



# ANNUAL SYSTEM RELIABILITY REPORT

2017

PREPARED FOR CALIFORNIA PUBLIC UTILITIES  
COMMISSION

# Executive Summary

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The reliability information contained in this report is for 2017 as required by 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 are 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, which was for 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 the 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 2017 was 1.5808.

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 2017 Performance Summary**

The below table captures SCE's 2017 performance for unplanned outages including and excluding MED. The table also includes a 10-year average performance for unplanned outages including and excluding MED for comparison. In 2017, SCE saw an improvement in our reliability excluding MED. SCE continues to look for ways to improve our reliability performance with specific focuses in the areas of improved restoration times through new processes for operations response, less customer impact through real-time outage diagnostics and improving our infrastructure through automation of Remote Re-closer Settings. As a result, SCE improved 2017 SAIDI performance against the 10-year average by 6.71 minutes. SCE's 2017 SAIFI performance also improved by 0.01 as compared to the 10-year average. In addition, SCE improved its performance as compared to 2016 for SAIDI (excluding MED) by 18.26 minutes and SAIFI (excluding MED) by 0.12.

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2017	139.73	1.19	1.84	117.19	91.72	0.87	1.42	105.40
10-Year Avg (2008-2017)	130.99	1.00	1.52	130.71	98.43	0.88	1.35	111.45

In 2017, 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 9 MEDs. Please see below the summary table of Major Event Days.

No.	Date	Event Cause	SAIDI	SAIFI	Sustained Customer Impacted	MAIFI	Momentary Customer Impacted	Excluded per IEEE 1366
1	1/20/2017	Wind, Vegetation Blown	5.13	0.021	104,898	0.036	181,723	Y
2	1/22/2017	Snow, Vegetation Blown	4.23	0.015	77,115	0.019	95,795	Y
3	2/17/2017	Vegetation Blown, OH Conductor	8.34	0.040	206,206	0.084	430,482	Y
4	8/29/2017	Fire	3.31	0.003	13,534	0.002	11,343	Y
5	8/31/2017	Storm cause Poles & Wire down	2.43	0.014	70,801	0.024	120,012	Y
6	12/4/2017	Fire	10.78	0.065	331,461	0.037	188,471	Y
7	12/5/2017	Fire	8.28	0.029	146,912	0.082	420,051	Y
8	12/7/2017	Fire, Wind, Safety power shut off	2.92	0.012	61,630	0.008	43,023	Y
9	12/10/2017	Fire	2.59	0.123	628,390	0.125	636,906	Y
	Total		48.00	0.322	1,640,947	0.418	2,127,806	

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**SECTION 1 – SYSTEM INDICES FOR THE LAST 10 YEARS**

a. System Indices Tables

Table 1 below contains the required SAIDI, SAIFI, MAIFI<sup>1</sup> and CAIDI indices for 2008-2017 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 (2008-2017)**

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2008	118.91	1.06	1.73	112.33	99.35	0.95	1.56	104.05
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

i. Distribution Indices<sup>2</sup>

**Table 2 – Unplanned Outage Distribution Indices (2008-2017)**

YEAR	Distribution Indices (< 50KV) (All Interruptions Included)				Distribution Indices (< 50KV) (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2008	117.05	1.02	1.65	114.62	97.48	0.92	1.48	106.25
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

<sup>1</sup> SCE calculates MAIFI at every individual outage event

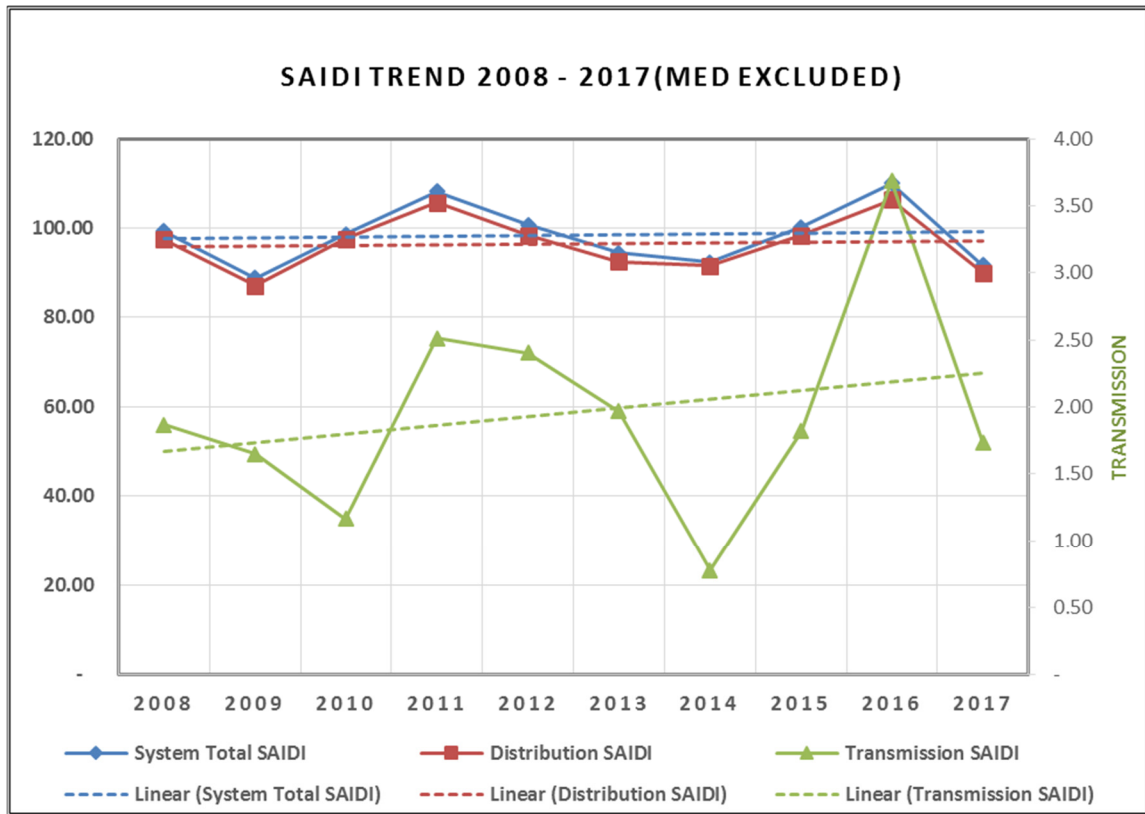
<sup>2</sup> Distribution system outages are defined as outages that are <50kV

ii. Transmission Indices<sup>3</sup>

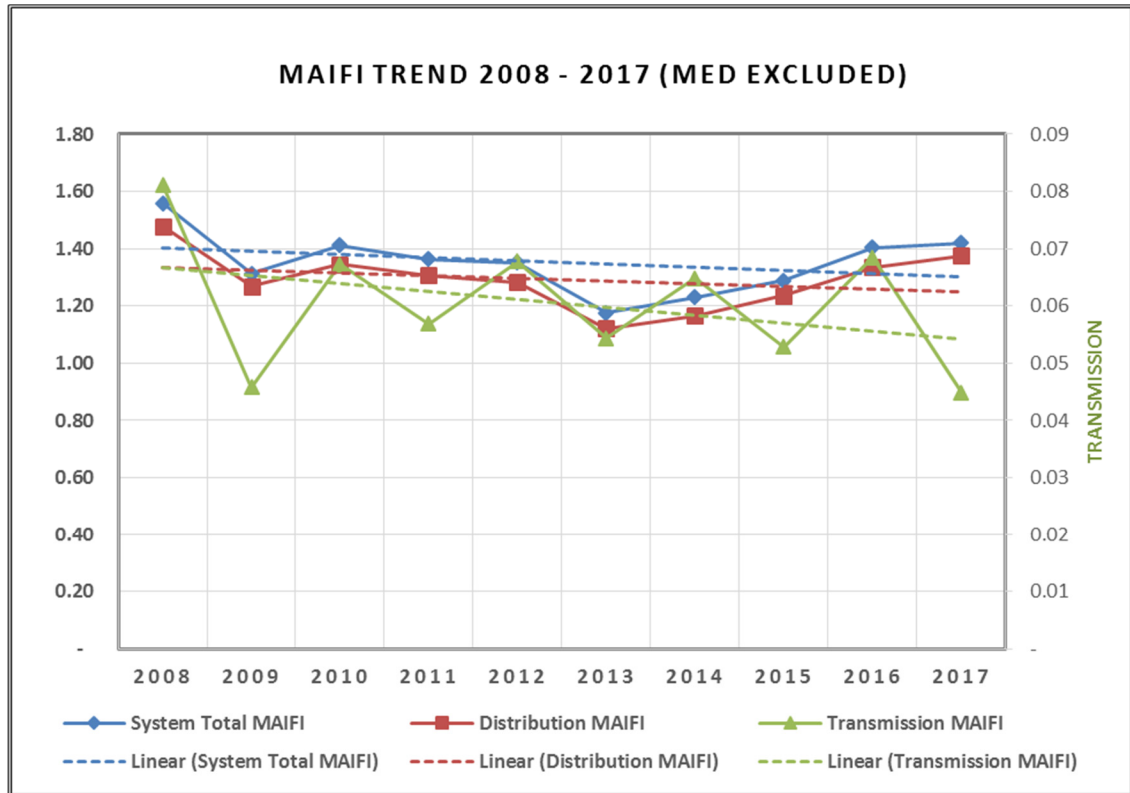
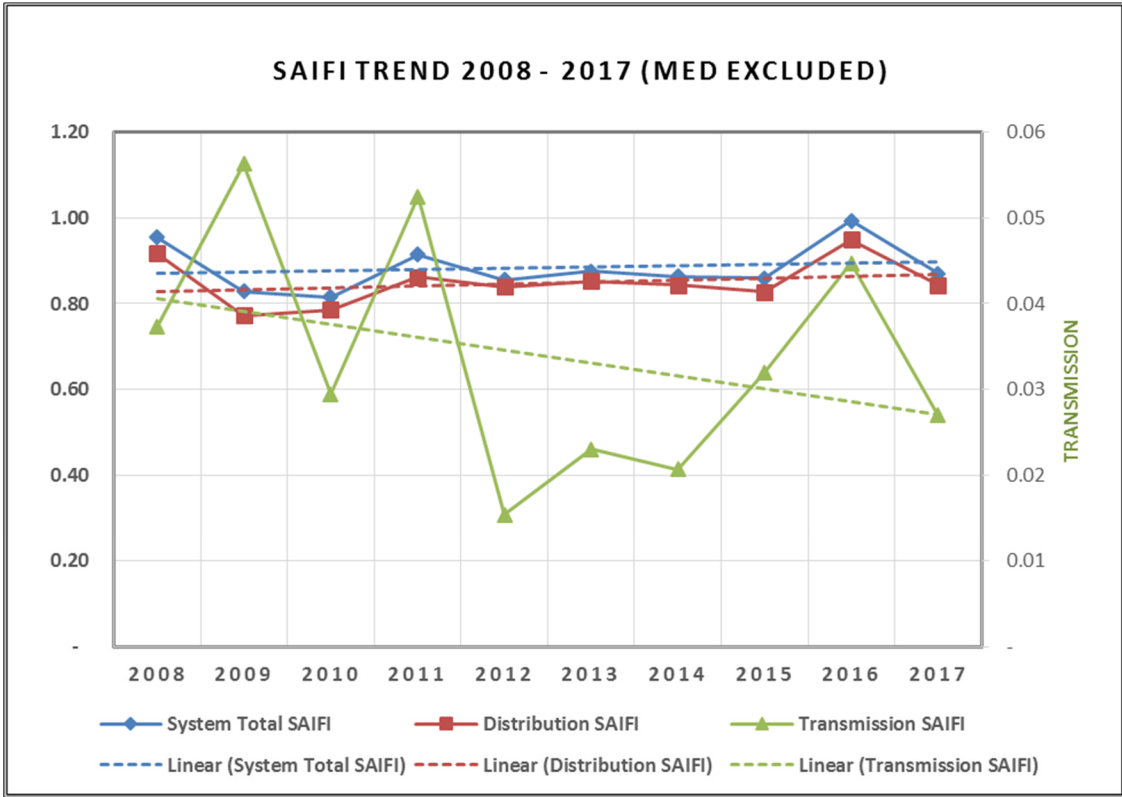
**Table 3 – Unplanned Outage Transmission Indices (2008-2017)**

YEAR	Transmission Indices (>= 50KV) (All Interruptions Included)				Transmission Indices (>= 50KV) (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2008	1.87	0.04	0.09	49.92	1.87	0.04	0.08	49.95
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

b. Unplanned Outage System Indices Charts (MED Excluded)

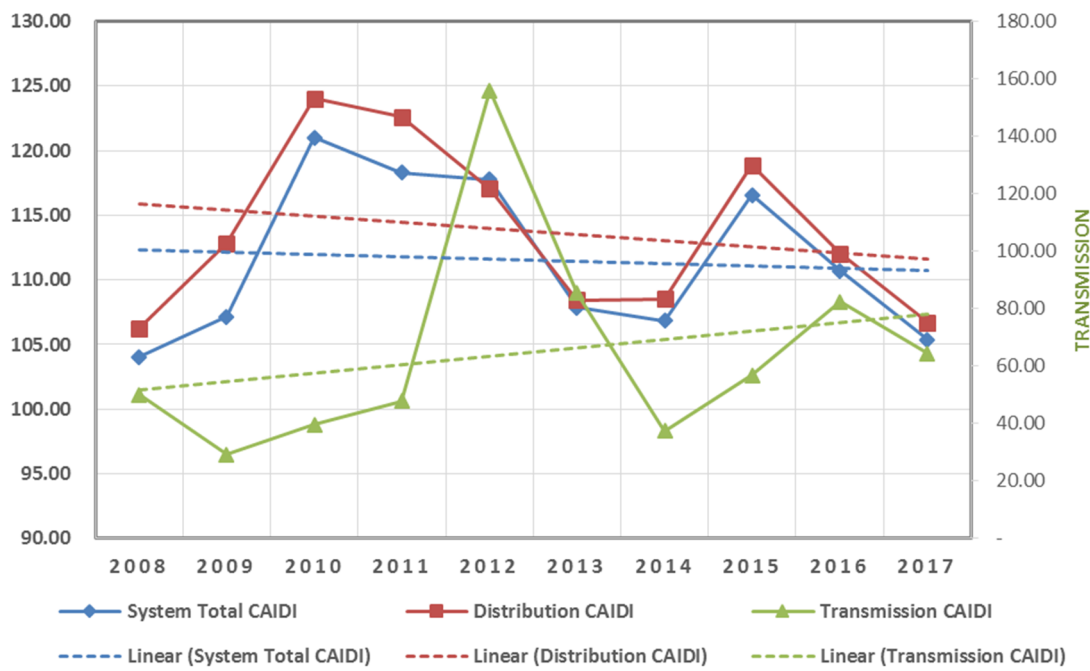


<sup>3</sup> Transmission system outages are defined as outages  $\geq 50kV$





CAIDI TREND 2008 - 2017 (MED EXCLUDED)



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

a. District SAIDI, SAIFI, MAIFI and CAIDI<sup>4</sup> (including and excluding MED) for unplanned outages

**Table 4 – District Indices (2008-2017)**

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>ANTELOPE VALLEY</b>								
2008	92.185	0.956	2.414	96.458	76.570	0.825	2.124	92.802
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
<b>ARROWHEAD</b>								
2008	1239.362	5.427	11.469	228.387	475.902	3.642	6.678	130.682
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
<b>BARSTOW</b>								
2008	403.157	2.363	4.415	170.643	318.756	1.920	3.625	166.036
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
<b>BISHOP</b>								
2008	265.070	1.087	1.923	243.782	159.414	0.882	1.777	180.641
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
<b>BLYTHE</b>								
2008	454.705	3.094	4.795	146.982	454.705	3.094	4.042	146.982
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

<sup>4</sup> 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
<b>CATALINA</b>								
2008	29.733	1.357	0.888	21.915	29.733	1.357	0.888	21.915
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
<b>COMPTON</b>								
2008	81.303	0.699	1.386	116.316	71.633	0.644	1.313	111.283
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
<b>COVINA</b>								
2008	84.551	0.639	1.358	132.397	74.686	0.582	1.269	128.384
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
<b>FOOTHILL</b>								
2008	85.539	0.636	1.658	134.423	76.793	0.577	1.605	133.050
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	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
<b>FULLERTON</b>								
2008	91.886	0.779	0.967	117.957	87.406	0.738	0.888	118.371
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
<b>HUNTINGTON BEACH</b>								
2008	84.497	0.776	0.954	108.846	80.194	0.739	0.898	108.503
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

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>KERNVILLE</b>								
2008	590.919	3.898	7.309	151.580	228.916	2.548	4.493	89.833
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
<b>LONG BEACH</b>								
2008	52.535	0.436	0.640	120.516	48.058	0.409	0.604	117.392
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
<b>MENIFEE</b>								
2008	111.189	1.570	1.757	70.808	83.826	1.490	1.726	56.272
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
<b>MONROVIA</b>								
2008	103.789	0.848	1.881	122.426	95.940	0.761	1.770	126.002
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
<b>MONTEBELLO</b>								
2008	93.833	0.712	1.678	131.832	85.623	0.665	1.633	128.688
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
<b>ONTARIO</b>								
2008	99.041	0.790	1.449	125.372	92.016	0.738	1.379	124.620
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

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>PALM SPRINGS</b>								
2008	170.541	1.506	2.405	113.251	144.142	1.400	2.213	102.984
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
<b>REDLANDS</b>								
2008	103.674	0.911	1.602	113.832	93.720	0.842	1.477	111.282
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
<b>RIDGECREST</b>								
2008	167.192	1.423	3.184	117.455	163.869	1.414	3.179	115.856
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
<b>SADDLEBACK</b>								
2008	89.743	0.925	0.572	97.007	84.923	0.874	0.567	97.138
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
<b>SANTA ANA</b>								
2008	77.542	0.681	0.943	113.881	73.380	0.649	0.852	113.109
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
<b>SANTA BARBARA</b>								
2008	535.533	6.309	3.588	84.883	336.797	5.121	2.604	65.764
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

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>SANTA MONICA</b>								
2008	60.490	0.800	1.211	75.635	53.518	0.755	1.163	70.847
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
<b>SHAVER LAKE</b>								
2008	104.921	2.499	2.291	41.977	91.752	2.059	1.466	44.558
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
<b>SOUTH BAY</b>								
2008	110.983	1.074	2.058	103.324	93.443	0.937	1.817	99.722
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
<b>TEHACHAPI</b>								
2008	538.562	3.013	2.695	178.746	475.358	2.737	2.517	173.697
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
<b>THOUSAND OAKS</b>								
2008	129.109	1.418	2.273	91.031	124.425	1.377	2.168	90.364
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
<b>TULARE</b>								
2008	102.285	1.010	2.105	101.290	93.741	0.984	2.026	95.232
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

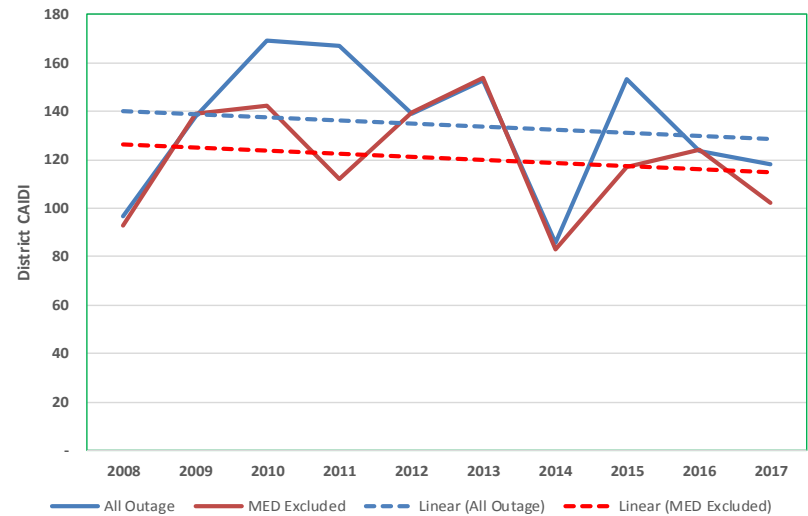
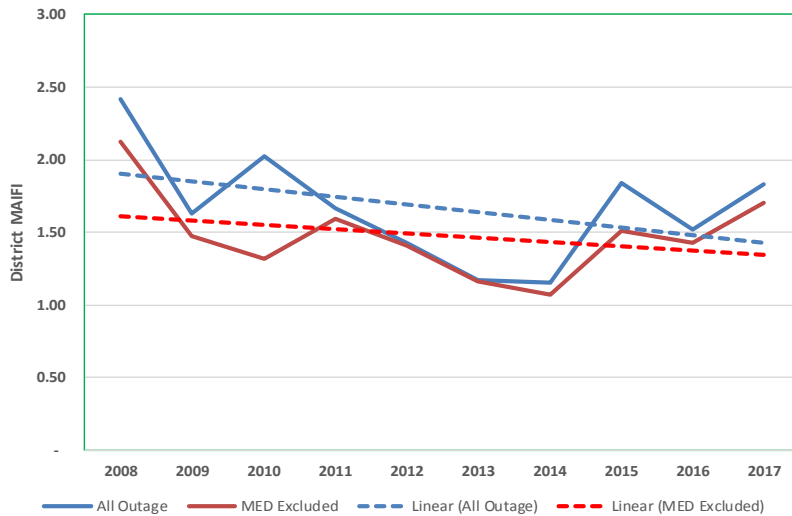
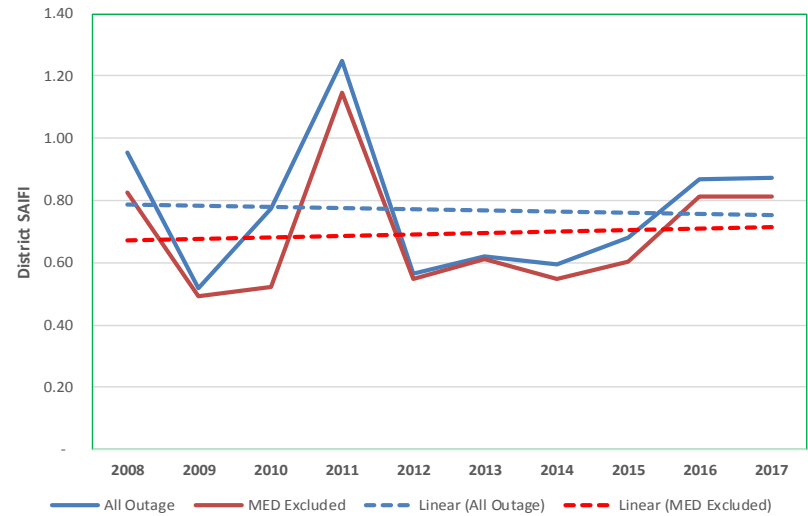
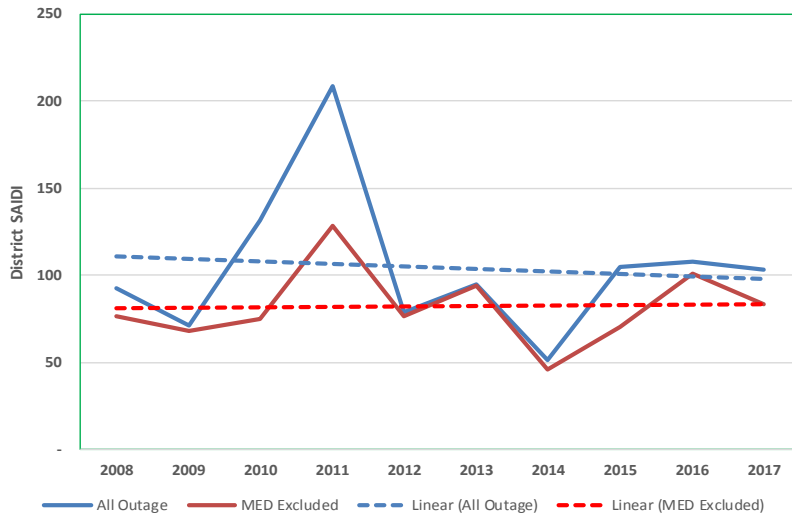
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>VALENCIA</b>								
2008	154.448	1.283	1.280	120.341	144.819	1.251	1.209	115.786
2009	101.701	0.812	1.519	125.209	101.368	0.800	1.400	126.765
2010	117.815	0.806	2.195	146.239	103.447	0.698	2.114	148.275
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
<b>VENTURA</b>								
2008	134.882	1.334	2.421	101.125	118.631	1.162	2.308	102.103
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
<b>VICTORVILLE</b>								
2008	136.461	1.248	3.540	109.335	110.202	1.111	2.872	99.232
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
<b>WHITTIER</b>								
2008	85.700	0.643	1.211	133.258	84.682	0.640	1.194	132.415
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
<b>WILDOMAR</b>								
2008	65.200	0.612	0.908	106.550	58.950	0.556	0.872	105.992
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
<b>YUCCA VALLEY</b>								
2008	465.373	2.789	10.074	166.836	351.816	2.018	7.137	174.382
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

- 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.



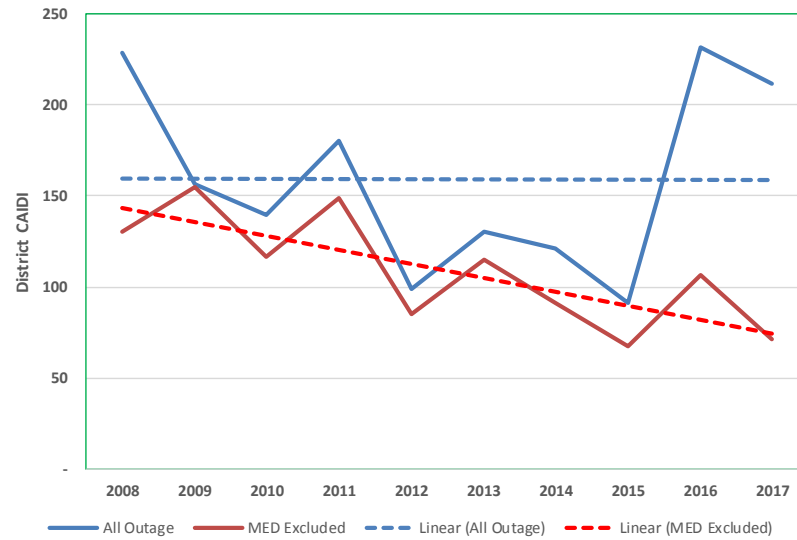
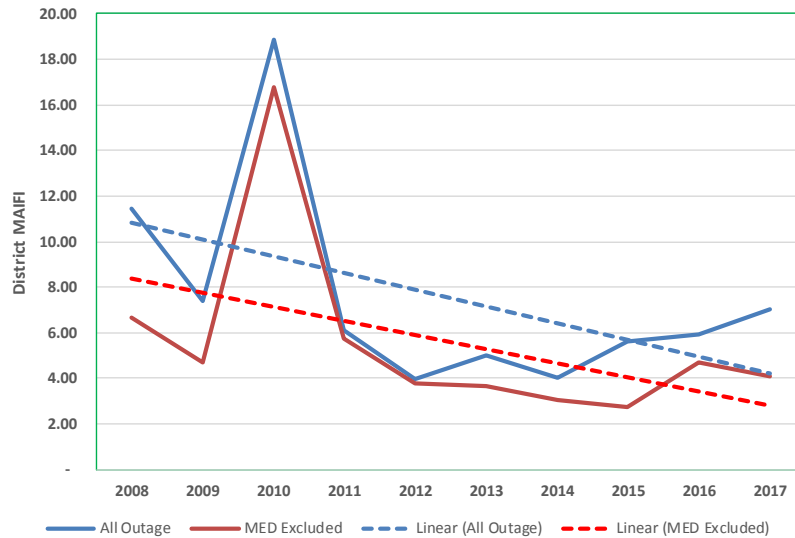
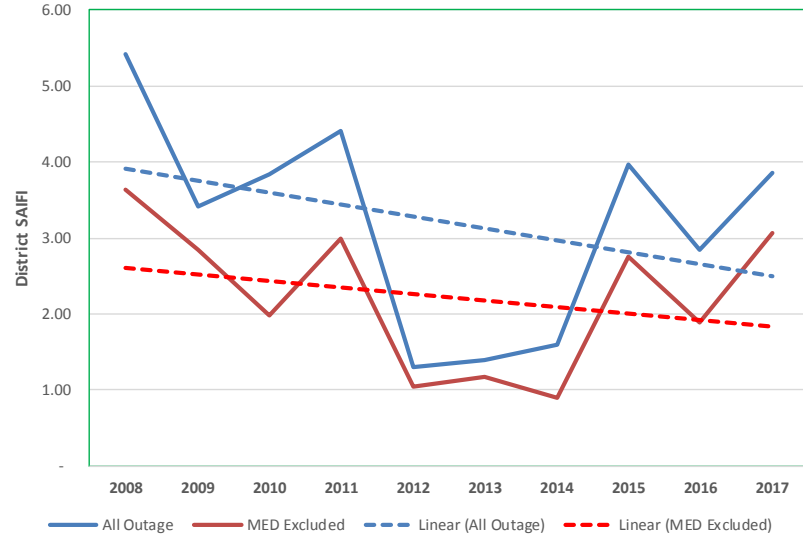
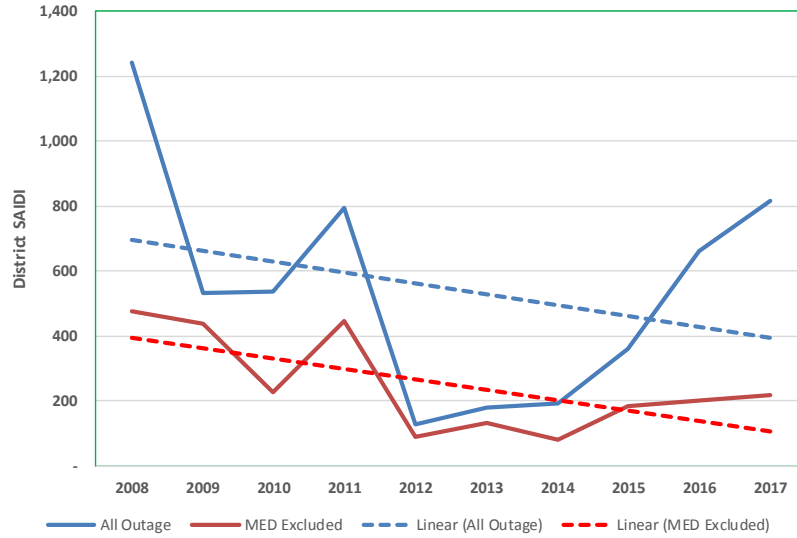
## 2008 -2017 District Reliability Graphs

### ANTELOPE VALLEY District Reliability Performance



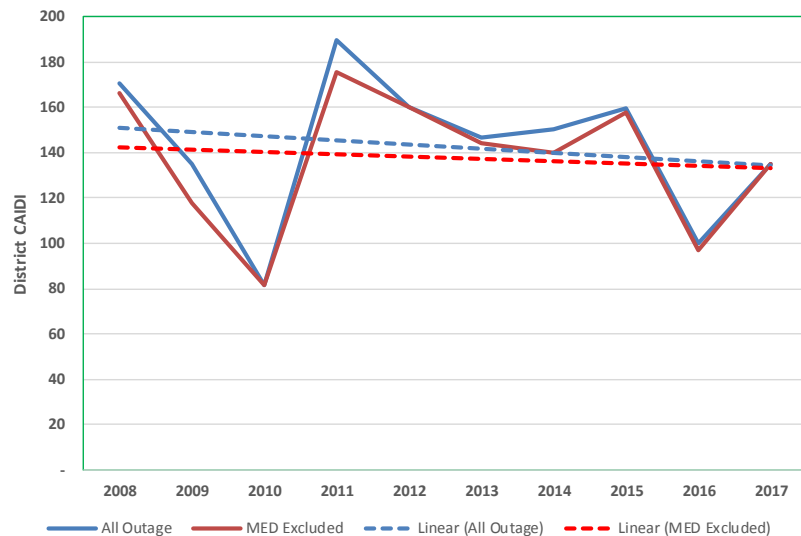
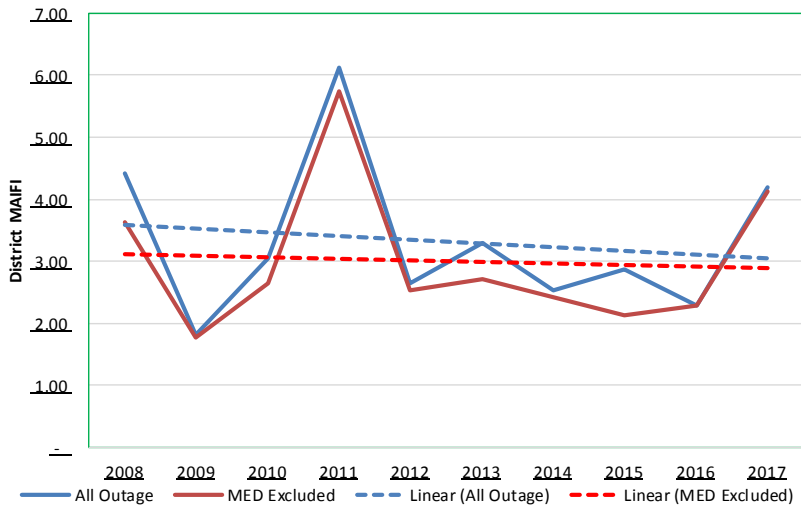
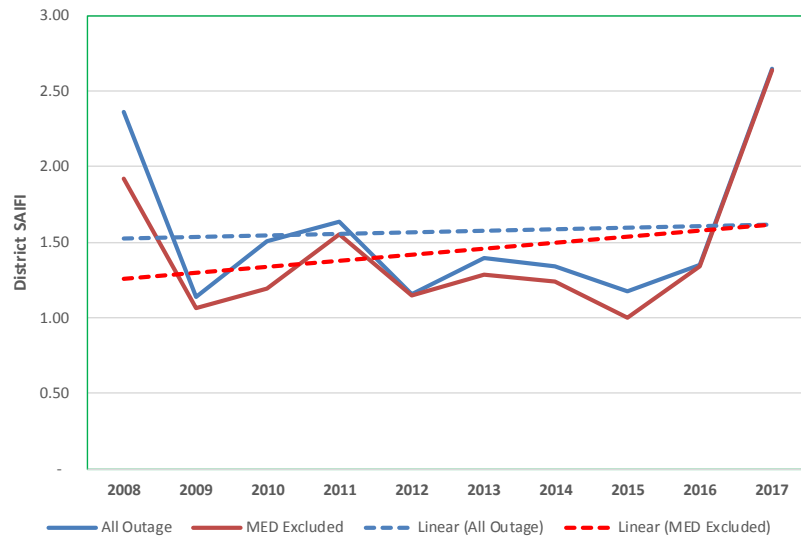
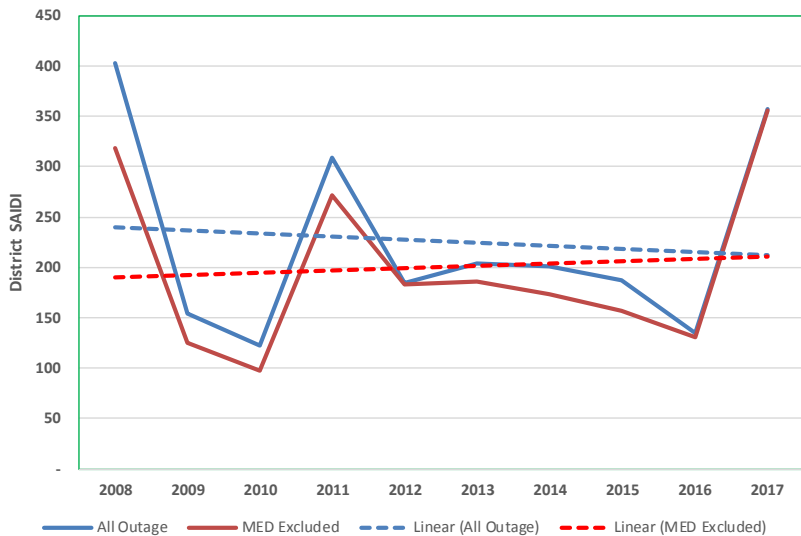
# 2008 -2017 District Reliability Graphs

## ARROWHEAD District Reliability Performance



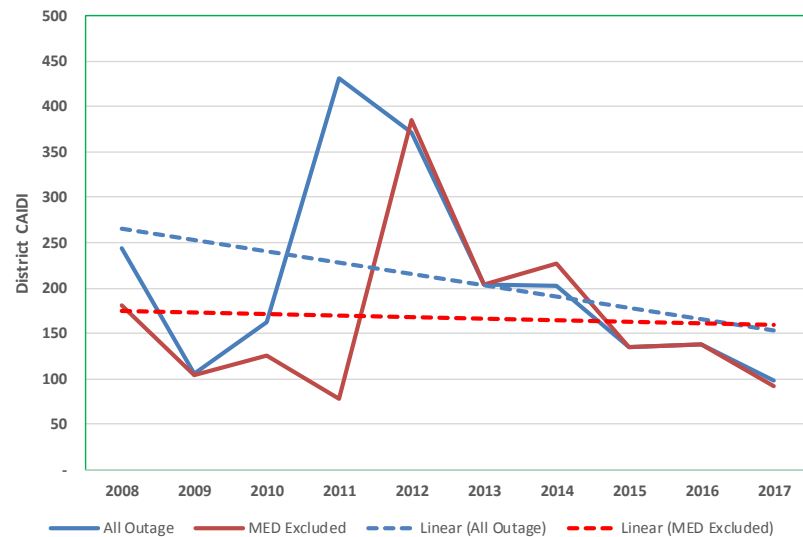
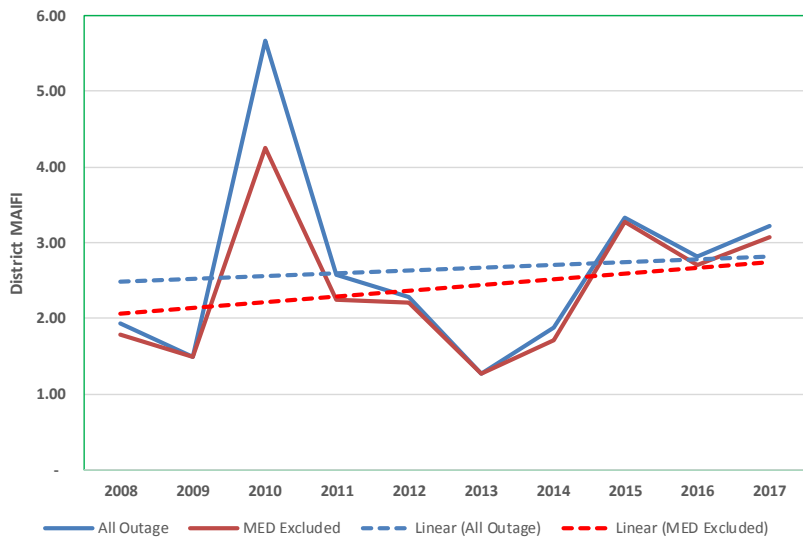
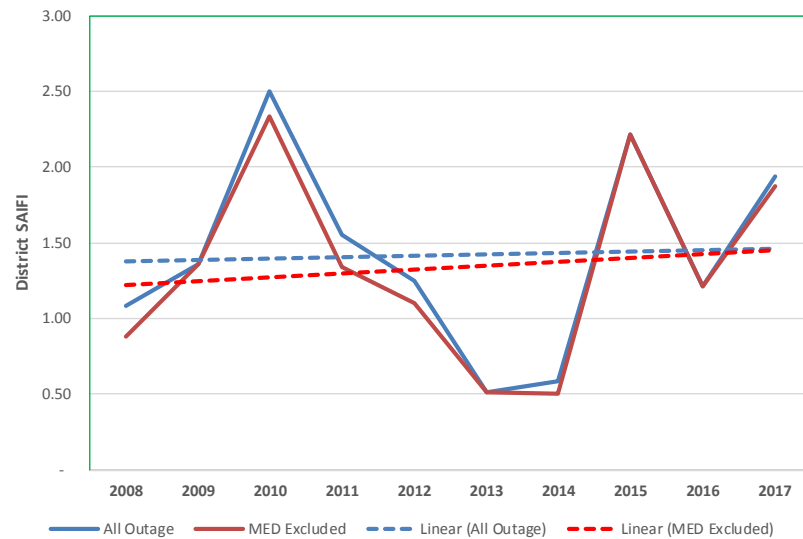
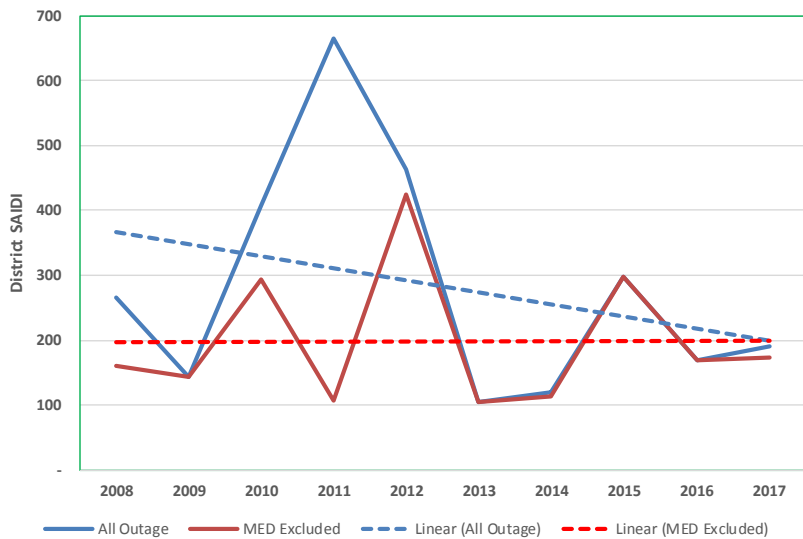
# 2008 -2017 District Reliability Graphs

## BARSTOW District Reliability Performance



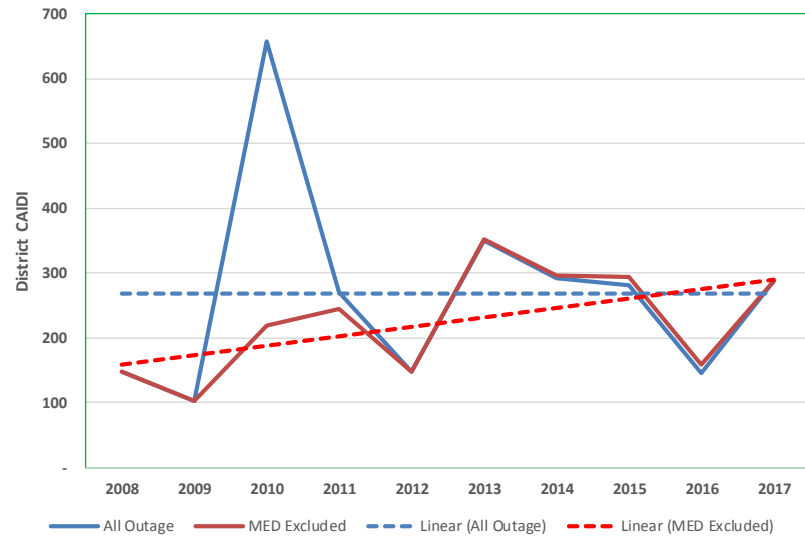
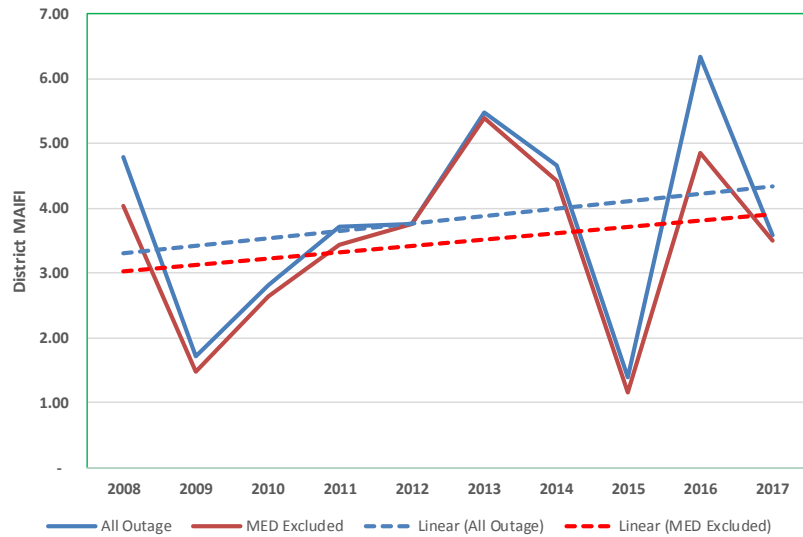
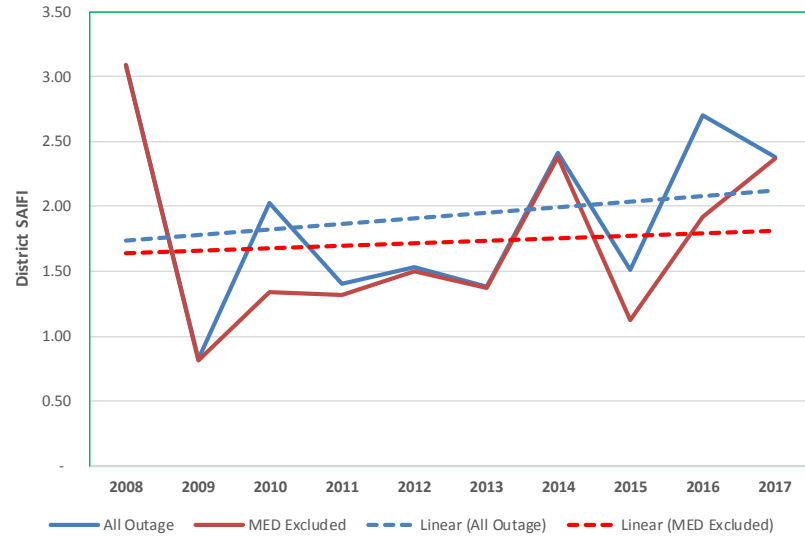
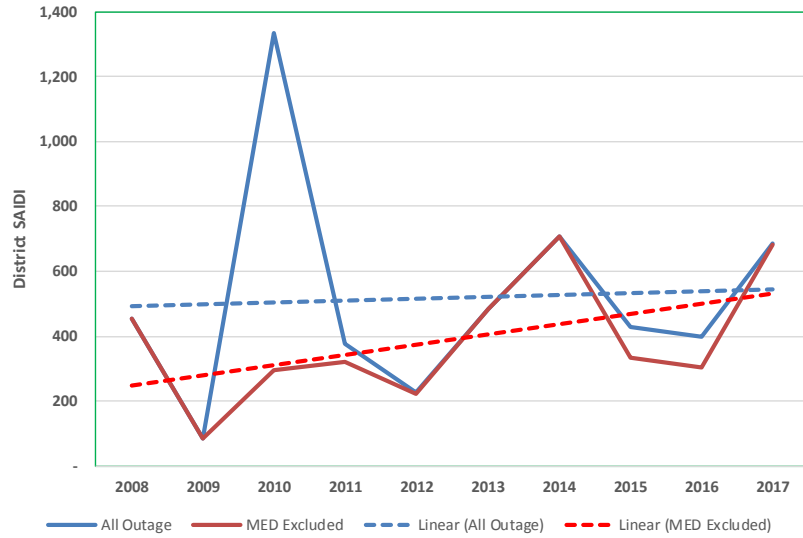
## 2008 -2017 District Reliability Graphs

### BISHOP District Reliability Performance



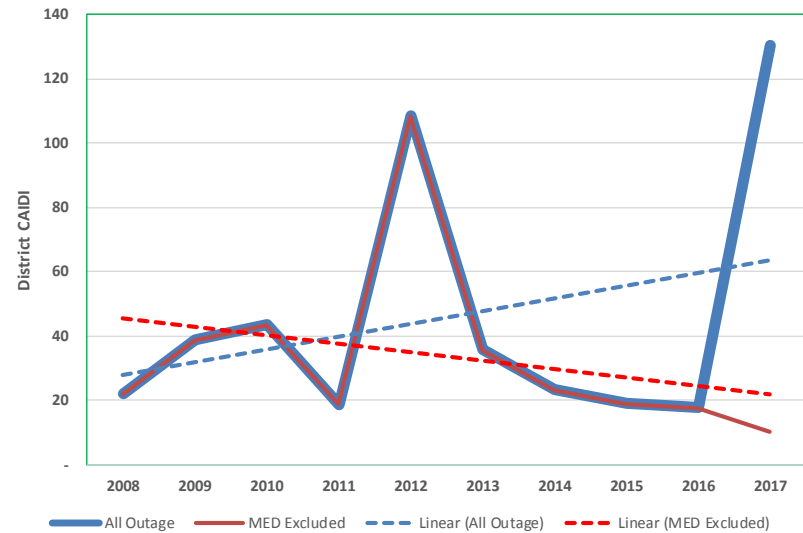
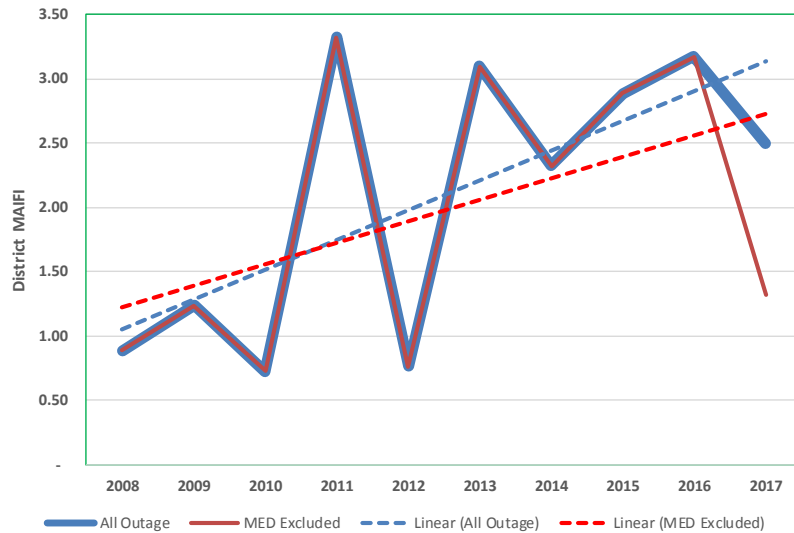
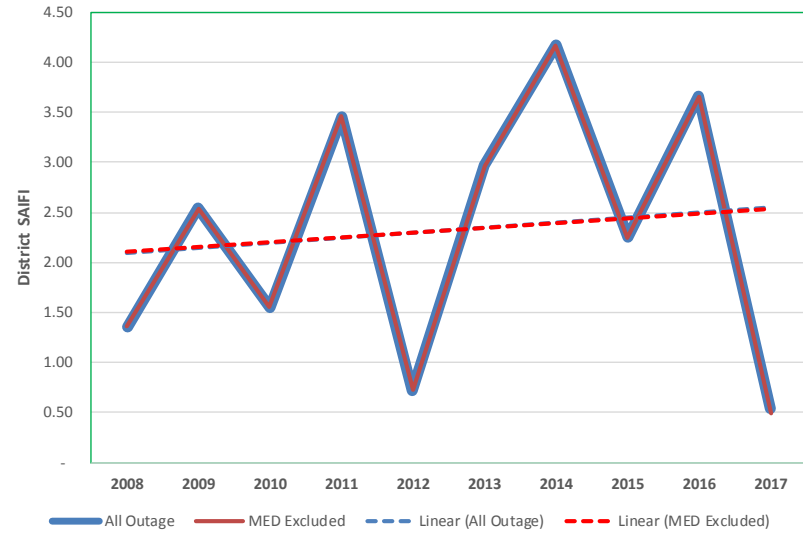
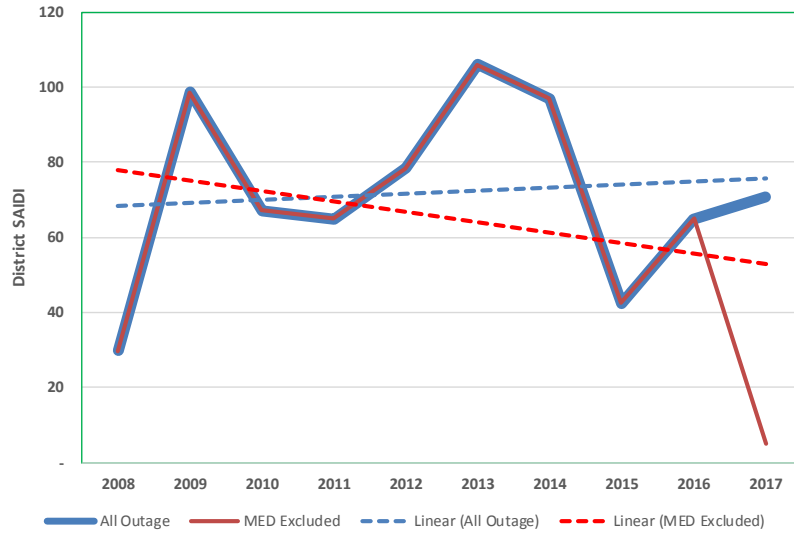
# 2008 -2017 District Reliability Graphs

## BLYTHE District Reliability Performance



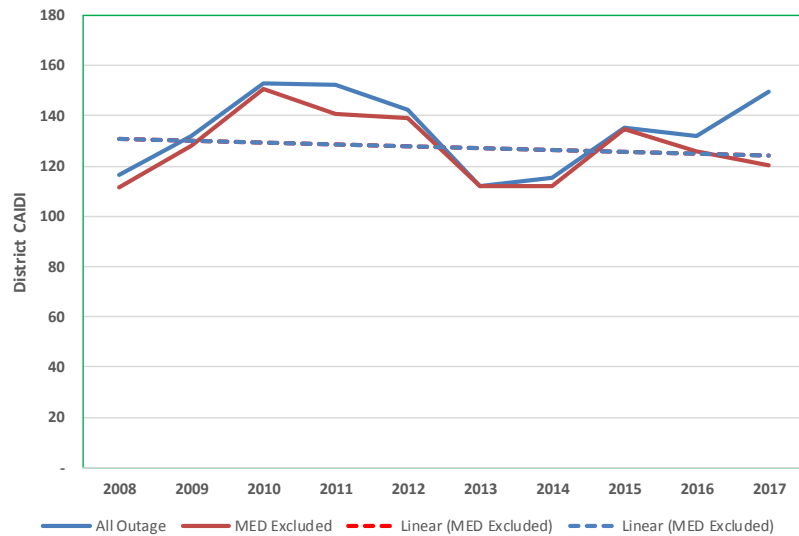
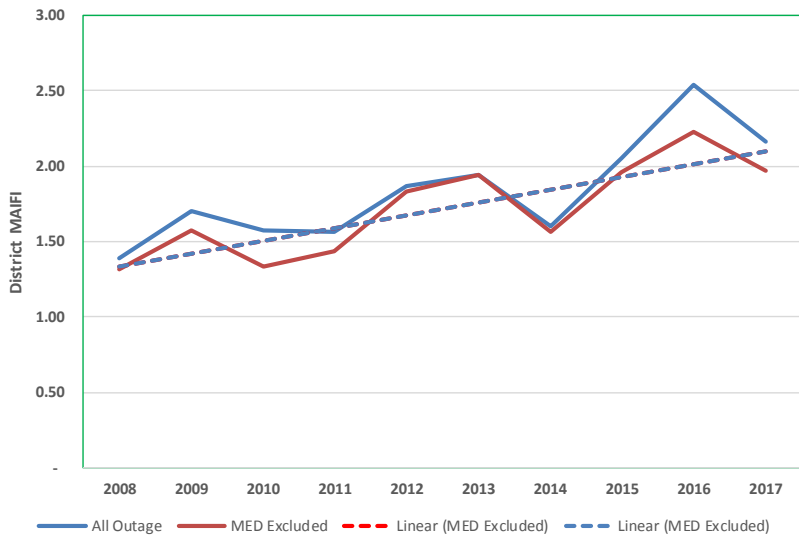
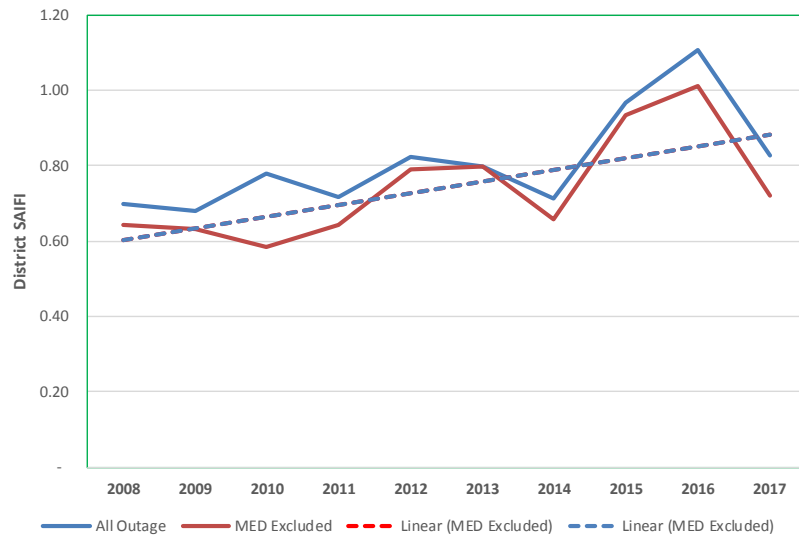
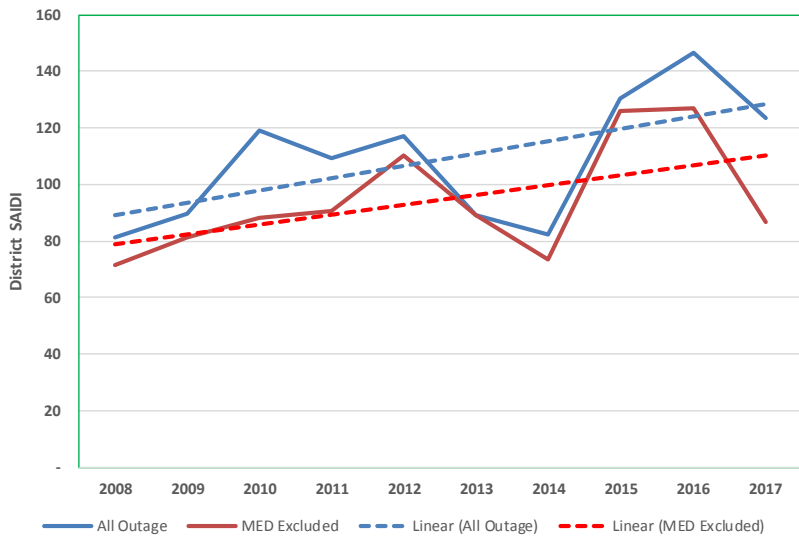
## 2008 -2017 District Reliability Graphs

