

# Memo



**Date:** December 7, 2009  
**To:** Kevin Stewart  
**From:** Markus Ritsch  
**Subject:** November 2009 ALERT Data Analysis

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## I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's Nova Star 4.0 base station (ALERT 2) were analyzed for the period November 1 through November 30, 2009.

## II. General System Analysis Summary

A total of 294,473 ALERT data reports were analyzed from the ALERT 2 base station. Meteorological sensors account for 85 percent, water level sensors 3 percent, and rain sensors 2 percent of the total monthly records.

The system-wide radio traffic loading was 9,816 reports per day with an average hourly loading of 409 reports. The peak hourly traffic loading was 868 reports, which occurred on November 1, between 1:00 AM and 2:00 AM. A plot of monthly average and peak hourly traffic loading is provided.

### A. Specific Issues Identified this Month

The performance of the following sensors, highlighted in yellow (Table 1), was unacceptable this month.

**Table 1. Rain Sensors with Unacceptable Performance Characteristics**

Rain ID	Description	Timer	Event	Comments
310	Guy Hill Ranch	0.58	1.0	Large number of invalid rain reports
700	Toll Gate at 6th	0.97	0.20	Poor timer performance, large jump in count
920	Aurora Town Hall Wx	0.47	1.0	Poor timer performance and large number of invalid reports
1420	Diamond Hill	0.92	0.96	Large number of invalid reports
1440	Elbert	0.92	0.57	Poor event performance
1460	Urban Farm	0.42	0.18	Poor overall performance
1480	Third Creek at DIA	0.90	0.20	Poor overall performance
1520	Marston Lake North	0.8	0.25	Poor event performance
1530	Bear Creek @ Lowell	0.05	--	Large number of invalid reports
2210	Hiwan G.C.	0.88	0.43	Poor event performance
2900	Russelville Gulch	0.95	0.83	New amplifier installed 11/2/2009 – improved!
2970	Rampart Range Rd	0.88	1.0	Testing new RF path direct to Diamond Hill – improved!
4030	Red Garden	0.70	0.91	Poor timer performance and large number of invalid reports
4330	Indian Ruins	0.68	0.29	Poor timer performance and large number of invalid reports

### III. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-hour timer-reporting interval. System-wide, the ALERT 2 base station received approximately 90 percent of the non-incrementing timer reports. The worst performing rain sensors for the month are summarized (Table 2).

**Table 2. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)**

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec
2850	4030	2840	1360	1350	2900	2270	1350	920	2970	220	
1650	4200	1020	1640	2850	2270	2370	920	1700	920	300	
1810	4490	1040	2270	2270	2850	2850	2360	2970	700	440	
4250	4520	1720	1600	410	410	1350	2350	2900	2920	510	
4790	4790	1030	2850	540	540	1530	2900	4330	1480	520	
4300	4020	1550	1350	2320	1350	110	1460	1480	2900	530	

\*-Timer statistics are skewed in these months because system start-up/shut-down occurs. The rain/stage network is operational between April 1 and October 15. Only the weather stations remain operational throughout the year.

Sensor ID 1460 and 700 have a 24-hour timer-reporting interval and Sensor ID 1810 and 1640 have an 18-hour timer-reporting interval.

Sensors identified as having poor timer performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

### IV. Rain Sensor Event Reporting Summary

#### A. District-Wide Total Tip/Count Statistics

The incrementing reports from all 1-mm rain sensors were analyzed to quantify the District-wide statistical total monthly tip summary (Table 3).

