City of Baltimore

Management Research Report

BBMR-13-01

FURTHER STEPS NEEDED TO IMPROVE COST-EFFECTIVENESS OF THE CONDUCT OF ELECTIONS

January 2013

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BBMR Management Research Project
Further Steps Needed to Improve Cost-Effectiveness of the Conduct of Elections

What BBMR Found

Cost-effectiveness of the conduct of elections in Baltimore City is currently not maximized. In-depth research of the conduct of elections shows that the administration of elections is not cost-effective because 1) polling places are overstaffed, 2) there are more precincts and polling places than necessary, and 3) voter turnout has historically been low.

Baltimore City spent $2.1 million to conduct the 2011 Mayoral Primary election with a 25 percent voter turnout. With 77,191 voters, cost per vote was $27.21. Although the cost of the 2008 Presidential General Election (inflation-adjusted to 2012 dollars) was higher, totaling $3.2 million, the high voter turnout reduces cost per vote to $12.94, 53 percent lower than cost per vote in the 2011 Mayoral Primary Election.

	2011 Mayoral Primary	2010 Gubernatorial Primary	2008 Presidential General
# of Voters Voted	77,191	164,556	251,127
Voter Turnout	**24.58%**	**48.16%**	**68.21%**
Cost per Vote	**$26.52**	**$17.44**	**$12.94**

When compared to other Maryland Counties, Baltimore City had the largest election administration appropriation and the highest cost per registered voter:

	Cost of Election*	Number of Registered Voters	Cost per Registered Voter	Cost per Vote
Baltimore City	$3,283,612	365,508	$8.98	$19.95
Baltimore County	$2,595,010	492,869	$5.27	$8.94
Anne Arundel	$2,389,600	331,101	$7.22	$11.69
Montgomery	$2,398,915	573,431	$4.18	$8.14
Prince George's	$2,541,700	517,500	$4.91	$10.87

2010 Gubernatorial General Election

To increase cost-effectiveness, Baltimore City should consider reducing the number of poll workers and precincts, co-locating precincts, and consolidating entry lines. Baltimore City should also examine alternative voting methods that other states and cities have used to increase voter turnout while reducing costs. Colorado's vote centers, Oregon's vote-by-mail, and West Virginia's pilot online voting are alternatives that Baltimore City should examine to better understand the feasibility of implementing alternative voting methods. A reevaluation of the ways Baltimore City conducts elections would better position the Board of Elections to be more competitive with administering elections in Baltimore City.

Summary of Savings Estimates of Recommended Alternatives

Alternatives	Savings from Using Staffing Model	Additional Savings	Cumulative Savings ($)	Cumulative Savings (%)
Use Staffing Model	$127,266	-	$127,266	6.18%
Co-Locate Precincts	$127,266	$18,819	$146,085	7.14%
Consolidate Entry Lines	$142,538	$21,561	$164,099	8.02%
Reduce Precincts	$142,538	$21,561	$164,099	8.02%
Establish Vote Centers	$191,200	-	$155,819*	7.61%
Changes to State Requirements	$75,000**	$101,522†	$17,522	8.62%

* Vote centers' cumulative savings is less than poll workers savings because of additional expenditure related to transportation coordinators and contingency amount.

**Savings stem from reducing poll workers' compensation rates.

†Additional Savings stem from savings related to fewer voting machines.

Why BBMR Did This Study

The Board of Elections is authorized by the Public General Laws of Maryland and is empowered to make rules consistent with State laws to ensure the proper and efficient registration of voters and conduct of elections. The purpose of conducting this study is to find ways to increase cost-effectiveness of the conduct of elections and to examine alternative voting methods so that Baltimore City can chart the future of its own system of election administration with the most information possible.

What BBMR Recommends

To improve cost-effectiveness of the conduct of elections, BBMR recommends the following actions:

1. Use the staffing model recommended by BBMR to determine the number of election judges for each election and reduce the number of poll workers accordingly
2. Measure performance indicators including average wait time, voter satisfaction, and election judges' utilization rate
3. Reduce the number of precincts
4. Co-locate precincts and consolidate entry lines upon further discussions with the State Board
5. Explore the feasibility of alternative voting methods, particularly introducing permanent absentee voting, vote-by-mail, and vote centers in Baltimore City
6. Expand the role of the Board of Elections by including maximize voter turnout as one of its missions

To view the full report, including scope and methodology, click on BBMR-13-01

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Bureau of the Budget and Management Research
100 N. Holliday Street, Baltimore, MD 21202

January 30, 2013

The Honorable Mayor Rawlings-Blake,

The Board of Elections is authorized by the Public General Laws of Maryland and is empowered to make rules consistent with State laws to ensure the proper and efficient registration of voters and conduct of elections. Its specific responsibilities include maintaining a voter registration database, recruiting and training poll workers, obtaining polling places, providing the public with information about registration and elections, serving as the local board of canvassers, and, if necessary, hearing and deciding challenges and appeals concerning voter registration, right to vote, and absentee ballots.

This management research project on the Board of Elections was conducted upon your request for the purpose of finding ways to improve the cost-effectiveness conducting of elections. The authority to conduct this project comes from the Finance Department's charter mandate to provide measures which might be taken to improve the organization and administration of City government. Key issues examined in this management research project include: 1) the cost of daily operations of the Board of Elections, 2) the full cost of conducting an election, 3) the current cost-effectiveness of election administration, 4) alternatives to increase cost-effectiveness and the savings estimates for each of the alternatives, and 5) potential positive and negative outcomes for each of the alternatives.

To determine the cost of the Board's daily operations and the full cost of conducting an election, BBMR analyzed financial transactions in Fiscal Years 2009, 2011, and 2012 and interviewed officials with operational knowledge of the service. To determine cost-effectiveness of the conduct of elections, BBMR compared Baltimore with other cities using a set of performance indicators. To recommend alternatives to increase cost-effectiveness and to estimate savings for each alternative, other states' and cities' practices are taken into consideration and a scenario analysis for each alternative is conducted. Potential positive and negative outcomes for each of the alternatives are based upon the current knowledge of the City populations' demographics and the outcomes other states and cities experienced when implementing the alternatives.

BBMR conducted this management research project from July to November 2012 in accordance with the standards set forth in the BBMR Project Management Guide and the BBMR Research Protocol. Those standards require that BBMR plans and performs the research project to obtain sufficient and appropriate evidence to provide a basis for the conclusions and recommendations contained in this report. BBMR believes that the evidence obtained provides a reasonable basis for the findings and conclusions in this report and that such findings and conclusions are based on research project objectives. More information on the scope and methodologies of this project can be found in the appendices.

BACKGROUND

STATUTORY AUTHORITY AND HISTORY

Baltimore City was first given authority over the administration of elections in 1776 when the Constitution of Maryland granted the sheriff of each county the authority to serve as the election judge. In 1799, county courts were authorized to appoint election judges for each election district, and by 1805, court judges were to appoint three election judges for each election district annually.[1] In 1865, the Mayor and City Council of Baltimore City were granted the responsibility of appointing election judges by the General Assembly.

The Board of Supervisors of Elections was created in 1888 and was given the authorities previous held by election judges. The Board was appointed by the Governor and was renamed the Board of Elections in 1999.

The function of the Board of Elections ("the Board") is to "oversee the conduct of all elections held in Baltimore City and ensure that the elections process is conducted in an open, convenient, and impartial manner." [2] Members of the board are appointed to four-year terms by the Governor, with consent by the Maryland State Senate. The Board was originally comprised of three members and two substitutes. Membership of the Board was changed to five members and no substitutes as of June 2011.

Timeline of the Conduct of Elections in Baltimore City

1776	The Constitution of Maryland granted authority to the sheriff of each Maryland county to serve as election judge
1799	The Act of 1799 authorized county courts to appoint election judges for each election district
1865	The Act of 1865 granted the responsibility of appointing election judges to the Mayor and City Council of Baltimore City
1882	Election Day first became a State holiday
	The Act of 1882 authorized the re-division of Baltimore City into election precincts, wards, and legislative districts
1888	The Board of Supervisors of Elections was created and given the authorities previous held by election judges
1915	Baltimore City began operating under a charter form of government and was given the authority to regulate elections
1969	Maryland State Board of Elections was created to direct, support, monitor, and evaluate the activities of the local boards of elections in Maryland
1999	The Board of Supervisors of Elections was renamed the Board of Elections
2002	The State Board began overseeing the upgrade and standardization of voting systems and election procedures statewide. Baltimore stopped owning its own voting system and started leasing it from the State Board in 2006
2010	Statewide administration of early voting and absentee voting

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[1] Chapter 97, Act of 1805
[2] From "Code Election Law Article, sec. 2-202."

ELECTION CYCLE

Baltimore City has been conducting off-year elections with the elections of City officials falling on an odd-numbered year. Baltimore City Council Bill 12-0023 was introduced in June 2012 to amend the charter, upon voters' approval, such that the election of the Mayor, the City Council, and the Comptroller would be held in November 2016 and on the same date in every succeeding fourth year.

The amendment reduces the number of elections from six elections to four elections (including both primary and general elections) every four years. It is estimated that the amendment would increase voter turnout and reduce expenditures related to conducting elections by approximately $4 million every four years.

Table 1: Election Cycles

	The 2008 Election Cycle	The 2016 Election Cycle
Year 1	Presidential Primary and General	Mayoral and Presidential Primary and General
Year 2	No Election	No Election
Year 3	Gubernatorial Primary and General	Gubernatorial Primary and General
Year 4	Mayoral Primary and General	No Election

RESPONSIBILITIES OF THE BOARD OF ELECTIONS

The Board of Elections is authorized by the Public General Laws of Maryland and is empowered to make rules consistent with State laws to ensure the proper and efficient registration of voters and conduct of elections. The responsibilities of the Board of Elections are separated into four categories: pre-election, on Election Day, post-election, and routine responsibilities.

Pre-Election Responsibilities

Facilitate Voter Registration

The Board facilitates voter registration using the Maryland Centralized Voting System (MDVoters). The system is part of the statewide voter registration system and allows the Board to verify voters' information and update registration records. The Board confirms voter registration by mailing voter notification cards to registered voters. There were 334,852 registered voters in Baltimore City in April 2012.

Recruit and Train Poll Workers[3]

The Board recruits and trains around 2,000 election judges and 300 voting machine technicians for each election.[4] There are four types of judges: chief judges, book judges, voting unit judges, and provisional ballot judges. Chief judges are the supervisory officials and are responsible for checking the polling place before Election Day, supervising the opening and closing of the polls, demonstrating the voting system, and returning supplies needed to conduct the election. Book judges are responsible for verifying the registration of each voter requesting a ballot and issuing voter authority cards and ballots. Voting unit judges are responsible for verifying

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[3] Poll workers include both election judges and voting machine technicians.
[4] The average number of poll workers in the last six elections was 2,145.

ballots and voter authority card numbers and monitoring activities around the voting units. Provisional ballot judges are mainly responsible for issuing provisional ballots.

All judges and voting machine technicians are required to participate in a mandatory training program provided by University of Baltimore's Schaefer Center for Public Policy before Election Day. The cost of the training program was $289,292 for the three elections in Fiscal 2012. Table 2 below shows the costs of the training program.

Table 2: Training Program for Poll Workers in Fiscal 2012[5]

Description	Cost
Election Judge Training (196 classes @ $1,135 each)	222,460
Curriculum Development	4,017
Program Management and Administration	9,000
Classroom Facilities (196 classrooms @ $128 each)	25,088
Scheduling Election Judge Training Sessions	12,361
Online Election Judge Training Scheduling and Registration	1,000
Reminder Calls prior to Election Day	15,366
TOTAL	**$289,292**

All judges and technicians are reimbursed $20 for participating in the mandatory training. On Election Day, chief judges' and regular judges' salaries are $200 and $150 respectively whereas the salary for voting machine technicians is $400. The total cost of recruiting, training, and reimbursing judges and technicians was $2 million for the three elections in Fiscal 2012.[6]

Lease Voting Machines and Electronic Poll Books from the State Board

The two major types of equipment required for administering elections are voting machines and electronic poll books. Baltimore City currently uses the Diebold direct-recording electronic (DRE) voting machines, which allow voters to vote electronically using the touchscreen. Electronic poll books contain the registration database and are used for voter lookup, verification, and identification when voters arrive at the polling place.

The Board currently leases voting machines and electronic poll books from the Maryland State Board of Elections and stores the equipment in the warehouse when it is not in use.[7] The warehouse is located at 301 North Franklintown Road. The Board reimbursed the State Board of Elections $875,409 in Fiscal 2012 for the leasing of voting units, electronic poll books, memory cards, and other equipment and services the State Board provided, as listed in Table 3:

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[5] Invoices for Fiscal 2012 were not available at the time this report was published. Figures in Table 2 are close estimates using invoices from Fiscal 2011 and proposals for Fiscal 2013.
[6] The total cost ($2.22 million) includes the cost for all three elections in Fiscal 2012: the 2011 Mayoral Primary, the 2011 Mayoral General, and the 2012 Presidential Primary Elections
[7] The leasing of voting machines from the State is in accordance to chapter 564 of the Laws of Maryland, http://www.elections.state.md.us/pdf/SBE_Final_Action_Plan.pdf

Table 3: State Reimbursement Breakdown

Description	Cost	Percentage
Ballots	25,672	3%
Training	32,289	4%
Project Management	50,449	6%
Regional Managers	55,904	6%
Application maintenance	66,941	8%
Voting Machines Capital Lease	73,905	8%
Database/Help Desk support	115,333	13%
Support Technician	172,363	20%
Transportation	204,505	23%
Other	78,047	9%
TOTAL	**$875,409**	**100%**

The State Board determines the amount of capital lease payment according to each jurisdiction's proportion of the statewide voting age population. Maryland jurisdictions' total share of the voting machines capital lease was $670,038 in Fiscal 2012. Since Baltimore City's voting age population ratio was 0.1103, its portion of the lease was $73,905. This method of determining the amount of the reimbursement applies to electronic poll books, memory cards, and other equipment and services the State Board provides.

The Budget Reconciliation and Financing Act of 2012 (Maryland Senate Bill 1301) states that it is the intent of the General Assembly that, beginning in Fiscal 2015, each county pays its share of one-half of any further cost of acquiring and operating the Optical Scan Voting System as required under Chapter 564 of the Acts of 2001.[8] Based on a study prepared for Maryland Department of Legislative Reference[9], the new Optical Scan System is estimated to cost $35 million. Baltimore City can expect its share for the new voting system to be $434,000 in Fiscal 2015, $930,000 in Fiscal 2016, and $930,000 in Fiscal 2017.

Prepare Voting Machines and Electronic Poll Books

Before each election, the Board facilitates the preparation of 1,932 voting units and 728 electronic polls books by an approved contractor and ensures that each voting machine and electronic poll book undergoes Logic and Accuracy testing before elections. Voting machine preparation was provided by McAfee Election Services and cost $1.33 million in Fiscal 2012. The Board of Estimates approved McAfee to be the designated selected source on May 26, 2010 and provided two one-year renewal options. Copies of the Board of Estimates memorandum and the proposal by McAfee Election Services for the 2011 Mayoral General Election are attached in Appendix I.

The standard cost of voting machine preparation was $383,180 for each election in Fiscal 2012. The services provided by McAfee for each election are listed in Table 4.

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[8] Senate Bill 1301, http://mlis.state.md.us/2012s1/chapters_noln/Ch_1_sb1301T.pdf, p. 44-45
[9] "Maryland Voting Systems Study," by RTI International,
http://mlis.state.md.us/2010rs/misc/2010votingsystemsstudyreport.pdf

Table 4: Cost of Voting Machine Preparation for One Election

Description	Calculations	Cost
EARLY VOTING		
Voting machine preparation (132 megabytes memory cards)	15 machines*6 locations @ $154.50 each	13,905
Electronic poll book preparation	3 books*6 locations @ $103 each	1,854
Technicians	12 hours*6 days*6 sites @ $82.40 each	35,597
Set up and break down at sites	6 sites @ $721 each	4,326
Early Voting Total		**$55,682**
ELECTION DAY		
Voting Machines preparation (32 megabytes memory cards)	1,842 machines @$133.90 each	246,643
Electronic poll book preparation	713 poll books @ $103 each	73,439
Nine trucks to deliver supplies	9 trucks@ $824 each	7,416
Election Day Total		**$327,498**
TOTAL		**$383,180**

With three elections in Fiscal 2012, the cost of voting machine preparation was $1.15 million.[10] McAfee also provided post-election maintenance and battery replacement services, therefore driving the total cost of voting machine maintenance up to $1.33 million in Fiscal 2012. The additional costs of post-election maintenance and battery replacement services are listed in Table 5:

Table 5: Costs of Post-Election Maintenance and Battery Replacement in Fiscal 2012

Description	Calculations	Cost
Post-election maintenance of voting machines	1,932 machines @ $36.05 each	69,469
Post-election maintenance of electronic poll books	728 poll books @ $41.20 each	29,994
Replacement of batteries and software upgrades	728 units @ $45 each	32,760
Mock Election	240 hours @82.40 each	19,776
Hours for maintenance	$400 hours @ 82.40 each	32,960
TOTAL		**$184,959**

The cost of voting machine preparation by McAfee Election Services was $1.33 million in Fiscal 2012. Table 6 below shows the cost breakdown of voting machine preparation:

Table 6: Cost of Voting Machine Preparation in Fiscal 2012

Description	Cost
2011 Mayoral Primary	383,180
2011 Mayoral General	383,180
2012 Presidential Primary	383,180
Post-Election Maintenance and Battery Replacement	184,959
TOTAL	**$1,334,499**

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[10] Voting machine preparation in Fiscal 12=$383,180*3 elections=$1,149,540

Voting Machine preparation is a high cost component not only for Baltimore City but for other jurisdictions as well. While this cost is necessary for the conduct of elections, BBMR recommends renegotiating the contract with McAfee Election Services and determine if there is room for reduced costs.

Secures Polling Places and Early Voting Sites

The Board secures polling places and early voting sites and ensures that they comply with federal standards for accessibility before each election. There is a rental fee of $350 for each of the private polling sites and a custodian fee for each of the public polling sites, such as libraries and schools. The total cost of securing 57 private and 156 public polling sites was $121,237 in Fiscal 2012.

Provide the Public with Information about Registration and Elections

The Board provides the public with information about registration and elections by mailing to eligible voting populations provisional and absentee ballots, Election Day forms, voter's cards, specimen ballots, voter registration forms, early voting notifications, and guidelines on new voting systems. Additionally, the Board prepares election materials, posters, contingency voter registration rosters, and contingency ballots before Election Day and publishes on the Internet a list of proposed deletions of registrants from the voter registry no later than 30 days before the close of registration prior to an election. The total cost of printing and mailing ballots, voter's cards, forms, and notifications was $105,652 in Fiscal 2012.

<u>**On Election Day**</u>

Prepare Polling Places

The Board staffs polling places with election judges and voting machine technicians and equips polling places with tables, chairs, and voting machines on Election Day. If more than one precinct is located in a polling place, the Board is responsible for separating the two precincts' voting areas with signs and cordons so that voters would be clearly directed to their respective voting areas. The cost of hauling tables and chairs to the polling places was $17,811 in Fiscal 2012.

Provide and Process Absentee and Provisional Voting

The Board provides absentee voting for registered voters who are unable to get to a polling place on Election Day or during early voting week, and no excuse is required for absentee voting. The Board facilitates absentee voting by processing absentee requests from registered individuals (including armed forces, students, and citizens out of state or country) and mails absentee ballots to those who request them.

The Board also provides provisional voting, a safeguard to ensure that individuals who claim they are registered and eligible to vote will not be prevented from casting a ballot. Provisional ballots are provided on Election Day and the Board is responsible for determining whether or not the individuals meet the criteria for their votes to be counted.

Monitor Polling Places

The Board uses the Watch Center to coordinate the opening of polling places to ensure that all 213 polling places and five early voting sites are opened on time on election morning and closed on time unless court-

ordered extended hours are enforced. The Watch Center is staffed by representatives from the Board of Elections, Baltimore City Police Department, Board of Education, Department of Public Works, and the Mayor's Office of CitiStat.

The Board also hires personnel from Baltimore City Police Department to deliver election materials and electronic poll books to the polling places, to ensure the security of polling places, and to act as the Board of Elections' liaison if problems arise on Election Day. The total overtime costs of hiring Police personnel was $98,400 in Fiscal 2012.

Arrange Transportation for Board members and Substitute Poll Workers

The Board hires the Yellow Cab Company to expedite the transportation of substitute elections judges and voting machine technicians to the polling places. Taxi cabs are also used by Board Members and support staff to visit and monitor polling places. The cost of hiring the Yellow Cab Company was $50,000 in Fiscal 2012.

<u>Post-Election</u>

Canvassing of Votes and Other Post-Election Responsibilities

The Board canvasses votes after each election and uploads the data to the GEM's server after the canvassing of votes is completed. The Board also certifies the results of the election, performs recounts, maintains election records, and discards them in accordance with State and Federal law. Additionally, the Board hears and decides challenges and appeals concerning voter registration, right to vote, and absentee ballots if necessary.

<u>Routine Responsibilities</u>

The Board's routine responsibilities include maintaining a voter registration database, storing and maintaining voting machines leased from the State Board of Elections, and reimbursing the State Board for payroll, healthcare, retirement, voting system, and electronic poll books. The Board also maintains the warehouse, works with BBMR to plan and monitor its budget, and reimburses the Mayor's Office of Information Technology for wiring, internet, and other support services. Table 7 below summarizes the Board of Elections' four categories of responsibilities:

Table 7: Board of Elections' Responsibilities

<u>Pre-Election</u>	<u>Election Day</u>	<u>Post-Election</u>
• Facilitate voter registration • Recruit and train poll workers • Prepare voting units and electronic poll books • Secure polling places and early voting sites • Provide public with information	• Prepare polling places • Provide absentee and provisional voting • Monitor polling places • Arrange transportation for Board members and substitute poll workers	• Canvass and certify results • Perform recounts • Maintain election records • Hear appeals
<u>Routine Responsibilities</u>		
Maintain voter registration database Store and maintain voting machines Reimburse the State Board of Elections Maintain the warehouse Work with City agencies		

Personnel

The Board of Elections currently has five board members who are funded by the City's General Fund. Members of the board are appointed to four-year terms by the Governor, with consent by the Maryland State Senate. There are also 34 state employees employed by the State Board of Elections. Baltimore City reimburses the State Board approximately $1.3 million each year for the 34 Full-Time Equivalent (FTE) employees. Table 8 summarizes the job titles and functions of the 34 state employees.

Table 8: Board of Elections State Employees

Job Title	Total Salary	FTEs	Job Function(s)
Election Administration Officer	636,592	16	• Assist election director • Supervise election clerks • Conduct studies and analyses of the program
Election Clerk	335,237	10	• Register voters • Process absentee ballots • Compile and maintain voters' records
Election Data Application Specialist	141,384	4	• Perform data entry
Election Deputy Director	69,974	1	• Assist Election Director • Oversee day-to-day operations
Election Director	78,718	1	• Direct elections • Supervise election staff
Election Information System Specialist	86,165	2	• Coordinate, maintain, and troubleshoot election information systems
TOTAL	**$1,348,070**	**34**	

PRIORITY OUTCOME AND PERFORMANCE MEASURES

Priority Outcome

The conduct of elections is closely related the priority outcome of Innovative Government. Specifically, high cost-effectiveness of election administration can:

- Increase the percentage of internal and external customers very satisfied with City services and business functions (by increasing voters' satisfaction)
- Reduce the City's Space Utilization Costs (by increasing utilization of polling places)
- Increase citizens' accessibility to City services (by increasing accessibility of polling places)

Performance Measures

In preparation for the planning of the Fiscal 2013 budget, the Board of Elections provided performance measures in its budget proposal, as shown in Table 9. The percentage of polling places opened on-time and the percentage of eligible voters registered remained stable from Fiscal 2009 through Fiscal 2011. Voter turnout fluctuated depending on the type of election, and the number of complaints lodged by the public slightly increased from 39 in Fiscal 2009 to 45 in Fiscal 2011.

Table 9: Fiscal 2013 Performance Measures

Type	Measure	FY09 Actual	FY10 Actual	FY11 Actual	FY12 Target	FY13 Target
Output	Percent of polling places opened on-time	98%	99%	99.8%	100%	100%
Efficiency	Number of complaints lodged by the public	39	40	45	40	40
Effectiveness	Percent of eligible voters registered	62%	62%	62%	62%	64%
Outcome	Voter turnout	Off Year	45%	23%	39%	67%

While the performance measures are useful and valid, BBMR recommends that the Board of Elections to measure and provide performance measures that are more relevant, specific, and ambitious. Below are the performance measures BBMR recommends the Board of Elections to consider:

Table 10: BBMR Recommended Performance Measures

Type	Measure
Output	• Percentage of polling places opened on-time • Percentage of poll workers who were hired and showed up for training • Percentage of poll workers who were trained and showed up on Election Day[11] • Number of registered voters
Efficiency	• Cost per registered voter • Cost per vote
Effectiveness	• Number of complaints lodged by the public • Average and maximum wait time at precincts
Outcome	• Voter turnout (compared to the last election of the same type) • Percentage of voters satisfied or very satisfied with the voting experience

<u>Average Wait Time</u>

The Board of Elections estimates the current average wait time to be 10 to 15 minutes but does not measure precise average wait time by precinct. Using available data on number of voters by precinct, BBMR estimated the average wait time for 2008 General Presidential Elections based on a simulation model. The model assumes that the peak times on Election Day are 7 to 9 a.m., 12 to 2 p.m., and 5 to 8 p.m. The model also assumes that 70 percent of the voters arrive during these seven peak hours, while the remaining 30 percent arrive during normal hours. This assumption is based on voting patterns of the 2006 Primary Election in Maryland.[12] Table 11 below

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[11] The Board of Election does not currently measure this output measure and is unable to provide an estimate.

[12] Maryland State officials tracked voting patterns in the 2006 Primary Election using a sample of 5,500 electronic poll books. The tracking of voting patterns show that while precincts have different voting patterns, 67 percent of voters arrived at polling places from 7 to 9a.m., 12 to 2p.m., and 5 to 7p.m on average. The assumption that 70 percent of voters arrived at polling place in this report is to take into account that Maryland currently has a 13-hour Election Day from 7a.m. to 8p.m. From "Data for Democracy, Improving Elections Through Metrics and Measurement" by Pew Center on the States, 2008, http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Election_reform/Final%20DfD.pdf

summarizes the distribution of the number of voters per hour at a polling place using the actual data from elections.

Table 11: Voters' Arrival Rates (Voters per Hour) at Polling Place

Range	Peak Times Arrival Rate			Normal Times Arrival Rate		
	Election Year			Election Year		
	2008	2010	2011	2008	2010	2011
Minimum Number of Voters per Hour	7	7	3	3	4	2
Maximum Number of Voters per Hour	251	159	84	126	79	42
Average Number of Voters per Hour	85	57	26	43	28	13

Using a simulation model according to the station flow of Chart 1 below, the average wait time during peak hours of the 2008 General Election was 16 minutes with six voting machines at the polling place. Average wait time for the 2010 and 2011 elections were significantly shorter because of lower turnouts, as shown in Table 11.

**Chart 1: Voting Station Flow**
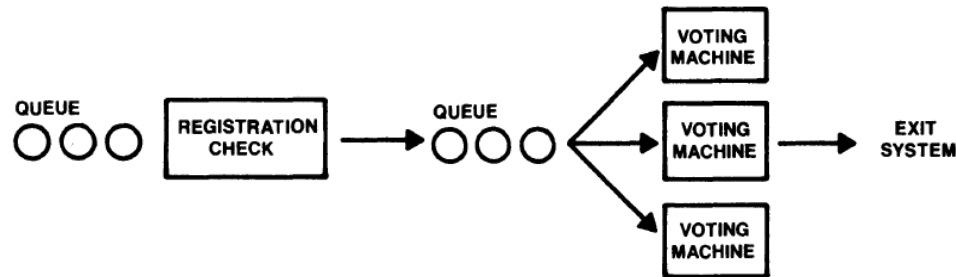
Table 12 shows the probability of arrival rates and service times of registration check and voting used in the simulations of previous elections:

Table 12: Service Times of Registration Check and Voting

Probability	Registration Check Service Times (min)	Voting Booth Service Times (min)
0.3	1.5	3
0.4	2	6
0.3	2.5	9

Table 13 shows the average wait time using the simulation model. The model assumes that an average voter takes between 1.5 to 2.5 minutes for registration check and between 3 to 9 minutes to vote at the voting booths.

BBMR validated the data by sending two staff to a polling place on Election Day in November 2012. Two BBMR staff went to precinct 22002 from 7a.m. to 9a.m. on November 6, 2012 and tallied the number of people arrived and their service times. Two hundred and eighteen voters arrived during the two-hour window and average registration and voter service times were 1.5 and 4.5 minutes respectively. While the data collected is not

statistically representative, it validates the simulation model and shows that the assumptions built-in to the model is realistic. The Board of Elections also confirms that this estimation of average wait time is realistic and reasonable. Details of the simulation model used to predict wait time are in Table 50 in Appendix I.