### CATALINA District Reliability Performance



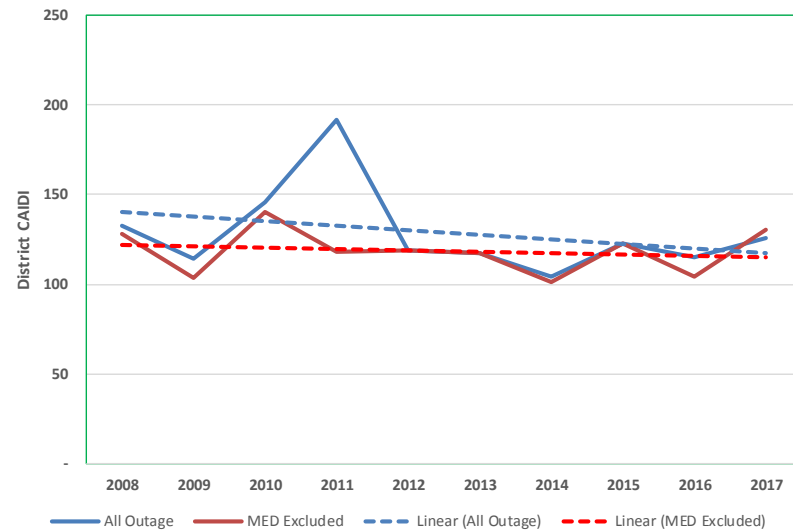
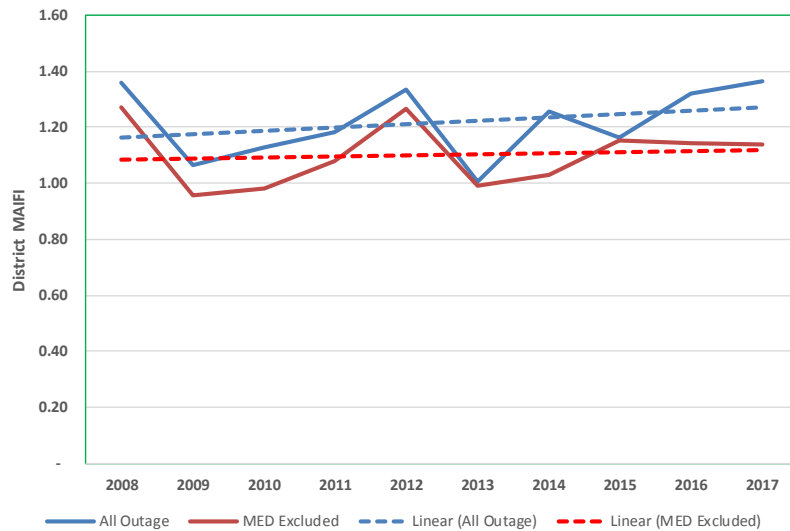
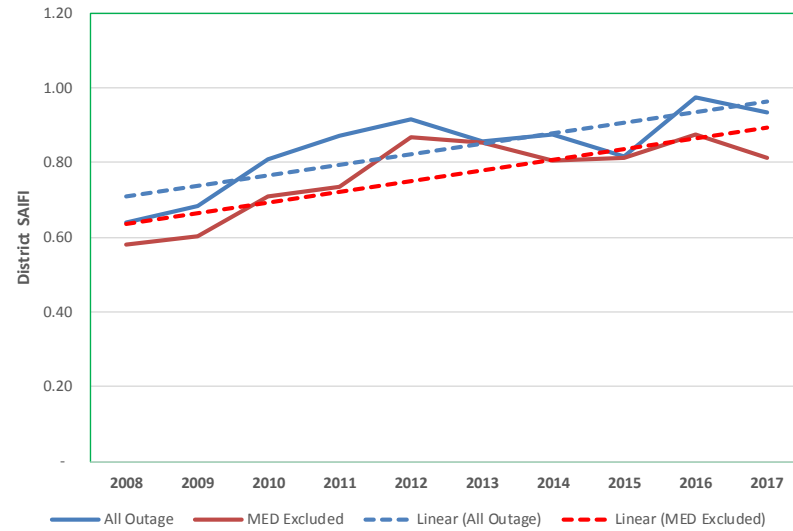
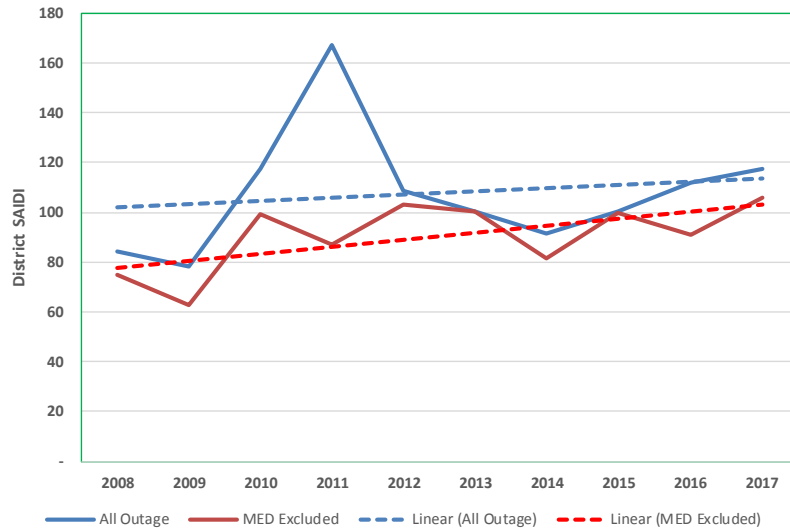
# 2008 -2017 District Reliability Graphs

## COMPTON District Reliability Performance



## 2008 -2017 District Reliability Graphs

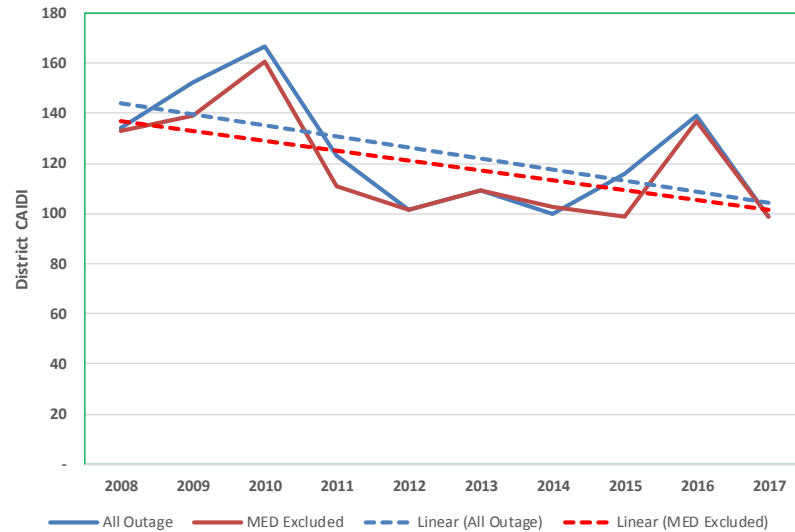
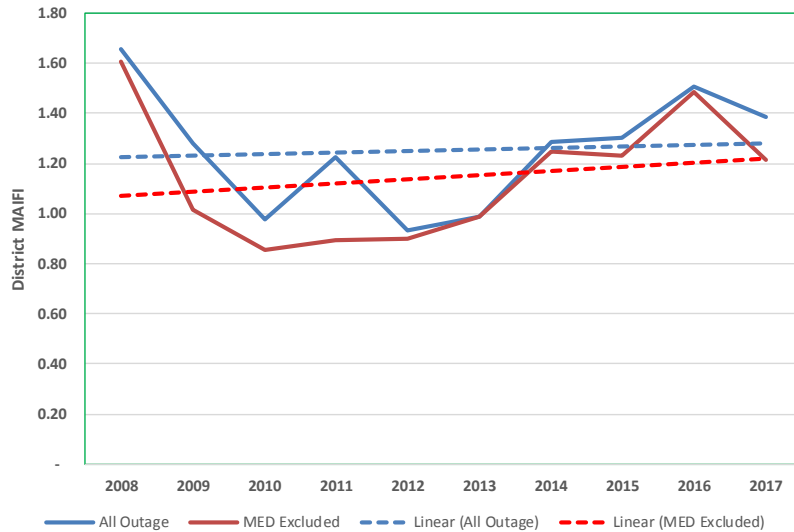
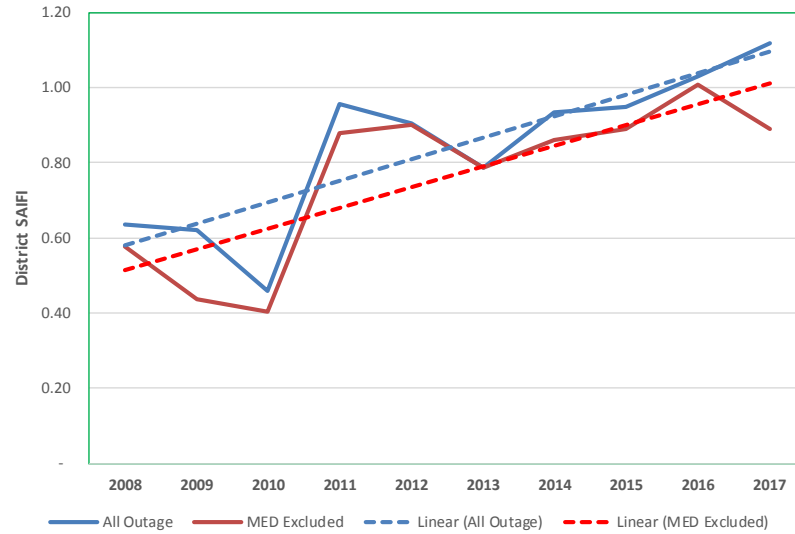
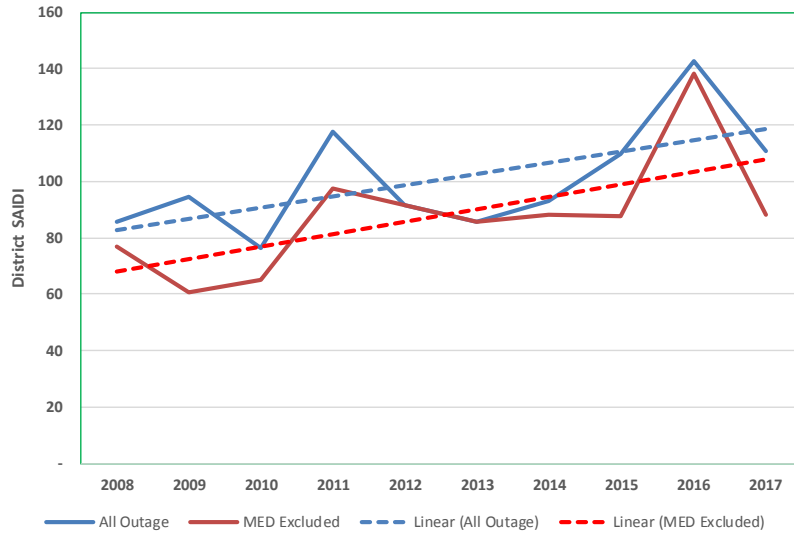
### COVINA District Reliability Performance





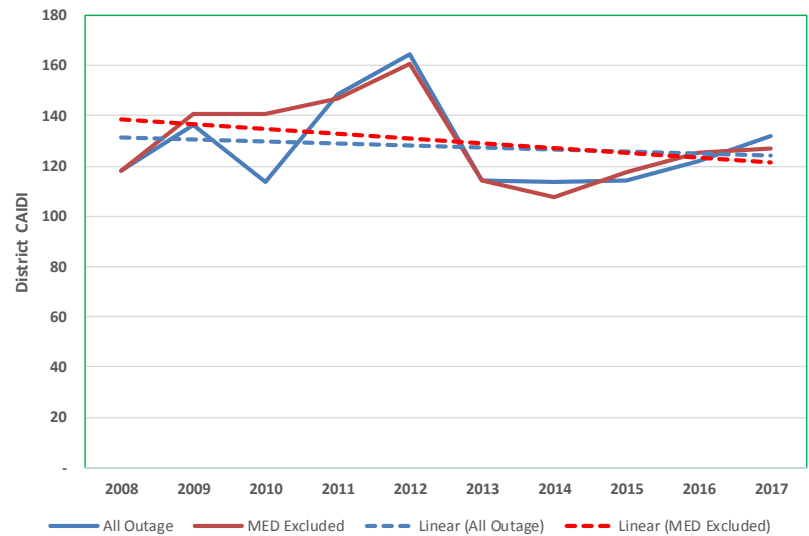
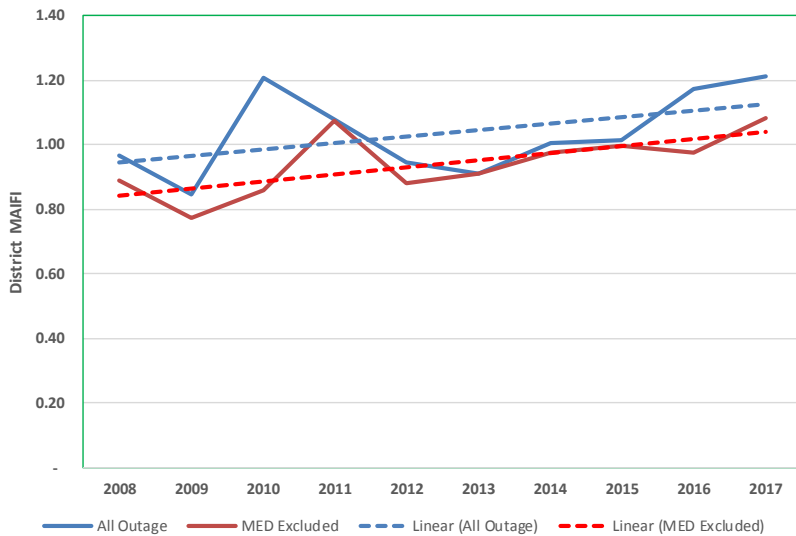
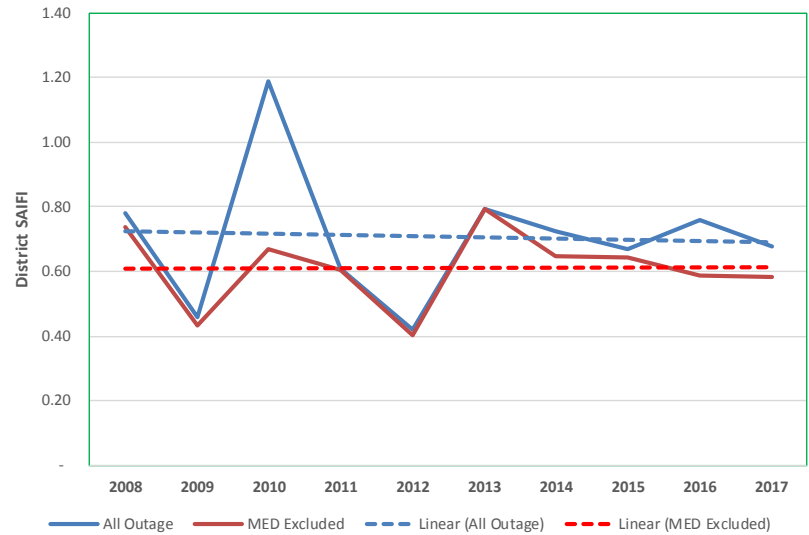
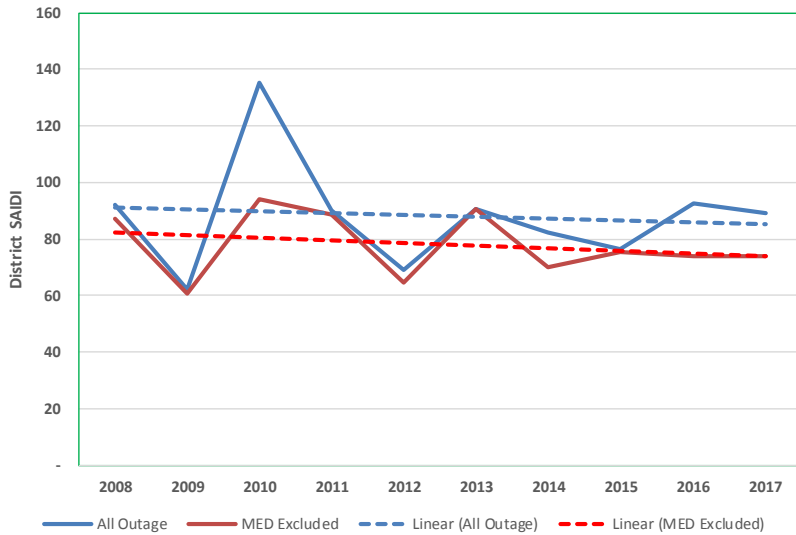
# 2008 -2017 District Reliability Graphs

## FOOTHILL District Reliability Performance



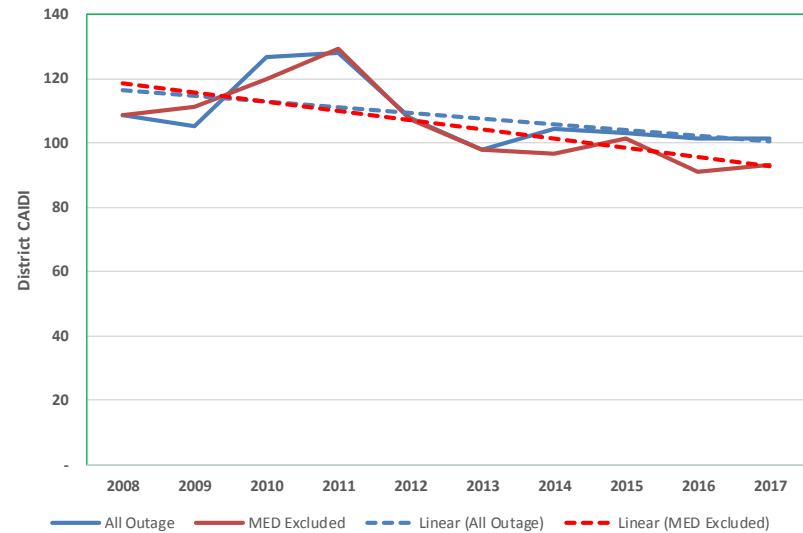
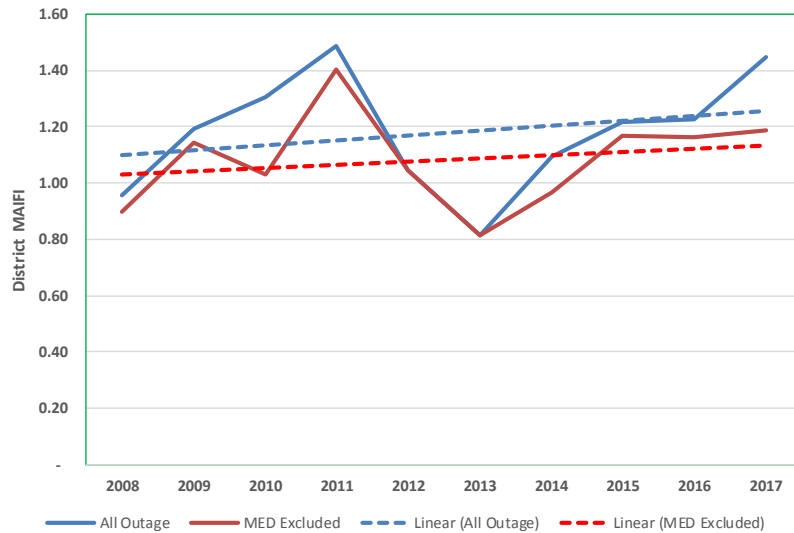
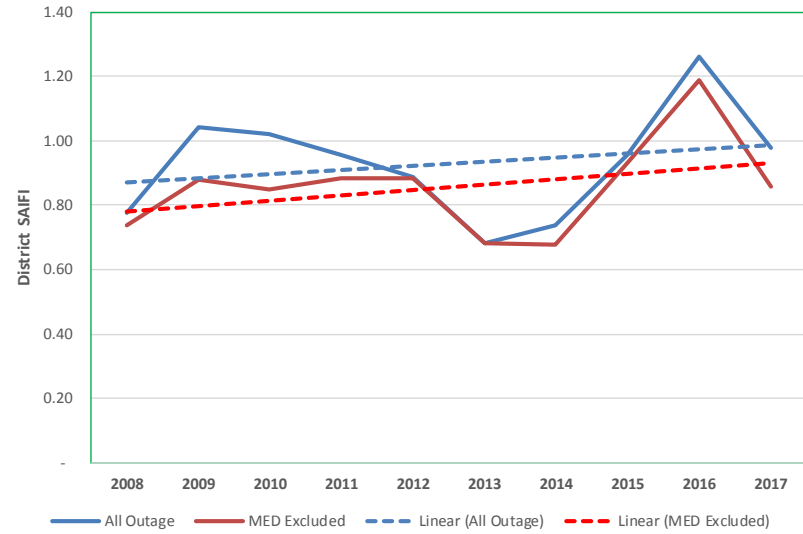
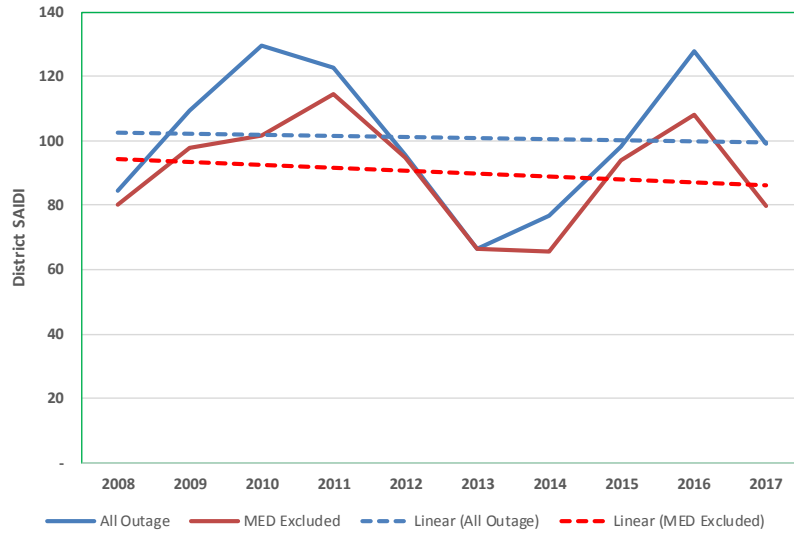
# 2008 -2017 District Reliability Graphs

## FULLERTON District Reliability Performance



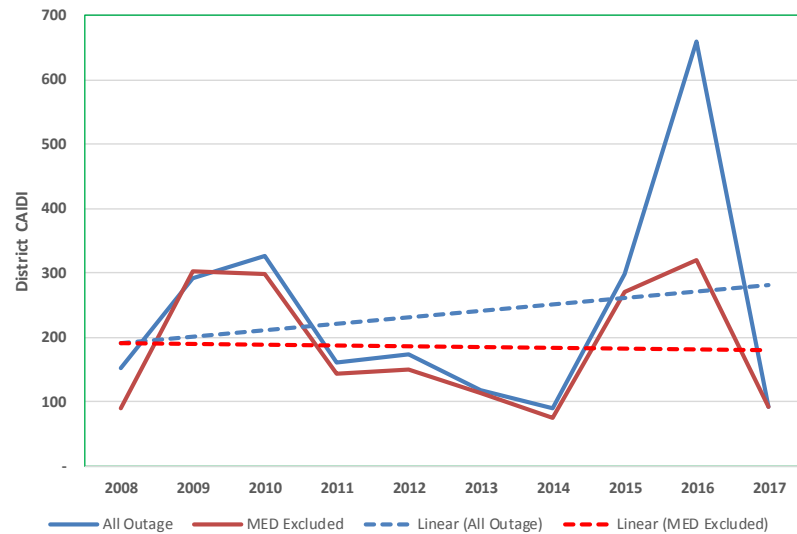
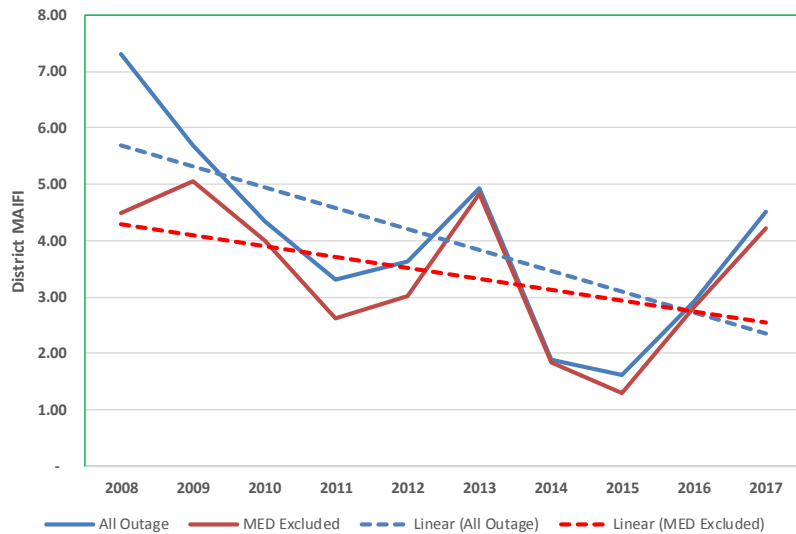
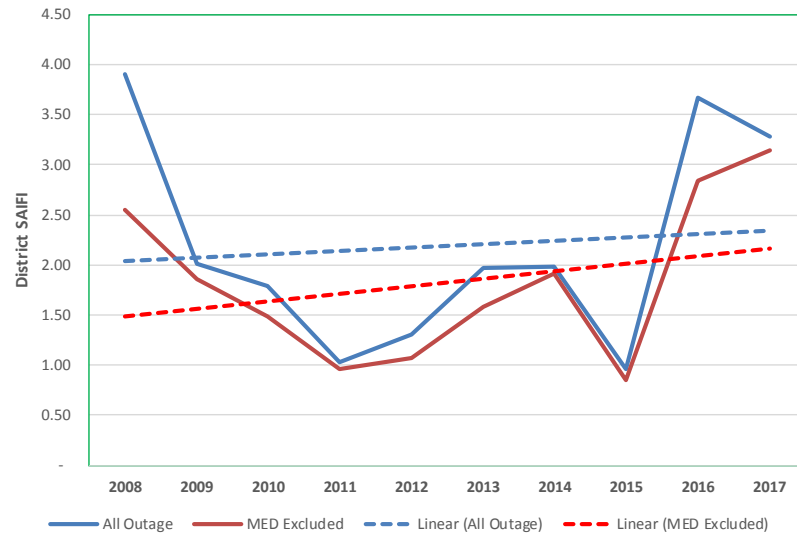
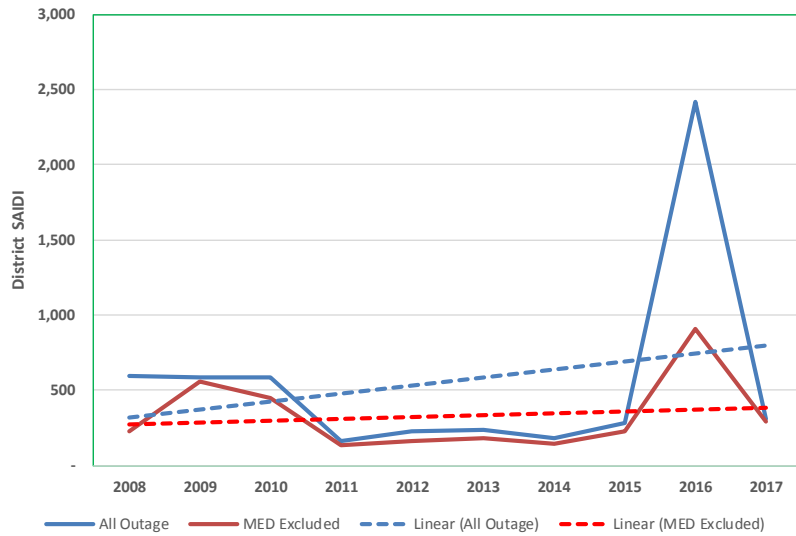
## 2008 -2017 District Reliability Graphs

### HUNTINGTON BEACH District Reliability Performance



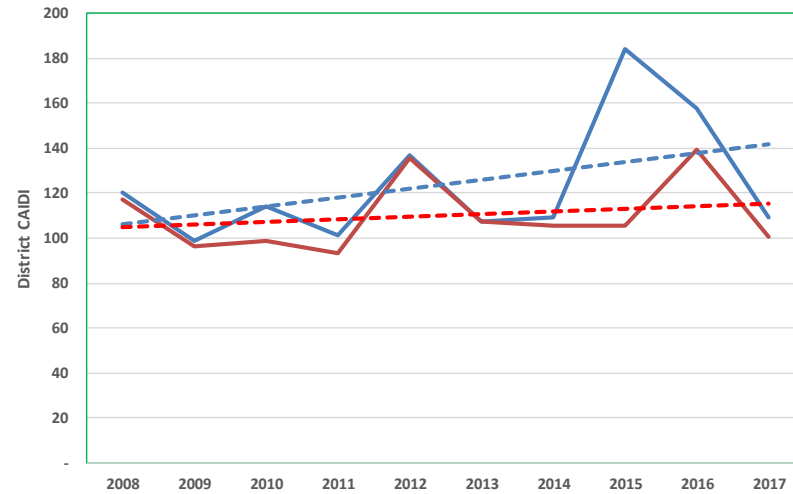
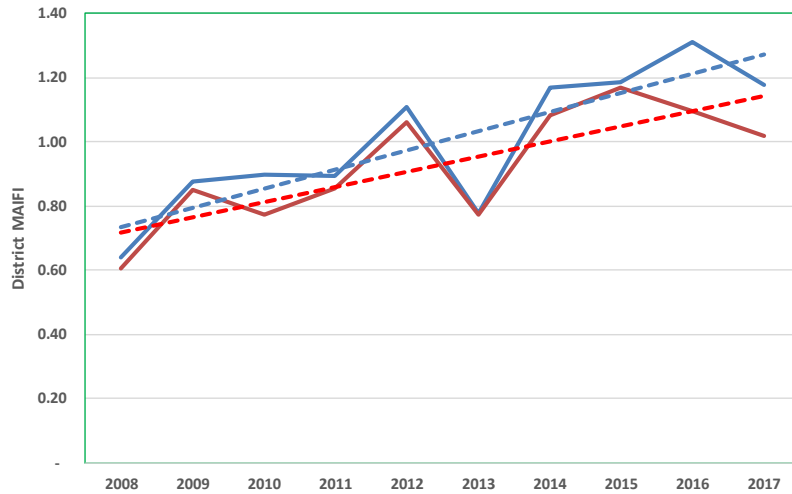
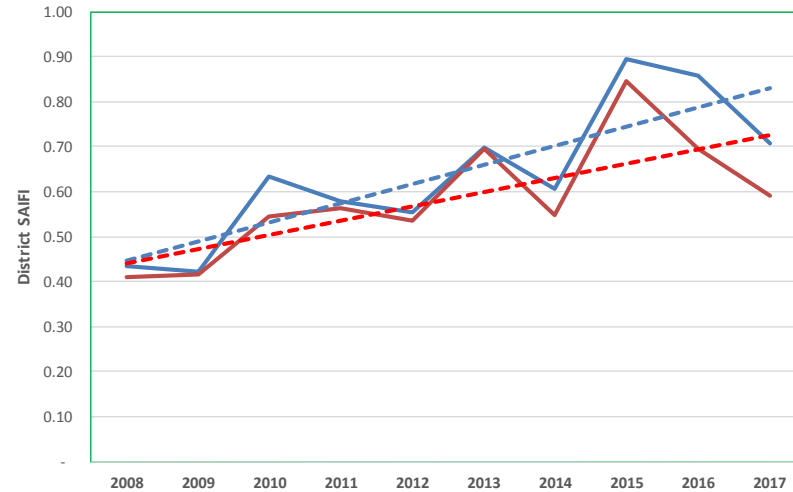
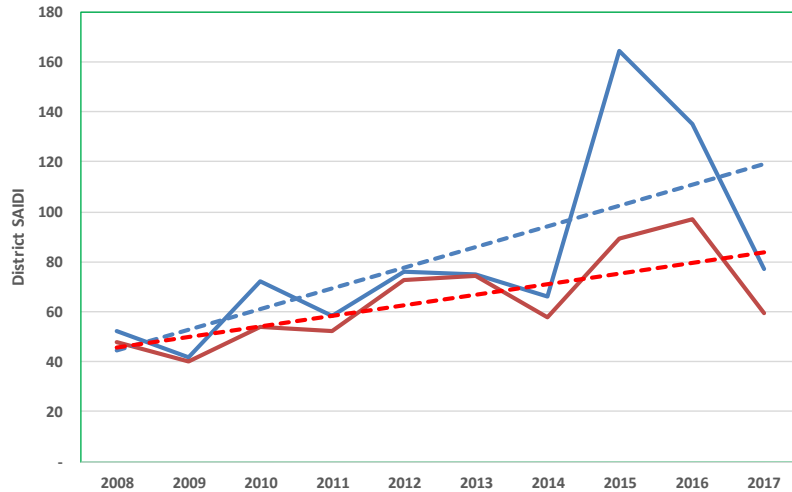
# 2008 -2017 District Reliability Graphs

## KERNVILLE District Reliability Performance



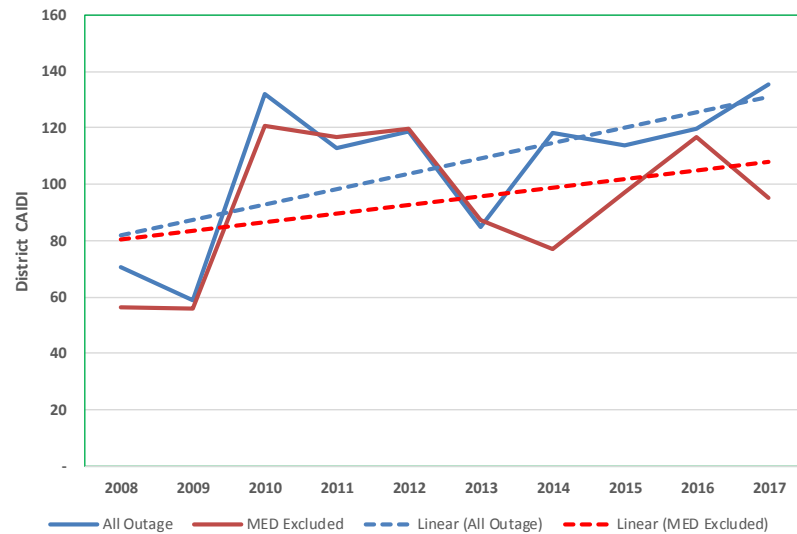
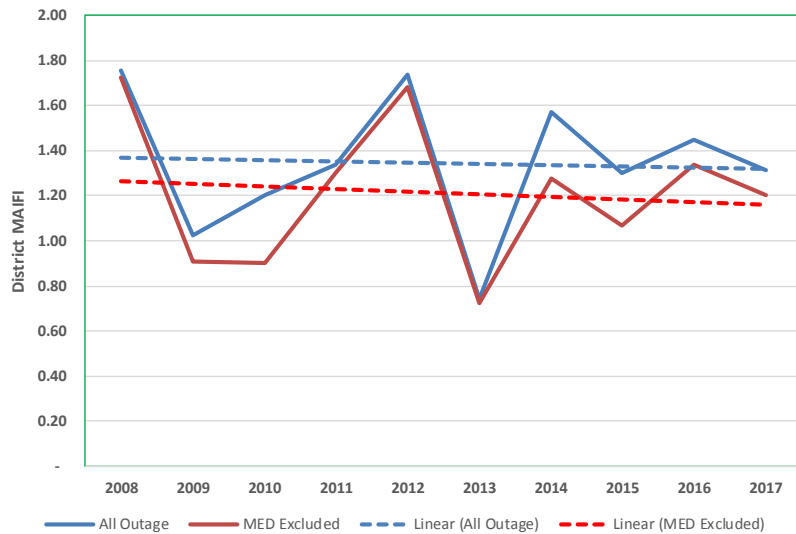
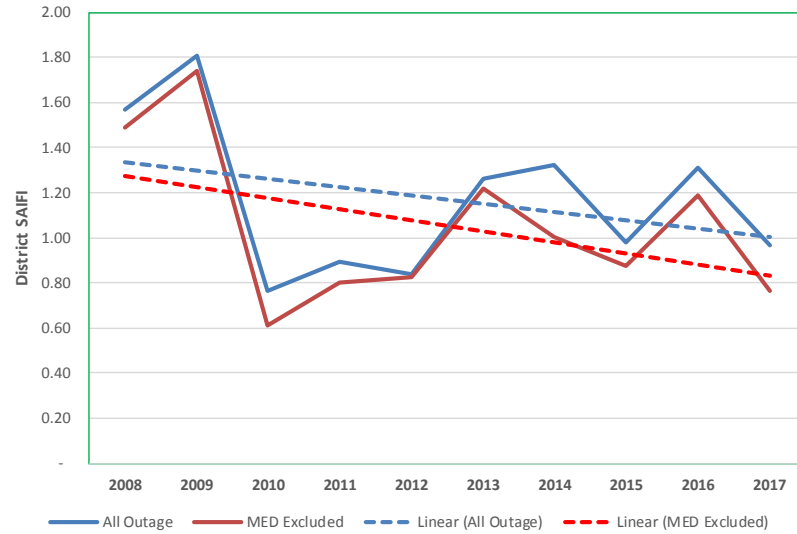
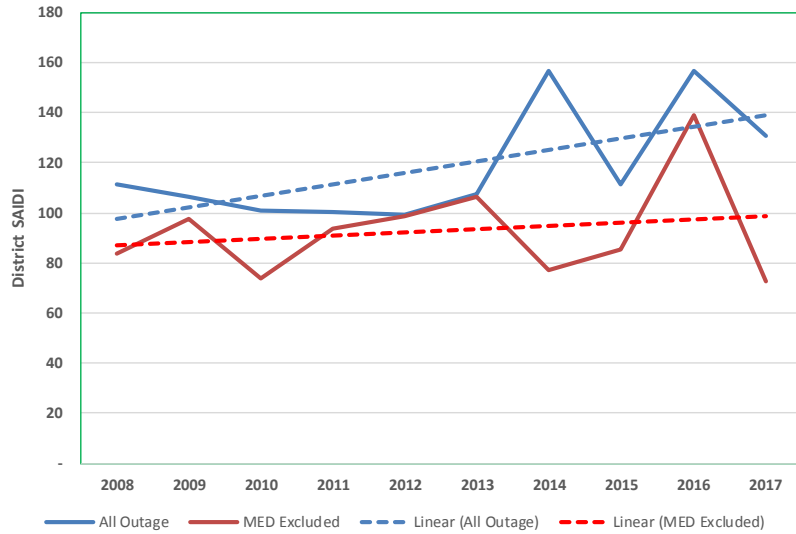
# 2008 -2017 District Reliability Graphs

## LONG BEACH District Reliability Performance



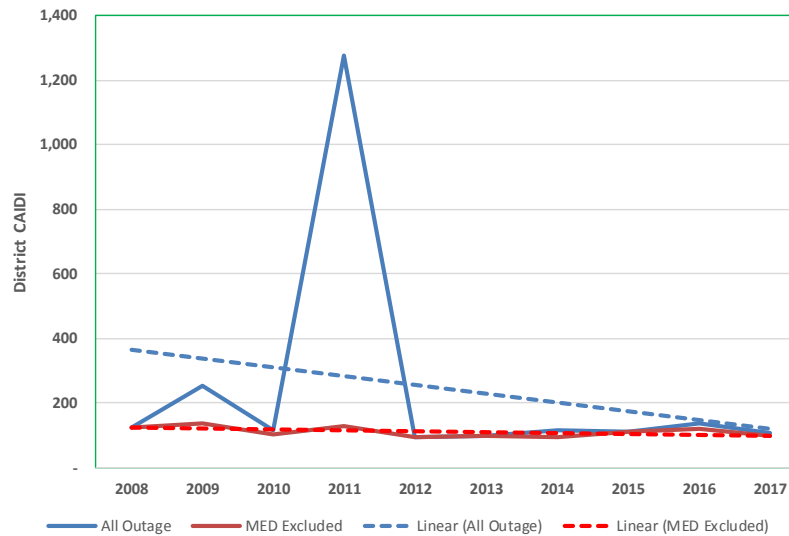
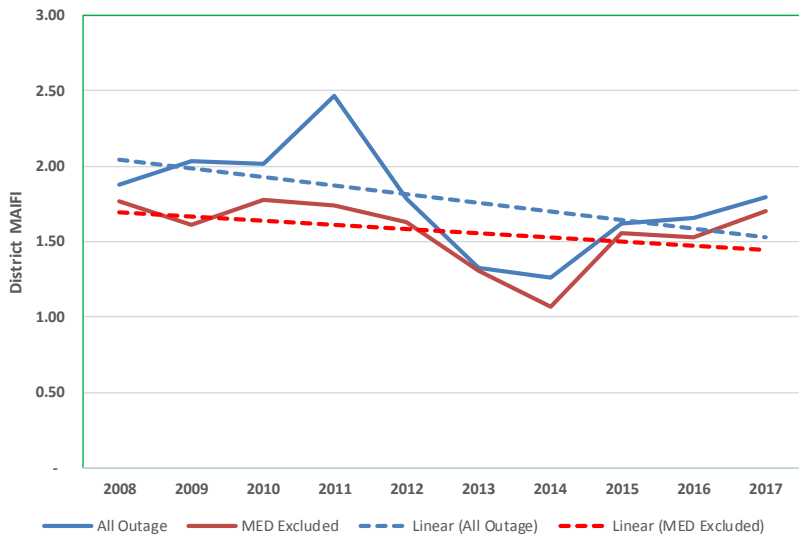
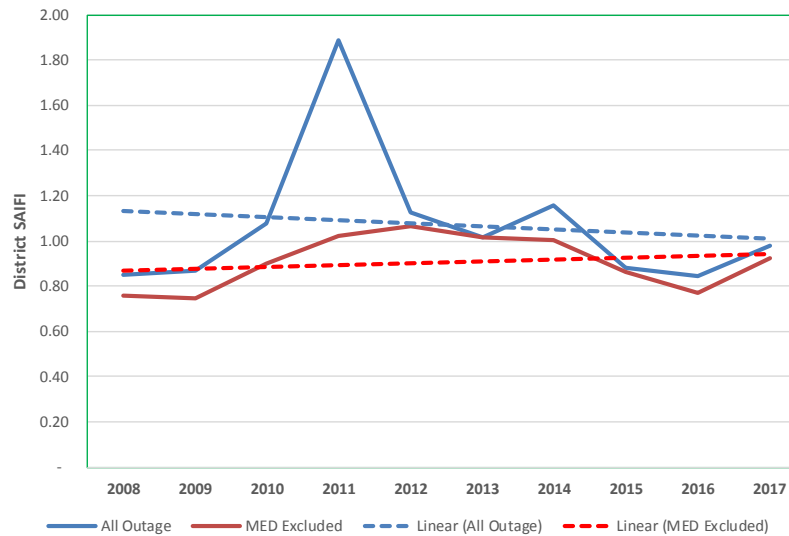
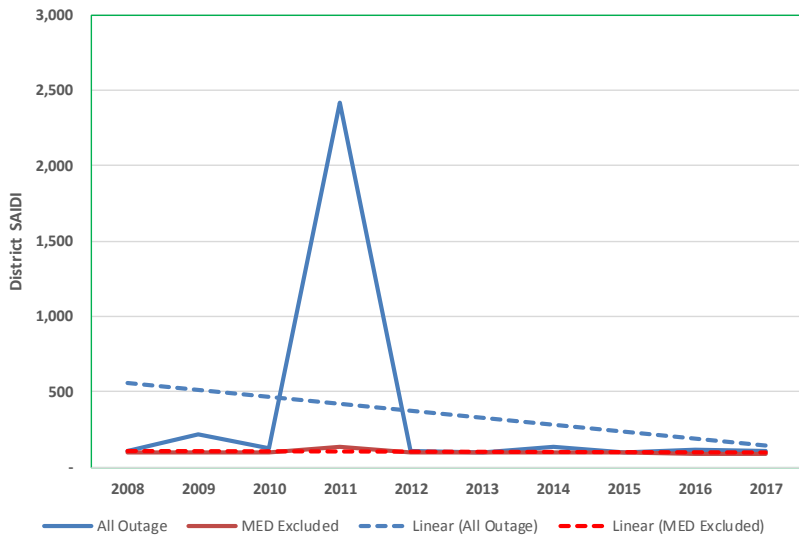
## 2008 -2017 District Reliability Graphs

### MENIFEE District Reliability Performance



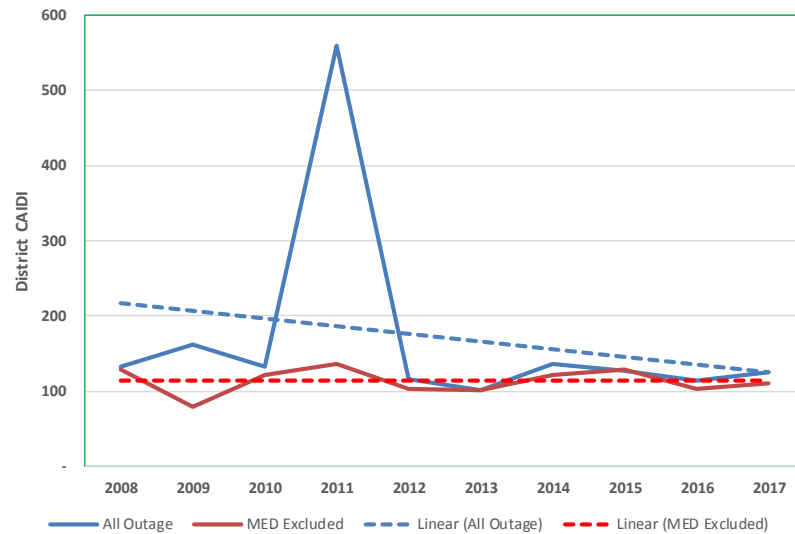
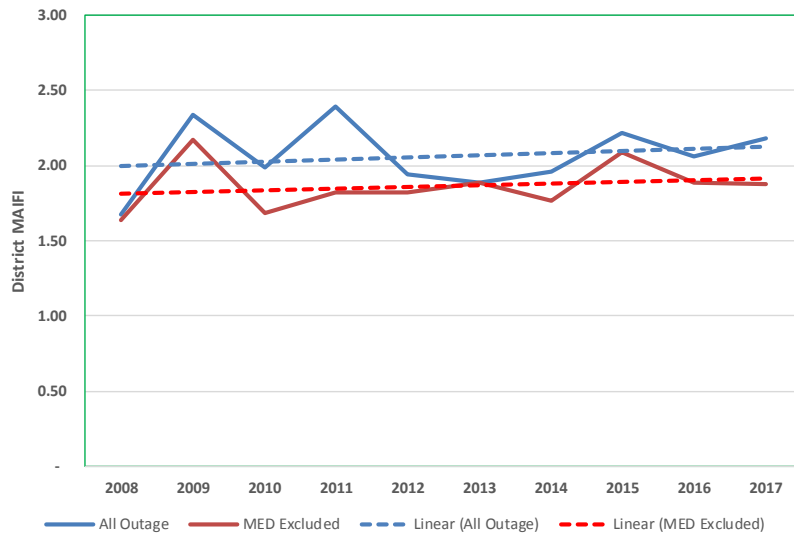
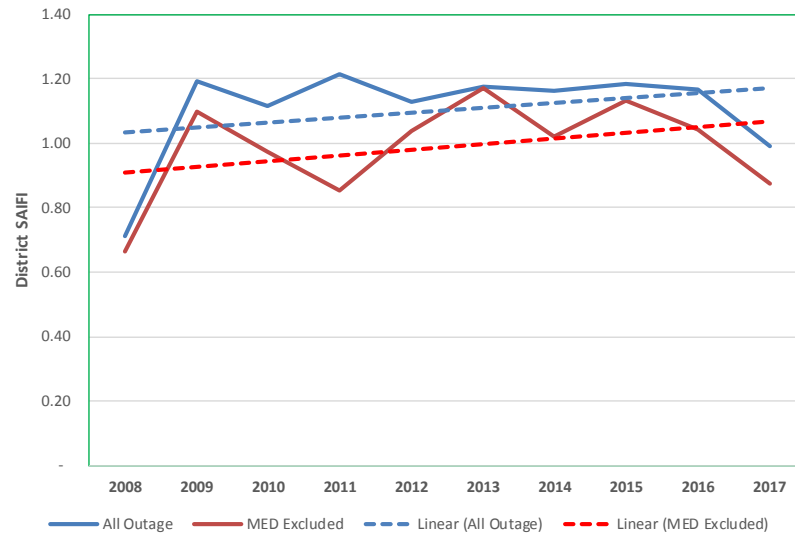
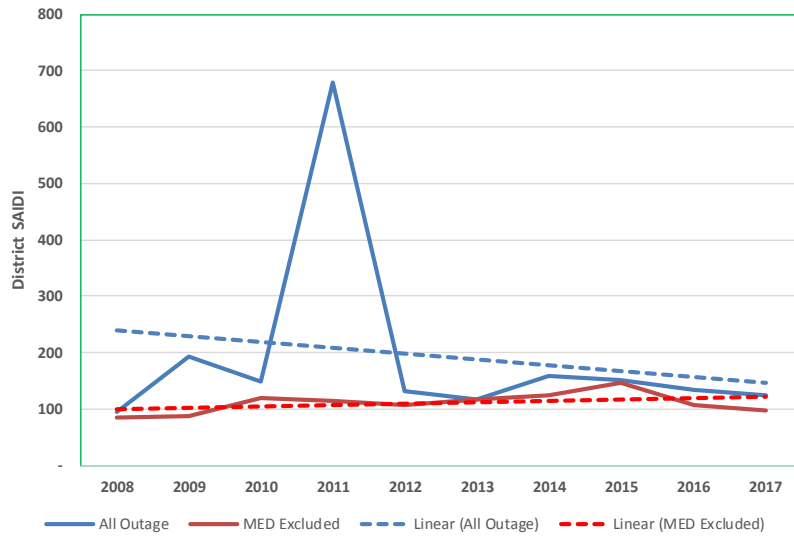
# 2008 -2017 District Reliability Graphs

## MONROVIA District Reliability Performance



## 2008 -2017 District Reliability Graphs

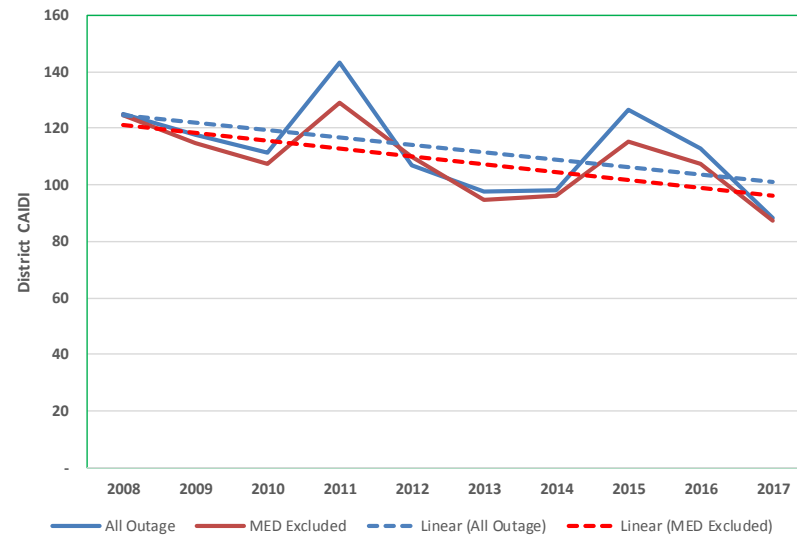
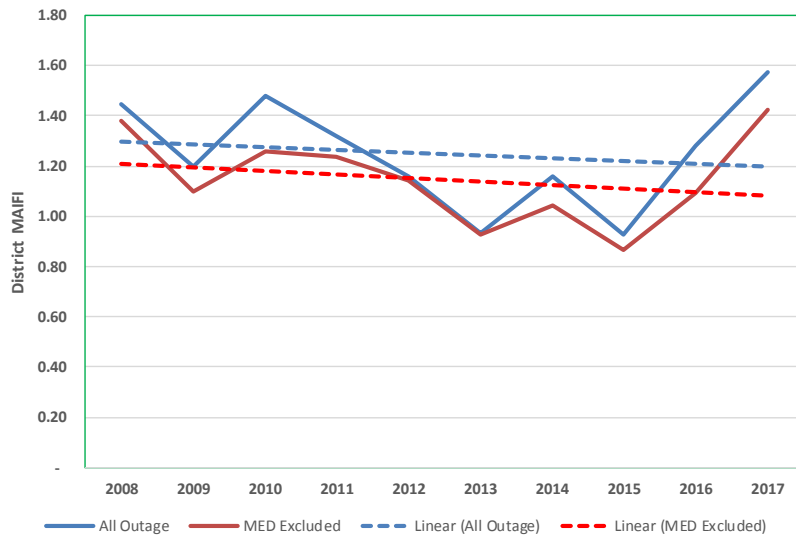
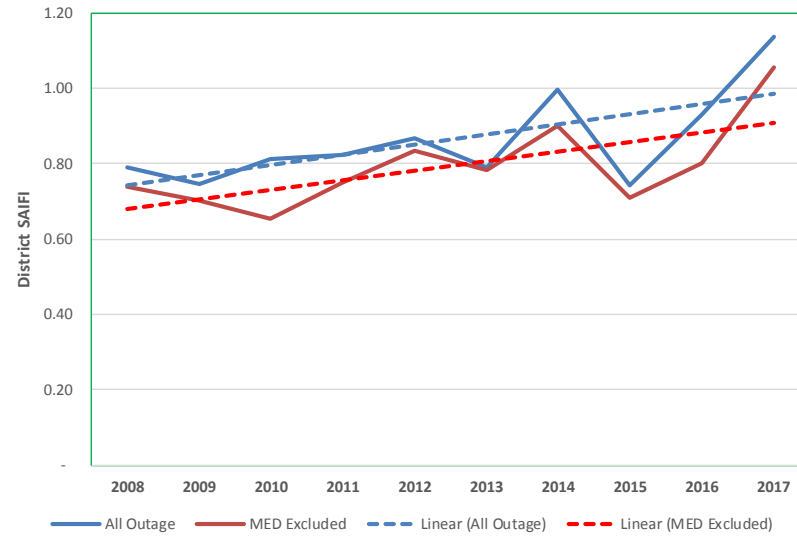
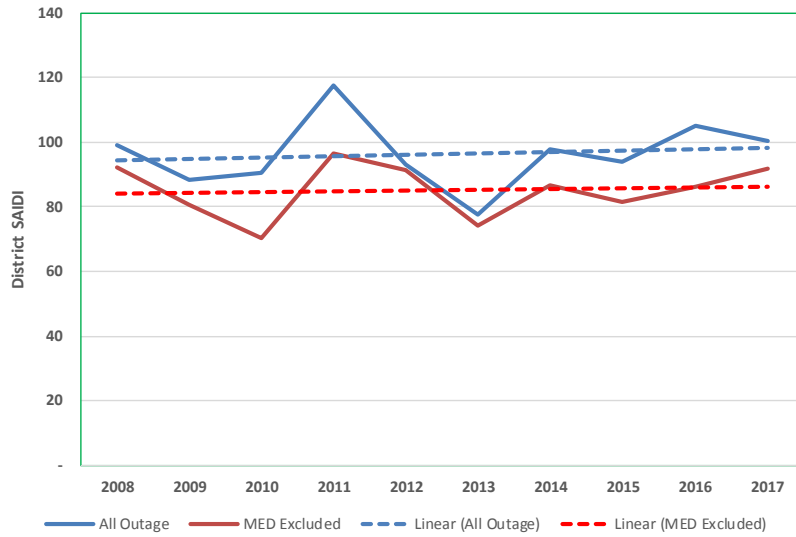
### MONTEBELLO District Reliability Performance





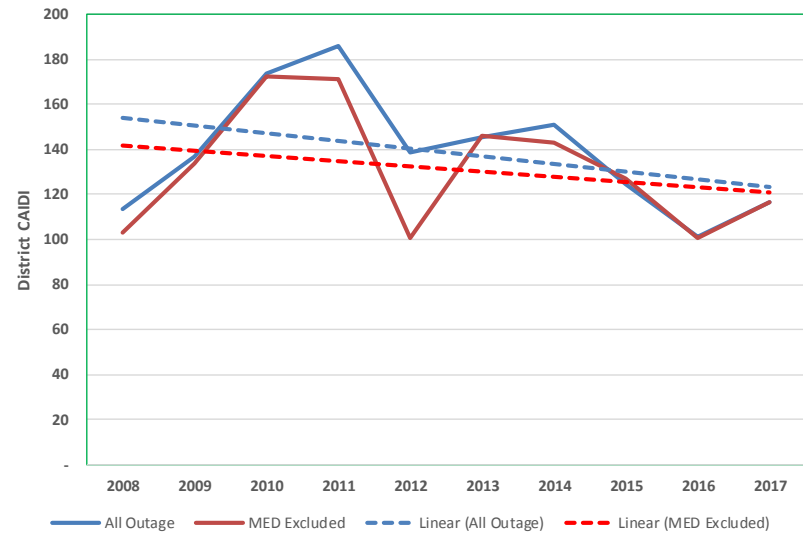
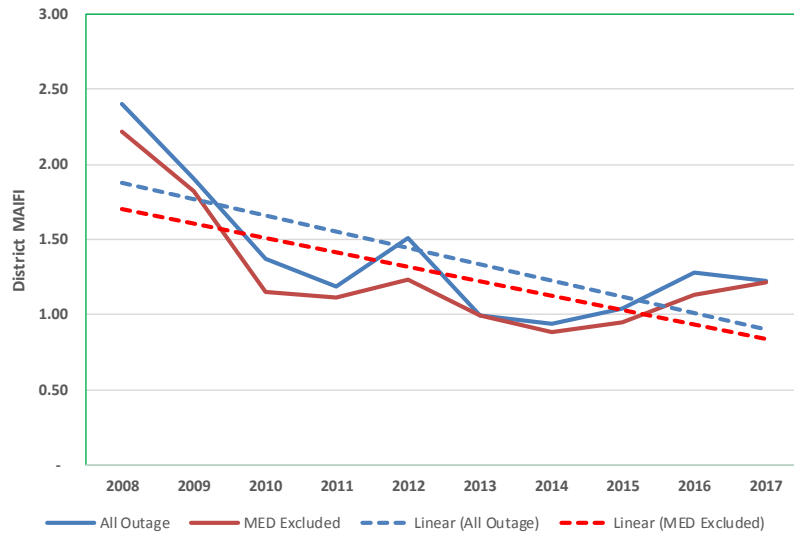
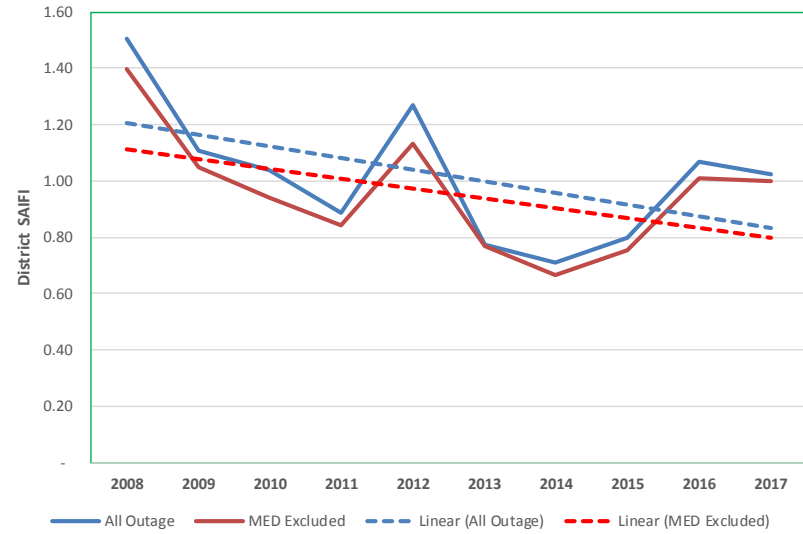
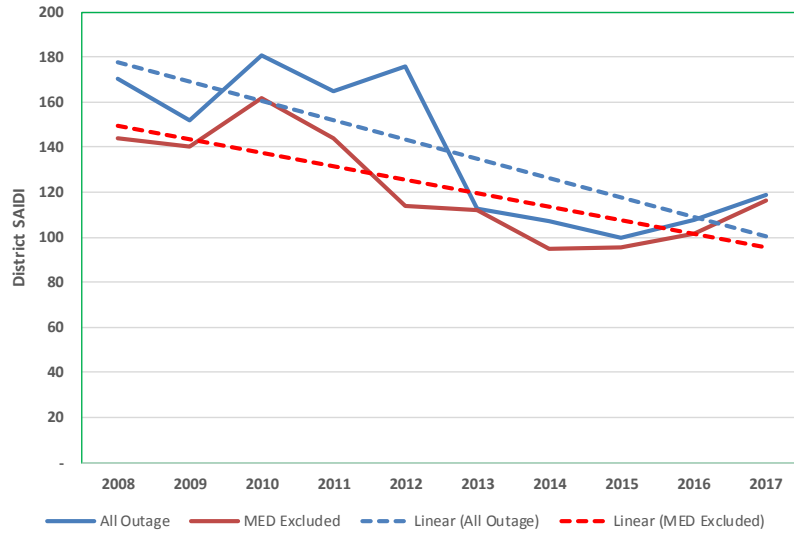
# 2008 -2017 District Reliability Graphs