**Table 3. District-Wide Total Tip/Count Statistical Summary**

Statistical Parameter	Value	Comments
Mean	11	Only the 1-mm rain sensors were included in the analysis
Median	11	Only the 1-mm rain sensors were included in the analysis
Standard deviation	5.65	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	27.95	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	Niver Detention (ID 1900)
Maximum total count	23	Maple Grove Res. And Diamond Hill (ID 1000 and 1420)

#### B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 4).

**Table 4. Monthly Summary of District-Wide Mean Total 1-mm Tip/Count**

Year	Jan	Feb	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec	Ave
2006	4.62	5.92	18.39	20.47	19.44	13.75	74.03	46.89	24.17	41.13	5.04	16.45	24.19
2007	11.56	5.40	29.75	65.03	68.30	15.87	36.20	46.38	22.13	29.50	6.54	11.29	29.00
2008	4.05	7.38	12.26	20.57	54.82	26.06	16.43	90.20	37.54	19.59	2.82	9.24	25.08
2009	6.33	3.11	11.37	59.26	63.45	68.00	65.00	20.00	27.29	30.24	11.00		

\*-Event statistics are skewed in these months because system start-up/shut-down occurs. The rain network is operational between April 1 and October 15. Only the weather stations remain operational throughout the year.

### C. Sensors with a Jump of Six or More in the Sequential Count

Several sensors experienced a large jump in the sequential tip count (Table 5).

**Table 5. Sensors with a Jump of More than 6 in Sequential Count**

Sensor Description	Sensor ID	Comment
Urban Farm	1460	One large jump between 11/14 and 11/15
Third Creek at DIA	1480	One large jump between 11/12 and 11/18
Marston Lake North	1520	One large jump between 11/17 and 11/17
Indian Ruins	4330	One large jump between 11/16 and 11/17

### D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 85 percent. A total of 893 incrementing reports were received and a total of 1,056 were expected. The total loss of incrementing reports for the month was approximately 15 percent. Those sensors with the worst event transmission performance are summarized (Table 6).

**Table 6. Monthly Summary of Sensors with the Most Missed Tips**

Jan	Feb*	Mar*	Apr**	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec
140	4030	860	860	110	2900	2900	2900	2900	1570	1460	
4490	4470	840	840	1350	540	2320	2810	1460	2210	700	
1420	4490	700	1640	2320	2320	2820	2320	1570	1480	1480	
4040	4110	2840	2850	2850	110	110	2820	1440	1460	1520	
4160	4510	1340	700	540	1350	1350	1350	1520	1520	4330	
4470	4790	920	1350	1810	2350	2370	1640	4330	220	2210	

\* - Event statistics are poor in February, March, and October due to system start-up.

\*\* - Poor event performance is evident at every station because the ALERT2 base station was unable to receive data for part of this month.

Sensors identified as having poor event performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

## V. Heavy Radio Traffic Analysis

Periods exceeding 500 messages per hour were analyzed independently in an attempt to quantify data loss rates from rain sensors using the sequential tip count series.

