

Memo

Date: September 11th, 2017
To: Kevin Stewart
From: Markus Ritsch
Subject: August 2017 ALERT Data Analysis

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's NovaStar 5 base station were analyzed for the period August 1 through August 31, 2017.

II. General System Analysis Summary

The District receives data through both the legacy ALERT channel and through the ALERT2 (concentrator plus A2 self-reports) channel. The following (Table 1) quantifies the data reports received by each channel.

Table 1. Reception of Data at Diamond Hill (Legacy, ALERT2 and Concentrator Reports from Recdatalog)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Legacy	234,074	212,539	255,638	218,706	286,772	253,292	257,529	260,532					1,979,082
Concentrator	361,187	367,684	388,156	352,903	463,501	398,350	397,942	413,748					3,143,471
ALERT2	327,977	422,710	422,580	480,051	562,023	600,824	612,240	610,314					4,038,719
TOTAL	923,238	1,002,933	1,066,374	1,051,660	1,312,296	1,252,466	1,267,711	1,284,594	0	0	0	0	9,161,272
Conc/Leg	1.54	1.73	1.52	1.61	1.62	1.57	1.55	1.59	0.00	0.00	0.00	0.00	1.59
DataChron	668,091	637,926	741,413	693,903	830,649	793,158	800,743	812,069					5,977,952

The District operates two NovaStar5 base stations: the primary (ns5a) at Diamond Hill and a redundant base (ns5b) at Greenhouse Data. Additional analyses are conducted on the data received by these two base stations (Table 2). The data received by both base stations for the month are shown below.

Table 2. Comparison of Data Reception by ns5a and ns5b

NS5A (Diamond Hill)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Legacy	234,074	212,539	255,638	218,706	286,772	253,292	257,529	260,532					1,979,082
Concentrator	361,187	367,684	388,156	352,903	463,501	398,350	397,942	413,748					3,143,471
ALERT2	327,977	422,710	422,580	480,051	562,023	600,824	612,240	610,314					4,038,719
NS5B (Greenhouse)													
Legacy	234,037	211,806	255,357	259,950	287,868	252,952	255,279	260,663					2,017,912
Concentrator	360,898	364,788	387,844	381,946	464,402	398,240	394,334	412,914					3,165,366
ALERT2	327,807	419,042	422,268	519,970	564,128	600,850	606,870	609,854					4,070,789
Diff (NS5a-NS5b)													
Legacy (Digi One)	37	733	281	-41,244	-1096	340	2250	-131	0	0	0	0	-38,830
Concentrator (B2010)	289	2,896	312	-29,043	-901	110	3608	834	0	0	0	0	-21,895
ALERT2 (B2010)	170	3,668	312	-39,919	-2105	-26	5370	460	0	0	0	0	-32,070
Comments		GH network outage on Feb 8		DH network outage on Apr 8, 9, and 16			GH network outage on July 30						

The daily ratio of concentrator to legacy reports is shown.

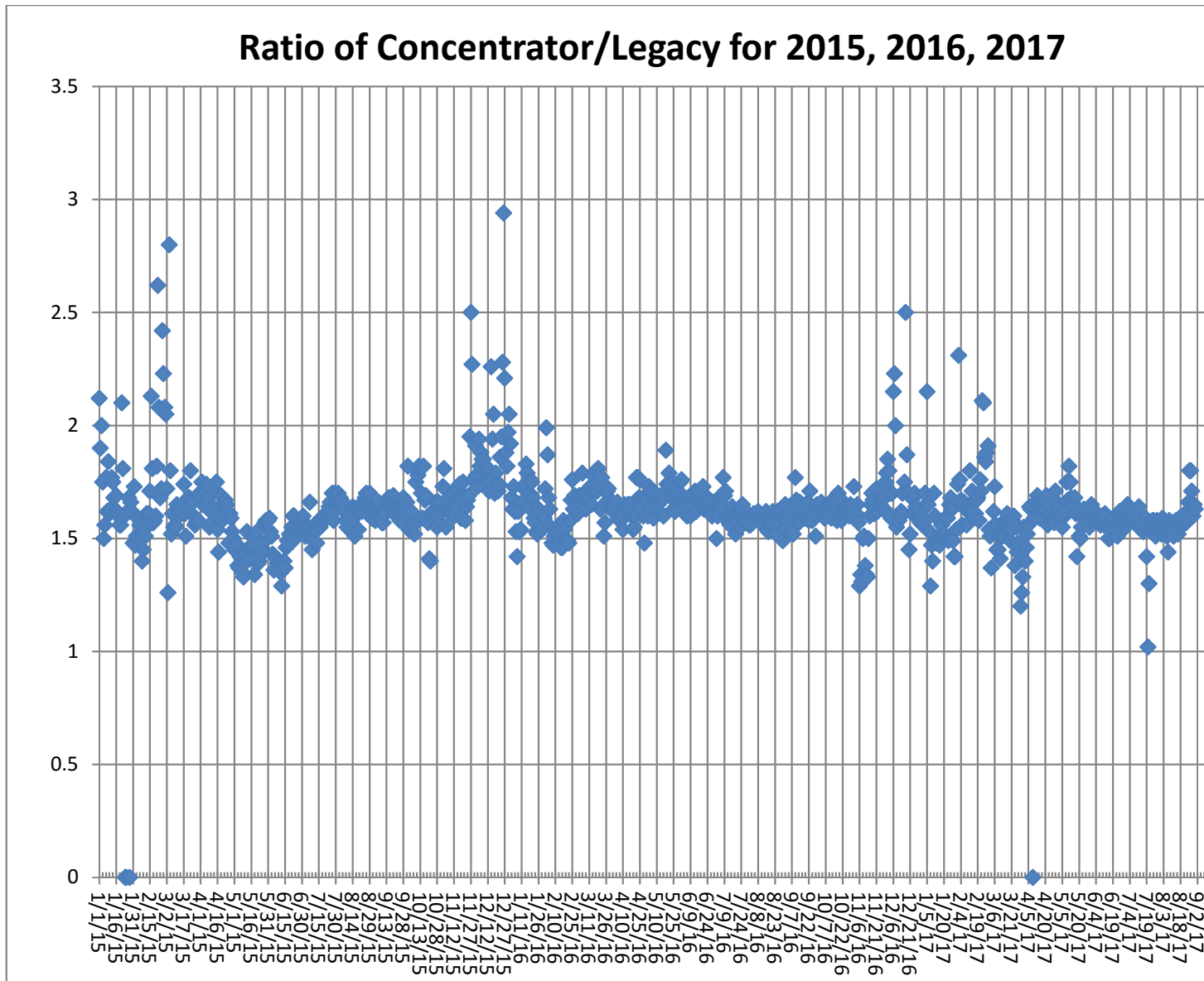


Figure 1. Daily Ratio of Concentrator Reports to Legacy Reports

The ratio becomes more volatile in the cold months as the Blue Mountain repeater has problems with legacy ALERT reporting when the temperature drops below zero.

The West Creek repeater experienced an outage late in the evening of July 19, 2017 due to a large storm and associated lightning in the Hayman Burn scar. The ALERT2 encoder board was destroyed and it was replaced on July 21st. No data was collected through the West Creek repeater on July 20th. Interesting to note in the figure above that the ratio of legacy to ALERT2 traffic on July 20th was 1.0 which is expected.

The ratio seems high on August 26, 2017 but a reason for this elevated reading is not apparent. An increase in concentration reports through West Creek would account for an elevated ratio but this was not the case. It is possible there was a decrease in legacy reports relative to concentrated reports through one of the main repeaters. The ratio comes back down to an expected value on the following day.

A. Continuous Operation of Base Receiver/Decoder

The base station was in continuous operation for the entire month. Data was collected on a continuous basis for a total of 744 hours of operation. Outages of less than one hour are not identified.

B. Specific Issues Identified

Performance of the following sensors (Table 3) was questionable this month.

Table 3. Sensors with Poor Performance Characteristics

Sensor ID	Description	Comments
2330	Bear Creek at Morrison	Consistently poor timer and event performance
8003	Unknown	Sent 4,750 reports on an unknown ID
3020	West Creek WX	ALERT2 station with drifting clock (negative latency)
3090	Big Dry Creek at Heritage Regional Park	Poor timer performance for 4 th month straight
0, 1, 2	Unknown	Unknown IDS transmitted on legacy ALERT

C. ALERT2 Repeater Loading

The District's ALERT2 architecture utilizes 5 repeaters with a single transmit frequency (170.300 MHz) to Diamond Hill. The repeaters utilize a 20 second frame where each repeater is allocated a slot of specific size and an offset within the frame. The slot allocated to each repeater is sized appropriately to accommodate the total number of existing and future remote sites routed through that repeater. Each repeater is shown along with its designated slot (Table 4). Currently there is no pass-listing for the ALERT2 repeaters. Any remote ALERT2 site can be received by all repeaters and re-broadcast to the base except for West Creek which has an input frequency unique to Douglas County.

