

Memo

Date: November 7, 2017
To: Kevin Stewart
From: Markus Ritsch
Subject: October 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 October 1 through October 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	223,927	236,829			2,439,838
Concentrator	361,187	367,684	388,156	352,903	463,501	398,350	397,942	413,748	371,481	363,887			3,878,839
ALERT2	327,977	422,710	422,580	480,051	562,023	600,824	612,240	610,314	648,789	664,041			5,351,549
TOTAL	923,238	1,002,933	1,066,374	1,051,660	1,312,296	1,252,466	1,267,711	1,284,594	1,244,197	1,264,757	0	0	11,670,226
Conc/Leg	1.54	1.73	1.52	1.61	1.62	1.57	1.55	1.59	1.66	1.54	0.00	0.00	1.59
DataChron	668,091	637,926	741,413	693,903	830,649	793,158	800,743	812,069	769,715	700,732			7,448,399

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	223,927	236,829			2,439,838
Concentrator	361,187	367,684	388,156	352,903	463,501	398,350	397,942	413,748	371,481	363,887			3,878,839
ALERT2	327,977	422,710	422,580	480,051	562,023	600,824	612,240	610,314	648,789	664,041			5,351,549
NS5B (Greenhouse)													
Legacy	234,037	211,806	255,357	259,950	287,868	252,952	255,279	260,663	223,907	236,319			236,319
Concentrator	360,898	364,788	387,844	381,946	464,402	398,240	394,334	412,914	371,155	362,988			3,899,509
ALERT2	327,807	419,042	422,268	519,970	564,128	600,850	606,870	609,854	648,457	664,749			5,383,995
Diff (NS5a-NS5b)													
Legacy (Digi One)	37	733	281	-41,244	-1096	340	2250	-131	17	510	0	0	-38,303
Concentrator (B2010)	289	2,896	312	-29,043	-901	110	3608	834	326	899	0	0	-20,670
ALERT2 (B2010)	170	3,668	312	-39,919	-2105	-26	5370	460	332	-708	0	0	-32,446
Comments		GH network outage on Feb 8		DH network outage on Apr 8, 9, and 16			GH network outage on July 30						

On July 30 at 6:15 AM the Greenhouse server went into failover. It seems the network was flaky between 6:00 AM and 6:45 AM and the network connection between Greenhouse and Diamond Hill was lost. The network connection was restored at approximately 10:00 AM on July 30th.

The daily ratio of concentrator to legacy reports is shown.

