin the firmware verification procedure.

#### **09:09 Verify firmware procedure for iVotronic DRE #1**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5185558 was selected. Perform iVotronic Firmware Verify Procedure.
2. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
3. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
4. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

#### **09:14 Verify firmware procedure for iVotronic DRE #2**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5179784 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display

**09:19 Verify firmware procedure for iVotronic DRE #3**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5184055 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**9:28 Verify firmware procedure for iVotronic DRE #4**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5184249 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**9:36 Verify firmware procedure for iVotronic DRE #5**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5183044 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display

**9:40 Verify firmware procedure for iVotronic DRE #6**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5186610 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**9:46 Verify firmware procedure for iVotronic DRE #7**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5182447 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**9:51 Verify firmware procedure for iVotronic DRE #8**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5183430 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code:  
(F6A8D4570988E2D159398503144E64D48F0CC69F) .
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:01 Verify firmware procedure for iVotronic DRE #9**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5183239 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:06 Verify firmware procedure for iVotronic DRE #10**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5186753 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:12 Verify firmware procedure for iVotronic DRE #11**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5183480 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:17 Verify firmware procedure for iVotronic DRE #12**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5178389 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:21 Verify firmware procedure for iVotronic DRE #13**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5181136 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was an Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The AMD firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code:  
(F6A8D4570988E2D159398503144E64D48F0CC69F) .
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:25 Verify firmware procedure for iVotronic DRE #14**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5184581 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:29 Verify firmware procedure for iVotronic DRE #15**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5186022 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:36 Verify firmware procedure for iVotronic DRE #16**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5181821 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:41 Verify firmware procedure for iVotronic DRE #17**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5178400` was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:45 Verify firmware procedure for iVotronic DRE #18**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5178460 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

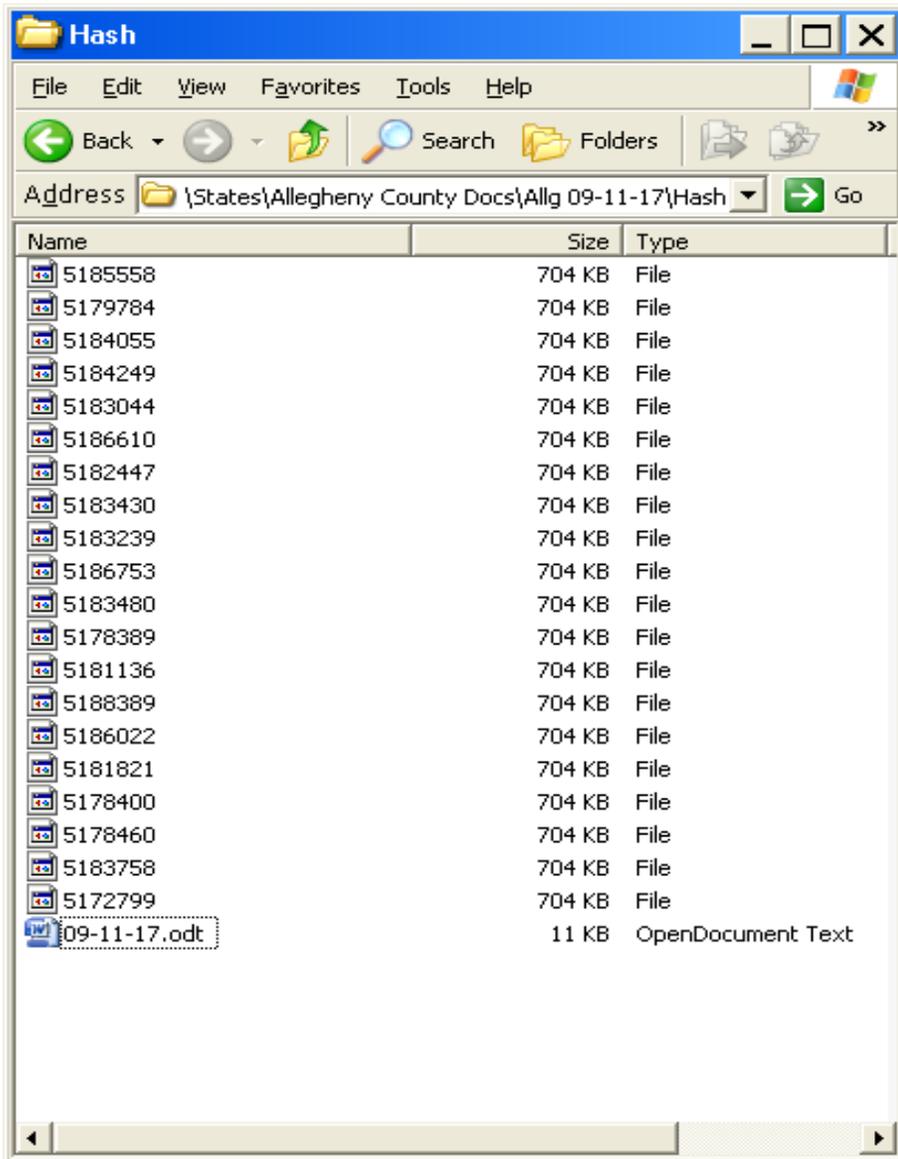
**10:48 Verify firmware procedure for iVotronic DRE #19**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5183758 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code.
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

**10:51 Verify firmware procedure for iVotronic DRE #20**

1. Randomly select an iVotronic DRE from the warehouse for the firmware verification procedure; s/n ->V5172799 was selected.
2. Perform iVotronic Firmware Verify Procedure.
3. Upon opening of iVotronic DRE, the removable CMOS was a Spansion CMOS part S29AL016D90TF101, and the CHIPMASTER 6000 XPU EEPROM programmer was used to read and save the binary firmware code.
4. The Spansion firmware chip was successfully read into the PC and the hash code generated did match the trusted build hash code:  
(F6A8D4570988E2D159398503144E64D48F0CC69F) .
5. The iVotronic DRE was closed and powered by County employees to verify that the DRE was working properly with the correct firmware date, time, and version number showing on the initial display.

### 3.2 September 11, 2017 Collective Firmware Files



## 4. FINDINGS

GRP Consulting Group was engaged by the Allegheny Division of Elections on site at 901 Pennsylvania Ave., Pittsburgh, PA on September 11, 2017; the purpose of the engagement was to apply the *Allegheny County iVotronic Firmware Verification Protocol* to verify the ES&S iVotronic firmware version 9.1.4.1 is resident on the Allegheny County iVotronic population.

On September 11, 2017, the GRP Consulting Group analyst completed the verification process of the firmware residing on twenty (20) Allegheny County ES&S iVotronics Direct-Recording Entry electronic voting machines chosen at random from the population of approximately 4700 iVotronic Direct-Recording Entry (DRE) electronic voting machines. It is the findings of GRP Consulting Group that the firmware version 9.1.4.1 residing on the twenty (20) randomly chosen DRE electronic voting machines, do represent the population, and furthermore; the firmware version as resident on the U1 designated Electronic Erasable Programmable Read Only Memory (EEPROM) chip is an exact, true, and unaltered version of the NVLAP federally certified trusted build as held in archive at SysTest Labs in Denver, Colorado and in escrow by the Pennsylvania Secretary of State in Harrisburg, PA.

## 5. APPENDIX A - TERMS AND ABBREVIATIONS

These terms and abbreviations will be used throughout this document:

**Table 2 - Matrix of Terms & Abbreviations**

Terms & Abbreviation	Description
Binary	The system of representing text or computer processor instructions by the use of a two digit number system. This system is composed of only the number zero, representing the off state, and the number one, representing the on state, combined in groups of 8. These groups of 8 bits can represent up to 256 different values and can correspond to a variety of different symbols, letters or instructions.
DOE	Division of Elections
DRE	Direct-Recording Entry - touch screen voting device
Firmware	Firmware is the programmable content of a hardware device, which can consist of machine language instructions for a processor or configuration settings for a fixed-function device, gate array or programmable logic device. A common feature of firmware is that it can be updated post-manufacturing, either electronically, or by replacing a storage medium such as a socketed memory chip.
Hardware	Hardware refers to the physical artifacts of a technology such as the physical components of a computer system
Hash Code	A hash function is a well-defined procedure or mathematical function for turning binary code into a relatively small integer that serves as a unique mathematical footprint.
ITA	Independent Test Authority
iVotronic	ES&S touch screen voting terminal
Protocol	Rules governing process conduct to a written instruction.
Trusted Build	Unaltered, true, and certified complied binary code.
SHA-256	Algorithm used to define the hash code value.
Software	Computer software is human interfacing computer programs, procedures and documentation that perform defined task on a computer system. The term includes application software that performs productive tasks for users, system software such as operating systems, which interface with hardware to provide the necessary services for application software.
Voting System Components	The units of equipment (server platform, DRE voting terminal, ballot scan device) when used together create a voting system.
Verification	The act of reviewing, inspecting, and/or testing to establish and document

Terms & Abbreviation	Description
	that a product, service, or system meets the regulatory, standard, or specification requirements.

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End of Report

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# County of Allegheny

## November 2017 Pre/**Post**-Election Air Gap Analysis of Election Tabulation Network

Research and Recommendations Provided by:



*a network infrastructure company*

Prepared by:  
Frank Calderone  
Security Practice Lead  
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## Overview

The County of Allegheny has engaged solutions4networks to perform a network air gap analysis of their elections tabulation network located in Pittsburgh, PA. An **air gap, air wall or air gapping** is a network security measure employed on one or more computers to ensure that a secure computer network is physically isolated from unsecured networks, such as the public Internet or an unsecured local area network. solutions4networks has been tasked to verify the tabulation network is a stand-alone, isolated network and to assess the networks' vulnerability to external access and/or tampering. In addition to the network, solutions4network has been asked to assess and document the general physical security of the warehouse building.

A pre-election onsite visit was made by Frank Calderone and David Stanton of solutions4networks on November 6, 2017. The purpose of this document is to report the results of the assessment, identify security concerns and to make recommendations for the remediation of these concerns. A post-Election onsite visit was made on May 18, 2017. This report covers both the Pre-Election assessment and the **Post-Election review**. Post-Election Review updates will be noted in **red**.

### **Site Contacts**

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412-350-6647

901 Pennsylvania Avenue

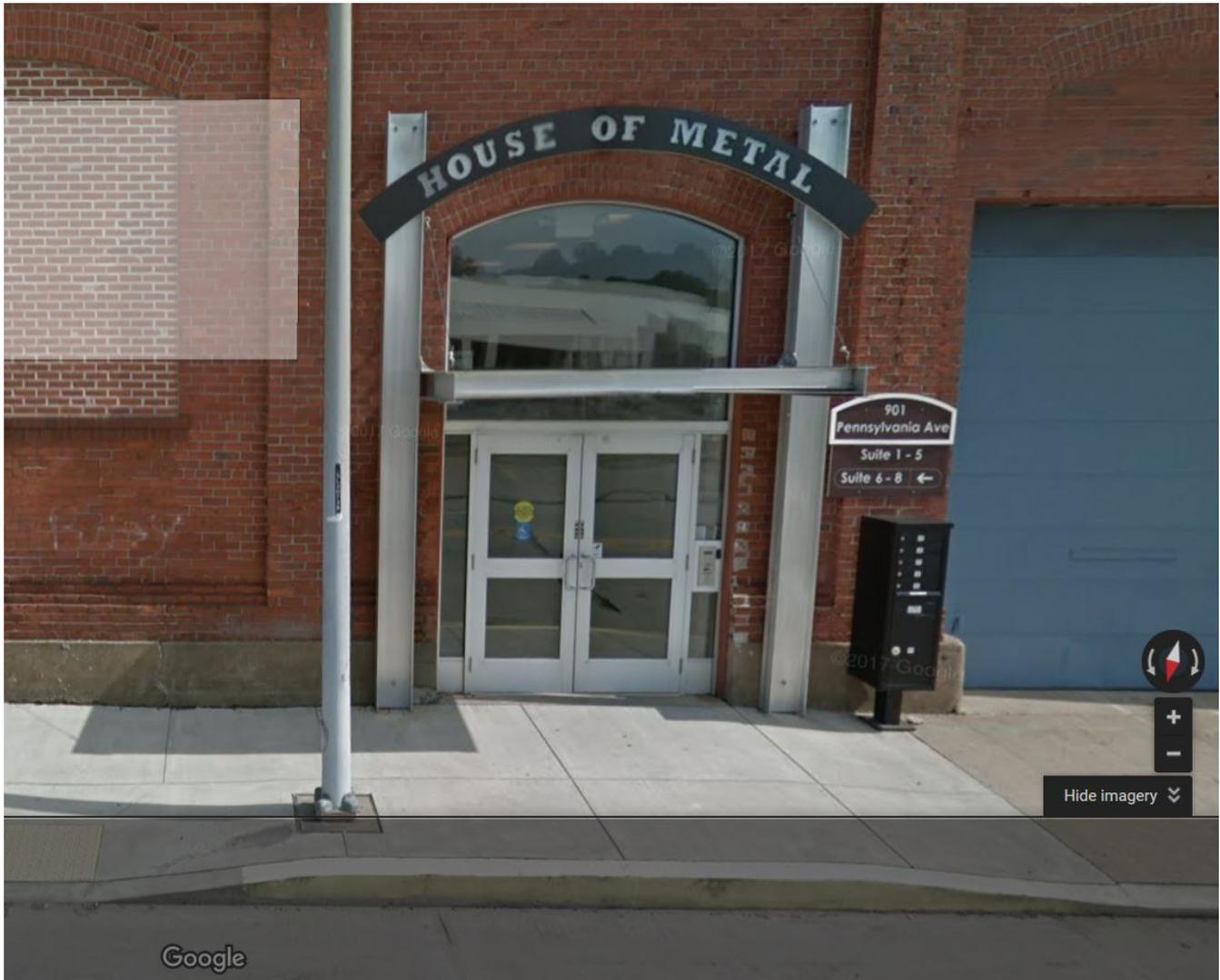
Pittsburgh, PA 15233

## General Physical Security/Building Access

### **Physical Security/Building Access - No Issues Found**

There are several suites within the warehouse and there were no outside signs, which identified that it was County of Allegheny building space. The building phone at the main entrance also did not have any entries to dial for the County of Allegheny.

**Building Main Entrance:**



**Suite 901:**



11/6/2017 - solutions4networks engineers, Frank Calderone and David Stanton, were met at suite 901 by Elizabeth Dell and were asked to provide a valid driver's license as identification before access to the building was granted.



11/9/2017 - solutions4networks engineer, Frank Calderone, was met at suite 901 by Elizabeth Dell and was asked to provide a driver's license identification before access to the building was granted.

Entrance from the street required badge card access or a key. The first door in the warehouse required a security code, but it was a physical, non-electronic lock.

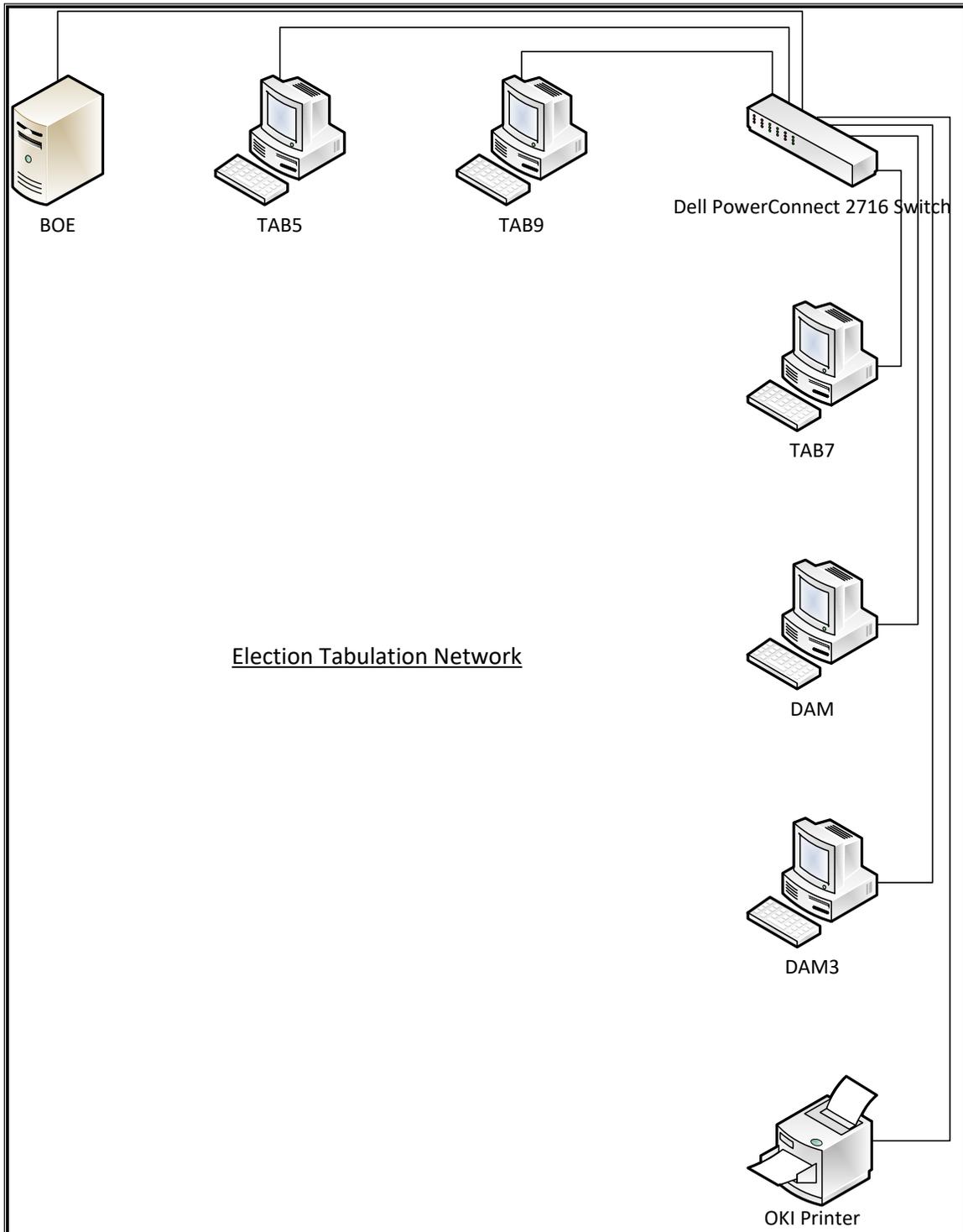
Security cameras were observed over the street entrance and inside the computer room. There is a sign in the tabulation network room that states "No Cell Phones are Permitted".

**Physical Post-Election Review: All items indicated above remained the same.**

## Election Tabulations Network

### Network Overview

The solutions4networks engineer created the following network drawing based off the observed finding from the onsite physical inspections performed during the air gap analysis.





The Election Tabulation Network consisted of the following devices:

- 1 Dell PowerConnect 2716 Ethernet Switch
- 1 Windows Server
- 5 Client PC's
  - Two DAM (Dial Access Modem) Servers
  - 3 Windows XP Clients
- 1 Printer

### **Network Overview - Logical**

All the devices had an address from RFC1918 private network 192.168.1.0/24. The Windows Server with address 192.168.1.20 provided DHCP, DNS and WINS services. A default gateway of 192.168.1.1 was configured, but no such device was found on the network. All devices on the network could ping each other so the network was fully self-contained and each node was accessible to one another.

**Post-Election Review: All items indicated above remained the same.**

Dell Server PE-SC1420	Dell Optiplex 790	Dell Optiplex 790	Dell Optiplex 790	Dell Precision 890	Dell Optiplex 790	Okidata Printer B6300
BOE.elections.local	TAB5.elections.local	TAB9.elections.local	TAB7.elections.local	DAM.elections.local	DAM3.elections.local	
provides DHCP, WINS, DNS Services	DHCP enabled	DHCP enabled	DHCP enabled	static	DHCP enabled/	DHCP Reserved
Win2003 SP1	Win XP Pro ver 2002 SP3	Win XP Pro ver 2002 SP3	Win XP Pro ver 2002 SP3	WinXP SP3	WinXP SP3	
Dell Server PESC1420						
intel Xeon CPU 3.20 GHZ	Intel core i5-2400 CPU 3.1 GHZ	Intel core i5-2400 CPU 3.1 GHZ	Intel core i5-2400 CPU 3.1 GHZ	Intel Xeon 5110@1.60GHZ		
3.19 GHZ 2.00 GB RAM	3.09 GHZ, 3.16 GB Ram	3.09 GHZ, 3.16 GB Ram	3.09 GHZ, 3.16 GB Ram	1.60 GHZ, 2.00 GB Ram		
2GB Ram	4 GB Ram	4 GB Ram	4 GB Ram	2 GB Ram	2 GB Ram	
IP: 192.168.1.20 (static)	IP: 192.168.1.24	IP: 192.168.1.18	IP: 192.168.1.40	IP: 192.168.1.101	IP: 192.168.1.41	IP: 192.168.1.50
netmask: 255.255.255.0	netmask: 255.255.255.0	netmask: 255.255.255.0	netmask: 255.255.255.0	netmask: 255.255.255.0	netmask: 255.255.255.0	netmask: 255.255.255.0
gateway: 192.168.1.1	gateway: 192.168.1.1 (doesn't exist)	gateway: 192.168.1.1 (doesn't exist)	gateway: 192.168.1.1 (doesn't exist)		gateway: 192.168.1.1 (doesn't exist)	
DNS: 192.168.1.20	DHCP Server: 192.168.1.20	DHCP Server: 192.168.1.20	DHCP Server: 192.168.1.20		DHCP Server: 192.168.1.20	
WINS: 192.168.1.20	DNS Server: 192.168.1.20	DNS Server: 192.168.1.20	DNS Server: 192.168.1.20	DNS Server: 192.168.1.20	DNS Server: 192.168.1.20	
	Wins Server: 192.168.1.20	Wins Server: 192.168.1.20	Wins Server: 192.168.1.20			
Conexant 56k modem						
wired keyboard	wired keyboard	wired keyboard	wired keyboard	wired keyboard	wired keyboard	
wired mouse	wired mouse	wired mouse	wired mouse	wired mouse	wired mouse	
3.5 floppy disk						
cd drive	RW/DVD	RW/DVD	RW/DVD	RW/DVD	RW/DVD	
tape drive				lomega Zip 250		
com1/com2	com1/com3	com1/com3	com1/com3	com1-10	com1/com2	
Dell PowerVault 100T DAT72						
Intel Pro 1000 MT LAN connection	Gigabit LAN connection	Gigabit LAN connection	Gigabit LAN connection	Broadcom Gigabit Controller		
Remote Desktop Enabled. Allowed users ELECTIONS\SBS Remote Operators	Remote Assistance is enabled	Remote Assistance is enabled	Remote Assistance is enabled	Remote Assistance is enabled	Remote Assistance is enabled	
	RDP disabled	RDP disabled	RDP disabled	RDP disabled	RDP disabled	
	connected to printer	connected to printer	connected to printer	connected to printer		



## **Network Overview - Physical**

Each device on the network was inspected Pre- and Post-election for physical attachments and are noted below.