Table 4. ALERT2 Repeater Architecture

Repeater	Slot Size (sec)	Slot Offset (sec)	Source Address	ALERT2 Input Frequency (MHz)	ALERT2 Output Frequency (MHz) – received at Diamond Hill
West Creek	2	0	6001	169.425	170.300
Smoky	3	2	6502	169.525	170.300
Blue Mt.	4	5	6503	169.525	170.300
Lee Hill	3	9	6505	169.525	170.300
Gold Hill	3	12	6506	169.525	170.300
Magnolia	5	15	6507		170.300
Frame Size	20				

The following tables summarize the total number of reports received through each repeater (Table 5). This helps to quantify repeater loading for the ALERT2 backbone.

Table 5. ALERT2 Reports Received through Each Repeater (Only A2 Self Reports)

Month-Yr	West Creek (6001)	Smoky (6502)	Blue Mt. (6503)	Lee Hill (6505)	Gold Hill (6506)	TOTAL
Jan-15	0	44,501	44,636	44,783	39,007	172,927
Feb-15	0	58,543	56,150	61,160	57,764	233,617
Mar-15	346	73,198	69,604	77,968	65,323	286,439
Apr-15	595	73,711	69,568	79,215	72,310	295,399
May-15	5,259	78,694	72,340	86,297	77,174	319,764
June-15	11,987	72,449	65,742	82,998	69,570	302,746
July-15	28,595	75,379	71,394	79,026	74,041	328,435
Aug-15	28,409	92,299	84,057	84,363	87,211	376,339
Sep-15	26,809	84,143	84,776	84,289	85,123	365,140
Oct-15	19,775	82,683	83,390	63,475**	84,825	334,148
Nov-15	6,438	62,615	61,477	50,888	58,004	239,422
Dec-15	9,835	72,886	72,465	73,431	47,996	276,613
Jan-16	4,034	38,348	36,826	37,168	19,768	138,160
Feb-16	11,732	93,120	99,206	96,284	99,188	399,530
Mar-16	12,533	126,123	134,329	140,226	139,536	552,747
Apr-16	13,262	128,473	130,223	135,499	133,197	540,654
May-16	27,002	125,098	124,280	138,033	130,513	544,926
Jun-16	30,405	117,877	111,309	133,036	122,798	515,425
Jul-16	37,492	108,334	102,335	115,028	110,577	473,766
Aug-16	48,323	130,666	123,827	136,746	131,957	571,519
Sep-16	49,555	122,625	115,898	129,454	127,606	545,138
Oct-16	51,170	111,105	110,038	116,087	116,489	504,889
Nov-2016	47,039	72,761	92,941	100,083	99,508	412,332
Dec-2016	48,946	102,329	97,321	79,274	102,097	429,967
Jan-2017	47,286	50,748**	27,307**	97,947	104,689	327,977
Feb-2017	45,366	96,629	94,065	88,239	98,411	422,710
Mar-2017	53,021	87,160**	33,983**	121,578	126,722	422,464
Apr-2017	49,833	110,418	116,486	122,506	120,727	519,970
May-2017	54,375	128,362	128,310	118,908	134,173	564,128
Jun-2017	60,671	131,745	124,019	146,333	138,056	600,824
Jul-2017	58,442	137,750	130,136	146,134	139,778	612,240
Aug-2017	60,322	136,739	128,716	145,280	139,257	610,314

** - The number of reports coming through these repeaters declined significantly

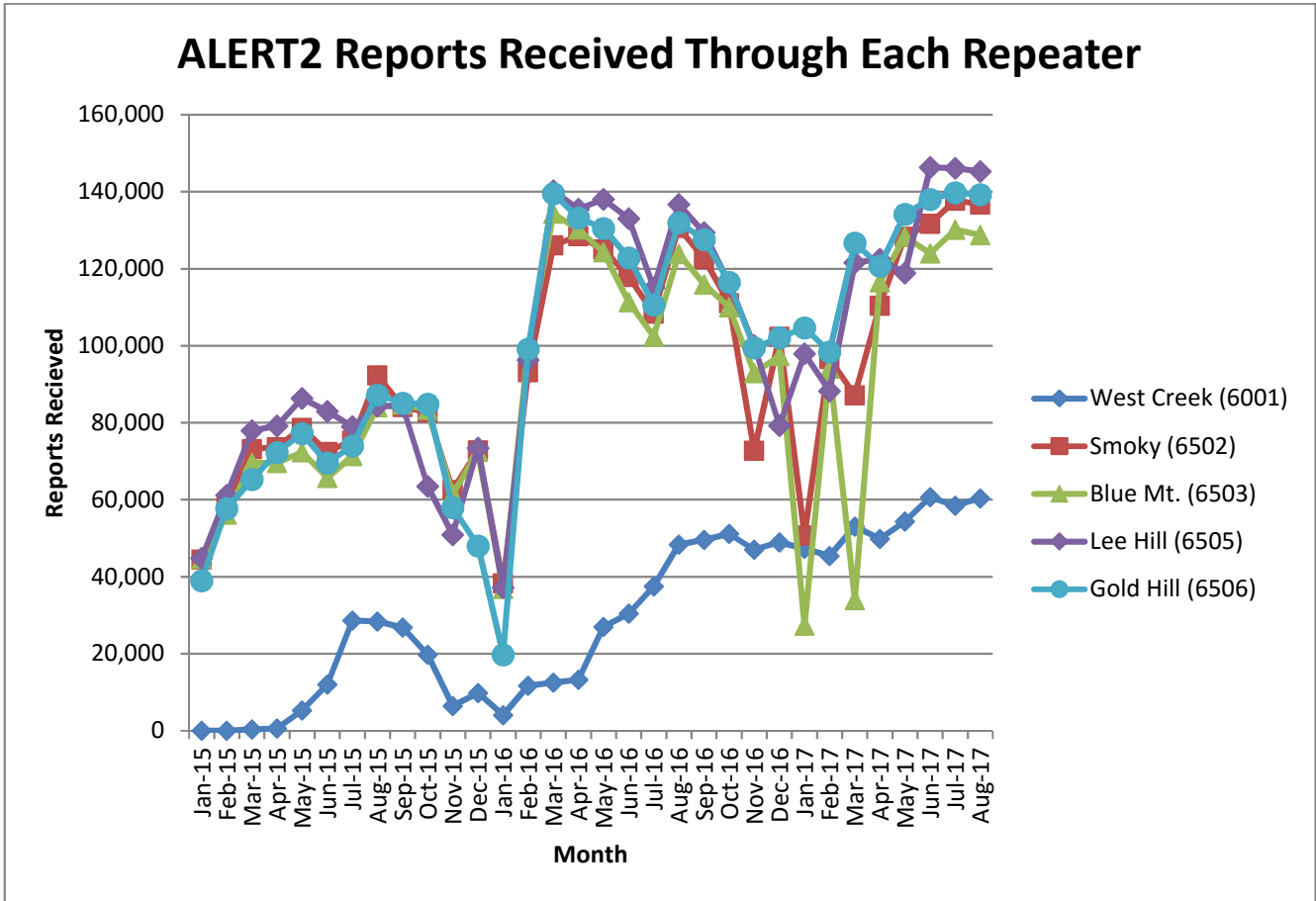


Figure 2. Reports received through each repeater (ALERT2 Only)

A convenient mechanism to track repeater performance throughout the year is to monitor total ALERT2 reports passed by each repeater. In general, each of the primary repeaters in the District process an equivalent number of ALERT2 reports because pass/block filtering is not being used. Several months are evident where the throughput of one repeater is not consistent with the other three.

In January of 2017 the ALERT2 reports received through Blue Mountain and through Smoky Hill showed a significant decrease. There may be a problem at these repeaters or it is possible that pass/block lists have been implemented.

In March of 2017 the ALERT2 reports received through Blue Mountain and through Smoky Hill showed a significant decrease. There may be a problem at these repeaters.

The West Creek repeater was down on July 20, 2017 which results in a reduced throughput for the month of July.

The following tables summarize the system-wide latency of ALERT2 self-reports (Table 6 and Table 7).