## ONTARIO District Reliability Performance



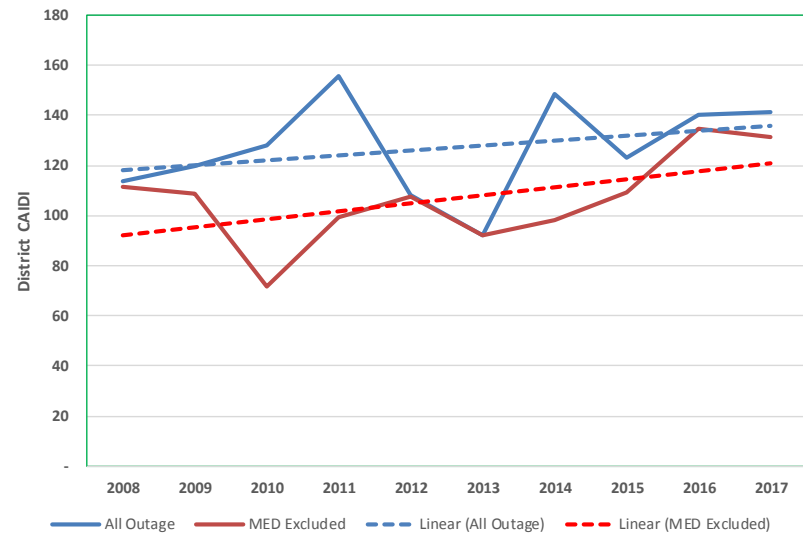
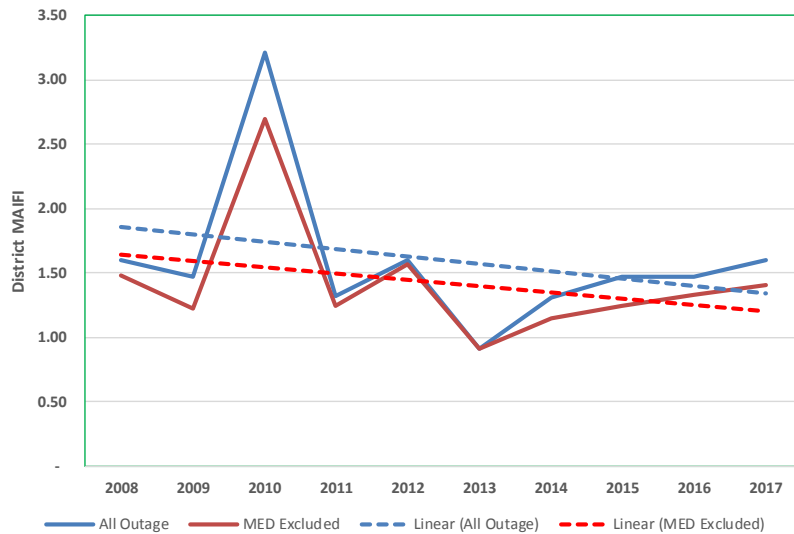
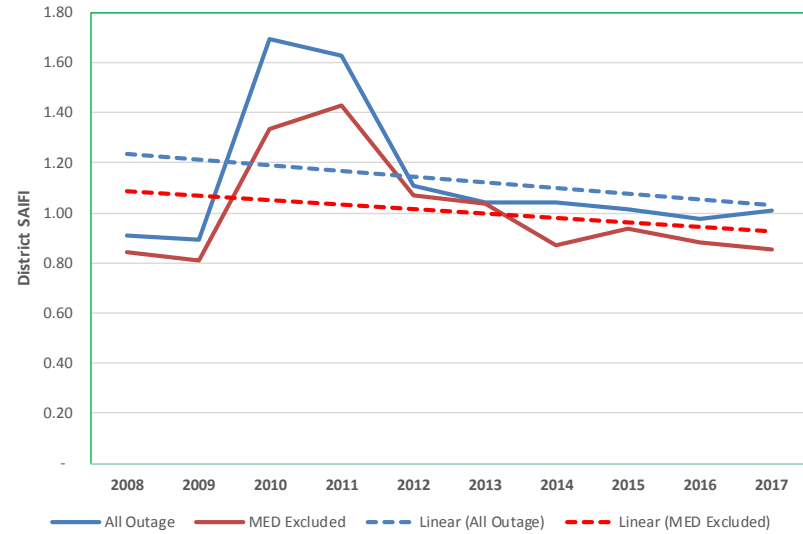
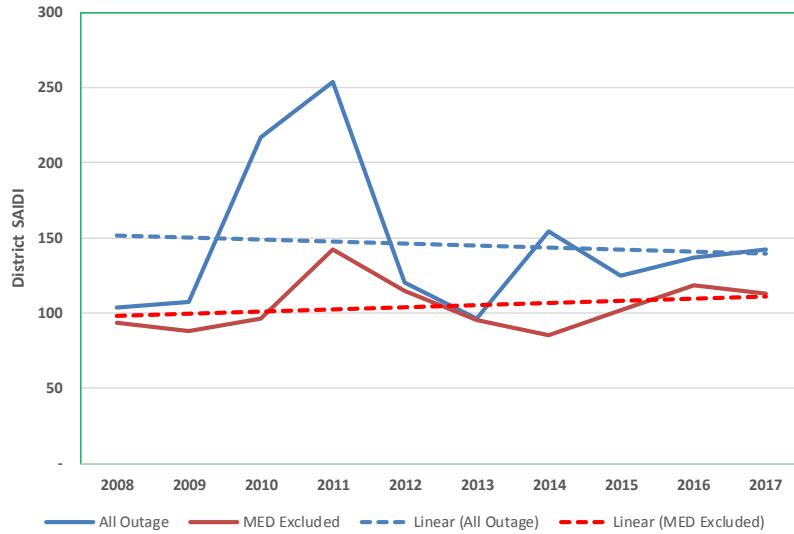
## 2008 -2017 District Reliability Graphs

### PALM SPRINGS District Reliability Performance



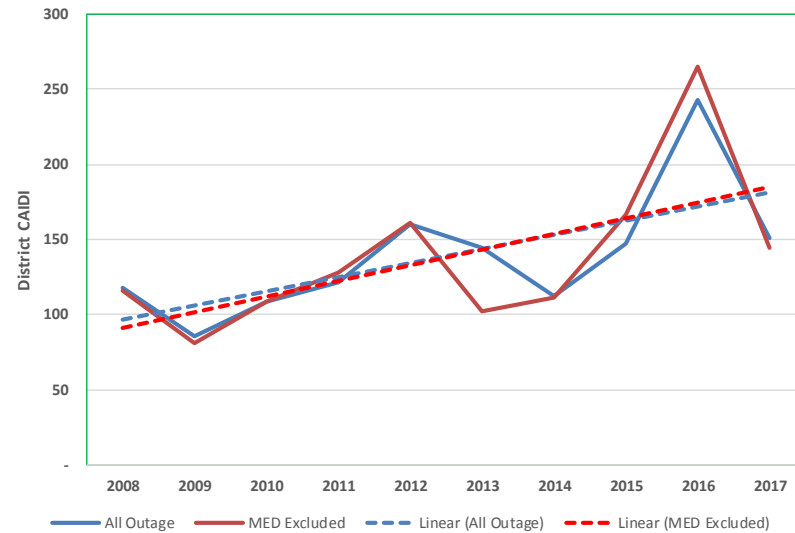
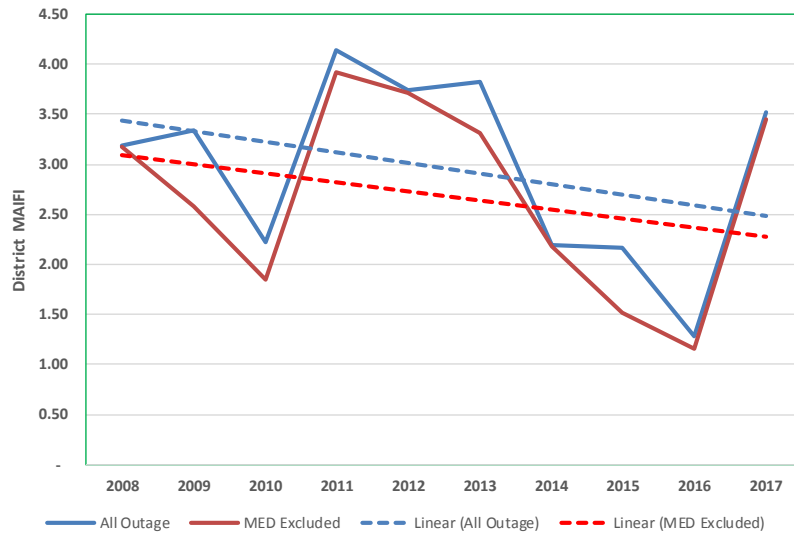
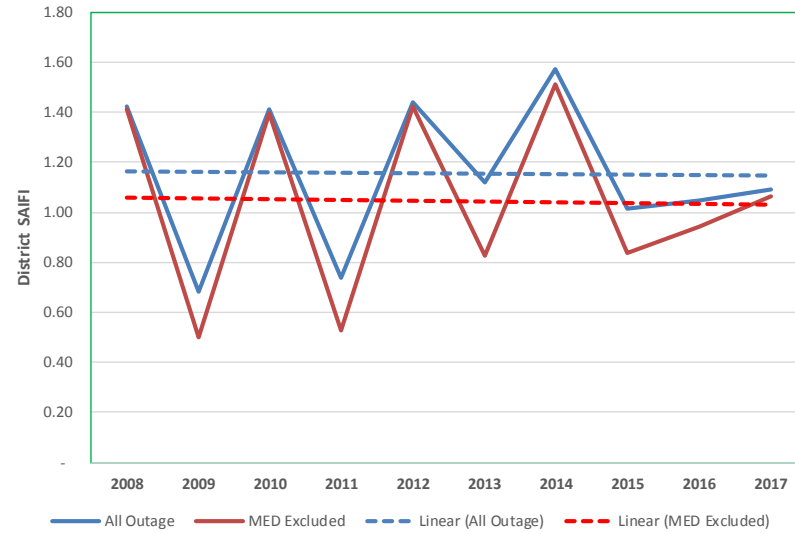
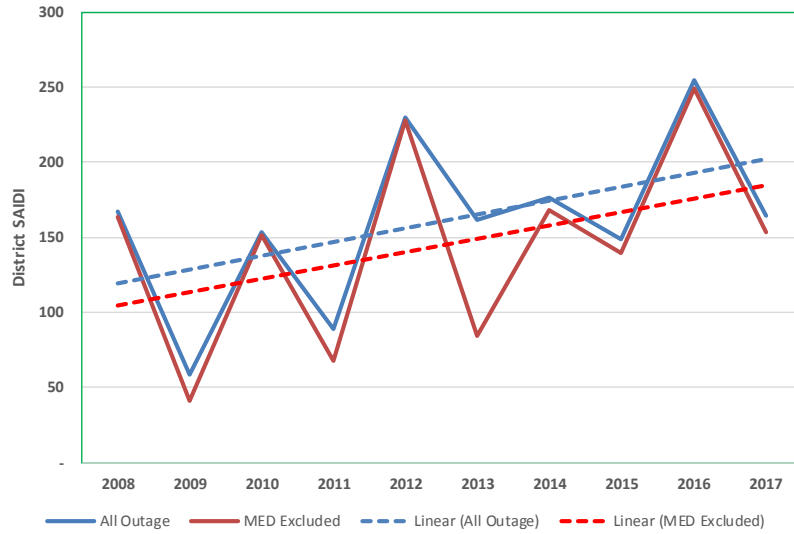
# 2008 -2017 District Reliability Graphs

## REDLANDS District Reliability Performance



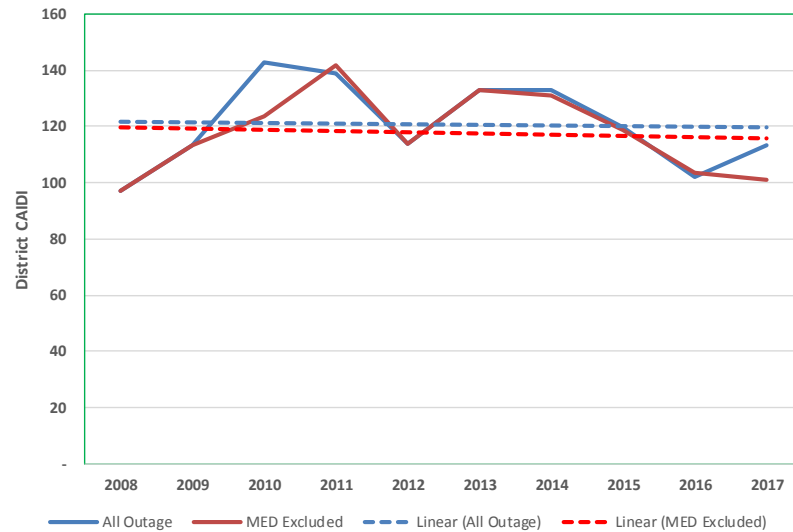
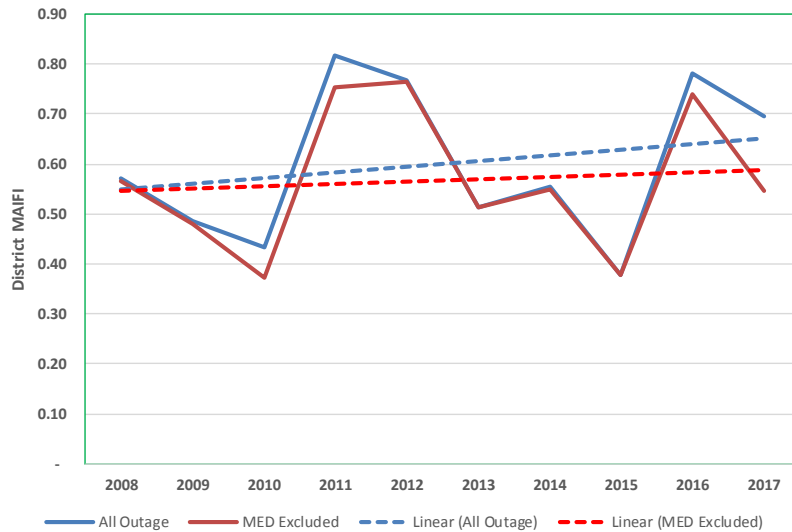
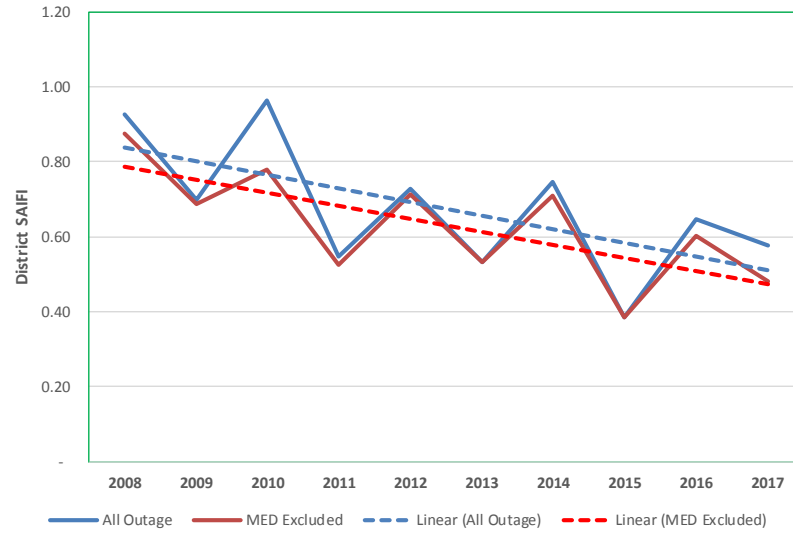
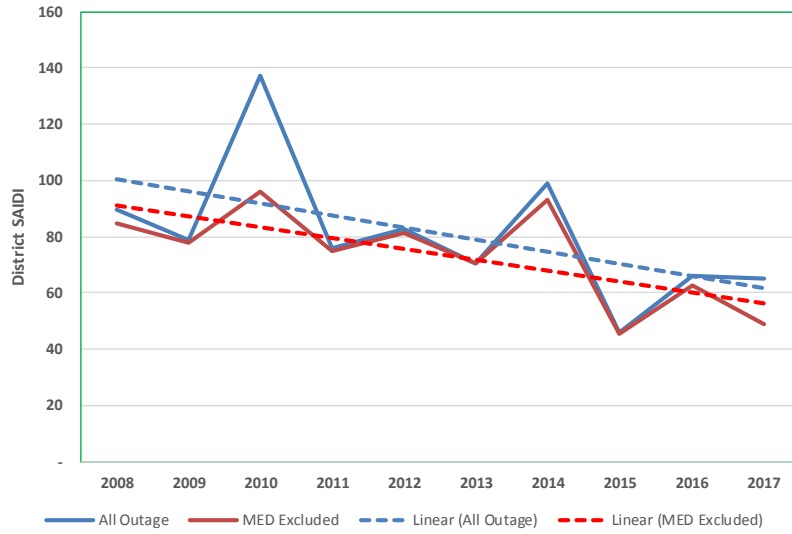
# 2008 -2017 District Reliability Graphs

## RIDGECREST District Reliability Performance



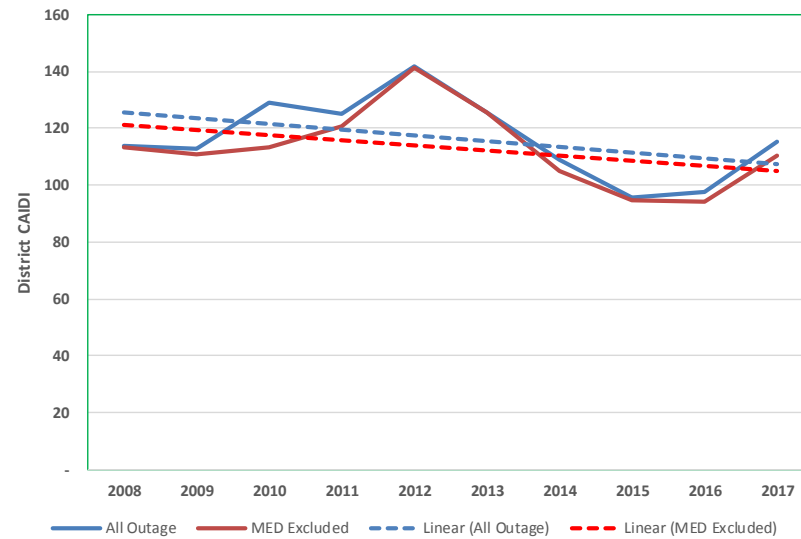
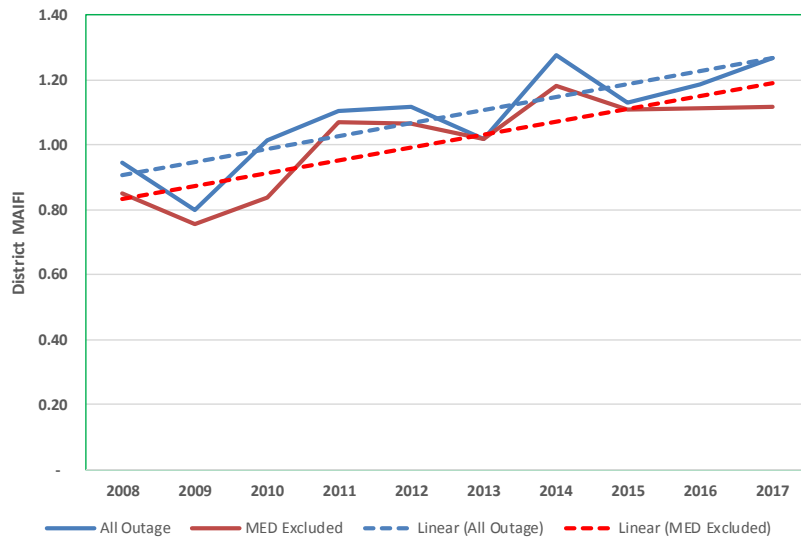
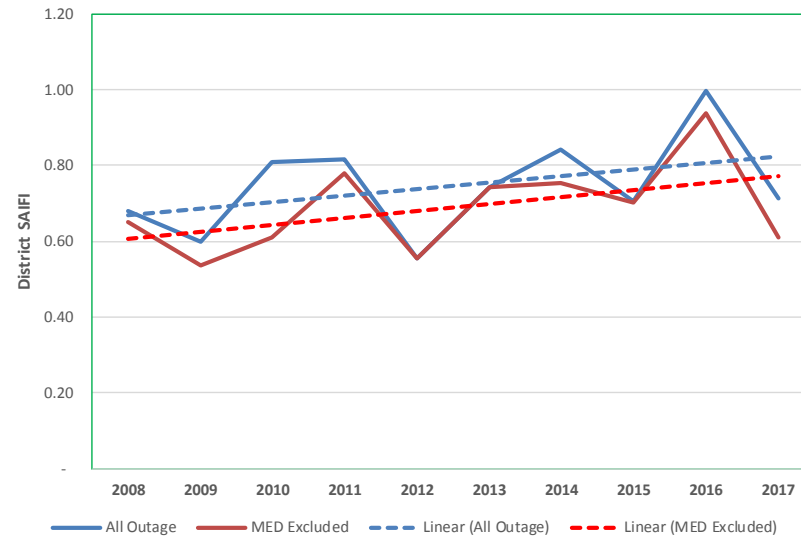
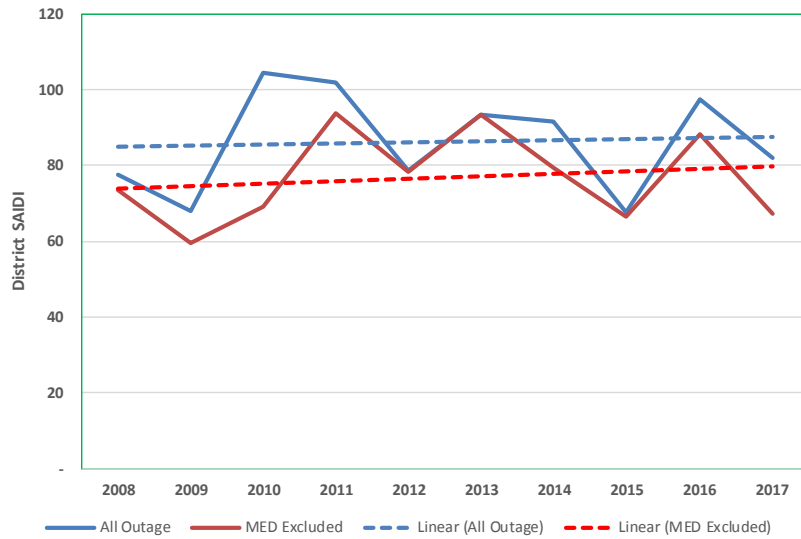
# 2008 -2017 District Reliability Graphs

## SADDLEBACK District Reliability Performance



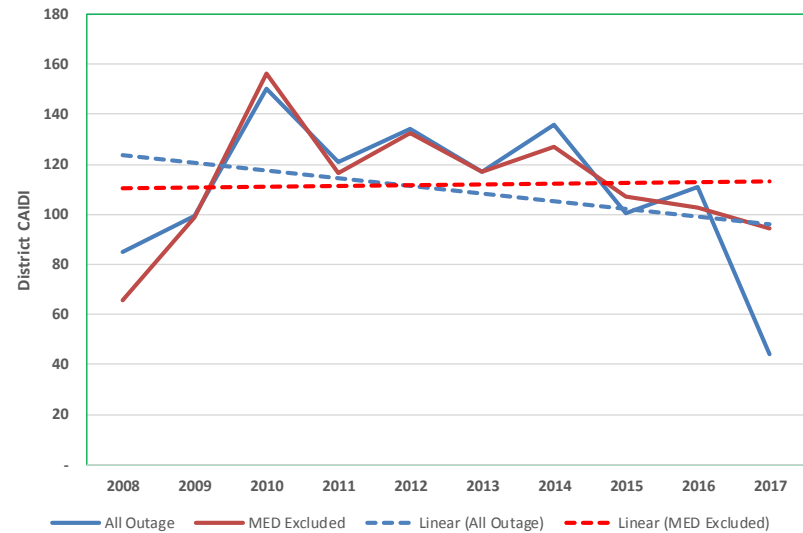
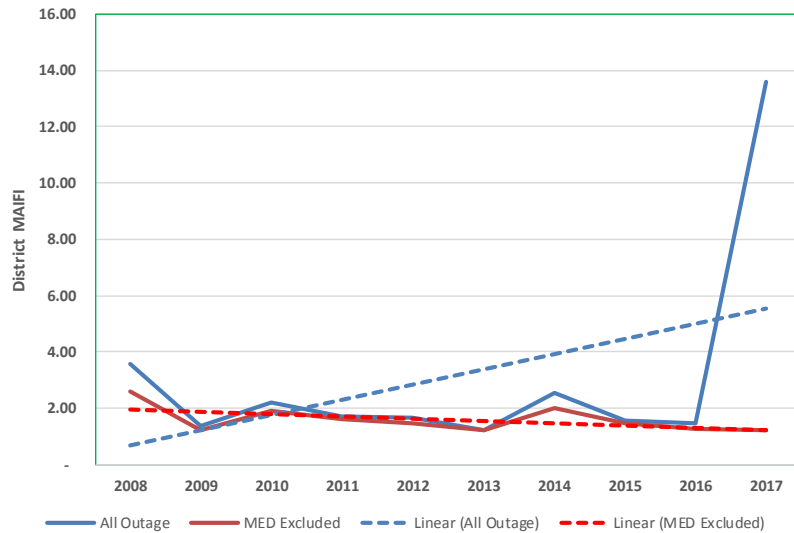
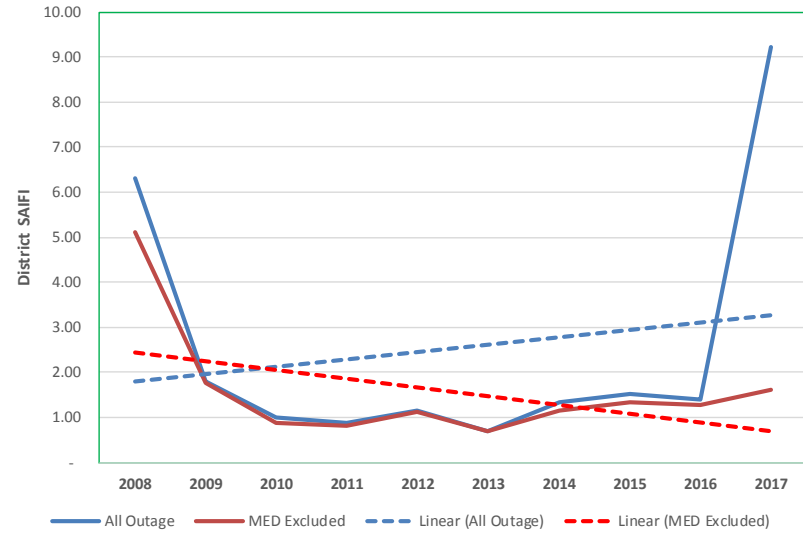
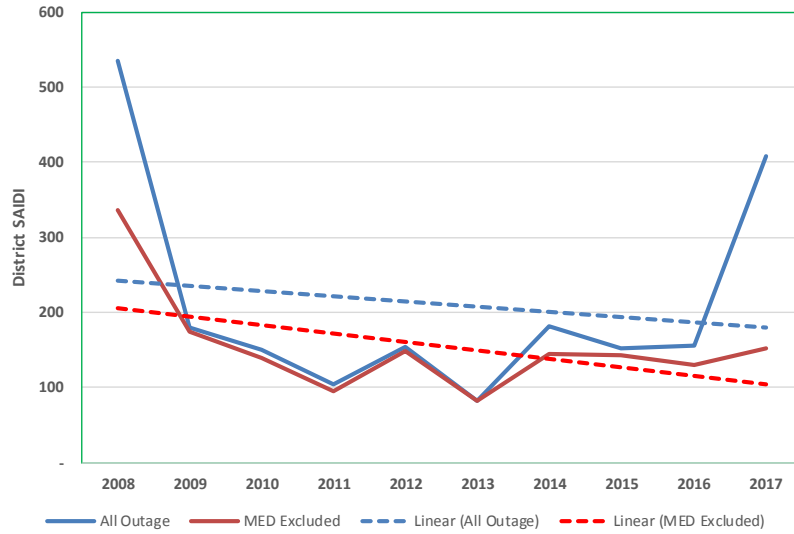
# 2008 -2017 District Reliability Graphs

## SANTA ANA District Reliability Performance



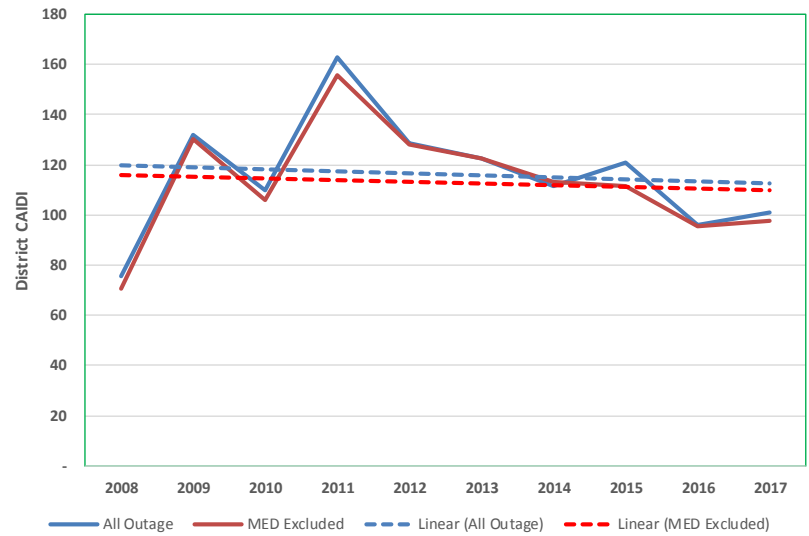
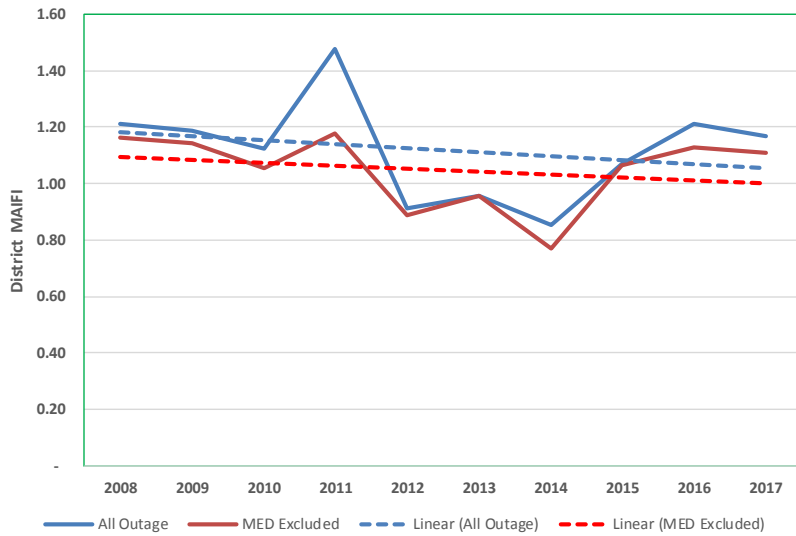
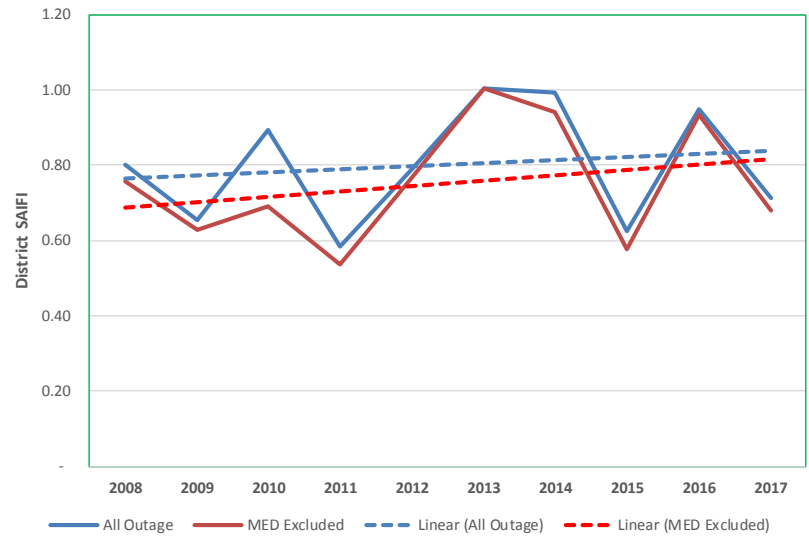
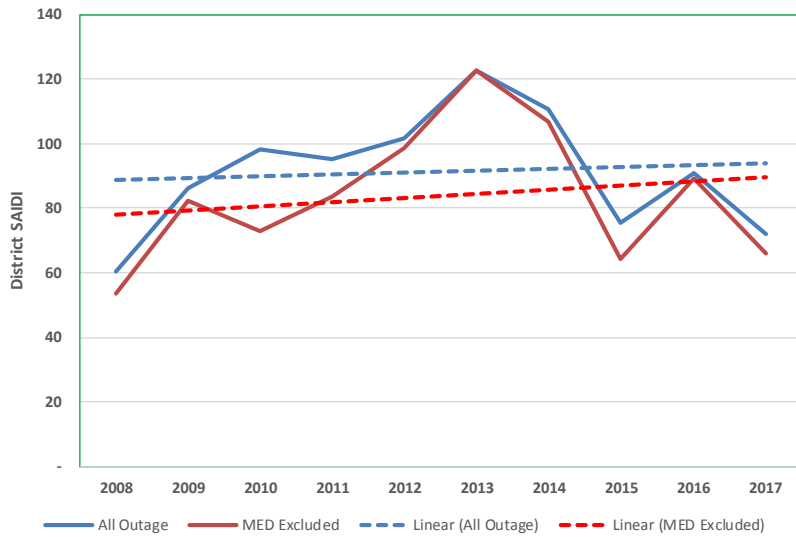
## 2008 -2017 District Reliability Graphs

### SANTA BARBARA District Reliability Performance



## 2008 -2017 District Reliability Graphs

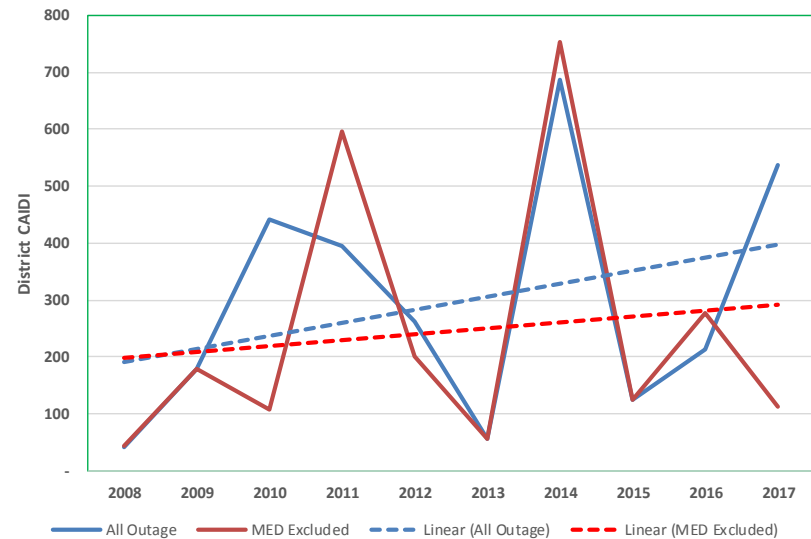
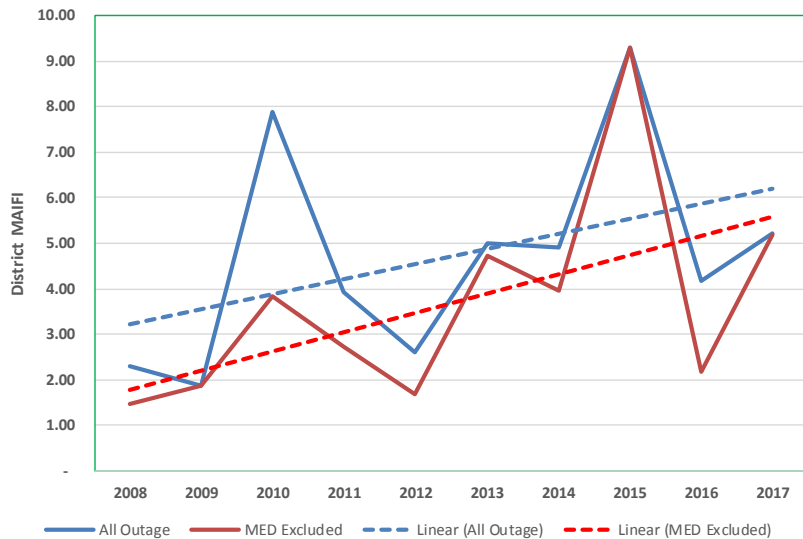
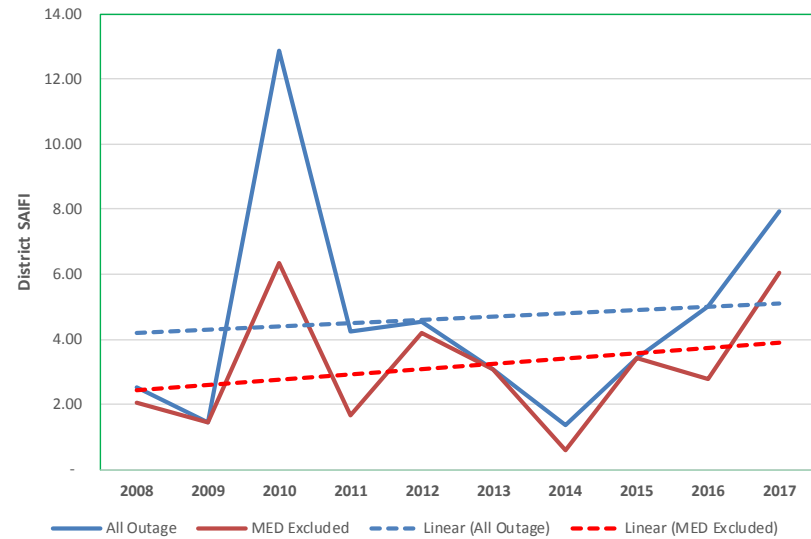
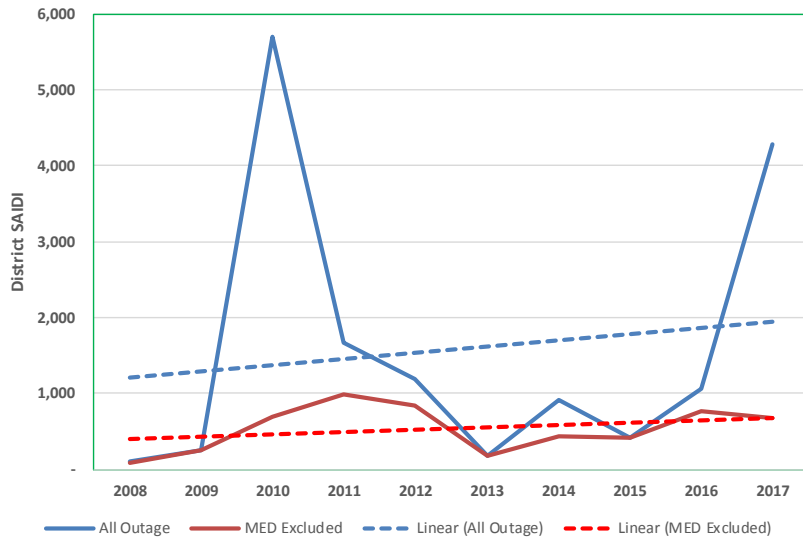
### SANTA MONICA District Reliability Performance





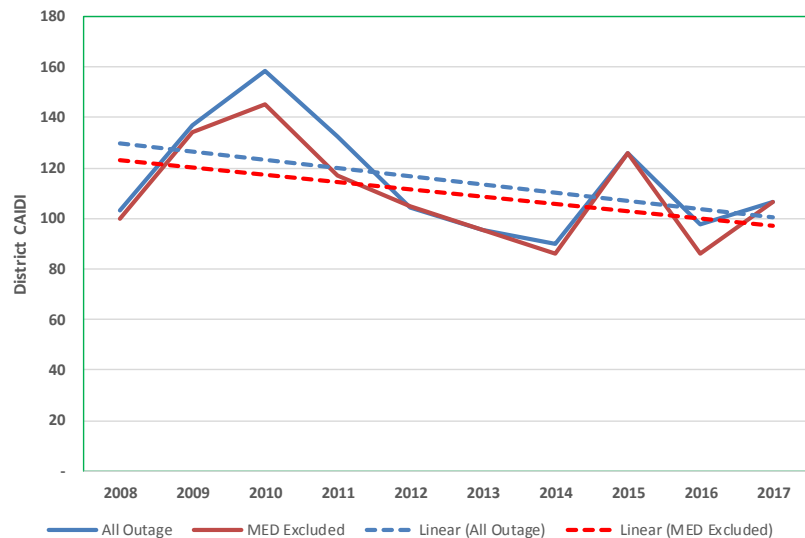
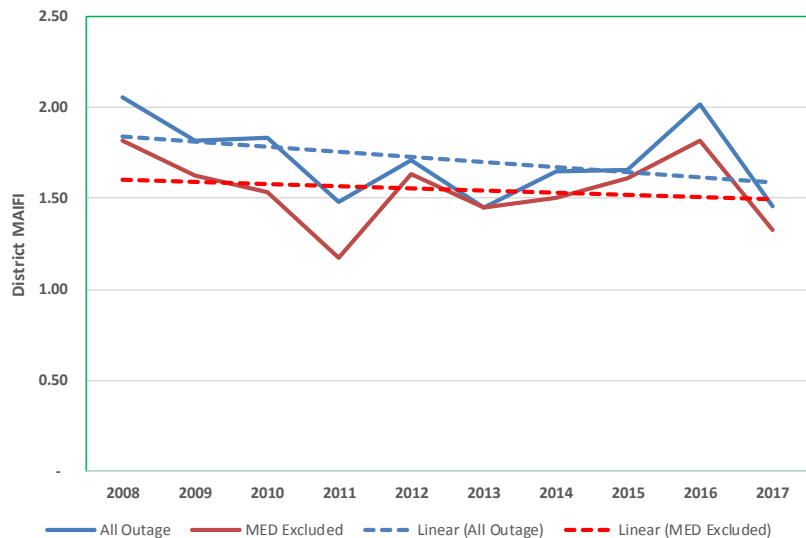
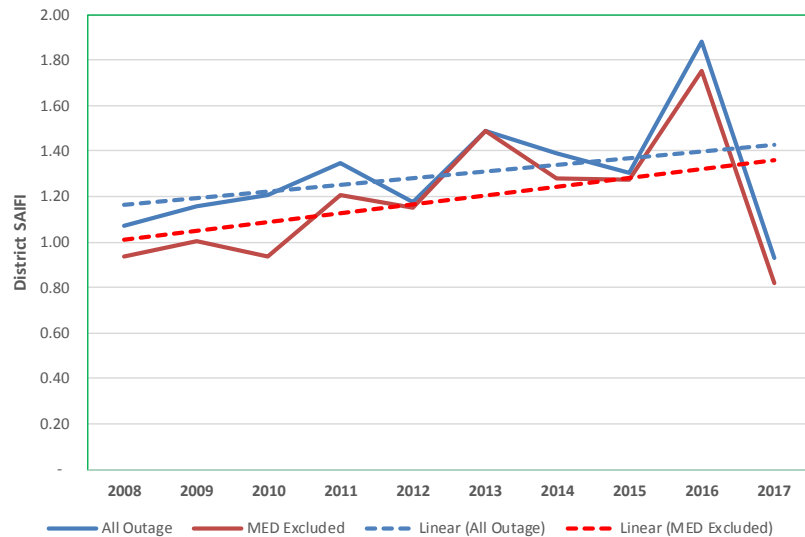
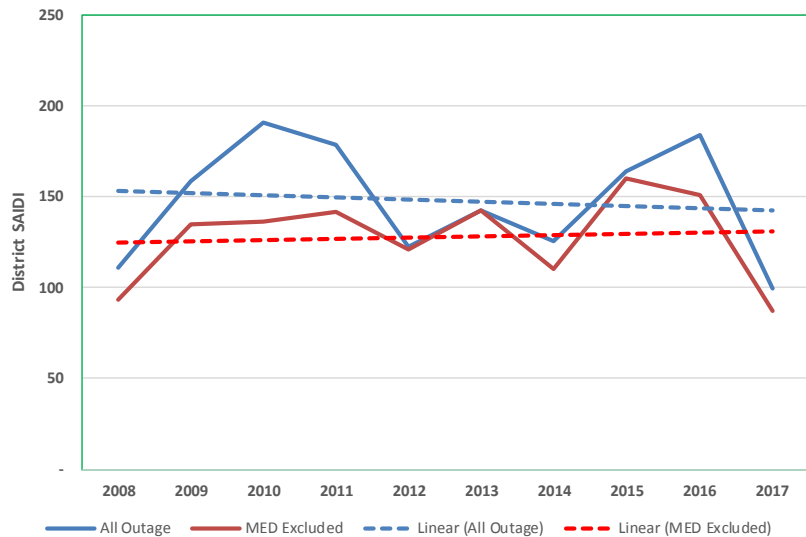
# 2008 -2017 District Reliability Graphs

## SHAVER LAKE District Reliability Performance



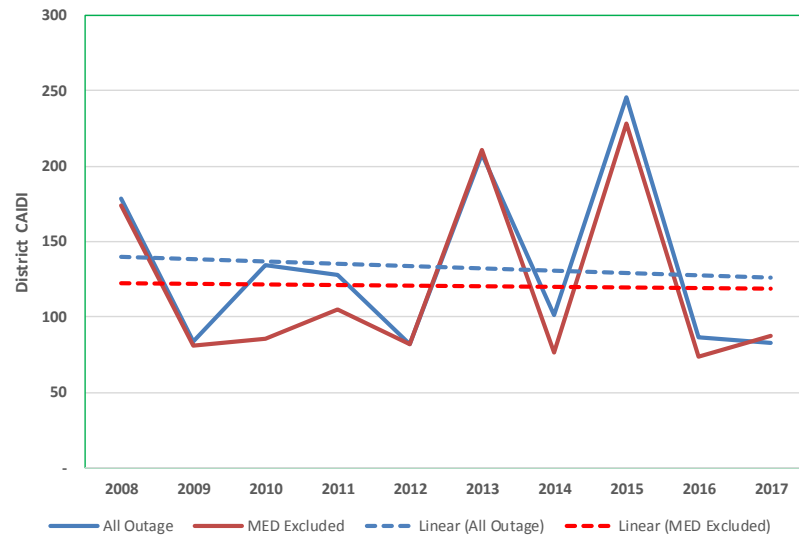
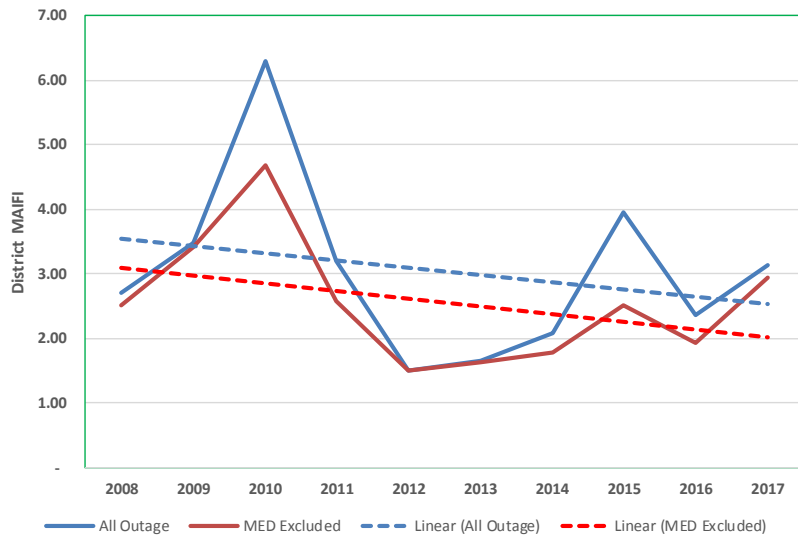
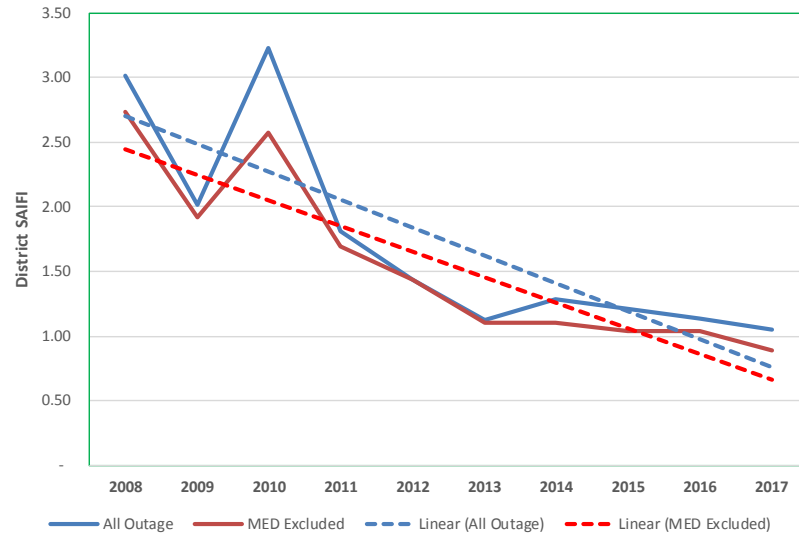
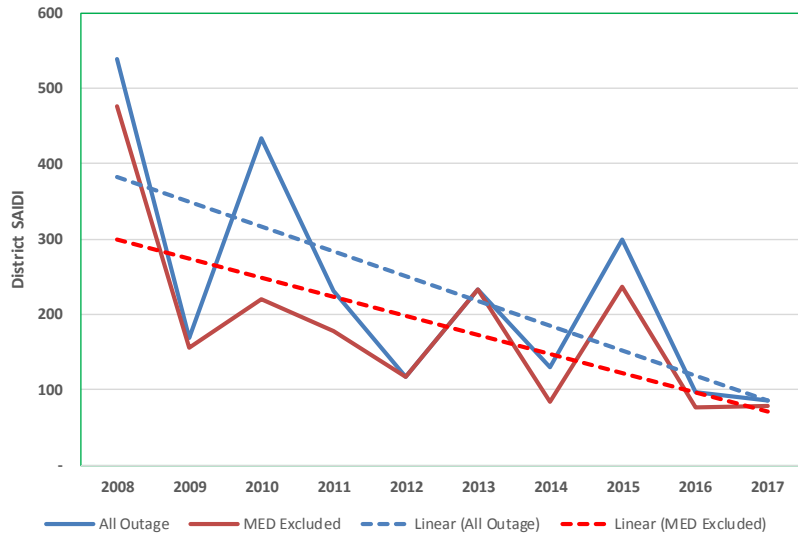
# 2008 -2017 District Reliability Graphs

## SOUTH BAY District Reliability Performance



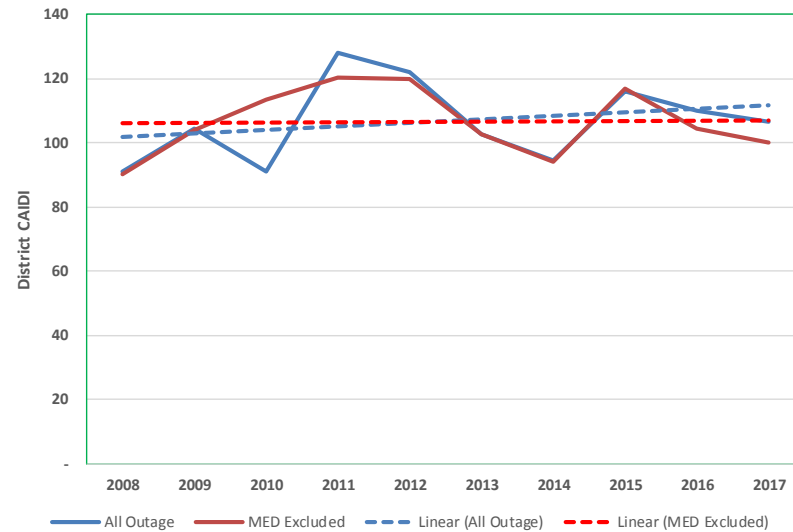
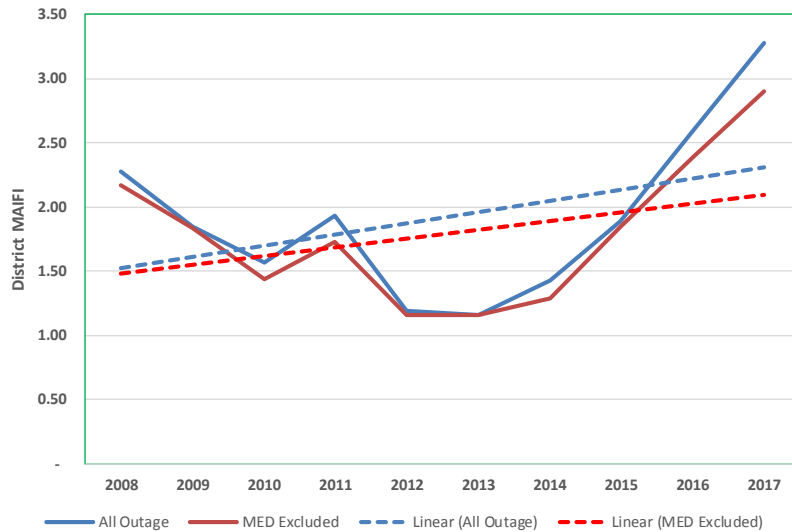
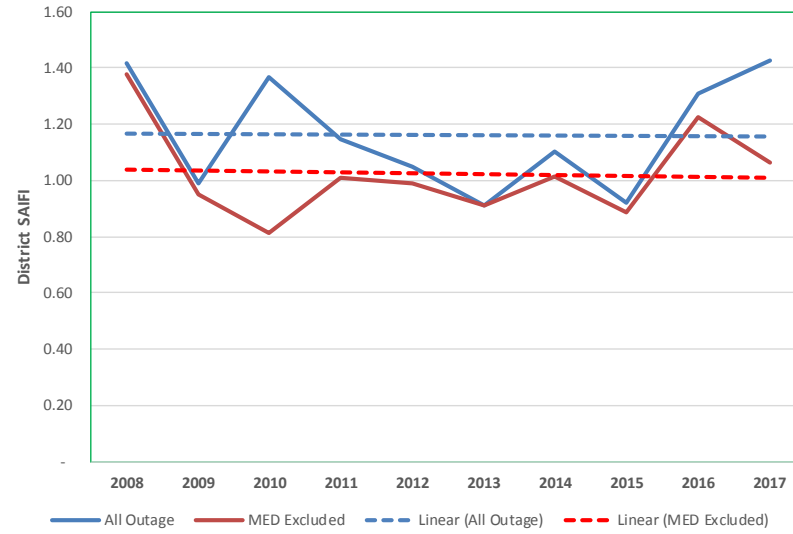
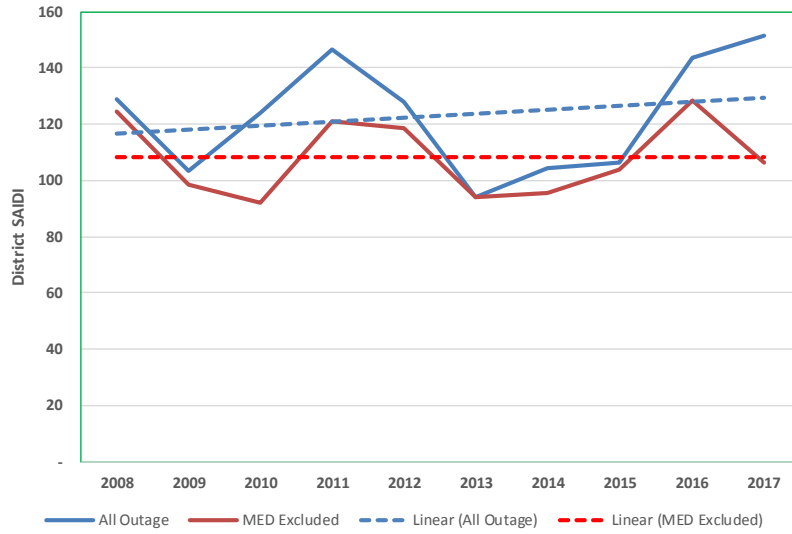
# 2008 -2017 District Reliability Graphs

