



ANNUAL SYSTEM RELIABILITY REPORT

For Year 2018

PREPARED FOR CALIFORNIA PUBLIC UTILITIES
COMMISSION

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Executive Summary

The reliability information contained in this report is for calendar year 2018, as required by California Public Utilities Commission (CPUC, or Commission) Decision 16-01-008. The data includes all outages (planned and unplanned) for distribution customers including and excluding Major Event Days (MED). SCE only excludes MEDs from the data where noted, and no other exclusions or exceptions were applied.

Unplanned outages and their calculated reliability indices are captured and calculated from our Outage Database and Reliability Metrics (ODRM) system.

Beginning in October 2015, SCE began collecting SmartMeter data for calculating and reporting planned outage reliability indices. SCE provides planned outage reliability indices for this report starting with the first full year available. The first full year for which this information was available was 2016.

The following content contained in this report is based on reliability indicators, definitions and calculations as defined below.

Major Event Day: A day in which the daily system SAIDI exceeds a threshold value. For purposes of calculating daily system SAIDI, any interruption that spans multiple calendar days is accrued to the day on which the interruption began. Statistically, days having a daily system SAIDI greater than a threshold value are days on which the energy delivery system experienced stresses beyond that normally expected (such as severe weather). Events are excluded based on the “2.5 beta method.” Per IEEE Standard 1366, days are excluded from a given year’s metric if their SAIDI exceeds 2.5 times the standard deviation of the natural logarithm of daily SAIDI over the previous five-year period.

ODRM: Outage Database and Reliability Metrics

OMS: Outage Management System

Sustained Interruption: Outage lasting longer than 5 minutes as defined in IEEE Std. 1366-2003

Momentary Interruption: Outage lasting 5 minutes or less as defined in IEEE Std. 1366-2003

SAIDI: The System Average Interruption Duration Index is the amount of time on average a customer was without power in a year due to sustained interruptions (measured in minutes per customer)

$$\text{SAIDI} = \frac{\text{sum of all "sustained" customer interruption durations}}{\text{total number of customers served}}$$

SAIFI: The System Average Interruption Frequency Index is the number of times an average customer was without power in a year due to service interruptions lasting more than 5 minutes (measured in interruptions per customer)

$$\text{SAIFI} = \frac{\text{sum of total quantity of "sustained" customer interruptions}}{\text{total number of customers served}}$$

MAIFI: The Momentary Average Interruption Frequency Index is the number of times an average customer was without power in a year due to service interruptions lasting 5 minutes or less (measured in interruptions per customer)

$$\text{MAIFI} = \frac{\text{sum of total quantity of "momentary" customer interruptions}}{\text{total number of customers served}}$$

Tmed: The calculated threshold value used to determine a Major Event Day. SCE's TMED value is calculated at the beginning of each year using SCE's daily SAIDI values for the prior 5 years. SCE's TMED value for 2018 was 1.76 min.

In years 2006 - 2010, SAIDI, SAIFI, and MAIFI were calculated per IEEE 1366 with the exception of using five years of historical data in applying the "2.5 beta method" to determine excludable days. Per IEEE 1366, days are excluded from a given year's metric if their SAIDI exceeds 2.5 times the standard deviation of the natural logarithm of daily SAIDI over the previous five-year period. However, complete ODRM data did not exist prior to 2006. Therefore, excludable days for years 2006 and 2007 were both determined based on daily SAIDI data in year 2006.

Excludable days for 2008 were determined based on daily SAIDI data in years 2006 and 2007. Excludable days for 2009 were determined based on daily SAIDI data in years 2006, 2007, and 2008. Excludable days for 2010 were determined based on daily SAIDI data in years 2006, 2007, 2008, and 2009. This interim approach is consistent with IEEE 1366.

SCE 2018 Performance Summary

The below table captures SCE’s 2018 performance for repair outages including and excluding MED. The table also consists of a 10-year average performance for repair outages including and excluding MED for comparison. In 2018, SCE saw an improvement in reliability, excluding MED. SCE continues to look for ways to improve our reliability performance, with a particular focus on reducing restoration times by improving processes for operations response, lessening customer impact through real-time outage diagnostics, and enhancing infrastructure by automating Remote Re-closer Settings.

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2018	136.82	0.87	1.43	156.61	71.25	0.72	1.27	99.58
10 Year Avg (2009-2018)	132.78	0.98	1.49	134.99	95.62	0.86	1.32	111.29

In addition, due to the increased fire risk from dry conditions and high winds, SCE has implemented proactive de-energization for our high-risk wildfire areas. This is known as Public Safety Power Shutoff (PSPS). SCE implemented proactive de-energization later in the year; therefore, a full impact will not be seen in 2018. Impacts to our system totaled 0.034 SAIDI min. and 0.000 SAIFI. Most of these events occurred on days that already met the Major Event Day exclusion criteria, leaving 0.004 SAIDI min and 0.000 SAIFI remaining in our non-excludable data. Total System Indices excluding MED, Planned, and PSPS are seen in the table below.

YEAR	MED, Planned, and Proactive De-energization Excluded			
	SAIDI	SAIFI	MAIFI	CAIDI
2018	71.21	0.72	1.27	99.58

In 2018, SCE experienced multiple fires and storm related events across its territory, some of which impacted reliability enough to result in MEDs. In total, SCE had 13 MEDs. Please refer below to the summary table of Major Event Days.

No.	Date	Event Cause	SAIDI	SAIFI	Sustained Customer Impacted	MAFI	Momentary Customer Impacted	Excluded per IEEE 1366
1	1/8/2018	Rain/Mudslides - Transformer Bank, Cross Arm, OH Conductor	2.38	0.011	58,539	0.014	70,634	y
2	1/9/2018	Rain/Mudslides - Landslide on Pole, Vegetation Blown	2.36	0.014	71,354	0.028	145,246	y
3	7/6/2018	Heat Storm - OH Conductor, Transformer, Fire	4.65	0.014	74,057	0.011	57,383	y
4	7/25/2018	Heat Storm/Cranston Fire - Open for Repairs	2.57	0.004	19,985	0.006	30,292	y
5	10/12/2018	Rain/Windstorm - Lightening, Vehicle Hit Pole	3.31	0.013	67,579	0.024	124,545	y
6	10/13/2018	Rain/Windstorm - Open for Repairs	1.83	0.010	52,155	0.011	55,844	y
7	10/15/2018	Rain/Windstorm - Unknown, Wind, Vegetation Blown	11.45	0.037	188,533	0.024	122,614	y
8	11/9/2018	Woolsey Fire - Denied Access, Substation Source lost	15.08	0.016	84,229	0.008	39,158	y
9	11/11/2018	Woolsey Fire - Substation Source Lost	3.50	0.006	30,174	0.004	18,927	y
10	11/12/2018	Woolsey Fire - Fire, Substation Source Lost	5.38	0.003	13,293	0.008	42,965	y
11	11/13/2018	Woolsey Fire - Substation Source Lost	8.48	0.005	24,523	0.002	7,855	y
12	11/15/2018	Woolsey Fire - Substation Source Lost	2.53	0.001	6,438	0.004	20,755	y
13	11/29/2018	Rainstorm - Lightning, Substation Source Lost	2.05	0.023	119,641	0.024	121,903	y
	Total		65.56	0.158	810,500	0.167	858,121	

SECTION 1 – SYSTEM INDICES FOR THE LAST 10 YEARS

a. System Indices Tables

Table 1 below contains the required SAIDI, SAIFI, MAIFI¹ and CAIDI indices for 2009-2018 including and excluding Major Event Day (MED) for the SCE System unplanned Outages. All calculations contained in the table are based on the IEEE 1366 method for Major Event Day (MED). Reliability indices are for unplanned outages only.

Table 1 – Unplanned Outage System Indices (2009-2018)

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2009	105.80	0.90	1.45	117.58	88.77	0.83	1.31	107.17
2010	140.91	1.05	1.69	134.56	98.69	0.82	1.41	120.99
2011	232.39	1.04	1.53	223.75	108.15	0.91	1.36	118.30
2012	108.13	0.89	1.43	121.10	100.70	0.86	1.35	117.76
2013	102.61	0.91	1.20	112.76	94.48	0.88	1.18	107.85
2014	112.10	0.97	1.36	116.04	92.30	0.86	1.23	106.82
2015	114.83	0.92	1.42	125.40	100.15	0.86	1.29	116.56
2016	134.48	1.10	1.55	122.26	109.98	0.99	1.40	110.69
2017	139.73	1.19	1.84	117.19	91.72	0.87	1.42	105.40
2018	136.82	0.87	1.43	156.61	71.25	0.72	1.27	99.58

i. Distribution Indices²

Table 2 – Unplanned Outage Distribution Indices (2009-2018)

YEAR	Distribution Indices (< 50KV) (All Interruptions Included)				Distribution Indices (< 50KV) (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2009	103.95	0.84	1.40	123.71	87.12	0.77	1.27	112.85
2010	139.01	1.01	1.61	138.12	97.52	0.79	1.34	124.04
2011	228.08	0.98	1.47	233.02	105.64	0.86	1.31	122.59
2012	105.58	0.88	1.35	120.63	98.30	0.84	1.28	117.06
2013	94.33	0.86	1.14	109.27	92.52	0.85	1.12	108.46
2014	111.08	0.94	1.29	117.64	91.52	0.84	1.17	108.52
2015	111.87	0.88	1.35	127.54	98.34	0.83	1.24	118.88
2016	129.32	1.05	1.47	123.24	106.29	0.95	1.33	112.03
2017	128.74	0.99	1.56	130.69	89.99	0.84	1.37	106.71
2018	134.87	0.86	1.39	156.34	70.81	0.71	1.23	99.70

¹ SCE calculates MAIFI at every individual outage event

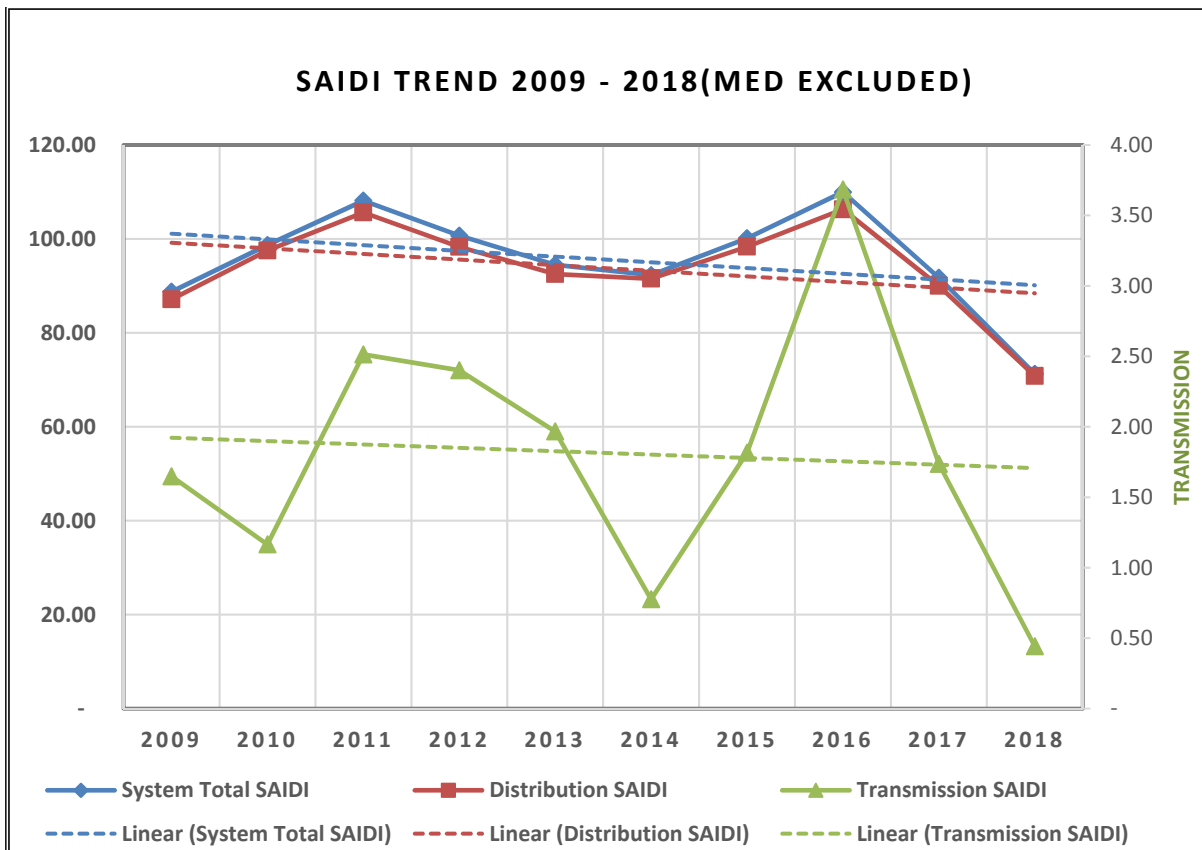
² Distribution system outages are defined as outages that are <50kV

ii. Transmission Indices³

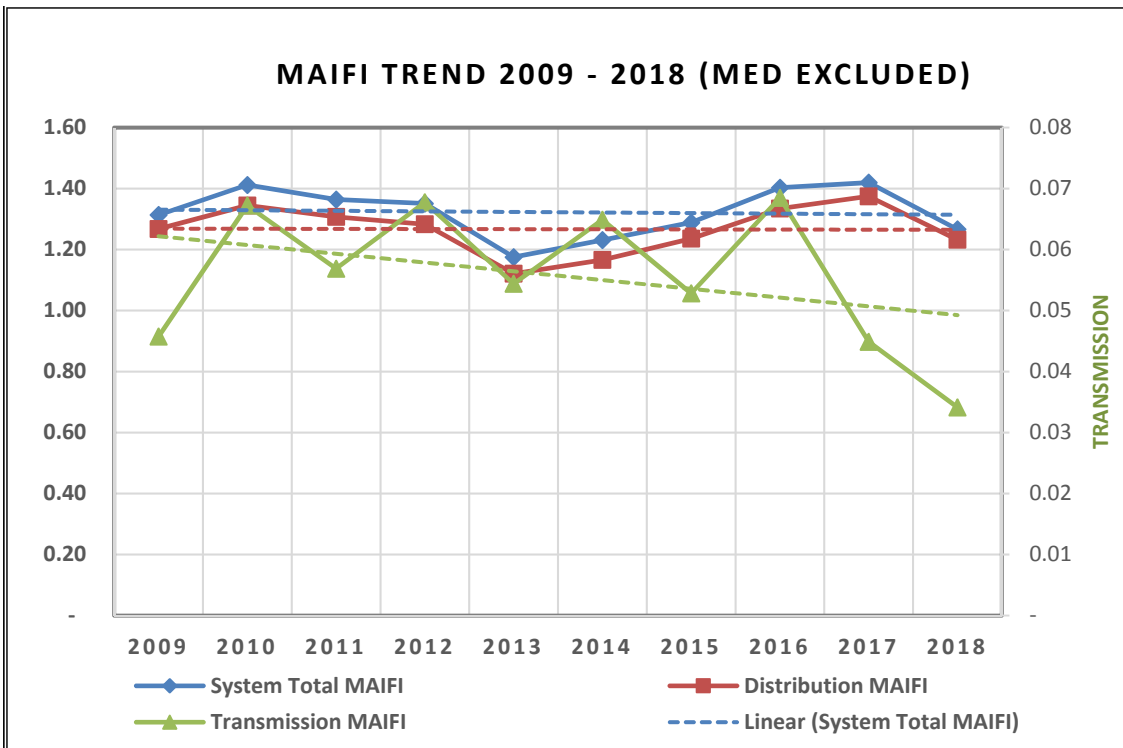
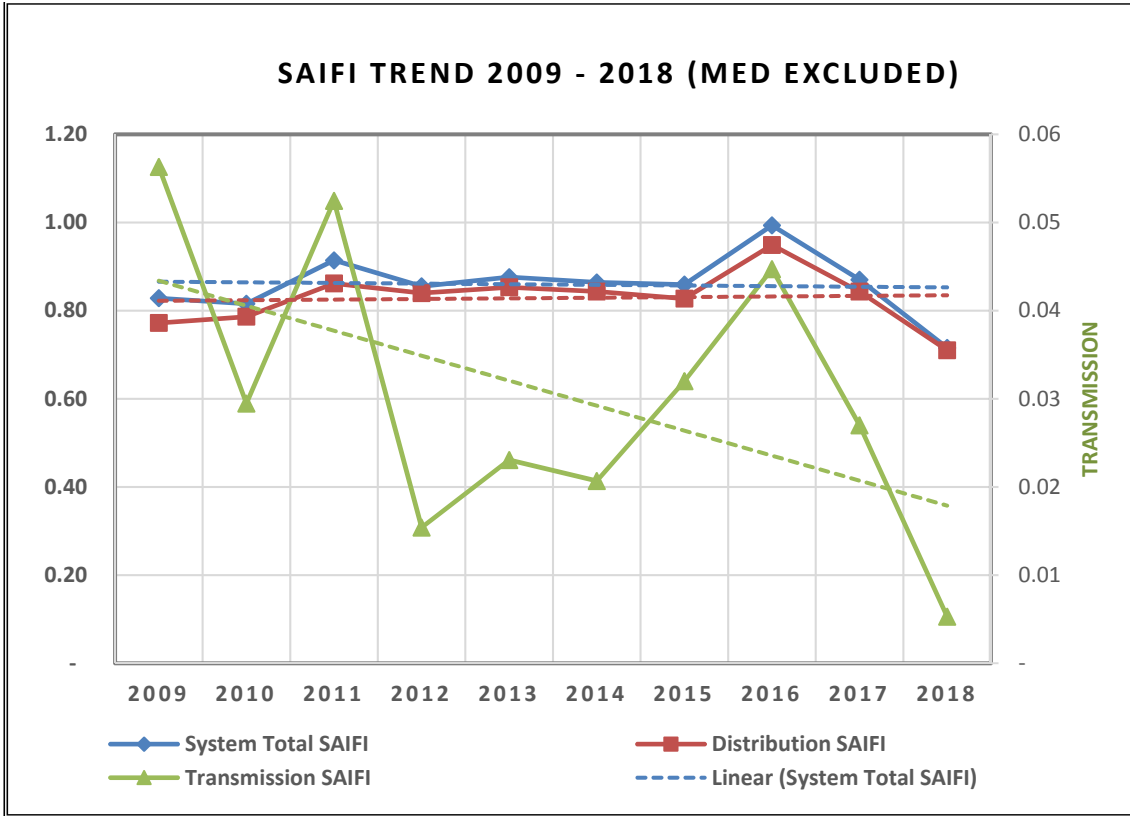
Table 3 – Unplanned Outage Transmission Indices (2009-2018)

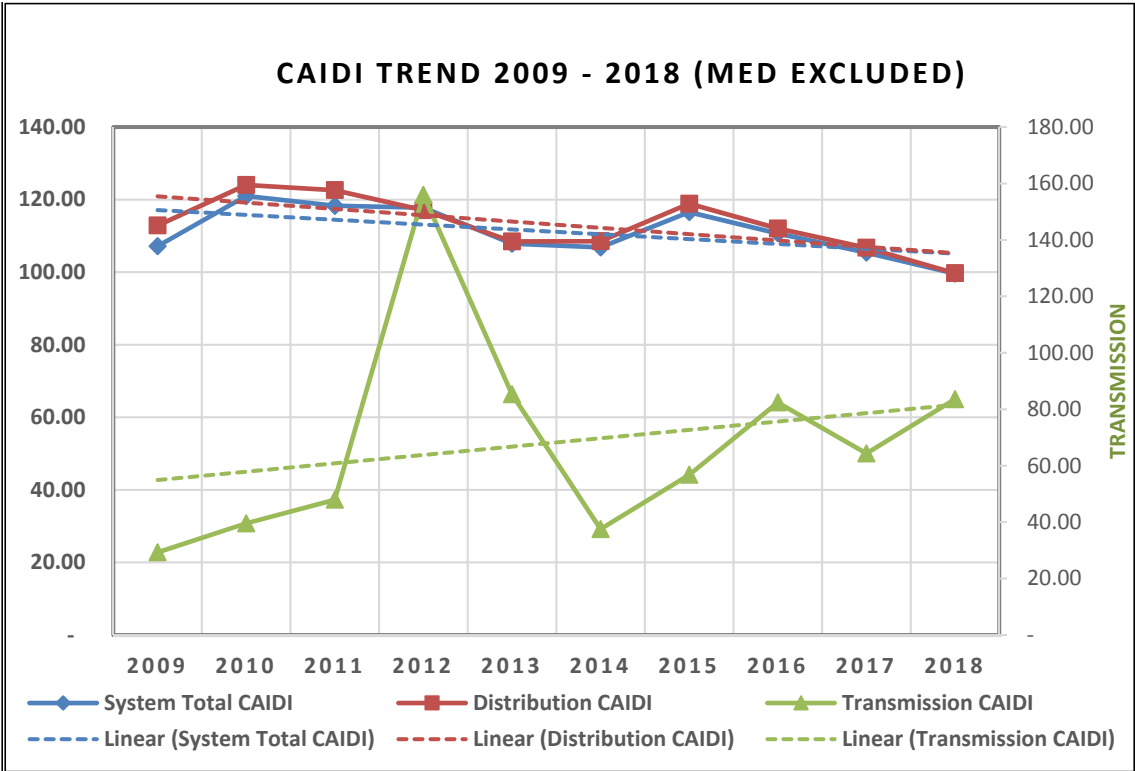
YEAR	Transmission Indices (>= 50KV) (All Interruptions Included)				Transmission Indices (>= 50KV) (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2009	1.85	0.06	0.05	31.08	1.65	0.06	0.05	29.27
2010	1.90	0.04	0.08	46.64	1.16	0.03	0.07	39.54
2011	4.31	0.06	0.07	72.06	2.51	0.05	0.06	47.91
2012	2.56	0.02	0.08	143.93	2.40	0.02	0.07	155.92
2013	8.29	0.05	0.06	177.25	1.97	0.02	0.05	85.29
2014	1.02	0.02	0.07	46.82	0.78	0.02	0.06	37.50
2015	2.96	0.04	0.07	76.68	1.82	0.03	0.05	56.75
2016	5.15	0.05	0.08	101.92	3.68	0.04	0.07	82.39
2017	10.99	0.21	0.27	53.01	1.74	0.03	0.04	64.31
2018	1.95	0.01	0.04	177.73	0.44	0.01	0.03	83.54

b. Unplanned Outage System Indices Charts (MED Excluded)



³ Transmission system outages are defined as outages \geq 50kV.





SECTION 2 – UNPLANNED OUTAGE DISTRICT RELIABILITY INDICES FOR THE PAST 10 YEARS INCLUDING AND EXCLUDING MED

a. District SAIDI, SAIFI, MAIFI and CAIDI⁴ (including and excluding MED) for unplanned outages

Table 4 – District Indices (2009-2018)

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
ANTELOPE VALLEY								
2009	71.229	0.516	1.631	137.979	68.386	0.492	1.473	139.019
2010	131.063	0.773	2.022	169.484	74.576	0.524	1.321	142.319
2011	208.159	1.247	1.669	166.965	128.137	1.144	1.595	111.981
2012	78.604	0.565	1.428	139.172	76.461	0.549	1.412	139.354
2013	94.416	0.619	1.172	152.621	94.222	0.613	1.166	153.772
2014	50.956	0.593	1.153	85.927	45.595	0.548	1.070	83.156
2015	104.337	0.680	1.838	153.528	70.206	0.601	1.514	116.783
2016	107.670	0.870	1.523	123.791	101.199	0.814	1.430	124.322
2017	103.191	0.873	1.833	118.151	83.352	0.814	1.704	102.390
2018	55.614	0.608	1.258	91.517	50.419	0.534	1.097	94.498
ARROWHEAD								
2009	534.083	3.406	7.385	156.795	440.132	2.842	4.674	154.893
2010	537.400	3.841	18.875	139.895	229.659	1.974	16.782	116.369
2011	792.792	4.403	6.090	180.074	444.698	2.992	5.736	148.605
2012	129.579	1.307	3.972	99.116	89.043	1.043	3.757	85.372
2013	180.586	1.386	5.017	130.286	134.768	1.174	3.637	114.839
2014	193.249	1.590	4.018	121.532	81.968	0.898	3.035	91.277
2015	362.615	3.973	5.595	91.273	186.743	2.755	2.730	67.794
2016	659.464	2.848	5.951	231.515	200.720	1.883	4.712	106.593
2017	816.518	3.861	7.057	211.496	218.331	3.058	4.093	71.391
2018	68.595	1.527	2.980	44.924	53.422	0.712	2.919	75.065
BARSTOW								
2009	153.493	1.139	1.824	134.766	125.148	1.060	1.773	118.040
2010	123.015	1.511	3.041	81.440	96.881	1.190	2.648	81.400
2011	308.760	1.631	6.115	189.288	271.659	1.549	5.735	175.418
2012	184.797	1.152	2.645	160.377	182.786	1.144	2.524	159.819
2013	204.329	1.395	3.284	146.469	185.788	1.286	2.702	144.416
2014	201.526	1.343	2.536	150.058	173.680	1.240	2.410	140.098
2015	187.113	1.174	2.859	159.416	157.379	0.997	2.131	157.841
2016	134.828	1.350	2.296	99.888	130.085	1.340	2.283	97.106
2017	357.468	2.652	4.195	134.806	356.064	2.639	4.132	134.934
2018	116.698	1.373	2.110	84.988	115.274	1.342	2.077	85.929
BISHOP								
2009	143.545	1.362	1.493	105.382	142.174	1.356	1.491	104.869
2010	407.920	2.502	5.664	163.016	293.294	2.332	4.251	125.792
2011	666.064	1.548	2.571	430.339	105.588	1.344	2.247	78.591
2012	463.093	1.248	2.288	371.138	424.766	1.103	2.205	384.980
2013	104.436	0.514	1.267	203.233	104.425	0.514	1.267	203.232
2014	118.793	0.587	1.885	202.475	113.618	0.499	1.706	227.572
2015	298.106	2.218	3.332	134.431	298.106	2.218	3.272	134.431
2016	168.592	1.216	2.820	138.643	168.530	1.216	2.711	138.603
2017	190.511	1.934	3.223	98.485	172.144	1.877	3.077	91.719
2018	139.695	0.539	1.957	258.986	136.470	0.499	1.820	273.587
BLYTHE								
2009	83.884	0.820	1.717	102.296	83.605	0.816	1.482	102.403
2010	1332.781	2.030	2.817	656.668	294.445	1.344	2.641	219.114
2011	378.393	1.402	3.717	269.845	321.050	1.312	3.443	244.767
2012	225.884	1.529	3.749	147.714	221.814	1.498	3.749	148.058
2013	483.127	1.380	5.466	349.971	482.815	1.372	5.382	351.779
2014	707.218	2.417	4.658	292.632	706.974	2.385	4.433	296.395
2015	426.997	1.515	1.396	281.754	331.521	1.129	1.163	293.751
2016	396.376	2.707	6.342	146.428	302.983	1.917	4.848	158.021
2017	684.484	2.377	3.585	287.955	683.564	2.372	3.493	288.176
2018	277.723	1.571	2.198	176.833	255.608	1.321	2.168	193.449

⁴ dSAIDI, dSAIFI, dMAIFI and dCAIDI are calculated utilizing the district CMI/ district customers.

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
CATALINA								
2009	98.586	2.542	1.235	38.779	98.586	2.542	1.235	38.779
2010	67.227	1.549	0.728	43.391	67.227	1.549	0.728	43.391
2011	65.029	3.454	3.317	18.828	65.029	3.454	3.317	18.828
2012	78.463	0.724	0.765	108.396	78.463	0.724	0.765	108.396
2013	105.939	2.968	3.093	35.691	105.939	2.968	3.093	35.691
2014	97.024	4.170	2.321	23.269	97.024	4.170	2.321	23.269
2015	42.563	2.252	2.885	18.904	42.563	2.252	2.885	18.904
2016	65.013	3.659	3.168	17.768	65.013	3.659	3.168	17.768
2017	70.671	0.542	2.496	130.359	4.944	0.487	1.324	10.161
2018	141.447	2.440	1.277	57.978	141.447	2.440	1.277	57.978
COMPTON								
2009	89.813	0.681	1.698	131.889	81.227	0.633	1.575	128.322
2010	119.230	0.779	1.578	153.004	88.110	0.585	1.337	150.626
2011	109.414	0.718	1.566	152.338	90.548	0.644	1.433	140.680
2012	117.225	0.824	1.863	142.330	110.077	0.792	1.830	139.031
2013	89.167	0.797	1.938	111.893	89.167	0.797	1.938	111.893
2014	82.192	0.711	1.603	115.553	73.493	0.656	1.560	111.977
2015	130.629	0.967	2.049	135.097	126.046	0.934	1.958	134.903
2016	146.384	1.107	2.537	132.203	127.155	1.010	2.229	125.937
2017	123.596	0.826	2.162	149.564	86.630	0.720	1.967	120.388
2018	93.365	0.852	2.447	109.544	66.378	0.718	2.266	92.400
COVINA								
2009	78.043	0.682	1.063	114.418	62.591	0.603	0.959	103.822
2010	117.660	0.810	1.130	145.299	99.323	0.708	0.983	140.232
2011	166.969	0.870	1.181	191.870	86.994	0.736	1.077	118.129
2012	108.732	0.915	1.333	118.824	102.888	0.867	1.267	118.680
2013	100.505	0.856	1.004	117.414	100.297	0.853	0.992	117.582
2014	91.418	0.874	1.257	104.580	81.424	0.804	1.028	101.295
2015	100.085	0.815	1.164	122.866	99.838	0.813	1.152	122.755
2016	112.134	0.974	1.319	115.182	90.930	0.875	1.145	103.915
2017	117.185	0.933	1.366	125.558	106.094	0.813	1.139	130.523
2018	103.181	0.832	1.455	124.043	73.463	0.700	1.367	104.983
FOOTHILL								
2009	94.329	0.620	1.281	152.254	60.566	0.435	1.015	139.105
2010	76.599	0.460	0.975	166.649	64.982	0.405	0.857	160.634
2011	117.405	0.955	1.226	122.901	97.462	0.879	0.896	110.915
2012	91.694	0.903	0.931	101.552	91.479	0.900	0.900	101.608
2013	85.800	0.987	0.987	109.087	85.800	0.787	0.987	109.087
2014	93.337	0.932	1.285	100.140	88.135	0.861	1.249	102.395
2015	109.637	0.947	1.304	115.764	87.796	0.890	1.230	98.673
2016	142.807	1.028	1.507	138.926	138.177	1.008	1.483	137.029
2017	110.528	1.118	1.387	98.876	88.001	0.890	1.213	98.910
2018	117.614	0.976	1.202	120.475	78.703	0.782	0.966	100.705
FULLERTON								
2009	62.350	0.457	0.846	136.512	60.763	0.431	0.773	140.841
2010	135.217	1.186	1.208	113.985	94.282	0.671	0.859	140.606
2011	90.110	0.607	1.076	148.499	88.745	0.604	1.075	146.940
2012	68.992	0.419	0.943	164.469	64.428	0.401	0.878	160.539
2013	90.572	0.793	0.910	114.158	90.572	0.793	0.910	114.158
2014	82.201	0.723	1.004	113.714	69.996	0.649	0.974	107.848
2015	76.586	0.669	1.014	114.471	75.504	0.642	0.995	117.681
2016	92.725	0.760	1.174	122.044	73.772	0.588	0.974	125.369
2017	89.287	0.676	1.211	132.085	74.154	0.584	1.084	126.996
2018	69.447	0.517	1.126	134.276	55.382	0.435	1.041	127.367
HUNTINGTON BEACH								
2009	109.420	1.041	1.191	105.156	97.754	0.881	1.143	111.009
2010	129.496	1.023	1.305	126.636	101.546	0.848	1.029	119.812
2011	122.539	0.956	1.488	128.169	114.519	0.885	1.406	129.457
2012	95.784	0.889	1.046	107.737	94.680	0.882	1.046	107.395
2013	66.507	0.680	0.815	97.833	66.507	0.680	0.815	97.833
2014	76.901	0.738	1.093	104.152	65.367	0.676	0.964	96.710
2015	98.315	0.955	1.217	102.952	94.111	0.929	1.169	101.352
2016	128.016	1.262	1.225	101.420	108.156	1.186	1.163	91.182
2017	99.075	0.976	1.448	101.480	79.708	0.856	1.188	93.140
2018	87.717	0.761	1.377	115.244	73.576	0.678	1.074	108.522

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
KERNVILLE								
2009	585.927	2.006	5.688	292.025	559.460	1.854	5.053	301.808
2010	584.742	1.795	4.336	325.686	444.191	1.490	4.011	298.084
2011	165.695	1.025	3.316	161.713	138.134	0.964	2.620	143.346
2012	226.761	1.311	3.636	172.995	160.694	1.066	3.010	150.692
2013	232.181	1.964	4.925	118.189	180.865	1.577	4.824	114.682
2014	178.691	1.987	1.882	89.932	142.946	1.918	1.831	74.541
2015	286.382	0.961	1.630	297.920	231.411	0.857	1.293	270.120
2016	2421.324	3.674	2.928	659.034	909.188	2.839	2.832	320.212
2017	305.533	3.286	4.508	92.982	290.601	3.148	4.210	92.311
2018	184.411	1.141	3.104	161.652	152.818	1.009	3.087	151.390
LONG BEACH								
2009	41.503	0.421	0.876	98.539	40.045	0.415	0.851	96.547
2010	72.284	0.633	0.897	114.156	53.982	0.546	0.774	98.809
2011	58.475	0.579	0.894	100.942	52.380	0.562	0.853	93.191
2012	75.830	0.554	1.106	136.864	72.654	0.536	1.059	135.673
2013	75.107	0.699	0.779	107.497	74.628	0.694	0.775	107.551
2014	66.226	0.606	1.168	109.270	57.781	0.548	1.083	105.376
2015	164.463	0.894	1.185	183.904	89.160	0.846	1.168	105.378
2016	135.163	0.857	1.308	157.701	96.978	0.695	1.095	139.507
2017	77.173	0.708	1.177	108.967	59.503	0.590	1.017	100.881
2018	51.477	0.445	1.223	115.686	42.300	0.400	1.100	105.879
MENIFEE								
2009	106.451	1.809	1.026	58.854	97.637	1.743	0.910	56.004
2010	100.653	0.762	1.202	132.119	74.081	0.613	0.903	120.754
2011	100.482	0.891	1.339	112.728	93.705	0.804	1.299	116.607
2012	99.320	0.838	1.736	118.576	98.627	0.824	1.680	119.740
2013	107.388	1.264	0.744	84.979	106.298	1.220	0.725	87.135
2014	156.641	1.323	1.573	118.410	77.367	1.004	1.276	77.030
2015	111.460	0.978	1.302	113.971	85.322	0.876	1.067	97.393
2016	156.748	1.311	1.448	119.535	139.005	1.191	1.338	116.738
2017	130.467	0.965	1.311	135.265	72.854	0.765	1.200	95.225
2018	174.057	0.897	1.436	194.002	70.952	0.696	1.270	102.015
MONROVIA								
2009	219.773	0.869	2.029	252.948	102.119	0.744	1.614	137.210
2010	124.340	1.078	2.014	115.381	93.507	0.902	1.775	103.624
2011	2414.044	1.891	2.463	1276.874	130.692	1.025	1.740	127.514
2012	108.110	1.126	1.781	95.987	99.185	1.068	1.632	92.910
2013	99.116	1.017	1.322	97.496	98.965	1.015	1.311	97.500
2014	133.311	1.157	1.258	115.176	96.360	1.005	1.069	95.846
2015	96.679	0.881	1.618	109.737	95.327	0.863	1.554	110.466
2016	116.575	0.844	1.652	138.064	93.387	0.772	1.523	121.000
2017	105.003	0.982	1.797	106.955	91.997	0.925	1.699	99.414
2018	243.023	1.427	1.614	170.294	102.583	1.030	1.453	99.573
MONTEBELLO								
2009	192.332	1.191	2.337	161.484	87.243	1.099	2.174	79.370
2010	147.851	1.117	1.987	132.361	118.232	0.972	1.688	121.649
2011	678.332	1.214	2.388	558.556	115.694	0.853	1.821	135.577
2012	131.058	1.127	1.946	116.316	107.511	1.040	1.823	103.423
2013	118.078	1.174	1.890	100.609	117.713	1.169	1.890	100.660
2014	158.316	1.164	1.959	136.010	124.669	1.020	1.763	122.179
2015	150.280	1.183	2.213	126.992	145.303	1.131	2.087	128.462
2016	133.522	1.166	2.057	114.552	107.263	1.043	1.882	102.871
2017	123.980	0.989	2.181	125.388	96.853	0.877	1.873	110.467
2018	160.883	1.063	2.269	151.313	98.880	0.782	1.859	126.380
ONTARIO								
2009	88.186	0.748	1.200	117.973	80.625	0.703	1.098	114.619
2010	90.448	0.811	1.480	111.528	70.279	0.655	1.258	107.242
2011	117.664	0.822	1.317	143.189	96.594	0.749	1.235	128.944
2012	93.087	0.869	1.159	107.130	91.407	0.833	1.140	109.720
2013	77.392	0.791	0.933	97.841	74.037	0.782	0.926	94.728
2014	97.881	0.996	1.160	98.312	86.676	0.902	1.041	96.114
2015	94.043	0.744	0.926	126.432	81.608	0.709	0.867	115.156
2016	105.067	0.930	1.282	112.936	86.158	0.803	1.095	107.337
2017	100.432	1.135	1.572	88.514	91.781	1.054	1.422	87.094
2018	80.041	0.723	1.048	110.711	53.434	0.589	0.918	90.776

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
PALM SPRINGS								
2009	151.662	1.106	1.905	137.079	140.027	1.047	1.824	133.722
2010	180.688	1.039	1.367	173.826	162.059	0.940	1.148	172.391
2011	164.765	0.886	1.182	186.029	144.131	0.842	1.117	171.272
2012	175.916	1.267	1.505	138.814	113.848	1.130	1.236	100.717
2013	112.796	0.774	0.997	145.669	112.193	0.769	0.997	145.815
2014	106.960	0.708	0.941	151.072	95.065	0.667	0.885	142.620
2015	99.542	0.800	1.042	124.376	95.795	0.753	0.949	127.171
2016	107.581	1.066	1.281	100.909	101.363	1.010	1.133	100.351
2017	119.105	1.022	1.220	116.564	116.436	0.998	1.210	116.632
2018	73.949	0.788	1.426	93.794	60.306	0.726	1.208	83.104
REDLANDS								
2009	107.204	0.895	1.469	119.732	87.582	0.807	1.221	108.514
2010	216.759	1.692	3.207	128.121	95.898	1.332	2.692	71.988
2011	253.703	1.630	1.323	155.689	142.273	1.428	1.244	99.628
2012	120.127	1.108	1.600	108.399	114.781	1.068	1.563	107.435
2013	96.481	1.044	0.911	92.410	95.273	1.036	0.908	91.977
2014	154.227	1.040	1.312	148.311	85.520	0.872	1.149	98.024
2015	124.519	1.012	1.467	122.990	102.289	0.935	1.247	109.365
2016	137.110	0.978	1.475	140.164	118.776	0.883	1.336	134.494
2017	142.591	1.009	1.595	141.350	112.447	0.856	1.407	131.325
2018	88.933	0.973	1.367	91.372	71.012	0.833	1.212	85.242
RIDGECREST								
2009	58.339	0.684	3.343	85.234	40.758	0.501	2.586	81.374
2010	153.378	1.410	2.219	108.746	151.176	1.394	1.850	108.443
2011	89.261	0.737	4.140	121.196	67.647	0.528	3.916	128.124
2012	229.646	1.439	3.738	159.634	228.264	1.421	3.711	160.656
2013	161.952	1.122	3.828	144.376	83.920	0.824	3.315	101.793
2014	176.795	1.573	2.193	112.388	167.746	1.509	2.180	111.181
2015	148.895	1.012	2.169	147.145	139.509	0.837	1.514	166.702
2016	254.311	1.048	1.283	242.667	249.209	0.941	1.160	264.837
2017	164.281	1.089	3.519	150.868	153.577	1.066	3.447	144.028
2018	254.588	1.099	1.287	231.588	99.802	0.732	1.278	136.389
SADDLEBACK								
2009	78.986	0.697	0.486	113.254	77.683	0.686	0.481	113.193
2010	137.236	0.962	0.433	142.663	96.192	0.778	0.373	123.677
2011	75.942	0.547	0.818	138.842	74.783	0.527	0.753	141.934
2012	83.013	0.728	0.766	113.998	81.379	0.715	0.765	113.864
2013	70.688	0.532	0.513	132.957	70.688	0.532	0.513	132.957
2014	99.074	0.745	0.556	133.025	92.899	0.708	0.549	131.230
2015	46.026	0.385	0.379	119.543	45.654	0.384	0.379	118.976
2016	65.991	0.646	0.780	102.225	62.466	0.602	0.739	103.695
2017	65.349	0.576	0.695	113.479	48.740	0.482	0.545	101.179
2018	45.805	0.377	0.413	121.548	35.830	0.316	0.364	113.487
SANTA ANA								
2009	67.833	0.600	0.800	113.062	59.543	0.536	0.755	111.017
2010	104.571	0.810	1.012	129.134	69.073	0.610	0.837	113.185
2011	102.008	0.816	1.104	125.033	93.837	0.778	1.068	120.566
2012	78.602	0.554	1.115	141.767	78.305	0.553	1.065	141.491
2013	93.345	0.742	1.019	125.854	93.345	0.742	1.019	125.854
2014	91.651	0.843	1.274	108.710	79.414	0.755	1.179	105.222
2015	67.457	0.706	1.130	95.596	66.452	0.703	1.109	94.562
2016	97.266	0.995	1.184	97.732	88.311	0.938	1.112	94.132
2017	81.900	0.712	1.269	115.087	67.193	0.609	1.118	110.346
2018	122.093	0.819	1.304	149.091	56.912	0.550	1.093	103.419
SANTA BARBARA								
2009	178.865	1.798	1.371	99.468	173.897	1.756	1.210	99.033
2010	151.187	1.008	2.228	149.999	138.640	0.888	1.887	156.212
2011	104.820	0.866	1.727	121.045	94.368	0.811	1.635	116.427
2012	153.813	1.148	1.673	133.954	149.352	1.127	1.456	132.567
2013	82.001	0.699	1.219	117.302	82.001	0.699	1.219	117.302
2014	181.231	1.335	2.549	135.717	145.165	1.141	2.012	127.238
2015	152.372	1.517	1.577	100.417	143.291	1.338	1.459	107.103
2016	156.665	1.411	1.464	111.029	130.007	1.269	1.249	102.442
2017	408.433	9.213	13.591	44.334	152.424	1.619	1.206	94.173
2018	172.898	1.022	1.201	169.205	85.566	0.908	1.000	94.285

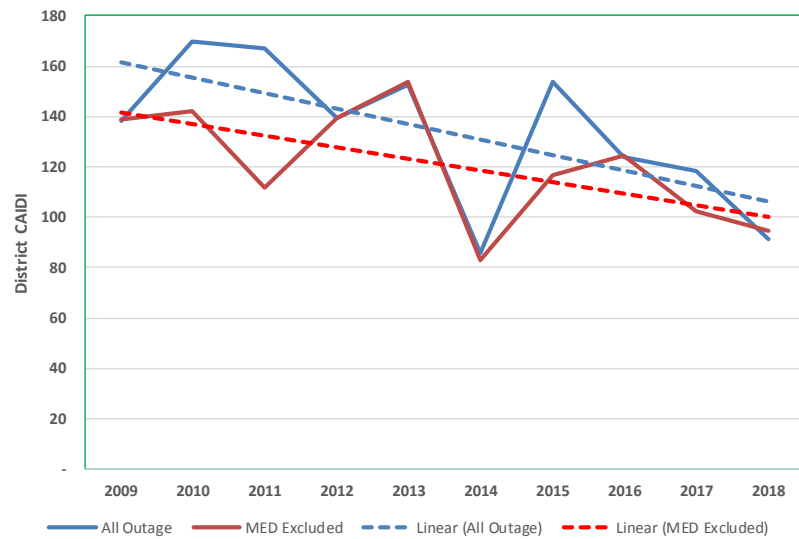
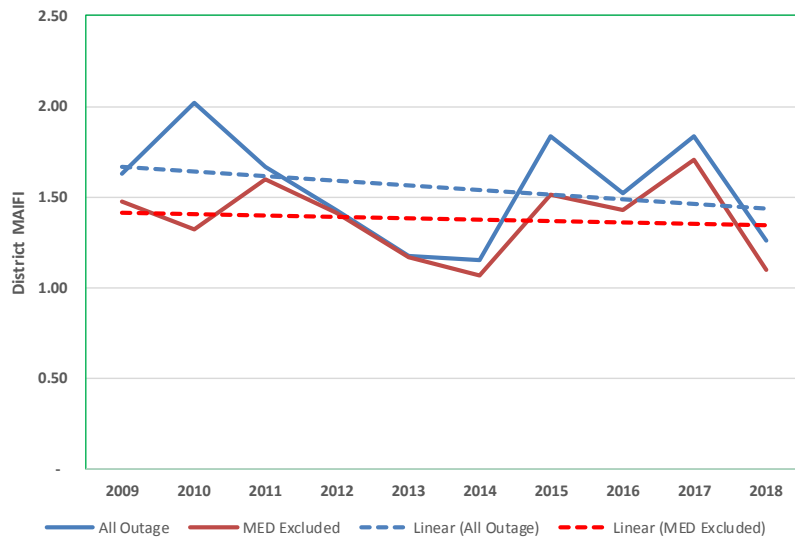
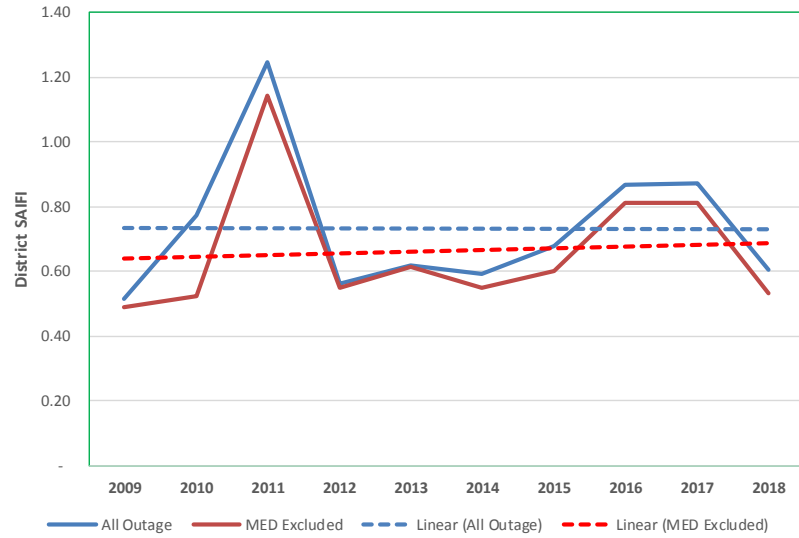
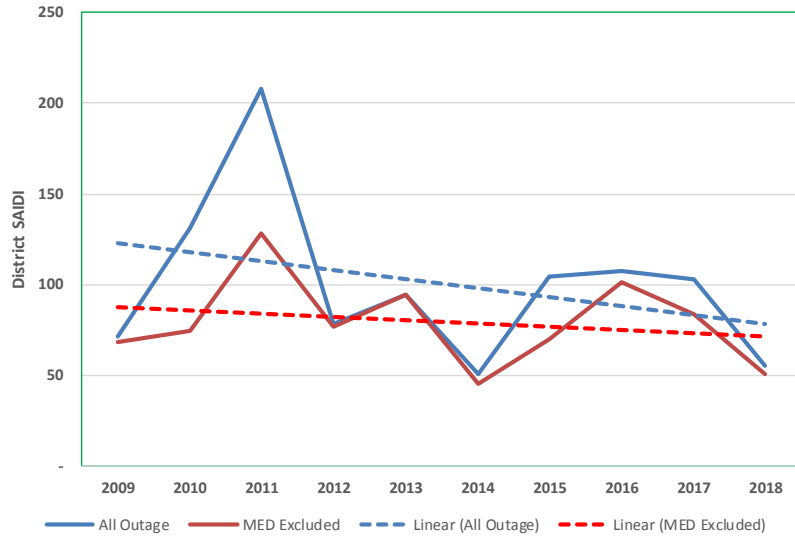
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
SANTA MONICA								
2009	86.226	0.655	1.187	131.696	82.128	0.629	1.145	130.473
2010	98.323	0.894	1.124	109.948	73.036	0.689	1.054	105.987
2011	95.085	0.583	1.476	162.996	83.791	0.537	1.177	155.914
2012	101.687	0.792	0.911	128.436	98.428	0.769	0.890	127.913
2013	122.783	1.003	0.959	122.447	122.783	1.003	0.959	122.447
2014	110.742	0.992	0.852	111.609	106.656	0.943	0.772	113.131
2015	75.407	0.625	1.069	120.681	64.417	0.577	1.065	111.607
2016	91.084	0.948	1.210	96.130	89.110	0.933	1.131	95.493
2017	71.892	0.712	1.168	101.023	66.138	0.678	1.108	97.491
2018	80.242	1.045	1.352	76.789	60.403	0.716	1.320	84.334
SHAVER LAKE								
2009	259.275	1.441	1.856	179.865	259.275	1.441	1.856	179.865
2010	5700.992	12.891	7.874	442.244	683.925	6.344	3.818	107.812
2011	1667.047	4.222	3.933	394.852	984.340	1.650	2.741	596.466
2012	1184.253	4.523	2.608	261.831	842.662	4.182	1.681	201.512
2013	176.510	3.080	4.987	57.308	176.510	3.080	4.711	57.308
2014	920.254	1.342	4.901	685.961	438.216	0.581	3.960	754.138
2015	422.768	3.415	9.298	123.785	422.768	3.415	9.298	123.785
2016	1062.011	4.993	4.157	212.703	773.999	2.795	2.165	276.874
2017	4273.522	7.947	5.220	537.732	676.224	6.039	5.197	111.971
2018	203.429	2.484	6.362	81.887	203.429	2.484	6.362	81.887
SOUTH BAY								
2009	158.299	1.156	1.814	136.881	135.003	1.007	1.627	134.053
2010	190.924	1.206	1.836	158.299	136.407	0.938	1.533	145.392
2011	178.724	1.347	1.481	132.690	141.550	1.207	1.169	117.293
2012	122.682	1.174	1.713	104.516	120.710	1.153	1.630	104.694
2013	142.153	1.490	1.448	95.391	142.153	1.490	1.448	95.391
2014	125.154	1.390	1.650	90.009	110.254	1.281	1.502	86.094
2015	164.072	1.305	1.660	125.704	160.399	1.272	1.613	126.136
2016	183.899	1.884	2.020	97.600	150.901	1.752	1.818	86.124
2017	99.194	0.931	1.460	106.532	87.355	0.818	1.328	106.765
2018	90.626	1.090	1.771	83.134	82.272	1.007	1.524	81.666
TEHACHAPI								
2009	168.038	2.010	3.482	83.614	155.009	1.915	3.413	80.957
2010	434.015	3.232	6.291	134.268	220.369	2.573	4.677	85.639
2011	231.229	1.814	3.190	127.454	177.911	1.694	2.582	105.026
2012	117.963	1.434	1.495	82.262	117.963	1.434	1.495	82.262
2013	232.672	1.121	1.661	207.634	232.333	1.102	1.638	210.815
2014	130.704	1.290	2.090	101.348	83.519	1.097	1.783	76.126
2015	298.959	1.215	3.960	246.114	236.807	1.037	2.513	228.329
2016	97.292	1.132	2.363	85.982	76.426	1.036	1.940	73.781
2017	86.514	1.048	3.126	82.573	77.927	0.890	2.946	87.574
2018	55.989	0.673	2.276	83.199	54.960	0.655	2.146	83.856
THOUSAND OAKS								
2009	103.160	0.987	1.850	104.469	98.658	0.948	1.833	104.026
2010	124.263	1.366	1.567	91.002	92.331	0.815	1.435	113.243
2011	146.687	1.145	1.928	128.129	121.175	1.008	1.732	120.168
2012	127.732	1.049	1.196	121.739	118.833	0.991	1.161	119.968
2013	93.860	0.914	1.164	102.735	93.846	0.913	1.154	102.755
2014	104.172	1.102	1.426	94.537	95.331	1.013	1.287	94.150
2015	106.589	0.919	1.893	115.938	103.685	0.889	1.845	116.643
2016	143.775	1.307	2.585	110.021	128.242	1.227	2.378	104.484
2017	151.735	1.427	3.270	106.304	106.392	1.063	2.903	100.056
2018	1167.537	1.480	1.634	788.966	109.945	0.967	1.354	113.663
TULARE								
2009	96.592	0.906	2.087	106.555	93.243	0.867	2.030	107.524
2010	126.684	1.043	1.642	121.481	98.341	0.932	1.503	105.567
2011	83.994	0.743	1.387	113.010	75.838	0.712	1.301	106.565
2012	135.897	1.044	1.455	130.115	123.112	1.005	1.290	122.504
2013	244.439	1.448	1.698	168.757	71.744	0.800	1.548	89.668
2014	137.738	1.164	1.519	118.285	93.658	0.997	1.303	93.949
2015	127.502	1.052	1.414	121.240	99.829	0.908	1.106	109.936
2016	108.444	1.091	1.105	99.370	101.822	1.040	1.082	97.895
2017	191.659	1.343	1.198	142.710	105.718	1.282	1.188	82.463
2018	56.234	0.685	1.077	82.150	51.292	0.652	1.017	78.639

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
VALENCIA								
2009	101.701	0.812	1.519	125.209	101.368	0.800	1.400	126.765
2010	117.815	0.806	2.195	146.239	103.447	0.698	2.114	148.275
2011	130.855	1.036	1.412	126.276	119.058	0.986	1.379	120.768
2012	62.009	0.462	1.134	134.286	61.595	0.461	1.133	133.738
2013	50.940	0.532	0.683	95.801	50.940	0.532	0.683	95.801
2014	79.216	0.605	0.998	130.876	63.729	0.533	0.935	119.499
2015	72.274	0.611	0.971	118.224	71.053	0.604	0.845	117.624
2016	105.087	0.968	1.549	108.594	97.405	0.846	1.522	115.187
2017	136.618	1.079	1.549	126.671	81.267	0.702	1.283	115.765
2018	92.407	1.063	1.451	86.969	79.329	0.945	1.391	83.982
VENTURA								
2009	112.422	1.288	1.743	87.292	106.956	1.242	1.651	86.140
2010	182.739	1.720	2.279	106.240	144.070	1.345	2.103	107.099
2011	167.849	2.247	1.561	74.683	139.680	2.112	1.337	66.150
2012	134.807	1.155	1.507	116.752	128.528	1.140	1.469	112.780
2013	100.521	1.210	1.417	83.104	100.504	1.210	1.417	83.093
2014	183.769	1.648	2.215	111.528	151.635	1.386	2.075	109.381
2015	148.848	1.190	1.447	125.112	141.430	1.149	1.375	123.110
2016	150.408	1.236	1.679	121.649	107.140	1.019	1.553	105.110
2017	520.897	3.122	2.293	166.846	114.758	1.240	1.542	92.559
2018	136.042	1.438	1.921	94.613	100.385	1.177	1.676	85.301
VICTORVILLE								
2009	61.926	0.644	1.607	96.147	52.591	0.550	1.384	95.565
2010	96.446	1.008	2.081	95.727	67.510	0.610	1.368	110.738
2011	196.846	1.008	2.153	195.358	82.406	0.791	1.877	104.144
2012	67.698	0.662	1.775	102.224	57.567	0.584	1.606	98.647
2013	61.333	0.632	1.312	97.109	61.010	0.620	1.179	98.380
2014	68.830	0.633	0.896	108.709	67.680	0.620	0.877	109.146
2015	87.026	0.906	1.839	96.063	72.897	0.812	1.551	89.751
2016	79.352	0.917	1.396	86.493	75.943	0.888	1.327	85.547
2017	84.068	0.895	2.353	93.936	73.124	0.808	1.757	90.485
2018	125.922	0.862	1.345	146.015	97.868	0.802	1.270	122.074
WHITTIER								
2009	74.921	0.530	0.987	141.419	64.929	0.499	0.949	129.996
2010	101.330	0.696	1.127	145.626	74.586	0.572	1.023	130.480
2011	99.736	0.749	1.187	133.093	91.881	0.724	1.122	126.855
2012	72.597	0.742	1.383	97.877	72.304	0.719	1.312	100.597
2013	135.043	0.859	1.055	157.172	135.043	0.859	1.055	157.172
2014	87.600	0.704	1.155	124.399	84.188	0.689	1.090	122.157
2015	114.520	0.733	1.084	156.317	104.851	0.704	0.989	148.883
2016	137.336	0.814	1.416	168.756	90.212	0.616	1.290	146.361
2017	148.909	0.896	1.872	166.103	91.911	0.750	1.655	122.501
2018	87.742	0.666	1.413	131.834	73.659	0.575	1.297	128.006
WILDOMAR								
2009	59.707	1.484	0.998	40.246	52.853	1.368	0.839	38.632
2010	127.124	1.122	1.565	113.258	79.888	0.881	1.172	90.656
2011	109.406	1.219	1.225	89.739	108.810	1.210	1.197	89.923
2012	88.539	0.725	0.805	122.193	87.186	0.690	0.756	126.346
2013	40.512	0.555	0.656	72.932	40.122	0.554	0.656	72.407
2014	118.493	0.806	0.743	147.031	112.300	0.772	0.683	145.548
2015	52.699	0.597	1.255	88.256	48.313	0.566	1.054	85.401
2016	84.010	0.866	0.951	97.031	79.151	0.839	0.861	94.378
2017	90.151	0.800	1.015	112.679	56.373	0.580	0.933	97.161
2018	60.772	0.747	0.846	81.358	51.890	0.622	0.760	83.373
YUCCA VALLEY								
2009	192.279	1.158	3.193	165.979	189.316	1.151	3.140	164.451
2010	307.670	3.017	5.167	101.994	235.893	2.370	4.016	99.547
2011	436.441	2.163	6.922	201.767	354.867	1.966	5.598	180.481
2012	319.821	3.413	7.170	93.708	250.377	2.806	5.467	89.239
2013	216.972	1.500	4.983	144.620	216.966	1.500	4.983	144.626
2014	304.182	1.490	4.856	204.146	293.662	1.407	4.851	208.750
2015	389.085	1.804	3.922	215.688	260.176	1.189	2.708	218.766
2016	463.683	3.393	3.875	136.661	440.057	3.257	3.106	135.131
2017	300.331	1.957	1.602	153.472	270.109	1.728	1.509	156.277
2018	353.832	1.937	2.747	182.664	206.580	1.488	1.832	138.842

- b. The linear charts below shows the past 10 years of dSAIDI, dSAIFI, dMAIFI and dCAIDI for all 35 districts. There are separate charts of unplanned outages including and excluding MED. The charts shown are listed in district name alphabetical order.

