



CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF ELECTIONS

John Arntz, Director

Honorable Members
Board of Supervisors
City and County of San Francisco
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco, California 94102

Statement of the Results
City and County of San Francisco
Consolidated Municipal Election – November 5, 2019

I, John Arntz, Director of Elections, certify that I have canvassed the ballots cast in the Consolidated Municipal Election held on Tuesday, November 5, 2019, in the City and County of San Francisco (City), in the manner required by Division 15 of the California Elections Code.

I certify that I began the canvass immediately upon the close of the polls and, as a result of the tabulation of all votes recorded, present a complete record entitled "Statement of the Results of the San Francisco Consolidated Municipal Election – November 5, 2019." I also certify that 206,122 voters cast ballots; therefore, 41.64% of San Francisco's 495,050 registered voters participated in this election.

In accordance with California Elections Code section 15374, I certify that this Statement of the Results provides the total number of votes cast for each candidate, and for and against each proposition. The precinct detail of all votes cast appears in the Statement of the Vote, which is posted on the Department of Elections' website at sfelections.org/results and is incorporated by reference into this Statement of the Results.

This Statement of the Results includes tables in Attachment 1 that list the total votes cast in each contest, and for and against each proposition, and is organized as follows:

A. City Offices

1. Mayor
2. Member, Board of Supervisors, District 5
3. City Attorney
4. District Attorney
5. Public Defender
6. Sheriff
7. Treasurer

B. District Offices

1. Member, Board of Education
2. Member, Community College Board

C. City Propositions

1. A, "Affordable Housing Bond."
2. B, "Department of Disability and Aging Services."
3. C, "Vapor Products."
4. D, "Traffic Congestion Mitigation Tax."
5. E, "Affordable Housing and Educator Housing."
6. F, "Campaign Contributions and Campaign Advertisements."

For each results table, the candidates and ballot propositions positions that received the most votes are preceded by arrows (→).

For the November 5 election, all voters received two-card ballots, with the content on each card as follows:

Card 1: Mayor, Member of the Board of Supervisors (District 5 only), City Attorney, District Attorney, Public Defender, Sheriff, Treasurer.

Card 2: Member of the San Francisco Board of Education and Member of the San Francisco Community College Board.

SHA-512 Cryptographic Hash Algorithm

The Department of Elections applied a SHA-512 cryptographic function to reports associated with this election to establish the integrity of the results in a verifiable manner. Attachment 4 provides information regarding the SHA-512 hash values for all electronic files associated with the final, certified results reports.

Voting System and Election Transparency

The City's new voting system that the Department implemented during the 2019 Consolidated Municipal Election allows for increased election transparency through the posting of images of voted ballots, equipment logs, and other election reports, all of which have been posted with the final election results on the Department's website, sfelections.org.

Voted ballot images. The Department posted images of voted ballots cast in this election, allowing members of the public to view each voted ballot cast in the City. In addition to the new system capturing images of voted ballot cards during processing, the system also appends statements that explain how the voting equipment interpreted and tallied each vote mark. These statements, or AuditMarks, provide the public with information on how the voting system operates in relation to recording and reporting votes.

Prior to posting the ballot images, the Department reviewed the images and redacted identifying information that voters may have placed on ballot cards.

Cast Vote Record. The Department posted a "Cast Vote Record" that lists each vote recorded on each ballot card associated with all contests and propositions. The data provided in the Cast Vote Record is captured from the ballots as the ballots are scanned by the voting equipment and before vote tabulation occurs, allowing members of the public to tabulate votes from specific precincts, districts, etc. and compare against the official election results.

Voting equipment logs. The Department also posted the audit logs from the voting equipment. The logs were obtained from the voting machines that voters used at the polling places as well as the equipment the Department uses to process vote-by-mail and provisional ballots in City Hall. The audit logs recorded the operation of the equipment while scanning and processing ballots, further informing members of the public regarding the system's operation.

Risk-Limiting Auditing of Ranked-Choice Voting Contest

The Department supported a pilot demonstration of a risk-limiting audit (RLA) of the vote-by-mail ballots cast in the election and involving the ranked-choice voting contest for District Attorney. While not inclusive of all ballots cast, vote-by-mail ballots represent nearly three-quarters of all votes cast in the election. The demonstration indicated that the new voting system accurately recorded and reported election results.

The mathematical and statistical basis of the auditing tool required many years of consideration. The primary contributors are led by Associate Professor Vanessa Teague from the University of Melbourne and Professor Philip B. Stark from University of California, Berkeley. The City's Department of Technology facilitated the programming of the auditing tool that the Department of Elections used during the pilot demonstration.

The RLA pilot demonstration consisted of manually inputting votes from 200 randomly selected vote-by-mail ballot cards into the application. Underlying the application are statistical calculations that essentially compare the accuracy of the voting system's reported results in relation to the randomly selected votes inputted into the application.

The RLA application uses open source software which is publicly available for review: github.com/pbstark/SHANGRLA

Attachments

Attachment 1 provides tables that list the votes cast in each contest and for or against each proposition.