## TEHACHAPI District Reliability Performance



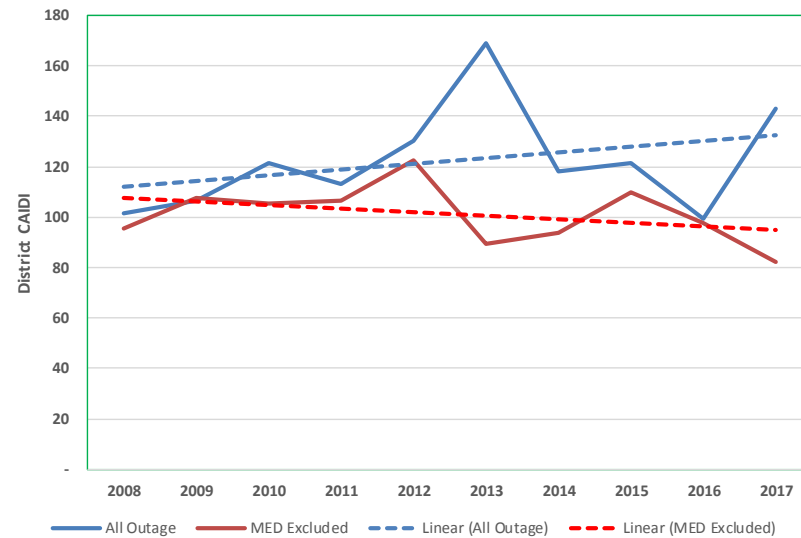
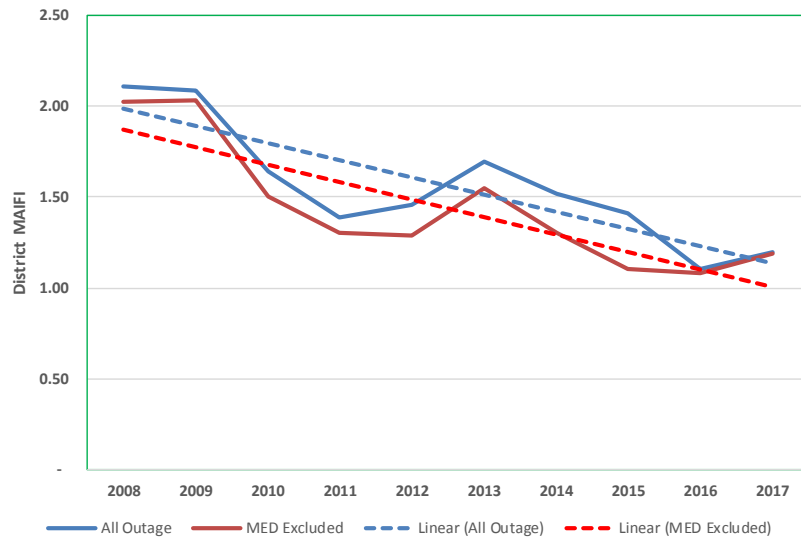
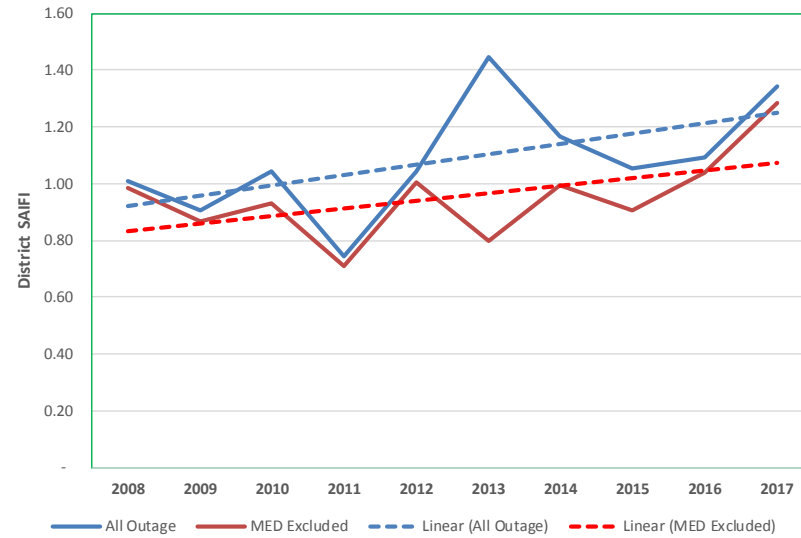
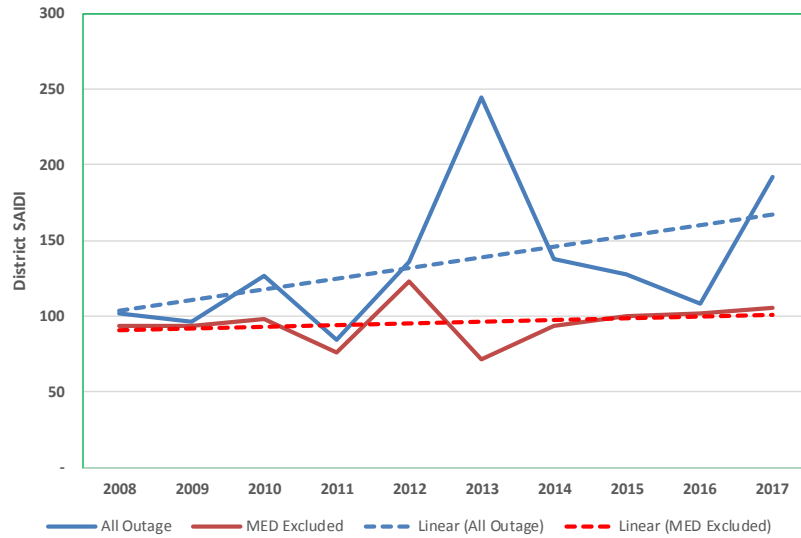
## 2008 -2017 District Reliability Graphs

### THOUSAND OAKS District Reliability Performance



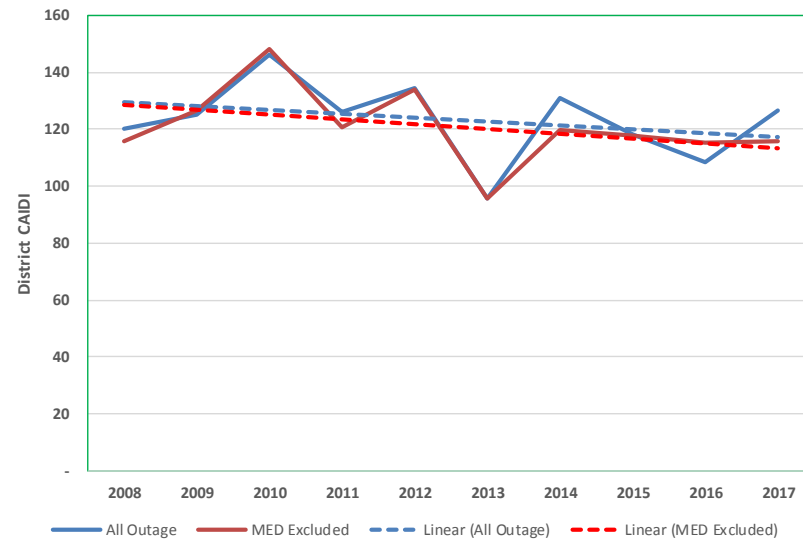
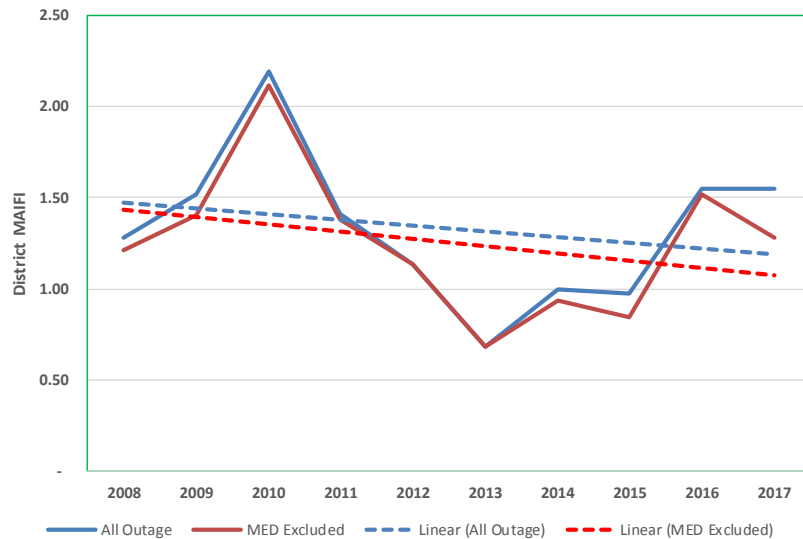
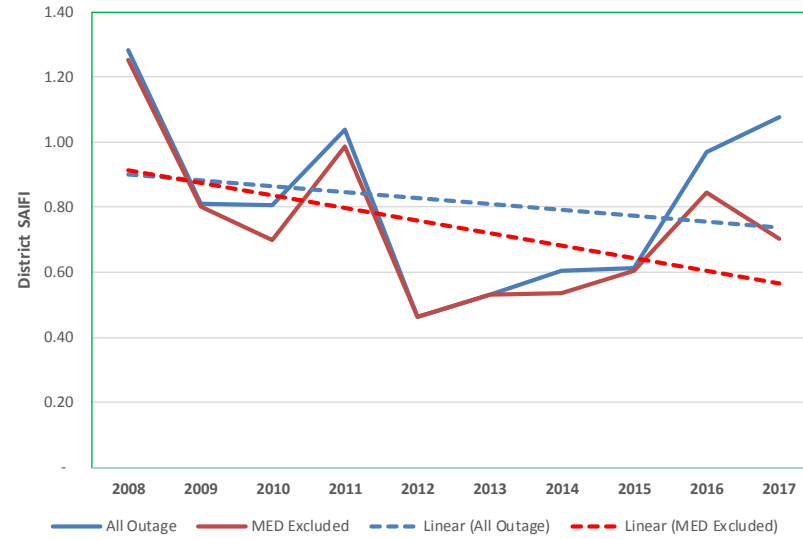
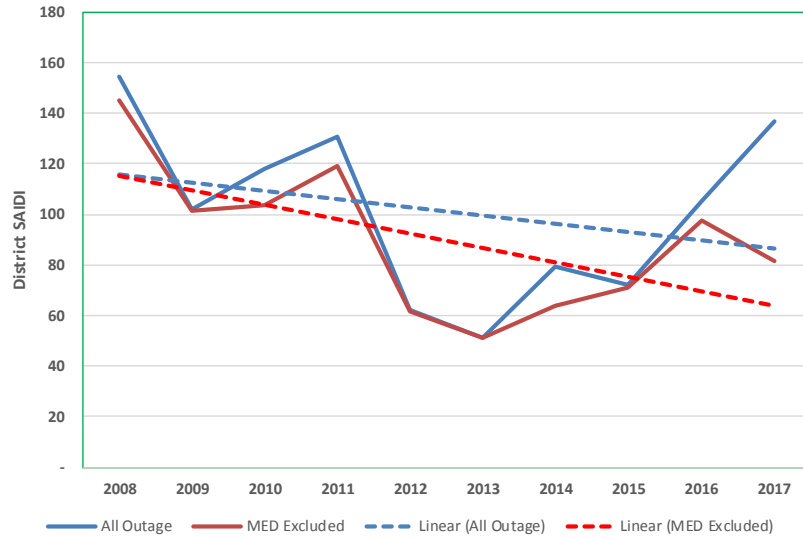
# 2008 -2017 District Reliability Graphs

## TULARE District Reliability Performance



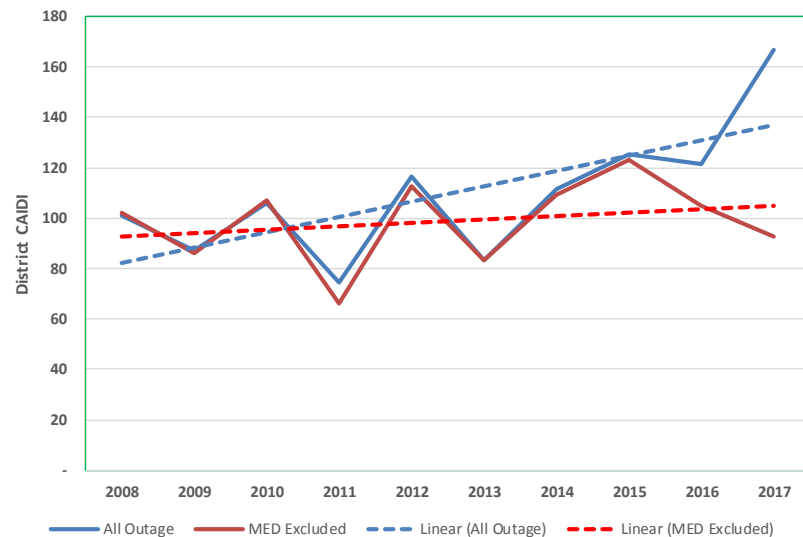
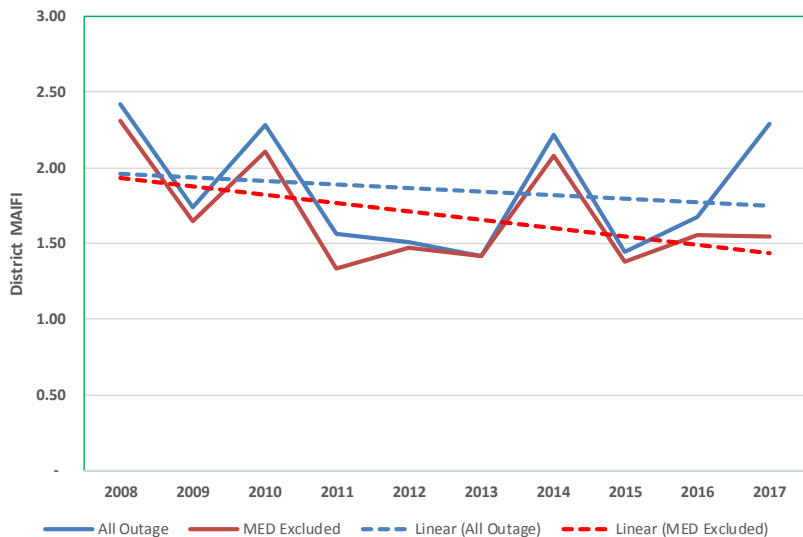
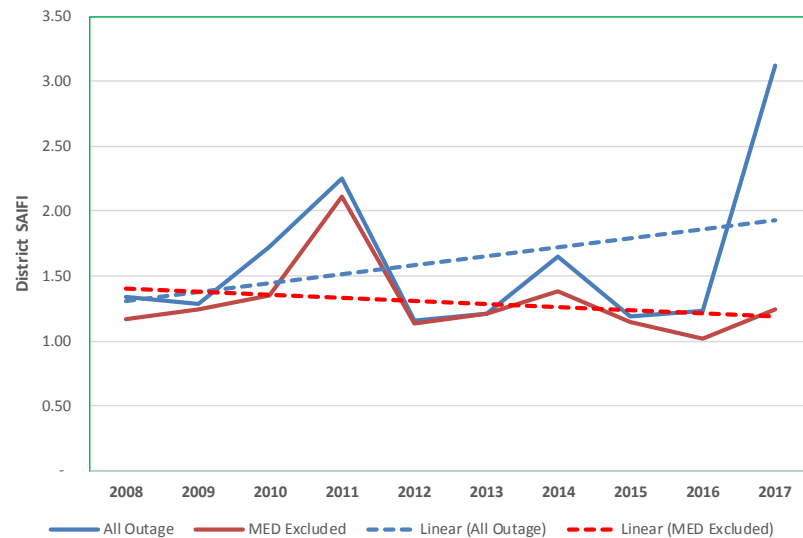
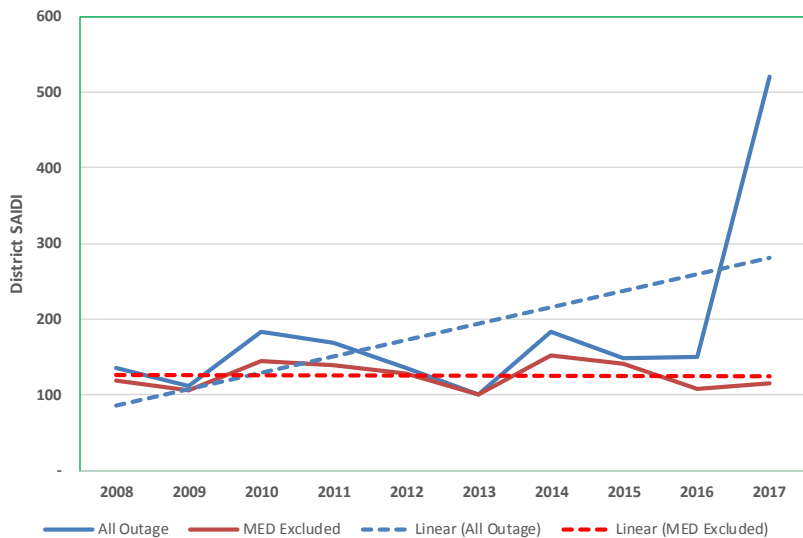
# 2008 -2017 District Reliability Graphs

## VALENCIA District Reliability Performance



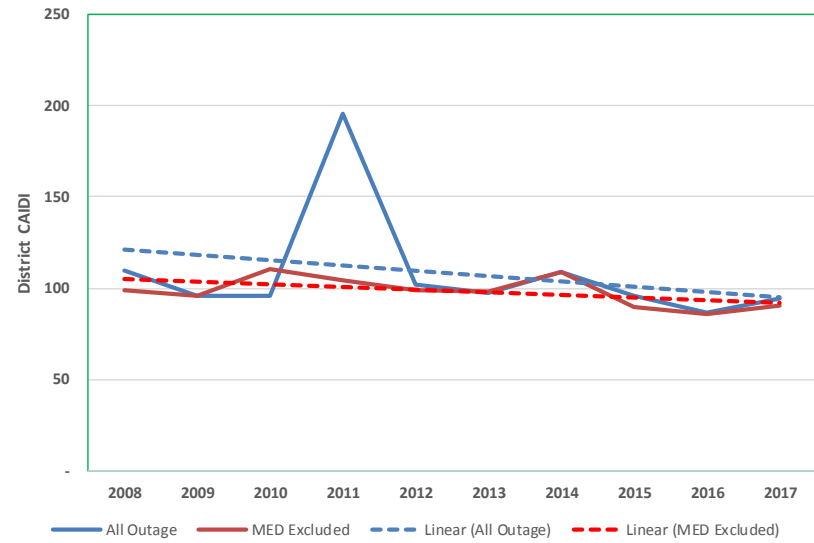
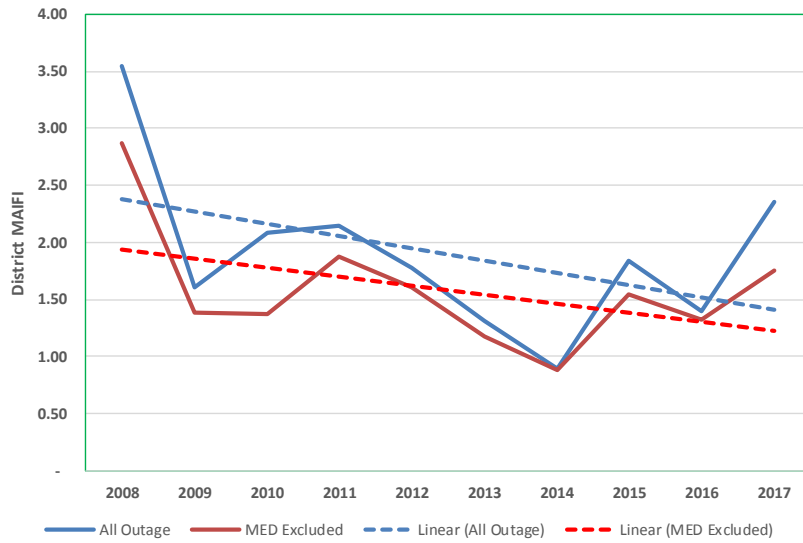
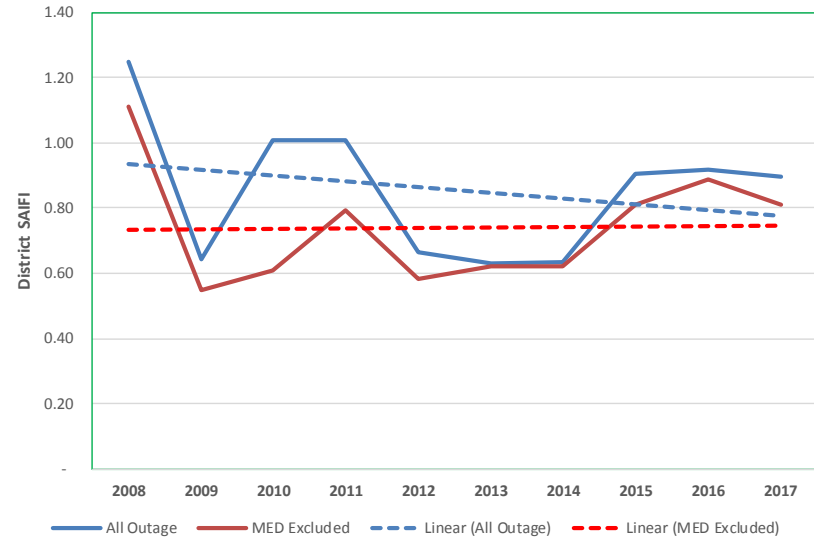
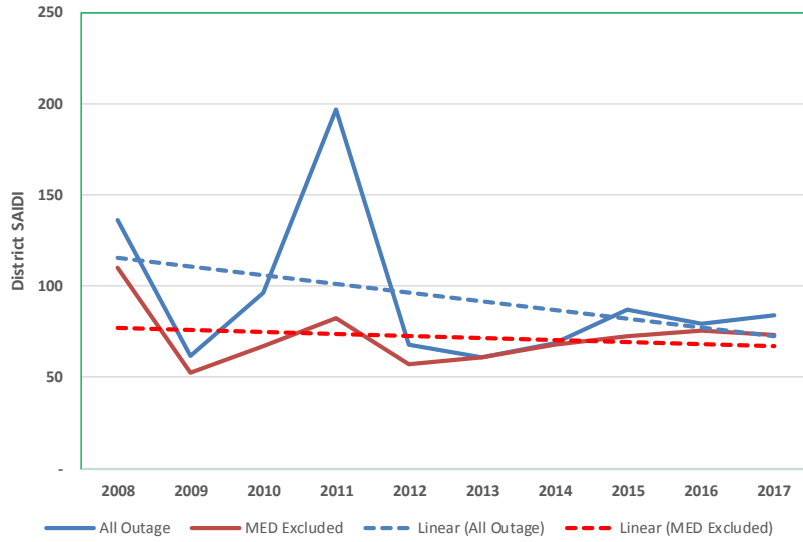
## 2008 -2017 District Reliability Graphs

### VENTURA District Reliability Performance



# 2008 -2017 District Reliability Graphs

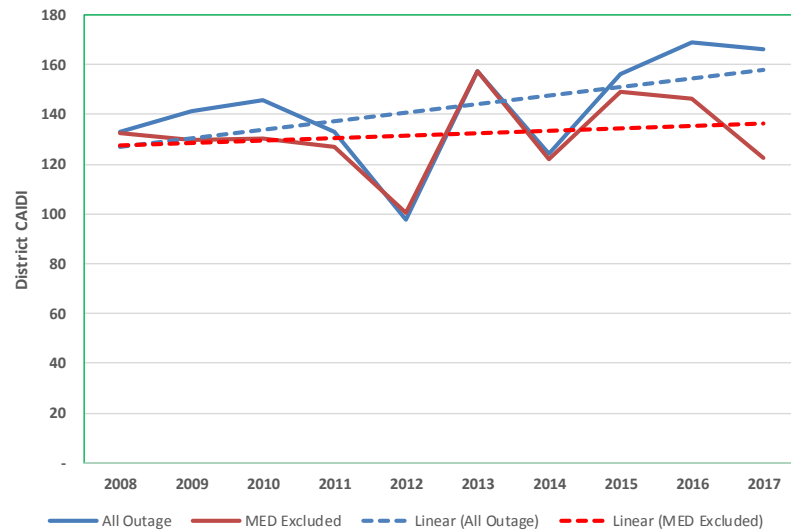
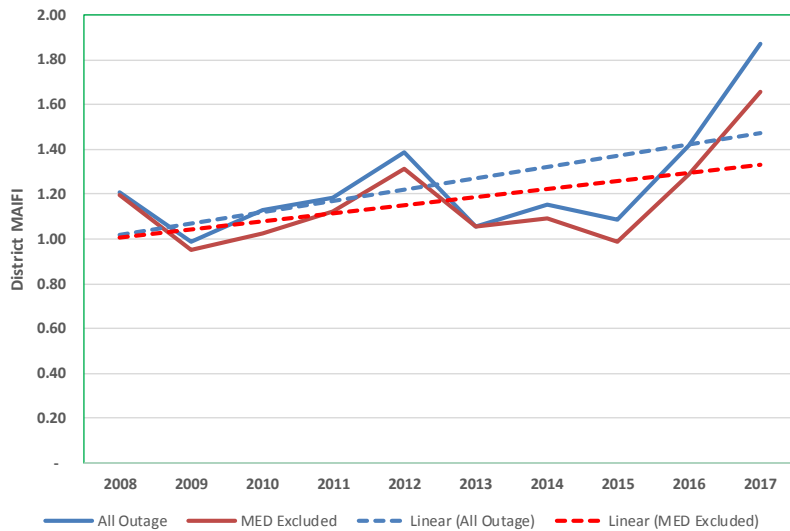
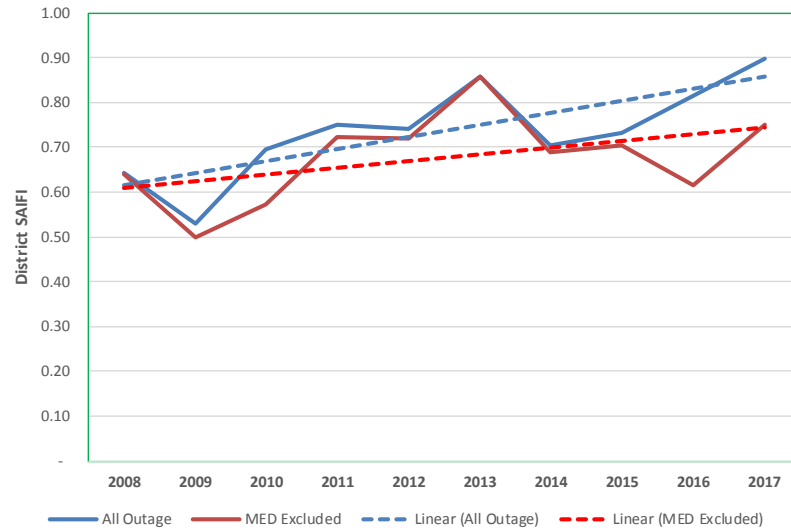
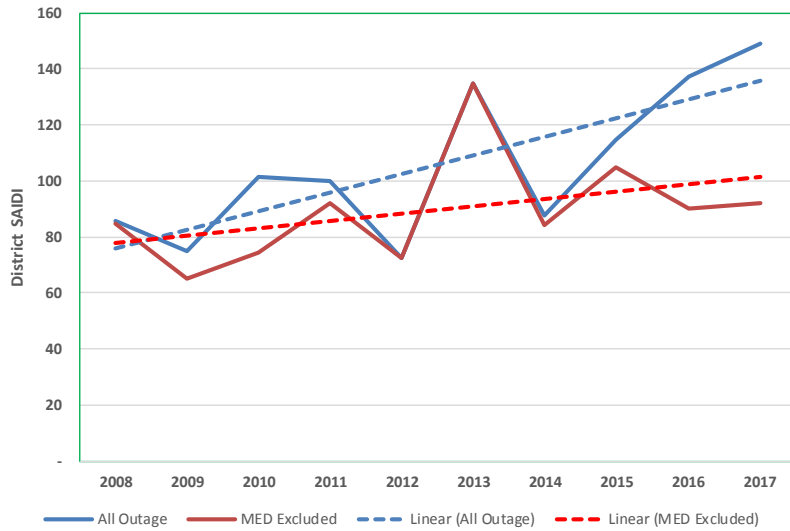
## VICTORVILLE District Reliability Performance





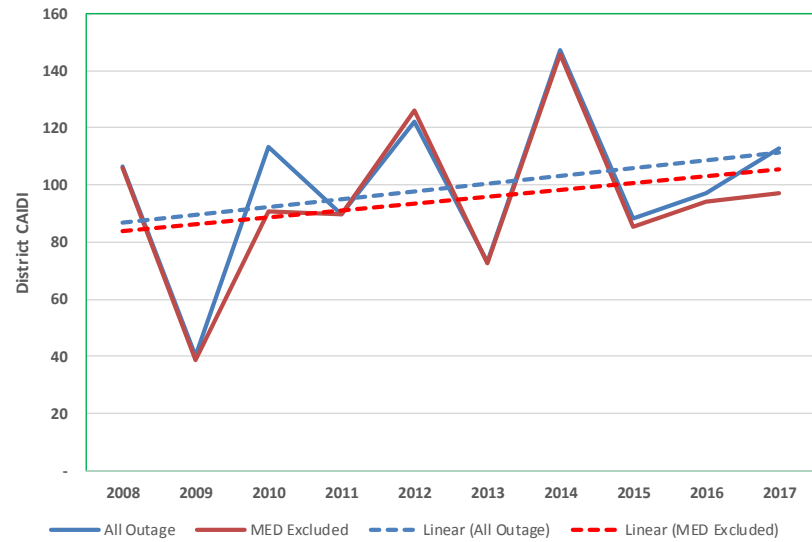
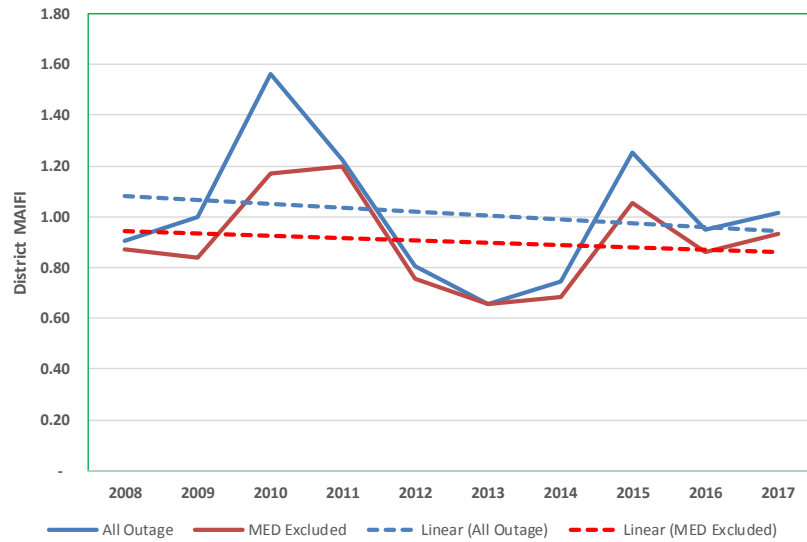
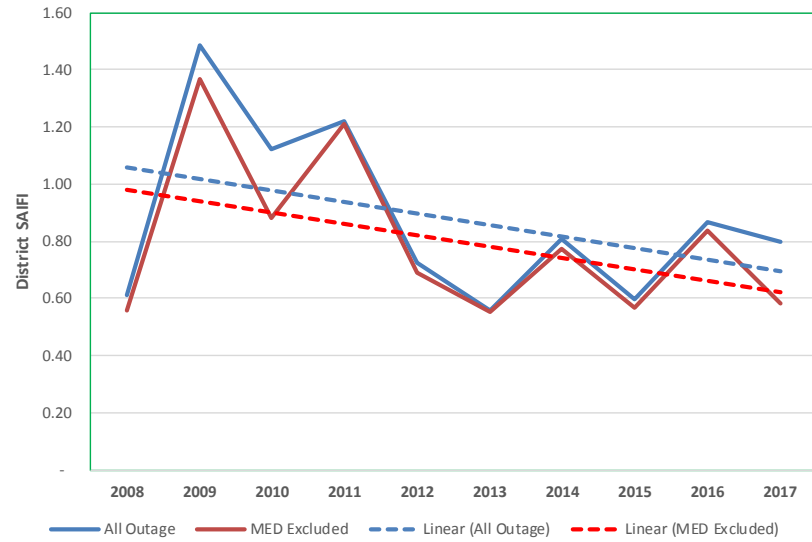
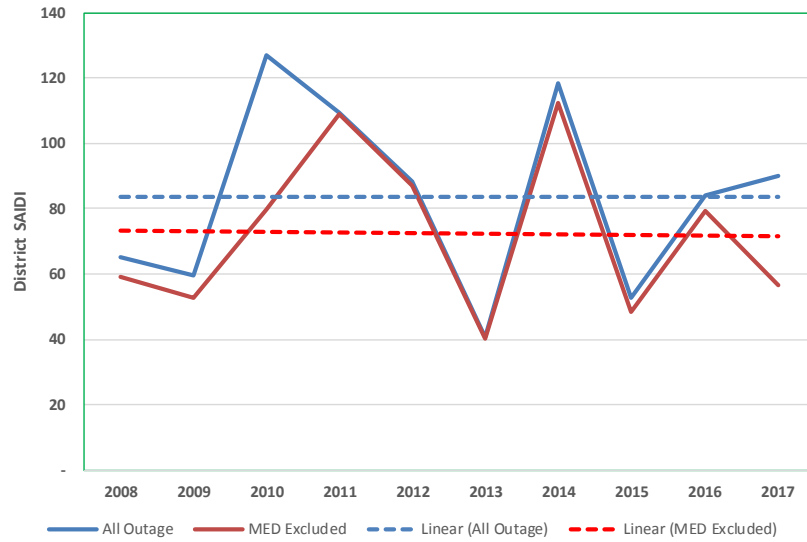
## 2008 -2017 District Reliability Graphs

### WHITTIER District Reliability Performance



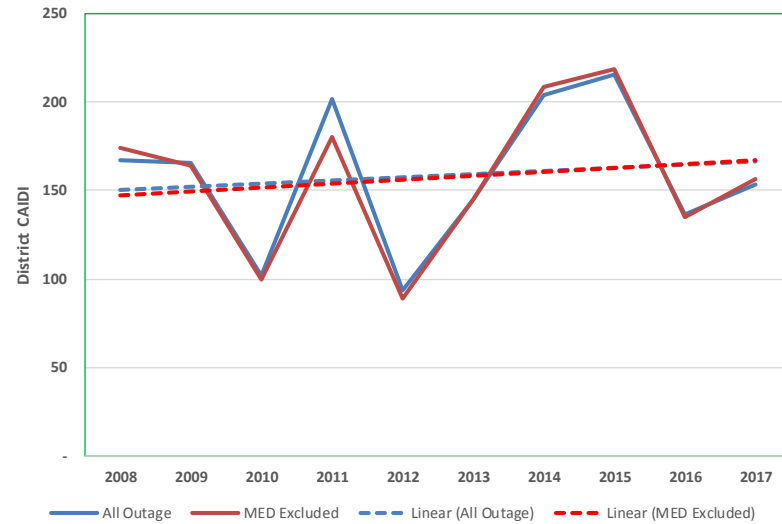
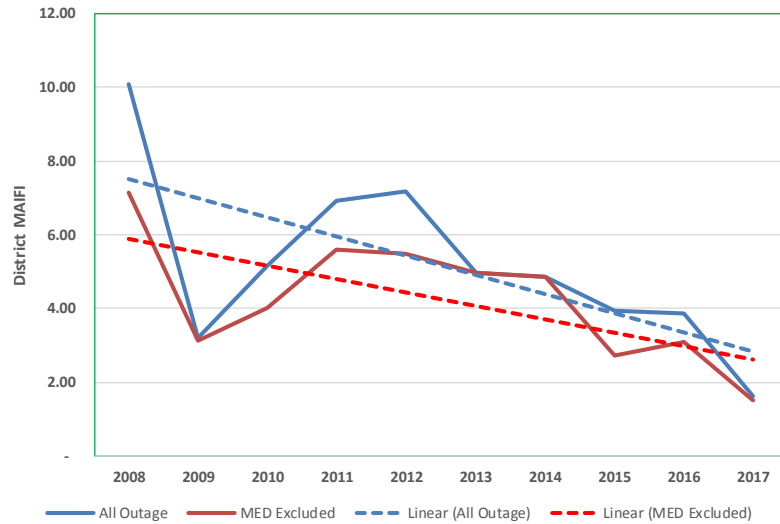
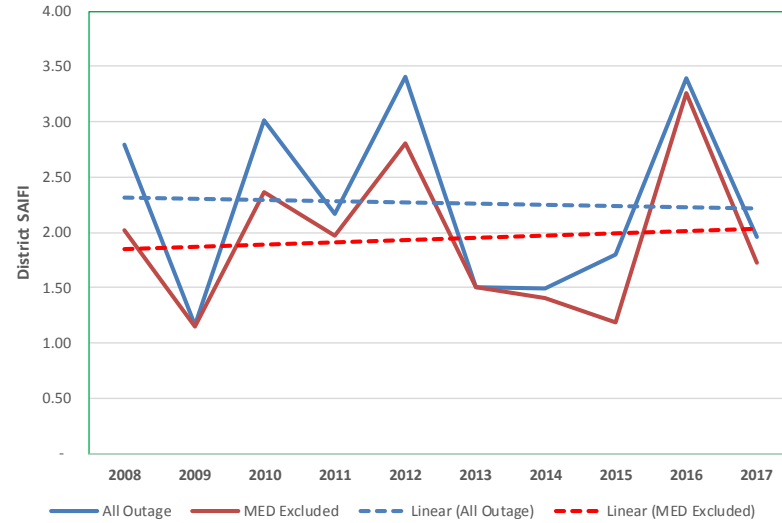
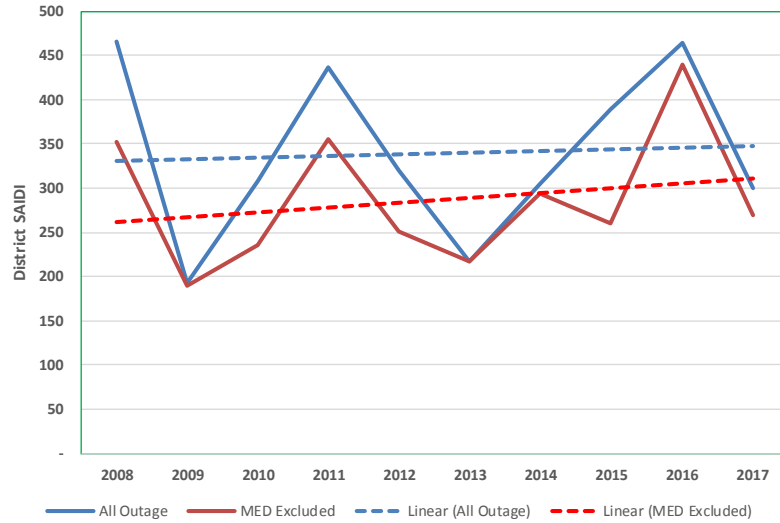
# 2008 -2017 District Reliability Graphs

## WILDOMAR District Reliability Performance



## 2008 -2017 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, MAIFI<sup>5</sup> and CAIDI indices for 2008-2017 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 (2008-2017) Planned and Unplanned<sup>6</sup>**

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2008	118.91	1.06	1.73	112.33	99.35	0.95	1.56	104.05
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

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

**Table 6 – District Indices (2008-2017) Planned and Unplanned**

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>ANTELOPE VALLEY</b>								
2008	92.185	0.956	2.414	96.458	76.570	0.825	2.124	92.802
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

<sup>5</sup> SCE calculates MAIFI at every individual outage event

<sup>6</sup> SCE began calculating planned SAIDI beginning in 2016

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>ARROWHEAD</b>								
2008	1239.362	5.427	11.469	228.387	475.902	3.642	6.678	130.682
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
<b>BARSTOW</b>								
2008	403.157	2.363	4.415	170.643	318.756	1.920	3.625	166.036
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	2.300	122.114	183.028	1.527	2.287	119.823
2017	408.946	2.815	4.197	145.250	407.542	2.803	4.134	145.419
<b>BISHOP</b>								
2008	265.070	1.087	1.923	243.782	159.414	0.882	1.777	180.641
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	2.836	197.843	331.943	1.678	2.727	197.818
2017	457.095	2.893	3.265	157.984	438.728	2.836	3.119	154.713
<b>BLYTHE</b>								
2008	454.705	3.094	4.795	146.982	454.705	3.094	4.042	146.982
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	4.855	200.447
2017	1100.260	3.321	3.586	331.330	1099.341	3.316	3.494	331.554
<b>CATALINA</b>								
2008	29.733	1.357	0.888	21.915	29.733	1.357	0.888	21.915
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
<b>COMPTON</b>								
2008	81.303	0.699	1.386	116.316	71.633	0.644	1.313	111.283
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

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>COVINA</b>								
2008	84.551	0.639	1.358	132.397	74.686	0.582	1.269	128.384
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
<b>FOOTHILL</b>								
2008	85.539	0.636	1.658	134.423	76.793	0.577	1.605	133.050
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
<b>FULLERTON</b>								
2008	91.886	0.779	0.967	117.957	87.406	0.738	0.888	118.371
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
<b>HUNTINGTON BEACH</b>								
2008	84.497	0.776	0.954	108.846	80.194	0.739	0.898	108.503
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	253.960	1.665	1.232	152.547	234.100	1.589	1.169	147.352
2017	207.148	1.344	1.455	154.169	187.781	1.223	1.196	153.525
<b>KERNVILLE</b>								
2008	590.919	3.898	7.309	151.580	228.916	2.548	4.493	89.833
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	3.103	600.638	1217.766	3.710	3.007	328.213
2017	610.622	4.144	4.587	147.356	595.690	4.006	4.288	148.701
<b>LONG BEACH</b>								
2008	52.535	0.436	0.640	120.516	48.058	0.409	0.604	117.392
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	1.100	222.387
2017	167.261	0.916	1.180	182.537	149.590	0.798	1.021	187.474

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>MENIFEE</b>								
2008	111.189	1.570	1.757	70.808	83.826	1.490	1.726	56.272
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
<b>MONROVIA</b>								
2008	103.789	0.848	1.881	122.426	95.940	0.761	1.770	126.002
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
<b>MONTEBELLO</b>								
2008	93.833	0.712	1.678	131.832	85.623	0.665	1.633	128.688
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
<b>ONTARIO</b>								
2008	99.041	0.790	1.449	125.372	92.016	0.738	1.379	124.620
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
<b>PALM SPRINGS</b>								
2008	170.541	1.506	2.405	113.251	144.142	1.400	2.213	102.984
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	1.285	169.743	252.026	1.465	1.137	171.990
2017	230.013	1.398	1.229	164.565	227.345	1.374	1.218	165.435
<b>REDLANDS</b>								
2008	103.674	0.911	1.602	113.832	93.720	0.842	1.477	111.282
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	1.478	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

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>RIDGECREST</b>								
2008	167.192	1.423	3.184	117.455	163.869	1.414	3.179	115.856
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
<b>SADDLEBACK</b>								
2008	89.743	0.925	0.572	97.007	84.923	0.874	0.567	97.138
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
<b>SANTA ANA</b>								
2008	77.542	0.681	0.943	113.881	73.380	0.649	0.852	113.109
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
<b>SANTA BARBARA</b>								
2008	535.533	6.309	3.588	84.883	336.797	5.121	2.604	65.764
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
<b>SANTA MONICA</b>								
2008	60.490	0.800	1.211	75.635	53.518	0.755	1.163	70.847
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	1.218	150.691	178.204	1.181	1.139	150.850
2017	235.009	1.096	1.172	214.420	229.254	1.063	1.112	215.714
<b>SHAVER LAKE</b>								
2008	104.921	2.499	2.291	41.977	91.752	2.059	1.466	44.558
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	5.305	499.772	1905.726	9.103	5.282	209.351



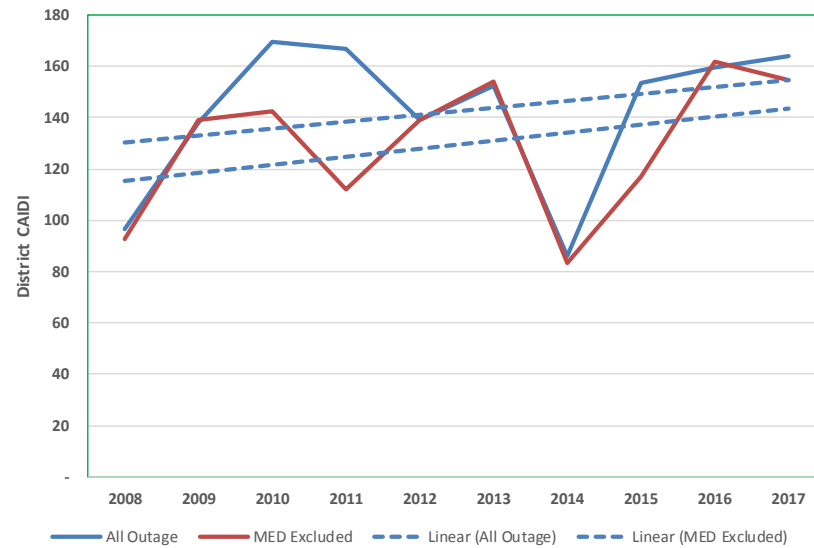
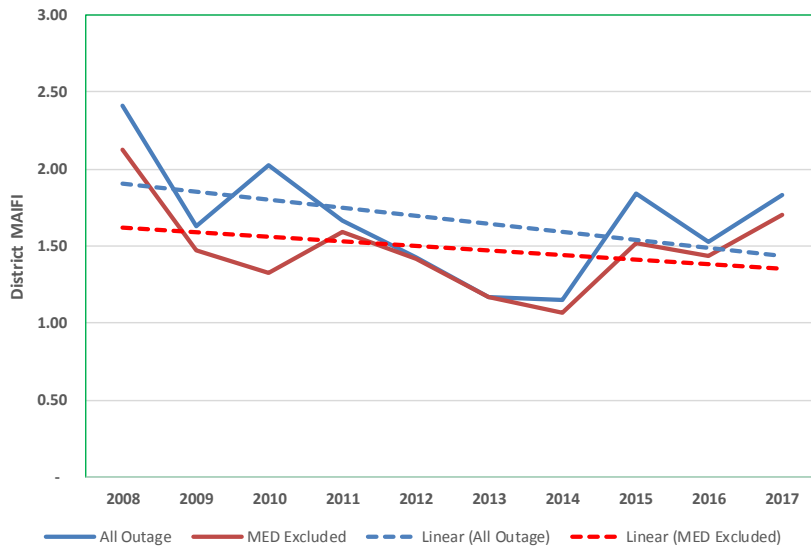
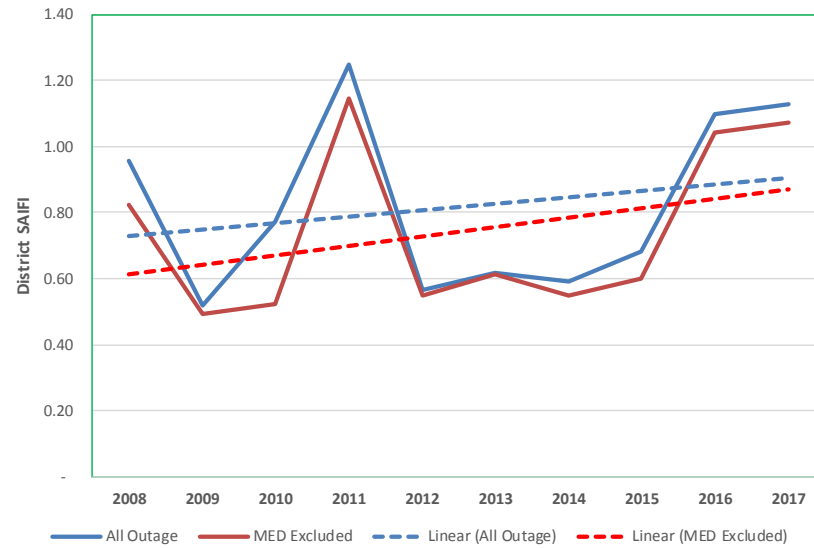
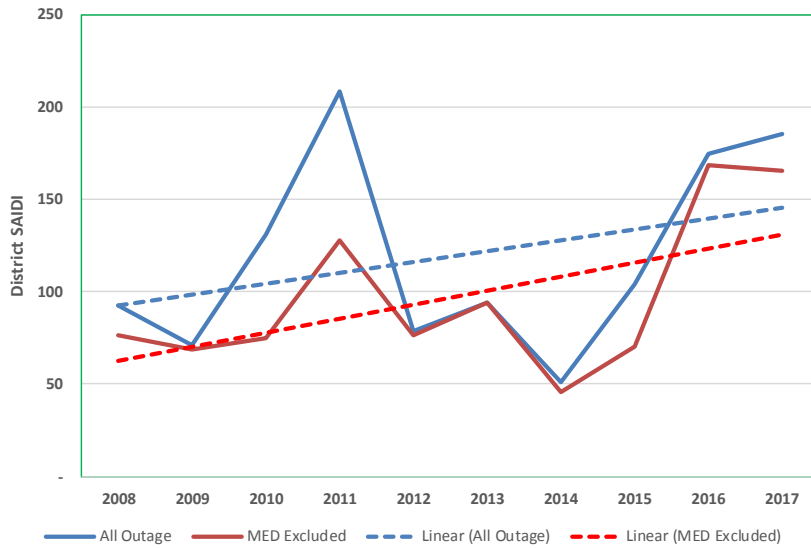
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>SOUTH BAY</b>								
2008	110.983	1.074	2.058	103.324	93.443	0.937	1.817	99.722
2009	158.299	1.156	1.814	136.881	135.003	1.007	1.627	134.053
2010	190.924	1.206	1.836	158.299	136.407	0.938	1.533	145.392
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	2.025	150.313	302.021	2.097	1.823	144.043
2017	268.368	1.330	1.467	201.767	256.529	1.217	1.335	210.758
<b>TEHACHAPI</b>								
2008	538.562	3.013	2.695	178.746	475.358	2.737	2.517	173.697
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	3.167	106.881	150.449	1.330	2.986	113.113
<b>THOUSAND OAKS</b>								
2008	129.109	1.418	2.273	91.031	124.425	1.377	2.168	90.364
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
<b>TULARE</b>								
2008	102.285	1.010	2.105	101.290	93.741	0.984	2.026	95.232
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	1.208	147.467
<b>VALENCIA</b>								
2008	154.448	1.283	1.280	120.341	144.819	1.251	1.209	115.786
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
<b>VENTURA</b>								
2008	134.882	1.334	2.421	101.125	118.631	1.162	2.308	102.103
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

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
<b>VICTORVILLE</b>								
2008	136.461	1.248	3.540	109.335	110.202	1.111	2.872	99.232
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
<b>WHITTIER</b>								
2008	85.700	0.643	1.211	133.258	84.682	0.640	1.194	132.415
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
<b>WILDOMAR</b>								
2008	65.200	0.612	0.908	106.550	58.950	0.556	0.872	105.992
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	0.955	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
<b>YUCCA VALLEY</b>								
2008	465.373	2.789	10.074	166.836	351.816	2.018	7.137	174.382
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

- 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 district name alphabetical order.