Table 6. System-Wide Latency of ALERT2 Self-Reports (seconds)

Statistical Parameter	Value (sec)	Comments
Mean	52.64	The average time it took a report from the field to reach the base
Minimum	-23	The minimum time it took for a report to go from the field to the base
Maximum	43,177	The maximum time it took for a report to go from the field to the base

Table 7. Summary of ALERT2 System-Wide Latency (seconds)

Statistical Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	53.1	51.39	55.86	61.18	56.20	55.02	52.17	52.64				
Minimum	-29	-23	-23	-4	-23	-23	-23	-23				
Maximum	286	12,946	43,177	43,197	43,177	43,177	320	43,177				
Station with Max Latency		West Creek WX	West Creek WX	West Creek WX	West Creek WX	West Creek WX	Sellers Gulch at Haystack	West Creek WX				

The negative latencies are observed only from the station West Creek WX. This is a HydroLynx transmitter. It is likely that the clock on this transmitter is drifting badly. A new GPS chip and EPROM are soon to be installed to help this station.

D. Rain Sensor Timer Reporting Summary

The following analysis assumes that each legacy rain sensor has a 12-hour timer-reporting interval and each A2 rain sensor has a 1-hour timer-reporting interval. The worst performing rain sensors for the month are summarized (Table 8).

Table 8. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
2790	2790	4470	2790	2790	2790	4100	3090				
5720	4100	100150	2800	3090	630	420	3010				
4510	4330	2360	4100	5810	3090	2360	2330				
100260	4040	2970	3050	1360	2330	3090	2360				
4870	4270	2270	920	2330	5810	5810	100260				
5940	4510	2350	1710	100270	4270	2330	4270				

*- Only sensors that operate year-round (weather stations and stations in Boulder County) are included for the analysis in these months.

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.

III. 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 9). For the months of January, February, March, October, November and December only the stations that operate year-round are included in the rain event analysis. These stations include all weather stations and the stations in Boulder County.

Table 9. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	44.58	Only the 1-mm rain sensors were included in the analysis
Median	42	Only the 1-mm rain sensors were included in the analysis
Standard deviation	17.72	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	97.74	Only the 1-mm rain sensors were included in the analysis
Mean minus two standard deviations	9.13	Only the 1-mm rain sensors were included in the analysis
Minimum total count	4	A2-Highlands Heritage Park (3090)
Maximum total count	109	Utah Park (430)
Sensors showing NO rain for the month		
Sensors greater than 3 SD (over reporting)	3	Utah Park (430) – irrigation influence, Fire Sta 47 (3060), West Cherry Head (2920)

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 10).

Table 10. 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	5.60	30.89
2010	5.97	11.90	32.54	70.57	39.63	56.04	50.23	31.01	4.18	18.31	8.30	3.31	27.67
2011	6.78	7.45	7.54	33.94	92.68	39.42	90.87	18.25	37.67	25.73	10.41	13.59	32.03
2012	4.89	13.57	2.35	30.17	38.97	19.35	73.03	11.31	48.81	22.32	2.98	4.18	22.66
2013	2.96	14.31	21.86	35.96	45.87	16.39	52.33	50.63	229.74	29.64	5.86	4.00	42.46
2014	6.88	11.86	25.91	29.30	77.30	29.16	99.73	43.59	50.96	29.26	13.36	8.11	35.45
2015	9.88	24.42	20.78	69.75	143.07	86.93	54.59	29.95	7.16	53.28	22.08	10.80	44.39
2016	4.68	9.91	32.30	52.10	49.40	40.50	24.20	31.00	8.86	7.51	8.56	8.74	23.23
2017	13.3	5.84	27.70	39.10	99.60	15.33	40.80	44.58					
Ave	6.83	10.09	20.23	43.85	66.04	35.57	56.45	38.65	41.54	25.54	8.08	7.94	28.09

*- Only sensors that operate year-round (weather stations and stations in Boulder County) are included for the analysis in these months.

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

Twenty-two sensors experienced a large jump in the sequential tip count (Table 11).

Table 11. Sensors with a Jump of 6 or More in Sequential Count

Sensor Description	Sensor ID	Comment
Happy Canyon at N Surrey Dr	2880	Mechanical issue with the tipping bucket to be resolved by WET
WX-EPC at Hwy 105	3010	All >6 reports were breaks in the data
Van Bibber @ Hwy 93	330	All >6 reports were breaks in the data
Sulphur Gulch	2840	All >6 reports were breaks in the data

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 95 percent. A total of 8,442 incrementing reports were received and a total of 8,843 reports were expected. The total loss of incrementing reports for the month was approximately 5 percent. Those sensors with the worst event transmission performance are summarized (Table 12).

Table 12. Monthly Summary of Sensors with the Worst Performance

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
2790	4330	2790	2790	2790	5810	2330	3010				
4870	750	1620	4270	4330	2790	2320	1340				
1920	2790	2940	4100	5810	3090	4270	2330				
3010	100260	2750	2330	3090	4270	2970	4270				
4510	4270	2980	920	5900	5720	2880	100260				
4330	4490	5900	1710	1500	630	2360	330				

*-Only sensors that are operational year-round (weather stations and stations in Boulder County) are included for the analysis in these months.

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.

IV. 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 13).

Table 13. Summary of Unknown IDs

Description	Concentrator	Legacy	A2
Total number of unknown IDs (IDs without a device definition)	221	210	0
Total reports from unknown IDs	6,678	804	0
Unknown IDs with only a single received report (potential noise)	160	167	0
Total reports from all IDs – RecData Log entire month	413,748	260,532	610,314
Unknown reports as a fraction of total reports	1.61%	0.31%	0.00%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 14) are the total reports received from unknown sensor IDs for each month of the year.

Table 14. Monthly Summary of Total Reports from Unknown IDs (Concentrator)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	1,220	1,474	1,276	1,174	721	5,707	610	1,738	442	533	2,857	6,396
2011	1,231	2,165	3,065	1,254	2,051	439	489	456	191	683	747	861
2012	692	750	1,575	977	5,469	11,016	453	683	774	2,657	3,854	5,466
2013	4,265	994	1,100	2,589	3,623	6,973	5,230	1,070	4,429	781	13,459	1,213
2014	870	4,284	2,399	2,104	25,746	1,832	3,983	268	369	448	470	1,099
2015	542	9,137	1,524	1,007	946	699	1,179	1,860	1,153	1,063	600	619
2016	323	1,241	3,085	3,586	1,268	945	1,408	2,029	1,413	753	617	879
2017	11,875	844	1,207	3,700	2,693	642	610	6,678				

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 15).

Table 15. Monthly Percent of Unknown Sensor Reports (Concentrator)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	0.42%	0.56%	0.38%	0.32%	0.20%	1.61%	0.17%	0.49%	0.13%	0.16%	0.93%	1.88%
2011	0.39%	0.73%	0.90%	0.37%	0.58%	0.12%	0.12%	0.05%	0.12%	0.18%	0.22%	0.26%
2012	0.30%	0.25%	0.43%	0.26%	1.37%	2.74%	0.11%	0.18%	0.20%	0.72%	1.15%	1.62%
2013	1.40%	0.31%	0.29%	0.60%	0.37%	0.61%	0.82%	0.21%	0.96%	0.31%	5.37%	0.23%
2014	0.14%	0.94%	0.40%	0.34%	3.95%	0.34%	0.66%	0.03%	0.03%	0.07%	0.11%	0.26%
2015	0.15%	2.25%	0.34%	0.22%	0.19%	0.14%	0.26%	0.42%	0.29%	0.24%	0.15%	0.15%
2016	0.10%	0.30%	0.69%	0.82%	0.28%	0.22%	0.33%	0.50%	0.36%	0.18%	0.17%	0.22%
2017	3.29%	0.23%	0.31%	0.97%	0.58%	0.16%	0.16%	1.16%				

Any month shaded in yellow has an excessive number of reports from unknown sensors.

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 16).

Table 16. Reports Received by Unknown IDs

Concentrator		Legacy ALERT		Comment
Unknown ID	Reports	Unknown ID	Reports	
--	--	0,1,2	62,62,119	Legacy reports for IDs 0,1,2 only, Blue Mountain repeater possibly sending invalid ID
4378	20	4378	20	Possible unknown ID transmitted from Gross Reservoir
8003	4,750	--	--	Unknown reports received on the concentration input line. Received through multiple repeaters using a source address of 9000, stopped reporting on August 28, 2017.
1101	1,152	--	--	Unknown reports received on the concentration input line. Received through multiple repeaters using a source address of 9000, stopped reporting on August 28, 2017
1365	53	1365	51	Denver Zoo possibly sending invalid ID
2271	51	2271	49	Cub Creek Below Blue possibly sending invalid ID
2272	51	2272	49	Cub Creek Below Blue possibly sending invalid ID
2274	51	2274	47	Cub Creek Below Blue possibly sending invalid ID

V. Sensors with Invalid Reports

The sensors below (Table 17 and Table 18) have the largest number of invalid decodes as determined by the validation process defined at the District NovaStar5 base station. These invalid reports may indicate poor radio paths (bit flip/contention errors/random decode) or validation criteria that do not match the physical installation at the site.