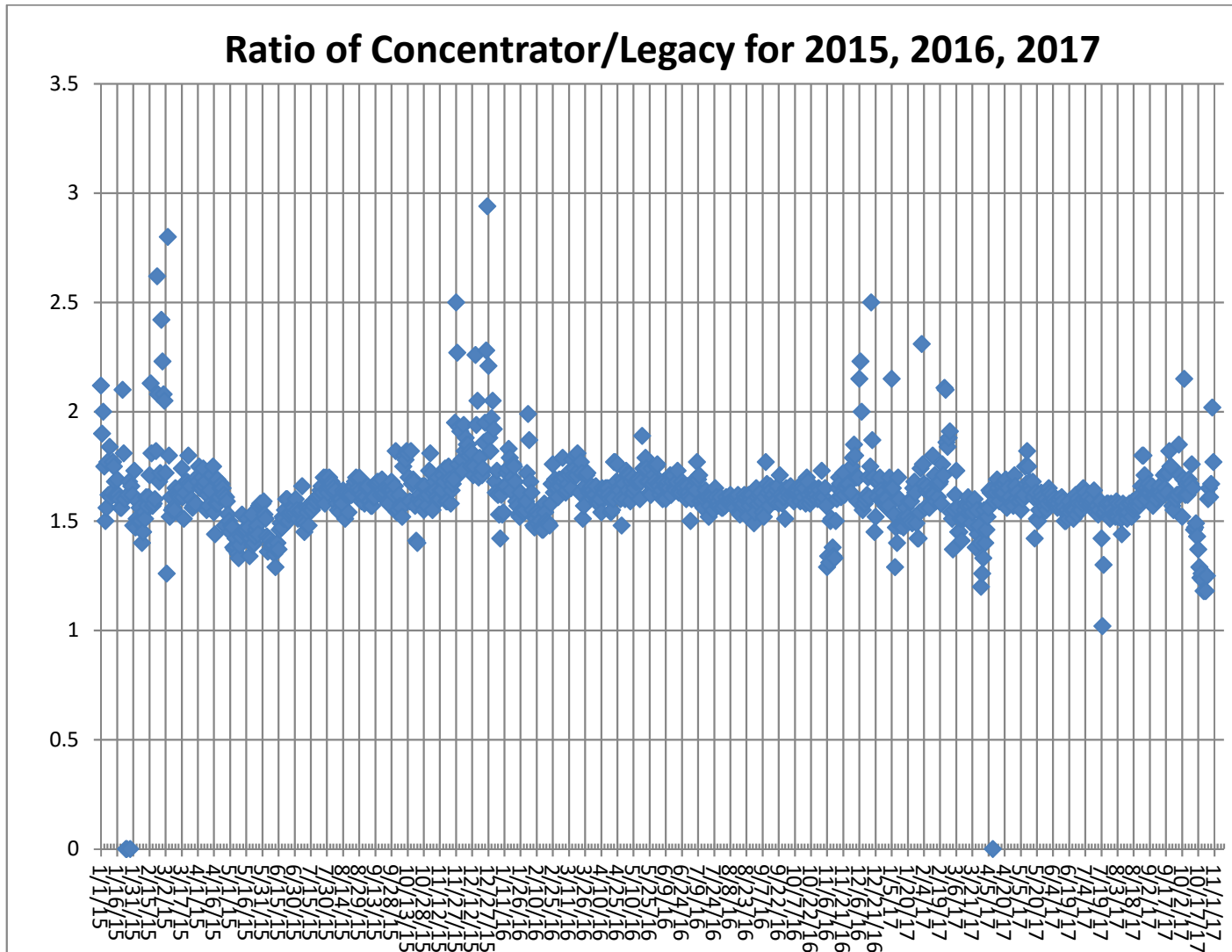


Figure 1. Daily Ratio of Concentrator Reports to Legacy Reports

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. Volatility in the ratio was experienced in March and early April as issues with the radio repeater network and the B2010 decoder are evident.

The West Creek repeater experienced an outage late in the evening of July 19th 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.

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
2790	West Cherry Creek	Poor timer performance
2360	Indian Hills	Poor timer and event performance
3020	West Creek WX	ALERT2 station with drifting clock (negative latency)
2101	Unknown	Unknown ID transmitted 4,344 reports on Concentrator
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
Sep-2017	58,388	146,759	135,632	157,248	150,762	648,789
Oct-2017	48,644	148,071	149,899	159,639	157,788	664,041