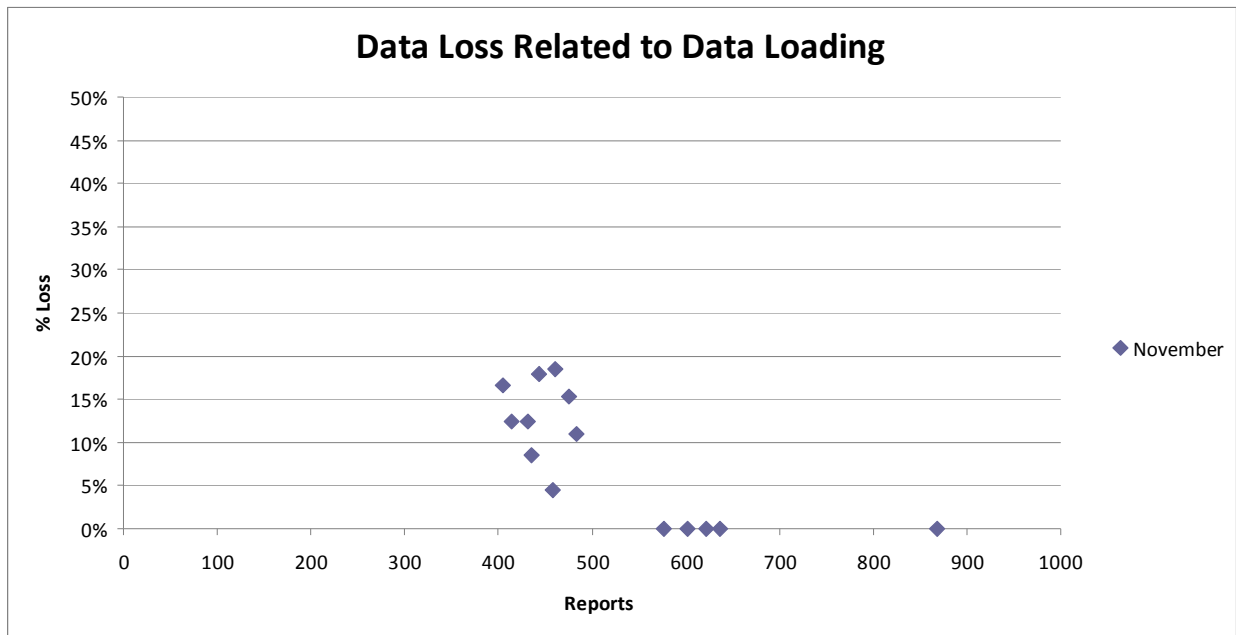
### A. The Heaviest Hourly Traffic Periods This Month

The hours of highest radio traffic this month are shown (Table 7).

**Table 7. Heavy Radio Traffic Periods**

Peak Traffic Periods	Reports/hour	Hour Beginning
Peak Hourly Traffic	868	11/9/2009 1:00 AM
2nd Max	637	11/23/2009 3:00 PM
3rd Max	622	11/13/2009 4:00 PM
4th Max	602	11/13/2009 3:00 PM
5th Max	577	11/16/2009 10:00 PM

Each hour exceeding 500 reports was analyzed to quantify the number of missing rain reports for that hour (Figure 1). The following plot shows the loss of data as a function of data loading.



**Figure 1. Data Loss vs. Data Loading**

## VI. Unknown Device Analysis – Received Data Log

The ALERT IDs present in the audio signal received by the decoder are compared against a list of “active” device IDs that are defined within NovaStar. Those IDs received by the decoder that are not defined within NovaStar are considered to be “unknown” and may be the result of radio noise or problems with the telemetry system. The reception of “unknown” device reports for the month is summarized (Table 8).

**Table 8. Summary of Unknown IDs**

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	387
Total reports from unknown IDs	990
Unknown IDs with only a single received report (potential noise)	221
Total reports from all IDs – RecData Log entire month	294,473
Unknown reports as a fraction of total reports	0.34%

The total number of reports from unknown sensors is very small relative to the total reports received for the month.

A number of “unknown” sensors had multiple reports, which may indicate the existence of a transmitter that is sending information on an ID that is not currently defined within NovaStar. The unknown IDs with multiple reports including the number of reports received by each are shown (Table 9).

**Table 9. Reports Received by Unknown IDs**

Unknown Sensor ID	Number of Reports
1479	26
1470	25
1423	24
1934	20
1529	18
1953	16
1926	14
1458	13
1443	13
1446	12
2748	11
208	11
1534	10
1954	10
1919	10
1949	9
2745	9
2811	9
4031	9
1933	8
914	8
2768	8
2716	8
414	8
152	8
1950	8
1531	8
206	8
1166	7
1454	7
2754	7
1651	7
1415	7
2705	7
1165	6
1486	6
1587	6
2715	6
1918	5
4469	5
1502	5
1915	5
2771	5
1947	5
4094	5
201	5
1930	5
202	5
2808	5
153	5
1450	5
910	4
912	4
4039	4
1430	4
2714	4
4093	4
1457	4
4029	4
2784	4
1449	4
1453	4
2775	4
1167	4
4047	4
412	4
4836	4
1501	4
4856	4
796	4
2329	4
909	4

The “unknown” device reports are analyzed temporally to understand when they are received during the day (Table 10). The goal of this analysis is to determine a pattern of occurrence that may correspond to a source of noise in the system, such as the use of a wireless microphone nearby.