Table 17. Rain Sensors with the Most Invalid Reports

Sensor ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1530-Bear Cr. At Lowell	9	11	8	5	6	--	--	--				
630-Temple Pond DTC	--	--	--	--	--	--	--	20**				
1100-Louisville Rec Ctr	--	--	--	--	--	--	--	152*				
2810-Pine Cliff Rd.	41	32	9	9	2	2	1	4				
2880-Happy Canyon	--	--	--	--	--	--	4	--				
3010-Wx-EPC @ 105	6	7	2	4	--	2	3	3				
3050-E/W Trailhead	23	18	7	5	3	5	1	2				
4030-Red Garden	--	10	5	--	4	2	2	3				
4330-Hansen	--	--	--	--	--	--	4	2				
4240-Sunset	--	9	5	2	--	--	--	5				
4790-Wx-Button Rock	--	--	5	4	2	5	2	4				

*-Louisville Rec Ctr (1100) was taken out of service on August 15 as it was not reporting correctly and placed back into service on August 16, 2017.

**-Temple Pond at DTC (630) was taken out of service at the beginning of August as it was not reporting correctly and placed back into service on August 4, 2017.

Table 18. Level Sensors with the Most Invalid Reports

Sensor ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
413-Kelly Dam	--	--	43	3	10	2	1	4				
403-Montview Park	--	--	--	--	--	--	--	833*				
213-Leyden Confluence	--	--	17	--	--	4	--	4				
723-WTG above Conf Pond	--	8	0	--	--	--	--	2				
1483-Third Creek at DIA	--	8	4	204	2	--	--	--				
1523-Marston Lake North	10	8	11	9	5	4	1	2				
1649-SPR at 19 th Street	152	--	1	1	2	--	--	2				
2223-Evergreen Lake	--	--	--	--	--	--	8	2				
2273-Cub Cr below Blue	--	--	--	--	--	--	8	4				
2803-Columbine Open Space	--	--	--	--	--	--	--	86**				
2813-Pine Cliff Road	16	12	11	7	1	3	--	2				
3013-EPC@Hwy 105	3	--	4	9	10	7	5	9				
4383-Eldorado Springs	16	2	2	--	1	--	--	--				
4593-Green Ditch	--	--	16	1	2	9	3	3				

*-Montview Park (403) had an upper limit set of 15 feet which was questioning data values. The upper limit was removed on September 11, 2017.

**--Columbine Open Space (2803) was out of service and was placed back into service on August 4, 2017.

VI. Rainfall Alarms and Intensity Analysis

The following rainfall rate alarms from the Urban Drainage and Flood Control District NovaStar 5.0 Web Server were identified this month.

<u>Point Numid</u>	<u>Point Name</u>	<u>Trigger Name</u>	<u>Alarm Time</u>
2990	Tomah Road Precipitation-DG	Douglas County 10 minute rainfall	8/2/2017 22:24
2800	East Plum Creek at Columbine Open Space Precip-DG	Douglas County 10 minute rainfall	8/2/2017 22:29
2800	East Plum Creek at Columbine Open Space Precip-DG	Douglas County 1 hour-1 Inch rainfall	8/2/2017 22:33
2990	Tomah Road Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	8/2/2017 22:55
4810	Shanahan Ridge Precipitation-BO	Boulder County 10 minute rainfall	8/3/2017 1:52
4100	Filter Plant Precipitation-BO	FMC-BA 0.50" in 30 Min Rainfall	8/3/2017 1:58
330	Van Bibber @ Hwy 93 Precipitation-JF	Jefferson County 10 minute rainfall	8/3/2017 11:36
3050	East/West Trailhead Precipitation	Douglas County 10 minute rainfall	8/5/2017 17:14
3080	Tallman Gulch at Tallman Park Precipitation-DG	Douglas County 10 minute rainfall	8/5/2017 17:23
2820	East Plum Creek at Haskins Gulch Precipitation-DG	Douglas County 10 minute rainfall	8/5/2017 17:28
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	8/5/2017 17:30
5900	Horse Creek Precipitation-DG	Hayman 30 minute rainfall	8/6/2017 16:00
5900	Horse Creek Precipitation-DG	Hayman 30 minute rainfall	8/6/2017 16:15
5940	Log Jumper Precipitation-DG	Hayman 30 minute rainfall	8/7/2017 15:51
100270	Westcreek Fire Station Wx Precipitation	Hayman 30 minute rainfall	8/7/2017 16:08
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	8/7/2017 17:45
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.4" in 1 Hour Rainfall	8/7/2017 17:45
5730	West Creek Teller Precipitation-TL	Hayman 30 minute rainfall	8/11/2017 14:22
5730	West Creek Teller Precipitation-TL	Hayman 30 minute rainfall	8/11/2017 14:33
330	Van Bibber @ Hwy 93 Precipitation-JF	Jefferson County 10 minute rainfall	8/12/2017 15:28
2900	Russellville Gulch Precipitation-DG	Douglas County 10 minute rainfall	8/12/2017 16:39
2800	East Plum Creek at Columbine Open Space Precip-DG	Douglas County 10 minute rainfall	8/12/2017 16:39
5940	Log Jumper Precipitation-DG	Hayman 30 minute rainfall	8/12/2017 16:42
3040	East Cherry Creek at Russellville Road Precip-DG	Douglas County 10 minute rainfall	8/12/2017 16:54
970	Pump Station 3 Precipitation-AR	Plains 10 minute rainfall	8/14/2017 18:27
970	Pump Station 3 Precipitation-AR	Plains 1 hour rainfall	8/14/2017 18:42
3060	Fire Station #47 Precipitation-DG	Douglas County 10 minute rainfall	8/15/2017 17:11
3060	Fire Station #47 Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	8/15/2017 17:25

General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2017\08-2017\Aug_Data.mdb

Summarize

First Date in Database	8/1/17 12:00 AM	Total Days	31.0
Last Date in Database	8/31/17 11:59 PM	Total Hours	744.0

Total Records Analyzed 1,284,594

Records by Group	Legacy		Concentrator		ALERT	
Wind Data	84,821	33%	147,758	36%	184,711	30%
Temperature	38,637	15%	67,578	16%	85,832	14%
Relative Humidity	37,897	15%	61,436	15%	84,393	14%
Barometric Pressure	21,842	8%	32,203	8%	1,246	0%
Water Level	18,167	7%	20,534	5%	67,125	11%
Battery Voltage	14,322	5%	27,215	7%	80,983	13%
Precipitation	13,928	5%	18,357	4%	56,507	9%
Solar Radiation	10,954	4%	11,088	3%	0	0%
Fuel Temperature	5,919	2%	5,939	1%	0	0%
Fuel Moisture	5,918	2%	5,941	1%	0	0%
Soil Moisture	2,912	1%	2,955	1%	0	0%
Repeater Status Report	2,286	1%	1,837	0%	0	0%
Unknown	804	0%	6,678	2%	0	0%
ET-Hourly	739	0%	744	0%	0	0%
Repeater Pass List	548	0%	62	0%	0	0%
12Hr Status Report	333	0%	345	0%	2,889	0%
Not Used	282	0%	300	0%	0	0%
Water Temp	122	0%	122	0%	0	0%
Handar 585 ALARM Status	59	0%	62	0%	0	0%
ET-Daily	34	0%	34	0%	0	0%
Hayman Battery	6	0%	2,352	1%	0	0%
ALERT/A2 Testing	1	0%	1	0%	0	0%
Solar Power	1	0%	0	0%	0	0%
GPS Lock	0	0%	207	0%	30,654	5%
Dew Point Temperature	0	0%	0	0%	8,801	1%
Flasher Status	0	0%	0	0%	7,173	1%
Total	260,532		413,748		610,314	

Traffic Loading Summary	Legacy		Concentrator		ALERT	
Alert Reports	260,532		413,748		610,314	
Average Daily Traffic	8,404		13,347		19,688	
Average Hourly Traffic	350		556		820	
Median Hourly Traffic	341	hour beginning	544	hour beginning	815	hour beginning
Peak Hourly Traffic	795	Aug 7, 6:00 PM	1,111	Aug 7, 6:00 PM	1,185	Aug 7, 6:00 PM
2nd Max	751	Aug 3, 2:00 AM	1,057	Aug 3, 2:00 AM	1,159	Aug 7, 7:00 PM
3rd Max	729	Aug 7, 7:00 PM	988	Aug 3, 3:00 AM	1,077	
4th Max	646	Aug 3, 3:00 AM	979	Aug 7, 7:00 PM	1,069	Aug 12, 4:00 PM
5th Max	606	Aug 7, 3:00 PM	963	Aug 12, 4:00 PM	1,067	Aug 7, 4:00 PM

Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
			0.50		0.922370796
3090	A2-Highland Heritage Park	102	1:00	744	14%
3010	WX-EPC at Hwy 105	39	14:28	64	61%
2330	Morrison	41	15:31	64	64%
2360	Indian Hills	42	13:08	64	66%
100260	Wx-A2-Trumbull (Hayman) - Precip	500	1:00	744	67%
4270	Cannon Mountain	46	14:50	64	72%
4870	SBC @ SB Road	46	14:50	64	72%
1710	Shop Creek	48	14:55	64	75%
4290	Red Hill	49	13:32	64	77%
540	Parker/Mississippi	50	14:21	64	78%
2880	Happy Canyon at N Surrey Dr	50	12:16	64	78%
4470	Little Narrows	50	13:50	64	78%
1360	Denver Zoo	51	13:39	64	80%
2280	Kinney Peak	51	14:21	64	80%
4510	Pinewood Springs	52	13:39	64	81%
1620	Slaughterhouse Glch	53	12:48	64	83%
2270	Cub Cr below Blue	53	12:57	64	83%
5720	Four Mile Creek	53	13:37	64	83%
430	Utah Park	54	12:50	64	84%
650	Iliff Pond	54	13:03	64	84%
2320	Choke Cherry Resvr	54	13:06	64	84%
2980	Dakan Rd	54	12:31	64	84%
630	Temple Pond at DTC	55	11:57	64	86%
2230	Bear Cr below Cub	55	11:58	64	86%
4330	Hansen Rain	55	13:09	64	86%
4490	Apple Valley	55	12:29	64	86%
1660	SPR at Henderson	56	13:16	64	88%
2840	Sulphur Gulch	56	12:15	64	88%
100150	A2-Sellers Gulch at Haystack Precip	659	1:00	744	89%
700	Toll Gate @ 6th	57	12:45	64	89%
2350	Idledale	57	12:31	64	89%
2860	CC at Stroh Rd	57	12:43	64	89%
2900	Russelville Gulch-Douglas	57	12:46	64	89%
4050	Walker Ranch	57	12:12	64	89%
4260	Taylor Mountain	57	11:57	64	89%
4520	Eagle Ridge	57	12:31	64	89%
5810	Stump Bump	57	12:05	64	89%
210	Leyden Confluence	58	12:12	64	91%
310	Guy Hill Ranch	58	12:29	64	91%
520	Jewell Detention	58	12:16	64	91%
1100	Louisville Rec Ctr	58	11:59	64	91%
1350	Chatfield COE	58	12:43	64	91%
1370	West Metro FS13	58	12:28	64	91%
2250	Rosedale	58	12:36	64	91%
2260	Brook Forest	58	12:14	64	91%
2310	Genesee Village	58	12:44	64	91%
2370	Red Rocks Park	58	12:11	64	91%
2920	West Cherry Head-Douglas Cnty	58	12:35	64	91%
4040	Martin Gulch	58	12:44	64	91%
4180	Gold Lake	58	12:28	64	91%
4220	Fling's	58	12:32	64	91%
4830	SBC @ San Souci	58	12:12	64	91%
4860	Fairview Peak	58	12:00	64	91%
500	Havana Park	59	12:14	64	92%

620	Quincy/Highline	59	12:12	64	92%
710	Horseshoe Park Drop	59	12:26	64	92%
840	Fire Station 12	59	12:14	64	92%
1010	Denver West	59	12:12	64	92%
1200	Broomfield 3207	59	12:12	64	92%
1440	Wx-Elbert	59	12:00	64	92%
1550	Lakewood CC	59	12:26	64	92%
1640	SPR at Union Ave.	59	11:57	64	92%
1700	Cherry Cr @ Champa	59	12:13	64	92%
1720	Cherry Cr @ Steele	59	12:12	64	92%
2240	Cold Sprg Glch conf	59	12:13	64	92%
2750	Wx-Castle Rock	59	12:16	64	92%
4030	Red Garden	59	12:26	64	92%
4060	Lakeshore	59	11:57	64	92%
4230	Golden Age	59	12:12	64	92%
4250	Geer Canyon	59	12:12	64	92%
4300	Big Elk Park	59	12:14	64	92%
4360	Justice Center	59	12:26	64	92%
4790	Wx-Button Rock	59	12:00	64	92%
4820	Doudy Draw	59	12:12	64	92%
140	Wx-Blue Mountain	60	12:15	64	94%
150	Nott Creek	60	11:57	64	94%
320	Sports Complex	60	12:11	64	94%
330	Van Bibber @ Hwy 93	60	11:57	64	94%
410	Kelly Dam	60	12:12	64	94%
420	Expo Park	60	11:57	64	94%
530	Fire Station #19	60	11:57	64	94%
610	Harvard @ Jackson	60	12:11	64	94%
750	Wx-Quincy Reservoir	60	11:57	64	94%
820	ETG @ Buckley	60	12:12	64	94%
850	Flying J	60	12:00	64	94%
940	Aurora Regional Pond	60	11:57	64	94%
1030	NREL/S. Table Mtn.	60	11:57	64	94%
1050	Jeffco Fairgrounds	60	12:12	64	94%
1060	Heritage Square	60	11:57	64	94%
1320	SPR at 3rd Ave	60	12:11	64	94%
1460	Wx-Urban Farm	60	12:14	64	94%
1480	Third Creek at DIA	60	12:13	64	94%
1520	Wx-Marston Lake North	60	12:00	64	94%
1800	Sand Creek Park	60	12:12	64	94%
2210	Wx-Hiwan G.C.	60	12:00	64	94%
2820	Haskins Gulch Conf	60	12:14	64	94%
2850	Cherry Cr bl Bayou Glch	60	11:43	64	94%
2890	Spruce Mt - Douglas	60	12:00	64	94%
2910	East Cherry Cr-Douglas	60	12:00	64	94%
2940	Willow Creek - DougCnty	60	12:00	64	94%
2960	Indian Creek	60	12:00	64	94%
2990	Wx-Tomah Rd-DougCnty	60	12:06	64	94%
3030	WX-Bingham Lake Park	60	12:15	64	94%
4070	Bear Peak	60	11:57	64	94%
4170	Pine Brook	60	11:57	64	94%
4310	Johnny Park	60	11:57	64	94%
4320	Lee Hill Rain 2012	60	12:12	64	94%
4530	Winiger Ridge	60	12:29	64	94%
4570	St. Antons	60	11:59	64	94%
4770	Wx-Cal-Wood Ranch	60	12:00	64	94%
110	Ralston Reservoir	61	11:58	64	95%
220	Upper Leyden	61	12:00	64	95%
300	Van Bibber Park	61	11:58	64	95%

400	Montview Park	61	11:55	64	95%
440	Fire Station #7	61	12:12	64	95%
510	Virginia Court	61	11:57	64	95%
600	Harvard Gulch Park	61	11:57	64	95%
640	Goldsmith @ Eastman	61	11:58	64	95%
720	Confluence Pond	61	11:58	64	95%
730	No Name @ Quincy	61	11:58	64	95%
760	Mission Viejo Park	61	11:57	64	95%
810	Granby Ditch @ 6th	61	11:57	64	95%
830	Side Creek Park	61	12:00	64	95%
1040	Lena @ U.S. Hwy 6	61	11:43	64	95%
1300	Hidden Lake	61	11:58	64	95%
1400	Upper Sloan Det.	61	12:12	64	95%
1420	Wx-A2-Diamond Hill	61	12:00	64	95%
1500	Powers Park	61	11:50	64	95%
1530	Bear Creek @ Lowell	61	11:57	64	95%
1900	Niver Detention	61	11:57	64	95%
2340	El Rancho	61	11:57	64	95%
2710	Wx-Highlands Ranch WTP	61	12:00	64	95%
2730	Wx-Salisbury Park	61	11:31	64	95%
2810	Pine Cliff Road	61	12:05	64	95%
2950	DC Public Works	61	12:00	64	95%
4010	Crescent	61	11:58	64	95%
4020	Rio Grande	61	11:57	64	95%
4090	Magnolia	61	11:57	64	95%
4100	Filter Plant	61	12:00	64	95%
4110	Betasso	61	11:57	64	95%
4130	Swiss Peaks	61	11:57	64	95%
4140	Logan Mill	61	11:57	64	95%
4150	Gold Hill	61	11:58	64	95%
4160	Sunshine	61	11:58	64	95%
4200	Lazy Acres	61	11:59	64	95%
4240	Sunset	61	11:58	64	95%
4350	Conifer Hill	61	11:58	64	95%
4550	Boulder Jail	61	11:57	64	95%
4710	Wx-Ward C-1	61	12:00	64	95%
4730	Wx-Sugarloaf	61	12:00	64	95%
4750	Wx-Louisville Lake	61	12:00	64	95%
4840	SBC@S Boulder Ditch	61	11:57	64	95%
4880	Whispering Pines	61	11:57	64	95%
5880	Hackett Mountain	61	12:00	64	95%
5940	Log Jumper	61	12:00	64	95%
100110	A2-ETG @ Hampden Precip	61	12:00	64	95%
100200	Wx-A2-OneRain Weather - Precipitation	61	12:00	64	95%
120	West Woods	62	11:38	64	97%
200	Leyden Reservoir	62	11:58	64	97%
800	Sable Ditch @ 18th	62	11:58	64	97%
900	Wx-Aurora Reservoir	62	11:49	64	97%
950	Piney at Liverpool	62	11:57	64	97%
970	Pump Sta 3	62	11:45	64	97%
1110	Gunbarrel	62	11:58	64	97%
1600	Englewood Dam	62	11:57	64	97%
3040	CC @ Russelville Road Precip	62	11:42	64	97%
3080	Tallman Gulch	62	11:43	64	97%
4080	Twin Sisters	62	11:57	64	97%
4190	Slaughterhouse	62	11:57	64	97%
4340	Riverside	62	11:57	64	97%
4810	Shanahan Ridge	62	11:57	64	97%
5730	West Creek	62	11:43	64	97%

