2011

November 2011 Preliminary RCV Analysis

David Latterman
University of San Francisco, dclatterman@usfca.edu

Corey Cook
University of San Francisco, cdcook2@usfca.edu

November 2011 preliminary RCV analysis

David Latterman
Corey Cook
University of San Francisco
dclatterman@usfca.edu
cdcook2@usfca.edu

We present here an initial RCV analysis of the 2011 San Francisco Sheriff, District Attorney, and Mayor race. For each race, we examine the first choice by second choice voting patterns, the frequency of slates, and the number of times a candidate is on a ballot, which is useful measure of candidate performance. We also show maps for each race's winner, with a few ethnic and Progressive Voter Index (PVI) correlations when noteworthy.

For the first time, we are also able to present **cross-contest** analyses at the individual voter level. The city's ballot images maintain consistent voter identification numbers. This facilitates associations across contests, so shown here are first choice crosstabs for each of the major races with some political and bullet-voting analyses.

This paper focuses primarily on political outcomes rather than indicators of voters' facility with ranked choice voting. The McCarthy Center will present research in early 2012 looking at RCV trends at a highly detailed level.

Our preliminary analysis indicates that:

- Ed Lee won the mayoralty with a broad coalition of Chinese and moderate voters. In addition to having a 12-point lead in voters' first choice ballots, he scored a sizeable number of second and third choice votes;
- There were strong Chinese-affinity voting patterns in the ballot slates
- John Avalos and David Onek, captured the progressive base but were largely unable to build a broader citywide coalition;
- Although she came in third, Sharmin Bock was better positioned than Onek to defeat the frontrunner, George Gascon, due to her higher proportion of second and third choice votes: she was narrowly behind Gascon in the total number of ballots on which she appeared. Bock and Mirkarimi were similar in that they appealed to voters who didn't necessarily put them first;
- Ross Mirkarimi did better in gaining votes across the city than other liberal candidates, but his support still remained highly correlated with the PVI;
- Though there was some synergy between the the moderate candidates in the race for Sheriff, moderate voters ultimately did not cast a sufficient number of Miyamoto-Cunnie or Cunnie-Miyamoto ballots to affect the outcome of the election;

- The progressive first-choice slate of Avalos-Onek-Mirkarimi was the most common slate among voters (11%);
- Around 9% of voters only chose one candidate in each of the three races. This voting pattern was more common in the southeastern neighborhoods.

Methodology

For this report, we use the November 20, 2011 ballot image data. These include approximately 98% of the final statement of vote ballots and we anticipate no changes in comparison to the final results. Demographics are taken from the 2010 census, and PVI data are from the 2011 PVI report[1]. Most of the analyses presented here are voter-level, taken directly from the ballot image data. However, where there are precinct analyses, like with PVI, eclogical fallacy issues exist as always.

The data reported herein are 'scrubbed', meaning that many voter errors (such as a voter casting no first place vote but having a second vote, or voting for the same candidate three times) have been resolved consistent with the tallying of these votes. This is different than reports of previous years. For instance, if someone votes for a candidate three times, he is simply reported as supporting the candidate and no one else (bullet voting). Please contact us for questions about the data. The percentages and totals shown here might be slightly different from other reports, though any discrepencies should be minimal and the overall impact on the final results negligible.

Voter ID was consistent across all three races and was used to merge data from these three races. [2] Accordingly, we know how the same voter voted in the three candidate races.

Sheriff

District 5 Supervisor Ross Mirkarimi defeated Sheriff's Deputy Paul Miyamoto and former police officer Chris Cunnie in a relatively close open race. Mirkarimi received 38% of the first-choice vote while Cunnie received 28% and Miyamoto received 27%. Mirkarimi was considered the “progressive” candidate in the race, with endorsements from the Bay Guardian, the Democratic Party, and the Harvey Milk Club. Cunnie and Miyamoto split many of the more moderate and law enofrcement endorsements. Cunnie entered the race much later than the other two major candidates.

Map 1 shows Mirkarimi's support throughout the city (first choice vote). Figure 1 shows the correlation with the Progressive Voter Index. Taken together, it's clear Mirkaimi indeed performed well in the more progressive areas of the city, with a very high percentage of votes in those precincts and neghborhoods.

[1] http://flanalytics.com/Work%20files/Latterman%20PVI%202011.pdf
[2] DOE lists an ID number is designed only as a placeholder for compiling election results. This does not correlate to anything in the voter file and it cannot be used to figure out how an individual voted.

Map 1: First choice vote for Mirkarimi

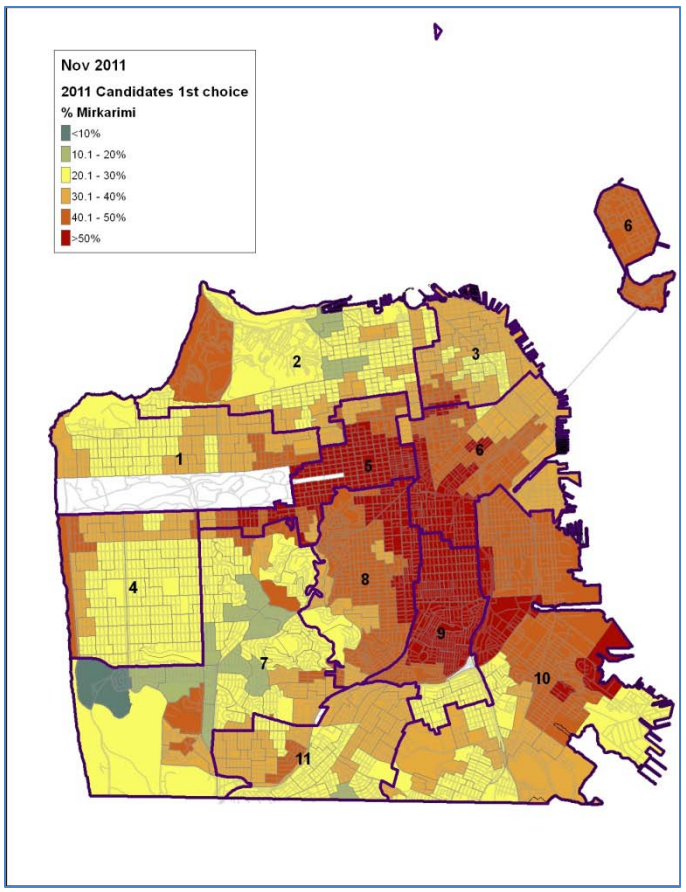
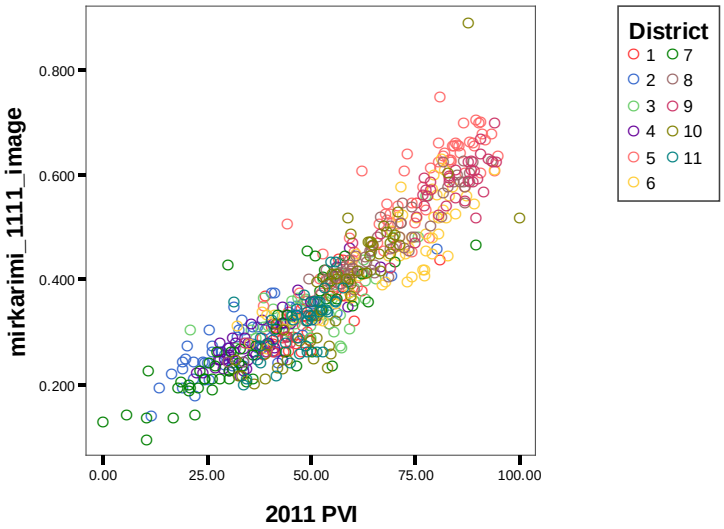


Figure 1: Correlation between 2011 Progressive Voter Index and first choice vote for Mirkarimi