**Table 10. Temporal Distribution of Unknown Reports**

Hour (AM)	Reports	Hour (PM)	Reports
0:00-00:59	55	12:00-12:59	44
1:00-1:59	61	1:00-1:59	41
2:00-2:59	55	2:00-2:59	37
3:00-3:59	33	3:00-3:59	48
4:00-4:59	37	4:00-4:59	24
5:00-5:59	50	5:00-5:59	33
6:00-6:59	36	6:00-6:59	33
7:00-7:59	45	7:00-7:59	16
8:00-8:59	35	8:00-8:59	43
9:00-9:59	15	9:00-9:59	46
10:00-10:59	41	10:00-10:59	37
11:00-11:59	70	11:00-11:59	55

## VII. Sensors with Invalid Reports

The following precipitation sensors had a large number of invalid reports (bit flip/contention errors/random decode):

Sensor ID	Description	July Reports	August Reports	Sept Reports	Oct Reports	Nov Reports
310	Guy Hill Ranch	0	0	3	2	5
900	Aurora Reservoir	0	0	0	5	1
920	Aurora Town Hall Wx	3	0	1	16	16
1420	Diamond Hill	0	0	0	3	6
1460	Urban Farm	0	0	0	3	0
1530	Bear Creek at Lowell	2	5	0	8	9
2210	Hiwan G.C.	12	6	2	0	3
2230	Bear Cr below Cub	6	3	3	0	0
2320	Choke Cherry Resvr	8	3	3	3	3
2810	Pine Cliff Road	6	0	0	2	0
2820	Haskins Gulch Conf	5	4	0	0	0
2860	CC at Stroh Rd	3	7	1	0	0
4030	Red Garden	2	4	3	4	2
4070	Bear Peak	0	0	3	1	3
4330	Indian Ruins	0	0	7	5	1
4790	Button Rock	0	0	3	0	1



The following rainfall intensity summary is presented to corroborate the rainfall rate alarms.

<b>10 Minute Peak Intensities</b>				
<b>Station</b>	<b>Date</b>	<b>Tips</b>	<b>Inches</b>	<b>in/hr</b>
1340	11/2/09	9	0.354	2.126
1520	11/17/09	9	0.354	2.126
1480	11/18/09	8	0.315	1.890
1460	11/15/09	7	0.276	1.654
700	11/17/09	6	0.236	1.417
1350	11/13/09	6	0.236	1.417
1460	11/14/09	5	0.197	1.181
1520	11/16/09	5	0.197	1.181
1900	11/3/09	5	0.197	1.181
300	11/3/09	4	0.157	0.945
700	11/15/09	4	0.157	0.945
2210	11/16/09	4	0.157	0.945
4240	11/16/09	4	0.157	0.945
540	11/4/09	3	0.118	0.709
1440	11/16/09	3	0.118	0.709
1460	11/16/09	3	0.118	0.709
2210	11/17/09	3	0.118	0.709
4090	11/16/09	3	0.118	0.709
4250	11/16/09	3	0.118	0.709
4260	11/16/09	3	0.118	0.709
4310	11/16/09	3	0.118	0.709