### ***BOE.elections.local***

Front: 2 USB ports - empty

1 Tape Drive – empty

1 CD/RW – empty

Rear: 1 USB – empty

1 USB connection on rear has a connection to a USB Seagate backup portable drive

2 serial/com ports – empty

1 LPT port – empty

PS2 Mouse/Keyboard

VGA port to monitor

LAN connection to Dell Switch

### **Additional Information Collected from CLI:**

```
C:\Documents and Settings\Administrator>hostname
```

```
BOE
```

```
C:\Documents and Settings\Administrator>whoami
```

```
elections\administrator
```

```
C:\Documents and Settings\Administrator>ipconfig /all
```

Windows IP Configuration

```
Host Name . . . . . : BOE
```



Primary Dns Suffix . . . . . : elections.local

Node Type . . . . . : Hybrid

IP Routing Enabled. . . . . : No

WINS Proxy Enabled. . . . . : No

DNS Suffix Search List. . . . . : elections.local

Ethernet adapter Server LAN NIC:

Connection-specific DNS Suffix . :

Description . . . . . : Intel(R) PRO/1000 MT Network Connection

Physical Address. . . . . : 00-14-22-60-3F-94

DHCP Enabled. . . . . : No

IP Address. . . . . : 192.168.1.20

Subnet Mask . . . . . : 255.255.255.0

Default Gateway . . . . . : 192.168.1.1

DNS Servers . . . . . : 192.168.1.20

Primary WINS Server . . . . . : 192.168.1.20

C:\Documents and Settings\Administrator>arp -a

Interface: 192.168.1.20 --- 0x10003

Internet Address	Physical Address	Type
192.168.1.11	18-03-73-14-1c-2c	dynamic
192.168.1.40	18-03-73-1b-cf-e2	dynamic
192.168.1.101	00-19-b9-1f-f2-17	dynamic



C:\Documents and Settings\Administrator>netstat -rn

IPv4 Route Table

=====

Interface List

0x1 ..... MS TCP Loopback interface

0x10003 ...00 14 22 60 3f 94 ..... Intel(R) PRO/1000 MT Network Connection

=====

=====

Active Routes:

Network Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	192.168.1.1	192.168.1.20	10
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
192.168.1.0	255.255.255.0	192.168.1.20	192.168.1.20	10
192.168.1.20	255.255.255.255	127.0.0.1	127.0.0.1	10
192.168.1.255	255.255.255.255	192.168.1.20	192.168.1.20	10
224.0.0.0	240.0.0.0	192.168.1.20	192.168.1.20	10
255.255.255.255	255.255.255.255	192.168.1.20	192.168.1.20	1

Default Gateway: 192.168.1.1

=====

Persistent Routes:

None

C:\Documents and Settings\Administrator>netstat -an



Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:25	0.0.0.0:0	LISTENING
TCP	0.0.0.0:42	0.0.0.0:0	LISTENING
TCP	0.0.0.0:53	0.0.0.0:0	LISTENING
TCP	0.0.0.0:80	0.0.0.0:0	LISTENING
TCP	0.0.0.0:88	0.0.0.0:0	LISTENING
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING
TCP	0.0.0.0:389	0.0.0.0:0	LISTENING
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING
TCP	0.0.0.0:464	0.0.0.0:0	LISTENING
TCP	0.0.0.0:593	0.0.0.0:0	LISTENING
TCP	0.0.0.0:636	0.0.0.0:0	LISTENING
TCP	0.0.0.0:691	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1026	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1027	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1068	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1074	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1075	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1076	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1078	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1081	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1097	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1100	0.0.0.0:0	LISTENING



TCP	0.0.0.0:1142	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1171	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1173	0.0.0.0:0	LISTENING
TCP	0.0.0.0:2160	0.0.0.0:0	LISTENING
TCP	0.0.0.0:2161	0.0.0.0:0	LISTENING
TCP	0.0.0.0:2260	0.0.0.0:0	LISTENING
TCP	0.0.0.0:3052	0.0.0.0:0	LISTENING
TCP	0.0.0.0:3268	0.0.0.0:0	LISTENING
TCP	0.0.0.0:3269	0.0.0.0:0	LISTENING
TCP	0.0.0.0:3389	0.0.0.0:0	LISTENING
TCP	0.0.0.0:6001	0.0.0.0:0	LISTENING
TCP	0.0.0.0:6002	0.0.0.0:0	LISTENING
TCP	0.0.0.0:6004	0.0.0.0:0	LISTENING
TCP	0.0.0.0:6358	0.0.0.0:0	LISTENING
TCP	0.0.0.0:6548	0.0.0.0:0	LISTENING
TCP	0.0.0.0:8081	0.0.0.0:0	LISTENING
TCP	0.0.0.0:10000	0.0.0.0:0	LISTENING
TCP	0.0.0.0:34571	0.0.0.0:0	LISTENING
TCP	0.0.0.0:34572	0.0.0.0:0	LISTENING
TCP	0.0.0.0:34573	0.0.0.0:0	LISTENING
TCP	127.0.0.1:389	127.0.0.1:15551	ESTABLISHED
TCP	127.0.0.1:1090	127.0.0.1:389	CLOSE_WAIT
TCP	127.0.0.1:1109	127.0.0.1:389	CLOSE_WAIT
TCP	127.0.0.1:1158	127.0.0.1:389	CLOSE_WAIT
TCP	127.0.0.1:1164	127.0.0.1:389	CLOSE_WAIT



TCP	127.0.0.1:15551	127.0.0.1:389	ESTABLISHED
TCP	192.168.1.20:135	192.168.1.20:1175	ESTABLISHED
TCP	192.168.1.20:135	192.168.1.20:18188	ESTABLISHED
TCP	192.168.1.20:135	192.168.1.20:18190	ESTABLISHED
TCP	192.168.1.20:135	192.168.1.20:18193	ESTABLISHED
TCP	192.168.1.20:135	192.168.1.20:18199	ESTABLISHED
TCP	192.168.1.20:139	0.0.0.0	LISTENING
TCP	192.168.1.20:139	192.168.1.11:2532	ESTABLISHED
TCP	192.168.1.20:139	192.168.1.101:1073	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15509	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15510	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15512	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15514	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15515	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15516	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15524	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15525	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15526	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15527	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15528	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15529	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15530	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15539	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15540	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:15543	ESTABLISHED



TCP	192.168.1.20:389	192.168.1.20:15831	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:17790	ESTABLISHED
TCP	192.168.1.20:389	192.168.1.20:18195	TIME_WAIT
TCP	192.168.1.20:389	192.168.1.20:18196	TIME_WAIT
TCP	192.168.1.20:389	192.168.1.20:18201	TIME_WAIT
TCP	192.168.1.20:389	192.168.1.20:18202	TIME_WAIT
TCP	192.168.1.20:389	192.168.1.20:18203	TIME_WAIT
TCP	192.168.1.20:389	192.168.1.20:18204	TIME_WAIT
TCP	192.168.1.20:445	192.168.1.20:18197	ESTABLISHED
TCP	192.168.1.20:445	192.168.1.40:1097	ESTABLISHED
TCP	192.168.1.20:445	192.168.1.41:1073	ESTABLISHED
TCP	192.168.1.20:691	192.168.1.20:1112	ESTABLISHED
TCP	192.168.1.20:691	192.168.1.20:1167	ESTABLISHED
TCP	192.168.1.20:691	192.168.1.20:1169	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:1108	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:1206	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:1356	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:14451	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:18191	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:18194	ESTABLISHED
TCP	192.168.1.20:1026	192.168.1.20:18200	ESTABLISHED
TCP	192.168.1.20:1093	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:1108	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:1111	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:1112	192.168.1.20:691	ESTABLISHED



TCP	192.168.1.20:1130	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:1134	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:1136	192.168.1.20:3268	CLOSE_WAIT
TCP	192.168.1.20:1159	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:1167	192.168.1.20:691	ESTABLISHED
TCP	192.168.1.20:1169	192.168.1.20:691	ESTABLISHED
TCP	192.168.1.20:1175	192.168.1.20:135	ESTABLISHED
TCP	192.168.1.20:1206	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:1356	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:3268	192.168.1.20:15507	ESTABLISHED
TCP	192.168.1.20:3268	192.168.1.20:15508	ESTABLISHED
TCP	192.168.1.20:3268	192.168.1.20:15531	ESTABLISHED
TCP	192.168.1.20:3268	192.168.1.20:15532	ESTABLISHED
TCP	192.168.1.20:14451	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:15507	192.168.1.20:3268	ESTABLISHED
TCP	192.168.1.20:15508	192.168.1.20:3268	ESTABLISHED
TCP	192.168.1.20:15509	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15510	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15512	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15514	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15515	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15516	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15517	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:15524	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15525	192.168.1.20:389	ESTABLISHED



TCP	192.168.1.20:15526	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15527	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15528	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15529	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15530	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15531	192.168.1.20:3268	ESTABLISHED
TCP	192.168.1.20:15532	192.168.1.20:3268	ESTABLISHED
TCP	192.168.1.20:15539	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15540	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15543	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:15831	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:17256	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:17790	192.168.1.20:389	ESTABLISHED
TCP	192.168.1.20:18068	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:18185	192.168.1.20:135	TIME_WAIT
TCP	192.168.1.20:18186	192.168.1.20:135	TIME_WAIT
TCP	192.168.1.20:18187	192.168.1.20:1026	TIME_WAIT
TCP	192.168.1.20:18188	192.168.1.20:135	ESTABLISHED
TCP	192.168.1.20:18189	192.168.1.20:135	TIME_WAIT
TCP	192.168.1.20:18190	192.168.1.20:135	ESTABLISHED
TCP	192.168.1.20:18191	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:18193	192.168.1.20:135	ESTABLISHED
TCP	192.168.1.20:18194	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:18195	192.168.1.20:389	TIME_WAIT
TCP	192.168.1.20:18197	192.168.1.20:445	ESTABLISHED



TCP	192.168.1.20:18199	192.168.1.20:135	ESTABLISHED
TCP	192.168.1.20:18200	192.168.1.20:1026	ESTABLISHED
TCP	192.168.1.20:18202	192.168.1.20:389	TIME_WAIT
TCP	192.168.1.20:18203	192.168.1.20:389	TIME_WAIT
TCP	192.168.1.20:18204	192.168.1.20:389	TIME_WAIT
TCP	192.168.1.20:29288	192.168.1.20:389	CLOSE_WAIT
TCP	192.168.1.20:29289	192.168.1.20:3268	CLOSE_WAIT
UDP	0.0.0.0:42	*.*	
UDP	0.0.0.0:135	*.*	
UDP	0.0.0.0:445	*.*	
UDP	0.0.0.0:500	*.*	
UDP	0.0.0.0:1035	*.*	
UDP	0.0.0.0:1065	*.*	
UDP	0.0.0.0:1072	*.*	
UDP	0.0.0.0:1082	*.*	
UDP	0.0.0.0:1101	*.*	
UDP	0.0.0.0:1132	*.*	
UDP	0.0.0.0:1172	*.*	
UDP	0.0.0.0:1207	*.*	
UDP	0.0.0.0:1434	*.*	
UDP	0.0.0.0:2160	*.*	
UDP	0.0.0.0:2161	*.*	
UDP	0.0.0.0:3456	*.*	
UDP	0.0.0.0:3457	*.*	
UDP	0.0.0.0:4500	*.*	



UDP	0.0.0.0:7846	*.*
UDP	0.0.0.0:38293	*.*
UDP	127.0.0.1:53	*.*
UDP	127.0.0.1:123	*.*
UDP	127.0.0.1:1064	*.*
UDP	127.0.0.1:1066	*.*
UDP	127.0.0.1:1083	*.*
UDP	127.0.0.1:1092	*.*
UDP	127.0.0.1:1102	*.*
UDP	127.0.0.1:1105	*.*
UDP	127.0.0.1:1141	*.*
UDP	127.0.0.1:1156	*.*
UDP	127.0.0.1:1163	*.*
UDP	127.0.0.1:1176	*.*
UDP	127.0.0.1:1185	*.*
UDP	127.0.0.1:1188	*.*
UDP	127.0.0.1:1191	*.*
UDP	127.0.0.1:1200	*.*
UDP	127.0.0.1:1358	*.*
UDP	127.0.0.1:3456	*.*
UDP	127.0.0.1:3457	*.*
UDP	127.0.0.1:3979	*.*
UDP	192.168.1.20:53	*.*
UDP	192.168.1.20:67	*.*
UDP	192.168.1.20:68	*.*



UDP 192.168.1.20:88 \*.\*  
UDP 192.168.1.20:123 \*.\*  
UDP 192.168.1.20:137 \*.\*  
UDP 192.168.1.20:138 \*.\*  
UDP 192.168.1.20:389 \*.\*  
UDP 192.168.1.20:464 \*.\*  
UDP 192.168.1.20:2535 \*.\*

C:\Documents and Settings\Administrator>**systeminfo**

Host Name: BOE  
OS Name: Microsoft(R) Windows(R) Server 2003 for Small Business Server  
OS Version: 5.2.3790 Service Pack 1 Build 3790  
OS Manufacturer: Microsoft Corporation  
OS Configuration: Primary Domain Controller  
OS Build Type: Multiprocessor Free  
Registered Owner: Allegheny County, PA  
Registered Organization: Board of Elections  
Product ID: 74995-OEM-4211904-03020  
Original Install Date: 5/8/2006, 1:24:53 PM  
System Up Time: 45 Days, 3 Hours, 33 Minutes, 56 Seconds  
System Manufacturer: Dell Inc.  
System Model: PowerEdge SC1420  
System Type: X86-based PC



Processor(s): 2 Processor(s) Installed.  
[01]: x86 Family 15 Model 4 Stepping 3 GenuineIntel ~  
3192 Mhz  
[02]: x86 Family 15 Model 4 Stepping 3 GenuineIntel ~  
3192 Mhz  
BIOS Version: DELL - 7  
Windows Directory: C:\WINDOWS  
System Directory: C:\WINDOWS\system32  
Boot Device: \Device\HarddiskVolume2  
System Locale: en-us;English (United States)  
Input Locale: en-us;English (United States)  
Time Zone: (GMT-05:00) Eastern Time (US & Canada)  
Total Physical Memory: 2,046 MB  
Available Physical Memory: 947 MB  
Page File: Max Size: 3,435 MB  
Page File: Available: 2,130 MB  
Page File: In Use: 1,305 MB  
Page File Location(s): C:\pagefile.sys  
Domain: elections.local  
Logon Server: \\BOE  
Hotfix(s): 19 Hotfix(s) Installed.  
[01]: File 1  
[02]: File 1  
[03]: File 1  
[04]: File 1



- [05]: File 1
- [06]: File 1
- [07]: File 1
- [08]: File 1
- [09]: File 1
- [10]: Q147222
- [11]: KB896358 - Update
- [12]: KB896422 - Update
- [13]: KB896424 - Update
- [14]: KB896688 - Update
- [15]: KB901214 - Update
- [16]: KB902400 - Update
- [17]: KB904706 - Update
- [18]: KB908519 - Update
- [19]: KB912919 - Update

Network Card(s): **1 NIC(s) Installed.**

[01]: Intel(R) PRO/1000 MT Network Connection

Connection Name: Server LAN NIC

DHCP Enabled: No

IP address(es)

[01]: 192.168.1.20

C:\Documents and Settings\Administrator>

**Post-Election Review: No Change**

***TAB5.elections.local***

Front: 4 USB ports – empty





Connection-specific DNS Suffix . : elections.local  
 Description . . . . . : Intel(R) 82579LM Gigabit Network Connection  
 Physical Address. . . . . : 18-03-73-14-1C-2C  
 Dhcp Enabled. . . . . : Yes  
 Autoconfiguration Enabled . . . . : Yes  
 IP Address. . . . . : 192.168.1.11  
 Subnet Mask . . . . . : 255.255.255.0  
 Default Gateway . . . . . : 192.168.1.1  
 DHCP Server . . . . . : 192.168.1.20  
 DNS Servers . . . . . : 192.168.1.20  
 Primary WINS Server . . . . . : 192.168.1.20  
 Lease Obtained. . . . . : Friday, November 03, 2017 7:23:53 A

Lease Expires . . . . . : Saturday, November 11, 2017 7:23:53AM

C:\Documents and Settings\administrator.ELECTIONS>arp -a

Interface: 192.168.1.11 --- 0x2

Internet Address	Physical Address	Type
192.168.1.20	00-14-22-60-3f-94	dynamic

C:\Documents and Settings\administrator.ELECTIONS>netstat -rn

Route Table

=====

Interface List



0x1 ..... MS TCP Loopback interface  
 0x2 ...18 03 73 14 1c 2c ..... Intel(R) 82579LM Gigabit Network Connection - Pa  
 cket Scheduler Miniport

=====  
 =====

Active Routes:

Network	Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	0.0.0.0	192.168.1.1	192.168.1.11	10
127.0.0.0	255.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
192.168.1.0	255.255.255.0	255.255.255.0	192.168.1.11	192.168.1.11	10
192.168.1.11	255.255.255.255	255.255.255.255	127.0.0.1	127.0.0.1	10
192.168.1.255	255.255.255.255	255.255.255.255	192.168.1.11	192.168.1.11	10
224.0.0.0	240.0.0.0	240.0.0.0	192.168.1.11	192.168.1.11	10
255.255.255.255	255.255.255.255	255.255.255.255	192.168.1.11	192.168.1.11	1

Default Gateway: 192.168.1.1

=====

Persistent Routes:

None

C:\Documents and Settings\administrator.ELECTIONS>netstat -an

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING



```
TCP 0.0.0.0:445      0.0.0.0:0      LISTENING
TCP 0.0.0.0:3306     0.0.0.0:0      LISTENING
TCP 127.0.0.1:1037   127.0.0.1:1038 ESTABLISHED
TCP 127.0.0.1:1038   127.0.0.1:1037 ESTABLISHED
TCP 127.0.0.1:1052   0.0.0.0:0      LISTENING
TCP 127.0.0.1:1054   0.0.0.0:0      LISTENING
TCP 192.168.1.11:139 0.0.0.0:0      LISTENING
TCP 192.168.1.11:3192 192.168.1.20:445 TIME_WAIT
UDP 0.0.0.0:445      *.*
UDP 0.0.0.0:500      *.*
UDP 0.0.0.0:4500     *.*
UDP 127.0.0.1:123    *.*
UDP 127.0.0.1:1025   *.*
UDP 127.0.0.1:1045   *.*
UDP 127.0.0.1:1900   *.*
UDP 192.168.1.11:123 *.*
UDP 192.168.1.11:137 *.*
UDP 192.168.1.11:138 *.*
UDP 192.168.1.11:1900 *.*
```

C:\Documents and Settings\administrator.ELECTIONS>**systeminfo**

```
Host Name:          TAB5
OS Name:            Microsoft Windows XP Professional
OS Version:         5.1.2600 Service Pack 3 Build 2600
```



OS Manufacturer: Microsoft Corporation  
OS Configuration: Member Workstation  
OS Build Type: Multiprocessor Free  
Registered Owner: admin  
Registered Organization:  
Product ID: 76487-OEM-0060807-79698  
Original Install Date: 8/2/2016, 6:04:17 PM  
System Up Time: 31 Days, 2 Hours, 45 Minutes, 4 Seconds  
System Manufacturer: Dell Inc.  
System Model: OptiPlex 790  
System type: X86-based PC  
Processor(s): 1 Processor(s) Installed.

[01]: x86 Family 6 Model 42 Stepping 7 GenuineIntel ~

3092 Mhz

BIOS Version: DELL - 6222004  
Windows Directory: C:\WINDOWS  
System Directory: C:\WINDOWS\system32  
Boot Device: \Device\HarddiskVolume1  
System Locale: en-us;English (United States)  
Input Locale: en-us;English (United States)  
Time Zone: (GMT-05:00) Eastern Time (US & Canada)

Total Physical Memory: 3,241 MB  
Available Physical Memory: 2,684 MB  
Virtual Memory: Max Size: 2,048 MB  
Virtual Memory: Available: 2,008 MB



Virtual Memory: In Use: 40 MB

Page File Location(s): C:\pagefile.sys

Domain: elections.local

Logon Server: \\BOE

Hotfix(s): 250 Hotfix(s) Installed.