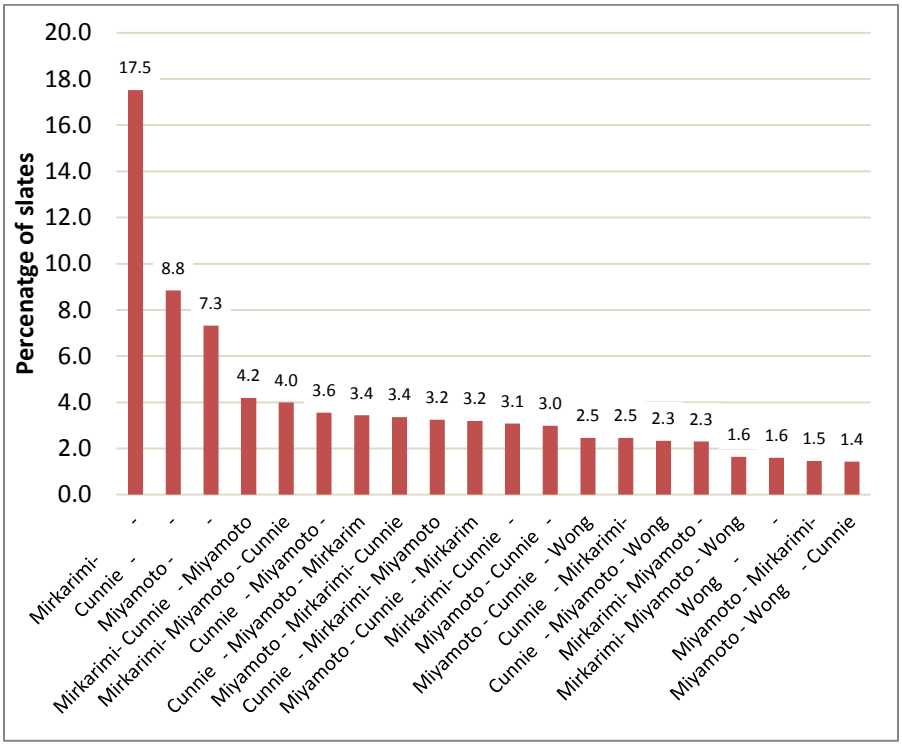
In the RCV tallies, Mirkarimi won after Cunnie's voted were redistributed in the final round (Wong's redistribution pushed Miyamoto ahead of Cunnie). Table 1 shows some details from this race.

Table 1: Summary RCV data for Sheriff's race

Sheriff votes (1st choice given)	181128	
1 choice	68926	38%
2 choices	35236	19%
3 choices	76553	42%
Had Mirkarimi	113981	63%
Had Miyamoto	107569	59%
Had Cunnie	106355	59%

The most striking thing about Table 1 is that nearly as many voters voted for one candidate as those who voted for three. 38% of voters only listed one choice. 63% of ballots contained the eventual winner, but both Cunnie (59%) and Miyamoto (59%) were close behind. Figure 2 shows the frequencies of the top 20 slates, which indicates that the top three slates, by a significant margin, were bullet votes for each of the three major candidates.

Figure 2: Top slate frequencies for the Sheriff's race



Mirkarimi received the most bullet votes by far, which is consistent with the fact he was politically unlike the other candidates. Many endorsement slates indicated to vote for Mirkarimi and no one else, which it appears is what many voters did.

Table 2 is the crosstab of first choice vs second choice for Sheriff. Mirkarimi received 25% of Cunnie's second choices and 24% of Miyamoto's second choices, from which we infer Mirkarimi would have won regardless of the Miyamoto-Cunnie order. However, there was clearly more synergy with the more moderate candidates, as 36% of Cunnie's seconds went to Miyamoto and 35% of Miyamoto's seconds went to Cunnie.

If there had been a runoff, whoever came in second to Mirkarimi probably would have prevailed. Turnout would have been important, as would the kind of campaigns the candidates ran. However, Mirkarimi was outpolled by moderates nearly two-to-one and in a more differentiating one-on-one race would have likely brought some voters - who placed a moderate first and Mirkarimi second - to the more conservative candidate in a runoff.

Table 2: Sheriff first choice vs Sheriff second choice Crosstab

			Sheriff2					Total
				Cunnie	Mirkarimi	Miyamoto	Wong	
Sheriff1		Count	14004	62	47	51	32	14196
		% within Sheriff1	98.6%	.4%	.3%	.4%	.2%	100.0%
		% within Sheriff2	16.8%	.2%	.2%	.1%	.3%	7.3%
	Cunnie	Count	17395	0	12334	18191	2893	50813
		% within Sheriff1	34.2%	.0%	24.3%	35.8%	5.7%	100.0%
		% within Sheriff2	20.9%	.0%	46.7%	47.5%	22.9%	26.0%
	Mirkarimi	Count	34353	16124	154	15519	3451	69601
		% within Sheriff1	49.4%	23.2%	.2%	22.3%	5.0%	100.0%
		% within Sheriff2	41.2%	46.6%	.6%	40.6%	27.3%	35.6%
	Miyamoto	Count	14417	16866	11856	0	6273	49412
		% within Sheriff1	29.2%	34.1%	24.0%	.0%	12.7%	100.0%
		% within Sheriff2	17.3%	48.7%	44.9%	.0%	49.6%	25.3%
	Wong	Count	3173	1586	2037	4505	0	11301
		% within Sheriff1	28.1%	14.0%	18.0%	39.9%	.0%	100.0%
		% within Sheriff2	3.8%	4.6%	7.7%	11.8%	.0%	5.8%
Total		Count	83342	34638	26428	38266	12649	195323
		% within Sheriff1	42.7%	17.7%	13.5%	19.6%	6.5%	100.0%
		% within Sheriff2	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

District Attorney

George Gascon, the appointed incumbent who had been in office about 10 months, defeated David Onek and Sharmin Bock, among other candidates. Gascon was the former police chief, and somewhat of a surprise DA pick once Kamala Harris won California AG in November 2010. He received 42% of the first choice votes, more than any other candidate on the ballot in November. Onek received 24% of the first choice vote and Bock received 21%. Gascon was considered the most conservative (law-and-order) of the major candidates. Bock is an Alameda County prosecutor who ran somewhat apolitically, but also somewhat law-and-order, while Onek ran as a left-leaning academic and a "reformer".

Map 2 shows the first choice vote for Gascon. He did pretty well throughout the city, except for the strongly progressive areas. The correlation between PVI and Gascon showed a somewhat strong correlation with moderate precincts (Figure 3). This is contrasted with Onek, whose PVI profile looked just like Mirkarimi's.

Map 2: First choice vote for Gascon

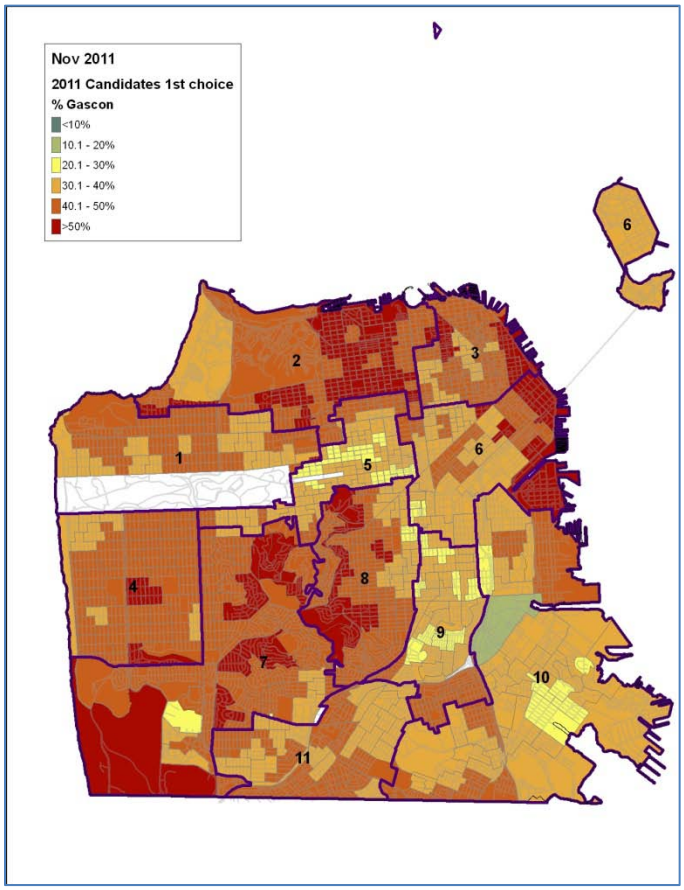
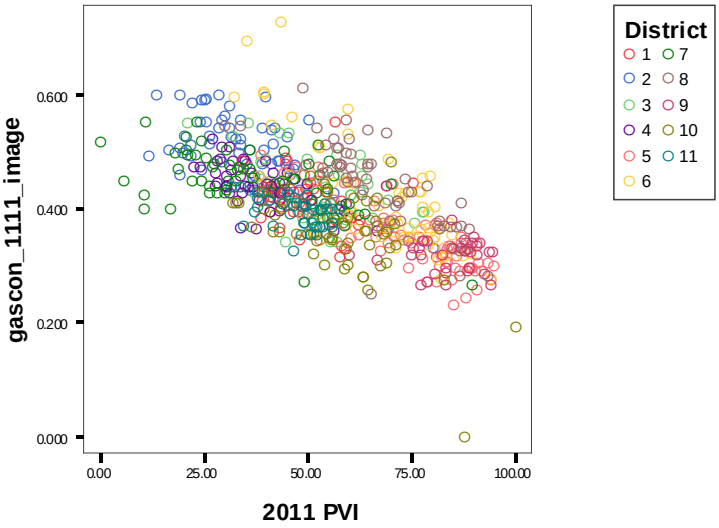