# General System Analysis

**Database Name**

P:\A207-UDFCD-Data-Analysis\2009\11-2009\Novastar\_extract\_2009Nov.mdb

**First Date in Database**

11/1/09 12:00 AM
11/30/09 11:59 PM

**Total Days**

30.0
720.0

**Last Date in Database**

**Total Hours**

**Total Records Analyzed**

294473

## Records by Group

Temperature	55716	19%
Relative Humidity	54286	18%
Wind Gust	43365	15%
Barometric Pressure	24419	8%
Wind Speed Average & Azimuth	22268	8%
Wind Direction	21103	7%
Wind Speed Average	20517	7%
Solar Radiation	8926	3%
Precipitation	6369	2%
Fuel Temperature	5913	2%
Fuel Moisture	5905	2%
Water Level PT-HSE	5454	2%
Battery Voltage HSE	4072	1%
Water Level Float	3630	1%
Battery Voltage Analog	3486	1%
Battery Voltage Digital	2589	1%
Repeater Status Report	2237	1%
Battery	1028	0%
Water Level PT	783	0%
Repeater Pass List	597	0%
12Hr Status Report	347	0%
Soil Moisture	95	0%
Wing Gust	95	0%
Battery Voltage	91	0%
Solar Power	17	0%
Handar 585 ALARM Status	15	0%
Hayman Battery	1	0%
<b>Total</b>	<b>293324</b>	

## Records by Major Group

Meteorologic Sensors	250600	85%
Sensor Status Transmissions	13360	5%
Soil and Fuel Sensors	11913	4%
Water Level Sensors	9867	3%
Rain Sensors	6369	2%
<b>Total</b>	<b>292109</b>	

## Records by Validation Type

Good	0	293793	99.77%
		680	0.23%
<b>Total</b>		<b>294473</b>	

## Sensors With Most Invalid Data

Description	Sensor	Reports
Cal-Wood Ranch	4774	71
Elbert	1437	61
Quincy Reservoir	755	49
Castle Rock	2744	38
Ward C-1	4704	25

## Traffic Loading Summary

Alert Reports	294473	
Average Daily Traffic	9816	
Average Hourly Traffic	409	
Median Hourly Traffic	403	hour beginning
Peak Hourly Traffic	868	11/1/09 1:00 AM
2nd Max	637	11/23/09 3:00 PM
3rd Max	622	11/13/09 4:00 PM
4th Max	602	11/13/09 3:00 PM
5th Max	577	11/16/09 10:00 PM