Attachments 2 and 3 provide detailed pass reports for the application of the ranked-choice voting tabulation method for the contests for Member, Board of Supervisors, District 5, and District Attorney, respectively.

Attachment 4 is the list of SHA-512 hashes associated with each final elections results report.

Attachment 5 is the report from the manual tallies that the Department conducted on randomly selected polling place, vote-by-mail, and provisional ballots to confirm the voting equipment operated properly, and accurately counted and reported election results.

In witness whereof, I hereby affix my hand and seal this 26th day of November in 2019.


John Arntz, Director of Elections



A. CITY OFFICES

I certify the results for the following **CITY OFFICES**:

For the ranked-choice voting contests for Mayor, Member, Board of Supervisors in District 5, City Attorney, District Attorney, Public Defender, Sheriff, and Treasurer, the following tables provide "Round 0" totals for every contest, which represent how voters marked their ballots before the application of the ranked-choice voting method. Each multi-candidate contest also lists vote totals from "Round 1," which represents the number of first-choice selections after the advancement of second- and third-choice selections. In Round 1, second- and third-choice selections advance whenever preceding choices are blank (undervoted) or contain invalid write-in votes for unqualified candidates.

For those contests in which no candidate received a majority of votes in Round 1 (Board of Supervisors in District 5 and District Attorney), and which required the elimination of candidates and the transfer of votes to remaining candidates, the ranked-choice voting method is applied. For these contests, the totals from the final round — reflecting the totals after all votes from eliminated candidates were transferred to the two remaining candidates with the most votes — are indicated to the right of the Round 1 totals. The number of passes required to reach two remaining candidates is noted in parentheses.

1. MAYOR

		Round 0		Round 1	
Candidates		Votes	%	Votes	%
→	LONDON N. BREED	125,200	70.66%	126,221	70.28%
	ELLEN LEE ZHOU	24,667	13.92%	25,006	13.92%
	JOEL VENTRESCA	12,850	7.25%	13,283	7.40%
	PAUL YBARRA ROBERTSON	7,472	4.22%	7,649	4.26%
	WILMA PANG	4,675	2.64%	4,963	2.76%
	ROBERT L. JORDAN, JR.	2,321	1.31%	2,458	1.37%
	MARC ROTH*	7	-	7	-
	Total Votes	177,192		179,587	
	Exhausted by Overvotes	539	-	603	
	Undervotes	28,386	-	25,927	
	Exhausted Ballots		-	-	
	Total Ballots Cast	206,117		206,117	

*Qualified Write-in Candidate

2. MEMBER, BOARD OF SUPERVISORS, DISTRICT 5

Candidates	Round 0		Round 1		Final Round (3)	
	Votes	%	Votes	%	Votes	%
→ DEAN PRESTON	11,119	47.37%	11,239	47.47%	11,723	50.40%
VALLIE BROWN	11,171	47.59%	11,208	47.34%	11,538	49.60%
RYAN LAM	918	3.91%	950	4.01%		
NOMVULA O'MEARA	265	1.13%	278	1.17%		
Total Votes	23,473		23,675		23,261	
Exhausted by Overvotes	39		40		48	
Undervotes	1,253		1,050		1,050	
Exhausted Ballots	-		-		406	
Total Ballots Cast	24,765		24,765		24,765	

3. CITY ATTORNEY

Candidates	Round 0	
	Votes	%
→ DENNIS J. HERRERA	161,369	100%
Total Votes	161,369	-
Exhausted by Overvotes	55	
Undervotes	44,693	
Exhausted	-	
Total Ballots Cast	206,117	

4. DISTRICT ATTORNEY

	Round 0		Round 1		Final Round (3)	
	Candidates	Votes	%	Votes	%	Votes
→	CHESA BOUDIN	68,575	35.71%	68,805	35.61%	86,712
	SUZY LOFTUS	59,698	31.08%	60,007	31.06%	83,872
	NANCY TUNG	37,022	19.28%	37,353	19.33%	
	LEIF DAUTCH	26,758	13.93%	27,031	13.99%	
	Total Votes	192,053		193,196		170,584
	Exhausted by Overvotes	474		525		717
	Undervotes	13,590		12,396		12,396
	Exhausted	-		-		22,420
	Total Ballots Cast	206,117		206,117		206,117

5. PUBLIC DEFENDER

	Round 0	
	Candidates	Votes
→	MANOHAR "MANO" RAJU	158,560
	Total Votes	158,560
	Exhausted by Overvotes	34
	Undervotes	47,523
	Exhausted	-
	Total Ballots Cast	206,117

6. SHERIFF

Round 0		
Candidates	Votes	%
→ PAUL MIYAMOTO	146,628	100%
Total Votes	146,628	
Exhausted by Overvotes	37	
Undervotes	59,452	
Exhausted Ballots	-	
Total Ballots Cast	206,117	

7. TREASURER

Round 0		
Candidates	Votes	%
→ JOSÉ CISNEROS	152,703	100%
Total Votes	152,703	
Exhausted by Overvotes	31	
Undervotes	53,383	
Exhausted	-	
Total Ballots Cast	206,117	

B. DISTRICT OFFICES

I certify the results for the following **DISTRICT OFFICES**:

1. MEMBER, BOARD OF EDUCATION*

	Candidates	Vote Totals	% of Votes
→	JENNY LAM	121,154	73.61%
	KIRSTEN STROBEL	26,036	15.82%
	ROBERT K. COLEMAN	17,395	10.57%
	Total Votes Cast	164,585	
	Undervotes	41,121	
	Overvotes	639	
	Total Ballots Cast	206,345	

*One open office.