Table 13: Simulated Average Wait Time for Six Voting Machines (3 to 9 Minutes Voting Time)

	2008 Presidential General	2010 Gubernatorial General	2011 Mayoral Primary
Voter Turnout	68.21%	48.16%	24.58%
Average Peak Hours Wait Time	16 minutes	2 minutes	<1 minute
Average Normal Hours Wait Time	<1 minute	<1 minute	<1 minute

Average wait time can be longer when there are more ballot questions. If voters take between 5 and 15 minutes to vote because of an increased number of ballot questions, average wait time can increase to two hours during peak hours with a 70 percent voter turnout. While it is unlikely that voters would take up to 15 minutes to vote, the limited capacity of voting stations to cope with unexpected fluctuations in voter numbers or voting time has been a major issue in many states. [13] Using the simulation model, Chart 2 shows the average wait time during peak hours for an election with a 70 percent turnout using a range of average voting times:

Chart 2: Average Wait Time as a Function of Average Voting Time During Peak Hours
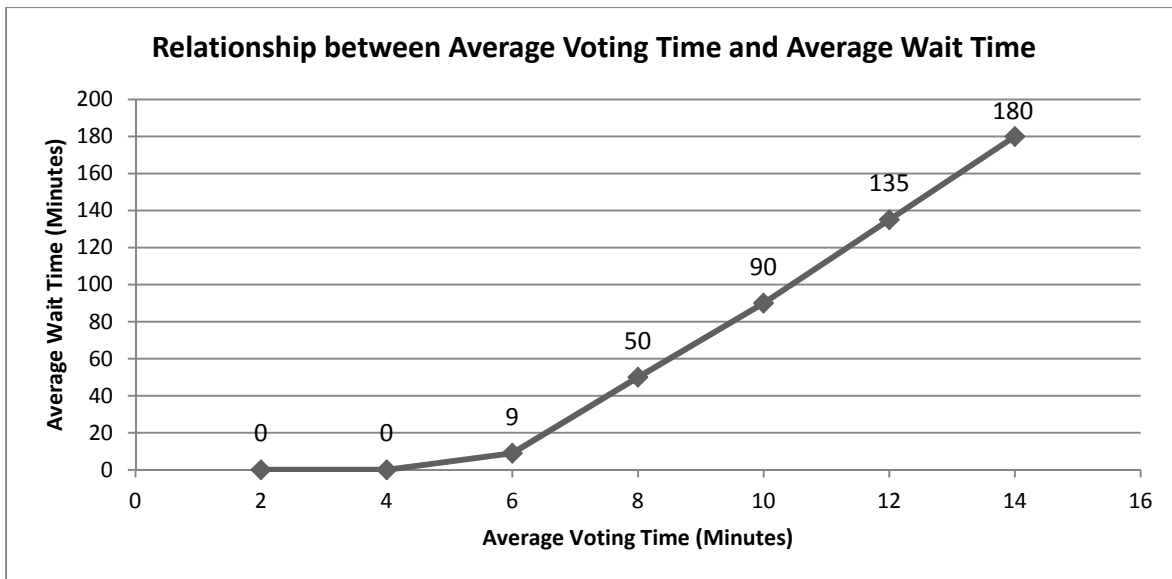
Election Day Notification Log

The Board of Elections keeps an Election Day Notification Log for each election. The notification log details all the citizen complaints and inquiries as well as requests and notifications by poll workers and staff. Table 14 shows the categories and examples of notifications and complaints in the 2010 Gubernatorial General Election, the 2011 Mayoral Primary Election, and the 2012 Presidential Primary Election.

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[13] From "Touchscreen Voting Machines Cause Long Lines and Disenfranchise Voters," by William A. Edelstein and Arthur D. Edelstein, 2008, http://static.usenix.org/events/evt/tech/full_papers/Edelstein.pdf

Table 14: Election Day Notification Log

Types of Notifications/ Complaints	Examples of Notifications/ Complaints	2010 Gubernatorial General		2011 Mayoral Primary		2012 Presidential Primary	
		Number	Percentage	Number	Percentage	Number	Percentage
Election Judges	• Election Judge being late or not showing up • Insufficient Republican Judges	62	33%	70	47%	67	41%
Request for Supplies	• Insufficient provisional ballots • Broken tables or chairs at polling places	65	35%	19	13%	28	17%
Polling Place	• Poll workers locked out of polling places before poll opens • Heat/AC not working property at polling places	19	10%	18	12%	15	9%
Challenger/Watcher	• Challengers did not have certifications • Challengers being too close to voting booths	9	5%	3	2%	0	0%
Voting Machines	• Voting machines not functioning	8	4%	4	3%	13	8%
Voter Registration	• Voters registered but were not found in Electronic Poll Books	7	4%	5	3%	2	1%
Provisional Ballots	• Voters had to vote using provisional ballots	4	2%	12	8%	5	3%
Absentee Ballots	• Inquiries about how to cast absentee ballots	3	2%	1	1%	1	1%
Voting Machine Technicians	• Insufficient voting machine technicians • Technicians not being helpful	3	2%	2	1%	2	1%
Electronic Poll Books	• Technical difficulties with Electronic Poll Books	1	1%	9	6%	16	10%
Other Complaints/ Inquiries	• Inquiries about election judges' lunch break • Inquiries about providing private booths for provisional voters	6	3%	7	5%	15	9%
TOTAL		**187**	**100%**	**150**	**100%**	**164**	**100%**

Table 14 shows that election judges were the most common type of notifications or complaints. Most of these notifications concern election judges being late to polling places or not showing up. Other notifications related to election judges include complaints regarding their behavior and attitude when assisting voters and requests to staff polling places with more Republican judges. Request for supplies is the second most common type of notifications or complaints. These notifications are made mostly because the polling place is short of provisional ballots or other supplies.

# COST OF OPERATIONS IN FISCAL 2012

Expenditures by Activities

The majority of the Board of Elections' expenditures are for the conduct of elections. Table 15 and Chart 3 below show the Board of Elections' expenditures by activities in Fiscal 2012:

Table 15: Expenditures by Activities in Fiscal 2012

Fiscal 2012 Expenditure by Activities	Cost	Percentage
2011 Mayoral Primary	2,047,165	30%
2011 Mayoral General	1,997,428	29%
2012 Presidential Primary	2,056,826	30%
Warehouse	343,547	5%
Daily Operations at Downtown Office	406,245	6%
TOTAL	**$6,904,082**	100%

Chart 3: Expenditures of the Board of Elections in Fiscal 2012 by Activities
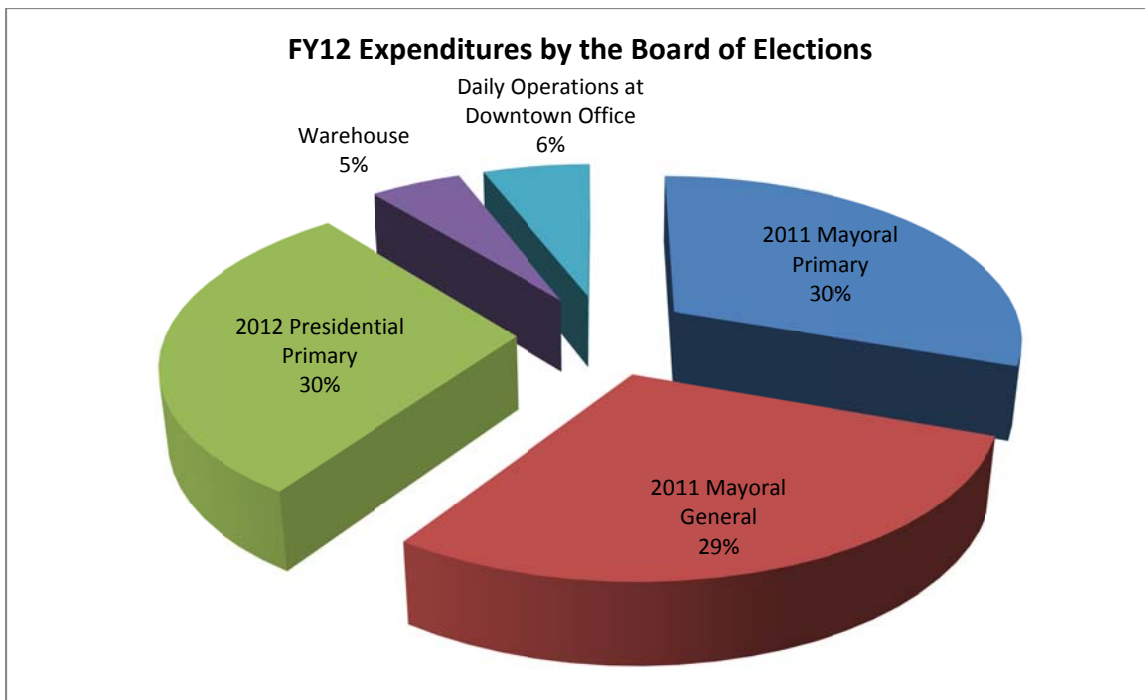
The Board of Elections spent $749,792 (11 percent of total expenditure) in Fiscal 2012 on the daily operations of the Board and the maintenance of the warehouse, located at 301 North Franklintown Road. The warehouse is mainly for the purpose of storing voting machines, electronic poll books, and other supplies necessary to the conduct of elections. Tables 16 and 17 show the breakdown of expenditures of the Downtown office and the warehouse respectively:

Table 16: Board of Elections' Expenditures at the Downtown Office

Fiscal 2012 Daily Operations' Expenditures	Cost
10% of Board members' Salary (5 Board Members)[14]	4,279
10% of Board members' Other Personnel Costs	1,582
10% of State Employees' Salaries (34 State Employees)	154,194
Salaries for Temporary Employees	62,378
Office supplies	21,639
Office machines and furniture	17,457
Local Mileage and Subsistence Allowance	13,444
Municipal Telephone Exchange	26,000
Board membership (Maryland Association of Election Officials)	867
Stamps	28,747
Cable (Comcast)	783
Stamp machine	5,521
MOIT	69,355
TOTAL	**$406,245**

Table 17: Board of Elections' Expenditures at the Warehouse

Fiscal 2012 Warehouse Expenditures	Cost
Voting Machines Maintenance	184,959
Salaries for Four Temporary Employees	46,698
Xerox copy machine	3,300
Waste management	1,039
Heating/AC servicing	10,542
Electrical work	6,656
Security Alarms	29,539
BGE/Constellation/Pepco Energy	59,119
Building maintenance	1,695
TOTAL	**$343,547**

Election Administration Costs

The cost of administering elections ranges from $2 to $3.2 million depending on the type of election, the number of registered voters, and voter turnout. Table 18 below shows the costs of conducting the 2011 Mayoral Primary, 2010 Gubernatorial General and 2008 Presidential General Elections[15]. Voter turnout figures are obtained from the Maryland State Board of Elections and include absentee and provisional ballots. The election cycle is from 45 days before to 10 days after Election Day. Historical voter turnout and costs of elections held from 2008 to 2012 can be found in Tables 45 and 46 in Appendix I.

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[14] This report assumes that all employees spent 30 percent of their time on each of the three elections in Fiscal 2012 and 10 percent on the daily operations of the Board.

[15] Because some cost figures of the 2008 Presidential General Election are unavailable or unreliable, selected data from the 2010 Gubernatorial General and 2011 Mayoral General Elections are used as the best substitutes.

Table 18: Election Administration Costs

	2011 Mayoral Primary	2010 Gubernatorial General	2008 Presidential General
Voter Turnout	**24.58%**	**48.16%**	**68.21%**
BEFORE ELECTION CYCLE			
Recruitment postage fees	27,300	27,300	41,889
Voters' cards postage fees	17,664	11,896	11,896
Sample ballots' postage fees	31,193	37,727	37,727
Printing Costs	119,141	122,663	38,108
TOTAL	**$195,298**	**$199,587**	**$129,620**
EARLY VOTING			
Poll workers training reimbursement	1,480	1,560	
Poll workers' salary	66,000	63,450	
Private Polling places rental fees	4,200	4,200	NO EARLY VOTING
Public polling places custodian fees	1,068	1,068	
School police	6,471	6,471	
Signs	1,094	1,094	
TOTAL	**$80,313**	**$77,743**	**-**
ELECTION DAY			
Absentee voting postage fees	957	7,788	7,788
Poll workers' training reimbursement	39,740	47,020	82,160
Poll workers' salary	399,900	454,500	630,750
Poll workers' training cost (by Schaefer Center)	77,401	121,323	331,740
Private Polling places' rental fees	19,600	19,600	18,424
Public Polling places' custodian fees	6,470	41,847	41,847
Police overtime	32,800	32,800	30,832
Library security guards overtime	1,350	1,350	1,269
Hauling of Table and chairs	5,937	5,745	5,369
Taxi cabs	20,063	21,064	17,626
Voting machines maintenance (McAfee)	383,180	505,200	494,589
Poll workers' cell phones (AT&T)	6,389	9,595	12,529
Voting machines and other state reimbursement	291,803	453,523	699,399
TOTAL	**$1,285,590**	**$1,721,355**	**$2,374,322**
SALARIES DURING ELECTION CYCLE			
State Employees' Salary (total salary*.3)	462,581	710,053	514,957
Board Members' Salaries and OPCs, Overtime, and Temporary	23,383	16,234	28,490
TOTAL	**$485,964**	**$726,287**	**$543,447**
TOTAL COSTS	**$2,047,165**	**$2,725,071**	**$3,047,389**
INFLATION-ADJUSTMENT FACTOR	-	1.051	1.066
TOTAL COSTS IN 2012 DOLLARS	**$2,047,165**	**$2,869,500**	**$3,248,517**

FINDINGS

COST-EFFECTIVENESS IS NOT MAXIMIZED IN THE CONDUCT OF ELECTIONS

One way to measure cost-effectiveness of the conduct of elections is to measure cost per vote. Baltimore City spent $2.1 million to conduct the 2011 Mayoral Primary election with a 25 percent voter turnout. With 77,191 voters, cost per vote was $26.52. Although the cost of the 2008 Presidential General Election (inflation-adjusted to 2012 dollars) was higher, totaling $3.2 million, the high voter turnout reduces cost per vote to $12.94, 53 percent lower than cost per vote in the 2011 Mayoral Primary Election.

Table 19: Cost-Effectiveness of the Conduct of Elections

	2011 Mayoral Primary	2010 Gubernatorial Primary	2008 Presidential General
Effectiveness Measures			
Eligible Active voters	314,095	365,508	368,142
# of Votes Cast	77,191	164,556	251,127
Voter Turnout	**24.58%**	**48.16%**	**68.21%**
Maryland Voter Turnout	N/A	54.02%	67.80%
Efficiency Measures			
Number of Precincts	294	290	290
Cost of Election	$2,047,165	$2,869,500	$3,248,517
Cost-Effectiveness			
Cost per Vote	**$26.52**	**$17.44**	**$12.94**

Cost per vote increases when the number of votes decreases and/or when the cost of running an election increases, as shown in Table 19. To examine the cost-effectiveness of the conduct of elections in Baltimore City, this report compares cost per registered voter and cost per vote of Baltimore City with that of other jurisdictions.

All Maryland counties had two elections in Fiscal 2011—the Gubernatorial Primary and General Elections. Table 20 below shows each jurisdiction's Fiscal 2011 budget and its cost per registered voter and cost per vote for the 2010 Gubernatorial General Election:

Table 20: Cost-Effectiveness of Maryland Jurisdictions in the 2010 Gubernatorial General Election

	FY11 Budget	Cost per Election	# of Registered Voters	# of Votes	Voter Turnout	Cost per Registered Voter	Cost per Vote
Baltimore City	6,567,223	3,283,612	365,508	164,556	45.02%	$8.98	$19.95
Baltimore County	5,190,019	2,595,010	492,869	290,399	58.92%	$5.27	$8.94
Anne Arundel	4,779,200	2,389,600	331,101	204,334	61.71%	$7.22	$11.69
Montgomery	4,797,830	2,398,915	573,431	294,604	51.38%	$4.18	$8.14
Prince George's	5,083,400	2,541,700	517,500	233,776	45.17%	$4.91	$10.87

Cost per election in Table 20 is calculated by dividing the elections administration's budget in Fiscal 2011 by the number of elections held. Cost per vote is calculated by dividing the election cost by the number of votes cast. Baltimore City's cost per registered voter and cost per vote were both the highest among Maryland jurisdictions with a population of more than 500,000. When compared to other major cities, Baltimore City's cost per vote was the below average but higher than five of the nine cities. Table 21 below shows a comparison of cost per vote among nine major cities:

Table 21: Cost-Effectiveness in Major Cities

Major Cities	Fiscal 2012 Budget	# of Elections	Cost per Election	# of Registered Voters	Voter Turnout[16]	Cost per Registered Voter	Cost per Vote	Alternative Voting Methods	Number of Precincts
Baltimore, MD	5,980,658	3	1,993,553	334,852	42.98%	5.95	13.85	-Six-day early voting -Absentee voting	**294**
Boston, MA	3,580,075	3	1,193,358	351,992	35.30%	3.39	9.61	-Excuse-required absentee voting	254
Chicago, IL	14,322,733	2	7,161,367	1,288,293	61.03%	5.56	9.11	-12-day early voting -Absentee voting	2,034
Detroit, MI	7,380,419	2	3,690,210	553,165	32.13%	6.67	20.76	-Excuse-required absentee voting	599
Milwaukee, WI	2,912,189	4	728,047	324,203	50.25%	2.25	4.47	-12-day early voting -Absentee voting	327
Minneapolis, MN	1,432,673	2	716,337	229,794	39.98%	3.12	7.80	-46-day early voting -Excuse-required absentee voting	117
San Francisco, CA	15,239,787	2	7,619,894	470,668	54.37%	16.19	29.78	-29-day early voting -Permanent absentee voting	579
St. Louis, MO	2,487,652	1	2,487,652	177,922	36.85%	13.98	37.94	-Absentee voting	222
Washington, DC	4,417,635	3	1,472,545	378,817	37.33%	3.89	10.41	-12-day early voting -Permanent absentee voting	143
AVERAGE	-	-	$2,990,231	456,002	43.36%	$6.75	$15.88	-	508

Election costs can vary among cities because state laws are different and the division of election administration responsibilities between state and local officials can differ. Other reasons major cities have a wide range of costs include different alternative voting methods, number of precincts, and poll worker compensation.

Boston, for example, has approximately the same population and number of registered voters as Baltimore City, but its cost per registered voter was half of Baltimore City's. There are a number of factors that contribute to higher election costs in Baltimore City. First, Baltimore City's reimbursement rates for poll workers are higher than Boston. Boston's Election Department reimburses poll workers between $100 and $150 on Election Day and $15 for training, while Baltimore City offers higher reimbursements due to State requirements. Baltimore City reimburses poll workers $20 for training and between $150 and $200 on Election Day.

Second, Baltimore City is required by Maryland to implement early voting while Massachusetts does not have early voting. Early voting costs Baltimore City approximately $80,000 for each election, therefore increasing election costs by $240,000 in Fiscal 2012. Third, Baltimore City is required to reimburse the Maryland Help American Vote Act (HAVA) program that implements a statewide voting system and ensures compliance with HAVA. Maryland local boards reimbursed the State Board a total of $6.6 million in Fiscal 2012 and Baltimore

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[16] Average voter turnout of presidential elections from 2000 to 2012

City's share was $875,409 in Fiscal 2012. Lastly, Baltimore has 40 more precincts than Boston, therefore increasing costs related to poll worker reimbursements, rental of polling sites, and voting machines.

Washington, DC also has approximately the same population and number of registered voters as Baltimore City, but its cost per registered voter was significantly lower than Baltimore City's as well. The reason for lower election costs in Washington, DC is because 1) Washington, DC's poll workers reimbursement rates range between $120 and $160 while Baltimore City's reimbursement rates are $40 more, ranging from $150 to $200, 2) Washington, DC has a significantly lower number of precincts than that of Baltimore City, and 3) Washington, DC hires about 500 fewer poll workers than Baltimore City does for each election.

This study also uses a scorecard to compare the operational efficiency of different cities. The efficiency components used in this study include number of precincts per 1,000 units of population density, early voting location and days, and the maximum poll worker reimbursement. Table 22 shows the scores for each efficiency component, with ten being the highest score (most efficient) and zero being the lowest score (least efficient). The balanced score is calculated by assigning equal weights to each efficiency component.

Table 22: Scorecard

Cities	Number of Precincts/1,000 Units of Population Density[17]		Early Voting Location and Days		Maximum Poll Worker Reimbursement		Score
	Number	Score	Location* Days	Score[18]	Reimbursement	Score	
Baltimore, MD	**38**	**3.8**	**6 sites*6 days**	**3.3**	**200**	**5.0**	**4.0**
Boston, MA	20	7.3	N/A	-	150	6.7	7.0
Chicago, IL	171	0.8	3 sites*12 days	3.3	150	6.7	3.6
Detroit, MI	124	1.2	N/A	-	185	5.4	3.3
Milwaukee, WI	53	2.8	Municipal Building*12 days	10.0	100	10.0	7.6
Minneapolis, MN	17	8.8	City Hall*46 days	2.6	114	8.8	6.7
San Francisco, CA	33	4.4	City Hall*29 days	4.1	170	5.9	4.8
St. Louis, MO	43	3.4	N/A	-	195	5.1	4.2
Washington, DC	14	10.0	Judiciary Square*12 days	10.0	160	6.3	8.8
AVERAGE	57	4.7	-	5.6	$158	6.6	5.6

The score takes operational efficiency factors into consideration, therefore allowing a more comprehensive understanding of the efficiency of different cities. Table 22 shows that Boston, Milwaukee, and Washington, D.C. are the most efficient in terms of their operations, with balanced scores of 7.0, 7.6, and 8.8 respectively. Detroit and Chicago are the least efficient cities with the balanced scores of 3.3 and 3.6 respectively. Baltimore City ranks below the average score of 5.6 with a balanced score of 4.0.

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[17] Population Density is calculated by dividing total population by land square miles.
[18] Early voting score is calculated by multiplying the number of locations by the number of early voting days and converting the score to a ten-point scale

To increase cost-effectiveness, the cost of conducting an election needs to be reduced and/or voter turnout needs to increase. In-depth research of the conduct of elections in Baltimore City shows that low cost-effectiveness in conducting elections is due to several factors:

1. Polling places have more staff than necessary
2. There are more precincts and polling places than necessary
3. Low voter turnout

1. Polling Places Have More Staff Than Necessary

The Code of Maryland Regulations ("the Code") currently requires each precinct to have a minimum of five poll workers: two chief judges, two regular election judges, and one voting machine technician. In a precinct with fewer than 200 registered voters, the Code allows the local board to provide two election judges for the precinct.

Baltimore City had 290 precincts in the 2011 Mayoral Primary Election. Each precinct was staffed with between three and 13 poll workers, adding up to a total of 1,987 poll workers with 146 poll workers who are substitute judges, election night workers, and telephone operators. For all precincts, there were one voting machine technician, two chief judges, and the rest were regular election judges.

The number of registered voters per election judge (including both chief judges and regular judges) at Baltimore polling places ranged from 20 to 944, and the number of votes per election judges ranged from seven to 280. On average, one election judge was hired for every 233 registered voters and 57 votes. Chart 4 shows the distribution of the number of registered voters per election judge.

Chart 4: Distribution of the Number of Registered Voters per Election Judge

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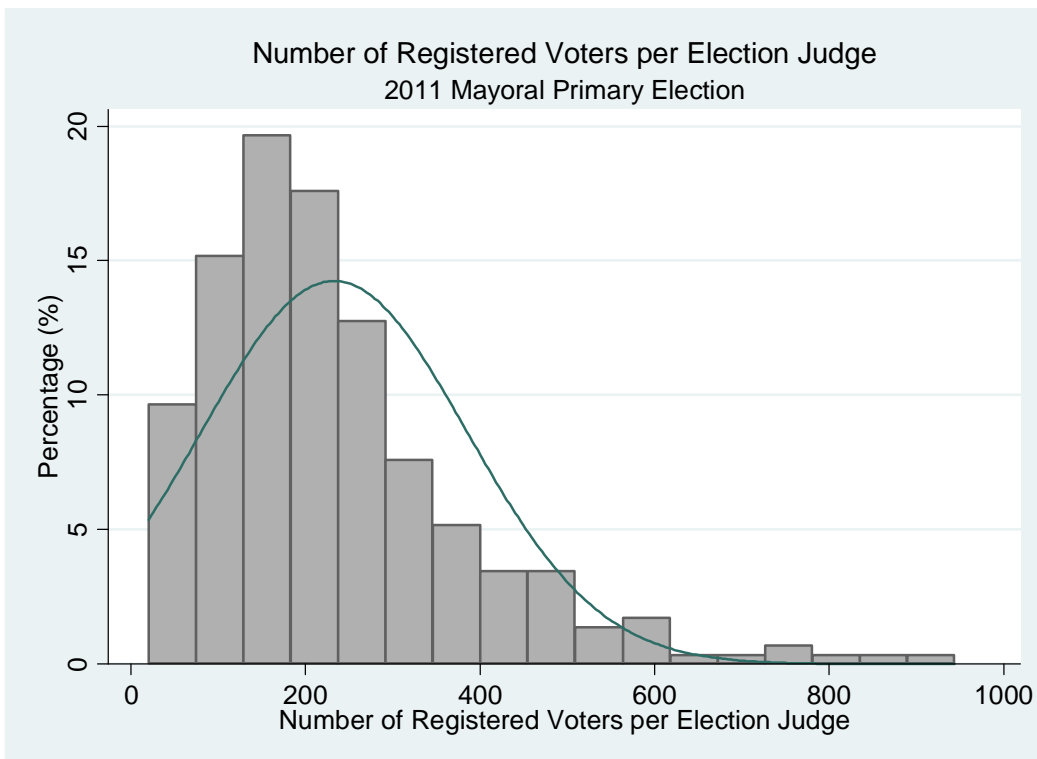
According to officials of the Board of Elections, there is no real measure of how the number of judges for each precinct is determined, but it is roughly based on the amount of election equipment and the number of registered voters. This study finds that the distributions of the number of registered voters and the number of votes per election judge is skewed with the majority of the distribution concentrated in the left side of the curve in Chart 4. This suggests that the majority of election judges were underutilized. On Election Day of the 2011 Mayoral Primary Election, only 67 precincts out of a total of 290 (23 percent) had more than 300 registered voters per election judge. 147 precincts (51 percent) had fewer than 200 registered voters per election judge. During the early voting week, there were 3,695 voters with 74 election judges, 10 of them chief judges and the rest regular judges. On average, only 10 voters were served by each election judge each day during early voting week.

The large range of the number of registered voters per election judge and, more importantly, the low number of registered voters per election judge suggest that there are more election judges than necessary for many of the precincts and that polling places are overstaffed.

Use a Staffing Model to Determine the Number of Poll Workers

One way to reduce election cost is to use a rational staffing model to determine the number of poll workers. Using a staffing model could effectively reduce election cost because poll worker-related expense[19] is the highest cost component of the conduct of elections, accounting for 31 percent of the total cost in an election. [20]

Chart 5: Cost Components of Elections

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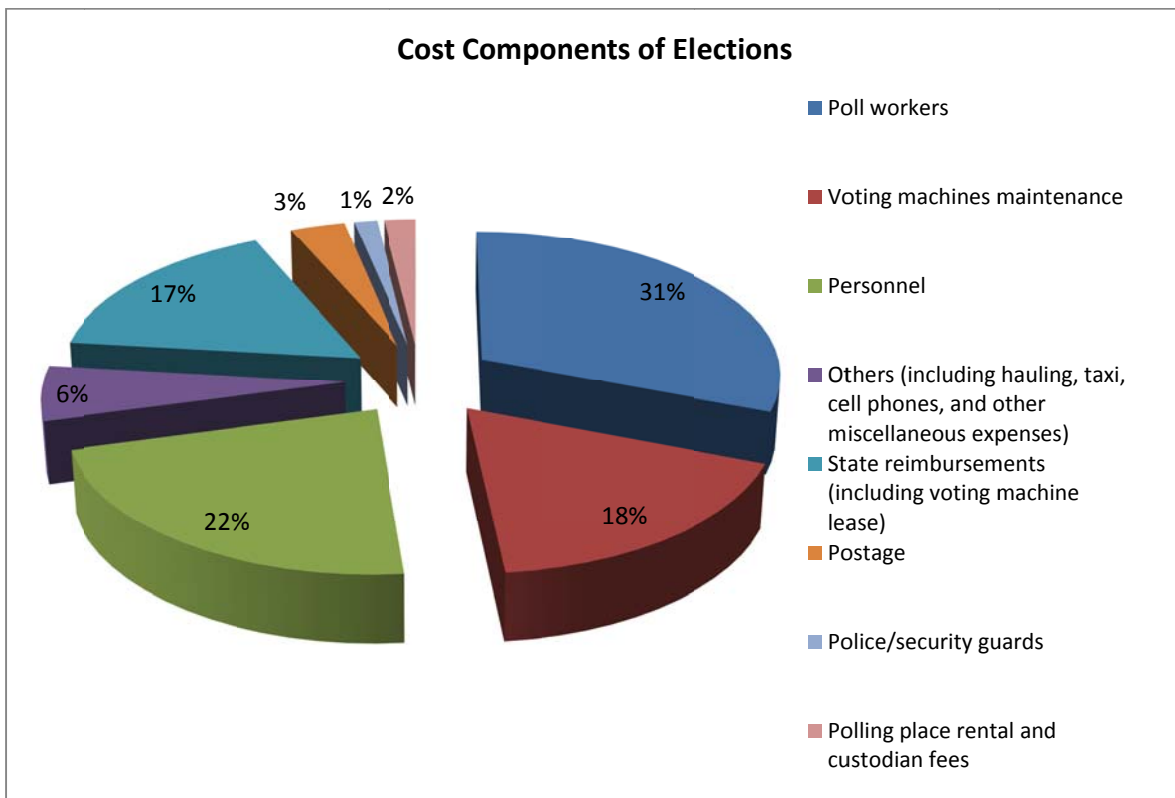
[19] Including expenses related to recruiting and training costs, salaries, and training reimbursements for poll workers.
[20] Cost components are calculated using the average cost of the last five elections from 2008 to 2012

To increase cost-effectiveness, BBMR recommends the Board of Elections to use a staffing model to determine the optimal number of poll workers for each precinct. Below are the steps BBMR recommends to estimate voter turnout and the number of poll workers needed for each election.