5740	Trail Creek	62	11:27	64	97%
100140	A2-Upper Sellers Gulch Precip	726	1:00	744	98%
3050	East/West Trailhead	728	1:00	744	98%
920	Wx-Aurora Town Hall	63	11:15	64	98%
1570	Wx-Brighton Ditch	63	11:32	64	98%
1920	Wx-Brighton	63	11:35	64	98%
2870	Cottonwood (Apache)	63	11:33	64	98%
2930	Wx-Spring Valley Rd-DougCnty	63	11:29	64	98%
5860	Cedar Mountain	63	11:44	64	98%
6601	Wx-A2-Magnolia WX-Precip	92	8:00	93	99%
2800	Columbine Open Space	738	1:00	744	99%
100270	Wx-A2-WestCreek (Hayman) - Precip	738	1:00	744	99%
100420	A2-Thorncreek - Precip	738	1:00	744	99%
4850	Porphory Mtn	739	1:00	744	99%
100290	A2-PlumCr at Sedalia - Precip	739	1:00	744	99%
870	A2-Murphy Creek GC	740	1:00	744	99%
100	A2-Carr Street	741	1:00	744	100%
1000	A2-Maple Grove Resv.	741	1:00	744	100%
1340	Sanderson at Xavier	742	1:00	744	100%
3070	A2-Newlin Gulch Precip	742	1:00	744	100%
100160	A2-Sand Creek at Colfax Precip	742	1:00	744	100%
100230	A2-Havana Pond Precip	742	1:00	744	100%
100240	A2-Westerly Cr Dam Precip	742	1:00	744	100%
100300	A2-CoalCreek at McCaslin - Precip	742	1:00	744	100%
1310	LDC at 64th	743	1:00	744	100%
100100	A2-Blackstone Precip	743	1:00	744	100%
100320	A2-Weir Gulch - Precip	743	1:00	744	100%
100410	A2-Brantner Gulch - Precip	743	1:00	744	100%
2970	Rampart Range Rd-Satellite	233			100%
5900	Horse Creek-Satellite	750			100%
3020	Wx-West Creek WX	756	1:00	744	100%
3060	Fire Sta 47	747	1:00	744	100%

Rain Event Performance	Reports Received	Reports Received	8,442	Analyze Rain Sensors						<<show stations with zero rain (1=yes, 0=no)									
	Systemwide Avg	Total Tips	8,843																
Description	Sensor	Performance	4.53%	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket				
WX-EPC at Hwy 105	3010	63%	33	3	3	1	2	0	1	1	40	63	16	0	0.0393701				
Sanderson at Xavier	1340	64%	7	0	1	1	0	0	0	0	9	14	5	0	0.0393701	Mean		44.58	
Morrison	2330	70%	5	1	1	0	0	0	0	0	7	10	3	0	0.0393701	Median		42	
Cannon Mountain	4270	71%	25	6	2	0	1	0	0	0	34	48	14	0	0.0393701	St. Dev		17.72	
Wx-A2-Trumbull (Hayman) - Precip	100260	71%	22	2	1	1	1	0	0	0	27	38	11	0	0.0393701	Mean plus 3 SD		97.74	
Van Bibber @ Hwy 93	330	75%	56	1	0	0	1	0	0	1	58	77	5	0	0.0393701	Mean Minus 2 SD		9.13	
Rampart Range Rd-Satellite	2970	78%	29	4	1	0	1	0	0	0	35	45	10	0	0.0393701	Min		4	
Cherry Cr @ Champa	1700	81%	21	3	0	1	0	0	0	0	25	31	6	0	0.0393701	Max		109	
Slaughterhouse Gich	1620	82%	21	0	1	1	0	0	0	0	23	28	5	0	0.0393701				
Iliff Pond	650	83%	25	4	1	0	0	0	0	0	30	36	6	0	0.0393701				
Shop Creek	1710	83%	25	4	1	0	0	0	0	0	30	36	6	0	0.0393701				
SPR at Henderson	1660	84%	26	6	0	0	0	0	0	0	32	38	6	0	0.0393701				
Louisville Rec Ctr	1100	84%	25	1	0	0	1	0	0	0	27	32	5	0	0.0393701				
Sulphur Gulch	2840	85%	61	2	1	0	0	0	0	1	64	75	4	0	0.0393701				
Indian Hills	2360	86%	27	1	2	0	0	0	0	0	30	35	5	0	0.0393701				
SBC @ SB Road	4870	86%	26	3	1	0	0	0	0	0	30	35	5	0	0.0393701				
Little Narrows	4470	86%	28	3	1	0	0	0	0	0	32	37	5	0	0.0393701				
Cold Sprg Gich conf	2240	87%	44	2	0	0	0	0	1	0	47	54	7	0	0.0393701				
Red Hill	4290	87%	29	5	0	0	0	0	0	0	34	39	5	0	0.0393701				
Gold Lake	4180	88%	31	5	0	0	0	0	0	0	36	41	5	0	0.0393701				
Lakeshore	4060	88%	20	1	1	0	0	0	0	0	22	25	3	0	0.0393701				
Wx-Button Rock	4790	88%	33	3	1	0	0	0	0	0	37	42	5	0	0.0393701				
Hansen Rain	4330	89%	36	3	1	0	0	0	0	0	40	45	5	0	0.0393701				
Third Creek at DIA	1480	89%	28	4	0	0	0	0	0	0	32	36	4	0	0.0393701				
Crescent	4010	89%	36	5	0	0	0	0	0	0	41	46	5	0	0.0393701				
Dakan Rd	2980	89%	30	2	1	0	0	0	0	0	33	37	4	0	0.0393701				
Wx-Marston Lake North	1520	89%	23	1	1	0	0	0	0	0	25	28	3	2	0.0393701				
A2-Weir Gulch - Precip	100320	90%	33	0	2	0	0	0	0	0	35	39	4	0	0.0393701				
Bear Cr below Cub	2230	90%	41	3	1	0	0	0	0	0	45	50	5	0	0.0393701				
Parker/Mississippi	540	90%	26	1	1	0	0	0	0	0	28	31	3	0	0.0393701				
Geer Canyon	4250	90%	25	3	0	0	0	0	0	0	28	31	3	0	0.0393701				
Apple Valley	4490	90%	35	2	1	0	0	0	0	0	38	42	4	0	0.0393701				
Toll Gate @ 6th	700	91%	26	3	0	0	0	0	0	0	29	32	3	0	0.0393701				
Kelly Dam	410	91%	18	2	0	0	0	0	0	0	20	22	2	0	0.0393701				
NREL/S. Table Mtn.	1030	91%	29	3	0	0	0	0	0	0	32	35	3	0	0.0393701				
Denver Zoo	1360	92%	20	2	0	0	0	0	0	0	22	24	2	0	0.0393701				
Harvard @ Jackson	610	92%	31	3	0	0	0	0	0	0	34	37	3	0	0.0393701				
Choke Cherry Resvr	2320	92%	42	4	0	0	0	0	0	0	46	50	4	0	0.0393701				
Kinney Peak	2280	92%	54	3	1	0	0	0	0	0	58	63	5	0	0.0393701				
Russelville Gulch-Douglas	2900	92%	53	5	0	0	0	0	0	0	58	63	5	0	0.0393701				
Jewell Detention	520	92%	54	5	0	0	0	0	0	0	59	64	5	0	0.0393701				
Horseshoe Park Drop	710	92%	33	3	0	0	0	0	0	0	36	39	3	0	0.0393701				
Golden Age	4230	92%	22	2	0	0	0	0	0	0	24	26	2	0	0.0393701				
Indian Creek	2960	93%	49	4	0	0	0	0	0	0	53	57	4	0	0.0393701				
Fire Station #7	440	93%	37	3	0	0	0	0	0	0	40	43	3	0	0.0393701				
Fire Station 12	840	93%	38	3	0	0	0	0	0	0	41	44	3	0	0.0393701				
Guy Hill Ranch	310	93%	51	4	0	0	0	0	0	0	55	59	4	0	0.0393701				
Pinewood Springs	4510	93%	51	4	0	0	0	0	0	0	55	59	4	0	0.0393701				
Granby Ditch @ 6th	810	93%	26	2	0	0	0	0	0	0	28	30	2	0	0.0393701				
Rosedale	2250	94%	57	0	0	0	1	0	0	0	58	62	4	0	0.0393701				
A2-Thorncreek - Precip	100420	94%	27	2	0	0	0	0	0	0	29	31	2	0	0.0393701				
ETG @ Buckley	820	94%	27	2	0	0	0	0	0	0	29	31	2	0	0.0393701				
Lazy Acres	4200	94%	27	2	0	0	0	0	0	0	29	31	2	0	0.0393701				
No Name @ Quincy	730	94%	41	3	0	0	0	0	0	0	44	47	3	0	0.0393701				
Eagle Ridge	4520	94%	41	3	0	0	0	0	0	0	44	47	3	0	0.0393701				
Martin Gulch	4040	94%	43	3	0	0	0	0	0	0	46	49	3	0	0.0393701				
Haskins Gulch Conf	2820	94%	44	3	0	0	0	0	0	0	47	50	3	0	0.0393701				