2. MEMBER, COMMUNITY COLLEGE BOARD*

	Candidates	Vote Totals	% of Votes
→	IVY LEE	157,858	100%
	Total Votes Cast	157,858	
	Undervotes	48,427	
	Overvotes	55	
	Total Ballots Cast	206,340	

*One open office.

C. CITY PROPOSITIONS

I certify the results for the following **CITY PROPOSITIONS**:

Unless otherwise noted, measures require 50% + 1 affirmative votes to pass.

1. PROPOSITION A - "Affordable Housing Bond."

Measure requires 66 2/3% + 1 affirmative votes to pass.

	Vote Totals	% of Votes		
→ YES	143,055	71.16%	Overvotes	42
NO	57,974	28.84%	Undervotes	5,269

2. PROPOSITION B - "Department of Disability and Aging Services."

	Vote Totals	% of Votes		
→ YES	152,456	78.49%	Overvotes	35
NO	41,775	21.51%	Undervotes	12,074

3. PROPOSITION C - "Vapor Products."

	Vote Totals	% of Votes		
→ NO	164,885	81.81%	Overvotes	119
YES	36,666	18.19%	Undervotes	4,670

4. PROPOSITION D - "Traffic Congestion Mitigation Tax."

Measure requires 66 2/3% + 1 affirmative votes to pass.

	Vote Totals	% of Votes		
→ YES	135,721	67.65%	Overvotes	49
NO	64,896	32.35%	Undervotes	5,674

5. PROPOSITION E - "Affordable Housing and Educator Housing."

	Vote Totals	% of Votes		
→ YES	151,865	76.30%	Overvotes	60
NO	47,175	23.70%	Undervotes	7,240

6. PROPOSITION F - "Campaign Contributions and Campaign Advertisements."

	Vote Totals	% of Votes		
→ YES	151,023	76.89%	Overvotes	28
NO	45,384	23.11%	Undervotes	9,905

Final RCV Short Report

City and County of San Francisco

November 5, 2019, Consolidated Municipal Election

MEMBER, BOARD OF SUPERVISORS, DISTRICT 5

Official results

Number of positions to elect is 1.

Tabulation status: All Positions Filled

Tabulation time: 11/25/2019 3:56:02 PM

Tabulation Options	
RCV method	IRV
Exclude unresolved write-ins	True
Declare winners by threshold	False
Uses precincts	True
Previous rounds evaluation method	None
Elimination type	Single
Fixed precision decimals	0
Perform elimination transfer in last round	False
Skip overvoted rankings	False
Votes to include in threshold calculation	Continuing ballots per round
Use first round suspension	False

City and County of San Francisco

Candidate	Round 1			Round 2			Round 3		
	Votes	Percentage	Transfer (Elimination)	Votes	Percentage	Transfer (Elimination)	Votes	Percentage	Transfer
RYAN LAM	950	4.01%	85	1,035	4.39%	-1,035	0	0.00%	0
DEAN PRESTON	11,239	47.47%	70	11,309	47.91%	414	11,723	50.40%	0
NOMVULA O'MEARA	278	1.17%	-278	0	0.00%	0	0	0.00%	0
VALLIE BROWN	11,208	47.34%	51	11,259	47.70%	279	11,538	49.60%	0
Continuing Ballots Total	23,675			23,603			23,261		
Blanks	1,050		0	1,050		0	1,050		0
Exhausted	0		71	71		335	406		0
Overvotes	40		1	41		7	48		0
Non Transferable Total	1,090			1,162			1,504		

* Tie resolved in accordance with election law.

Final RCV Short Report

City and County of San Francisco

November 5, 2019, Consolidated Municipal Election

DISTRICT ATTORNEY

Official results

Number of positions to elect is 1.

Tabulation status:

All Positions Filled

Tabulation time:

11/25/2019 3:56:37 PM

Tabulation Options	
RCV method	IRV
Exclude unresolved write-ins	True
Declare winners by threshold	False
Uses precincts	True
Previous rounds evaluation method	None
Elimination type	Single
Fixed precision decimals	0
Perform elimination transfer in last round	False
Skip overvoted rankings	False
Votes to include in threshold calculation	Continuing ballots per round
Use first round suspension	False

City and County of San Francisco

Candidate	Round 1			Round 2			Round 3		
	Votes	Percentage	Transfer (Elimination)	Votes	Percentage	Transfer (Elimination)	Votes	Percentage	Transfer
SUZU LOFTUS	60,007	31.06%	6,501	66,508	35.63%	17,364	83,872	49.17%	0
LEIF DAUTCH	27,031	13.99%	-27,031	0	0.00%	0	0	0.00%	0
NANCY TUNG	37,353	19.33%	9,277	46,630	24.98%	-46,630	0	0.00%	0
CHESA BOUDIN	68,805	35.61%	4,745	73,550	39.40%	13,162	86,712	50.83%	0
Continuing Ballots Total	193,196			186,688			170,584		
Blanks	12,396		0	12,396		0	12,396		0
Exhausted	0		6,439	6,439		15,981	22,420		0
Overvotes	525		69	594		123	717		0
Non Transferable Total	12,921			19,429			35,533		

* Tie resolved in accordance with election law.