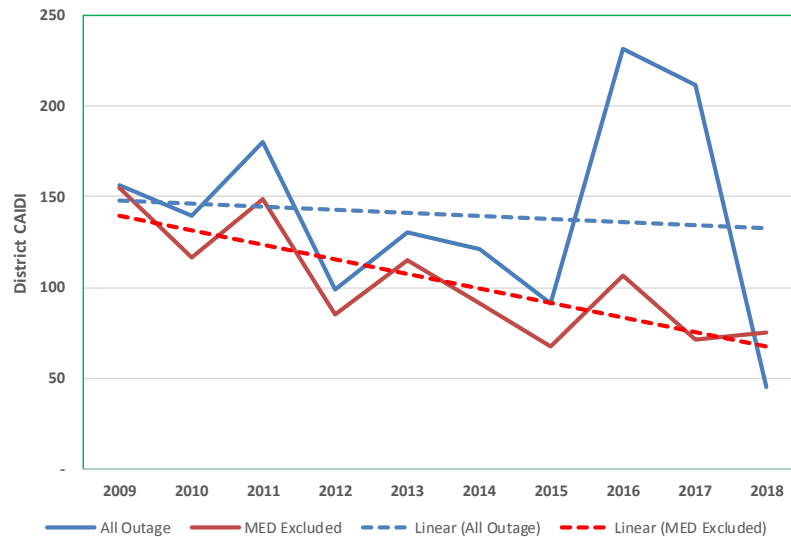
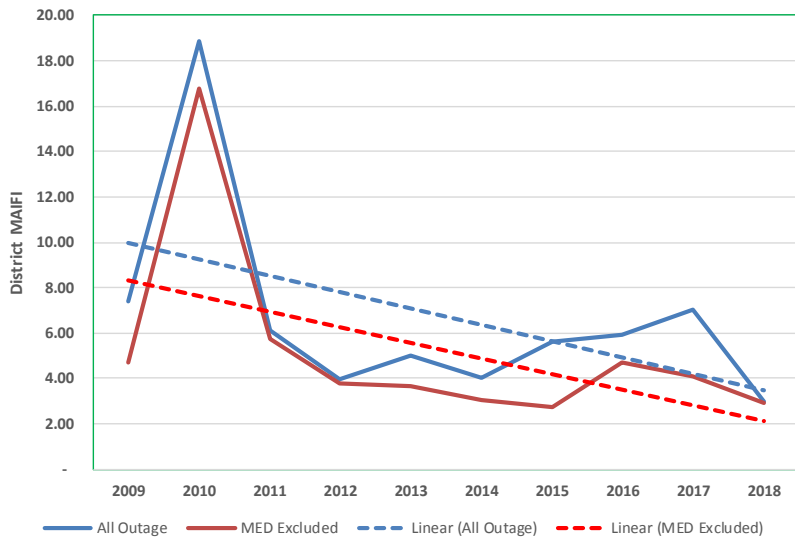
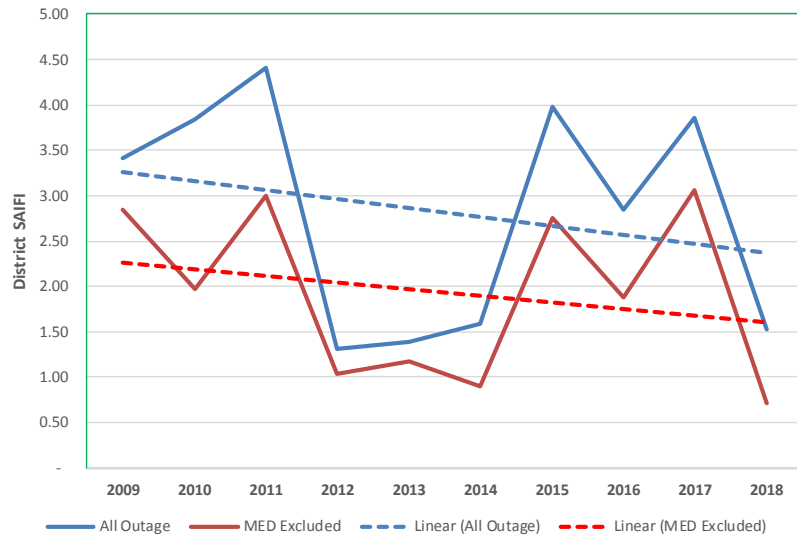
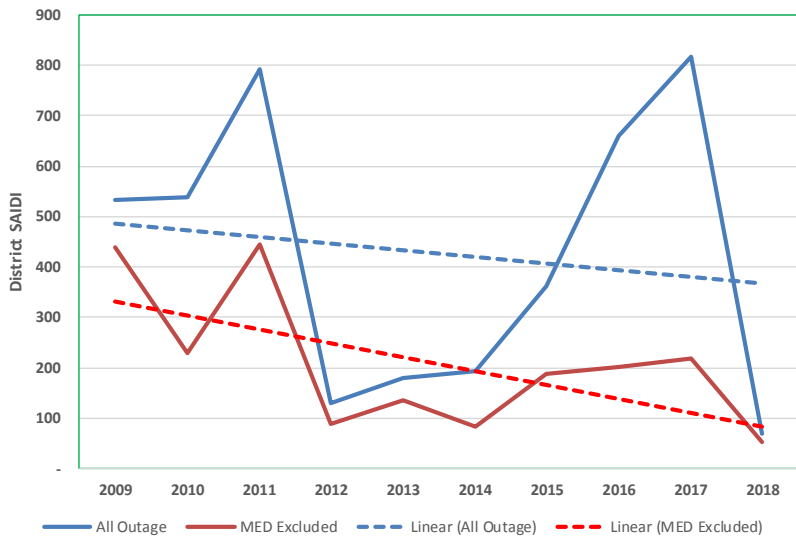
2009 -2018 District Reliability Graphs

ANTELOPE VALLEY District Reliability Performance



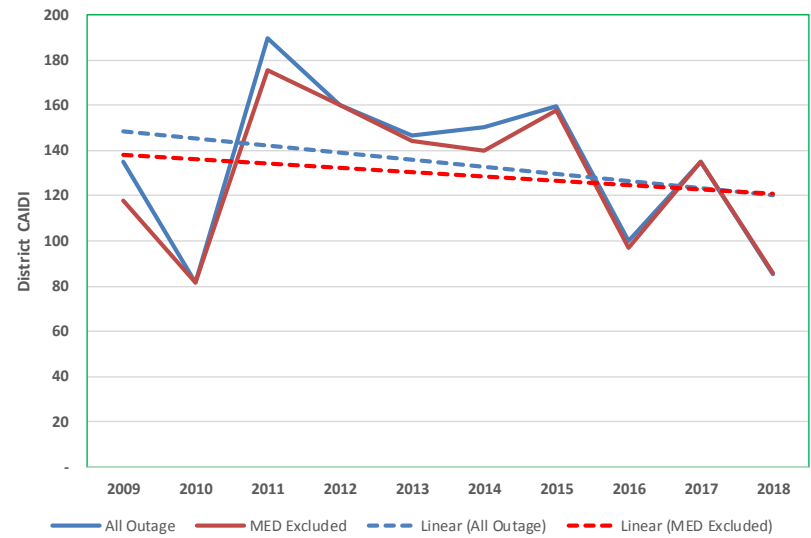
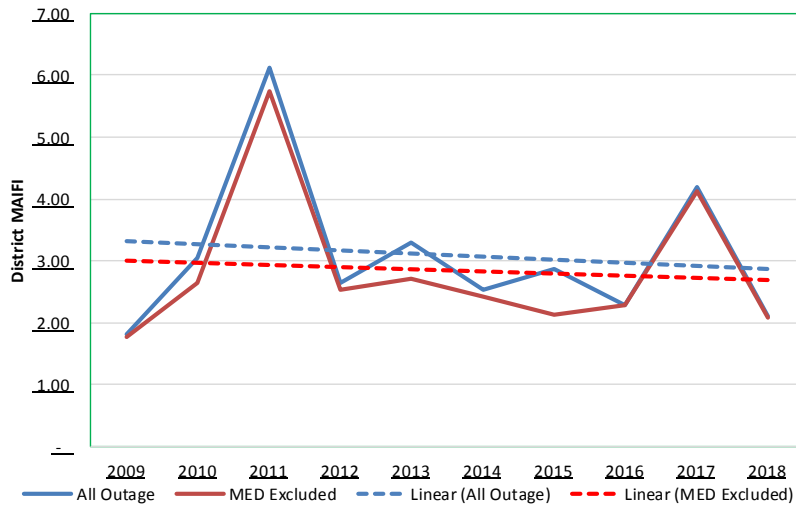
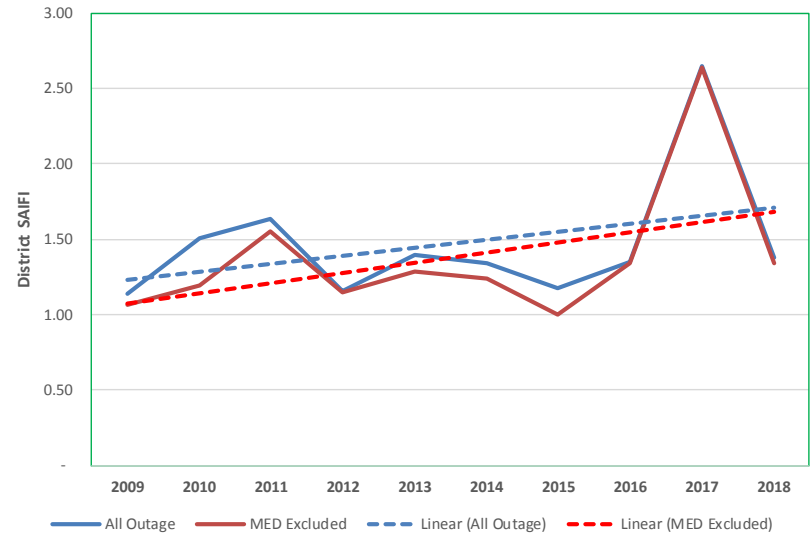
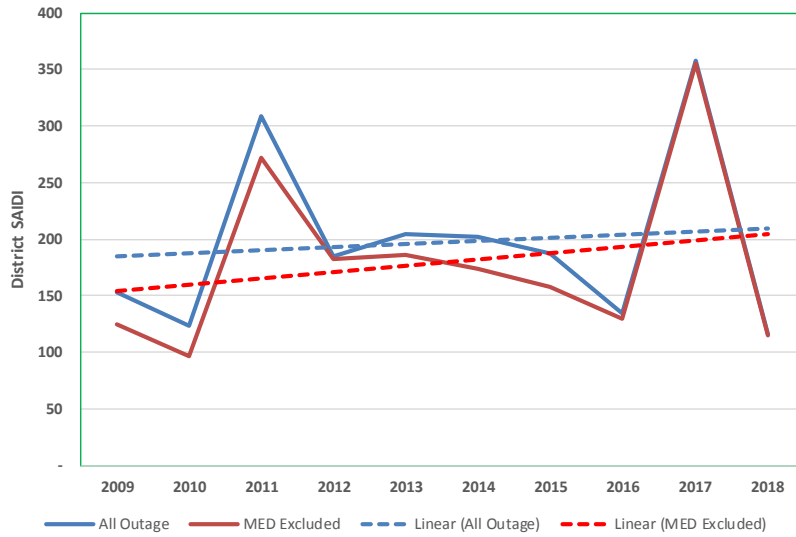
2009 -2018 District Reliability Graphs

ARROWHEAD District Reliability Performance



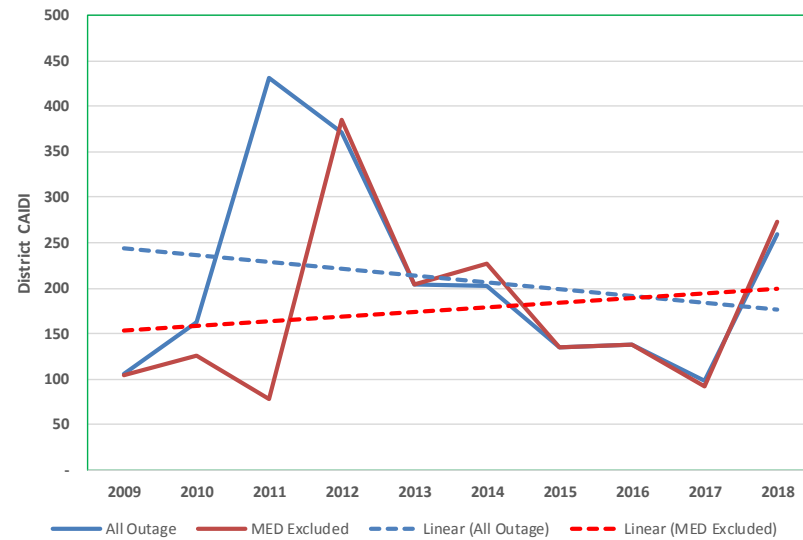
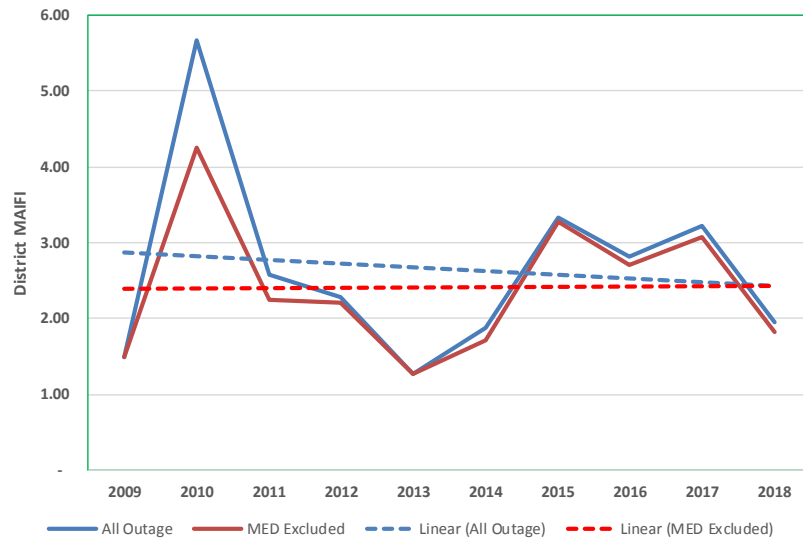
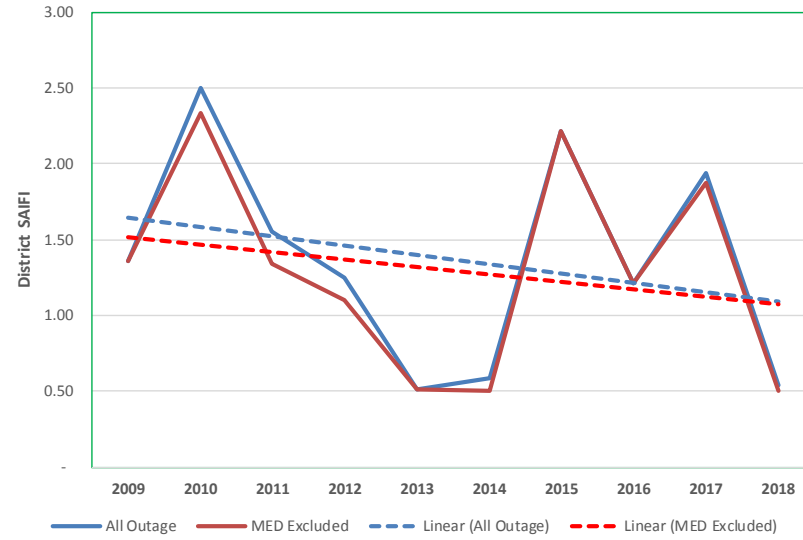
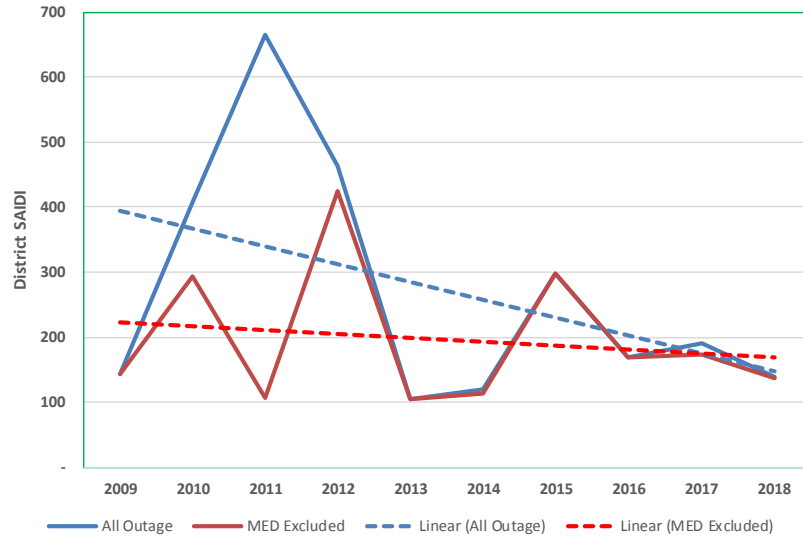
2009 -2018 District Reliability Graphs

BARSTOW District Reliability Performance



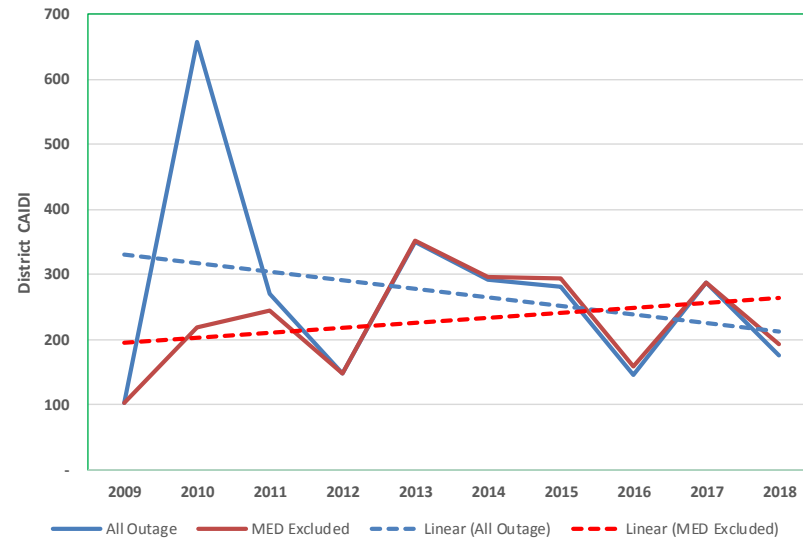
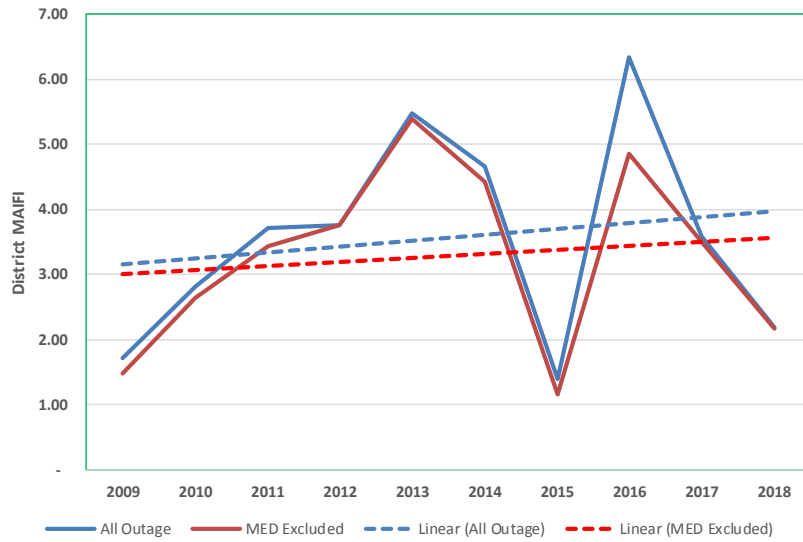
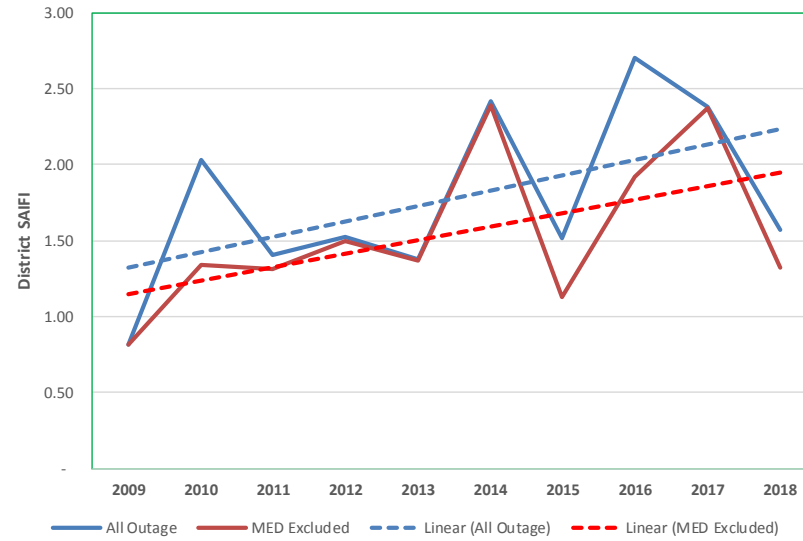
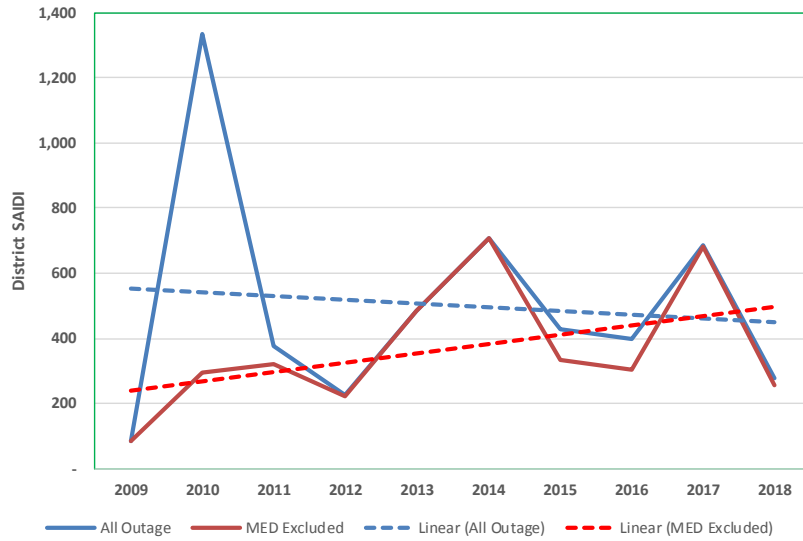
2009 -2018 District Reliability Graphs

BISHOP District Reliability Performance



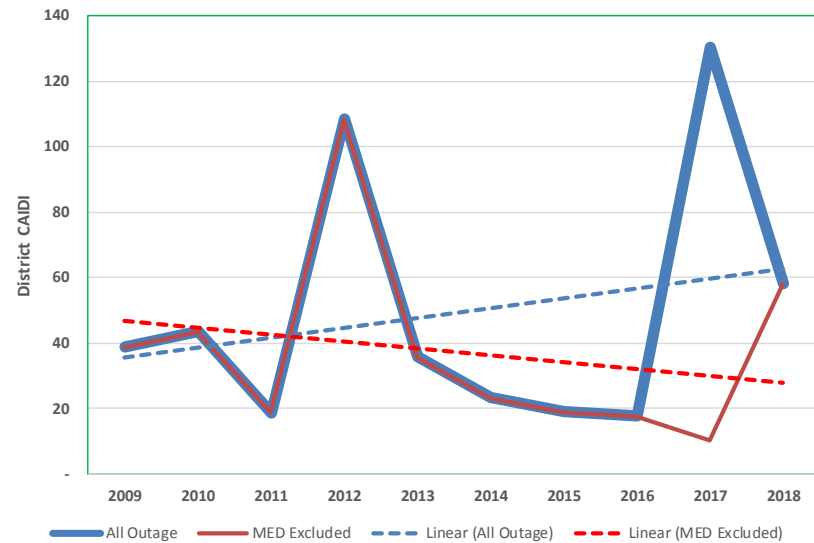
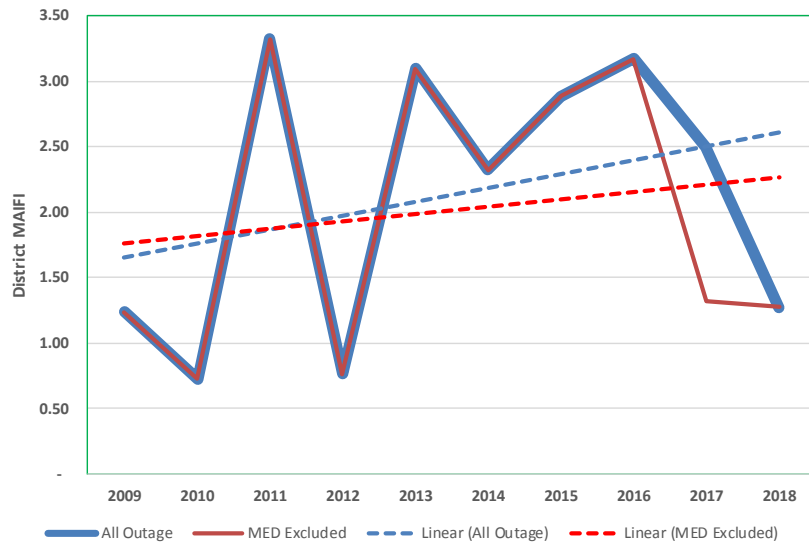
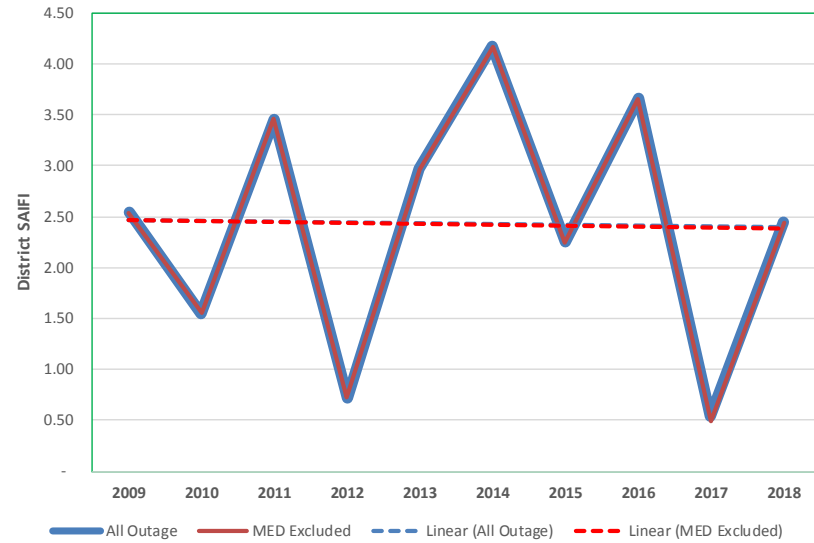
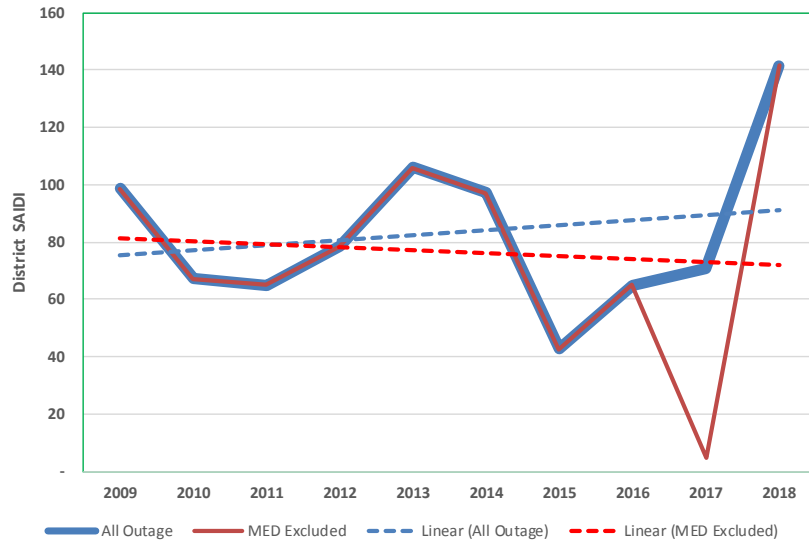
2009 -2018 District Reliability Graphs

BLYTHE District Reliability Performance



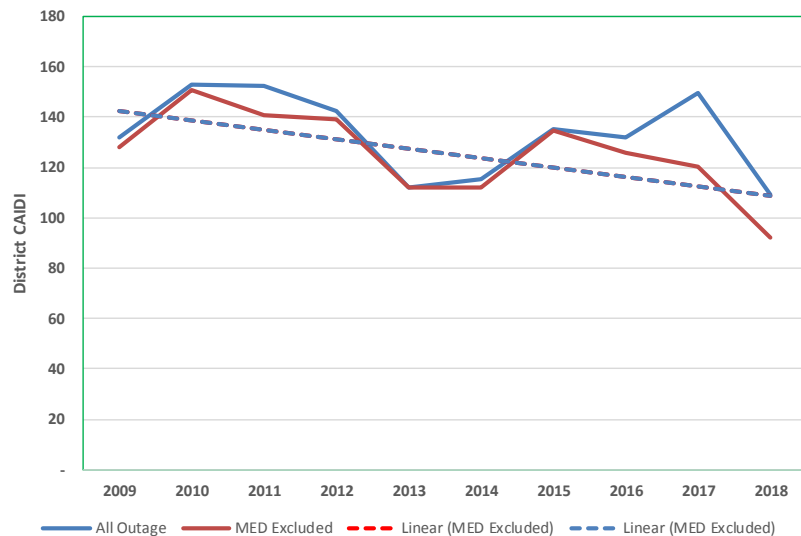
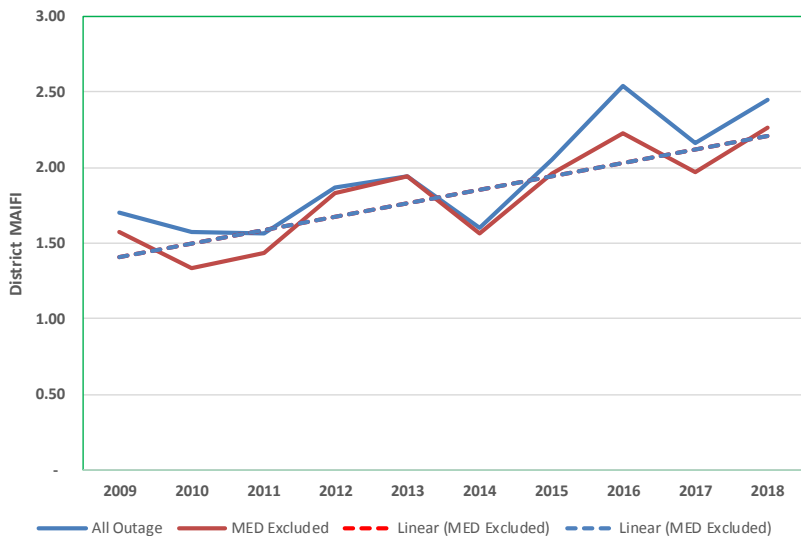
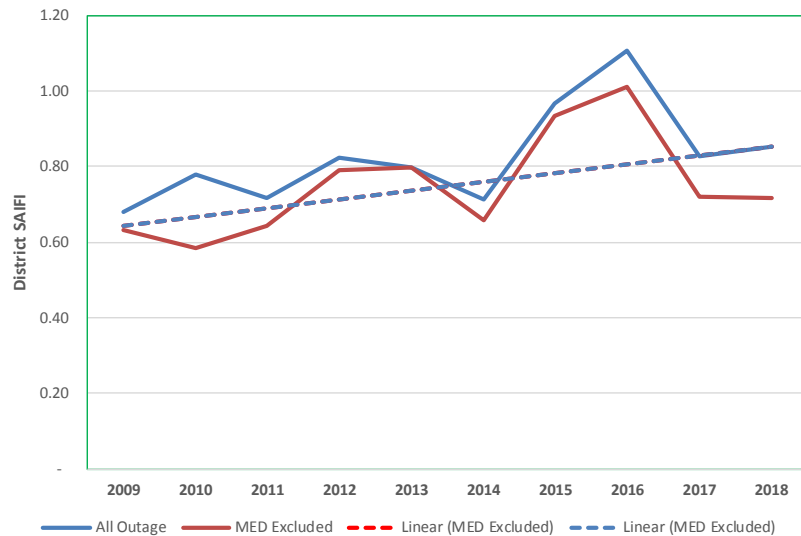
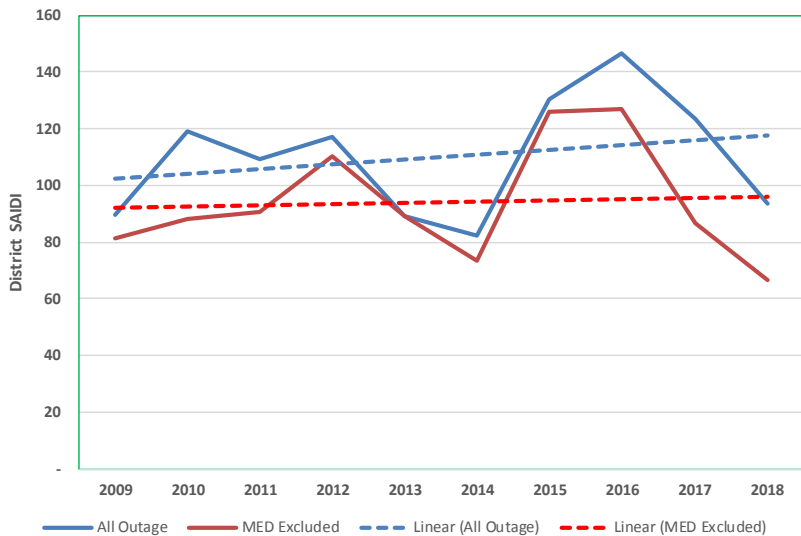
2009 -2018 District Reliability Graphs

CATALINA District Reliability Performance



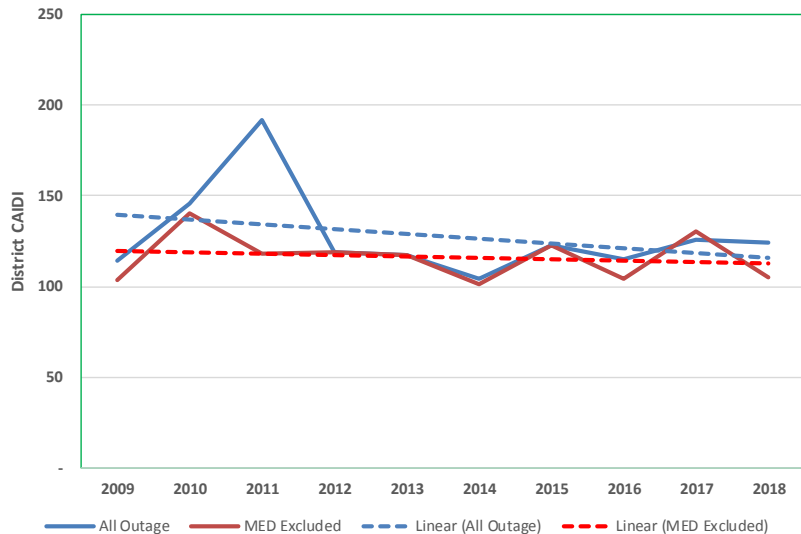
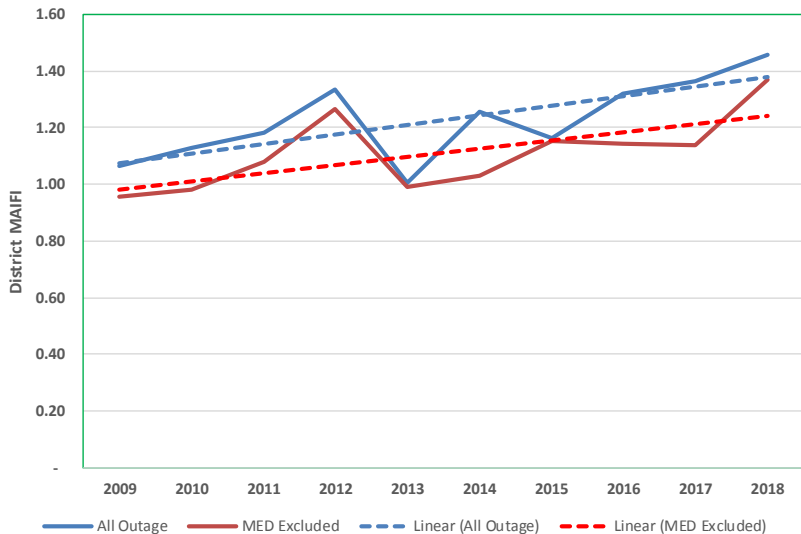
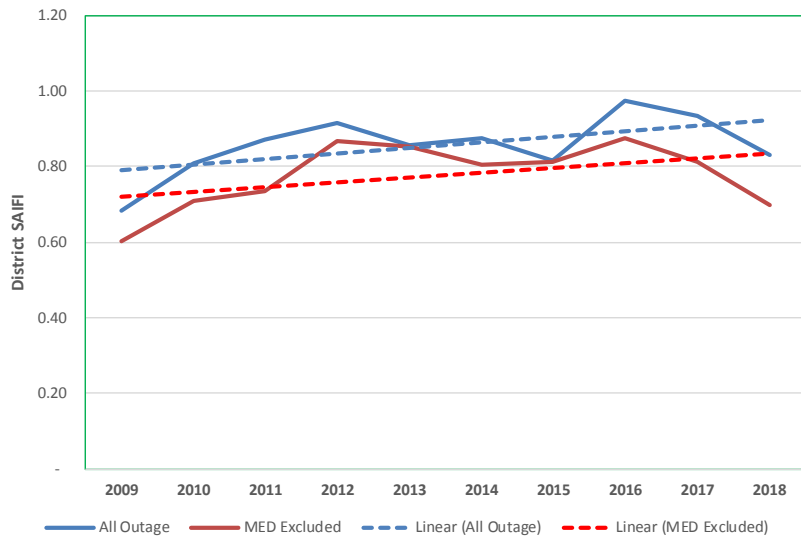
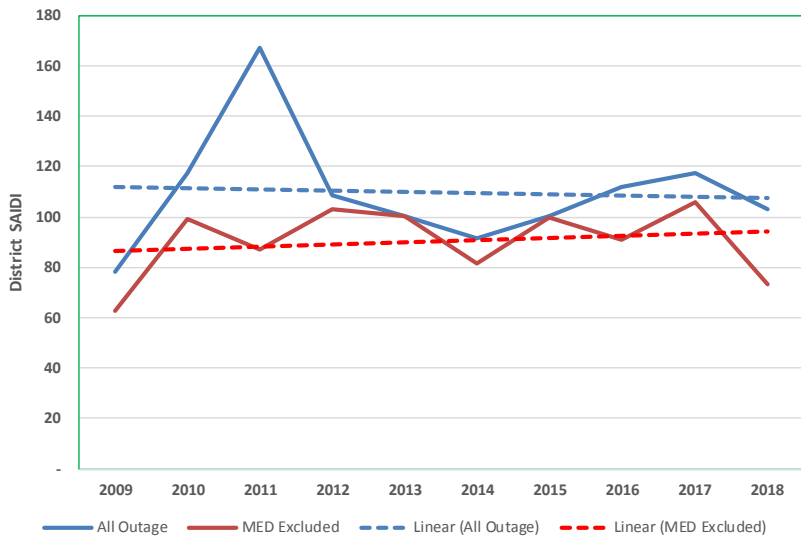
2009 -2018 District Reliability Graphs

COMPTON District Reliability Performance



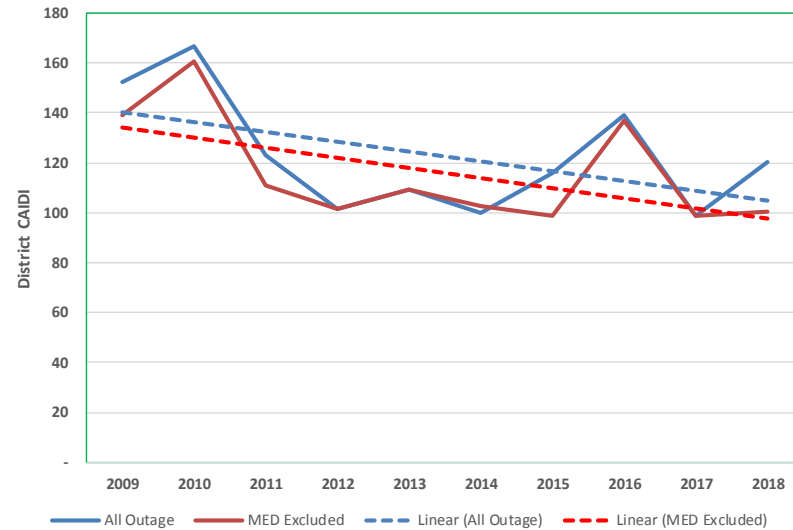
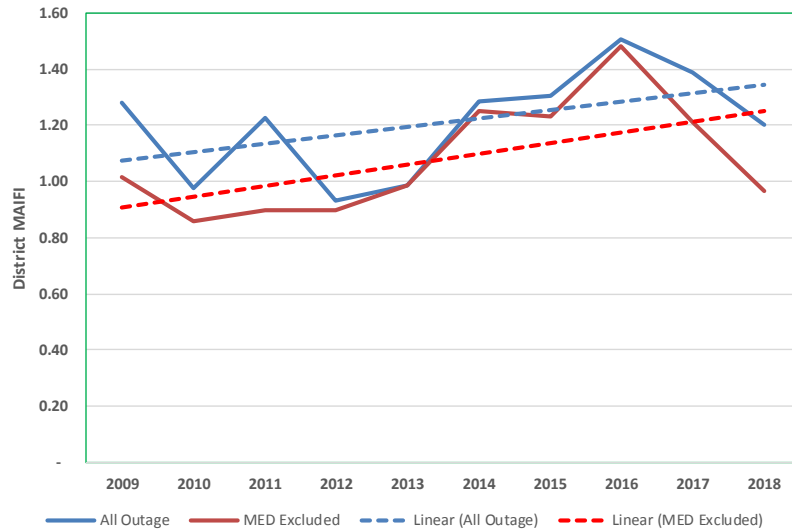
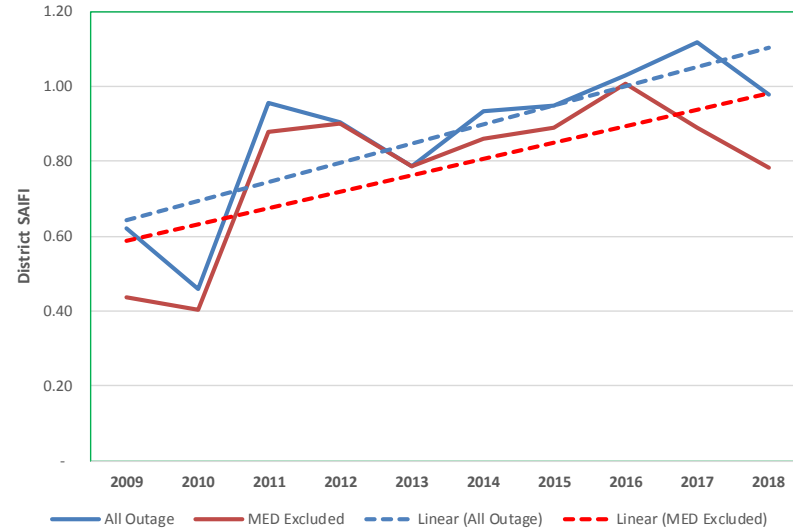
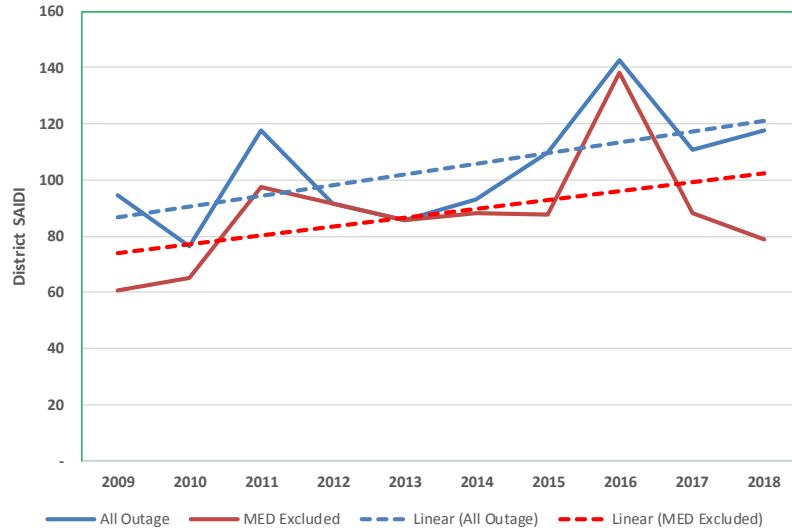
2009 -2018 District Reliability Graphs

COVINA District Reliability Performance



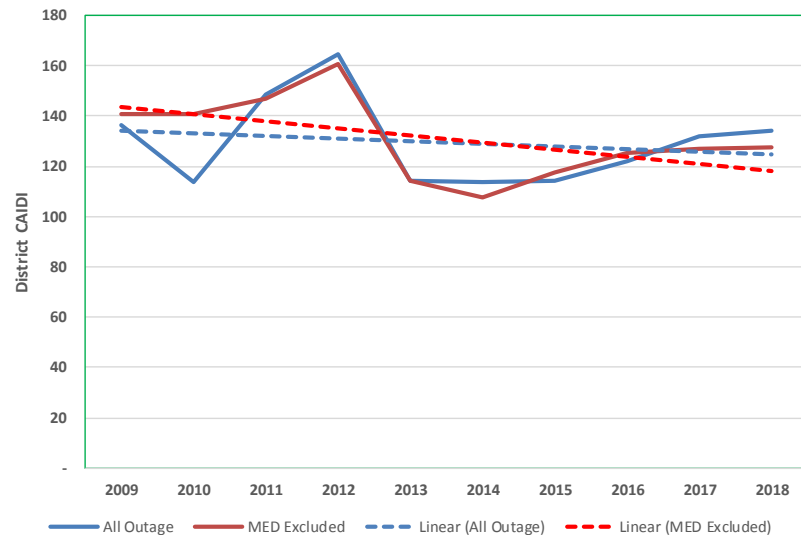
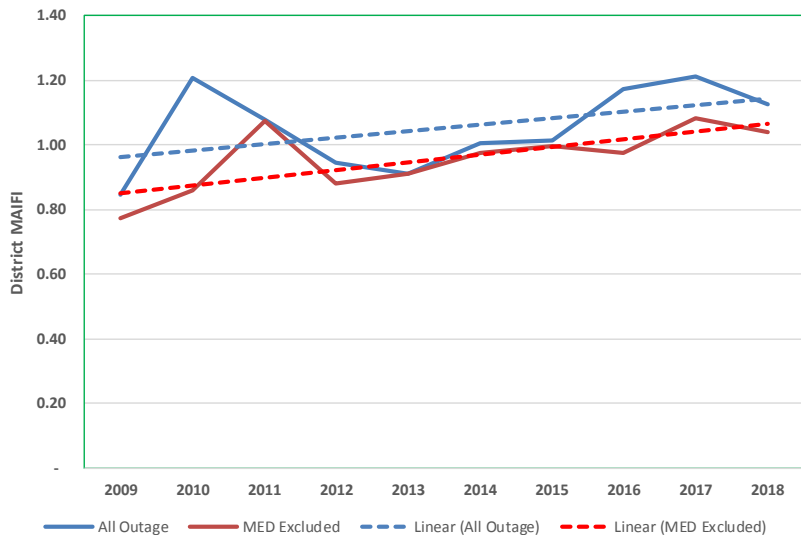
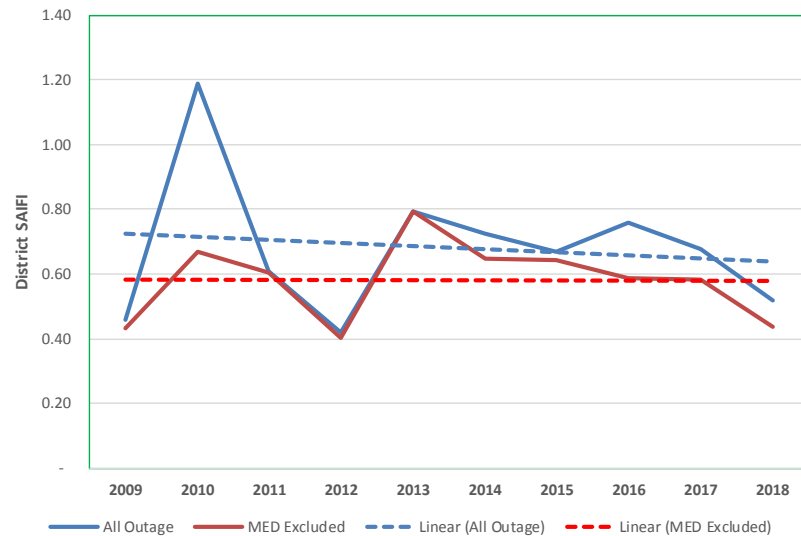
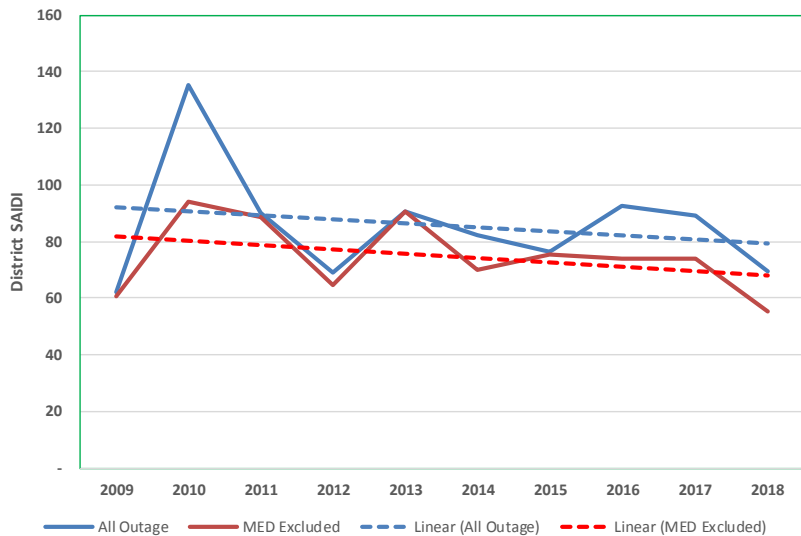
2009 -2018 District Reliability Graphs

FOOTHILL District Reliability Performance



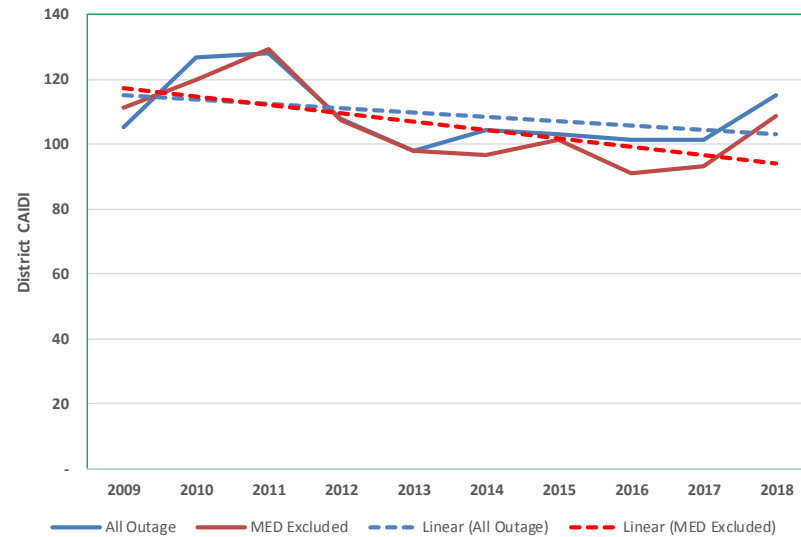
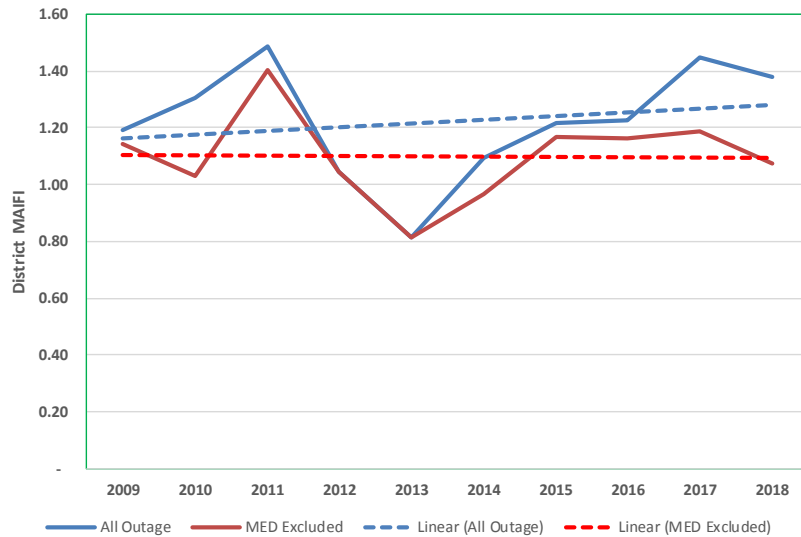
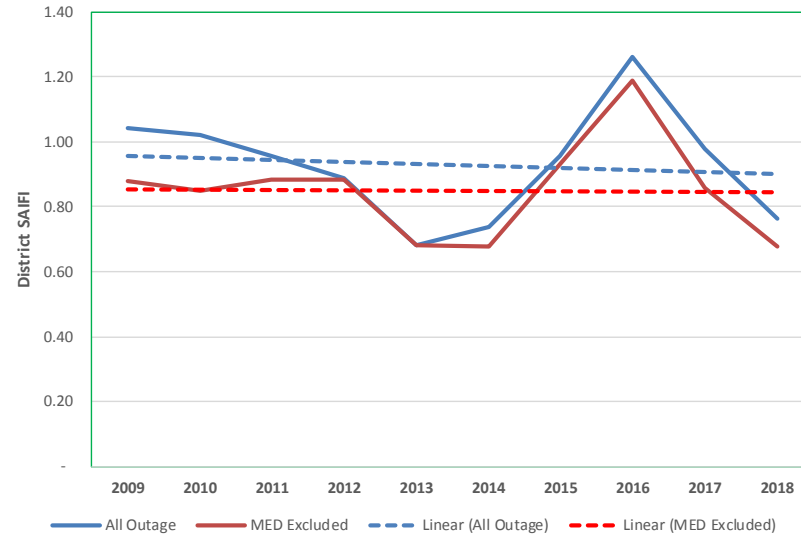
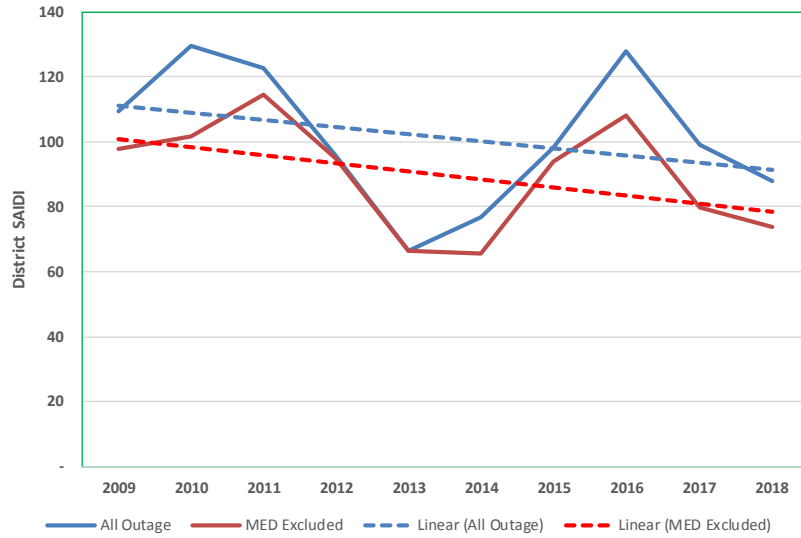
2009 -2018 District Reliability Graphs

FULLERTON District Reliability Performance



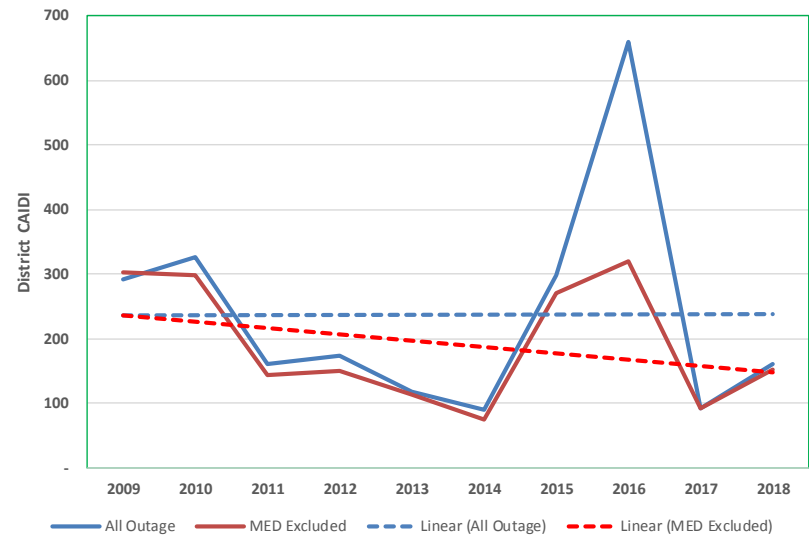
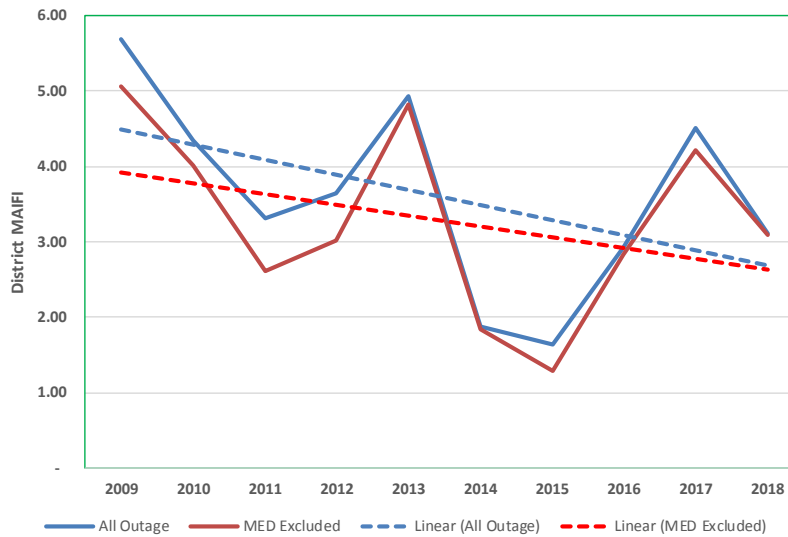
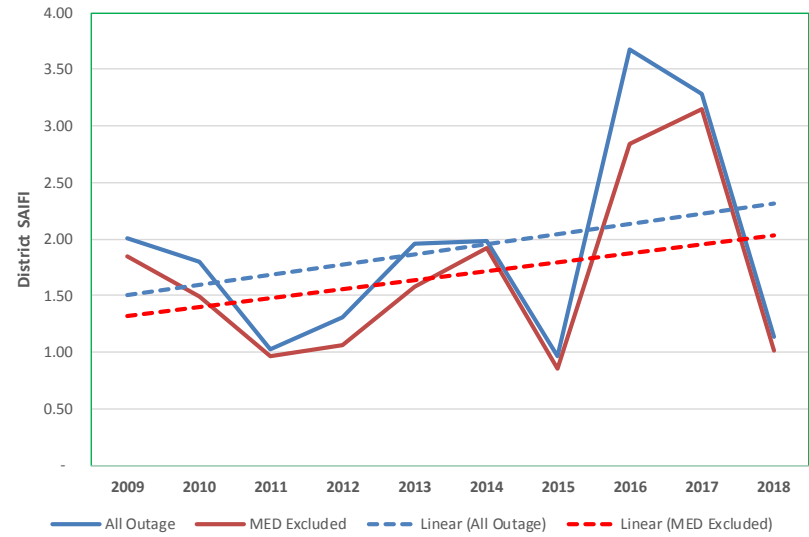
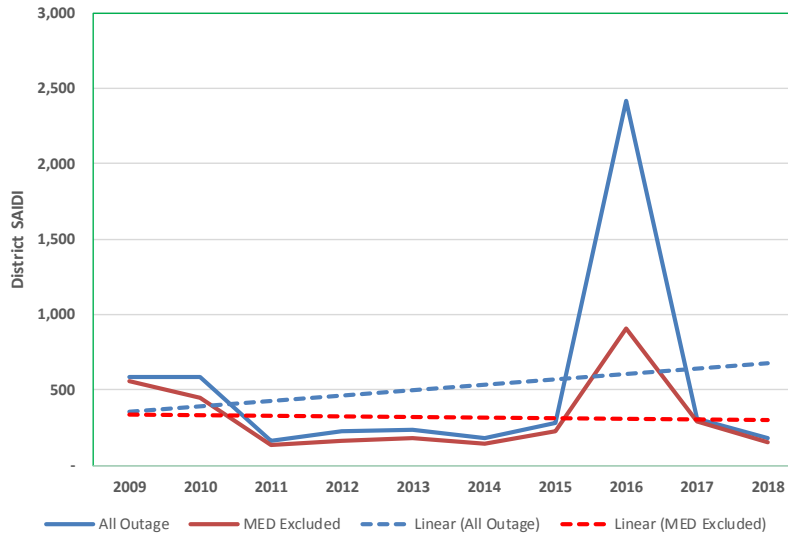
2009 -2018 District Reliability Graphs

HUNTINGTON BEACH District Reliability Performance



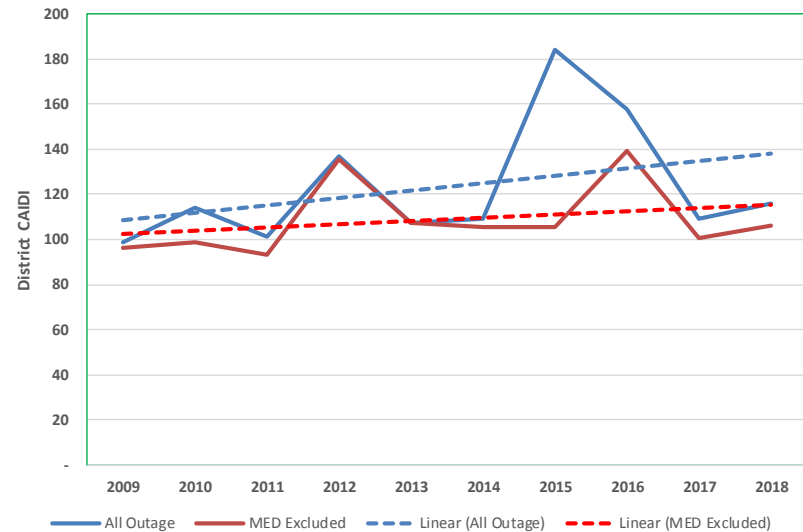
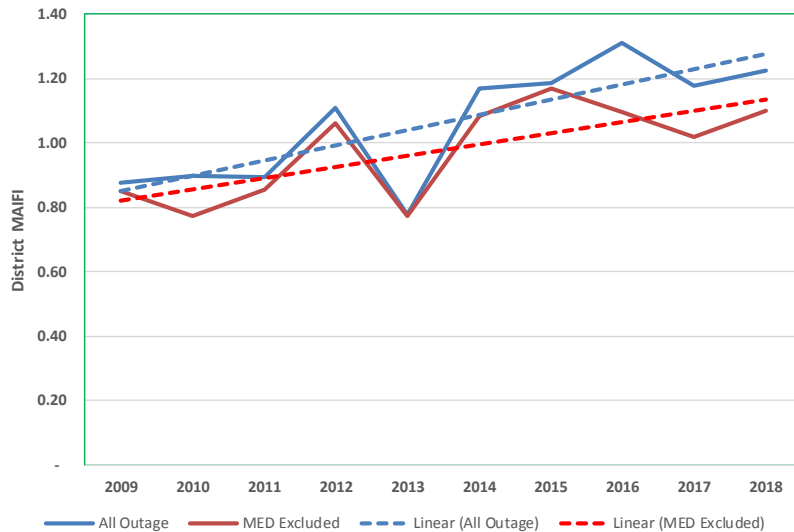
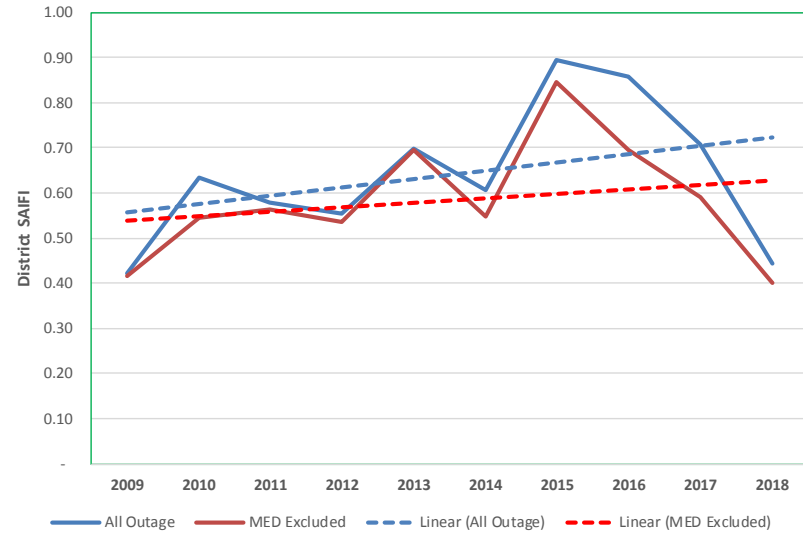
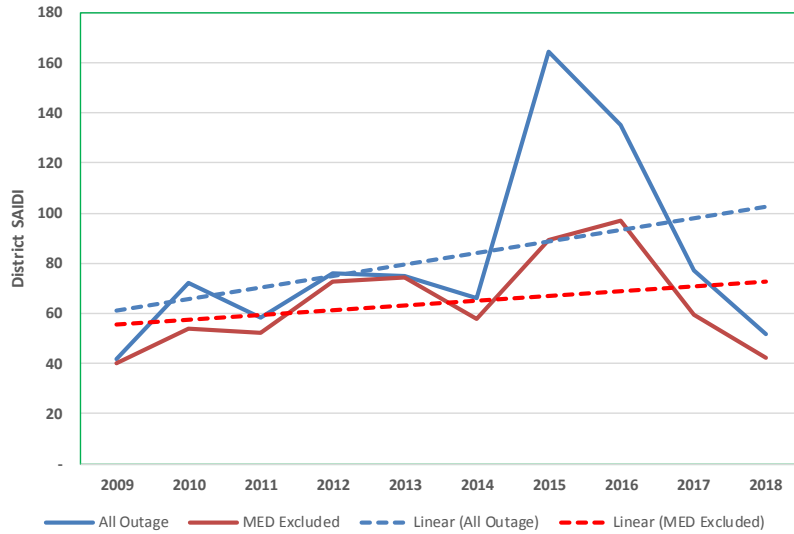
2009 -2018 District Reliability Graphs

KERNVILLE District Reliability Performance



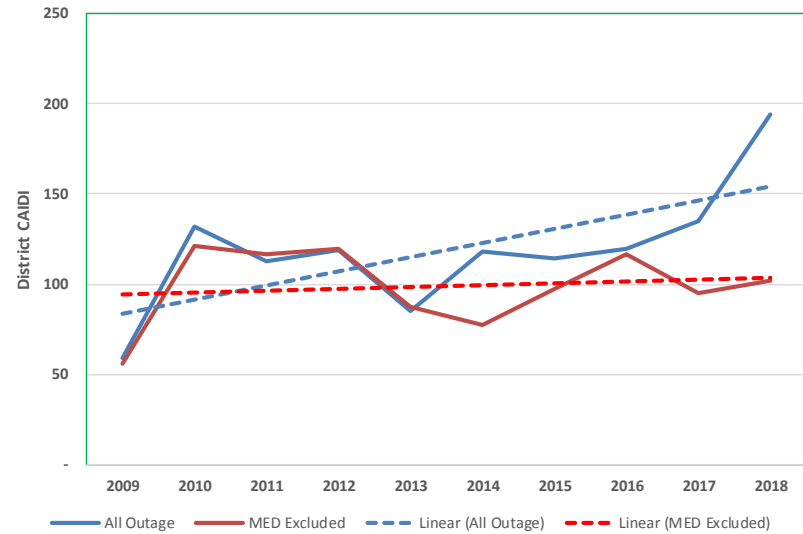
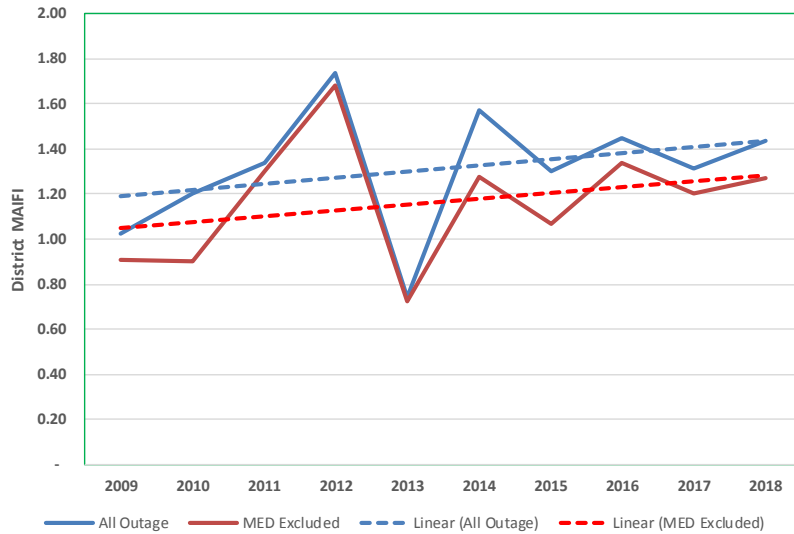
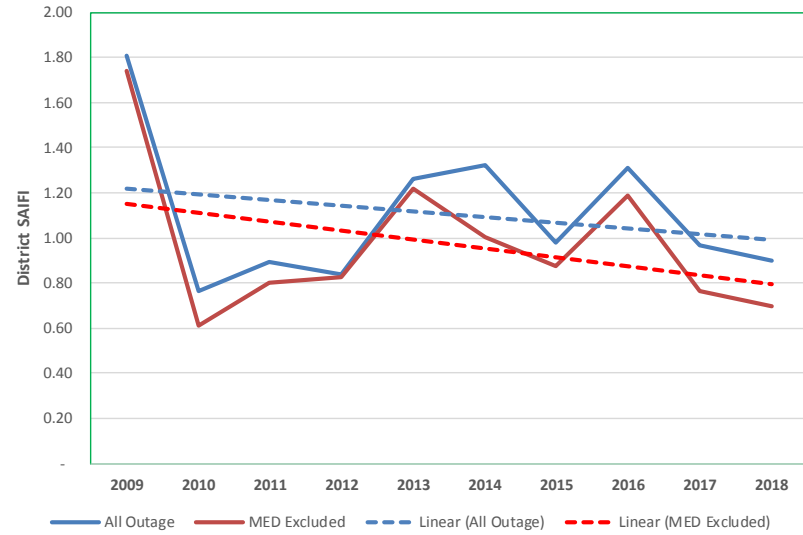
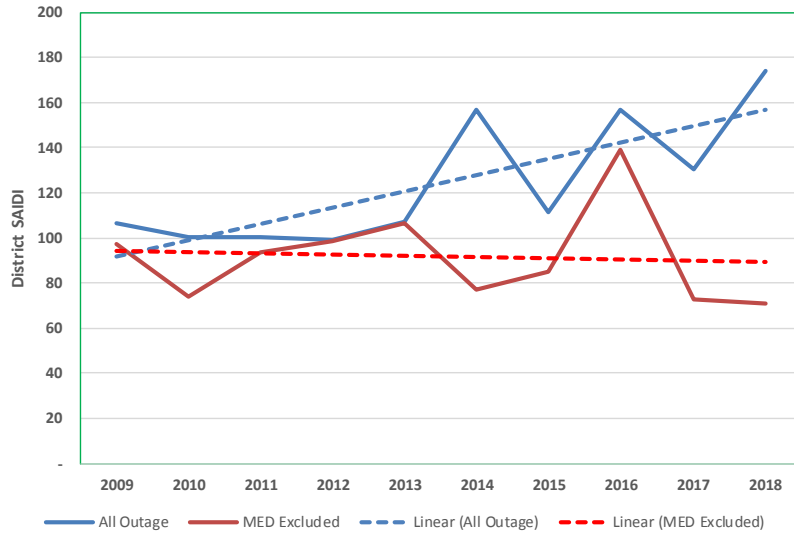
2009 -2018 District Reliability Graphs