Formula to Determine the Number of Poll Workers Needed

1. Calculate the percentage of votes at each precinct by dividing the number of votes at each precinct by the total number of votes in the last ten elections and taking the average of the ten elections (Table 48 in Appendix I).
2. Estimate the overall voter turnout by taking the average of the last two elections of the same type plus a contingency voter turnout of 5 percent (Table 48 in Appendix I).
3. Multiply voter turnout by the estimated percentage of votes to determine the estimated number of votes at each precinct.
4. Maryland requires one voting machine for every 200 registered voters. Divide the number of registered voters in each precinct by 200 to determine the number of voting machines needed at each precinct
5. Calculate the number of voters per voting machine.
6. Add a voting machine for precincts where the number of voters per voting machine is above the 90th percentile. This can reduce average wait time for precincts with high voter turnout.
7. Maryland requires four election judges and one voting machine technician at each precinct. The number of poll workers needed at each precinct=
4 judges + 1 voting machine technician + 1 additional judge for precincts with >10 voting machines

Even though overall voter turnout fluctuates depending on the type of election, as shown in Table 36 in Appendix I, the percentage of votes at each precinct (number of votes at each precinct divided by total number of votes) remains stable. Statistical tests show that the average percentage of the last 10 elections from 2006 to 2011 was a reasonably accurate predictor (98 percent confidence level) of the percentage of votes at each precinct for the 2012 Presidential Election. Percentage of votes at each precinct in the last ten elections is shown in Table 49 and details of the statistical tests of the model can be found in Table 47 in Appendix I.

Calculations for the 2011 Mayoral Primary Election

The model for estimating the number of poll workers needed is based on three factors: 1) the number of voting machines, 2) the estimated percentage of votes at each precinct, and 3) the average voter turnout of the last two elections of the same type. Table 23 shows how the number of poll workers for the 2011 Mayoral Primary Election can be derived using the formula recommended:

Table 23: Estimated Number of Poll Workers for Election Day

Input	Calculations	Output
Estimated voter turnout	[(38.57%+31.93%)/2]+5%	40.25%
Estimated number of votes	314,095*.4025	126,491
Number of voting machines	1 per every 200 registered voters	1,570
Number of additional voting machines for precincts with number of voters per voting machine above the 90th percentile		30
Total number of voting machines	1,570+30	1,600
Number of poll workers needed at each	2 regular judges+2 chief judges+	1,461

precinct	1 voting machine tech + 1 additional judge for precincts with >10 voting machines	
Total number of poll workers	1,461+100 substitute judges	1,561

Voter turnouts from the 2003 and 2007 Mayoral Primary data are used in the calculations. The 100 additional poll workers are substitute judges that are needed to ensure polling places have adequate judges in cases when election judges do not show up and/or when voter turnout is exceedingly high. Details of how the number of poll workers is derived at each precinct are in Table 50 in Appendix I.

Using the model in Table 23, the number of voting machines is reduced from 1,686 to 1,600 and reduces the number of poll workers on Election Day from 1,987 to 1,561. The 1,561 number of poll workers consist of 290 voting machine technician, 580 chief judges, 591 regular judges, and 100 substitute judges. A similar formula can be applied to early voting week as well. Since early voting was not introduced in Baltimore City until 2010, only historical data that dates back to 2010 was used:

Table 24: Estimated Number of Poll Workers of Early Voting Week

Input	Calculations	Output
Number of votes/machines (as required by the state)	3,000/15	200
Number of election judges at each early voting site	2 chief judges + 1 voting machine tech +1 regular judge every 3 voting machines	8
Total number of poll workers for early voting	8 poll workers*5 sites	40

The Code states that the local board shall provide one voting unit for each 200 early voters at an early voting center each day. The 15 voting machines are the number of voting machines Baltimore City currently uses for each early voting site based on the number of votes estimated by the State Board.

Using the staffing model recommended by BBMR, the total number of poll workers would reduce from 2,061 to 1,601 for the 2011 Mayoral Primary Election. By reducing 426 poll workers on Election Day and 34 poll workers during early voting week, the City would save $127,266 (6.22 percent).

Table 25: Savings Generated by Using New Staffing Model

Component	Cost Before Using Staffing Model	Cost After Using Staffing Model	Percentage Change
Poll workers	507,120	414,170	-18%
Training Costs	77,401	60,807	-21%
Postage	196,392	184,342	-6%
Polling place rental and custodian fees	31,338	31,338	0%
Police/security guards	40,621	40,621	0%
Voting machines lease payment and maintenance	383,180	383,180	0%
Other State reimbursements	291,803	291,803	0%
Personnel	485,964	485,964	0%
Others	33,346	27,674	-17%
TOTAL	**$2,047,165**	**$1,919,899**	**-6.22%**

Reducing the number of election judges will not increase voters' average wait time. The skewed distribution of voters per election judge in Chart 6 shows that the efficiency of judges is currently not maximized because the majority of the distribution is concentrated in the left side of the curve. The skewed distribution also implies that there is an excessive amount of idle time with the number of election judges being employed currently. Reducing the number of judges reduces the amount of idle time, therefore increasing productivity of the election judges.

Chart 6: Number of Votes per Election Judge
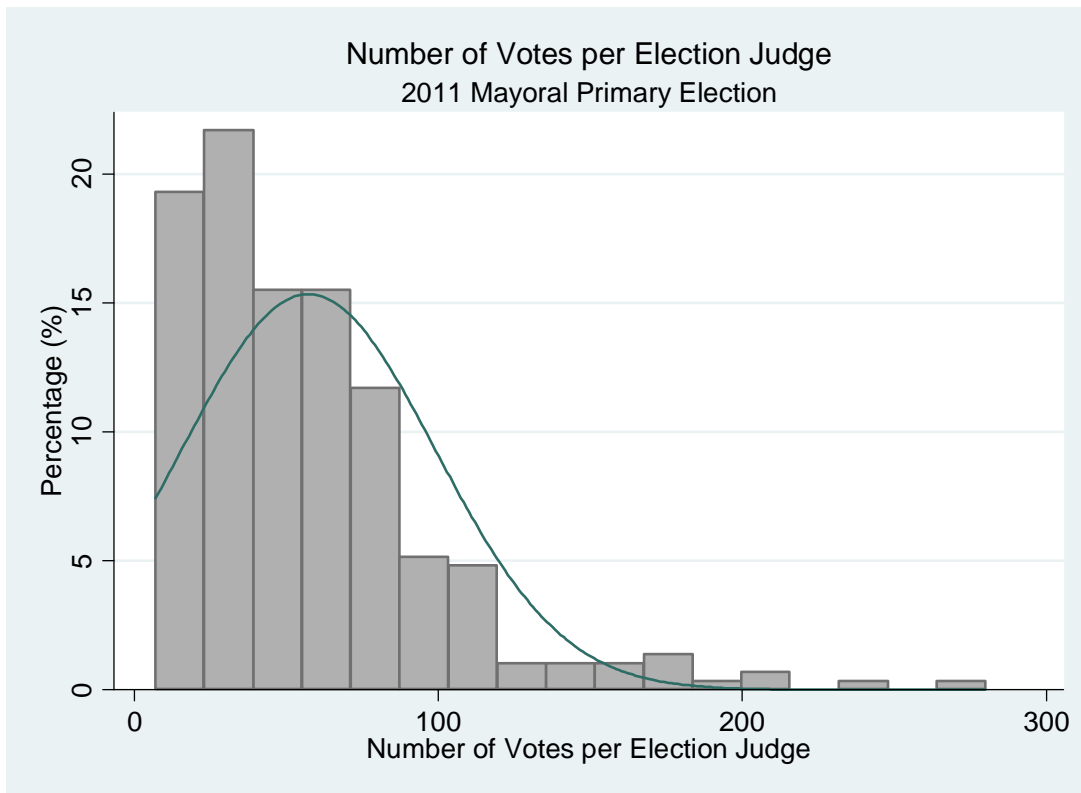
One of the major concerns about reducing the number of poll workers is that the long queues during the primary election in 2006 will happen again. The conduct of the September 2006 primary election was disorganized in Maryland with long wait times because election judges did not show up, the delivery of supplies was delayed, and electronic poll books were malfunctioning.[21] After the election, the State Board did a major investigation on the synchronization of electronic poll books and University of Baltimore's Schaefer Center for Public Policy was contracted for the recruitment and training of election judges in Baltimore City.[22] The likelihood that election judges do not show up on Election Day significantly reduces with the establishment of the new recruitment and training programs. Additionally, too few election judges were employed for the 2006 primary election. The formula in Table 23 would require the hiring of 1,516 poll workers for that election instead of the 1,375 who were employed.

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[21] From Minutes of the Maryland State Board Meeting, November 28, 2006.
[22] From "In search of Decent Judges," *Baltimore Sun*, September 15, 2006.

2. More Precincts and Polling Places than Necessary

In 2012, there were 294 precincts and 213 polling places. There can be multiple precincts in one polling place, and different precincts are separated within the polling place by cordons and signs. The Code requires each precinct to be staffed with at least four election judges and one voting machine technician regardless of voter turnout and at least one voting unit needs to be provided for every 200 registered voters and one electronic poll book needs to be provided for every 550 registered voters.

In the 2011 Mayoral Primary Election, Enoch Pratt Library (a polling place) housed two precincts (precincts 12004 and 12005). The east side was designated for precinct 12004 and the west side was designated for precinct 12005. The polling place was staffed with a total of at least eight election judges with at least four judges at each precinct. The large number of precincts and polling places in Baltimore City significantly increases the cost of conducting an election and reduces cost-effectiveness.

When compared to other Maryland jurisdictions, the number of polling places per 100,000 population in Baltimore City was 34.3 in 2012, 6.26 (22 percent) higher than the statewide average. The number of precincts and polling places per square mile were 15 and 19 times higher than the statewide average respectively, while population per square mile was only 13 times higher than the statewide average. This suggests that Baltimore City has a disproportionately high number of precincts and polling places per square mile compared to other Maryland jurisdictions.

Table 26: Precincts and Polling Places in April 2012

County	Precincts	Polling Places	Population	Land area (sq. miles)	Population per Sq. Mile	# of Precincts per Sq. Mile	# of Polling Places per Sq. Mile	# of Polling Places per 100,000 Population
Allegany	36	36	75,087	424.16	177	0.08	0.08	47.94
Anne Arundel	189	157	537,656	414.9	1,296	0.46	0.38	29.20
Baltimore City	**294**	**213**	**620,961**	**80.94**	**7,672**	**3.63**	**2.63**	**34.30**
Baltimore County	227	201	805,029	598.3	1,346	0.38	0.34	24.97
Calvert	23	23	88,737	213.15	416	0.11	0.11	25.92
Caroline	8	8	33,066	319.42	104	0.03	0.03	24.19
Carroll	35	33	167,134	447.6	373	0.08	0.07	19.74
Cecil	19	17	101,108	346.27	292	0.05	0.05	16.81
Charles	43	43	146,551	457.75	320	0.09	0.09	29.34
Dorchester	31	20	32,618	540.77	60	0.06	0.04	61.32
Frederick	79	70	233,385	660.22	353	0.12	0.11	29.99
Garrett	19	18	30,097	647.1	47	0.03	0.03	59.81
Harford	76	73	244,826	437.09	560	0.17	0.17	29.82
Howard	111	88	287,085	250.74	1,145	0.44	0.35	30.65
Kent	10	9	20,197	277.03	73	0.04	0.03	44.56
Montgomery	238	230	971,777	491.25	1,978	0.48	0.47	23.67

Prince George's	235	220	863,420	482.69	1,789	0.49	0.46	25.48
Queen Anne's	16	16	47,798	371.91	129	0.04	0.04	33.47
St. Mary's	31	27	105,151	357.18	294	0.09	0.08	25.68
Somerset	23	12	26,470	319.72	83	0.07	0.04	45.33
Talbot	12	9	37,782	268.54	141	0.04	0.03	23.82
Washington	54	48	147,430	457.78	322	0.12	0.10	32.56
Wicomico	38	30	98,733	374.44	264	0.10	0.08	30.38
Worchester	18	18	51,454	468.28	110	0.04	0.04	34.98
Maryland	**1,865**	**1,626**	**5,773,552**	**9,707.23**	**595**	**0.19**	**0.17**	**28.04**

When compared to other major cities, the number of precincts per 1,000 units of population density in Baltimore City was the fifth among the ten cities, following Chicago, Detroit, Milwaukee, and St. Louis.

Table 27: Comparison among Cities

	Number of Precincts	Land area (sq. mile)	Population	Population Density (Population/ sq. Mile)	Number of Precincts per Sq. Mile	Number of Precincts /100,000 Population	Number of Precincts/ 1,000 units of Population Density
Baltimore	**294**	**80.94**	**620,961**	**7,672**	**3.63**	**47.35**	**38.32**
Boston, MA	254	48.28	617,594	12,792	5.26	41.13	19.86
Chicago, IL	2,034	227.63	2,707,120	11,893	8.94	75.14	171.03
Detroit, MI	599	138.75	706,585	6,220	4.32	84.77	123.51
Milwaukee, WI	327	96.12	597,867	6,220	3.40	54.69	52.57
Minneapolis, MN	117	53.97	382,578	7,089	2.17	30.58	16.51
Richmond, VA	65	59.81	204,214	3,414	1.09	31.83	19.04
St. Louis, MO	222	61.91	318,069	5,138	3.59	69.80	32.69
San Francisco, CA	567	46.87	812,826	17,342	12.10	69.79	43.21
Washington, DC	143	61	601,723	9,864	2.34	23.77	14.50

Baltimore City's high number of precincts and polling places per square mile and per 100,000 population when compared with other Maryland jurisdictions and other major cities suggests that 1) the number of precincts and polling places are higher than necessary and 2) polling places are not used in ways that maximize the use of resources. Map 1 shows the 213 polling places in Baltimore City in 2012. Polling places were on average 0.62 miles away from each other.

Map 1: Polling places in Baltimore City in 2012
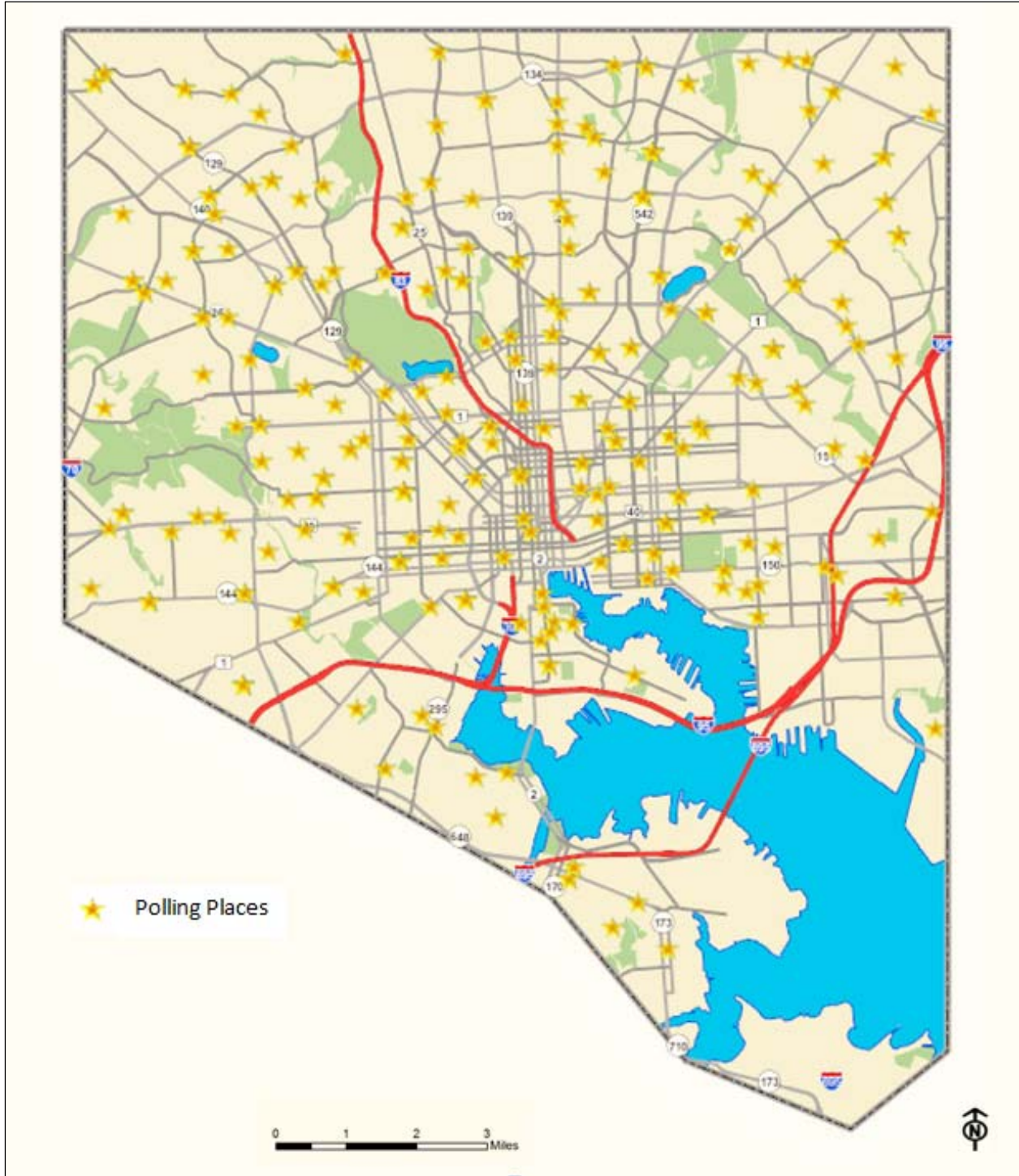
Co-Locate Additional Precincts

One alternative to maximize the use of each polling places is to co-locate additional precincts. Co-locating precincts means there would be more than one precinct at one polling place. The Code of Maryland states that a polling place must be in the precinct that it serves unless no suitable location can be found within that precinct,

in which case the Board may establish the polling place in an adjacent precinct. Baltimore City would need to have further discussions with the State if this alternative is to be implemented to ensure that co-locating precincts is in accordance with State law.

If precincts were co-located, citizens from different precincts would go to the same polling place on Election Day, and there would be different entry lines for citizens from different precincts. According to the list of polling places in 2012, there were 34.3 polling places per 100,000 populations in Baltimore and polling places were on average 0.62 miles away from each other[23]. If Baltimore City co-locates precincts using the statewide average of 28 polling places per 100,000 population, there would still be 294 precincts but only 174 polling places. The average distance between each location would increase from 0.62 to 0.68 miles.

By co-locating precincts, there would only be minimal savings in any rental and custodian costs because some of the savings would be offset by the extra cost of renting larger polling places. There will also be extra costs related to programming voting machines to accommodate voters from more than one precinct. However, there would be significant savings generated from fewer election judges and security guards, lower costs associated with the hauling of tables and chairs and taxi cabs, and lower recruitment postage fees with fewer judges. Table 28 below shows the cost before and after co-locating precincts for the 2011 Mayoral Primary Election. The estimated savings includes savings generated from reducing the number of poll workers.

Table 28: Cost Before and After Co-Location of Precincts

Component	Cost Before Co-Location	Cost After Co-Location	Percentage Change
Poll workers	507,120	414,970	-18%
Training Costs	77,401	60,807	-21%
Postage	196,392	178,185	-9%
Polling place rental and custodian fees	31,338	27,201	-13%
Police/security guards	40,621	33,183	-18%
Voting machines lease payment and maintenance	383,180	383,180	0%
Other State reimbursements	291,803	291,803	0%
Personnel	485,964	485,964	0%
Others	33,346	26,587	-20%
TOTAL	**$2,047,165**	**$1,901,080**	**-7.14%**

Table 28 shows that the cumulative savings of reducing the number of poll workers to 1,561 and providing 174 polling places instead of the original 213 places is $146,085, a 7.14 percent decrease from the current cost. The cost estimate for the co-location scenario includes additional costs in obtaining larger polling sites, and the additional savings compared to the scenario of reducing poll workers come from savings related to security guards and police, the hauling of equipment, printing costs, postage, and taxi fees.

Cost savings in the co-location of precincts is driven by the reduced number of poll workers. If the number of poll workers remains unchanged from current practice, co-locating precincts would only save one percent of total election costs.

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[23] Distance between polling locations=(80.94 sq. miles/213 locations)^.5=0.62

Table 29: Cost Before and After Co-Location of Precincts without Staffing Change

Component	Cost Before Co-Location	Cost After Co-Location	Percentage Change
Poll workers	507,120	507,120	0%
Training Costs	77,401	77,401	0%
Postage	196,392	190,235	-3%
Polling place rental and custodian fees	31,338	27,201	-13%
Police/security guards	40,621	33,183	-18%
Voting machines lease payment and maintenance	383,180	383,180	0%
Other State reimbursements	291,803	291,803	0%
Personnel	485,964	485,964	0%
Others	33,346	32,259	-3%
TOTAL	**$2,047,165**	**$2,028,346**	**-1%**

Chart 7: Co-Locating Additional Precincts

Reduce 460 Poll Workers (Saves $127,266)

➕

Savings Related to Co-Location of Precincts (Saves $18,819)

➡️

Co-Locate Additional Precincts (Saves $146,085)
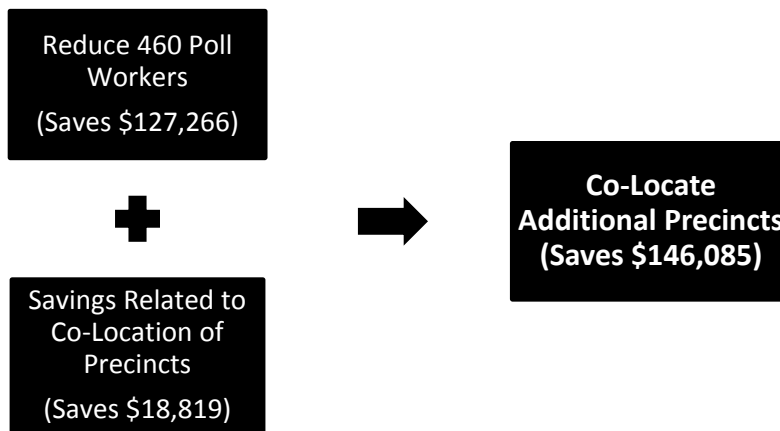
Co-locating precincts will not increase average wait time because the same number of voting machines and election judges are used. Co-locating precincts, however, may reduce the accessibility of polling places and thus lower voter turnout. To increase voter turnout, BBMR recommends the Board of Elections to examine the feasibility of coordinating transportation for voters who are unable to access polling places due to inconveniences related to transportation. More detailed discussions of the use of transportation and health care facilities coordinators to increase voter turnout can be found later in the report.

Consolidation of Entry Lines

If precincts were co-located, citizens from different precincts would go to the same polling place designated for those precincts on Election Day, but there would be different entry lines for citizens from different precincts and each precinct would have its own set of election judges and voting units. By consolidating entry lines of co-

located precincts, citizens from different precincts would enter with a single-entry line instead of multiple entry lines according to the citizens' precincts.[24]

This scenario envisions 294 precincts with 174 polling places. Assuming that each polling place has an average of eight poll workers[25], the cumulative savings of reducing poll workers, co-locating precincts, and consolidating entry lines is $164,099, reducing election costs by 8.02 percent. The cost estimate for the consolidation entry lines scenario includes the estimated cost increase related to renting larger polling places and reprogramming voting machines to accommodate a larger number of voters at each polling place.

Table 30: Cost Before and After Consolidating of Entry Lines

Component	Cost Before Consolidating Entry Lines	Cost After Consolidating Entry Lines	Percentage Change
Poll workers (1,532 poll workers in total)	507,120	405,340	-25%
Training Costs	77,401	60,807	-21%
Postage	196,392	172,228	-12%
Polling place rental and custodian fees	31,338	29,189	-7%
Police/security guards	40,621	33,183	-18%
Voting machines lease payment and maintenance	383,180	377,965	-1%
Other State reimbursements	291,803	291,803	0%
Personnel	485,964	485,964	0%
Other	33,346	26,587	-20%
TOTAL	**$2,047,165**	**$1,883,066**	**-8.02%**

Chart 8: Consolidating Entry Lines

Reduce 529 Poll Workers (Saves $142,538)

➕

Savings Related to Co-Location of Precincts (Saves $18,819)

➕

Other Savings Related to Consolidation of Entry Lines (Saves $2,742)

➡ **Consolidating Entry Lines (Saves $164,099)**

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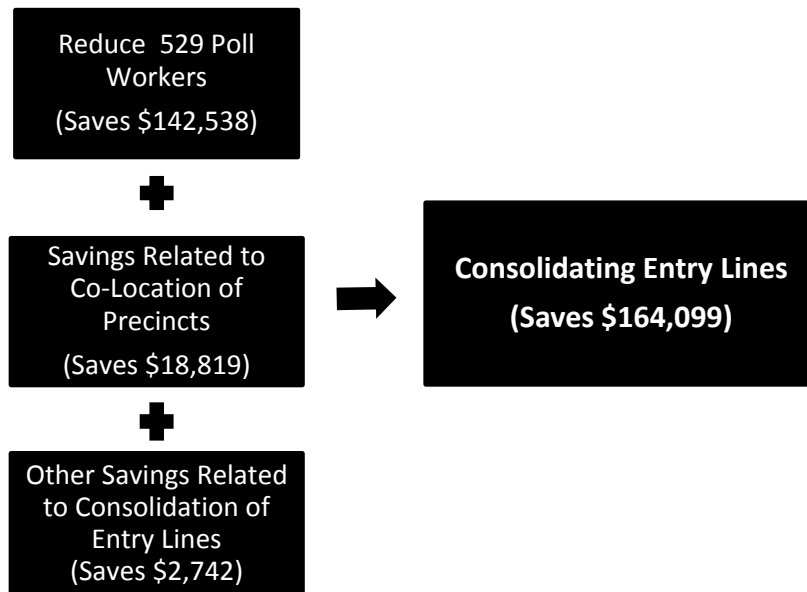
[24] From "Vote Centers and Election Costs," by The Indiana Fiscal Policy Institute, 2010, http://www.in.gov/sos/elections/files/IFPI_Vote_Centers_and_Election_Costs_Report.pdf
[25] The eight poll workers include two voting machine technicians, two chief judges, and four regular election judges.

Average wait time remains the same when entry lines are consolidated. Although the number of poll workers is reduced with fewer polling places, the number of voting machines remains the same and the higher number of voters at each polling places are served by a proportionately higher number of poll workers. The reduction in the number of poll workers therefore only results in reduced idle time and does not increase wait time for voters.

Reduce the Number of Precincts

The scenario of consolidating entry lines can also be applied to reducing the number of precincts. If Baltimore City reduces the number of precincts from 294 to 174, the fiscal impact is the same as consolidating entry lines for co-located precincts, reducing election costs by 8.02 percent. Reducing the number of precincts is, however, a more direct alternative to save costs and can potentially cause less confusion to voters than the alternative of consolidating entry lines of co-located precincts.

While reducing the number of precincts is a more direct way to reduce election costs, there are legal issues involved. There is currently no legal requirement for a certain number of precincts in Baltimore City. The Maryland Code currently authorizes the local board to create and alter the boundaries for precincts, designate the location for polling places, and combine or abolish precincts, according to Election Law Article, Section 2-303.

There are, however, various issues that Baltimore City needs to consider when reducing the number of precincts. First, the Code mandates that a precinct may not be created, and the boundaries of a precinct may not be changed, so as to cross any district boundary. [26] The State Board of Elections defines district as Ward, Council District, Legislative District, or Congressional District. Second, reducing the number of precincts would reduce the accessibility of polling places. Baltimore City voters, unlike voters in other jurisdictions, often walk to a polling place instead of driving. This is a unique requirement that Baltimore City needs to consider when reducing the number of precincts.

Establish Vote Centers

Under current practice, most polling places have one precinct, and when multiple precincts are co-located in a polling place, voters from different precincts are separated by cordons and signs so that they can be served by the appropriate set of poll workers and voting machines specific to their precincts. By establishing vote centers, voters choose to vote in any one of several larger, strategically located polling sites throughout the City on Election Day instead of using traditional neighborhood precincts.

This scenario envisions 30 vote centers in Baltimore City on Election Day, and the five polling places for the six-day early voting week remains unchanged. The 30 vote centers would be located throughout the City such that they would be around 1.64 miles away from one another.[27] For each vote center, there would be 10 chief judges, 15 regular judges, five voting machine technicians, and five trouble shooters.[28] Troubleshooters are responsible for traffic flow through the vote center and for identifying technology issues that arise.

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[26] COMAR 33.15.02.02
[27] The land area of Baltimore City is 80.94 square miles. Distance between each vote center=(80.94/30)^.5=1.64 miles.
[28] The number of poll workers is determined using the vote center model in Colorado. The use of vote centers decreased the number of Election judges needed by 50 percent in Larimer County, Colorado in 2003.

Vote centers require larger polling places than do traditional precincts; however, the economies of scale created by using the vote center model mitigate some of the costs of administering an election, therefore reducing the number of poll workers, machines, and sites needed. Table 31 shows the differences in costs using traditional precincts and vote centers.