[01]: File 1

[02]: File 1

[03]: File 1

[04]: File 1

[05]: File 1

[06]: File 1

[07]: File 1

[08]: File 1

[09]: File 1

[10]: File 1

[11]: File 1

[12]: File 1

[13]: File 1

[14]: File 1

[15]: File 1

[16]: File 1

[17]: File 1

[18]: File 1

[19]: File 1

[20]: File 1



[21]: File 1

[22]: File 1

[23]: File 1

[24]: File 1

[25]: File 1

[26]: File 1

[27]: File 1

[28]: File 1

[29]: File 1

[30]: File 1

[31]: File 1

[32]: File 1

[33]: File 1

[34]: File 1

[35]: File 1

[36]: File 1

[37]: File 1

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[39]: File 1

[40]: File 1

[41]: File 1

[42]: File 1

[43]: File 1

[44]: File 1

[45]: File 1



[46]: File 1

[47]: File 1

[48]: File 1

[49]: File 1

[50]: File 1

[51]: File 1

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[59]: File 1

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[96]: File 1

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[101]: File 1

[102]: File 1

[103]: File 1

[104]: File 1

[105]: File 1

[106]: File 1

[107]: File 1

[108]: File 1

[109]: File 1

[110]: File 1

[111]: File 1

[112]: File 1

[113]: File 1

[114]: File 1

[115]: File 1

[116]: File 1

[117]: File 1

[118]: File 1

[119]: File 1

[120]: File 1



- [121]: File 1
- [122]: Q147222
- [123]: KB2378111\_WM9
- [124]: KB2803821-v2\_WM9
- [125]: KB952069\_WM9
- [126]: KB954155\_WM9
- [127]: KB973540\_WM9
- [128]: KB975558\_WM8
- [129]: KB978695\_WM9
- [130]: KB2564958 - Update
- [131]: KB936929 - Service Pack
- [132]: KB2115168 - Update
- [133]: KB2229593 - Update
- [134]: KB2296011 - Update
- [135]: KB2347290 - Update
- [136]: KB2387149 - Update
- [137]: KB2393802 - Update
- [138]: KB2419632 - Update
- [139]: KB2423089 - Update
- [140]: KB2443105 - Update
- [141]: KB2478960 - Update
- [142]: KB2478971 - Update
- [143]: KB2479943 - Update
- [144]: KB2481109 - Update
- [145]: KB2483185 - Update



- [146]: KB2485663 - Update
- [147]: KB2506212 - Update
- [148]: KB2507938 - Update
- [149]: KB2508429 - Update
- [150]: KB2509553 - Update
- [151]: KB2510581 - Update
- [152]: KB2535512 - Update
- [153]: KB2536276-v2 - Update
- [154]: KB2544893-v2 - Update
- [155]: KB2566454 - Update
- [156]: KB2570947 - Update
- [157]: KB2584146 - Update
- [158]: KB2585542 - Update
- [159]: KB2592799 - Update
- [160]: KB2598479 - Update
- [161]: KB2603381 - Update
- [162]: KB2619339 - Update
- [163]: KB2620712 - Update
- [164]: KB2631813 - Update
- [165]: KB2653956 - Update
- [166]: KB2655992 - Update
- [167]: KB2659262 - Update
- [168]: KB2661637 - Update
- [169]: KB2676562 - Update
- [170]: KB2686509 - Update



- [171]: KB2691442 - Update
- [172]: KB2698365 - Update
- [173]: KB2705219-v2 - Update
- [174]: KB2712808 - Update
- [175]: KB2719985 - Update
- [176]: KB2723135-v2 - Update
- [177]: KB2727528 - Update
- [178]: KB2757638 - Update
- [179]: KB2770660 - Update
- [180]: KB2780091 - Update
- [181]: KB2802968 - Update
- [182]: KB2807986 - Update
- [183]: KB2813345 - Update
- [184]: KB2820917 - Update
- [185]: KB2834886 - Update
- [186]: KB2847311 - Update
- [187]: KB2850869 - Update
- [188]: KB2859537 - Update
- [189]: KB2862152 - Update
- [190]: KB2862330 - Update
- [191]: KB2862335 - Update
- [192]: KB2864063 - Update
- [193]: KB2868038 - Update
- [194]: KB2868626 - Update
- [195]: KB2876217 - Update



- [196]: KB2876331 - Update
- [197]: KB2884256 - Update
- [198]: KB2892075 - Update
- [199]: KB2893294 - Update
- [200]: KB2898715 - Update
- [201]: KB2900986 - Update
- [202]: KB2904266 - Update
- [203]: KB2909212 - Update
- [204]: KB2914368 - Update
- [205]: KB2916036 - Update
- [206]: KB2922229 - Update
- [207]: KB2929961 - Update
- [208]: KB2930275 - Update
- [209]: KB2936068 - Update
- [210]: KB2964358 - Update
- [211]: KB923561 - Update
- [212]: KB942288-v3 - Update
- [213]: KB946648 - Update
- [214]: KB950762 - Update
- [215]: KB950974 - Update
- [216]: KB951376-v2 - Update
- [217]: KB952004 - Update
- [218]: KB95

NetWork Card(s): **1 NIC(s) Installed.**



[01]: Intel(R) 82579LM Gigabit Network Connection

Connection Name: Local Area Connection

DHCP Enabled: Yes

DHCP Server: 192.168.1.20

IP address(es)

[01]: 192.168.1.11

C:\Documents and Settings\administrator.ELECTIONS>

Post-Election Review: No Change

*TAB9.elections.local*

Front: 4 USB ports – empty

CD/RW – empty

Rear: 3 USB – empty

USB Keyboard

USB Mouse

VGA Monitor

Serial/COM connection to flatbed voter machine

USB connection to tabulation cartridge voter device

LAN connection to Dell Switch

**Additional Information Collected from CLI:**

C:\Documents and Settings\Administrator.ELECTIONS>hostname

TAB9

C:\Documents and Settings\Administrator.ELECTIONS>ipconfig /all

Windows IP Configuration



Host Name . . . . . : TAB9  
Primary Dns Suffix . . . . . : elections.local  
Node Type . . . . . : Hybrid  
IP Routing Enabled. . . . . : No  
WINS Proxy Enabled. . . . . : No  
DNS Suffix Search List. . . . . : elections.local  
elections.local

Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . : elections.local  
Description . . . . . : Intel(R) 82579LM Gigabit Network Connection  
Physical Address. . . . . : 18-03-73-15-97-68  
Dhcp Enabled. . . . . : Yes  
Autoconfiguration Enabled . . . . : Yes  
IP Address. . . . . : 192.168.1.10  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . : 192.168.1.1  
DHCP Server . . . . . : 192.168.1.20  
DNS Servers . . . . . : 192.168.1.20  
Primary WINS Server . . . . . : 192.168.1.20  
Lease Obtained. . . . . : Sunday, November 05, 2017 7:32:53 AM  
  
Lease Expires . . . . . : Monday, November 13, 2017 7:32:53 AM



C:\Documents and Settings\Administrator.ELECTIONS>arp -a

Interface: 192.168.1.10 --- 0x2

Internet Address	Physical Address	Type
192.168.1.20	00-14-22-60-3f-94	dynamic

C:\Documents and Settings\Administrator.ELECTIONS>netstat -rn

Route Table

=====

Interface List

0x1 ..... MS TCP Loopback interface

0x2 ...18 03 73 15 97 68 ..... Intel(R) 82579LM Gigabit Network Connection - Packet Scheduler Miniport

=====

Active Routes:

Network	Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	192.168.1.1	192.168.1.10	10	
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1	
192.168.1.0	255.255.255.0	192.168.1.10	192.168.1.10	10	
192.168.1.10	255.255.255.255	127.0.0.1	127.0.0.1	10	
192.168.1.255	255.255.255.255	192.168.1.10	192.168.1.10	10	
224.0.0.0	240.0.0.0	192.168.1.10	192.168.1.10	10	
255.255.255.255	255.255.255.255	192.168.1.10	192.168.1.10	1	



Default Gateway: 192.168.1.1

=====

Persistent Routes:

None

C:\Documents and Settings\Administrator.ELECTIONS>

C:\Documents and Settings\Administrator.ELECTIONS>**netstat -an**

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING
TCP	0.0.0.0:3306	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1045	127.0.0.1:1046	ESTABLISHED
TCP	127.0.0.1:1046	127.0.0.1:1045	ESTABLISHED
TCP	127.0.0.1:1052	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1057	0.0.0.0:0	LISTENING
TCP	192.168.1.10:139	0.0.0.0:0	LISTENING
TCP	192.168.1.10:2440	192.168.1.10:16992	ESTABLISHED
TCP	192.168.1.10:2443	192.168.1.10:16993	SYN_SENT
TCP	192.168.1.10:16992	192.168.1.10:2440	ESTABLISHED
UDP	0.0.0.0:445	*.*	
UDP	0.0.0.0:500	*.*	



UDP 0.0.0.0:4500 \*.\*  
UDP 127.0.0.1:123 \*.\*  
UDP 127.0.0.1:1025 \*.\*  
UDP 127.0.0.1:1041 \*.\*  
UDP 127.0.0.1:1900 \*.\*  
UDP 192.168.1.10:123 \*.\*  
UDP 192.168.1.10:137 \*.\*  
UDP 192.168.1.10:138 \*.\*  
UDP 192.168.1.10:1900 \*.\*

C:\Documents and Settings\Administrator\ELECTIONS>**systeminfo**

Host Name: TAB9  
OS Name: Microsoft Windows XP Professional  
OS Version: 5.1.2600 Service Pack 3 Build 2600  
OS Manufacturer: Microsoft Corporation  
OS Configuration: Member Workstation  
OS Build Type: Multiprocessor Free  
Registered Owner: admin  
Registered Organization:  
Product ID: 76487-OEM-0060807-79698  
Original Install Date: 8/2/2016, 6:04:17 PM  
System Up Time: 1 Days, 2 Hours, 56 Minutes, 0 Seconds  
System Manufacturer: Dell Inc.  
System Model: OptiPlex 790



System type: X86-based PC

Processor(s): 1 Processor(s) Installed.

[01]: x86 Family 6 Model 42 Stepping 7 GenuineIntel ~  
3092 Mhz

BIOS Version: DELL - 6222004

Windows Directory: C:\WINDOWS

System Directory: C:\WINDOWS\system32

Boot Device: \Device\HarddiskVolume1

System Locale: en-us;English (United States)

Input Locale: en-us;English (United States)

Time Zone: (GMT-05:00) Eastern Time (US & Canada)

Total Physical Memory: 3,241 MB

Available Physical Memory: 2,757 MB

Virtual Memory: Max Size: 2,048 MB

Virtual Memory: Available: 2,008 MB

Virtual Memory: In Use: 40 MB

Page File Location(s): C:\pagefile.sys

Domain: elections.local

Logon Server: \\BOE

Hotfix(s): 250 Hotfix(s) Installed.

[01]: File 1

[02]: File 1

[03]: File 1

[04]: File 1

[05]: File 1



[06]: File 1

[07]: File 1

[08]: File 1

[09]: File 1

[10]: File 1

[11]: File 1

[12]: File 1

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[88]: File 1

[89]: File 1

[90]: File 1

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[93]: File 1

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[96]: File 1

[97]: File 1

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- [106]: File 1
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- [118]: File 1
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- [120]: File 1
- [121]: File 1
- [122]: Q147222
- [123]: KB2378111\_WM9
- [124]: KB2803821-v2\_WM9
- [125]: KB952069\_WM9
- [126]: KB954155\_WM9
- [127]: KB973540\_WM9
- [128]: KB975558\_WM8
- [129]: KB978695\_WM9
- [130]: KB2564958 - Update



- [131]: KB936929 - Service Pack
- [132]: KB2115168 - Update
- [133]: KB2229593 - Update
- [134]: KB2296011 - Update
- [135]: KB2347290 - Update
- [136]: KB2387149 - Update
- [137]: KB2393802 - Update
- [138]: KB2419632 - Update
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- [147]: KB2506212 - Update
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- [150]: KB2509553 - Update
- [151]: KB2510581 - Update
- [152]: KB2535512 - Update
- [153]: KB2536276-v2 - Update
- [154]: KB2544893-v2 - Update
- [155]: KB2566454 - Update



- [156]: KB2570947 - Update
- [157]: KB2584146 - Update
- [158]: KB2585542 - Update
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- [160]: KB2598479 - Update
- [161]: KB2603381 - Update
- [162]: KB2619339 - Update
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- [173]: KB2705219-v2 - Update
- [174]: KB2712808 - Update
- [175]: KB2719985 - Update
- [176]: KB2723135-v2 - Update
- [177]: KB2727528 - Update
- [178]: KB2757638 - Update
- [179]: KB2770660 - Update
- [180]: KB2780091 - Update



- [181]: KB2802968 - Update
- [182]: KB2807986 - Update
- [183]: KB2813345 - Update
- [184]: KB2820917 - Update
- [185]: KB2834886 - Update
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- [187]: KB2850869 - Update
- [188]: KB2859537 - Update
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- [193]: KB2868038 - Update
- [194]: KB2868626 - Update
- [195]: KB2876217 - Update
- [196]: KB2876331 - Update
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- [200]: KB2898715 - Update
- [201]: KB2900986 - Update
- [202]: KB2904266 - Update
- [203]: KB2909212 - Update
- [204]: KB2914368 - Update
- [205]: KB2916036 - Update



- [206]: KB2922229 - Update
- [207]: KB2929961 - Update
- [208]: KB2930275 - Update
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- [210]: KB2964358 - Update
- [211]: KB923561 - Update
- [212]: KB942288-v3 - Update
- [213]: KB946648 - Update
- [214]: KB950762 - Update
- [215]: KB950974 - Update
- [216]: KB951376-v2 - Update
- [217]: KB952004 - Update
- [218]: KB95

NetWork Card(s): **1 NIC(s) Installed.**

[01]: Intel(R) 82579LM Gigabit Network Connection

Connection Name: Local Area Connection

DHCP Enabled: Yes

DHCP Server: 192.168.1.20

IP address(es)

[01]: 192.168.1.10

C:\Documents and Settings\Administrator\ELECTIONS>

**Post-Election Review: No changes**

***TAB7.elections.local***

Front: 4 USB ports – empty





Connection-specific DNS Suffix . : elections.local  
 Description . . . . . : Intel(R) 82579LM Gigabit Network Connection  
 Physical Address. . . . . : 18-03-73-1B-CF-E2  
 Dhcp Enabled. . . . . : Yes  
 Autoconfiguration Enabled . . . . : Yes  
 IP Address. . . . . : 192.168.1.40  
 Subnet Mask . . . . . : 255.255.255.0  
 Default Gateway . . . . . : 192.168.1.1  
 DHCP Server . . . . . : 192.168.1.20  
 DNS Servers . . . . . : 192.168.1.20  
 Primary WINS Server . . . . . : 192.168.1.20  
 Lease Obtained. . . . . : Monday, November 06, 2017 9:47:05 AM  
 Lease Expires . . . . . : Tuesday, November 14, 2017 9:47:05 AM

C:\Documents and Settings\Administrator.ELECTIONS>netstat -rn

Route Table

=====

Interface List

0x1 ..... MS TCP Loopback interface  
 0x2 ...18 03 73 1b cf e2 ..... Intel(R) 82579LM Gigabit Network Connection - Packet Scheduler Miniport

=====

=====

Active Routes:



Network	Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	192.168.1.1	192.168.1.40		10
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1		1
192.168.1.0	255.255.255.0	192.168.1.40	192.168.1.40		10
192.168.1.40	255.255.255.255	127.0.0.1	127.0.0.1		10
192.168.1.255	255.255.255.255	192.168.1.40	192.168.1.40		10
224.0.0.0	240.0.0.0	192.168.1.40	192.168.1.40		10
255.255.255.255	255.255.255.255	192.168.1.40	192.168.1.40		1

Default Gateway: 192.168.1.1

=====

Persistent Routes:

None

C:\Documents and Settings\Administrator.ELECTIONS>arp -a

Interface: 192.168.1.40 --- 0x2

Internet Address	Physical Address	Type
192.168.1.20	00-14-22-60-3f-94	dynamic

C:\Documents and Settings\Administrator.ELECTIONS>netstat -rn

Route Table

=====

Interface List

- 0x1 ..... MS TCP Loopback interface
- 0x2 ...18 03 73 1b cf e2 ..... Intel(R) 82579LM Gigabit Network Connection - Packet Scheduler Miniport



=====  
=====  
Active Routes:

Network	Destination	Netmask	Gateway	Interface	Metric
0.0.0.0	0.0.0.0	0.0.0.0	192.168.1.1	192.168.1.40	10
127.0.0.0	255.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
192.168.1.0	255.255.255.0	255.255.255.0	192.168.1.40	192.168.1.40	10
192.168.1.40	255.255.255.255	255.255.255.255	127.0.0.1	127.0.0.1	10
192.168.1.255	255.255.255.255	255.255.255.255	192.168.1.40	192.168.1.40	10
224.0.0.0	240.0.0.0	240.0.0.0	192.168.1.40	192.168.1.40	10
255.255.255.255	255.255.255.255	255.255.255.255	192.168.1.40	192.168.1.40	1

Default Gateway: 192.168.1.1  
=====

Persistent Routes:

None

C:\Documents and Settings\Administrator\ELECTIONS>**netstat -an**

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING
TCP	0.0.0.0:3306	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1045	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1048	127.0.0.1:1049	ESTABLISHED



```
TCP 127.0.0.1:1049    127.0.0.1:1048    ESTABLISHED
TCP 127.0.0.1:1055    0.0.0.0:0         LISTENING
TCP 192.168.1.40:139  0.0.0.0:0         LISTENING
TCP 192.168.1.40:2437 192.168.1.20:445  TIME_WAIT
UDP 0.0.0.0:445       *.*
UDP 0.0.0.0:500       *.*
UDP 0.0.0.0:4500      *.*
UDP 127.0.0.1:123     *.*
UDP 127.0.0.1:1025    *.*
UDP 127.0.0.1:1041    *.*
UDP 127.0.0.1:1900    *.*
UDP 192.168.1.40:123  *.*
UDP 192.168.1.40:137  *.*
UDP 192.168.1.40:138  *.*
UDP 192.168.1.40:1900 *.*
```

C:\Documents and Settings\Administrator.ELECTIONS>**systeminfo**

```
Host Name:          TAB7
OS Name:            Microsoft Windows XP Professional
OS Version:         5.1.2600 Service Pack 3 Build 2600
OS Manufacturer:   Microsoft Corporation
OS Configuration:  Member Workstation
OS Build Type:      Multiprocessor Free
Registered Owner:   admin
```



Registered Organization:

Product ID: 76487-OEM-0060807-79698

Original Install Date: 8/2/2016, 6:04:17 PM

System Up Time: 0 Days, 0 Hours, 45 Minutes, 26 Seconds

System Manufacturer: Dell Inc.

System Model: OptiPlex 790

System type: X86-based PC

Processor(s): 1 Processor(s) Installed.

[01]: x86 Family 6 Model 42 Stepping 7 GenuineIntel ~

3092 Mhz

BIOS Version: DELL - 6222004

Windows Directory: C:\WINDOWS

System Directory: C:\WINDOWS\system32

Boot Device: \Device\HarddiskVolume1

System Locale: en-us;English (United States)

Input Locale: en-us;English (United States)

Time Zone: (GMT-05:00) Eastern Time (US & Canada)

Total Physical Memory: 3,241 MB

Available Physical Memory: 2,855 MB

Virtual Memory: Max Size: 2,048 MB

Virtual Memory: Available: 2,008 MB

Virtual Memory: In Use: 40 MB

Page File Location(s): C:\pagefile.sys

Domain: elections.local

Logon Server: \\BOE



Hotfix(s): 250 Hotfix(s) Installed.

[01]: File 1

[02]: File 1

[03]: File 1

[04]: File 1

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[10]: File 1

[11]: File 1

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[32]: File 1

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[35]: File 1

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[37]: File 1

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[42]: File 1

[43]: File 1

[44]: File 1

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[68]: File 1

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[100]: File 1

[101]: File 1

[102]: File 1

[103]: File 1

[104]: File 1

[105]: File 1

[106]: File 1

[107]: File 1

[108]: File 1

[109]: File 1

[110]: File 1

[111]: File 1

[112]: File 1

[113]: File 1

[114]: File 1

[115]: File 1

[116]: File 1

[117]: File 1

[118]: File 1

[119]: File 1

[120]: File 1

[121]: File 1

[122]: Q147222

[123]: KB2378111\_WM9

[124]: KB2803821-v2\_WM9



- [125]: KB952069\_WM9
- [126]: KB954155\_WM9
- [127]: KB973540\_WM9
- [128]: KB975558\_WM8
- [129]: KB978695\_WM9
- [130]: KB2564958 - Update
- [131]: KB936929 - Service Pack
- [132]: KB2115168 - Update
- [133]: KB2229593 - Update
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- [150]: KB2509553 - Update
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- [153]: KB2536276-v2 - Update
- [154]: KB2544893-v2 - Update
- [155]: KB2566454 - Update
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- [174]: KB2712808 - Update



- [175]: KB2719985 - Update
- [176]: KB2723135-v2 - Update
- [177]: KB2727528 - Update
- [178]: KB2757638 - Update
- [179]: KB2770660 - Update
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- [181]: KB2802968 - Update
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- [183]: KB2813345 - Update
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- [188]: KB2859537 - Update
- [189]: KB2862152 - Update
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- [191]: KB2862335 - Update
- [192]: KB2864063 - Update
- [193]: KB2868038 - Update
- [194]: KB2868626 - Update
- [195]: KB2876217 - Update
- [196]: KB2876331 - Update
- [197]: KB2884256 - Update
- [198]: KB2892075 - Update
- [199]: KB2893294 - Update



- [200]: KB2898715 - Update
- [201]: KB2900986 - Update
- [202]: KB2904266 - Update
- [203]: KB2909212 - Update
- [204]: KB2914368 - Update
- [205]: KB2916036 - Update
- [206]: KB2922229 - Update
- [207]: KB2929961 - Update
- [208]: KB2930275 - Update
- [209]: KB2936068 - Update
- [210]: KB2964358 - Update
- [211]: KB923561 - Update
- [212]: KB942288-v3 - Update
- [213]: KB946648 - Update
- [214]: KB950762 - Update
- [215]: KB950974 - Update
- [216]: KB951376-v2 - Update
- [217]: KB952004 - Update
- [218]: KB95

NetWork Card(s): **1 NIC(s) Installed.**

[01]: Intel(R) 82579LM Gigabit Network Connection

Connection Name: Local Area Connection

DHCP Enabled: Yes

DHCP Server: 192.168.1.20



IP address(es)

[01]: 192.168.1.40

C:\Documents and Settings\Administrator.ELECTIONS>

C:\Documents and Settings\Administrator.ELECTIONS>

Post-Election Review: No Changes.

*DAM.elections.local*

Front: 2 USB – empty

CD/RW - empty

Floppy – empty

Rear: Octal Serial Cable to Modem bank

USB Keyboard

USB Mouse

VGA Monitor

LAN connection to Dell Switch

**Additional Information Collected from CLI:**

C:\Documents and Settings\administrator.ELECTIONS>**hostname**

**DAM**

C:\Documents and Settings\administrator.ELECTIONS>**ipconfig /all**

Windows IP Configuration

Host Name . . . . . : DAM

Primary Dns Suffix . . . . . : elections.local



Node Type . . . . . : Broadcast  
IP Routing Enabled. . . . . : No  
WINS Proxy Enabled. . . . . : No  
DNS Suffix Search List. . . . . : elections.local

Ethernet adapter Local Area Connection:

Connection-specific DNS Suffix . :  
Description . . . . . : Broadcom NetXtreme 57xx Gigabit Controller  
Physical Address. . . . . : 00-19-B9-1F-F2-17  
Dhcp Enabled. . . . . : No  
IP Address. . . . . : 192.168.1.101  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . :  
DNS Servers . . . . . : 192.168.1.20

C:\Documents and Settings\administrator.ELECTIONS>arp -a

Interface: 192.168.1.101 --- 0x2

Internet Address	Physical Address	Type
192.168.1.20	00-14-22-60-3f-94	dynamic

C:\Documents and Settings\administrator.ELECTIONS>netstat -rn

Route Table



=====

Interface List

Ox1 ..... MS TCP Loopback interface  
Ox2 ...00 19 b9 1f f2 17 ..... Broadcom NetXtreme 57xx Gigabit Controller - Packet Scheduler Miniport

=====

=====

Active Routes:

Network	Destination	Netmask	Gateway	Interface	Metric
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1	
192.168.1.0	255.255.255.0	192.168.1.101	192.168.1.101	10	
192.168.1.101	255.255.255.255	127.0.0.1	127.0.0.1	10	
192.168.1.255	255.255.255.255	192.168.1.101	192.168.1.101	10	
224.0.0.0	240.0.0.0	192.168.1.101	192.168.1.101	10	
255.255.255.255	255.255.255.255	192.168.1.101	192.168.1.101	1	

=====

Persistent Routes:

None

C:\Documents and Settings\administrator.ELECTIONS>netstat -an

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING



TCP	0.0.0.0:3071	0.0.0.0:0	LISTENING
TCP	0.0.0.0:49152	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1047	0.0.0.0:0	LISTENING
TCP	192.168.1.101:139	0.0.0.0:0	LISTENING
UDP	0.0.0.0:445	*.*	
UDP	0.0.0.0:500	*.*	
UDP	0.0.0.0:1025	*.*	
UDP	0.0.0.0:1026	*.*	
UDP	0.0.0.0:4500	*.*	
UDP	127.0.0.1:123	*.*	
UDP	127.0.0.1:1027	*.*	
UDP	127.0.0.1:1043	*.*	
UDP	127.0.0.1:1900	*.*	
UDP	192.168.1.101:123	*.*	
UDP	192.168.1.101:137	*.*	
UDP	192.168.1.101:138	*.*	
UDP	192.168.1.101:1900	*.*	

C:\Documents and Settings\administrator.ELECTIONS>systeminfo

Host Name: DAM  
OS Name: Microsoft Windows XP Professional  
OS Version: 5.1.2600 Service Pack 2 Build 2600  
OS Manufacturer: Microsoft Corporation  
OS Configuration: Member Workstation



OS Build Type: Multiprocessor Free

Registered Owner: damsw

Registered Organization:

Product ID: 76487-OEM-0011903-00102

Original Install Date: 7/25/2007, 9:15:46 AM

System Up Time: 0 Days, 0 Hours, 51 Minutes, 46 Seconds

System Manufacturer: Dell Inc.