LONG BEACH District Reliability Performance



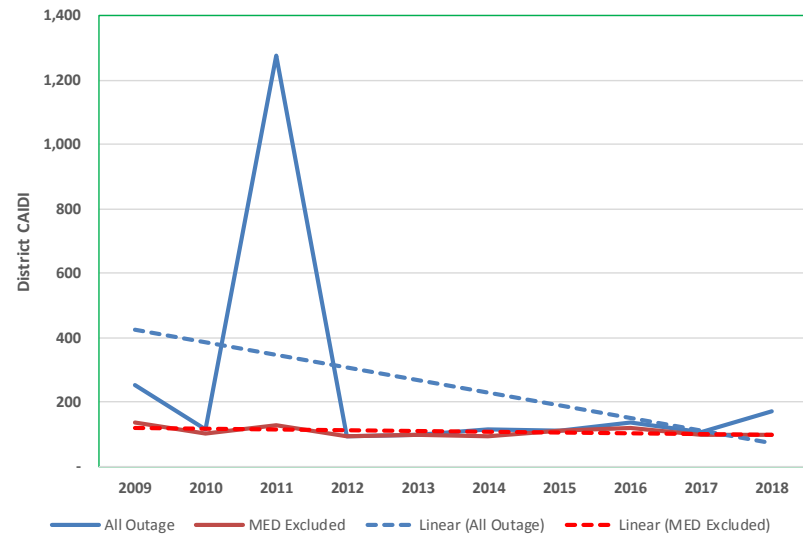
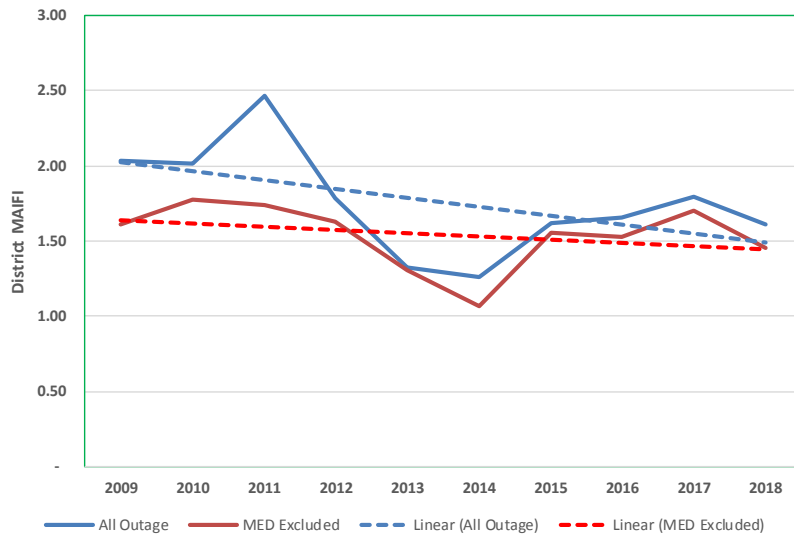
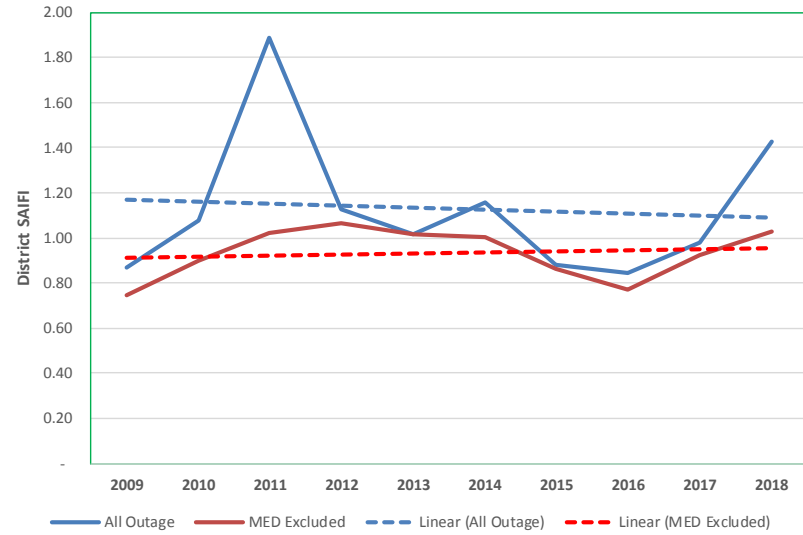
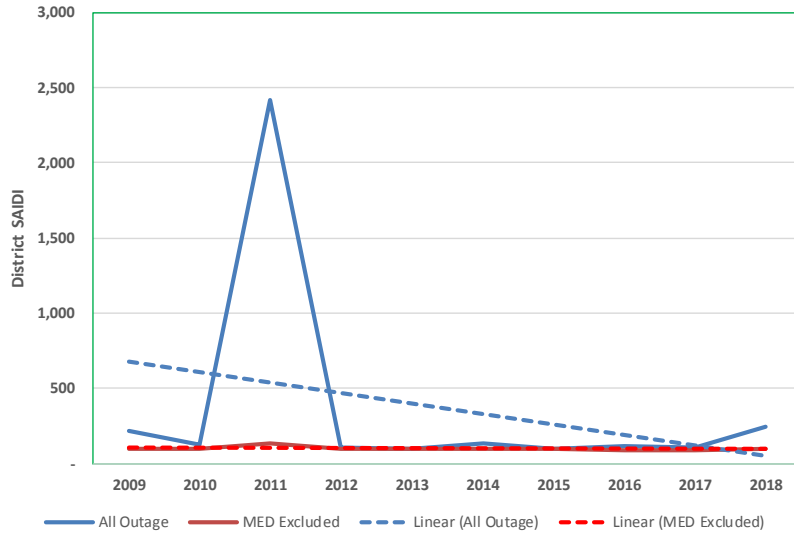
2009 -2018 District Reliability Graphs

MENIFEE District Reliability Performance



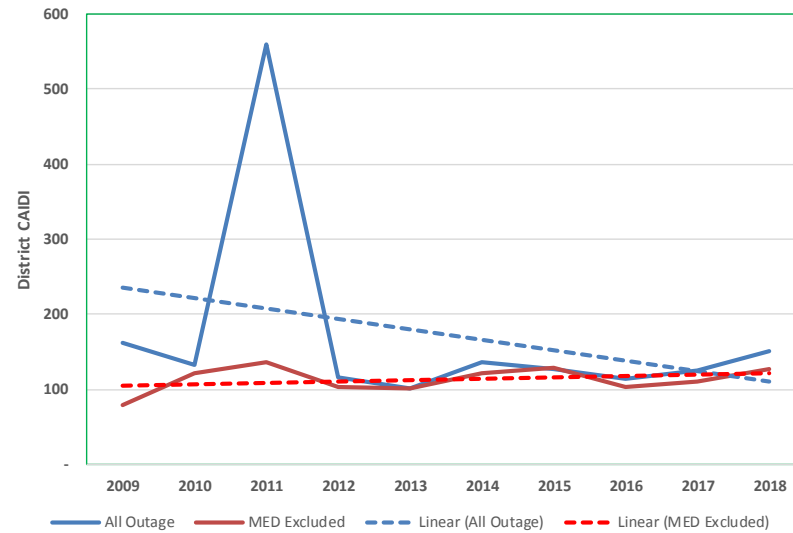
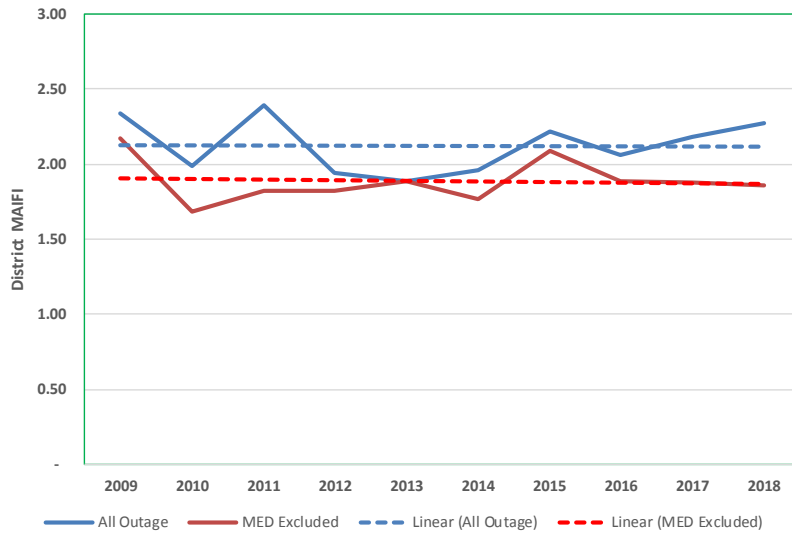
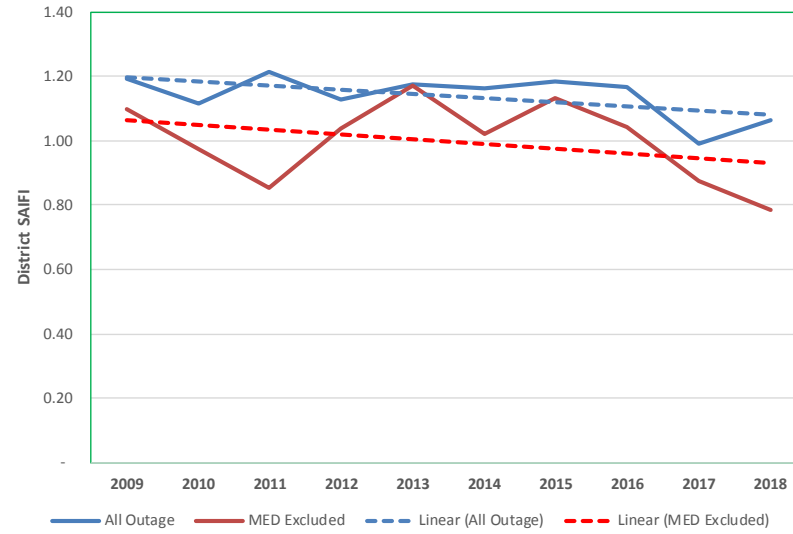
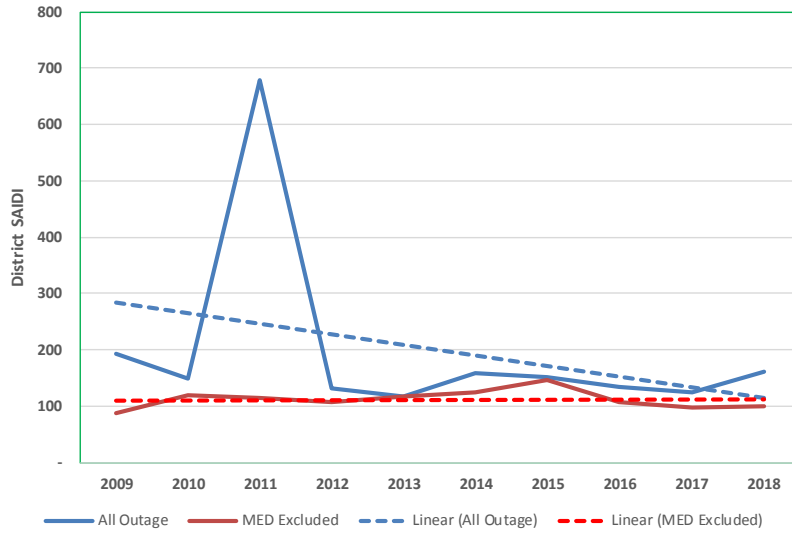
2009 -2018 District Reliability Graphs

MONROVIA District Reliability Performance



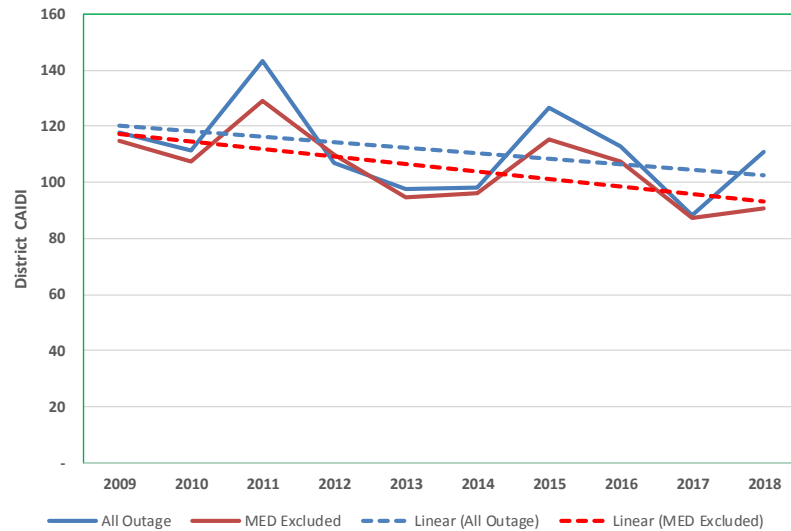
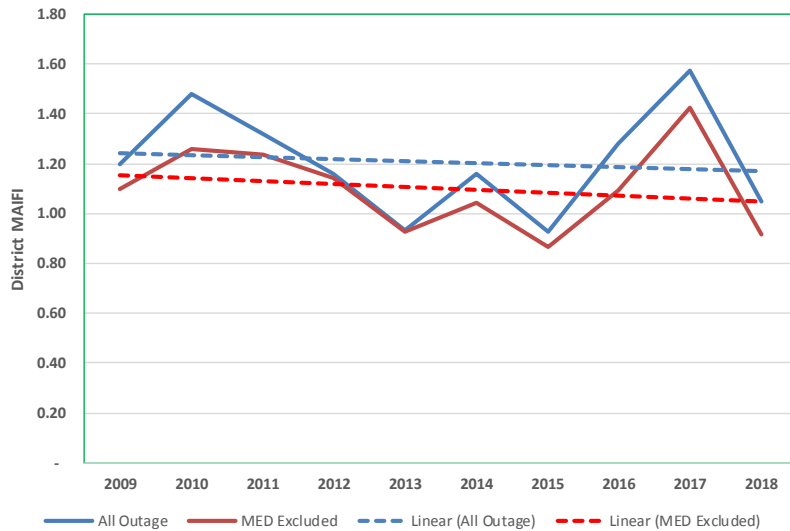
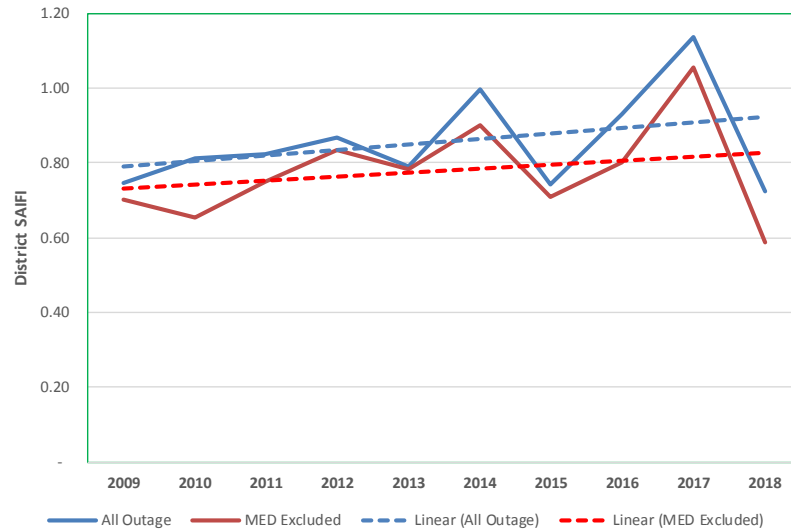
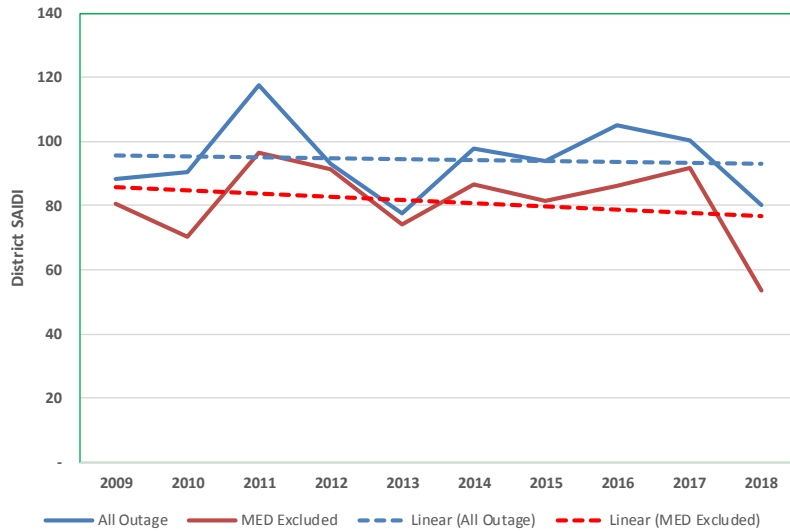
2009 -2018 District Reliability Graphs

MONTEBELLO District Reliability Performance



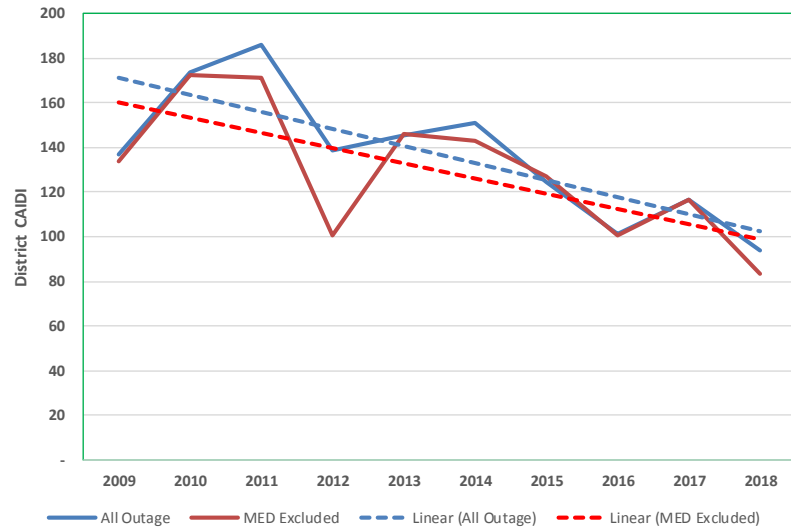
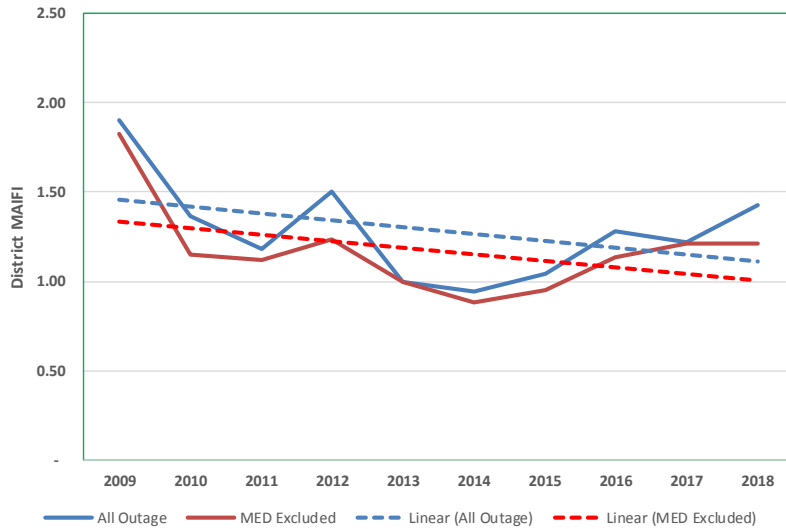
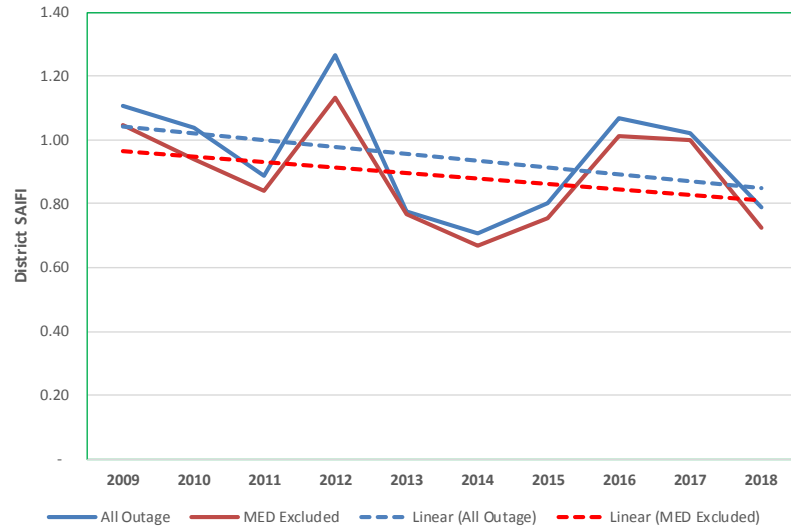
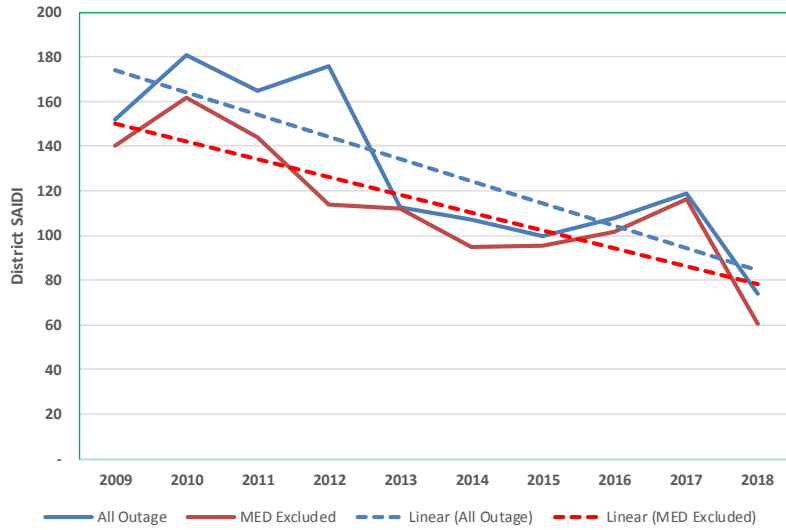
2009 -2018 District Reliability Graphs

ONTARIO District Reliability Performance



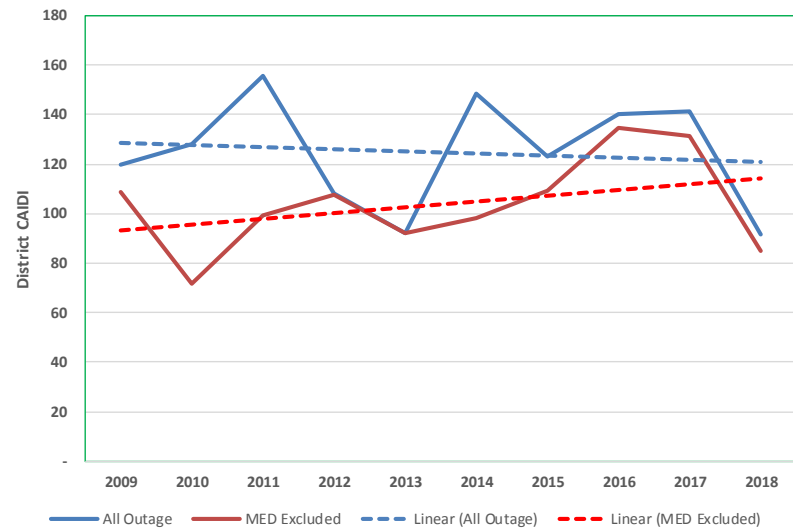
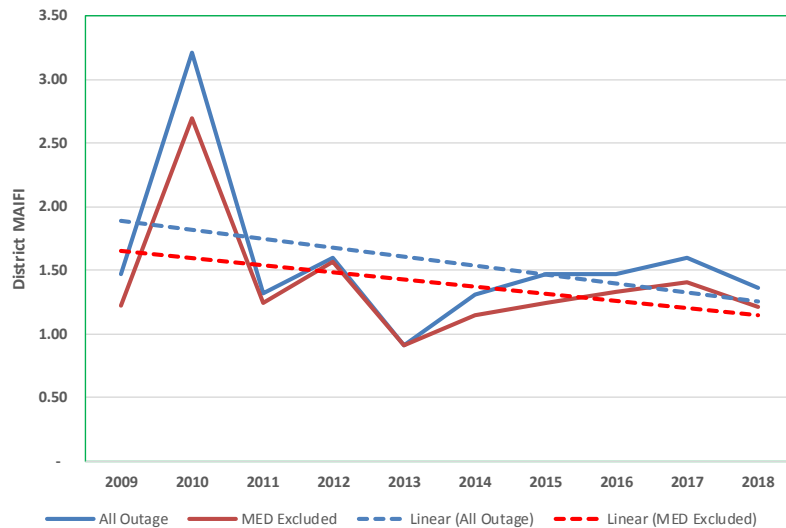
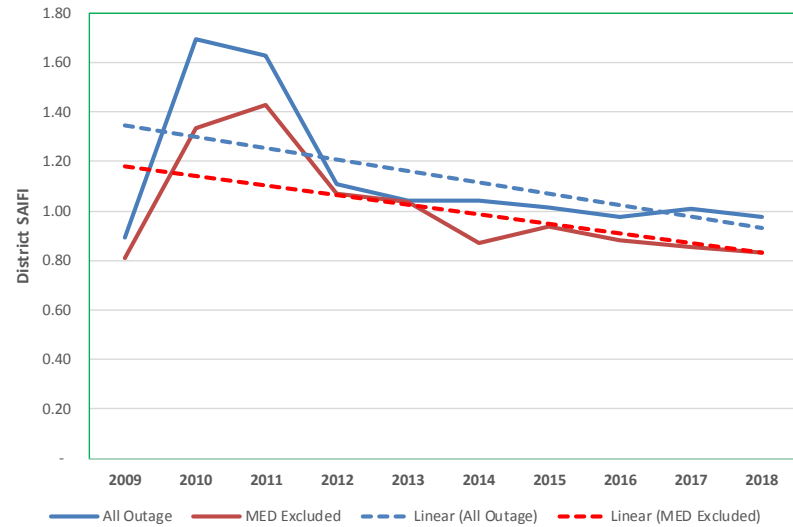
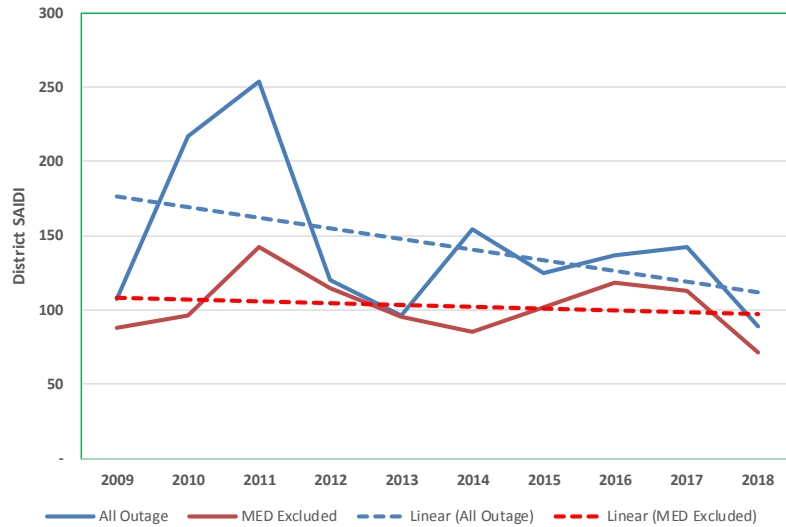
2009 -2018 District Reliability Graphs

PALM SPRINGS District Reliability Performance



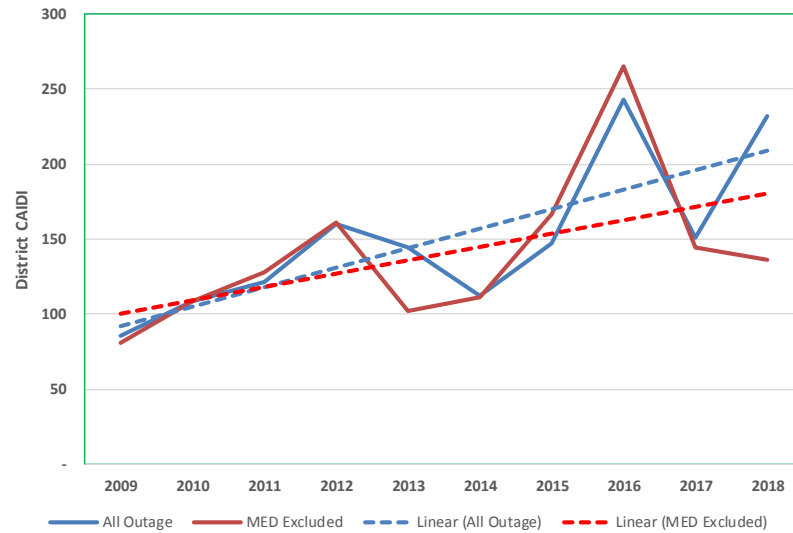
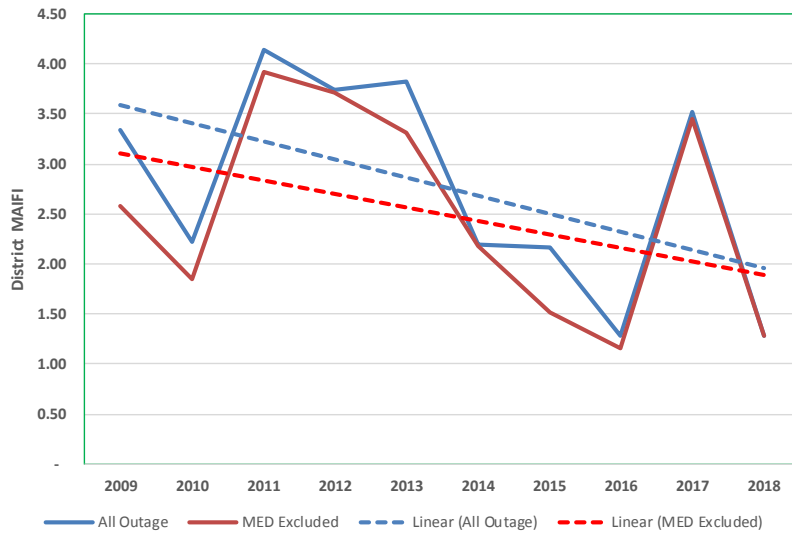
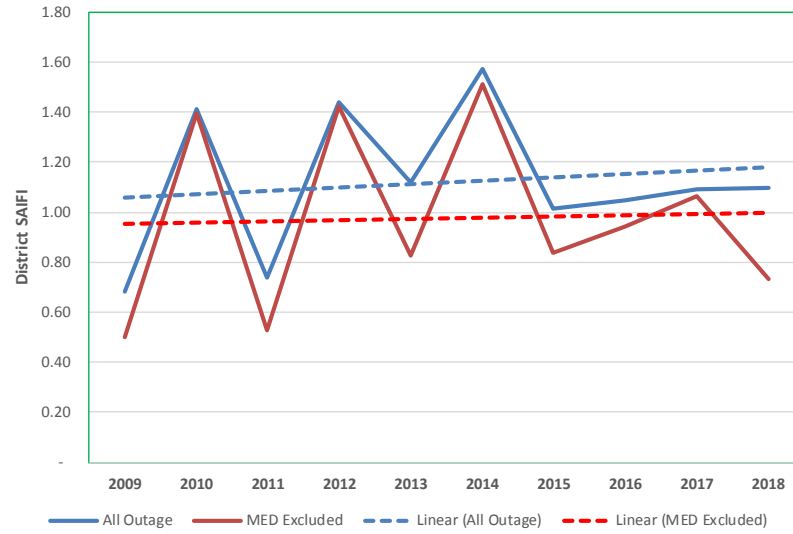
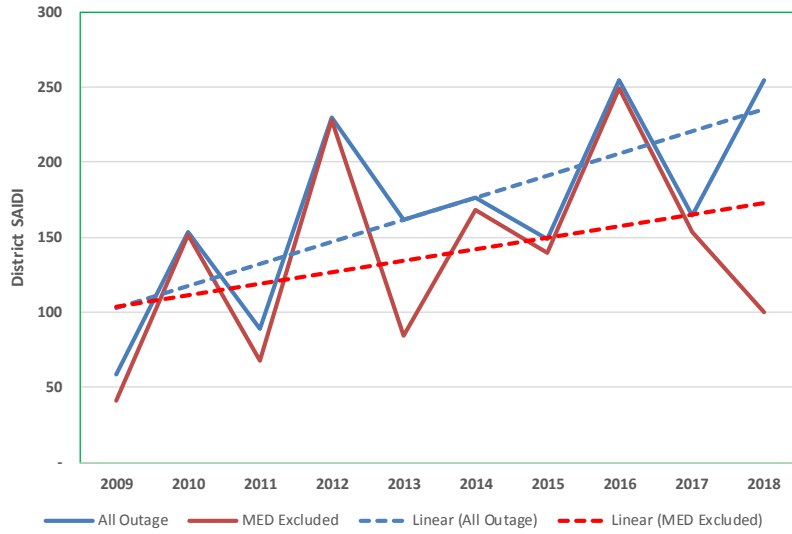
2009 -2018 District Reliability Graphs

REDLANDS District Reliability Performance



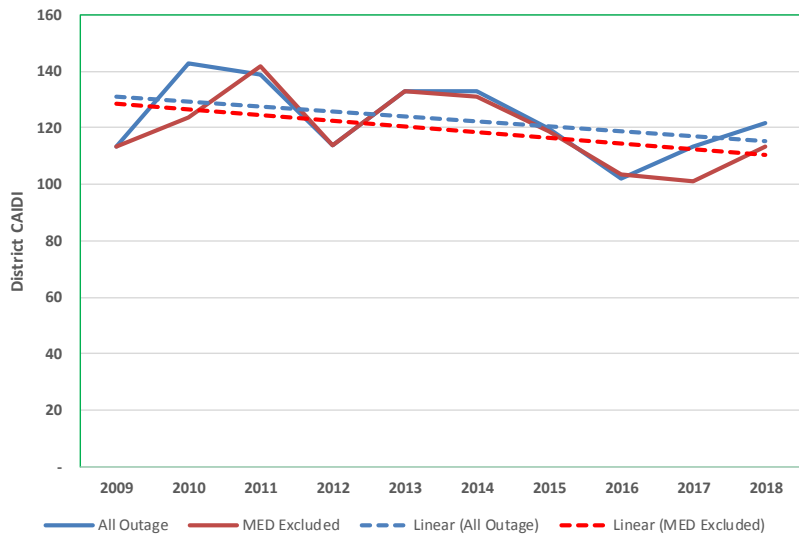
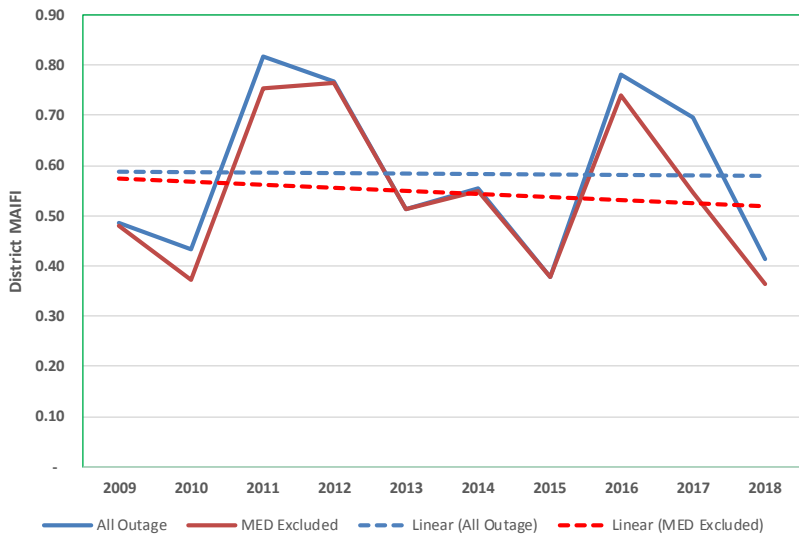
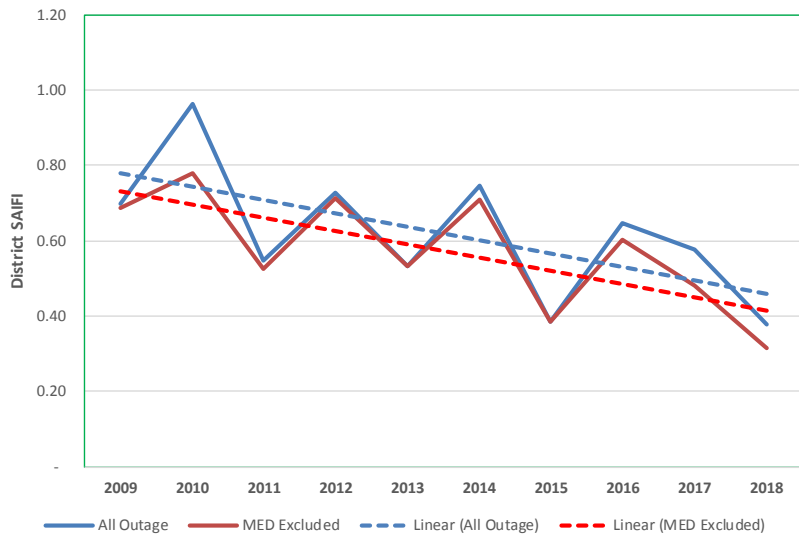
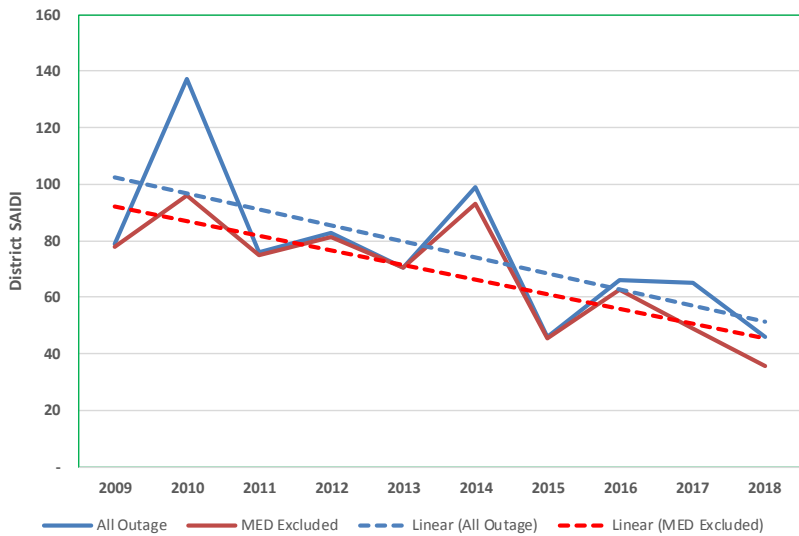
2009 -2018 District Reliability Graphs

RIDGECREST District Reliability Performance



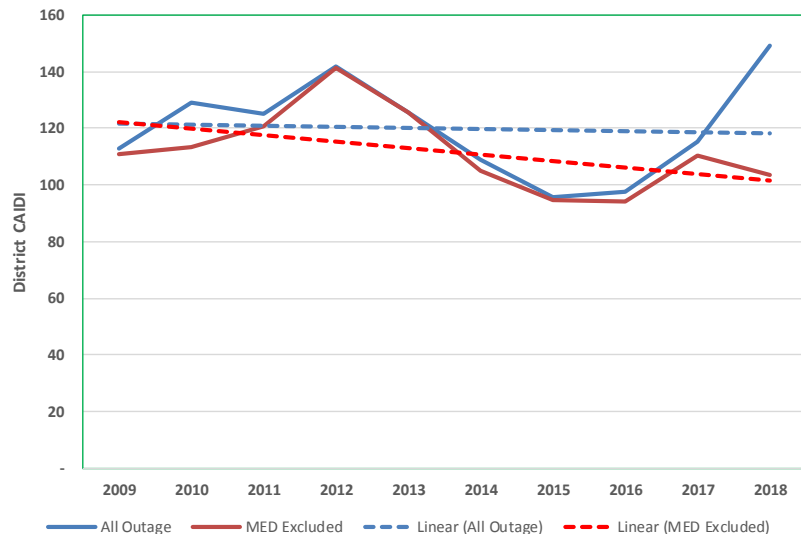
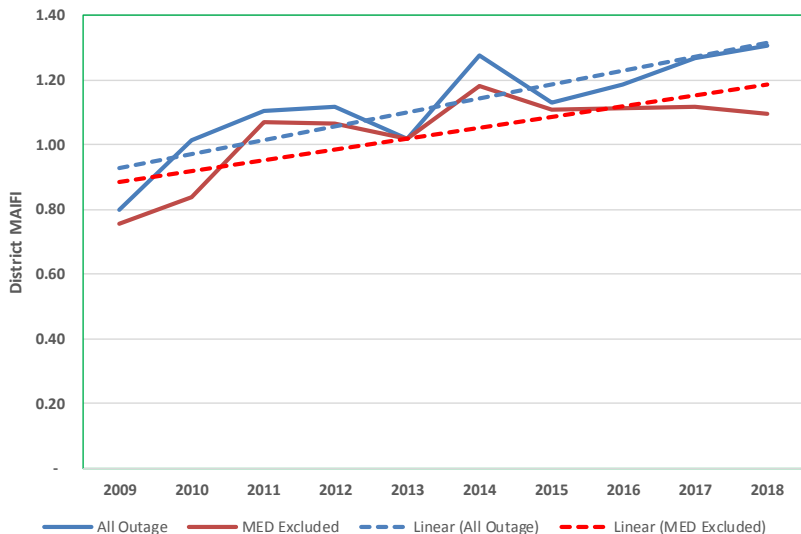
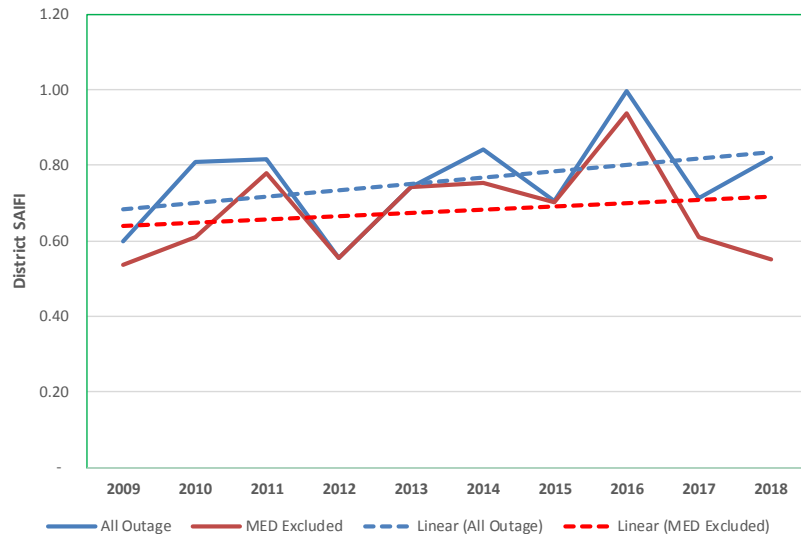
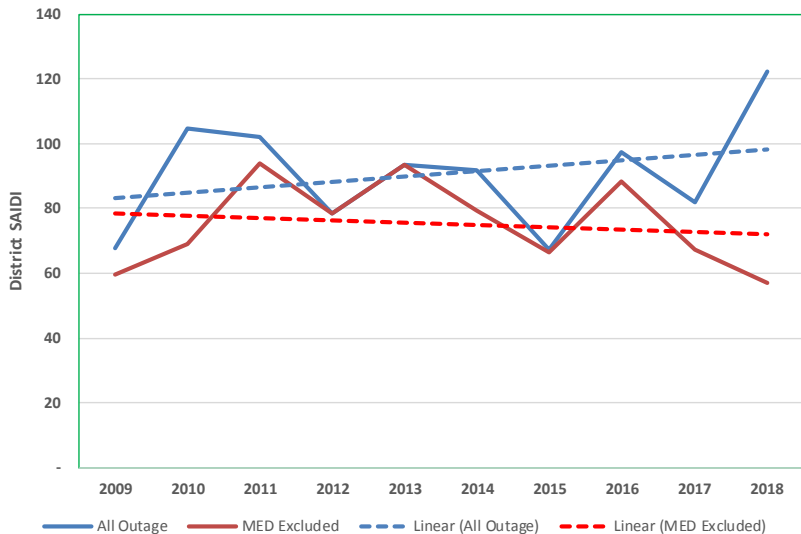
2009 -2018 District Reliability Graphs

SADDLEBACK District Reliability Performance



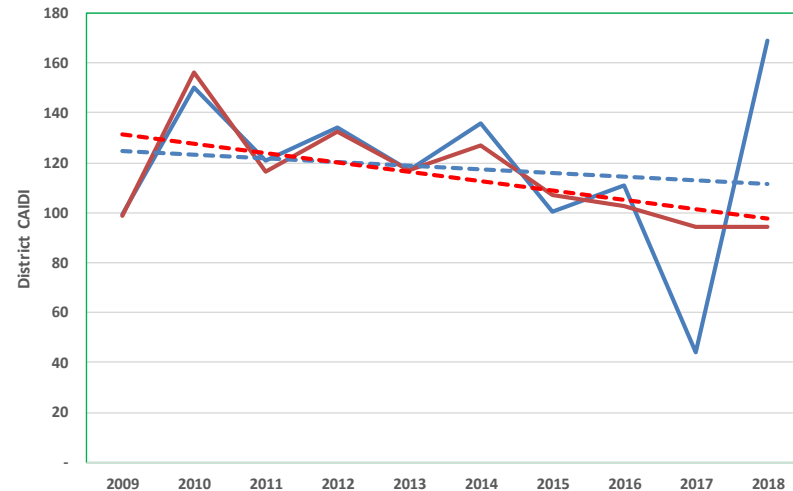
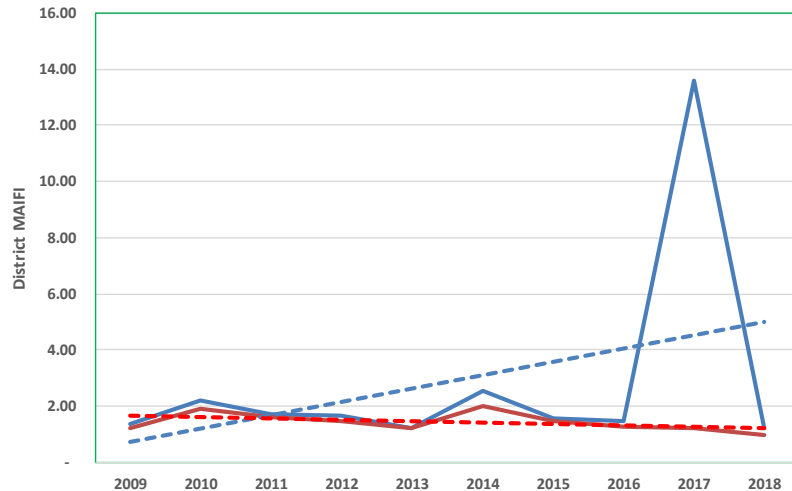
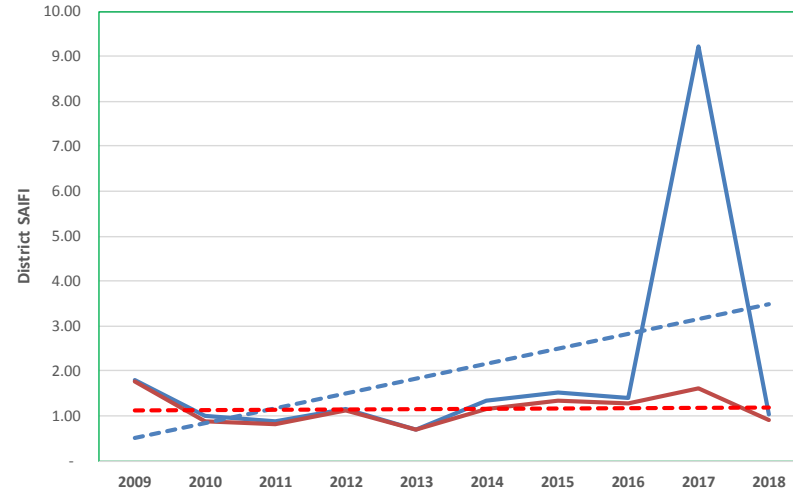
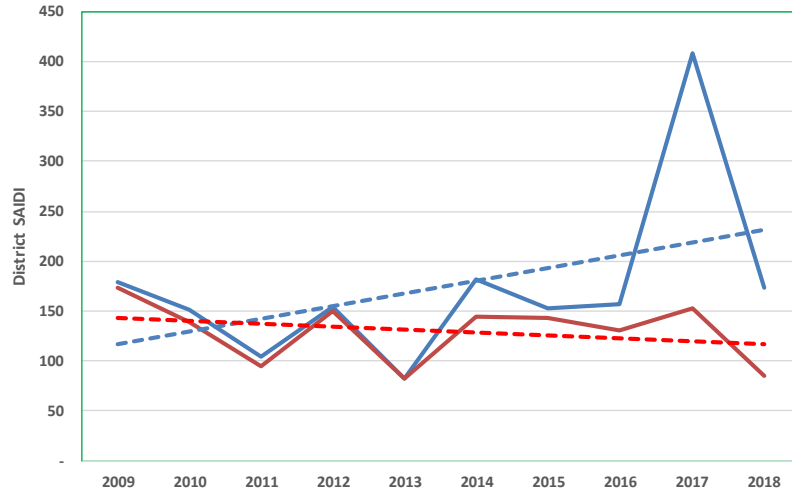
2009 -2018 District Reliability Graphs

SANTA ANA District Reliability Performance



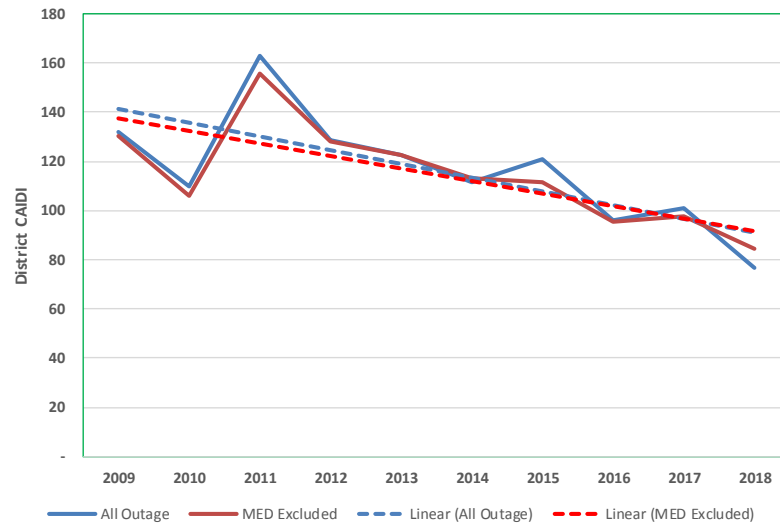
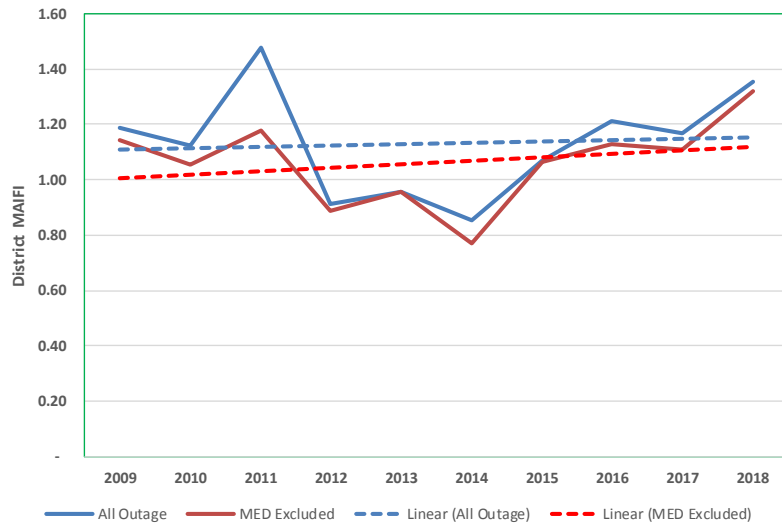
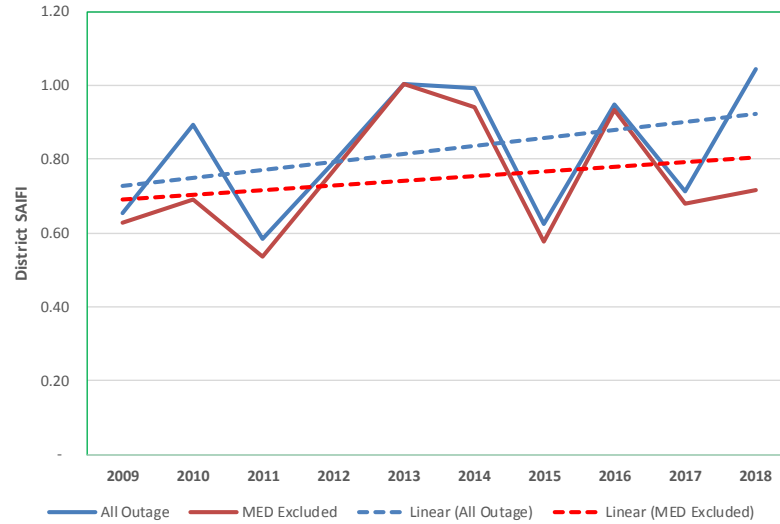
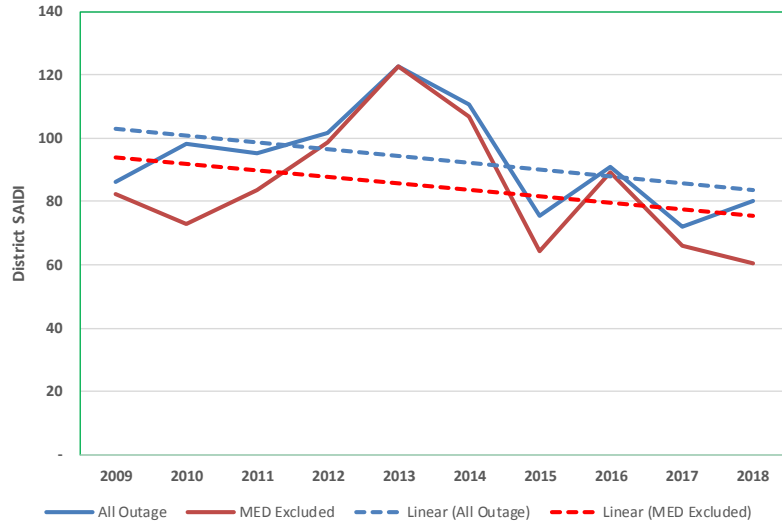
2009 -2018 District Reliability Graphs

SANTA BARBARA District Reliability Performance



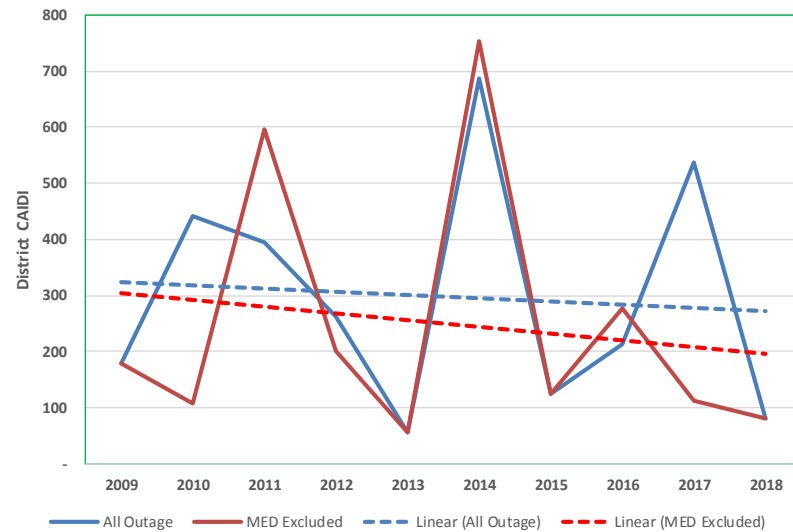
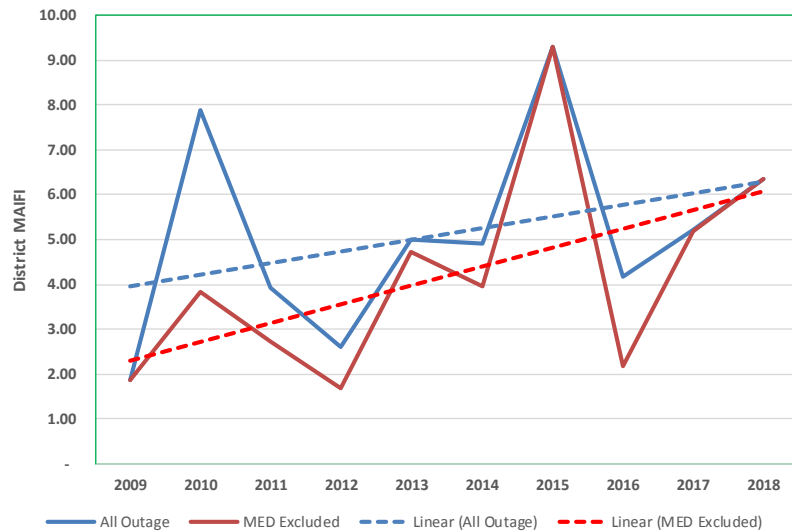
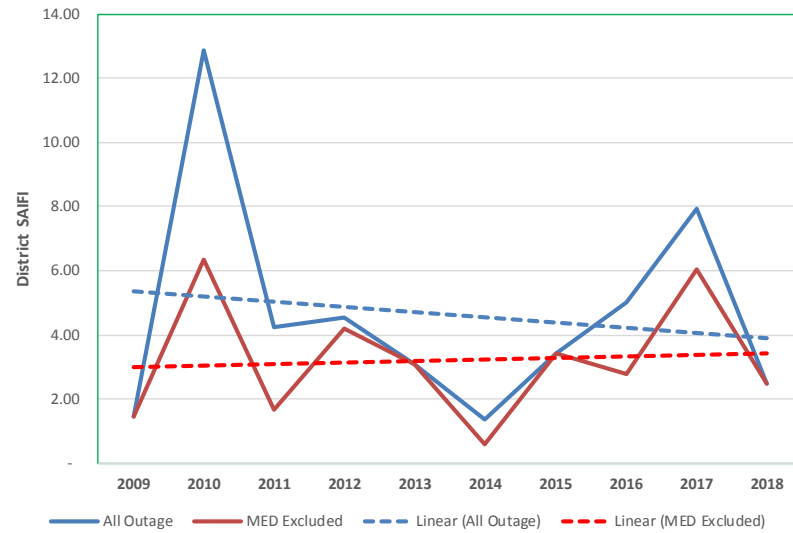
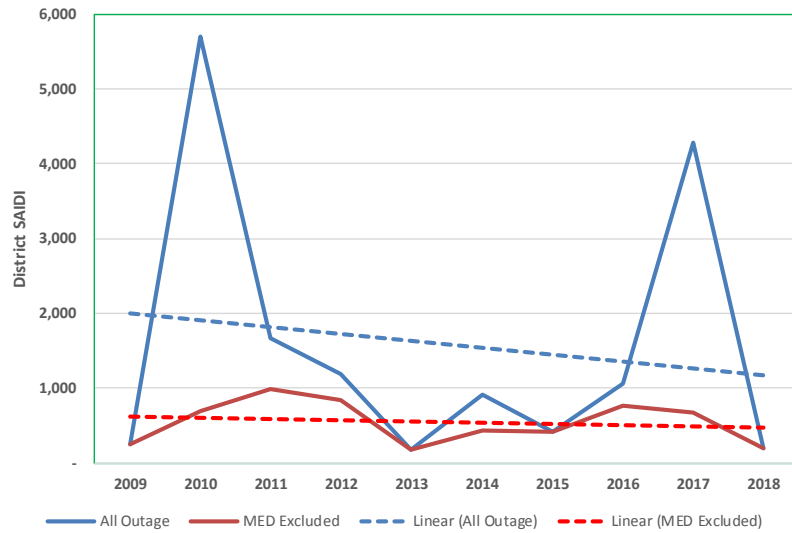
2009 -2018 District Reliability Graphs

SANTA MONICA District Reliability Performance



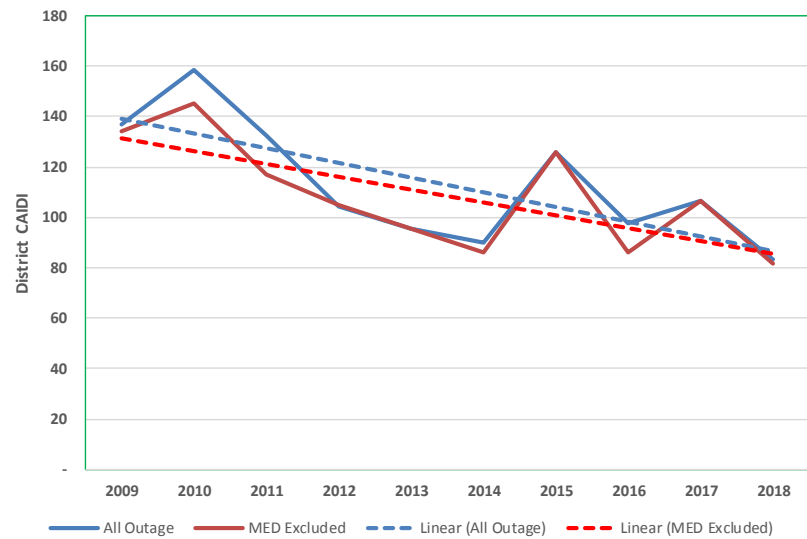
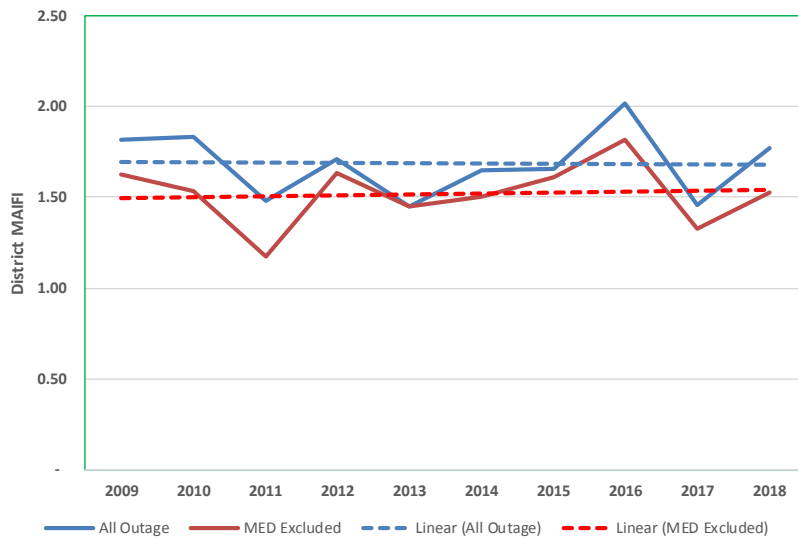
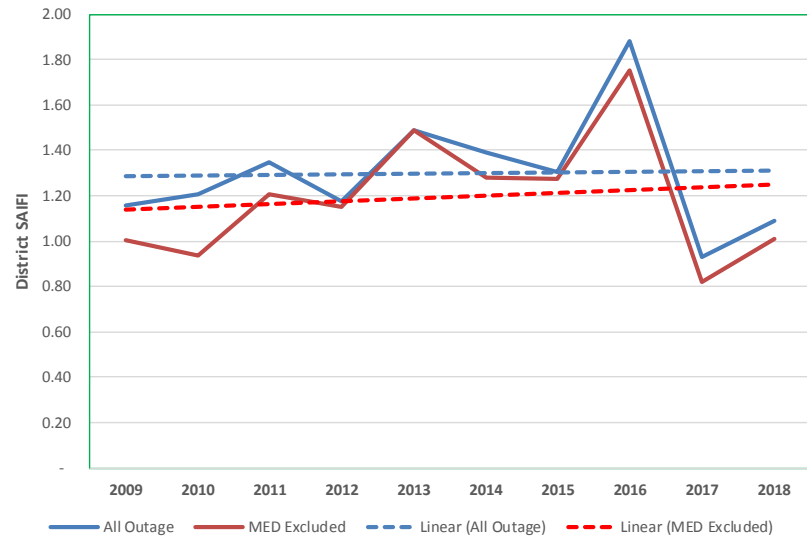
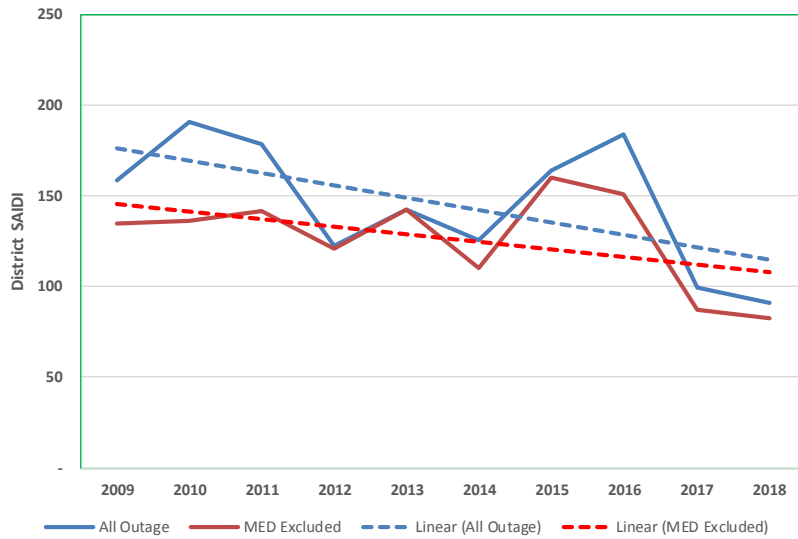
2009 -2018 District Reliability Graphs

SHAVER LAKE District Reliability Performance



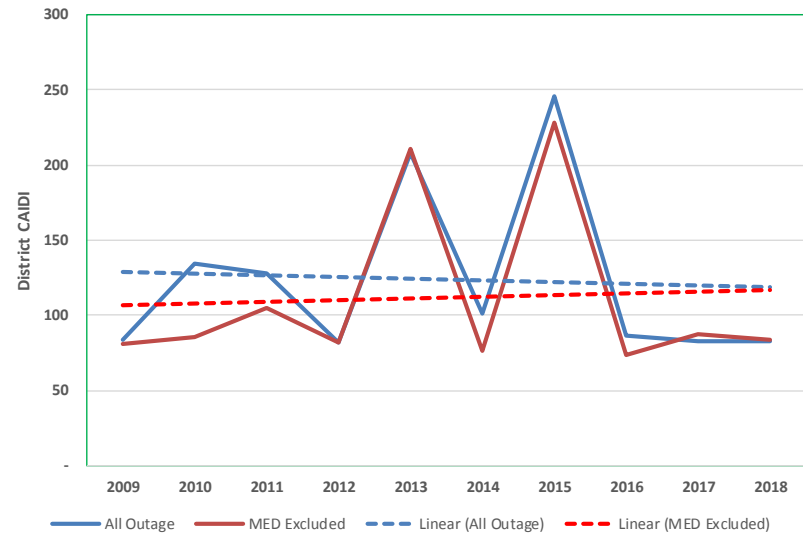
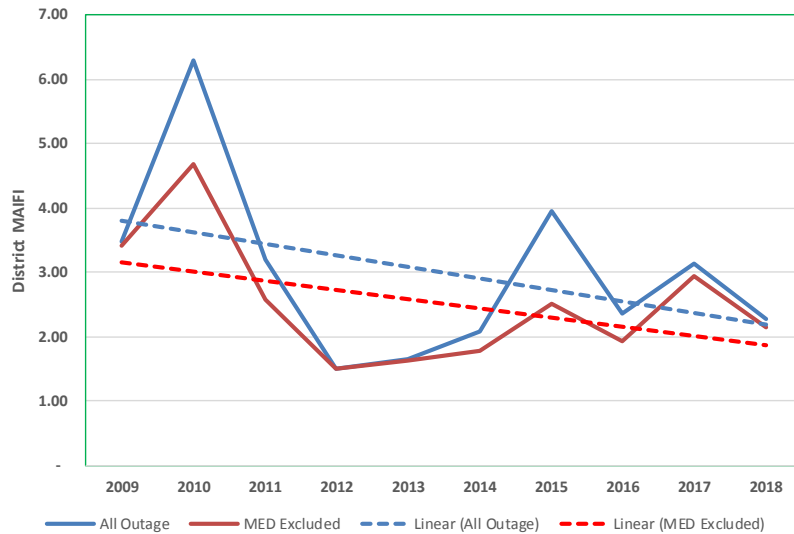
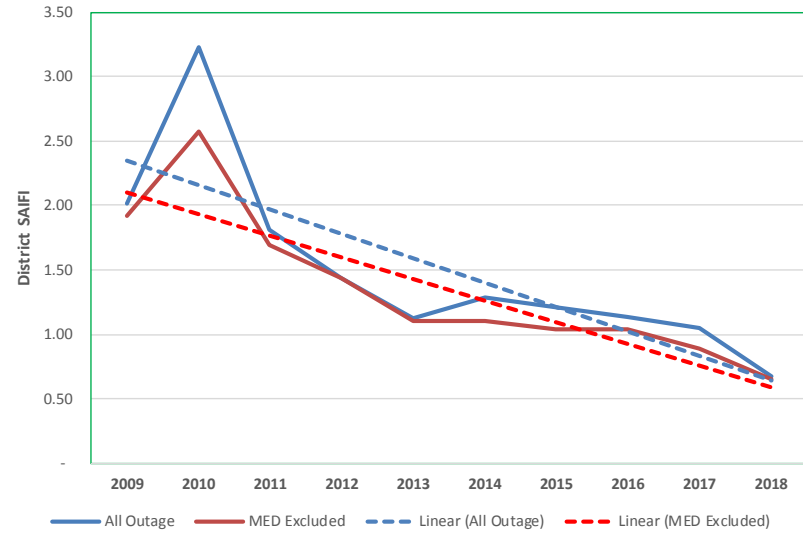
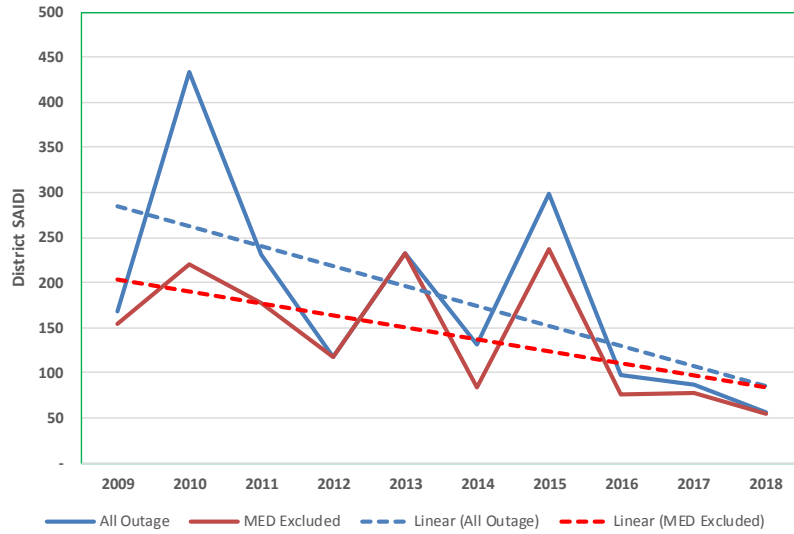
2009 -2018 District Reliability Graphs