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

This list represents the various certified results reports the Department of Elections issued for the November 5, 2019, Consolidated Municipal Election. The file names for each report are listed numerically, and underneath each file name is the SHA-512 cryptographic hash value applicable to each file. All reports are posted on the Department's website: www.sfelections.org/results

1. **"Summary – PDF,"** lists a summary of votes cast by contest, using a PDF format.

Hash value:

6E77DE84B7742875142749083AEB4D720F39289966A3A401FCBF56C8728A162CF0A2B888F49
9B370443EF15EB81DEBD5050B9B72E476172F3007120332DE94F5

2. **"Summary – Excel,"** lists a summary of votes cast by contest, using Microsoft Excel.

Hash value:

3F60EE2989E54FE49F9B0165219BB19E75ECC7BEB8ECFB17C2873546DD5CC6164A086066E
B41BCF6E811D2A3108FCB2300655E9339A2E00089A6B70BF9A10560

3. **"Summary – XML,"** lists a summary of votes cast by contest, using XML format.

Hash value:

A256D717096F25732174E41FB1A77995209FB5CD9FB9AE57D4F4A0B2E81FDD3E7262AC5C14
3B52F2ED97EC2E23310D5F3563D7100A02BE602E2AB514398A98B7

4. **"SOV – PDF,"** lists votes cast in each precinct and for each contest, using a PDF format.

Hash value:

F62C7D2ACF72B5C161C4F41D5BDDE1E3DFAB8E8F25DAED13D0D55E4BB6CFD98BCB81D7
DA90C0BF7E83CA5E7F301C89FEB0F444B244C04EF1A3A4465A79C263F8

5. **"SOV – Excel,"** lists votes cast in each precinct and for each contest, using Microsoft Excel.

Hash value:

A516AA5D6D449CC59D97E0E1D1BE27B5CE5F2B0B9C458C72043A2ED2416BB99879EDFE8D
426B8A0C691F1986DC8B68E6B64BA2436631864BFA71952C5427C3F2

6. **"SOV – XML,"** lists votes cast in each precinct and for each contest, using XML format.

Hash value:

4C04B97F94A8866BA6D7599058564124B75E53DA28E4333AA449E2633B6CD7F726046704FC7
632769D2500BE41BF96ED4C198136F59D6CE79BC8B2EC00328E4B

7. **"District SOV – PDF,"** lists votes cast in each district and for each contest, using a PDF format.

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

Hash value:

8981F86B52002BF8984BEC961249BD6BB15414B4359A3C265C64DEE36C1864F215FE0B629F
F1B55832D1BA6DBC0F08BF44E104DDBC5CF293CC29920A3E4F61B49

8. **“District SOV – Excel,”** lists votes cast in each district and for each contest, using Microsoft Excel.

Hash value:

946536D9DE37439BD9DBF139F464263D6304DB61138E86A664C4D9E2D575C82F575D3FB205
19AF4556D36C42315E984FF047CBDCC78FF05B60773D30B2792F3E

9. **“District SOV – XML,”** lists votes cast in each district and for each contest, using XML format.

Hash value:

4B1ADECD370193C85A8D2A4BD4CC84E939606BDA086F061E8D02A22C66D64A6C9259B25A
E47E502FC2B1360EF46D64CFD1ED05E8DABE3A2002DAFD06B46199DB

10. **“Mayor – Short Report - PDF,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates in PDF format.

Hash value:

7913DFAF1B6525D7C885E256B910C37ABBC454CF176F6C00B5A256C63BF4F536A390C0CC0
558EC9FB0935B86B18A4508CD190729DBEB09647FD5B0F1E1EB5644

11. **“Mayor – Short Report - Excel,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates using Microsoft Excel.

Hash value:

04C722B0E9E389F493A7D239FF21EAF1C16285FE18C4AE168CABD5176F2B823B9E87E02E35
51C65B791B88CAB91E8467043826C50F6DA17240416822089BF663

12. **“Mayor – Short Report - XML,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates in XML format.

Hash value:

E54E811507408C56938BA0BE847B7A29A53B3899D459D4DBB506189889BA77D5ACE2258B3A
40B52EC1DF1F1C0C220C4FE3FF0DC92037729976131E893E888DB5

13. **“Mayor – Detail Report - PDF,”** lists the ranked-choice voting pass report in a PDF file.