System Model: Precision WorkStation 690

System type: X86-based PC

Processor(s): 2 Processor(s) Installed.

[01]: x86 Family 6 Model 15 Stepping 6 GenuineIntel ~  
1595 Mhz

[02]: x86 Family 6 Model 15 Stepping 6 GenuineIntel ~  
1595 Mhz

BIOS Version: DELL - d

Windows Directory: C:\WINDOWS

System Directory: C:\WINDOWS\system32

Boot Device: \Device\HarddiskVolume2

System Locale: en-us;English (United States)

Input Locale: en-us;English (United States)

Time Zone: (GMT-05:00) Eastern Time (US & Canada)

Total Physical Memory: 2,046 MB

Available Physical Memory: 1,743 MB

Virtual Memory: Max Size: 2,048 MB

Virtual Memory: Available: 2,008 MB



Virtual Memory: In Use: 40 MB

Page File Location(s): C:\pagefile.sys

Domain: elections.local

Logon Server: \\BOE

Hotfix(s): 94 Hotfix(s) Installed.

[01]: File 1

[02]: File 1

[03]: File 1

[04]: File 1

[05]: File 1

[06]: File 1

[07]: File 1

[08]: File 1

[09]: File 1

[10]: File 1

[11]: File 1

[12]: File 1

[13]: File 1

[14]: File 1

[15]: File 1

[16]: File 1

[17]: File 1

[18]: File 1

[19]: File 1

[20]: File 1



[21]: File 1

[22]: File 1

[23]: File 1

[24]: File 1

[25]: File 1

[26]: File 1

[27]: File 1

[28]: File 1

[29]: File 1

[30]: File 1

[31]: File 1

[32]: File 1

[33]: File 1

[34]: File 1

[35]: File 1

[36]: File 1

[37]: File 1

[38]: File 1

[39]: File 1

[40]: File 1

[41]: File 1

[42]: File 1

[43]: File 1

[44]: File 1

[45]: File 1



- [46]: Q147222
- [47]: S867460 - Update
- [48]: KB925398\_WMP64
- [49]: KB923689
- [50]: KB873339 - Update
- [51]: KB885250 - Update
- [52]: KB885835 - Update
- [53]: KB887472 - Update
- [54]: KB889673 - Update
- [55]: KB891781 - Update
- [56]: KB896256 - Update
- [57]: KB896358 - Update
- [58]: KB896423 - Update
- [59]: KB896424 - Update
- [60]: KB899588 - Update
- [61]: KB899591 - Update
- [62]: KB901214 - Update
- [63]: KB904706 - Update
- [64]: KB908519 - Update
- [65]: KB908531 - Update
- [66]: KB908673 - Update
- [67]: KB909095 - Update
- [68]: KB911562 - Update
- [69]: KB912919 - Update
- [70]: KB912945 - Update



- [71]: KB914388 - Update
- [72]: KB917344 - Update
- [73]: KB917422 - Update
- [74]: KB918439 - Update
- [75]: KB918899 - Update
- [76]: KB919007 - Update
- [77]: KB920213 - Update
- [78]: KB920670 - Update
- [79]: KB920683 - Update
- [80]: KB920685 - Update
- [81]: KB921398 - Update
- [82]: KB922616 - Update
- [83]: KB923191 - Update
- [84]: KB923414 - Update
- [85]: KB923694 - Update
- [86]: KB923980 - Update
- [87]: KB924191 - Update
- [88]: KB924270 - Update
- [89]: KB924496 - Update
- [90]: KB925454 - Update
- [91]: KB926255 - Update
- [92]: KB928388 - Update
- [93]: KB929969 - Update
- [94]: KB835221WXP - Update

NetWork Card(s): **2 NIC(s) Installed.**



[01]: Broadcom NetXtreme 57xx Gigabit Controller

Connection Name: Local Area Connection

DHCP Enabled: No

IP address(es)

[01]: 192.168.1.101

[02]: 1394 Net Adapter

Connection Name: 1394 Connection

DHCP Enabled: Yes

DHCP Server: N/A

IP address(es)

**Post-Election Review: No Changes.**

#### *DAM3.elections.local*

Front: 4 USB Ports – empty

CD/DVD – empty

Rear: 2 USB connected to 2 Digi Rapidport /4 modems

USB Keyboard

USB Mouse

VGA Monitor

LAN Connection to Dell Switch

#### **Additional Information Collected from CLI:**

C:\Documents and Settings\Administrator.ELECTIONS>**hostname**

**DAM3**

C:\Documents and Settings\Administrator.ELECTIONS>**ipconfig /all**

Windows IP Configuration



Host Name . . . . . : DAM3  
Primary Dns Suffix . . . . . : elections.local  
Node Type . . . . . : Hybrid  
IP Routing Enabled. . . . . : No  
WINS Proxy Enabled. . . . . : No  
DNS Suffix Search List. . . . . : elections.local  
elections.local

Ethernet adapter Local Area Connection 2:

Connection-specific DNS Suffix . : elections.local  
Description . . . . . : Intel(R) 82579LM Gigabit Network Connection  
Physical Address. . . . . : D4-BE-D9-A4-D1-C5  
Dhcp Enabled. . . . . : Yes  
Autoconfiguration Enabled . . . . : Yes  
IP Address. . . . . : 192.168.1.41  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . : 192.168.1.1  
DHCP Server . . . . . : 192.168.1.20  
DNS Servers . . . . . : 192.168.1.20  
Primary WINS Server . . . . . : 192.168.1.20  
Lease Obtained. . . . . : Monday, November 06, 2017 9:47:48 AM  
  
Lease Expires . . . . . : Tuesday, November 14, 2017 9:47:48 AM



C:\Documents and Settings\Administrator.ELECTIONS>arp -a

Interface: 192.168.1.41 --- 0x2

Internet Address	Physical Address	Type
192.168.1.20	00-14-22-60-3f-94	dynamic

C:\Documents and Settings\Administrator.ELECTIONS>netstat -an

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1040	127.0.0.1:1041	ESTABLISHED
TCP	127.0.0.1:1041	127.0.0.1:1040	ESTABLISHED
TCP	127.0.0.1:1053	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1057	0.0.0.0:0	LISTENING
TCP	192.168.1.41:139	0.0.0.0:0	LISTENING
TCP	192.168.1.41:1102	192.168.1.20:135	TIME_WAIT
UDP	0.0.0.0:445	*.*	
UDP	0.0.0.0:500	*.*	
UDP	0.0.0.0:1025	*.*	
UDP	0.0.0.0:1026	*.*	



```
UDP 0.0.0.0:4500 *.*
UDP 127.0.0.1:123 *.*
UDP 127.0.0.1:1027 *.*
UDP 127.0.0.1:1049 *.*
UDP 127.0.0.1:1900 *.*
UDP 192.168.1.41:123 *.*
UDP 192.168.1.41:137 *.*
UDP 192.168.1.41:138 *.*
UDP 192.168.1.41:1900 *.*
```

C:\Documents and Settings\Administrator.ELECTIONS>netstat -an

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1047	127.0.0.1:1048	ESTABLISHED
TCP	127.0.0.1:1048	127.0.0.1:1047	ESTABLISHED
TCP	127.0.0.1:1054	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1057	0.0.0.0:0	LISTENING
TCP	192.168.1.41:139	0.0.0.0:0	LISTENING
TCP	192.168.1.41:1086	192.168.1.20:139	ESTABLISHED
TCP	192.168.1.41:1088	192.168.1.20:1026	TIME_WAIT
TCP	192.168.1.41:1106	192.168.1.20:135	TIME_WAIT
TCP	192.168.1.41:1107	192.168.1.20:1026	TIME_WAIT
TCP	192.168.1.41:1111	192.168.1.20:445	TIME_WAIT
UDP	0.0.0.0:445	*.*	



UDP 0.0.0.0:500 \*.\*  
UDP 0.0.0.0:1025 \*.\*  
UDP 0.0.0.0:1026 \*.\*  
UDP 0.0.0.0:4500 \*.\*  
UDP 127.0.0.1:123 \*.\*  
UDP 127.0.0.1:1027 \*.\*  
UDP 127.0.0.1:1043 \*.\*  
UDP 127.0.0.1:1900 \*.\*  
UDP 192.168.1.41:123 \*.\*  
UDP 192.168.1.41:137 \*.\*  
UDP 192.168.1.41:138 \*.\*  
UDP 192.168.1.41:1900 \*.\*

C:\Documents and Settings\Administrator\ELECTIONS>**systeminfo**

Host Name: DAM3  
OS Name: Microsoft Windows XP Professional  
OS Version: 5.1.2600 Service Pack 3 Build 2600  
OS Manufacturer: Microsoft Corporation  
OS Configuration: Member Workstation  
OS Build Type: Multiprocessor Free  
Registered Owner: ess  
Registered Organization:  
Product ID: 76487-OEM-0060807-79692  
Original Install Date: 3/30/2016, 10:52:49 AM  
System Up Time: 0 Days, 0 Hours, 54 Minutes, 28 Seconds  
System Manufacturer: Dell Inc.



System Model: OptiPlex 790

System type: X86-based PC

Processor(s): 1 Processor(s) Installed.

[01]: x86 Family 6 Model 42 Stepping 7 GenuineIntel ~

3092 Mhz

BIOS Version: DELL - 6222004

Windows Directory: C:\WINDOWS

System Directory: C:\WINDOWS\system32

Boot Device: \Device\HarddiskVolume1

System Locale: en-us;English (United States)

Input Locale: en-us;English (United States)

Time Zone: (GMT-05:00) Eastern Time (US & Canada)

Total Physical Memory: 3,241 MB

Available Physical Memory: 2,917 MB

Virtual Memory: Max Size: 2,048 MB

Virtual Memory: Available: 2,008 MB

Virtual Memory: In Use: 40 MB

Page File Location(s): C:\pagefile.sys

Domain: elections.local

Logon Server: \\BOE

Hotfix(s): 10 Hotfix(s) Installed.

[01]: File 1

[02]: File 1

[03]: File 1

[04]: File 1



[05]: Q147222

[06]: KB936929 - Service Pack

[07]: KB942288-v3 - Update

[08]: KB953356 - Update

[09]: KB954550-v5 - Update

[10]: KB835221WXP - Update

NetWork Card(s): **1 NIC(s) Installed.**

[01]: Intel(R) 82579LM Gigabit Network Connection

Connection Name: Local Area Connection 2

DHCP Enabled: Yes

DHCP Server: 192.168.1.20

IP address(es)

[01]: 192.168.1.41

**Post-Election Review: No Change**

### External Connections on Client Devices

The only outside (external) connections found on the network were the dial-up modems on the 2 DAM servers which are part of the application and are outbound only. No other external connections were found on the network. Each server/workstation was tested and none of them had Internet access. The 7 Ethernet connections on the Dell 2716 switch were traced to valid devices. No other cables were connected to the Dell Switch and no loose cables were observed near the switch. The solutions4networks engineer asked if there was a valid login for the Dell 2716 switch but was told that no one was aware of one.





### **No Wireless Adapters or Bluetooth Capability Found on Client Devices**

Each PC was physically inspected for the presence of a wireless adapter or Bluetooth adapter and none were found.

The Windows “Device Manager” of each device was also inspected for the presence of any wireless devices.

### **No Wireless Keyboards and Mice**

The keyboards and mice all had physical wires connected to the computers.

**Post-Election Review: All items indicated above remained the same.**

### **Network Air Gap Analysis**

No issues found.

### **Air Gap Network Intact - Recommendations for Improvement**

solutions4networks did not find any problems with the Election Tabulation Network, but have these recommendations to improve security of the network:



### **Client Operating Systems – Update the Clients to a supported OS.**

The client PC's were found to be running Windows XP which is no longer supported by Microsoft. These may be more vulnerable to attack if the network was ever compromised. The clients also had their internal Firewall disabled. They did have Symantec Anti-virus installed, but the definitions were out of date. If this remains a closed air gapped network this should be a viable OS.

### **Server Operating System – Update the Server Operating System.**

The server operating system is running Windows Server 2003, which is end of life July 2015. Any OS that is end of life is more vulnerable to attack if the network is ever compromised as it is no longer updated with any security patches. If this remains a closed air gapped network this should be a viable OS.

### **Remote Assistance Enabled.**

Remote Assistance is enabled on the 3 clients and 2 DAM servers. This serves no positive purpose in a closed network environment where each machine is physically accessible and should be disabled in the event the network is ever compromised.

### **Remote Desktop is Enabled.**

Remoted Desktop is enabled on the BOE server. Once again, this does not serve any positive purpose in a closed local network and should be disabled in the event the network is ever compromised.

### **Windows Update Enabled/None Selected.**

The two DAM servers are configured differently from the rest of the computers on the network. Consistency should be the norm. All other computers have Auto Updates turned off. DAM1 has nothing selected and DAM2 has Auto Updates enabled and set for 3:00AM. Since this is a closed network and the OSes that are running are end of life there isn't a need to have Windows Update enabled.

### **Lock Physical Access to the Dell PowerConnect 2716**

The Dell switch is easily accessible on the countertop. A locked cabinet would make it more difficult to connect an external cable. It is also recommended to disable any unused ports on the Dell Switch or move the unused ports to a different VLAN from the production network, but since the login is unknown a locked cabinet would suffice. Since the password is currently unknown and this is a flat network for ease of networking on the Dell switch there is the ability to reset it to unmanaged mode which would put all ports in Vlan 1.

### **Remove the Default Gateway Option**

The DHCP server is giving the clients a default gateway of 192.168.1.1 even though no device exists. Removing the default gateway completely would make it more difficult for the clients to communicate with external networks. There is some inconsistency on the network in that not all the clients are set up for DHCP. Either set them all up for DHCP or set them all up for Static. For a more secure environment it would be better to disable DHCP on the BOE server entirely and configure static IPs on all the clients that way if someone were to ever connect to the Dell switch they would never obtain a DHCP address but would have to know the network addressing to hard code their PC.

**County of Allegheny,  
Commonwealth of Pennsylvania**

Parallel Test Report  
Municipal Election

November 7, 2017



**BAKER TILLY**

Candor. Insight. Results.

# County of Allegheny, Commonwealth of Pennsylvania

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Mr. William McKain, County Manager  
County of Allegheny, Commonwealth of Pennsylvania  
Office of the County Manager  
436 Grant Street  
Room 119 Courthouse  
Pittsburgh, PA 15219

To assist with your evaluation of County of Allegheny's electronic voting machines, we randomly selected an election day polling location, scripted votes for parallel testing, and tested the functionality of the Direct Recording Electronic equipment, ES&S iVotronic voting machines. The test was performed on November 7, 2017, the date of the municipal election. The scripting component included creating hypothetical ballots for parallel testing by mimicking voter behavior and voting patterns from data and statistics provided by County of Allegheny, Department of Elections, for Precinct 752, Pittsburgh, Ward 14 District 9. Our engagement was performed in accordance with the consulting standards prescribed by the American Institute of Certified Public Accountants.

The results of the work performed indicate that the three voting machines tested, accurately recorded and counted the results of 178 ballots cast for the selected polling location. Our results are supported by visual evidence that the electronic voting machine recorded and maintained the vote counts properly. At the beginning of the process, we verified that the zero tape did in fact contain zero vote counts for each candidate in each race. Testing was done under video surveillance, capturing votes as they were entered into each voting machine from the scripted ballots. At the end of the election process, we compared the vote totals in the script, the Master Personalized Electronic Ballot (PEB), the Final Results Tape, and Flash Cards from the machines tested and found them to be in agreement. There were no discrepancies between the number of ballots cast, ballots cast for a particular party, votes for a particular candidate, the number of under-votes, the number of canceled votes, and the audio ballot cast for the visually impaired.

Because of its special purpose, this report is not suited for any purpose other than to assist you in your evaluation and, as such, is intended only for your internal use.

*Baker Tilly Virchow Krause, LLP*

Pittsburgh, Pennsylvania  
November 7, 2017

**COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA**  
**RECONCILIATION OF VOTE TOTALS IN SCRIPT TO FINAL RESULTS TAPE, FLASH CARDS AND MASTER PEB**  
**NOVEMBER 7, 2017**

PRECINCT: PITTSBURGH WARD 14 DISTRICT 9

	Voter Terminal Data per Script				Final Results Tape	Flash Card Data (from Precinct Report)				Master PEB Data	Differences
	V5181260	V5185724	V5173166	Total		V5181260	V5185724	V5173166	Total		
Public Count	104	0	0	104	104	104	0	0	104	104	0
	0	73	0	73	73	0	73	0	73	73	0
	0	0	1	1	1	0	0	1	1	1	0
	104	73	1	178	178	104	73	1	178	178	0
Justice of the Supreme Court											
Dwayne Woodruff	54	38	0	92	92	54	38	0	92	92	0
Sallie Mundy	50	35	1	86	86	50	35	1	86	86	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	104	73	1	178	178	104	73	1	178	178	0
Judge of the Superior Court											
Maria McLaughlin	53	33	1	87	87	53	33	1	87	87	0
Carolyn H. Nichols	48	34	0	82	82	48	34	0	82	82	0
Debbie Kunselman	38	29	1	68	68	38	29	1	68	68	0
Geoff Moulton	56	33	1	90	90	56	33	1	90	90	0
Craig Stedman	48	31	0	79	79	48	31	0	79	79	0
Emil Giordano	38	34	1	73	73	38	34	1	73	73	0
Wade A. Kagarise	51	30	0	81	81	51	30	0	81	81	0
Mary Murray	50	34	0	84	84	50	34	0	84	84	0
Jules Mermelstein	34	34	0	68	68	34	34	0	68	68	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	416	292	4	712	712	416	292	4	712	712	0
Judge of Commonwealth Court											
Ellen Ceisler	48	39	1	88	88	48	39	1	88	88	0
Irene M. Clark	57	35	0	92	92	57	35	0	92	92	0
Paul Lalley	60	38	1	99	99	60	38	1	99	99	0
Christine Fizzano Cannon	43	34	0	77	77	43	34	0	77	77	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	208	146	2	356	356	208	146	2	356	356	0
Judge of the Court of Common Pleas											
Patrick Connelly	65	43	1	109	109	65	43	1	109	109	0
David Lee Spurgeon	76	49	1	126	126	76	49	1	126	126	0
Mary C. McGinley	67	54	0	121	121	67	54	0	121	121	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	208	146	2	356	356	208	146	2	356	356	0

**COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA**  
**RECONCILIATION OF VOTE TOTALS IN SCRIPT TO FINAL RESULTS TAPE, FLASH CARDS AND MASTER PEB**  
**NOVEMBER 7, 2017**

PRECINCT: PITTSBURGH WARD 14 DISTRICT 9

	Voter Terminal Data per Script				Final Results Tape	Flash Card Data (from Precinct Report)				Master PEB Data	Differences
	V5181260	V5185724	V5173166	Total		V5181260	V5185724	V5173166	Total		
<b>Sheriff</b>											
Bill Mullen	104	73	1	178	178	104	73	1	178	178	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>Mayor</b>											
William Peduto	104	73	1	178	178	104	73	1	178	178	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>Member of Council</b>											
Dan Gilman	104	73	1	178	178	104	73	1	178	178	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>Magisterial District Judge</b>											
Dan Butler	104	73	1	178	178	104	73	1	178	178	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>Judge of Election</b>											
Write-in: A (Alpha)	3	2	0	5	5	3	2	0	5	5	0
Write-in: B (Bravo)	2	2	0	4	4	2	2	0	4	4	0
<b>Total</b>	<u>5</u>	<u>4</u>	<u>0</u>	<u>9</u>	<u>9</u>	<u>5</u>	<u>4</u>	<u>0</u>	<u>9</u>	<u>9</u>	<u>0</u>
<b>Inspector of Election</b>											
Dean A. Damick	104	73	1	178	178	104	73	1	178	178	0
Write-in	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>Proposed Constitutional Amendment</b>											
Yes	76	45	1	122	122	76	45	1	122	122	0
No	28	28	0	56	56	28	28	0	56	56	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>City of Pittsburgh HRC</b>											
Yes	78	64	1	143	143	78	64	1	143	143	0
No	26	9	0	35	35	26	9	0	35	35	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>
<b>Retention of Justice Saylor</b>											
Yes	70	58	1	129	129	70	58	1	129	129	0
No	34	15	0	49	49	34	15	0	49	49	0
<b>Total</b>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>104</u>	<u>73</u>	<u>1</u>	<u>178</u>	<u>178</u>	<u>0</u>

**COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA**  
**RECONCILIATION OF VOTE TOTALS IN SCRIPT TO FINAL RESULTS TAPE, FLASH CARDS AND MASTER PEB**  
**NOVEMBER 7, 2017**

PRECINCT: PITTSBURGH WARD 14 DISTRICT 9

	Voter Terminal Data per Script				Final Results Tape	Flash Card Data (from Precinct Report)				Master PEB Data	Differences
	V5181260	V5185724	V5173166	Total		V5181260	V5185724	V5173166	Total		
Retention of Justice Todd											
Yes	72	41	1	114	114	72	41	1	114	114	0
No	32	32	0	64	64	32	32	0	64	64	0
<b>Total</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>0</b>
Retention of Judge Shogan											
Yes	78	53	1	132	132	78	53	1	132	132	0
No	26	20	0	46	46	26	20	0	46	46	0
<b>Total</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>0</b>
Retention of Judge Bigley											
Yes	70	47	1	118	118	70	47	1	118	118	0
No	34	26	0	60	60	34	26	0	60	60	0
<b>Total</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>0</b>
Retention of Judge Cawood Bubash											
Yes	78	54	1	133	133	78	54	1	133	133	0
No	26	19	0	45	45	26	19	0	45	45	0
<b>Total</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>0</b>
Retention of Judge McCarthy											
Yes	69	40	0	109	109	69	40	0	109	109	0
No	35	33	1	69	69	35	33	1	69	69	0
<b>Total</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>0</b>
Retention of Judge McVay											
Yes	71	53	1	125	125	71	53	1	125	125	0
No	33	20	0	53	53	33	20	0	53	53	0
<b>Total</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>104</b>	<b>73</b>	<b>1</b>	<b>178</b>	<b>178</b>	<b>0</b>

## Exhibit A

The parallel testing work performed was as follows:

### Control and Security Procedures

1. We randomly selected a precinct.
2. We selected three ES&S iVotronic voting machines with "tamper-evident" seals from the County of Allegheny warehouse. We test-voted on each of the ES&S iVotronic voting machines.
3. We created a script for parallel testing to mimic voter behavior and voting patterns for the polling location randomly selected.
4. We obtained and secured the Master Personalized Electronic Ballot (PEB) and two Supervisor PEBs. The Master PEB is used to open voting machines and to print the zero tape (a "zero-vote" count tape from the ES&S iVotronic voting machines) before electronic balloting starts, and the Supervisor PEB is used to activate an ES&S iVotronic voting machine for each voter. Each PEB was secured in a locked file in our office after election day to prevent access and tampering.
5. We set up parallel test equipment where all actions could be visibly recorded by video surveillance. One video camera was set up to document the votes cast on each of the ES&S iVotronic voting machines selected.
6. We conducted the parallel test in a low traffic area to avoid interruptions.