# Rain Timer Performance

# n Timer Performance

Analyze Rain Sensors

12:26

Ave

0.63697479

Sensor ID	Description	Rcv	Average Timer Interval	Exp	Performance
120	West Woods	34	13:09	60.00	57%
140	Blue Mountain	56	12:40	60.00	93%
150	Nott Creek	46	12:31	60.00	77%
220	Upper Leyden	10	1:03	60.00	17%
300	Van Bibber Park	4	11:57	60.00	7%
310	Guy Hill Ranch	35	16:39	60.00	58%
440	Fire Station #7	6	11:57	60.00	10%
510	Virginia Court	6	11:57	60.00	10%
520	Jewell Detention	5	14:57	60.00	8%
530	Fire Station #19	6	11:57	60.00	10%
540	Parker/Mississippi	5	14:56	60.00	8%
620	Quincy/Highline	9	11:57	60.00	15%
700	Toll Gate @ 6th	26	1:02	60.00	43%
750	Quincy Reservoir	58	11:56	60.00	97%
760	Mission Viejo Park	5	14:57	60.00	8%
830	Side Creek Park	6	11:57	60.00	10%
900	Aurora Reservoir	55	13:03	60.00	92%
920	Aurora Town Hall Wx	28	22:36	60.00	47%
940	Sampson Gulch	2	11:56	60.00	3%
970	Pump Sta 3	55	12:13	60.00	92%
1000	Maple Grove Resv.	56	12:35	60.00	93%
1010	Denver West	2	11:57	60.00	3%
1030	NREL/S. Table Mtn.	7	17:55	60.00	12%
1050	Jeffco Fairgrounds	2	11:57	60.00	3%
1060	Heritage Square	44	12:48	60.00	73%
1100	Louisville Rec Ctr	51	11:26	60.00	85%
1110	Gunbarrel	10	13:16	60.00	17%
1200	Broomfield 3207	40	11:17	60.00	67%
1300	Hidden Lake	4	11:58	60.00	7%
1310	LDC at 64th	35	12:46	60.00	58%
1320	SPR at 3rd Ave	2	11:57	60.00	3%
1340	Sanderson at Xavier	3	11:59	60.00	5%
1350	Chatfield COE	5	9:28	60.00	8%
1370	West Metro FS13	3	17:59	60.00	5%
1400	Upper Sloan Det.	4	11:57	60.00	7%
1420	Diamond Hill	55	12:44	60.00	92%
1440	Elbert	55	12:00	60.00	92%
1460	Urban Farm	25	0:39	60.00	42%
1480	Third Creek at DIA	54	9:47	60.00	90%
1520	Marston Lake North	48	13:32	60.00	80%
1530	Bear Creek @ Lowell	3	11:57	60.00	5%
1550	Lakewood CC	52	13:16	60.00	87%
1570	Brighton Ditch Wx	59	11:35	60.00	98%
1640	SPR at Union Ave.	57	12:28	60.00	95%
1660	SPR at Henderson	56	12:02	60.00	93%
1710	Shop Creek	10	12:00	60.00	17%
1720	Cherry Cr @ Steele	10	11:57	60.00	17%
1810	Sand Creek at mouth	57	12:11	60.00	95%
1900	Niver Detention	3	11:57	60.00	5%
1920	Brighton	57	11:20	60.00	95%
2190	Squaw Mountain	57	12:13	60.00	95%
2210	Hiwan G.C.	53	12:29	60.00	88%
2230	Bear Cr below Cub	4	19:54	60.00	7%
2240	Cold Sprg Glch conf	3	17:57	60.00	5%
2250	Rosedale	5	14:56	60.00	8%
2260	Brook Forest	5	14:56	60.00	8%
2270	Cub Cr below Blue	5	14:57	60.00	8%