Hash value:

A2DB65C2D0CFD353A3C9DDEB4F74EBBE69B5307574F183BEDA3C127883475ABD794C2997
FC3B060EA3CB2F1BACD81D892729CA5DA9AA18CE6D434BAB5944ED04

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

14. **“Mayor – Detail Report - Excel,”** lists the ranked-choice voting pass report using Microsoft Excel.

Hash value:

07F356BAA3D56401A08CEF3993C5F110D2D3413A64405B1BC28D448EB1731D62F81E0270CE
0FB3C2BA8BA20C9F943E9459D62D6F593177AD8B5E6F32AB7B8623

15. **“Mayor – Detail Report - XML,”** lists the ranked-choice voting pass report in XML format.

Hash value:

1F9089AFEC3A3CDC4EBE08F89B8C68077EA806263F5010372AA8215613FB730CDAAD31383
D359F18DC4395B59398BBD847BB275271E9C2B991665095093D8970

16. **“Board of Supervisors, District 5 – Short Report - PDF,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates in PDF format.

Hash value:

AD86C7AF83BB3BB3C444BC962A7C80B89094FC395006EBFD35A94E377055AB832B879B83C
199D2728F8A841AA64585148A121B7F7FA5D885851F1EBE794CDB99

17. **“Board of Supervisors, District 5 – Short Report - Excel,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates using Microsoft Excel.

Hash value:

A5766F25F5B1E70BD9F2EDC9F21122C5A2D20EF9DD229DD0EE521E1BE78F2F6ED50374037
FBB90B629FEAB538A4E6BAF801FC4FB3E5D13299860772007708C24

18. **“Board of Supervisors, District 5 – Short Report - XML,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates in XML format.

Hash value:

E94197E30E3282E386DDA33F683E41484C55FFE616AB170D270EB3E10810EF50718800F000A
82D243B3D41BC12C30966EFE5D476C60D519A4EED8247BF028D5C

19. **“Board of Supervisors, District 5 – Detail Report - PDF,”** lists the ranked-choice voting pass report in a PDF file.

Hash value:

A594D0C04ECF5D026D4C8786EE11E4EBF036A8E8759B1BBBD373A03E40D996588BD940946
09EE794D164539E89753110B1D2E99F265B4E580048732424C752F0

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

20. **“Board of Supervisors, District 5 – Detail Report - Excel,”** lists the ranked-choice voting pass report using Microsoft Excel.

Hash value:

E0BC50529946E553704A4757E6D0A47CE3259B022C2AF35881A1872E46F835C432A337A027B
1C4F29526031FC458E0A57D438E61C63FE1D8408474FB4FDC0CAA

21. **“Board of Supervisors, District 5 – Detail Report - XML,”** lists the ranked-choice voting pass report in XML format.

Hash value:

A76FD9AD4A1BDEE0C93437847662073D02D59D26252219A19295E5B2735F5652B742D841D5
D6E3F2030039D07BDCD642A208A4664435410F56F7DC050ED46A71

22. **“District Attorney – Short Report - PDF,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates in PDF format.

Hash value:

C2CA7A7BF05586FE70367051CE2A9A72D1C268040050CEE4B78A5481A75A043D96569EAD05
17385C34A3B6029A319899D0CA303310DFC28698C2AEF496486165

23. **“District Attorney – Short Report - Excel,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates using Microsoft Excel.

Hash value:

1C46D660D64FD82ABFDA7CA315CBC8A12C3AD475585133ED9BE4B2BA62AE600F1BD95F9B
6B04E774C1B40859754CE1198E6CB6A28A6CA7BB4C16D025BC84B035

24. **“District Attorney – Short Report - XML,”** displays total votes cast in ranked-choice voting contest and elimination of candidates and transfer of remaining votes to next ranked candidates in XML format.

Hash value:

626BCAF7F53FBF35B7D70BC1A41E783A02ADAA765C11FCE877D8C02683163BE46047502FF
9352CBCEDD79BBCAF4AD608A0485D31A263FA87A2816472562F857D

25. **“District Attorney – Detail Report - PDF,”** lists the ranked-choice voting pass report in a PDF file.

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

Hash value:

A71ECCCD42D0CD7433E4DB03C0AE75CE789EFD40FE99BF56B194055411B96C6ECB14D7A8
B34717EB91BDDA10FB87845CC5A6D20EA7D80A9D89352ADDFA12E4FC

26. **“District Attorney – Detail Report - Excel,”** lists the ranked-choice voting pass report using Microsoft Excel.

Hash value:

F7E1817D2346F858D4E832343F8972D22505ED92E4D8AC8CBE24ED10B14EB7E350F3FEBAE
9DC1082A15BE55A9658825A182E6D91044C54F3F9DEBB93E765C8D7

27. **“District Attorney – Detail Report - XML,”** lists the ranked-choice voting pass report in XML format.

Hash value:

9AEEF5296C810191D08AAB1789D5938C80393B93F1396139664597A5ED7D72B7B0F943CDDD
44CEF2239FD1500AFD9BE03964B601E98369A82469F7AC2B7E9D70

28. **“Cast Vote Record - JSON,”** lists votes cast on each ballot card in a zipped JSON format.