### Casting Votes

1. Ballots were scripted to ensure that "voter turnout" in the mock election closely approximated the projected voter turnout for the randomly selected polling location.
2. The video camera was focused on the ES&S iVotronic voting machine screen in a manner that votes could be seen as they were entered.
3. Actual voting was conducted as follows:
  - First team member: Called out each vote as marked on the ballot script.
  - Second team member: As each vote was called, entered the vote in the ES&S iVotronic voting machine.
  - Second team member: Called back the votes cast as they appeared on the summary screen(s) on the ES&S iVotronic voting machine.
  - First team member: As the second team member called back the votes, verified that the vote was cast as it was read, and made a notation on the script.

The terminals closed at 8:00 PM. The final results tape was printed and the flash card from each voting machine was removed. Video camera tapes were marked according to the applicable voting machine and the time votes were entered into the voting machine selected for testing.

Terminal S/N: V5173166->  
PEB S/N PS223792- (FMW 1.07)  
Software Version 9.1.4.1  
Created 02/01/06 8:50  
Copyright ES&S, Inc. 1993-2005  
All Rights Reserved  
Diagnostic check completed: OK  
iVotronic I

2017 Municipal Election  
PITTSBURGH WARD 14 DIST 9  
POLLING LOCATION ZERO TAPE

Public Count Statistics

Total Ballots Cast: 0  
Total Ballots Counted: 0

Number of Terminals Opened: 3

Individual Voter Terminal Data

S/N V5181260

Public Count: 0  
Protective Count: 4226  
OPENED 06:56:19 11/07/2017  
NOT CLOSED

S/N V5185724

Public Count: 0  
Protective Count: 4343  
OPENED 06:58:17 11/07/2017  
NOT CLOSED

S/N V5173166

Public Count: 0  
Protective Count: 3742  
OPENED 07:02:05 11/07/2017  
NOT CLOSED

\*\*\*\*\*

PRECINCT: PITTSBURGH WARD 14 DIST 9

Public Count: 0

Ballot Style Counts

Ballot Style #752 0

Straight Party Option

(Vote for 1) Total: 0

Dem-Democratic 0

Rep-Republican 0

Aia-Avalon Is Awesome 0

Fcs-Fort Cherry School 0

Grn-Green 0

Ind-Independent 0

Nai-New Afrikan Independence 0

Sgt-Sensible Government 0

UnderVotes For Above contest: 0

JUSTICE OF THE SUPREME COURT  
(Vote for 1) Total: 0  
Dem-Dwayne Woodruff 0  
Rep-Sallie Mundy 0

>Write-ins in above contest: 0  
UnderVotes For Above contest: 0

JUDGE OF THE SUPERIOR COURT  
(Vote for 4) Total: 0  
Dem-Maria McLaughlin 0  
Dem-Carolyn H. Nichols 0  
Dem-Debbie Kunselman 0  
Dem-Geoff Moulton 0  
Rep-Craig Stedman 0  
Rep-Emil Giordano 0  
Rep-Wade A. Kagarise 0  
Rep-Mary Murray 0  
Grn-Jules Mermelstein 0

>Write-ins in above contest: 0  
UnderVotes For Above contest: 0

JUDGE OF THE COMMONWEALTH COURT  
(Vote for 2) Total: 0  
Dem-Ellen Ceisler 0  
Dem-Irene M. Clark 0  
Rep-Paul Lalley 0  
Rep-Christine Fizzano Cannon 0

>Write-ins in above contest: 0  
UnderVotes For Above contest: 0

JUDGE OF THE COURT OF COMMON PLEAS  
(Vote for 2) Total: 0  
Dem/Rep- 0  
-Patrick Connelly 0  
Dem-David Lee Spurgeon 0  
Rep-Mary C. McGinley 0

>Write-ins in above contest: 0  
UnderVotes For Above contest: 0

COUNTY SHERIFF  
(Vote for 1) Total: 0  
Dem/Rep- 0  
-Bill Mullen 0

>Write-ins in above contest: 0  
UnderVotes For Above contest: 0

CTYWIDE MAYOR CITY OF PITTSBURGH  
(Vote for 1) Total: 0  
Dem-William Peduto 0

>Write-ins in above contest: 0  
UnderVotes For Above contest: 0

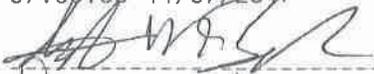
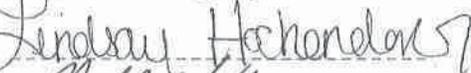
CTYCLO8 MEMBER OF PITTSBURGH COUNCIL 4		
(Vote for 1)	Total:	0
Dem-Dan Gilman		0
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
MAGO235 MAGISTERIAL DISTRICT JUDGE		
(Vote for 1)	Total:	0
Dem/Rep-		
-Dan Butler		0
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
JUDGEWI Judge of Election W/I		
(Vote for 1)	Total:	0
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
0752 Inspector of Election		
(Vote for 1)	Total:	0
Dem-Dean A. Damick		0
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
Proposed Constitutional Amendment		
(Vote for 1)	Total:	0
Yes		0
No		0
UnderVotes For Above contest:		0
MUN188 City of Pittsburgh HRC		
(Vote for 1)	Total:	0
Yes		0
No		0
UnderVotes For Above contest:		0
Retention of Justice Saylor		
(Vote for 1)	Total:	0
Yes		0
No		0
UnderVotes For Above contest:		0
Retention of Justice Todd		
(Vote for 1)	Total:	0
Yes		0
No		0
UnderVotes For Above contest:		0
Retention of Judge Shogan		
(Vote for 1)	Total:	0
Yes		0
No		0
UnderVotes For Above contest:		0
Retention of Judge Bigley		
(Vote for 1)	Total:	0
Yes		0
No		0
UnderVotes For Above contest:		0

Retention of Judge Cawood Bubash  
(Vote for 1) Total: 0  
Yes 0  
No 0  
UnderVotes For Above contest: 0

Retention of Judge McCarthy  
(Vote for 1) Total: 0  
Yes 0  
No 0  
UnderVotes For Above contest: 0

Retention of Judge McVay  
(Vote for 1) Total: 0  
Yes 0  
No 0  
UnderVotes For Above contest: 0

Time/Date: 07:08:56 11/07/2017

Signature:   
Signature: Lindsay Hochendahl   
Signature:   
Signature: 

COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA  
 ELECTION, TUESDAY, NOVEMBER 7, 2017  
 SUMMARY OF SCRIPTS

Machine #	Justice of the Supreme Court (vote for one)			Judge of the Superior Court (vote for not more than four)										Judge of the Commonwealth Court (vote for not more than two)					
	Public Count #	Woodruff	Mundy	Write-In	McLaughlin	Nichols	Kunselman	Moulton	Stedman	Giordano	Kagarise	Murray	Mermelstein	Write-In	Ceisker	Clark	Lalley	Cannon	Write-in
Machine 1 0001879	104	54	50	0	53	48	38	56	48	38	51	50	34	0	48	57	60	43	0
Machine 2 0001878	73	38	35	0	33	34	29	33	31	34	30	34	34	0	39	35	38	34	0
Machine 3 0001877	1	0	1	0	1	0	1	1	0	1	0	0	0	0	1	0	1	0	0
Total	178	92	86	0	87	82	68	90	79	73	81	84	68	0	88	92	99	77	0

Machine # Public Count #	Judge of the Court of Common Pleas (vote for not more than two)			Sheriff (vote for one)		Mayor (vote for one)		Member of Council (vote for one)		Magisterial District Judge (vote for one)		Judge of Election (vote for one)			Inspector of Election (vote for one)	
	Connelly	Spurgeon	McGinley	Write-In	Mullen	Write-in	Peduto	Write-in	Gilman	Write-in	Butler	Write-in	Write-in: (A) Alpha	Write-in: (B) Bravo	Damick	Write-in
Machine 1 0001879	65	76	67	0	104	0	104	0	104	0	104	0	3	2	104	0
Machine 2 0001878	43	49	54	0	73	0	73	0	73	0	73	0	2	2	73	0
Machine 3 0001877	1	1	0	0	1	0	1	0	1	0	1	0	0	0	1	0
<b>Total</b>	<b>109</b>	<b>126</b>	<b>121</b>	<b>0</b>	<b>178</b>	<b>0</b>	<b>178</b>	<b>0</b>	<b>178</b>	<b>0</b>	<b>178</b>	<b>0</b>	<b>5</b>	<b>4</b>	<b>178</b>	<b>0</b>

Machine 1 0001879	Machine 2 0001878	Machine 3 0001877	Public Count #	Proposed Constitutional Amendment		City of Pittsburgh HRC		Retention of Justice Saylor		Retention of Justice Todd		Retention of Judge Shogan		Retention of Judge Bigley		Retention of Judge Cavood Babash		Retention of Judge McCarthy		Retention of Judge McVay	
				Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
			104	76	28	78	26	70	34	72	32	78	26	70	34	78	26	69	35	71	33
			73	45	28	64	9	58	15	41	32	53	20	47	26	54	19	40	33	53	20
			1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	1	1	0
<b>Total</b>			178	122	56	143	35	129	49	114	64	132	46	118	60	133	45	109	69	125	53



COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA  
 ELECTION, TUESDAY, NOVEMBER 7, 2017  
 VOTER SIMULATION PROJECT SCRIPT

Machine #  
 0001879

Public Count #	Justice of the Supreme Court (vote for one)				Judge of the Superior Court (vote for not more than four)										Judge of the Commonwealth Court (vote for not more than two)				
	Woodruff	Mundy	Write-In		McLaughlin	Nichols	Kunnsdman	Monlton	Stedman	Giordano	Kagarise	Murray	Mermelstein	Write-In	Ceisler	Clark	Lalley	Cannon	Write-in
55																			
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100																			
101																			
102																			
103																			
104																			
Subtotal	54	50	0	0	53	48	38	56	48	38	51	50	34	0	48	57	60	43	0



Machine #  
0001879

Public Count #	Judge of the Court of Common Pleas (vote for not more than two)			Sheriff (vote for one)		Mayor (vote for one)		Member of Council (vote for one)		Magisterial District Judge (vote for one)		Judge of Election (vote for one)			Inspector of Election (vote for one)		
	Connelly	Spurgeon	McGinley	Write-In	Mullen	Write-in	Peduto	Write-in	Gilman	Write-in	Butler	Write-in	Write-in: (A) Alpha	Write-in: (B) Bravo	Write-in	Damick	Write-in
55																	
56	1				1				1								
57		1				1											
58	1																
59		1															
60	1																
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62	1																
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96	1																
97		1															
98	1																
99		1															
100	1																
101		1															
102	1																
103		1															
104	1																
Subtotal	65	76	67	0	104	0	104	0	104	0	104	0	3	2	104	0	0



Public Count #	Proposed Constitutional Amendment			City of Pittsburgh HRC			Retention of Justice Saylor			Retention of Justice Todd			Retention of Judge Shogan			Retention of Judge Bigley			Retention of Judge Carwood Bubash			Retention of Judge McCarthy			Retention of Judge McVay							
	Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No		Yes	No						
55																																
56	I			I			I			I			I			I			I			I			I							
57		I			I			I			I			I			I			I			I			I						
58	I			I			I			I			I			I			I			I			I							
59	I			I			I			I			I			I			I			I			I							
60	I			I			I			I			I			I			I			I			I							
61	I			I			I			I			I			I			I			I			I							
62	I			I			I			I			I			I			I			I			I							
63		I			I			I			I			I			I			I			I			I						
64	I			I			I			I			I			I			I			I			I							
65	I			I			I			I			I			I			I			I			I							
66	I			I			I			I			I			I			I			I			I							
67	I			I			I			I			I			I			I			I			I							
68	I			I			I			I			I			I			I			I			I							
69	I			I			I			I			I			I			I			I			I							
70	I			I			I			I			I			I			I			I			I							
71		I			I			I			I			I			I			I			I			I						
72	I			I			I			I			I			I			I			I			I							
73	I			I			I			I			I			I			I			I			I							
74	I			I			I			I			I			I			I			I			I							
75	I			I			I			I			I			I			I			I			I							
76	I			I			I			I			I			I			I			I			I							
77	I			I			I			I			I			I			I			I			I							
78	I			I			I			I			I			I			I			I			I							
79	I			I			I			I			I			I			I			I			I							
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81	I			I			I			I			I			I			I			I			I							
82	I			I			I			I			I			I			I			I			I							
83	I			I			I			I			I			I			I			I			I							
84	I			I			I			I			I			I			I			I			I							
85	I			I			I			I			I			I			I			I			I							
86	I			I			I			I			I			I			I			I			I							
87	I			I			I			I			I			I			I			I			I							
88	I			I			I			I			I			I			I			I			I							
89	I			I			I			I			I			I			I			I			I							
90	I			I			I			I			I			I			I			I			I							
91	I			I			I			I			I			I			I			I			I							
92	I			I			I			I			I			I			I			I			I							
93	I			I			I			I			I			I			I			I			I							
94	I			I			I			I			I			I			I			I			I							
95	I			I			I			I			I			I			I			I			I							
96	I			I			I			I			I			I			I			I			I							
97	I			I			I			I			I			I			I			I			I							
98	I			I			I			I			I			I			I			I			I							
99	I			I			I			I			I			I			I			I			I							
100	I			I			I			I			I			I			I			I			I							
101	I			I			I			I			I			I			I			I			I							
102	I			I			I			I			I			I			I			I			I							
103	I			I			I			I			I			I			I			I			I							
104	I			I			I			I			I			I			I			I			I							
Subtotal	76	28		78	26		70	34		72	32		78	26		70	34		78	26		70	34		78	26		69	35		71	33



COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA  
 ELECTION, TUESDAY, NOVEMBER 7, 2017  
 VOTER SIMULATION PROJECT SCRIPT

Machine #  
 0001878

Public Count #	Justice of the Supreme Court (vote for one)			Judge of the Superior Court (vote for not more than four)										Judge of the Commonwealth Court (vote for not more than two)				
	Woodruff	Mundy	Write-In	McLaughlin	Nichols	Kunselman	Monilton	Stedman	Giordano	Kagarise	Murray	Mermelstein	Write-In	Ceisler	Clark	Lalley	Cannon	Write-in
161																		
162																		
163																		
164																		
165																		
166																		
167																		
168																		
169																		
170																		
171																		
172																		
173																		
174																		
175																		
176																		
177																		
<b>Subtotal</b>	<b>38</b>	<b>35</b>	<b>0</b>	<b>33</b>	<b>34</b>	<b>29</b>	<b>33</b>	<b>31</b>	<b>34</b>	<b>30</b>	<b>34</b>	<b>34</b>	<b>0</b>	<b>39</b>	<b>35</b>	<b>38</b>	<b>34</b>	<b>0</b>



Machine #  
0001878

Public Count #	Judge of the Court of Common Pleas (vote for not more than two)			Sheriff (vote for one)		Mayor (vote for one)		Member of Council (vote for one)		Magisterial District Judge (vote for one)		Judge of Election (vote for one)		Inspector of Election (vote for one)		
	Connelly	Spurgeon	McGintey	Write-In	Mullen	Write-in	Peduto	Write-in	Gilman	Write-in	Butler	Write-in	Write-in: (A) Alpha	Write-in: (B) Bravo	Damick	Write-in
161																
162	1				1		1		1		1					1
163	1				1		1		1		1					1
164		1			1		1		1		1					1
165			1		1		1		1		1					1
166	1				1		1		1		1					1
167					1		1		1		1					1
168	1				1		1		1		1					1
169					1		1		1		1					1
170	1				1		1		1		1					1
171					1		1		1		1					1
172	1				1		1		1		1					1
173					1		1		1		1					1
174	1				1		1		1		1					1
175					1		1		1		1					1
176	1				1		1		1		1					1
177					1		1		1		1					1
Subtotal	43	49	54	0	73	0	73	0	73	0	73	0	2	2	73	0





COUNTY OF ALLEGHENY, COMMONWEALTH OF PENNSYLVANIA  
 ELECTION, TUESDAY, NOVEMBER 7, 2017  
 VOTER SIMULATION PROJECT SCRIPT

Machine #  
 0001877

Public Count #	Justice of the Supreme Court (vote for one)			Judge of the Superior Court (vote for not more than four)								Judge of the Commonwealth Court (vote for not more than two)						
	Woodruff	Mundy	Write-In	McLaughlin	Nichols	Kunselman	Moulton	Stedman	Giordano	Kagarise	Murray	Mermelstein	Write-In	Ceisler	Clark	Lalley	Cannon	Write-in
178	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	1	0	0
Subtotal	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	1	0	0

Machine #  
0001877

Public Count #	Judge of the Court of Common Pleas (vote for not more than two)	Sheriff (vote for one)	Mayor (vote for one)	Member of Council (vote for one)	Magisterial District Judge (vote for one)	Judge of Election (vote for one)	Inspector of Election (vote for one)
178	Connelly   Spurgeon   McGintey   Write-In	Mullen   Write-in	Peduto   Write-in	Gilman   Write-in	Butler   Write-in	Write-in: (A) Alpha   Write-in: (B) Bravo	Damick   Write-in
	1   1   0   0	1   0	1   0	1   0	1   0	0   0	1   0
Subtotal	1   1   0   0	1   0	1   0	1   0	1   0	0   0	1   0



Terminal S/N: V5173166->  
PEB S/N PS223792-- (FMW 1.07)  
Software Version 9.1.4.1  
Created 02/01/06 8:50  
Copyright ES&S, Inc. 1993-2005  
All Rights Reserved  
Diagnostic check completed: OK  
iVotronic I

2017 Municipal Election  
PITTSBURGH WARD 14 DIST 9  
POLLING LOCATION RESULTS

Public Count Statistics

Total Ballots Cast: 178  
Total Ballots Counted: 178

Number of Terminals Opened: 3

Individual Voter Terminal Data  
S/N V5181260

Public Count: 104  
Protective Count: 4330  
OPENED 06:56:19 11/07/2017  
CLOSED 20:04:17 11/07/2017  
Terminal Ballots Counted: 104

S/N V5185724

Public Count: 73  
Protective Count: 4416  
OPENED 06:58:17 11/07/2017  
CLOSED 20:06:52 11/07/2017  
Terminal Ballots Counted: 73

S/N V5173166

Public Count: 1  
Protective Count: 3743  
OPENED 07:02:05 11/07/2017  
CLOSED 20:11:06 11/07/2017  
Terminal Ballots Counted: 1

\*\*\*\*\*

PRECINCT: PITTSBURGH WARD 14 DIST 9

Public Count: 178  
Ballot Style Counts  
Ballot Style #752 178

Straight Party Option

(Vote for 1) Total: 0  
Dem-Democratic 0  
Rep-Republican 0  
Aia-Avalon Is Awesome 0  
Fcs-Fort Cherry School 0  
Grn-Green 0  
Ind-Independent 0  
Nai-New Afrikan Independence 0  
Sgt-Sensible Government 0  
UnderVotes For Above contest: 178

JUSTICE OF THE SUPREME COURT		
(Vote for 1)	Total:	178
Dem-Dwayne Woodruff		92
Rep-Sallie Mundy		86

>Write-ins in above contest:	0
UnderVotes For Above contest:	0

JUDGE OF THE SUPERIOR COURT		
(Vote for 4)	Total:	712
Dem-Maria McLaughlin		87
Dem-Carolyn H. Nichols		82
Dem-Debbie Kunselman		68
Dem-Geoff Moulton		90
Rep-Craig Stedman		79
Rep-Emil Giordano		73
Rep-Wade A. Kagarise		81
Rep-Mary Murray		84
Grn-Jules Mermelstein		68

>Write-ins in above contest:	0
UnderVotes For Above contest:	0

JUDGE OF THE COMMONWEALTH COURT		
(Vote for 2)	Total:	356
Dem-Ellen Ceisler		88
Dem-Irene M. Clark		92
Rep-Paul Lalley		99
Rep-Christine Fizzano Cannon		77

>Write-ins in above contest:	0
UnderVotes For Above contest:	0

JUDGE OF THE COURT OF COMMON PLEAS		
(Vote for 2)	Total:	356
Dem/Rep-		
-Patrick Connelly		109
Dem-David Lee Spurgeon		126
Rep-Mary C. McGinley		121

>Write-ins in above contest:	0
UnderVotes For Above contest:	0

COUNTY SHERIFF		
(Vote for 1)	Total:	178
Dem/Rep-		
-Bill Mullen		178

>Write-ins in above contest:	0
UnderVotes For Above contest:	0

CTYWIDE MAYOR CITY OF PITTSBURGH		
(Vote for 1)	Total:	178
Dem-William Peduto		178

>Write-ins in above contest:	0
UnderVotes For Above contest:	0

CTYCLO8 MEMBER OF PITTSBURGH COUNCIL 4		
(Vote for 1)	Total:	178
Dem-Dan Gilman		178
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
MAGO235 MAGISTERIAL DISTRICT JUDGE		
(Vote for 1)	Total:	178
Dem/Rep-		
-Dan Butler		178
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
JUDGEWI Judge of Election W/I		
(Vote for 1)	Total:	9
>A		
>B		
>B		
>A		
>A		
>B		
>A		
>A		
>B		
>Write-ins in above contest:		9
UnderVotes For Above contest:		169
0752 Inspector of Election		
(Vote for 1)	Total:	178
Dem-Dean A. Damick		178
>Write-ins in above contest:		0
UnderVotes For Above contest:		0
Proposed Constitutional Amendment		
(Vote for 1)	Total:	178
Yes		122
No		56
UnderVotes For Above contest:		0
MUN188 City of Pittsburgh HRC		
(Vote for 1)	Total:	178
Yes		143
No		35
UnderVotes For Above contest:		0
Retention of Justice Saylor		
(Vote for 1)	Total:	178
Yes		129
No		49
UnderVotes For Above contest:		0
Retention of Justice Todd		
(Vote for 1)	Total:	178
Yes		114
No		64
UnderVotes For Above contest:		0

Retention of Judge Shogan  
(Vote for 1) Total: 178  
Yes 132  
No 46  
UnderVotes For Above contest: 0

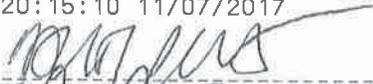
Retention of Judge Bigley  
(Vote for 1) Total: 178  
Yes 118  
No 60  
UnderVotes For Above contest: 0

Retention of Judge Cawood Bubash  
(Vote for 1) Total: 178  
Yes 133  
No 45  
UnderVotes For Above contest: 0