2280	Kinney Peak	4	11:56	60.00	7%
2310	Genesee Village	6	11:56	60.00	10%
2320	Choke Cherry Resvr	229		60.00	
2330	Morrison	59	12:12	60.00	98%
2340	El Rancho	5	11:57	60.00	8%
2350	Idledale	4	11:56	60.00	7%
2360	Indian Hills	4	11:56	60.00	7%
2370	Red Rocks Park	4	11:57	60.00	7%
2710	Highlands Ranch WTP	57	12:28	60.00	95%
2730	Salisbury Park	59	12:00	60.00	98%
2750	Castle Rock	56	12:26	60.00	93%
2900	Russelville Gulch-Douglas	57	12:00	60.00	95%
2930	Spring Valley Rd - DougCnty	59	12:00	60.00	98%
2970	Rampart Range Rd	53	13:12	60.00	88%
2990	Tomah Rd-Douglas Cnty	59	12:12	60.00	98%
3020	West Creek WX	57	12:13	60.00	95%
4010	Crescent	55	13:07	60.00	92%
4020	Rio Grande	58	12:10	60.00	97%
4030	Red Garden	42	12:34	60.00	70%
4040	Martin Gulch	58	12:11	60.00	97%
4050	Walker Ranch	56	12:25	60.00	93%
4060	Lakeshore	45	15:02	60.00	75%
4070	Bear Peak	56	12:34	60.00	93%
4080	Twin Sisters	53	13:09	60.00	88%
4090	Magnolia	52	13:27	60.00	87%
4100	Filter Plant	56	12:13	60.00	93%
4110	Betasso	55	12:56	60.00	92%
4130	Swiss Peaks	50	13:44	60.00	83%
4140	Logan Mill	52	13:24	60.00	87%
4150	Gold Hill	54	13:09	60.00	90%
4160	Sunshine	58	12:10	60.00	97%
4170	Pine Brook	52	13:29	60.00	87%
4180	Gold Lake	57	12:38	60.00	95%
4190	Slaughterhouse	56	12:41	60.00	93%
4200	Lazy Acres	56	12:40	60.00	93%
4220	Fling's	55	12:25	60.00	92%
4230	Golden Age	57	12:24	60.00	95%
4240	Sunset	40	15:44	60.00	67%
4250	Geer Canyon	56	12:38	60.00	93%
4260	Taylor Mountain	59	11:58	60.00	98%
4270	Cannon Mountain	55	12:41	60.00	92%
4290	Red Hill	56	12:26	60.00	93%
4300	Big Elk Park	58	11:46	60.00	97%
4310	Johnny Park	55	12:30	60.00	92%
4330	Indian Ruins	41	16:03	60.00	68%
4340	Riverside	57	12:14	60.00	95%
4350	Conifer Hill	57	12:26	60.00	95%
4360	Justice Center	58	12:10	60.00	97%
4470	Little Narrows	52	12:44	60.00	87%
4490	Apple Valley	57	12:24	60.00	95%
4510	Pinewood Springs	52	13:49	60.00	87%
4520	Eagle Ridge	60	12:00	60.00	100%
4530	Winiger Ridge	51	13:47	60.00	85%
4550	Boulder Jail	58	12:10	60.00	97%
4570	St. Antons	51	13:57	60.00	85%
4710	Ward C-1	49	14:10	60.00	82%
4730	Sugarloaf	56	12:41	60.00	93%
4750	Louisville Lake	55	12:28	60.00	92%
4770	Cal-Wood Ranch	56	12:40	60.00	93%
4790	Button Rock	58	12:13	60.00	97%
4810	Shanahan Ridge	56	12:41	60.00	93%
4820	Doudy Draw	54	12:56	60.00	90%
4830	SBC @ San Souci	57	12:24	60.00	95%