Figure 3: Correlation between 2011 Progressive Voter Index and first choice vote for Gascon



Gascon seemed to have won rather easily, with more first-choice votes than any other candidate. However, in this case, the race was much closer than first appearences. Table 3 shows the breakdown of choices made. More voters indicated three preferences (52%) than in the Sheriff's race; and twice as many as bullet voted in this race (27%). But the most noteworthy percentage is that Bock appeared on only 1% fewer slates than Gascon.

Table 3: Summary RCV stats for the DA's race

DA votes (1st choice given)	182044	
1 choice	48467	27%
2 choices	39019	21%
3 choices	94562	52%
Had Gascon	112827	62%
Had Onek	83431	46%
Had Bock	111914	61%

While the Gascon bullet slate was certainly the largest plurality choice (Figure 4), the next three most frequent slates omitted him, and all had Bock. Table 4 shows the first choice by second choice crosstab. The Bock numbers are revealing; she received 62% of Onek's seconds while Gascon received 12%, (a 5:1 ratio). This is a larger single-transfer than the Rebecca Kaplan to Jean Quan transfer that swung the 2010 Oakland mayoral race in Quan's favor. Because Onek came in second through his support from the progressive community, the race appeared lopsided. Gascon received 29% of Bock's seconds, while Onek received 23% of those votes. This explains why the final results were not particularly close. And this transfer made sense given Bock's appeals as a "law-and-order" candidate herself. However, had

Bock managed to come in second, the final tally would have been very close but still likely in Gascon's favor.

Gascon would have prevailed somewhat easily in a runoff against Onek. Against Bock, however, the race would have been much closer, especially if there were strong progressive turnout. Notwithstanding, Gascon would likely have won this race, due to his strong base of existing suport (and assuming his first choice vote stayed with him).

Figure 4: Top slate frequencies for the DA's race

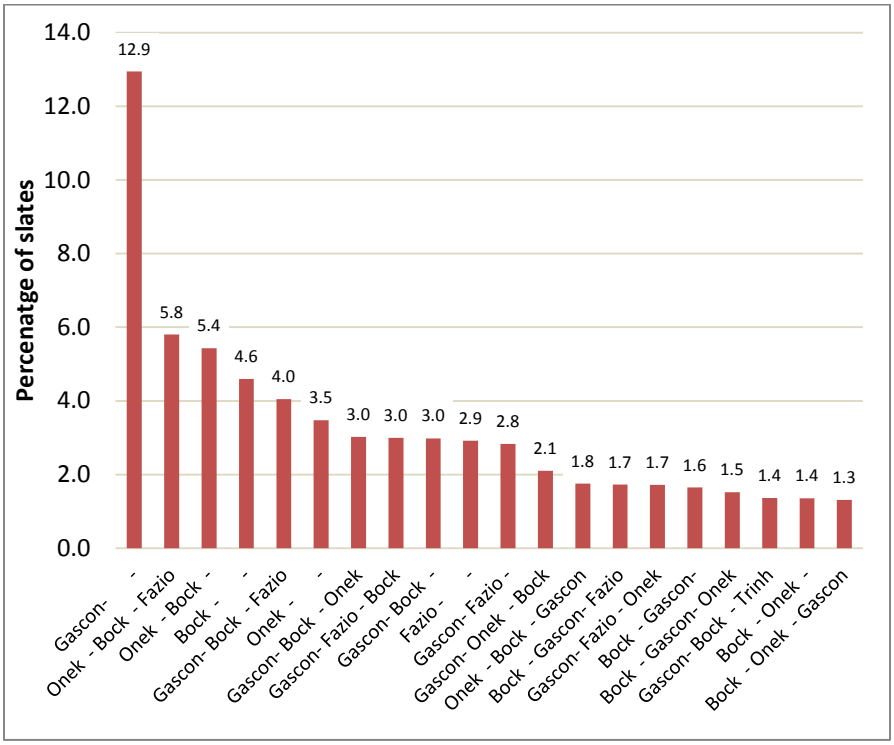


Table 4: DA first choice vs DA second choice crosstab

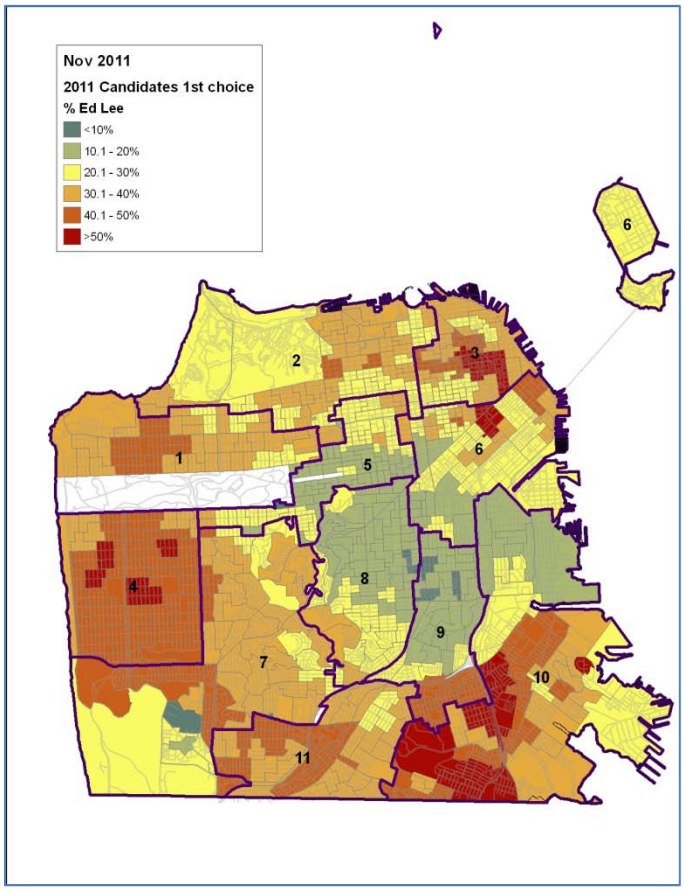
			DA 2						
				Bock	Fazio	Gascon	Onek	Trinh	Total
DA 1		Count	13279	0	0	0	0	0	13279
		% within DA 1	100.0%	.0%	.0%	.0%	.0%	.0%	100.0%
		% within DA 2	21.5%	.0%	.0%	.0%	.0%	.0%	6.8%
	Bock	Count	8981	0	6039	11090	8523	3166	37799
		% within DA 1	23.8%	.0%	16.0%	29.3%	22.5%	8.4%	100.0%
		% within DA 2	14.5%	.0%	23.1%	47.8%	39.9%	37.7%	19.4%
	Fazio	Count	5701	4014	0	5695	2605	1114	19129
		% within DA 1	29.8%	21.0%	.0%	29.8%	13.6%	5.8%	100.0%
		% within DA 2	9.2%	7.4%	.0%	24.6%	12.2%	13.3%	9.8%
	Gascon	Count	25285	22304	16234	0	9055	2833	75711
		% within DA 1	33.4%	29.5%	21.4%	.0%	12.0%	3.7%	100.0%
		% within DA 2	41.0%	41.0%	62.0%	.0%	42.4%	33.7%	38.8%
	Onek	Count	6795	26439	3222	5082	0	1294	42832
		% within DA 1	15.9%	61.7%	7.5%	11.9%	.0%	3.0%	100.0%
		% within DA 2	11.0%	48.6%	12.3%	21.9%	.0%	15.4%	21.9%
	Trinh	Count	1705	1693	683	1320	1172	0	6573
		% within DA 1	25.9%	25.8%	10.4%	20.1%	17.8%	.0%	100.0%
		% within DA 2	2.8%	3.1%	2.6%	5.7%	5.5%	.0%	3.4%
Total		Count	61746	54450	26178	23187	21355	8407	195323
		% within DA 1	31.6%	27.9%	13.4%	11.9%	10.9%	4.3%	100.0%
		% within DA 2	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Mayor