SOUTH BAY District Reliability Performance



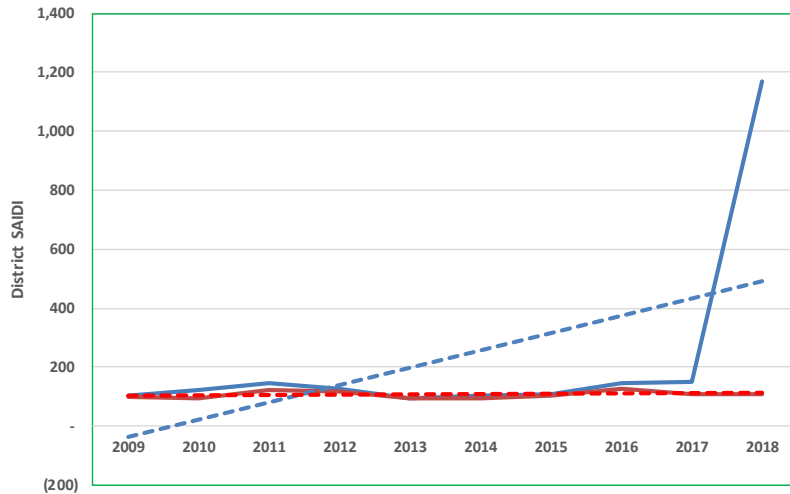
2009 -2018 District Reliability Graphs

TEHACHAPI District Reliability Performance

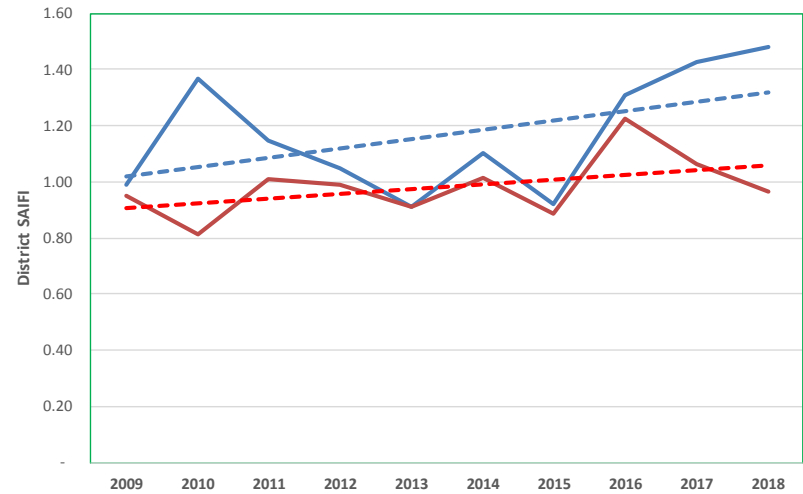


2009 -2018 District Reliability Graphs

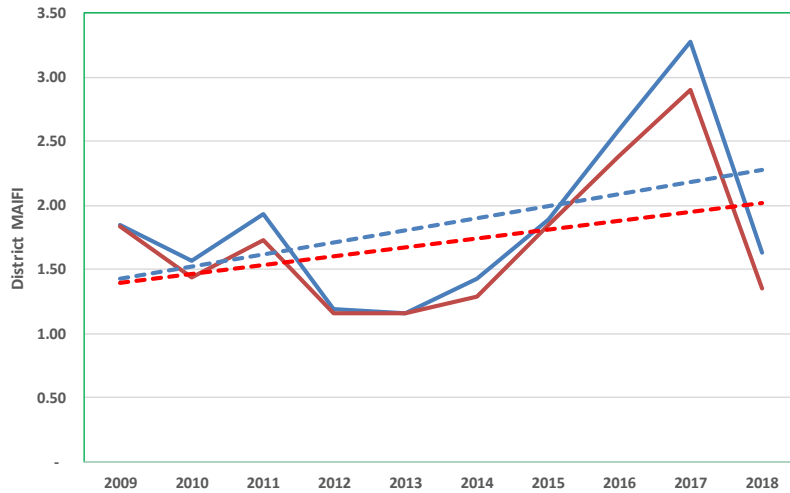
THOUSAND OAKS District Reliability Performance



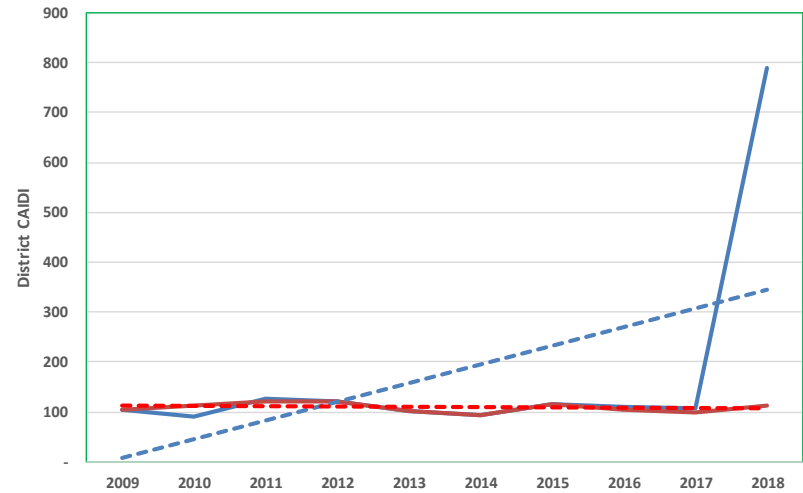
— All Outage — MED Excluded - - - Linear (All Outage) - - - Linear (MED Excluded)



— All Outage — MED Excluded - - - Linear (All Outage) - - - Linear (MED Excluded)



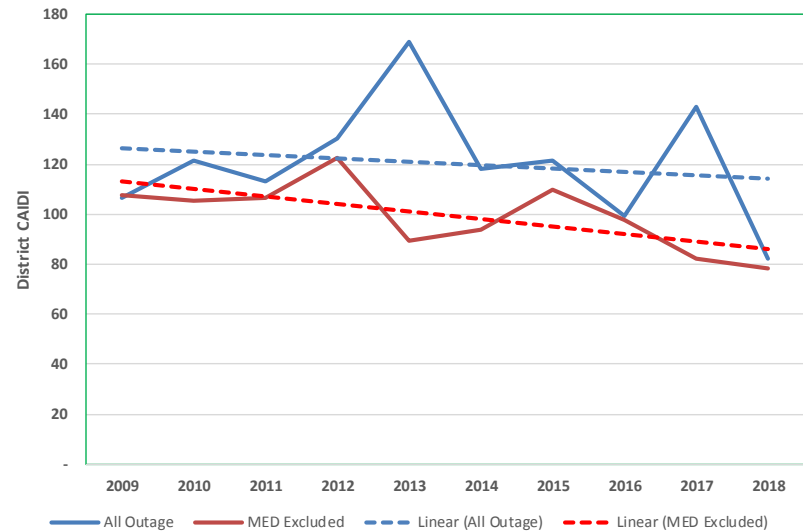
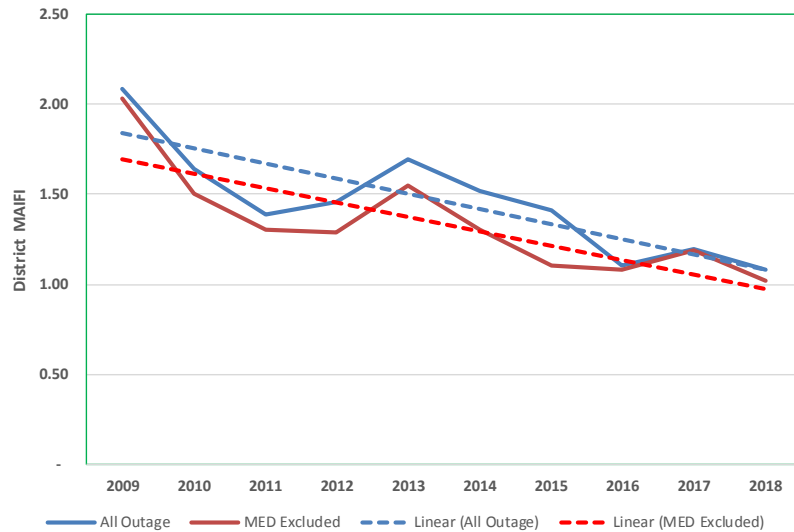
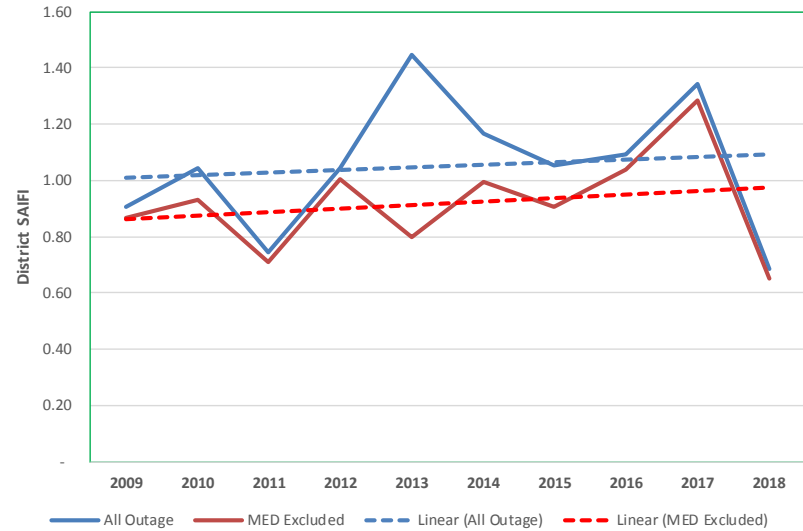
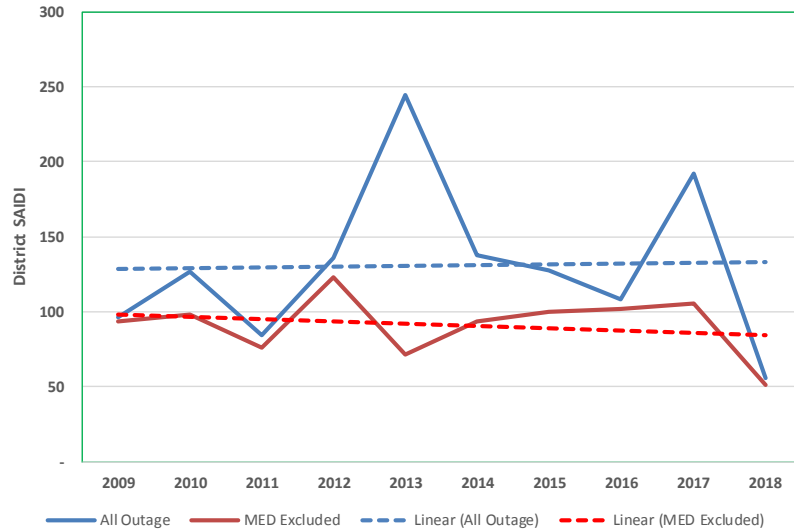
— All Outage — MED Excluded - - - Linear (All Outage) - - - Linear (MED Excluded)



— All Outage — MED Excluded - - - Linear (All Outage) - - - Linear (MED Excluded)

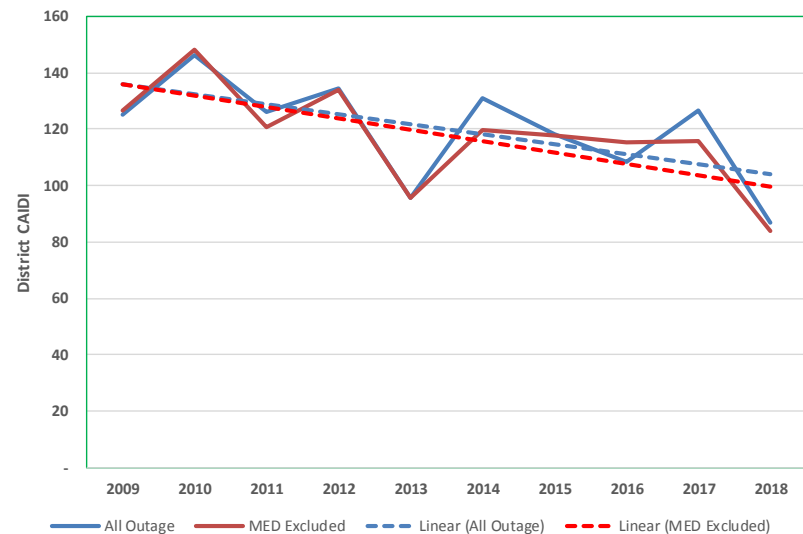
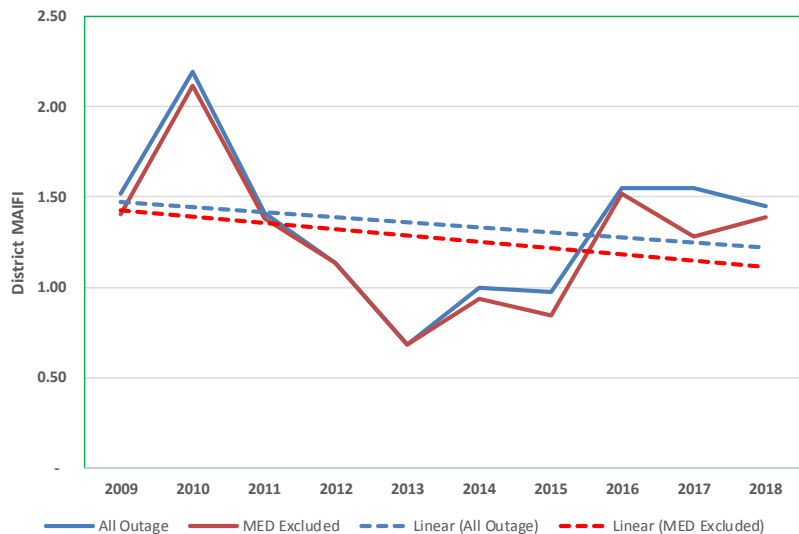
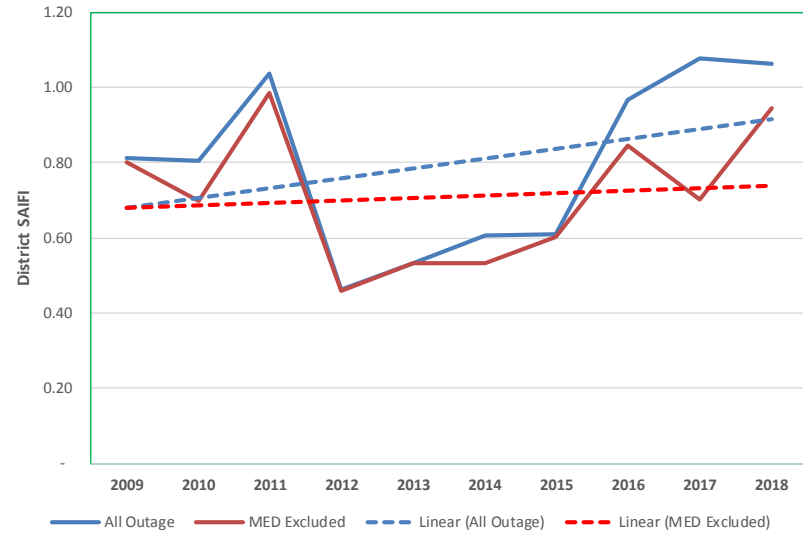
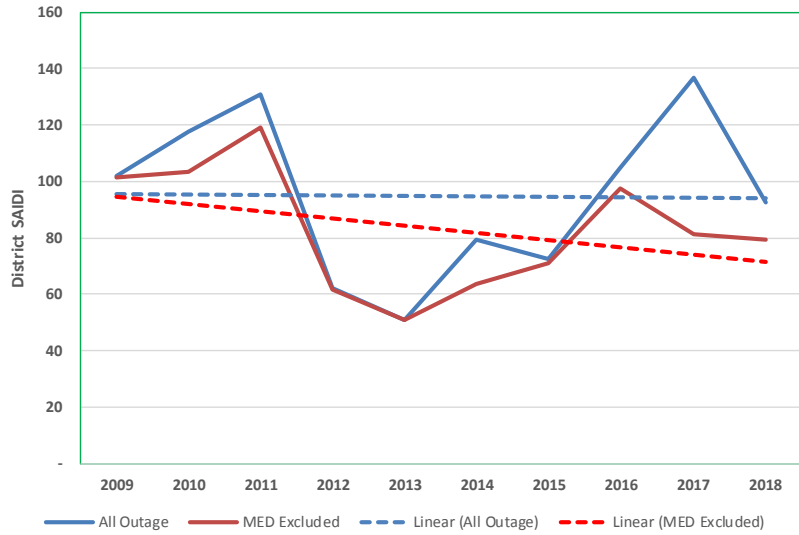
2009 -2018 District Reliability Graphs

TULARE District Reliability Performance



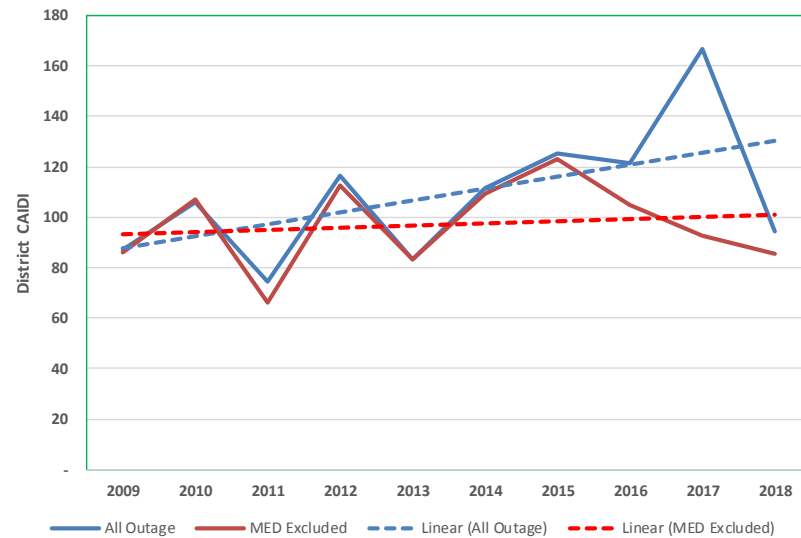
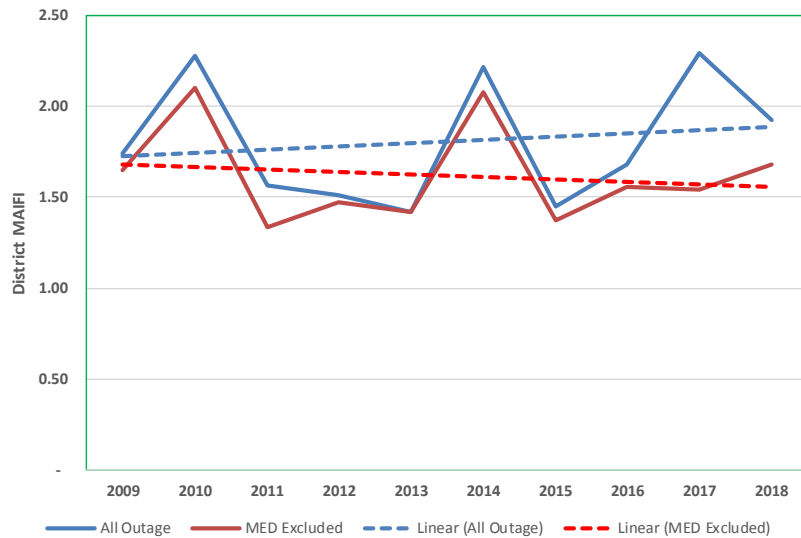
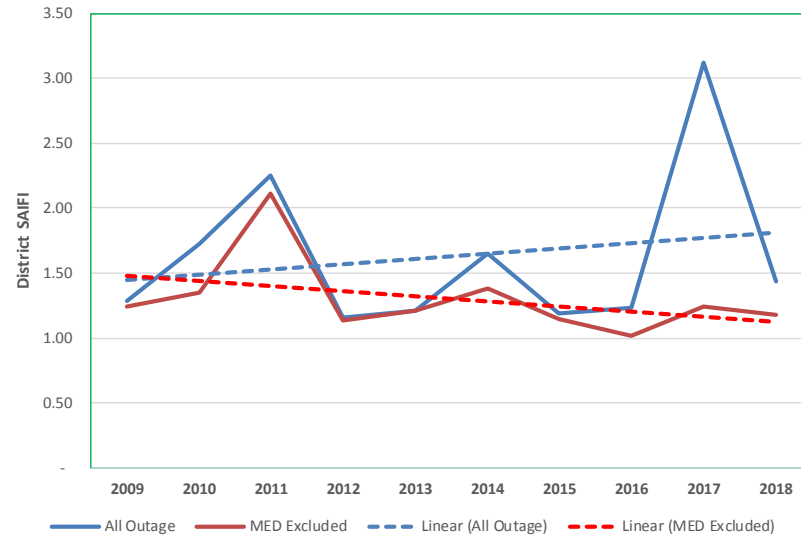
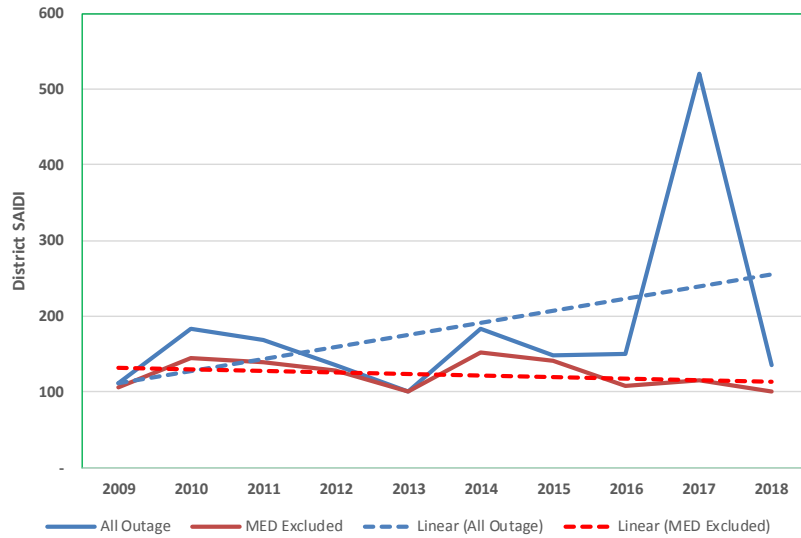
2009 -2018 District Reliability Graphs

VALENCIA District Reliability Performance



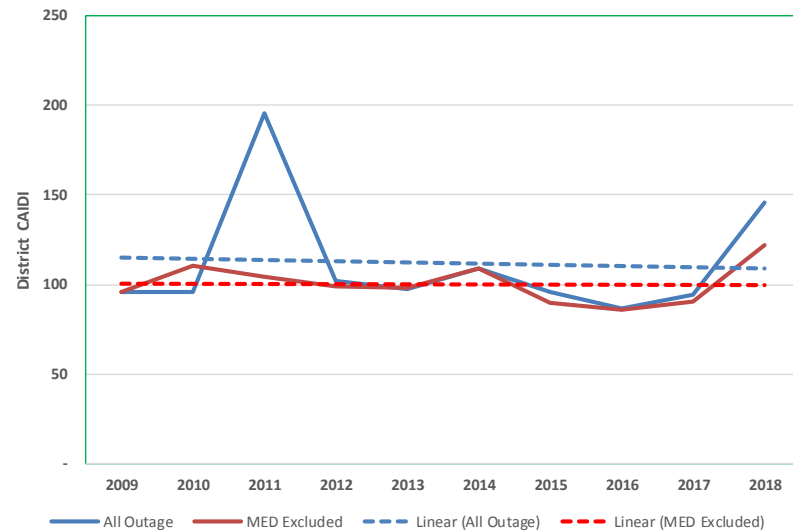
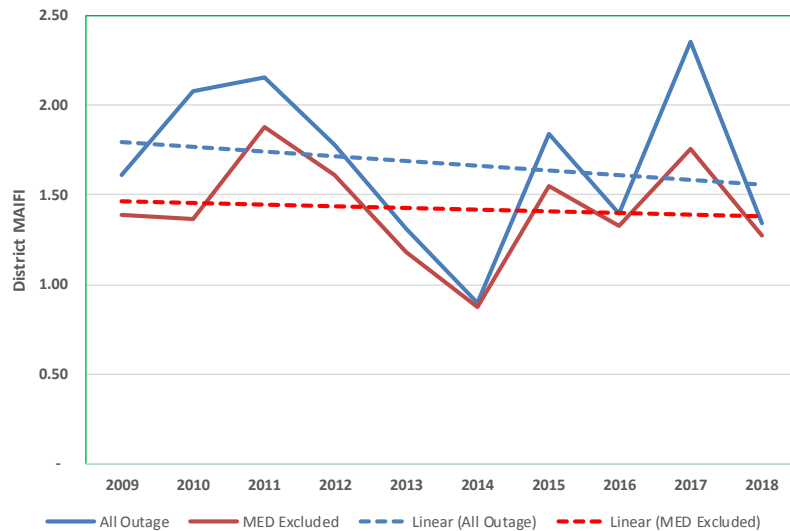
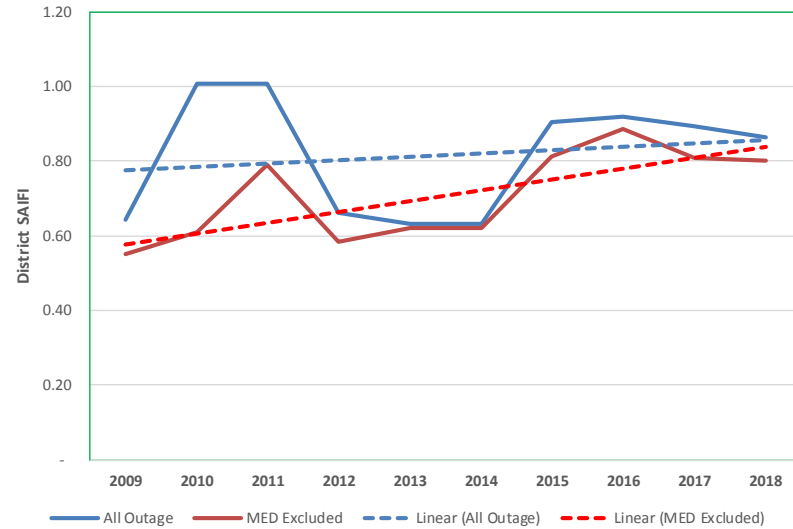
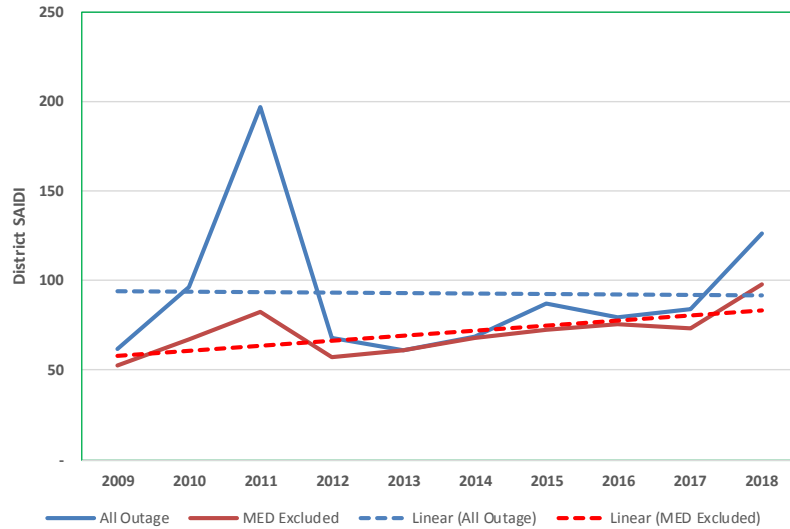
2009 -2018 District Reliability Graphs

VENTURA District Reliability Performance



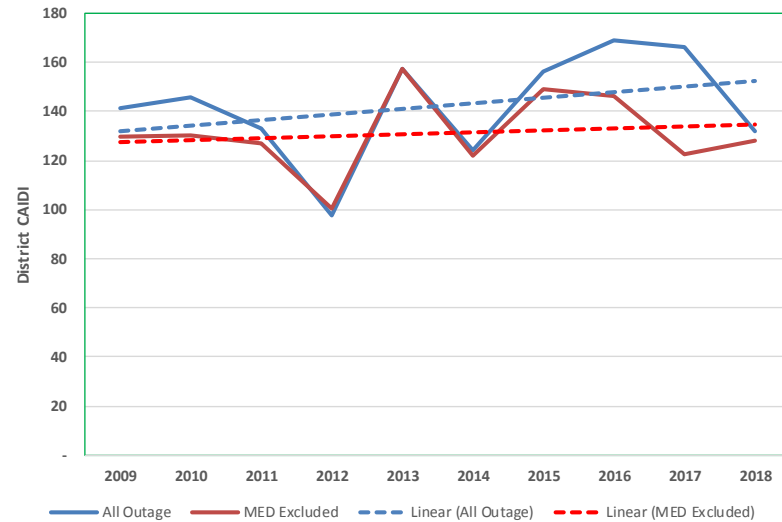
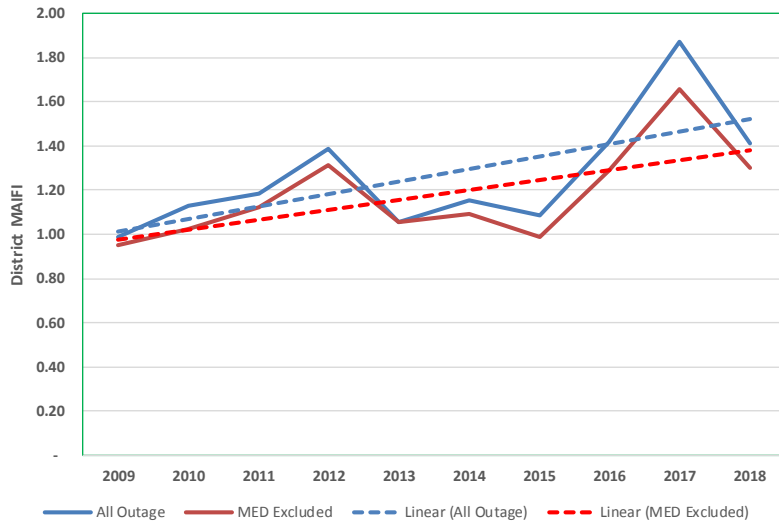
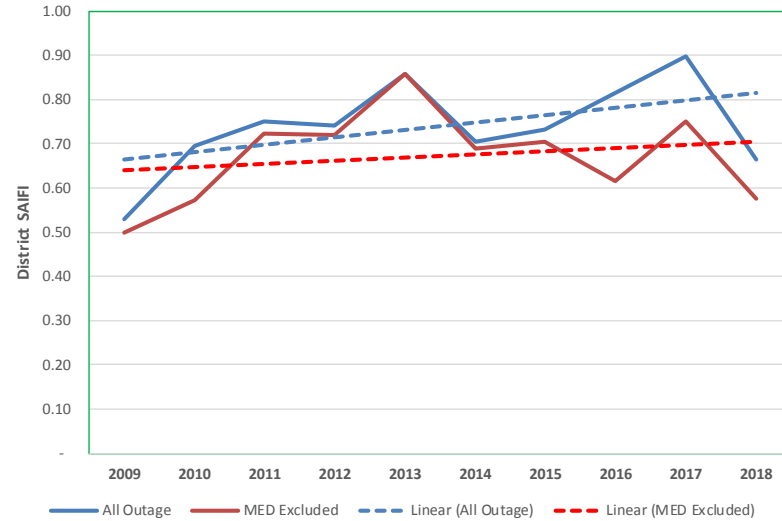
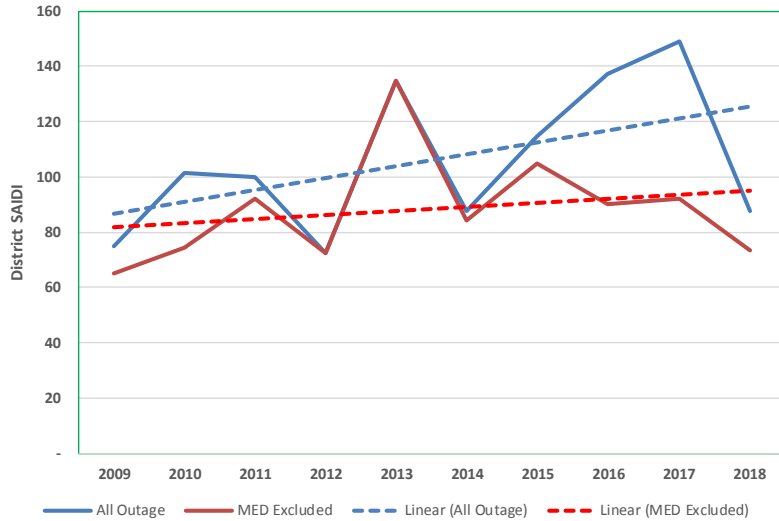
2009 -2018 District Reliability Graphs

VICTORVILLE District Reliability Performance



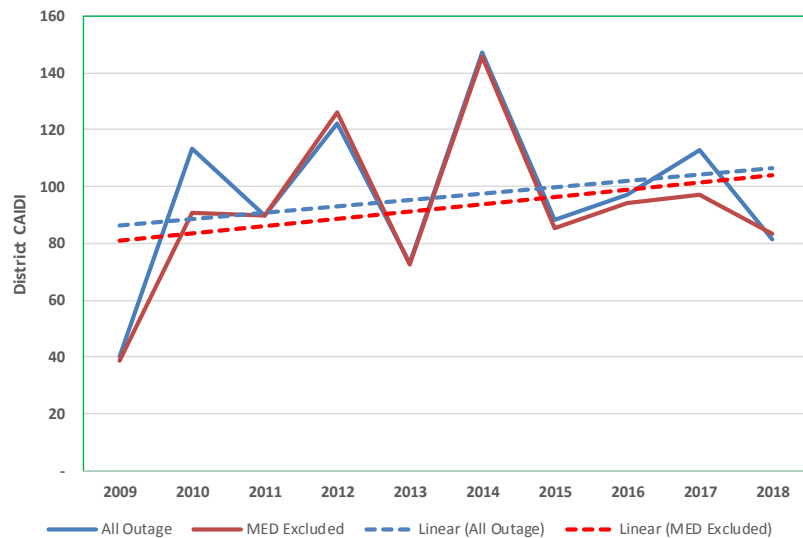
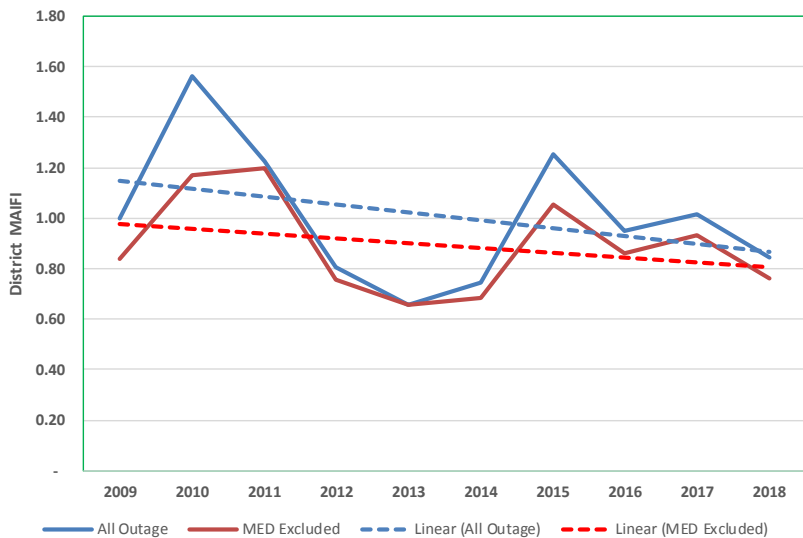
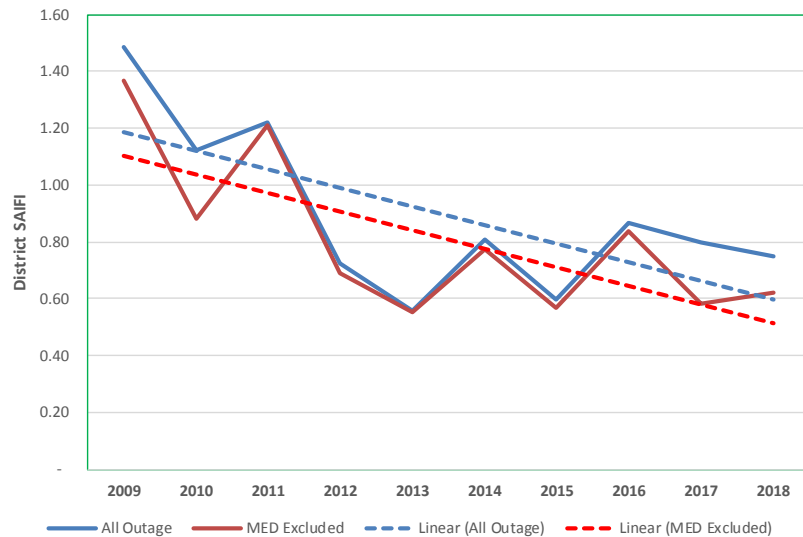
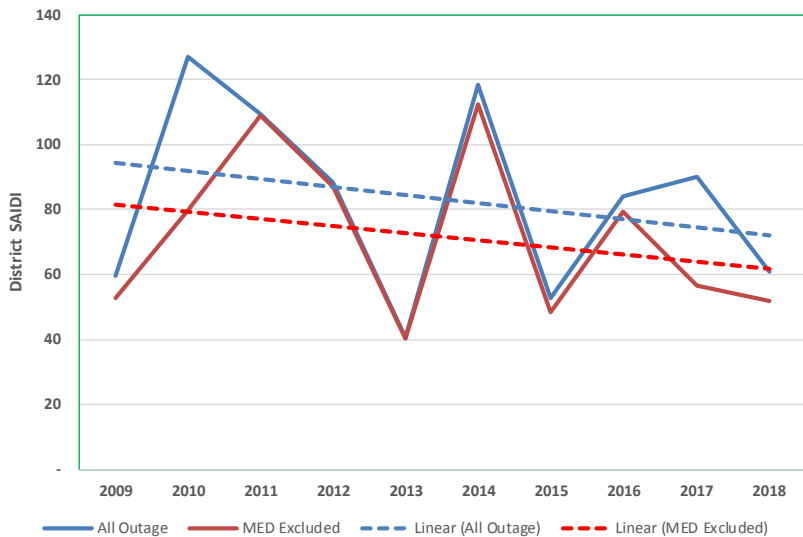
2009 -2018 District Reliability Graphs

WHITTIER District Reliability Performance



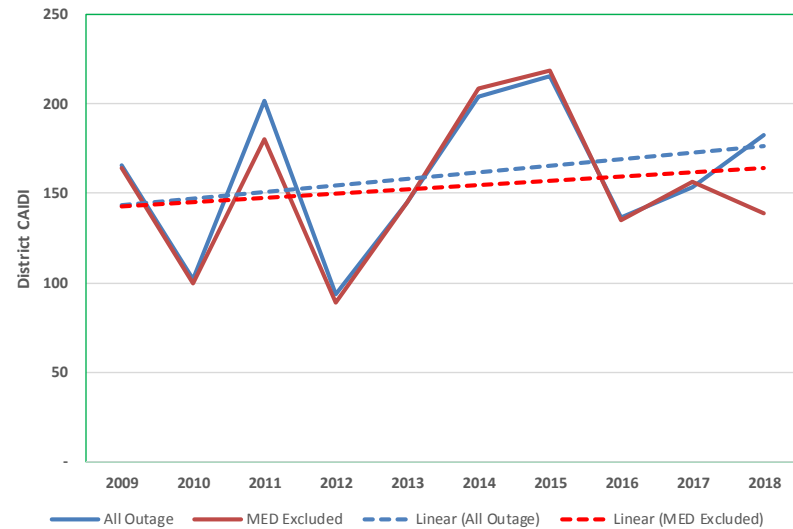
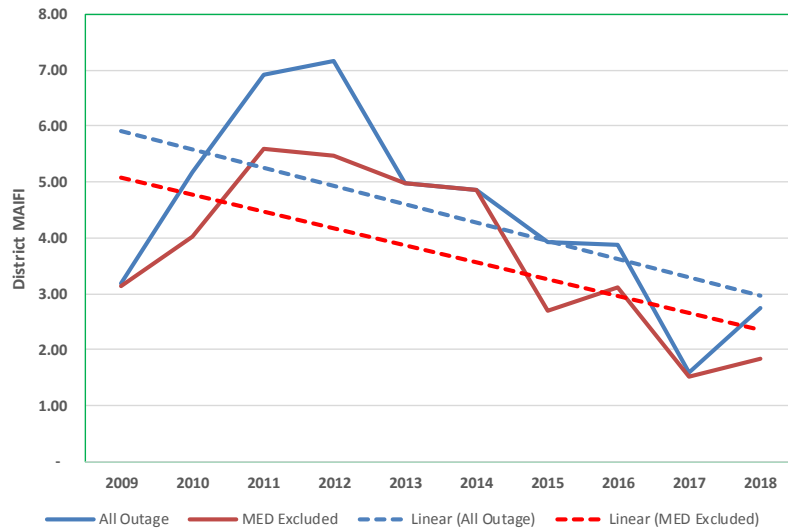
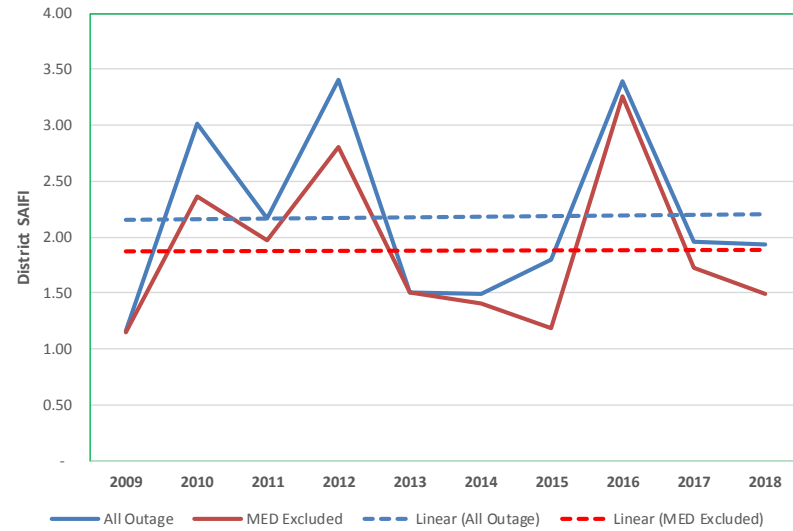
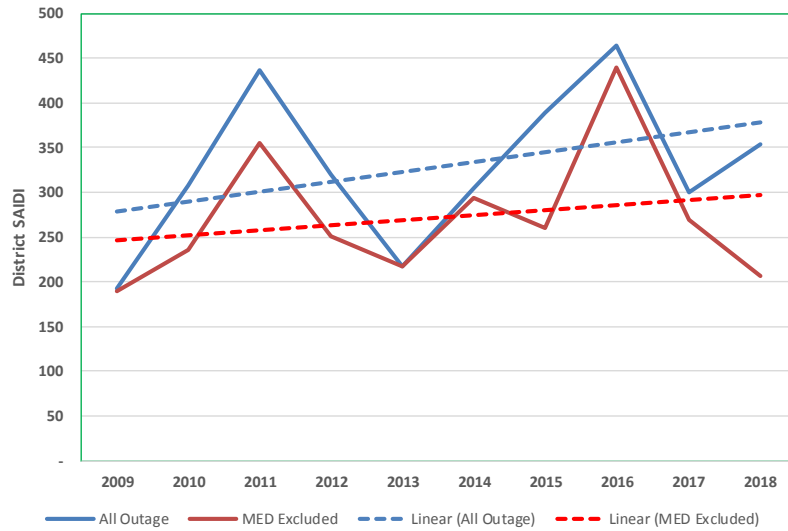
2009 -2018 District Reliability Graphs

WILDOMAR District Reliability Performance



2009 -2018 District Reliability Graphs

YUCCA VALLEY District Reliability Performance



SECTION 3: SYSTEM AND DISTRICT INDICES BASED ON IEEE 1366 FOR THE PAST 10 YEARS INCLUDING PLANNED AND UNPLANNED OUTAGES AND INCLUDING AND EXCLUDING MED

Table 5 below contains the required SAIDI, SAIFI, MAIFI⁵ and CAIDI indices for 2009-2018 including and excluding Major Event Day (MED) for the SCE System, Planned and Unplanned outages combined. All calculations contained in the table are based on the IEEE 1366 method for Major Event Day (MED). Planned outages are not excluded on Major Event Days.

Table 5 – System Indices (2009-2018) Planned and Unplanned⁶

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2009	105.80	0.90	1.45	117.58	88.77	0.83	1.31	107.17
2010	140.91	1.05	1.69	134.56	98.69	0.82	1.41	120.99
2011	232.39	1.04	1.53	223.75	108.15	0.91	1.36	118.30
2012	108.13	0.89	1.43	121.10	100.70	0.86	1.35	117.76
2013	102.61	0.91	1.20	112.76	94.48	0.88	1.18	107.85
2014	112.10	0.97	1.36	116.04	92.30	0.86	1.23	106.82
2015	114.83	0.92	1.42	125.40	100.15	0.86	1.29	116.56
2016	265.83	1.44	1.56	184.43	241.33	1.33	1.41	180.78
2017	261.24	1.52	1.84	171.33	213.24	1.20	1.43	177.30
2018	248.61	1.19	1.44	209.34	183.05	1.03	1.27	177.80

Table 6 below contains the District SAIDI, SAIFI, MAIFI and CAIDI (including and excluding MED).

Table 6 – District Indices (2009-2018) Planned and Unplanned

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
ANTELOPE VALLEY								
2009	71.229	0.516	1.631	137.979	68.386	0.492	1.473	139.019
2010	131.063	0.773	2.022	169.484	74.576	0.524	1.321	142.319
2011	208.159	1.247	1.669	166.965	128.137	1.144	1.595	111.981
2012	78.604	0.565	1.428	139.172	76.461	0.549	1.412	139.354
2013	94.416	0.619	1.172	152.621	94.222	0.613	1.166	153.772
2014	50.956	0.593	1.153	85.927	45.595	0.548	1.070	83.156
2015	104.337	0.680	1.838	153.528	70.206	0.601	1.514	116.783
2016	174.941	1.096	1.528	159.616	168.470	1.040	1.435	161.952
2017	185.114	1.130	1.835	163.840	165.274	1.071	1.706	154.388
2018	119.431	0.807	1.261	147.930	114.236	0.733	1.100	155.803

⁵ SCE calculates MAIFI at every individual outage event.

⁶ SCE began calculating planned SAIDI beginning in 2016.

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
ARROWHEAD								
2009	534.083	3.406	7.385	156.795	440.132	2.842	4.674	154.893
2010	537.400	3.841	18.875	139.895	229.659	1.974	16.782	116.369
2011	792.792	4.403	6.090	180.074	444.698	2.992	5.736	148.605
2012	129.579	1.307	3.972	99.116	89.043	1.043	3.757	85.372
2013	180.586	1.386	5.017	130.286	134.768	1.174	3.637	114.839
2014	193.249	1.590	4.018	121.532	81.968	0.898	3.035	91.277
2015	362.615	3.973	5.595	91.273	186.743	2.755	2.730	67.794
2016	753.996	3.192	5.974	236.234	295.253	2.226	4.734	132.620
2017	944.146	4.279	7.078	220.651	345.959	3.476	4.114	99.515
2018	435.669	2.568	3.047	169.674	420.495	1.752	2.987	239.951
BARSTOW								
2009	153.493	1.139	1.824	134.766	125.148	1.060	1.773	118.040
2010	123.015	1.511	3.041	81.440	96.881	1.190	2.648	81.400
2011	308.760	1.631	6.115	189.288	271.659	1.549	5.735	175.418
2012	184.797	1.152	2.645	160.377	182.786	1.144	2.524	159.819
2013	204.329	1.395	3.284	146.469	185.788	1.286	2.702	144.416
2014	201.526	1.343	2.536	150.058	173.680	1.240	2.410	140.098
2015	187.113	1.174	2.859	159.416	157.379	0.997	2.131	157.841
2016	187.771	1.538	2.299	122.114	183.028	1.527	2.286	119.823
2017	408.931	2.815	4.197	145.248	407.527	2.802	4.134	145.417
2018	151.136	1.488	2.113	101.551	149.712	1.457	2.079	102.777
BISHOP								
2009	143.545	1.362	1.493	105.382	142.174	1.356	1.491	104.869
2010	407.920	2.502	5.664	163.016	293.294	2.332	4.251	125.792
2011	666.064	1.548	2.571	430.339	105.588	1.344	2.247	78.591
2012	463.093	1.248	2.288	371.138	424.766	1.103	2.205	384.980
2013	104.436	0.514	1.267	203.233	104.425	0.514	1.267	203.232
2014	118.793	0.587	1.885	202.475	113.618	0.499	1.706	227.572
2015	298.106	2.218	3.332	134.431	298.106	2.218	3.272	134.431
2016	332.005	1.678	2.830	197.843	331.943	1.678	2.721	197.818
2017	457.095	2.893	3.264	157.984	438.728	2.836	3.118	154.713
2018	343.456	1.074	1.970	319.777	340.230	1.033	1.833	329.211
BLYTHE								
2009	83.884	0.820	1.717	102.296	83.605	0.816	1.482	102.403
2010	1332.781	2.030	2.817	656.668	294.445	1.344	2.641	219.114
2011	378.393	1.402	3.717	269.845	321.050	1.312	3.443	244.767
2012	225.884	1.529	3.749	147.714	221.814	1.498	3.749	148.058
2013	483.127	1.380	5.466	349.971	482.815	1.372	5.382	351.779
2014	707.218	2.417	4.658	292.632	706.974	2.385	4.433	296.395
2015	426.997	1.515	1.396	281.754	331.521	1.129	1.163	293.751
2016	649.170	3.562	6.349	182.233	555.778	2.773	4.854	200.447
2017	1100.260	3.321	3.586	331.330	1099.341	3.316	3.494	331.554
2018	598.157	2.515	2.421	237.811	576.042	2.266	2.390	254.206
CATALINA								
2009	98.586	2.542	1.235	38.779	98.586	2.542	1.235	38.779
2010	67.227	1.549	0.728	43.391	67.227	1.549	0.728	43.391
2011	65.029	3.454	3.317	18.828	65.029	3.454	3.317	18.828
2012	78.463	0.724	0.765	108.396	78.463	0.724	0.765	108.396
2013	105.939	2.968	3.093	35.691	105.939	2.968	3.093	35.691
2014	97.024	4.170	2.321	23.269	97.024	4.170	2.321	23.269
2015	42.563	2.252	2.885	18.904	42.563	2.252	2.885	18.904
2016	97.450	3.700	3.207	26.338	97.450	3.700	3.207	26.338
2017	93.777	0.637	2.496	147.215	28.051	0.581	1.324	48.239
2018	286.447	2.780	1.277	103.054	286.447	2.780	1.277	103.054
COMPTON								
2009	89.813	0.681	1.698	131.889	81.227	0.633	1.575	128.322
2010	119.230	0.779	1.578	153.004	88.110	0.585	1.337	150.626
2011	109.414	0.718	1.566	152.338	90.548	0.644	1.433	140.680
2012	117.225	0.824	1.863	142.330	110.077	0.792	1.830	139.031
2013	89.167	0.797	1.938	111.893	89.167	0.797	1.938	111.893
2014	82.192	0.711	1.603	115.553	73.493	0.656	1.560	111.977
2015	130.629	0.967	2.049	135.097	126.046	0.934	1.958	134.903
2016	288.090	1.398	2.541	206.024	268.861	1.301	2.232	206.699
2017	237.826	1.064	2.167	223.572	200.861	0.957	1.972	209.891
2018	153.029	0.995	2.448	153.748	126.041	0.861	2.267	146.325

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
COVINA								
2009	78.043	0.682	1.063	114.418	62.591	0.603	0.959	103.822
2010	117.660	0.810	1.130	145.299	99.323	0.708	0.983	140.232
2011	166.969	0.870	1.181	191.870	86.994	0.736	1.077	118.129
2012	108.732	0.915	1.333	118.824	102.888	0.867	1.267	118.680
2013	100.505	0.856	1.004	117.414	100.297	0.853	0.992	117.582
2014	91.418	0.874	1.257	104.580	81.424	0.804	1.028	101.295
2015	100.085	0.815	1.164	122.866	99.838	0.813	1.152	122.755
2016	239.474	1.288	1.323	185.960	218.270	1.189	1.149	183.532
2017	204.581	1.183	1.371	172.991	193.489	1.062	1.144	182.171
2018	195.693	1.071	1.458	182.671	165.975	0.939	1.370	176.714
FOOTHILL								
2009	94.329	0.620	1.281	152.254	60.566	0.435	1.015	139.105
2010	76.599	0.460	0.975	166.649	64.982	0.405	0.857	160.634
2011	117.405	0.955	1.226	122.901	97.462	0.879	0.896	110.915
2012	91.694	0.903	0.931	101.552	91.479	0.900	0.900	101.608
2013	85.800	0.787	0.987	109.087	85.800	0.787	0.987	109.087
2014	93.337	0.932	1.285	100.140	88.135	0.861	1.249	102.395
2015	109.637	0.947	1.304	115.764	87.796	0.890	1.230	98.673
2016	268.951	1.422	1.512	189.100	264.322	1.403	1.488	188.437
2017	233.590	1.562	1.390	149.574	211.063	1.334	1.216	158.270
2018	250.380	1.411	1.208	177.480	211.469	1.216	0.972	173.904
FULLERTON								
2009	62.350	0.457	0.846	136.512	60.763	0.431	0.773	140.841
2010	135.217	1.186	1.208	113.985	94.282	0.671	0.859	140.606
2011	90.110	0.607	1.076	148.499	88.745	0.604	1.075	146.940
2012	68.992	0.419	0.943	164.469	64.428	0.401	0.878	160.539
2013	90.572	0.793	0.910	114.158	90.572	0.793	0.910	114.158
2014	82.201	0.723	1.004	113.714	69.996	0.649	0.974	107.848
2015	76.586	0.669	1.014	114.471	75.504	0.642	0.995	117.681
2016	204.966	1.107	1.179	185.149	186.013	0.936	0.979	198.795
2017	194.061	0.997	1.212	194.721	178.928	0.905	1.086	197.812
2018	142.016	0.743	1.128	191.051	127.951	0.661	1.043	193.581
HUNTINGTON BEACH								
2009	109.420	1.041	1.191	105.156	97.754	0.881	1.143	111.009
2010	129.496	1.023	1.305	126.636	101.546	0.848	1.029	119.812
2011	122.539	0.956	1.488	128.169	114.519	0.885	1.406	129.457
2012	95.784	0.889	1.046	107.737	94.680	0.882	1.046	107.395
2013	66.507	0.680	0.815	97.833	66.507	0.680	0.815	97.833
2014	76.901	0.738	1.093	104.152	65.367	0.676	0.964	96.710
2015	98.315	0.955	1.217	102.952	94.111	0.929	1.169	101.352
2016	253.959	1.665	1.232	152.547	234.099	1.589	1.169	147.352
2017	207.148	1.344	1.455	154.169	187.781	1.223	1.196	153.525
2018	172.712	1.043	1.381	165.585	158.571	0.960	1.078	165.198
KERNVILLE								
2009	585.927	2.006	5.688	292.025	559.460	1.854	5.053	301.808
2010	584.742	1.795	4.336	325.686	444.191	1.490	4.011	298.084
2011	165.695	1.025	3.316	161.713	138.134	0.964	2.620	143.346
2012	226.761	1.311	3.636	172.995	160.694	1.066	3.010	150.692
2013	232.181	1.964	4.925	118.189	180.865	1.577	4.824	114.682
2014	178.691	1.987	1.882	89.932	142.946	1.918	1.831	74.541
2015	286.382	0.961	1.630	297.920	231.411	0.857	1.293	270.120
2016	2729.902	4.545	3.102	600.638	1217.766	3.710	3.006	328.213
2017	610.622	4.144	4.587	147.356	595.690	4.006	4.288	148.701
2018	536.123	2.004	3.168	267.559	504.530	1.872	3.152	269.457
LONG BEACH								
2009	41.503	0.421	0.876	98.539	40.045	0.415	0.851	96.547
2010	72.284	0.633	0.897	114.156	53.982	0.546	0.774	98.809
2011	58.475	0.579	0.894	100.942	52.380	0.562	0.853	93.191
2012	75.830	0.554	1.106	136.864	72.654	0.536	1.059	135.673
2013	75.107	0.699	0.779	107.497	74.628	0.694	0.775	107.551
2014	66.226	0.606	1.168	109.270	57.781	0.548	1.083	105.376
2015	164.463	0.894	1.185	183.904	89.160	0.846	1.168	105.378
2016	258.116	1.151	1.312	224.274	219.930	0.989	1.099	222.387
2017	167.261	0.916	1.180	182.537	149.590	0.798	1.021	187.474
2018	169.862	0.725	1.225	234.380	160.684	0.679	1.102	236.556

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
MENIFEE								
2009	106.451	1.809	1.026	58.854	97.637	1.743	0.910	56.004
2010	100.653	0.762	1.202	132.119	74.081	0.613	0.903	120.754
2011	100.482	0.891	1.339	112.728	93.705	0.804	1.299	116.607
2012	99.320	0.838	1.736	118.576	98.627	0.824	1.680	119.740
2013	107.388	1.264	0.744	84.979	106.298	1.220	0.725	87.135
2014	156.641	1.323	1.573	118.410	77.367	1.004	1.276	77.030
2015	111.460	0.978	1.302	113.971	85.322	0.876	1.067	97.393
2016	272.761	1.691	1.450	161.345	255.018	1.570	1.340	162.435
2017	210.646	1.250	1.314	168.458	153.033	1.051	1.203	145.610
2018	267.524	1.242	1.446	215.395	164.418	1.040	1.279	158.045
MONROVIA								
2009	219.773	0.869	2.029	252.948	102.119	0.744	1.614	137.210
2010	124.340	1.078	2.014	115.381	93.507	0.902	1.775	103.624
2011	2414.044	1.891	2.463	1276.874	130.692	1.025	1.740	127.514
2012	108.110	1.126	1.781	95.987	99.185	1.068	1.632	92.910
2013	99.116	1.017	1.322	97.496	98.965	1.015	1.311	97.500
2014	133.311	1.157	1.258	115.176	96.360	1.005	1.069	95.846
2015	96.679	0.881	1.618	109.737	95.327	0.863	1.554	110.466
2016	256.395	1.176	1.660	218.071	233.207	1.103	1.531	211.395
2017	271.780	1.370	1.804	198.422	258.774	1.313	1.706	197.034
2018	410.435	1.837	1.632	223.466	269.995	1.440	1.471	187.519
MONTEBELLO								
2009	192.332	1.191	2.337	161.484	87.243	1.099	2.174	79.370
2010	147.851	1.117	1.987	132.361	118.232	0.972	1.688	121.649
2011	678.332	1.214	2.388	558.556	115.694	0.853	1.821	135.577
2012	131.058	1.127	1.946	116.316	107.511	1.040	1.823	103.423
2013	118.078	1.174	1.890	100.609	117.713	1.169	1.890	100.660
2014	158.316	1.164	1.959	136.010	124.669	1.020	1.763	122.179
2015	150.280	1.183	2.213	126.992	145.303	1.131	2.087	128.462
2016	352.148	1.632	2.066	215.752	325.890	1.509	1.892	215.923
2017	253.609	1.299	2.186	195.262	226.482	1.187	1.878	190.834
2018	302.525	1.397	2.271	216.561	240.523	1.116	1.861	215.502
ONTARIO								
2009	88.186	0.748	1.200	117.973	80.625	0.703	1.098	114.619
2010	90.448	0.811	1.480	111.528	70.279	0.655	1.258	107.242
2011	117.664	0.822	1.317	143.189	96.594	0.749	1.235	128.944
2012	93.087	0.869	1.159	107.130	91.407	0.833	1.140	109.720
2013	77.392	0.791	0.933	97.841	74.037	0.782	0.926	94.728
2014	97.881	0.996	1.160	98.312	86.676	0.902	1.041	96.114
2015	94.043	0.744	0.926	126.432	81.608	0.709	0.867	115.156
2016	227.939	1.274	1.288	178.977	209.030	1.146	1.101	182.411
2017	207.596	1.448	1.575	143.412	198.946	1.367	1.426	145.565
2018	179.063	1.015	1.051	176.468	152.457	0.880	0.921	173.172
PALM SPRINGS								
2009	151.662	1.106	1.905	137.079	140.027	1.047	1.824	133.722
2010	180.688	1.039	1.367	173.826	162.059	0.940	1.148	172.391
2011	164.765	0.886	1.182	186.029	144.131	0.842	1.117	171.272
2012	175.916	1.267	1.505	138.814	113.848	1.130	1.236	100.717
2013	112.796	0.774	0.997	145.669	112.193	0.769	0.997	145.815
2014	106.960	0.708	0.941	151.072	95.065	0.667	0.885	142.620
2015	99.542	0.800	1.042	124.376	95.795	0.753	0.949	127.171
2016	258.243	1.521	1.284	169.743	252.026	1.465	1.136	171.990
2017	230.013	1.398	1.228	164.565	227.345	1.374	1.218	165.435
2018	189.052	1.176	1.433	160.817	175.409	1.113	1.215	157.626
REDLANDS								
2009	107.204	0.895	1.469	119.732	87.582	0.807	1.221	108.514
2010	216.759	1.692	3.207	128.121	95.898	1.332	2.692	71.988
2011	253.703	1.630	1.323	155.689	142.273	1.428	1.244	99.628
2012	120.127	1.108	1.600	108.399	114.781	1.068	1.563	107.435
2013	96.481	1.044	0.911	92.410	95.273	1.036	0.908	91.977
2014	154.227	1.040	1.312	148.311	85.520	0.872	1.149	98.024
2015	124.519	1.012	1.467	122.990	102.289	0.935	1.247	109.365
2016	237.564	1.273	1.477	186.559	219.230	1.178	1.339	186.054
2017	243.956	1.325	1.603	184.160	213.812	1.172	1.414	182.408
2018	189.472	1.278	1.371	148.255	171.551	1.138	1.217	150.778