Hash value:

D1EB82120437E5068780DC0FA220B89B8E6C2C6D934CA817A61AF2F61DECA8DCF0B81D69
C3CF2CC7906AAB49D0FB341CD113B8477361D875D1CC4958D78B220E

29. **“Ballot Images, District 1 - ZIP,”** contains scanned ballot images in zipped TIFF format.

Hash value:

ABE2589E5A10EB00D251CF2C6C6FA767B6577D1F22D203369026AE4CF155A56649F5F3FC8F
C2D1A932757F11A7B8778C2808269A3C33B853F9F75F1BD709618C

30. **“Ballot Images, District 2 - ZIP,”** contains scanned ballot images in zipped TIFF format.

Hash value:

F395D6E4441D789A8B79749B11D01E9F580D1B2C20E72D466003FEF2EA2E54A13FAEE9107F
AD22635C5CDEE17C803EFF18C6FE781AB6F0F24F15307C1658B280

31. **“Ballot Images, District 3 - ZIP,”** contains scanned ballot images in zipped TIFF format.

Hash value:

C10A46A8C147BE2C1F31E46067A55DB9CCAD13672395EFC55EAD5D65E7D8D72E3C4F61F7
F78E2B6367F6994E6B2A97CEF6D68BC1680536C6257EA2D816B74FE0

32. **“Ballot Images, District 4 - ZIP,”** contains scanned ballot images in zipped TIFF format.

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

Hash value:

A82CE4567118DA0119360C6098410B764BA49EF3175B3F556D67A3B8526167DB23370A0EA66
F2C313353339A49AB0ADA512949EF19B02614E75BBFB3EE93B8E3

33. **"Ballot Images, District 5 - ZIP"**, contains scanned ballot images in zipped TIFF format.

Hash value:

AE7019B0113937D15BB506C6E6BF873C8013C8C2E6D4F9245B77452B7F3A1DB4A31ABF3E4
DA5D3488C160F0288A1045D0E2BC8F4BF347BC10A3C6655A9CD66C5

34. **"Ballot Images, District 6 - ZIP"**, contains scanned ballot images in zipped TIFF format.

Hash value:

3A123984AD67AFF2A0AE9393A28FE485E3DAA0B1DF1C91443D7B3C0E878F770B19160C0120
B20E2AF8CF90194F35DCF91357EA4B92C4608FB8026989F062CA47

35. **"Ballot Images, District 7 - ZIP"**, contains scanned ballot images in zipped TIFF format.

Hash value:

AAEC718B24A480CF5F2A255BF358481FCBAC5B499A0564A9220A0CA3E80F4CBFF1F3AF16F
EFF02E85C62B0FF1C1A1D1AA2FDDCE49DDF8549DE2BFDD1068CBEE0

36. **"Ballot Images, District 8 - ZIP"**, contains scanned ballot images in zipped TIFF format.

Hash value:

442FBDC7B37FD612E596A6FF7D408D4A589A7269C70E039DBDB64BD3F30550998C053BA2A
8FAC68C2B81B716B7BB464499415D2A2F9925048FA0115CA64B61CA

37. **"Ballot Images, District 9 - ZIP"**, contains scanned ballot images in zipped TIFF format.

Hash value:

BF507DA70EF9FE9EA67990B4091687D8D98B738B0AB29D805B1332468A55409AA670BB667A
ECBDAF6112F08EB11987A461CB183888527AAEB4B1626861993160

38. **"Ballot Images, District 10 - ZIP"**, contains scanned ballot images in zipped TIFF format.

Hash value:

7B09436D799CAC0E9A863787A8975A9B0E375C3AF4CD0BB3E09ED7F9EFAB05D9ECA6751D
A1ED85660BB97E8634360987B4E0C2D891C7568033713195DEA42433

39. **"Ballot Images, District 11 - ZIP"**, contains scanned ballot images in zipped TIFF format.

**List of SHA-512 Hash Values for Certified Results Reports
Statement of the Results
Consolidated Municipal Election, November 5, 2019**

Hash value:

D9B61D7AAAB68F75EF47E0A05028CD01B8CB32C375AD6B6B5F4654C329DCBC590912385E6
A6622EE751A4216DDA7CF769C5B49060FB741D4E0963270795AE01C

40. **"Ballot Scanning Machine Logs - ZIP,"** audit logs from Ballot Scanning Machines used at Polling Places on Election Day.

Hash value:

6703AAE6237536F50A3463BA1AD1C26E3E2D7A7B361FC0FFF68AB1644C811DDF305B75320F
F9C63F53B467AED359B836C7DDE94C96896C447AC7CF9169D60979

41. **"ImageCast Central Logs - ZIP,"** audit logs from ImageCast Central machines used at City Hall.

Hash value:

D34319D962B2D5DD5B19F063611319599B237CCB179D96146C454C09220732E7DB019E1A974
D854B2040CEE5D80130ADD9CDD76082A15B4327766DDBB7E76E3F

42. **"Vote-by-Mail Status Report,"** lists the disposition of the vote-by-mail ballots the Department received.