The Mayor's race was a wide-open affair before appointed incumbent Mayor Ed Lee entered the race in August. Several well-known candidates were vying against one another - with several relatively close in the standings - until Lee announced his intention to seek the office. Most polling had him in the low 30% range of voter's first choices when he entered the race, which is exactly what he recevied when he won (31%). He was followed by District 11 Supervisor John Avalos, the most "progressive" major candidate in the race (19%), City Attorney Dennis Herrera (11%), and President of the Board of Supervisors David Chiu (9%). Lee was considered somewhat of a moderate, and Herrera and Chiu were seen by most as center-left. However, in this race, stated political ideology wasn't as major a factor as it had been in previous years. Instead, much of this race centered around the 'Chinese vote' and whether if or how any one candidate could rise above Lee.

Map 3 shows Lee's first choice votes, concentrated disproportionately in Chinese and moderate parts of the city. Lee's support among these two groups become especially clear after seeing the Lee first choice vote correlated with the Asian precinct percenatge[3] (Figure 5) and PVI (Figure 6). The positive correlations with both groups are strong.

Map 3: First choice vote for Lee



[3] This value is over 18 Asian percentage. Chinese specific data were not available, but these data do not include Pacific Islanders.

Figure 5: Correlation between 2010 Census over 18 Asian percentage and Lee

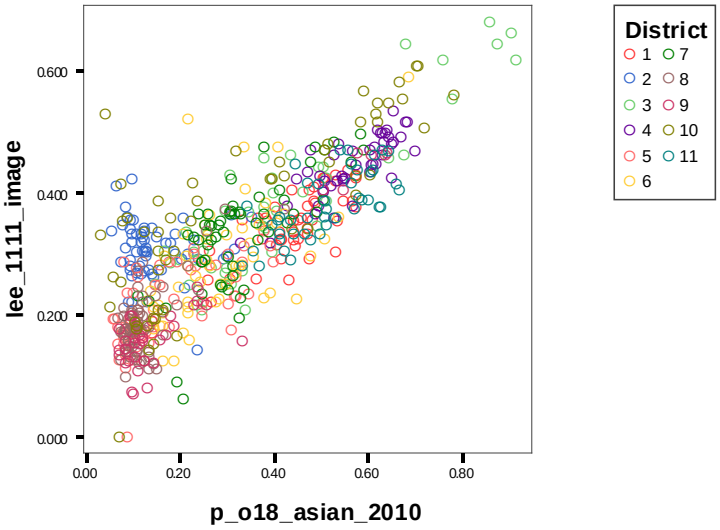
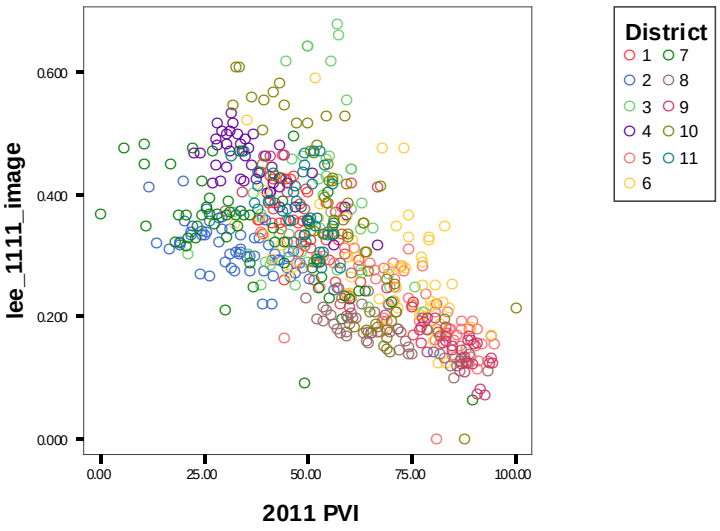


Figure 6: Correlation between PVI and Lee



Unlike the down-ballot races, bullet voting for this race was relatively low, with 73% of voters expressing three choices (Table 5) and only 16% of voters only choosing one candidate. The large plurality of bullet votes went for Lee, followed by Avalos. Interestingly, Avalos, who came in second, appeared on the fourth-most ballots, below Lee, Herrera, and Chiu.

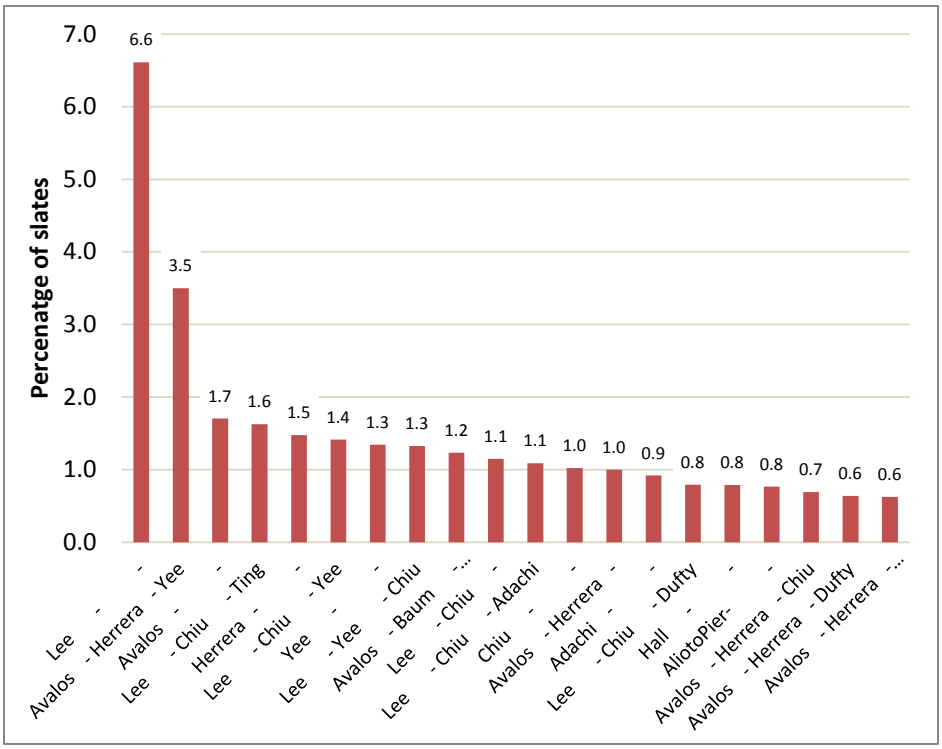
Table 5: Summary RCV stats for the Mayor's race

Mayor votes (1st choice given)	192901	
1 choice	30565	16%
2 choices	21574	11%
3 choices	140762	73%
Had Lee	88987	46%
Had Avalos	61731	32%
Had Herrera	69593	36%
Had Chiu	61820	32%
Had Yee	50006	26%

Much was made about the Chinese vote in this race, which was energized to vote for one of several Chinese candidates (but especially the incumbent Mayor). Looking the the slate frequency for the Mayor's race, there is some evidence for Chinese ethnic voting patterns (Figure 7). Of the top 12 slates, 7 were some form of Chinese only candidates, including bullets. After the Lee bullet-vote which was by far the single most common slate, the second most common slate was the *Bay Guardian* slate of Avalos-Herrera-Yee, which appeared on 3.5% of all ballots. This number is somewhat consistent to plast elections of the *Guardian*'s citywide influence. Obviously, that number varies by district. The Democratic Party slate of Avalos-Herrera was the 20th most common, and appeared on less than 1% of all ballots.