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
RIDGECREST								
2009	58.339	0.684	3.343	85.234	40.758	0.501	2.586	81.374
2010	153.378	1.410	2.219	108.746	151.176	1.394	1.850	108.443
2011	89.261	0.737	4.140	121.196	67.647	0.528	3.916	128.124
2012	229.646	1.439	3.738	159.634	228.264	1.421	3.711	160.656
2013	161.952	1.122	3.828	144.376	83.920	0.824	3.315	101.793
2014	176.795	1.573	2.193	112.388	167.746	1.509	2.180	111.181
2015	148.895	1.012	2.169	147.145	139.509	0.837	1.514	166.702
2016	287.217	1.150	1.285	249.712	282.115	1.043	1.162	270.433
2017	316.092	1.432	3.535	220.660	305.387	1.410	3.463	216.606
2018	385.241	1.485	1.311	259.389	230.455	1.118	1.301	206.202
SADDLEBACK								
2009	78.986	0.697	0.486	113.254	77.683	0.686	0.481	113.193
2010	137.236	0.962	0.433	142.663	96.192	0.778	0.373	123.677
2011	75.942	0.547	0.818	138.842	74.783	0.527	0.753	141.934
2012	83.013	0.728	0.766	113.998	81.379	0.715	0.765	113.864
2013	70.688	0.532	0.513	132.957	70.688	0.532	0.513	132.957
2014	99.074	0.745	0.556	133.025	92.899	0.708	0.549	131.230
2015	46.026	0.385	0.379	119.543	45.654	0.384	0.379	118.976
2016	159.284	0.959	0.781	166.143	155.758	0.916	0.740	170.123
2017	168.934	0.880	0.701	191.956	152.325	0.786	0.552	193.818
2018	127.416	0.629	0.414	202.577	117.442	0.568	0.365	206.817
SANTA ANA								
2009	67.833	0.600	0.800	113.062	59.543	0.536	0.755	111.017
2010	104.571	0.810	1.012	129.134	69.073	0.610	0.837	113.185
2011	102.008	0.816	1.104	125.033	93.837	0.778	1.068	120.566
2012	78.602	0.554	1.115	141.767	78.305	0.553	1.065	141.491
2013	93.345	0.742	1.019	125.854	93.345	0.742	1.019	125.854
2014	91.651	0.843	1.274	108.710	79.414	0.755	1.179	105.222
2015	67.457	0.706	1.130	95.596	66.452	0.703	1.109	94.562
2016	210.964	1.315	1.187	160.413	202.009	1.258	1.115	160.572
2017	157.257	0.957	1.271	164.245	142.549	0.855	1.121	166.774
2018	182.258	0.999	1.306	182.354	117.077	0.731	1.095	160.191
SANTA BARBARA								
2009	178.865	1.798	1.371	99.468	173.897	1.756	1.210	99.033
2010	151.187	1.008	2.228	149.999	138.640	0.888	1.887	156.212
2011	104.820	0.866	1.727	121.045	94.368	0.811	1.635	116.427
2012	153.813	1.148	1.673	133.954	149.352	1.127	1.456	132.567
2013	82.001	0.699	1.219	117.302	82.001	0.699	1.219	117.302
2014	181.231	1.335	2.549	135.717	145.165	1.141	2.012	127.238
2015	152.372	1.517	1.577	100.417	143.291	1.338	1.459	107.103
2016	355.518	1.829	1.477	194.407	328.861	1.687	1.263	194.963
2017	805.014	10.181	13.621	79.068	549.005	2.587	1.236	212.198
2018	586.424	2.087	1.244	280.962	499.093	1.973	1.043	252.974
SANTA MONICA								
2009	86.226	0.655	1.187	131.696	82.128	0.629	1.145	130.473
2010	98.323	0.894	1.124	109.948	73.036	0.689	1.054	105.987
2011	95.085	0.583	1.476	162.996	83.791	0.537	1.177	155.914
2012	101.687	0.792	0.911	128.436	98.428	0.769	0.890	127.913
2013	122.783	1.003	0.959	122.447	122.783	1.003	0.959	122.447
2014	110.742	0.992	0.852	111.609	106.656	0.943	0.772	113.131
2015	75.407	0.625	1.069	120.681	64.417	0.577	1.065	111.607
2016	180.178	1.196	1.217	150.691	178.204	1.181	1.138	150.850
2017	235.009	1.096	1.172	214.420	229.254	1.063	1.112	215.714
2018	199.328	1.356	1.364	146.947	179.489	1.028	1.332	174.645
SHAVER LAKE								
2009	259.275	1.441	1.856	179.865	259.275	1.441	1.856	179.865
2010	5700.992	12.891	7.874	442.244	683.925	6.344	3.818	107.812
2011	1667.047	4.222	3.933	394.852	984.340	1.650	2.741	596.466
2012	1184.253	4.523	2.608	261.831	842.662	4.182	1.681	201.512
2013	176.510	3.080	4.987	57.308	176.510	3.080	4.711	57.308
2014	920.254	1.342	4.901	685.961	438.216	0.581	3.960	754.138
2015	422.768	3.415	9.298	123.785	422.768	3.415	9.298	123.785
2016	1672.107	7.236	4.232	231.067	1384.095	5.039	2.241	274.676
2017	5503.024	11.011	5.301	499.772	1905.726	9.103	5.278	209.351
2018	2012.829	6.742	6.660	298.567	2012.829	6.742	6.660	298.567

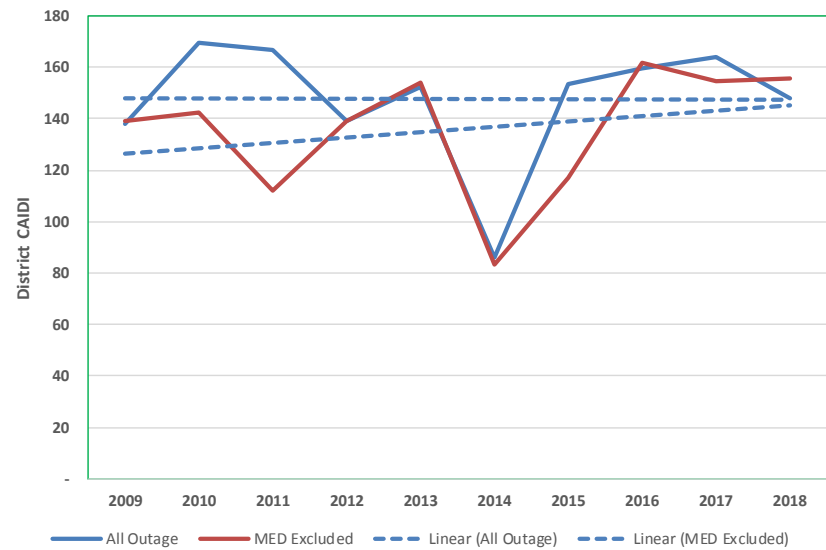
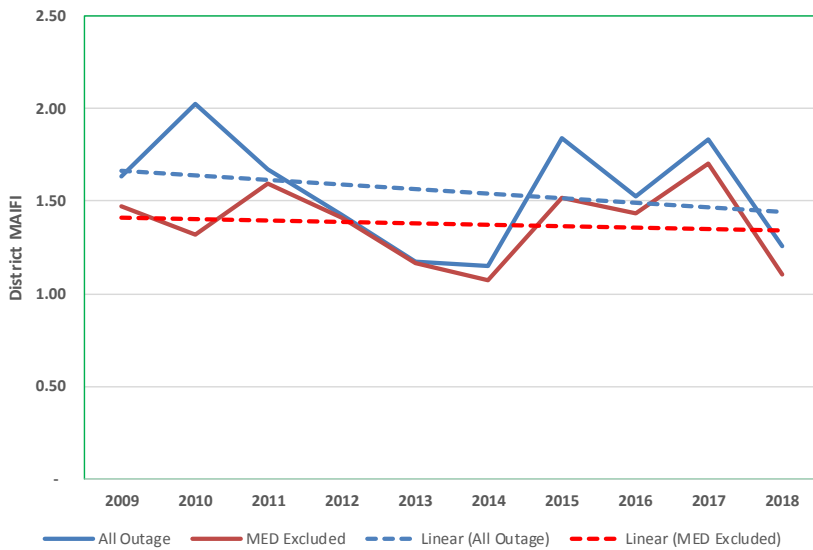
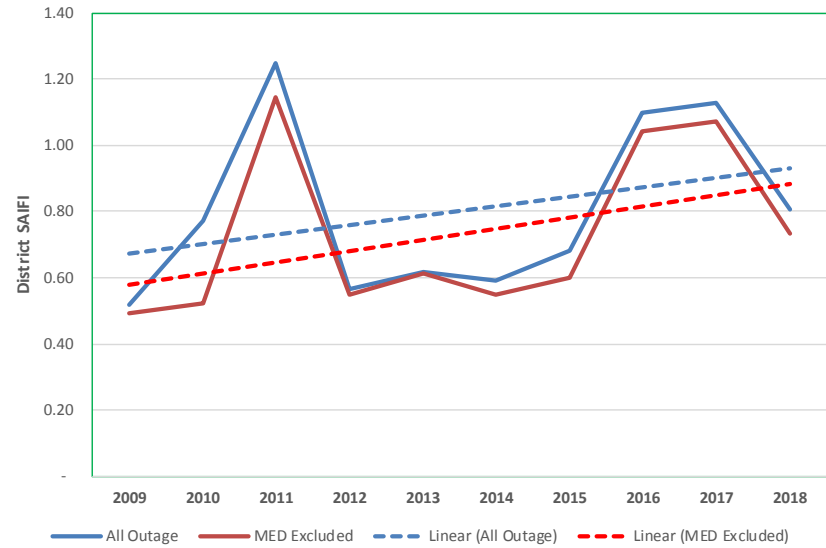
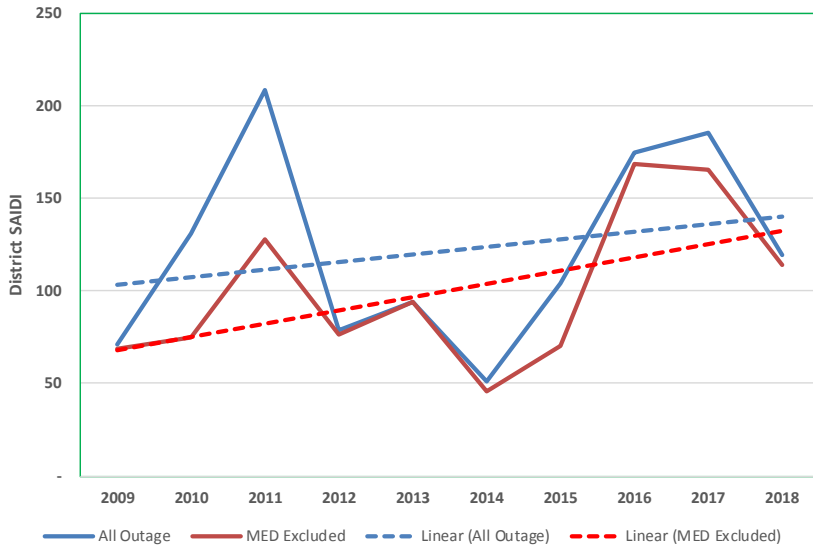
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
SOUTH BAY								
2009	158.299	1.156	1.814	136.881	135.003	1.007	1.627	134.053
2010	190.924	1.206	1.836	158.299	136.407	0.938	1.533	145.392
2011	178.724	1.347	1.481	132.690	141.550	1.207	1.169	117.293
2012	122.682	1.174	1.713	104.516	120.710	1.153	1.630	104.694
2013	142.153	1.490	1.448	95.391	142.153	1.490	1.448	95.391
2014	125.154	1.390	1.650	90.009	110.254	1.281	1.502	86.094
2015	164.072	1.305	1.660	125.704	160.399	1.272	1.613	126.136
2016	335.018	2.229	2.024	150.313	302.021	2.097	1.822	144.043
2017	268.368	1.330	1.467	201.767	256.529	1.217	1.335	210.758
2018	227.260	1.450	1.773	156.710	218.906	1.367	1.526	160.078
TEHACHAPI								
2009	168.038	2.010	3.482	83.614	155.009	1.915	3.413	80.957
2010	434.015	3.232	6.291	134.268	220.369	2.573	4.677	85.639
2011	231.229	1.814	3.190	127.454	177.911	1.694	2.582	105.026
2012	117.963	1.434	1.495	82.262	117.963	1.434	1.495	82.262
2013	232.672	1.121	1.661	207.634	232.333	1.102	1.638	210.815
2014	130.704	1.290	2.090	101.348	83.519	1.097	1.783	76.126
2015	298.959	1.215	3.960	246.114	236.807	1.037	2.513	228.329
2016	235.751	1.536	2.384	153.517	214.885	1.440	1.961	149.228
2017	159.036	1.488	3.149	106.881	150.449	1.330	2.968	113.113
2018	211.711	1.111	2.292	190.535	210.682	1.094	2.162	192.651
THOUSAND OAKS								
2009	103.160	0.987	1.850	104.469	98.658	0.948	1.833	104.026
2010	124.263	1.366	1.567	91.002	92.331	0.815	1.435	113.243
2011	146.687	1.145	1.928	128.129	121.175	1.008	1.732	120.168
2012	127.732	1.049	1.196	121.739	118.833	0.991	1.161	119.968
2013	93.860	0.914	1.164	102.735	93.846	0.913	1.154	102.755
2014	104.172	1.102	1.426	94.537	95.331	1.013	1.287	94.150
2015	106.589	0.919	1.893	115.938	103.685	0.889	1.845	116.643
2016	387.439	1.782	2.600	217.455	371.906	1.702	2.392	218.476
2017	309.183	1.874	3.292	165.021	263.840	1.510	2.924	174.779
2018	1364.456	1.981	1.668	688.934	306.864	1.468	1.387	209.037
TULARE								
2009	96.592	0.906	2.087	106.555	93.243	0.867	2.030	107.524
2010	126.684	1.043	1.642	121.481	98.341	0.932	1.503	105.567
2011	83.994	0.743	1.387	113.010	75.838	0.712	1.301	106.565
2012	135.897	1.044	1.455	130.115	123.112	1.005	1.290	122.504
2013	244.439	1.448	1.698	168.757	71.744	0.800	1.548	89.668
2014	137.738	1.164	1.519	118.285	93.658	0.997	1.303	93.949
2015	127.502	1.052	1.414	121.240	99.829	0.908	1.106	109.936
2016	259.232	1.367	1.121	189.694	252.610	1.315	1.099	192.043
2017	310.041	1.581	1.218	196.148	224.100	1.520	1.207	147.467
2018	146.131	0.910	1.111	160.550	141.189	0.878	1.051	160.826
VALENCIA								
2009	101.701	0.812	1.519	125.209	101.368	0.800	1.400	126.765
2010	117.815	0.806	2.195	146.239	103.447	0.698	2.114	148.275
2011	130.855	1.036	1.412	126.276	119.058	0.986	1.379	120.768
2012	62.009	0.462	1.134	134.286	61.595	0.461	1.133	133.738
2013	50.940	0.532	0.683	95.801	50.940	0.532	0.683	95.801
2014	79.216	0.605	0.998	130.876	63.729	0.533	0.935	119.499
2015	72.274	0.611	0.971	118.224	71.053	0.604	0.845	117.624
2016	181.251	1.245	1.552	145.575	173.569	1.123	1.525	154.560
2017	195.045	1.271	1.558	153.426	139.695	0.895	1.292	156.129
2018	170.785	1.307	1.453	130.666	157.708	1.189	1.394	132.628
VENTURA								
2009	112.422	1.288	1.743	87.292	106.956	1.242	1.651	86.140
2010	182.739	1.720	2.279	106.240	144.070	1.345	2.103	107.099
2011	167.849	2.247	1.561	74.683	139.680	2.112	1.337	66.150
2012	134.807	1.155	1.507	116.752	128.528	1.140	1.469	112.780
2013	100.521	1.210	1.417	83.104	100.504	1.210	1.417	83.093
2014	183.769	1.648	2.215	111.528	151.635	1.386	2.075	109.381
2015	148.848	1.190	1.447	125.112	141.430	1.149	1.375	123.110
2016	334.355	1.697	1.687	196.992	291.088	1.480	1.561	196.652
2017	704.536	3.609	2.307	195.237	298.397	1.726	1.555	172.839
2018	349.065	1.982	1.938	176.086	313.409	1.721	1.693	182.074

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
VICTORVILLE								
2009	61.926	0.644	1.607	96.147	52.591	0.550	1.384	95.565
2010	96.446	1.008	2.081	95.727	67.510	0.610	1.368	110.738
2011	196.846	1.008	2.153	195.358	82.406	0.791	1.877	104.144
2012	67.698	0.662	1.775	102.224	57.567	0.584	1.606	98.647
2013	61.333	0.632	1.312	97.109	61.010	0.620	1.179	98.380
2014	68.830	0.633	0.896	108.709	67.680	0.620	0.877	109.146
2015	87.026	0.906	1.839	96.063	72.897	0.812	1.551	89.751
2016	143.745	1.102	1.397	130.401	140.336	1.073	1.328	130.835
2017	178.268	1.159	2.360	153.853	167.325	1.072	1.764	156.104
2018	185.541	1.098	1.347	168.956	157.487	1.037	1.272	151.797
WHITTIER								
2009	74.921	0.530	0.987	141.419	64.929	0.499	0.949	129.996
2010	101.330	0.696	1.127	145.626	74.586	0.572	1.023	130.480
2011	99.736	0.749	1.187	133.093	91.881	0.724	1.122	126.855
2012	72.597	0.742	1.383	97.877	72.304	0.719	1.312	100.597
2013	135.043	0.859	1.055	157.172	135.043	0.859	1.055	157.172
2014	87.600	0.704	1.155	124.399	84.188	0.689	1.090	122.157
2015	114.520	0.733	1.084	156.317	104.851	0.704	0.989	148.883
2016	296.179	1.143	1.420	259.097	249.056	0.946	1.294	263.363
2017	315.766	1.220	1.879	258.770	258.768	1.074	1.662	240.925
2018	152.992	0.834	1.415	183.422	138.909	0.744	1.300	186.710
WILDOMAR								
2009	59.707	1.484	0.998	40.246	52.853	1.368	0.839	38.632
2010	127.124	1.122	1.565	113.258	79.888	0.881	1.172	90.656
2011	109.406	1.219	1.225	89.739	108.810	1.210	1.197	89.923
2012	88.539	0.725	0.805	122.193	87.186	0.690	0.756	126.346
2013	40.512	0.555	0.656	72.932	40.122	0.554	0.656	72.407
2014	118.493	0.806	0.743	147.031	112.300	0.772	0.683	145.548
2015	52.699	0.597	1.255	88.256	48.313	0.566	1.054	85.401
2016	145.671	1.092	0.954	133.411	140.811	1.065	0.865	132.249
2017	160.508	1.031	1.016	155.709	126.730	0.811	0.934	156.273
2018	105.497	0.936	0.848	112.657	96.615	0.812	0.762	119.004
YUCCA VALLEY								
2009	192.279	1.158	3.193	165.979	189.316	1.151	3.140	164.451
2010	307.670	3.017	5.167	101.994	235.893	2.370	4.016	99.547
2011	436.441	2.163	6.922	201.767	354.867	1.966	5.598	180.481
2012	319.821	3.413	7.170	93.708	250.377	2.806	5.467	89.239
2013	216.972	1.500	4.983	144.620	216.966	1.500	4.983	144.626
2014	304.182	1.490	4.856	204.146	293.662	1.407	4.851	208.750
2015	389.085	1.804	3.922	215.688	260.176	1.189	2.708	218.766
2016	694.456	3.917	3.894	177.297	670.831	3.780	3.125	177.445
2017	411.497	2.306	1.609	178.470	381.275	2.077	1.516	183.553
2018	376.985	2.036	2.757	185.130	229.733	1.587	1.842	144.746

- a. The linear charts below shows the past 10 years of dSAIDI, dSAIFI, dMAIFI and dCAIDI for all 35 districts. There are separate charts including and excluding MED. The charts shown are listed in alphabetical order of the district name.

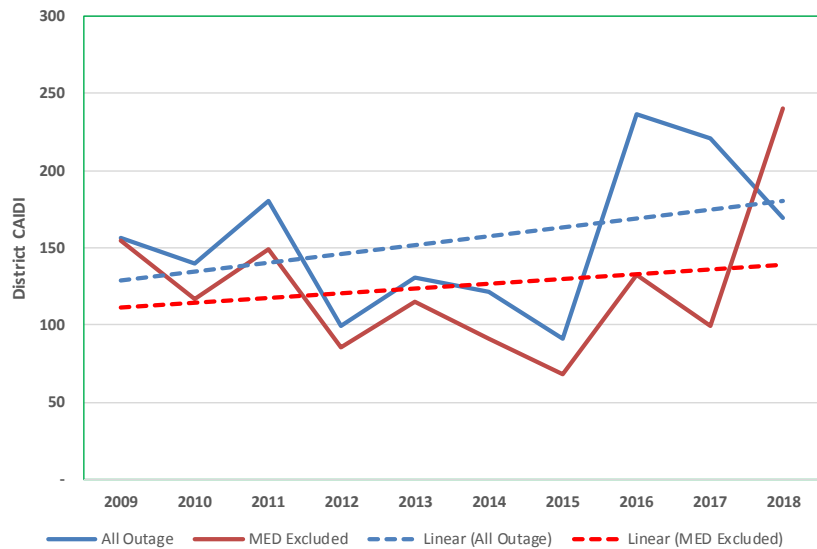
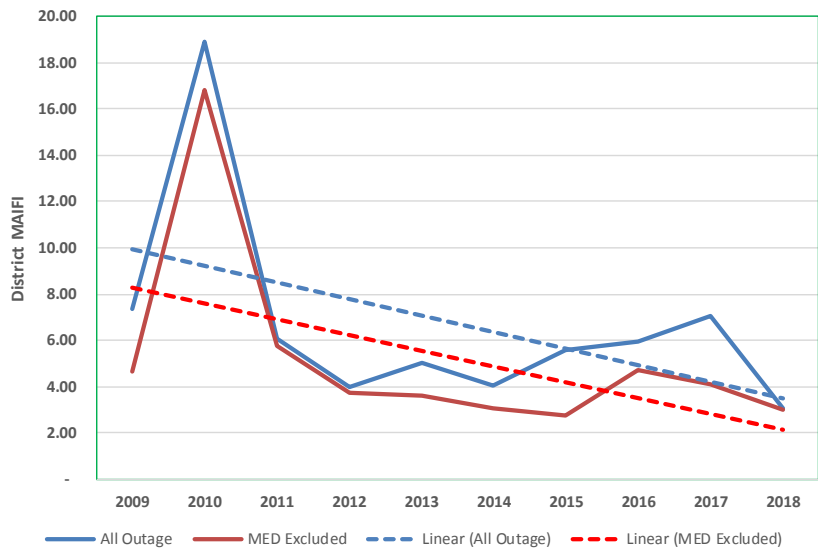
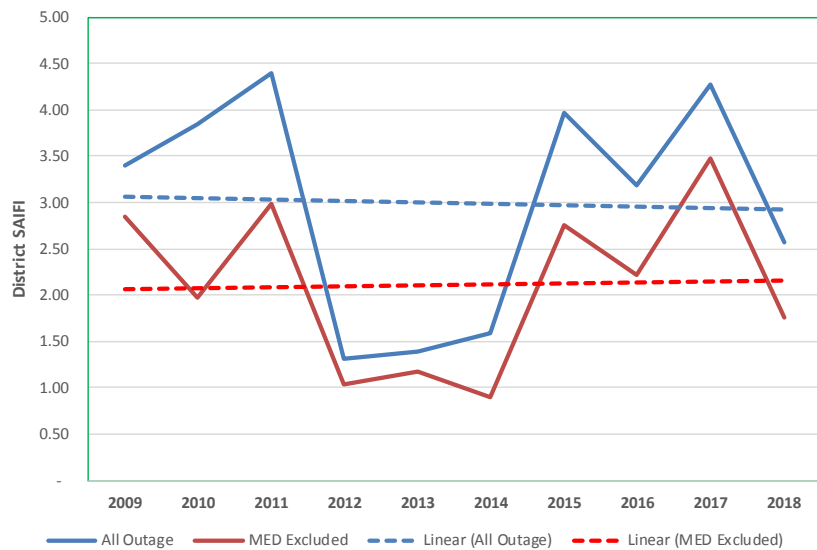
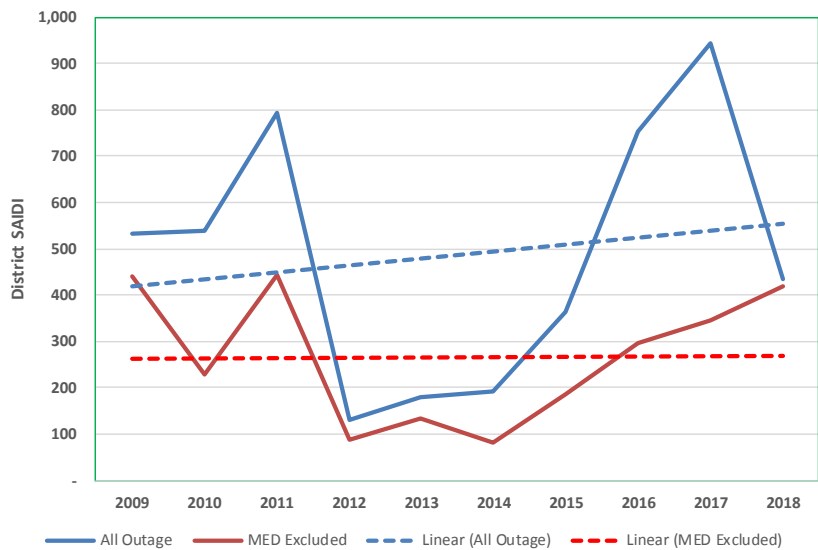
2009 - 2018 District Reliability Graphs (With Planned)

ANTELOPE VALLEY District Reliability Performance



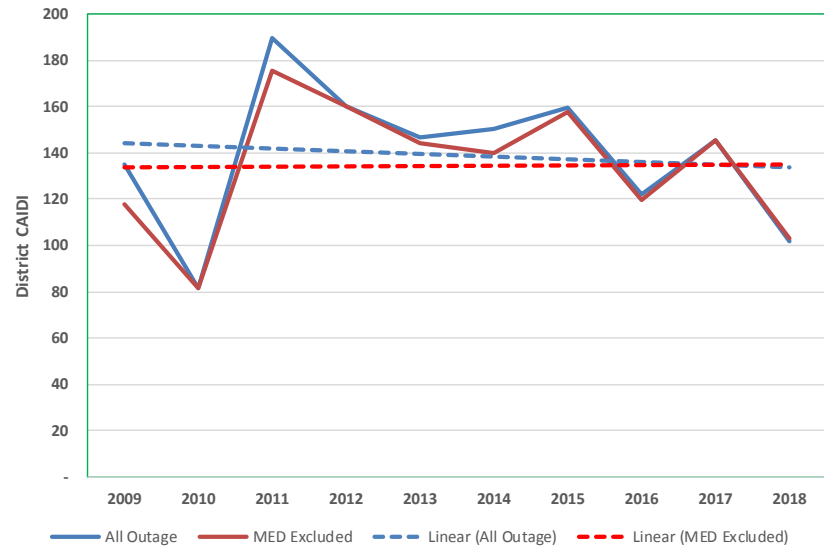
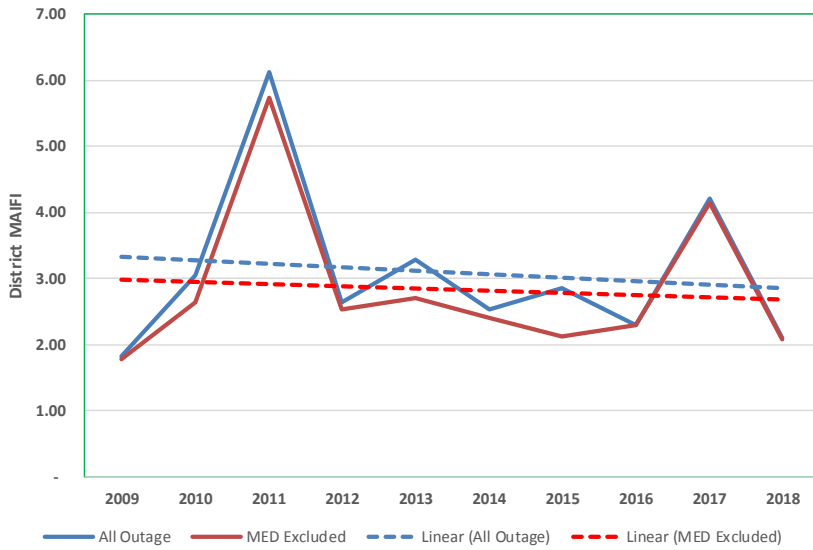
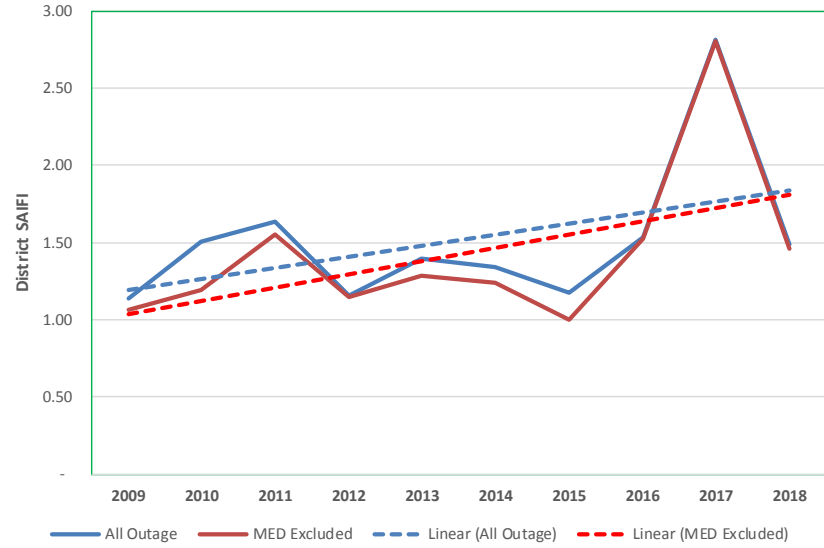
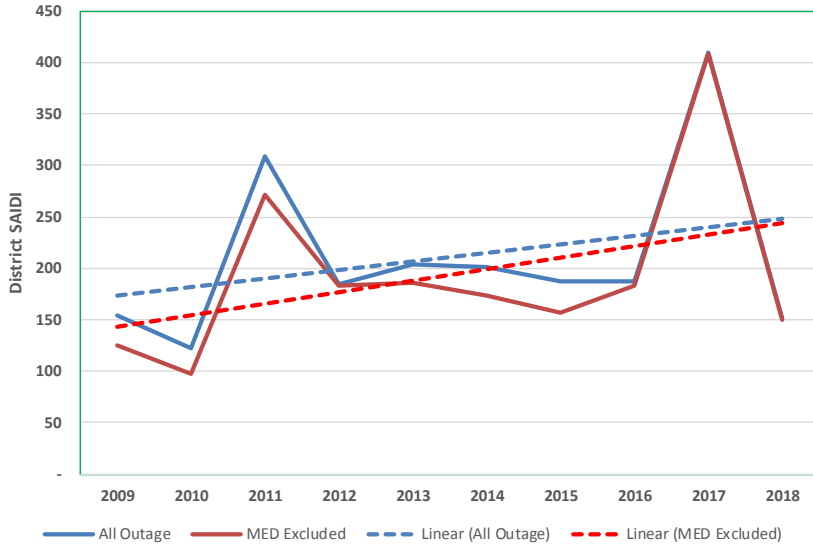
2009 - 2018 District Reliability Graphs (With Planned)

ARROWHEAD District Reliability Performance



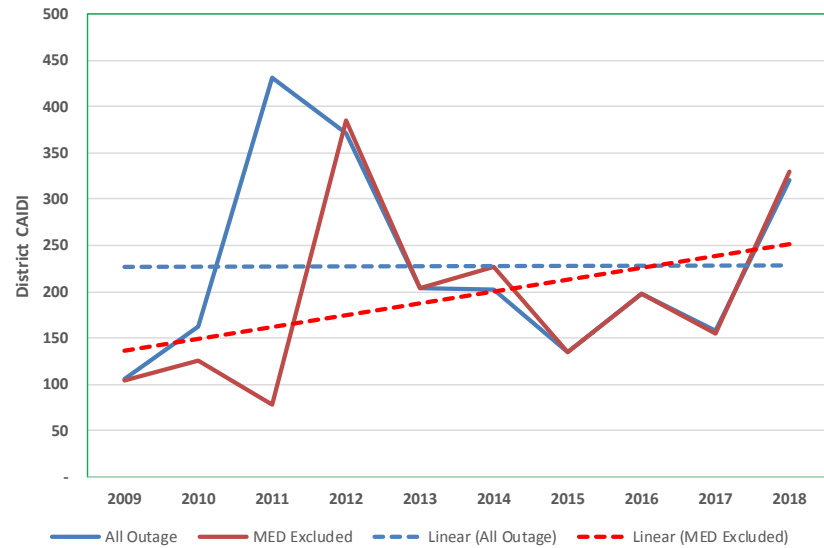
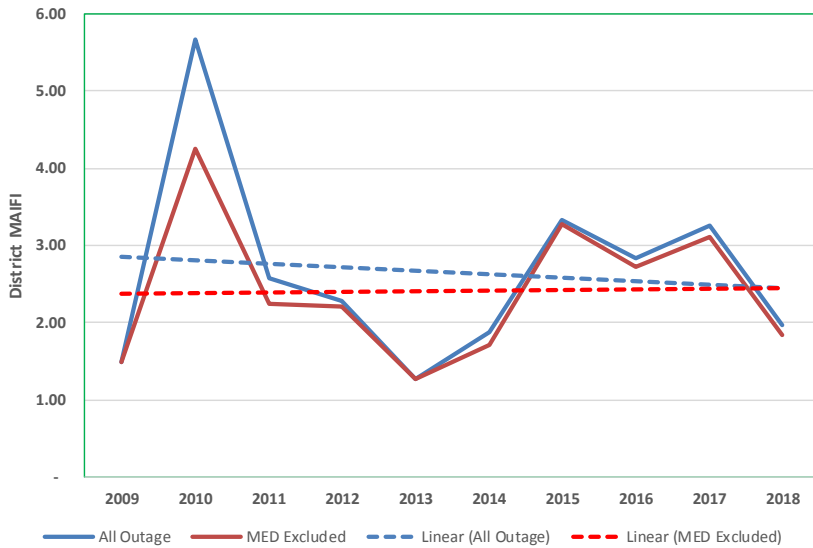
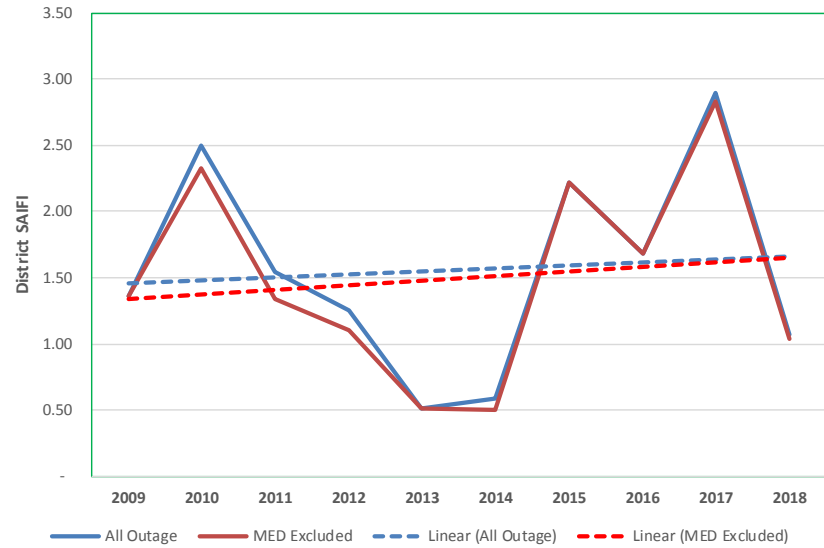
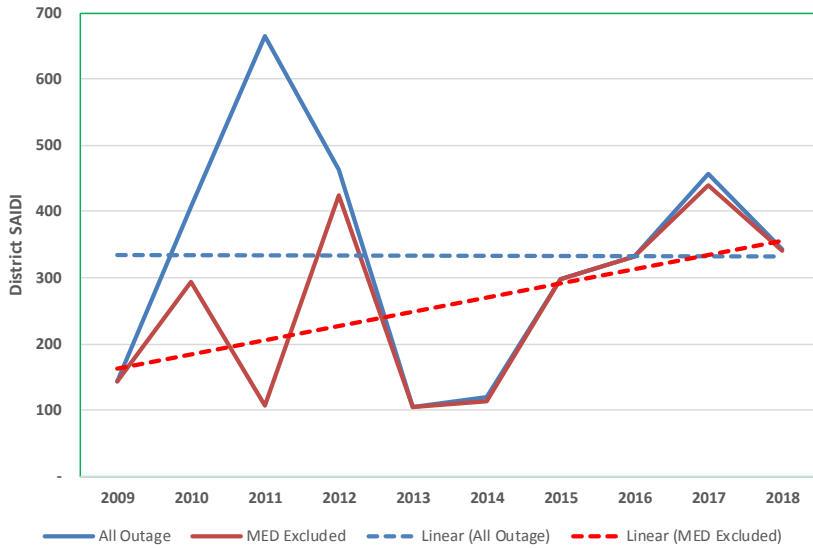
2009 - 2018 District Reliability Graphs (With Planned)

BARSTOW District Reliability Performance



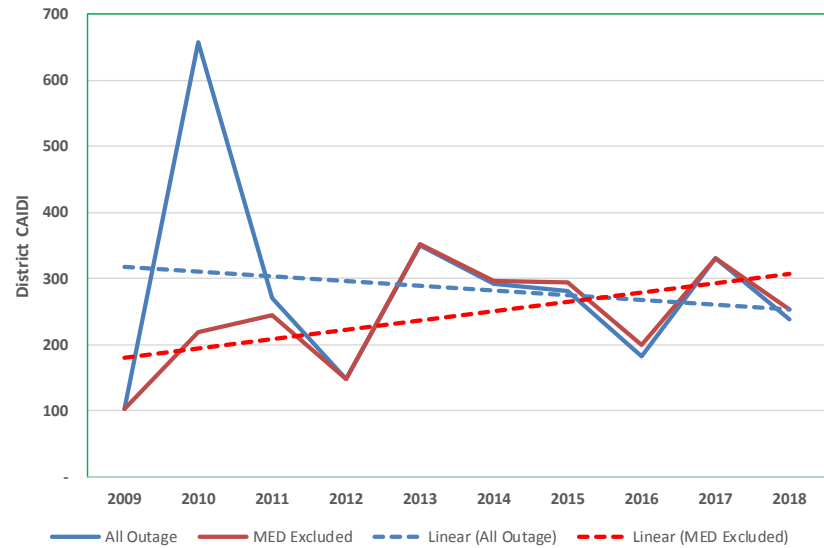
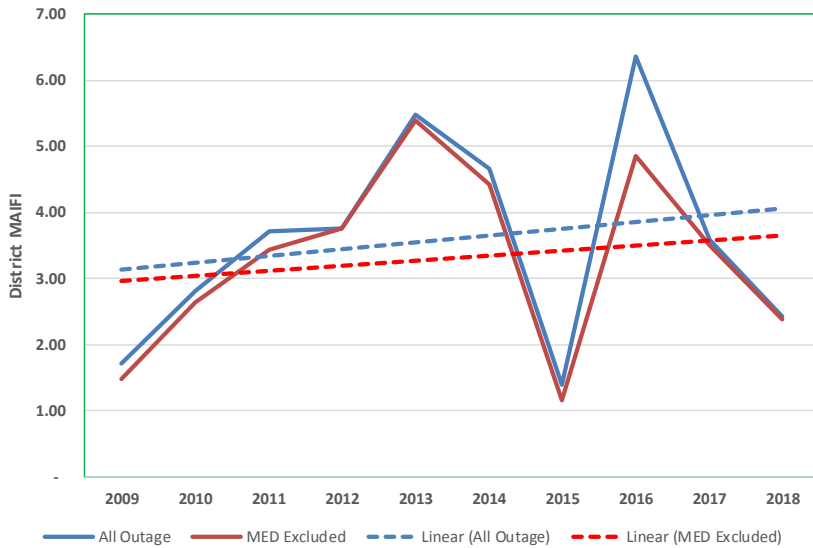
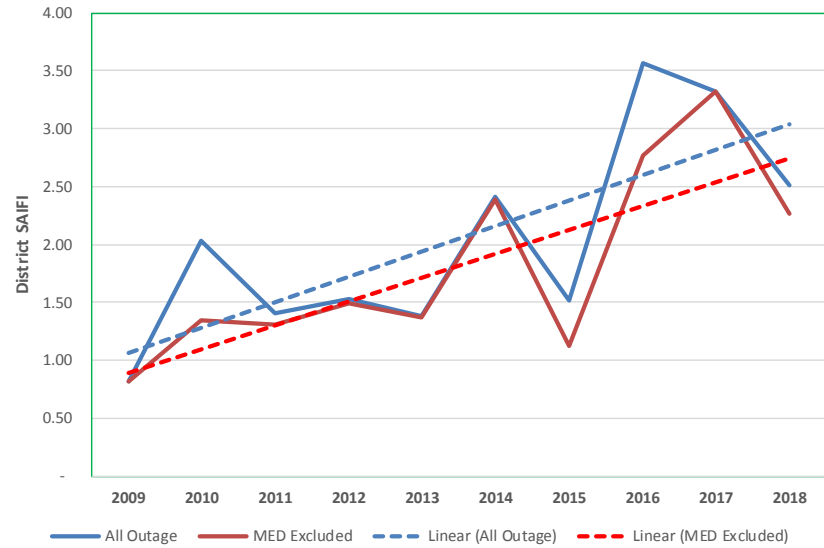
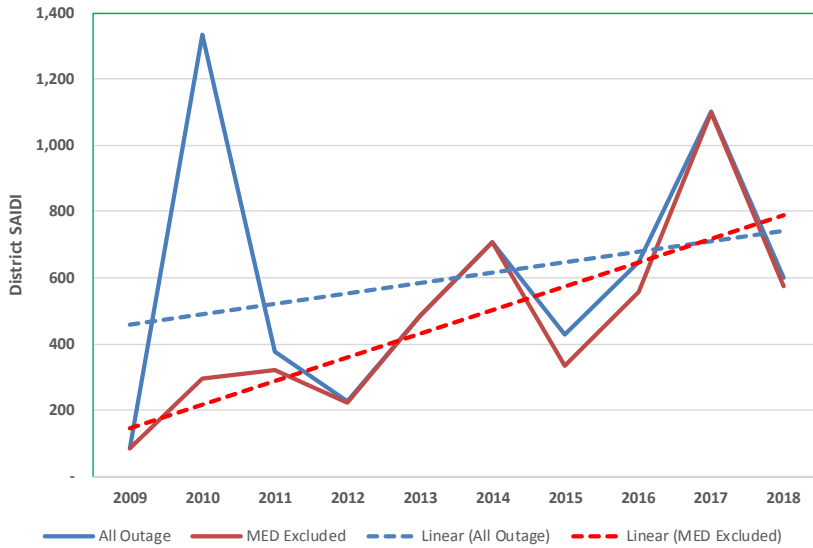
2009 - 2018 District Reliability Graphs (With Planned)

BISHOP District Reliability Performance



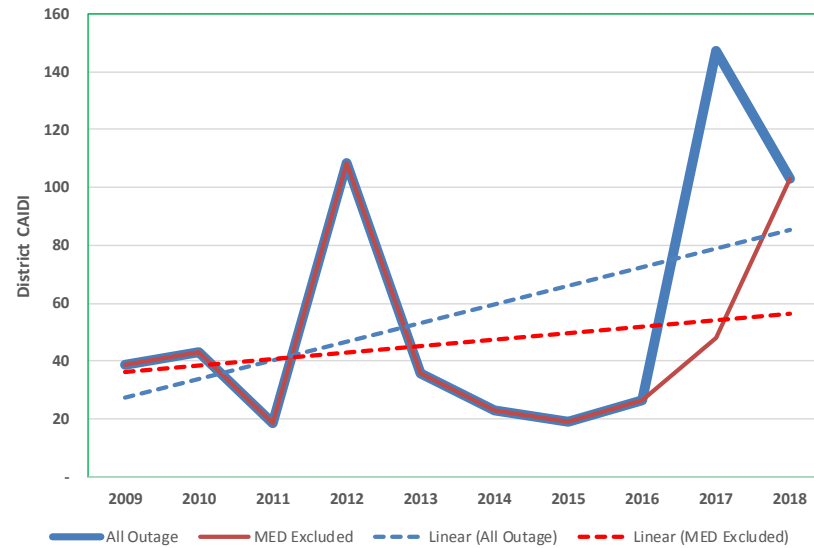
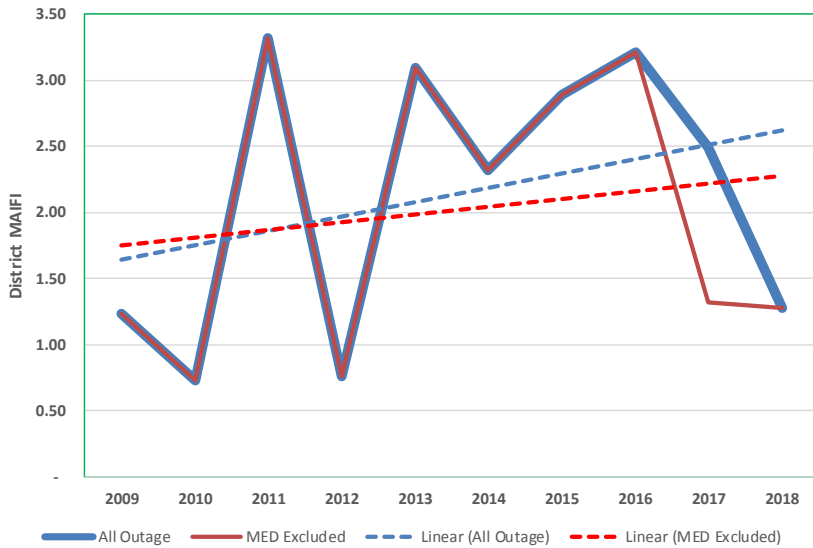
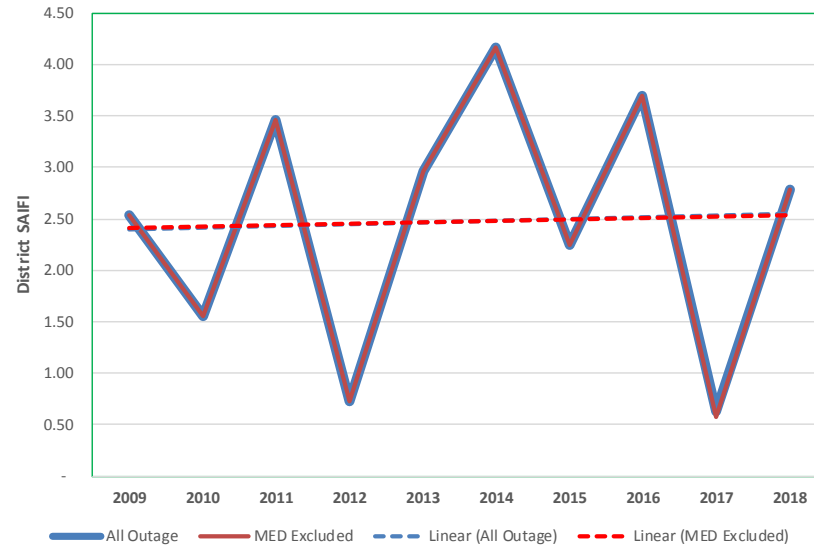
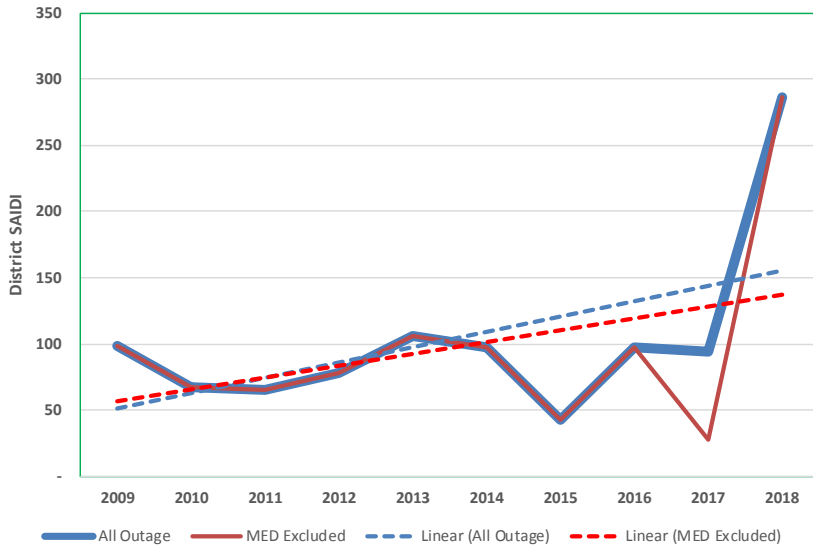
2009 - 2018 District Reliability Graphs (With Planned)

BLYTHE District Reliability Performance



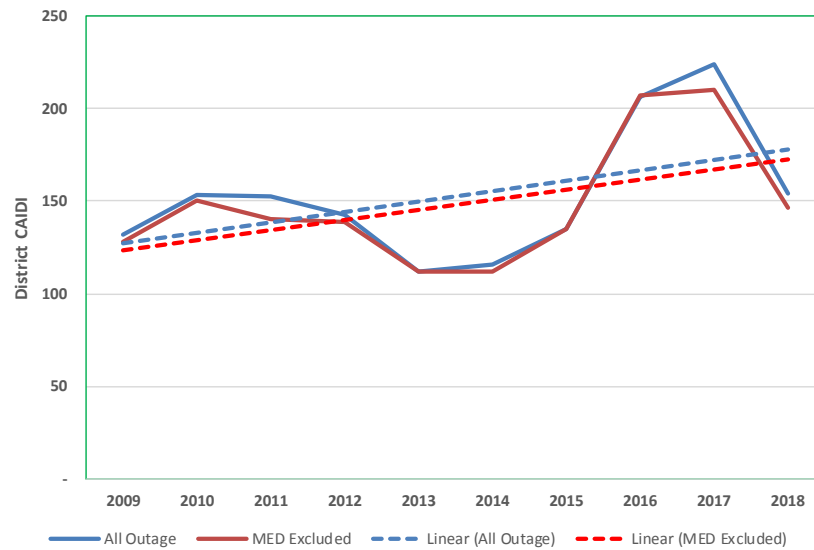
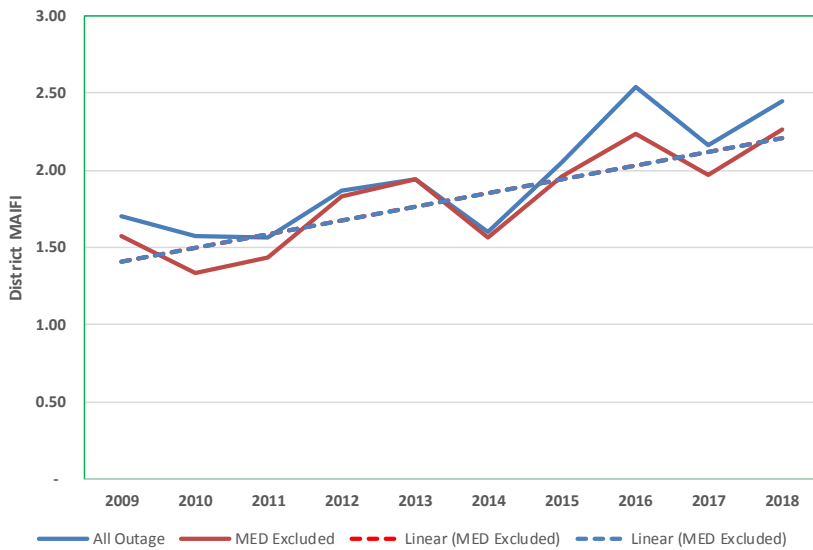
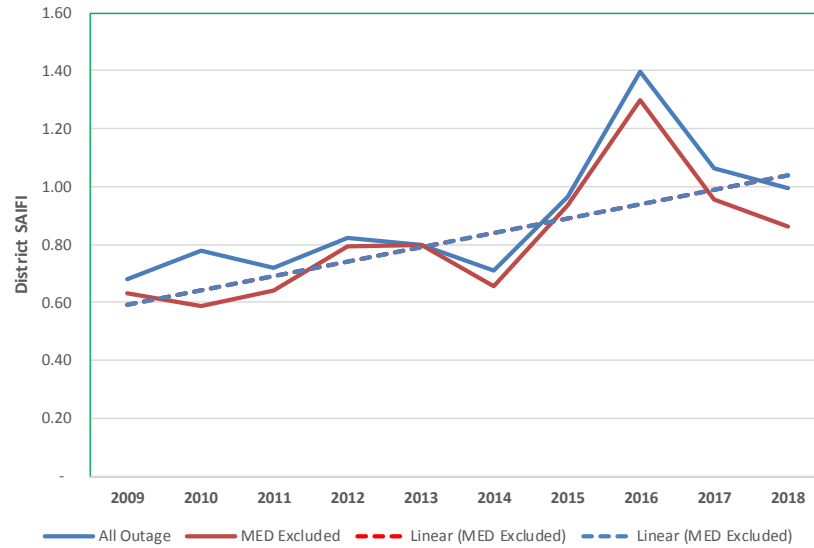
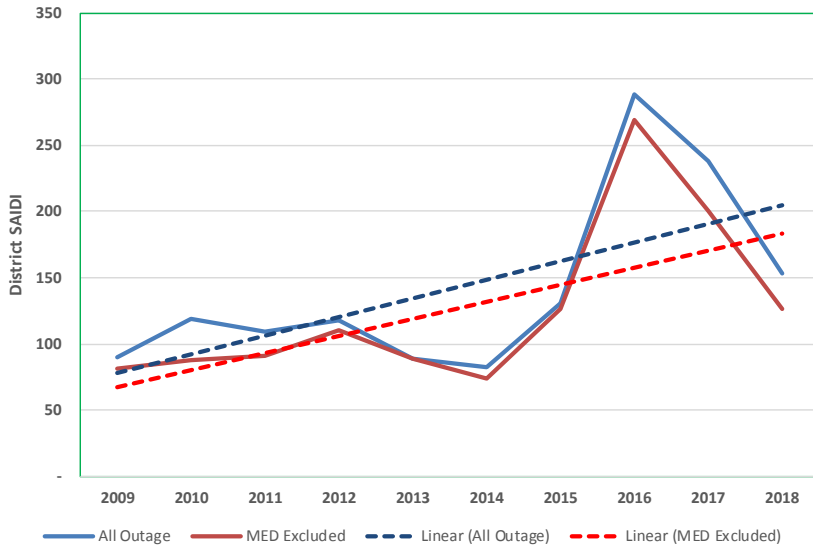
2009 - 2018 District Reliability Graphs (With Planned)

CATALINA District Reliability Performance



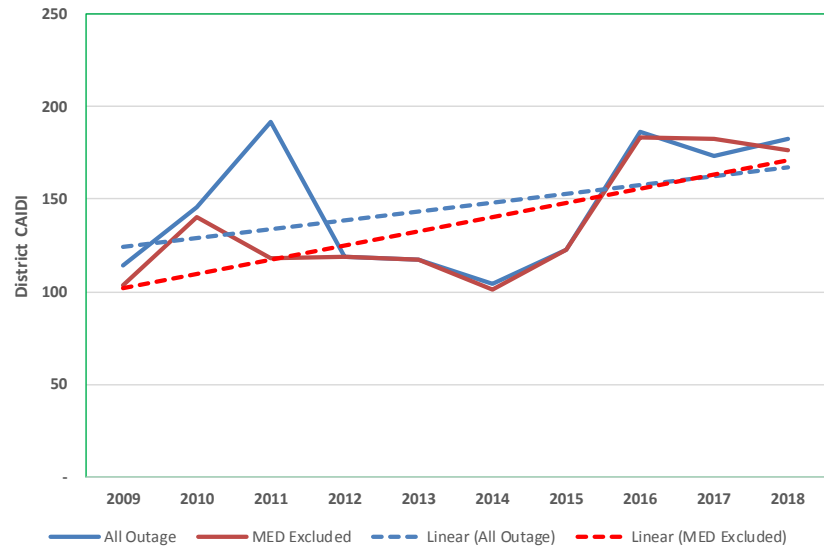
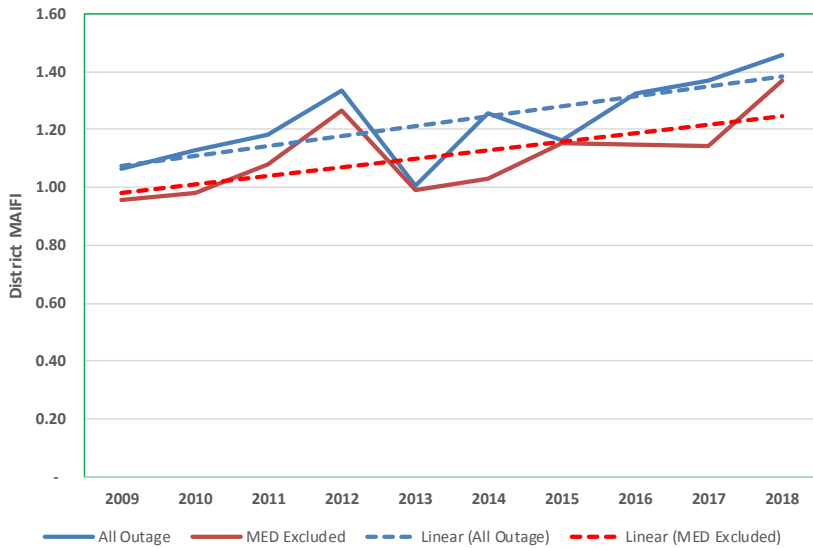
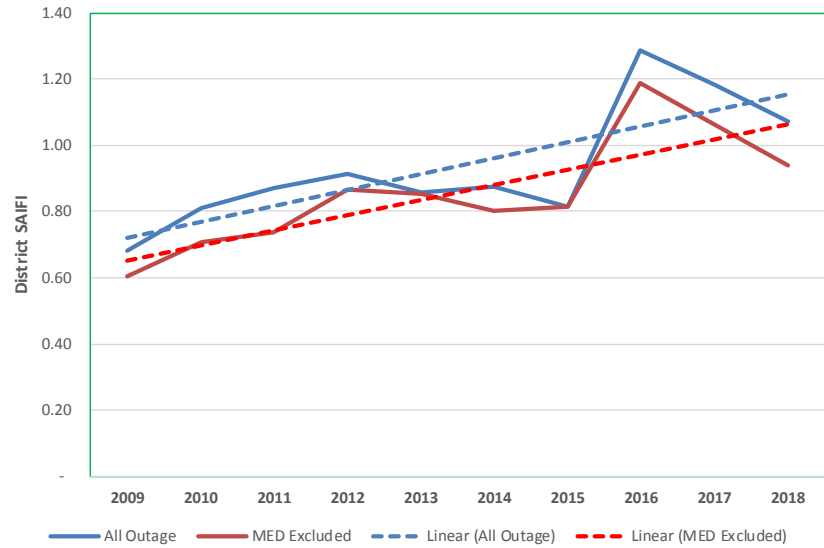
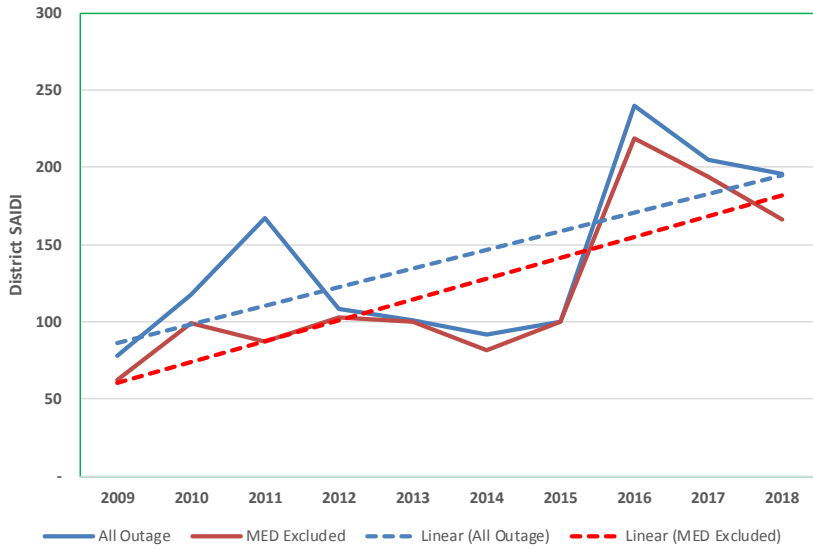
2009 - 2018 District Reliability Graphs (With Planned)

COMPTON District Reliability Performance



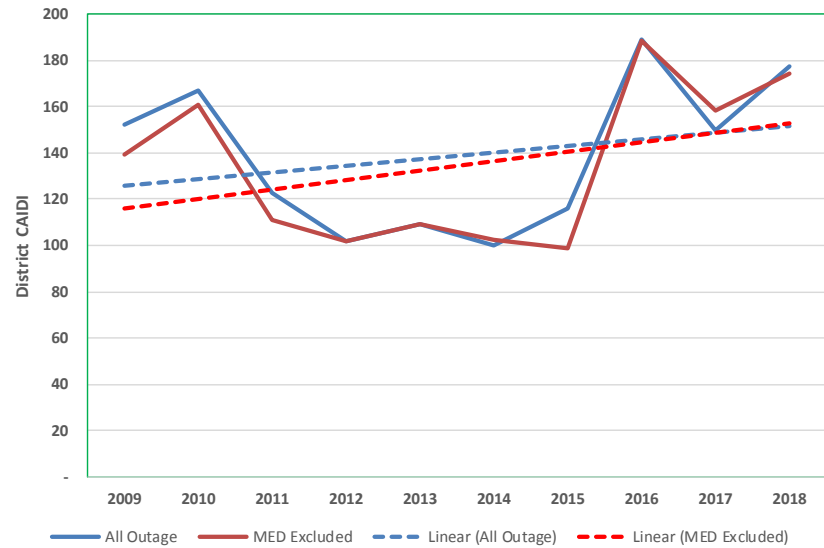
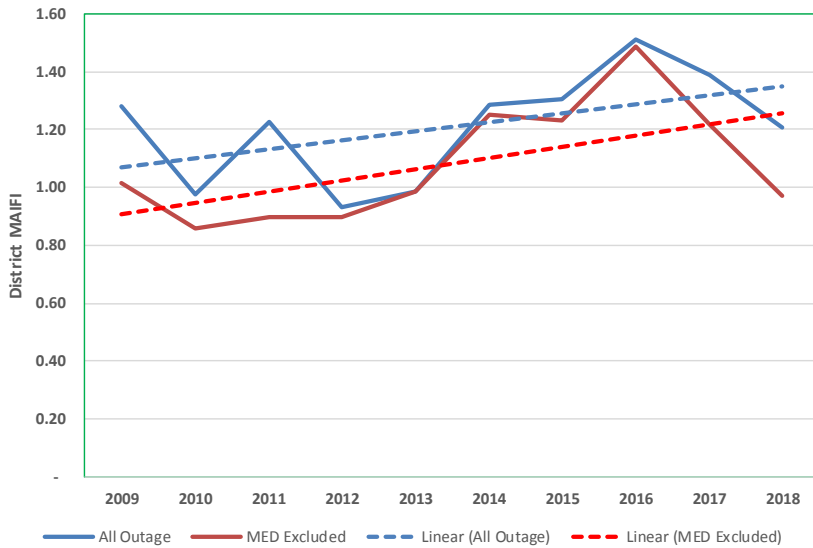
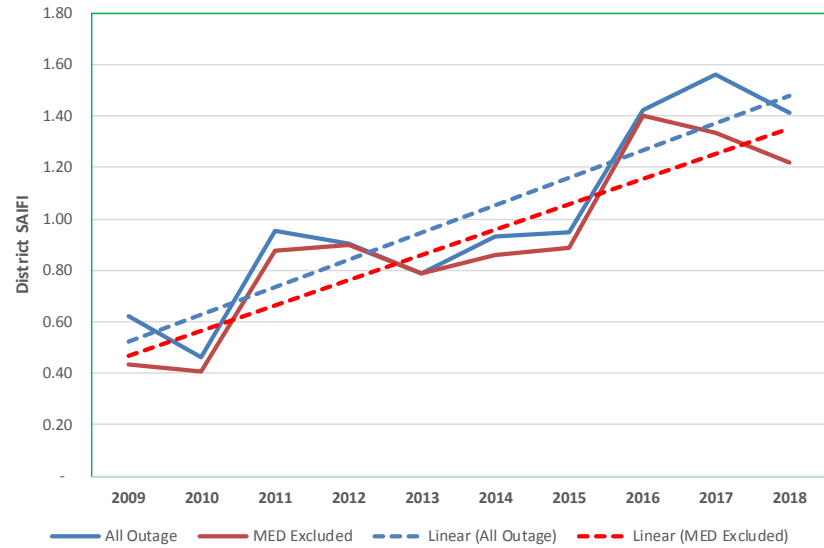
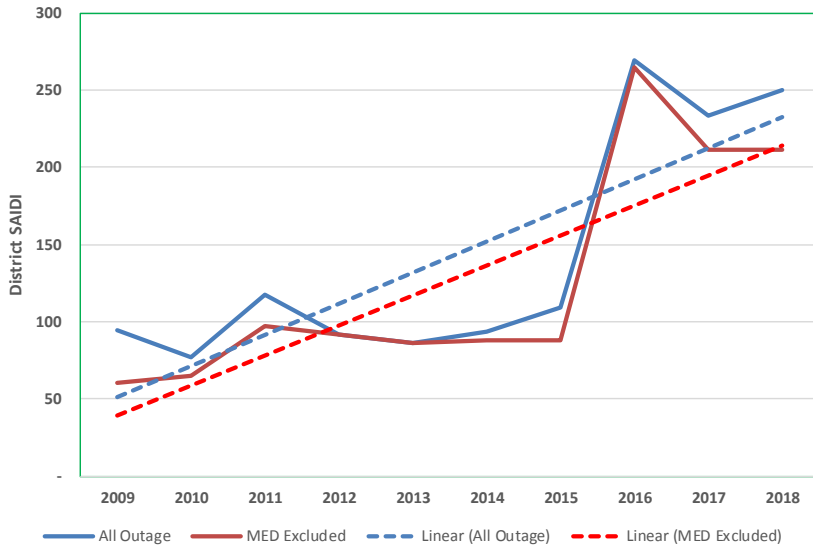
2009 - 2018 District Reliability Graphs (With Planned)