**Table 31: Comparison of Costs between Traditional Precincts and Vote Centers
for the 2011 Mayoral Primary Election**

	Traditional Precincts	Vote Centers	Change
BEFORE ELECTION CYCLE			
Recruitment postage fees	27,300	14,426	-47%
Voters' cards postage fees	17,664	17,664	0%
Sample ballots' postage fees	31,193	31,193	0%
Printing Costs	119,141	95,313	-20%
TOTAL	$195,298	$158,596	-19%
EARLY VOTING			
Poll workers training reimbursement	1,480	920	-38%
Poll workers' salary	66,000	46,500	-30%
Private Polling places rental fees	4,200	3,431	-18%
Public polling places custodian fees	1,068	872	-18%
School police	6,471	5,286	-18%
Signs	1,094	894	-18%
TOTAL	$80,313	$57,783	-49%
ELECTION DAY			
Absentee voting postage fees	957	957	0%
Poll workers' training reimbursement	39,740	21,000	-54%
Poll workers' salary	399,900	247,500	-45%
Poll workers' training cost (by Schaefer Center)	77,401	40,901	-47%
Private Polling places' rental fees	19,600	15,000	-23%
Public Polling places' custodian fees	6,470	6,470	0%
Police overtime	32,800	17,333	-47%
Library security guards overtime	1,350	713	-47%
Hauling of Table and chairs	5,937	3,137	-47%
Taxi cabs	20,063	10,602	-47%
Voting machines maintenance (McAfee)	383,180	395,210	+3%
Poll workers' cell phones (AT&T)	6,389	3,376	-47%
Voting machines and other state reimbursement	291,,803	320,983	+10%
Transportation and health care facilities coordinators	-	*25,000*	*+100%*
TOTAL	$1,285,590	$1,079,002	-16%
SALARIES DURING ELECTION CYCLE			
State Employees' Salaries (total salary*30%)	462,581	462,581	0%
Board Members' Salaries, OPCs, Overtime, and temporary employees	23,383	23,383	0%
TOTAL	$485,964	$485,964	**0%**
5% Contingency Amount		*$85,000*	*+100%*
TOTAL COSTS OF THE 2011 MAYORAL PRIMARY	**$2,047,165**	**$1,891,346**	**-7.61%**

Establishing vote centers would reduce election costs by 7.61 percent, totaling $155,819. The savings assumes the rental of 15 public and 15 private polling places, with the private polling places costing $2,000 each on Election Day. Security guard and police overtime costs would be 50 percent of the traditional precinct method of conducing elections, and voting machines maintenance would reduce by 20 percent. These savings are generated through the economies of scale. The costs of training and hiring five trouble shooters per voting center are also built-in to the scenario because of difficulties with traffic flow and unforeseen challenges when operating a large vote center. Additionally, a contingency amount of five percent ($85,000) is built-in to allow for unforeseen problems and extra costs that are unaccounted for.[29]

There would be minimal increases in costs related to the reprogramming of the voting machines. According to McAfee Election Services, Baltimore City's current vendor of voting machine preparation, there would be a $20.60 increase in programming cost per voting machine if the voting machines are reprogrammed to allow all voters to vote, regardless of precincts. The increase in cost is because of the increased programing and testing time with the larger memory cards needed for the voting machines. Baltimore City currently leases 32 megabyte memory cards from the State Board. To accommodate all voters, Baltimore City would require the use of 128 megabyte memory cards instead. This additional cost of memory cards is also built-in to the model in Table 31.

Using vote centers as an alternative voting method will not increase wait time. There would be 56 voting machines at each vote center since the State requires one voting machine for every 200 registered voters. During peak hours on Election Day, there will be 837 voters per hour (one voter every 4.3 seconds) with a 70 percent voter turnout. With 56 voting machines and 25 judges (including both chief and regular judges), the simulated average wait time would reduce from the 16 minutes to 14 minutes using vote centers instead of traditional precincts (see Table 51 in Appendix I).

One of the drawbacks of establishing vote centers is accessibility. To make sure all persons can access vote centers, Baltimore City should seek buildings located along bus routes and major thoroughfares for use as vote centers. Voters who still require transportation can be referred to transportation coordinators who run passenger vans on Election Day. Additionally, Baltimore City could promote voting opportunities for persons residing in health care facilities or retirement communities. Baltimore City can coordinate with health care facilities to personally deliver mail-in ballots to their residents, providing one member from each local major political party to assist the voters and return completed ballots to the local Board. The additional costs of hiring transportation and health care facilities coordinators are built-in to the model in Table 31.

3. Low Voter Turnout

While Baltimore City has the highest number of precincts, its voter turnout has historically been low compared to other Maryland jurisdictions. Only 14.76 percent of registered voters voted in Baltimore City, compared to 18.78 percent in the State of Maryland in the 2012 Presidential Primary Election. The districts with the highest voter turnout were the Northern and Northwestern districts, and the districts with the lowest voter turnout were the Southern, Southeastern, and the Eastern districts (see Map 2 in Appendix I). Table 32 below shows the percentage of voters who voted in all Maryland jurisdictions in the 2012 Presidential Primary Election and the 2008 Presidential Primary and General Elections:

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[29] The 5% contingency amount is based upon the vote center model of Larimer County, Colorado.

Table 32: Baltimore City's Voter Turnout Compared to MD Jurisdictions

County	2012 Presidential Primary Voter Turnout	2008 Presidential General Voter Turnout	2008 Presidential Primary Voter Turnout
Allegany	28.39%	71.35%	31.47%
Anne Arundel	21.26%	79.43%	45.24%
Baltimore City	**14.76%**	**68.21%**	**38.25%**
Baltimore County	19.72%	76.59%	42.67%
Calvert	20.85%	79.95%	35.14%
Caroline	20.30%	75.92%	44.44%
Carroll	17.58%	80.91%	32.77%
Cecil	24.42%	72.60%	28.61%
Charles	18.02%	80.57%	48.73%
Dorchester	22.27%	79.78%	49.51%
Frederick	23.56%	83.46%	40.18%
Garrett	28.67%	71.88%	35.80%
Harford	22.63%	83.03%	43.06%
Howard	19.55%	83.55%	43.60%
Kent	31.18%	79.62%	52.94%
Montgomery	15.81%	79.55%	45.14%
Prince George's	15.33%	76.58%	48.33%
Queen Anne's	25.26%	82.79%	42.82%
St. Mary's	22.20%	77.57%	44.85%
Somerset	19.25%	77.46%	44.38%
Talbot	28.96%	82.92%	48.72%
Washington	28.75%	73.07%	34.66%
Wicomico	20.97%	80.14%	48.86%
Worchester	23.35%	80.45%	47.55%
State of Maryland	**18.78%**	**77.63%**	**42.86%**

Baltimore City's turnout has historically been low compared to other major cities as well. When compared to nine other cities' voter turnout in mayoral elections from 1979 to 2003, Baltimore City's median turnout was third to the lowest:

Table 33: Mayoral Elections' Voter Turnout Compared to Major Cities[30]

Major Cities	Median Turnout of Mayoral Elections
Philadelphia	44%
Memphis	37%
Portland	36%
Washington, DC	33%
Cleveland	30%
Pittsburgh	27%
Boston	26%
Baltimore	**22%**
Minneapolis	19%
Phoenix	13%

When compared to 37 cities that have a population of over 500,000, Baltimore City's median turnout ranked 28th, as shown in Table 48 in Appendix I. The low voter turnout was possibly due in part to off-year Mayoral Elections. Empirical research indicates that elections held on days different from Presidential or other major offices are generally marked by lower turnout as there is less public attention focused on the election and fewer overall resources devoted to turnout. [31]When compared to the same cities' voter turnout in presidential elections from 2000 to 2012, Baltimore City's ranking was significantly higher:

Table 34: Presidential Elections' Voter Turnout Compared to Major Cities

Major Cities	Average Turnout of Presidential Elections
Philadelphia	39%
Memphis	40%
Portland	63%
Washington, DC	37%
Cleveland	46%
Pittsburgh	43%
Boston	35%
Baltimore	**43%**
Minneapolis	40%
Phoenix	49%

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[30] From "Big City, Big Turnout? Electoral Participation in American Cities," by Neal Caren, 2007, *University of Michigan,* http://www.unc.edu/~ncaren/publications/files/bigcity.pdf
[31] From "Municipal Institutions and Voter Turnout in Local Elections," by Zoltan L. Hajnal and Paul G. Lewis, 2003, Urban Affairs Review, http://www.sarasotagov.com/InsideCityGovernment/Content/CAC/PDF/UofCalifornia.pdf

<u>Increase Voter Turnout</u>

Maryland has experimented with various alternative voting methods to increase voter turnout over the years. Maryland started implementing Election Day as a State holiday in 1882, but evidence indicates that Election Day holiday does not increase voter turnout when turnout data from States with Election Day State holidays are compared with the turnout data from States without Election Day holidays and with the entire country.[32] In 2010, Maryland implemented early voting, allowing voters to vote at any early voting site during the six-day early voting week before Election Day. There is currently no evidence that early voting week has an impact on voter turnout.

To increase voter turnout in municipal elections, Baltimore City will be aligning the mayoral elections with presidential elections starting in 2016. Empirical evidence indicates that controlling for other factors, municipal elections that coincide with presidential elections increase voter turnout by 36 percent compared to off-cycle municipal elections.[33] To address the fundamental goal of increasing civic engagement, however, Baltimore City should examine other alternate voting methods to increase voter turnout.

As mentioned in the report earlier, establishing vote centers can generate significant savings and increase cost-effectiveness. Although there is no hard evidence that establishing vote centers can increase voter turnout, voter turnout increased significantly following the introduction of vote centers in Larimer County, Colorado in 2003. Voter turnout increased from 62 percent to 79 percent from 2000 to 2004 (both presidential general elections), as shown in Table 35:

Table 35: Larimer County Election Year Totals

Voting Method	Election	Year	Total Registered	Total Early Voted	Vote Center or Precinct Voting	Total Voted	Voter Turnout
Vote Center	*General*	*2004*	*199,129*	*92,933*	*52,481*	*147,112*	*78.88%*
Precinct Voting	General	2002	188,168	45,560	48,919	95,276	50.63%
	General	2000	191,124	61,402	57,582	119,201	62.37%
	General	1998	166,700	30,370	56,484	86,875	52.11%

Voter turnout in Colorado increased by 14 percent from 2000 to 2004, whereas the voter turnout increase in Larimer County was 26 percent. The significantly larger increase in voter turnout in Larimer County versus Colorado as a whole suggests that the increased convenience of vote centers as opposed to traditional precincts encouraged more votes in the 2004 General Election.

Table 36: Larimer County and Colorado Voter Turnout

	2000 General Election	2004 General Election	% Change
Larimer County	62.37%	78.88%	26%
Colorado	53.7%	61.2%	14%

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[32] From "Alternative Voting Methods," by U.S. Election Assistance Commission, 2008, http://www.eac.gov/assets/1/workflow_staging/Page/54.PDF

[33] From "Municipal Elections in California: Turnout, Timing, and Competitions," by Zoltan L. Hajnal, Paul G Lewis, and Huge Louch, 2002.

The increase in voter turnout in Larimer County was also the largest when compared to other major cities' voter turnout in the 2000 and 2004 Presidential Elections, as shown in Table 37:

Table 37: Presidential General Elections (2000 and 2004)

	Population	2000 Presidential General	2004 Presidential General	% Change
Larimer County	305,525	62%	79%	26%
Philadelphia	1,536,471	55%	64%	16%
Memphis	652,050	42%	44%	4%
Portland	593,820	78%	85%	9%
Washington, DC	601,723	58%	60%	3%
Cleveland	393,806	58%	68%	18%
Pittsburgh	307,484	64%	70%	10%
Boston	617,594	55%	59%	6%
Baltimore	620,961	63%	70%	11%
Minneapolis	387,753	82%	70%	-15%
Phoenix	1,469,471	75%	78%	5%

Increased voter turnout in Larimer County could be due in part to increased public relations work performed by local officials. Early in the process of establishing vote centers, local officials contracted with an outside public relations expert to address the voter education challenges of the project. Because vote centers represented a major change to the traditional voting process, election officials developed a comprehensive plan for systematically informing voters of and preparing them for the new system of voting on Election Day.

The Larimer County vote center example suggests that vote centers can increase voter turnout under three conditions: 1) vote centers are strategically located such that it provides additional convenience to voters, 2) effective publicity work is performed early in the process to inform and prepare voters, and 3) vote centers are well-equipped with enough election judges and voting machines on Election Day. The goal of examining the feasibility of vote centers is to find ways to reduce election costs and increase voter turnout in Baltimore City, both of which are essential to increasing cost-effectiveness, as shown in Table 38:

Table 38: Cost-Effectiveness of the Conduct of Elections

	2011 Mayoral Primary	2010 Gubernatorial Primary	2008 Presidential General
# of Votes	77,191	164,556	251,127
Voter Turnout	24.58%	48.16%	68.21%
Cost of Election	$2,047,165	$2,869,500	$3,248,517
Cost per Vote	**$26.52**	**$17.44**	**$12.94**

While cost per vote is a valid and useful cost-effectiveness indicator, the Board of Elections should consider having a wider range of performance indicators. BBMR recommends that the Board measures average wait time, voter satisfaction, and election judges' utilization rate by precinct.

Summary of Alternatives to Increase Cost-Effectiveness

The low cost-effectiveness of conducting elections in Baltimore City is due to several factors: 1) polling places have more staff than necessary, 2) there are more precincts and polling places than necessary, and 3) low voter turnout. The table below shows how each alternative can tackle these problems and reduce the cost of conducting elections, with using the staffing model generating the most savings. Baltimore City would need to have further discussions with the State Board if these alternatives are to be implemented to ensure that the way Baltimore City conducts elections is still in accordance to State law.

Table 39: Alternatives to Increase Cost-Effectiveness

Alternatives	Savings from Using Staffing Model	Additional Savings	Cumulative Savings ($)	Cumulative Savings (%)
Use Staffing Model	$127,266	-	$127,266	6.18%
Co-Locate Precincts	$127,266	$18,819	$146,085	7.14%
Consolidate Entry Lines	$142,538	$21,561	$164,099	8.02%
Reduce Precincts	$142,538	$21,561	$164,099	8.02%
Establish Vote Centers	$191,200	-	$155,819[34]	7.61%

State Requirements

Voting Machines

The current number of voting machines on Election Day is determined by the State requirement that one voting unit needs to be provided for every 200 registered voters. This requirement is higher than the nationwide average. The average number of registered voters per voting unit for all the states in the U.S. that use Diebold Recording Electronic (DRE) voting machines is 353. Table 40 below shows the number of registered voters and voters per voting units in states that use DRE voting machines in the 2010 Gubernatorial Election.

Table 40: Registered Voters per DRE Voting Machine[35]

State	Number of Registered Voters	Number of DRE Machines	Registered Voters per DRE Machine	Voters per DRE Machine
Delaware	623,425	1,338	466	237
Georgia	5,748,459	26,436	217	99
Indiana	4,329,977	20,951	207	86
Louisiana	2,935,062	8,941	328	145
Maryland	**3,468,287**	**15,209**	**228**	**123**
New Jersey	5,135,830	11,244	457	194

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[34] Vote centers' cumulative savings is less than poll workers savings because of additional expenditure related to transportation coordinators and contingency amount

[35] The 2010 Election Administration and Voting Survey, Election Assistance Commission, http://www.eac.gov/assets/1/Documents/990-281_EAC_EAVS_508_revised.pdf

Pennsylvania	8,220,759	11,305	727	359
South Carolina	2,630,363	10,302	255	132
Tennessee	3,952,404	8,633	458	188
Texas	13,262,432	34,210	388	148
Virginia	5,032,135	8,040	626	275
AVERAGE	**5,030,830**	**14,237**	**353**	**156**

If Baltimore City uses the nationwide average of one voting machine per 353 registered voters instead of 200 registered voters, only 920 voting machines would be needed instead of 1,600. Reducing the number of voting machines from 1,600 to 920 would reduce voting machine leasing and maintenance costs by $101,521 per election.

Table 41: Voting Machines' Savings

	One Voting Machine per 200 Registered Voters	One Voting Machine per 353 Registered Voters	Savings (%)
Voting Machine Lease	24,635	14,165	-43%
Voting Machine Maintenance	383,180	292,128	-24%
TOTAL	**$407,815**	**$306,293**	**-24.89%**

It is the intent of the General Assembly to acquire the new Optical Scan Voting System beginning in Fiscal 2015.[36] Based on a study prepared for Maryland Department of Legislative Reference,[37] the new Optical Scan System is estimated to cost the State Board $35 million. Baltimore City can expect its share for the new voting system to be $434,000 in Fiscal 2015, $930,000 in Fiscal 2016, and $930,000 in Fiscal 2017.

BBMR recommends that the State Board of Elections consider the feasibility of reducing the number of voting machines required as the State acquires the new optical scan voting system for all Maryland Counties in Fiscal 2015. BBMR also recommends a voting machine requirement based on the number of estimated votes instead of registered voters to increase the productivity of voting machines and maximize the use of resources.

If Baltimore City uses the nationwide average of 156 votes per voting machine and estimates the number of voting machines needed based on the expected number of votes, the 2011 Mayoral Primary Election would only require 592 voting machines instead of 1,600. The 595 voting machines already include 100 contingency voting machines. Reducing the number of voting machines from 1,600 to 595 would reduce costs by $150,500, a 7.4 percent decrease in election costs.

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[36] Senate Bill 1301, http://mlis.state.md.us/2012s1/chapters_noln/Ch_1_sb1301T.pdf, p. 44-45
[37] "Maryland Voting Systems Study," by RTI International, http://mlis.state.md.us/2010rs/misc/2010votingsystemsstudyreport.pdf

Election Judges

Election Judges' Compensation

The Code of Maryland currently requires local boards to compensate regular election judges $150 and chief judges $200 on Election Day. The compensation rates are the highest among comparison cities, as shown in Table 42 below.

Table 42: Chief Judges' Compensation Rates

Cities	Chief Judges' Compensation Rates
Baltimore, MD	**200**
Boston, MA	150
Chicago, IL	150
Detroit, MI	185
Milwaukee, WI	100
Minneapolis, MN	114
San Francisco, CA	170
St. Louis, MO	195
Washington, DC	160
AVERAGE	**$158**

BBMR recommends the State Board to explore the feasibility of reducing election judges' compensation rates to the national average. Reducing election judges' compensation rates would significantly reduce cost because expenditure related poll workers is the highest cost component in election administration, as discussed earlier in the report. If Baltimore City compensates election judges using the national average compensation rates, election costs would reduce by $75,000 per election.

Early Voting

All Maryland jurisdictions are required to conduct early voting that lasts for six days as a result of the passage of House Bill 1179 in 2008. The operation of 46 early voting centers in Maryland costs around $2.6 million per election, and since Maryland implemented early voting in 2010, voter turnout has not increased with only 2.4 percent of registered voters who used early voting centers in the 2010 and 2012 primary elections and 6.3 percent in the 2010 general election.[38]

Early voting costs Baltimore City around $80,000 per election. The cost includes rental costs of polling places, voting machines maintenance cost, and training and compensation for poll workers. BBMR recommends the State to use other major cities as an example and conduct early voting at City Hall or other municipal buildings to reduce costs and to continue providing early voting to Maryland voters.

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[38] From "Early Voting Costs Counties $2.6 M, but hasn't increased voter turnout yet," by Glynis Kazanjian, Maryland Reporter, September 10, 2012, http://marylandreporter.com/2012/09/10/early-voting-costs-counties-2-6m-but-hasnt-increased-turnout-yet/

OTHER JURISDICTIONS' ALTERNATIVE VOTING METHODS COULD PROVIDE INSIGHTS TO ENHANCE COST-EFFECTIVENESS

As Baltimore City's Board of Elections examines alternatives to enhance cost-effectiveness, alternative voting methods employed by other states and cities could provide insights for the City's efforts. Alternative voting methods examined in this report include:

1. Vote centers
2. Vote-by-mail
3. Permanent absentee voting
4. Online voting

The goal of examining different alternative voting methods is so that Baltimore City can chart the future of its own system of election administration with the most information possible.

1. Vote Centers

Colorado was a pioneer in experimenting with vote centers. More than 20 counties in Colorado have used the vote center model in at least one election. Phoenix, Arizona also recently started using the vote center model, using 26 vote centers in its last election.

Vote centers are located in high-profile, major-traffic areas rather than in neighborhood schools or churches, and voters are not restricted to vote at his/her precinct only. This new method of voting could reduce the number of provisional ballots needed for each election, because any registered voter can choose to vote in any vote center. The chart below shows how vote centers are administered:

Chart 9: Vote Center Stations
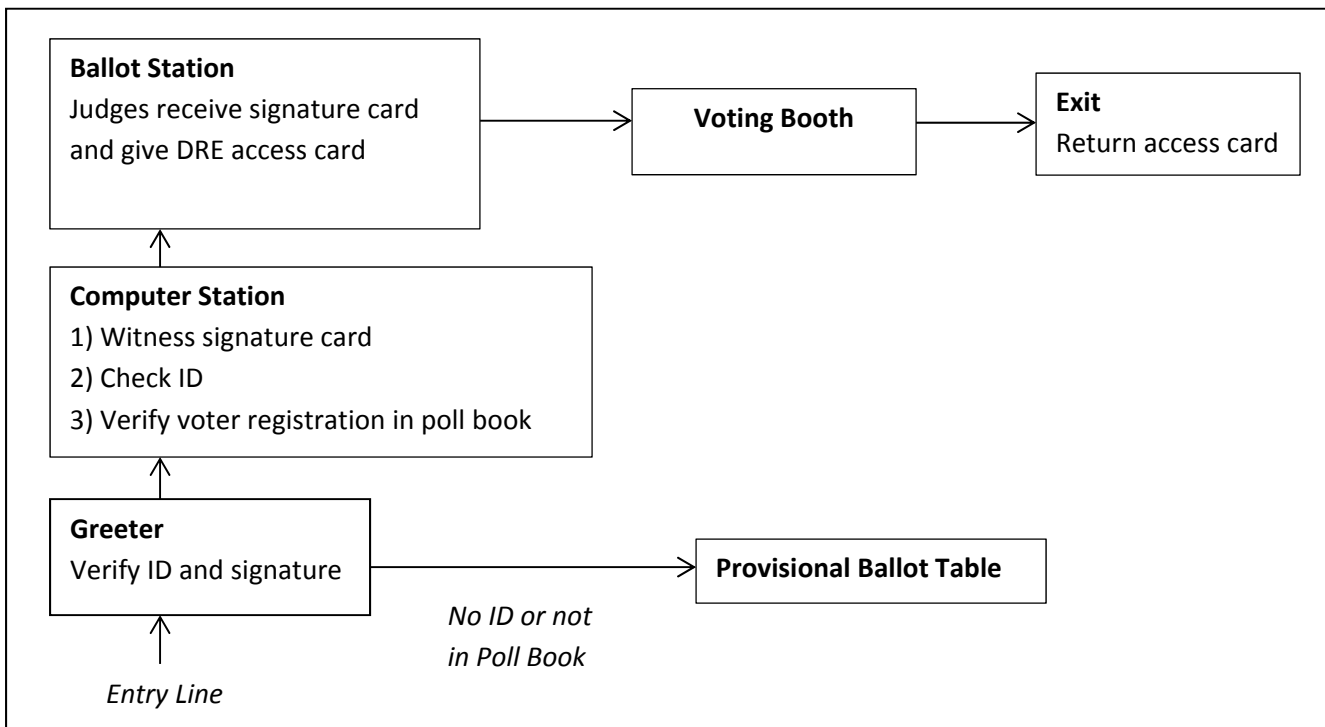
By having a smaller number of polling places, administrators can recruit the most efficient poll workers to serve on Election Day instead of staffing hundreds of small, individual precincts. Fewer provisional ballots need to be issued since a registered individual cannot vote in the "wrong" polling place with the establishment of vote centers. Larger polling places also allow more adequate parking logistics and a more effective deployment of resources.[39]

While vote centers seem to be more cost-efficient, there are other costs that might offset savings. First, vote centers require more specialized training for poll workers because of increased complexities of a large polling site. There is also the need to staff "trouble shooters" at each vote center to be responsible for traffic flow through the vote center and for identifying technology issues that arise. Second, traditional public polling sites such as libraries and schools might not have sufficient space to accommodate the large number of voters, and the price volatility of the rental costs of larger sites poses the risk of increased cost. Third, while vote centers are strategically located and should provide increased convenience, some voters might find them less accessible than the traditional precincts. There might be a need to hire transportation and health care facilities coordinators to provide transportation for voters who have difficulties accessing the vote centers. These are a few costs that need to be accounted for when exploring the option of establishing vote centers in Baltimore City.

Following the introduction of vote centers in Larimer County, Colorado in 2003, voter turnout increased significantly. Voter turnout increased from 62 percent to 79 percent from 2000 to 2004, as mentioned earlier in the report. While there are many advantages with vote centers such as increased turnout and reduced cost, the result would be far worse than a traditional precinct should there be any technical or operational error. In Denver, for example, voters had to wait for two to three hours at the City's 55 vote centers because of the repeated failure of electronic poll books in the 2006 General Election.[40] Approximately 18,000 to 20,000 voters (20 percent of the anticipated turnout) left the vote centers without casting a ballot because of the wait time. [41]

2. Vote-by-Mail

The States of Oregon and Washington currently conduct all elections by mail. A ballot is automatically mailed to every registered voter in advance of the election, and the traditional in-person voting precincts are not available.

Vote-by-mail in Oregon began in 1981 as an effort to increase voter turnout. The 1981 legislation had many restrictions, requiring the elections division of the Secretary of State's office to adopt an administrative authorization rule for the jurisdiction if local election officials wanted to conduct a vote-by-mail election. By 1998, the increasing number of voters who applied for absentee voting led local election officials to initiate vote-by-mail in primary and general elections. In 2000, Oregon for the first time initiated vote-by-mail for the entire Presidential election cycle.[42] While there is no hard evidence that there is a causal relationship between vote-by-mail and voter turnout, there was an overall increase in voter turnout since the introduction of vote-by-mail in primary and general elections in Oregon.

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[39] From "Alternative Voting Methods," by U.S. Election Assistance Commission, 2008,
http://www.eac.gov/assets/1/workflow_staging/Page/54.PDF
[40] From "Report on Denver Electronic Poll Problems," http://electionupdates.caltech.edu/2007/01/09/report-on-denver-electronic-pollbook-problems/
[41] From "Voter Centers 'a Total Fiasco'," by Monte Whaley and Joey Bunch, Denver Post,
http://www.denverpost.com/ci_4627496
[42] From "Alternative Voting Methods," by U.S. Election Assistance Commission, 2008.

Oregon's Voter Turnout: 1996-2008
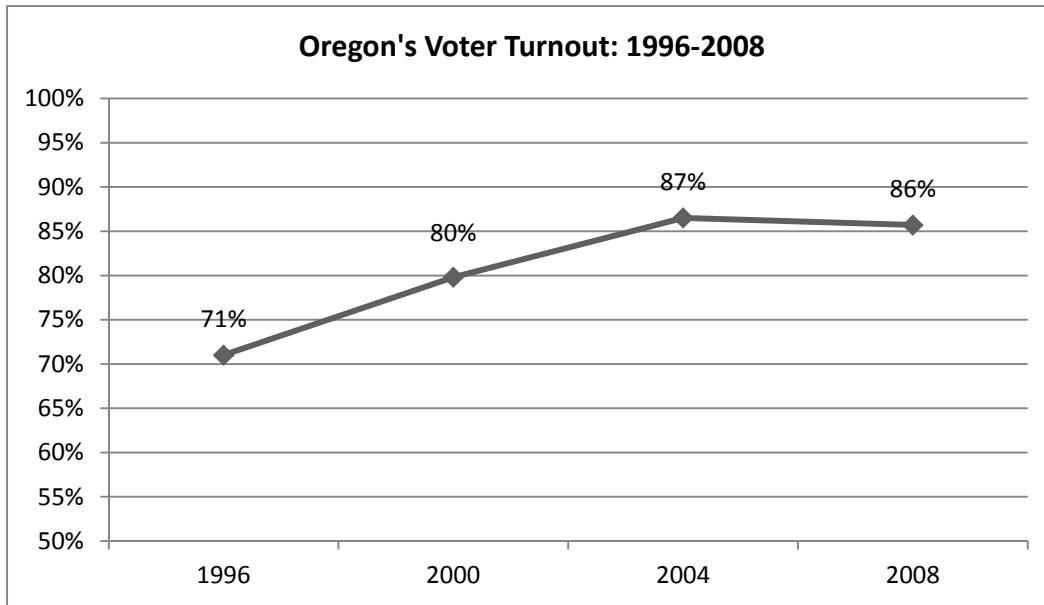
There are certain advantages with vote-by-mail. First, the administration of elections becomes less complicated when the pressures involved in recruiting, training, and managing poll workers are eliminated. Second, without in-person voting, officials have no need to secure numerous polling places. Third, voter registration lists tend to be more accurate because the frequent mailing of non-forwardable ballots provides local election officials with updated information about the actual home addresses of the voters when mail is returned as undeliverable. Furthermore, soft evidence indicates that vote-by-mail elections might cost less to administer than precinct-based elections and may increase voter turnout.[43]

There were 334,852 registered voters in April 2012 in Baltimore City. Using this figure as the cost driver, vote-by-mail would cost $1.9 millon, a 6.9 percent decrease in election costs compared to the traditional precinct voting method. This amount already includes a 10 percent contingency amount to account for costs that are unaccounted for in this study.

Table 43: Cost of Running the 2011 Mayoral Primary Election Using Vote-By-Mail

Component	Calculations	Cost
Voters Cards' Postage Fees	334,852*$.44	147,335
Ballots' Postage Fees (including return mail postage)	334,852*$.44*2	294,670
Printing Costs	334,852*$1	334,852
Pitney-Bowes Relia-Vote[44] (Ballot Processing machine)	215,000*5/3 elections	358,330
Coding Accuracy Support System (Address coding software upgrade)	$1,000 annual fee/3 elections	333

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[43] From "A report to the Best Practices and Vision Commission Office of the Colorado Secretary of State," by Peggy Cuciti and Allan Wallis, *University of Colorado Denver*, 2011,
http://www.sos.state.co.us/pubs/elections/BestPractices/CUDenverElectionReformStudy02012011.pdf
[44] From Jefferson County, CO's Five-Year Capital Improvement Plan,
http://jeffco.us/jeffco/portal_uploads/Citizen_Budget_Review_Panel/march_31/GF_CEF_Projects_03312009.pdf

Temporary Employees[45] (for canvassing of votes)	(334,852*2 minutes per vote)*$10.79 hourly rate/60 minutes	120,435
State Employees' Salaries	Total Salary*30%	462,581
Board Members' Salaries	Total Salary*30%	13,550
10% Contingency Amount	*10% of total cost*	*173,209*
TOTAL		**$1,905,298**

The estimated cost includes the costs of leasing mail and ballot processing equipment and purchasing address coding software upgrades. The ballot processing equipment[46] (Relia-Vote) is a large volume envelope processing and tracking system that prints barcodes that are unique to voters, scans and stamps envelopes for outgoing mail, and verifies voters' signature. The major savings in the scenario compared to the traditional precinct voting method are the savings related to poll workers and voting machine maintenance, two of the biggest cost components in conducting elections. In Fiscal 2012, the Board of Elections spent $2 million and $1.33 million on poll workers and voting machine maintenance respectively for conducting three elections. Eliminating these two cost components alone would save $1.1 million for each election in Fiscal 2012.