Lee was able to win this race by dominating the Chinese vote and doing well with second and third choices throughout most of the city. Though he wasn't able to gain on his first-choice total from when he entered the race, he was able to form a broader coalition than other candidates. Avalos did very well in maximizing his potential first choice vote, but similar to Onek, wasn't able to draw beyond the progressive base for second or third choice votes. Herrera and Chiu were on more total ballots and showed more breadth of support. Had this race gone to a runoff, Lee would have defeated Avalos somewhat easily, given his much stronger second-choice performance. Ironically, Lee may have had a more difficult time with other candidates in a runoff.

Figure 7: Top slate frequencies for Mayor's race



The first choice mayor vote by second choice mayor vote crosstab (Table 6) reveals some noteworthy trends. These include:

- By a wide margin, Chiu received the plurality of Lee's second place votes (27%). This was the same number of second choice votes Lee received from Chiu, suggesting substantial overlap between the two candidacies.
- The largest transfers between candidates came from Herrera and Avalos. Herrera received an impressive 42% of Avalos' seconds while Avalos received 21% of Herrera's seconds.
- Voters were likely to bullet vote for the more conservative candidates. 23% of Alioto-Pier voters had no second choice, followed by Hall (23%) and Lee (22%).
- Lee was the top second choice for every Chinese candidate.

Table 6: Mayor first choice vs Mayor second choice crosstab

		Mayor2																		
Mayor1		Null	Adachi	Alioto Pier	Ascar runz	Avalos	Baum	Chiu	Currier	Dufty	Hall	Herrera	Lawr ence	Lee	Pang	Rees	Ting	W-In	Yee	Total
Null	Count	2422.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2422.0
	% within Mayor1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
	% within Mayor2	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Adachi	Count	1829.0	0.0	807.0	84.0	1446.0	97.0	1525.0	50.0	598.0	865.0	1787.0	72.0	1535.0	103.0	479.0	259.0	1.0	888.0	12425.0
	% within Mayor1	14.7	0.0	6.5	0.7	11.6	0.8	12.3	0.4	4.8	7.0	14.4	0.6	12.4	0.8	3.9	2.1	0.0	7.1	100.0
	% within Mayor2	5.5	0.0	8.0	7.2	9.4	2.2	5.7	9.9	5.3	19.5	5.8	11.0	9.3	5.7	10.3	6.3	16.7	5.8	6.4
AliotoPier	Count	1515.0	475.0	0.0	81.0	385.0	92.0	383.0	29.0	447.0	375.0	751.0	71.0	947.0	40.0	487.0	55.0	0.0	519.0	6652.0
	% within Mayor1	22.8	7.1	0.0	1.2	5.8	1.4	5.8	0.4	6.7	5.6	11.3	1.1	14.2	0.6	7.3	0.8	0.0	7.8	100.0
	% within Mayor2	4.5	3.4	0.0	7.0	2.5	2.1	1.4	5.7	4.0	8.4	2.4	10.8	5.7	2.2	10.4	1.3	0.0	3.4	3.4
Ascarrunz	Count	89.0	32.0	61.0	0.0	72.0	12.0	13.0	10.0	18.0	42.0	55.0	21.0	38.0	10.0	24.0	11.0	0.0	29.0	537.0
	% within Mayor1	16.6	6.0	11.4	0.0	13.4	2.2	2.4	1.9	3.4	7.8	10.2	3.9	7.1	1.9	4.5	2.0	0.0	5.4	100.0
	% within Mayor2	0.3	0.2	0.6	0.0	0.5	0.3	0.0	2.0	0.2	0.9	0.2	3.2	0.2	0.6	0.5	0.3	0.0	0.2	0.3
Avalos	Count	3407.0	2901.0	811.0	277.0	0.0	3496.0	2973.0	74.0	1916.0	167.0	15420.0	47.0	1592.0	85.0	397.0	190.0	0.0	3114.0	36867.0
	% within Mayor1	9.2	7.9	2.2	0.8	0.0	9.5	8.1	0.2	5.2	0.5	41.8	0.1	4.3	0.2	1.1	0.5	0.0	8.4	100.0
	% within Mayor2	10.2	20.8	8.1	23.8	0.0	80.4	11.0	14.7	16.9	3.8	50.0	7.2	9.6	4.7	8.5	4.6	0.0	20.4	18.9
Baum	Count	91.0	96.0	42.0	12.0	993.0	0.0	41.0	17.0	57.0	19.0	69.0	22.0	46.0	44.0	47.0	13.0	0.0	41.0	1650.0
	% within Mayor1	5.5	5.8	2.5	0.7	60.2	0.0	2.5	1.0	3.5	1.2	4.2	1.3	2.8	2.7	2.8	0.8	0.0	2.5	100.0
	% within Mayor2	0.3	0.7	0.4	1.0	6.5	0.0	0.2	3.4	0.5	0.4	0.2	3.3	0.3	2.4	1.0	0.3	0.0	0.3	0.8
Chiu	Count	2020.0	1752.0	646.0	26.0	2017.0	53.0	0.0	30.0	1043.0	233.0	2939.0	23.0	4449.0	98.0	417.0	590.0	0.0	1485.0	17821.0
	% within Mayor1	11.3	9.8	3.6	0.1	11.3	0.3	0.0	0.2	5.9	1.3	16.5	0.1	25.0	0.5	2.3	3.3	0.0	8.3	100.0
	% within Mayor2	6.1	12.5	6.4	2.2	13.1	1.2	0.0	5.9	9.2	5.2	9.5	3.5	26.8	5.4	8.9	14.4	0.0	9.7	9.1