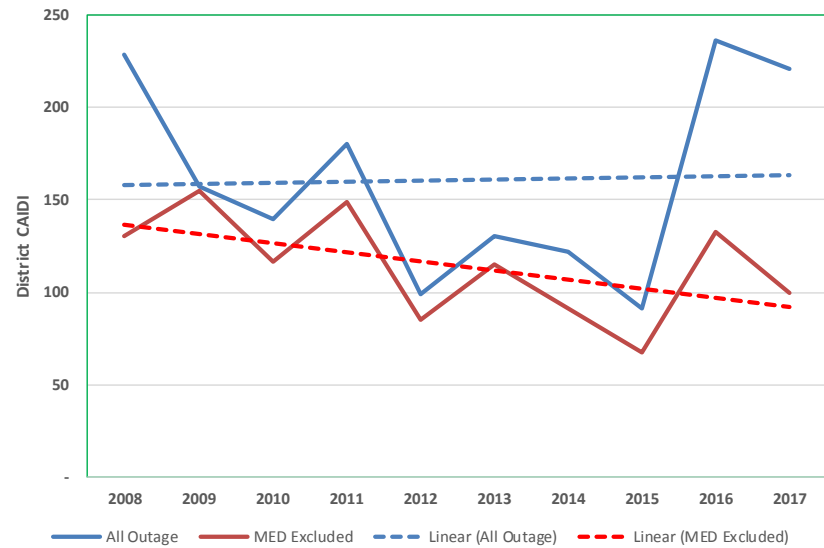
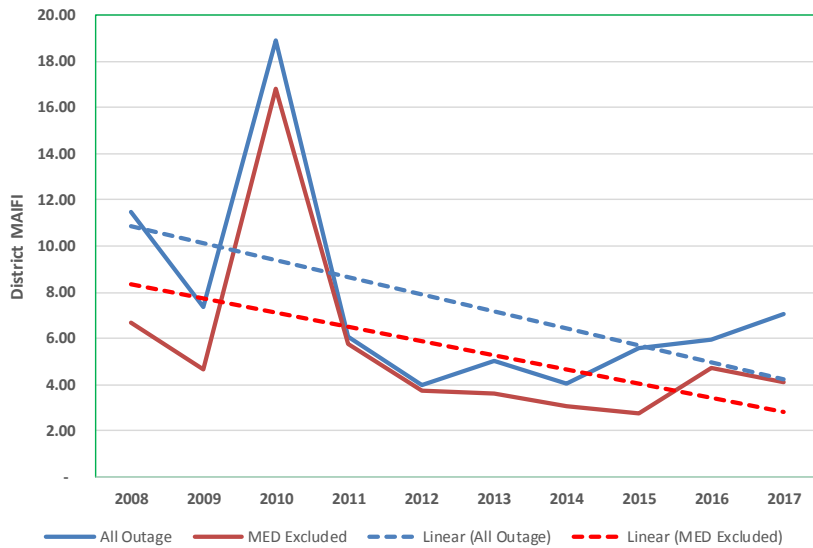
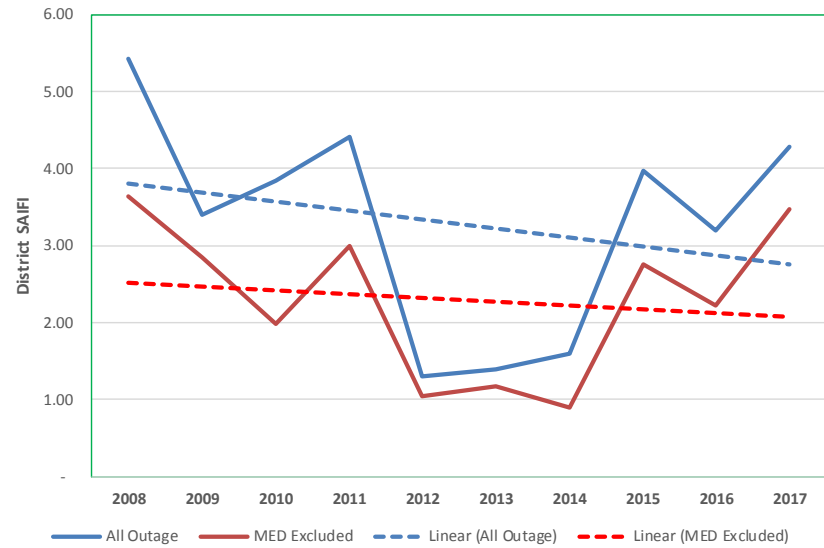
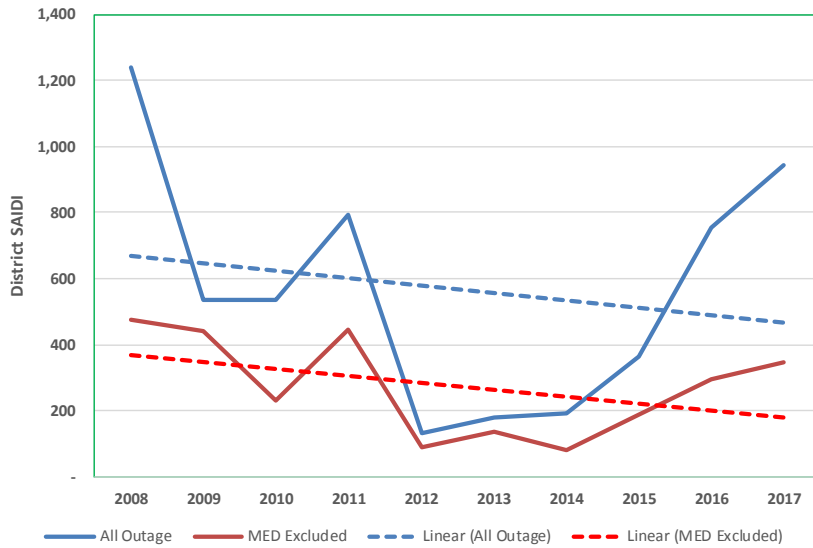
## 2008 - 2017 District Reliability Graphs (With Planned)

### ANTELOPE VALLEY District Reliability Performance



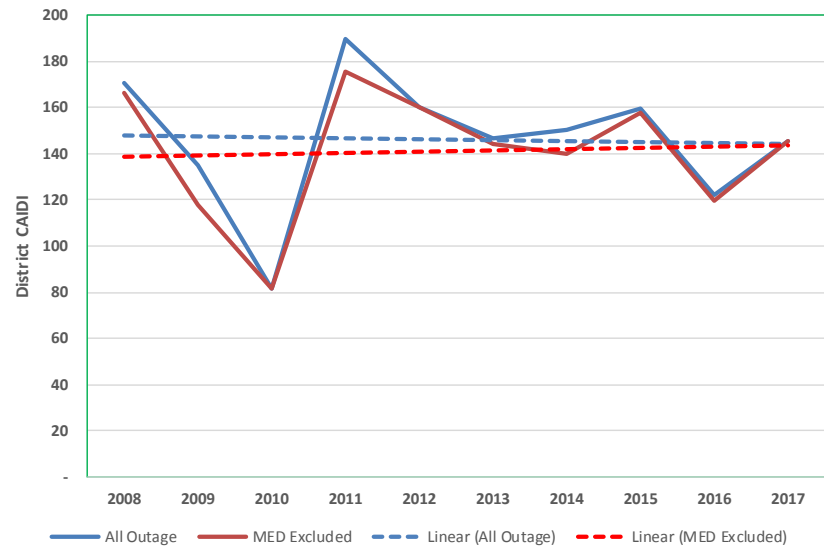
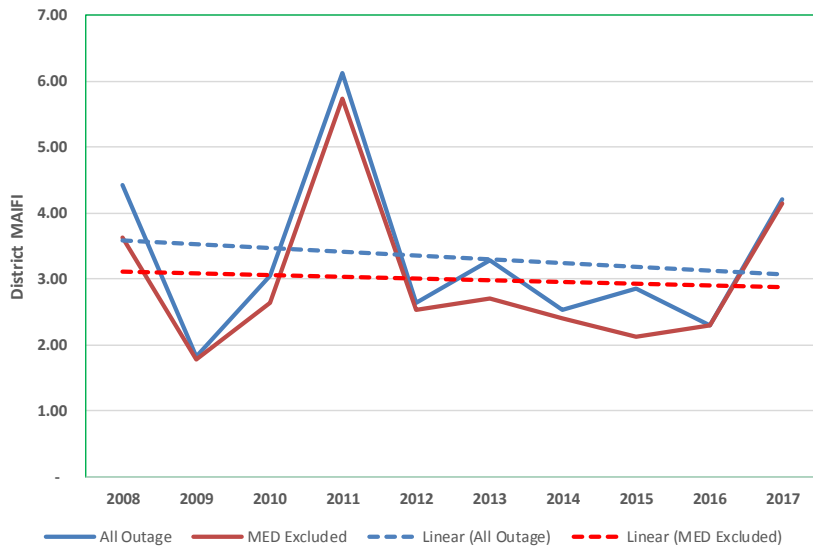
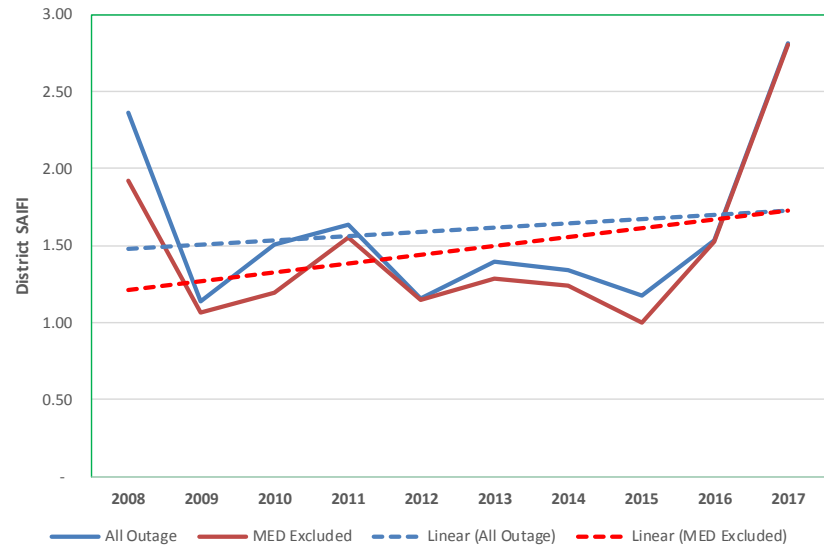
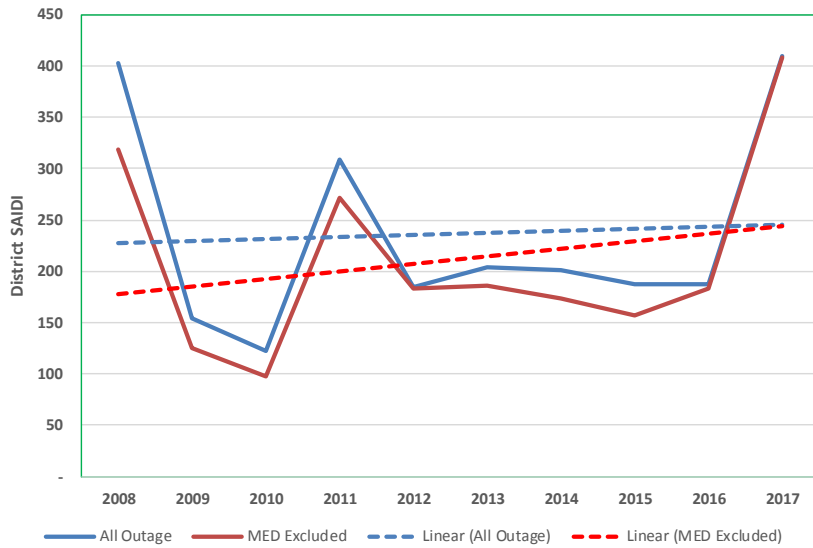
## 2008 - 2017 District Reliability Graphs (With Planned)

### ARROWHEAD District Reliability Performance



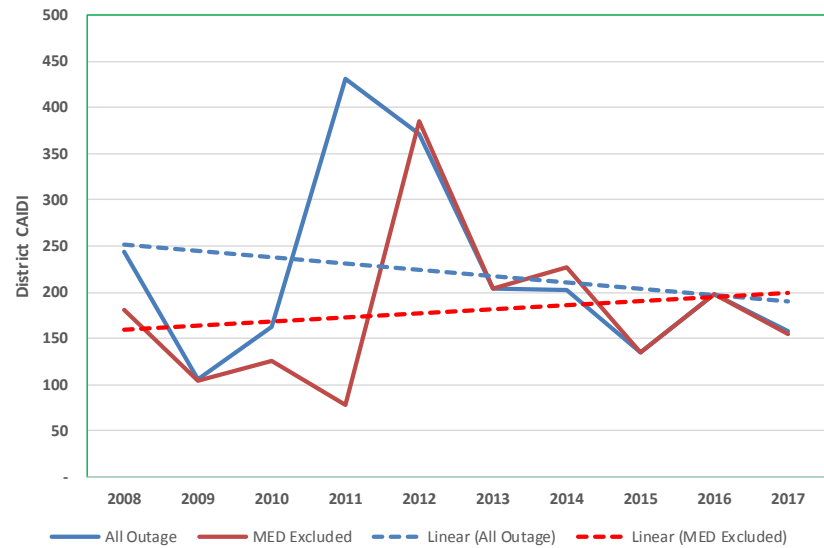
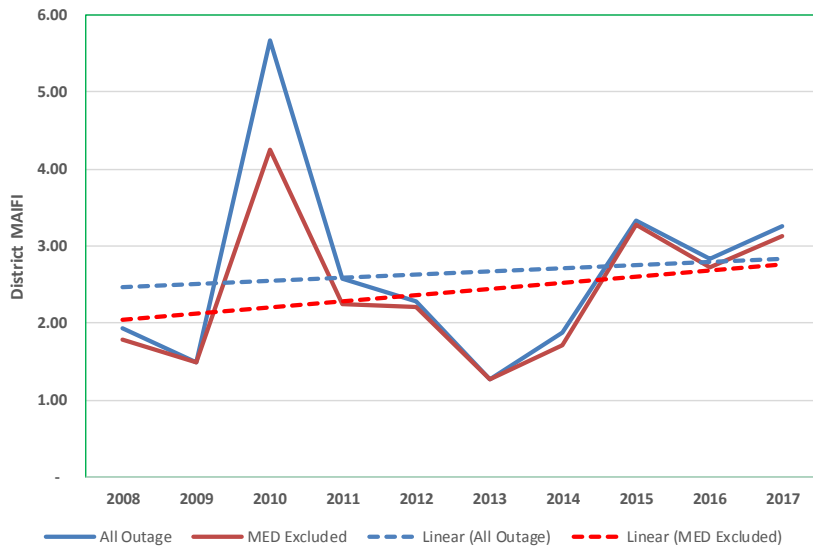
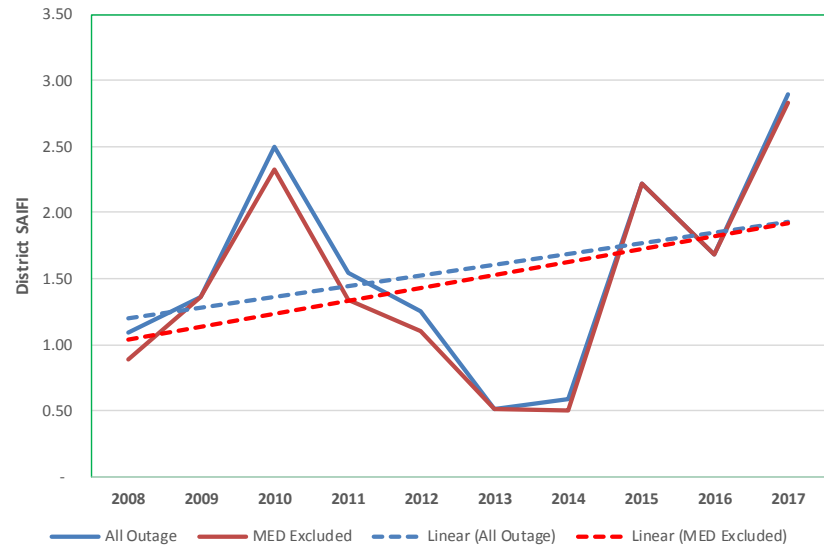
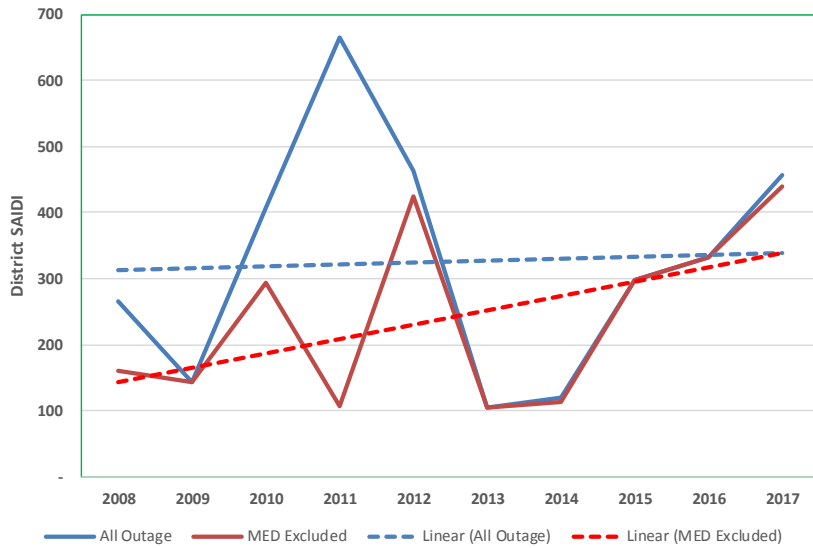
## 2008 - 2017 District Reliability Graphs (With Planned)

### BARSTOW District Reliability Performance



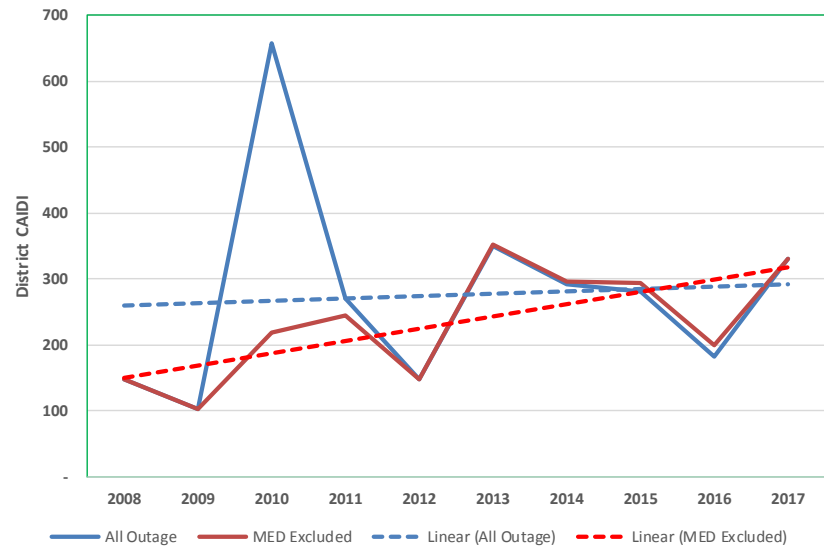
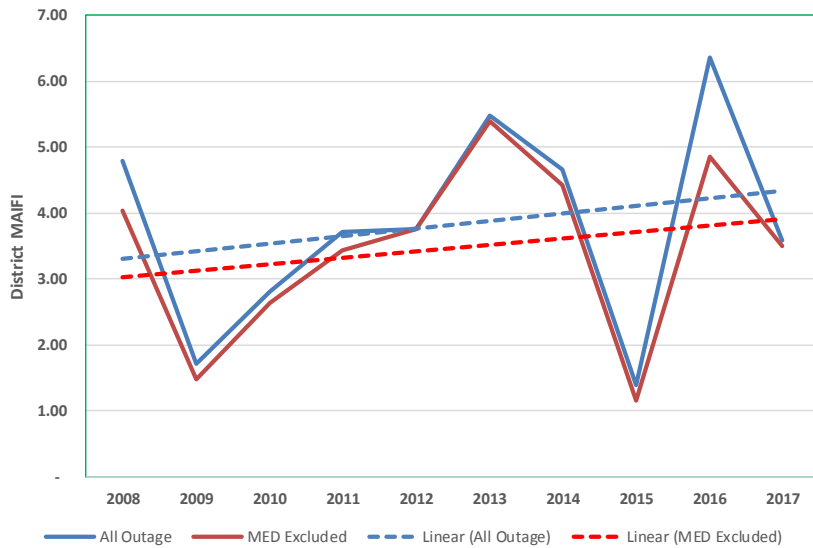
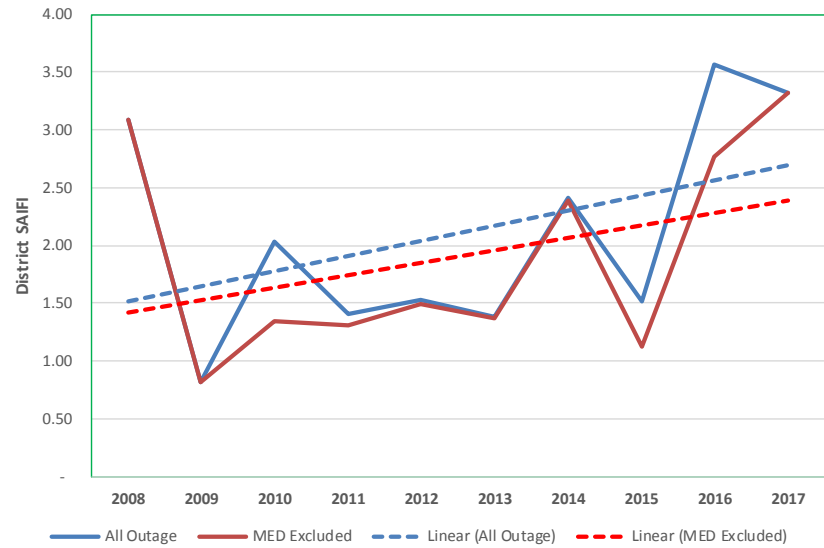
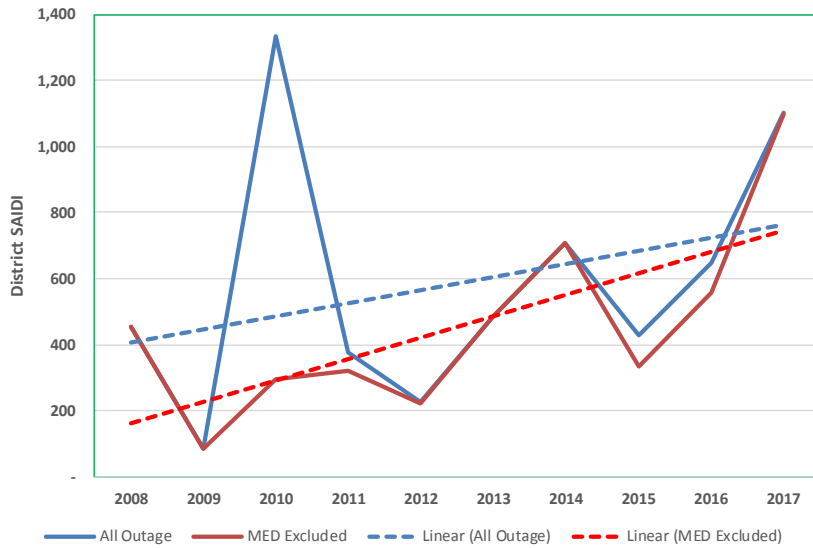
## 2008 - 2017 District Reliability Graphs (With Planned)

### BISHOP District Reliability Performance



## 2008 - 2017 District Reliability Graphs (With Planned)

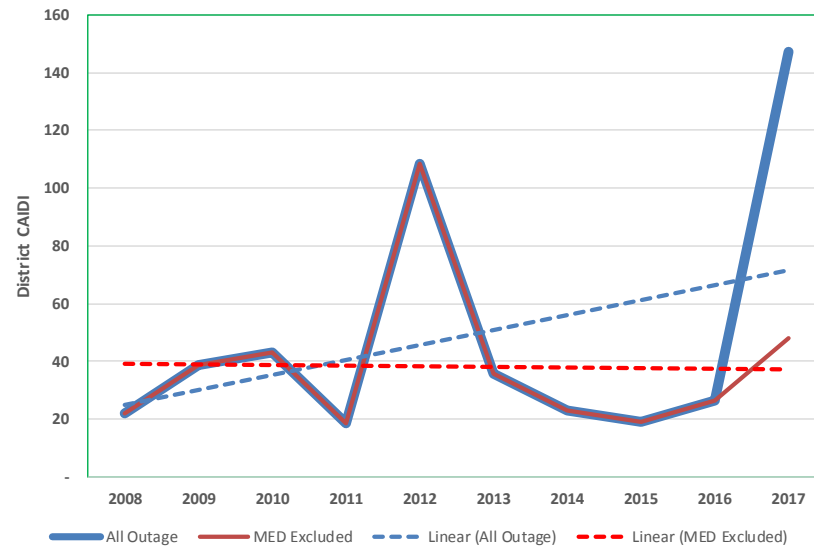
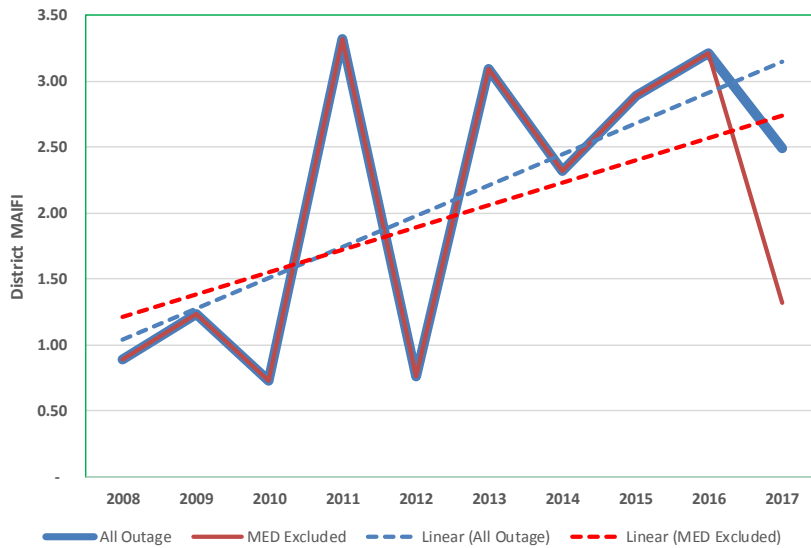
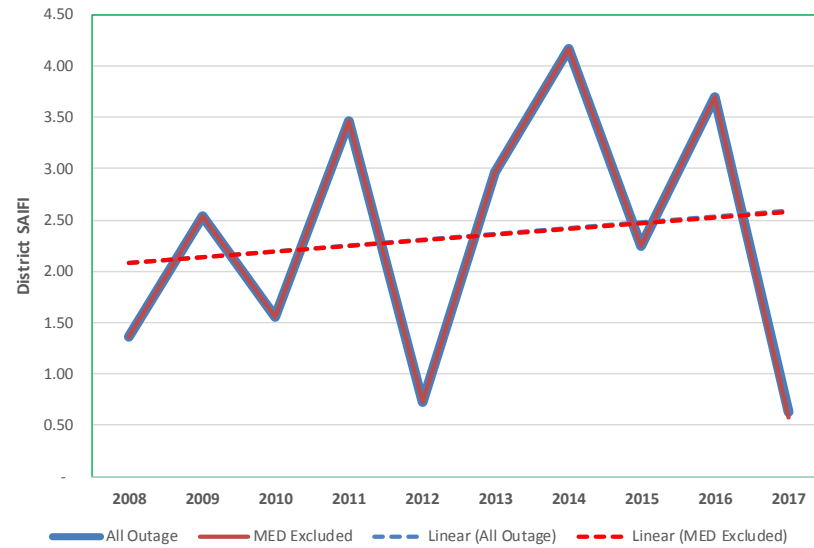
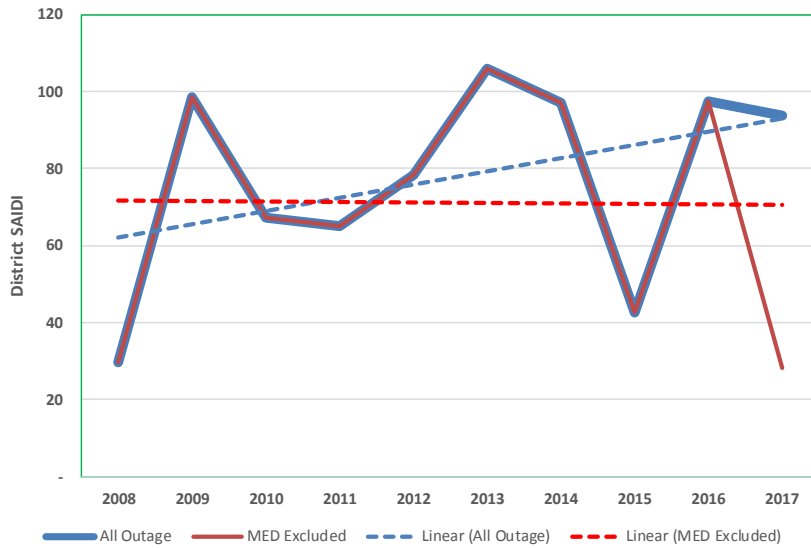
### BLYTHE District Reliability Performance





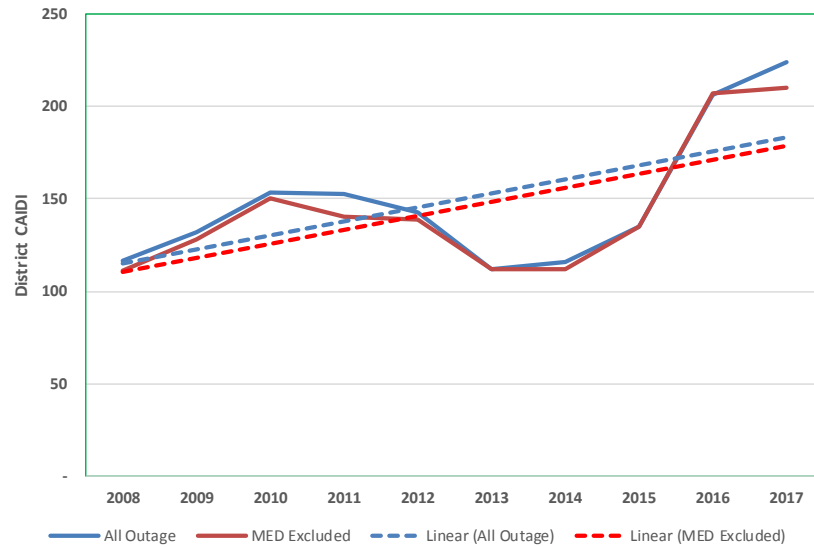
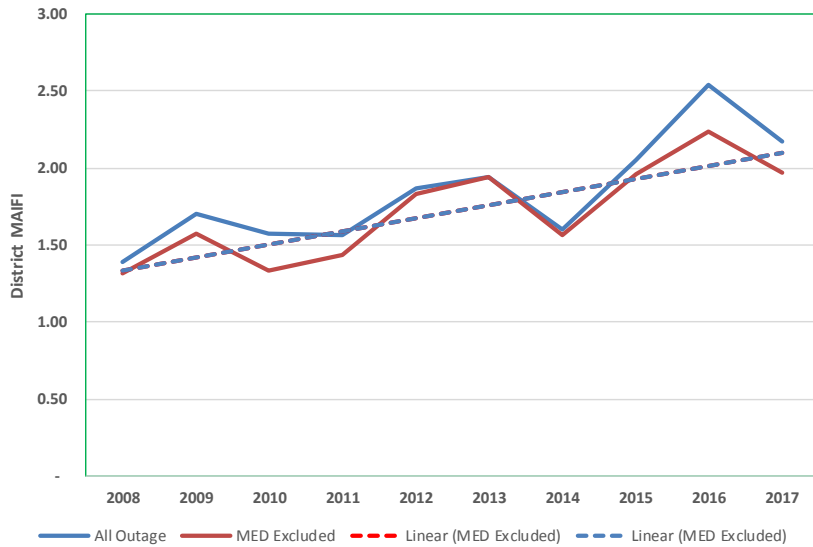
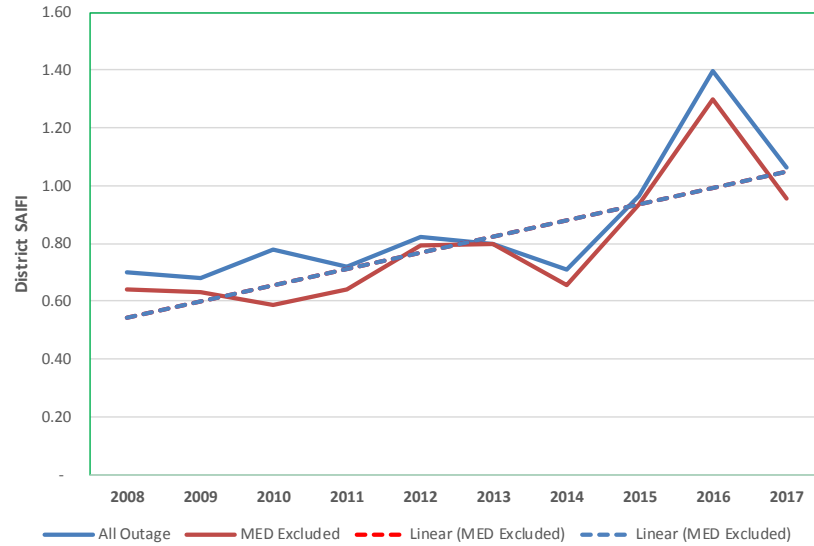
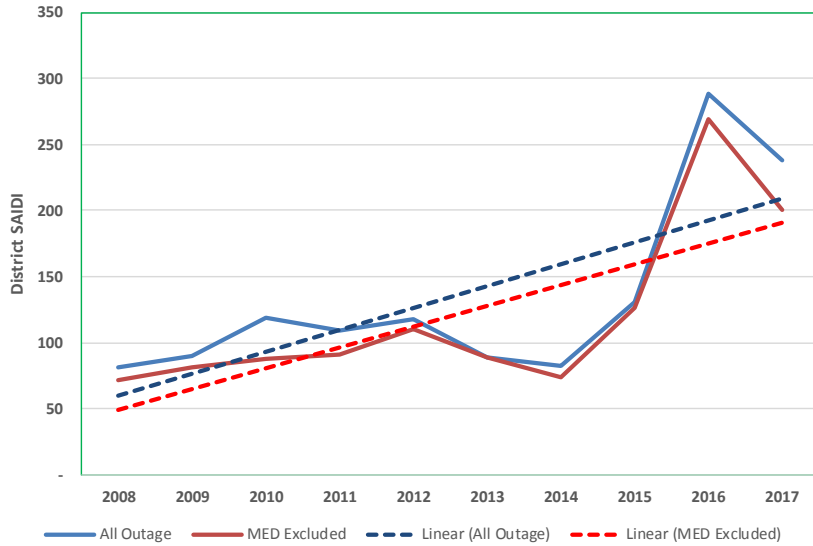
## 2008 - 2017 District Reliability Graphs (With Planned)

### CATALINA District Reliability Performance



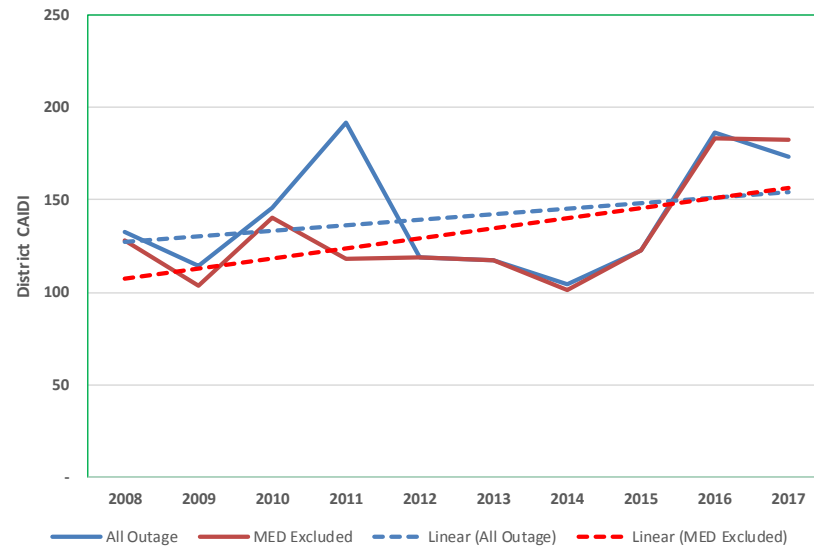
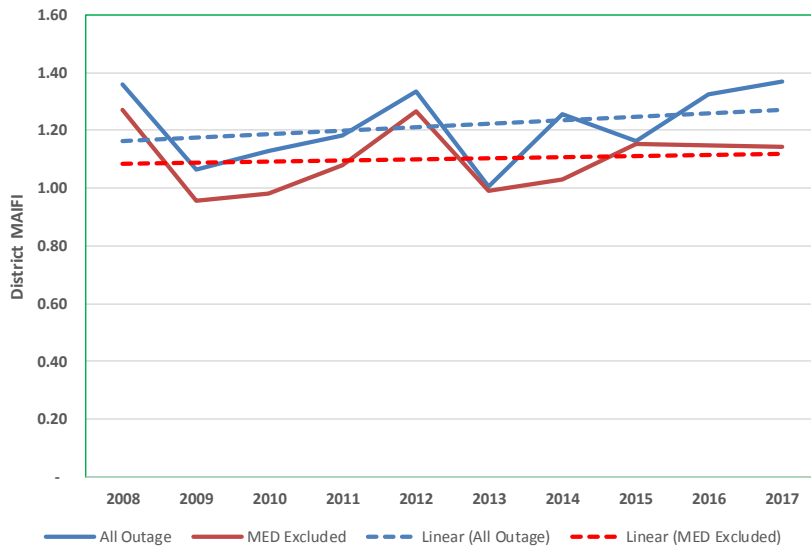
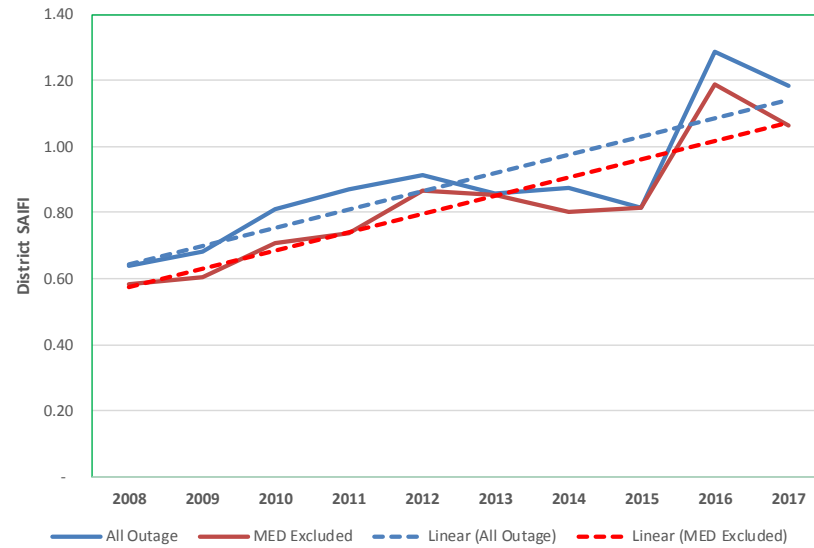
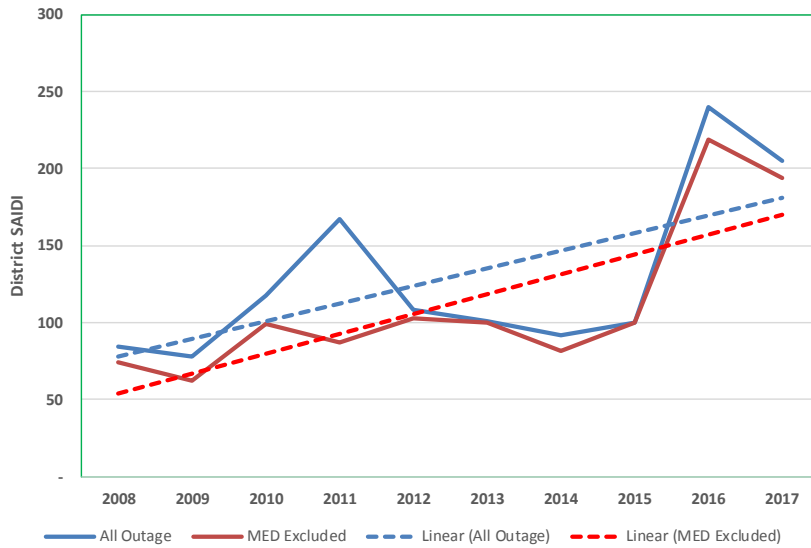
## 2008 - 2017 District Reliability Graphs (With Planned)

### COMPTON District Reliability Performance



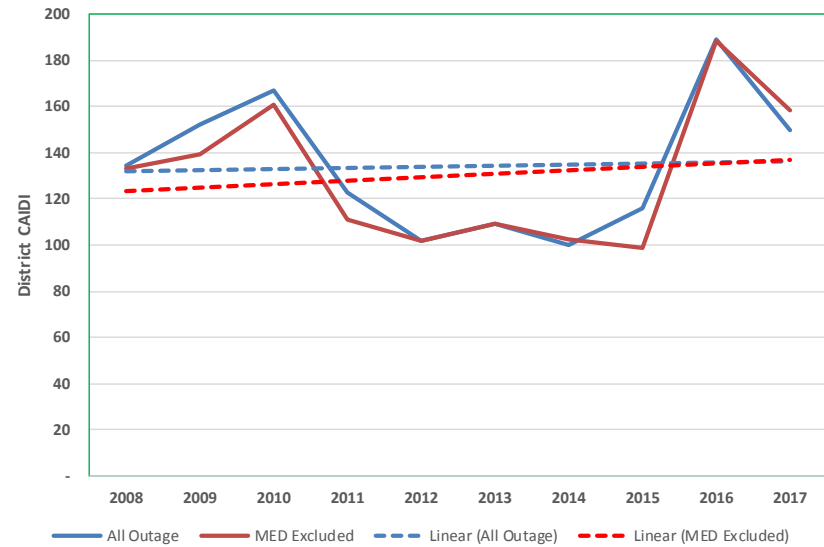
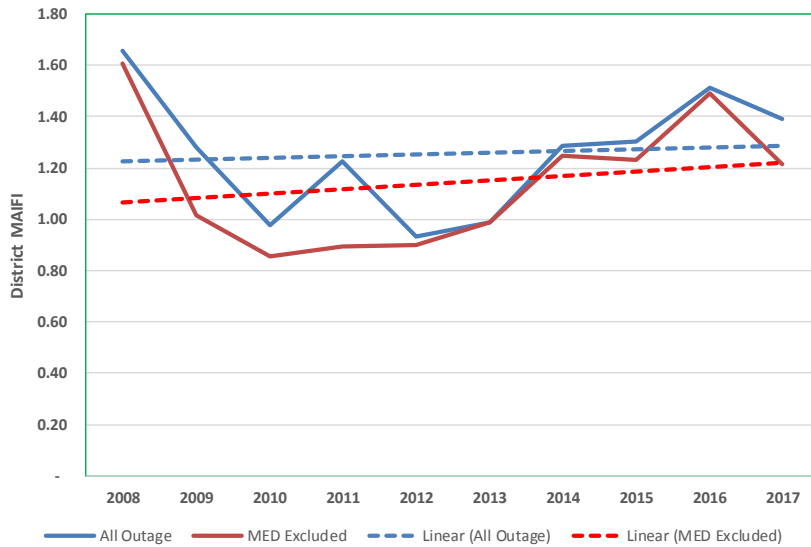
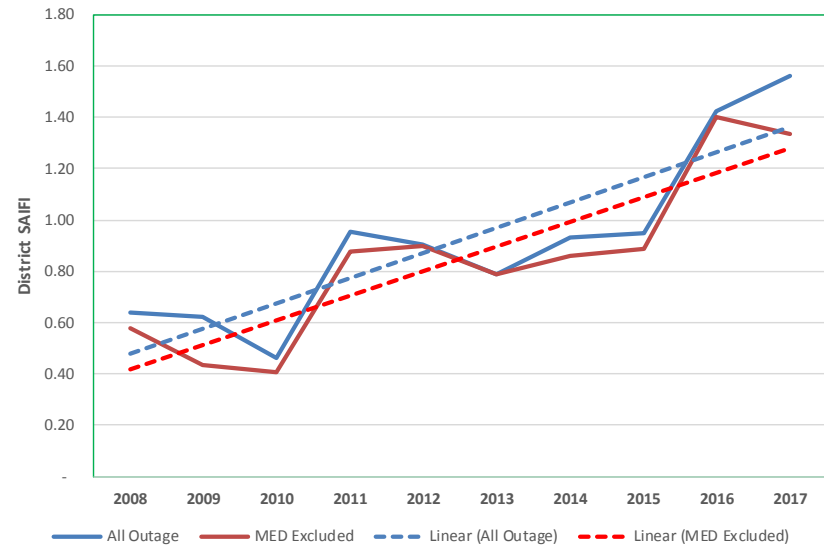
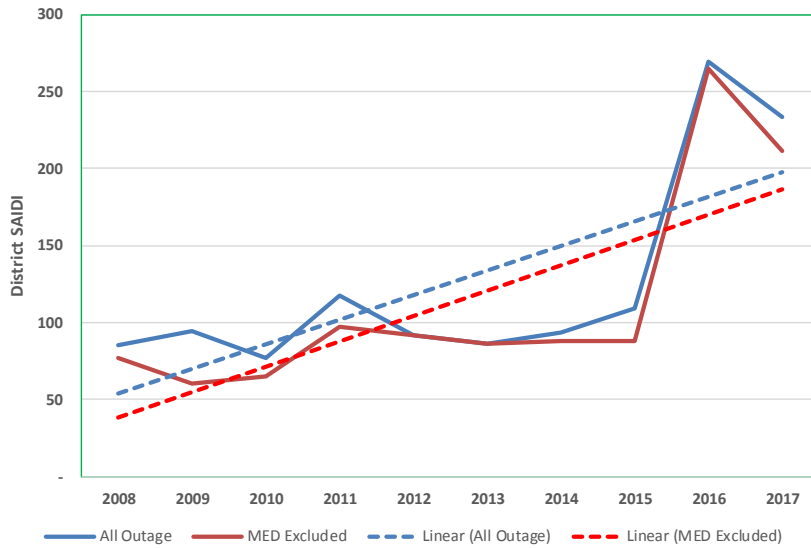
## 2008 - 2017 District Reliability Graphs (With Planned)

### COVINA District Reliability Performance



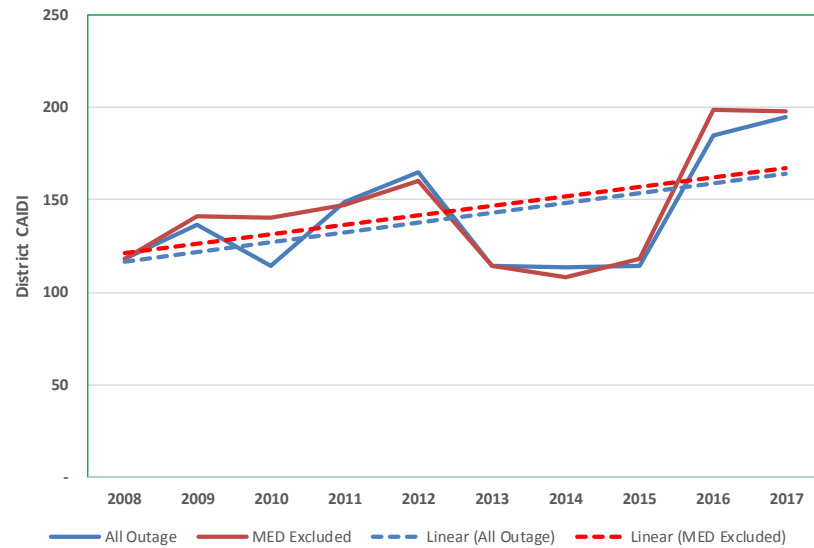
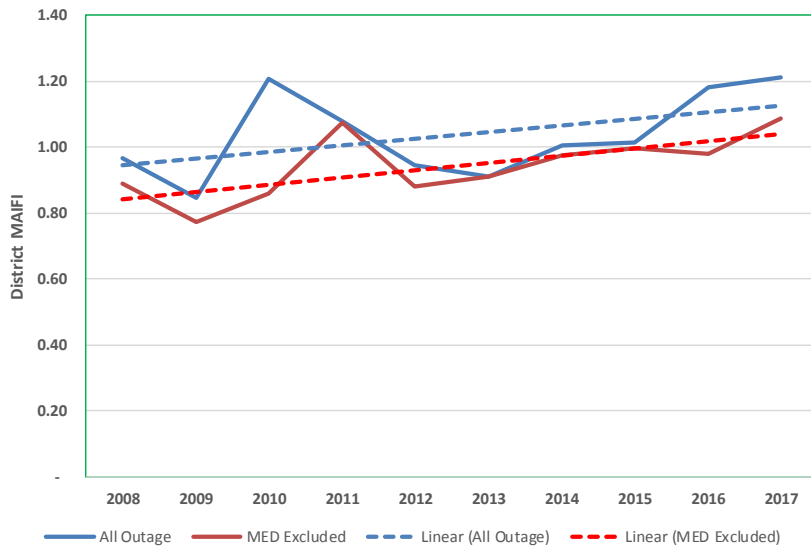
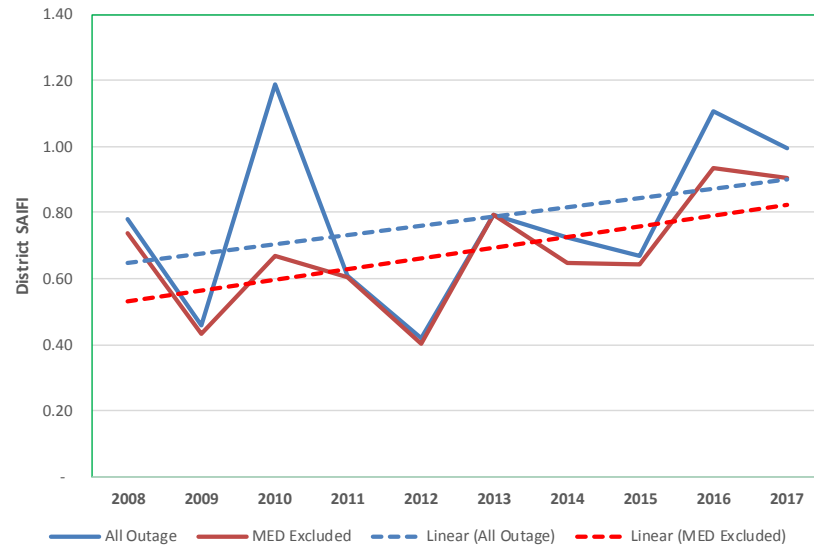
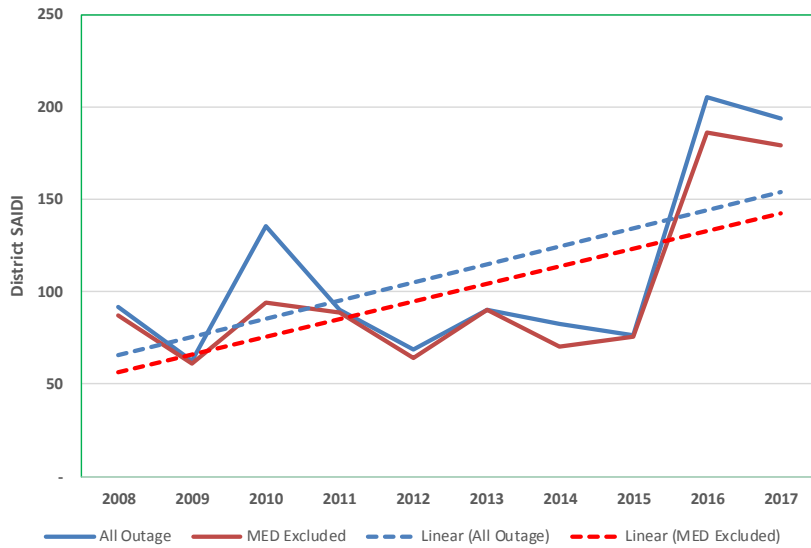
## 2008 - 2017 District Reliability Graphs (With Planned)

### FOOTHILL District Reliability Performance



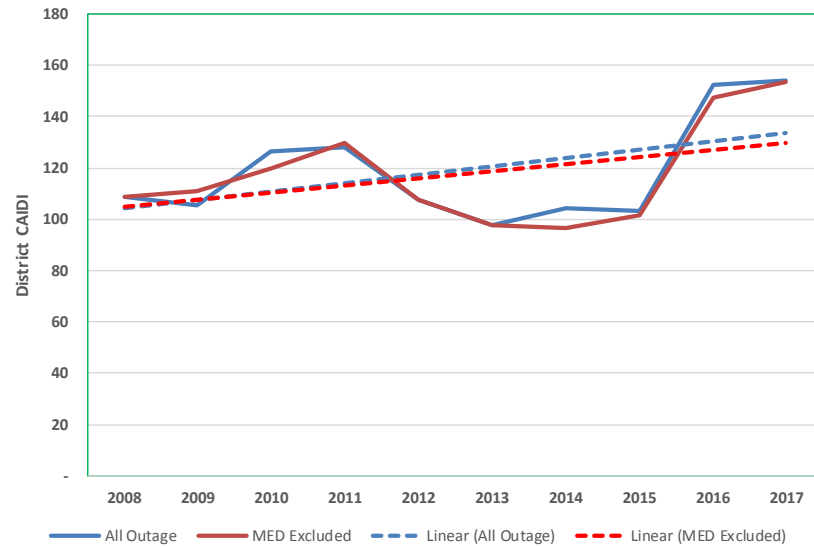
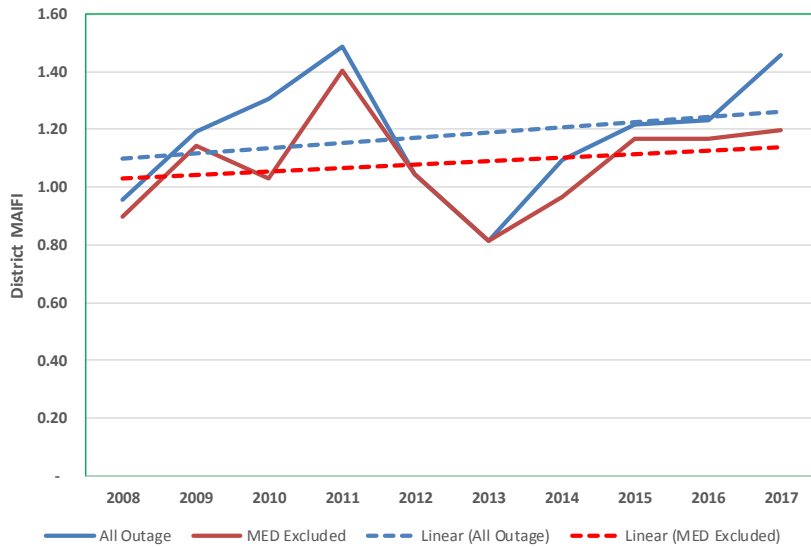
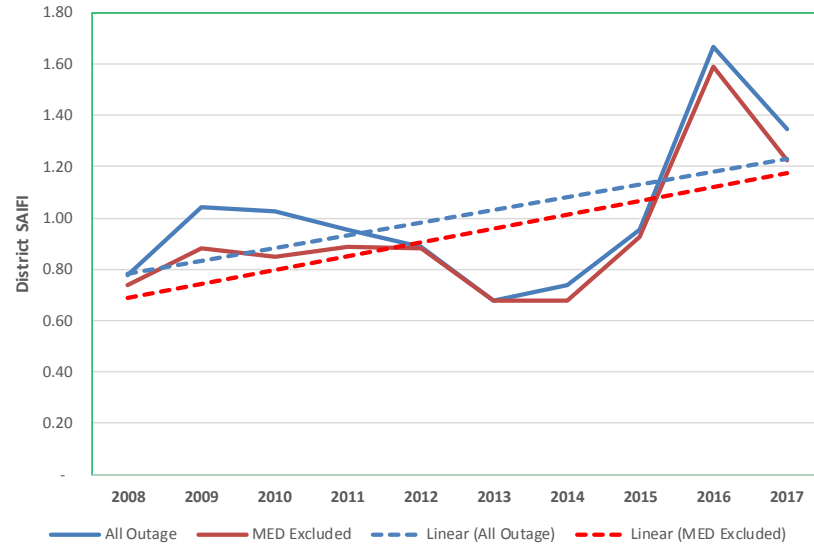
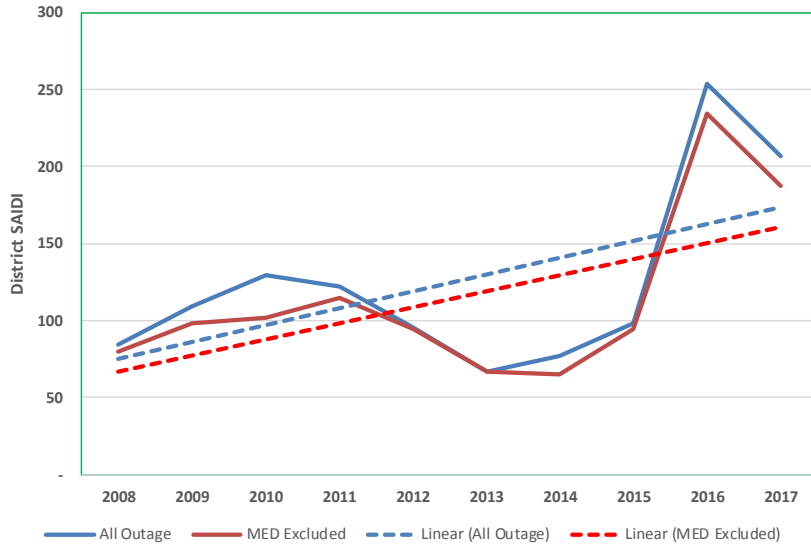
## 2008 - 2017 District Reliability Graphs (With Planned)

### FULLERTON District Reliability Performance



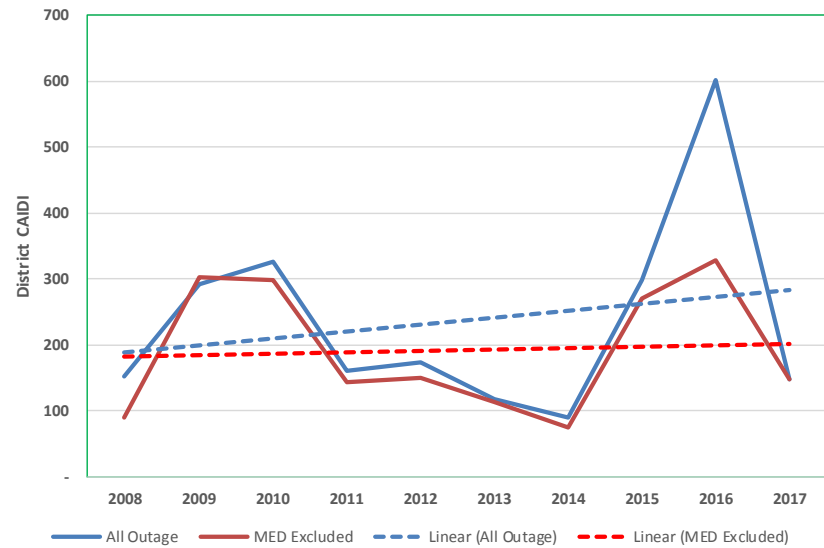
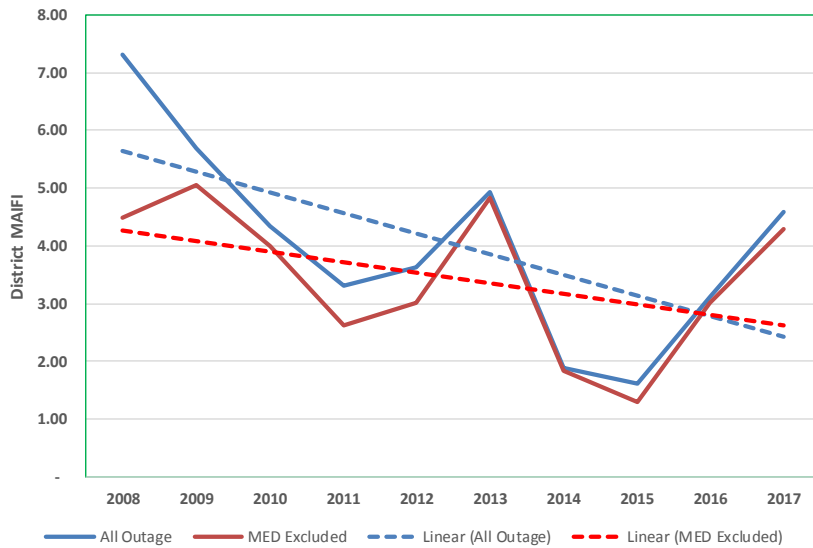
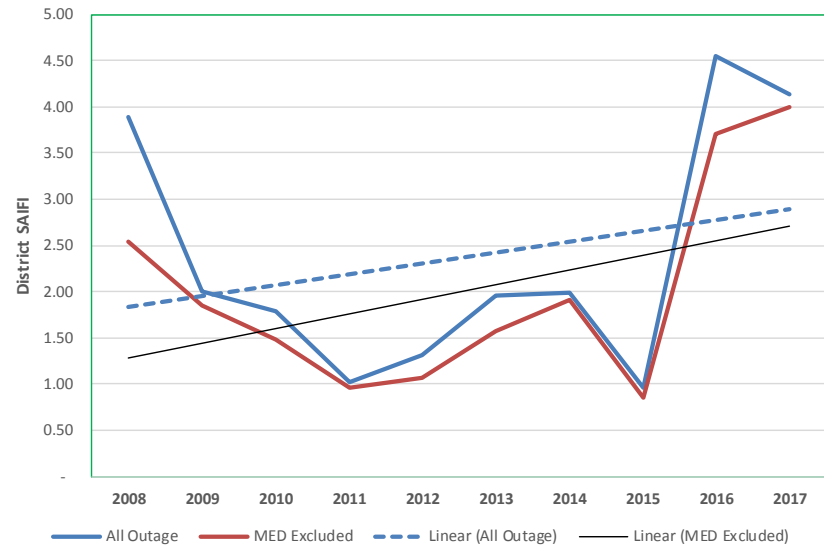
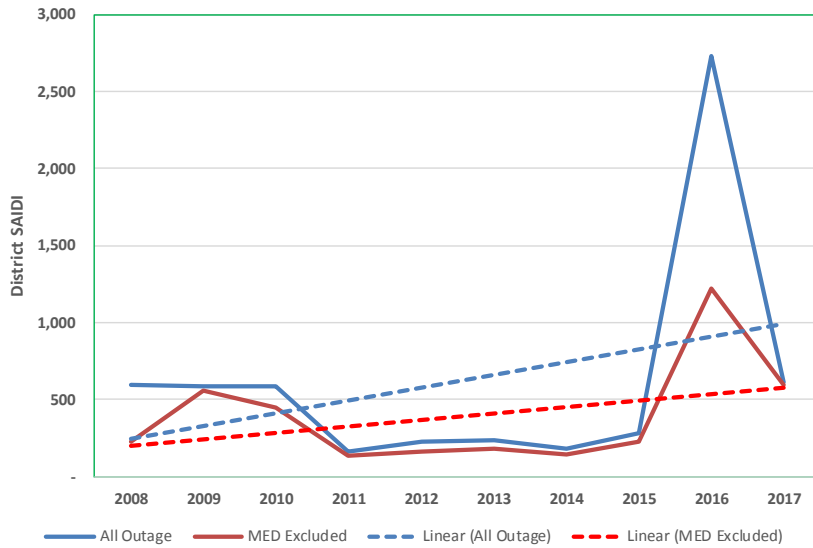
## 2008 - 2017 District Reliability Graphs (With Planned)