Administrative Challenges

While vote-by-mail reduces costs and can potentially increase voter turnout, it has many administrative challenges. To prevent fraud in voting, Baltimore City would need to purchase mail processing equipment that has a voter signature verification function, so that if the signature on the ballot secrecy envelope does not match the signature on file with the Board of Elections, the ballot would be rejected. The process of verification, however, increases administrative costs and time. The second challenge with vote-by-mail is that people are transient and do not always cancel their voter registrations when they move, which allows for the possibility of ballots being sent to addresses at which voters no longer live. According to the 2010 Census, 130,740 (44 percent) housing units in Baltimore were renter occupied whereas only 119,163 (40 percent) housing units were owner occupied. The higher percentage of renter occupied housing units in Baltimore City than the nationwide average (35 percent) suggests that Baltimore has a more transient population. Additionally, 37 percent of Baltimore citizens said they were likely or very likely to move out of Baltimore in the next one to three years according to the 2012 Baltimore Citizen Survey.[47] The high percentage of renters and the likelihood of Baltimore residents to leave Baltimore increase the possibility of returned ballots and reduce the effectiveness of implementing vote-by-mail.

Legal Challenges

The most significant legal dispute over Oregon's vote-by-mail elections was a lawsuit in federal court challenging the State's authority to expand voting in federal elections beyond Election Day. The federal court ruled that Oregon was in compliance with the federal Election Day because elections were not "consummated" before

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[45] The hourly rate of $10.79 per hour is the current hourly rate for temporary employees working in the Downtown office.
[46] Other ballot processing equipment manufactured by other vendors include 1) Mail in Ballot Tracker (MiBT) by VoteHere, 2) Secure Ballot System (SBS) by Integrity Voting Systems (a division of K&H Integrated Print Solutions), and 3) Automated Signature Verification by VoteRemote Suite (Diebold), http://www.sos.wa.gov/documentvault/BallotTrackingSystemsReportJanuary2007-1852.pdf
[47] From "2012 Baltimore Citizen Survey," by University of Baltimore, 2012.

Election Day when voters voted by mail.[48] Although the legal dispute of vote-by-mail was settled by federal court, Baltimore City would need to work with the Maryland State Senate and the State Board of Elections to settle the legal issues involved with vote-by-mail.

With the administrative and legal challenges involved, it might not be feasible for Baltimore City to implement vote-by-mail at this point. Baltimore City can nonetheless explore alternative forms of vote-by-mail to reduce election costs and increase voter turnout, as discussed below.

3. Permanent Absentee Voting

While it might not be feasible for Baltimore City to administer elections through vote-by-mail, allowing alternative forms of vote-by-mail could increase cost-effectiveness. One of the alternative forms of vote-by-mail is permanent absentee voting. Maryland currently allows absentee voting, but absentee voters must apply and register for each primary and general election. Permanent absentee voting, on the other hand, allows the voter to automatically receive an absentee ballot for all future elections once a voter opts in, and does not require the voter to state any reason for absentee voting. Permanent absentee voting basically gives voters the option to vote by mail or to vote at the actual polling sites. The cost of allowing permanent absentee voting might increase election costs in the initial years of implementation, but would allow Baltimore City to examine whether vote-by-mail is a feasible alternative to conduct elections and determine if such an investment is worthwhile.

If permanent absentee voting is implemented in combination with vote centers, voter turnout will likely increase. Table 44 shows that using vote centers would cost $1,891,346 per election. Assuming that voter turnout would increase by five percent because of increased absentee voting, permanent absentee voting in combination with establishing vote centers would cost $1.99 million for the 2011 Mayoral Election, a 2.6 percent decrease compared to current costs.

Table 44: Vote Centers in Combination with Permanent Absentee Voting

Component	Calculations	Cost
Voters Cards' Postage Fees	16,742*$.44	7,367
Ballots' Postage Fees (including return mail postage)	16,742*$.44*2	7,367
Printing Costs	16,742*$1	16,743
Pitney-Bowes Relia-Vote (Ballot Processing machine)	215,000/3 elections	71,667
Coding Accuracy Support System (Address coding software upgrade)	$1000 annual fee/3 elections	333
Vote Centers		1,891,346
TOTAL		$1,994,823

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[48] From "The Voting Integrity Project, Inc. et al v," by Phil Keisling, Secretary of State of Oregon, 259 F.3d 1169, 1176 (9th Cir. 2001).

4. Online Voting

West Virginia initiated a pilot program in 2010 to provide deployed military and overseas citizens the opportunity to cast their ballot over the internet. During the 2010 general election, 125 West Virginia voters from eight counties cast their ballot online, representing a 162 percent increase over the participation in the 2010 primary. The 76 percent online-vote return rate far exceeds the average 58 percent absentee ballot return rate experienced by counties using standard mail as the ballot transmission method.

While online voting can save costs and increase turnout, the idea is still in its embryonic stage with many who are concerned about its security. The District of Columbia canceled its online voting plans in 2010 after University of Michigan computer experts were able to infiltrate the system and remotely change votes. While it is premature at this time to introduce online voting, Baltimore City can still explore options to initiate a pilot program to understand the effect of online voting on voter turnout.

CONCLUSIONS

Cost-effectiveness is currently not maximized in the conduct of elections in Baltimore City. This study shows that the conduct of elections is not cost-effective because 1) polling places have more staff than necessary, 2) there are more precincts and polling places than necessary, and 3) voter turnout has historically been low in Baltimore City. To maximize cost-effectiveness, Baltimore City needs to examine ways to reduce costs and increase voter turnout. Alternative voting methods practiced by other cities and states, such as vote centers and vote-by-mail, could provide insights to enhance cost-effectiveness. Changes to state requirements related to election judges and voting machines can also generate significant savings. A reevaluation of the ways Baltimore City conducts elections would better position the Board of Elections to be more competitive with administering elections in Baltimore City.

RECOMMENDATIONS

To improve the cost-effectiveness of the conduct of elections, BBMR recommends the following actions:

1. Use the staffing model recommended by BBMR to determine the number of election judges for each election and reduce the number of poll workers accordingly
2. Measure performance indicators including average wait time, voter satisfaction, and election judges' productivity rates (such as number of votes per judge)
3. Reduce the number of precincts
4. Co-locate precincts and consolidate entry lines upon further discussions with the State Board
5. Explore the feasibility of alternative voting methods, particularly introducing permanent absentee voting, vote-by-mail, and vote centers in Baltimore City
6. Expand the role of the Board of Elections by including maximizing voter turnout as one of its missions

AGENCY COMMENTS

BBMR held an exit conference after a draft of this report was provided to the Board of Elections. BBMR verified the data and the facts in the report and discussed the feasibility of implementing recommended alternatives at the exit conference. The written comments provided by the Board of Elections are reprinted in Appendix III.

The Board of Elections verified that the data used in this study was accurate. The data verified includes the cost of administering elections, the cost components of election administration, and cost per vote and per registered voter.

The Board of Elections did not concur with any of the recommended alternatives provided by BBMR. BBMR recommended the Board of Elections to use the formula stated in this report to determine the number of election judges needed and reduce the number of poll workers accordingly. The Board of Elections states that they cannot further reduce the number of poll workers hired because the agency is required to prepare and staff for a 100 percent voter turnout. The Board of Elections also states that there is no way to estimate voter turnout accurately for any given election. The Board of Elections currently hires around 2,000 poll workers for each election regardless of voter turnout.

BBMR's second recommendation to the Board of Elections is to measure performance indicators including average wait time, voter satisfaction, and election judges' productivity rates. The Board of Elections did not concur with the recommendation, stating that these performance measures can only be measured on Election Day and the Board of Elections staff does not have the capacity or resources to measure performance on Election Day because of the large amount of responsibilities they have on Election Day.

BBMR's third recommendation is to consider co-locating additional precincts and consolidating entry lines. The Board of Elections states the there are three issues with this recommendation. First, consolidating entry lines would pose significant challenges to the agency because of the need for larger polling places, which are difficult to obtain and secure. Second, voting machines would need to be re-programmed to accommodate voters from multiple precincts. Third, the Board of Elections foresees a lower voter satisfaction because of the inconveniences involved in the consolidation of entry lines.

BBMR's fourth recommendation is to explore the feasibility of alternative voting methods such as vote centers, permanent absentee voting, and vote-by-mail. The Board of Election made it clear that implementing alternative voting methods are at the discretion not of the local board but of the State Board of Elections and Maryland General Assembly.

BBMR's last recommendation for the Board of Elections is to expand the role of the agency by including maximizing voter turnout as one of its missions. The Board of Elections states that they are already mailing out flyers and specimen ballots before elections and the agency does not have additional measures that can maximize voter turnout.

This report is being sent to Armstead Jones, Director of the Board of Elections, Abigail Goldman, Deputy Director of the Board of Elections, and Ann MacNeille, Assistant Attorney General of the Office of the Attorney General. We will also make copies available on our website at:
http://www.baltimorecity.gov/Government/AgenciesDepartments/Finance/BudgetManagementResearch.aspx.
If you have any questions about this report, please contact Vieen Leung at 410-396-4964.

Andrew Kleine, Chief
Bureau of the Budget and Management Research,
Department of Finance

APPENDIX I

Table 45: Historical Voter Turnout in Baltimore City

Year	Election Type	Voter Turnout
2004	Presidential Primary	20.07%
2004	Presidential General	70.01%
2006	Gubernatorial Primary	33.64%
2006	Gubernatorial General	47.10%
2007	Mayoral Primary	38.57%
2007	Mayoral General	16.88%
2008	Presidential Primary	38.25%
2008	Presidential General	68.21%
2010	Gubernatorial Primary	22.78%
2010	Gubernatorial General	45.02%
2011	Mayoral Primary	24.58%
2011	Mayoral General	13.38%
2012	Presidential Primary	14.76%

Chart 11: Historical Voter Turnout in Baltimore

49
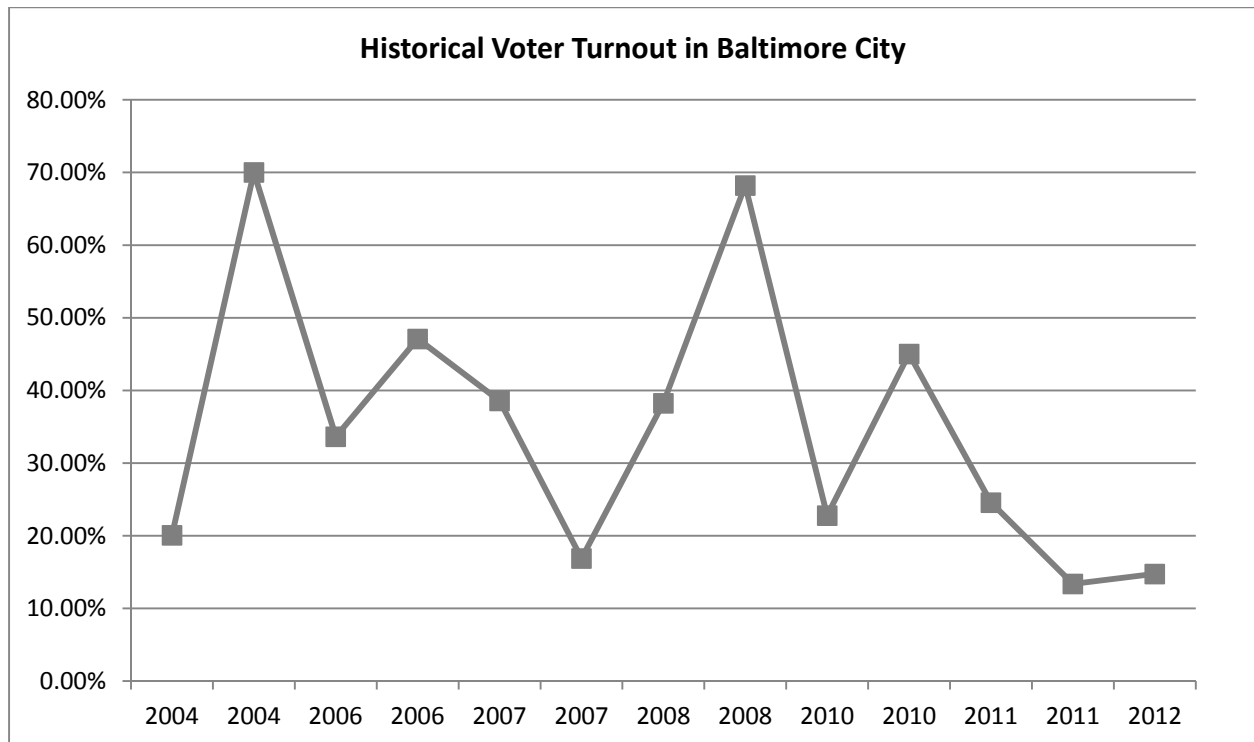
Table 46: Historical Elections Costs

	2012 Presidential Primary	2011 Mayoral General	2011 Mayoral Primary	2010 Gubernatorial General	2008 Presidential General
Voter Turnout	**14.76%**	**13.38%**	**24.58%**	**48.16%**	**68.21%**
BEFORE ELECTION CYCLE					
Recruitment postage fees	24,527	24,527	27,300	27,300	41,889
Voters' cards postage fees	14,286	8,941	17,664	11,896	11,896
Sample ballots' postage fees	27,059	36,193.00	31,193	37,727	37,727
Baltimore Sun Advertisement	2,291	-	-	-	-
Printing Costs	71,496	73,523	119,141	122,663	38,108
TOTAL	**$139,659**	**$143,184**	**$195,298**	**$199,587**	**$129,620**
EARLY VOTING					
Poll workers training reimbursement	1,360	1,000	1,480	1,560	NO EARLY VOTING
Poll workers' salary	63,400	43,800	66,000	63,450	
Private Polling places rental fees	4,200	4,200	4,200	4,200	
Public polling places custodian fees	2,200	1,068	1,068	1,068	
School police	6,471	6,471	6,471	6,471	
Signs	1,094	1,094	1,094	1,094	
TOTAL	**$78,725**	**$57,633**	**$80,313**	**$77,843**	**-**
ELECTION DAY					
Absentee voting postage fees	808	1,202	957	7,788	7,788
Poll workers' training reimbursement	41,060	38,320	39,740	47,020	82,160
Poll workers' salary	411,200	389,250	399,900	454,500	630,750
Poll workers' training cost (by Schaefer Center)	134,490	77,401	77,401	121,323	331,740
Private Polling places' rental fees	19,950	19,600	19,600	19,600	18,424
Public Polling places' custodian fees	6,470	41,847	6,470	41,847	41,847
Police overtime	32,800	32,800	32,800	32,800	30,832
Library security guards overtime	1,350	1,350	1,350	1,350	1,269
Hauling of Table and chairs	5,937	5,937	5,937	5,745	5,369
Taxi cabs	15,000	16,168	20,063	21,064	17,626
Voting machines maintenance (Mcafee)	383,181	383,180	383,180	505,200	494,589
Poll workers' cell phones (AT&T)	8,429	11,789	6,389	9,595	12,529
Voting machines and other state reimbursement	291,803	291,803	291,803	453,523	699,399
TOTAL	**$1,352,477**	**$1,310,647**	**$1,285,590**	**$1,721,355**	**$2,374,322**
SALARIES DURING ELECTION CYCLE					
State Employees' Salary (total salary*.3)	462,581	462,581	462,581	710,053	514,957
Board Members' Salaries and OPCs, Overtime, and Temporary	23,383	23,383	23,383	16,234	28,490
TOTAL	**$485,964**	**$485,964**	**$485,964**	**$726,287**	**$543,447**
TOTAL COSTS FOR THE 2012 PRESIDENTIAL PRIMARY ELECTION	**$2,056,826**	**$1,997,428**	**$2,047,165**	**$2,725,071**	**$3,047,389**
INFLATION-ADJUSTMENT FACTOR	-	-	-	1.053	1.066
TOTAL COSTS IN 2012 DOLLARS	**$2,056,826**	**$1,997,428**	**$2,047,165**	**$2,869,500**	**$3,248,517**

Statistical Tests

The results of a paired t-test comparing the average percentage of votes at each precinct for the last 10 elections from 2006 to 2011 and the percentage of votes at the 2012 Presidential Primary shows that the difference in percentage is statistically insignificant.

Table 47: T Test Results

```
Paired t test
─────────────────────────────────────────────────────────────────────────────────
Variable  |     Obs        Mean    Std. Err.    Std. Dev.    [95% Conf. Interval]
──────────┼──────────────────────────────────────────────────────────────────────
Presid~l  |     290    .3448276    .0130903     .2229202     .3190631    .3705921
 Average  |     290    .3450114    .0085559     .1457024     .3281715    .3618513
──────────┼──────────────────────────────────────────────────────────────────────
    diff  |     290   -.0001838    .0066228      .112782    -.0132188    .0128512
─────────────────────────────────────────────────────────────────────────────────
     mean(diff) = mean(Presidential - Average)              t =    -0.0278
 Ho: mean(diff) = 0                          degrees of freedom =        289

 Ha: mean(diff) < 0           Ha: mean(diff) != 0            Ha: mean(diff) > 0
 Pr(T < t) = 0.4889        Pr(|T| > |t|) = 0.9779         Pr(T > t) = 0.5111
```

The result of the t-test shows that the model is 98 percent confident that the average percentage of votes at each precinct in the last 10 elections is the same as the percentage of votes at each precinct in the 2012 Presidential Primary Election. Additionally, the two variables are almost perfectly correlated, as shown in Chart 12:

Chart 12: Correlation of Percentage of Votes at Each Precinct

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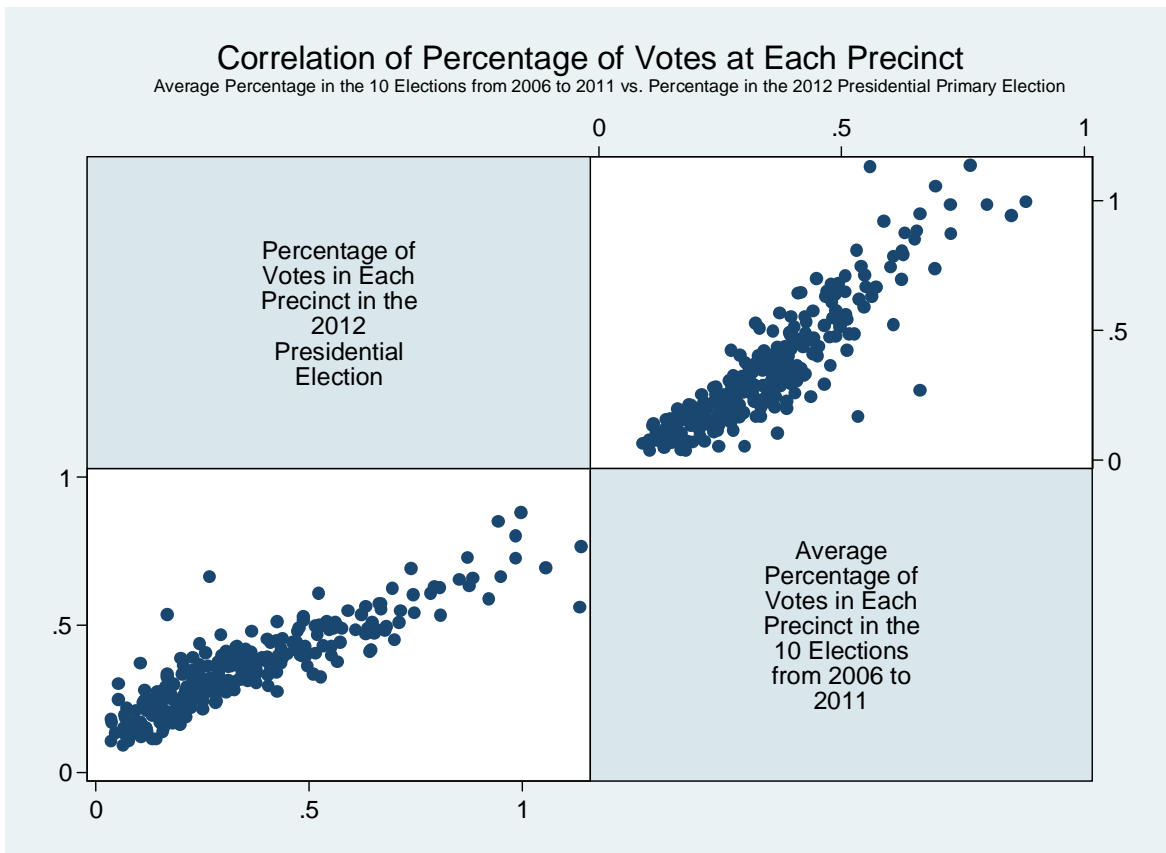
Table 48: Median Voter Turnout of Cities with Over 500,000 Populations[50]

Cities	First Election	Total Number of Elections	Voting Population (2000)	Median Turnout[49]
Atlanta	1981	8	305,624	24%
Austin	1979	18	438,460	20%
Baltimore	**1979**	**6**	**475,527**	**22%**
Boston	1979	12	388,579	26%
Buffalo	1981	6	209,860	33%
Charlotte	1979	9	371,067	24%
Chicago	1979	8	1,789,020	48%
Cincinnati	2001	1	242,247	36%
Cleveland	1981	11	331,843	30%
Columbus	1979	6	510,843	32%
Dallas	1985	9	675,591	14%
Denver	1979	12	372,817	34%
Detroit	1981	11	630,777	26%
El Paso	1983	10	318,154	16%
Fort Worth	1989	4	331,930	5%
Houston	1983	9	1,094,370	28%
Indianapolis	1987	5	561,329	31%
Jacksonville	1979	6	520,068	30%
Kansas City	1979	14	315,069	24%
Los Angeles	1981	8	1,834,370	26%
Memphis	1979	10	452,455	37%
Milwaukee	1980	10	399,352	25%
Minneapolis	1979	12	264,333	19%
Nashville	1987	7	400,227	25%
New Orleans	1990	6	346,200	40%
New York	1981	6	4,683,500	29%
Oklahoma City	1979	7	353,047	12%
Philadelphia	1979	7	1,071,780	44%
Phoenix	1979	11	775,596	13%
Pittsburgh	1981	5	257,622	27%
Portland, OR	1980	7	381,178	36%
San Antonio	1979	15	750,609	14%
San Diego	1979	13	776,625	31%
San Francisco	1979	13	553,675	41%
San Jose	1982	8	494,192	27%
Seattle	1981	11	431,375	35%
St. Louis	1981	5	247,667	29%
Washington	1982	6	411,044	33%

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[49] Median Turnout of Mayoral Elections from 1979 to 2003.

[50] From "Big City, Big Turnout? Electoral Participation in American Cities," by Neal Caren, *University of Michigan,* 2007.

Table 49: Percentage of Votes by Precincts (in Percentage)

Precinct	2012 Prim	2011 Prim	2011 Gen	2010 Prim	2010 Gen	2008 Prim	2008 Gen	2007 Prim	2007 Gen	2006 Prim	2006 Gen	Average
PRECINCT 01001	0.21	0.24	0.19	0.31	0.32	0.22	0.27	0.29	0.17	0.24	0.33	0.26
PRECINCT 01002	0.31	0.39	0.40	0.45	0.33	0.38	0.42	0.29	0.34	0.35	0.75	0.41
PRECINCT 01003	0.23	0.23	0.26	0.35	0.32	0.32	0.40	0.56	0.26	0.27	0.92	0.39
PRECINCT 01004	0.49	0.40	0.43	0.54	0.63	0.45	0.54	0.89	0.39	0.43	0.58	0.53
PRECINCT 01005	0.52	0.52	0.55	0.73	0.94	0.63	0.72	0.40	0.58	0.60	0.40	0.61
PRECINCT 02001	0.17	0.19	0.26	0.20	0.62	0.19	0.23	0.34	0.20	0.18	0.82	0.32
PRECINCT 02002	0.29	0.29	0.33	0.41	0.46	0.35	0.37	0.28	0.34	0.32	0.24	0.34
PRECINCT 02003	0.35	0.37	0.37	0.47	0.77	0.43	0.49	0.21	0.36	0.38	0.17	0.40
PRECINCT 03001	0.24	0.27	0.24	0.27	0.33	0.26	0.32	0.24	0.24	0.26	0.25	0.27
PRECINCT 03002	0.05	0.11	0.06	0.08	0.17	0.09	0.15	0.24	0.08	0.04	0.33	0.13
PRECINCT 03003	0.28	0.27	0.26	0.34	0.26	0.26	0.34	0.25	0.26	0.25	0.27	0.28
PRECINCT 04001	0.18	0.14	0.20	0.16	0.23	0.18	0.25	0.13	0.13	0.10	0.17	0.17
PRECINCT 04002	0.16	0.10	0.14	0.12	0.32	0.22	0.34	0.35	0.12	0.10	0.29	0.21
PRECINCT 04003	0.16	0.12	0.12	0.14	0.30	0.14	0.15	0.71	0.12	0.13	0.70	0.26
PRECINCT 05001	0.24	0.31	0.24	0.21	0.15	0.23	0.32	0.34	0.26	0.29	0.27	0.26
PRECINCT 05002	0.11	0.08	0.11	0.08	0.30	0.10	0.07	0.27	0.15	0.13	0.24	0.15
PRECINCT 06001	0.18	0.24	0.27	0.17	0.66	0.22	0.25	0.46	0.20	0.18	0.35	0.30
PRECINCT 06002	0.08	0.11	0.12	0.08	0.28	0.09	0.12	0.20	0.10	0.11	0.21	0.14
PRECINCT 06003	0.12	0.12	0.14	0.10	0.24	0.10	0.10	0.24	0.10	0.11	0.21	0.15
PRECINCT 06004	0.26	0.28	0.42	0.27	0.35	0.28	0.27	0.39	0.28	0.24	0.31	0.31
PRECINCT 06005	0.30	0.45	0.41	0.46	0.17	0.40	0.51	0.30	0.30	0.34	0.29	0.36
PRECINCT 07001	0.19	0.21	0.18	0.14	0.22	0.13	0.22	0.40	0.13	0.09	0.37	0.21
PRECINCT 07002	0.04	0.05	0.03	0.04	0.32	0.08	0.07	0.38	0.08	0.06	0.59	0.17
PRECINCT 07003	0.30	0.45	0.45	0.31	0.31	0.36	0.48	0.26	0.38	0.39	0.24	0.36
PRECINCT 07004	0.33	0.48	0.48	0.32	0.42	0.42	0.51	0.43	0.37	0.41	0.41	0.42
PRECINCT 08001	0.33	0.39	0.36	0.44	0.56	0.39	0.31	0.46	0.40	0.48	0.47	0.43
PRECINCT 08002	0.27	0.29	0.30	0.23	0.28	0.26	0.33	0.60	0.24	0.24	0.39	0.32
PRECINCT 08003	0.35	0.36	0.38	0.31	0.35	0.38	0.44	0.67	0.32	0.35	0.27	0.38
PRECINCT 08004	0.10	0.09	0.10	0.09	0.38	0.10	0.11	0.31	0.12	0.11	0.30	0.17
PRECINCT 08005	0.36	0.42	0.38	0.38	0.40	0.41	0.44	0.23	0.47	0.42	0.29	0.38
PRECINCT 08006	0.42	0.47	0.40	0.35	0.34	0.39	0.45	0.31	0.41	0.43	0.31	0.38
PRECINCT 08007	0.08	0.11	0.10	0.07	0.25	0.10	0.11	0.24	0.11	0.10	0.13	0.13
PRECINCT 08008	0.13	0.19	0.21	0.16	0.26	0.17	0.19	0.10	0.22	0.18	0.33	0.20
PRECINCT 08009	0.16	0.23	0.23	0.18	0.30	0.22	0.26	0.31	0.24	0.21	0.61	0.28
PRECINCT 08010	0.94	1.09	1.30	0.95	0.30	0.97	0.88	0.50	1.10	1.03	0.36	0.85
PRECINCT 08011	0.15	0.14	0.16	0.13	0.55	0.14	0.14	0.31	0.15	0.15	0.37	0.22
PRECINCT 09001	0.15	0.15	0.12	0.16	0.32	0.16	0.17	0.43	0.16	0.13	0.56	0.24
PRECINCT 09002	0.24	0.23	0.22	0.24	0.34	0.24	0.23	0.50	0.29	0.22	0.32	0.28
PRECINCT 09003	0.38	0.39	0.42	0.41	0.12	0.36	0.37	0.39	0.40	0.37	0.15	0.34
PRECINCT 09004	0.81	0.74	0.76	0.80	0.15	0.68	0.53	0.09	0.68	0.66	0.23	0.53
PRECINCT 09005	0.68	0.56	0.60	0.61	0.24	0.58	0.47	0.31	0.58	0.58	0.41	0.49
PRECINCT 09006	0.79	0.73	0.68	0.73	0.65	0.75	0.58	0.58	0.72	0.70	0.18	0.63
PRECINCT 09007	0.53	0.50	0.48	0.49	0.42	0.50	0.47	0.20	0.53	0.50	0.20	0.43
PRECINCT 09008	0.25	0.30	0.28	0.24	0.18	0.31	0.37	0.21	0.33	0.31	0.16	0.27
PRECINCT 09009	0.25	0.22	0.22	0.23	0.20	0.23	0.24	0.16	0.24	0.21	0.17	0.21
PRECINCT 09010	0.25	0.30	0.30	0.24	0.09	0.26	0.30	0.13	0.24	0.25	0.31	0.24
PRECINCT 09011	0.04	0.04	0.03	0.03	0.17	0.04	0.07	0.25	0.05	0.05	0.33	0.11
PRECINCT 09012	0.37	0.39	0.38	0.33	0.35	0.39	0.39	0.08	0.45	0.41	0.06	0.32
PRECINCT 09013	0.20	0.24	0.22	0.19	0.95	0.22	0.22	0.50	0.26	0.22	0.32	0.33
PRECINCT 09014	0.30	0.33	0.30	0.27	0.26	0.32	0.34	0.99	0.37	0.36	0.40	0.40
PRECINCT 09015	0.40	0.46	0.40	0.37	0.38	0.36	0.41	0.27	0.42	0.34	1.11	0.45
PRECINCT 10001	0.24	0.32	0.28	0.25	0.77	0.26	0.28	0.47	0.27	0.26	0.30	0.35
PRECINCT 10002	0.41	0.41	0.36	0.35	0.40	0.32	0.30	0.32	0.43	0.35	0.38	0.36
PRECINCT 10003	0.05	0.10	0.09	0.07	0.86	0.08	0.12	1.12	0.09	0.08	0.40	0.30
PRECINCT 10004	0.11	0.16	0.16	0.11	0.28	0.14	0.15	0.29	0.14	0.14	0.88	0.24
PRECINCT 11001	0.23	0.32	0.26	0.29	0.66	0.29	0.35	0.58	0.20	0.23	0.25	0.34
PRECINCT 11002	0.15	0.14	0.16	0.13	0.14	0.13	0.12	0.14	0.17	0.10	0.72	0.20
PRECINCT 11003	0.40	0.44	0.49	0.46	0.39	0.43	0.34	0.17	0.42	0.42	0.20	0.38
PRECINCT 11004	0.20	0.17	0.16	0.17	0.06	0.17	0.21	0.11	0.20	0.21	0.17	0.16
PRECINCT 11005	0.08	0.11	0.10	0.10	0.21	0.11	0.13	0.41	0.08	0.10	0.10	0.14
PRECINCT 11006	0.41	0.40	0.47	0.44	0.23	0.45	0.50	0.86	0.44	0.38	0.23	0.44
PRECINCT 11007	0.26	0.34	0.31	0.27	0.37	0.30	0.34	0.41	0.22	0.25	0.22	0.30