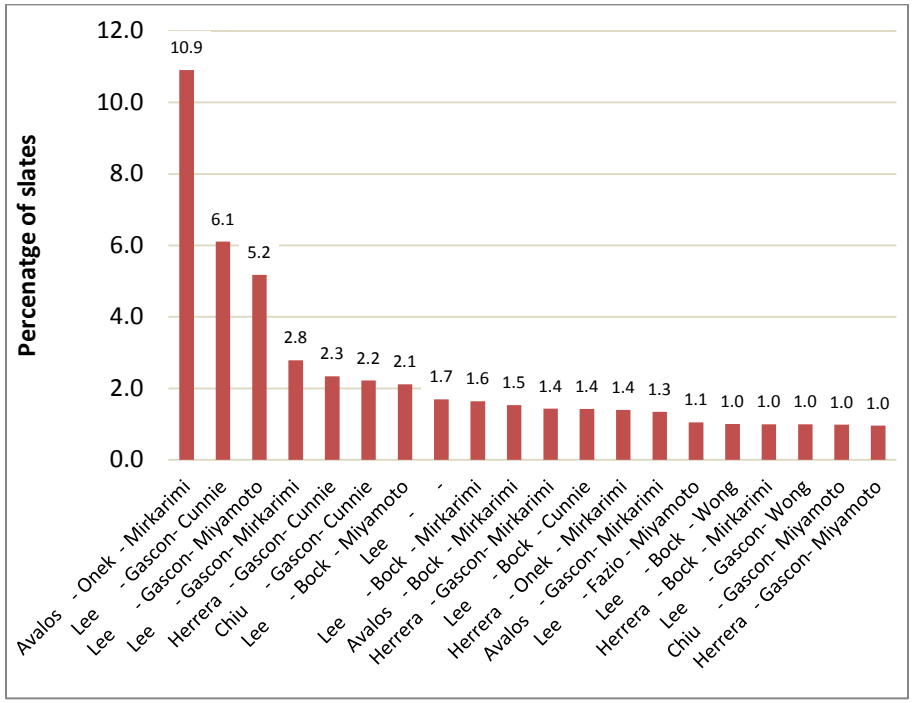
		Null	Adachi	Alioto Pier	Ascar runz	Avalos	Baum	Chiu	Currier	Dufty	Hall	Herrera	Lawr ence	Lee	Pang	Rees	Ting	W-In	Yee	Total
Currier	Count	40.0	22.0	11.0	13.0	26.0	11.0	9.0	0.0	11.0	23.0	21.0	12.0	17.0	11.0	7.0	6.0	0.0	9.0	249.0
	% within Mayor1	16.1	8.8	4.4	5.2	10.4	4.4	3.6	0.0	4.4	9.2	8.4	4.8	6.8	4.4	2.8	2.4	0.0	3.6	100.0
	% within Mayor2	0.1	0.2	0.1	1.1	0.2	0.3	0.0	0.0	0.1	0.5	0.1	1.8	0.1	0.6	0.1	0.1	0.0	0.1	0.1
Dufty	Count	1059.0	454.0	613.0	45.0	1315.0	92.0	847.0	23.0	0.0	141.0	2444.0	12.0	1227.0	24.0	214.0	91.0	0.0	487.0	9088.0
	% within Mayor1	11.7	5.0	6.7	0.5	14.5	1.0	9.3	0.3	0.0	1.6	26.9	0.1	13.5	0.3	2.4	1.0	0.0	5.4	100.0
	% within Mayor2	3.2	3.3	6.1	3.9	8.5	2.1	3.1	4.6	0.0	3.2	7.9	1.8	7.4	1.3	4.6	2.2	0.0	3.2	4.7
Hall	Count	1556.0	993.0	755.0	79.0	138.0	38.0	251.0	43.0	203.0	0.0	526.0	97.0	1327.0	20.0	506.0	82.0	0.0	255.0	6869.0
	% within Mayor1	22.7	14.5	11.0	1.2	2.0	0.6	3.7	0.6	3.0	0.0	7.7	1.4	19.3	0.3	7.4	1.2	0.0	3.7	100.0
	% within Mayor2	4.7	7.1	7.5	6.8	0.9	0.9	0.9	8.5	1.8	0.0	1.7	14.8	8.0	1.1	10.8	2.0	0.0	1.7	3.5
Herrera	Count	2943.0	1840.0	1225.0	179.0	4512.0	113.0	2654.0	49.0	2999.0	472.0	0.0	47.0	2095.0	45.0	631.0	248.0	0.0	1687.0	21739.0
	% within Mayor1	13.5	8.5	5.6	0.8	20.8	0.5	12.2	0.2	13.8	2.2	0.0	0.2	9.6	0.2	2.9	1.1	0.0	7.8	100.0
	% within Mayor2	8.8	13.2	12.2	15.4	29.3	2.6	9.9	9.7	26.5	10.6	0.0	7.2	12.6	2.5	13.5	6.1	0.0	11.1	11.1
Lawrence	Count	89.0	29.0	29.0	27.0	8.0	19.0	17.0	15.0	10.0	37.0	14.0	0.0	26.0	11.0	30.0	8.0	1.0	13.0	383.0
	% within Mayor1	23.2	7.6	7.6	7.0	2.1	5.0	4.4	3.9	2.6	9.7	3.7	0.0	6.8	2.9	7.8	2.1	0.3	3.4	100.0
	% within Mayor2	0.3	0.2	0.3	2.3	0.1	0.4	0.1	3.0	0.1	0.8	0.0	0.0	0.2	0.6	0.6	0.2	16.7	0.1	0.2
Lee	Count	13042.0	4028.0	3622.0	234.0	2208.0	160.0	15736.0	103.0	3286.0	1515.0	4599.0	132.0	0.0	1097.0	1090.0	2208.0	4.0	6415.0	59479.0
	% within Mayor1	21.9	6.8	6.1	0.4	3.7	0.3	26.5	0.2	5.5	2.5	7.7	0.2	0.0	1.8	1.8	3.7	0.0	10.8	100.0
	% within Mayor2	39.1	28.8	36.1	20.1	14.4	3.7	58.5	20.4	29.1	34.1	14.9	20.1	0.0	60.8	23.3	54.0	66.7	42.1	30.5
Pang	Count	61.0	35.0	21.0	4.0	15.0	32.0	46.0	14.0	12.0	21.0	17.0	10.0	75.0	0.0	35.0	19.0	0.0	27.0	444.0
	% within Mayor1	13.7	7.9	4.7	0.9	3.4	7.2	10.4	3.2	2.7	4.7	3.8	2.3	16.9	0.0	7.9	4.3	0.0	6.1	100.0
	% within Mayor2	0.2	0.3	0.2	0.3	0.1	0.7	0.2	2.8	0.1	0.5	0.1	1.5	0.5	0.0	0.7	0.5	0.0	0.2	0.2
Rees	Count	474.0	241.0	424.0	35.0	173.0	45.0	264.0	19.0	160.0	236.0	340.0	50.0	353.0	48.0	0.0	42.0	0.0	181.0	3085.0
	% within Mayor1	15.4	7.8	13.7	1.1	5.6	1.5	8.6	0.6	5.2	7.6	11.0	1.6	11.4	1.6	0.0	1.4	0.0	5.9	100.0
	% within Mayor2	1.4	1.7	4.2	3.0	1.1	1.0	1.0	3.8	1.4	5.3	1.1	7.6	2.1	2.7	0.0	1.0	0.0	1.2	1.6

	Null	Adachi	Alioto Pier	Ascar runz	Avalos	Baum	Chiu	Currier	Dufty	Hall	Herrera	Lawr ence	Lee	Pang	Rees	Ting	W-In	Yee	Total	
Ting	Count	112.0	96.0	42.0	8.0	75.0	11.0	150.0	6.0	53.0	29.0	110.0	5.0	189.0	17.0	32.0	0.0	0.0	81.0	1016.0
	% within Mayor1	11.0	9.4	4.1	0.8	7.4	1.1	14.8	0.6	5.2	2.9	10.8	0.5	18.6	1.7	3.1	0.0	0.0	8.0	100.0
	% within Mayor2	0.3	0.7	0.4	0.7	0.5	0.3	0.6	1.2	0.5	0.7	0.4	0.8	1.1	0.9	0.7	0.0	0.0	0.5	0.5
W-In	Count	14.0	0.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0	5.0	1.0	3.0	3.0	0.0	0.0	0.0	0.0	1.0	32.0
	% within Mayor1	43.8	0.0	3.1	3.1	3.1	0.0	0.0	3.1	3.1	15.6	3.1	9.4	9.4	0.0	0.0	0.0	0.0	3.1	100.0
	% within Mayor2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yee	Count	2624.0	971.0	935.0	59.0	1998.0	75.0	1997.0	22.0	490.0	260.0	1738.0	33.0	2668.0	152.0	276.0	267.0	0.0	0.0	14565.0
	% within Mayor1	18.0	6.7	6.4	0.4	13.7	0.5	13.7	0.2	3.4	1.8	11.9	0.2	18.3	1.0	1.9	1.8	0.0	0.0	100.0
	% within Mayor2	7.9	7.0	9.3	5.1	13.0	1.7	7.4	4.4	4.3	5.9	5.6	5.0	16.1	8.4	5.9	6.5	0.0	0.0	7.5
Total	Count	33387.0	13965.0	10045.0	1164.0	15382.0	4346.0	26906.0	505.0	11304.0	4440.0	30831.0	657.0	16587.0	1805.0	4672.0	4089.0	6.0	15232.0	195323.0
	% within Mayor1	17.1	7.1	5.1	0.6	7.9	2.2	13.8	0.3	5.8	2.3	15.8	0.3	8.5	0.9	2.4	2.1	0.0	7.8	100.0
	% within Mayor2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Cross-race analyses

Because of the consistent voter ID used in the ballot image data, we are able to perform some analyses at the voter level on the three races together. This hasn't been done before in any RCV race in San Francisco. We first look at the 'All Firsts Slate' (Figure 8), where we see the most common first choice slate is the progressive slate, with Avalos, Onek, and Mirkarimi. This may be a truer metric of the 'left-leaning endorsement suite' than looking at any one race.[4] Here, it's about 11%.