### HUNTINGTON BEACH District Reliability Performance



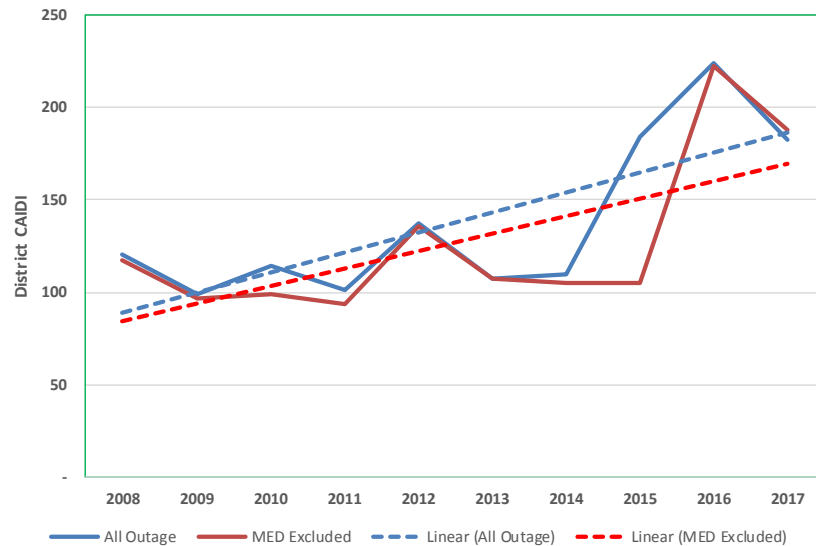
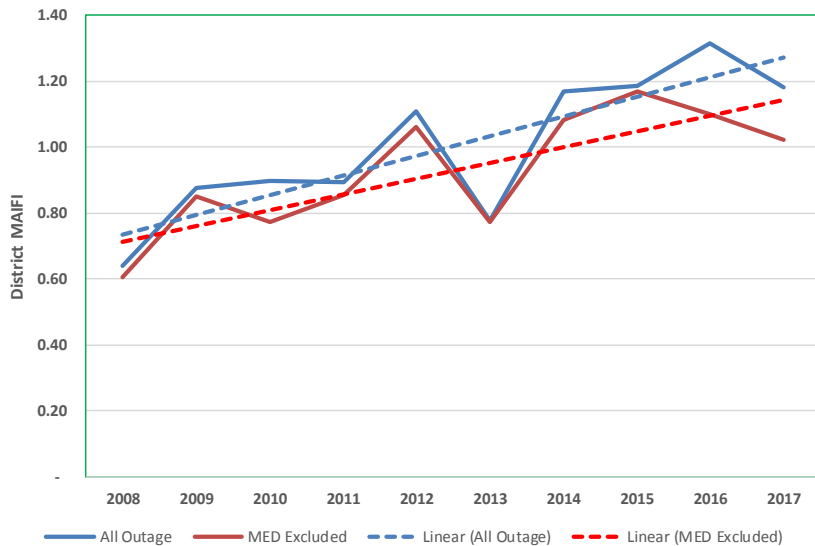
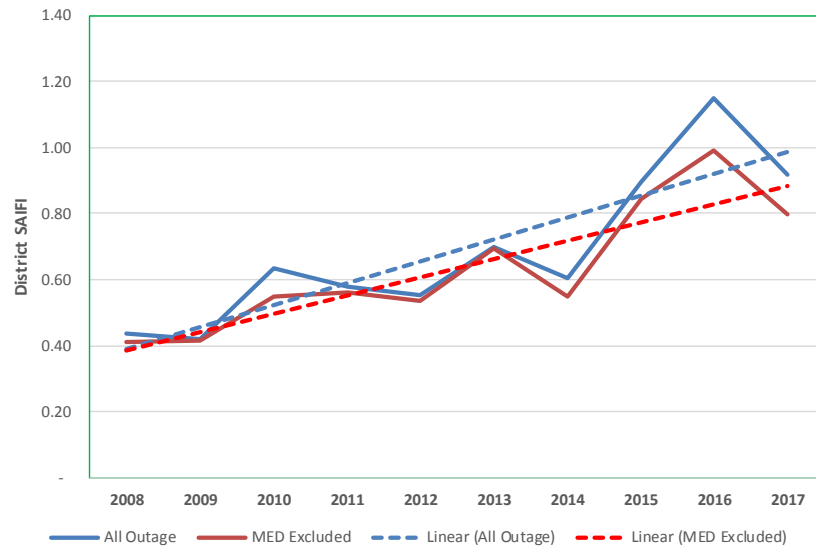
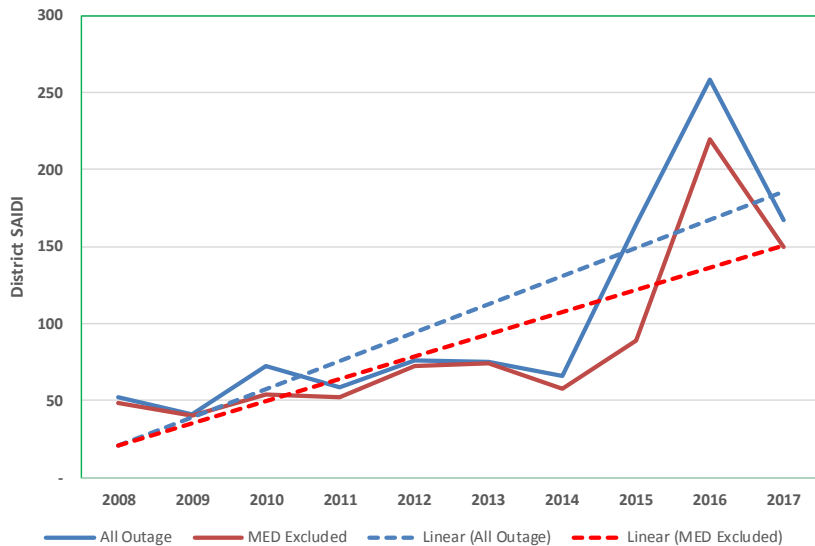
## 2008 - 2017 District Reliability Graphs (With Planned)

### KERNVILLE District Reliability Performance



## 2008 - 2017 District Reliability Graphs (With Planned)

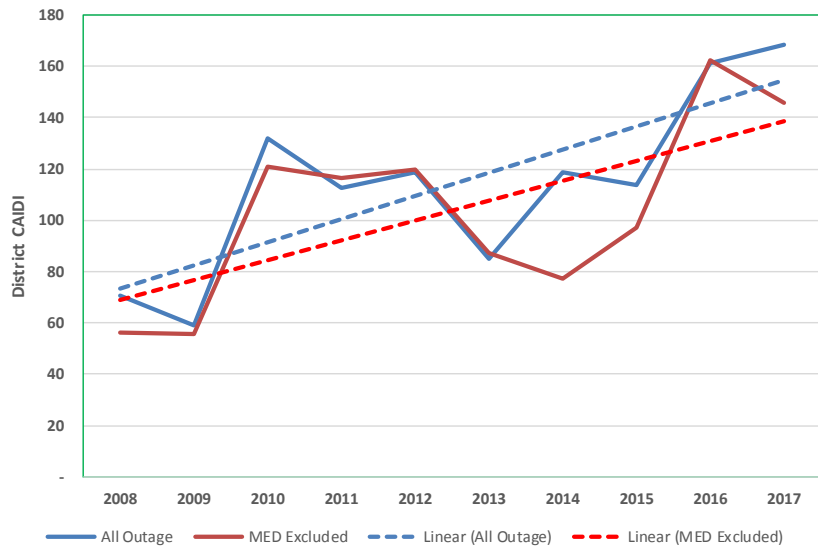
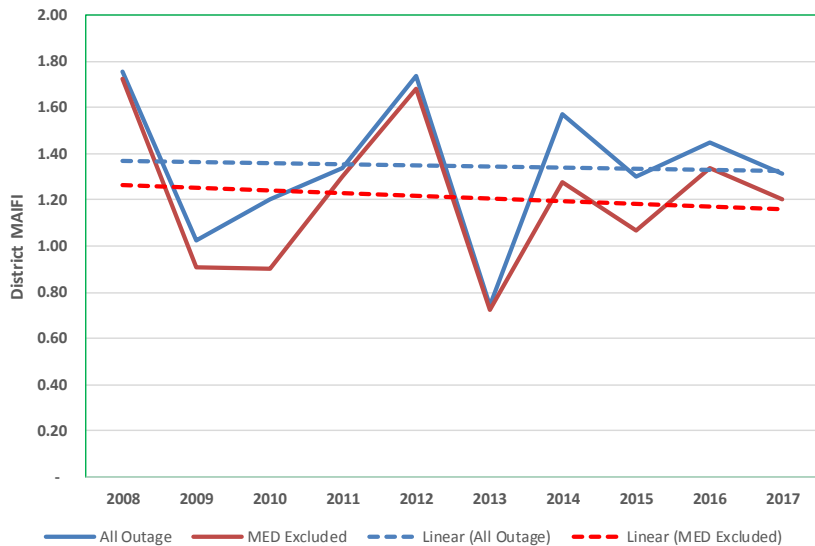
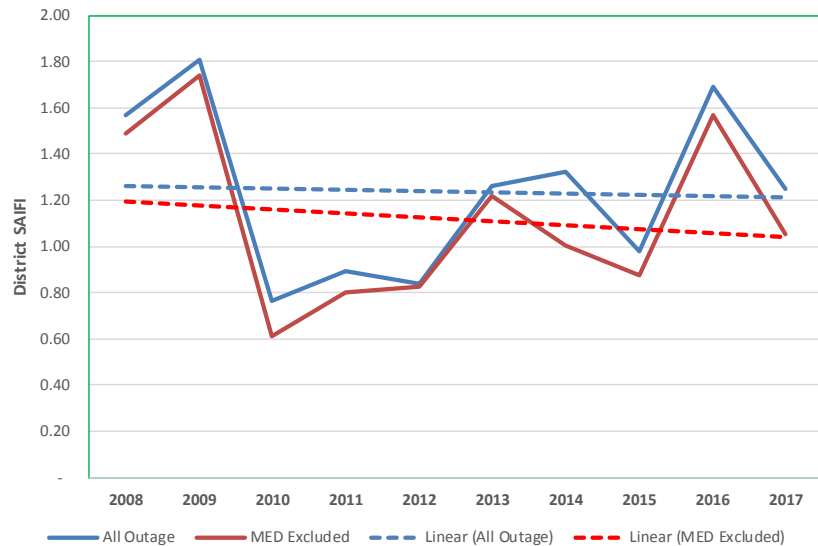
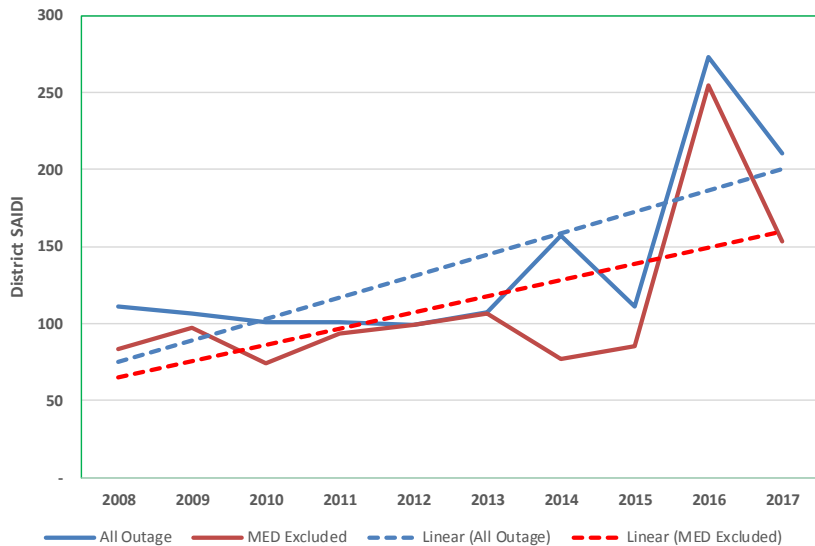
### LONG BEACH District Reliability Performance





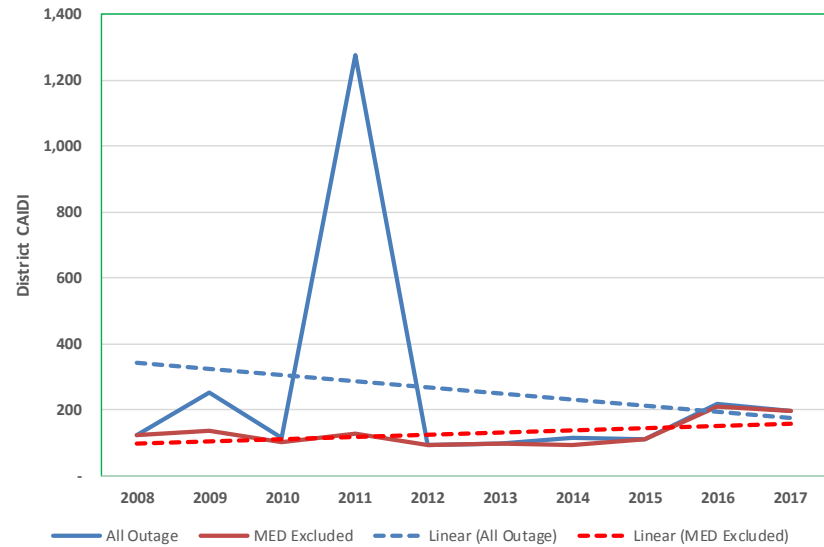
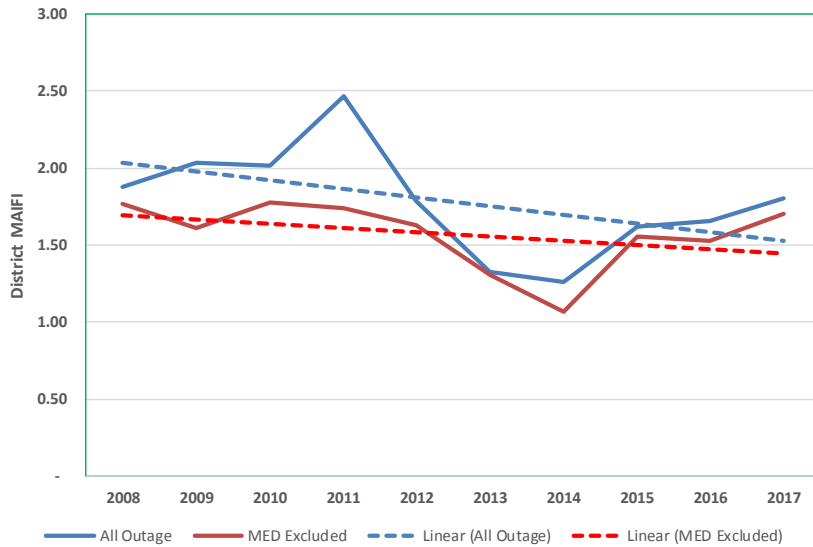
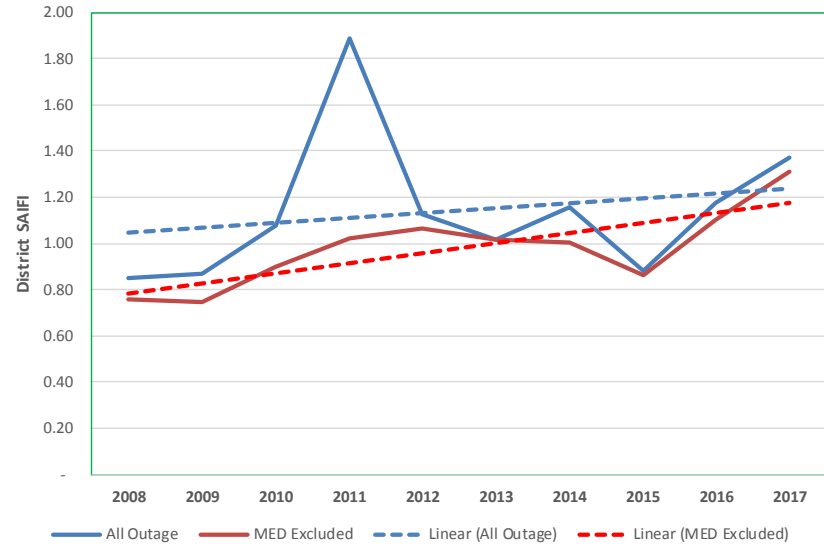
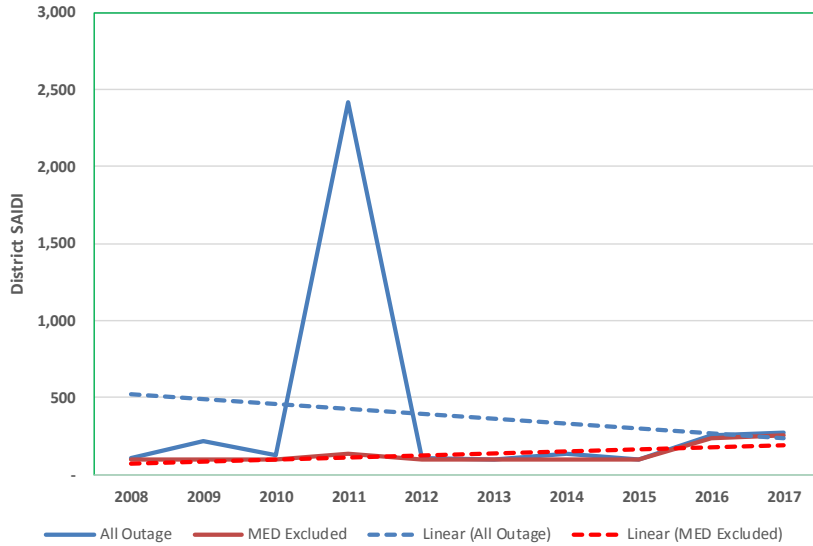
## 2008 - 2017 District Reliability Graphs (With Planned)

### MENIFEE District Reliability Performance



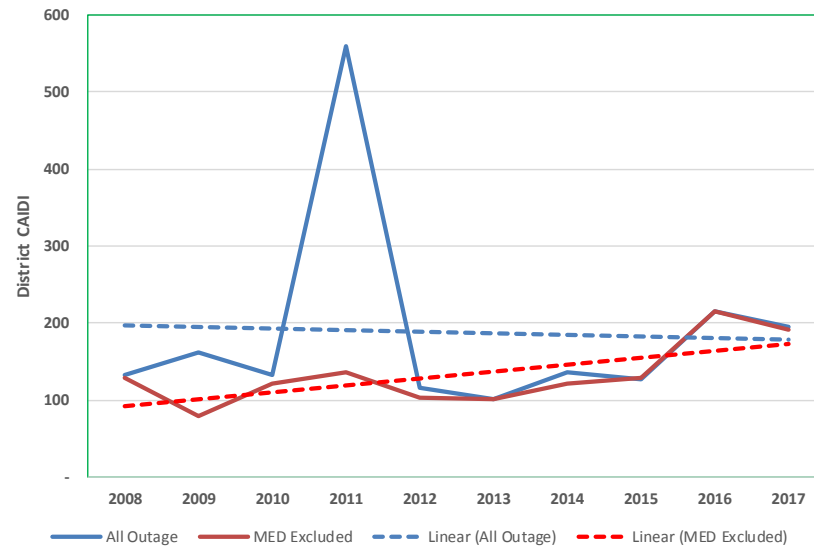
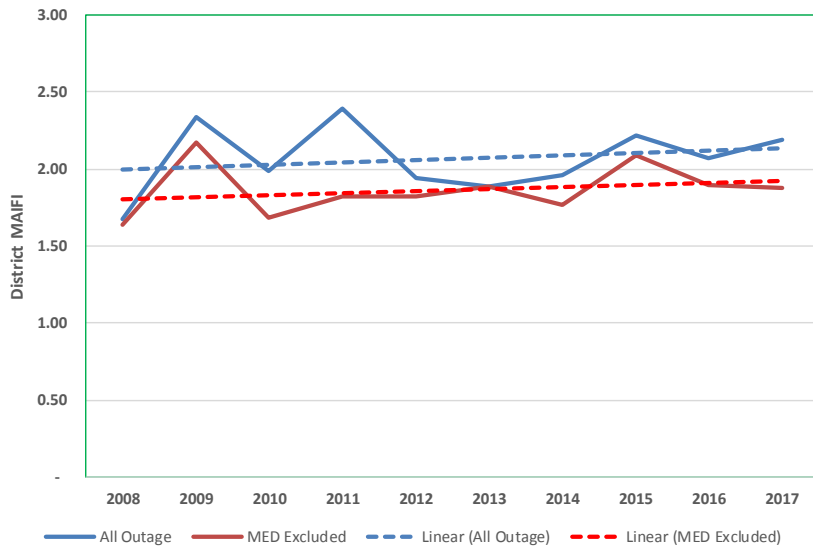
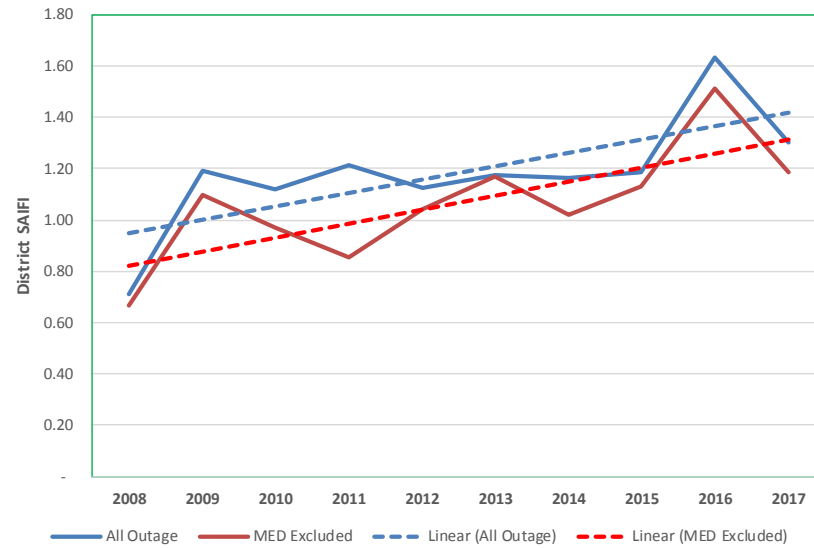
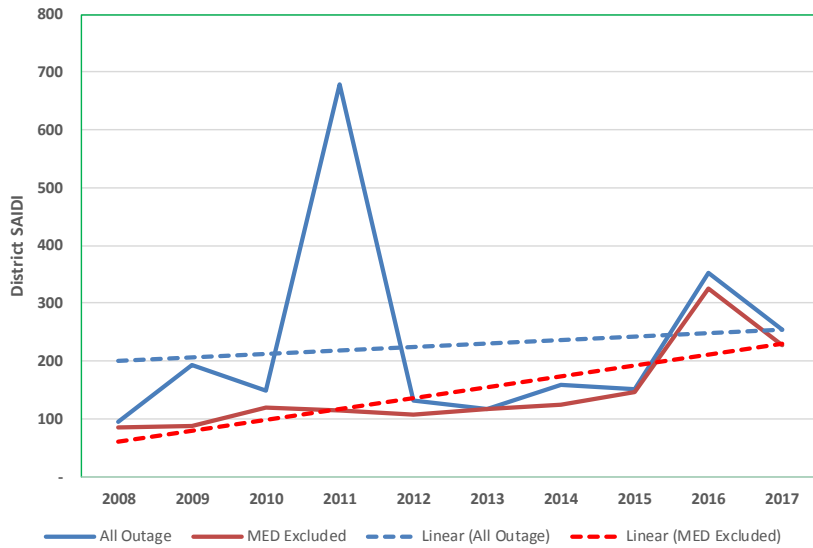
## 2008 - 2017 District Reliability Graphs (With Planned)

### MONROVIA District Reliability Performance



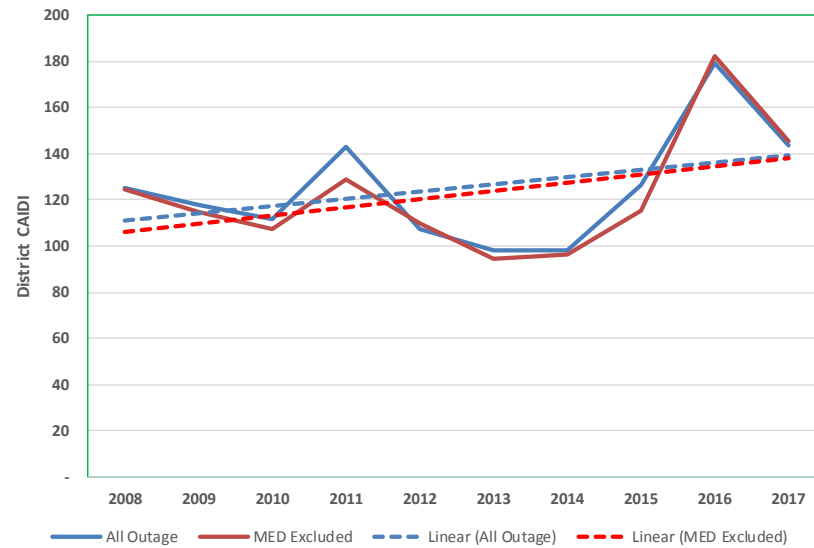
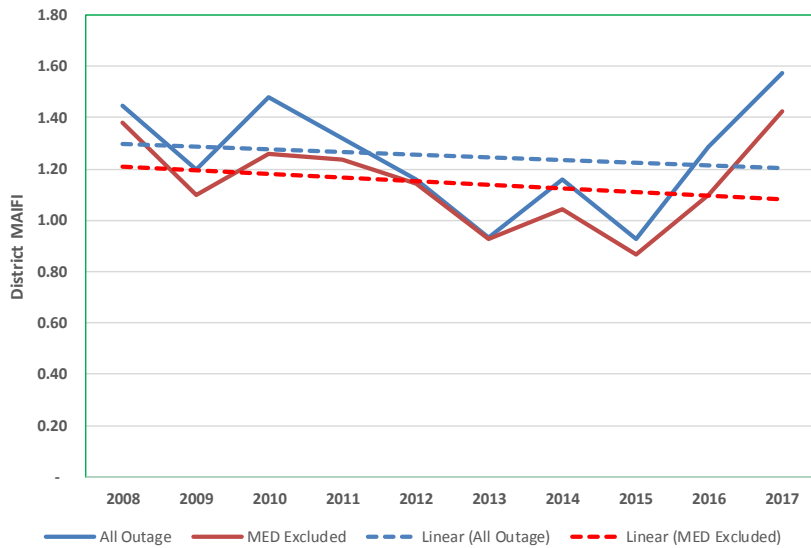
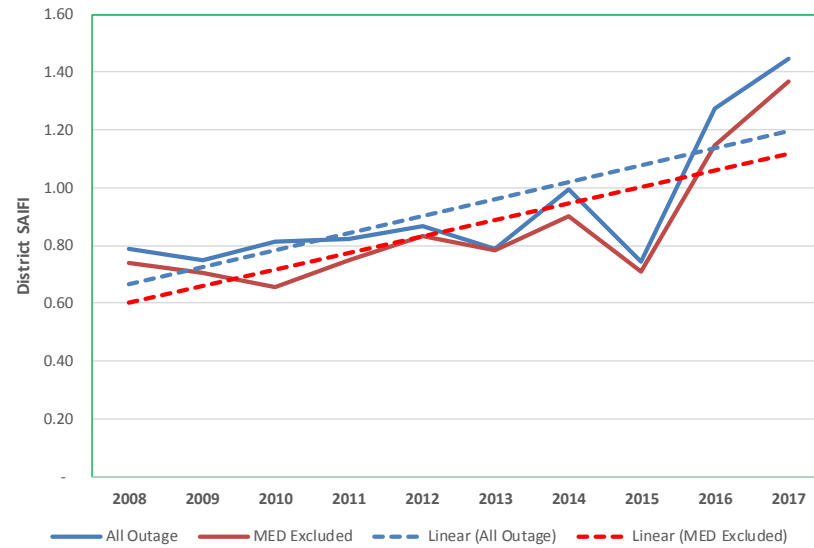
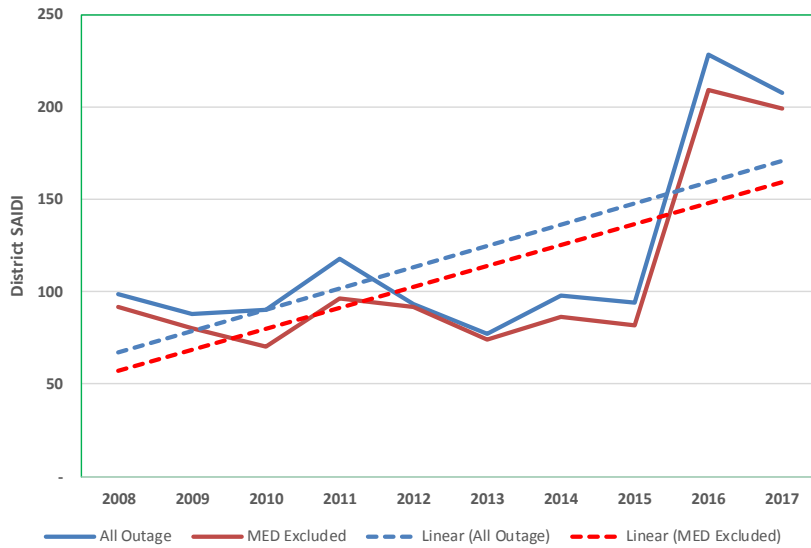
## 2008 - 2017 District Reliability Graphs (With Planned)

### MONTEBELLO District Reliability Performance



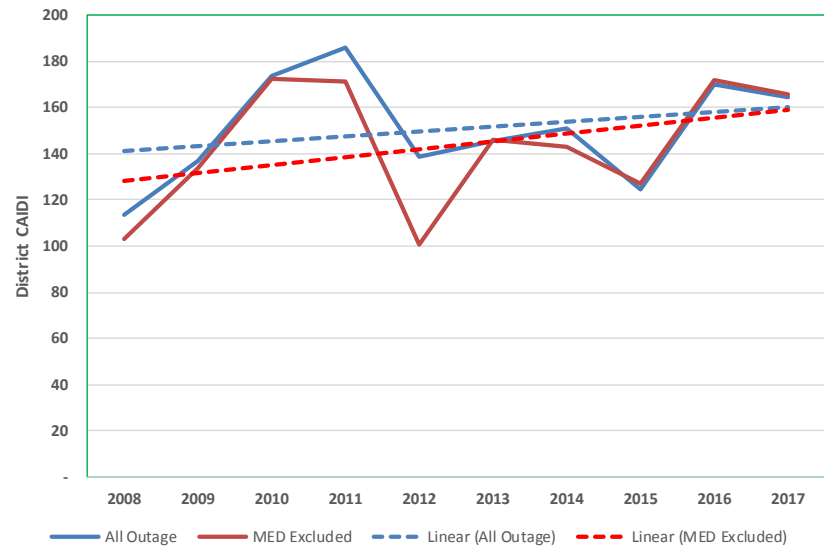
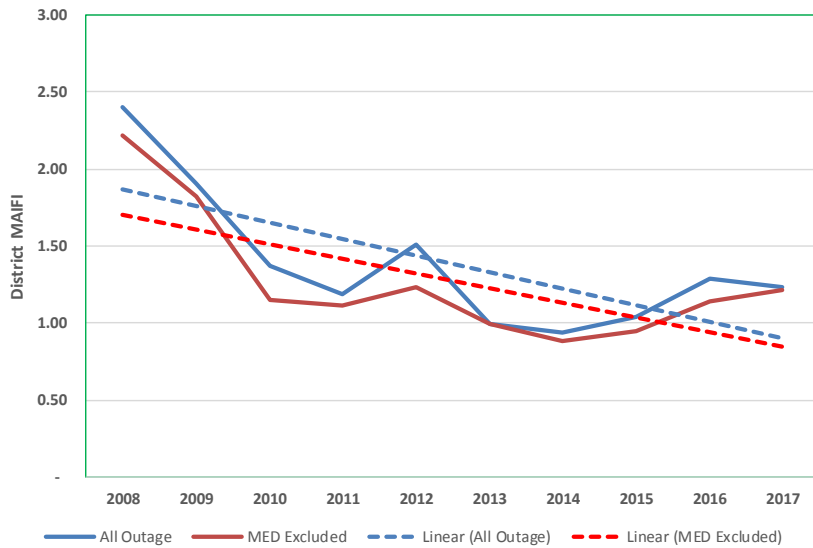
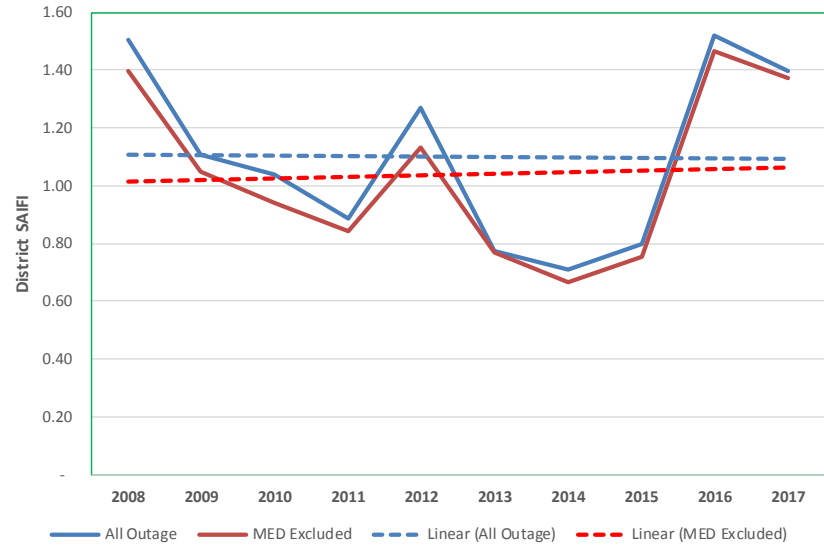
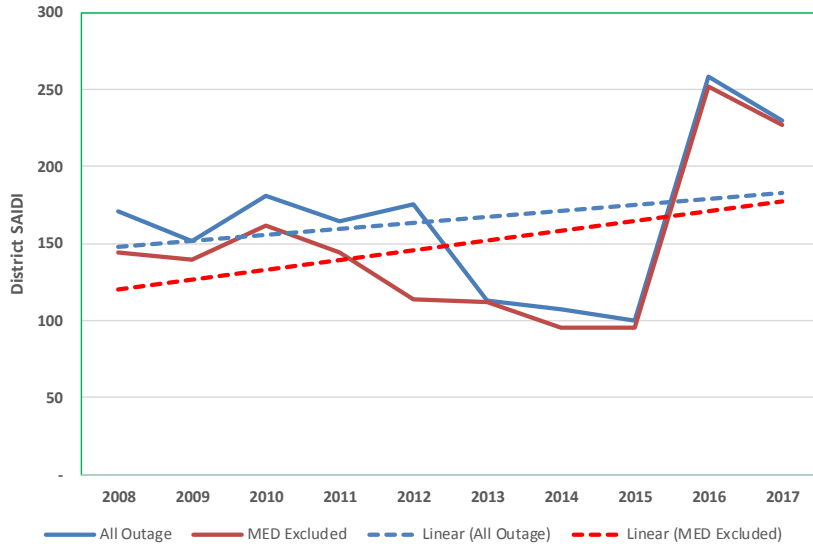
## 2008 - 2017 District Reliability Graphs (With Planned)

### ONTARIO District Reliability Performance



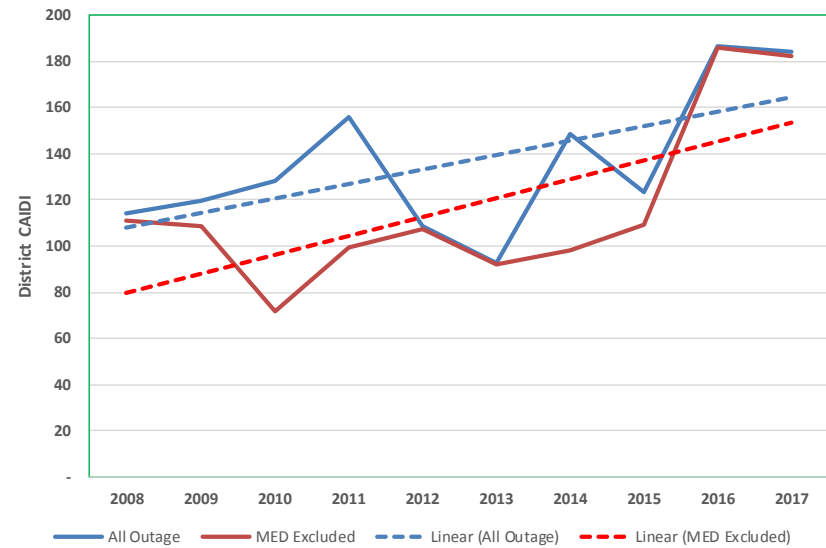
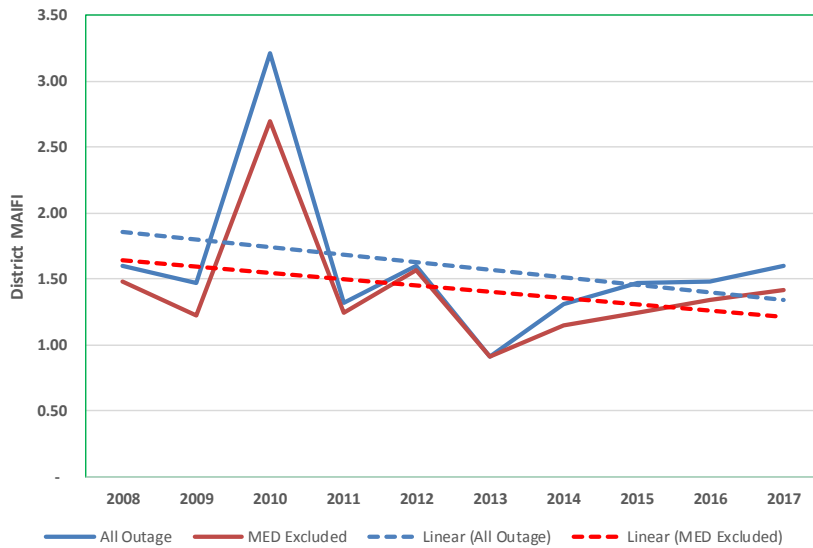
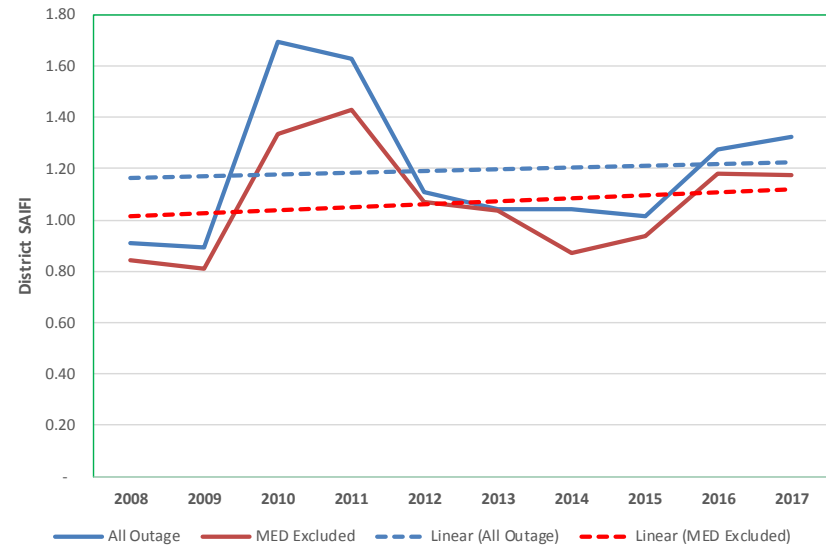
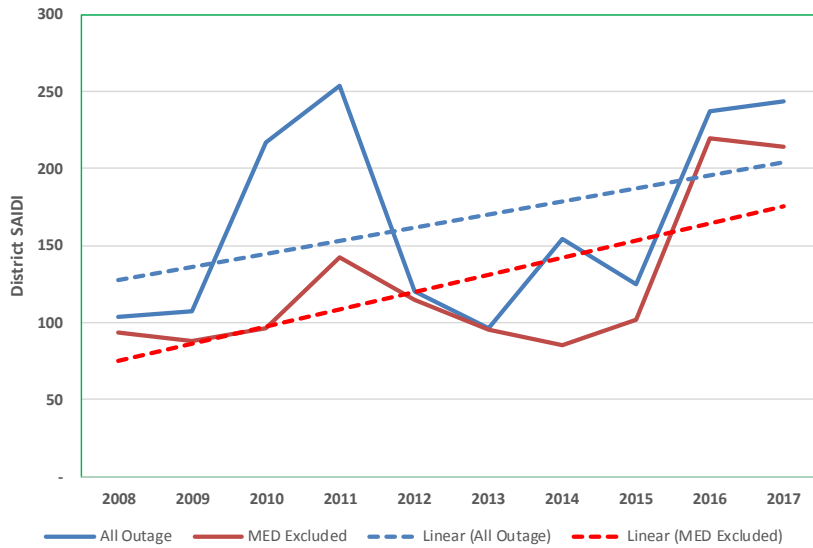
## 2008 - 2017 District Reliability Graphs (With Planned)

### PALM SPRINGS District Reliability Performance



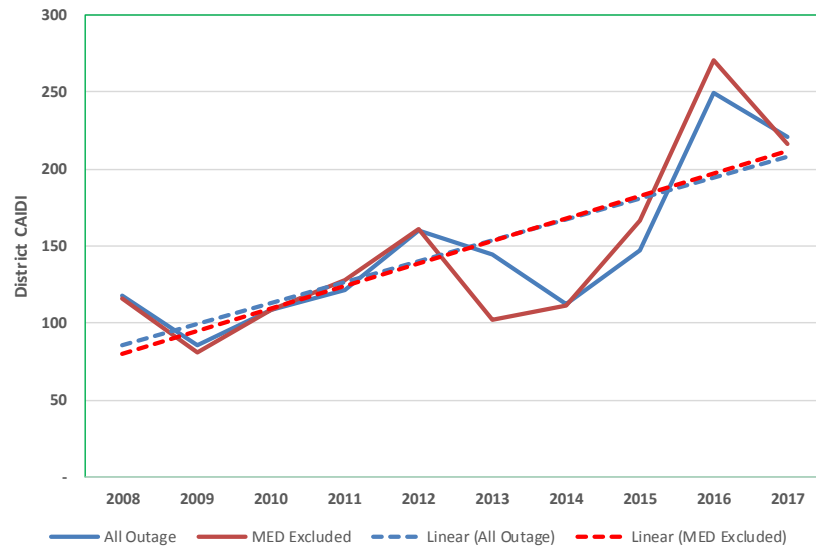
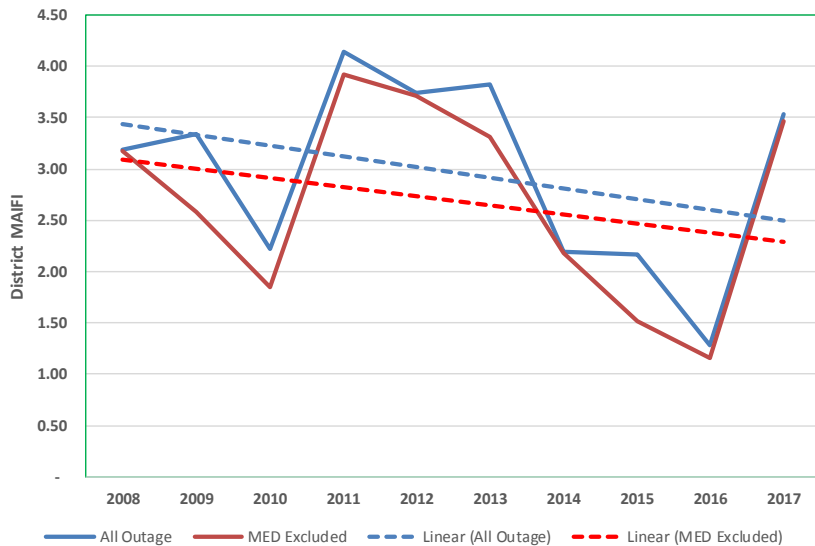
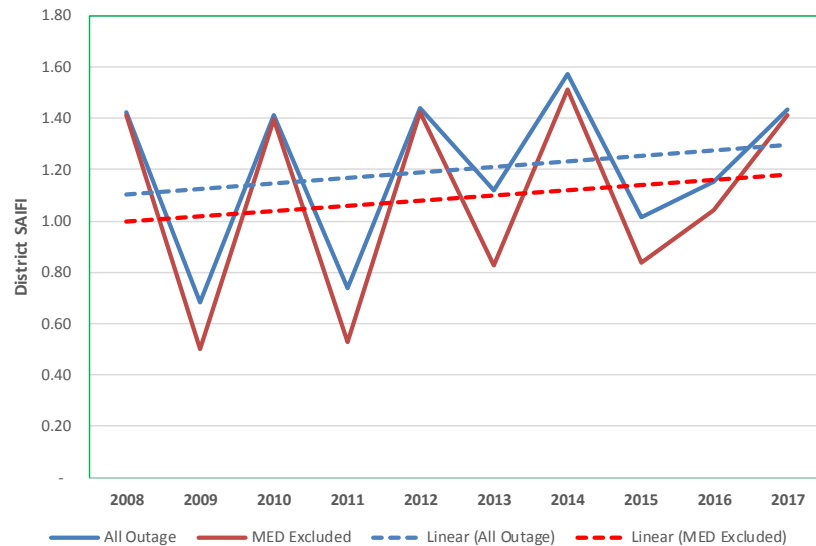
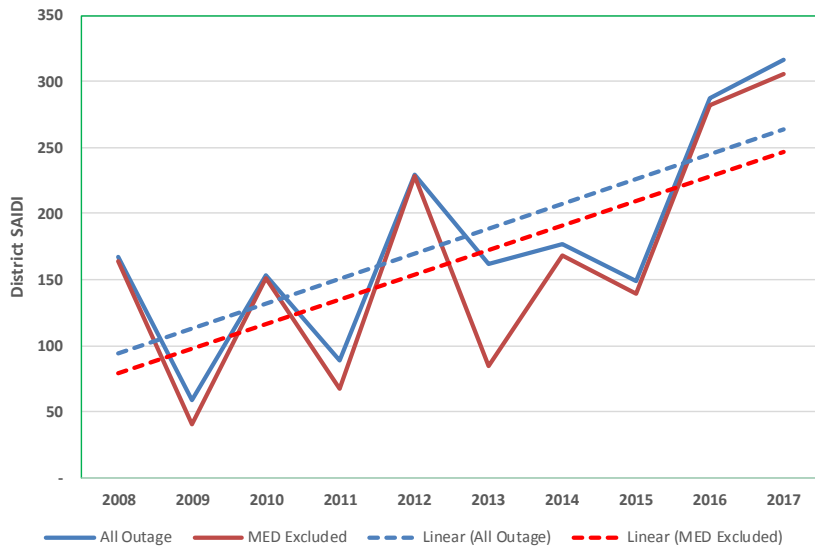
## 2008 - 2017 District Reliability Graphs (With Planned)

### REDLANDS District Reliability Performance



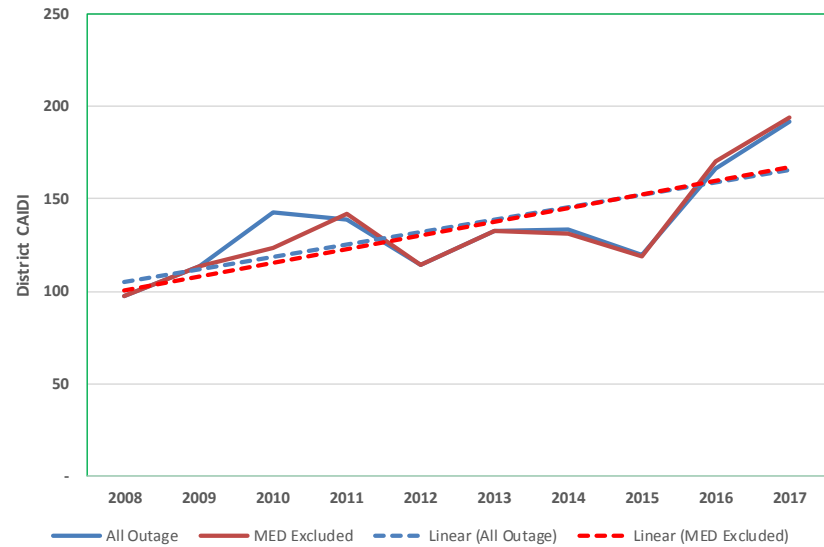
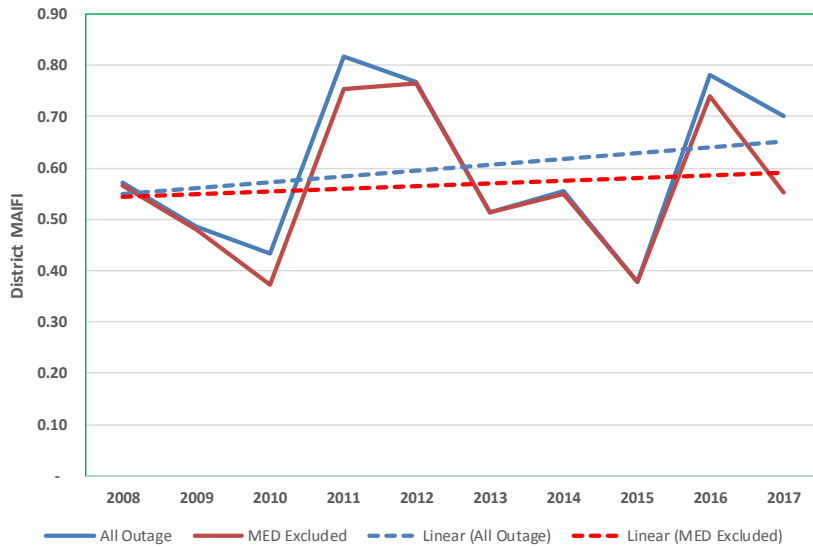
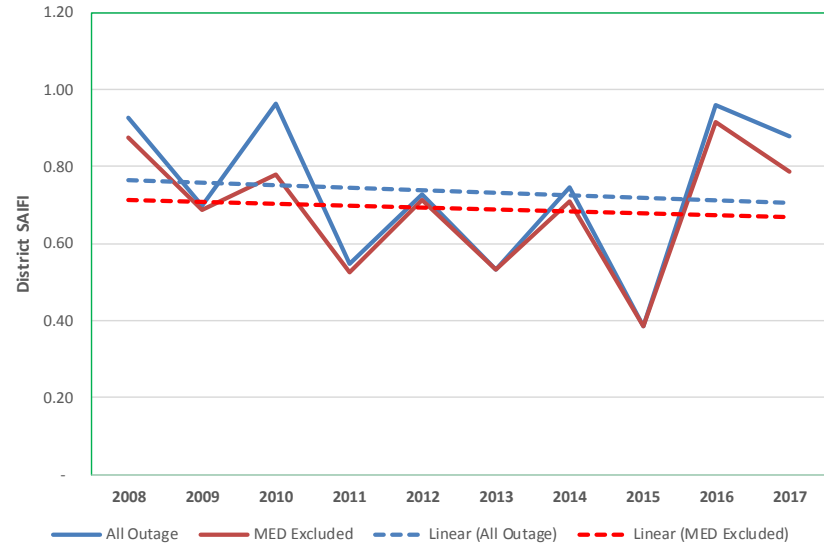
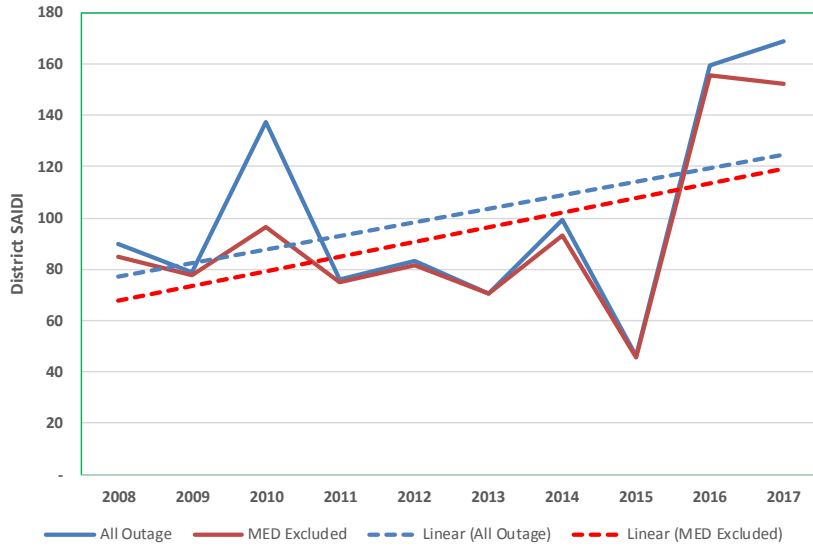
## 2008 - 2017 District Reliability Graphs (With Planned)

### RIDGECREST District Reliability Performance



## 2008 - 2017 District Reliability Graphs (With Planned)

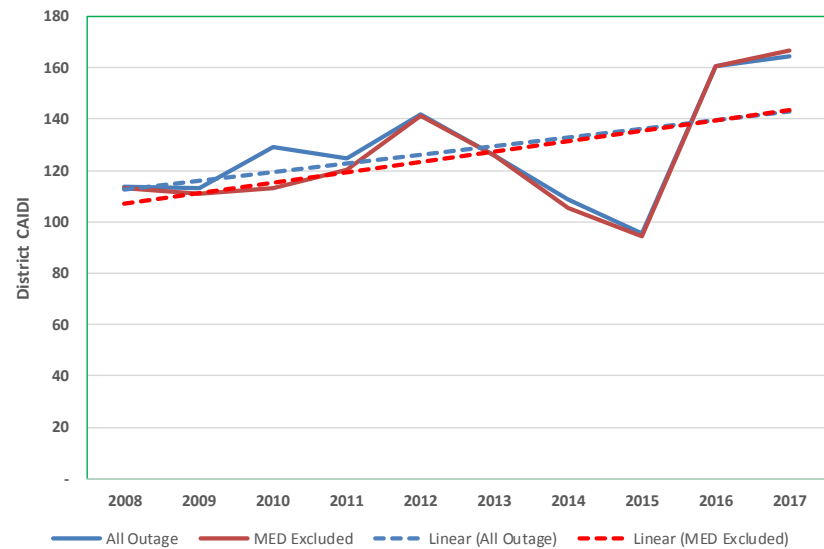
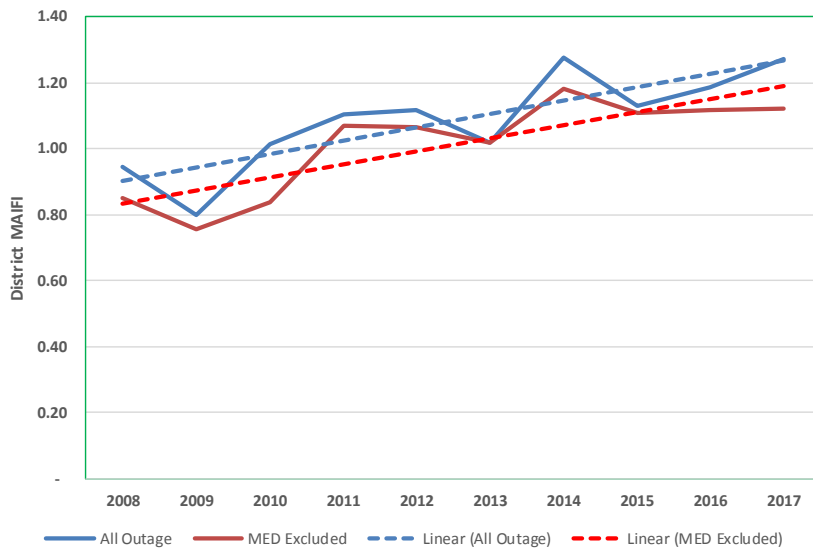
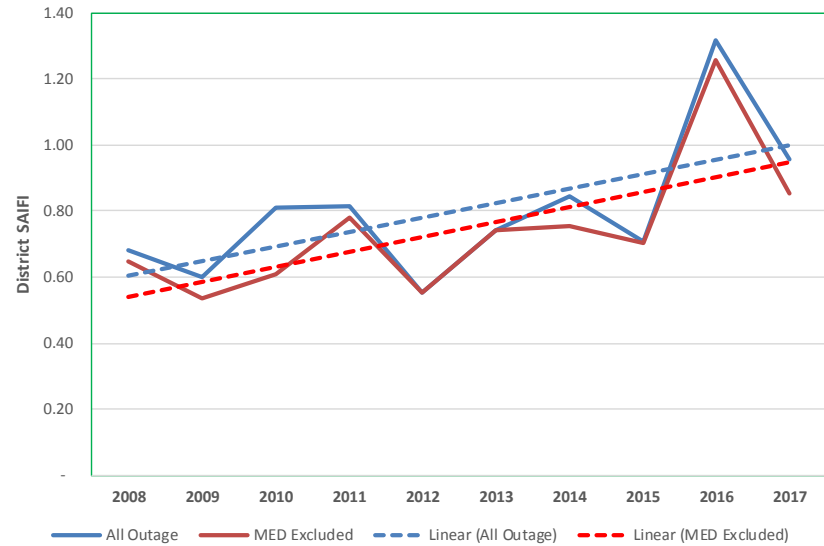
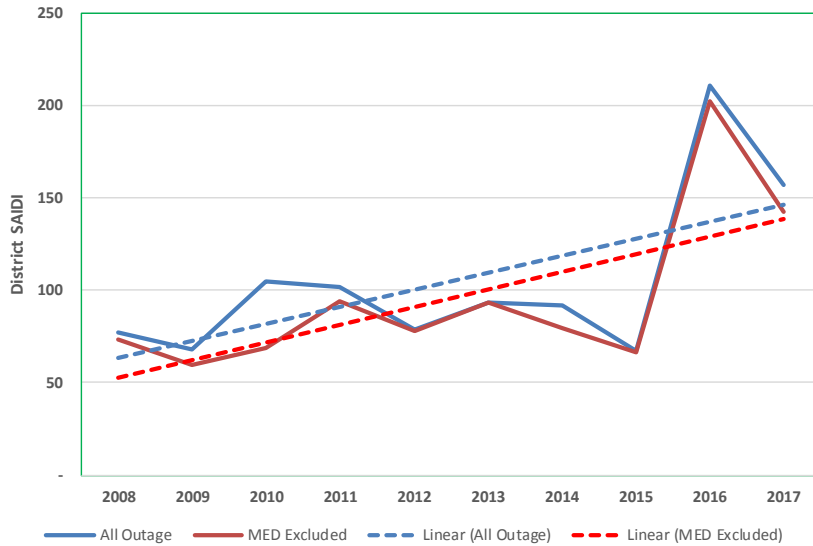
### SADDLEBACK District Reliability Performance