Retention of Judge McCarthy  
(Vote for 1) Total: 178  
Yes 109  
No 69  
UnderVotes For Above contest: 0

Retention of Judge McVay  
(Vote for 1) Total: 178  
Yes 125  
No 53  
UnderVotes For Above contest: 0

Time/Date: 20:15:10 11/07/2017

Signature:   
Signature:   
Signature:   
Signature: 

EL30

<HTML>  
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 PRECINCT REPORT  
 RUN DATE: 12/18/17  
 RUN TIME: 10:02 AM

0752 PITTSBURGH WARD 14 DIST 9

	VOTES	PERCENT
REGISTERED VOTERS - TOTAL . . . . .	792	
BALLOTS CAST - TOTAL . . . . .	178	
VOTER TURNOUT - TOTAL . . . . .		22.47

Straight Party  
 Vote for 1

Democratic (Dem) . . . . .	0
Republican (Rep) . . . . .	0
Avalon Is Awesome (Aia) . . . . .	0
Fort Cherry School (Fcs) . . . . .	0
Green (Grn) . . . . .	0
Independent (Ind) . . . . .	0
New Afrikan Independ (Nai) . . . . .	0
Sensi ble Government (Sgt) . . . . .	0

Justice of the Supreme Court  
 Vote for 1

Dwayne Woodruff (Dem) . . . . .	92	51.69
Sallie Mundy (Rep) . . . . .	86	48.31
WRITE-IN . . . . .	0	

Judge of the Superior Court  
 Vote for 4

Maria McLaughlin (Dem) . . . . .	87	12.22
Carolyn H. Nichols (Dem) . . . . .	82	11.52
Debbie Kunselman (Dem) . . . . .	68	9.55
Geoff Moulton (Dem) . . . . .	90	12.64
Craig Stedman (Rep) . . . . .	79	11.10
Emil Giordano (Rep) . . . . .	73	10.25
Wade A. Kagari se (Rep) . . . . .	81	11.38
Mary Murray (Rep) . . . . .	84	11.80
Jul es Mermel stein (Grn) . . . . .	68	9.55
WRITE-IN . . . . .	0	

Judge of the Commonwealth Court  
 Vote for 2

Ellen Ceisler (Dem) . . . . .	88	24.72
Irene M. Clark (Dem) . . . . .	92	25.84
Paul Lalley (Rep) . . . . .	99	27.81
Christine Fizzano Cannon (Rep) . . . . .	77	21.63
WRITE-IN . . . . .	0	

Judge of the Court of Common Pleas  
 Vote for 2

Patrick Connelly (Dem/Rep) . . . . .	109	30.62
David Lee Spurgeon (Dem) . . . . .	126	35.39
Mary C. McGinley (Rep) . . . . .	121	33.99
WRITE-IN . . . . .	0	

Sheriff  
 Vote for 1

	EL30		
Bill Mullen (Dem/Rep)		178	100.00
WRITE-IN.		0	
Mayor CITYWIDE			
Vote for 1			
William Peduto (Dem).		178	100.00
WRITE-IN.		0	
Member of Council DISTRICT 8			
Vote for 1			
Dan Gilman (Dem)		178	100.00
WRITE-IN.		0	
Magisterial District Judge 05-02-35			
Vote for 1			
Dan Butler (Dem/Rep).		178	100.00
WRITE-IN.		0	
Judge of Election			
Vote for 1			
WRITE-IN.		9	100.00
Inspector of Election PITTSBURGH WARD 14 DIST 9 (Prec-0)			
Vote for 1			
Dean A. Damick (Dem).		178	100.00
WRITE-IN.		0	
Proposed Constitutional Amendment			
Vote for 1			
Yes		122	68.54
No.		56	31.46
City of Pittsburgh HRC			
Vote for 1			
Yes		143	80.34
No.		35	19.66
Retention of Justice Saylor			
Vote for 1			
Yes		129	72.47
No.		49	27.53
Retention of Justice Todd			
Vote for 1			
Yes		114	64.04
No.		64	35.96
Retention of Judge Shogan			
Vote for 1			
Yes		132	74.16
No.		46	25.84
Retention of Judge Bigley			
Vote for 1			
Yes		118	66.29
No.		60	33.71

EL30

Retention of Judge Cawood Bubash

Vote for 1		
Yes . . . . .	133	74.72
No. . . . .	45	25.28

Retention of Judge McCarthy

Vote for 1		
Yes . . . . .	109	61.24
No. . . . .	69	38.76

Retention of Judge McVay

Vote for 1		
Yes . . . . .	125	70.22
No. . . . .	53	29.78

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EL30A

Judge of the Commonwealth Court

Vote for	2	1	48	24.72	88	39
Ellen Ceisler (Dem)	88	1	48	24.72	88	39
Irene M. Clark (Dem)	92	0	57	25.84	92	35
Paul Lalley (Rep)	99	1	60	27.81	99	38
Christine Fizzano Cannon (Rep)	77	0	43	21.63	77	34
WRITE-IN.	0	0	0		0	0

Judge of the Court of Common Pleas

Vote for	2	1	65	30.62	109	43
Patrick Connelly (Dem/Rep)	109	1	65	30.62	109	43
David Lee Spurgeon (Dem)	126	1	76	35.39	126	49
Mary C. McGinley (Rep)	121	0	67	33.99	121	54
WRITE-IN.	0	0	0		0	0

Sheriff

Vote for	1	104	73
Bill Mullen (Dem/Rep)	178	104	73
WRITE-IN.	0	0	0

Mayor CITYWIDE

Vote for	1	104	73
William Peduto (Dem)	178	104	73
WRITE-IN.	0	0	0

Member of Council DISTRICT 8

Vote for	1	104	73
Dan Gilman (Dem)	178	104	73
WRITE-IN.	0	0	0

Magisterial District Judge 05-02-35

Vote for	1	104	73
Dan Butler (Dem/Rep)	178	104	73
WRITE-IN.	0	0	0

Judge of Election

Vote for	1
	1

	9	EL30A 100.00	0	5	4
WRITE-IN. . . . .					
Inspector of Election PITTSBURGH WARD 14 DIST 9 (Prec-0					
Vote for 1					
Dean A. Dami ck (Dem). . . . .	178	100.00	1	104	73
WRITE-IN. . . . .	0		0	0	0
Proposed Constitutional Amendment					
Vote for 1					
Yes . . . . .	122	68.54	1	76	45
No. . . . .	56	31.46	0	28	28
City of Pittsburgh HRC					
Vote for 1					
Yes . . . . .	143	80.34	1	78	64
No. . . . .	35	19.66	0	26	9
Retention of Justice Saylor					
Vote for 1					
Yes . . . . .	129	72.47	1	70	58
No. . . . .	49	27.53	0	34	15
Retention of Justice Todd					
Vote for 1					
Yes . . . . .	114	64.04	1	72	41
No. . . . .	64	35.96	0	32	32
Retention of Judge Shogan					
Vote for 1					
Yes . . . . .	132	74.16	1	78	53
No. . . . .	46	25.84	0	26	20
Retention of Judge Bigley					
Vote for 1					
Yes . . . . .	118	66.29	1	70	47
No. . . . .	60	33.71	0	34	26

Retention of Judge Cawood Bubash		EL30A			
Vote for 1					
Yes	133	74.72	1	78	54
No.	45	25.28	0	26	19
Retention of Judge McCarthy					
Vote for 1					
Yes	109	61.24	0	69	40
No.	69	38.76	1	35	33
Retention of Judge McVay					
Vote for 1					
Yes	125	70.22	1	71	53
No.	53	29.78	0	33	20

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# 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
1	ALEPPO	101	0	1	1357
2	ASPINWALL	102	0	1	866
3	ASPINWALL	102	0	2	594
4	ASPINWALL	102	0	3	849
5	AVALON	103	1	0	1106
6	AVALON	103	2	1	698
7	AVALON	103	2	2	464
8	AVALON	103	3	1	317
9	AVALON	103	3	2	485
10	AVALON	103	3	3	491
11	BALDWIN BR	104	0	1	569
12	BALDWIN BR	104	0	2	1007
13	BALDWIN BR	104	0	3	795
14	BALDWIN BR	104	0	4	753
15	BALDWIN BR	104	0	5	781
16	BALDWIN BR	104	0	6	753
17	BALDWIN BR	104	0	7	802
18	BALDWIN BR	104	0	8	696
19	BALDWIN BR	104	0	9	739
20	BALDWIN BR	104	0	10	1019
21	BALDWIN BR	104	0	11	1128
22	BALDWIN BR	104	0	12	619
23	BALDWIN BR	104	0	13	661
24	BALDWIN BR	104	0	14	573
25	BALDWIN BR	104	0	15	780
26	BALDWIN BR	104	0	16	881
27	BALDWIN BR	104	0	17	664
28	BALDWIN BR	104	0	18	920
29	BALDWIN TP	105	0	1	765
30	BALDWIN TP	105	0	2	695
31	BELL ACRES	106	0	1	1128
32	BELLEVUE	107	1	1	1016
33	BELLEVUE	107	1	2	954
34	BELLEVUE	107	2	1	1115
35	BELLEVUE	107	2	2	978
36	BELLEVUE	107	3	1	1026
37	BELLEVUE	107	3	2	927
38	BEN AVON	108	0	1	461
39	BEN AVON	108	0	2	954
40	BEN AVON HT	109	0	1	314
41	BETHEL PARK	110	1	1	864
42	BETHEL PARK	110	1	2	810
43	BETHEL PARK	110	1	3	807
44	BETHEL PARK	110	2	1	729
45	BETHEL PARK	110	2	2	897
46	BETHEL PARK	110	2	3	1100
47	BETHEL PARK	110	3	1	793
48	BETHEL PARK	110	3	2	916
49	BETHEL PARK	110	3	3	1072
50	BETHEL PARK	110	4	1	1293
51	BETHEL PARK	110	4	2	795
52	BETHEL PARK	110	4	3	856
53	BETHEL PARK	110	5	1	595
54	BETHEL PARK	110	5	2	645

## 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
55	BETHEL PARK	110	5	3	1426
56	BETHEL PARK	110	6	1	1277
57	BETHEL PARK	110	6	2	958
58	BETHEL PARK	110	6	3	789
59	BETHEL PARK	110	7	1	1149
60	BETHEL PARK	110	7	2	957
61	BETHEL PARK	110	7	3	747
62	BETHEL PARK	110	8	1	504
63	BETHEL PARK	110	8	2	542
64	BETHEL PARK	110	8	3	1216
65	BETHEL PARK	110	8	4	451
66	BETHEL PARK	110	9	1	555
67	BETHEL PARK	110	9	2	709
68	BETHEL PARK	110	9	3	1354
69	BLAWNOX	111	0	1	1046
70	BRACKENRIDGE	112	1	0	484
71	BRACKENRIDGE	112	2	0	790
72	BRACKENRIDGE	112	3	0	659
73	BRADDOCK	113	1	0	545
74	BRADDOCK	113	2	0	583
75	BRADDOCK	113	3	0	455
76	BRADDOCK HL	114	0	1	800
77	BRADDOCK HL	114	0	2	532
78	BRADFORDWOOD	115	0	1	1014
79	BRENTWOOD	116	0	1	536
80	BRENTWOOD	116	0	2	752
81	BRENTWOOD	116	0	3	562
82	BRENTWOOD	116	0	4	774
83	BRENTWOOD	116	0	5	719
84	BRENTWOOD	116	0	6	704
85	BRENTWOOD	116	0	7	753
86	BRENTWOOD	116	0	8	719
87	BRENTWOOD	116	0	9	591
88	BRENTWOOD	116	0	10	555
89	BRIDGEVILLE	117	0	1	805
90	BRIDGEVILLE	117	0	2	858
91	BRIDGEVILLE	117	0	3	852
92	BRIDGEVILLE	117	0	4	973
93	CARNEGIE	118	1	1	523
94	CARNEGIE	118	1	2	1191
95	CARNEGIE	118	1	3	802
96	CARNEGIE	118	1	4	381
97	CARNEGIE	118	2	1	655
98	CARNEGIE	118	2	2	511
99	CARNEGIE	118	2	3	479
100	CARNEGIE	118	2	4	937
101	CASL SHANNON	119	0	1	1052
102	CASL SHANNON	119	0	2	850
103	CASL SHANNON	119	0	3	805
104	CASL SHANNON	119	0	4	641
105	CASL SHANNON	119	0	5	622
106	CASL SHANNON	119	0	6	643
107	CASL SHANNON	119	0	7	755
108	CASL SHANNON	119	0	8	556
109	CHALFANT	120	0	1	583

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
110	CHESWICK	121	0	1	607
111	CHESWICK	121	0	2	632
112	CHURCHILL	122	0	1	687
113	CHURCHILL	122	0	2	692
114	CHURCHILL	122	0	3	642
115	CHURCHILL	122	0	4	676
116	CLAIRTON	123	1	1	401
117	CLAIRTON	123	1	2	413
118	CLAIRTON	123	1	3	346
119	CLAIRTON	123	2	1	134
120	CLAIRTON	123	2	2	341
121	CLAIRTON	123	2	3	469
122	CLAIRTON	123	3	1	441
123	CLAIRTON	123	3	2	394
124	CLAIRTON	123	3	3	414
125	CLAIRTON	123	4	1	394
126	CLAIRTON	123	4	2	389
127	CLAIRTON	123	4	3	430
128	COLLIER	124	0	1	1141
129	COLLIER	124	0	2	1238
130	COLLIER	124	0	3	1198
131	COLLIER	124	0	4	770
132	COLLIER	124	0	5	952
133	COLLIER	124	0	6	1095
134	CORAOPOLIS	125	1	1	466
135	CORAOPOLIS	125	1	2	496
136	CORAOPOLIS	125	2	0	820
137	CORAOPOLIS	125	3	1	590
138	CORAOPOLIS	125	3	2	614
139	CORAOPOLIS	125	4	1	453
140	CORAOPOLIS	125	4	2	517
141	CRAFTON	126	1	1	881
142	CRAFTON	126	1	2	615
143	CRAFTON	126	2	1	600
144	CRAFTON	126	2	2	794
145	CRAFTON	126	3	1	959
146	CRAFTON	126	3	2	585
147	CRESCENT	127	1	0	1109
148	CRESCENT	127	2	0	669
149	DORMONT	128	0	1	768
150	DORMONT	128	0	2	537
151	DORMONT	128	0	3	940
152	DORMONT	128	0	4	644
153	DORMONT	128	0	5	1074
154	DORMONT	128	0	6	513
155	DORMONT	128	0	7	506
156	DORMONT	128	0	8	421
157	DORMONT	128	0	9	531
158	DORMONT	128	0	10	607
159	DRAVOSBURG	129	0	1	569
160	DRAVOSBURG	129	0	2	379
161	DRAVOSBURG	129	0	3	263
162	DUQUESNE	130	1	1	482
163	DUQUESNE	130	1	2	531
164	DUQUESNE	130	1	3	331

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
165	DUQUESNE	130	1	4	223
166	DUQUESNE	130	2	1	408
167	DUQUESNE	130	2	2	421
168	DUQUESNE	130	2	3	467
169	DUQUESNE	130	3	1	250
170	DUQUESNE	130	3	2	177
171	DUQUESNE	130	3	3	581
172	EAST DEER	131	1	0	319
173	EAST DEER	131	2	0	586
174	E MCKEESPORT	132	0	1	412
175	E MCKEESPORT	132	0	2	511
176	E MCKEESPORT	132	0	3	486
177	E PITTSBURGH	133	1	0	352
178	E PITTSBURGH	133	2	0	395
179	E PITTSBURGH	133	3	0	498
180	EDGEWOOD	134	0	1	1014
181	EDGEWOOD	134	0	2	944
182	EDGEWOOD	134	0	3	866
183	EDGEWORTH	135	0	1	697
184	EDGEWORTH	135	0	2	751
185	ELIZABETH BR	136	0	1	926
186	ELIZABETH TP	137	1	1	575
187	ELIZABETH TP	137	1	2	907
188	ELIZABETH TP	137	2	0	1262
189	ELIZABETH TP	137	3	0	1324
190	ELIZABETH TP	137	4	1	909
191	ELIZABETH TP	137	4	2	462
192	ELIZABETH TP	137	5	1	441
193	ELIZABETH TP	137	5	2	832
194	ELIZABETH TP	137	6	1	614
195	ELIZABETH TP	137	6	2	720
196	ELIZABETH TP	137	7	0	1256
197	EMSWORTH	138	0	1	770
198	EMSWORTH	138	0	2	951
199	ETNA	139	1	0	819
200	ETNA	139	2	0	718
201	ETNA	139	3	0	709
202	FAWN	50	0	1	542
203	FAWN	50	0	2	906
204	FINDLAY	141	0	1	1134
205	FINDLAY	141	0	2	1692
206	FINDLAY	141	0	3	1221
207	FOREST HILLS	142	0	1	628
208	FOREST HILLS	142	0	2	615
209	FOREST HILLS	142	0	3	636
210	FOREST HILLS	142	0	4	720
211	FOREST HILLS	142	0	5	689
212	FOREST HILLS	142	0	6	558
213	FOREST HILLS	142	0	7	760
214	FOREST HILLS	142	0	8	718
215	FORWARD	143	0	1	368
216	FORWARD	143	0	2	875
217	FORWARD	143	0	3	392
218	FORWARD	143	0	4	447
219	FOX CHAPEL	144	0	1	795

## 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
220	FOX CHAPEL	144	0	2	993
221	FOX CHAPEL	144	0	3	740
222	FOX CHAPEL	144	0	4	1187
223	FOX CHAPEL	144	0	5	890
224	FRANKLIN PK	145	1	1	1159
225	FRANKLIN PK	145	1	2	1215
226	FRANKLIN PK	145	1	3	1321
227	FRANKLIN PK	145	2	1	1036
228	FRANKLIN PK	145	2	2	1252
229	FRANKLIN PK	145	2	3	1333
230	FRANKLIN PK	145	3	1	1254
231	FRANKLIN PK	145	3	2	781
232	FRANKLIN PK	145	3	3	1214
233	FRAZER	146	0	1	749
234	GLASSPORT	147	0	1	557
235	GLASSPORT	147	0	2	390
236	GLASSPORT	147	0	3	539
237	GLASSPORT	147	0	4	240
238	GLASSPORT	147	0	5	502
239	GLASSPORT	147	0	6	440
240	GLENFIELD	148	0	1	149
241	GREENTREE	149	0	1	783
242	GREENTREE	149	0	2	1062
243	GREENTREE	149	0	3	939
244	GREENTREE	149	0	4	848
245	HAMPTON	150	0	1	1198
246	HAMPTON	150	0	2	1193
247	HAMPTON	150	0	3	1323
248	HAMPTON	150	0	4	619
249	HAMPTON	150	0	5	704
250	HAMPTON	150	0	6	649
251	HAMPTON	150	0	7	1290
252	HAMPTON	150	0	8	928
253	HAMPTON	150	0	9	1251
254	HAMPTON	150	0	10	1479
255	HAMPTON	150	0	11	1671
256	HAMPTON	150	0	12	842
257	HAMPTON	150	0	13	759
258	HARMAR	151	0	1	1280
259	HARMAR	151	0	2	738
260	HARMAR	151	0	3	364
261	HARRISON	152	1	1	290
262	HARRISON	152	1	2	577
263	HARRISON	152	1	3	652
264	HARRISON	152	2	1	321
265	HARRISON	152	2	2	609
266	HARRISON	152	3	1	1025
267	HARRISON	152	3	2	620
268	HARRISON	152	4	1	664
269	HARRISON	152	4	2	581
270	HARRISON	152	5	1	512
271	HARRISON	152	5	2	813
272	HAYSVILLE	153	0	1	59
273	HEIDELBERG	154	0	1	848
274	HOMESTEAD	155	1	1	611

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
275	HOMESTEAD	155	1	2	380
276	HOMESTEAD	155	2	1	453
277	HOMESTEAD	155	2	2	318
278	HOMESTEAD	155	3	1	525
279	HOMESTEAD	155	3	2	323
280	INDIANA	156	0	1	965
281	INDIANA	156	0	2	881
282	INDIANA	156	0	3	1213
283	INDIANA	156	0	4	1091
284	INDIANA	156	0	5	918
285	INGRAM	157	0	1	793
286	INGRAM	157	0	2	629
287	INGRAM	157	0	3	910
288	JEFFERSON HL	158	0	1	1566
289	JEFFERSON HL	158	0	2	840
290	JEFFERSON HL	158	0	3	636
291	JEFFERSON HL	158	0	4	680
292	JEFFERSON HL	158	0	5	2043
293	JEFFERSON HL	158	0	6	950
294	JEFFERSON HL	158	0	7	367
295	JEFFERSON HL	158	0	8	1116
296	KENNEDY	159	0	1	1522
297	KENNEDY	159	0	2	844
298	KENNEDY	159	0	3	1010
299	KENNEDY	159	0	4	437
300	KENNEDY	159	0	5	1322
301	KENNEDY	159	0	6	832
302	KENNEDY	159	0	7	529
303	KILBUCK	160	0	1	587
304	LEET	161	0	1	390
305	LEET	161	0	2	750
306	LEETSDALE	162	0	1	871
307	LIBERTY	163	0	1	931
308	LIBERTY	163	0	2	767
309	LINCOLN	164	0	1	692
310	MARSHALL	165	0	1	875
311	MARSHALL	165	0	2	1096
312	MARSHALL	165	0	3	799
313	MARSHALL	165	0	4	1087
314	MARSHALL	165	0	5	1422
315	MARSHALL	165	0	6	977
316	MCCANDLESS	166	1	1	1098
317	MCCANDLESS	166	1	2	927
318	MCCANDLESS	166	1	3	1226
319	MCCANDLESS	166	2	1	1416
320	MCCANDLESS	166	2	2	859
321	MCCANDLESS	166	2	3	866
322	MCCANDLESS	166	3	1	946
323	MCCANDLESS	166	3	2	1077
324	MCCANDLESS	166	3	3	1021
325	MCCANDLESS	166	4	1	1500
326	MCCANDLESS	166	4	2	903
327	MCCANDLESS	166	4	3	729
328	MCCANDLESS	166	5	1	820
329	MCCANDLESS	166	5	2	1318