Hash value:

095DF03B746E96601C279AC97BDDA6B09302A7A5B7AE89C6AE08CB6D1DDA88ECECD9485C
F2E42B01E5AF17079413990AD33FD773686AD19FC96397DE43C09864

43. **"Provisional Ballot Status Report,"** lists the disposition of the provisional ballots the Department received.

Hash value:

57C223B3B30A1A89BCEBD4253D7C52FE2347A2D4019536962DC26D3640713279AE4E3D80D3
3131C63FC742A2FB4D878A6AFF00BF41807AEC90B9217C7DA67A2C

44. **"Conditional Voter Registration Report,"** lists the disposition of the ballots cast during the Conditional Voter Registration period.

Hash value:

AF7C5E34FB872FC1C3F82BBA7C6BE04BC203EC67DD539C2E2830872909D2F8475C03DEE27
D58D15BE774E0AC00127A6F5F2F265462580D040DF5D5ED062048CC

45. **"SHA-512.csv,"** provides a list of all hashed election results files in CSV format.

Hash value:

F42E8B08B695A83E002C8F6680DE0DFFAC73B4C3CE87A43BFC4002133F4E0A911E2CA312FC
5987BBCF639547B803BA1F24777E88FFE22F73AE7797EA282BDDCC



November 26, 2019

California Secretary of State
1500 11th Street, 5th Floor
Sacramento, CA 95814

**November 5, 2019, Consolidated Municipal Election
Results of Post-Election One Percent Manual Tally**

California Elections Code requires an Official Canvass, which is an internal audit of the election to ensure the accuracy and validity of the results. The canvass entails many tasks, among which are tallies of ballots cast in one percent (1%) of precincts participating in an election, as well as 1% of the vote-by-mail ballots and other ballots cast in an election.

The tallies from the manual count are compared against the results reports issued from voting equipment that tallied the cards. The purpose of conducting the manual count and then comparing those results to vote totals tabulated by voting equipment is to verify that the equipment properly tabulated ballots.

Upon completion of the 1% manual tally, the San Francisco Department of Elections (Department) prepares a report with the results of the tallies and includes the report in the certification of the Official Canvass for the election.

Following is a report of the results of the 1% manual tally for the November 5, 2019, Consolidated Municipal Election.

Random Selection of Ballots

On November 13, 2019, the Department conducted a random selection of ballots for manual tallies.

Five days prior to conducting the selection, the Department issued a press release and posted a public notice on its website, sfelections.org, and outside its office, announcing the date, time, and place of the event. Additionally, the Department webcast the random selection process and posted a recording of the process on its website, sfelections.org.

For the November 5 election, the Department first conducted the selection of five precincts, equal to one percent of all precincts included in the election, to manually tally cards voted at those precincts.

Next, the Department selected six batches of vote-by-mail ballots and one batch of provisional ballots that equal one percent of the batches processed for each type of ballots.

Using three, 10-sided dice, the Department randomly selected the precincts and batches to be tallied in full. Because the precincts included in the first selected batch of provisional ballots did not cover all contests for the election, an additional batch was randomly selected to cover the remaining contests. For this additional batch of provisional ballots, only the contest for the Board of Supervisors, District, 5 was manually tallied. For a list of randomly selected precincts and contests tallied in each precinct, see Appendix A.

Conducting the 1% Manual Tally

The manual tally of cards voted in randomly selected precincts began on Thursday, November 14, 2019, and was completed on the same day. The manual tally took place at the Department's warehouse at Pier 31, located on Embarcadero Street. The manual tally was open to public observation both in person and via live streaming on the Department's website at sfelections.org/live.

For each selected precinct, Department personnel manually tallied votes cast at the polling places using the ballot-scanning machines and ballot-marking devices, accepted provisional ballots, and accepted vote-by-mail ballots, including those issued at the Department's voting centers. Provisional ballots, vote-by-mail ballots, and ballots duplicated through the remake process using the ballot-marking devices are tabulated using the central scanners located in City Hall. The manual counts were then compared against the results reports from the voting system ballot counts. If there were any discrepancies between the tallies and voting equipment reports, the Department sought explanations for these discrepancies.

The Department also tested the voting system's application of the ranked-choice voting (RCV) algorithm. This test is performed by manually applying a series of logical steps of the algorithm to the manually tallied precinct results for a relevant contest and comparing the results of each elimination round to an RCV results report generated for that precinct or batch.

In the November 5 election, voters received two-card ballots, with the following contests on each card:

Card 1	Mayor, Board of Supervisors (Supervisory District 5 only), City Attorney, District Attorney, Public Defender, Sheriff, and Treasurer.
Card 2	Member of the Board of Education, Member of the Community College Board, Local Propositions A – F

Department personnel worked in six, four-person teams to manually tally votes on precinct ballots, vote-by-mail ballots, and provisional ballots. Each team was assigned one precinct or one batch to count at a time. Once all the votes for a contest were counted, a supervisor verified that the manual count matched the machine count. If all the vote counts matched, the team proceeded to the next contest until all the contests on the card have been tallied.