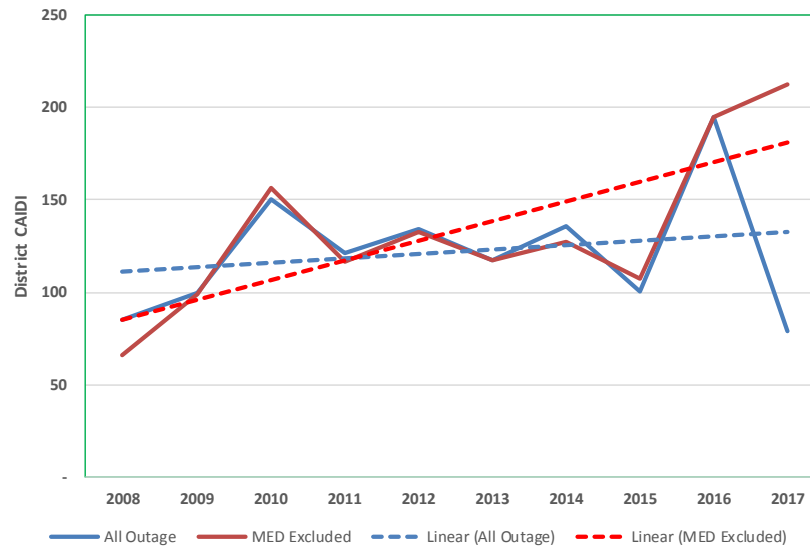
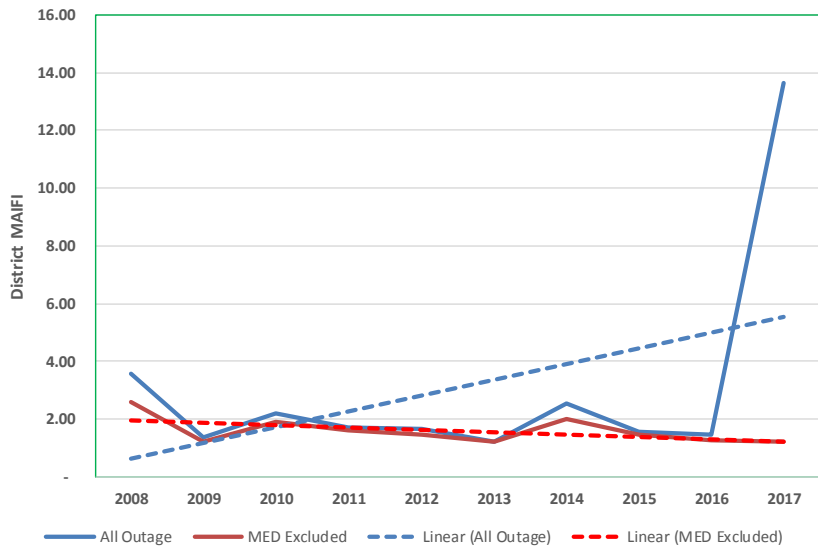
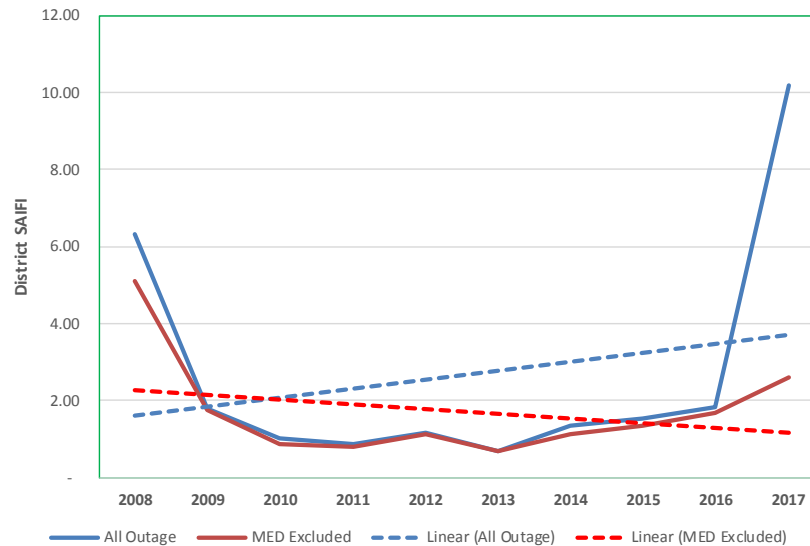
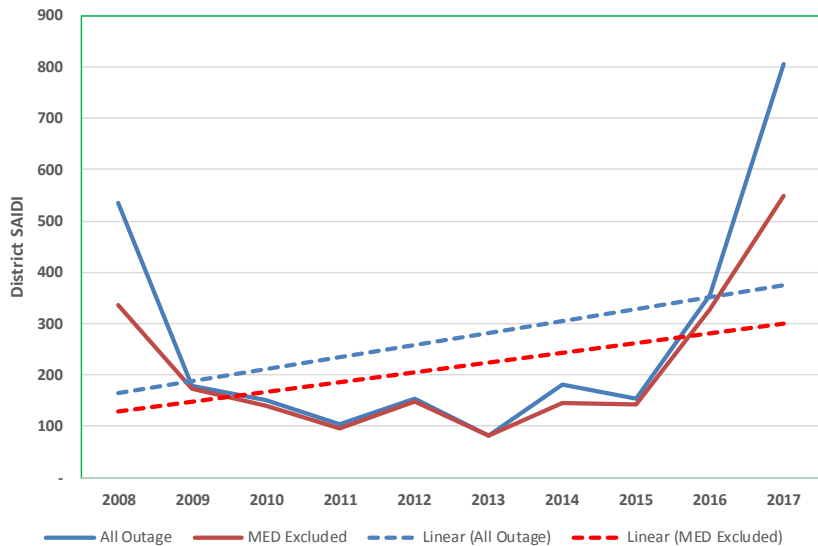
## 2008 - 2017 District Reliability Graphs (With Planned)

### SANTA ANA District Reliability Performance



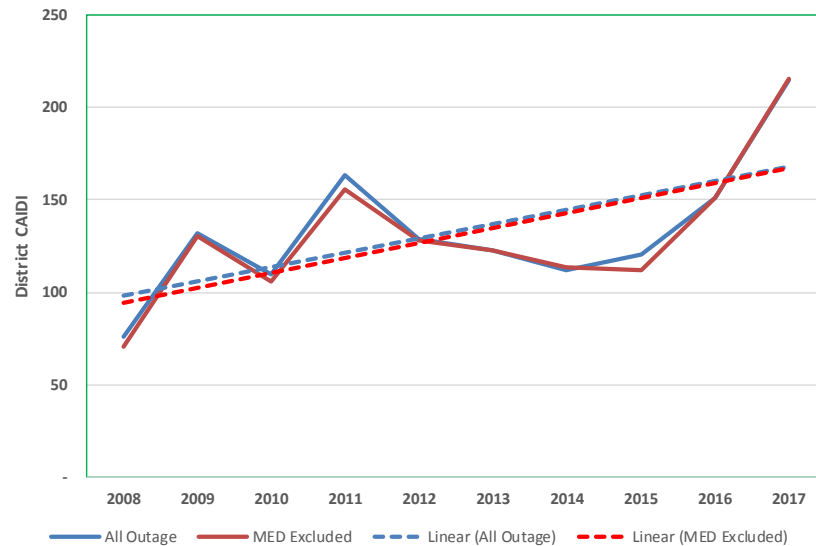
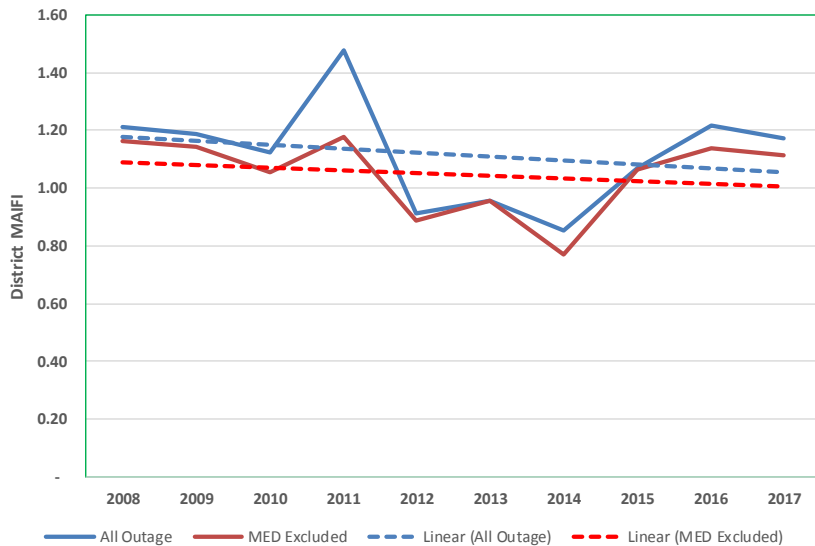
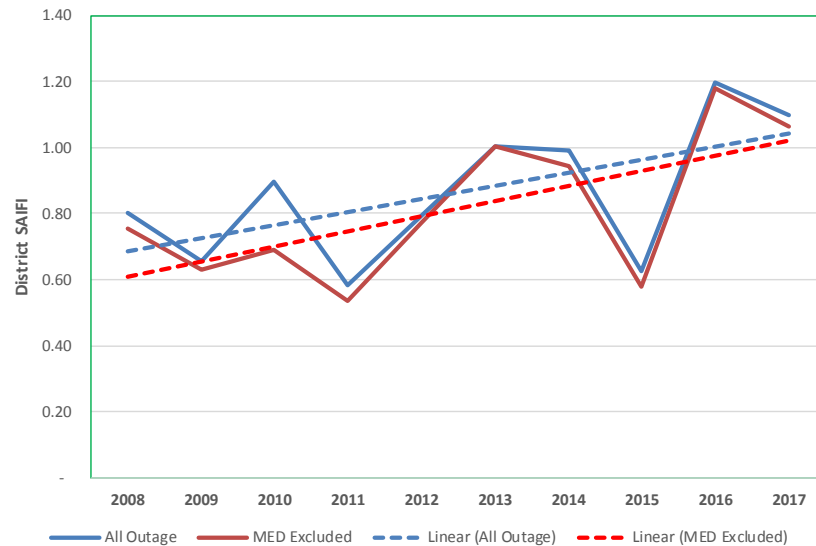
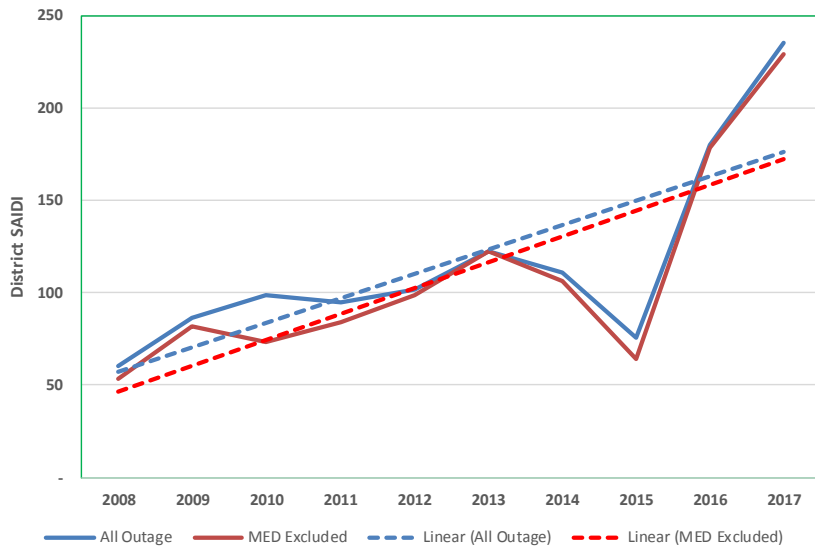
## 2008 - 2017 District Reliability Graphs (With Planned)

### SANTA BARBARA District Reliability Performance



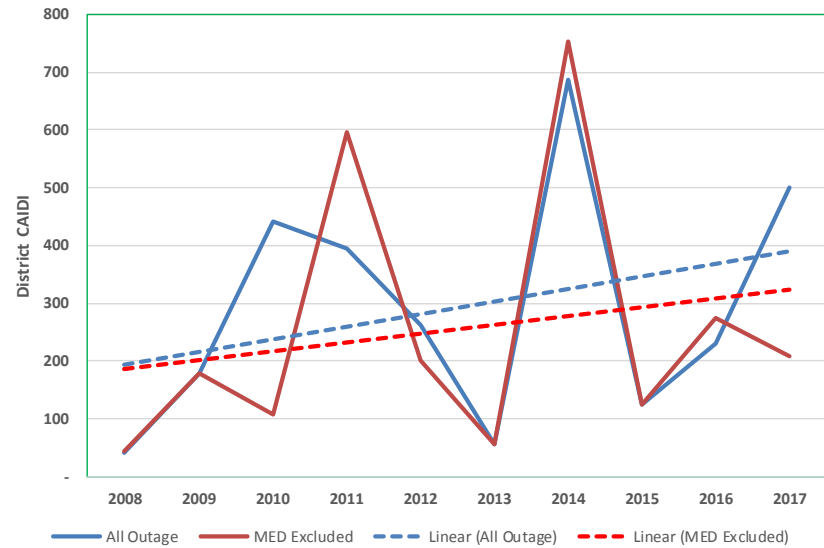
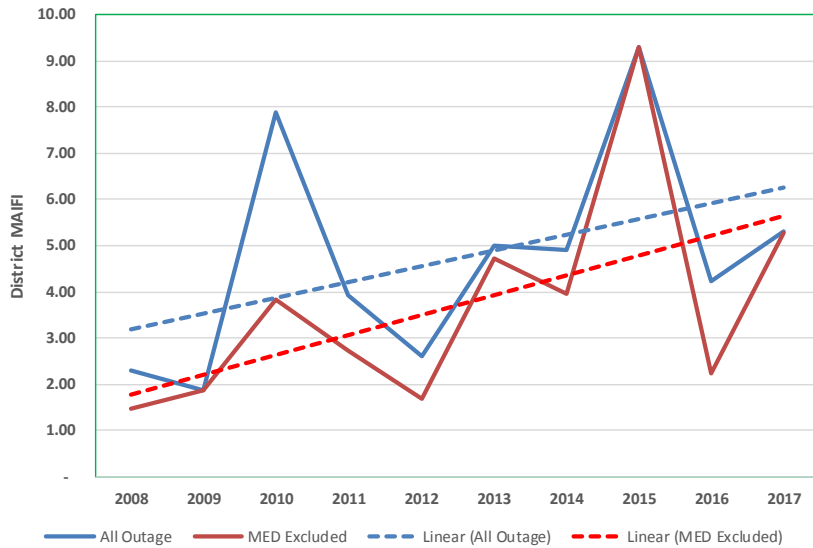
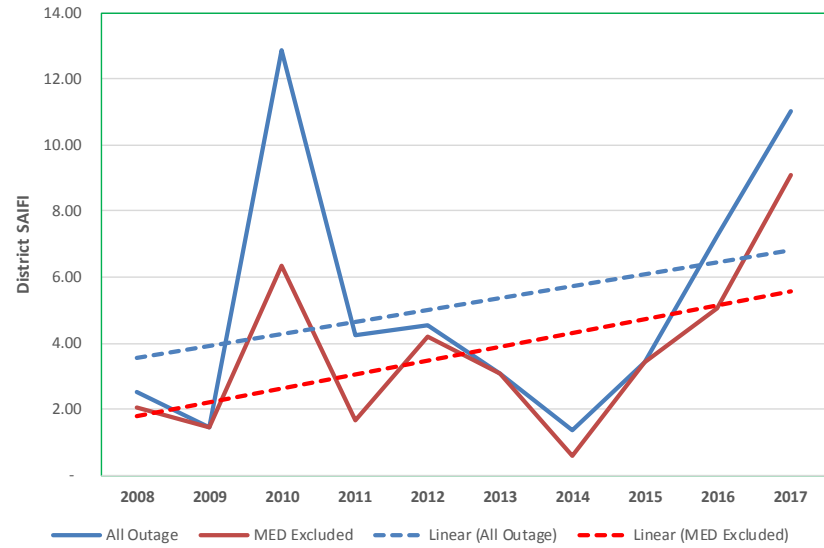
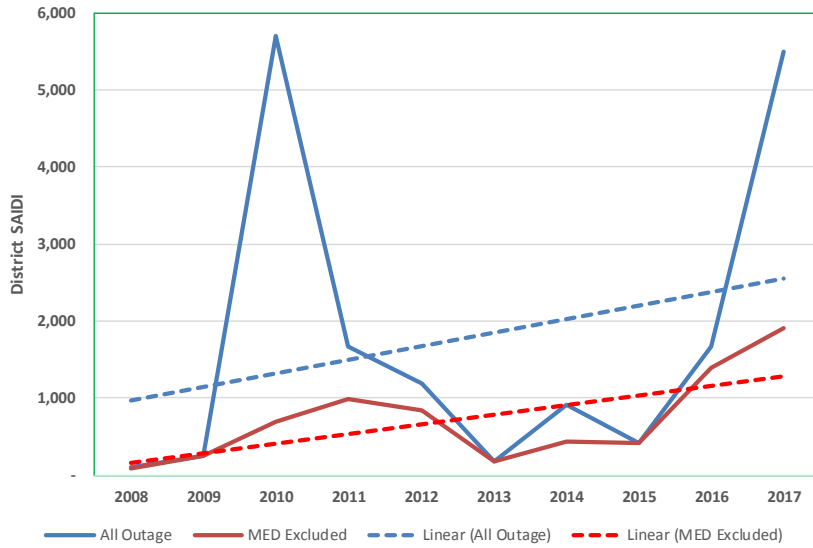
## 2008 - 2017 District Reliability Graphs (With Planned)

### SANTA MONICA District Reliability Performance



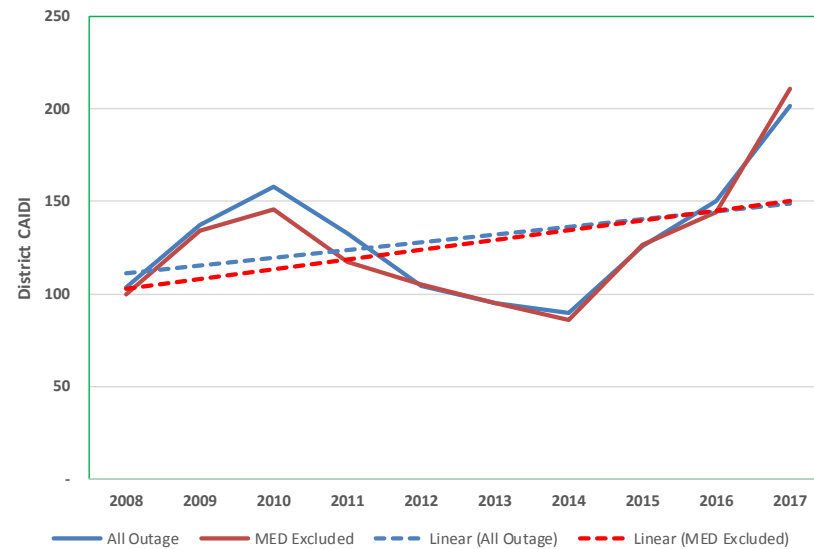
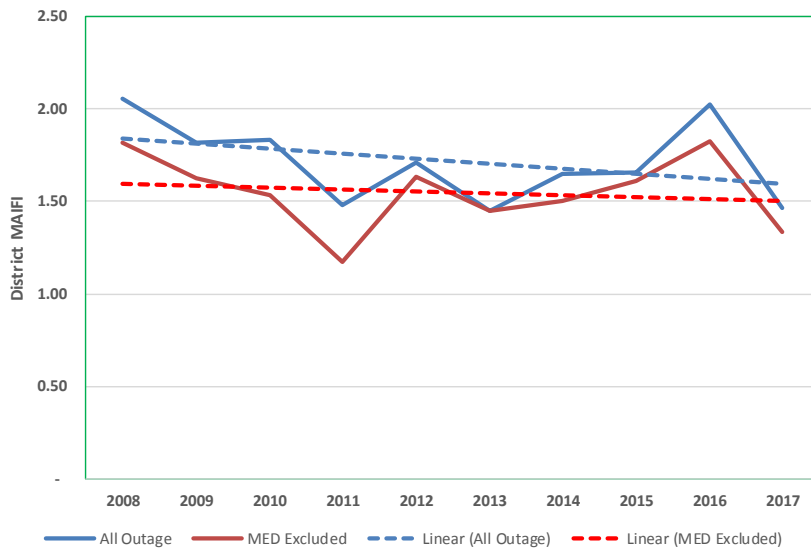
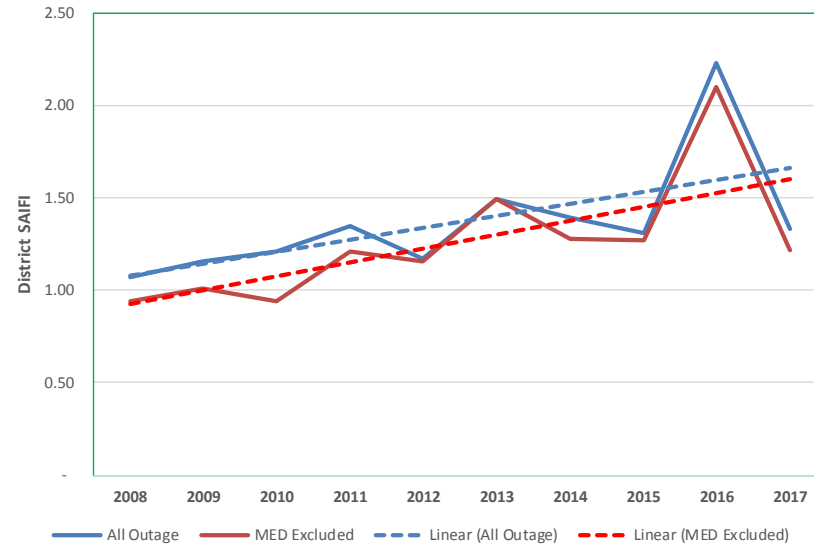
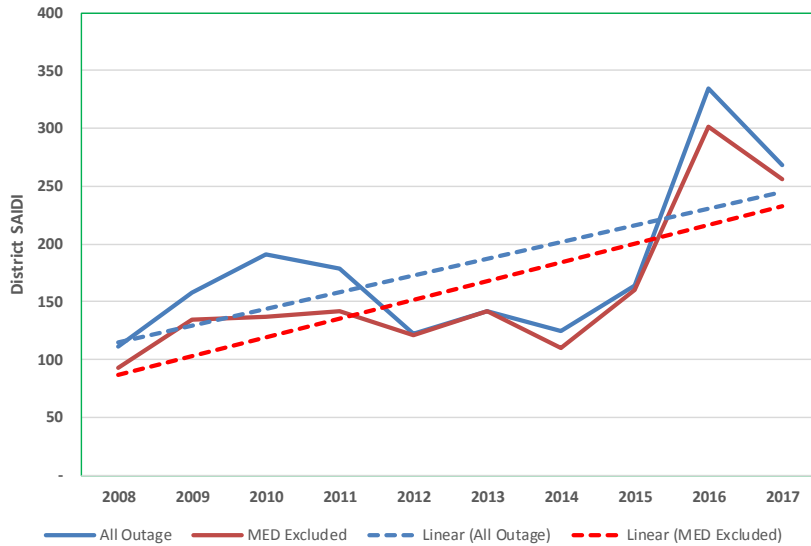
## 2008 - 2017 District Reliability Graphs (With Planned)

### SHAVER LAKE District Reliability Performance



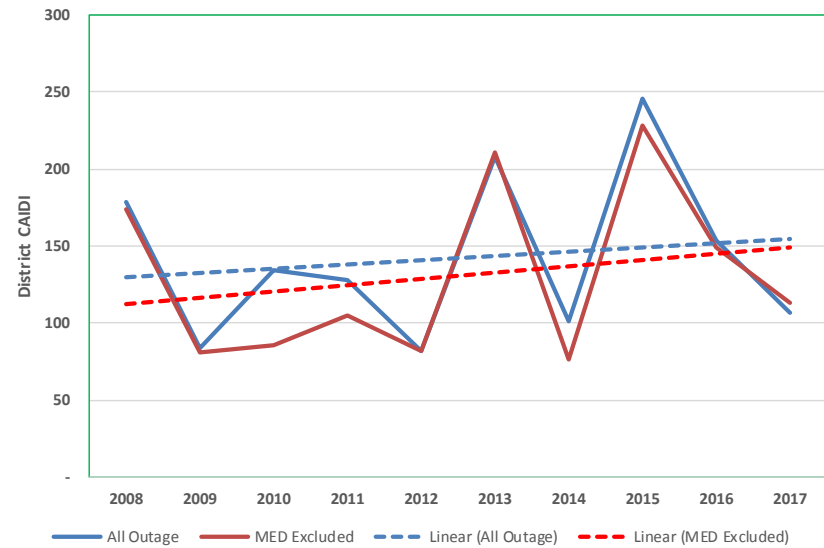
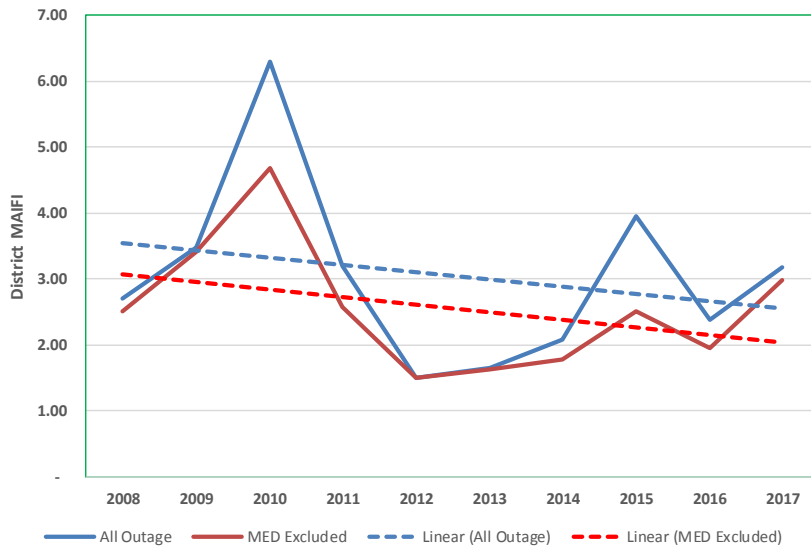
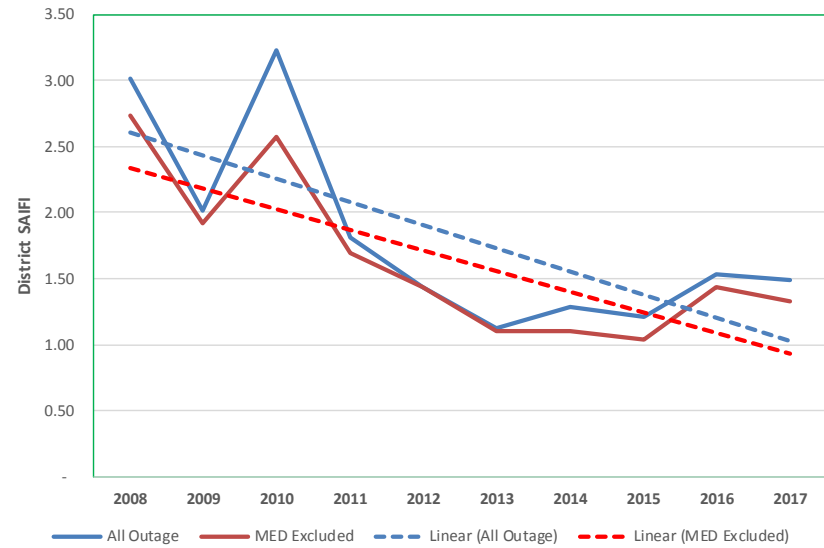
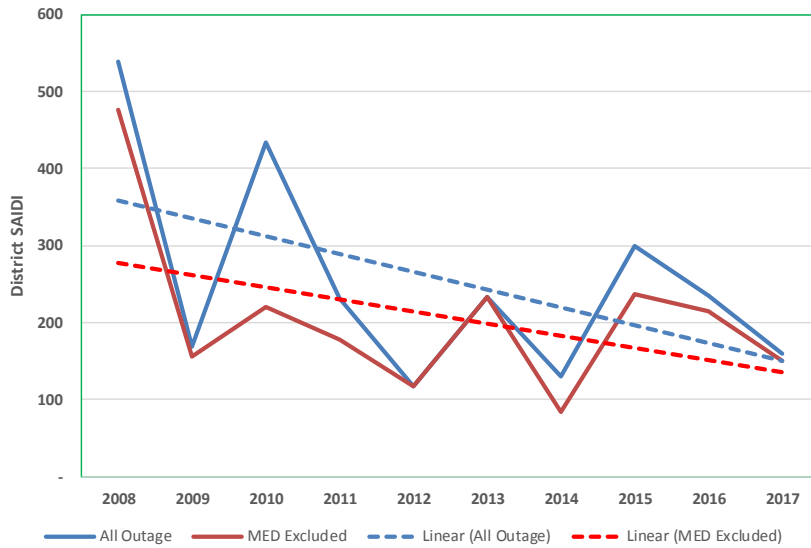
## 2008 - 2017 District Reliability Graphs (With Planned)

### SOUTH BAY District Reliability Performance



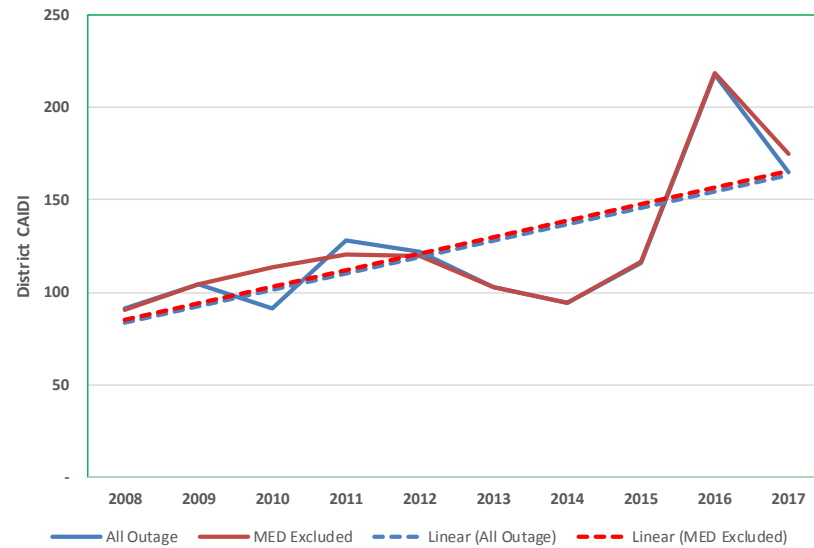
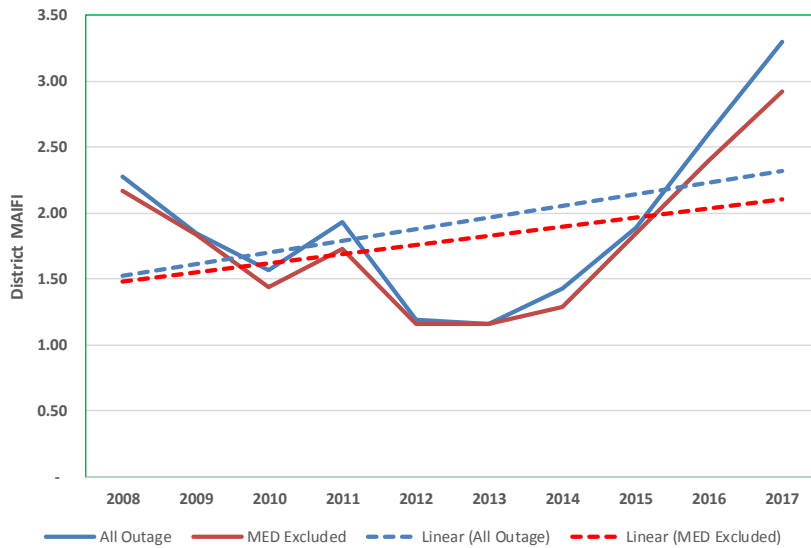
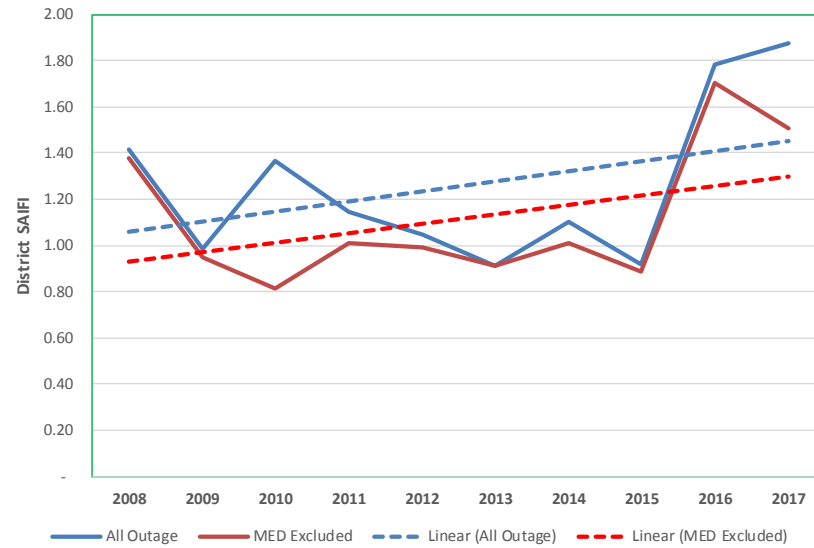
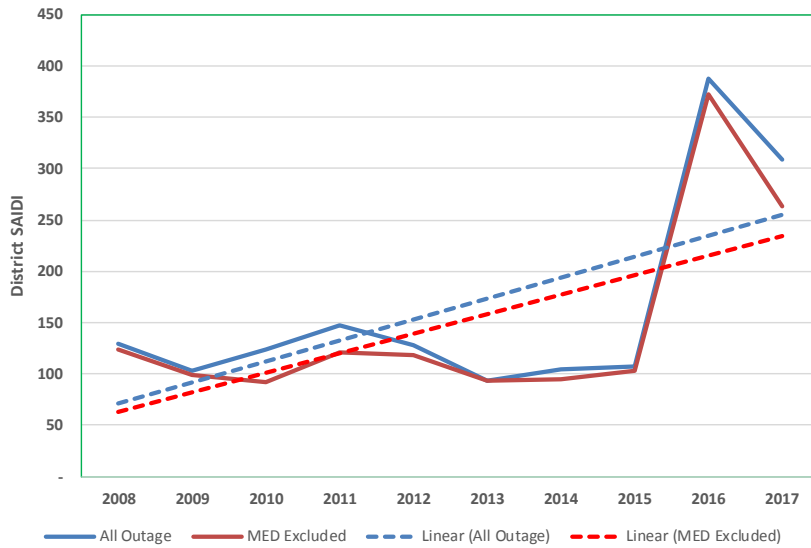
## 2008 - 2017 District Reliability Graphs (With Planned)

### TEHACHAPI District Reliability Performance



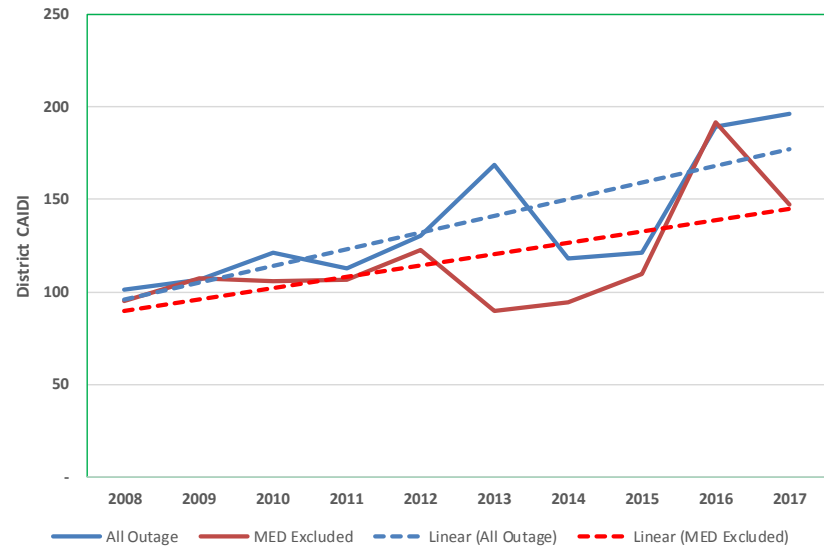
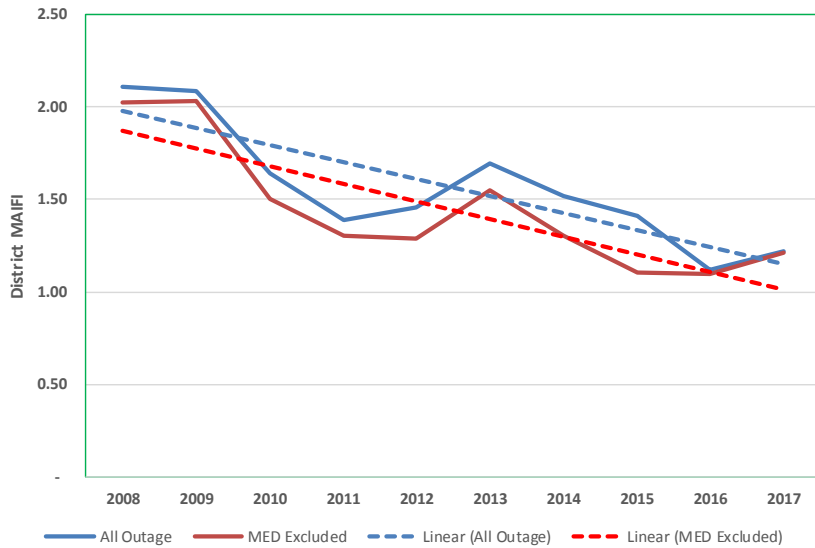
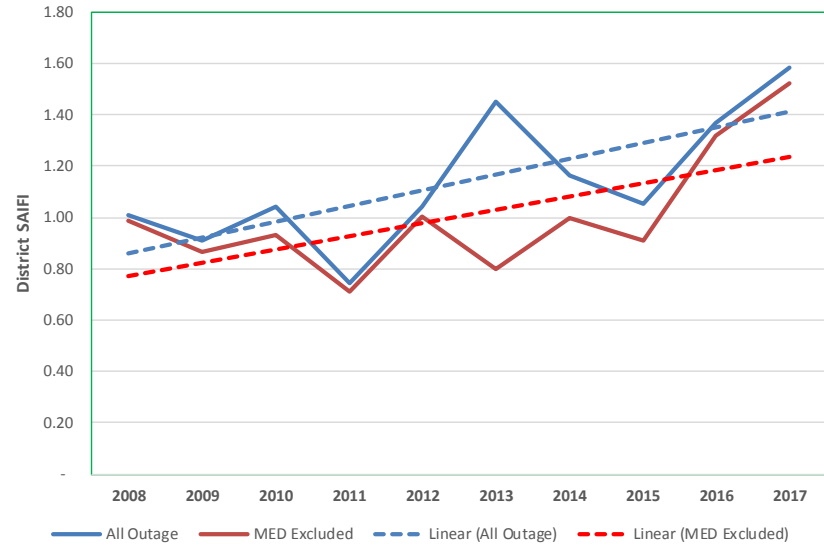
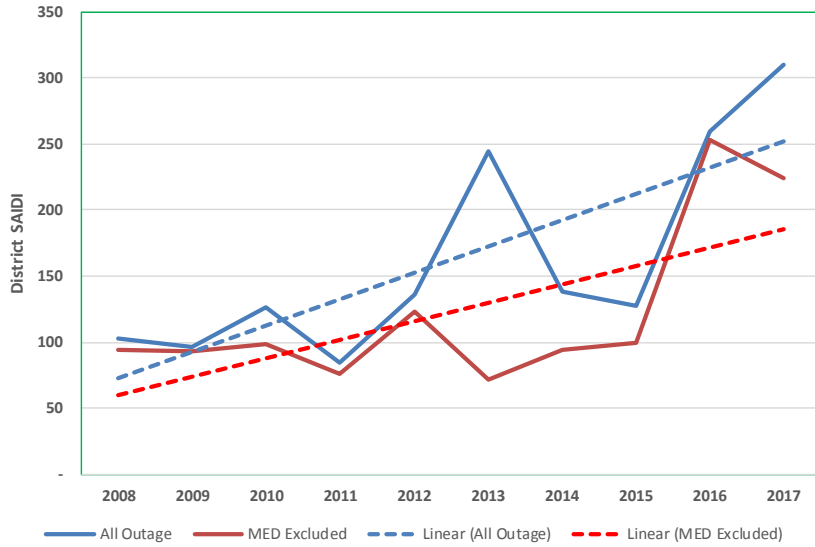
## 2008 - 2017 District Reliability Graphs (With Planned)

### THOUSAND OAKS District Reliability Performance



## 2008 - 2017 District Reliability Graphs (With Planned)

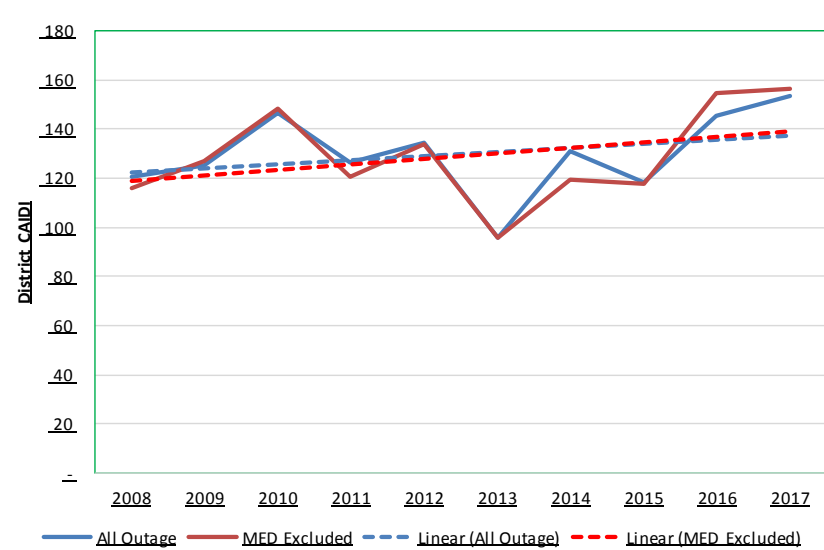
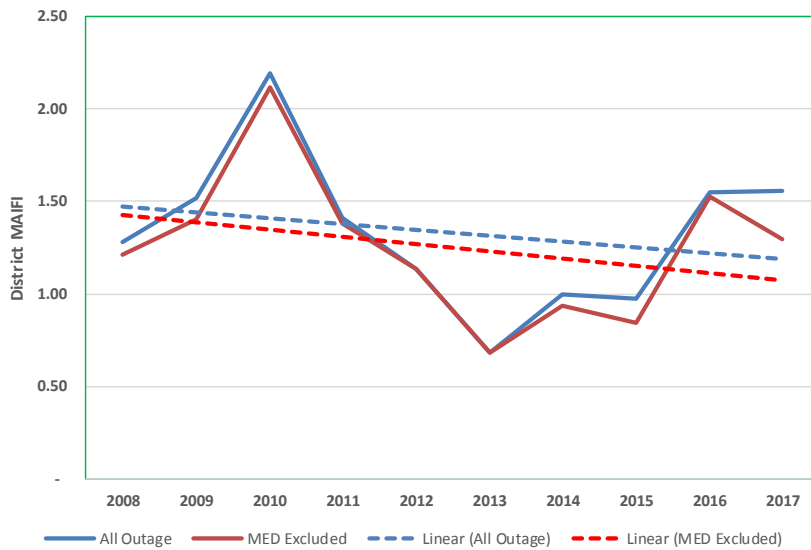
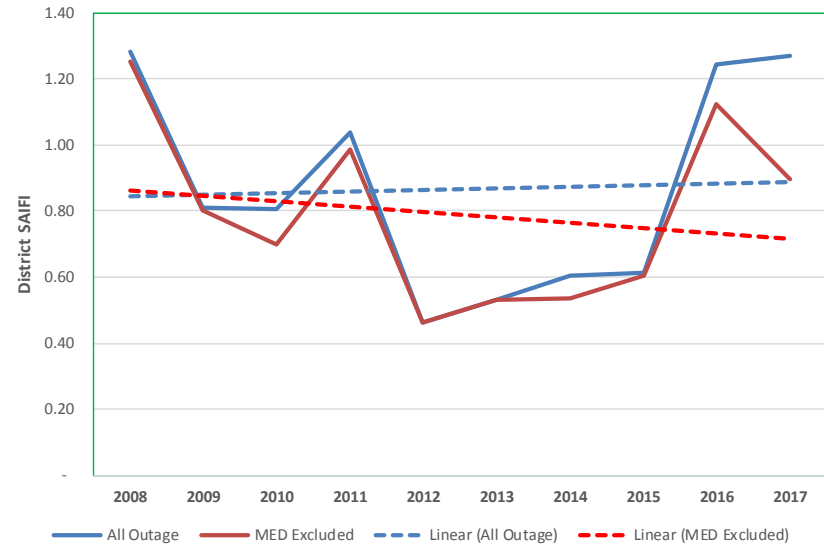
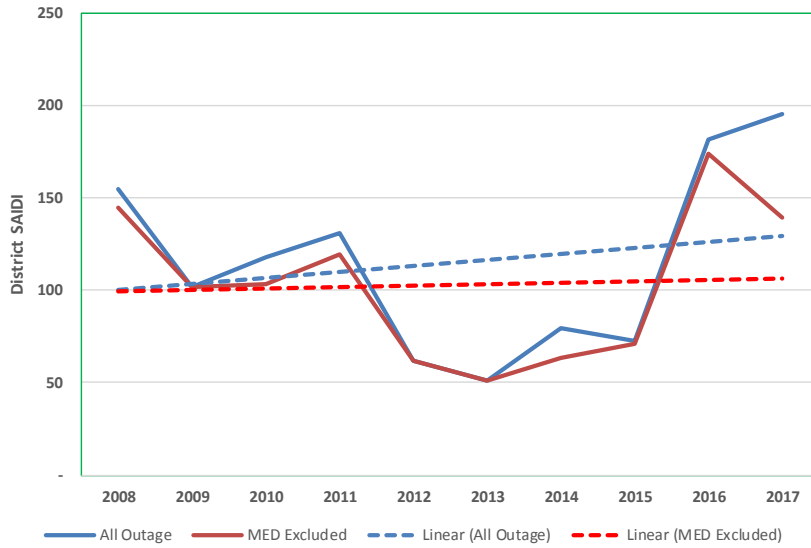
### TULARE District Reliability Performance





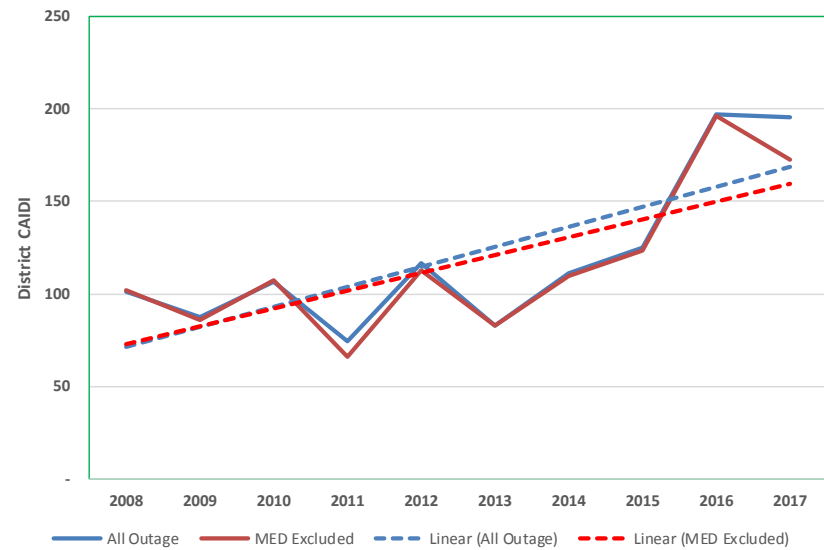
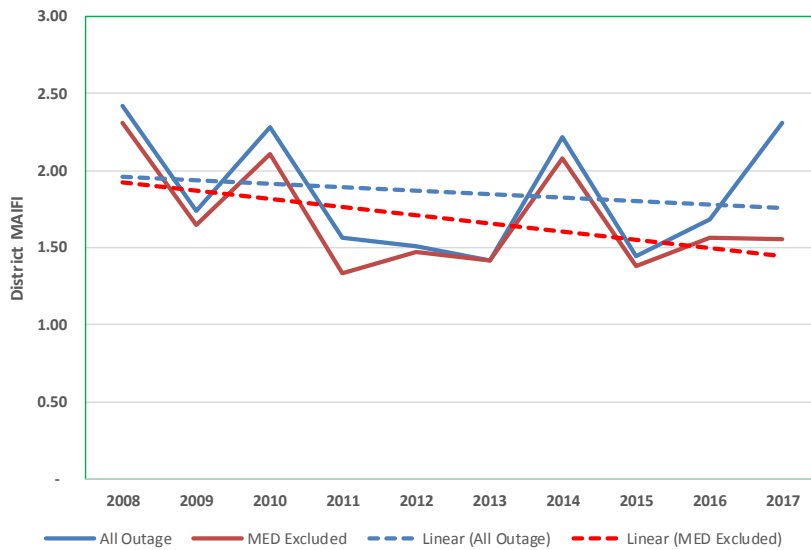
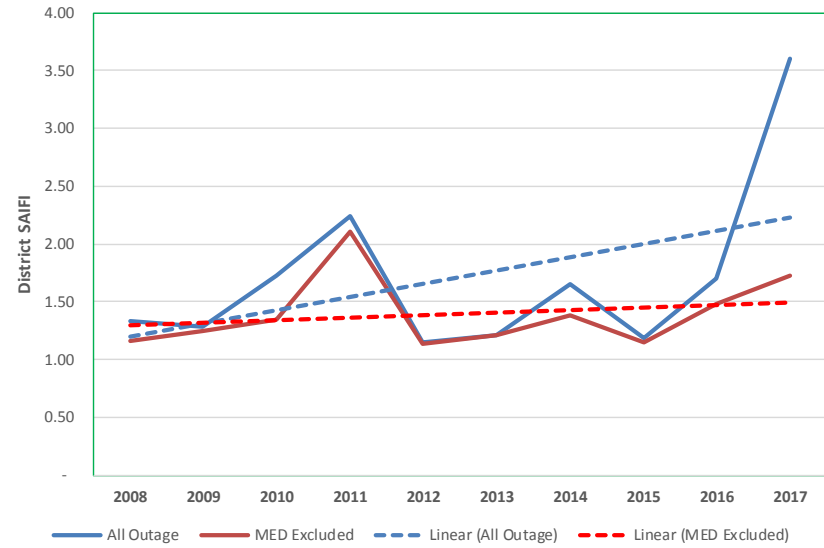
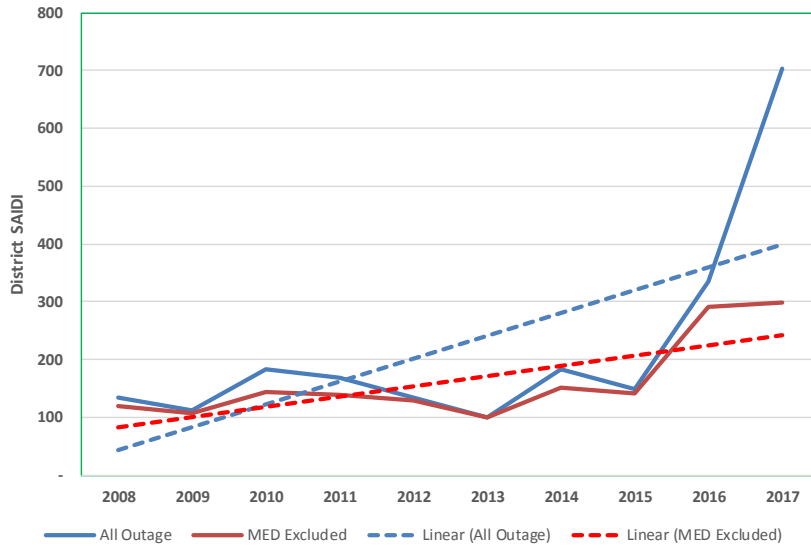
## 2008 - 2017 District Reliability Graphs (With Planned)

### VALENCIA District Reliability Performance



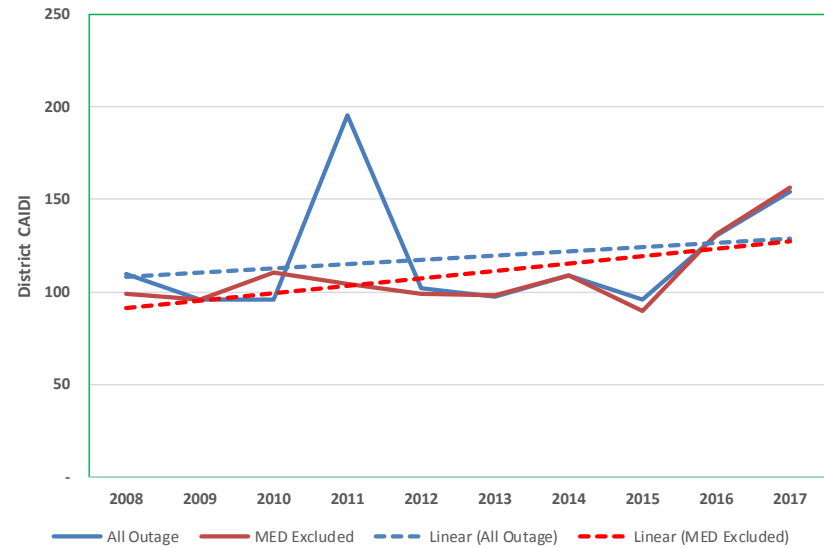
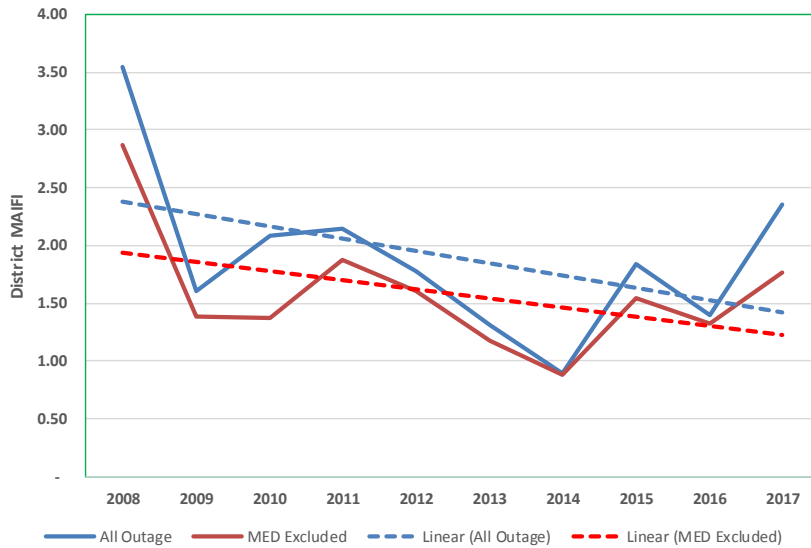
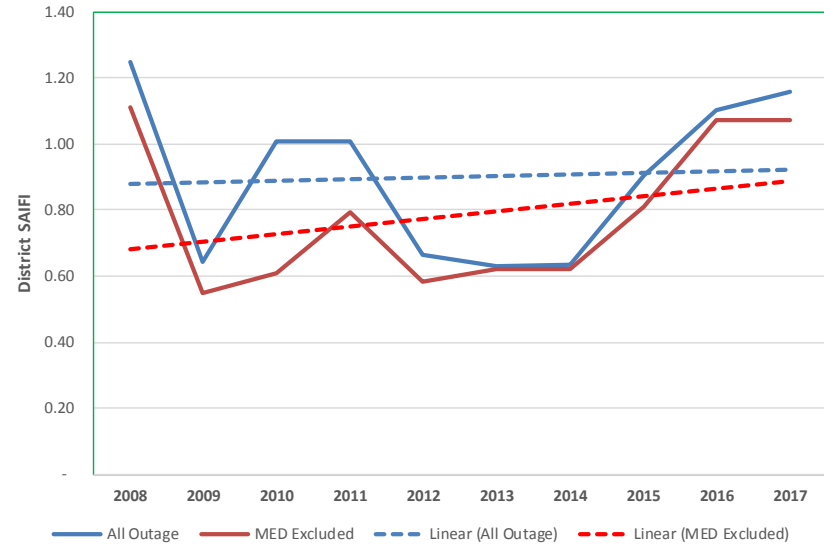
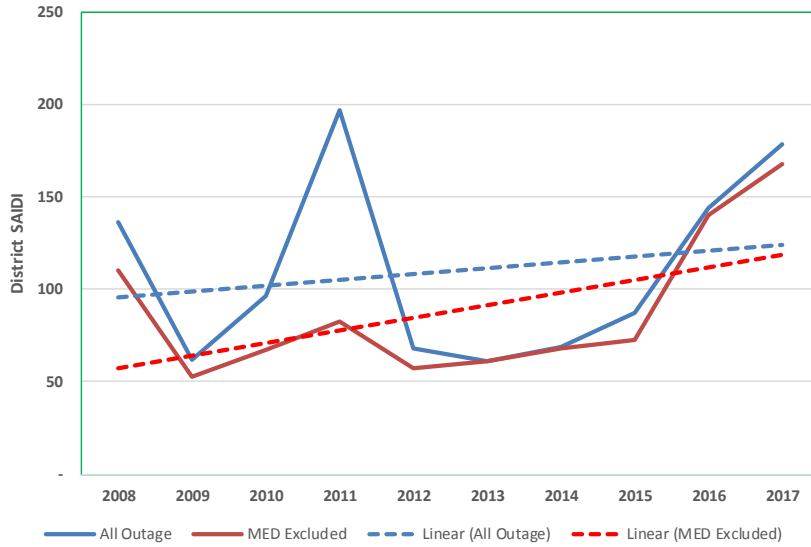
## 2008 - 2017 District Reliability Graphs (With Planned)

### VENTURA District Reliability Performance



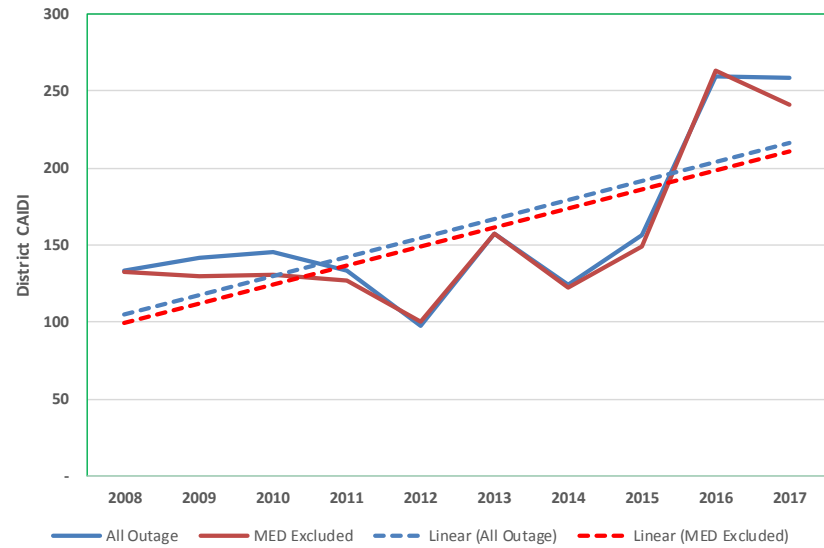
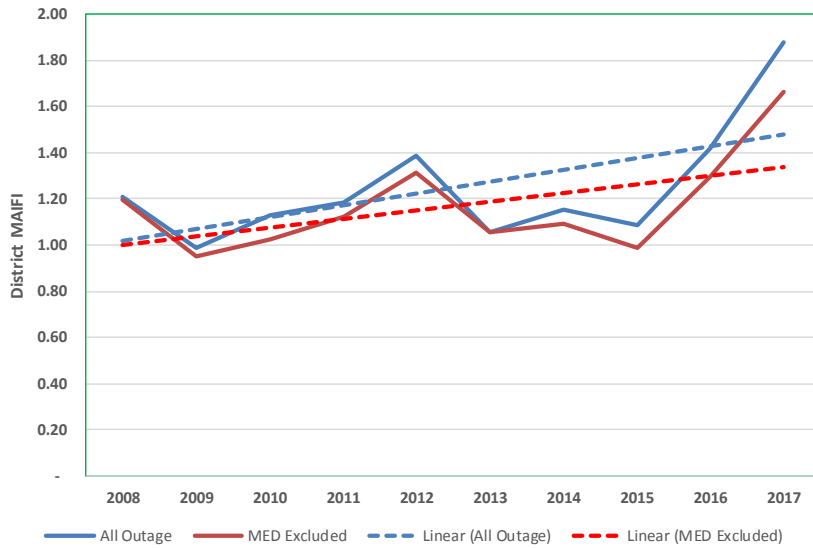
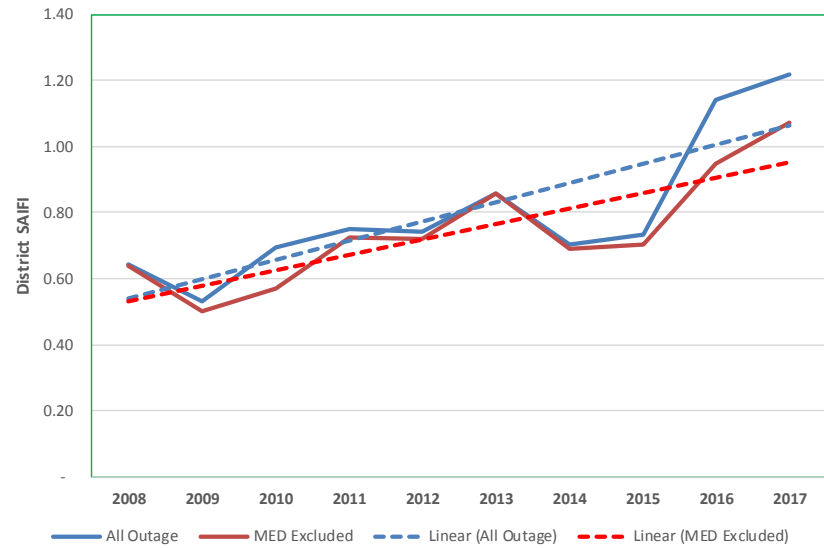
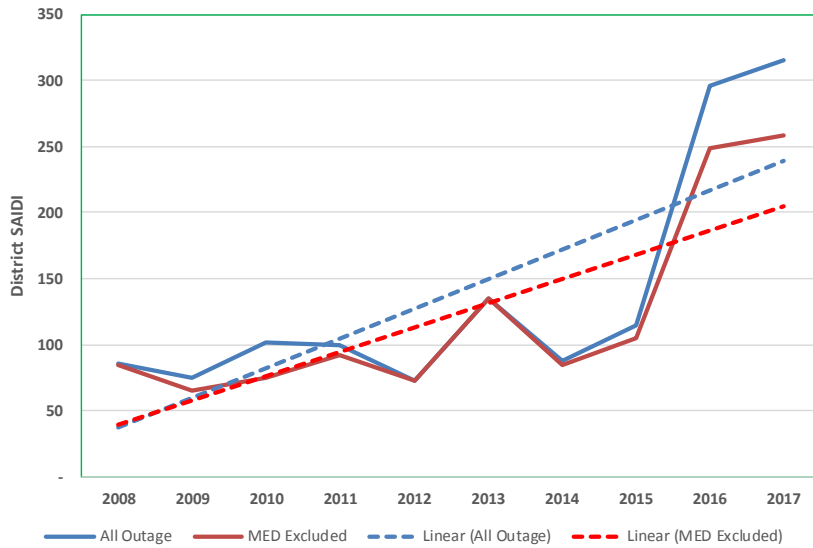
## 2008 - 2017 District Reliability Graphs (With Planned)