## 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
330	MCCANDLESS	166	5	3	935
331	MCCANDLESS	166	6	1	469
332	MCCANDLESS	166	6	2	1005
333	MCCANDLESS	166	6	3	1756
334	MCCANDLESS	166	7	1	1581
335	MCCANDLESS	166	7	2	977
336	MCCANDLESS	166	7	3	514
337	MCDONALD	167	0	5	209
338	MCKEESPORT	168	1	0	16
339	MCKEESPORT	168	2	0	263
340	MCKEESPORT	168	3	1	298
341	MCKEESPORT	168	3	2	123
342	MCKEESPORT	168	4	0	319
343	MCKEESPORT	168	5	0	515
344	MCKEESPORT	168	6	1	398
345	MCKEESPORT	168	6	2	321
346	MCKEESPORT	168	7	1	505
347	MCKEESPORT	168	7	2	287
348	MCKEESPORT	168	7	3	348
349	MCKEESPORT	168	7	4	469
350	MCKEESPORT	168	7	5	537
351	MCKEESPORT	168	7	6	477
352	MCKEESPORT	168	7	7	377
353	MCKEESPORT	168	8	1	321
354	MCKEESPORT	168	8	2	515
355	MCKEESPORT	168	8	3	561
356	MCKEESPORT	168	8	4	457
357	MCKEESPORT	168	8	5	553
358	MCKEESPORT	168	8	6	230
359	MCKEESPORT	168	9	1	461
360	MCKEESPORT	168	9	2	594
361	MCKEESPORT	168	9	3	424
362	MCKEESPORT	168	10	1	338
363	MCKEESPORT	168	10	2	324
364	MCKEESPORT	168	11	1	458
365	MCKEESPORT	168	11	2	434
366	MCKEESPORT	168	11	3	265
367	MCKEESPORT	168	12	1	311
368	MCKEESPORT	168	12	2	368
369	MCKEESPORT	168	12	3	560
370	MCKEES ROCKS	169	1	1	267
371	MCKEES ROCKS	169	1	2	572
372	MCKEES ROCKS	169	2	1	709
373	MCKEES ROCKS	169	2	2	664
374	MCKEES ROCKS	169	3	1	751
375	MCKEES ROCKS	169	3	2	577
376	MCKEES ROCKS	169	3	3	545
377	MILLVALE	170	0	1	554
378	MILLVALE	170	0	2	432
379	MILLVALE	170	0	3	452
380	MILLVALE	170	0	4	439
381	MILLVALE	170	0	5	578
382	MONROEVILLE	171	1	1	692
383	MONROEVILLE	171	1	2	640
384	MONROEVILLE	171	1	3	837

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
385	MONROEVILLE	171	1	4	912
386	MONROEVILLE	171	2	1	887
387	MONROEVILLE	171	2	2	966
388	MONROEVILLE	171	2	3	1059
389	MONROEVILLE	171	3	1	1185
390	MONROEVILLE	171	3	2	648
391	MONROEVILLE	171	3	3	980
392	MONROEVILLE	171	3	4	414
393	MONROEVILLE	171	4	1	668
394	MONROEVILLE	171	4	2	1054
395	MONROEVILLE	171	4	3	956
396	MONROEVILLE	171	5	1	605
397	MONROEVILLE	171	5	2	888
398	MONROEVILLE	171	5	3	878
399	MONROEVILLE	171	5	4	651
400	MONROEVILLE	171	6	1	812
401	MONROEVILLE	171	6	2	815
402	MONROEVILLE	171	6	3	1093
403	MONROEVILLE	171	6	4	357
404	MONROEVILLE	171	7	1	1330
405	MONROEVILLE	171	7	2	833
406	MONROEVILLE	171	7	3	614
407	MOON	172	0	1	1439
408	MOON	172	0	2	1777
409	MOON	172	0	3	1424
410	MOON	172	0	4	762
411	MOON	172	0	5	2387
412	MOON	172	0	6	2186
413	MOON	172	0	7	1528
414	MOON	172	0	8	963
415	MOON	172	0	9	1933
416	MOON	172	0	10	761
417	MOON	172	0	11	1319
418	MOON	172	0	12	991
419	MOON	172	0	13	703
420	MT LEBANON	173	1	1	833
421	MT LEBANON	173	1	2	680
422	MT LEBANON	173	1	3	652
423	MT LEBANON	173	1	4	770
424	MT LEBANON	173	1	5	604
425	MT LEBANON	173	1	6	1076
426	MT LEBANON	173	1	7	777
427	MT LEBANON	173	2	1	957
428	MT LEBANON	173	2	2	602
429	MT LEBANON	173	2	3	709
430	MT LEBANON	173	2	4	537
431	MT LEBANON	173	2	5	584
432	MT LEBANON	173	2	6	553
433	MT LEBANON	173	2	7	621
434	MT LEBANON	173	2	8	995
435	MT LEBANON	173	3	1	648
436	MT LEBANON	173	3	2	854
437	MT LEBANON	173	3	3	676
438	MT LEBANON	173	3	4	743
439	MT LEBANON	173	3	5	705

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
440	MT LEBANON	173	3	6	443
441	MT LEBANON	173	3	7	807
442	MT LEBANON	173	3	8	323
443	MT LEBANON	173	4	1	777
444	MT LEBANON	173	4	2	885
445	MT LEBANON	173	4	3	716
446	MT LEBANON	173	4	4	666
447	MT LEBANON	173	4	5	606
448	MT LEBANON	173	4	6	664
449	MT LEBANON	173	4	7	799
450	MT LEBANON	173	5	1	633
451	MT LEBANON	173	5	2	454
452	MT LEBANON	173	5	3	600
453	MT LEBANON	173	5	4	577
454	MT LEBANON	173	5	5	623
455	MT LEBANON	173	5	6	467
456	MT LEBANON	173	5	7	782
457	MT LEBANON	173	5	8	1007
458	MT OLIVER	174	0	1	720
459	MT OLIVER	174	0	2	769
460	MT OLIVER	174	0	3	490
461	MT OLIVER	174	0	4	328
462	MUNHALL	175	0	1	490
463	MUNHALL	175	0	2	482
464	MUNHALL	175	0	3	523
465	MUNHALL	175	0	4	435
466	MUNHALL	175	0	5	731
467	MUNHALL	175	0	6	715
468	MUNHALL	175	0	7	1151
469	MUNHALL	175	0	8	613
470	MUNHALL	175	0	9	692
471	MUNHALL	175	0	10	511
472	MUNHALL	175	0	11	938
473	MUNHALL	175	0	12	573
474	NEVILLE	176	1	0	278
475	NEVILLE	176	2	0	226
476	NEVILLE	176	3	0	276
477	N BRADDOCK	177	1	1	215
478	N BRADDOCK	177	1	2	522
479	N BRADDOCK	177	1	3	552
480	N BRADDOCK	177	2	1	439
481	N BRADDOCK	177	2	2	598
482	N BRADDOCK	177	3	1	378
483	N BRADDOCK	177	3	2	535
484	N FAYETTE	178	0	1	2019
485	N FAYETTE	178	0	2	2262
486	N FAYETTE	178	0	3	2413
487	N FAYETTE	178	0	4	1069
488	N FAYETTE	178	0	5	2416
489	N VERSAILLES	179	1	1	669
490	N VERSAILLES	179	1	2	664
491	N VERSAILLES	179	2	1	636
492	N VERSAILLES	179	2	2	196
493	N VERSAILLES	179	3	1	508
494	N VERSAILLES	179	3	2	614

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
495	N VERSAILLES	179	4	1	473
496	N VERSAILLES	179	4	2	411
497	N VERSAILLES	179	5	1	565
498	N VERSAILLES	179	5	2	428
499	N VERSAILLES	179	6	1	631
500	N VERSAILLES	179	6	2	542
501	N VERSAILLES	179	7	0	706
502	OAKDALE	180	0	1	588
503	OAKDALE	180	0	2	439
504	OAKMONT	181	0	1	903
505	OAKMONT	181	0	2	1059
506	OAKMONT	181	0	3	755
507	OAKMONT	181	0	4	874
508	OAKMONT	181	0	5	725
509	OAKMONT	181	0	6	1065
510	OHARA	182	1	1	1047
511	OHARA	182	1	2	643
512	OHARA	182	2	1	593
513	OHARA	182	2	2	901
514	OHARA	182	3	1	669
515	OHARA	182	3	2	573
516	OHARA	182	4	1	548
517	OHARA	182	4	2	770
518	OHARA	182	5	1	725
519	OHARA	182	5	2	861
520	OHIO	183	0	1	1370
521	OHIO	183	0	2	1490
522	OHIO	183	0	3	1819
523	GLEN OSBORNE	184	0	1	446
524	PENN HILLS	185	1	1	760
525	PENN HILLS	185	1	2	751
526	PENN HILLS	185	1	3	550
527	PENN HILLS	185	1	4	340
528	PENN HILLS	185	1	5	254
529	PENN HILLS	185	2	1	794
530	PENN HILLS	185	2	2	747
531	PENN HILLS	185	2	3	894
532	PENN HILLS	185	2	4	608
533	PENN HILLS	185	3	1	776
534	PENN HILLS	185	3	2	514
535	PENN HILLS	185	3	3	637
536	PENN HILLS	185	3	4	805
537	PENN HILLS	185	3	5	472
538	PENN HILLS	185	3	6	452
539	PENN HILLS	185	4	1	547
540	PENN HILLS	185	4	2	738
541	PENN HILLS	185	4	3	757
542	PENN HILLS	185	4	4	598
543	PENN HILLS	185	4	5	598
544	PENN HILLS	185	5	1	735
545	PENN HILLS	185	5	2	620
546	PENN HILLS	185	5	3	676
547	PENN HILLS	185	5	4	617
548	PENN HILLS	185	5	5	499
549	PENN HILLS	185	5	6	746

## 2017 Municipal Election

<b><u>Ballot #</u></b>	<b><u>Municipality</u></b>	<b><u>Muni</u></b>	<b><u>Ward</u></b>	<b><u>District</u></b>	<b><u>Total Registered</u></b>
550	PENN HILLS	185	6	1	569
551	PENN HILLS	185	6	2	648
552	PENN HILLS	185	6	3	531
553	PENN HILLS	185	6	4	590
554	PENN HILLS	185	6	5	584
555	PENN HILLS	185	6	6	580
556	PENN HILLS	185	7	1	681
557	PENN HILLS	185	7	2	661
558	PENN HILLS	185	7	3	891
559	PENN HILLS	185	7	4	612
560	PENN HILLS	185	7	5	678
561	PENN HILLS	185	7	6	758
562	PENN HILLS	185	7	7	727
563	PENN HILLS	185	8	1	633
564	PENN HILLS	185	8	2	545
565	PENN HILLS	185	8	3	537
566	PENN HILLS	185	8	4	615
567	PENN HILLS	185	8	5	945
568	PENN HILLS	185	8	6	457
569	PENN HILLS	185	9	1	511
570	PENN HILLS	185	9	2	546
571	PENN HILLS	185	9	3	800
572	PENN HILLS	185	9	4	588
573	PENN HILLS	185	9	5	332
574	PINE	186	0	1	1241
575	PINE	186	0	2	1698
576	PINE	186	0	3	442
577	PINE	186	0	4	1222
578	PINE	186	0	5	1676
579	PINE	186	0	6	579
580	PINE	186	0	7	1417
581	PINE	186	0	8	1095
582	PITCAIRN	187	0	1	949
583	PITCAIRN	187	0	2	509
584	PITCAIRN	187	0	3	668
585	PITTSBURGH	188	1	1	3871
586	PITTSBURGH	188	1	2	676
587	PITTSBURGH	188	2	1	1900
588	PITTSBURGH	188	2	2	1018
589	PITTSBURGH	188	3	1	275
590	PITTSBURGH	188	3	2	688
591	PITTSBURGH	188	3	3	362
592	PITTSBURGH	188	3	4	575
593	PITTSBURGH	188	3	5	447
594	PITTSBURGH	188	4	1	325
595	PITTSBURGH	188	4	2	811
596	PITTSBURGH	188	4	3	362
597	PITTSBURGH	188	4	4	243
598	PITTSBURGH	188	4	5	1158
599	PITTSBURGH	188	4	6	823
600	PITTSBURGH	188	4	7	3164
601	PITTSBURGH	188	4	8	4673
602	PITTSBURGH	188	4	9	674
603	PITTSBURGH	188	4	10	593
604	PITTSBURGH	188	4	11	565

## 2017 Municipal Election

<b><u>Ballot #</u></b>	<b><u>Municipality</u></b>	<b><u>Muni</u></b>	<b><u>Ward</u></b>	<b><u>District</u></b>	<b><u>Total Registered</u></b>
605	PITTSBURGH	188	4	12	669
606	PITTSBURGH	188	4	13	903
607	PITTSBURGH	188	4	14	1728
608	PITTSBURGH	188	4	15	1085
609	PITTSBURGH	188	4	16	1553
610	PITTSBURGH	188	4	17	645
611	PITTSBURGH	188	4	18	518
612	PITTSBURGH	188	4	19	298
613	PITTSBURGH	188	5	1	257
614	PITTSBURGH	188	5	2	353
615	PITTSBURGH	188	5	3	157
616	PITTSBURGH	188	5	4	304
617	PITTSBURGH	188	5	5	237
618	PITTSBURGH	188	5	6	556
619	PITTSBURGH	188	5	7	449
620	PITTSBURGH	188	5	8	438
621	PITTSBURGH	188	5	9	1131
622	PITTSBURGH	188	5	10	462
623	PITTSBURGH	188	5	11	380
624	PITTSBURGH	188	5	12	426
625	PITTSBURGH	188	5	13	283
626	PITTSBURGH	188	5	14	272
627	PITTSBURGH	188	5	15	251
628	PITTSBURGH	188	5	16	209
629	PITTSBURGH	188	5	17	255
630	PITTSBURGH	188	5	18	48
631	PITTSBURGH	188	6	1	886
632	PITTSBURGH	188	6	2	637
633	PITTSBURGH	188	6	3	769
634	PITTSBURGH	188	6	4	577
635	PITTSBURGH	188	6	5	476
636	PITTSBURGH	188	7	1	670
637	PITTSBURGH	188	7	2	1044
638	PITTSBURGH	188	7	3	773
639	PITTSBURGH	188	7	4	1093
640	PITTSBURGH	188	7	5	730
641	PITTSBURGH	188	7	6	663
642	PITTSBURGH	188	7	7	750
643	PITTSBURGH	188	7	8	734
644	PITTSBURGH	188	7	9	796
645	PITTSBURGH	188	7	10	1025
646	PITTSBURGH	188	7	11	1112
647	PITTSBURGH	188	7	12	937
648	PITTSBURGH	188	7	13	543
649	PITTSBURGH	188	7	14	465
650	PITTSBURGH	188	8	1	367
651	PITTSBURGH	188	8	2	624
652	PITTSBURGH	188	8	3	865
653	PITTSBURGH	188	8	4	741
654	PITTSBURGH	188	8	5	593
655	PITTSBURGH	188	8	6	430
656	PITTSBURGH	188	8	7	799
657	PITTSBURGH	188	8	8	647
658	PITTSBURGH	188	8	9	711
659	PITTSBURGH	188	8	10	668

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
660	PITTSBURGH	188	8	11	622
661	PITTSBURGH	188	8	12	650
662	PITTSBURGH	188	8	13	582
663	PITTSBURGH	188	9	1	510
664	PITTSBURGH	188	9	2	615
665	PITTSBURGH	188	9	3	605
666	PITTSBURGH	188	9	4	614
667	PITTSBURGH	188	9	5	700
668	PITTSBURGH	188	9	6	587
669	PITTSBURGH	188	9	7	454
670	PITTSBURGH	188	9	8	710
671	PITTSBURGH	188	9	9	654
672	PITTSBURGH	188	10	1	527
673	PITTSBURGH	188	10	2	622
674	PITTSBURGH	188	10	3	695
675	PITTSBURGH	188	10	4	547
676	PITTSBURGH	188	10	5	504
677	PITTSBURGH	188	10	6	508
678	PITTSBURGH	188	10	7	595
679	PITTSBURGH	188	10	8	582
680	PITTSBURGH	188	10	9	533
681	PITTSBURGH	188	10	10	594
682	PITTSBURGH	188	10	11	613
683	PITTSBURGH	188	10	12	556
684	PITTSBURGH	188	10	13	534
685	PITTSBURGH	188	10	14	552
686	PITTSBURGH	188	10	15	361
687	PITTSBURGH	188	10	16	344
688	PITTSBURGH	188	10	17	539
689	PITTSBURGH	188	10	18	560
690	PITTSBURGH	188	10	19	480
691	PITTSBURGH	188	11	1	602
692	PITTSBURGH	188	11	2	587
693	PITTSBURGH	188	11	3	470
694	PITTSBURGH	188	11	4	572
695	PITTSBURGH	188	11	5	564
696	PITTSBURGH	188	11	6	869
697	PITTSBURGH	188	11	7	680
698	PITTSBURGH	188	11	8	598
699	PITTSBURGH	188	11	9	654
700	PITTSBURGH	188	11	10	585
701	PITTSBURGH	188	11	11	695
702	PITTSBURGH	188	11	12	686
703	PITTSBURGH	188	11	13	670
704	PITTSBURGH	188	11	14	587
705	PITTSBURGH	188	11	15	276
706	PITTSBURGH	188	11	16	596
707	PITTSBURGH	188	11	17	683
708	PITTSBURGH	188	11	18	569
709	PITTSBURGH	188	12	1	242
710	PITTSBURGH	188	12	2	333
711	PITTSBURGH	188	12	3	167
712	PITTSBURGH	188	12	4	344
713	PITTSBURGH	188	12	5	170
714	PITTSBURGH	188	12	6	245

## 2017 Municipal Election

<b><u>Ballot #</u></b>	<b><u>Municipality</u></b>	<b><u>Muni</u></b>	<b><u>Ward</u></b>	<b><u>District</u></b>	<b><u>Total Registered</u></b>
715	PITTSBURGH	188	12	7	306
716	PITTSBURGH	188	12	8	220
717	PITTSBURGH	188	12	9	336
718	PITTSBURGH	188	12	10	457
719	PITTSBURGH	188	12	11	468
720	PITTSBURGH	188	12	12	739
721	PITTSBURGH	188	12	13	430
722	PITTSBURGH	188	12	14	351
723	PITTSBURGH	188	12	15	566
724	PITTSBURGH	188	12	16	401
725	PITTSBURGH	188	13	1	296
726	PITTSBURGH	188	13	2	413
727	PITTSBURGH	188	13	3	335
728	PITTSBURGH	188	13	4	315
729	PITTSBURGH	188	13	5	347
730	PITTSBURGH	188	13	6	358
731	PITTSBURGH	188	13	7	401
732	PITTSBURGH	188	13	8	255
733	PITTSBURGH	188	13	9	311
734	PITTSBURGH	188	13	10	209
735	PITTSBURGH	188	13	11	438
736	PITTSBURGH	188	13	12	444
737	PITTSBURGH	188	13	13	308
738	PITTSBURGH	188	13	14	290
739	PITTSBURGH	188	13	15	332
740	PITTSBURGH	188	13	16	354
741	PITTSBURGH	188	13	17	882
742	PITTSBURGH	188	13	18	226
743	PITTSBURGH	188	13	19	487
744	PITTSBURGH	188	14	1	709
745	PITTSBURGH	188	14	2	1479
746	PITTSBURGH	188	14	3	886
747	PITTSBURGH	188	14	4	757
748	PITTSBURGH	188	14	5	804
749	PITTSBURGH	188	14	6	723
750	PITTSBURGH	188	14	7	3718
751	PITTSBURGH	188	14	8	774
752	PITTSBURGH	188	14	9	794
753	PITTSBURGH	188	14	10	703
754	PITTSBURGH	188	14	11	814
755	PITTSBURGH	188	14	12	760
756	PITTSBURGH	188	14	13	775
757	PITTSBURGH	188	14	14	872
758	PITTSBURGH	188	14	15	762
759	PITTSBURGH	188	14	16	512
760	PITTSBURGH	188	14	17	459
761	PITTSBURGH	188	14	18	779
762	PITTSBURGH	188	14	19	621
763	PITTSBURGH	188	14	20	664
764	PITTSBURGH	188	14	21	585
765	PITTSBURGH	188	14	22	723
766	PITTSBURGH	188	14	23	726
767	PITTSBURGH	188	14	24	570
768	PITTSBURGH	188	14	25	928
769	PITTSBURGH	188	14	26	622

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
770	PITTSBURGH	188	14	27	544
771	PITTSBURGH	188	14	28	528
772	PITTSBURGH	188	14	29	775
773	PITTSBURGH	188	14	30	679
774	PITTSBURGH	188	14	31	1088
775	PITTSBURGH	188	14	32	779
776	PITTSBURGH	188	14	33	795
777	PITTSBURGH	188	14	34	852
778	PITTSBURGH	188	14	35	623
779	PITTSBURGH	188	14	36	854
780	PITTSBURGH	188	14	37	639
781	PITTSBURGH	188	14	38	577
782	PITTSBURGH	188	14	39	590
783	PITTSBURGH	188	14	40	530
784	PITTSBURGH	188	14	41	82
785	PITTSBURGH	188	15	1	638
786	PITTSBURGH	188	15	2	723
787	PITTSBURGH	188	15	3	613
788	PITTSBURGH	188	15	4	634
789	PITTSBURGH	188	15	5	553
790	PITTSBURGH	188	15	6	545
791	PITTSBURGH	188	15	7	681
792	PITTSBURGH	188	15	8	635
793	PITTSBURGH	188	15	9	175
794	PITTSBURGH	188	15	10	628
795	PITTSBURGH	188	15	11	577
796	PITTSBURGH	188	15	12	487
797	PITTSBURGH	188	15	13	449
798	PITTSBURGH	188	15	14	329
799	PITTSBURGH	188	15	15	390
800	PITTSBURGH	188	15	16	565
801	PITTSBURGH	188	15	17	33
802	PITTSBURGH	188	15	18	562
803	PITTSBURGH	188	15	19	507
804	PITTSBURGH	188	16	1	803
805	PITTSBURGH	188	16	2	1186
806	PITTSBURGH	188	16	3	845
807	PITTSBURGH	188	16	4	418
808	PITTSBURGH	188	16	5	608
809	PITTSBURGH	188	16	6	460
810	PITTSBURGH	188	16	7	413
811	PITTSBURGH	188	16	8	185
812	PITTSBURGH	188	16	9	543
813	PITTSBURGH	188	16	10	397
814	PITTSBURGH	188	16	11	408
815	PITTSBURGH	188	17	1	185
816	PITTSBURGH	188	17	2	846
817	PITTSBURGH	188	17	3	650
818	PITTSBURGH	188	17	4	776
819	PITTSBURGH	188	17	5	590
820	PITTSBURGH	188	17	6	503
821	PITTSBURGH	188	17	7	394
822	PITTSBURGH	188	17	8	454
823	PITTSBURGH	188	18	1	586
824	PITTSBURGH	188	18	2	446