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PRECINCT 12001	1.13	0.54	0.58	0.70	0.31	0.56	0.43	0.50	0.59	0.66	0.72	0.56
PRECINCT 12002	0.10	0.26	0.53	0.27	0.39	0.56	0.10	0.52	0.53	0.20	0.32	0.37
PRECINCT 12003	0.09	0.12	0.17	0.16	0.45	0.16	0.15	0.23	0.15	0.13	0.38	0.21
PRECINCT 12004	0.29	0.27	0.32	0.34	0.18	0.36	0.32	0.51	0.28	0.33	0.48	0.34
PRECINCT 12005	0.24	0.27	0.31	0.34	0.44	0.32	0.30	0.44	0.28	0.28	0.20	0.32
PRECINCT 12006	0.17	0.16	0.18	0.20	0.59	0.23	0.24	0.24	0.18	0.19	0.49	0.27
PRECINCT 12007	0.24	0.37	0.35	0.31	0.40	0.30	0.32	0.34	0.33	0.30	0.61	0.36
PRECINCT 12008	0.30	0.41	0.43	0.36	0.20	0.37	0.34	0.50	0.38	0.32	0.37	0.37
PRECINCT 12009	0.29	0.32	0.33	0.27	0.32	0.25	0.32	0.21	0.26	0.27	0.20	0.28
PRECINCT 12010	0.34	0.36	0.35	0.27	0.21	0.29	0.32	0.76	0.33	0.30	0.40	0.36
PRECINCT 12011	0.27	0.25	0.26	0.20	0.57	0.21	0.21	0.23	0.30	0.22	0.29	0.27
PRECINCT 12012	0.16	0.24	0.22	0.16	0.19	0.16	0.23	0.49	0.15	0.17	0.63	0.26
PRECINCT 13001	0.67	0.53	0.72	0.71	0.39	0.59	0.47	0.50	0.71	0.61	0.27	0.55
PRECINCT 13002	0.30	0.27	0.35	0.34	0.51	0.31	0.27	0.29	0.32	0.34	0.63	0.36
PRECINCT 13003	0.29	0.37	0.45	0.43	0.23	0.42	0.44	0.38	0.31	0.38	0.25	0.37
PRECINCT 13004	0.23	0.23	0.29	0.29	0.19	0.23	0.25	0.24	0.18	0.26	0.60	0.28
PRECINCT 13005	0.17	0.18	0.26	0.20	0.25	0.17	0.20	0.21	0.15	0.13	0.21	0.20
PRECINCT 13006	0.22	0.19	0.21	0.17	0.62	0.16	0.17	0.22	0.22	0.20	0.19	0.23
PRECINCT 13007	0.34	0.37	0.36	0.27	0.27	0.35	0.34	0.44	0.36	0.41	0.21	0.34
PRECINCT 13008	0.48	0.51	0.53	0.44	0.23	0.43	0.43	0.28	0.43	0.47	0.23	0.40
PRECINCT 13009	0.32	0.34	0.38	0.26	0.41	0.23	0.23	0.26	0.27	0.25	0.38	0.30
PRECINCT 13010	0.43	0.52	0.54	0.37	0.12	0.41	0.44	0.38	0.39	0.39	0.25	0.38
PRECINCT 13011	0.32	0.39	0.47	0.45	0.30	0.44	0.49	0.16	0.37	0.40	0.12	0.36
PRECINCT 13012	0.23	0.26	0.31	0.29	0.16	0.30	0.26	0.26	0.26	0.24	0.32	0.27
PRECINCT 14001	0.21	0.20	0.22	0.21	0.22	0.18	0.17	0.19	0.19	0.20	0.12	0.19
PRECINCT 14002	0.34	0.37	0.42	0.37	0.16	0.36	0.35	0.24	0.33	0.36	0.21	0.32
PRECINCT 14003	0.19	0.16	0.19	0.15	0.23	0.16	0.21	0.29	0.15	0.16	0.15	0.18
PRECINCT 14004	0.48	0.50	0.46	0.45	0.16	0.46	0.48	0.13	0.47	0.49	0.35	0.39
PRECINCT 14005	0.10	0.14	0.16	0.12	0.29	0.11	0.12	0.23	0.14	0.14	0.23	0.17
PRECINCT 15001	0.51	0.45	0.42	0.40	0.09	0.45	0.40	0.10	0.51	0.44	0.09	0.33
PRECINCT 15002	0.32	0.27	0.28	0.24	0.66	0.26	0.23	0.53	0.29	0.29	0.79	0.38
PRECINCT 15003	0.88	0.81	0.82	0.69	0.36	0.80	0.67	0.42	0.91	0.75	0.34	0.66
PRECINCT 15004	0.24	0.28	0.26	0.22	0.34	0.24	0.22	0.30	0.25	0.24	0.31	0.27
PRECINCT 15005	0.63	0.58	0.61	0.54	0.66	0.50	0.38	0.59	0.60	0.57	0.59	0.56
PRECINCT 15006	0.59	0.62	0.64	0.52	0.41	0.53	0.46	0.50	0.59	0.58	0.60	0.55
PRECINCT 15007	0.38	0.42	0.39	0.34	0.69	0.39	0.37	0.13	0.47	0.38	0.17	0.37
PRECINCT 15008	0.39	0.33	0.33	0.34	0.50	0.32	0.22	0.63	0.39	0.35	0.48	0.39
PRECINCT 15009	0.79	0.71	0.79	0.63	0.39	0.69	0.67	0.44	0.71	0.67	0.36	0.61
PRECINCT 15010	0.51	0.49	0.49	0.43	0.63	0.43	0.38	0.69	0.47	0.33	0.62	0.50
PRECINCT 15011	0.34	0.36	0.39	0.30	0.49	0.35	0.34	0.56	0.39	0.32	0.50	0.40
PRECINCT 15012	0.09	0.09	0.09	0.07	0.38	0.07	0.08	0.37	0.07	0.09	0.35	0.16
PRECINCT 15013	0.17	0.16	0.16	0.14	0.62	0.17	0.17	0.51	0.13	0.19	0.42	0.27
PRECINCT 15014	0.41	0.39	0.40	0.33	0.51	0.38	0.35	0.38	0.41	0.37	0.21	0.37
PRECINCT 15015	0.14	0.17	0.13	0.13	0.21	0.16	0.19	0.25	0.15	0.20	0.49	0.21
PRECINCT 15016	0.18	0.25	0.22	0.20	0.44	0.25	0.24	0.45	0.24	0.26	0.39	0.29
PRECINCT 15017	0.42	0.46	0.49	0.40	0.42	0.44	0.45	0.45	0.49	0.47	0.41	0.45
PRECINCT 15018	0.15	0.19	0.20	0.13	0.32	0.17	0.27	0.51	0.17	0.16	0.30	0.24
PRECINCT 15019	0.36	0.37	0.39	0.29	0.36	0.30	0.41	0.31	0.32	0.31	0.38	0.34
PRECINCT 15020	0.57	0.58	0.62	0.48	0.29	0.53	0.56	0.37	0.57	0.52	0.38	0.49
PRECINCT 15021	0.37	0.31	0.34	0.26	0.60	0.29	0.27	0.27	0.35	0.34	0.60	0.36
PRECINCT 15022	0.35	0.36	0.35	0.26	0.20	0.30	0.31	0.53	0.35	0.34	0.57	0.35
PRECINCT 15023	0.36	0.40	0.35	0.34	0.13	0.39	0.41	0.52	0.43	0.46	0.65	0.41
PRECINCT 15024	0.43	0.43	0.38	0.36	0.54	0.45	0.49	0.12	0.46	0.45	0.17	0.39
PRECINCT 15025	0.15	0.17	0.16	0.14	0.17	0.15	0.20	0.18	0.17	0.17	0.16	0.17
PRECINCT 16001	0.16	0.18	0.14	0.14	0.05	0.20	0.20	0.05	0.19	0.20	0.05	0.14
PRECINCT 16002	0.31	0.35	0.31	0.34	0.11	0.30	0.33	0.13	0.36	0.34	0.11	0.27
PRECINCT 16003	0.18	0.21	0.21	0.17	0.07	0.19	0.22	0.08	0.22	0.21	0.09	0.17
PRECINCT 16004	0.14	0.12	0.10	0.12	0.06	0.13	0.17	0.05	0.16	0.17	0.04	0.11
PRECINCT 16005	0.35	0.47	0.38	0.39	0.39	0.44	0.44	0.43	0.42	0.45	0.36	0.42
PRECINCT 16006	0.47	0.47	0.49	0.42	0.38	0.45	0.42	0.33	0.55	0.52	0.40	0.44
PRECINCT 16007	0.34	0.36	0.30	0.26	0.65	0.28	0.25	0.55	0.30	0.28	0.67	0.39
PRECINCT 16008	0.41	0.45	0.43	0.31	0.17	0.39	0.37	0.16	0.49	0.41	0.18	0.34
PRECINCT 16009	0.41	0.49	0.45	0.35	0.27	0.37	0.41	0.32	0.45	0.45	0.26	0.38
PRECINCT 16010	0.20	0.24	0.25	0.20	0.19	0.23	0.24	0.23	0.23	0.24	0.20	0.22
PRECINCT 16011	0.17	0.20	0.17	0.16	0.14	0.17	0.19	0.13	0.20	0.20	0.18	0.17
PRECINCT 16012	0.44	0.47	0.44	0.38	0.68	0.44	0.43	0.19	0.43	0.47	0.29	0.42

PRECINCT 16013	0.56	0.51	0.44	0.44	0.28	0.49	0.47	0.85	0.52	0.25	0.63	0.49
PRECINCT 16014	1.06	0.97	0.91	0.85	0.21	0.93	0.81	0.18	0.96	0.91	0.21	0.69
PRECINCT 17001	0.40	0.39	0.41	0.33	0.97	0.32	0.40	0.20	0.40	0.34	0.16	0.39
PRECINCT 17002	0.26	0.27	0.23	0.23	0.20	0.26	0.29	0.85	0.30	0.26	1.14	0.40
PRECINCT 18001	0.23	0.25	0.24	0.22	0.15	0.22	0.28	0.74	0.21	0.27	0.61	0.32
PRECINCT 18002	0.20	0.28	0.25	0.27	0.73	0.29	0.36	0.70	0.29	0.29	0.42	0.39
PRECINCT 19001	0.29	0.37	0.36	0.26	0.62	0.28	0.32	0.14	0.32	0.33	0.20	0.32
PRECINCT 19002	0.30	0.34	0.32	0.30	0.28	0.33	0.39	0.26	0.32	0.30	0.24	0.31
PRECINCT 20001	0.38	0.49	0.41	0.38	0.23	0.41	0.42	0.15	0.42	0.42	0.14	0.35
PRECINCT 20002	0.12	0.12	0.11	0.11	0.15	0.11	0.15	0.28	0.12	0.12	0.23	0.15
PRECINCT 20003	0.42	0.45	0.39	0.35	0.22	0.41	0.51	0.21	0.47	0.41	0.32	0.38
PRECINCT 20004	0.07	0.08	0.07	0.05	0.30	0.06	0.06	0.39	0.10	0.09	0.30	0.15
PRECINCT 20005	0.26	0.28	0.27	0.25	0.35	0.28	0.27	0.38	0.30	0.32	0.28	0.30
PRECINCT 20006	0.99	0.99	0.94	0.88	0.19	0.96	0.89	0.13	1.07	0.97	0.24	0.73
PRECINCT 20007	0.58	0.58	0.52	0.53	0.35	0.56	0.56	0.30	0.66	0.56	0.27	0.49
PRECINCT 20008	0.11	0.13	0.12	0.12	0.10	0.13	0.14	0.09	0.13	0.13	0.10	0.12
PRECINCT 20009	0.06	0.09	0.06	0.10	0.11	0.09	0.11	0.09	0.05	0.10	0.12	0.09
PRECINCT 20010	0.08	0.07	0.07	0.06	0.21	0.06	0.09	0.16	0.06	0.07	0.19	0.10
PRECINCT 20011	0.15	0.20	0.21	0.17	0.36	0.19	0.29	0.44	0.20	0.10	0.34	0.25
PRECINCT 21001	0.14	0.11	0.12	0.16	0.32	0.13	0.19	0.41	0.11	0.11	0.30	0.20
PRECINCT 21002	0.29	0.31	0.33	0.31	0.29	0.31	0.34	0.19	0.31	0.25	0.36	0.30
PRECINCT 21003	0.25	0.30	0.34	0.26	0.19	0.23	0.32	0.19	0.27	0.21	0.19	0.25
PRECINCT 21004	0.08	0.08	0.14	0.08	0.13	0.08	0.09	0.16	0.10	0.08	0.20	0.11
PRECINCT 22001	0.42	0.31	0.43	0.41	0.13	0.28	0.27	0.13	0.31	0.35	0.13	0.27
PRECINCT 22002	0.42	0.37	0.51	0.51	0.15	0.41	0.38	0.20	0.37	0.40	0.12	0.34
PRECINCT 23001	0.18	0.14	0.19	0.26	0.52	0.26	0.33	0.37	0.20	0.21	0.16	0.26
PRECINCT 23002	0.14	0.17	0.20	0.19	0.14	0.16	0.22	0.17	0.18	0.14	0.55	0.21
PRECINCT 23003	0.21	0.18	0.25	0.33	0.69	0.29	0.37	0.00	0.21	0.28	0.66	0.36
PRECINCT 24001	0.17	0.15	0.21	0.23	0.62	0.20	0.17	0.79	0.19	0.20	0.58	0.33
PRECINCT 24002	0.13	0.10	0.17	0.18	0.50	0.17	0.22	0.65	0.15	0.14	0.21	0.25
PRECINCT 24003	0.32	0.27	0.35	0.43	0.45	0.37	0.44	0.26	0.28	0.31	0.52	0.37
PRECINCT 24004	0.29	0.30	0.36	0.58	0.47	0.44	0.60	0.44	0.39	0.44	0.63	0.46
PRECINCT 24005	0.42	0.42	0.55	0.70	0.60	0.51	0.59	0.44	0.43	0.50	0.36	0.51
PRECINCT 25001	0.66	0.60	0.53	0.58	0.40	0.63	0.63	0.63	0.44	0.59	0.70	0.57
PRECINCT 25002	0.49	0.42	0.34	0.40	0.16	0.44	0.50	0.47	0.38	0.37	0.45	0.39
PRECINCT 25003	0.32	0.35	0.40	0.53	0.64	0.47	0.50	0.07	0.49	0.51	0.08	0.40
PRECINCT 25004	0.34	0.37	0.41	0.45	0.10	0.38	0.43	0.52	0.53	0.45	0.41	0.41
PRECINCT 25005	0.30	0.29	0.26	0.34	0.80	0.38	0.46	0.26	0.30	0.30	0.44	0.38
PRECINCT 25006	0.22	0.23	0.23	0.22	0.45	0.24	0.24	0.25	0.27	0.24	0.31	0.27
PRECINCT 25007	0.05	0.09	0.07	0.07	0.41	0.08	0.11	0.70	0.07	0.08	0.79	0.25
PRECINCT 25008	0.34	0.40	0.37	0.38	0.26	0.38	0.52	0.24	0.42	0.38	0.21	0.36
PRECINCT 25009	0.21	0.28	0.27	0.25	0.22	0.23	0.29	0.47	0.26	0.21	0.42	0.29
PRECINCT 25010	0.28	0.29	0.28	0.32	0.24	0.35	0.34	0.28	0.36	0.29	0.37	0.31
PRECINCT 25011	0.07	0.08	0.10	0.14	0.37	0.12	0.13	0.41	0.12	0.12	0.34	0.19
PRECINCT 25012	0.15	0.16	0.16	0.22	0.37	0.19	0.26	0.08	0.23	0.21	0.06	0.19
PRECINCT 25013	0.10	0.08	0.09	0.12	0.07	0.10	0.13	0.39	0.07	0.10	0.33	0.15
PRECINCT 25014	0.08	0.09	0.10	0.11	0.26	0.12	0.19	0.11	0.13	0.10	0.41	0.16
PRECINCT 25015	0.12	0.14	0.13	0.13	0.43	0.16	0.20	0.31	0.16	0.15	0.26	0.21
PRECINCT 25016	0.14	0.14	0.18	0.22	0.36	0.17	0.24	0.34	0.20	0.20	0.68	0.27
PRECINCT 26001	0.04	0.06	0.04	0.08	0.65	0.07	0.07	0.47	0.09	0.09	0.18	0.18
PRECINCT 26002	0.18	0.23	0.24	0.24	0.23	0.24	0.30	0.26	0.26	0.25	0.23	0.25
PRECINCT 26003	0.23	0.18	0.21	0.29	0.21	0.25	0.25	0.27	0.24	0.30	0.26	0.25
PRECINCT 26004	0.15	0.19	0.15	0.23	0.27	0.18	0.21	0.14	0.18	0.26	0.13	0.19
PRECINCT 26005	0.11	0.11	0.12	0.14	0.16	0.10	0.11	0.45	0.14	0.15	0.17	0.17
PRECINCT 26006	0.13	0.17	0.17	0.25	0.10	0.20	0.18	0.23	0.19	0.26	0.16	0.19
PRECINCT 26007	0.07	0.10	0.09	0.15	0.13	0.11	0.13	0.18	0.14	0.16	0.10	0.13
PRECINCT 26008	0.12	0.11	0.14	0.16	0.15	0.13	0.15	0.13	0.14	0.14	0.12	0.14
PRECINCT 26009	0.46	0.48	0.46	0.70	0.23	0.50	0.61	0.10	0.53	0.55	0.24	0.44
PRECINCT 26010	0.28	0.33	0.28	0.41	0.23	0.31	0.40	0.19	0.32	0.31	0.27	0.31
PRECINCT 26011	0.10	0.13	0.12	0.17	0.04	0.15	0.16	0.18	0.15	0.20	0.09	0.14
PRECINCT 26012	0.08	0.09	0.10	0.08	0.49	0.10	0.13	0.08	0.11	0.10	0.47	0.17
PRECINCT 26013	0.11	0.14	0.15	0.15	0.44	0.17	0.16	0.57	0.12	0.19	0.28	0.24
PRECINCT 26014	0.07	0.11	0.10	0.17	0.32	0.13	0.15	0.37	0.13	0.18	0.52	0.22
PRECINCT 26015	0.29	0.39	0.32	0.29	0.53	0.29	0.35	0.46	0.26	0.27	0.59	0.38
PRECINCT 26016	0.34	0.36	0.32	0.33	0.18	0.38	0.37	0.40	0.32	0.32	0.17	0.32
PRECINCT 26017	0.07	0.06	0.07	0.03	0.64	0.04	0.05	0.22	0.07	0.04	0.62	0.18

PRECINCT 26018	0.27	0.82	0.87	0.66	0.67	0.57	0.38	0.78	0.53	0.66	0.69	0.66
PRECINCT 26019	0.37	0.41	0.42	0.32	0.69	0.35	0.35	0.83	0.33	0.38	0.69	0.48
PRECINCT 26020	0.18	0.17	0.19	0.11	0.55	0.15	0.17	0.77	0.12	0.12	0.62	0.30
PRECINCT 26021	0.17	0.63	0.71	0.54	0.48	0.41	0.65	0.44	0.51	0.47	0.52	0.53
PRECINCT 26022	0.17	0.17	0.17	0.16	0.23	0.18	0.18	0.42	0.14	0.17	0.21	0.20
PRECINCT 26023	0.21	0.24	0.18	0.21	0.52	0.24	0.27	0.25	0.16	0.18	0.51	0.28
PRECINCT 26024	0.47	0.54	0.44	0.41	0.47	0.50	0.54	0.62	0.37	0.41	0.47	0.48
PRECINCT 26025	0.31	0.28	0.27	0.23	0.40	0.34	0.39	0.58	0.39	0.29	0.39	0.36
PRECINCT 26026	0.34	0.35	0.33	0.35	0.47	0.39	0.41	0.36	0.38	0.36	0.49	0.39
PRECINCT 26027	0.32	0.33	0.30	0.32	0.18	0.35	0.34	0.34	0.31	0.30	0.18	0.29
PRECINCT 26028	0.32	0.30	0.27	0.23	0.34	0.28	0.29	0.23	0.26	0.24	0.34	0.28
PRECINCT 26029	0.87	0.92	0.75	0.85	0.27	1.02	1.02	0.45	0.82	0.91	0.26	0.73
PRECINCT 26030	0.19	0.20	0.17	0.19	0.23	0.22	0.22	0.31	0.19	0.24	0.10	0.21
PRECINCT 26031	0.16	0.14	0.15	0.18	0.11	0.17	0.18	0.12	0.18	0.15	0.10	0.15
PRECINCT 27001	0.44	0.54	0.50	0.51	0.35	0.56	0.54	0.12	0.56	0.51	0.35	0.45
PRECINCT 27002	0.23	0.21	0.26	0.26	0.10	0.21	0.18	0.30	0.26	0.25	0.50	0.25
PRECINCT 27003	0.19	0.20	0.23	0.22	0.29	0.20	0.18	0.34	0.22	0.20	0.14	0.22
PRECINCT 27004	0.16	0.13	0.15	0.16	0.18	0.14	0.15	0.14	0.15	0.15	0.23	0.16
PRECINCT 27005	0.52	0.54	0.58	0.57	0.22	0.59	0.58	0.20	0.57	0.57	0.24	0.46
PRECINCT 27006	0.67	0.71	0.60	0.69	0.28	0.78	0.75	0.28	0.63	0.72	0.26	0.57
PRECINCT 27007	0.31	0.29	0.29	0.27	0.19	0.31	0.31	0.23	0.27	0.24	0.46	0.29
PRECINCT 27008	0.54	0.53	0.52	0.59	0.48	0.63	0.61	0.55	0.52	0.58	0.11	0.51
PRECINCT 27009	0.33	0.33	0.34	0.37	0.47	0.35	0.36	0.13	0.31	0.35	0.08	0.31
PRECINCT 27010	0.20	0.18	0.17	0.21	0.13	0.17	0.18	0.09	0.17	0.19	0.35	0.18
PRECINCT 27011	0.55	0.48	0.44	0.58	0.06	0.55	0.59	0.42	0.43	0.54	0.18	0.43
PRECINCT 27012	0.13	0.11	0.10	0.14	0.17	0.12	0.14	0.16	0.01	0.11	0.08	0.11
PRECINCT 27013	0.48	0.44	0.46	0.52	0.21	0.58	0.67	0.07	0.49	0.49	0.06	0.40
PRECINCT 27014	0.65	0.56	0.60	0.63	0.15	0.65	0.64	0.08	0.60	0.62	0.18	0.47
PRECINCT 27015	0.64	0.54	0.55	0.52	0.06	0.54	0.51	0.16	0.54	0.52	0.16	0.41
PRECINCT 27016	0.21	0.20	0.22	0.22	0.09	0.19	0.18	0.12	0.21	0.20	0.23	0.19
PRECINCT 27017	0.40	0.41	0.41	0.41	0.21	0.38	0.32	0.20	0.43	0.40	0.13	0.33
PRECINCT 27018	0.57	0.58	0.56	0.58	0.15	0.55	0.45	0.11	0.68	0.53	0.20	0.44
PRECINCT 27019	0.20	0.20	0.18	0.20	0.36	0.20	0.19	0.17	0.16	0.19	0.04	0.19
PRECINCT 27020	0.68	0.62	0.56	0.56	0.15	0.71	0.68	0.06	0.65	0.68	0.14	0.48
PRECINCT 27021	0.71	0.68	0.57	0.60	0.87	0.72	0.67	0.09	0.54	0.63	0.11	0.55
PRECINCT 27022	1.14	0.97	0.96	0.89	0.09	0.91	0.76	1.03	0.90	0.90	0.26	0.77
PRECINCT 27023	0.28	0.22	0.24	0.24	0.29	0.23	0.17	0.12	0.24	0.23	0.39	0.24
PRECINCT 27024	0.28	0.20	0.19	0.18	0.41	0.20	0.17	0.27	0.21	0.21	0.37	0.24
PRECINCT 27025	0.52	0.47	0.51	0.48	0.48	0.44	0.38	0.43	0.49	0.47	0.84	0.50
PRECINCT 27026	0.36	0.37	0.34	0.35	0.28	0.30	0.25	0.31	0.35	0.33	0.45	0.33
PRECINCT 27027	0.64	0.57	0.51	0.53	0.32	0.52	0.49	0.52	0.56	0.52	0.32	0.49
PRECINCT 27028	0.51	0.43	0.40	0.41	0.58	0.43	0.38	0.24	0.43	0.41	0.34	0.40
PRECINCT 27029	0.31	0.27	0.24	0.26	0.22	0.28	0.26	0.40	0.27	0.25	0.66	0.31
PRECINCT 27030	0.50	0.40	0.39	0.34	0.19	0.42	0.41	0.51	0.36	0.36	0.21	0.36
PRECINCT 27031	0.75	0.69	0.59	0.63	0.34	0.68	0.62	0.27	0.57	0.61	0.42	0.54
PRECINCT 27032	0.65	0.68	0.60	0.67	0.12	0.67	0.62	0.31	0.61	0.66	0.13	0.51
PRECINCT 27033	0.74	0.73	0.71	0.75	0.38	0.79	0.67	0.16	0.73	0.71	0.39	0.60
PRECINCT 27034	0.49	0.45	0.43	0.39	0.40	0.47	0.43	0.48	0.51	0.44	0.25	0.43
PRECINCT 27035	0.85	0.85	0.75	0.78	0.31	0.85	0.80	0.26	0.87	0.75	0.30	0.65
PRECINCT 27036	0.29	0.25	0.25	0.25	0.38	0.24	0.27	0.31	0.28	0.27	0.41	0.29
PRECINCT 27037	0.22	0.20	0.22	0.30	0.10	0.22	0.20	0.41	0.19	0.24	0.10	0.22
PRECINCT 27038	0.41	0.41	0.47	0.47	0.39	0.45	0.38	0.10	0.53	0.46	0.17	0.38
PRECINCT 27039	0.36	0.31	0.31	0.38	0.31	0.32	0.26	0.20	0.29	0.35	0.37	0.31
PRECINCT 27040	0.53	0.45	0.42	0.62	0.46	0.56	0.48	0.46	0.44	0.57	0.50	0.50
PRECINCT 27041	0.66	0.58	0.57	0.76	0.12	0.66	0.53	0.35	0.52	0.69	0.06	0.48
PRECINCT 27042	0.70	0.50	0.50	0.70	0.23	0.60	0.49	0.07	0.50	0.64	0.25	0.45
PRECINCT 27043	0.38	0.32	0.34	0.41	0.31	0.31	0.24	0.09	0.26	0.39	0.35	0.30
PRECINCT 27044	0.43	0.45	0.42	0.53	0.21	0.51	0.38	0.34	0.36	0.51	0.26	0.40
PRECINCT 27045	0.48	0.56	0.52	0.73	0.18	0.70	0.53	0.17	0.59	0.73	0.16	0.49
PRECINCT 27046	0.32	0.33	0.29	0.45	0.16	0.34	0.26	0.10	0.39	0.37	0.15	0.28
PRECINCT 27047	0.24	0.22	0.31	0.26	0.31	0.27	0.28	0.15	0.26	0.26	0.36	0.27
PRECINCT 27048	0.55	0.47	0.48	0.42	0.37	0.39	0.29	0.29	0.49	0.39	0.37	0.40
PRECINCT 27049	1.00	0.96	0.87	1.16	0.68	1.08	0.80	0.48	0.88	1.25	0.65	0.88
PRECINCT 27050	0.56	0.55	0.50	0.57	0.38	0.51	0.37	0.77	0.51	0.58	0.36	0.51
PRECINCT 27051	0.11	0.11	0.12	0.06	0.85	0.08	0.06	0.46	0.14	0.10	0.80	0.28
PRECINCT 27052	0.74	0.80	0.68	0.71	0.34	0.72	0.72	0.99	0.78	0.79	0.39	0.69