COVINA District Reliability Performance



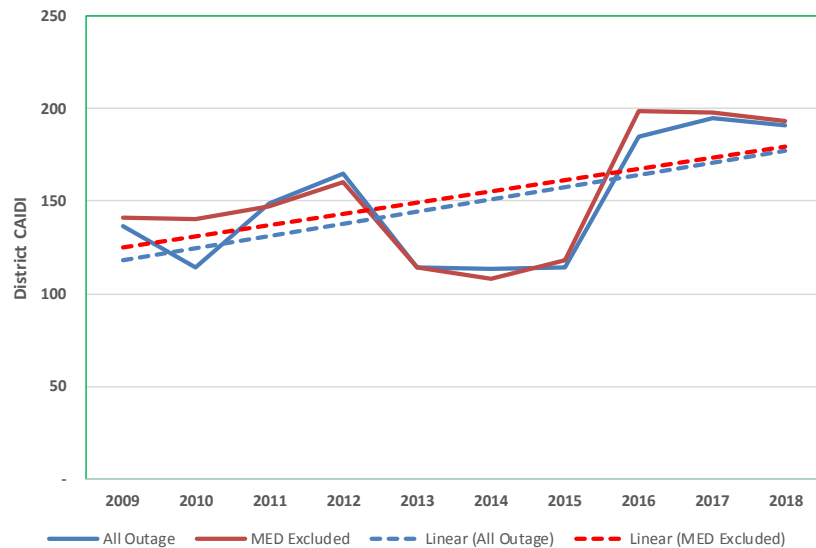
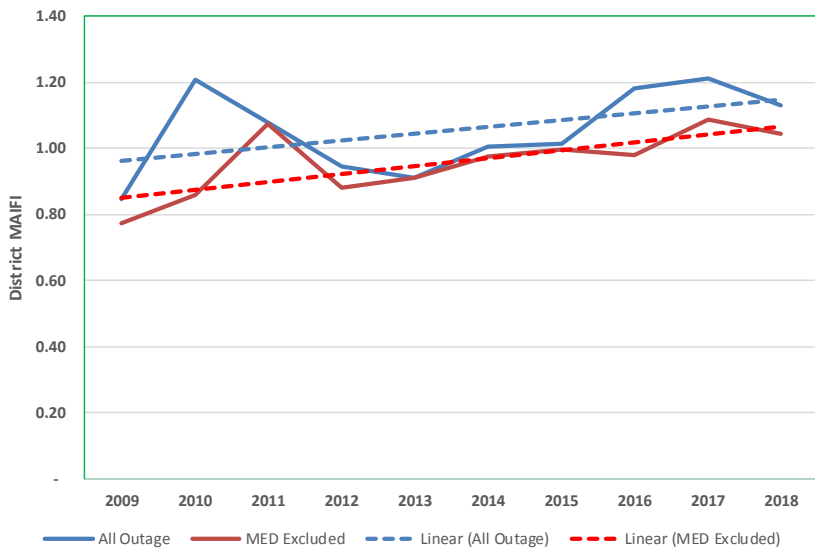
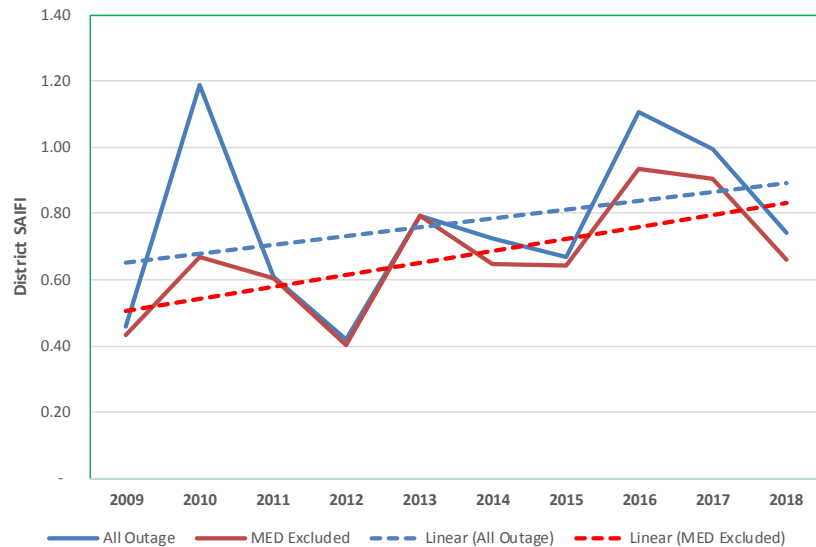
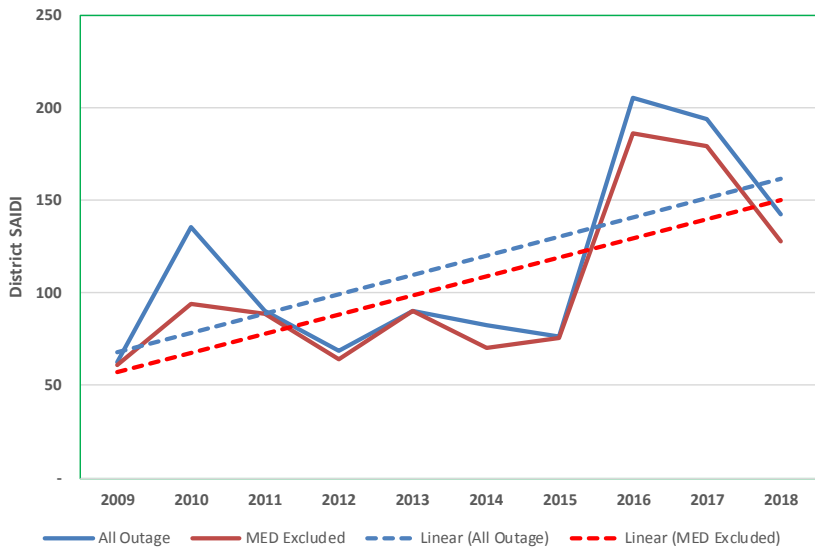
2009 - 2018 District Reliability Graphs (With Planned)

FOOTHILL District Reliability Performance



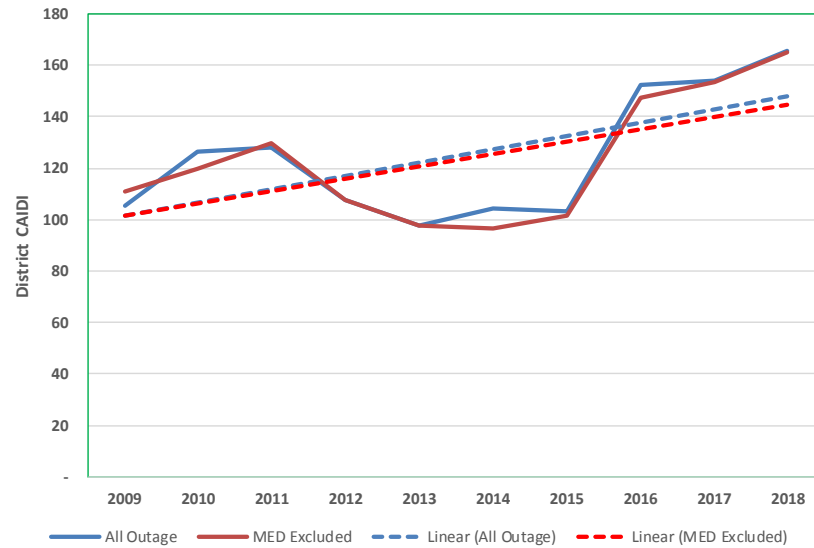
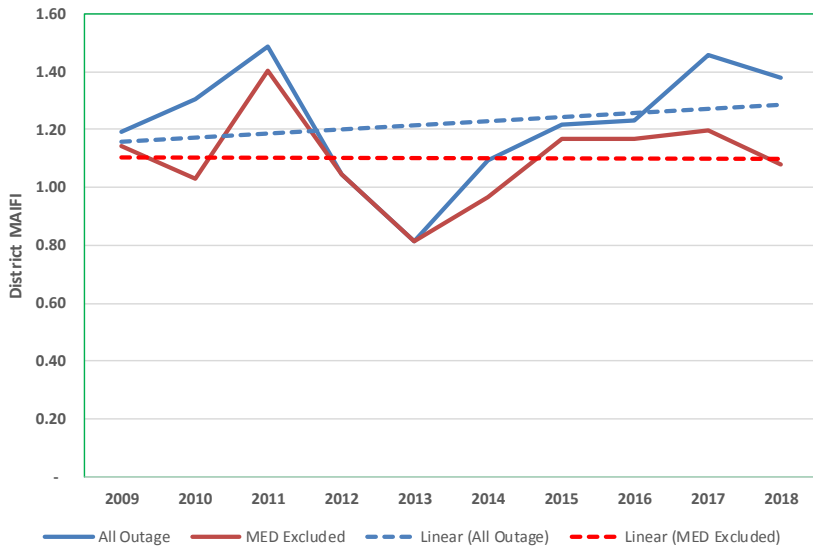
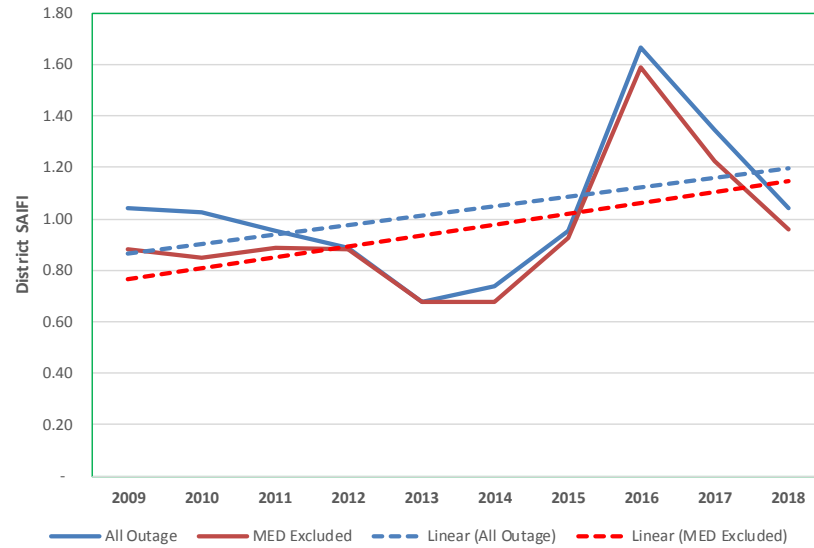
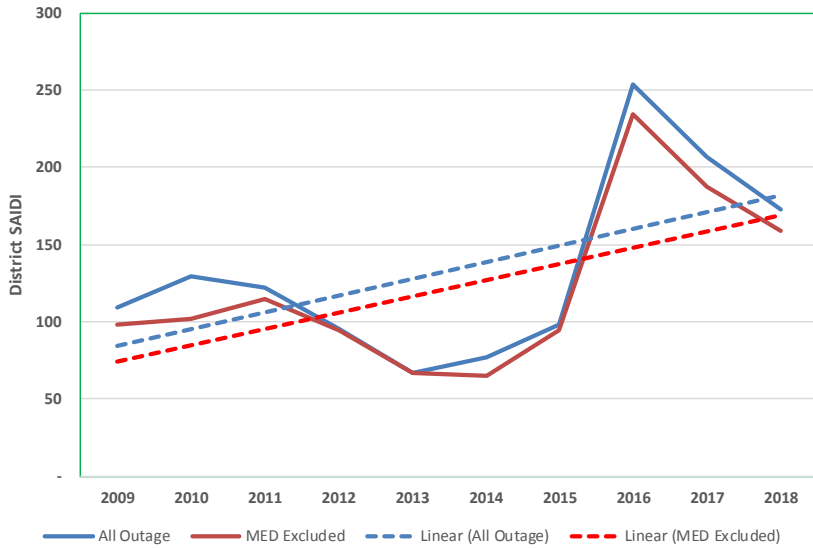
2009 - 2018 District Reliability Graphs (With Planned)

FULLERTON District Reliability Performance



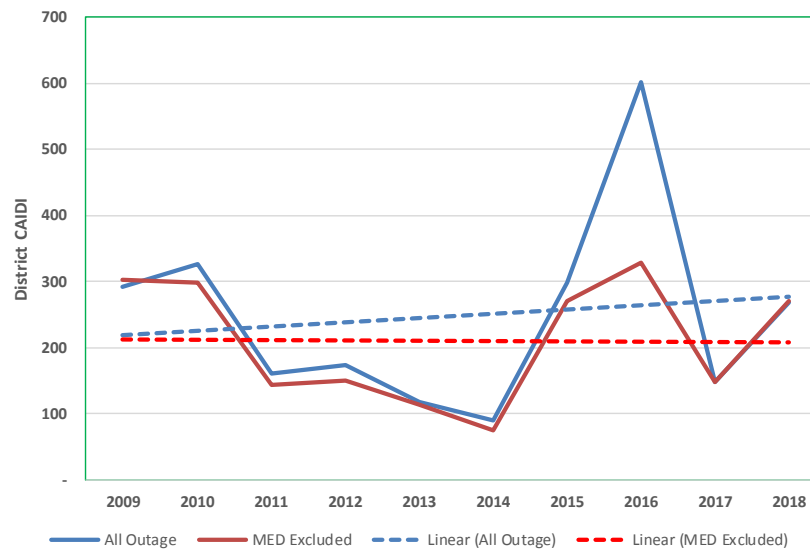
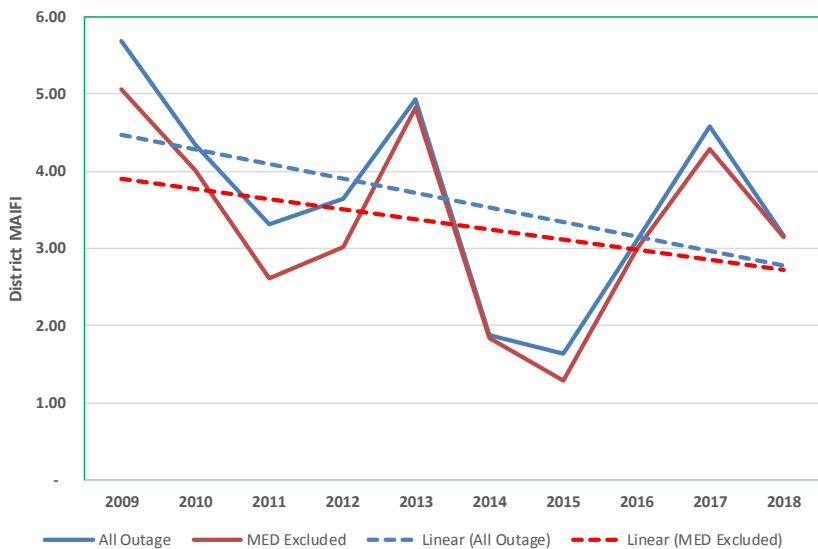
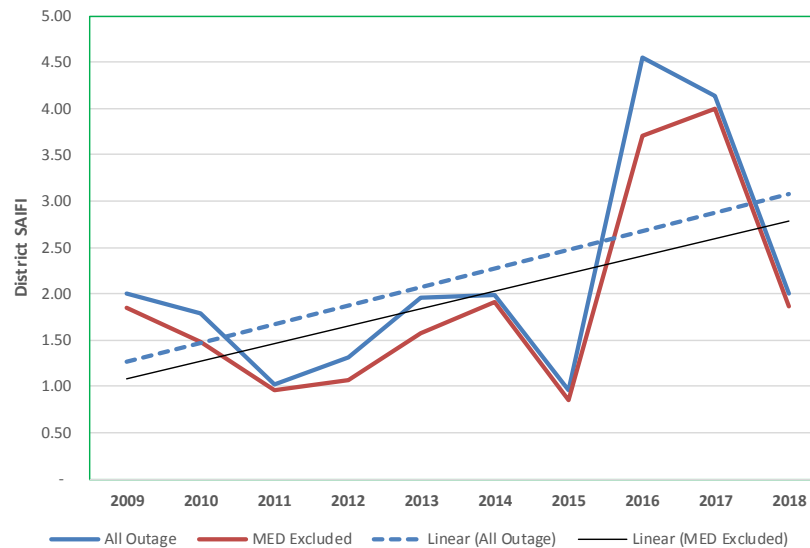
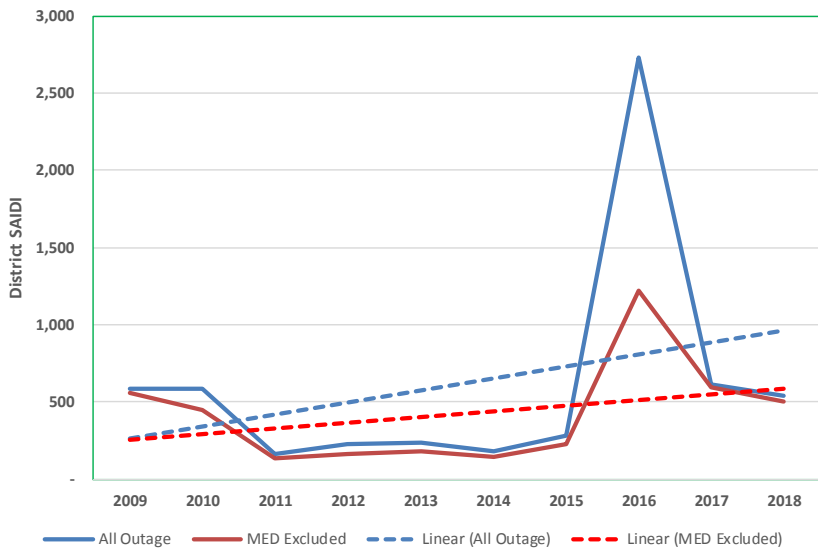
2009 - 2018 District Reliability Graphs (With Planned)

HUNTINGTON BEACH District Reliability Performance



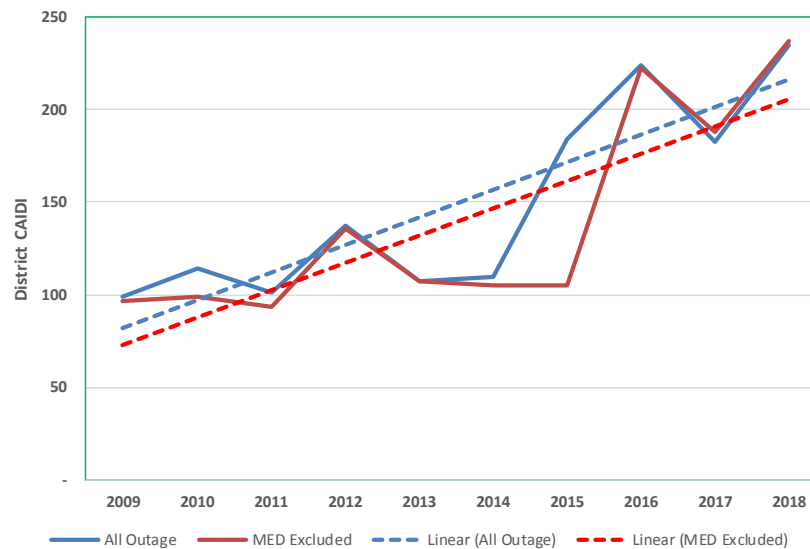
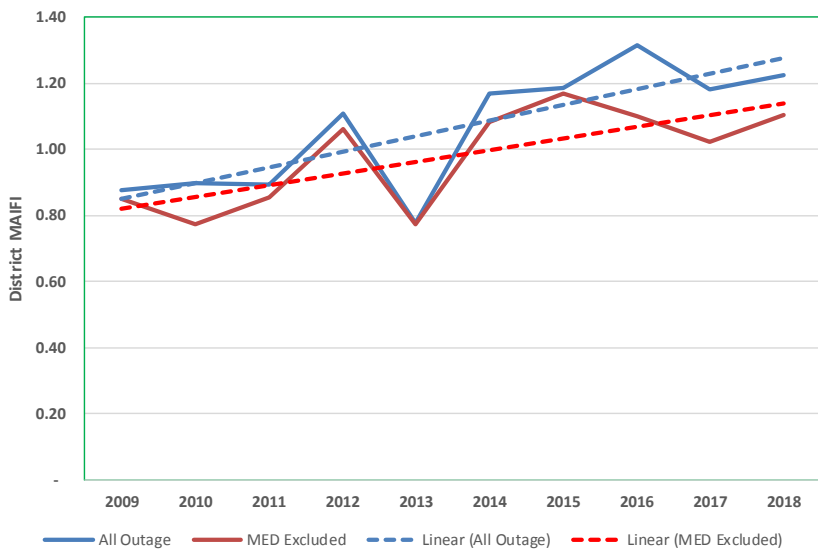
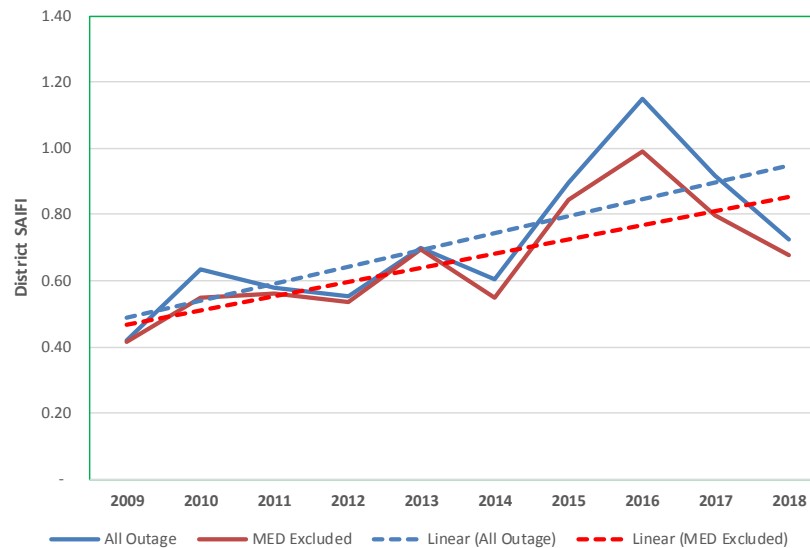
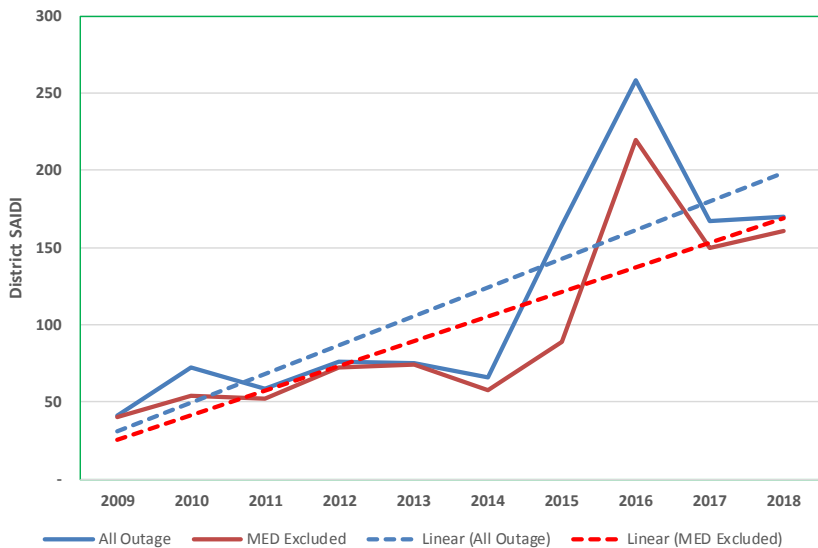
2009 - 2018 District Reliability Graphs (With Planned)

KERNVILLE District Reliability Performance



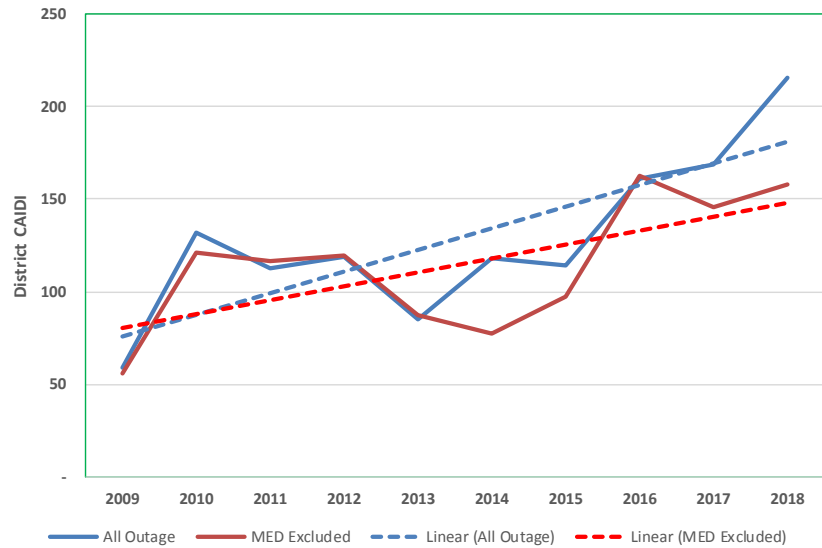
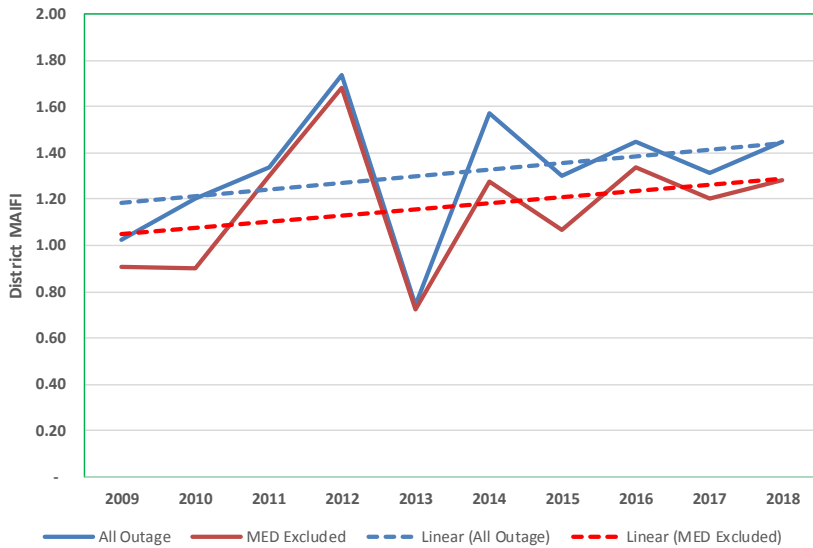
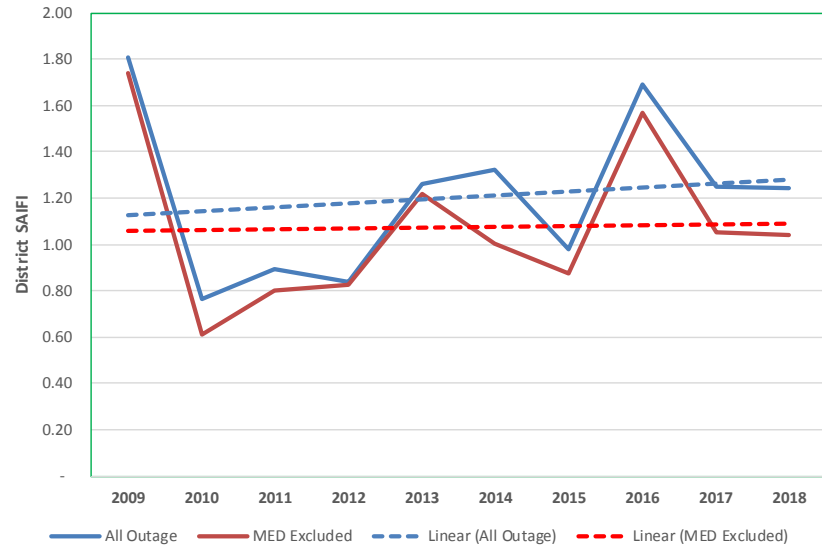
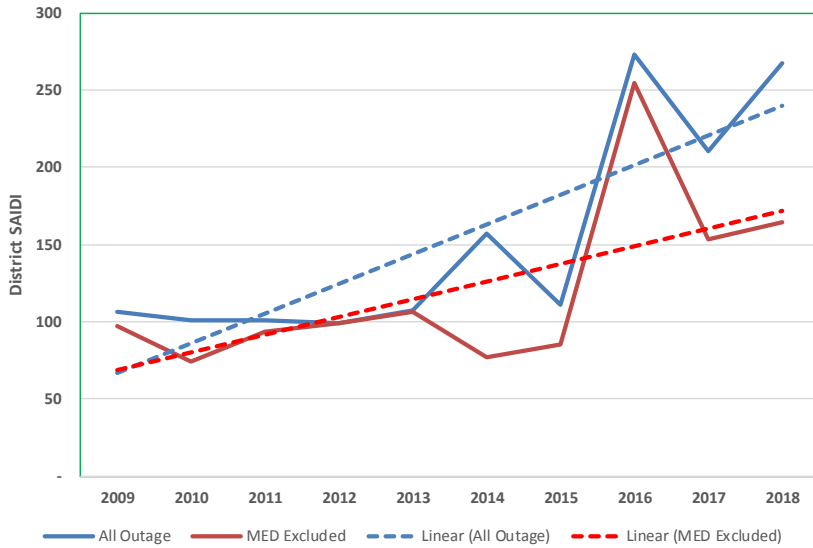
2009 - 2018 District Reliability Graphs (With Planned)

LONG BEACH District Reliability Performance



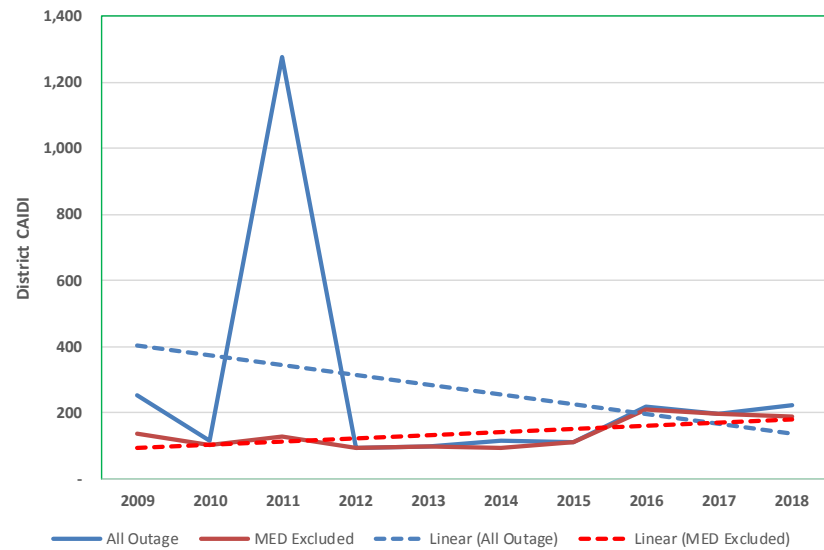
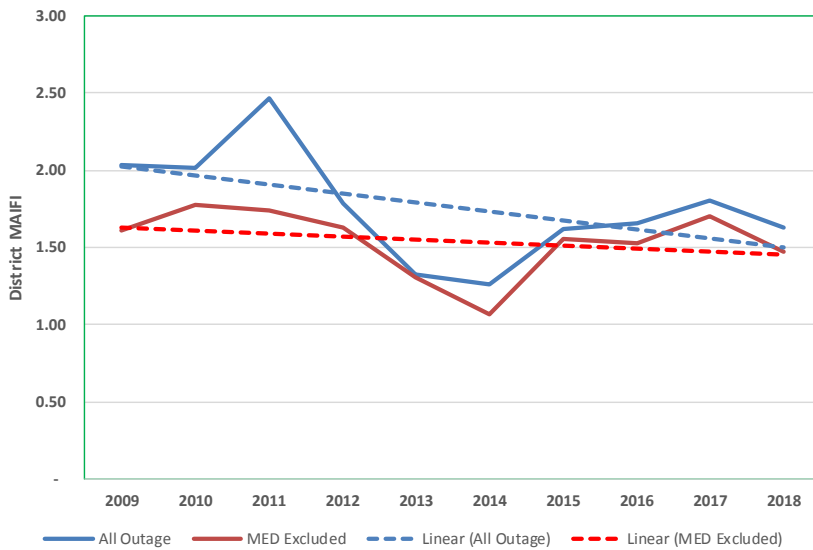
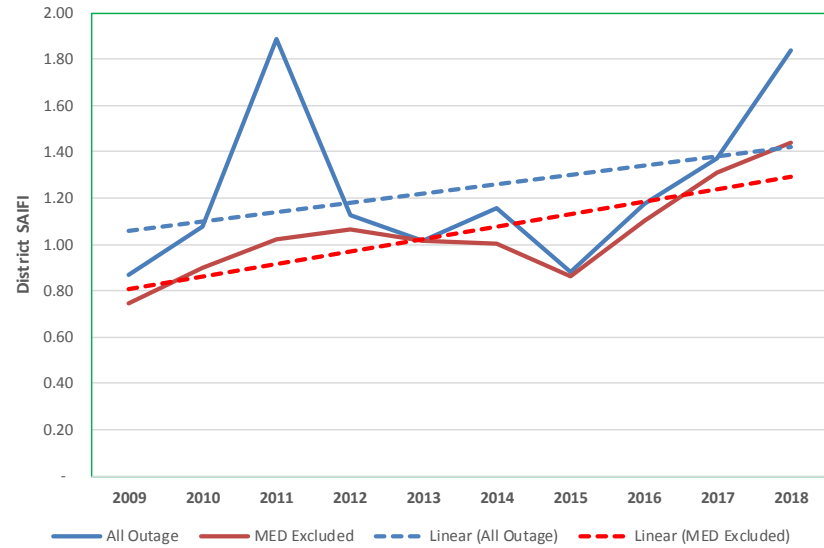
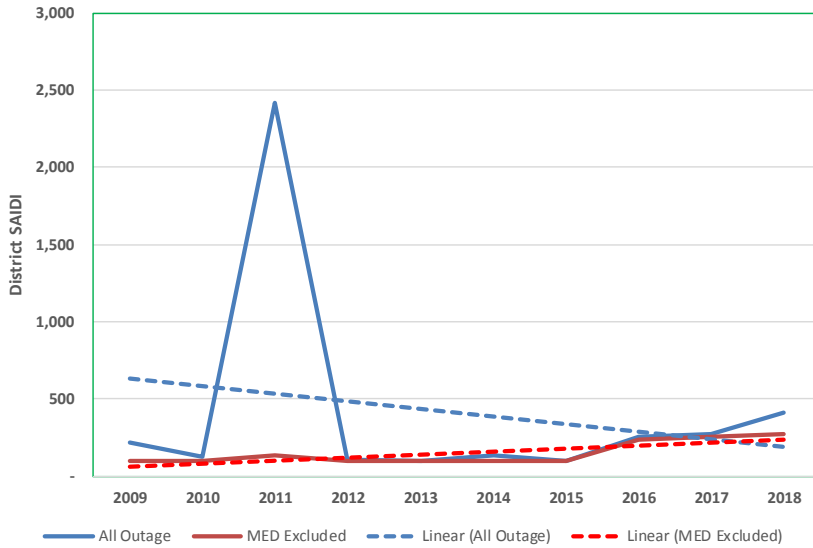
2009 - 2018 District Reliability Graphs (With Planned)

MENIFEE District Reliability Performance



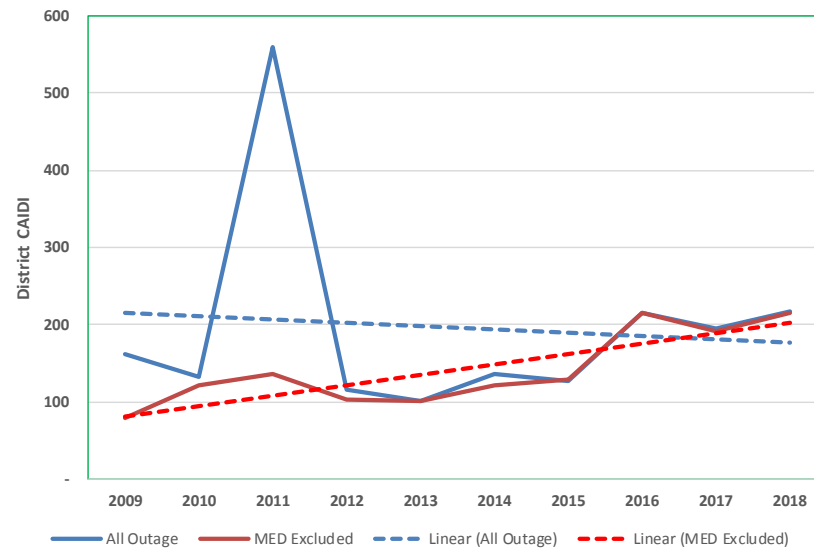
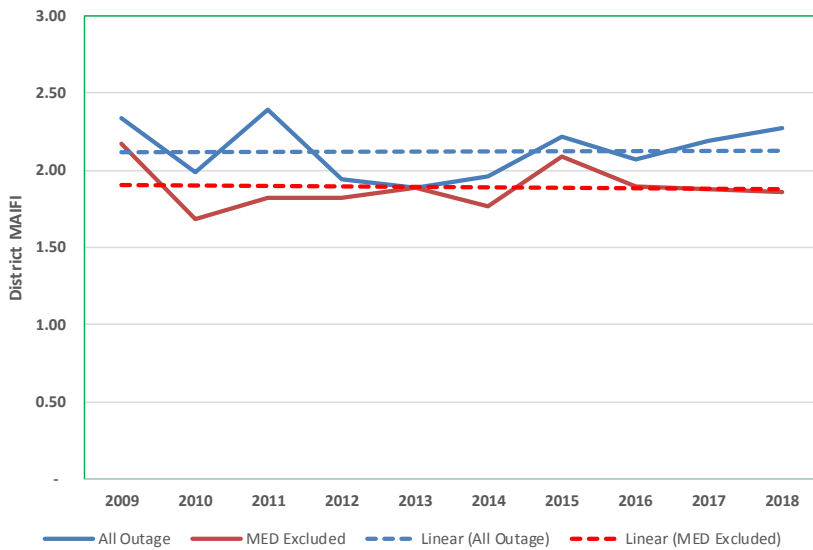
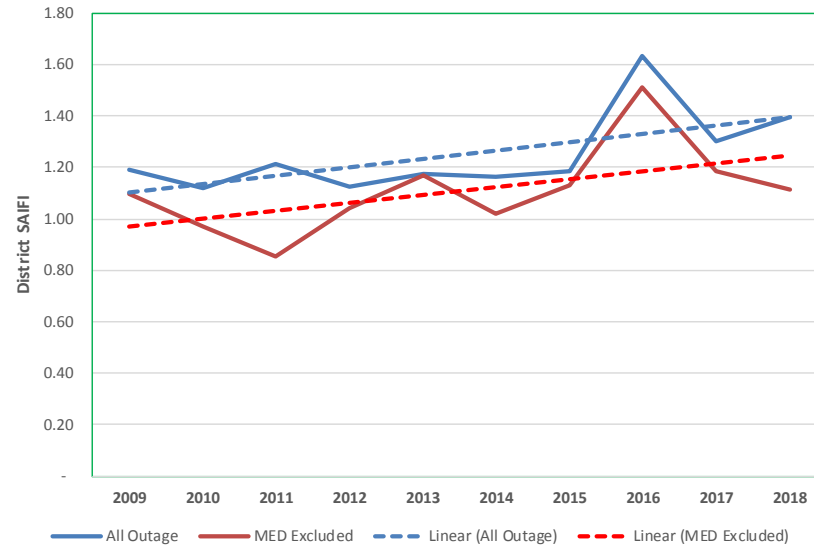
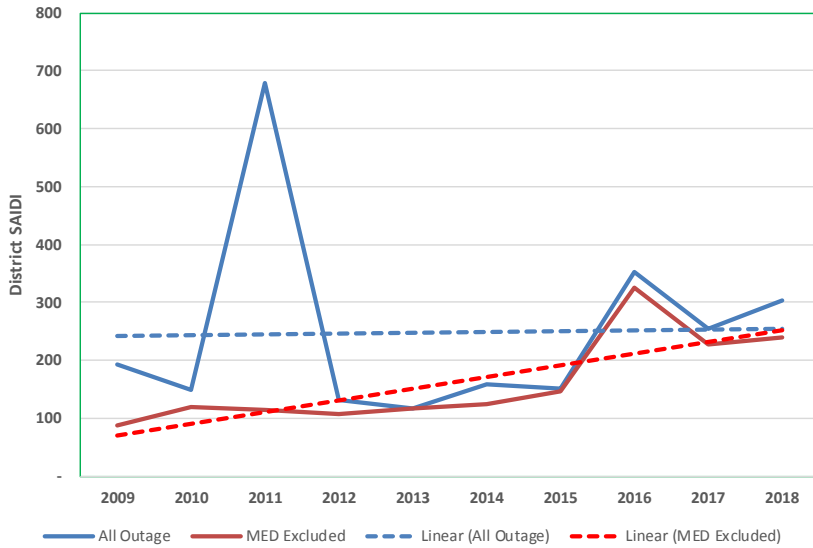
2009 - 2018 District Reliability Graphs (With Planned)

MONROVIA District Reliability Performance



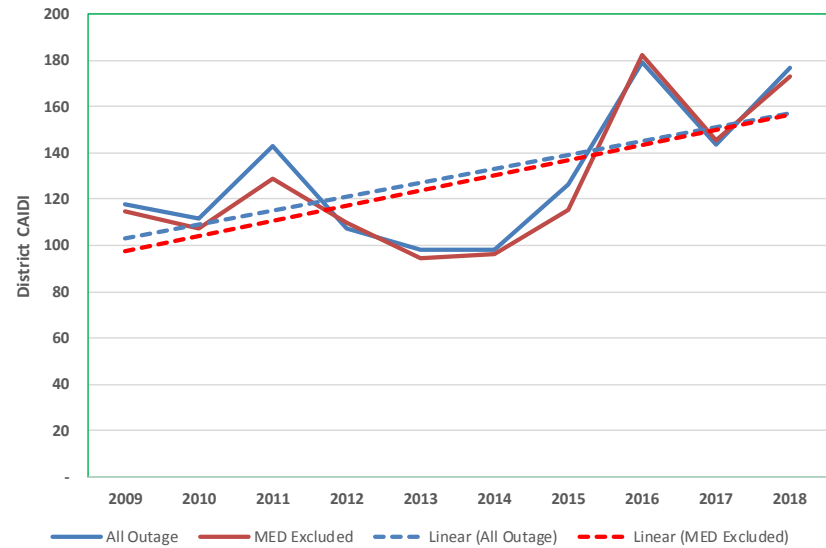
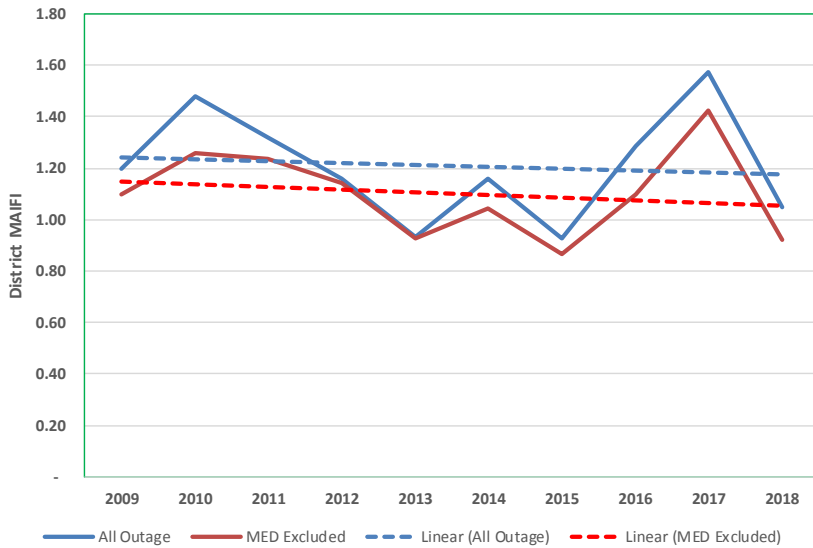
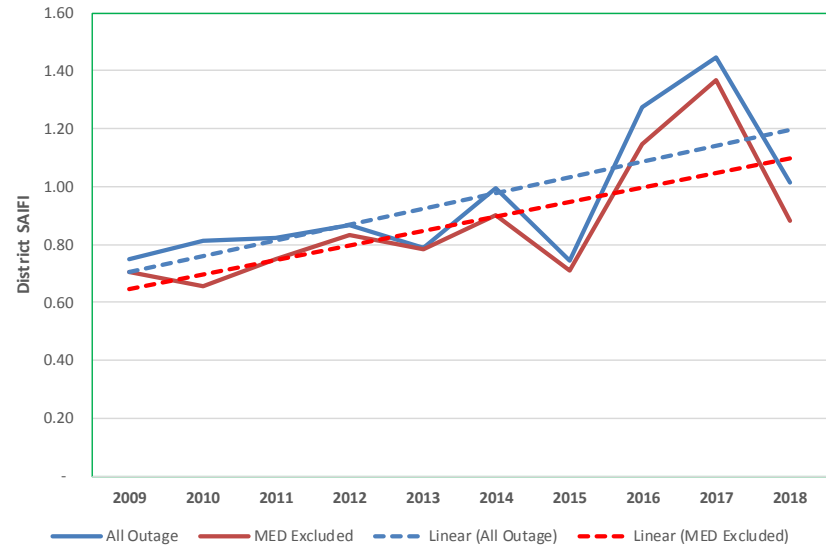
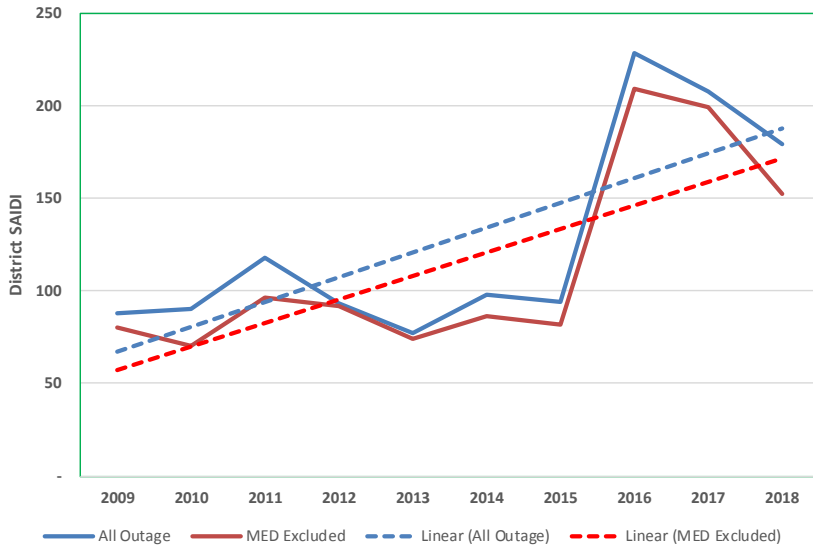
2009 - 2018 District Reliability Graphs (With Planned)

MONTEBELLO District Reliability Performance



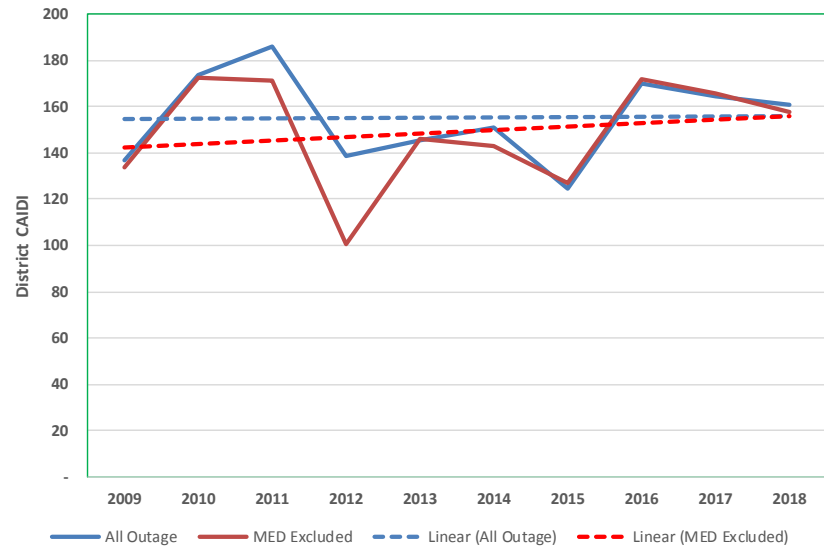
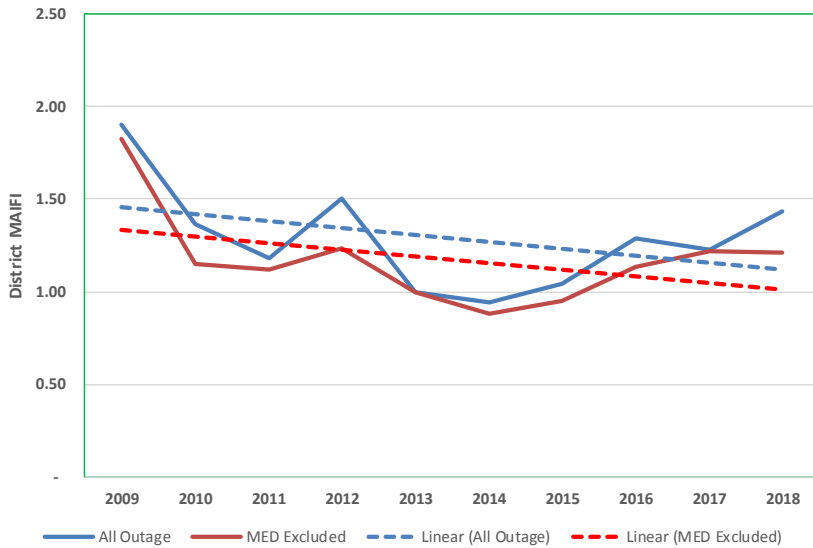
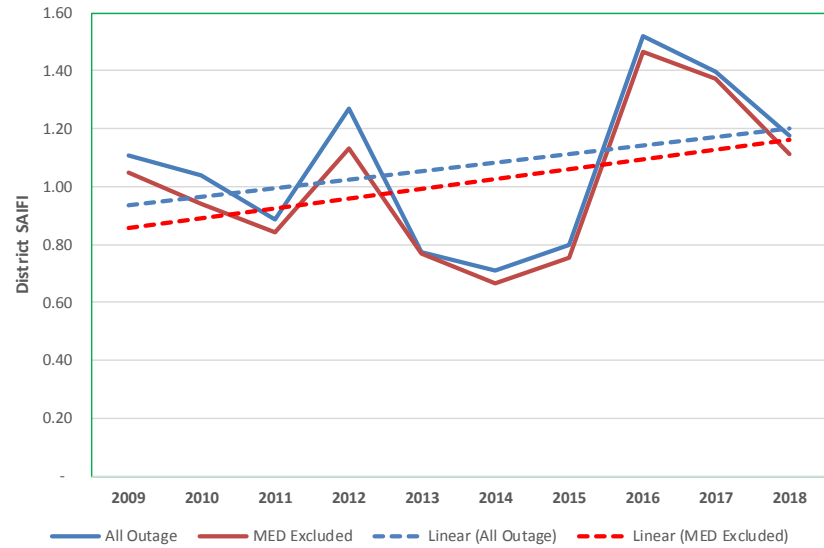
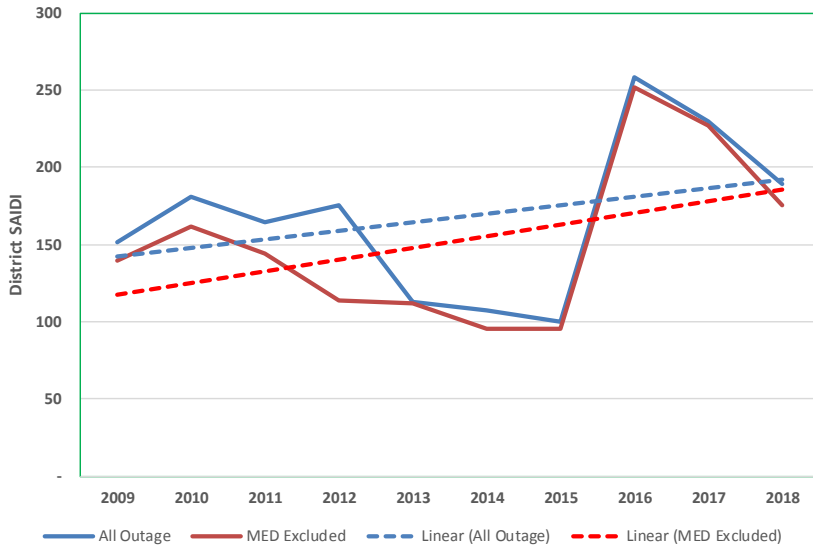
2009 - 2018 District Reliability Graphs (With Planned)

ONTARIO District Reliability Performance



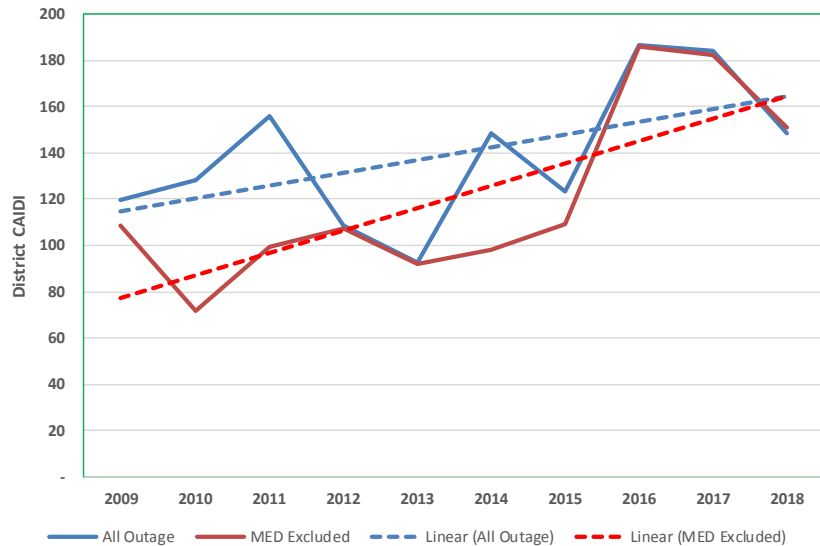
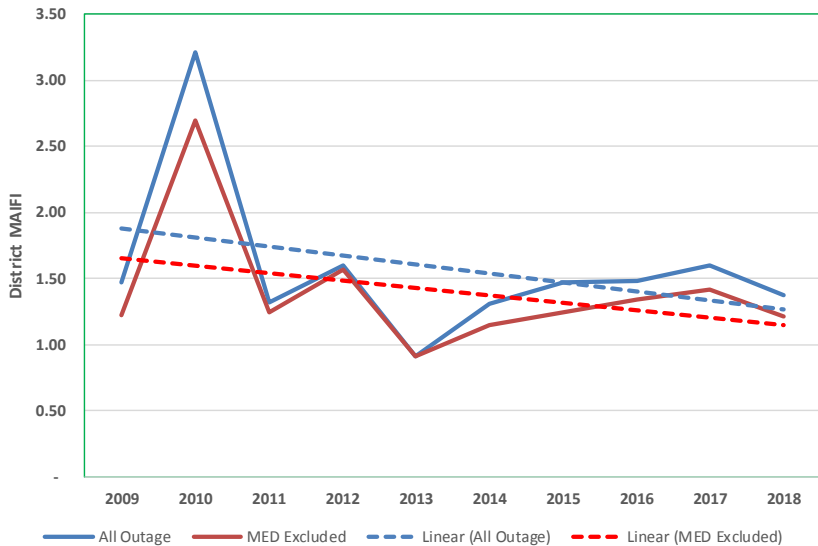
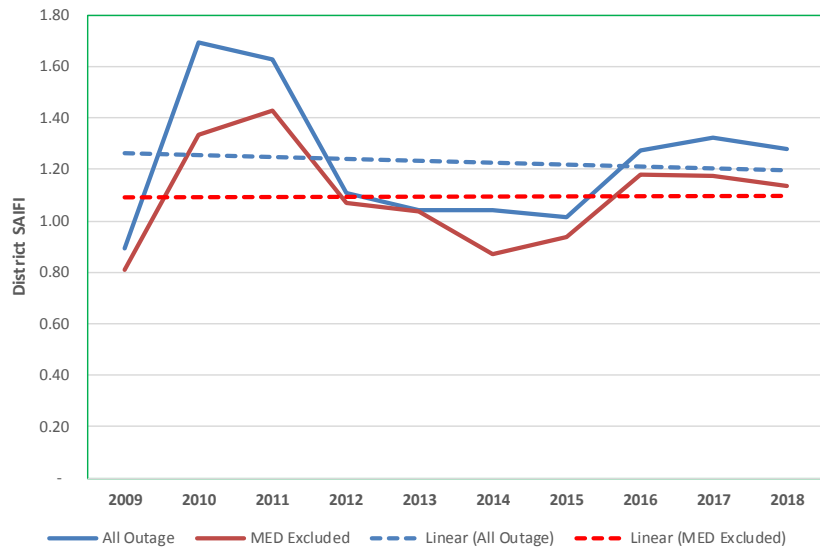
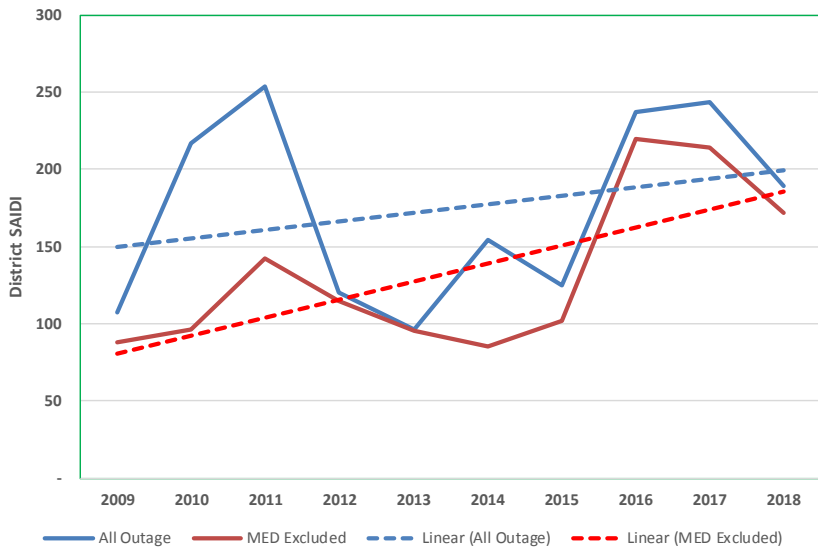
2009 - 2018 District Reliability Graphs (With Planned)

PALM SPRINGS District Reliability Performance



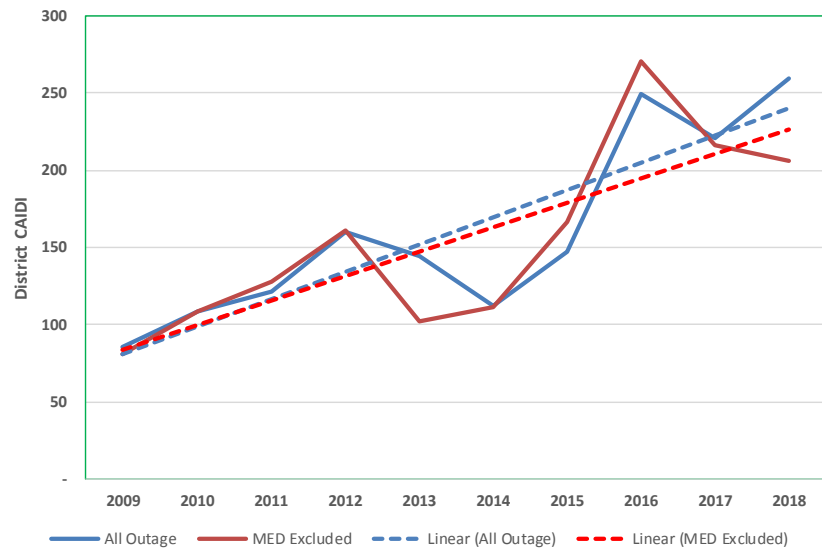
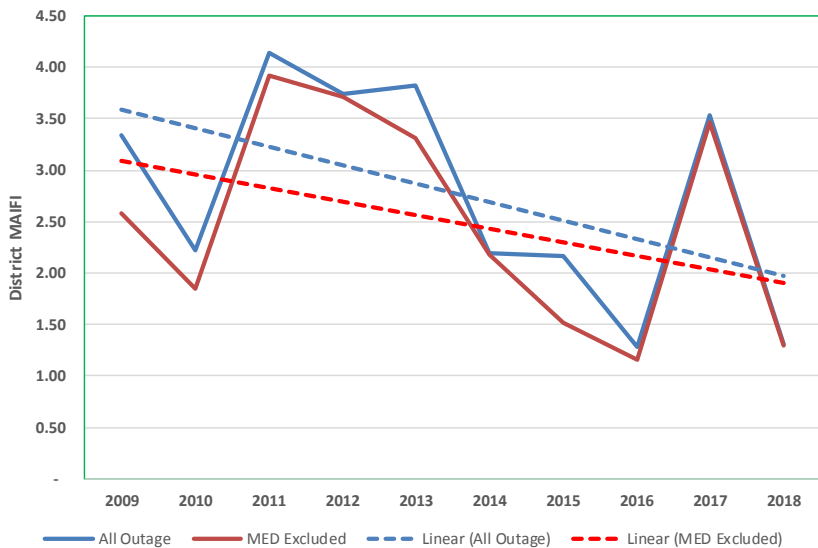
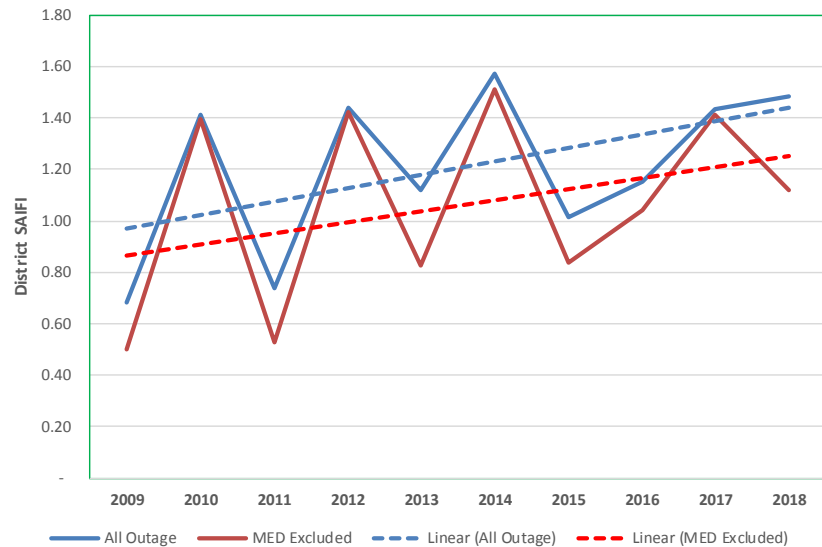
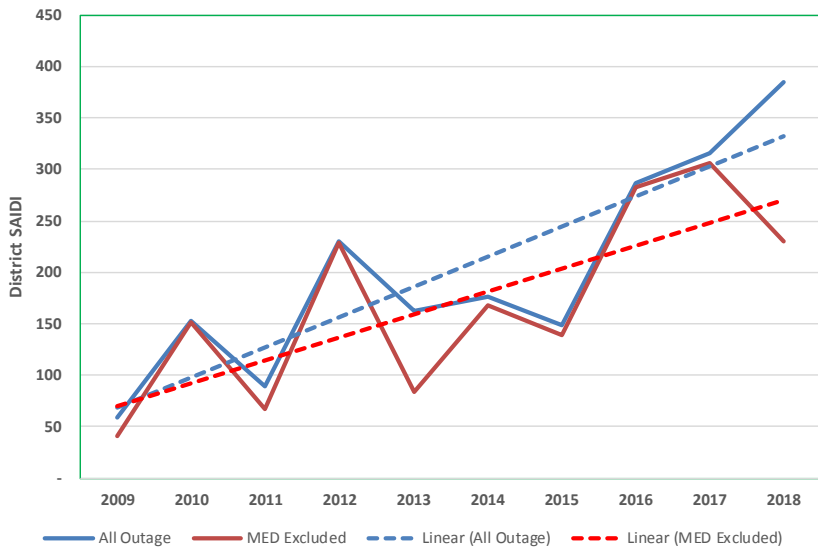
2009 - 2018 District Reliability Graphs (With Planned)

REDLANDS District Reliability Performance



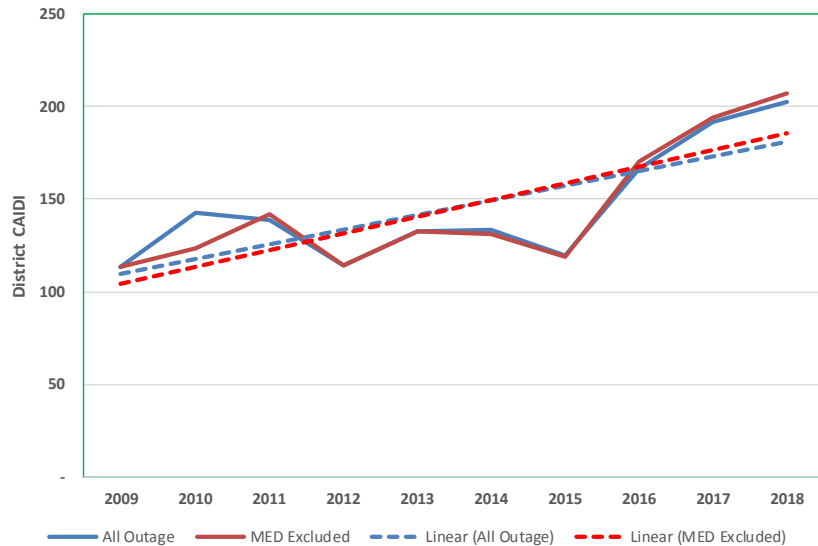
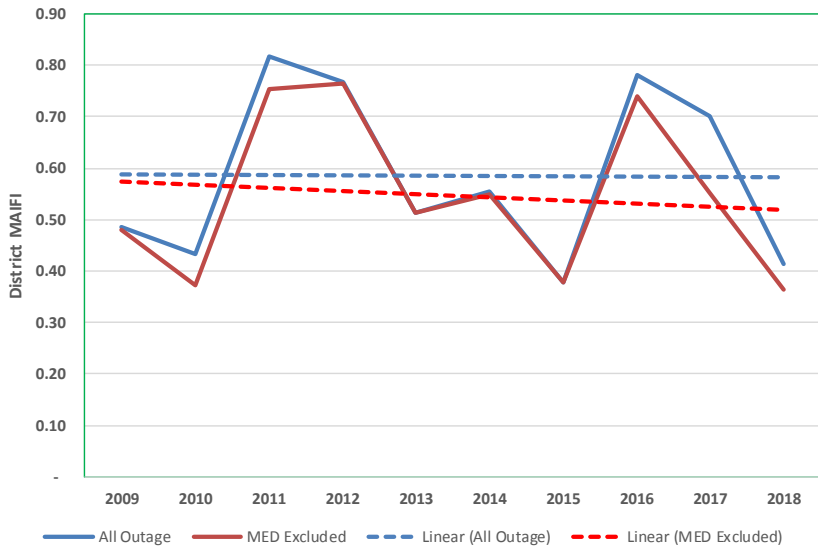
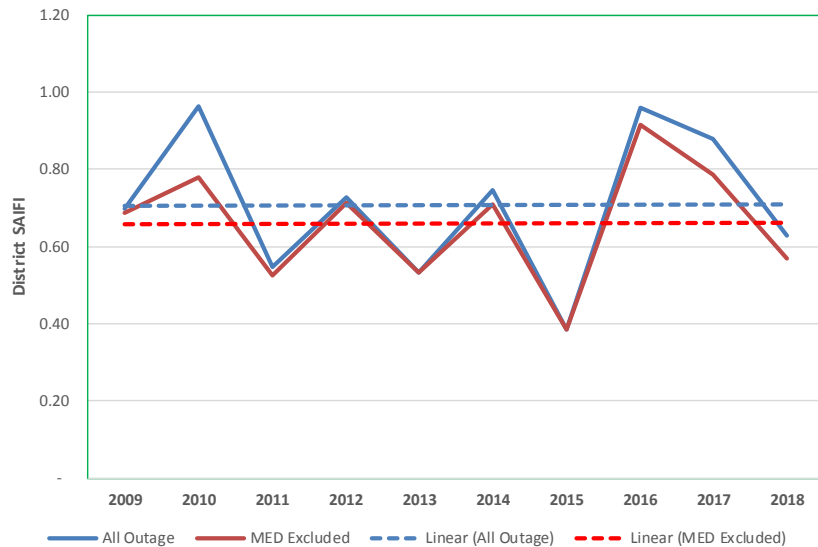
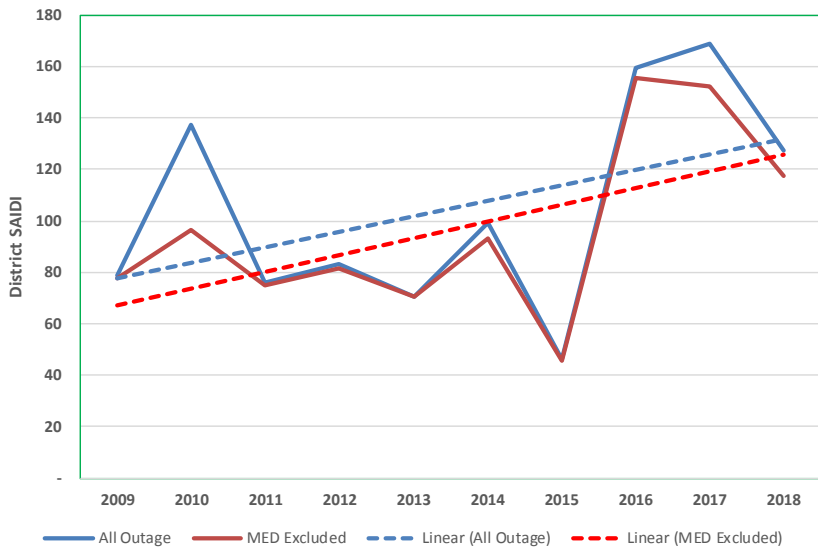
2009 - 2018 District Reliability Graphs (With Planned)