Nott Creek	150	94%	46	3	0	0	0	0	0	0	49	52	3	0	0.0393701		
Conifer Hill	4350	94%	46	3	0	0	0	0	0	0	49	52	3	0	0.0393701		
Horse Creek-Satellite	5900	94%	62	4	0	0	0	0	0	0	66	70	4	0	0.0393701		
Aurora Regional Pond	940	94%	48	3	0	0	0	0	0	0	51	54	3	0	0.0393699		
Denver West	1010	94%	32	2	0	0	0	0	0	0	34	36	2	0	0.0393701		
Wx-Tomah Rd-DougCnty	2990	95%	65	4	0	0	0	0	0	0	69	73	4	0	0.0393701		
Cub Cr below Blue	2270	95%	50	1	1	0	0	0	0	0	52	55	3	0	0.0393701		
Spruce Mt - Douglas	2890	95%	49	3	0	0	0	0	0	0	52	55	3	0	0.0393701		
Walker Ranch	4050	95%	33	2	0	0	0	0	0	0	35	37	2	0	0.0393701		
Rio Grande	4020	95%	51	3	0	0	0	0	0	0	54	57	3	0	0.0393701		
Lena @ U.S. Hwy 6	1040	95%	34	2	0	0	0	0	0	0	36	38	2	0	0.0393701		
A2-Westerly Cr Dam Precip	100240	95%	17	1	0	0	0	0	0	0	18	19	1	0	0.0393701		
Cottonwood (Apache)	2870	95%	52	3	0	0	0	0	0	0	55	58	3	0	0.0393701		
WX-Bingham Lake Park	3030	95%	52	3	0	0	0	0	0	0	55	58	3	0	0.0393701		
Fling's	4220	95%	52	3	0	0	0	0	0	0	55	58	3	0	0.0393701		
Wx-Urban Farm	1460	95%	36	0	1	0	0	0	0	0	37	39	2	0	0.0393701		
Happy Canyon at N Surrey Dr	2880	95%	19	1	0	0	0	0	0	1	20	21	1	0	0.0393701		
Upper Sloan Det.	1400	95%	38	2	0	0	0	0	0	0	40	42	2	0	0.0393701		
A2-ETG @ Hampden Precip	100110	95%	39	0	1	0	0	0	0	0	40	42	2	0	0.0393701		
Heritage Square	1060	95%	19	1	0	0	0	0	0	0	20	21	1	0	0.0393701		
SPR at Union Ave.	1640	95%	19	1	0	0	0	0	0	0	20	21	1	0	0.0393701		
A2-Sand Creek at Colfax Precip	100160	95%	40	0	1	0	0	0	0	0	41	43	2	1	0.0393701		
Chatfield COE	1350	95%	20	1	0	0	0	0	0	0	21	22	1	0	0.0393701		
Red Garden	4030	96%	43	2	0	0	0	0	0	0	45	47	2	0	0.0393701		
EI Rancho	2340	96%	44	2	0	0	0	0	0	0	46	48	2	0	0.0393701		
A2-Upper Sellers Gulch Precip	100140	96%	46	2	0	0	0	0	0	0	48	50	2	0	0.0393701		
Wx-West Creek WX	3020	96%	73	0	0	1	0	0	0	0	74	77	3	0	0.0393701		
Bear Peak	4070	96%	48	2	0	0	0	0	0	0	50	52	2	0	0.0393701		
Shanahan Ridge	4810	96%	49	2	0	0	0	0	0	0	51	53	2	0	0.0393701		
Goldsmith @ Eastman	640	96%	25	1	0	0	0	0	0	0	26	27	1	0	0.0393701		
Cherry Cr @ Steele	1720	96%	25	1	0	0	0	0	0	0	26	27	1	0	0.0393701		
Wx-Brighton	1920	96%	25	1	0	0	0	0	0	0	26	27	1	0	0.0393701		
St. Antons	4570	96%	51	2	0	0	0	0	0	0	53	55	2	0	0.0393701		
Stump Bump	5810	96%	77	3	0	0	0	0	0	0	80	83	3	0	0.0393701		
Sable Ditch @ 18th	800	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Englewood Dam	1600	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
CC @ Russelville Road Precip	3040	96%	53	2	0	0	0	0	0	0	55	57	2	0	0.0393701		
Trail Creek	5740	97%	83	3	0	0	0	0	0	0	86	89	3	0	0.0393701		
Taylor Mountain	4260	97%	56	2	0	0	0	0	0	0	58	60	2	0	0.0393701		
Four Mile Creek	5720	97%	56	2	0	0	0	0	0	0	58	60	2	0	0.0393701		
Leyden Reservoir	200	97%	30	1	0	0	0	0	0	0	31	32	1	0	0.0393701		
Sand Creek Park	1800	97%	30	1	0	0	0	0	0	0	31	32	1	0	0.0393701		
Hackett Mountain	5880	97%	91	3	0	0	0	0	0	0	94	97	3	0	0.0393701		
Sports Complex	320	97%	31	1	0	0	0	0	0	0	32	33	1	0	0.0393701		
Wx-Spring Valley Rd-DougCnty	2930	97%	63	2	0	0	0	0	0	0	65	67	2	0	0.0393701		
SPR at 3rd Ave	1320	97%	32	1	0	0	0	0	0	0	33	34	1	0	0.0393701		
Riverside	4340	97%	67	2	0	0	0	0	0	0	69	71	2	1	0.0393701		
East Cherry Cr-Douglas	2910	97%	68	2	0	0	0	0	0	0	70	72	2	0	0.0393701		
Tallman Gulch	3080	97%	68	2	0	0	0	0	0	0	70	72	2	0	0.0393701		
Van Bibber Park	300	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Quincy/Highline	620	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Mission Viejo Park	760	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Utah Park	430	97%	103	3	0	0	0	0	0	0	106	109	3	0	0.0393701		
Leyden Confluence	210	97%	35	1	0	0	0	0	0	0	36	37	1	0	0.0393701		
Havana Park	500	97%	35	1	0	0	0	0	0	0	36	37	1	0	0.0393701		
Jeffco Fairgrounds	1050	97%	35	1	0	0	0	0	0	0	36	37	1	0	0.0393701		
Wx-Highlands Ranch WTP	2710	97%	35	1	0	0	0	0	0	0	36	37	1	0	0.0393701		
A2-Havana Pond Precip	100230	97%	35	1	0	0	0	0	0	0	36	37	1	0	0.0393701		
Log Jumper	5940	97%	71	2	0	0	0	0	0	0	73	75	2	0	0.0393701		
A2-Maple Grove Resv.	1000	97%	36	1	0	0	0	0	0	0	37	38	1	0	0.0393701		
Ralston Reservoir	110	97%	37	1	0	0	0	0	0	0	38	39	1	0	0.0393701		
Lakewood CC	1550	97%	37	1	0	0	0	0	0	0	38	39	1	0	0.0393701		