### VICTORVILLE District Reliability Performance



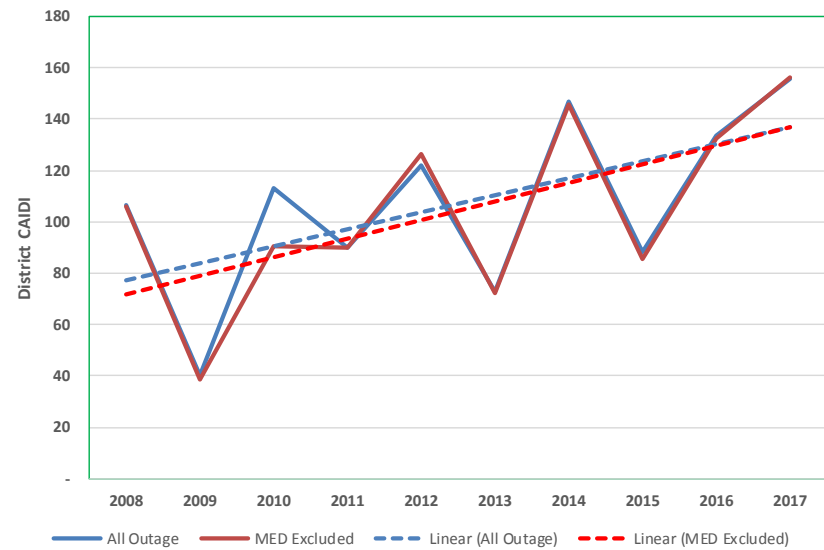
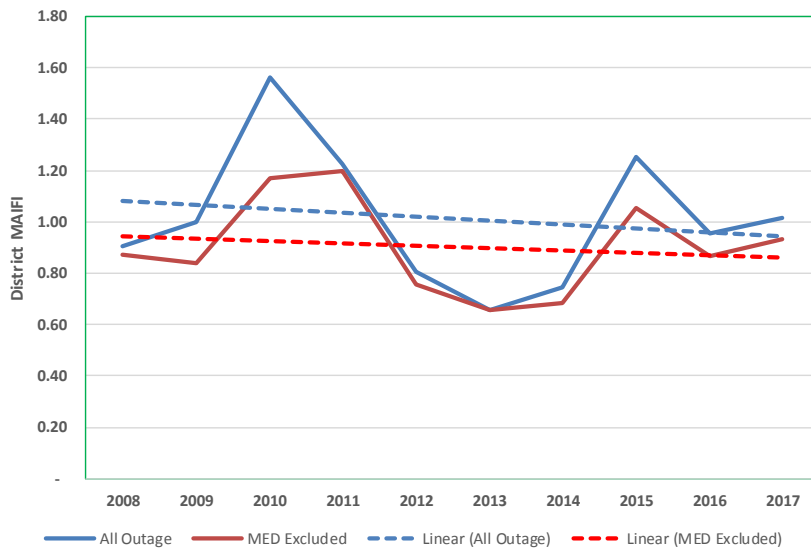
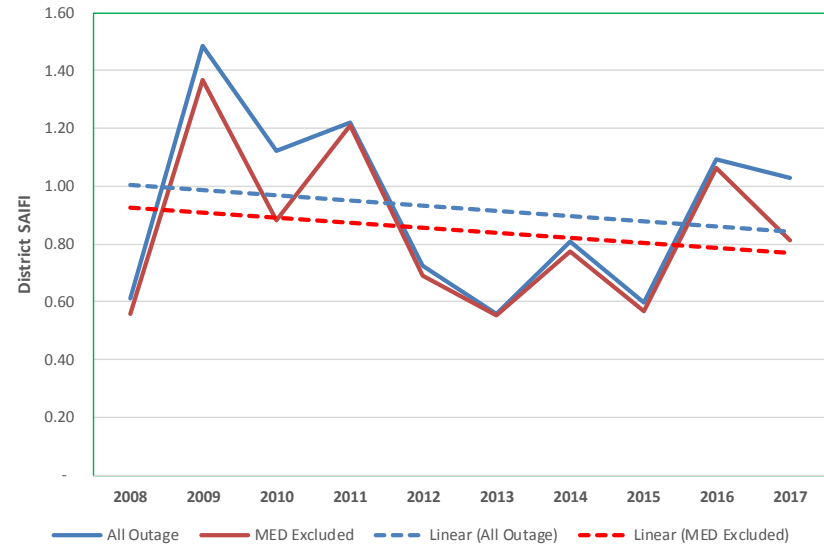
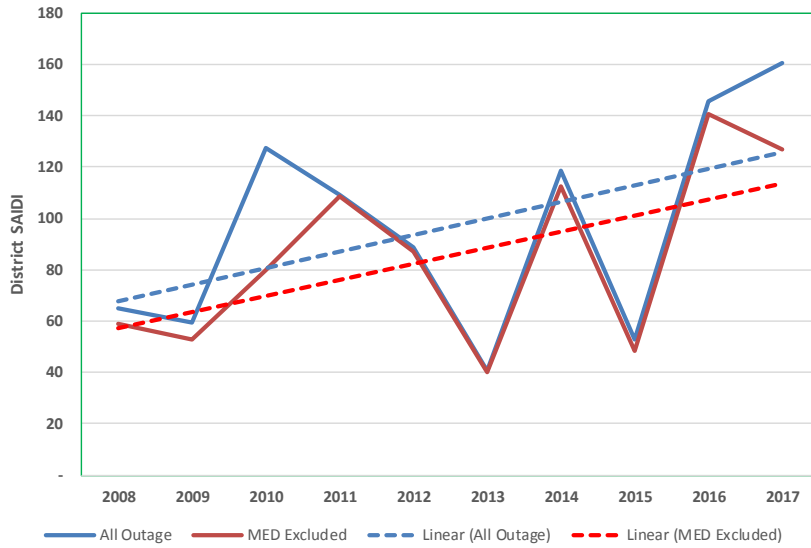
## 2008 - 2017 District Reliability Graphs (With Planned)

### WHITTIER District Reliability Performance



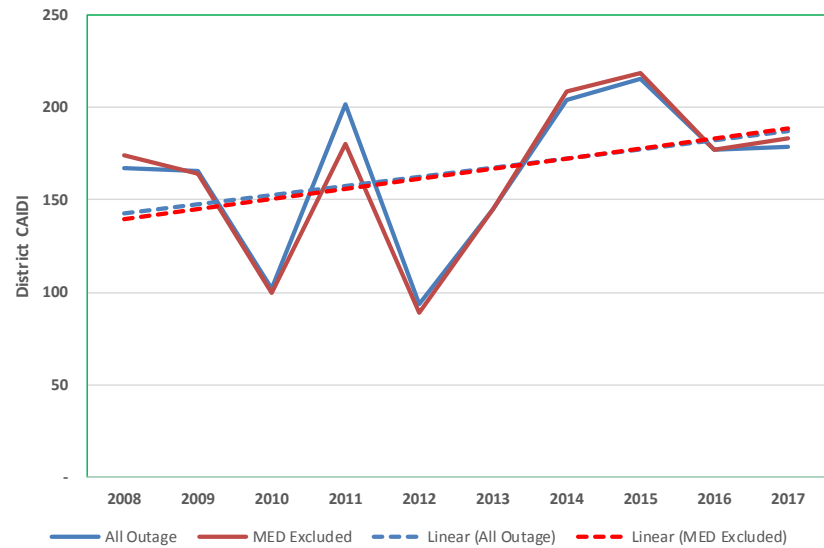
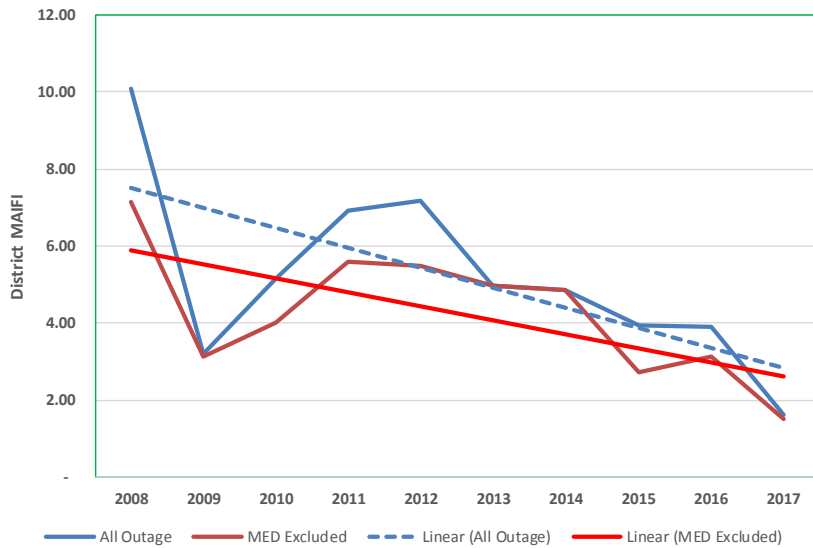
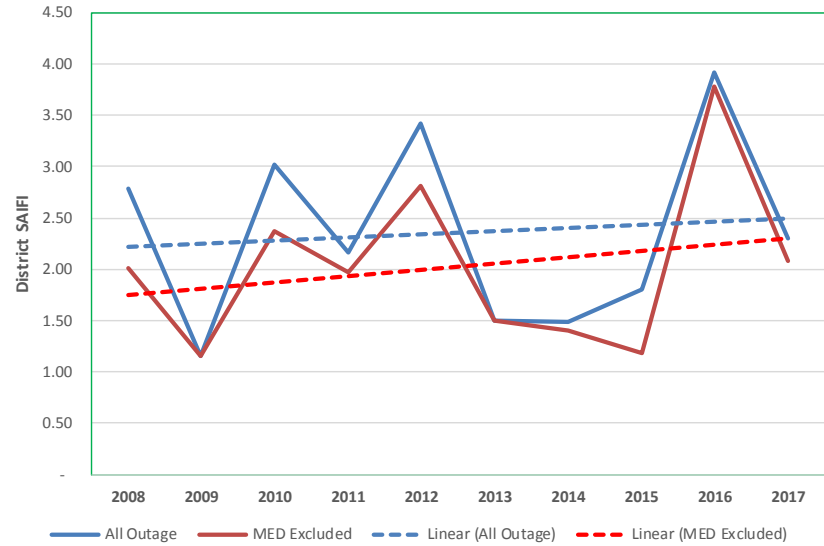
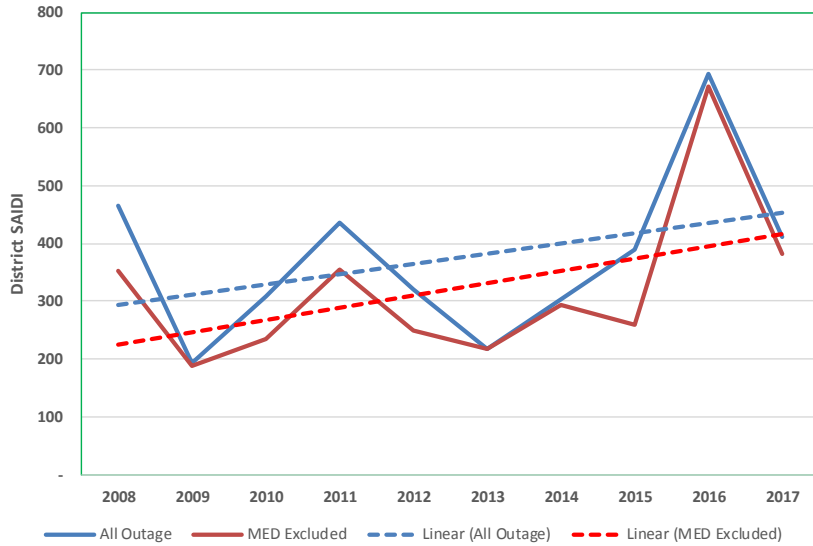
## 2008 - 2017 District Reliability Graphs (With Planned)

### WILDOMAR District Reliability Performance



## 2008 - 2017 District Reliability Graphs (With Planned)

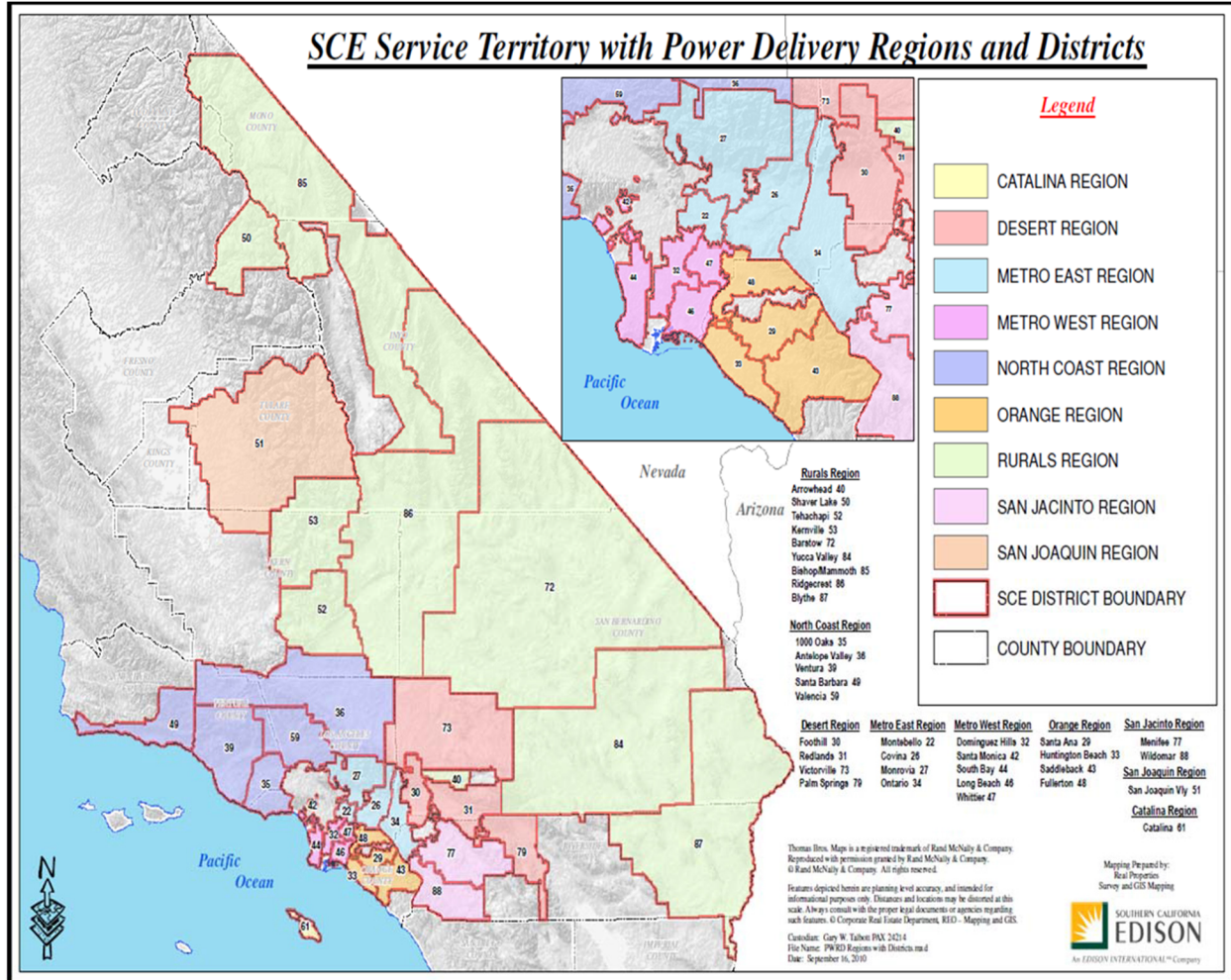
### YUCCA VALLEY District Reliability Performance



- 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 Circuit Rehabilitation (WCR) program is the current method for addressing poor reliability performance on a circuit level. The WCR process typically takes two years from circuit review to construction completion. Budgets are based on each region's contribution to the three year average of equipment outages. Seventy percent of the budget is allocated based on SAIFI contribution, and thirty percent on SAIDI contribution.

A worst circuit rehabilitation typically begins with the identification of each circuit's most risk-significant mainline cable, and then additional enhancements are identified to improve the overall circuit reliability. These circuit enhancements include equipment such as automation, automatic re-closers, branch line fuses, and fault indicators wherever judged to be cost effective. A project may not be scoped if there is other work already planned that will enhance reliability.

SCE's selection of its WCR circuits begin 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. This is also done for the circuit level indices to see the impact to the average customer on the circuit. Additional metrics are considered to address other reliability issues such as: Source Loss (Feeder circuits causing downstream circuits to lose power), CEMI6 (Customers Experiencing Multiple Interruptions<sup>7</sup>), Circuits experiencing 4 or more cable failures, and Circuits experiencing greater or equal to 20 equipment failures within one year. (See Appendix-B)

SCE uses the above criteria for selecting the worst (top) 1% of circuits to improve. (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 preferred metric SAIDI and Table 8 contains the Top 1% WPC using the preferred metric SAIFI. 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 re-closer, and (9)its preferred reliability metric.

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<sup>7</sup> 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) 2016 Customer Count	(4) Substation	(5) Circuit-Miles	(6) % UG	(7) % OH	(8) Circuit Breaker or Automatic Re-Closer Operation <sup>1</sup> 2016	(9) Sys. SAIDI RANK	(9) Sys. SAIDI <sup>2</sup>
Topoc 16kV	87-Blythe	844	Landing 66/16 (D)	23.67	43.1%	56.9%	14	1	0.4791241
*Calico 12kV	29-Santa Ana	3,045	Sullivan 66/12 (D)	13.64	24.3%	75.7%	6	2	0.3041441
*Cimarron 16kV	44-South Bay	3,711	Inglewood 66/16 (D)	15.32	22.9%	77.2%	9	3	0.2799947
Tenneco 12kV	36-Antelope Valley	4,702	Frazier Park 66/12 (D)	114.2	20.1%	79.9%	16	4	0.2750656
*Landers 25kV	84-Yucca Valley	1,779	Nugget 33/25 (D)	141	1.3%	98.7%	42	5	0.2659515
Huevos 12kV	72-Barstow	2,452	Tortilla 115/12 (D)	23.09	47.3%	52.7%	9	6	0.2573929
Salmon 16kV	44-South Bay	3,851	El Nido 66/16 (D)	18.8	44.9%	55.1%	19	7	0.2564313
Clover 12kV	48-Fullerton	3,493	Barre 66/12 (D)	22.35	9.6%	90.4%	12	8	0.2542988
Camp Nelson 4kV	51-San Joaquin	695	Camp Nelson P.T. 12/4.16	25.2	7.4%	92.6%	13	9	0.2538616
*Jordan 12kV	53-Kernville	1,078	Glennville 66/12 (D)	175	2.8%	97.2%	20	10	0.2514599
Highball 12kV	30-Foothill	1,629	Bloomington 66/12 (D)	22.86	25.0%	75.1%	8	11	0.2472422
Patricia 16kV	39-Ventura	2,592	Ojai 66/16 (D)	48.35	19.0%	81.0%	26	12	0.2468993
Milpas 16kV	49-Santa Barbara	4,926	Santa Barbara 66/16 (D)	25.31	47.8%	52.2%	12	13	0.2467595
Hot Springs 16kV	49-Santa Barbara	3,643	Santa Barbara 66/16 (D)	32.3	59.1%	40.9%	12	14	0.2437688
*Fantail 16kV	42-Santa Monica	4,465	Tahiti 66/16 (D)	15.4	88.5%	11.5%	5	15	0.2405684
Ramp 12kV	46-Long Beach	4,301	Stadium 66/12 (D)	21.18	57.6%	42.4%	5	16	0.2352721
*Blue Cut 12kV	30-Foothill	283	Blue Cut P.T. 33/12 (A)	36.66	3.4%	96.6%	8	17	0.2195465
*Sago 16kV	44-South Bay	3,751	Torrance 66/16 (D)	22.22	30.2%	69.8%	13	18	0.2040094
Petri 12kV	26-Covina	2,991	Bassett 66/12 (D)	22.63	32.4%	67.7%	17	19	0.1977349
Mallet 12kV	26-Covina	2,747	Railroad 66/12 (D)	29.46	70.8%	29.2%	15	20	0.1931616
Maplewood 12kV	32-Dominguez Hills	2,329	Somerset 66/12 (D)	16.33	52.9%	47.1%	6	21	0.1918115
Russell 12kV	46-Long Beach	3,686	Broadway 66/12 (D)	12.41	37.6%	62.4%	3	22	0.1912427
Rosa 16kV	39-Ventura	4,819	Camarillo 66/16 (D)	49.47	90.9%	9.1%	17	23	0.1830042
*Crump 12kV	31-Redlands	476	Crump P.T. 33/12 (A)	5.068	12.6%	87.4%	2	24	0.1825115
*Highway 16kV	39-Ventura	4,999	Saticoy 66/16 (D)	36.07	58.3%	41.7%	11	25	0.1807364
*Snead 12kV	33-Huntington Beach	3,267	Lafayette 66/12 (D)	20.7	80.3%	19.7%	11	26	0.1789041
Jenks Lake 12kV	31-Redlands	175	Converse Flats 33/12 (A)	15.23	1.4%	98.6%	5	27	0.1757717
*Melody 25kV	84-Yucca Valley	1,866	Hi Desert 33/25 (D)	314.4	0.1%	99.9%	52	28	0.1753273
Sexton 16kV	39-Ventura	3,524	Saticoy 66/16 (D)	41.16	39.2%	60.8%	23	29	0.1738075
Skelton 12kV	79-Palm Springs	2,108	Farrell 115/12 (D)	20.96	87.0%	13.0%	10	30	0.1737111
Aha 12kV	87-Blythe	592	Aha P.T. 33/12 (A)	10.91	10.0%	90.0%	7	31	0.1728669
*Arvana 16kV	44-South Bay	3,370	Victoria 66/16 (D)	20.64	55.3%	44.7%	5	32	0.1726503
*Azores 12kV	26-Covina	1,910	Puente 66/12 (D)	19.94	15.5%	84.6%	6	33	0.1724123
*Grapevine 12kV	86-Ridgecrest	14	Grapevine P.T. 25/12 (A)	7.035	1.2%	98.8%	0	34	0.1696971
Zinc 16kV	44-South Bay	2,656	Crest 66/16 (D)	24.27	87.0%	13.0%	10	35	0.1691568
Waite 12kV	88-Willdomar	1,753	Skylark 115/12 (D)	29.03	81.1%	18.9%	9	36	0.1660969
Faye 12kV	53-Kernville	755	Weldon 66/12 (D)	39.83	18.9%	81.1%	10	37	0.1650775
Cienigatas 16kV	49-Santa Barbara	2,037	Santa Barbara 66/16 (D)	10.38	44.8%	55.2%	9	38	0.1644601
Otis 16kV	32-Dominguez Hills	3,382	Cudahy 66/16 (D)	24.07	40.0%	60.0%	9	39	0.1642666
*Butane 16kV	44-South Bay	4,191	Sepulveda 66/16 (D)	16.3	25.3%	74.8%	11	40	0.1639948
Level 12kV	26-Covina	2,237	Industry 66/12 (D)	15.37	11.9%	88.1%	4	41	0.1622532
Trestle 12kV	26-Covina	2,600	Railroad 66/12 (D)	26.26	56.3%	43.7%	12	42	0.1620769
Cowcatcher 12kV	26-Covina	1,598	Railroad 66/12 (D)	19.11	52.3%	47.7%	7	43	0.1615081
Crosson 16kV	39-Ventura	5,141	Camarillo 66/16 (D)	41.11	50.2%	49.8%	16	44	0.1608404
*Surfside 16kV	39-Ventura	5,601	Channel Island 66/16 (D)	31.78	66.3%	33.7%	6	45	0.1607595
Ruthellen 16kV	44-South Bay	1,821	Brighton 66/16 (D)	9.809	15.0%	85.0%	8	46	0.1604314

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

<sup>1</sup> Includes Sustain and Momentary outages that affected the Circuit Breaker

<sup>2</sup> SAIDI is based on a three year weighted average

**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 <sup>1</sup> 2016	(9) Sys. SAIFI RANK	(9) Sys. SAIFI <sup>2</sup>
*Milpas 16kV	49-Santa Barbara	4,926	Santa Barbara 66/16 (D)	25.31	47.8%	52.2%	12	1	0.0030391
Hot Springs 16kV	49-Santa Barbara	3,643	Santa Barbara 66/16 (D)	32.3	59.1%	40.9%	12	2	0.0029593
*Asteroid 16kV	22-Montebello	4,207	Alhambra 66/16 (D)	21.09	41.8%	58.2%	14	3	0.0026823
*Rosa 16kV	39-Ventura	4,819	Camarillo 66/16 (D)	49.47	90.9%	9.1%	17	4	0.0025791
*Highway 16kV	39-Ventura	4,999	Saticoy 66/16 (D)	36.07	58.3%	41.7%	11	5	0.0024828
Tenneco 12kV	36-Antelope Valley	4,702	Frazier Park 66/12 (D)	114.2	20.1%	79.9%	16	6	0.0023471
*Sago 16kV	44-South Bay	3,751	Torrance 66/16 (D)	22.22	30.2%	69.8%	13	7	0.0023319
*Cimarron 16kV	44-South Bay	3,711	Inglewood 66/16 (D)	15.32	22.9%	77.2%	9	8	0.0022868
*Otis 16kV	32-Dominguez Hills	3,382	Cudahy 66/16 (D)	24.07	40.0%	60.0%	9	9	0.0021092
*Pablo 12kV	46-Long Beach	3,715	Bowl 66/12 (D)	18.67	59.9%	40.0%	12	10	0.0020667
Sexton 16kV	39-Ventura	3,524	Saticoy 66/16 (D)	41.16	39.2%	60.8%	23	11	0.0019967
Hollywood 16kV	42-Santa Monica	3,614	Fairfax 66/16 (D)	12.44	77.9%	22.1%	17	12	0.0019253
Vallecito 16kV	49-Santa Barbara	3,914	Carpinteria 66/16 (D)	41.3	48.8%	51.2%	21	13	0.0018949
Crosson 16kV	39-Ventura	5,141	Camarillo 66/16 (D)	41.11	50.2%	49.8%	16	14	0.0018941
*January 12kV	33-Huntington Beach	4,371	Lafayette 66/12 (D)	23.44	91.7%	8.3%	14	15	0.0018878
Mustang 12kV	53-Kernville	2,124	Isabella 66/12 (D)	48.87	4.3%	95.7%	16	16	0.0018849
*Albatross 16kV	42-Santa Monica	4,691	Santa Monica 66/16 (D)	10.04	51.7%	48.4%	6	17	0.0018753
*Surfside 16kV	39-Ventura	5,601	Channel Island 66/16 (D)	31.78	66.3%	33.7%	6	18	0.0018365
Salmon 16kV	44-South Bay	3,851	El Nido 66/16 (D)	18.8	44.9%	55.1%	19	19	0.0018362
*Sundown 12kV	73-Victorville	2,919	Helendale 33/12 (D)	58.44	77.2%	22.8%	9	20	0.0018200
Locksley 16kV	27-Monrovia	4,256	Ravendale 66/16 (D)	18.91	46.9%	53.1%	9	21	0.0018150
*Galahad 16kV	35-Thousand Oaks	2,265	Latigo 66/16 (D)	80.88	36.5%	63.5%	31	22	0.0017242
Saunders 12kV	77-Menifee	2,112	Idyllwild 33/12 (D)	39.03	6.6%	93.4%	14	23	0.0017091
Blimp 16kV	32-Dominguez Hills	3,724	Nola 66/16 (D)	32.89	30.1%	69.9%	13	24	0.0017023
Snead 12kV	33-Huntington Beach	3,267	Lafayette 66/12 (D)	20.7	80.3%	19.7%	11	25	0.0016756
*Warriors 12kV	33-Huntington Beach	3,651	Team 66/12 (D)	18.81	36.3%	63.6%	2	26	0.0016734
Salvador 16kV	39-Ventura	2,603	San Miguel 66/16 (D)	26.88	89.4%	10.6%	9	27	0.0016251
Sonics 12kV	33-Huntington Beach	3,607	Team 66/12 (D)	23.25	33.2%	66.8%	7	28	0.0016065
*Driskill 16kV	49-Santa Barbara	3,560	San Marcos 66/16 (D)	43.42	47.1%	52.9%	7	29	0.0015988
*Fantail 16kV	42-Santa Monica	4,465	Tahiti 66/16 (D)	15.4	88.5%	11.5%	5	30	0.0015887
Hooligan 16kV	35-Thousand Oaks	3,710	Newbury 66/16 (D)	51.12	87.0%	13.0%	31	31	0.0015885
Aventura 12kV	79-Palm Springs	1,887	Aventura P.T. 33/12 (A)	19.35	13.8%	86.3%	12	32	0.0015025
*Landers 25kV	84-Yucca Valley	1,779	Nugget 33/25 (D)	141	1.3%	98.7%	42	33	0.0014903
Cienigatas 16kV	49-Santa Barbara	2,037	Santa Barbara 66/16 (D)	10.38	44.8%	55.2%	9	34	0.0014815
Perimeter 12kV	50-Big Creek	1,250	Timberwine 33/12 (D)	38.66	47.6%	52.4%	8	35	0.0014372
Standard 12kV	33-Huntington Beach	3,707	Oceanview 66/12 (D)	21.48	55.5%	44.5%	10	36	0.0014300
Zinc 16kV	44-South Bay	2,656	Crest 66/16 (D)	24.27	87.0%	13.0%	10	37	0.0014160
Pawnee 12kV	77-Menifee	2,647	Gavilan (115) 33/12 (D)	94.86	14.1%	85.9%	26	38	0.0014016
*Malden 16kV	32-Dominguez Hills	6,180	Vail 66/16 (D)	29.47	27.3%	72.7%	6	39	0.0013868
Halldale 16kV	44-South Bay	2,749	Brighton 66/16 (D)	13.21	12.7%	87.2%	3	40	0.0013819
*Cuthbert 16kV	35-Thousand Oaks	2,223	Latigo 66/16 (D)	34.77	40.1%	59.9%	14	41	0.0013699
Picador 16kV	22-Montebello	4,439	Mesa 66/16 (D)	16.74	29.1%	70.9%	6	42	0.0013390
*Fairhaven 16kV	44-South Bay	2,953	Inglewood 66/16 (D)	18.72	61.4%	38.6%	9	43	0.0013372
Kadota 12kV	34-Ontario	2,797	Francis 66/12 (D)	25.48	54.2%	45.8%	8	44	0.0013319
Piston 16kV	44-South Bay	4,369	Ditmar 66/16 (D)	19.79	47.1%	52.9%	8	45	0.0013209
Tungsten 12kV	53-Kernville	1,738	Isabella 66/12 (D)	1.689	7.9%	92.2%	6	46	0.0013200

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

<sup>1</sup> Includes Sustain and Momentary outages that affected the Circuit Breaker

<sup>2</sup> SAIFI is based on a three year weighted average

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.	iv.		
	2015-2017 Sys. SAIDI RANK	2015-2017 Sys. SAIDI	2014-2016 Sys. SAIDI RANK	2014-2016 Sys. SAIDI	Explanation of Repeat Deficiency	Submitted	Engineering Scope	Anticipated Completion year
Calico 12kV	2	0.30414	41	0.184107	Project identified, but not yet constructed.	9/29/2016	4 RIS 2 UG RCS 8 BLF's 6 OH Switches	2018
Cimarron 16kV	3	0.27999	11	0.259805	Project identified, but not yet constructed.	10/27/2016	12 BLF's 3 Automated Switches	2018
Landers 25kV	5	0.26595	5	0.338989	Project identified, but not yet constructed.	10/27/2016	78 BLF's 2 Automated Switches 1 RAR	2018
Jordan 12kV	10	0.25146	1	0.49653	Project identified, but not yet constructed.	1/30/2018	114 BLF's	2019
Fantail 16kV	15	0.24057	3	0.40751	Project identified, but not yet constructed.	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
Blue Cut 12kV	17	0.21955	2	0.453235	Project identified, but not yet constructed.	11/2/2015	7.0 Cond Mi of OH Conductor 1 OH Switch	2018
Sago 16kV	18	0.20401	34	0.196517	Project identified, but not yet constructed.	9/30/2016	1.0 Cond Mi of OH Conductor 37 BLF's 3 Automated Switches	2018
Crump 12kV	24	0.18251	7	0.309717	Project identified, but not yet constructed.	6/30/2018	14 BLF's Upgrades to Source feed	2019
Snead 12kV	26	0.17890	35	0.193478	Project identified, but not yet constructed.	11/20/2017	5 OH Switch 1 UG Switch 0.3 Cond Mi UG Cable	2019
Melody 25kV	28	0.17533	18	0.229035	Project identified, but not yet constructed.	11/23/2016	22 BLF's 2 RFI's	2018
Arvana 16kV	32	0.17265	32	0.199586	Project identified, but not yet constructed.	10/27/2016	2018 WCR 4 Automated Switches 2 RFI	2018
Azores 12kV	33	0.17241	12	0.255661	Project identified, but not yet constructed.	9/30/2016	1.8 Cond Mi OH Conductor 2.7 Cond Mi UG Cable 2 RFI 4 Automated Switches 2 Overhead Switches 37 BLF 1 UG Switch Civil	2018
Grapevine 12kV	34	0.169697051	4	0.382304	Project identified, but not yet constructed.	5/31/2017	2 RFIs	2018
Butane 16kV	40	0.16399	22	0.218545	Project identified, but not yet constructed.	9/29/2016	21 BLF's 5 FI's 7 OH Switches 1 UG Switch Civil	2018
Surfside 16kV	45	0.16076	21	0.224988	Project identified, but not yet constructed.	10/27/2016	2.2 Cond Mi OH Conductor 4 Automated Switches 10 BLF's	2018

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

Circuit	i.		ii.		iii. Explanation of Repeat Deficiency	Submitted	iv. Engineering Scope	Anticipated Completion year
	2015-2017 Sys. SAIDI RANK	2015-2017 Sys. SAIDI	2014-2016 Sys. SAIDI RANK	2014-2016 Sys. SAIDI				
Milpas 16kV	1	0.00304	19	0.00223	Project identified, but not yet constructed.	10/31/2017	1.44 Cond Mi UG Cable Install 51 BLFs 6 OH RFI 2 Automated Switch	2019
Asteroid 16kV	3	0.00268	2	0.00366	Project identified, but not yet constructed.	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	2018
Rosa 16kV	4	0.00258	12	0.00260	Project identified, but not yet constructed.	11/23/2016	0.12 Cond Mi of OH Conductor 3 Automated Switches 3 BLF's 2 UG Switches Civil	2018
Highway 16kV	5	0.00248	28	0.00195	Project identified, but not yet constructed.	9/30/2016	1.78 Cond Mi of UG Cable 3 OH Switches 4 Automated Switches 4 RIS 6 BLF's 1 UG Switch 2.4 Cond Mi of OH Conductor	2018
Sago 16kV	7	0.00233	15	0.00244	Project identified, but not yet constructed.	9/30/2016	1.0 Cond Mi of OH Conductor 37 BLF's 3 Automated Switches	2018
Cimarron 16kV	8	0.00229	9	0.00269	Project identified, but not yet constructed.	10/27/2016	12 BLF's 3 Automated Switches	2018
Otis 16kV	9	0.00211	38	0.00181	Project identified, but not yet constructed.	10/31/2017	6 OH Switches 8 BLF's	2019
Pablo 12kV	10	0.00207	32	0.00187	Project identified, but not yet constructed.	10/27/2017	0.38 Cond Mi of UG Cable 4 OH Switches	2019
January 12kV	15	0.00189	31	0.00188	Project identified, but not yet constructed.	11/21/2017	0.21 Cond Mi of UG Cable 1 OH Switch 8 UG Switch	2019
Albatross 16kV	17	0.00188	11	0.00261	Project identified, but not yet constructed.	5/18/2017	6 Automated Switches	2018
Surfside 16kV	18	0.00184	14	0.00250	Project identified, but not yet constructed.	10/27/2016	2.2 Cond Mi Of OH Conductor 4 Automated Switches 10 BLF's	2018
Sundown 12kV	20	0.00182	1	0.00461	Project identified, but not yet constructed.	11/23/2016	7.37 Cond Mi of UG Cable 32 BLF's 2 Automated Switches 6 UG Switches Civil	2018

Circuit	i.		ii.		iii. Explanation of Repeat Deficiency	Submitted	iv. Engineering Scope	Anticipated Completion year
	2015-2017 Sys. SAIFI RANK	2015-2017 Sys. SAIFI	2014-2016 Sys. SAIFI RANK	2014-2016 Sys. SAIFI				
Galahad 16kV	22	0.00172	3	0.00350	Project identified, but not yet constructed.	11/23/2016	3.7 Cond Mi of UG Cable 2.0 Cond Mi of OH Conductor 129 BLF's 5 FI's 1 OH Switch 1 Automated Switch Civil	2018
Warriors 12kV	26	0.00167	45	0.00169	Project identified, but not yet constructed.	4/27/2017	Install 3 RIS at 3 locations Install 3 RCS+ at 3 locations Install 1 RAG at 1 location Replace 10 KPFs with Omni-rupters Install 5 fuses OCP MAT Codes: 2PS - Non 4kV (7%) Install 4 fuses	2018
Driskill 16kV	29	0.00160	16	0.00236	Project identified, but not yet constructed.	4/20/2017	11 BLF's 1 RAR 3 OH Switches 2 UG Switches 6 Automated Switch Civil	2018
Fantail 16kV	30	0.00159	13	0.00258	Project identified, but not yet constructed.	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
Landers 25kV	33	0.00149	37	0.00181	Project identified, but not yet constructed.	10/27/2016	78 BLF's 2 Automated Switches 1 RAR	2018
Malden 16kV	39	0.00139	6	0.00289	Project constructed, waiting to evaluate circuit based on post project performance.	10/27/2016	0.07 Cond Mi of UG Cable 0.49 Cond Mi of OH Conductor 6 Automated Switches 1 RFI 1 FI 118 BLF's	2017
Cuthbert 16kV	41	0.00137	23	0.00212	Project constructed, waiting to evaluate circuit based on post project performance.	1/31/2017	3 RFI's 1 RAR	2017
Fairhaven 16kV	43	0.00134	4	0.00321	Project identified, but not yet constructed.	10/27/2016	2.24 Cond Mi UG Cable 6 Automated Switches	2018

- v) A quantitative description of the utility's expectation for that circuit's future performance has not been done as SCE projects reliability improvements for WCR projects at the system level, not at the individual circuit level. For additional details, see discussion in SCE's 2018 General Rate Case Testimony, SCE-02 Volume 08, pages 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 2016 including the cause and location of the outage. (See Appendix A for wildfire requested top 10)

**Table 11 – Top 10 Major Unplanned Outage Events (2017)**

Rank	System Outage ID	Switching Center	Primary Cause Description	Description	SAIDI	Date	Number of Customers Affected	Longest Individual Customer Interruption (minutes)
1	303349	VENTURA	LOST   SOURCE   SUBSTATION	Thomas Fire	4.998	12/4/2017	181,830	1,377
2	298030	RECTOR	FIRE   OVERHEAD EQUIPMENT   CONDUCTOR/WIRE	Pier Fire	3.023	8/29/2017	1,008	32,392
3	303217	VENTURA	FIRE   STRUCTURE   POLE	Thomas Fire	2.259	12/4/2017	6,841	16,826
4	286230	RECTOR	TOPPLED/BROKEN   STRUCTURE   POLE	Snow Storm	2.045	1/22/2017	5,236	10,393
5	303315	VENTURA	FIRE   STRUCTURE   POLE	Thomas Fire	1.849	12/5/2017	4,640	19,065
6	303350	VENTURA	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	Thomas Fire	1.450	12/4/2017	85,545	262
7	301515	VALLEY	LOST   SOURCE   SUBSTATION	Public Safety Power Shutoff	0.923	12/7/2017	2,824	1,940
8	302696	VENTURA	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	Thomas Fire	0.898	12/10/2017	84,977	66
9	290334	VISTA	BALLOON   OVERHEAD EQUIPMENT   POTHEAD	Balloon Outage	0.740	4/30/2017	12,818	797
10	302693	VENTURA	LOST   SOURCE   SUBSTATION	Thomas Fire	0.622	12/4/2017	175,978	18



**SECTION 7 – SUMMARY LIST OF MED PER IEEE 1366**

Table 11 below captures all MED occurring in 2017 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 12 – Summary list of MED Per IEEE (2017)**

Cause	Wind, Vegetation Blown	TOPPLED POLE, Vegetation Blown	Vegetation Blown, OH Conductor	Fire	Storm cause Poles & Wire down	Fire	Fire	Fire, Wind, Safty power shut off	Fire
Location	R, O, SJQ, SJC	SJQ, O, MW	MW, NC, ME, O	SJQ	SJC, D, MW, ME	NC	NC	SJC, NC	NC
Outage Duration	1/20/2017	1/22/2017	2/17/2017	8/29/2017	8/31/2017	12/4/2017	12/5/2017	12/7/2017	12/10/2017
0 to 1 hour	234,505	137,695	506,345	19,516	159,066	379,481	461,012	70,058	1,206,127
1 to 5 hours	34,121	22,672	91,294	3,023	21,920	121,392	84,441	27,375	57,416
5 to 10 hours	7,845	6,823	21,112	1,063	2,163	7,564	11,634	2,032	746
10 to 15 hours	2,214	2,307	6,638	248	4,393	7,941	2,929	545	117
15 to 20 hours	465	970	3,745	72	760	27	732	80	728
20 to 24 hours	1,036	97	5,015		423	951	365	44	4
1 to 2 days	5,158	329	2,201	4	2,087	562	4,160	4,242	108
2 to 3 days	1,195	1,316	224		1	1,135	398	221	26
3 to 4 days	79	110	111			38	166	7	
4 to 5 days	3					517	314	3	11
5 to 6 days		578	1			131	244	1	
6 to 7 days		3				84	44		2
>= 7 days		10	2	951		109	524	45	11
<b>Total</b>	<b>286,621</b>	<b>172,910</b>	<b>636,688</b>	<b>24,877</b>	<b>190,813</b>	<b>519,932</b>	<b>566,963</b>	<b>104,653</b>	<b>1,265,296</b>

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 13 below captures the ten largest unplanned outage events for each of the years from 2008-2017.

**Table 13 – Historical Top 10 Outage Events (2017)**

Rank	Cause Description	System OutageID	Date	SAIDI	Number of Customers Affected	Longest Individual Customer Interruption (minutes)	Location Switching Center
<b>2017</b>							
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
<b>2016</b>							
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
<b>2015</b>							
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
<b>2014</b>							
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
<b>2013</b>							
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
<b>2012</b>							
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
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

Rank	Cause Description	System Outage ID	Date	SAIDI	Number of Customers Affected	Longest Individual Customer Interruption (minutes)	Location Switching Center
<b>2011</b>							
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
<b>2010</b>							
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
<b>2009</b>							
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
<b>2008</b>							
1	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	95472	7/2/2008	1.980	83,116	869	VENTURA
2	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	95488	7/2/2008	1.131	39,023	325	VENTURA
3	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	95625	7/3/2008	0.815	45,604	87	VENTURA
4	OPEN FOR REPAIRS   STANDARD OPERATION   OPERATOR/CREW	90296	6/16/2008	0.768	19,568	194	MESA
5	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	95867	7/7/2008	0.723	45,670	77	VENTURA
6	UNKNOWN   STRUCTURE   SUBSTATION STRUCTURE/RACK	78460	1/24/2008	0.632	1,116	4,343	VISTA
7	UNKNOWN   OVERHEAD EQUIPMENT   CONDUCTOR/WIRE	104308	12/17/2008	0.504	3,327	5,703	VALLEY
8	OTHER-SEE NOTES   STRUCTURE   SUBSTATION STRUCTURE/RACK	76338	1/7/2008	0.489	7,523	417	VINCENT
9	UNKNOWN   OVERHEAD EQUIPMENT   SPLICE/CONNECTOR/TAP	79988	2/23/2008	0.468	4,136	733	EL NIDO
10	OPEN FOR REPAIRS   STANDARD OPERATION   OPERATOR/CREW	77991	1/24/2008	0.453	22,147	6,183	VISTA

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

In 2017, SCE received a total of 41 customer inquiries relating to circuit outage history or reliability data. SCE responded to 24% of the inquiries within 7 business days, 61% of the inquiries within 15 business days and 15% were greater than 15 business days.

## Appendix-A

Section 6 of this report captures the Top 10 Major Unplanned Outage Events Within A Reporting Year. As part of a 2018 request, SCE is providing additional detailed information for the Top 10 Major Unplanned Outage Events as detailed below:

- (i) A description of the event (cause, location, etc.)
- (ii) Dates of the event
- (iii) The number of customer affected by the event
- (iv) Longest customer interruption in hours
- (v) # of utility staff and other utility staff (mutual assistance) to restore service
- (vi) Coordination with other electric, gas, and telecommunication companies
- (vii) The number of customers who have repeated power interruptions during the event (due to weather, equipment failure, etc.)
- (viii) The number of customers whose power was interrupted in order to restore power service.
- (ix) The number of customer without power during the event in hourly interval
- (x) The factors that affect the restoration of power (lesson-learned, communication, safety, access, weather, etc.)
- (xi) Estimated cost for the utility to restore electric services for the event

Table 14 provides responses for items (i), (ii), (iii), (iv), (vii) and (viii), table 15 provides responses for items (v), (vi), (x), and (xi), and table 16 provides responses for item (ix).

**Table 14 – Top 10 Major Unplanned Outage Events (2017)**

(i) Ranking	(i) System Outage ID	(i) Switching Center	(i) Cause Description	(i) SAIDI	(ii) Date	(iii) Number of Customers Affected	(iv) Longest Individual Customer Interruption (hours)	(viii) Customer interrupted due to restoration (Standard Operations)	(vii) Customer with Repeated power interruptions Due to Weather, equipment, etc other than standard operations
1	303349	VENTURA	LOST   SOURCE   SUBSTATION	4.998	12/4/2017	181,830	22.9	-	-
2	298030	RECTOR	FIRE   OVERHEAD EQUIPMENT   CONDUCTOR/WIRE	3.023	8/29/2017	1,008	539.9	59	-
3	303217	VENTURA	FIRE   STRUCTURE   POLE	2.259	12/4/2017	6,841	280.4	2,125	-
4	286230	RECTOR	TOPPLED/BROKEN   STRUCTURE   POLE	2.045	1/22/2017	5,236	173.2	13	2,290
5	303315	VENTURA	FIRE   STRUCTURE   POLE	1.849	12/5/2017	4,640	317.8	1,413	-
6	303350	VENTURA	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	1.450	12/4/2017	85,545	4.4	-	-
7	301515	VALLEY	LOST   SOURCE   SUBSTATION	0.923	12/7/2017	2,824	32.3	7	-
8	302696	VENTURA	FIRE   TRANSMISSION EQUIPMENT   CONDUCTOR	0.898	12/10/2017	84,977	1.1	-	-
9	290334	VISTA	BALLOON   OVERHEAD EQUIPMENT   POTHEAD	0.740	4/30/2017	12,818	13.3	-	-
10	302693	VENTURA	LOST   SOURCE   SUBSTATION	0.622	12/4/2017	175,978	0.3	-	-

**Table 15 – Top 10 Major Unplanned Outage Events (2017)**

(i) Ranking	(i) System Outage ID	(v) #of Utility Staff & Other Staff	(vi) Coordination with other electric, gas and telecommunications	(x) Factors that affect restoration	(xi) Estimated Cost for the utility to restore electric services
1	303349	Approximately 900 SCE personnel were involved in the restoration process. We did not use mutual assistance during the wildfires but we did conduct a mutual assistance call with neighboring utilities in preparation for calling in assistance. However, we did not end up asking for any help. SCE has 3 mutual assistance agreements (State, Regional and National).	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity and safe access issues delayed restoration	Thomas Fire Inception to Date <sup>1</sup> Costs: Approximately \$48,415,000.00. Costs include both incremental and non-incremental costs. If SCE files for CEMA recovery, only incremental costs will be requested. Analysis of incremental vs. non-incremental costs will occur prior to SCE's request for incremental CEMA recovery. Additional trailing costs may record that are related to these events.
2	298030	Approximately 200 SCE personnel involved in the restoration process.	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity delayed the efforts to restore power	Pier Fire Inception to Date <sup>1</sup> Costs: Approximately \$3,840,400.00. costs include both incremental and non-incremental costs
3	303217	Approximately 900 SCE personnel were involved in the restoration process. We did not use mutual assistance during the wildfires but we did conduct a mutual assistance call with neighboring utilities in preparation for calling in assistance. However, we did not end up asking for any help. SCE has 3 mutual assistance agreements (State, Regional and National).	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity and safe access issues delayed restoration	Thomas Fire Inception to Date <sup>1</sup> Costs: Approximately \$48,415,000.00. Costs include both incremental and non-incremental costs. If SCE files for CEMA recovery, only incremental costs will be requested. Analysis of incremental vs. non-incremental costs will occur prior to SCE's request for incremental CEMA recovery. Additional trailing costs may record that are related to these events.
4	286230	Approximately 14 SCE personnel	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Significant snow storm and safe access issues delayed restoration	Approximately \$811,000
5	303315	Approximately 900 SCE personnel were involved in the restoration process. We did not use mutual assistance during the wildfires but we did conduct a mutual assistance call with neighboring utilities in preparation for calling in assistance. However, we did not end up asking for any help. SCE has 3 mutual assistance agreements (State, Regional and National).	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity and safe access issues delayed restoration	Thomas Fire Inception to Date <sup>1</sup> Costs: Approximately \$48,415,000.00. Costs include both incremental and non-incremental costs. If SCE files for CEMA recovery, only incremental costs will be requested. Analysis of incremental vs. non-incremental costs will occur prior to SCE's request for incremental CEMA recovery. Additional trailing costs may record that are related to these events.

<sup>1</sup>Inception to date is 3/21/2018

(i) Ranking	(i) System Outage ID	(v) #of Utility Staff & Other Staff	(vi) Coordination with other electric, gas and telecommunications	(x) Factors that affect restoration	(xi) Estimated Cost for the utility to restore electric services
6	303350	Approximately 900 SCE personnel were involved in the restoration process. We did not use mutual assistance during the wildfires but we did conduct a mutual assistance call with neighboring utilities in preparation for calling in assistance. However, we did not end up asking for any help. SCE has 3 mutual assistance agreements (State, Regional and National).	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity and safe access issues delayed restoration	Thomas Fire Inception to Date <sup>1</sup> Costs: Approximately \$48,415,000.00. Costs include both incremental and non-incremental costs. If SCE files for CEMA recovery, only incremental costs will be requested. Analysis of incremental vs. non-incremental costs will occur prior to SCE's request for incremental CEMA recovery. Additional trailing costs may record that are related to these events.
7	301515	Approximately 38 SCE personnel	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	This was a proactive de-energization. Due to public safety to avoid a wind driven fire in the community, it was determined to proactively de-energize the circuits. Prior to energizing and to ensure public safety, SCE performed a detailed patrol on all 7 circuits. Red Flag alert was in effect and required SCE to perform patrol.	Inception to Date <sup>2</sup> Costs: Approximately \$369,000. costs include both incremental and non-incremental costs
8	302696	Approximately 900 SCE personnel were involved in the restoration process. We did not use mutual assistance during the wildfires but we did conduct a mutual assistance call with neighboring utilities in preparation for calling in assistance. However, we did not end up asking for any help. SCE has 3 mutual assistance agreements (State, Regional and National).	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity and safe access issues delayed restoration	Thomas Fire Inception to Date <sup>1</sup> Costs: Approximately \$48,415,000.00. Costs include both incremental and non-incremental costs. If SCE files for CEMA recovery, only incremental costs will be requested. Analysis of incremental vs. non-incremental costs will occur prior to SCE's request for incremental CEMA recovery. Additional trailing costs may record that are related to these events.
9	290334	Approximately 11 SCE personnel	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Crew was in process of picking up the load from an adjacent source and found that abnormal equipment prevented SCE from picking up the load. Lesson learned is to ensure that abnormal devices are repaired in a timely manner and review the distribution circuits for reliability concerns in the future.	Approximatley \$8,300
10	302693	Approximately 900 SCE personnel were involved in the restoration process. We did not use mutual assistance during the wildfires but we did conduct a mutual assistance call with neighboring utilities in preparation for calling in assistance. However, we did not end up asking for any help. SCE has 3 mutual assistance agreements (State, Regional and National).	No coordination with other gas, electric and telecommunications required for restoration efforts. However, SCE is a member of the California Utility Emergency Association (CUEA). This group includes IOU and non-IOU electric utilities, natural gas utilities, water and waste water utilities, and telecommunication companies across the state. CUEA meets quarterly and facilitates coordination across the infrastructure sectors listed above. SCE also chairs a group called the Critical Lifelines group. This group includes Federal and State response entities as well as electric, gas, water and telecommunication companies in Southern California). This group meets quarterly and is focused on Southern California.	Fire activity and safe access issues delayed restoration	Thomas Fire Inception to Date <sup>1</sup> Costs: Approximately \$48,415,000.00. Costs include both incremental and non-incremental costs. If SCE files for CEMA recovery, only incremental costs will be requested. Analysis of incremental vs. non-incremental costs will occur prior to SCE's request for incremental CEMA recovery. Additional trailing costs may record that are related to these events.

<sup>1</sup>Inception to date is 3/21/2018

<sup>2</sup>Inception to date is 3/26/2018



**Table 16 – Top 10 Hourly Interval (2017)**

Ranking	1	2	3	4	5	6	7	8	9	10
System Outage ID	303349	298030	303217	286230	303315	303350	301515	302696	290334	302693
Outage Start Hour	12/4/2017 9:00:00 PM	8/29/2017 2:00:00 AM	12/4/2017 9:00:00 PM	1/22/2017 8:00:00 AM	12/5/2017 8:00:00 AM	12/4/2017 9:00:00 PM	12/7/2017 11:00:00 AM	12/10/2017 1:00:00 AM	4/30/2017 10:00:00 PM	12/4/2017 10:00:00 PM
0 - 1 Hour	181830	949	4716	2874	3227	85545	2824	84977	12818	175978
1 - 2 Hour	82731	949	4716	1948	3227	28594	2824	75172	12818	0
2 - 3 Hour	82731	949	4716	1948	3227	28594	2824	0	9412	0
3 - 4 Hour	82731	949	4716	1948	2500	28594	2824	0	5072	0
4 - 5 Hour	74332	949	4716	1948	2500	28594	2824	0	3924	0
5 - 6 hour	71828	949	4716	1948	2500	28578	2824	0	3924	0
6 - 7 Hour	10827	949	4716	1948	2500	0	2824	0	3071	0
7 - 8 Hour	10827	949	4716	1948	2500	0	2824	0	3071	0
8 - 9 Hour	7282	949	4716	1948	2500	0	2822	0	3071	0
9 - 10 Hour	7282	949	3161	1948	2500	0	2822	0	3071	0
10 - 11 Hour	7282	949	3161	1948	1430	0	2822	0	3071	0
11 - 12 Hour	5605	949	3161	1948	1430	0	2822	0	3071	0
12 - 13 Hour	2942	949	3161	1948	1430	0	2822	0	3071	0
13 - 14 Hour	908	949	3161	1948	1430	0	2822	0	3071	0
14 - 15 Hour	908	949	3161	1948	1430	0	2822	0	0	0
15 - 16 Hour	908	949	1165	1948	1430	0	2822	0	0	0
16 - 17 Hour	908	949	1165	1948	1430	0	2822	0	0	0
17 - 18 Hour	908	949	1165	1948	1430	0	2822	0	0	0
18 - 19 Hour	908	949	3161	1948	1430	0	2822	0	0	0
19 - 20 Hour	908	949	3161	1948	1430	0	2822	0	0	0
20 - 21 Hour	908	949	3161	1948	2157	0	2822	0	0	0
21 - 22 Hour	908	949	3161	1948	1256	0	2822	0	0	0
22 - 23 Hour	908	949	3161	1948	1093	0	2822	0	0	0
23 - 24 Hour	98	949	3161	1948	1093	0	2817	0	0	0
After 24 Hour (includes interruptions started at later days/Hours)	0	1008	3290	4310	1779	0	2817	0	0	0

## Appendix-B

### 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 $\geq 4$ 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.