RIDGECREST District Reliability Performance



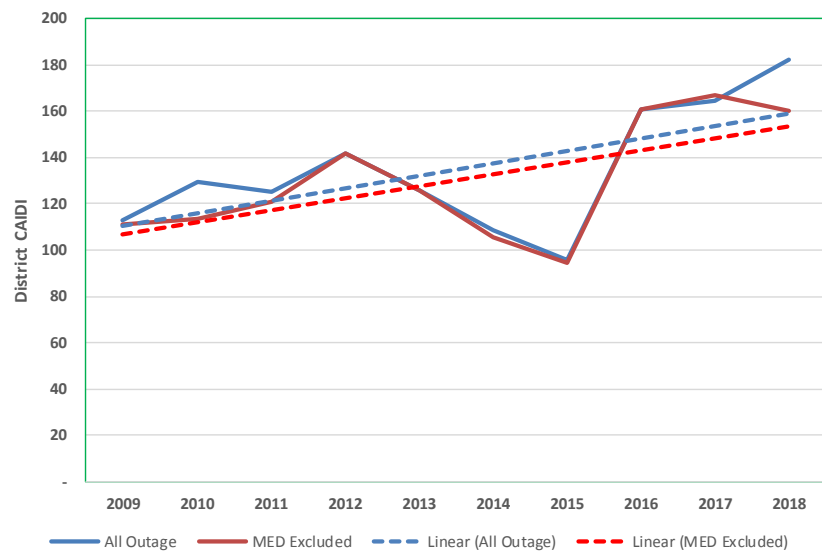
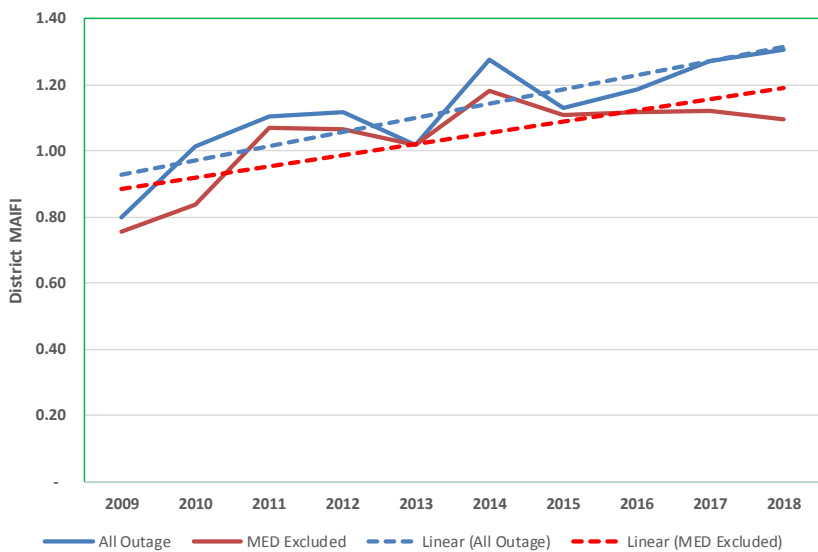
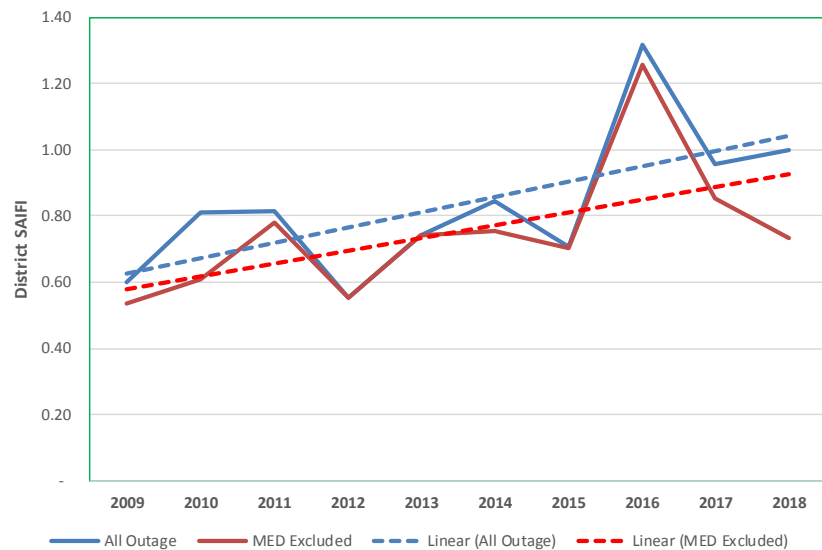
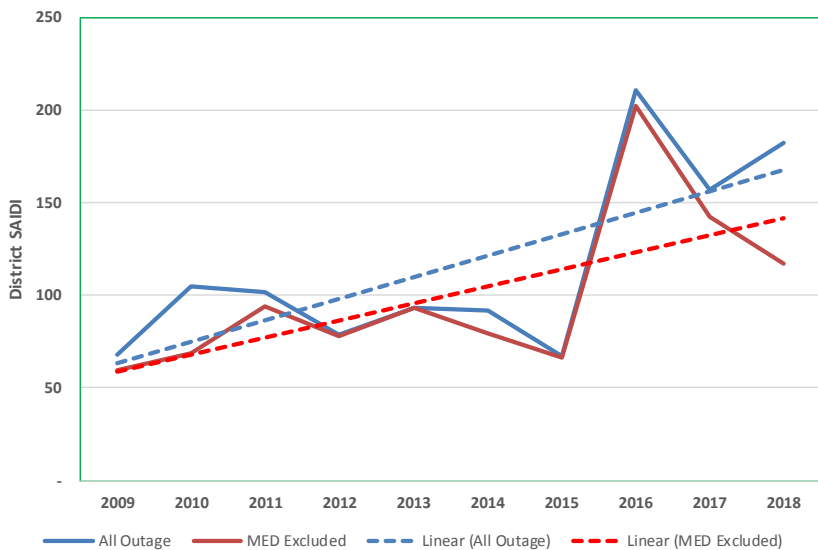
2009 - 2018 District Reliability Graphs (With Planned)

SADDLEBACK District Reliability Performance



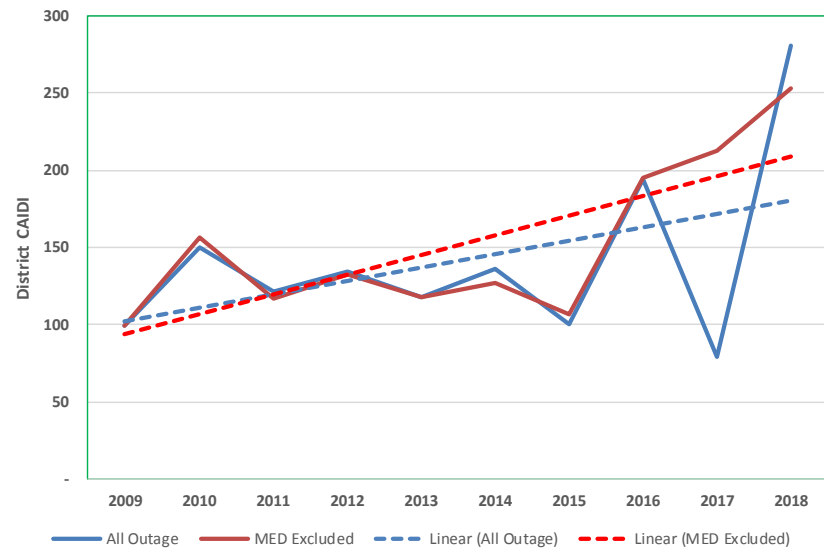
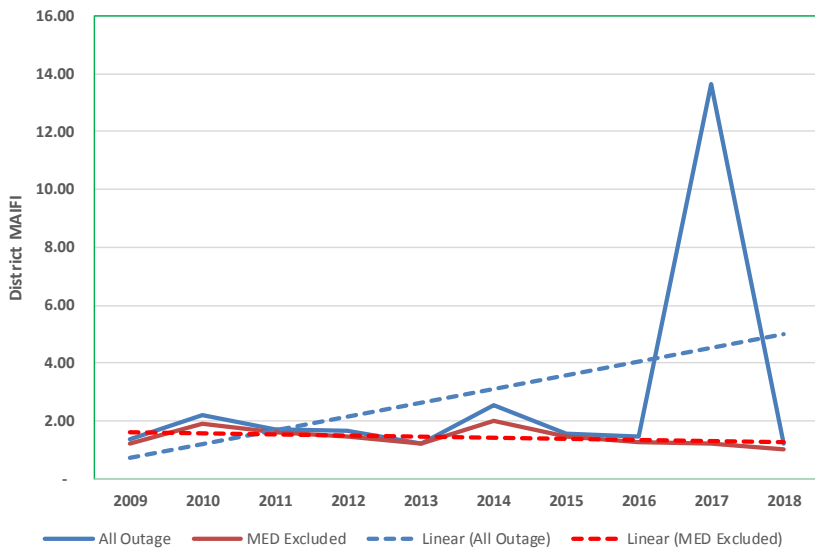
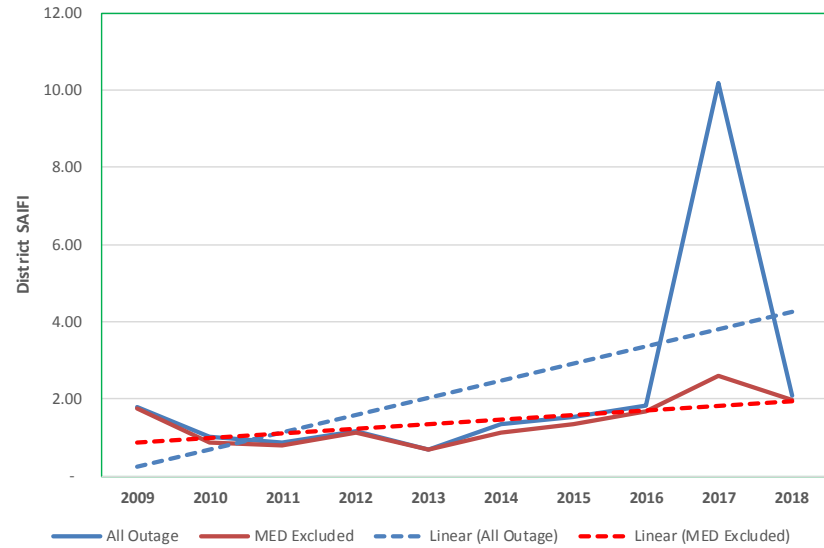
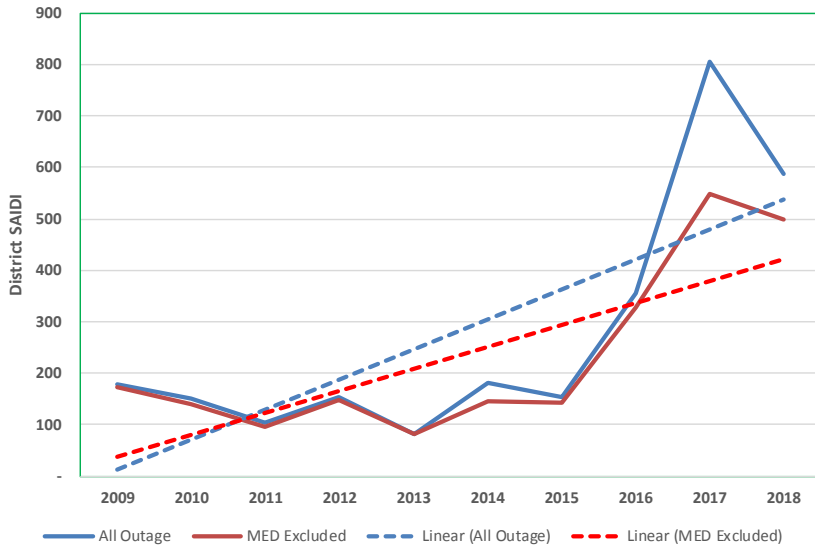
2009 - 2018 District Reliability Graphs (With Planned)

SANTA ANA District Reliability Performance



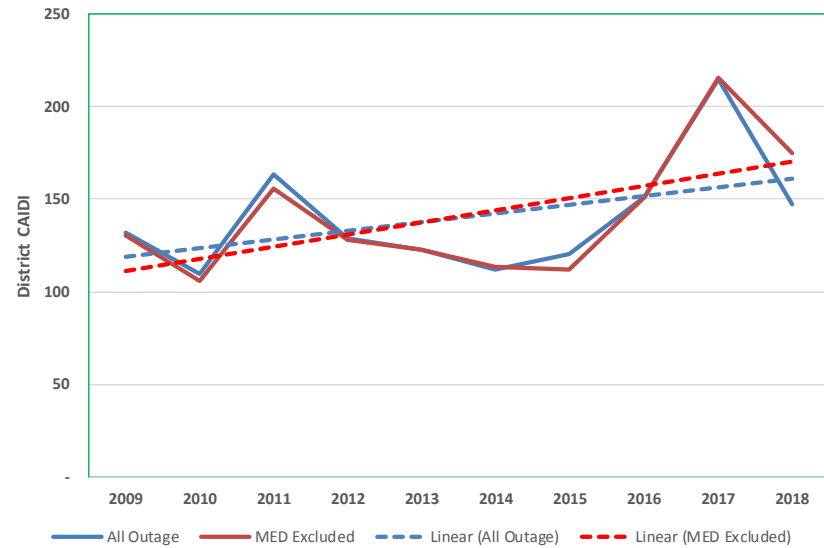
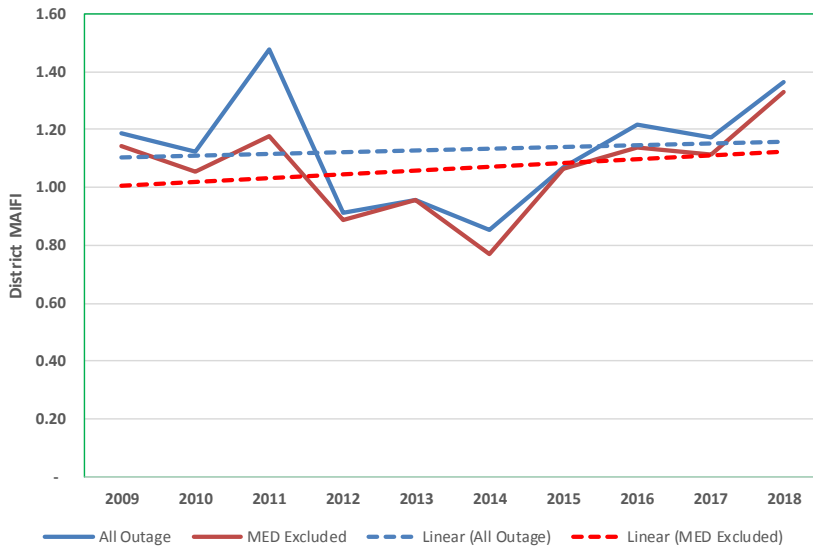
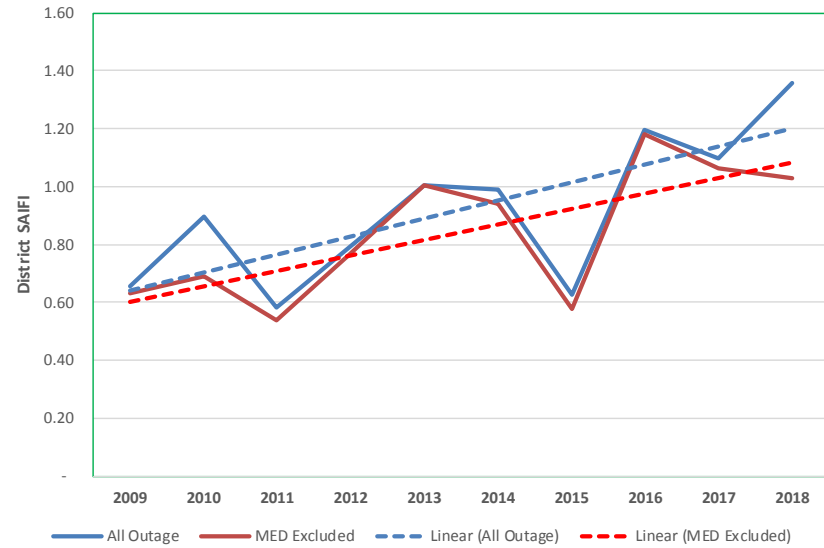
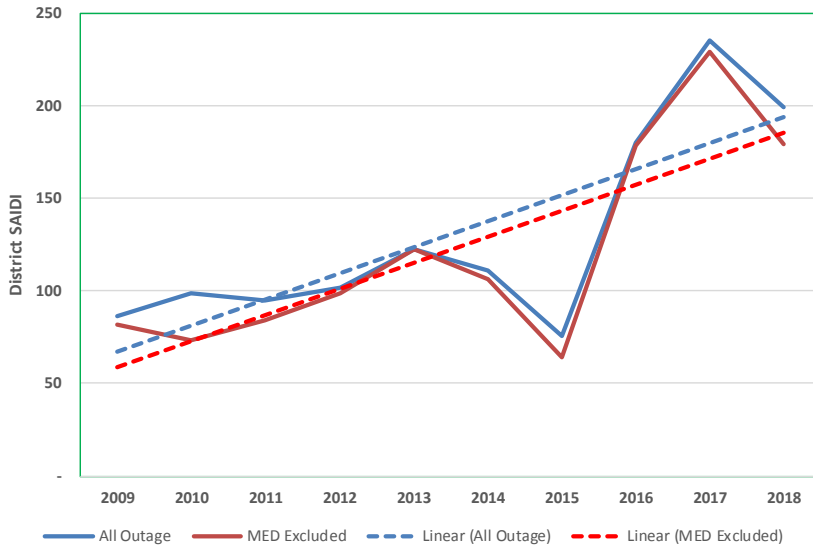
2009 - 2018 District Reliability Graphs (With Planned)

SANTA BARBARA District Reliability Performance



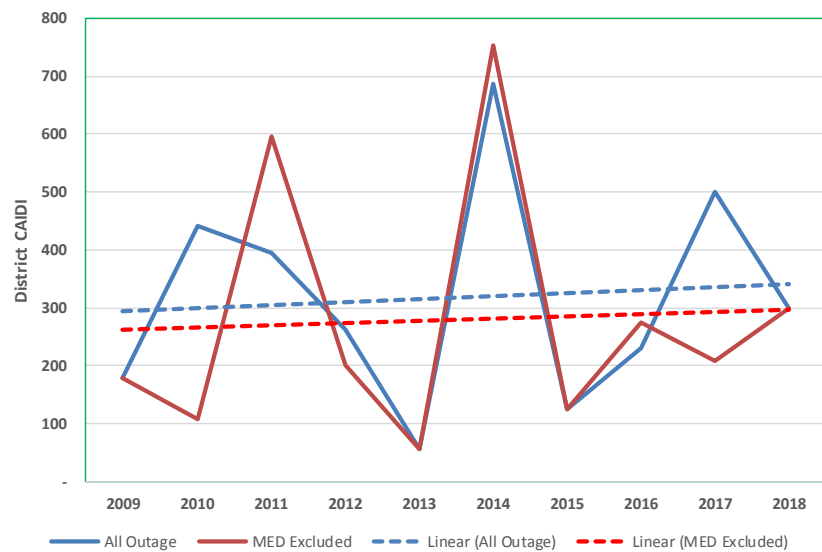
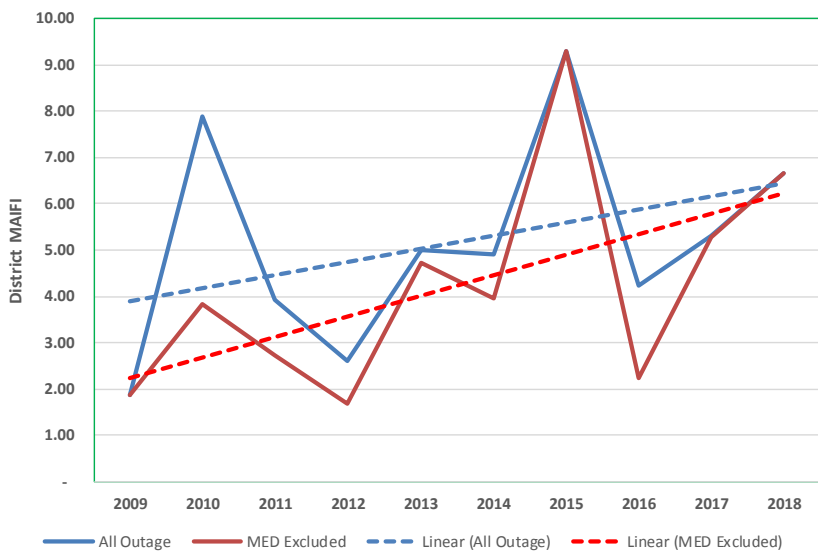
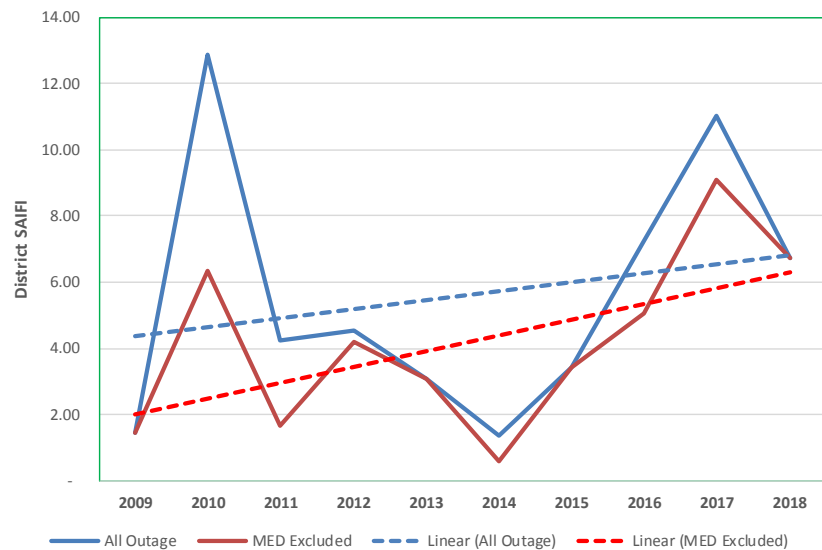
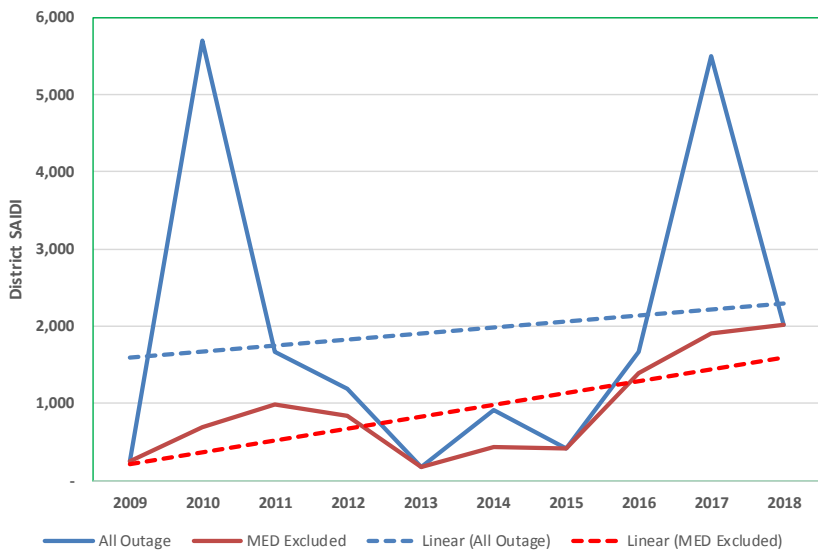
2009 - 2018 District Reliability Graphs (With Planned)

SANTA MONICA District Reliability Performance



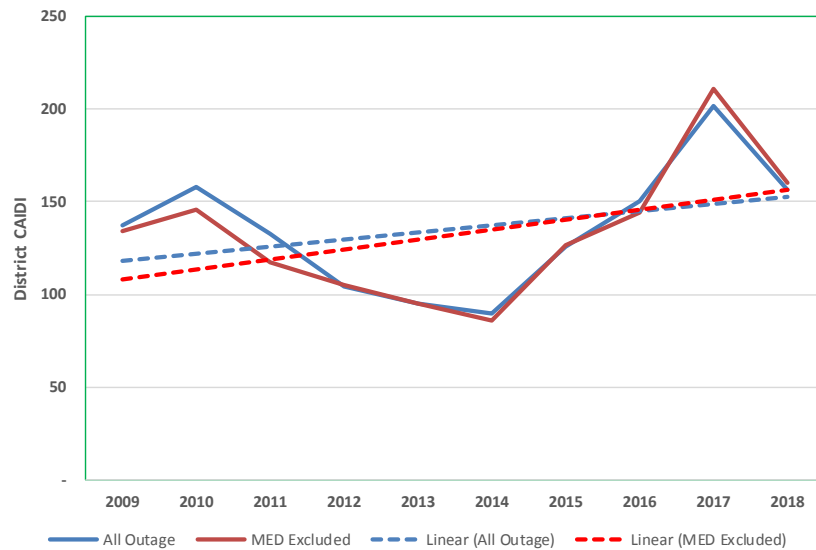
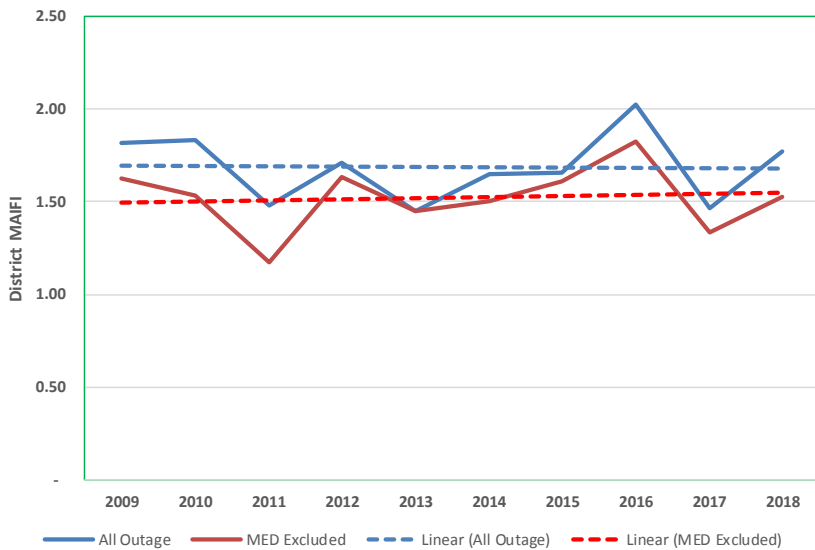
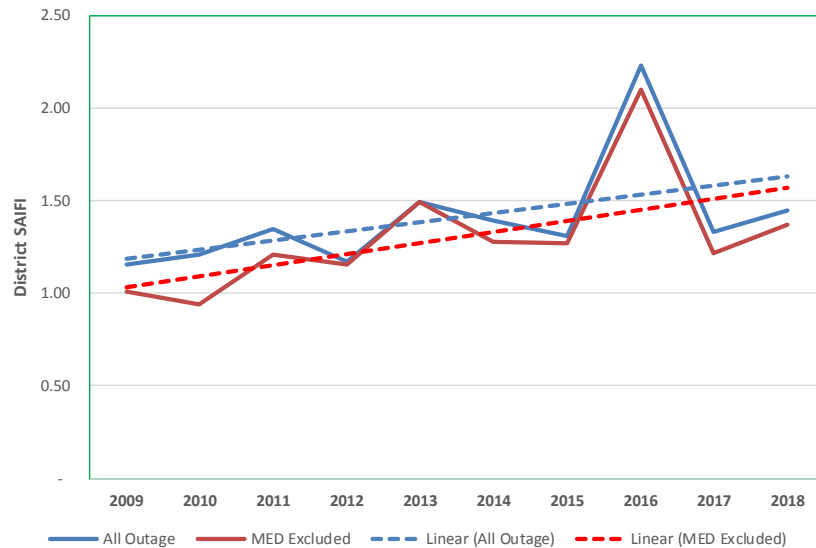
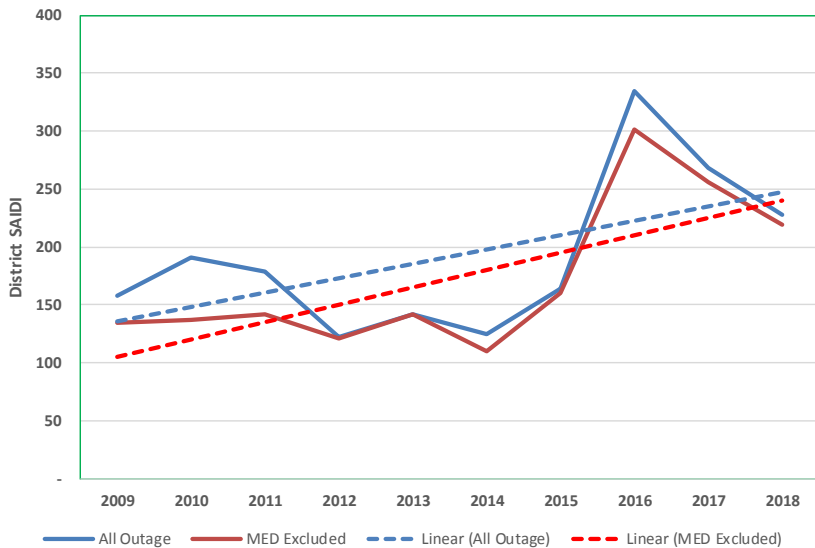
2009 - 2018 District Reliability Graphs (With Planned)

SHAVER LAKE District Reliability Performance



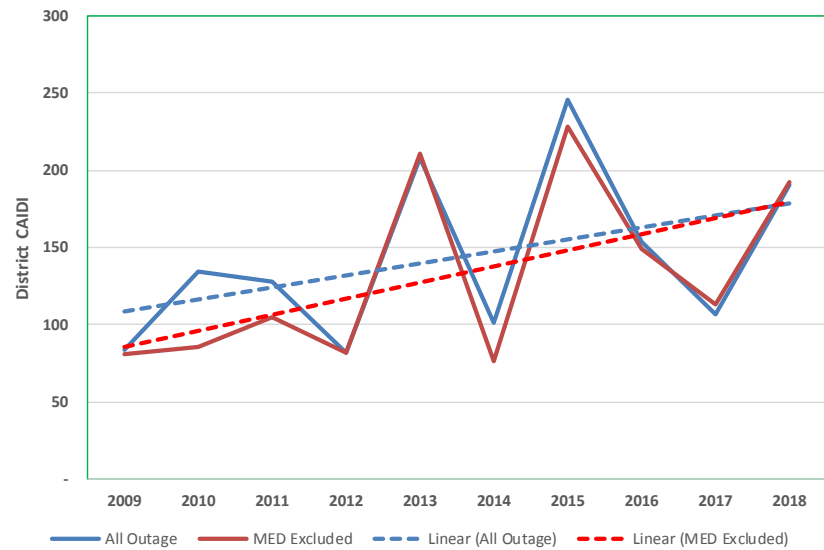
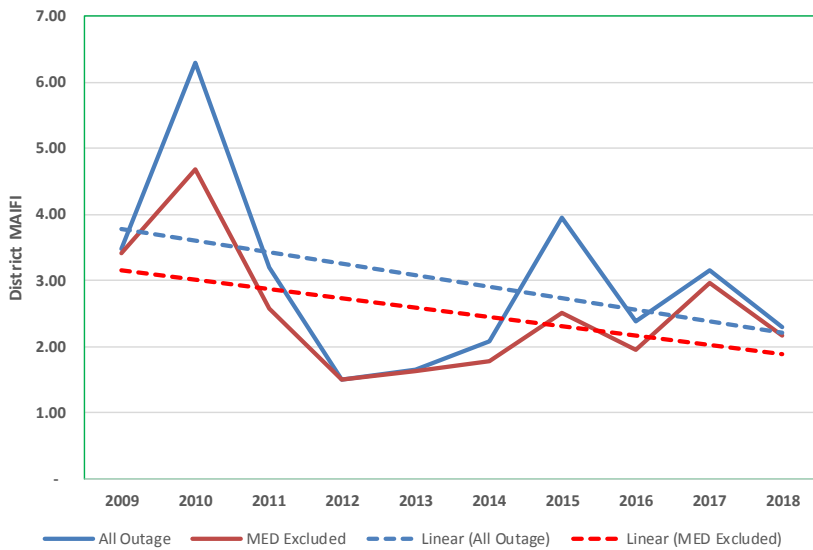
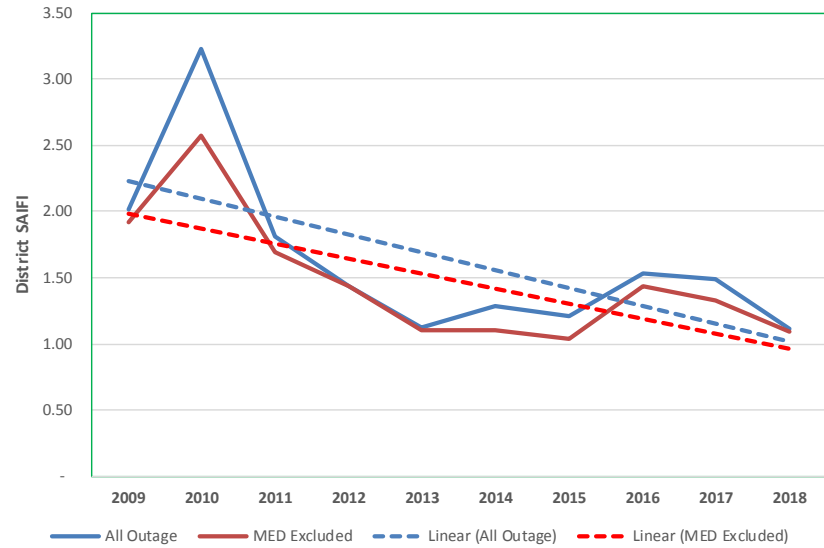
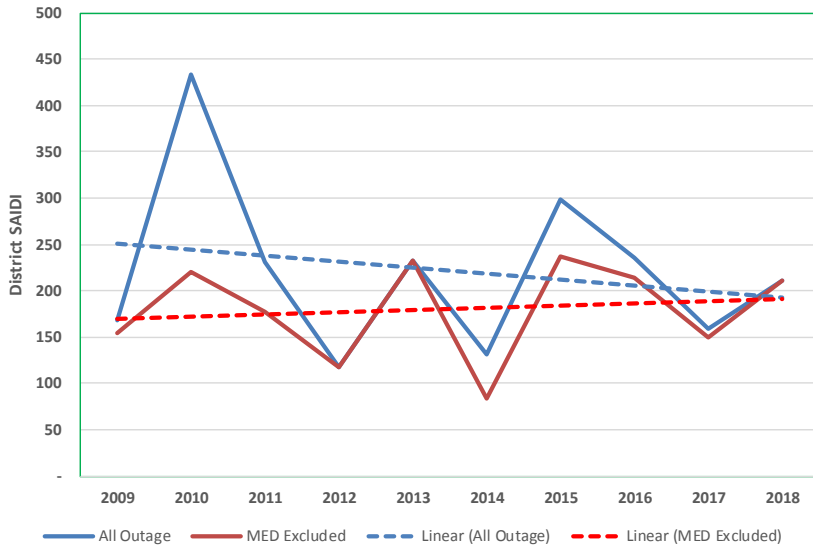
2009 - 2018 District Reliability Graphs (With Planned)

SOUTH BAY District Reliability Performance



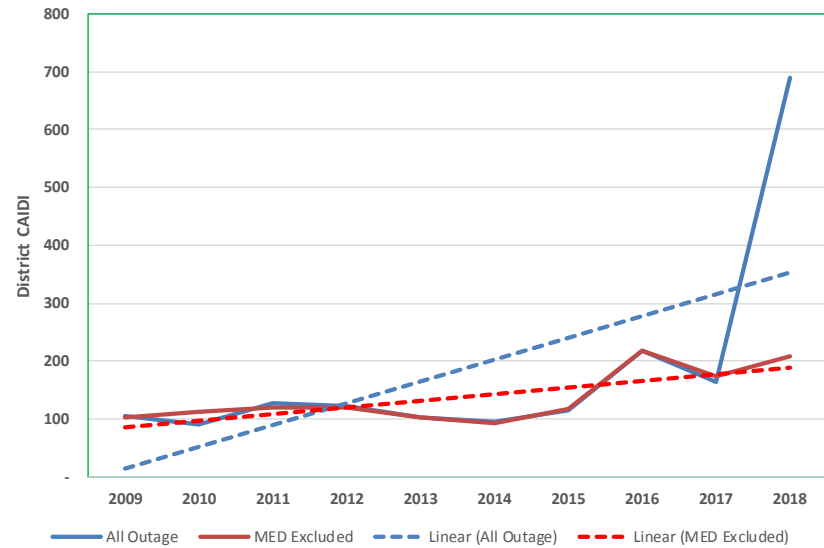
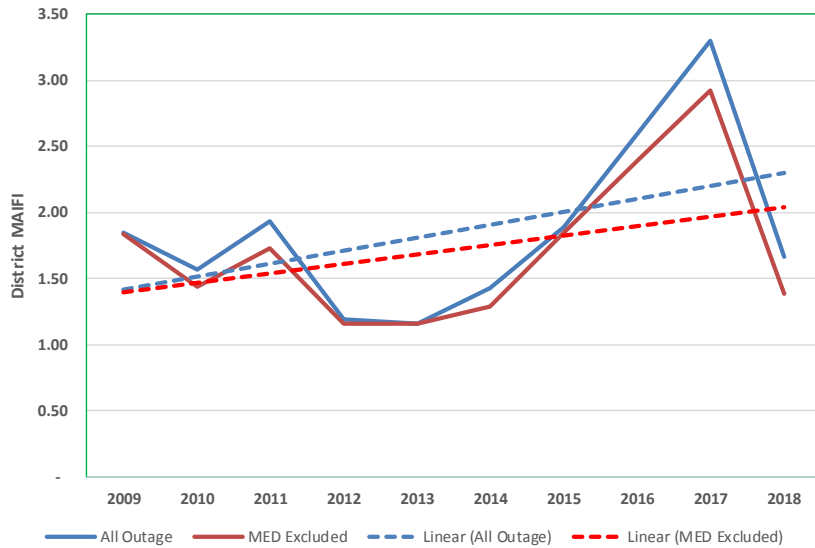
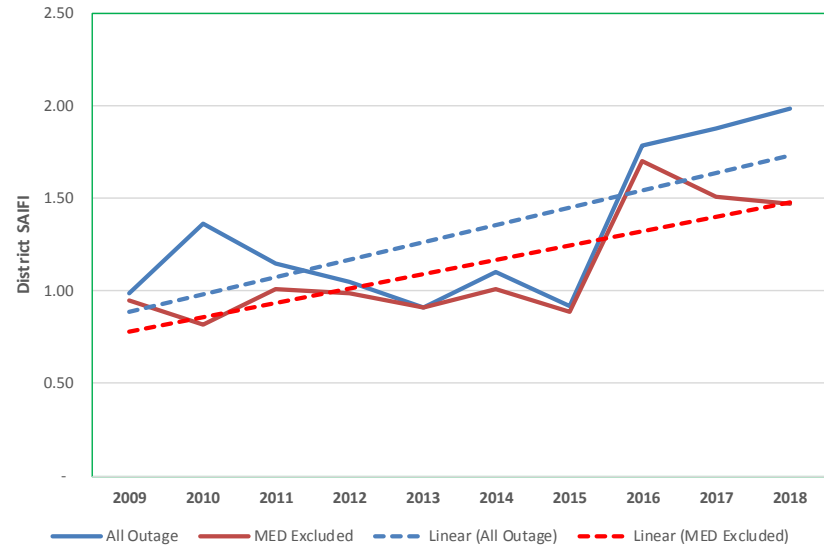
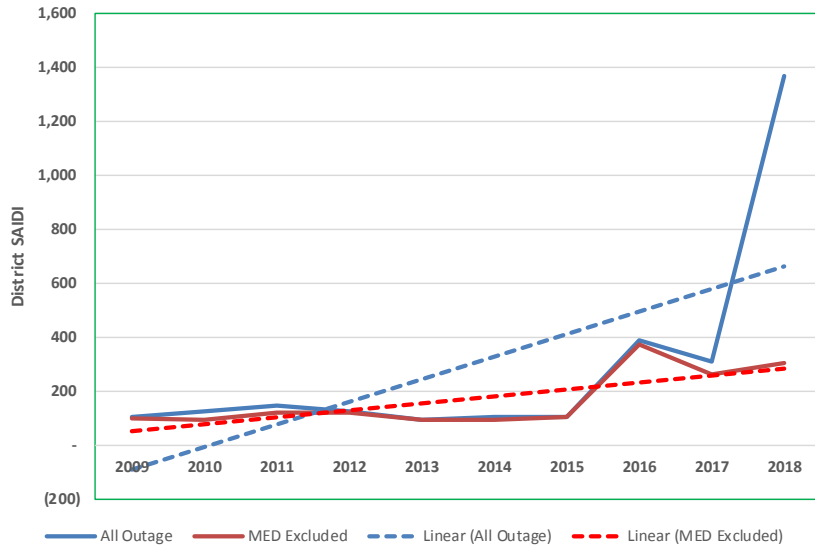
2009 - 2018 District Reliability Graphs (With Planned)

TEHACHAPI District Reliability Performance



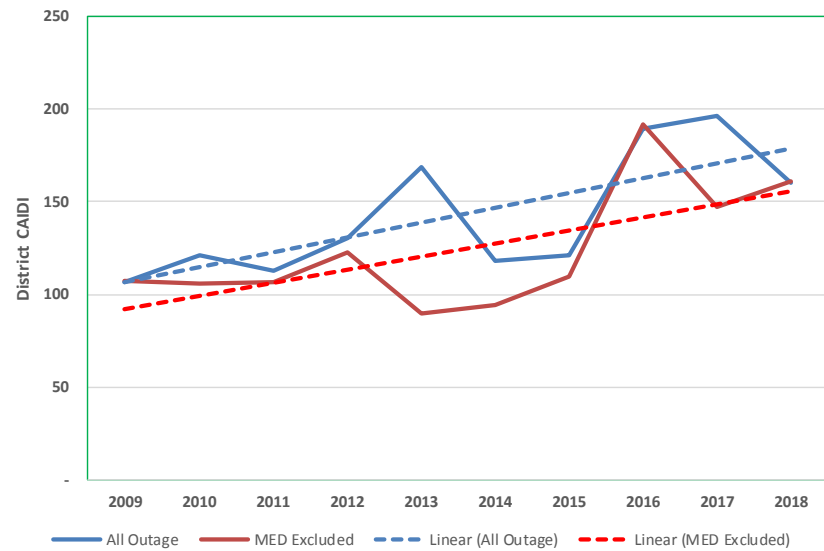
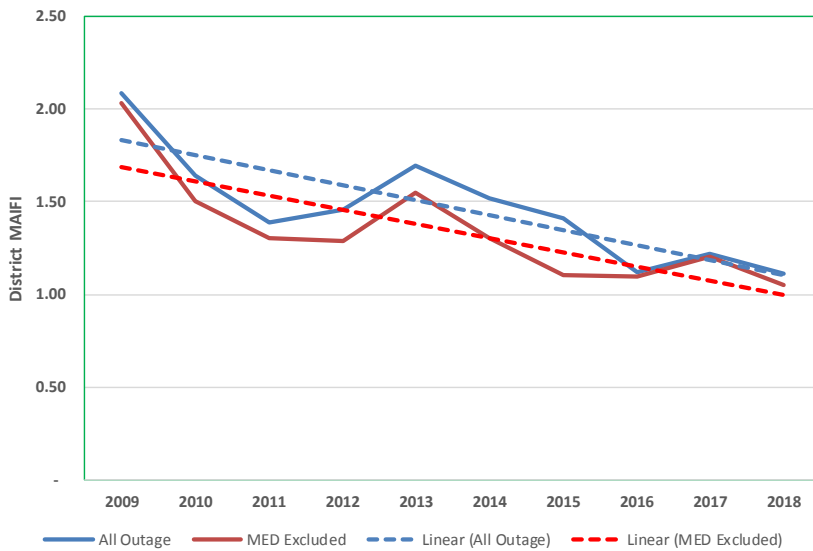
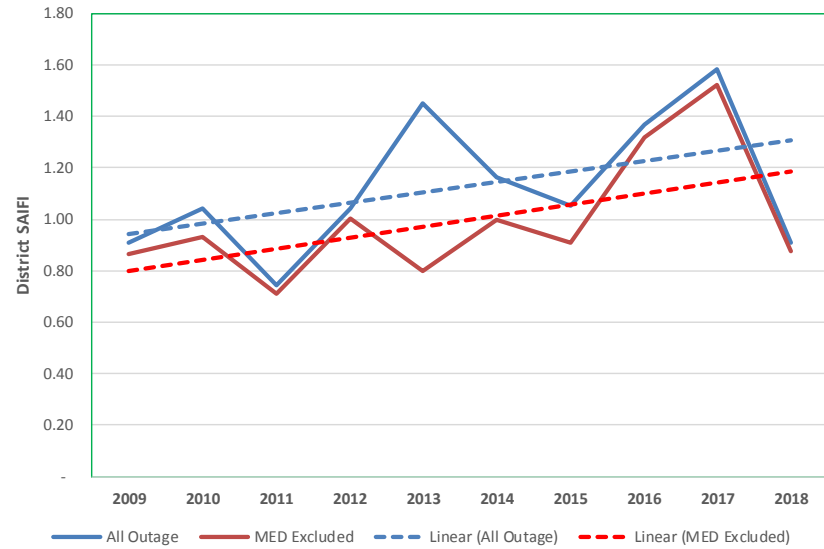
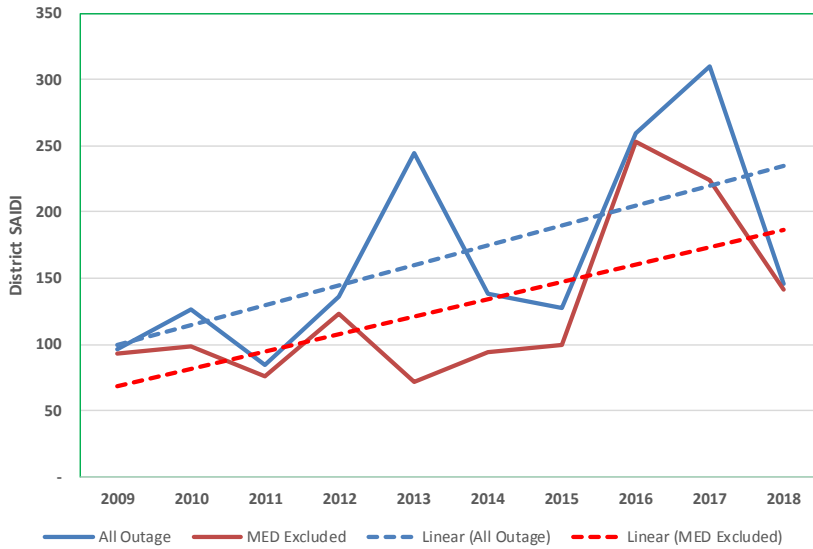
2009 - 2018 District Reliability Graphs (With Planned)

THOUSAND OAKS District Reliability Performance



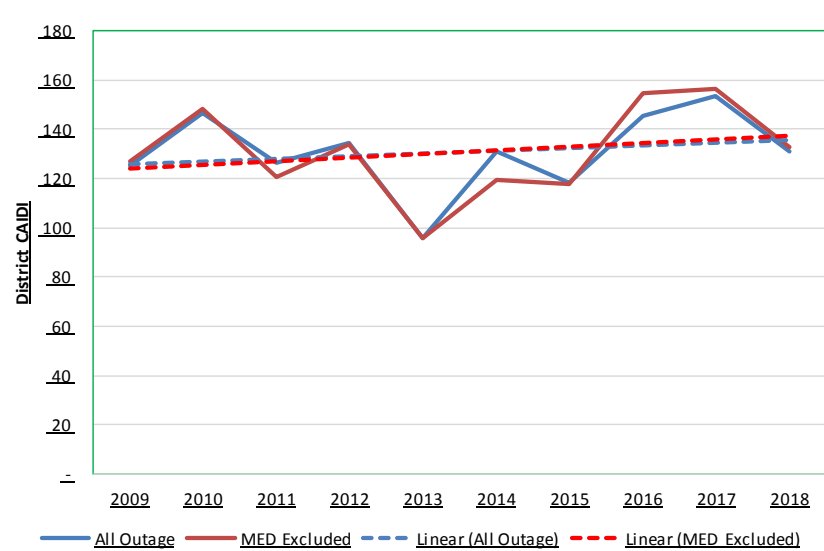
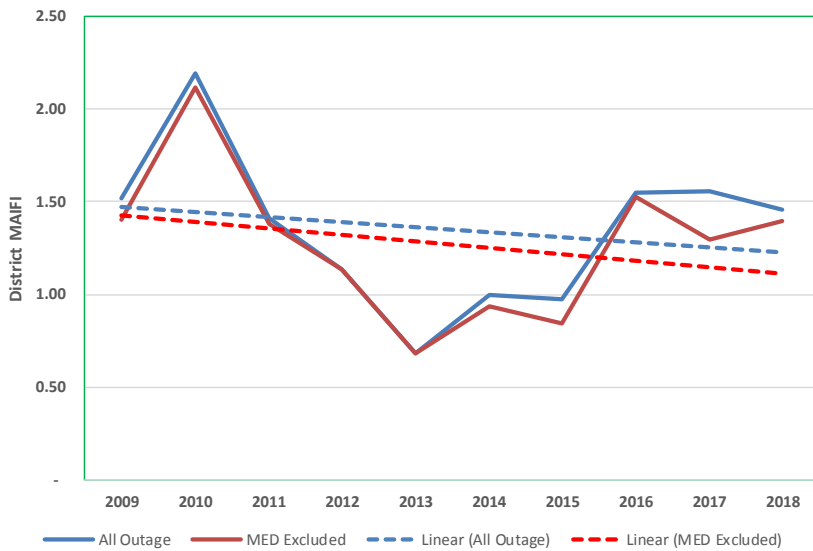
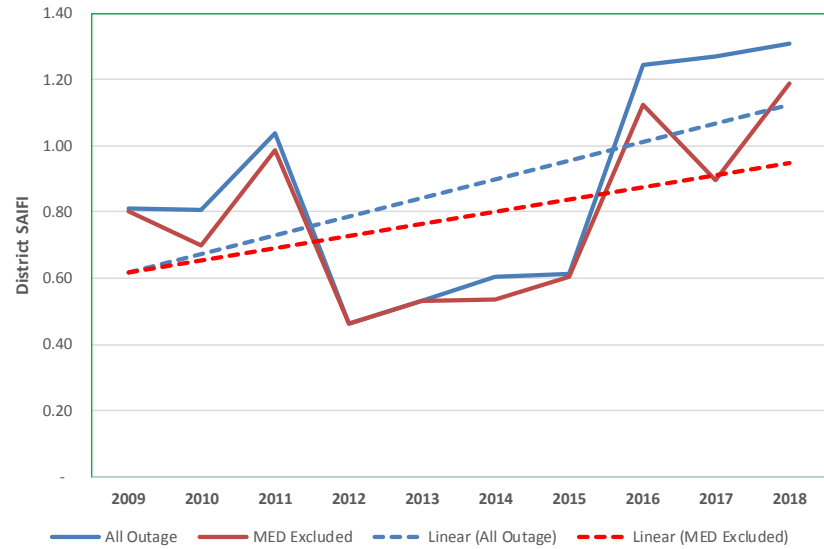
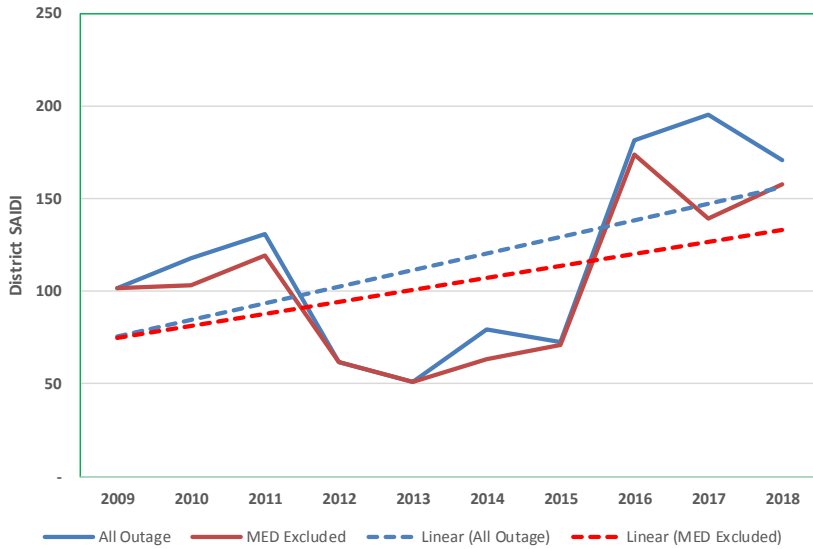
2009 - 2018 District Reliability Graphs (With Planned)

TULARE District Reliability Performance



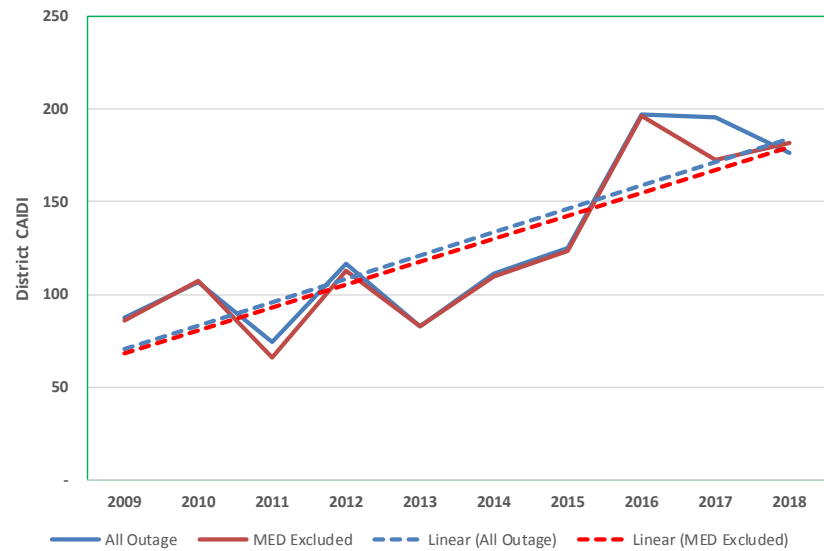
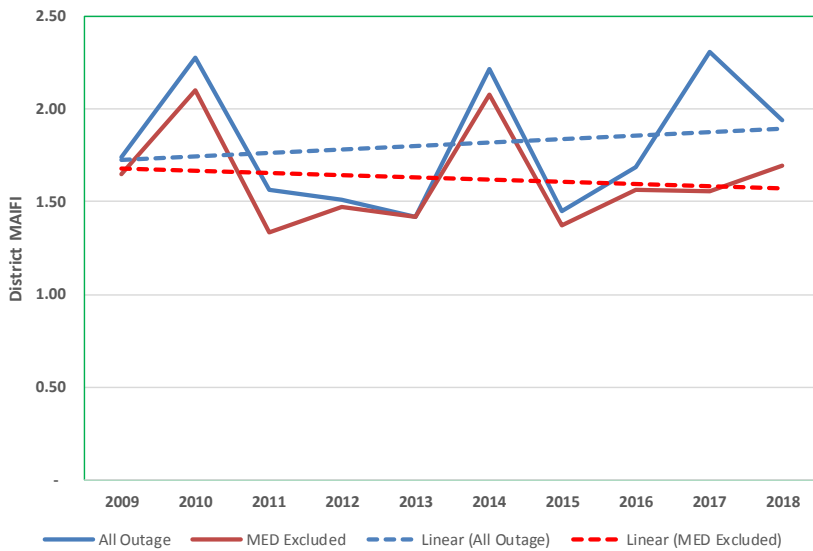
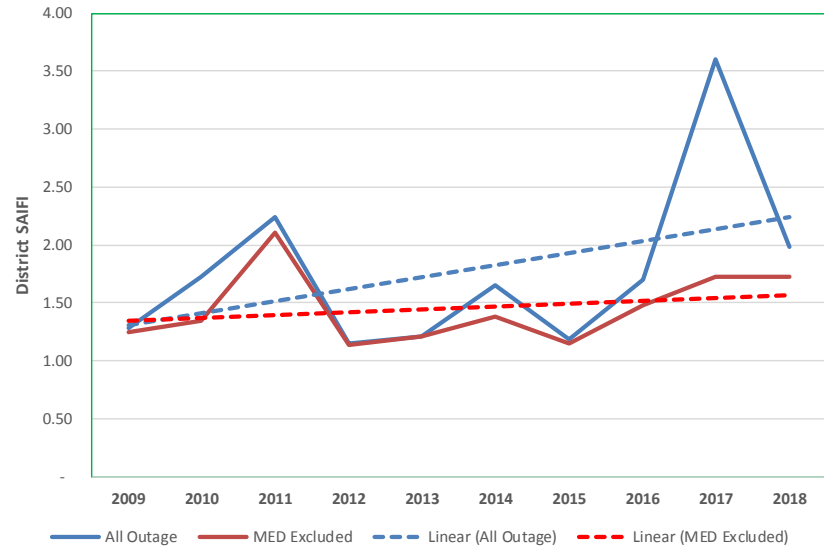
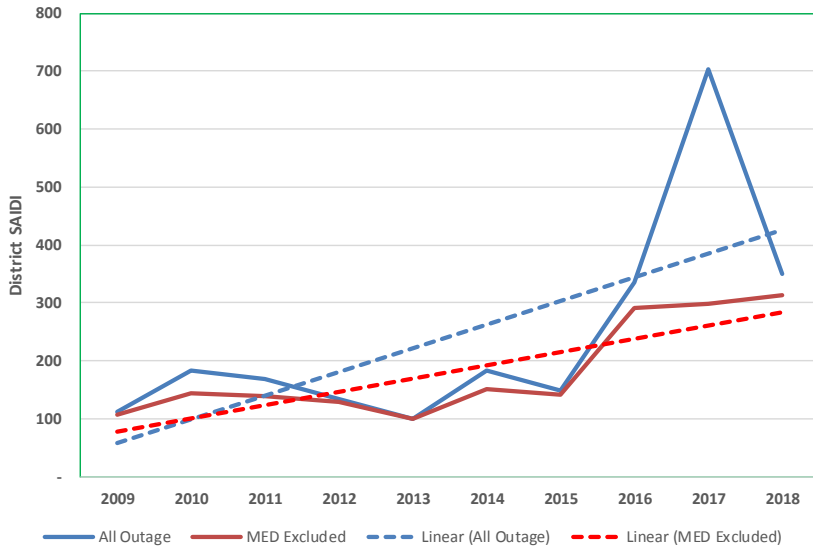
2009 - 2018 District Reliability Graphs (With Planned)

VALENCIA District Reliability Performance



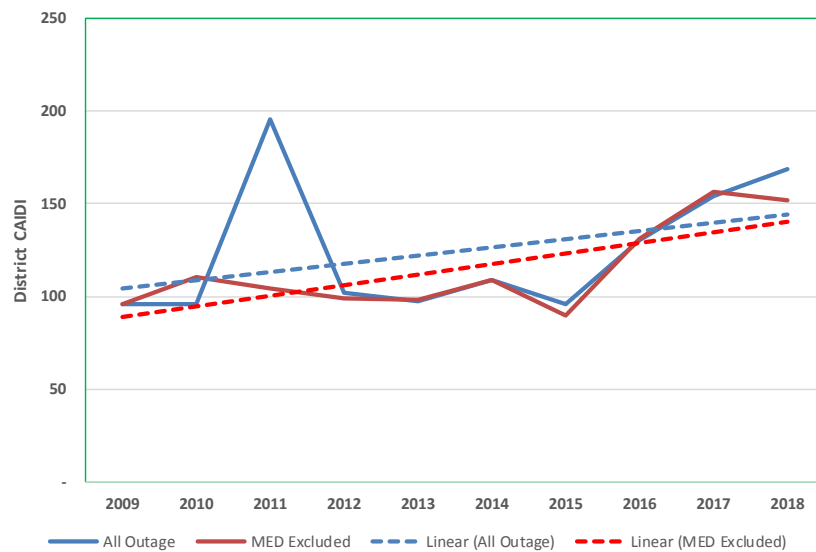
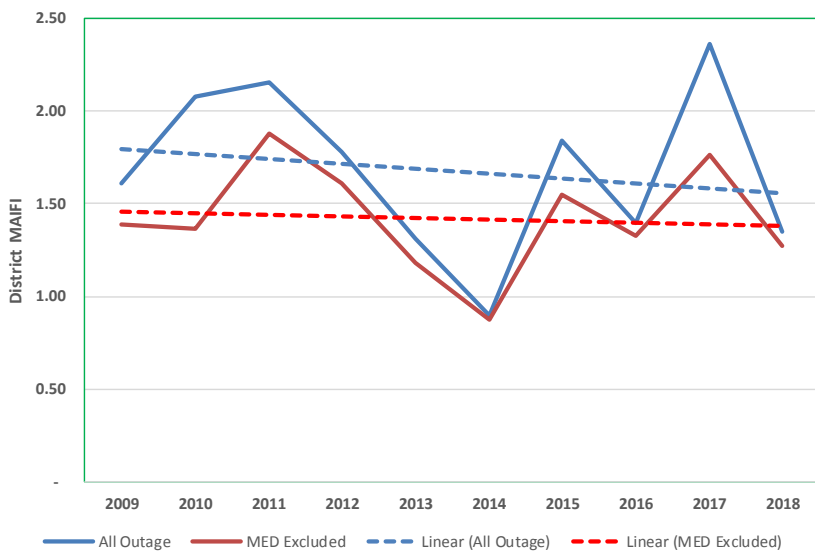
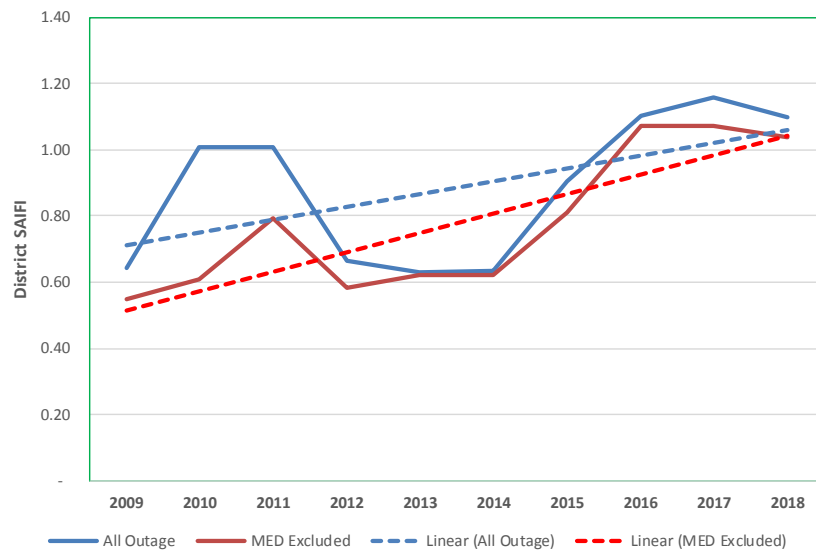
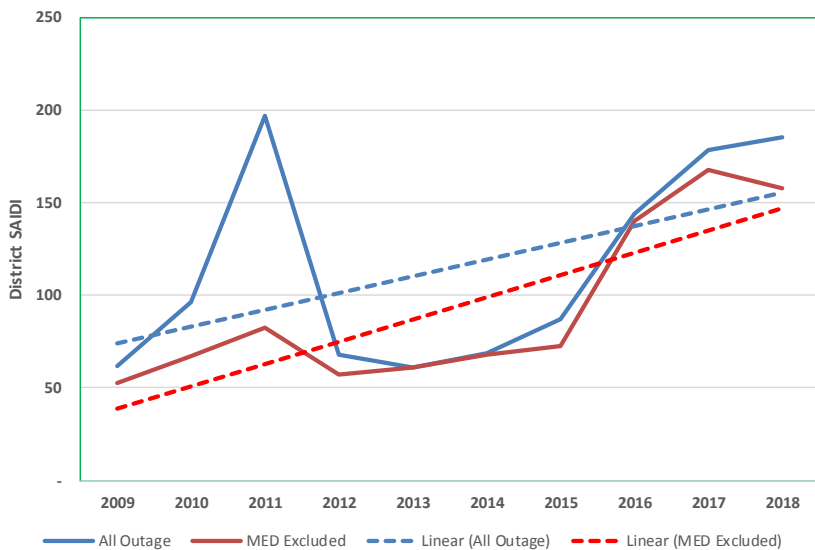
2009 - 2018 District Reliability Graphs (With Planned)