Cedar Mountain	5860	97%	75	2	0	0	0	0	0	77	79	2	0	0.0393701
Twin Sisters	4080	98%	40	1	0	0	0	0	0	41	42	1	0	0.0393701
Wx-Brighton Ditch	1570	98%	41	1	0	0	0	0	0	42	43	1	0	0.0393701
Wx-A2-WestCreek (Hayman) - Precip	100270	98%	83	2	0	0	0	0	0	85	87	2	0	0.0393701
Wx-Blue Mountain	140	98%	43	1	0	0	0	0	0	44	45	1	0	0.0393701
Wx-Cal-Wood Ranch	4770	98%	43	1	0	0	0	0	0	44	45	1	0	0.0393701
Wx-Sugarloaf	4730	98%	44	1	0	0	0	0	0	45	46	1	0	0.0393701
Willow Creek - DougCnty	2940	98%	46	1	0	0	0	0	0	47	48	1	0	0.0393701
Wx-Salisbury Park	2730	98%	47	1	0	0	0	0	0	48	49	1	0	0.0393701
West Cherry Head-Douglas Cnty	2920	98%	95	2	0	0	0	0	0	97	99	2	0	0.0393701
A2-Murphy Creek GC	870	98%	48	1	0	0	0	0	0	49	50	1	0	0.0393701
Cherry Cr bl Bayou Glch	2850	98%	48	1	0	0	0	0	0	49	50	1	0	0.0393701
Doudy Draw	4820	98%	48	1	0	0	0	0	0	49	50	1	0	0.0393701
Upper Leyden	220	98%	50	1	0	0	0	0	0	51	52	1	0	0.0393701
Big Elk Park	4300	98%	50	1	0	0	0	0	0	51	52	1	0	0.0393701
A2-CoalCreek at McCaslin - Precip	100300	98%	50	1	0	0	0	0	0	51	52	1	1	0.0393701
Wx-Aurora Reservoir	900	98%	50	1	0	0	0	0	0	51	52	1	0	0.0393699
Betasso	4110	98%	51	1	0	0	0	0	0	52	53	1	0	0.0393701
Harvard Gulch Park	600	98%	53	1	0	0	0	0	0	54	55	1	0	0.0393701
West Creek	5730	99%	91	1	0	0	0	0	0	92	93	1	0	0.0393701
Fire Sta 47	3060	100%	102	0	0	0	0	0	0	102	102	0	0	0.0393701
Columbine Open Space	2800	100%	82	0	0	0	0	0	0	82	82	0	3	0.0393701
Wx-Ward C-1	4710	100%	74	0	0	0	0	0	0	74	74	0	0	0.0393701
Pump Sta 3	970	100%	70	0	0	0	0	0	0	70	70	0	0	0.0393701
Brook Forest	2260	100%	59	0	0	0	0	0	0	59	59	0	0	0.0393701
Expo Park	420	100%	56	0	0	0	0	0	0	56	56	0	0	0.0393701
East/West Trailhead	3050	100%	55	0	0	0	0	0	0	55	55	0	3	0.0393701
Temple Pond at DTC	630	100%	53	0	0	0	0	0	0	53	53	0	0	0.0393701
Johnny Park	4310	100%	53	0	0	0	0	0	0	53	53	0	0	0.0393701
Wx-Hiwan G.C.	2210	100%	52	0	0	0	0	0	0	52	52	0	1	0.0393701
A2-Newlin Gulch Precip	3070	100%	51	0	0	0	0	0	0	51	51	0	0	0.0393701
Filter Plant	4100	100%	51	0	0	0	0	0	0	51	51	0	1	0.0393701
A2-Blackstone Precip	100100	100%	50	0	0	0	0	0	0	50	50	0	0	0.0393701
West Woods	120	100%	49	0	0	0	0	0	0	49	49	0	0	0.0393701
Virginia Court	510	100%	49	0	0	0	0	0	0	49	49	0	0	0.0393701
Wx-Aurora Town Hall	920	100%	49	0	0	0	0	0	0	49	49	0	0	0.0393701
Powers Park	1500	100%	48	0	0	0	0	0	0	48	48	0	0	0.0393701
Winiger Ridge	4530	100%	48	0	0	0	0	0	0	48	48	0	0	0.0393701
Piney at Liverpool	950	100%	47	0	0	0	0	0	0	47	47	0	0	0.0393701
Genesee Village	2310	100%	46	0	0	0	0	0	0	46	46	0	0	0.0393701
CC at Stroh Rd	2860	100%	45	0	0	0	0	0	0	45	45	0	0	0.0393701
Side Creek Park	830	100%	43	0	0	0	0	0	0	43	43	0	0	0.0393701
Wx-Elbert	1440	100%	42	0	0	0	0	0	0	42	42	0	0	0.0393701
Gold Hill	4150	100%	42	0	0	0	0	0	0	42	42	0	0	0.0393701
Logan Mill	4140	100%	40	0	0	0	0	0	0	40	40	0	0	0.0393701
Sunset	4240	100%	40	0	0	0	0	0	0	40	40	0	0	0.0393701
A2-PlumCr at Sedalia - Precip	100290	100%	40	0	0	0	0	0	0	40	40	0	1	0.0393701
A2-Brantner Gulch - Precip	100410	100%	39	0	0	0	0	0	0	39	39	0	0	0.0393701
Magnolia	4090	100%	38	0	0	0	0	0	0	38	38	0	0	0.0393701
Justice Center	4360	100%	38	0	0	0	0	0	0	38	38	0	0	0.0393701
Montview Park	400	100%	37	0	0	0	0	0	0	37	37	0	0	0.0393701
Sunshine	4160	100%	37	0	0	0	0	0	0	37	37	0	0	0.0393701
A2-Carr Street	100	100%	35	0	0	0	0	0	0	35	35	0	0	0.0393701
Flying J	850	100%	35	0	0	0	0	0	0	35	35	0	0	0.0393701
Idledale	2350	100%	34	0	0	0	0	0	0	34	34	0	0	0.0393701
Red Rocks Park	2370	100%	34	0	0	0	0	0	0	34	34	0	0	0.0393701
SBC@S Boulder Ditch	4840	100%	34	0	0	0	0	0	0	34	34	0	0	0.0393701
Lee Hill Rain 2012	4320	100%	33	0	0	0	0	0	0	33	33	0	0	0.0393701
Whispering Pines	4880	100%	33	0	0	0	0	0	0	33	33	0	0	0.0393701
Gunbarrel	1110	100%	32	0	0	0	0	0	0	32	32	0	1	0.0393701
SBC @ San Souci	4830	100%	32	0	0	0	0	0	0	32	32	0	0	0.0393701
A2-Sellers Gulch at Haystack Precip	100150	100%	31	0	0	0	0	0	0	31	31	0	0	0.0393701

Slaughterhouse	4190	100%	30	0	0	0	0	0	0	0	30	30	0	0	0.0393701		
Confluence Pond	720	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701		
Hidden Lake	1300	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701		
Wx-A2-Diamond Hill	1420	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701		
Pine Brook	4170	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701		
West Metro FS13	1370	100%	28	0	0	0	0	0	0	0	28	28	0	0	0.0393701		
Bear Creek @ Lowell	1530	100%	28	0	0	0	0	0	0	0	28	28	0	0	0.0393701		
Broomfield 3207	1200	100%	27	0	0	0	0	0	0	0	27	27	0	0	0.0393701		
Boulder Jail	4550	100%	27	0	0	0	0	0	0	0	27	27	0	0	0.0393701		
Niver Detention	1900	100%	25	0	0	0	0	0	0	0	25	25	0	0	0.0393701		
Wx-Castle Rock	2750	100%	24	0	0	0	0	0	0	0	24	24	0	0	0.0393701		
LDC at 64th	1310	100%	22	0	0	0	0	0	0	0	22	22	0	0	0.0393701		
Wx-Louisville Lake	4750	100%	22	0	0	0	0	0	0	0	22	22	0	0	0.0393701		
Pine Cliff Road	2810	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701		
DC Public Works	2950	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701		
Fire Station #19	530	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Swiss Peaks	4130	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701		
A2-Highland Heritage Park	3090	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701		
		Total Tips	8111	286	30	7	6	2									
Wx-A2-OneRain Weather - Precipitation	100200	87%	141	15	5	0	0	0	0	0	161	186	25	7	0.01		
Fairview Peak	4860	92%	154	5	0	0	0	0	1	159	172	5	1	0.01			
Porphory Mtn	4850	95%	141	6	1	0	0	0	0	148	156	8	10	0.01			
Wx-A2-Magnolia WX-Precip	6601	95%	202	7	0	1	0	0	0	210	220	10	9	0.01			

2017 Monthly Peak Hour ALERT Radio Traffic Summary