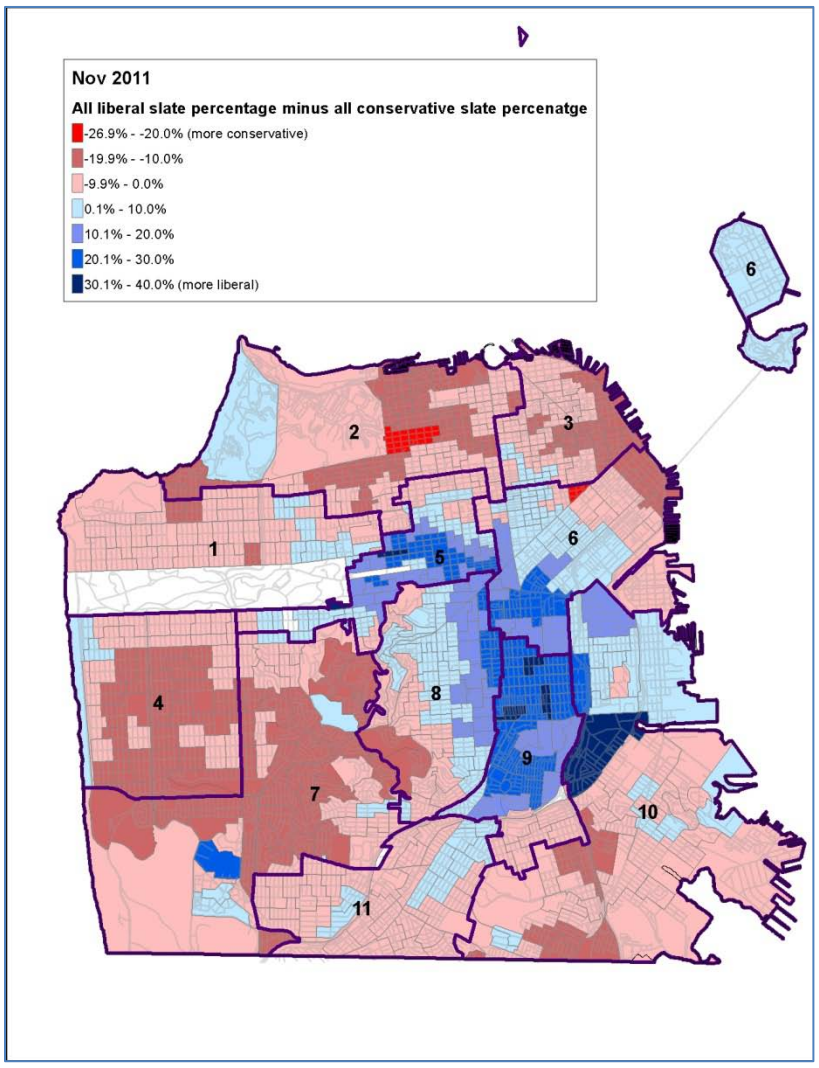
Figure 8: Top slate frequencies for all first choice votes across the three races



Map 4 shows the geographic distribution of "liberal" and "conservative" first-choice slates. We first took the percentage of a precinct that had a Mayor-DA-Sheriff slate of Avalos-Onek-Mirkarimi (the "liberal" slate). Then, we subtracted the precinct percentage of Lee-Gascon-Miyamoto/Cunnie (the "conservative" slate) from the liberal percentage. The result shows the neighborhoods that voted the most consistently liberal or conservative across all three races. This map is consistent with typical San Francisco voting patterns and is strongly correlative with PVI.

[4] This includes the collective assortment of left-leaning slates, which are often quite similar. For example, the *Bay Guardian*, the Democratic party, Tenants Union, Milk Club, etc.

Map 4: Percentage of the 'liberal' three-race slate minus the 'conservative three-race slate



Tables 7, 8, and 9 show the first choice crosstabs for Mayor vs DA, Mayor vs Sheriff, and DA vs Sheriff respectively. There's a lot to look at. Here we just present some selected findings of interest:

- Over 50% of Lee voters voted for Gascon. Over 60% of Lee voters chose Cunnie or Miyamoto. Voters here showed some stronger ideological synergy among choices.
- Only 6% of Lee voters supported Onek, but 19% voted for Mirkarimi. For whatever reason, Mirkarimi was seen as more palateable to non-progressive voters.
- 64% of Avalos voters supported Onek, 55% of Onek voters supported Avalos.
- 75% of Onek voters supported Mirkarimi, but just 45% of Mirkarimi voters supported Onek.
- The largest correlation we found was that 77% of Avalos voters also voted for Mirkarimi. All in all, progressives vote progressive across the ticket more than other political or even ethnic affinities, at least this year.
- Lee voters voted 59% to Wong for Sheriff, representing the largest Chinese pattern we could find.

Table 7: Mayor first choice vs DA first choice Crosstab

			DA 1						
			Null	Bock	Fazio	Gascon	Onek	Trinh	Total
Mayor1	Null	Count	982	334	235	562	235	74	2422
		% within Mayor1	40.5%	13.8%	9.7%	23.2%	9.7%	3.1%	100.0%
		% within DA 1	7.4%	.9%	1.2%	.7%	.5%	1.1%	1.2%
	Adachi	Count	866	2559	2137	4419	1894	550	12425
		% within Mayor1	7.0%	20.6%	17.2%	35.6%	15.2%	4.4%	100.0%
		% within DA 1	6.5%	6.8%	11.2%	5.8%	4.4%	8.4%	6.4%
	AliotoPier	Count	327	1709	1209	2793	494	120	6652
		% within Mayor1	4.9%	25.7%	18.2%	42.0%	7.4%	1.8%	100.0%
		% within DA 1	2.5%	4.5%	6.3%	3.7%	1.2%	1.8%	3.4%
	Ascarrunz	Count	29	77	121	201	73	36	537
		% within Mayor1	5.4%	14.3%	22.5%	37.4%	13.6%	6.7%	100.0%
		% within DA 1	.2%	.2%	.6%	.3%	.2%	.5%	.3%
	Avalos	Count	1775	4349	1592	5395	23512	244	36867
		% within Mayor1	4.8%	11.8%	4.3%	14.6%	63.8%	.7%	100.0%
		% within DA 1	13.4%	11.5%	8.3%	7.1%	54.9%	3.7%	18.9%
	Baum	Count	98	226	80	140	1055	51	1650
		% within Mayor1	5.9%	13.7%	4.8%	8.5%	63.9%	3.1%	100.0%
		% within DA 1	.7%	.6%	.4%	.2%	2.5%	.8%	.8%
	Chiu	Count	1166	3564	1109	8612	2718	652	17821
		% within Mayor1	6.5%	20.0%	6.2%	48.3%	15.3%	3.7%	100.0%
		% within DA 1	8.8%	9.4%	5.8%	11.4%	6.3%	9.9%	9.1%
	Currier	Count	21	49	43	61	52	23	249
		% within Mayor1	8.4%	19.7%	17.3%	24.5%	20.9%	9.2%	100.0%
		% within DA 1	.2%	.1%	.2%	.1%	.1%	.3%	.1%
	Dufty	Count	601	1520	868	4220	1785	94	9088
		% within Mayor1	6.6%	16.7%	9.6%	46.4%	19.6%	1.0%	100.0%
		% within DA 1	4.5%	4.0%	4.5%	5.6%	4.2%	1.4%	4.7%
	Hall	Count	383	1063	2228	2674	320	201	6869
		% within Mayor1	5.6%	15.5%	32.4%	38.9%	4.7%	2.9%	100.0%
		% within DA 1	2.9%	2.8%	11.6%	3.5%	.7%	3.1%	3.5%
	Herrera	Count	901	4527	2113	9618	4442	138	21739
		% within Mayor1	4.1%	20.8%	9.7%	44.2%	20.4%	.6%	100.0%
		% within DA 1	6.8%	12.0%	11.0%	12.7%	10.4%	2.1%	11.1%

			Null	Bock	Fazio	Gascon	Onek	Trinh	Total
	Lawrence	Count	31	85	90	72	79	26	383
		% within Mayor1	8.1%	22.2%	23.5%	18.8%	20.6%	6.8%	100.0%
		% within DA 1	.2%	.2%	.5%	.1%	.2%	.4%	.2%
	Lee	Count	4753	12724	4798	30450	3467	3287	59479
		% within Mayor1	8.0%	21.4%	8.1%	51.2%	5.8%	5.5%	100.0%
		% within DA 1	35.8%	33.7%	25.1%	40.2%	8.1%	50.0%	30.5%
	Pang	Count	61	126	37	88	44	88	444
		% within Mayor1	13.7%	28.4%	8.3%	19.8%	9.9%	19.8%	100.0%
		% within DA 1	.5%	.3%	.2%	.1%	.1%	1.3%	.2%
	Rees	Count	243	968	463	985	348	78	3085
		% within Mayor1	7.9%	31.4%	15.0%	31.9%	11.3%	2.5%	100.0%
		% within DA 1	1.8%	2.6%	2.4%	1.3%	.8%	1.2%	1.6%
	Ting	Count	64	215	143	329	173	92	1016
		% within Mayor1	6.3%	21.2%	14.1%	32.4%	17.0%	9.1%	100.0%
		% within DA 1	.5%	.6%	.7%	.4%	.4%	1.4%	.5%
	W-In	Count	11	5	11	1	3	1	32
		% within Mayor1	34.4%	15.6%	34.4%	3.1%	9.4%	3.1%	100.0%
		% within DA 1	.1%	.0%	.1%	.0%	.0%	.0%	.0%
	Yee	Count	967	3699	1852	5091	2138	818	14565
		% within Mayor1	6.6%	25.4%	12.7%	35.0%	14.7%	5.6%	100.0%
		% within DA 1	7.3%	9.8%	9.7%	6.7%	5.0%	12.4%	7.5%
Total		Count	13279	37799	19129	75711	42832	6573	195323
		% within Mayor1	6.8%	19.4%	9.8%	38.8%	21.9%	3.4%	100.0%
		% within DA 1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 8: Mayor first choice vs Sheriff first choice Crosstab