VENTURA District Reliability Performance



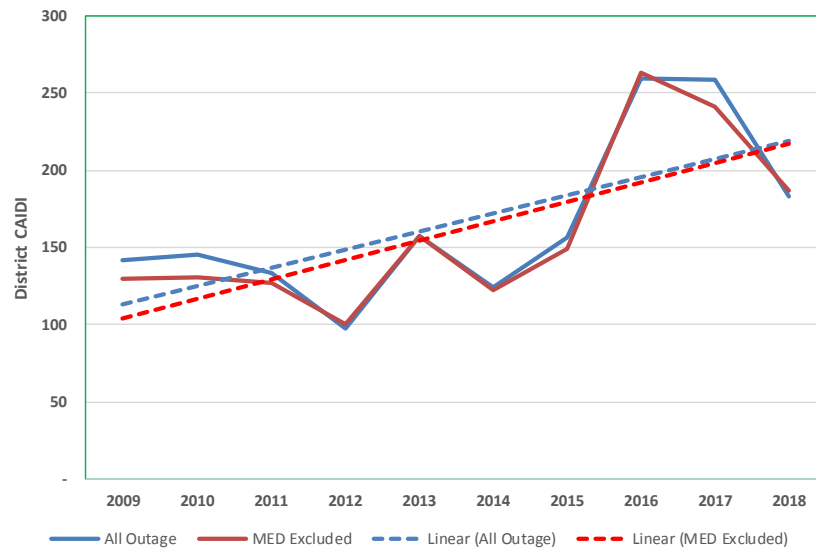
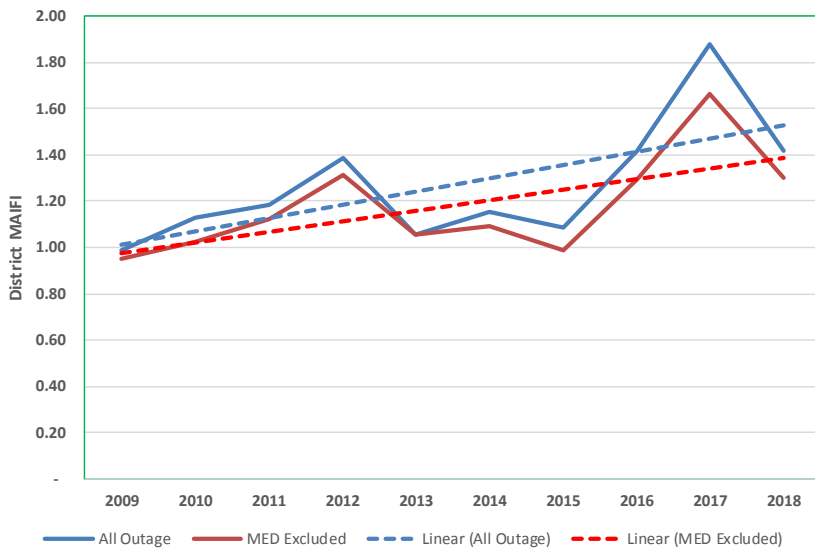
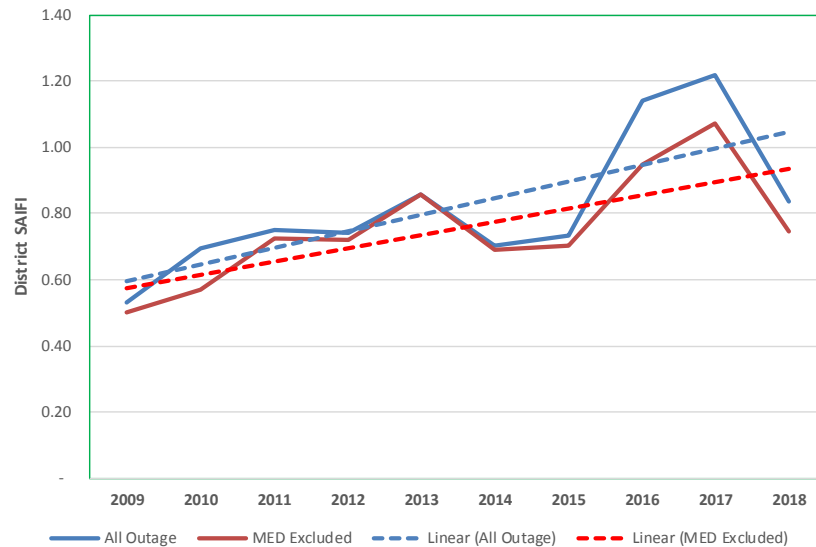
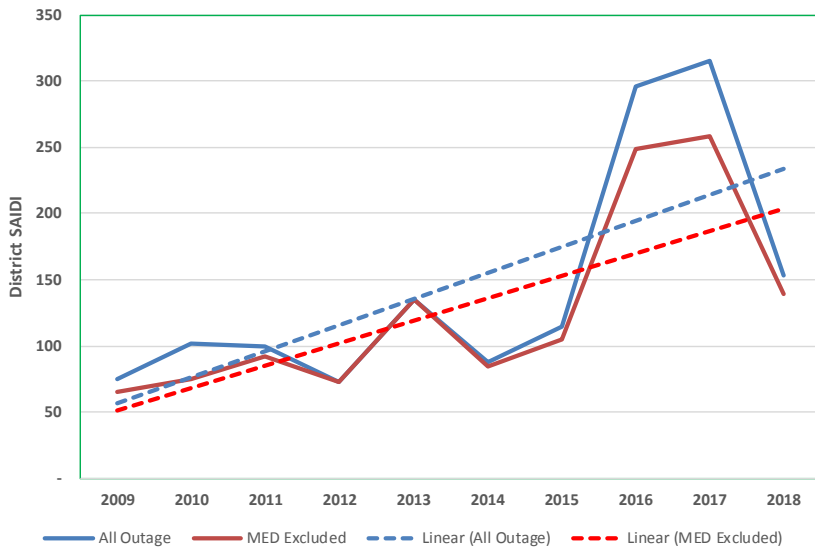
2009 - 2018 District Reliability Graphs (With Planned)

VICTORVILLE District Reliability Performance



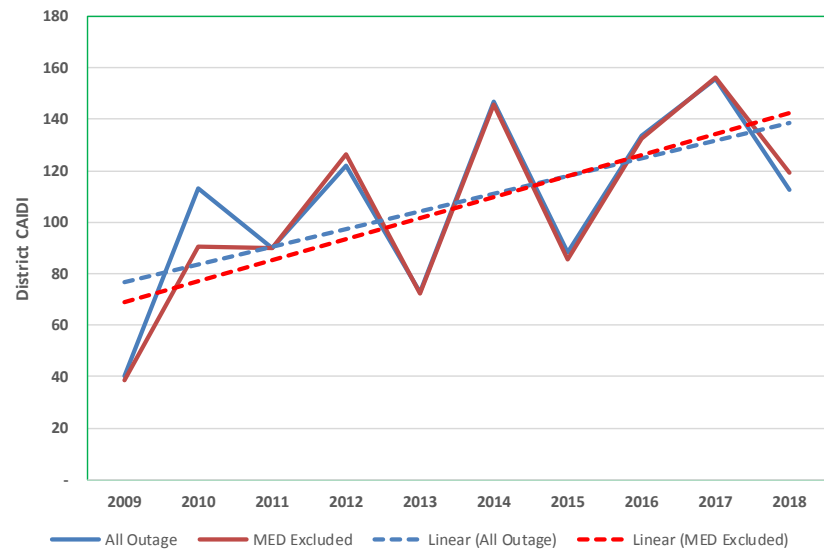
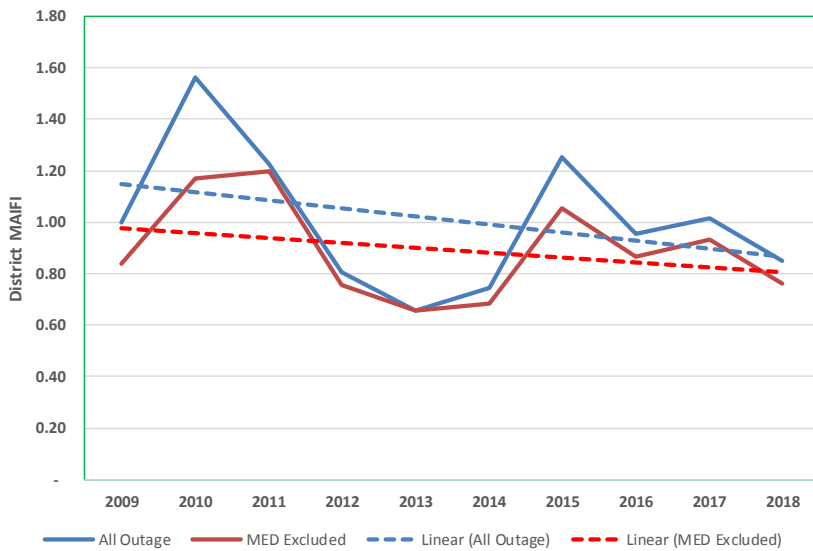
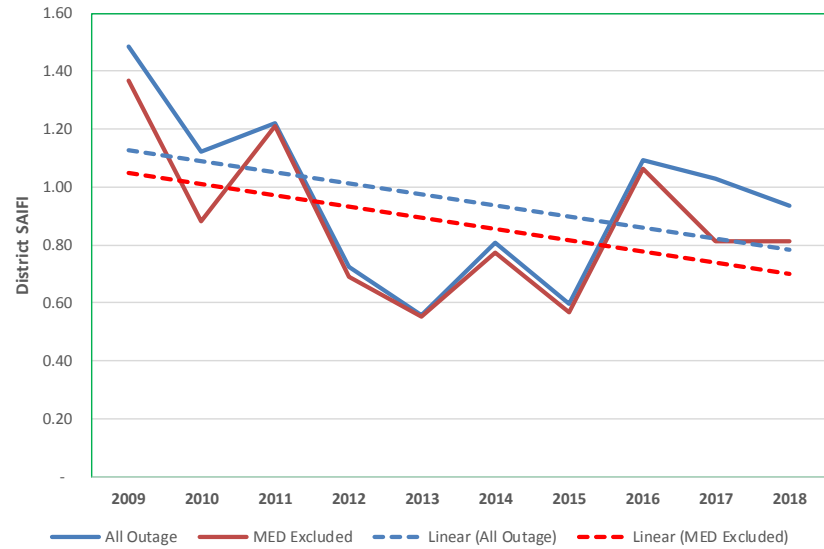
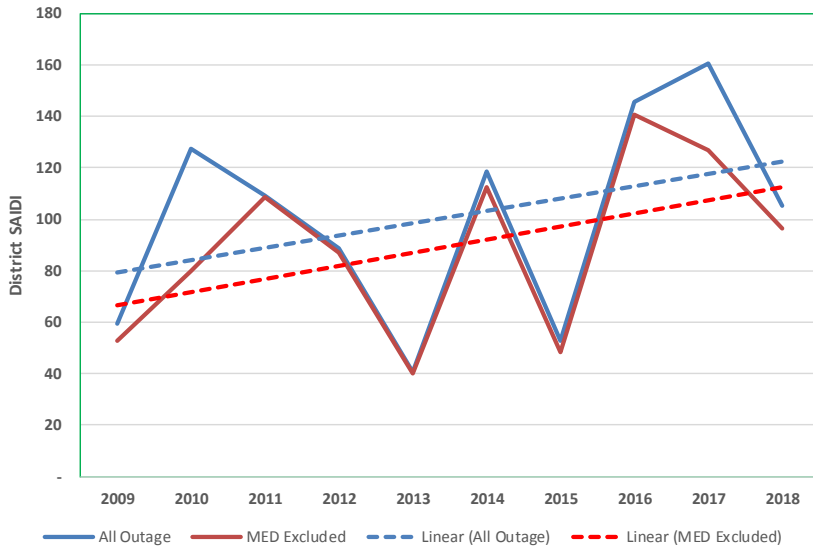
2009 - 2018 District Reliability Graphs (With Planned)

WHITTIER District Reliability Performance



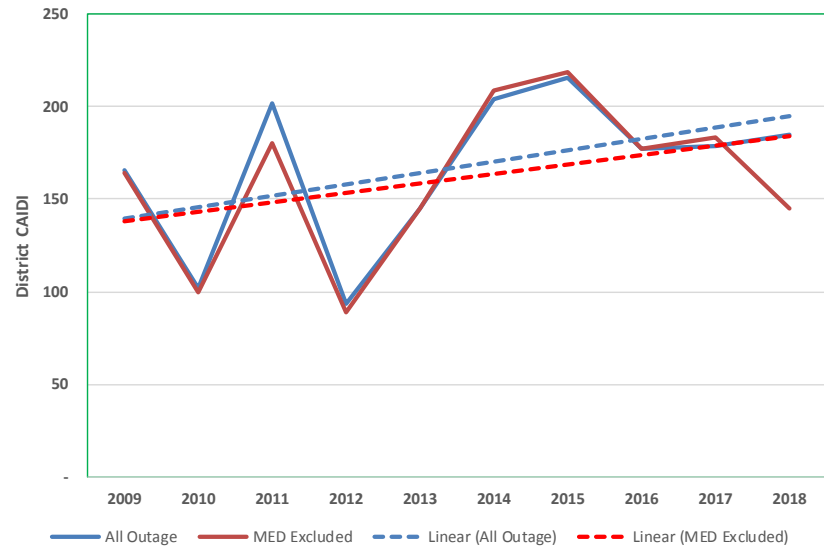
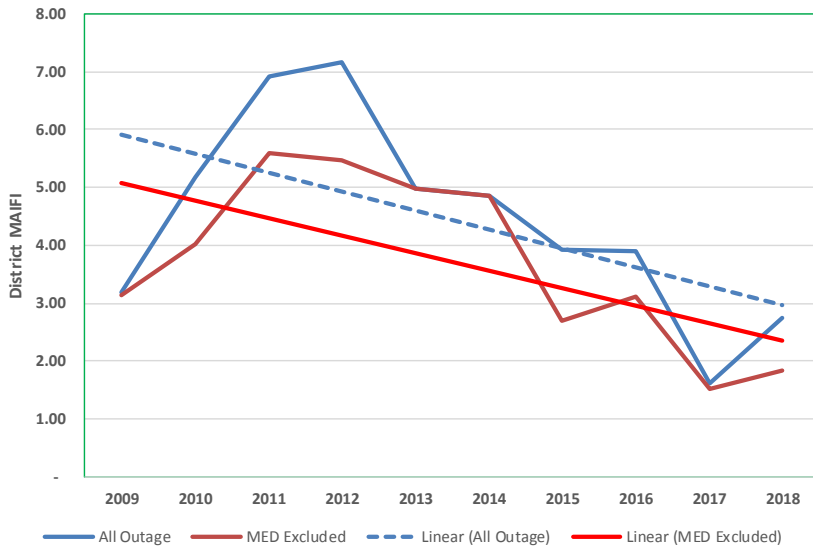
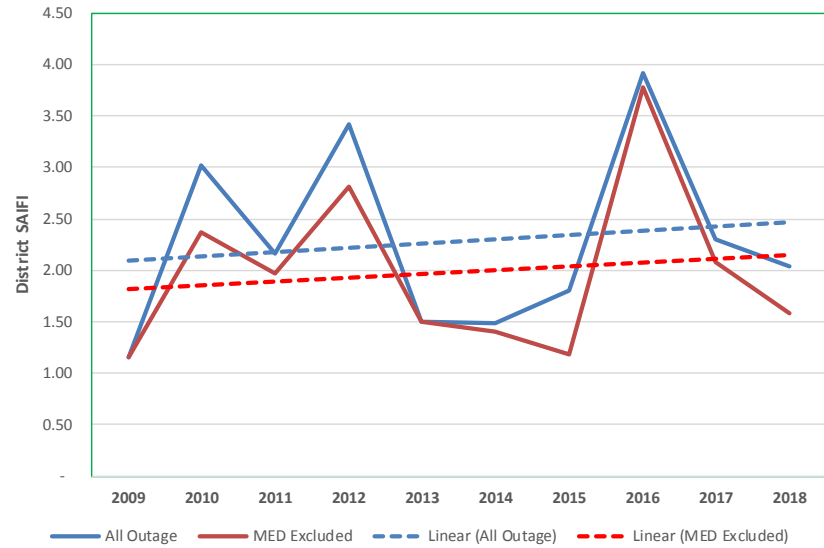
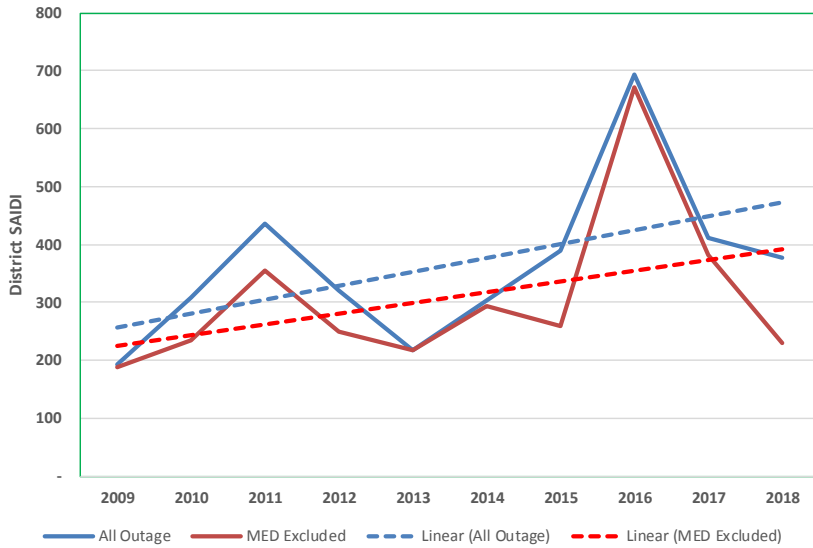
2009 - 2018 District Reliability Graphs (With Planned)

WILDOMAR District Reliability Performance



2009 - 2018 District Reliability Graphs (With Planned)

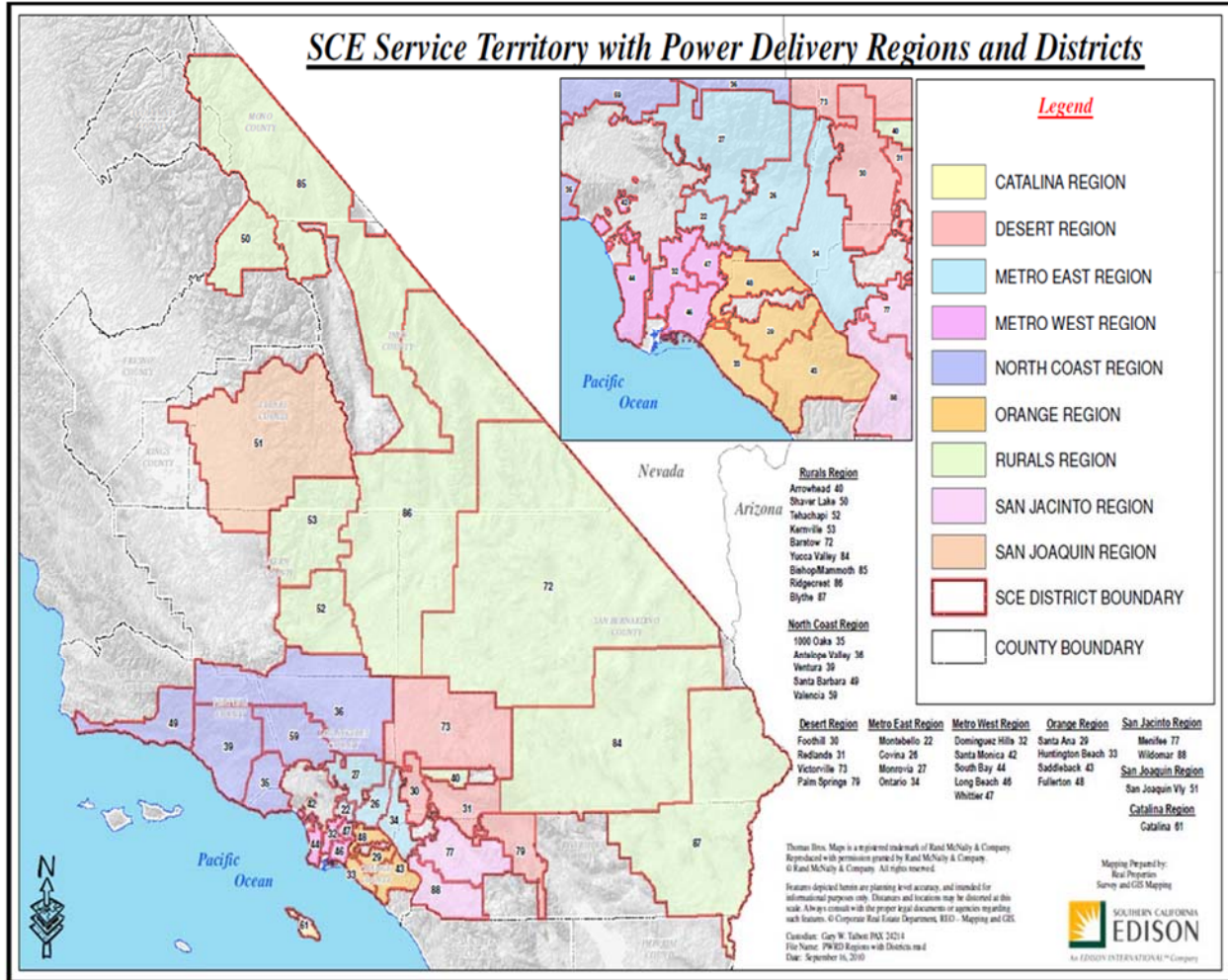
YUCCA VALLEY District Reliability Performance



- b. The information on the number, date, and location of planned outages are provided under seal in a separate report to the Directors of the Energy Division and the Safety Enforcement Division.

SECTION 4 – SERVICE TERRITORY MAP

The following is the SCE Service Territory with Power Delivery Regions and Districts Map. The map contains both SCE district boundaries and county boundaries. SCE has 8 regions and 35 districts.



SECTION 5 – TOP 1% OF WORST PERFORMING CIRCUITS (WPC) EXCLUDING MAJOR EVENT DAY (MED)

SCE's Worst Performing Circuits (WPC) projects take two years from circuit review to construction completion. A worst performing circuit rehabilitation identifies enhancements to improve the overall circuit reliability, as well as appropriate replacement of our riskiest assets. These circuit enhancements include equipment such as additional switches for isolation, installation of automation, automatic reclosers, branch line fuses, and fault indicators wherever judged to be cost-effective. A project may not be scoped if we have already planned other work that will enhance reliability.

SCE's selection of its WPC's begins with three years of historical data excluding MED and planned outages. Recent years are weighted higher by factors of 61%, 28% and 11%, respectively. The sum of SAIDI for the weighted three years are then ranked in descending order for the SAIDI index. The same methodology is applied to SAIFI for the SAIFI index. The top 1% of circuits SAIDI and top 1% of circuits SAIFI are then listed and reviewed for improvements (See Tables 7 and 8). The method produces 46 circuits based on SAIDI and 46 circuit based on SAIFI.

Please see below Table 7 and Table 8 that capture the top 1% WPC. Table 7 contains the Top 1% WPC using the SAIDI metric and Table 8 contains the Top 1% WPC using the SAIFI metric. The tables provide the (1) circuit name, (2) district, (3) customer count, (4) substation name, (5) circuit miles, (6) %UG, (7) %OH, (8) number of mainline outages resulting in the operation of a circuit breaker or automatic recloser, (9) System Level reliability metric, and (10) Circuit Level reliability metric.

⁷ The numerical value (6) indicates any circuit where a customer has experienced greater or equal to 6 outages.

Table 7 – Top 1% Worst Performing Circuits Based on SAIDI (Excluding MED)

(1) Circuit	(2) District	(3) 2018 Customer Count	(4) Substation	(5) Circuit-Miles	(6) % UG	(7) % OH	(8) Circuit Breaker or Automatic Re-Closer Operation 1 2018	(9) Sys. SAIDI RANK	(9) Sys. SAIDI2	(10) Ckt. SAIDI RANK	(10) Ckt. SAIDI4
Asteroid 16kV	22-Montebello	4,343	Alhambra	22.92	38.8%	61.2%	18	1	0.50763646	102	598.07
*Topoc 16kV	87-Blythe	848	Landing	24.49	45.8%	54.1%	9	2	0.27728257	15	1,674.67
Windjammer 16kV	39-Ventura	7,668	Channel Island	42.06	50.8%	49.2%	18	3	0.27690746	496	196.83
*Surfside 16kV	39-Ventura	5,584	Channel Island	31.66	66.6%	33.4%	24	4	0.27101780	333	248.33
Saunders 12kV	77-Menifee	2,500	Idyllwild	38.91	6.4%	93.5%	19	5	0.22611707	138	487.06
Carr 12kV	26-Covina	1,355	Puente	14.25	25.7%	74.3%	7	6	0.22388662	62	848.03
*Landers 25kV	84-Yucca Valley	1,784	Nugget	141.6	1.3%	98.7%	43	7	0.22379734	95	621.39
*Highball 12kV	30-Foothill	1,637	Bloomington	22.92	25.8%	74.2%	12	8	0.21253066	74	665.12
*Fantail 16kV	42-Santa Monica	4,585	Tahiti	15.96	89.0%	11.0%	4	9	0.19913096	403	222.49
January 12kV	33-Huntington Beach	4,355	Lafayette	23.59	91.9%	8.1%	22	10	0.19074870	399	223.87
Lark 2.4kV	73-Victorville	714	Wrightwood	7.581	10.8%	89.2%	6	11	0.18943691	23	1,343.23
Sewell 12kV	33-Huntington Beach	4,075	Hamilton	27.69	61.5%	38.5%	20	12	0.18602410	368	233.25
Chargers 12kV	33-Huntington Beach	3,961	Slater	29.88	63.1%	36.9%	22	13	0.18364981	350	240.44
*Butane 16kV	44-South Bay	4,805	Sepulveda	19.71	21.2%	78.8%	13	14	0.18035251	467	201.82
*Tenneco 12kV	36-Antelope Valley	4,692	Frazier Park	113.3	20.3%	79.7%	8	15	0.17991652	499	195.41
Belpac 16kV	35-Thousand Oaks	2,999	Newbury	39.47	87.1%	12.9%	9	16	0.17550580	248	301.34
Locksley 16kV	27-Monrovia	4,263	Ravendale	19.13	47.4%	52.5%	7	17	0.17541125	434	210.79
Campanula 25kV	84-Yucca Valley	1,966	Nugget	133.5	7.7%	92.4%	55	18	0.17134993	160	443.53
*Calico 12kV	29-Santa Ana	3,105	Sullivan	15.38	21.1%	78.9%	8	19	0.16990181	279	281.43
*Salmon 16kV	44-South Bay	3,997	El Nido	18.7	45.2%	54.8%	11	20	0.16757024	408	220.09
Lakeland 12kV	88-Wildomar	1,666	Elsinore	42.38	36.3%	63.7%	16	21	0.16572338	127	527.67
Ebony 16kV	44-South Bay	4,187	Torrance	18.57	62.3%	37.7%	8	22	0.16436024	475	200.74
Devils Gate 16kV	27-Monrovia	2,234	Arroyo	18.52	11.3%	88.7%	10	23	0.16316645	196	373.60
Rhumba 16kV	44-South Bay	4,071	Brighton	16.89	43.7%	56.3%	4	24	0.16292212	456	205.42
Linnet 2.4kV	73-Victorville	720	Wrightwood	6.125	12.0%	88.0%	2	25	0.15977581	35	1,142.78
Rhoda 16kV	35-Thousand Oaks	882	Crater	15.61	76.3%	23.7%	6	26	0.15974147	53	928.58
*Aha 12kV	87-Blythe	577	Aha P.T.	10.91	10.0%	90.0%	3	27	0.15918719	22	1,390.83
*Crosson 16kV	39-Ventura	4,425	Camarillo	40.94	50.5%	49.5%	15	28	0.15802001	604	172.76
*Waite 12kV	88-Wildomar	1,753	Skylark	29.51	81.6%	18.4%	7	29	0.15445229	157	450.32
Bard 4.16kV	39-Ventura	1,295	Bard P.T.	9.769	14.6%	85.4%	5	30	0.15295407	99	605.12
Lapins 12kV	31-Redlands	3,177	Maraschino	50.82	92.6%	7.4%	9	31	0.14933647	330	249.01
Camp Nelson 4.16kV	51-San Joaquin	682	Camp Nelson P.T.	25.2	7.4%	92.6%	8	32	0.14819385	37	1,093.49
Roxanne 12kV	46-Long Beach	1,573	Stadium	14.54	92.0%	8.0%	14	33	0.14804363	140	482.55
*Milpas 16kV	49-Santa Barbara	4,243	Santa Barbara	19.57	47.5%	52.5%	9	34	0.14685654	695	158.35
*Cimarron 16kV	44-South Bay	3,700	Inglewood	15.26	23.0%	77.1%	5	35	0.14575297	482	199.61
Tarpon 12kV	33-Huntington Beach	3,694	Bayside	18.43	60.5%	39.5%	9	36	0.14402579	481	199.87
Spinnaker 16kV	39-Ventura	5,007	Channel Island	29.14	37.2%	62.8%	15	37	0.14346989	770	146.97
Hub City 16kV	32-Dominguez Hills	1,828	Fremont	14.29	31.7%	68.3%	15	38	0.14282951	186	403.91
Big Rock 16kV	35-Thousand Oaks	2,866	Chatsworth	27.38	45.6%	54.4%	5	39	0.14177149	288	272.51
Thrush 2.4kV	73-Victorville	557	Wrightwood	5.989	15.2%	84.8%	6	40	0.14062728	30	1,291.05
Medford 4.16kV	22-Montebello	881	Terrace	6.18	40.1%	59.9%	10	41	0.13994151	68	812.65
Penrose 16kV	32-Dominguez Hills	1,884	Fremont	21.38	36.1%	63.9%	7	42	0.13827847	194	378.05
*Hot Springs 16kV	49-Santa Barbara	3,677	Santa Barbara	32.11	60.0%	40.0%	11	43	0.13742040	513	192.06
*Huevos 12kV	72-Barstow	2,464	Tortilla	23.25	47.8%	52.2%	8	44	0.13718804	273	285.09
Formosa 16kV	42-Santa Monica	3,461	Fairfax	5.896	38.9%	61.1%	9	45	0.13710046	461	203.09
Galahad 16kV	35-Thousand Oaks	2,255	Latigo	80.26	36.2%	63.8%	23	46	0.13660049	240	309.46

Circuits that have appeared in this report that were in last year's report are marked with an asterisk (*) per D. 16-01-008 Annual Electric Report.

¹ Includes Sustain and Momentary outages that affected the Circuit Breaker.

² SAIDI is based on a three-year weighted average.

³ List is a base case year.

⁴ Ckt, SAIDI is based on a three-year weighted factor (Average Customer experience on Circuit).

Table 8 – Top 1% Worst Performing Circuits Based on SAIFI (Excluding MED)

(1) Circuit	(2) District	(3) 2016 Customer Count	(4) Substation	(5) Circuit-Miles	(6) % UG	(7) % OH	(8) Circuit Breaker or Automatic Re-Closer Operation ¹ 2016	(9) Sys. SAIFI RANK	(9) Sys. SAIFI ²	(10) Ckt. SAIFI RANK	(10) Ckt. SAIFI ⁴
*Surfside 16kV	39-Ventura	5,584	Channel Island	31.66	66.6%	33.4%	24	1	0.00340603	93	3.12
*Asteroid 16kV	22-Montebello	4,343	Alhambra	22.92	38.8%	61.2%	18	2	0.00275183	88	3.20
*Crosson 16kV	39-Ventura	4,425	Camarillo	40.94	50.5%	49.5%	15	3	0.00273186	105	3.04
*Highway 16kV	39-Ventura	5,083	Saticoy	36.33	58.6%	41.4%	18	4	0.00253579	163	2.57
*Saunders 12kV	77-Menifee	2,500	Idyllwild	38.91	6.4%	93.5%	19	5	0.00225560	25	4.87
*Salmon 16kV	44-South Bay	3,997	El Nido	18.7	45.2%	54.8%	11	6	0.00221413	117	2.89
Huskie 12kV	43-Saddleback	3,443	Moulton	22.22	99.9%	0.1%	10	7	0.00221181	81	3.29
*Milpas 16kV	49-Santa Barbara	4,243	Santa Barbara	19.57	47.5%	52.5%	9	8	0.00220100	203	2.42
Spinnaker 16kV	39-Ventura	5,007	Channel Island	29.14	37.2%	62.8%	15	9	0.00214362	262	2.19
Windjammer 16kV	39-Ventura	7,668	Channel Island	42.06	50.8%	49.2%	18	10	0.00207977	673	1.46
Sewell 12kV	33-Huntington Beach	4,075	Hamilton	27.69	61.5%	38.5%	20	11	0.00203302	170	2.55
*Vallecito 16kV	49-Santa Barbara	3,954	Carpinteria	42.24	50.2%	49.8%	16	12	0.00196479	172	2.55
*Hot Springs 16kV	49-Santa Barbara	3,677	Santa Barbara	32.11	60.0%	40.0%	11	13	0.00182930	168	2.56
Campanula 25kV	84-Yucca Valley	1,966	Nugget	133.5	7.7%	92.4%	55	14	0.00179965	34	4.59
Riptide 16kV	42-Santa Monica	4,903	Santa Monica	14.19	78.6%	21.3%	8	15	0.00179529	379	1.90
*Fantail 16kV	42-Santa Monica	4,585	Tahiti	15.96	89.0%	11.0%	4	16	0.00179486	307	2.01
*Hooligan 16kV	35-Thousand Oaks	3,449	Newbury	46	85.5%	14.5%	19	17	0.00178826	159	2.58
Butane 16kV	44-South Bay	4,805	Sepulveda	19.71	21.2%	78.8%	13	18	0.00176688	356	1.94
*Cimarron 16kV	44-South Bay	3,700	Inglewood	15.26	23.0%	77.1%	5	19	0.00176039	198	2.42
Bilton 16kV	22-Montebello	3,197	Rosemead	14.03	18.2%	81.8%	9	20	0.00163706	201	2.42
King 16kV	44-South Bay	3,751	Victoria	14.87	53.3%	46.7%	10	21	0.00161501	265	2.18
*Sundown 12kV	73-Victorville	2,930	Helendale	58.07	77.4%	22.6%	9	22	0.00158827	129	2.77
Raiders 12kV	33-Huntington Beach	3,619	Slater	18.72	52.1%	47.9%	7	23	0.00152963	269	2.16
*January 12kV	33-Huntington Beach	4,355	Lafayette	23.59	91.9%	8.1%	22	24	0.00152711	451	1.79
Mesquite 12kV	73-Victorville	2,321	Hesperia	37.8	26.8%	73.2%	10	25	0.00152318	71	3.36
*Galahad 16kV	35-Thousand Oaks	2,255	Latigo	80.26	36.2%	63.8%	23	26	0.00151886	69	3.44
Ebony 16kV	44-South Bay	4,187	Torrance	18.57	62.3%	37.7%	8	27	0.00149861	422	1.83
Cottonmouth 16kV	59-Valencia	3,399	North Oaks	26.69	99.7%	0.3%	8	28	0.00149427	238	2.25
Hawthorne 16kV	44-South Bay	3,746	Yukon	26.49	22.0%	78.0%	15	29	0.00142240	247	2.23
*Hollywood 16kV	42-Santa Monica	3,650	Fairfax	12.06	76.3%	23.7%	5	30	0.00141832	392	1.88
Dornes 12kV	46-Long Beach	2,361	Eric	17.36	49.3%	50.7%	6	31	0.00141290	104	3.05
Cachuma 16kV	49-Santa Barbara	4,027	Vegas	81.18	19.0%	81.0%	22	32	0.00141118	446	1.79
*Locksley 16kV	27-Monrovia	4,263	Ravendale	19.13	47.4%	52.5%	7	33	0.00140854	512	1.69
Corsica 16kV	39-Ventura	6,001	Gonzales	45.54	67.1%	32.9%	7	34	0.00139762	943	1.22
Lyons 16kV	59-Valencia	3,585	Newhall	22.92	65.8%	34.2%	8	35	0.00139412	322	1.99
Diablo 16kV	39-Ventura	4,245	San Miguel	38.34	65.5%	34.5%	10	36	0.00139240	517	1.69
*Salvador 16kV	39-Ventura	2,594	San Miguel	26.86	89.4%	10.6%	7	37	0.00138539	134	2.72
*Sonics 12kV	33-Huntington Beach	3,614	Team	23.24	33.2%	66.8%	10	38	0.00137422	357	1.94
Tarpon 12kV	33-Huntington Beach	3,694	Bayside	18.43	60.5%	39.5%	9	39	0.00134107	409	1.86
*Aventura 12kV	79-Palm Springs	1,870	Aventura P.T.	18.96	13.3%	86.8%	10	40	0.00132747	62	3.60
Chargers 12kV	33-Huntington Beach	3,961	Slater	29.88	63.1%	36.9%	22	41	0.00131236	454	1.79
Belpac 16kV	35-Thousand Oaks	2,999	Newbury	39.47	87.1%	12.9%	9	42	0.00130124	245	2.23
*Otis 16kV	32-Dominguez Hills	3,532	Cudahy	24.08	40.0%	60.0%	6	43	0.00130113	359	1.94
Stocker 16kV	44-South Bay	2,187	Windsor Hills	17.54	41.2%	58.8%	7	44	0.00129688	108	3.03
Blocker 16kV	44-South Bay	4,615	Walteria	22.95	21.8%	78.1%	11	45	0.00129644	690	1.44
Huron 12kV	36-Antelope Valley	2,252	Great Lakes	29.74	37.4%	62.6%	11	46	0.00128085	139	2.69

Circuits that have appeared in this report that were in last year's report are marked with an asterisk (*) per D. 16-01-008 Annual Electric Report.

¹ Includes Sustain and Momentary outages that affected the Circuit Breaker.

² SAIFI is based on a three-year weighted average.

³ List is a base case year.

⁴ Ckt, SAIFI is based on a three-year weighted factor (Average Customer experience on Circuit).

Tables 9 and 10 below identify the circuits that are top 1% WPC (by SAIDI or SAIFI this year) *and* were top 1% circuits by SAIDI or SAIFI on SCE's WPC list in 2016.

The information contained in the tables captures the following information:

- i) An explanation of why it was ranked as a "deficient" circuit, i.e., the value of the metric used to indicate its performance.
- ii) A historical record of the metric.
- iii) An explanation of why it was on the deficiency list again.
- iv) An explanation of what is being done to improve the circuit's future performance and the anticipated timeline for completing those activities (or an explanation why remediation is not being planned).

Table 9 – (SAIDI Preferred Metric – “Repeat Deficient” List)

Circuit	i.		ii.		iii. Explanation of Repeat Deficiency	Submitted	iv. Engineering Scope	Anticipated Completion year
	2016-2018 Sys. SAIDI RANK	2016-2018 Sys. SAIDI	2015-2017 Sys. SAIDI RANK	2015-2017 Sys. SAIDI				
Topoc 16kV	2	0.27728	1	0.47912	Project identified, but not yet constructed.	6/29/2018	3 Automated Switches 1 FI 13 BLF's	2020
Surfside 16kV	4	0.27102	45	0.16076	Projected moved from 2018 operation date to 2019.	10/27/2016	2.2 Cond Mi of OH Conductor 4 Automated Switches 10 BLF's	2019
Landers 25kV	7	0.22380	5	0.26595	Projected moved from 2018 operation date to 2019.	10/27/2016	2 Automated Switches 78 BLF's 1 RAR	2019
Highball 12kV	8	0.21253	11	0.24724	Project identified, but not yet constructed.	7/31/2018	2 OH Switches 6 BLF's	2020
Fantail 16kV	9	0.19913	15	0.24057	Project completed, in process of evaluating circuit performance.	9/30/2016	2.5 Cond Mi of UG Cable 1.57 Cond Mi of OH Conductor 2 UG Switches 4 FI's Civil	2018
Butane 16kV	14	0.18035	40	0.16399	Projected moved from 2018 operation date to 2020.	9/29/2016	7 OH Switches 1 UG Switch 21 BLF's 5 FI's Civil	2020
Tenneco 12kV	15	0.17992	4	0.27507	Project identified, but not yet constructed.	1/31/2018	13 OH Switches	2019
Calico 12kV	19	0.16990	2	0.30414	Project completed, in process of evaluating circuit performance.	9/29/2016	4 RIS 2 UG RCS 6 OH Switches 8 BLF's	2018
Salmon 16kV	20	0.16757	7	0.25643	Projected moved from 2018 operation date to 2019.	10/27/2016	3 Automated Switches	2019
Aha 12kV	27	0.15919	31	0.17287	Projected moved from 2018 operation date to 2019.	10/27/2016	2 Automated Switches 1 RAR 1 RFI	2019
Crosson 16kV	28	0.15802	44	0.16084	Projected moved from 2018 operation date to 2020.	9/30/2016	.85 Cond Mi of UG Cable 4 Automated Switches 5 BLF's	2020
Waite 12kV	29	0.15445	36	0.16610	Project identified, but not yet constructed.	7/31/2018	17.17 Cond Mi UG Cable 3 UG Switches 13 BLF's 4 FI's	2020
Milpas 16kV	34	0.14686	13	0.24676	Project identified, but not yet constructed.	10/31/2017	1.44 Cond Mi UG Cable 2 Automated Switch 6 OH RFI 51 BLFs	2019
Cimarron 16kV	35	0.14575	3	0.27999	Project completed, in process of evaluating circuit performance.	10/27/2016	3 Automated Switches 12 BLF's	2018
Hot Springs 16kV	43	0.13742	14	0.24377	Projected moved from 2018 operation date to 2019.	11/23/2016	15 BLF's	2019
Huevos 12kV	44	0.13719	6	0.25739	Project identified, but not yet constructed.	7/31/2018	4.12 Cond Mi of UG Cable 3 UG Switches 3 OH Switches	2020

Table 10 – (SAIFI Preferred Metric – “Repeat Deficient” List)

Circuit	i.		ii.		iii.	iv.		
	2016-2018 Sys. SAIFI RANK	2016-2018 Sys. SAIFI	2015-2017 Sys. SAIFI RANK	2015-2017 Sys. SAIFI	Explanation of Repeat Deficiency	Submitted	Engineering Scope	Anticipated Completion year
Surfside 16kV	1	0.00341	18	0.00184	Projected moved from 2018 operation date to 2019.	10/27/2016	2.2 Cond Mi of OH Conductor 4 Automated Switches 10 BLF's	2019
Asteroid 16kV	2	0.00275	3	0.00268	Projected moved from 2018 operation date to 2019.	9/30/2016	1.6 Cond Mi UG Cable 3.3 Cond Mi OH Conductor 3 RFI's 3 Automated Switches 2 OH Switches 33 BLF's	2019
Crosson 16kV	3	0.00273	14	0.00189	Projected moved from 2018 operation date to 2020.	9/30/2016	.85 Cond Mi of UG Cable 4 Automated Switches 5 BLF's	2020
Highway 16kV	4	0.00254	5	0.00248	Projected moved from 2018 operation date to 2020.	9/30/2016	1.78 Cond Mi of UG Cable 2.4 Cond Mi of OH Conductor 3 OH Switches 4 Automated Switches 1 UG Switch 6 BLF's	2020
Saunders 12kV	5	0.00226	23	0.00171	Project identified, but not yet constructed.	10/31/2017	1 Automated Switch 7 RFI 31 BLF's	2019
Salmon 16kV	6	0.00221	19	0.00184	Projected moved from 2018 operation date to 2019.	10/27/2016	3 Automated Switches	2019
Milpas 16kV	8	0.00220	1	0.00304	Project identified, but not yet constructed.	10/31/2017	1.44 Cond Mi UG Cable 2 Automated Switch 6 OH RFI 51 BLFs	2019
Vallecito 16kV	12	0.00196	13	0.0018949	Project identified, but not yet constructed.	8/31/2018	9.04 Cond Mi of UG Cable 1 Automated Switch 1 RAR 1 OH Switch	2020
Hot Springs 16kV	13	0.00183	2	0.0029593	Projected moved from 2018 operation date to 2019.	11/23/2016	15 BLF's	2019
Fantail 16kV	16	0.00179	30	0.0015887	Project completed, in process of evaluating circuit performance.	9/30/2016	2.5 Cond Mi of UG Cable 1.57 Cond Mi of OH Conductor 2 UG Switches 4 FI's Civil	2018
Hooligan 16kV	17	0.00179	31	0.00159	Projected moved from 2018 operation date to 2020.	11/23/2016	.28 Cond Mi of UG Cable 5 Automated Switches 2 UG Switches 1 FI 2 BLF's	2020
Cimarron 16kV	19	0.00176	8	0.00229	Project completed, in process of evaluating circuit performance.	10/27/2016	3 Automated Switches 12 BLF's	2018

Circuit	i.		ii.		iii. Explanation of Repeat Deficiency	Submitted	iv. Engineering Scope	Anticipated Completion year
	2016 -2018 Sys. SAIFI RANK	2016 - 2018 Sys. SAIFI	2015 -2017 Sys. SAIFI RANK	2015 - 2017 Sys. SAIFI				
Sundown 12kV	22	0.00159	20	0.00182	Projected moved from 2018 operation date to 2019.	11/23/2016	7.37 Cond Mi of UG Cable 2 Automated Switches 6 UG Switches 32 BLF's Civil	2019
January 12kV	24	0.00153	15	0.00189	Project identified, but not yet constructed.	11/21/2017	.21 Cond Mi of UG Cable 1 OH Switch 8 UG Switches	2019
Galahad 16kV	26	0.00152	22	0.00172	Projected moved from 2018 operation date to 2020.	11/23/2016	3.7 Cond Mi of UG Cable 2.0 Cond Mi of OH Conductor 1 Automated Switch 1 OH Switch 5 FI's 129 BLF's Civil	2020
Hollywood 16kV	30	0.00142	12	0.00193	Project identified, but not yet constructed.	7/31/2018	5.62 Cond Mi of UG Cable 2 OH Switches	2020
Locksley 16kV	33	0.00141	21	0.00182	Projected moved from 2018 operation date to 2019.	10/27/2016	2 Automated Switches 1 UG Switch 3 RFI's 1 FI 33 BLF's	2019
Salvador 16kV	37	0.00139	27	0.0016251	Project completed, in process of evaluating circuit performance.	5/19/2016	2 BLF's	2018
Sonics 12kV	38	0.00137	28	0.00161	Project identified, but not yet constructed.	11/21/2017	7 Automated Switches 15 OH Switches 24 BLF's	2019
Aventura 12kV	40	0.00133	32	0.00150	Project completed, in process of evaluating circuit performance.		4 Automated Switches 4 OH Switches 26 BLF's	2018
Otis 16kV	43	0.00130	9	0.00211	Project identified, but not yet constructed.	10/31/2017	6 OH Switches 8 BLF's	2019

- v) A quantitative description of the utility's expectation for that circuit's future performance has not been developed, because SCE projects reliability improvements for WCR projects at the system level rather than at the individual circuit level. For additional details, please refer to the discussion in SCE's 2018 General Rate Case Testimony, as shown in Exhibit SCE-02, Volume 08, page 23 ("quantitative benefits").

SECTION 6 – TOP 10 MAJOR UNPLANNED POWER OUTAGE EVENTS WITHIN A REPORTING YEAR

Table 11 below captures the top 10 major unplanned outage events for 2018 including the cause and location of the outage. Table 12 captures the Number of customers without power in hourly interval for the 2018 Top 10 outages.

Table 11 – Top 10 Major Unplanned Outage Events (2018)

Rank	System Outage ID	Switching Center	Cause Description	SAIDI	Date	Number of Customers Affected	Longest Individual Customer Interruption (minutes)
1	320389	VENTURA	LOST SOURCE SUBSTATION	7.577	11/13/2018	2,828	47,832
2	320287	VENTURA	FIRE STRUCTURE POLE	4.159	11/12/2018	914	44,776
3	320225	VENTURA	PUBLIC AGENCY DENIED ACCESS POLE	3.703	11/9/2018	2,141	8,867
4	320091	VENTURA	LOST SOURCE SUBSTATION	2.743	11/11/2018	833	31,785
5	320324	VENTURA	LOST SOURCE SUBSTATION	2.463	11/15/2018	2,492	46,234
6	320390	VENTURA	PUBLIC AGENCY DENIED ACCESS POLE	2.421	11/9/2018	2,085	5,954
7	313579	VALLEY	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	2.199	7/25/2018	7,732	4,189
8	319319	VENTURA	LOST SOURCE SUBSTATION	2.063	11/9/2018	1,743	27,656
9	318316	VALLEY	LOST SOURCE DISTRIBUTION LINE	1.306	10/15/2018	5,475	2,021
10	319972	VENTURA	LOST SOURCE SUBSTATION	0.933	11/9/2018	2,313	30,448

Table 12 – Number of Customers without Power in Hourly Intervals

Ranking	1	2	3	4	5	6	7	8	9	10
System Outage ID	320389	320287	320225	320091	320324	320390	313579	319319	318316	319972
Outage Start Hour	11/13/2018 12:00:00 PM	11/12/2018 9:00:00 AM	11/9/2018 9:00:00 AM	11/11/2018 10:00:00 AM	11/15/2018 1:00:00 PM	11/9/2018 9:00:00 AM	7/25/2018 1:00:00 PM	11/9/2018 5:00:00 AM	10/15/2018 11:00:00 AM	11/9/2018 6:00:00 PM
0 - 1 Hour	2218	752	2141	748	2141	2085	37	1743	4126	936
1 - 2 Hour	2218	752	2141	748	2141	2085	3697	1743	4126	936
2 - 3 Hour	2218	752	2141	748	2141	2085	3697	1743	4126	936
3 - 4 Hour	2218	752	2141	748	2141	2085	3697	1743	4126	899
4 - 5 Hour	2218	752	2141	748	1933	2085	3697	1743	4126	899
5 - 6 hour	2218	752	2141	748	1933	2085	3697	1743	4126	899
6 - 7 Hour	2218	752	2141	748	1933	2085	3697	1743	4126	899
7 - 8 Hour	2218	752	2141	748	1933	2085	3697	1743	3696	899
8 - 9 Hour	2218	752	2141	748	1933	2085	3697	1743	2803	899
9 - 10 Hour	2218	752	2141	748	1933	2085	3868	1743	2685	899
10 - 11 Hour	2218	752	2141	748	1933	2085	3868	1743	4034	899
11 - 12 Hour	2218	752	2141	748	1933	2085	3868	1743	3977	899
12 - 13 Hour	2218	752	2141	748	1933	2085	3868	1743	3977	899
13 - 14 Hour	2218	752	2141	748	1933	2085	3868	1743	3977	899
14 - 15 Hour	2218	752	2141	748	1933	2085	3868	1743	3977	899
15 - 16 Hour	2218	752	2141	748	1933	2085	3868	1743	3977	899
16 - 17 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
17 - 18 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
18 - 19 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
19 - 20 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
20 - 21 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
21 - 22 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
22 - 23 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
23 - 24 Hour	2218	752	2141	748	1933	2085	3868	1700	3977	899
After24Hour (includes interruptions started at later days/Hours)	2828	914	2141	833	2216	2085	7732	1700	3977	2276

SECTION 7 – SUMMARY LIST OF MED PER IEEE 1366

Table 13 below captures all MED occurring in 2018 per IEEE 1366 definition of MED. The information includes the number of customers without service at periodic intervals, the cause and the location of each Major Event.

Table 13 – Summary list of MED Per IEEE (2018)

Cause	Transformer Bank, CrossArm, OH Conductor	Landslide on Pole, Vegetation Blown	OH Conductor, Transformer, Fire	Open for Repairs	Lightning, Vehicle Hit Pole	Open for Repairs	Unknown, Wind, Vegetation Blown	Denied Access, Substation Source lost	Substation Source Lost	Fire, Substation Source Lost
Location	D, R, ME	NC, MW, ME	ME, O, NC, D, MW	SJ	ME, MW, O	ME, R, D, MW	ME, O, NC, SJ	NC	NC	NC
Outage Duration	1/8/2018	1/9/2018	7/6/2018	7/25/2018	10/12/2018	10/13/2018	10/15/2018	11/9/2018	11/11/2018	11/12/2018
0 to 1 hour	99,630	185,190	80,468	42,267	148,766	81,322	162,937	65,531	39,828	47,887
1 to 5 hours	18,109	24,730	31,593	3,066	28,776	16,498	78,788	27,219	7,084	5,750
5 to 10 hours	2,048	2,943	7,643	469	5,942	6,183	39,974	9,613	942	481
10 to 15 hours	6,779	2,116	2,187	29	2,154	2,337	16,667	3,419	6	65
15 to 20 hours	580	478	2,975	433	3,989	1,242	6,560	1,045		569
20 to 24 hours		12	3,457	7	1,833	111	2,252	1,887		90
1 to 2 days	2,027	836	2,928	3,868	661	266	3,967	6,899	1	165
2 to 3 days		83	188	-	3	40	2	1,786	412	10
3 to 4 days			1					485		237
4 to 5 days								3,355		103
5 to 6 days		11		138				1		
6 to 7 days		2						2,141	80	
>= 7 days		199		-				6	748	901
Total	129,173	216,600	131,440	50,277	192,124	107,999	311,147	123,387	49,101	56,258

Cause	Substation Source Lost	Substation Source Lost	Lightning, Substation Source Lost
Location	NC	NC	MW, ME, NC
Outage Duration	11/13/2018	11/15/2018	11/29/2018
0 to 1 hour	12,203	22,655	197,818
1 to 5 hours	14,381	2,509	37,093
5 to 10 hours	1,257	80	3,848
10 to 15 hours	97	7	2,197
15 to 20 hours	2,222		468
20 to 24 hours		71	5
1 to 2 days		323	98
2 to 3 days	625	7	13
3 to 4 days		367	4
4 to 5 days	60	113	
5 to 6 days	5	562	
6 to 7 days		239	
>= 7 days	1,528	260	
Total	32,378	27,193	241,544

Note:
D - DESERT
ME - METRO EAST
MW - METRO WEST
NC - NORTH COAST
O - ORANGE
R - RURALS
SJC - SAN JACINTO
SJQ - SAN JOAQUIN

SECTION 8 - Historical Ten Largest Unplanned Outage Events for the past 10 Years

Table 14 below captures the ten largest unplanned outage events for each of the years from 2009-2018.

Table 14 – Historical Top 10 Outage Events (2018)

Rank	Cause Description	System OutageID	Date	SAIDI	Number of Customers Affected	Longest Individual Customer Interruption (minutes)	Location Switching Center
2018							
1	LOST SOURCE SUBSTATION	320389	11/13/2018	7,577	2,828	47,832	VENTURA
2	FIRE STRUCTURE POLE	320287	11/12/2018	4,159	914	44,776	VENTURA
3	PUBLIC AGENCY DENIED ACCESS POLE	320225	11/9/2018	3,703	2,141	8,867	VENTURA
4	LOST SOURCE SUBSTATION	320091	11/11/2018	2,743	833	31,785	VENTURA
5	LOST SOURCE SUBSTATION	320324	11/15/2018	2,463	2,492	46,234	VENTURA
6	PUBLIC AGENCY DENIED ACCESS POLE	320390	11/9/2018	2,421	2,085	5,954	VENTURA
7	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	313579	7/25/2018	2,199	7,732	4,189	VALLEY
8	LOST SOURCE SUBSTATION	319319	11/9/2018	2,063	1,743	27,656	VENTURA
9	LOST SOURCE DISTRIBUTION LINE	318316	10/15/2018	1,306	5,475	2,021	VALLEY
10	LOST SOURCE SUBSTATION	319972	11/9/2018	0,933	2,313	30,448	VENTURA
2017							
1	LOST SOURCE SUBSTATION	303349	12/4/2017	4,998	181,830	1,377	VENTURA
2	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	298030	8/29/2017	3,023	1,008	32,392	RECTOR
3	FIRE STRUCTURE POLE	303217	12/4/2017	2,259	6,841	16,826	VENTURA
4	TOPPLED/BROKEN STRUCTURE POLE	286230	1/22/2017	2,045	5,236	10,393	RECTOR
5	FIRE STRUCTURE POLE	303315	12/5/2017	1,849	4,640	19,065	VENTURA
6	FIRE TRANSMISSION EQUIPMENT CONDUCTOR	303350	12/4/2017	1,450	85,545	262	VENTURA
7	LOST SOURCE SUBSTATION	301515	12/7/2017	0,923	2,824	1,940	VALLEY
8	FIRE TRANSMISSION EQUIPMENT CONDUCTOR	302696	12/10/2017	0,898	84,977	66	VENTURA
9	BALLOON OVERHEAD EQUIPMENT POTHEAD	290334	4/30/2017	0,740	12,818	797	VISTA
10	LOST SOURCE SUBSTATION	302693	12/4/2017	0,622	175,978	18	VENTURA
2016							
1	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	272685	4/29/2016	1,507	40,012	451	VALLEY
2	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	278786	8/19/2016	1,298	1,238	18,457	RECTOR
3	FIRE STRUCTURE POLE	276042	6/23/2016	1,171	7,608	3,666	RECTOR
4	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	267639	1/7/2016	0,979	12,812	2,424	VISTA
5	OVERLOAD/FATIGUE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	275066	6/20/2016	0,928	16,162	1,572	LIGHTHIPE
6	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	276005	6/23/2016	0,880	1,678	9,359	RECTOR
7	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	276561	6/23/2016	0,840	664	11,716	RECTOR
8	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	275884	6/23/2016	0,830	440	9,546	RECTOR
9	SUBSTATION MAINTENANCE ERROR DURING ROUTINE WORK	280501	10/11/2016	0,694	103,448	304	EL NIDO
10	BALLOON OVERHEAD EQUIPMENT CONDUCTOR/WIRE	269108	2/15/2016	0,640	8,220	696	EL NIDO
2015							
1	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	257095	7/15/2015	2,316	3,849	3,035	LIGHTHIPE
2	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	257307	7/15/2015	0,783	1,329	3,372	LIGHTHIPE
3	UNKNOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	258625	8/13/2015	0,611	5,884	1,136	DEVERS
4	TOPPLED/BROKEN STRUCTURE POLE	261130	9/9/2015	0,467	4,301	7,215	MIRA LOMA
5	UNKNOWN UNDERGROUND EQUIPMENT CABLE	257337	7/15/2015	0,452	1,801	3,539	LIGHTHIPE
6	OTHER-SEE NOTES STRUCTURE POLE	257205	7/19/2015	0,446	3,906	1,247	VALLEY
7	N/A UNKNOWN NOT PATROLLED	262924	10/15/2015	0,436	10,130	581	VISTA
8	UNKNOWN UNDERGROUND EQUIPMENT CABLE	261743	9/19/2015	0,411	4,024	906	ORANGE COUNTY
9	UNKNOWN SUBSTATION EQUIPMENT CIRCUIT BREAKER	261051	9/15/2015	0,387	17,282	135	LIGHTHIPE
10	LANDSLIDE/MUDSLIDE STRUCTURE POLE	267353	10/18/2015	0,382	18	106,745	ELDORADO
2014							
1	BUSHING SUBSTATION EQUIPMENT CIRCUIT BREAKER	247325	12/22/2014	2,155	20,314	741	VISTA
2	LOST SOURCE SUBSTATION	239280	7/24/2014	0,808	29,678	345	ORANGE COUNTY
3	TOPPLED/BROKEN STRUCTURE POLE	236393	5/14/2014	0,739	5,694	1,033	VALLEY
4	UNKNOWN UNDERGROUND EQUIPMENT CABLE	247704	12/31/2014	0,464	1,308	4,188	VALLEY
5	UNKNOWN OVERHEAD EQUIPMENT POTHEAD	245855	11/23/2014	0,401	1,395	1,440	DEVERS
6	OTHER-SEE NOTES STRUCTURE SUBSTATION STRUCTURE/RACK	239913	7/30/2014	0,399	6,895	503	MESA
7	OVERLOADED SUBSTATION EQUIPMENT TRANSFORMER BANK	243293	10/2/2014	0,384	51,167	293	VENTURA
8	TOPPLED/BROKEN STRUCTURE POLE	245458	11/16/2014	0,365	785	2,329	DEVERS
9	LOST SOURCE SUBSTATION	232941	2/28/2014	0,351	25,087	87	VENTURA
10	TESTING/TROUBLESHOOTING STANDARD OPERATION OPERATOR/CREW	246973	12/15/2014	0,348	2,423	2,398	ORANGE COUNTY
2013							
1	LOST SOURCE SUBSTATION	224692	8/19/2013	6,316	125,876	1,729	RECTOR
2	UNKNOWN TRANSMISSION EQUIPMENT CONDUCTOR	226855	9/15/2013	1,500	107,741	381	EL NIDO
3	SUDDEN PRESSURE DEVICE SUBSTATION EQUIPMENT TRANSFORMER BANK	221685	6/28/2013	1,111	64,709	164	LIGHTHIPE
4	UNKNOWN OVERHEAD EQUIPMENT TRANSFORMER	217672	4/9/2013	0,801	5,613	1,453	LIGHTHIPE
5	LIGHTNING SUBSTATION EQUIPMENT CIRCUIT BREAKER	215922	2/8/2013	0,728	30,145	883	LIGHTHIPE
6	UNKNOWN UNDERGROUND EQUIPMENT CABLE	223292	7/26/2013	0,618	5,904	1,443	ORANGE COUNTY
7	UNKNOWN UNDERGROUND EQUIPMENT CABLE	229947	12/15/2013	0,543	1,572	1,867	EL NIDO
8	VANDALISM SUBSTATION EQUIPMENT BUS/CONDUCTOR	218242	4/24/2013	0,519	22,217	304	VALLEY
9	PULLED APART OVERHEAD EQUIPMENT SPLICE/CONNECTOR/TAP	214695	1/1/2013	0,440	4,979	1,395	MESA
10	UNKNOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	218132	4/26/2013	0,437	2,911	1,483	LIGHTHIPE

Rank	Cause Description	System Outage ID	Date	SAIDI	Number of Customers Affected	Longest Individual Customer Interruption (minutes)	Location Switching Center
2012							
1	UNKNOWN UNDERGROUND EQUIPMENT CABLE	200972	2/3/2012	0.923	31	147,812	CONTROL
2	UTILITY CONTACT TRANSMISSION EQUIPMENT INSULATOR	206814	8/21/2012	0.711	815	4,320	RECTOR
3	UNKNOWN SUBSTATION EQUIPMENT RELAY	195706	2/14/2012	0.570	21,253	181	ORANGE COUNTY
4	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	211557	11/10/2012	0.491	7,670	1,202	VENTURA
5	DETERIORATION STRUCTURE POLE	201705	6/5/2012	0.490	5,117	978	VINCENT
6	UNKNOWN STRUCTURE CROSSARM	212445	12/11/2012	0.477	15,674	170	VISTA, DEVERS
7	OTHER-SEE NOTES SUBSTATION EQUIPMENT TRANSFORMER BANK	207499	9/15/2012	0.443	3,320	1,320	MESA, MIRA LOMA
8	LOST SOURCE SUBSTATION	206078	8/23/2012	0.427	17,529	189	RECTOR
9	LIGHTNING OVERHEAD EQUIPMENT CONDUCTOR/WIRE	210892	10/11/2012	0.410	3,687	1,981	MESA
10	UNKNOWN UNDERGROUND EQUIPMENT CABLE	199511	4/20/2012	0.352	3,559	4,022	LIGHTHIPE
2011							
1	TOPPLED/BROKEN STRUCTURE POLE	193063	11/30/2011	3.000	6,321	8,373	MESA
2	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	193495	11/30/2011	2.917	3,722	8,575	MESA
3	WIND OVERHEAD EQUIPMENT CONDUCTOR/WIRE	193921	11/30/2011	2.810	4,118	3,379	MESA
4	TOPPLED/BROKEN STRUCTURE POLE	193361	11/30/2011	2.654	4,566	8,337	MESA
5	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	192988	11/30/2011	2.498	4,068	8,072	MESA
6	TOPPLED/BROKEN STRUCTURE POLE	193802	11/30/2011	2.203	2,062	7,552	MESA
7	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	192826	12/1/2011	2.166	2,429	8,105	MESA
8	ICE/SNOW TRANSMISSION EQUIPMENT CONDUCTOR HARDWARE	176231	3/20/2011	1.970	15,135	6,305	VINCENT
9	WIND OVERHEAD EQUIPMENT CONDUCTOR/WIRE	193447	12/1/2011	1.796	2,324	7,165	MESA
10	N/A UNKNOWN PATROLLED	182898	1/1/2011	1.742	33	260,236	CONTROL
2010							
1	TOPPLED/BROKEN STRUCTURE POLE	135650	1/21/2010	1.207	2,651	6,142	DEVERS
2	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	135801	1/20/2010	1.038	2,011	13,285	RECTOR
3	UNKNOWN OVERHEAD EQUIPMENT SPLICE/CONNECTOR/TAP	137790	2/27/2010	0.813	6,878	1,128	EL NIDO
4	LIGHTNING SUBSTATION EQUIPMENT BUS/CONDUCTOR	163903	10/1/2010	0.797	113,070	1,479	ORANGE COUNTY
5	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	136464	1/21/2010	0.765	479	8,718	VISTA
6	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	145558	6/7/2010	0.758	3,876	996	DEVERS
7	UNKNOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	136448	1/22/2010	0.742	562	12,184	VISTA
8	TOPPLED/BROKEN STRUCTURE POLE	135277	1/21/2010	0.675	1,679	8,438	DEVERS
9	EXTERNAL COMPONENT OVERHEAD EQUIPMENT SWITCH/DISCONNECT/AR	135727	1/23/2010	0.673	1,918	1,727	RECTOR
10	PROTECTION SUBSTATION EQUIPMENT CIRCUIT BREAKER	164418	10/19/2010	0.585	77,652	145	VENTURA
2009							
1	OTHER-SEE NOTES STRUCTURE SUBSTATION STRUCTURE/RACK	125285	8/31/2009	3.536	9,102	2,774	MESA
2	FIRE STRUCTURE POLE	133178	8/27/2009	2.007	54	181,485	MESA
3	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	127698	8/29/2009	1.125	117	62,056	MESA
4	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	116570	5/20/2009	1.102	12,400	3,346	RECTOR
5	OVERLOADED OVERHEAD EQUIPMENT SPLICE/CONNECTOR/TAP	123338	7/10/2009	0.739	3,710	973	ORANGE COUNTY
6	OTHER-SEE NOTES OVERHEAD EQUIPMENT CONDUCTOR/WIRE	128583	10/15/2009	0.667	4,075	1,979	EL NIDO
7	FIRE STRUCTURE POLE	133358	8/30/2009	0.547	197	177,730	VINCENT
8	VEHICLE HIT STRUCTURE POLE	107726	2/7/2009	0.504	842	3,296	EL NIDO
9	OVERLOADED OVERHEAD EQUIPMENT SPLICE/CONNECTOR/TAP	112977	4/20/2009	0.504	13,464	474	MESA
10	TOPPLED/BROKEN STRUCTURE POLE	112798	4/3/2009	0.458	1,650	2,841	DEVERS

SECTION 9 – THE NUMBER OF CUSTOMER INQUIRIES ON RELIABILITY DATA AND THE NUMBER OF DAYS PER RESPONSE.

In 2018, SCE received a total of 49 customer inquiries relating to circuit outage history or reliability data. SCE responded to 18% of the inquiries within 7 business days, 53% of the inquiries within 15 business days and 29% in a time frame greater than 15 business days.

Appendix-A

Circuit SAIFI

The number of times the average customer on the circuit experienced an outage lasting more than 5 minutes.

Circuit SAIDI

The amount of time the average customer on the circuit was without power due to outages lasting longer than 5 minutes.

Frequency *Peak Load/#Customers

The number of outages (AR or CB, sustained +momentary) multiplied by the peak load in the past year all divided by the number of customers.

Source Loss

Circuits that caused other circuits/circuits to experience an outage will have the CI and CMI rolled up into them and ranked. This ranking is based on all distribution outages from 2015 through 2017.

Circuits experiencing ≥ 4 cable failures

Any circuit experiencing greater or equal to 4 sustained cable failures will be flagged in the circuit rankings. This ranking is based on all distribution outages from 2015 through 2017.

Circuits experiencing >20 equipment failures

Any circuit experiencing greater or equal to 20 sustained equipment failures will be flagged in the circuit rankings. This ranking is based on all distribution outages from 2015 through 2017.

CEMI6

Any circuit where a customer has experienced greater or equal to 6 outages in 2017 will be flagged in the circuit rankings.