When conducting the manual tally for ranked-choice voting contests, the teams manually eliminated candidates and then transferred votes to remaining candidates by physically moving ballot cards amongst stacks designated for specific candidates. At each round, vote totals for each remaining candidate were compared to a precinct results report showing round-by-round elimination of candidates and the transfer of the votes for those candidates to the voters' subsequent choices.

Department personnel attempted to resolve any discrepancies between the manual tally and the machine count and documented the resolutions on Manual Tally Incident forms. For this election, there was only one discrepancy found during the 1% manual tally, see Appendix B. For a detailed comparison of manual and machine tallies with discrepancies organized by contest and precinct, see Appendix C.

Results of the 1% Manual Tally

In accordance with the Post-Election Manual Tally Emergency Regulations, a “variance” means any difference between the machine tally and the manual tally for a contest, including, but not limited to, differences due to machine malfunction, operator error, or voter error in marking a ballot.

Upon completion of the manual tally of cards voted in 1% of San Francisco’s precincts in the November 5 election, the Department found no variances between the manual tallies and the results reports caused by voting equipment malfunction.

A variance occurred, however, for polling place ballots tallied from precinct 7624. This variance was not due to machine error but was due to two misplaced Card 2 ballots that could not be included in the tally. As a result, all of the contests listed on this card, when manually tallied, indicated two fewer votes than was reported from the machine count.

The results of the 1% manual tally confirmed that the voting equipment used in the November 5, 2019, Consolidated Municipal Election accurately tabulated votes cast for contests appearing on the official ballots.

Appendices

- A. Randomly Selected Precincts and Contests Tallied for the 1% Manual Tally
- B. Summary of the Results of the 1% Manual Tally
- C. Comparison of the Manual Tallies and Machine Counts (for discrepancies only)

Appendix A:

The following table provides a list of randomly selected precincts and the contests tallied for each precinct.

Randomly Selected Precincts and Contests included in the 1% Manual Tally November 5, 2019, Consolidated Municipal Election			
Initial five precincts selected for Precinct Ballots			
Order Drawn	Precinct	Ballot Type	Contests Tallied
1st	7013	2	All
2nd	7512	1	All
3rd	7624	3	All
4th	9404	2	All
5th	9748	2	All
Initial six batches selected for VBM Ballots			
Order Drawn	Batch (Box) #		Contests Tallied
1st	0012	mixed	All
2nd	0220	mixed	All
3rd	0222	mixed	All
4th	0226	mixed	All
5th	0284	mixed	All
6th	0298	mixed	All
Initial batch selected for PV Ballots			
Order Drawn	Batch #		Contests Tallied
1st	4039	mixed	All
2nd	4019	mixed	Board of Supervisors, District 5





Appendix B:

The following table provides a summary of the results of the 1% manual tally, including any discrepancies between the manual tally and the results reports generated by the voting equipment and possible causes of these discrepancies.

Summary of Results of the 1% Manual Tally November 5, 2019 Election			
Precinct	Contests Tallied	Precinct Ballots	
		Discrepancies found?	Causes
7013	All	No	NA
7512	All	No	NA
7624	All	Yes	Two, Card 2s were misplaced and not included in the manual tally, creating two votes less for each contest
9404	All	No	NA
9748	All	No	NA
Batch	Contests Tallied	Vote-by-Mail Ballots	
(Box) #		Discrepancies found?	Causes
0012	All	No	NA
0220	All	No	NA
0222	All	No	NA
0226	All	No	NA
0284	All	No	NA
0298	All	No	NA
Batch	Contests Tallied	Provisional Ballots	
(Box) #		Discrepancies found?	Causes
4039	All	No	NA
4019	Member, Board of Supervisors, District 5	No	NA

Appendix C:

The following table details each discrepancy found during the 1% Manual Tally, including the precinct number for which the discrepancy was found, the type of ballot on which the discrepancy was found, the number of votes indicated by the voting equipment results report (machine tally), the number of votes indicated by the manual tally, and the variance between the results report and manual tally. Each discrepancy is color-coded to indicate the identified cause of variance. For this election there was one variance which was caused by two misplaced ballot cards.

 Type of ink and density
  Crease/ faint vote mark
  Vote mark off the arrow
  Misplaced ballot card/s

Comparison of Manual and Machine Tallies November 5, 2019, Election						
Precinct 7624	Precinct Ballots			Vote-By-Mail Ballots		
<i>Member, Board of Education</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
OVERVOTES				1	0	1
KIRSTEN STROBEL				8	7	1
<i>Member, Community College Board</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
IVY LEE				41	39	1
<i>Proposition A</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
YES				40	38	1
<i>Proposition B</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
YES				31	30	1
NO				13	12	1
<i>Proposition C</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
YES				20	18	1
<i>Proposition D</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
YES				28	27	1
NO				18	17	1
<i>Proposition E</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
YES				40	38	1
<i>Proposition F</i>	Machine Tally	Manual Tally	Variance	Machine Tally	Manual Tally	Variance
YES				35	33	1