			Sheriff1					
			Null	Cunnie	Mirkarimi	Miyamoto	Wong	Total
Mayor1	Null	Count	988	405	509	406	114	2422
		% within Mayor1	40.8%	16.7%	21.0%	16.8%	4.7%	100.0%
		% within Sheriff1	7.0%	.8%	.7%	.8%	1.0%	1.2%
	Adachi	Count	917	2832	3539	4670	467	12425
		% within Mayor1	7.4%	22.8%	28.5%	37.6%	3.8%	100.0%
		% within Sheriff1	6.5%	5.6%	5.1%	9.5%	4.1%	6.4%
	AliotoPier	Count	442	2421	1565	1998	226	6652
		% within Mayor1	6.6%	36.4%	23.5%	30.0%	3.4%	100.0%
		% within Sheriff1	3.1%	4.8%	2.2%	4.0%	2.0%	3.4%
	Ascarrunz	Count	47	135	108	187	60	537
		% within Mayor1	8.8%	25.1%	20.1%	34.8%	11.2%	100.0%
		% within Sheriff1	.3%	.3%	.2%	.4%	.5%	.3%
	Avalos	Count	1579	3317	28464	3085	422	36867
		% within Mayor1	4.3%	9.0%	77.2%	8.4%	1.1%	100.0%
		% within Sheriff1	11.1%	6.5%	40.9%	6.2%	3.7%	18.9%
	Baum	Count	93	137	1167	197	56	1650
		% within Mayor1	5.6%	8.3%	70.7%	11.9%	3.4%	100.0%
		% within Sheriff1	.7%	.3%	1.7%	.4%	.5%	.8%
	Chiu	Count	1324	6317	4928	4274	978	17821
		% within Mayor1	7.4%	35.4%	27.7%	24.0%	5.5%	100.0%
		% within Sheriff1	9.3%	12.4%	7.1%	8.6%	8.7%	9.1%
	Currier	Count	23	77	60	69	20	249
		% within Mayor1	9.2%	30.9%	24.1%	27.7%	8.0%	100.0%
		% within Sheriff1	.2%	.2%	.1%	.1%	.2%	.1%
	Dufty	Count	581	2855	3376	2138	138	9088
		% within Mayor1	6.4%	31.4%	37.1%	23.5%	1.5%	100.0%
		% within Sheriff1	4.1%	5.6%	4.9%	4.3%	1.2%	4.7%
	Hall	Count	381	2271	744	3269	204	6869
		% within Mayor1	5.5%	33.1%	10.8%	47.6%	3.0%	100.0%
		% within Sheriff1	2.7%	4.5%	1.1%	6.6%	1.8%	3.5%
	Herrera	Count	1065	8054	8303	4040	277	21739
		% within Mayor1	4.9%	37.0%	38.2%	18.6%	1.3%	100.0%
		% within Sheriff1	7.5%	15.9%	11.9%	8.2%	2.5%	11.1%
	Lawrence	Count	32	123	56	119	53	383
		% within Mayor1	8.4%	32.1%	14.6%	31.1%	13.8%	100.0%
		% within Sheriff1	.2%	.2%	.1%	.2%	.5%	.2%
	Lee	Count	5343	17455	11104	18959	6618	59479
		% within Mayor1	9.0%	29.3%	18.7%	31.9%	11.1%	100.0%
		% within Sheriff1	37.6%	34.4%	16.0%	38.4%	58.6%	30.5%

			Null	Cunnie	Mirkarimi	Miyamoto	Wong	Total
	Pang	Count	54	58	72	119	141	444
		% within Mayor1	12.2%	13.1%	16.2%	26.8%	31.8%	100.0%
		% within Sheriff1	.4%	.1%	.1%	.2%	1.2%	.2%
	Rees	Count	271	1060	648	999	107	3085
		% within Mayor1	8.8%	34.4%	21.0%	32.4%	3.5%	100.0%
		% within Sheriff1	1.9%	2.1%	.9%	2.0%	.9%	1.6%
	Ting	Count	78	188	269	362	119	1016
		% within Mayor1	7.7%	18.5%	26.5%	35.6%	11.7%	100.0%
		% within Sheriff1	.5%	.4%	.4%	.7%	1.1%	.5%
	W-In	Count	11	11	7	2	1	32
		% within Mayor1	34.4%	34.4%	21.9%	6.3%	3.1%	100.0%
		% within Sheriff1	.1%	.0%	.0%	.0%	.0%	.0%
	Yee	Count	967	3097	4682	4519	1300	14565
		% within Mayor1	6.6%	21.3%	32.1%	31.0%	8.9%	100.0%
		% within Sheriff1	6.8%	6.1%	6.7%	9.1%	11.5%	7.5%
Total		Count	14196	50813	69601	49412	11301	195323
		% within Mayor1	7.3%	26.0%	35.6%	25.3%	5.8%	100.0%
		% within Sheriff1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 9: DA first choice vs Sheriff first choice Crosstab

			Sheriff1					
			Null	Cunnie	Mirkarimi	Miyamoto	Wong	Total
DA 1	Null	Count	8489	1065	1704	1532	489	13279
		% within DA 1	63.9%	8.0%	12.8%	11.5%	3.7%	100.0%
		% within Sheriff1	59.8%	2.1%	2.4%	3.1%	4.3%	6.8%
	Bock	Count	1524	9102	13053	11048	3072	37799
		% within DA 1	4.0%	24.1%	34.5%	29.2%	8.1%	100.0%
		% within Sheriff1	10.7%	17.9%	18.8%	22.4%	27.2%	19.4%
	Fazio	Count	640	5448	4409	7531	1101	19129
		% within DA 1	3.3%	28.5%	23.0%	39.4%	5.8%	100.0%
		% within Sheriff1	4.5%	10.7%	6.3%	15.2%	9.7%	9.8%
	Gascon	Count	2493	29693	17945	22515	3065	75711
		% within DA 1	3.3%	39.2%	23.7%	29.7%	4.0%	100.0%
		% within Sheriff1	17.6%	58.4%	25.8%	45.6%	27.1%	38.8%
	Onek	Count	859	4952	31701	4489	831	42832
		% within DA 1	2.0%	11.6%	74.0%	10.5%	1.9%	100.0%
		% within Sheriff1	6.1%	9.7%	45.5%	9.1%	7.4%	21.9%
	Trinh	Count	191	553	789	2297	2743	6573
		% within DA 1	2.9%	8.4%	12.0%	34.9%	41.7%	100.0%
		% within Sheriff1	1.3%	1.1%	1.1%	4.6%	24.3%	3.4%
Total		Count	14196	50813	69601	49412	11301	195323
		% within DA 1	7.3%	26.0%	35.6%	25.3%	5.8%	100.0%
		% within Sheriff1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Finally, being able to track individual voter behavior across the three citywide races affords us a unique opportunity to study voting patterns in an RCV setting. In the coming months, the McCarthy Center will be undertaking detailed research of how people utilize their choices in RCV, in terms of ethnicity and geography. Here, we show one piece of that analysis.

Map 5 displays the percentage of voters in each precinct who chose only one candidate in all three races. This is a bullet-voting index of sorts, around 9% of total voters. The percentage is lowest in the progressive parts of the city, and highest in the south eastern neighborhoods. Further research is needed to discern why these voters consistently choose to bullet vote. However the existence of these data allow for greater inferences about voter behavior than before.

Map 5: Percentage of precinct where the votes choice only one choice for each race