PRECINCT 27053	0.45	0.42	0.38	0.34	0.38	0.40	0.41	0.39	0.47	0.43	0.39	0.40
PRECINCT 27054	0.14	0.13	0.08	0.10	0.47	0.12	0.14	0.47	0.14	0.12	0.46	0.22
PRECINCT 27055	0.16	0.18	0.18	0.13	0.52	0.19	0.21	0.53	0.22	0.20	0.53	0.29
PRECINCT 27056	0.24	0.25	0.25	0.23	0.82	0.26	0.28	0.94	0.30	0.24	0.80	0.44
PRECINCT 27057	0.61	0.57	0.53	0.48	0.31	0.55	0.54	0.33	0.65	0.55	0.30	0.48
PRECINCT 27058	0.18	0.17	0.16	0.14	0.77	0.15	0.17	0.55	0.18	0.17	0.53	0.30
PRECINCT 27059	0.26	0.25	0.21	0.19	0.59	0.23	0.23	0.74	0.27	0.23	0.65	0.36
PRECINCT 27060	0.53	0.26	0.26	0.24	0.25	0.26	0.24	0.36	0.31	0.25	0.80	0.32
PRECINCT 27061	0.20	0.08	0.13	0.35	0.41	0.04	0.03	0.46	0.12	0.06	0.26	0.19
PRECINCT 27062	0.49	0.54	0.53	0.63	0.44	0.55	0.58	0.57	0.57	0.64	0.11	0.52
PRECINCT 27063	0.63	0.46	0.48	0.56	0.45	0.44	0.43	0.48	0.46	0.54	0.38	0.47
PRECINCT 27064	0.55	0.43	0.43	0.66	0.63	0.47	0.45	0.36	0.36	0.58	0.46	0.48
PRECINCT 27065	0.99	0.79	0.86	1.21	0.39	0.90	0.86	0.55	0.79	1.22	0.44	0.80
PRECINCT 27066	0.70	0.55	0.58	0.80	0.53	0.60	0.58	0.47	0.50	0.88	0.75	0.62
PRECINCT 27067	0.62	0.53	0.59	0.67	0.20	0.57	0.56	0.69	0.51	0.66	0.38	0.54
PRECINCT 28001	0.41	0.33	0.33	0.32	0.24	0.32	0.36	0.19	0.29	0.31	0.23	0.29
PRECINCT 28002	0.95	0.78	0.79	0.76	0.66	0.80	0.62	0.21	0.93	0.83	0.25	0.66
PRECINCT 28003	0.14	0.14	0.14	0.12	0.40	0.13	0.12	0.47	0.15	0.14	0.67	0.25
PRECINCT 28004	0.25	0.23	0.22	0.21	0.11	0.21	0.18	0.52	0.24	0.23	0.43	0.26
PRECINCT 28005	0.65	0.56	0.53	0.52	0.24	0.53	0.46	0.12	0.57	0.49	0.15	0.42
PRECINCT 28006	0.92	0.80	0.73	0.72	0.35	0.76	0.65	0.13	0.85	0.74	0.12	0.59
PRECINCT 28007	0.44	0.43	0.43	0.35	0.43	0.41	0.35	0.16	0.47	0.42	0.23	0.37
PRECINCT 28008	0.57	0.46	0.43	0.42	0.18	0.43	0.40	0.24	0.45	0.41	0.32	0.37
PRECINCT 28009	0.47	0.39	0.41	0.43	0.13	0.51	0.52	0.46	0.47	0.47	0.39	0.42
PRECINCT 28010	0.71	0.68	0.64	0.59	0.34	0.69	0.60	0.14	0.65	0.62	0.14	0.51
PRECINCT 28011	0.87	0.74	0.73	0.74	0.67	0.71	0.57	0.20	0.87	0.73	0.35	0.63
PRECINCT 28012	0.17	0.12	0.13	0.14	0.51	0.14	0.11	0.00	0.14	0.12	0.13	0.17
PRECINCT 28013	0.44	0.39	0.36	0.32	0.29	0.37	0.36	0.20	0.47	0.45	0.63	0.39
PRECINCT 28014	0.17	0.16	0.13	0.17	0.38	0.15	0.16	0.32	0.12	0.17	0.27	0.20
PRECINCT 28015	0.81	0.65	0.69	0.77	0.11	0.80	0.76	0.65	0.69	0.73	0.39	0.63
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100

Table 50: Number of Poll Workers by Precinct

Precinct	Average % of Votes in Each Precinct	Voter turnout (40.25%)	Registered voters	Number of Voting Machines (1 per every 200 Registered Voters)	Votes per Machine	Additional Voting Machine for Precincts with >90th Percentile of Number of Voters per Voting Machine	Total Voting Machines	Total Number of Poll Workers
PRECINCT 01001	0.0026	327	802	4	82		4	5
PRECINCT 01002	0.0041	518	992	5	104		5	5
PRECINCT 01003	0.0039	490	1467	7	67		7	5
PRECINCT 01004	0.0053	667	1643	8	81		8	5
PRECINCT 01005	0.0061	768	1627	8	94		8	5
PRECINCT 02001	0.0032	410	1443	7	57		7	5
PRECINCT 02002	0.0034	429	995	5	86		5	5
PRECINCT 02003	0.0040	506	554	3	183		3	5
PRECINCT 03001	0.0027	341	580	3	118		3	5
PRECINCT 03002	0.0013	170	753	4	45		4	5
PRECINCT 03003	0.0028	348	919	5	76		5	5
PRECINCT 04001	0.0017	213	428	2	100		2	5
PRECINCT 04002	0.0021	266	1263	6	42		6	5
PRECINCT 04003	0.0026	332	1309	7	51		7	5
PRECINCT 05001	0.0026	331	1843	9	36		9	5
PRECINCT 05002	0.0015	192	819	4	47		4	5
PRECINCT 06001	0.0030	379	1150	6	66		6	5
PRECINCT 06002	0.0014	180	519	3	69		3	5
PRECINCT 06003	0.0015	185	521	3	71		3	5
PRECINCT 06004	0.0031	391	705	4	111		4	5
PRECINCT 06005	0.0036	459	1326	7	69		7	5
PRECINCT 07001	0.0021	265	3091	15	17		15	6
PRECINCT 07002	0.0017	215	1249	6	34		6	5
PRECINCT 07003	0.0036	457	1215	6	75		6	5
PRECINCT 07004	0.0042	537	1644	8	65		8	5
PRECINCT 08001	0.0043	539	955	5	113		5	5
PRECINCT 08002	0.0032	402	1021	5	79		5	5
PRECINCT 08003	0.0038	485	1267	6	77		6	5
PRECINCT 08004	0.0017	215	990	5	43		5	5
PRECINCT 08005	0.0038	483	2101	11	46		11	6

Precinct								
PRECINCT 08006	0.0038	485	544	3	178		3	5
PRECINCT 08007	0.0013	167	836	4	40		4	5
PRECINCT 08008	0.0020	254	1194	6	43		6	5
PRECINCT 08009	0.0028	353	1121	6	63		6	5
PRECINCT 08010	0.0085	1,053	1053	5	200	1	6	5
PRECINCT 08011	0.0022	283	1335	7	42		7	5
PRECINCT 09001	0.0024	300	851	4	70		4	5
PRECINCT 09002	0.0028	359	982	5	73		5	5
PRECINCT 09003	0.0034	388	388	2	200	1	3	5
PRECINCT 09004	0.0053	419	419	2	200	1	3	5
PRECINCT 09005	0.0049	625	1161	6	108		6	5
PRECINCT 09006	0.0063	795	923	5	172		5	5
PRECINCT 09007	0.0043	542	694	3	156		3	5
PRECINCT 09008	0.0027	340	1075	5	63		5	5
PRECINCT 09009	0.0021	268	805	4	67		4	5
PRECINCT 09010	0.0024	305	974	5	63		5	5
PRECINCT 09011	0.0011	134	706	4	38		4	5
PRECINCT 09012	0.0032	408	1011	5	81		5	5
PRECINCT 09013	0.0033	422	2244	11	38		11	6
PRECINCT 09014	0.0040	500	1303	7	77		7	5
PRECINCT 09015	0.0045	571	1594	8	72		8	5
PRECINCT 10001	0.0035	437	2457	12	36		12	6
PRECINCT 10002	0.0036	456	1147	6	80		6	5
PRECINCT 10003	0.0030	380	2831	14	27		14	6
PRECINCT 10004	0.0024	308	1627	8	38		8	5
PRECINCT 11001	0.0034	436	967	5	90		5	5
PRECINCT 11002	0.0020	247	1846	9	27		9	5
PRECINCT 11003	0.0038	422	422	2	200	1	3	5
PRECINCT 11004	0.0016	206	1123	6	37		6	5
PRECINCT 11005	0.0014	183	314	2	116		2	5
PRECINCT 11006	0.0044	558	733	4	152		4	5
PRECINCT 11007	0.0030	382	1155	6	66		6	5
PRECINCT 12001	0.0056	708	1073	5	132		5	5
PRECINCT 12002	0.0037	466	1273	6	73		6	5

PRECINCT 12003	0.0021	264	1018	5	52		5	5
PRECINCT 12004	0.0034	428	2028	10	42		10	6
PRECINCT 12005	0.0032	404	762	4	106		4	5
PRECINCT 12006	0.0027	341	1157	6	59		6	5
PRECINCT 12007	0.0036	461	748	4	123		4	5
PRECINCT 12008	0.0037	467	1660	8	56		8	5
PRECINCT 12009	0.0028	348	730	4	95		4	5
PRECINCT 12010	0.0036	453	1507	8	60		8	5
PRECINCT 12011	0.0027	346	1193	6	58		6	5
PRECINCT 12012	0.0026	334	942	5	71		5	5
PRECINCT 13001	0.0055	697	1034	5	135		5	5
PRECINCT 13002	0.0036	459	569	3	161		3	5
PRECINCT 13003	0.0037	463	843	4	110		4	5
PRECINCT 13004	0.0028	348	2179	11	32		11	6
PRECINCT 13005	0.0020	247	1272	6	39		6	5
PRECINCT 13006	0.0023	297	1640	8	36		8	5
PRECINCT 13007	0.0034	427	789	4	108		4	5
PRECINCT 13008	0.0040	501	1080	5	93		5	5
PRECINCT 13009	0.0030	382	1278	6	60		6	5
PRECINCT 13010	0.0038	482	523	3	184		3	5
PRECINCT 13011	0.0036	455	604	3	151		3	5
PRECINCT 13012	0.0027	338	599	3	113		3	5
PRECINCT 14001	0.0019	240	362	2	133		2	5
PRECINCT 14002	0.0032	401	558	3	144		3	5
PRECINCT 14003	0.0018	233	647	3	72		3	5
PRECINCT 14004	0.0039	498	667	3	149		3	5
PRECINCT 14005	0.0017	213	816	4	52		4	5
PRECINCT 15001	0.0033	408	408	2	200	1	3	5
PRECINCT 15002	0.0038	485	1707	9	57		9	5
PRECINCT 15003	0.0066	830	1602	8	104		8	5
PRECINCT 15004	0.0027	337	1103	6	61		6	5
PRECINCT 15005	0.0056	711	1967	10	72		10	5
PRECINCT 15006	0.0055	690	1774	9	78		9	5
PRECINCT 15007	0.0037	473	1821	9	52		9	5

PRECINCT 15008	0.0039	492	1773	9	56		9	5
PRECINCT 15009	0.0061	768	1145	6	134		6	5
PRECINCT 15010	0.0050	628	1688	8	74		8	5
PRECINCT 15011	0.0040	505	1624	8	62		8	5
PRECINCT 15012	0.0016	208	1155	6	36		6	5
PRECINCT 15013	0.0027	336	1319	7	51		7	5
PRECINCT 15014	0.0037	471	905	5	104		5	5
PRECINCT 15015	0.0021	260	1257	6	41		6	5
PRECINCT 15016	0.0029	372	1065	5	70		5	5
PRECINCT 15017	0.0045	565	1631	8	69		8	5
PRECINCT 15018	0.0024	304	985	5	62		5	5
PRECINCT 15019	0.0034	435	917	5	95		5	5
PRECINCT 15020	0.0049	621	1655	8	75		8	5
PRECINCT 15021	0.0036	460	1717	9	54		9	5
PRECINCT 15022	0.0035	449	497	2	181		2	5
PRECINCT 15023	0.0041	517	617	3	167		3	5
PRECINCT 15024	0.0039	487	1621	8	60		8	5
PRECINCT 15025	0.0017	213	697	3	61		3	5
PRECINCT 16001	0.0014	176	279	1	126		1	5
PRECINCT 16002	0.0027	341	401	2	170		2	5
PRECINCT 16003	0.0017	210	269	1	156		1	5
PRECINCT 16004	0.0011	142	259	1	110		1	5
PRECINCT 16005	0.0042	527	1233	6	85		6	5
PRECINCT 16006	0.0044	559	1510	8	74		8	5
PRECINCT 16007	0.0039	493	1732	9	57		9	5
PRECINCT 16008	0.0034	426	730	4	117		4	5
PRECINCT 16009	0.0038	483	1052	5	92		5	5
PRECINCT 16010	0.0022	284	1171	6	48		6	5
PRECINCT 16011	0.0017	219	503	3	87		3	5
PRECINCT 16012	0.0042	531	577	3	184		3	5
PRECINCT 16013	0.0049	617	2025	10	61		10	6
PRECINCT 16014	0.0069	492	492	2	200	1	3	5
PRECINCT 17001	0.0039	494	2481	12	40		12	6
PRECINCT 17002	0.0040	512	527	3	194		3	5

PRECINCT 18001	0.0032	404	677	3	119		3	5
PRECINCT 18002	0.0039	489	884	4	111		4	5
PRECINCT 19001	0.0032	405	1676	8	48		8	5
PRECINCT 19002	0.0031	389	919	5	85		5	5
PRECINCT 20001	0.0035	441	925	5	95		5	5
PRECINCT 20002	0.0015	190	576	3	66		3	5
PRECINCT 20003	0.0038	475	815	4	116		4	5
PRECINCT 20004	0.0015	192	761	4	50		4	5
PRECINCT 20005	0.0030	377	1410	7	54		7	5
PRECINCT 20006	0.0073	917	1090	5	168		5	5
PRECINCT 20007	0.0049	521	521	3	200	1	4	5
PRECINCT 20008	0.0012	149	506	3	59		3	5
PRECINCT 20009	0.0009	115	686	3	34		3	5
PRECINCT 20010	0.0010	133	431	2	62		2	5
PRECINCT 20011	0.0025	316	1369	7	46		7	5
PRECINCT 21001	0.0020	248	543	3	91		3	5
PRECINCT 21002	0.0030	379	460	2	165		2	5
PRECINCT 21003	0.0025	315	502	3	126		3	5
PRECINCT 21004	0.0011	145	692	3	42		3	5
PRECINCT 22001	0.0027	346	1385	7	50		7	5
PRECINCT 22002	0.0034	431	705	4	122		4	5
PRECINCT 23001	0.0026	334	2295	11	29		11	6
PRECINCT 23002	0.0021	268	1747	9	31		9	5
PRECINCT 23003	0.0036	459	1602	8	57		8	5
PRECINCT 24001	0.0033	423	1425	7	59		7	5
PRECINCT 24002	0.0025	314	1655	8	38		8	5
PRECINCT 24003	0.0037	465	1380	7	67		7	5
PRECINCT 24004	0.0046	515	515	3	200	1	4	5
PRECINCT 24005	0.0051	646	1724	9	75		9	5
PRECINCT 25001	0.0057	313	313	2	200	1	3	5
PRECINCT 25002	0.0039	498	2034	10	49		10	6
PRECINCT 25003	0.0040	509	1500	8	68		8	5
PRECINCT 25004	0.0041	513	1106	6	93		6	5
PRECINCT 25005	0.0038	483	964	5	100		5	5

PRECINCT 25006	0.0027	339	705	4	96		4	5
PRECINCT 25007	0.0025	312	954	5	65		5	5
PRECINCT 25008	0.0036	450	1845	9	49		9	5
PRECINCT 25009	0.0029	366	1407	7	52		7	5
PRECINCT 25010	0.0031	266	266	1	200	1	2	5
PRECINCT 25011	0.0019	244	851	4	57		4	5
PRECINCT 25012	0.0019	244	1523	8	32		8	5
PRECINCT 25013	0.0015	187	1105	6	34		6	5
PRECINCT 25014	0.0016	205	1742	9	24		9	5
PRECINCT 25015	0.0021	263	1220	6	43		6	5
PRECINCT 25016	0.0027	344	928	5	74		5	5
PRECINCT 26001	0.0018	228	736	4	62		4	5
PRECINCT 26002	0.0025	313	1207	6	52		6	5
PRECINCT 26003	0.0025	313	799	4	78		4	5
PRECINCT 26004	0.0019	246	674	3	73		3	5
PRECINCT 26005	0.0017	210	387	2	108		2	5
PRECINCT 26006	0.0019	241	366	2	132		2	5
PRECINCT 26007	0.0013	163	571	3	57		3	5
PRECINCT 26008	0.0014	175	891	4	39		4	5
PRECINCT 26009	0.0044	557	1023	5	109		5	5
PRECINCT 26010	0.0031	386	875	4	88		4	5
PRECINCT 26011	0.0014	176	966	5	36		5	5
PRECINCT 26012	0.0017	219	1088	5	40		5	5
PRECINCT 26013	0.0024	300	1275	6	47		6	5
PRECINCT 26014	0.0022	276	791	4	70		4	5
PRECINCT 26015	0.0038	474	1715	9	55		9	5
PRECINCT 26016	0.0032	399	1849	9	43		9	5
PRECINCT 26017	0.0018	233	1802	9	26		9	5
PRECINCT 26018	0.0066	838	1248	6	134		6	5
PRECINCT 26019	0.0048	603	1128	6	107		6	5
PRECINCT 26020	0.0030	376	760	4	99		4	5
PRECINCT 26021	0.0053	676	1793	9	75		9	5
PRECINCT 26022	0.0020	258	1972	10	26		10	5
PRECINCT 26023	0.0028	350	1485	7	47		7	5

PRECINCT 26024	0.0048	602	1235	6	97		6	5
PRECINCT 26025	0.0036	451	713	4	126		4	5
PRECINCT 26026	0.0039	492	1246	6	79		6	5
PRECINCT 26027	0.0029	373	863	4	86		4	5
PRECINCT 26028	0.0028	351	1226	6	57		6	5
PRECINCT 26029	0.0073	781	781	4	200	1	5	5
PRECINCT 26030	0.0021	264	428	2	123		2	5
PRECINCT 26031	0.0015	187	1253	6	30		6	5
PRECINCT 27001	0.0045	449	449	2	200	1	3	5
PRECINCT 27002	0.0025	320	767	4	83		4	5
PRECINCT 27003	0.0022	253	253	1	200	1	2	5
PRECINCT 27004	0.0016	200	570	3	70		3	5
PRECINCT 27005	0.0046	480	480	2	200	1	3	5
PRECINCT 27006	0.0057	722	1189	6	121		6	5
PRECINCT 27007	0.0029	360	508	3	142		3	5
PRECINCT 27008	0.0051	646	1429	7	90		7	5
PRECINCT 27009	0.0031	388	1504	8	52		8	5
PRECINCT 27010	0.0018	234	573	3	82		3	5
PRECINCT 27011	0.0043	539	552	3	195	1	4	5
PRECINCT 27012	0.0011	142	290	1	98		1	5
PRECINCT 27013	0.0040	506	884	4	115		4	5
PRECINCT 27014	0.0047	484	484	2	200	1	3	5
PRECINCT 27015	0.0041	199	199	1	200	1	2	3
PRECINCT 27016	0.0019	235	349	2	134		2	5
PRECINCT 27017	0.0033	417	761	4	110		4	5
PRECINCT 27018	0.0044	557	1198	6	93		6	5
PRECINCT 27019	0.0019	59	59	0	200	1	1	3
PRECINCT 27020	0.0048	402	402	2	200	1	3	5
PRECINCT 27021	0.0055	693	2719	14	51		14	6
PRECINCT 27022	0.0077	387	387	2	200	1	3	5
PRECINCT 27023	0.0024	299	902	5	66		5	5
PRECINCT 27024	0.0024	306	1845	9	33		9	5
PRECINCT 27025	0.0050	631	1397	7	90		7	5
PRECINCT 27026	0.0033	422	752	4	112		4	5

PRECINCT 27027	0.0049	614	1441	7	85		7	5
PRECINCT 27028	0.0040	510	1271	6	80		6	5
PRECINCT 27029	0.0031	393	841	4	93		4	5
PRECINCT 27030	0.0036	455	578	3	158		3	5
PRECINCT 27031	0.0054	683	698	3	196	1	4	5
PRECINCT 27032	0.0051	614	614	3	200	1	4	5
PRECINCT 27033	0.0060	761	1041	5	146		5	5
PRECINCT 27034	0.0043	539	1462	7	74		7	5
PRECINCT 27035	0.0065	793	793	4	200	1	5	5
PRECINCT 27036	0.0029	368	506	3	145		3	5
PRECINCT 27037	0.0022	274	1460	7	38		7	5
PRECINCT 27038	0.0038	483	1001	5	96		5	5
PRECINCT 27039	0.0031	392	1523	8	52		8	5
PRECINCT 27040	0.0050	560	560	3	200	1	4	5
PRECINCT 27041	0.0048	613	1115	6	110		6	5
PRECINCT 27042	0.0045	567	889	4	127		4	5
PRECINCT 27043	0.0030	382	682	3	112		3	5
PRECINCT 27044	0.0040	501	617	3	162		3	5
PRECINCT 27045	0.0049	617	624	3	198	1	4	5
PRECINCT 27046	0.0028	358	462	2	155		2	5
PRECINCT 27047	0.0027	340	689	3	99		3	5
PRECINCT 27048	0.0040	501	1393	7	72		7	5
PRECINCT 27049	0.0088	1,114	1998	10	112		10	5
PRECINCT 27050	0.0051	644	1151	6	112		6	5
PRECINCT 27051	0.0028	351	2511	13	28		13	6
PRECINCT 27052	0.0069	875	1072	5	163		5	5
PRECINCT 27053	0.0040	506	1546	8	65		8	5
PRECINCT 27054	0.0022	283	1494	7	38		7	5
PRECINCT 27055	0.0029	365	2289	11	32		11	6
PRECINCT 27056	0.0044	552	1136	6	97		6	5
PRECINCT 27057	0.0048	608	2199	11	55		11	6
PRECINCT 27058	0.0030	377	592	3	127		3	5
PRECINCT 27059	0.0036	455	1397	7	65		7	5
PRECINCT 27060	0.0032	409	1268	6	64		6	5

PRECINCT 27061	0.0019	246	1321	7	37		7	5
PRECINCT 27062	0.0052	652	1434	7	91		7	5
PRECINCT 27063	0.0047	592	1376	7	86		7	5
PRECINCT 27064	0.0048	610	1411	7	86		7	5
PRECINCT 27065	0.0080	479	479	2	200	1	3	5
PRECINCT 27066	0.0062	640	640	3	200	1	4	5
PRECINCT 27067	0.0054	677	1887	9	72		9	5
PRECINCT 28001	0.0029	368	1730	9	43		9	5
PRECINCT 28002	0.0066	836	1388	7	120		7	5
PRECINCT 28003	0.0025	313	488	2	128		2	5
PRECINCT 28004	0.0026	325	728	4	89		4	5
PRECINCT 28005	0.0042	526	1116	6	94		6	5
PRECINCT 28006	0.0059	742	1540	8	96		8	5
PRECINCT 28007	0.0037	466	1794	9	52		9	5
PRECINCT 28008	0.0037	472	849	4	111		4	5
PRECINCT 28009	0.0042	483	483	2	200	1	3	5
PRECINCT 28010	0.0051	643	1028	5	125		5	5
PRECINCT 28011	0.0063	799	1788	9	89		9	5
PRECINCT 28012	0.0017	203	203	1	200	1	2	5
PRECINCT 28013	0.0039	487	1098	5	89		5	5
PRECINCT 28014	0.0020	255	1206	6	42		6	5
PRECINCT 28015	0.0063	340	340	2	200	1	3	5
TOTAL	**1**	**121,909***	**314,095**	**1,570**	**27,349**	**30**	**1,600**	**1,461**

The total number of votes is different from the overall turnout (314,095*.4025=126,423) because the number of votes exceeds the number of registered voters in a few precincts. In those cases, the number of votes equals the number of registered voters, therefore causing the small difference between the total number of votes and overall vote turnout.

Table 51: Simulation Model of Average Wait Time for the 2008 Presidential Election (Peak Hours of Noon to 2 p.m.)

Customer	Inter-arrival Time (min)	Arrival Time (hr:min)	Service Time (min)	Server #1 Start (hr:min)	End (hr:min)	Server #2 Start (hr:min)	End (hr:min)	Server #3 Start (hr:min)	End (hr:min)	Server #4 Start (hr:min)	End (hr:min)	Server #5 Start (hr:min)	End (hr:min)	Server #6 Start (hr:min)	End (hr:min)	Wait Time (hr:min)	Total Time (hr:min)
1	0.64	12:00	3	12:00	12:03											0:00	0:03
2	0.43	12:01	6			12:01	12:07									0:00	0:06
3	0.43	12:02	6					12:02	12:08							0:00	0:06
4	0.64	12:03	3	12:03	12:06											0:00	0:03
5	0.43	12:04	6							12:04	12:10					0:00	0:06
6	1.60	12:04	9									12:04	12:13			0:00	0:09
7	1.60	12:06	9											12:06	12:15	0:00	0:09
8	1.60	12:07	3	12:07	12:10											0:00	0:03
9	0.64	12:07	9			12:07	12:16									0:00	0:09
10	0.64	12:09	6					12:09	12:15							0:00	0:06
11	0.94	12:10	6	12:10	12:16											0:00	0:06
12	1.60	12:10	9							12:10	12:19					0:00	0:09
13	0.43	12:11	6									12:13	12:19			0:02	0:08
14	0.43	12:12	9					12:15	12:24							0:03	0:12
15	1.60	12:12	9											12:15	12:24	0:02	0:11
16	0.64	12:13	9	12:16	12:25											0:03	0:12
17	0.43	12:14	6			12:16	12:22									0:01	0:07
18	1.60	12:15	9							12:19	12:28					0:04	0:13
19	1.60	12:16	6									12:19	12:25			0:03	0:09
20	0.43	12:17	6			12:22	12:28									0:05	0:11
21	0.94	12:19	6					12:24	12:30							0:05	0:11
22	0.94	12:19	9											12:24	12:33	0:05	0:14

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#		Time		T1	T2	T3	T4	T5	T6		
23	0.94	12:20	6	12:25	12:31					0:05	0:11
24	0.43	12:21	3					12:25	12:28	0:04	0:07
25	0.64	12:22	9			12:28	12:37			0:06	0:15
26	0.64	12:23	9					12:28		0:05	0:14
27	1.60	12:24	6			12:28	12:34			0:04	0:10
28	0.64	12:24	6			12:30	12:36			0:05	0:11
29	0.64	12:25	3	12:31	12:34					0:05	0:08
30	0.94	12:27	6					12:33	12:39	0:06	0:12
31	1.60	12:28	3	12:34	12:37					0:06	0:09
32	0.64	12:28	6					12:34	12:40	0:05	0:11
33	0.64	12:29	3	12:36	12:39					0:06	0:09
34	1.60	12:31	3	12:37	12:40					0:06	0:09
35	0.43	12:32	9			12:37	12:46			0:05	0:14
36	0.94	12:32	3	12:37						0:05	0:08
37	0.64	12:33	9	12:39	12:48					0:05	0:14
38	0.43	12:34	9					12:39	12:48	0:05	0:14
39	0.64	12:34	6	12:40	12:46					0:05	0:11
40	0.94	12:36	6	12:40	12:46					0:04	0:10
41	0.94	12:37	9			12:40	12:49			0:03	0:12
42	0.43	12:38	6	12:46	12:52					0:07	0:13
43	0.43	12:39	9			12:46	12:55			0:07	0:16
44	0.64	12:40	6	12:46	12:52					0:06	0:12
45	0.64	12:41	9	12:48	12:57					0:06	0:15
46	0.64	12:42	9			12:48	12:57			0:05	0:14
47	1.60	12:43	9			12:49	12:58			0:06	0:15
48	1.60	12:44	6	12:52	12:58					0:07	0:13

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49	0.64	12:45	6	12:52	12:58	0:07	0:13
50	0.64	12:47	9	12:55	13:04	0:08	0:17
51	0.64	12:48	9	12:57	13:06	0:09	0:18
52	0.43	12:48	3	12:57	13:00	0:08	0:11
53	0.64	12:49	6	12:58	13:04	0:08	0:14
54	0.64	12:49	6	12:58	13:04	0:08	0:14
55	0.94	12:50	6	12:58	13:04	0:08	0:14
56	0.64	12:51	9	13:00	13:09	0:08	0:17
57	1.60	12:52	6	13:04	13:10	0:11	0:17
58	0.64	12:53	9	13:04	13:13	0:11	0:20
59	1.60	12:54	3	13:04	13:07	0:10	0:13
60	1.60	12:54	6	13:04	13:10	0:10	0:16
61	1.60	12:55	6	13:06	13:12	0:11	0:17
62	1.60	12:56	6	13:07	13:13	0:10	0:16
63	0.94	12:58	9	13:09	13:18	0:11	0:20
64	0.94	12:58	6	13:10	13:16	0:11	0:17
65	0.64	12:59	3	13:10	13:13	0:11	0:14
66	0.64	12:59	9	13:12	13:21	0:12	0:21
67	1.60	13:00	9	13:13	13:22	0:13	0:22
68	0.94	13:01	9	13:13	13:22	0:12	0:21
69	1.60	13:02	3	13:13	13:16	0:11	0:14
70	0.43	13:03	9	13:16	13:25	0:12	0:21
71	0.43	13:05	9	13:16	13:25	0:11	0:20
72	0.64	13:06	6	13:18	13:24	0:11	0:17
73	0.64	13:07	9	13:21	13:30	0:14	0:23
		13:08	6	13:22	13:28	0:14	0:20