Rain Event Performance				Analyze Rain Sensors										
	Systemwide Avg	Reports Received	893											
	84.56%	Total Tips	1,056											
		Data Loss	15.44%											
Rain ID	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket	
1460	18%	0	1	1	0	1	0	1	3	17	7	0	0.0393701	
700	20%	0	0	0	1	0	1	0	2	10	8	0	0.0393701	
1480	20%	2	0	0	0	0	0	1	2	10	0	0	0.0393701	
1520	25%	2	2	0	0	1	0	1	5	20	6	0	0.0393701	
4330	29%	5	0	0	0	0	0	1	5	17	0	0	0.0393701	
1350	38%	2	0	0	0	0	1	0	3	8	5	0	0.0393701	
1900	40%	1	0	0	1	0	0	0	2	5	3	0	0.0393701	
2210	43%	1	3	1	1	0	0	0	6	14	8	0	0.0393701	
1340	44%	2	1	0	0	1	0	0	4	9	5	0	0.0393701	
4240	46%	3	1	0	2	0	0	0	6	13	7	0	0.0393701	
300	50%	1	0	1	0	0	0	0	2	4	2	0	0.0393701	
1440	57%	2	1	1	0	0	0	0	4	7	3	0	0.0393701	
970	60%	1	2	0	0	0	0	0	3	5	2	0	0.0393701	
540	67%	1	1	0	0	0	0	0	2	3	1	1	0.0393701	
2930	67%	2	2	0	0	0	0	0	4	6	2	0	0.0393701	
4140	71%	6	4	0	0	0	0	0	10	14	4	0	0.0393701	
4170	75%	4	2	0	0	0	0	0	6	8	2	0	0.0393701	
4220	76%	9	4	0	0	0	0	0	13	17	4	0	0.0393701	
220	80%	3	1	0	0	0	0	0	4	5	1	0	0.0393701	
4510	81%	10	3	0	0	0	0	0	13	16	3	0	0.0393701	
4090	82%	8	0	1	0	0	0	0	9	11	2	0	0.0393701	
4250	82%	11	3	0	0	0	0	0	14	17	3	0	0.0393701	
1310	83%	12	3	0	0	0	0	0	15	18	3	0	0.0393701	
2900	83%	8	2	0	0	0	0	0	10	12	2	0	0.0393701	
4010	83%	8	2	0	0	0	0	0	10	12	2	0	0.0393701	
4070	83%	8	2	0	0	0	0	0	10	12	2	0	0.0393701	
4490	83%	8	2	0	0	0	0	0	10	12	2	0	0.0393701	
4060	85%	9	2	0	0	0	0	0	11	13	2	0	0.0393701	
4340	85%	9	2	0	0	0	0	0	11	13	2	1	0.0393701	
4150	87%	11	2	0	0	0	0	0	13	15	2	0	0.0393701	
4470	87%	11	2	0	0	0	0	0	13	15	2	0	0.0393701	
4080	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701	
4260	88%	12	2	0	0	0	0	0	14	16	2	0	0.0393701	
4520	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701	
4750	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701	
4530	88%	13	2	0	0	0	0	0	15	17	2	0	0.0393701	
4050	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701	
4230	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701	
4820	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701	
4810	89%	15	2	0	0	0	0	0	17	19	2	0	0.0393701	
1550	91%	18	2	0	0	0	0	0	20	22	2	0	0.0393701	
4030	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701	
4730	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701	
4300	92%	10	1	0	0	0	0	0	11	12	1	0	0.0393701	
2320	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701	
4200	93%	12	1	0	0	0	0	0	13	14	1	0	0.0393701	
4350	93%	12	1	0	0	0	0	0	13	14	1	0	0.0393701	
4790	93%	12	1	0	0	0	0	0	13	14	1	0	0.0393701	
4110	93%	13	1	0	0	0	0	0	14	15	1	0	0.0393701	
4290	94%	14	1	0	0	0	0	0	15	16	1	0	0.0393701	
4190	94%	15	1	0	0	0	0	0	16	17	1	0	0.0393701	
4310	94%	15	1	0	0	0	0	0	16	17	1	0	0.0393701	
1640	94%	16	1	0	0	0	0	0	17	18	1	0	0.0393701	
4360	95%	19	1	0	0	0	0	0	20	21	1	0	0.0393701	
4840	95%	19	1	0	0	0	0	0	20	21	1	0	0.0393701	
1000	96%	21	1	0	0	0	0	0	22	23	1	0	0.0393701	
1420	96%	21	1	0	0	0	0	0	22	23	1	0	0.0393701	
120	100%	19	0	0	0	0	0	0	19	19	0	0	0.0393701	
140	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701	
150	100%	18	0	0	0	0	0	0	18	18	0	0	0.0393701	
310	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701	
510	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
530	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
750	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701	
900	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393699	
920	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
1050	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
1060	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701	
1100	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701	
1200	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	
1660	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701	
1810	100%	14	0	0	0	0	0	0	14	14	0	0	0.0393701	
1920	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701	

2190	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2270	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
2280	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2330	100%	14	0	0	0	0	0	0	0	14	14	0	0	0.0393701
2340	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
2710	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
2730	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
2750	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
2970	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
2990	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
3020	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
4020	100%	13	0	0	0	0	0	0	0	13	13	0	0	0.0393701
4040	100%	17	0	0	0	0	0	0	0	17	17	0	0	0.0393701
4100	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
4130	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
4160	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
4180	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
4270	100%	14	0	0	0	0	0	0	0	14	14	0	0	0.0393701
4550	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
4570	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
4710	100%	11	0	0	0	0	0	0	0	11	11	0	0	0.0393701
4770	100%	11	0	0	0	0	0	0	0	11	11	0	0	0.0393701
4830	100%	16	0	0	0	0	0	0	0	16	16	0	0	0.0393701
	<b>Total Tips</b>	<b>798</b>	<b>80</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>893</b>	<b>1,056</b>	<b>127</b>	<b>2</b>		

# Monthly Traffic Loading