## 2017 Municipal Election

<b><u>Ballot #</u></b>	<b><u>Municipality</u></b>	<b><u>Muni</u></b>	<b><u>Ward</u></b>	<b><u>District</u></b>	<b><u>Total Registered</u></b>
825	PITTSBURGH	188	18	3	386
826	PITTSBURGH	188	18	4	479
827	PITTSBURGH	188	18	5	967
828	PITTSBURGH	188	18	6	378
829	PITTSBURGH	188	18	7	447
830	PITTSBURGH	188	18	8	260
831	PITTSBURGH	188	18	9	695
832	PITTSBURGH	188	18	10	86
833	PITTSBURGH	188	18	11	573
834	PITTSBURGH	188	19	1	528
835	PITTSBURGH	188	19	2	691
836	PITTSBURGH	188	19	3	547
837	PITTSBURGH	188	19	4	414
838	PITTSBURGH	188	19	5	445
839	PITTSBURGH	188	19	6	512
840	PITTSBURGH	188	19	7	238
841	PITTSBURGH	188	19	8	587
842	PITTSBURGH	188	19	9	556
843	PITTSBURGH	188	19	10	673
844	PITTSBURGH	188	19	11	496
845	PITTSBURGH	188	19	12	429
846	PITTSBURGH	188	19	13	480
847	PITTSBURGH	188	19	14	571
848	PITTSBURGH	188	19	15	622
849	PITTSBURGH	188	19	16	582
850	PITTSBURGH	188	19	17	571
851	PITTSBURGH	188	19	18	483
852	PITTSBURGH	188	19	19	541
853	PITTSBURGH	188	19	20	514
854	PITTSBURGH	188	19	21	637
855	PITTSBURGH	188	19	22	544
856	PITTSBURGH	188	19	23	614
857	PITTSBURGH	188	19	24	509
858	PITTSBURGH	188	19	25	523
859	PITTSBURGH	188	19	26	475
860	PITTSBURGH	188	19	27	463
861	PITTSBURGH	188	19	28	645
862	PITTSBURGH	188	19	29	510
863	PITTSBURGH	188	19	30	529
864	PITTSBURGH	188	19	31	499
865	PITTSBURGH	188	19	32	516
866	PITTSBURGH	188	19	33	454
867	PITTSBURGH	188	19	34	520
868	PITTSBURGH	188	19	35	505
869	PITTSBURGH	188	19	36	638
870	PITTSBURGH	188	19	37	453
871	PITTSBURGH	188	19	38	500
872	PITTSBURGH	188	20	1	623
873	PITTSBURGH	188	20	2	218
874	PITTSBURGH	188	20	3	693
875	PITTSBURGH	188	20	4	61
876	PITTSBURGH	188	20	5	573
877	PITTSBURGH	188	20	6	539
878	PITTSBURGH	188	20	7	682
879	PITTSBURGH	188	20	8	734

## 2017 Municipal Election

<b><u>Ballot #</u></b>	<b><u>Municipality</u></b>	<b><u>Muni</u></b>	<b><u>Ward</u></b>	<b><u>District</u></b>	<b><u>Total Registered</u></b>
880	PITTSBURGH	188	20	9	206
881	PITTSBURGH	188	20	10	633
882	PITTSBURGH	188	20	11	678
883	PITTSBURGH	188	20	12	931
884	PITTSBURGH	188	20	13	476
885	PITTSBURGH	188	20	14	860
886	PITTSBURGH	188	20	15	915
887	PITTSBURGH	188	20	16	638
888	PITTSBURGH	188	20	17	440
889	PITTSBURGH	188	20	18	509
890	PITTSBURGH	188	21	1	473
891	PITTSBURGH	188	21	2	463
892	PITTSBURGH	188	21	3	679
893	PITTSBURGH	188	21	4	619
894	PITTSBURGH	188	22	1	703
895	PITTSBURGH	188	22	2	666
896	PITTSBURGH	188	22	3	674
897	PITTSBURGH	188	22	4	801
898	PITTSBURGH	188	23	1	1181
899	PITTSBURGH	188	23	2	827
900	PITTSBURGH	188	23	3	396
901	PITTSBURGH	188	24	1	428
902	PITTSBURGH	188	24	2	437
903	PITTSBURGH	188	24	3	363
904	PITTSBURGH	188	24	4	611
905	PITTSBURGH	188	24	5	541
906	PITTSBURGH	188	24	6	555
907	PITTSBURGH	188	25	1	459
908	PITTSBURGH	188	25	2	407
909	PITTSBURGH	188	25	3	569
910	PITTSBURGH	188	25	4	359
911	PITTSBURGH	188	25	5	379
912	PITTSBURGH	188	25	6	381
913	PITTSBURGH	188	25	7	412
914	PITTSBURGH	188	26	1	550
915	PITTSBURGH	188	26	2	467
916	PITTSBURGH	188	26	3	440
917	PITTSBURGH	188	26	4	435
918	PITTSBURGH	188	26	5	484
919	PITTSBURGH	188	26	6	400
920	PITTSBURGH	188	26	7	319
921	PITTSBURGH	188	26	8	643
922	PITTSBURGH	188	26	9	345
923	PITTSBURGH	188	26	10	680
924	PITTSBURGH	188	26	11	744
925	PITTSBURGH	188	26	12	505
926	PITTSBURGH	188	26	13	564
927	PITTSBURGH	188	26	14	588
928	PITTSBURGH	188	26	15	497
929	PITTSBURGH	188	26	16	710
930	PITTSBURGH	188	26	17	199
931	PITTSBURGH	188	27	1	768
932	PITTSBURGH	188	27	2	690
933	PITTSBURGH	188	27	3	563
934	PITTSBURGH	188	27	4	730

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
935	PITTSBURGH	188	27	5	694
936	PITTSBURGH	188	27	6	751
937	PITTSBURGH	188	27	7	607
938	PITTSBURGH	188	27	8	602
939	PITTSBURGH	188	27	9	596
940	PITTSBURGH	188	27	10	637
941	PITTSBURGH	188	27	11	648
942	PITTSBURGH	188	27	12	535
943	PITTSBURGH	188	27	13	557
944	PITTSBURGH	188	28	1	672
945	PITTSBURGH	188	28	2	532
946	PITTSBURGH	188	28	3	874
947	PITTSBURGH	188	28	4	651
948	PITTSBURGH	188	28	5	676
949	PITTSBURGH	188	28	6	582
950	PITTSBURGH	188	28	7	685
951	PITTSBURGH	188	28	8	836
952	PITTSBURGH	188	28	9	600
953	PITTSBURGH	188	28	10	535
954	PITTSBURGH	188	28	11	137
955	PITTSBURGH	188	29	1	602
956	PITTSBURGH	188	29	2	538
957	PITTSBURGH	188	29	3	470
958	PITTSBURGH	188	29	4	538
959	PITTSBURGH	188	29	5	555
960	PITTSBURGH	188	29	6	575
961	PITTSBURGH	188	29	7	627
962	PITTSBURGH	188	29	8	545
963	PITTSBURGH	188	29	9	451
964	PITTSBURGH	188	29	10	525
965	PITTSBURGH	188	29	11	628
966	PITTSBURGH	188	29	12	561
967	PITTSBURGH	188	30	1	419
968	PITTSBURGH	188	30	2	422
969	PITTSBURGH	188	30	3	374
970	PITTSBURGH	188	30	4	621
971	PITTSBURGH	188	30	5	660
972	PITTSBURGH	188	31	1	232
973	PITTSBURGH	188	31	2	428
974	PITTSBURGH	188	31	3	569
975	PITTSBURGH	188	31	4	557
976	PITTSBURGH	188	31	5	686
977	PITTSBURGH	188	31	6	549
978	PITTSBURGH	188	31	7	129
979	PITTSBURGH	188	32	1	506
980	PITTSBURGH	188	32	2	634
981	PITTSBURGH	188	32	3	525
982	PITTSBURGH	188	32	4	363
983	PITTSBURGH	188	32	5	573
984	PITTSBURGH	188	32	6	608
985	PITTSBURGH	188	32	7	531
986	PITTSBURGH	188	32	8	654
987	PLEASANT HL	189	0	1	712
988	PLEASANT HL	189	0	2	535
989	PLEASANT HL	189	0	3	550

## 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
990	PLEASANT HL	189	0	4	522
991	PLEASANT HL	189	0	5	757
992	PLEASANT HL	189	0	6	910
993	PLEASANT HL	189	0	7	512
994	PLEASANT HL	189	0	8	510
995	PLEASANT HL	189	0	9	636
996	PLEASANT HL	189	0	10	519
997	PLUM	190	0	1	1763
998	PLUM	190	0	2	594
999	PLUM	190	0	3	962
1000	PLUM	190	0	4	828
1001	PLUM	190	0	5	874
1002	PLUM	190	0	6	1245
1003	PLUM	190	0	7	1237
1004	PLUM	190	0	8	585
1005	PLUM	190	0	9	1088
1006	PLUM	190	0	10	570
1007	PLUM	190	0	11	793
1008	PLUM	190	0	12	1072
1009	PLUM	190	0	13	568
1010	PLUM	190	0	14	740
1011	PLUM	190	0	15	822
1012	PLUM	190	0	16	570
1013	PLUM	190	0	17	707
1014	PLUM	190	0	18	823
1015	PLUM	190	0	19	1861
1016	PLUM	190	0	20	800
1017	PLUM	190	0	21	400
1018	PORT VUE	191	0	1	592
1019	PORT VUE	191	0	2	529
1020	PORT VUE	191	0	3	545
1021	PORT VUE	191	0	4	688
1022	RANKIN	192	1	0	365
1023	RANKIN	192	2	0	406
1024	RANKIN	192	3	0	614
1025	RESERVE	193	1	0	524
1026	RESERVE	193	2	0	560
1027	RESERVE	193	3	0	514
1028	RESERVE	193	4	0	858
1029	RICHLAND	194	0	1	1061
1030	RICHLAND	194	0	2	1123
1031	RICHLAND	194	0	3	1142
1032	RICHLAND	194	0	4	1116
1033	RICHLAND	194	0	5	1004
1034	RICHLAND	194	0	6	1055
1035	RICHLAND	194	0	7	1095
1036	RICHLAND	194	0	8	938
1037	ROBINSON	195	0	1	1584
1038	ROBINSON	195	0	2	956
1039	ROBINSON	195	0	3	678
1040	ROBINSON	195	0	4	690
1041	ROBINSON	195	0	5	599
1042	ROBINSON	195	0	6	878
1043	ROBINSON	195	0	7	1380
1044	ROBINSON	195	0	8	1543

## 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
1045	ROBINSON	195	0	9	2386
1046	ROSS	196	1	1	730
1047	ROSS	196	1	2	612
1048	ROSS	196	1	3	495
1049	ROSS	196	1	4	839
1050	ROSS	196	2	1	1160
1051	ROSS	196	2	2	939
1052	ROSS	196	2	3	712
1053	ROSS	196	3	1	660
1054	ROSS	196	3	2	673
1055	ROSS	196	3	3	527
1056	ROSS	196	3	4	689
1057	ROSS	196	4	1	878
1058	ROSS	196	4	2	669
1059	ROSS	196	4	3	716
1060	ROSS	196	4	4	693
1061	ROSS	196	5	1	601
1062	ROSS	196	5	2	409
1063	ROSS	196	5	3	795
1064	ROSS	196	5	4	746
1065	ROSS	196	6	1	498
1066	ROSS	196	6	2	956
1067	ROSS	196	6	3	645
1068	ROSS	196	6	4	581
1069	ROSS	196	7	1	598
1070	ROSS	196	7	2	550
1071	ROSS	196	7	3	702
1072	ROSS	196	7	4	593
1073	ROSS	196	8	1	1568
1074	ROSS	196	8	2	527
1075	ROSS	196	8	3	541
1076	ROSS	196	9	1	787
1077	ROSS	196	9	2	944
1078	ROSS	196	9	3	818
1079	ROSSLYN FARM	197	0	1	375
1080	SCOTT	198	1	1	568
1081	SCOTT	198	1	2	656
1082	SCOTT	198	2	1	494
1083	SCOTT	198	2	2	669
1084	SCOTT	198	3	1	499
1085	SCOTT	198	3	2	715
1086	SCOTT	198	4	1	768
1087	SCOTT	198	4	2	611
1088	SCOTT	198	5	1	589
1089	SCOTT	198	5	2	735
1090	SCOTT	198	6	1	708
1091	SCOTT	198	6	2	791
1092	SCOTT	198	7	1	888
1093	SCOTT	198	7	2	634
1094	SCOTT	198	8	1	511
1095	SCOTT	198	8	2	1015
1096	SCOTT	198	9	1	298
1097	SCOTT	198	9	2	329
1098	SEWICKLEY	199	1	0	953
1099	SEWICKLEY	199	2	1	509

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
1100	SEWICKLEY	199	2	2	611
1101	SEWICKLEY	199	3	0	1010
1102	SEWICKLEY HT	200	0	1	757
1103	SEWICKLEY HL	201	0	1	528
1104	SHALER	202	1	1	483
1105	SHALER	202	1	2	501
1106	SHALER	202	1	3	587
1107	SHALER	202	1	4	581
1108	SHALER	202	1	5	651
1109	SHALER	202	2	1	1042
1110	SHALER	202	2	2	744
1111	SHALER	202	2	3	587
1112	SHALER	202	2	4	740
1113	SHALER	202	2	5	360
1114	SHALER	202	3	1	595
1115	SHALER	202	3	2	597
1116	SHALER	202	3	3	587
1117	SHALER	202	3	4	711
1118	SHALER	202	3	5	686
1119	SHALER	202	4	1	819
1120	SHALER	202	4	2	452
1121	SHALER	202	4	3	659
1122	SHALER	202	4	4	657
1123	SHALER	202	4	5	521
1124	SHALER	202	5	1	710
1125	SHALER	202	5	2	673
1126	SHALER	202	5	3	525
1127	SHALER	202	5	4	352
1128	SHALER	202	5	5	761
1129	SHALER	202	6	1	627
1130	SHALER	202	6	2	675
1131	SHALER	202	6	3	542
1132	SHALER	202	6	4	327
1133	SHALER	202	6	5	540
1134	SHALER	202	7	1	583
1135	SHALER	202	7	2	791
1136	SHALER	202	7	3	630
1137	SHALER	202	7	4	997
1138	SHARPSBURG	203	0	1	578
1139	SHARPSBURG	203	0	2	795
1140	SHARPSBURG	203	0	3	855
1141	S FAYETTE	204	0	1	556
1142	S FAYETTE	204	0	2	1086
1143	S FAYETTE	204	0	3	1488
1144	S FAYETTE	204	0	4	852
1145	S FAYETTE	204	0	5	846
1146	S FAYETTE	204	0	6	1203
1147	S FAYETTE	204	0	7	635
1148	S FAYETTE	204	0	8	1470
1149	S FAYETTE	204	0	9	623
1150	S FAYETTE	204	0	10	769
1151	S FAYETTE	204	0	11	931
1152	S FAYETTE	204	0	12	470
1153	SOUTH PARK	205	0	1	719
1154	SOUTH PARK	205	0	2	755

## 2017 Municipal Election

<b>Ballot #</b>	<b>Municipality</b>	<b>Muni</b>	<b>Ward</b>	<b>District</b>	<b>Total Registered</b>
1155	SOUTH PARK	205	0	3	615
1156	SOUTH PARK	205	0	4	467
1157	SOUTH PARK	205	0	5	759
1158	SOUTH PARK	205	0	6	844
1159	SOUTH PARK	205	0	7	1106
1160	SOUTH PARK	205	0	8	515
1161	SOUTH PARK	205	0	9	788
1162	SOUTH PARK	205	0	10	852
1163	SOUTH PARK	205	0	11	596
1164	SOUTH PARK	205	0	12	565
1165	SOUTH PARK	205	0	13	1033
1166	S VERSAILLES	206	0	1	212
1167	SPRINGDAL BR	207	0	1	705
1168	SPRINGDAL BR	207	0	2	584
1169	SPRINGDAL BR	207	0	3	519
1170	SPRINGDAL BR	207	0	4	440
1171	SPRINGDAL TP	208	0	1	1165
1172	STOWE	209	1	0	410
1173	STOWE	209	2	1	179
1174	STOWE	209	2	2	699
1175	STOWE	209	3	0	387
1176	STOWE	209	4	1	371
1177	STOWE	209	4	2	361
1178	STOWE	209	5	0	501
1179	STOWE	209	6	0	464
1180	STOWE	209	7	0	292
1181	STOWE	209	8	0	453
1182	STOWE	209	9	0	321
1183	SWISSVALE	210	0	1	918
1184	SWISSVALE	210	0	2	753
1185	SWISSVALE	210	0	3	680
1186	SWISSVALE	210	0	4	624
1187	SWISSVALE	210	0	5	750
1188	SWISSVALE	210	0	6	397
1189	SWISSVALE	210	0	7	665
1190	SWISSVALE	210	0	8	735
1191	SWISSVALE	210	0	9	655
1192	SWISSVALE	210	0	10	236
1193	SWISSVALE	210	0	11	675
1194	TARENTUM	211	1	1	675
1195	TARENTUM	211	1	2	479
1196	TARENTUM	211	2	0	525
1197	TARENTUM	211	3	1	299
1198	TARENTUM	211	3	2	587
1199	THORNBURG	212	0	1	431
1200	THORNBURG	212	0	2	572
1201	TRAFFORD	213	0	1	43
1202	TURTLE CREEK	214	1	1	823
1203	TURTLE CREEK	214	1	2	405
1204	TURTLE CREEK	214	2	1	681
1205	TURTLE CREEK	214	2	2	318
1206	TURTLE CREEK	214	3	1	608
1207	TURTLE CREEK	214	3	2	487
1208	UP ST CLAIR	215	1	1	690
1209	UP ST CLAIR	215	1	2	832

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
1210	UP ST CLAIR	215	1	3	953
1211	UP ST CLAIR	215	1	4	798
1212	UP ST CLAIR	215	2	1	940
1213	UP ST CLAIR	215	2	2	689
1214	UP ST CLAIR	215	2	3	1022
1215	UP ST CLAIR	215	2	4	533
1216	UP ST CLAIR	215	3	1	1026
1217	UP ST CLAIR	215	3	2	869
1218	UP ST CLAIR	215	3	3	1169
1219	UP ST CLAIR	215	4	1	972
1220	UP ST CLAIR	215	4	2	753
1221	UP ST CLAIR	215	4	3	609
1222	UP ST CLAIR	215	4	4	1027
1223	UP ST CLAIR	215	5	1	1299
1224	UP ST CLAIR	215	5	2	795
1225	UP ST CLAIR	215	5	3	866
1226	VERONA	216	0	1	503
1227	VERONA	216	0	2	580
1228	VERONA	216	0	3	615
1229	VERSAILLES	217	0	1	522
1230	VERSAILLES	217	0	2	466
1231	WALL	218	0	1	322
1232	WEST DEER	219	0	1	1355
1233	WEST DEER	219	0	2	575
1234	WEST DEER	219	0	3	826
1235	WEST DEER	219	0	4	778
1236	WEST DEER	219	0	5	836
1237	WEST DEER	219	0	6	759
1238	WEST DEER	219	0	7	1574
1239	WEST DEER	219	0	8	1410
1240	W ELIZABETH	220	0	1	268
1241	W HOMESTEAD	221	0	1	483
1242	W HOMESTEAD	221	0	2	451
1243	W HOMESTEAD	221	0	3	526
1244	WEST MIFFLIN	222	0	1	721
1245	WEST MIFFLIN	222	0	2	467
1246	WEST MIFFLIN	222	0	3	474
1247	WEST MIFFLIN	222	0	4	453
1248	WEST MIFFLIN	222	0	5	851
1249	WEST MIFFLIN	222	0	6	316
1250	WEST MIFFLIN	222	0	7	760
1251	WEST MIFFLIN	222	0	8	563
1252	WEST MIFFLIN	222	0	9	770
1253	WEST MIFFLIN	222	0	10	518
1254	WEST MIFFLIN	222	0	11	764
1255	WEST MIFFLIN	222	0	12	1001
1256	WEST MIFFLIN	222	0	13	569
1257	WEST MIFFLIN	222	0	14	865
1258	WEST MIFFLIN	222	0	15	588
1259	WEST MIFFLIN	222	0	16	1200
1260	WEST MIFFLIN	222	0	17	556
1261	WEST MIFFLIN	222	0	18	783
1262	WEST MIFFLIN	222	0	19	648
1263	WEST MIFFLIN	222	0	20	463
1264	WEST MIFFLIN	222	0	21	651

## 2017 Municipal Election

<b>Ballot #</b>	<b><i>Municipality</i></b>	<b><i>Muni</i></b>	<b><i>Ward</i></b>	<b><i>District</i></b>	<b><i>Total Registered</i></b>
1265	WEST VIEW	223	0	1	693
1266	WEST VIEW	223	0	2	758
1267	WEST VIEW	223	0	3	570
1268	WEST VIEW	223	0	4	586
1269	WEST VIEW	223	0	5	747
1270	WEST VIEW	223	0	6	691
1271	WEST VIEW	223	0	7	645
1272	WHITAKER	224	0	1	429
1273	WHITAKER	224	0	2	391
1274	WHITEHALL	225	0	1	521
1275	WHITEHALL	225	0	2	589
1276	WHITEHALL	225	0	3	660
1277	WHITEHALL	225	0	4	668
1278	WHITEHALL	225	0	5	677
1279	WHITEHALL	225	0	6	1005
1280	WHITEHALL	225	0	7	435
1281	WHITEHALL	225	0	8	800
1282	WHITEHALL	225	0	9	542
1283	WHITEHALL	225	0	10	610
1284	WHITEHALL	225	0	11	621
1285	WHITEHALL	225	0	12	546
1286	WHITEHALL	225	0	13	448
1287	WHITEHALL	225	0	14	581
1288	WHITEHALL	225	0	15	976
1289	WHITEHALL	225	0	16	600
1290	WHITE OAK	226	0	1	740
1291	WHITE OAK	226	0	2	786
1292	WHITE OAK	226	0	3	858
1293	WHITE OAK	226	0	4	751
1294	WHITE OAK	226	0	5	794
1295	WHITE OAK	226	0	6	705
1296	WHITE OAK	226	0	7	1064
1297	WILKINS	227	1	1	769
1298	WILKINS	227	1	2	651
1299	WILKINS	227	1	3	799
1300	WILKINS	227	1	4	634
1301	WILKINS	227	1	5	430
1302	WILKINS	227	2	1	621
1303	WILKINS	227	2	2	906
1304	WILKINSBURG	228	1	1	1011
1305	WILKINSBURG	228	1	2	764
1306	WILKINSBURG	228	1	3	485
1307	WILKINSBURG	228	1	4	605
1308	WILKINSBURG	228	1	5	533
1309	WILKINSBURG	228	1	6	991
1310	WILKINSBURG	228	2	1	838
1311	WILKINSBURG	228	2	2	978
1312	WILKINSBURG	228	2	3	849
1313	WILKINSBURG	228	2	4	528
1314	WILKINSBURG	228	2	5	771
1315	WILKINSBURG	228	3	1	739
1316	WILKINSBURG	228	3	2	651
1317	WILKINSBURG	228	3	3	845
1318	WILKINSBURG	228	3	4	1021
1319	WILKINSBURG	228	3	5	1045

## 2017 Municipal Election

<b><u>Ballot #</u></b>	<b><u>Municipality</u></b>	<b><u>Muni</u></b>	<b><u>Ward</u></b>	<b><u>District</u></b>	<b><u>Total Registered</u></b>
1320	WILKINSBURG	228	3	6	543
1321	WILMERDING	229	0	1	523
1322	WILMERDING	229	0	2	737

BALLOT	MUNICIPALITY	MUNI	WARD	DISTRICT	TOTAL REGISTERED	RANDOM SAMPLE
752	PITTSBURGH	188	14	9	794	752