#								
74	1.60							0:22
75	0.64	9	13:09	13:22	13:31	13:31	0:13	0:22
76	0.94	3	13:10		13:24	13:27	0:13	0:16
77	0.94	3	13:11	13:25	13:28	13:31	0:13	0:16
78	0.94	6	13:11		13:25	13:31	0:14	0:20
79	0.64	6	13:12		13:27	13:33	0:15	0:21
80	0.94	9	13:12	13:28	13:37		0:15	0:24
81	1.60	3	13:13	13:28	13:31		0:15	0:18
82	0.64	6	13:14	13:30	13:36		0:15	0:21
83	1.60	6	13:15	13:31	13:37		0:16	0:22
84	0.94	9	13:16	13:31	13:40		0:14	0:23
85	1.60	3	13:17	13:31	13:34		0:14	0:17
86	1.60	3	13:18	13:33	13:36		0:15	0:18
87	0.64	3	13:18	13:34	13:37		0:16	0:19
88	1.60	6	13:20	13:36	13:42		0:16	0:22
89	0.94	6	13:21	13:36	13:42		0:15	0:21
90	0.64	6	13:22	13:37	13:43		0:14	0:20
91	0.43	6	13:23	13:37	13:43		0:14	0:20
92	0.94	9	13:24	13:37	13:46		0:13	0:22
93	0.94	9	13:25	13:40	13:49		0:15	0:24
94	0.64	3	13:25	13:42	13:45		0:16	0:19
95	0.94	9	13:26	13:42	13:51		0:15	0:24
96	0.64	9	13:28	13:43	13:52		0:15	0:24
97	0.43	6	13:29	13:43	13:49		0:13	0:19
98	0.64	6	13:30	13:45	13:51		0:14	0:20
99	0.64	6	13:32	13:46	13:52		0:14	0:20
		9	13:32	13:49	13:58		0:16	0:25

100	0.94					0:15	0:18
101	1.60	13:34	3	13:49	13:52	0:15	0:18
102	0.43	13:35	3	13:51	13:54	0:16	0:19
103	0.43	13:35	3	13:51	13:54	0:15	0:18
104	0.64	13:36	9	13:52	14:01	0:15	0:24
105	1.60	13:37	3	13:52	13:55	0:15	0:18
106	0.94	13:37	9	13:52	14:01	0:15	0:24
107	0.64	13:39	3	13:54	13:57	0:15	0:18
108	0.64	13:39	9	13:54	14:03	0:14	0:23
109	0.94	13:41	9	13:55	14:04	0:14	0:23
110	0.64	13:43	6	13:57	14:03	0:14	0:20
111	0.43	13:43	3	13:58	14:01	0:14	0:17
112	0.64	13:44	9	14:01	14:10	0:16	0:25
113	0.94	13:45	9	14:01	14:10	0:16	0:25
114	1.60	13:46	3	14:01	14:04	0:15	0:18
115	1.60	13:46	3	14:03	14:06	0:16	0:19
116	0.94	13:47	6	14:03	14:09	0:16	0:22
117	0.94	13:48	9	14:04	14:13	0:15	0:24
118	1.60	13:49	6	14:04	14:10	0:15	0:21
119	1.60	13:50	6	14:06	14:12	0:16	0:22
120	1.60	13:50	9	14:09	14:18	0:18	0:27
121	1.60	13:51	6	14:10	14:16	0:19	0:25
122	0.64	13:51	9	14:10	14:19	0:19	0:28
123	0.43	13:53	6	14:10	14:16	0:17	0:23
124	0.94	13:53	6	14:12	14:18	0:18	0:24
125	0.94	13:55	6	14:13	14:19	0:18	0:24

126	0.64	13:56	3	14:16	14:19		0:20	0:23
127	0.94	13:57	6		14:16	14:22	0:19	0:25
128	0.64	13:58	6		14:18	14:24	0:19	0:25
Average Wait Time from 13:00 to 14:00								**15.29**

Table 52: Simulated Wait Time for Vote Centers (Peak Hours)

Customer	Inter-arrival Time (min)	Arrival Time (hr:min)	Service Time (min)	Server #1 Start (hr:min)	Server #1 End (hr:min)	Server #2 Start (hr:min)	Server #2 End (hr:min)	Server #3 Start (hr:min)	Server #3 End (hr:min)	Server #4 Start (hr:min)	Server #4 End (hr:min)	Server #5 Start (hr:min)	Server #5 End (hr:min)	Server #6 Start (hr:min)	Server #6 End (hr:min)	Wait Time (hr:min)	Total Time (hr:min)
1	0.72	12:00	6	12:00	12:06											0:00	0:06
2	0.72	12:01	3			12:01	12:04									0:00	0:03
3	0.72	12:02	3					12:02	12:05							0:00	0:03
4	0.72	12:03	3							12:03	12:06					0:00	0:03
5	0.72	12:04	9			12:04	12:13									0:00	0:09
6	0.72	12:04	3									12:04	12:07			0:00	0:03
7	0.72	12:06	9					12:06	12:15							0:00	0:09
8	0.72	12:07	6	12:07	12:13											0:00	0:06
9	0.72	12:07	9							12:07	12:16					0:00	0:09
10	0.72	12:09	3									12:09	12:12			0:00	0:03
11	0.72	12:10	9											12:10	12:19	0:00	0:09
12	0.72	12:10	6									12:12	12:18			0:01	0:07
13	0.72	12:11	3	12:13	12:16											0:01	0:04
14	0.72	12:12	9			12:13	12:22									0:01	0:10
15	0.72	12:12	6					12:15	12:21							0:02	0:08
16	0.72	12:13	3	12:16	12:19											0:02	0:05
17	0.72	12:14	6							12:16	12:22					0:01	0:07
18	0.72	12:15	6									12:18	12:24			0:03	0:09
19	0.72	12:16	6	12:19	12:25											0:02	0:08
20	0.72	12:17	9											12:19	12:28	0:01	0:10
21	0.72	12:19	9					12:21	12:30							0:02	0:11
22	0.72	12:19	6			12:22	12:28									0:02	0:08

23	0.72	12:20	6	12:22	12:28			0:02	0:08
24	0.72	12:21	6	12:24	12:30			0:02	0:08
25	0.72	12:22	6	12:25	12:31			0:02	0:08
26	0.72	12:23	3	12:28	12:31			0:04	0:07
27	0.72	12:24	9	12:28	12:37			0:04	0:13
28	0.72	12:24	3	12:28	12:31			0:03	0:06
29	0.72	12:25	6	12:30	12:36			0:04	0:10
30	0.72	12:27	9	12:30	12:39			0:03	0:12
31	0.72	12:28	3	12:31	12:34			0:02	0:05
32	0.72	12:28	9	12:31	12:40			0:02	0:11
33	0.72	12:29	9	12:31	12:40			0:02	0:11
34	0.72	12:31	9	12:34	12:43			0:02	0:11
35	0.72	12:32	9	12:36	12:45			0:04	0:13
36	0.72	12:32	9	12:37	12:46			0:04	0:13
37	0.72	12:33	9	12:39	12:48			0:06	0:15
38	0.72	12:34	6	12:40	12:46			0:05	0:11
39	0.72	12:34	9	12:40	12:49			0:06	0:15
40	0.72	12:36	6	12:43	12:49			0:06	0:12
41	0.72	12:37	6	12:45	12:51			0:08	0:14
42	0.72	12:38	9	12:46	12:55			0:07	0:16
43	0.72	12:39	9	12:46	12:55			0:07	0:16
44	0.72	12:40	6	12:48	12:54			0:08	0:14
45	0.72	12:41	9	12:49	12:58			0:07	0:16
46	0.72	12:42	6	12:49	12:55			0:07	0:13
47	0.72	12:43	6	12:51	12:57			0:08	0:14
48	0.72	12:44	9	12:54	13:03			0:09	0:18

49	0.72	9	12:45	12:55	13:04	0:09	0:18
50	0.72	9	12:47	12:55	13:04	0:08	0:17
51	0.72	3	12:48	12:55	12:58	0:07	0:10
52	0.72	9	12:48	12:57	13:06	0:08	0:17
53	0.72	9	12:49	12:58	13:07	0:08	0:17
54	0.72	3	12:49	12:58	13:01	0:08	0:11
55	0.72	9	12:50	13:01	13:10	0:10	0:19
56	0.72	9	12:51	13:03	13:12	0:11	0:20
57	0.72	9	12:52	13:04	13:13	0:11	0:20
58	0.72	3	12:53	13:04	13:07	0:11	0:14
59	0.72	6	12:54	13:06	13:12	0:12	0:18
60	0.72	6	12:54	13:07	13:13	0:12	0:18
61	0.72	6	12:55	13:07	13:13	0:12	0:18
62	0.72	6	12:56	13:10	13:16	0:13	0:19
63	0.72	9	12:58	13:12	13:21	0:13	0:22
64	0.72	9	12:58	13:12	13:21	0:13	0:22
65	0.72	6	12:59	13:13	13:19	0:13	0:19
66	0.72	6	12:59	13:13	13:19	0:13	0:19
67	0.72	3	13:00	13:13	13:16	0:12	0:15
68	0.72	9	13:01	13:16	13:25	0:15	0:24
69	0.72	6	13:02	13:16	13:22	0:13	0:19
70	0.72	3	13:03	13:19	13:22	0:15	0:18
71	0.72	6	13:05	13:19	13:25	0:14	0:20
72	0.72	6	13:06	13:21	13:27	0:14	0:20
73	0.72	3	13:07	13:21	13:24	0:14	0:17
74		6	13:08	13:22	13:28	0:13	0:19

	0.72							
75	0.72	13:09	9	13:22	13:31		0:13	0:22
76	0.72	13:10	3	13:24	13:27		0:13	0:16
77	0.72	13:11	3	13:25		13:28	0:13	0:16
78	0.72	13:11	9	13:25	13:34		0:13	0:22
79	0.72	13:12	3	13:27	13:30		0:15	0:18
80	0.72	13:12	3	13:27	13:30		0:14	0:17
81	0.72	13:13	9	13:28	13:37		0:14	0:23
82	0.72	13:14	3	13:28		13:31	0:13	0:16
83	0.72	13:15	6	13:30	13:36		0:15	0:21
84	0.72	13:16	9	13:30	13:39		0:13	0:22
85	0.72	13:17	3	13:31		13:34	0:13	0:16
86	0.72	13:18	9	13:31	13:40		0:13	0:22
87	0.72	13:18	3	13:34		13:37	0:15	0:18
88	0.72	13:20	3	13:34	13:37		0:14	0:17
89	0.72	13:21	6	13:36	13:42		0:15	0:21
90	0.72	13:22	9	13:37	13:46		0:14	0:23
91	0.72	13:23	6	13:37		13:43	0:13	0:19
92	0.72	13:24	3	13:37	13:40		0:13	0:16
93	0.72	13:25	3	13:39	13:42		0:14	0:17
94	0.72	13:25	6	13:40	13:46		0:14	0:20
95	0.72	13:26	3	13:40	13:43		0:14	0:17
96	0.72	13:28	3	13:42	13:45		0:14	0:17
97	0.72	13:29	9	13:42	13:51		0:12	0:21
98	0.72	13:30	3	13:43		13:46	0:12	0:15
99	0.72	13:32	9	13:43	13:52		0:11	0:20
100	0.72	13:32	6	13:45	13:51		0:12	0:18

#	0.72						
101	0.72	13:34	3	13:46	13:49	0:11	0:14
102	0.72	13:35	9	13:46	13:55	0:11	0:20
103	0.72	13:35	3	13:46	13:49	0:10	0:13
104	0.72	13:36	6	13:49	13:55	0:12	0:18
105	0.72	13:37	6	13:49	13:55	0:12	0:18
106	0.72	13:37	6	13:51	13:57	0:13	0:19
107	0.72	13:39	6	13:51	13:57	0:12	0:18
108	0.72	13:39	6	13:52	13:58	0:12	0:18
109	0.72	13:41	3	13:55	13:58	0:13	0:16
110	0.72	13:43	3	13:55	13:58	0:12	0:15
111	0.72	13:43	3	13:55	13:58	0:11	0:14
112	0.72	13:44	6	13:57	14:03	0:12	0:18
113	0.72	13:45	9	13:57	14:06	0:12	0:21
114	0.72	13:46	6	13:58	14:04	0:11	0:17
115	0.72	13:46	9	13:58	14:07	0:11	0:20
116	0.72	13:47	9	13:58	14:07	0:11	0:20
117	0.72	13:48	6	13:58	14:04	0:09	0:15
118	0.72	13:49	9	14:03	14:12	0:13	0:22
119	0.72	13:50	6	14:04	14:10	0:13	0:19
120	0.72	13:50	6	14:04	14:10	0:13	0:19
121	0.72	13:51	6	14:06	14:12	0:15	0:21
122	0.72	13:51	9	14:07	14:16	0:15	0:24
123	0.72	13:53	9	14:07	14:16	0:14	0:23
124	0.72	13:53	3	14:10	14:13	0:16	0:19
125	0.72	13:55	3	14:10	14:13	0:15	0:18

126	0.72	13:56	6			14:12	14:18	0:16	0:22
127	0.72	13:57	3	14:12	14:15			0:14	0:17
128	0.72	13:58	6	14:13	14:19			0:14	0:20

Average Wait Time from 13:00 to 14:00 **13:38**

Map 2: Voter Turnout (by Districts) in the 2012 Presidential Primary Election

Northwest
(17.64%)

North
(17.09%)

Northeast
(14.9%)

West
(12.73%)

Central
(12.33%)

East
(10.42%)

Southwest
(16.01%)

South
(10.01%)

Southeast
(10.32%)

**City
of Baltimore**
Voter Turnout

Legend

10.01% – 10.42%

10.43% – 12.73%

12.74% – 16.01%

16.02% – 17.64%

0   1   2   3
Miles

N

8/8/2012

FROM
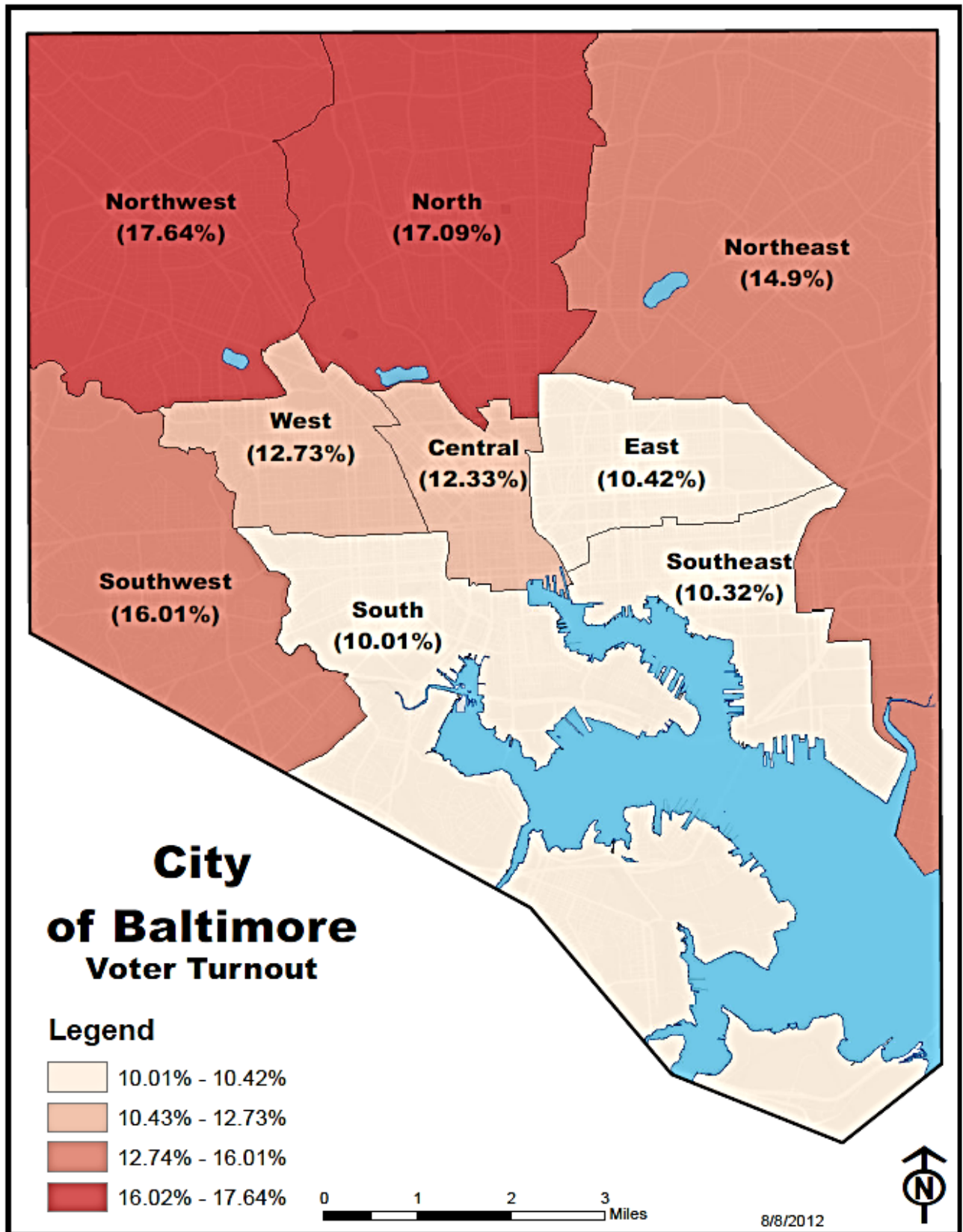
NAME & TITLE: Joseph D. Mazza, CPPO, City Purchasing Agent

AGENCY NAME & ADDRESS: Bureau of Purchases
231 East Baltimore Street, Suite 300

SUBJECT: Informal – Selected Source

MEMO

TO

Honorable President and Members
of the Board of Estimates

May 18, 2010

Dear President and Members:

ACTION REQUESTED OF B/E:
The Board is requested to approve **an agreement and a selected source award** for **Solicitation Number 06000 – Election Services** to McAfee Election Services, Inc., 3409 McFair Lane, Thonotosassa, FL 33592. Period covered is May 26, 2010 through April 30, 2011 with two one-year renewal options.

AMOUNT OF MONEY AND SOURCE OF FUNDS:
$135,440.00   Account No.: 1001-000000-1800-184500-603035
$826,660.00   Not Available (FY2011 Funds)

BACKGROUND/EXPLANATION:
The Board of Elections wishes to engage McAfee Election Services to prepare, inspect and maintain the Diebold touch screen voting units, E-poll books, Judge's Portfolios and additional services as may be required by the City and State of Maryland Board of Elections. The contractor has in-depth knowledge of the equipment, City's voting process, and precinct sites and is considered the best source.

The pricing has been reviewed and deemed fair and reasonable. The agreement has been reviewed and approved by the Board of Elections, Law Department and all concerned parties.

Req. No.: R546791   **Board of Elections**

MBE/WBE PARTICIPATION:
On May 4, 2010, it was determined that no goals would be set because of no opportunity to segment the contract.

BALTIMORE CITY RESIDENTS FIRST (BCRF):
BCRF is not applicable (Not advertised)

LIVING WAGE
Living Wage is not applicable.

Attachments: Agreements (5 original copies); MWBOO Goal Sheet

APPROVED BY BOARD OF ESTIMATES

Bernice W. Taylor

DATE   MAY 26 2010   CLERK   JDM:wtg   #0433

March 28, 2011

PROPOSAL #3
ELECTION SERVICES FOR BALTIMORE CITY
City Fiscal Year 2012

FOR THE SUPERVISION OF THE VOTING MACHINE WAREHOUSE, THE DIEBOLD TOUCH SCREEN VOTING SYSTEM AND THE PREPARATION OF THE VOTING EQUIPMENT FOR THE NOVEMBER, 2011 MAYORAL GENERAL ELECTION, INCLUDING EARLY VOTING.

McAfee Election Services, Inc. to continue its operation at the Voting Machine Warehouse at 301 North Franklintown Road, to be available to advise and report to the Baltimore City Board and Director. McAfee Elections Services, Inc. will seek recommendations and advisement from the State Board regarding legal requirements of the voting equipment. McAfee will serve as a liaison between the Baltimore City Board, the State Board of Elections, ES&S and Cirdan Group.

McAfee Election Services, Inc. will provide supervisory personnel for the warehouse at least 60 days prior to each election and remain for 14 days after each election. McAfee will prepare the machine assignment, and prepare each machine for set up using the P.C. cards (from the State network server person) and load the touch screen units with the election, test vote the units, collect the cards from each precinct and return to the network server person. After the cards have been uploaded to the server, McAfee will reinstall the cards into the units, make the units ready for Election Day, seal and prepare set up log for each precinct. McAfee Election Services, Inc. will prepare, label and test one audio unit per precinct. McAfee Election Services, Inc. will program the electronic poll books and prepare the voter access cards for each precinct. McAfee will ready the warehouse and units for the public logic and accuracy tests on the day designated and assist in the tests. McAfee will assist the Board of Elections in preparing the press/candidate viewing room for the election night tally. McAfee will be on stand by Election Day to oversee the technicians and EDSS, and coordinate the Election Day support and services. McAfee will oversee and assist the Board of Elections with the unofficial election night tally. McAfee will

1 of 3

assist the Board of Elections with the Absentee and Provisional Ballot count, and the official canvassing and report.

McAfee will oversee the packing of the "Judge's Portfolio" as to insure the voter access cards, programmed encoders, master voter access cards, machines keys, return seals, tamper tape, and PIN numbers are supplied.

McAfee will prepare T/S voting units, electronic poll books etc. for the early voting sites. McAfee will oversee the delivery of the early voting equipment to all six locations on Thursday, (prior to Early Voting starting on Friday) and set up each location. McAfee will provide a Technician stationed at each early voting site all the days of early voting. McAfee will oversee the pick up the early voting equipment Thursday night at the close of early voting and secure it in the designated location at the city warehouse.

McAfee will provide nine trucks for the delivery of the electronic poll books and election judges supply bags to the nine Police Districts. McAfee will oversee the loading, security procedures and delivery.

Costs for this service will be:
Early Voting T/S unit preparation (15 x 6 pcts. @ $154.50ea)	$13,905.00
Early voting e-poll book prep (3x6 pcts. @ 103 ea.	1,854.00
Technicians at each Early Vote site (6 days, 12hrs @$82.40, 6 sites)	35,596.80
Set up & break down each early vote site (6 x $721.00)	4,326.00
Election day T/S Unit prep & W/H supervision ($133.90 X 1842)	$246,643.80
E-Poll book preparation & Judges Portfolio ($103.00 X 713)	73,439.00
Nine trucks to deliver supplies to the Police Dept	7,416.00
TOTAL COST	$383,180.60

In addition to the above, services beyond those outlined may be billed to the City at a rate of $82.40 per man-hour. Additional Election Day technicians will be billed at the hourly rate plus expenses.

POST ELECTION MAINTENANCE:

Following the General election, and after the State Board has released the voting equipment, McAfee election Services will inspect all touch screen units. Check the condition of the legs, power up the unit, check battery levels, check printers

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for operation, inspect and replace paper roll if necessary, inspect the screen for damages and clean. Check the memory and card guard. Do an overall visual inspection. Return all the units to the carts and daisy chain units together for charging. Identify any non operating units and report to the SBE.

After Federal Redistricting is completed and before the Presidential Primary Election, McAfee will re-assign, re-label all voting equipment to accommodate redistricting

Costs for these services shall be:

1. *T/S unit post election maintenance ($36.05 X 1932)* 69,648.60
2. *E-Poll Book/printer post maintenance ($41.20 X 728)* 29,993.60
3. *Est. hrs to re-assign, re-label (200 hrs. @ 82.40 ea.)* 16,480.00

Post maintenance total $116,122.20
Proposal # 2 total 383,180.60
TOTAL $499,302.80

In addition to the above, services beyond those outlined may be billed to the City at a rate of $82.40 per man-hour.

APPENDIX II: SCOPE AND METHODOLOGY

The objectives of this study are to 1) determine the cost of daily operations of the Board of Elections, 2) determine the full cost of conducting an election, 3) determine the current cost-effectiveness of election administration, 4) recommend alternatives to increase cost-effectiveness and savings estimates for each of the alternatives, and 5) estimate potential positive and negative outcomes for each of the alternatives.

To determine the cost of daily operation and the full cost of conducting an election, invoices, adopted budgets, and general ledgers of Fiscal Years 2009, 2011, and 2012 are used to reconcile figures and determine the most accurate cost to reflect the expenditures of the agency. When invoices are not available, conversations with the agency helped to determine the most accurate costs. In cases where certain cost figures do not match, the cost figure in the general ledger is assumed to be the most accurate figure.

To determine the current cost-effectiveness of election administration, performance data is obtained from the agency and is then calculated to get the final numbers for cost-effectiveness and performance. Cost-effectiveness and performance indicators include voter turnout, cost per vote, and number of precincts and polling places per square mile and per 100,000 populations. Cost-effectiveness and performance data are then compared to that of Maryland jurisdictions and other major cities to determine the cost-effectiveness of Baltimore City's election administration.

To recommend alternatives to increase cost-effectiveness and estimate savings for each alternative, other cities' practices are taken into consideration and a scenario analysis for each alternative is conducted. The scenario analyses are hypothetical analyses and therefore do not reflect true savings if Baltimore City were to implement any of the alternatives recommended.

Potential positive and negative outcomes for each of the alternatives are based upon the current knowledge of the City populations' demographics and the outcomes other states and cities experienced when implementing the alternatives.

BBMR conducted this management research project from July 2012 to November 2012 in accordance with the standards set forth in the BBMR Project Management Guide and the BBMR Research Protocol. Those standards require that BBMR plans and performs the research project to obtain sufficient and appropriate evidence to provide a basis for the conclusions and recommendations contained in this report. BBMR believes that the evidence obtained provides a reasonable basis for the findings and conclusions in this report and that such findings and conclusions are based on research project objectives.

APPENDIX III: COMMENTS FROM THE BOARD OF ELECTIONS

Armstead B. Crawley Jones, Sr.
Election Director III

Abigail Goldman
Election Deputy Director

Lawrence C. Cager, Jr.
President

Eleanor K. Wang
Vice President

**BALTIMORE CITY
BOARD OF ELECTIONS**

Tara Andrews, Esq.
Secretary

Cory V. McCray
Member

Frankie L. Powell
Member

December 4, 2012

Dear Mr. Andrew Kleine:

Please consider this letter to be this State agency's formal written response to Ms. Leung's summary of "Agency Comments and Evaluation" at the meeting I attended with her and Mr. Cenname on November 20, 2012.

At the meeting, Ms. Goldman, Ms. MacNeille, and I tried to convey that the Management Research Project document does not sufficiently account for the status of the Election Board as a State agency, statutorily subject to the regulations set by the State Board of Elections. The State Board sets standards for the voting system we use, the staffing and equipment of polling places, and the maintenance of registration lists.

Therefore, whatever the merits might be of alternative methods of voting and other measures recommended in the report, this Board is bound to follow the uniform election law, as well as the regulations and directions issued by the State Board to all local boards. For example, we must provide at least one machine for every 200 voters, election judges from the majority and minority parties, and technical staff for each polling place, and our precincts may not cross district lines. The Board similarly has little authority with regard to early voting days and centers.

I explained that I also believe in saving money, but that the Board's and my functions do not include making predictions as to which candidates and ballot questions will motivate the voters in each precinct, even if we could do so accurately. As might be imagined, decisions not to allocate resources to a given precinct could give an appearance of partisanship that would hardly serve the public well.

The Board has not devoted resources to verifying the statistics in the report, and I did not intend to convey in the meeting that either I or the five-member Board had done so. We did try to convey that assessing "performance" through per-voter costs and waiting times is problematic when one is addressing this Board's mission, which is the provision, to all registered voters and with integrity, of the means by which they can exercise their right to vote. We explained that waiting times vary by polling place, by the physical abilities of the voters, and by the need for many voters to submit provisional ballots, which are labor-intensive. We explained that combining precincts into one polling place is difficult given the limited supply of places that can handle large numbers of people, and, in any event, often leads to confusion and longer waits.

With respect to polling place evaluation, it should be clarified that the Board, in accordance with State Board directions, engages polling place evaluators who review the polling places with checklists of criteria provided by the State Board. The Board members and I, also visit the polling places.

With respect to voter turn-out efforts, we explained that the Board members and I frequently address civic and other groups and distribute materials. We ask the City to hang banners over the streets, and it has done so on a limited basis, in accordance with its policies, and we would encourage the City to increase its efforts in that regard if it can. We note that some of the proposed cost-cutting measures at polling places would likely have a negative impact on voter turn-out, as the prospect of traveling further to polls or waiting longer to vote may deter people.

There is one area in which the City might be able to avoid expenses and enhance our efficiency, and that would be the prompt payment of the vendors' bills we submit to the City for payment. Fairly often, we receive second notices for bills we have already submitted, sometimes threatening the termination of the service, and often tacking on late fees. If the City indeed pays the late charges that appear on these bills, that measure might be helpful.

We appreciate the thought and effort given to producing the Project document. If you have any questions, please call me at 410-396-5570.

Sincerely,

Armstead B. Crawley Jones, Sr.

Armstead B. Crawley Jones, Sr.

cc: Linda Lamone, Administrator State Board
    Lawrence Cager, Board President
    Ann MacNeille, Board Attorney

Benton Office Building • 417 E. Fayette Street, Room 129 • Baltimore, Maryland 21202-3432
410-396-5550 • Fax: 410-962-8747 • TTY: 410-545-6148

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APPENDIX IV: BBMR CONTACT AND ACKNOWLEDGEMENTS

BBMR Contact and Acknowledgements

Vieen Leung
vieen.leung@baltimorecity.gov
410-396-4964

BBMR Mission

The Bureau of the Budget and Management Research is an essential fiscal steward for the City of Baltimore. Our mission is to promote economy and efficiency in the use of City resources and help the Mayor and City agencies achieve positive outcomes for the citizens of Baltimore. We do this by planning for sustainability, exercising fiscal oversight, and performing analysis of resource management and service performance. We value integrity, learning and innovating, excellent customer service, and team spirit.

Obtaining Copies of BBMR

All BBMR reports are made available at no charge on Management Research Reports our website at: http://www.baltimorecity.gov/Government/AgenciesDepartments/Finance/BudgetManagementResearch.aspx.

Contacting BBMR

Please contact us by phone at 410-396-4941 or by fax at 410-396-4236.