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

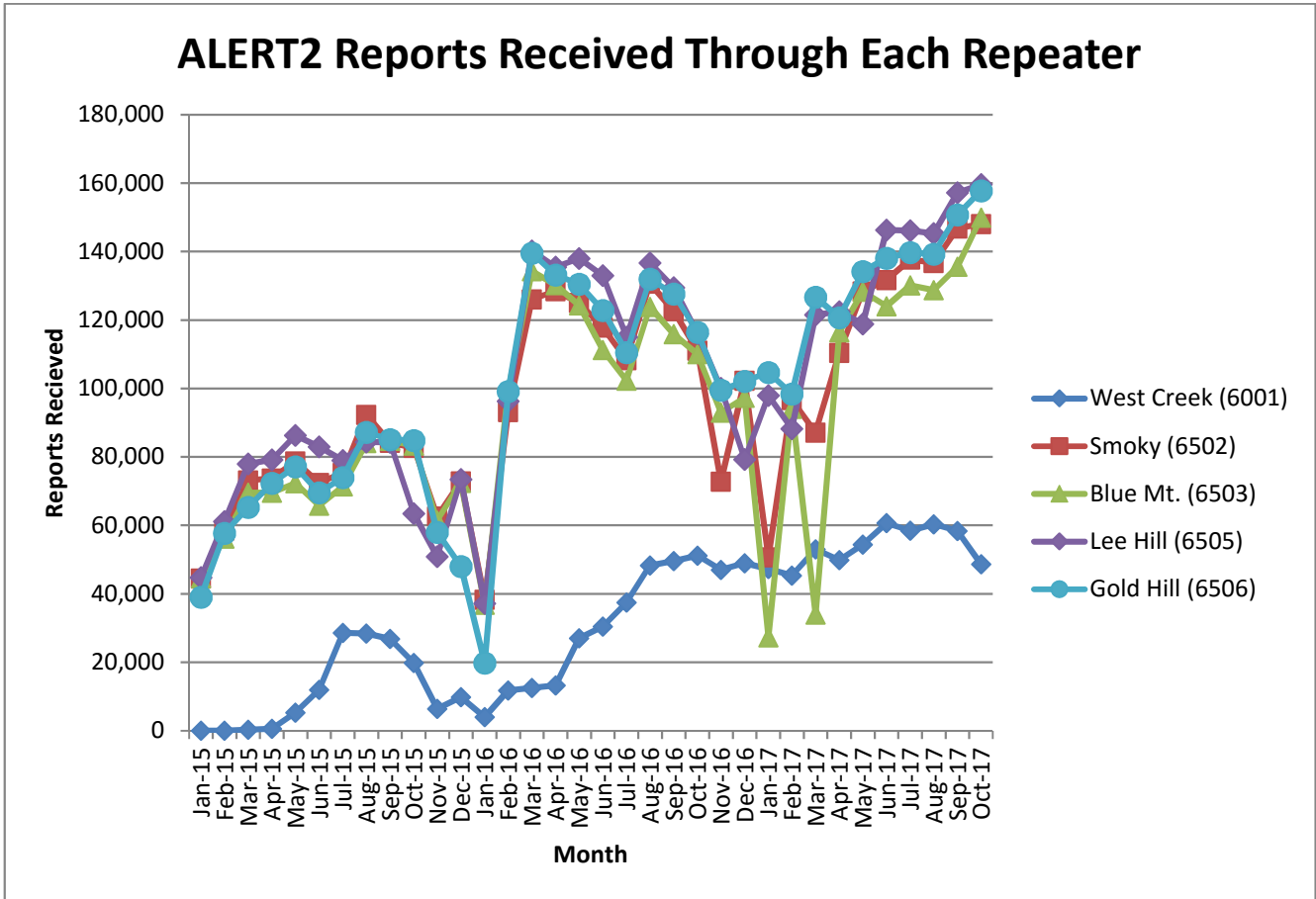


Figure 2. Reports received through each repeater (ALERT2 Only)

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	47.14	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	50.28	47.14		
Minimum	-29	-23	-23	-4	-23	-23	-23	-23	-23	-23		
Maximum	286	12,946	43,177	43,197	43,177	43,177	320	43,177	43,177	43,177		
Station with Max Latency		West Creek WX	West Creek Wx	West Creek WX	West Creek WX	West Creek WX	West Creek WX	Sellers Gulch at Haystack	West Creek WX	West Creek WX	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	750	2790		
5720	4100	100150	2800	3090	630	420	3010	1710	2880		
4510	4330	2360	4100	5810	3090	2360	2330	4340	4470		
100260	4040	2970	3050	1360	2330	3090	2360	2330	2360		
4870	4270	2270	920	2330	5810	5810	100260	4550	2230		
5940	4510	2350	1710	100270	4270	2330	4270	5720	2900		

*- 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	31.88	Only the 1-mm rain sensors were included in the analysis
Median	32	Only the 1-mm rain sensors were included in the analysis
Standard deviation	16.16	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	80.37	Only the 1-mm rain sensors were included in the analysis
Mean minus two standard deviations	0	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	Mission Viejo Park (760)
Maximum total count	84	Shanahan Ridge (4810)
Sensors showing NO rain for the month		
Sensors greater than 3 SD (over reporting)	1	Shanahan Ridge (4810)

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	40.74	31.88			
Ave	6.83	10.09	20.23	43.85	66.04	35.57	56.45	38.65	44.94	28.20	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
Boulder Jail	4550	All >6 reports were breaks in the data
Indian Hills	2360	All >6 reports were breaks in the data
Kinney Peak	2280	All >6 reports were breaks in the data
Bear Cr below Cub	2230	7 sequential tips were missed
Brook Forest	2260	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 96 percent. A total of 6,007 incrementing reports were received and a total of 6,273 reports were expected. The total loss of incrementing reports for the month was approximately 4 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	1620	2980		
4870	750	1620	4270	4330	2790	2320	1340	4290	2360		
1920	2790	2940	4100	5810	3090	4270	2330	4470	5720		
3010	100260	2750	2330	3090	4270	2970	4270	4270	2330		
4510	4270	2980	920	5900	5720	2880	100260	4490	940		
4330	4490	5900	1710	1500	630	2360	330	2230	2230		

*-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)	301	254	0
Total reports from unknown IDs	5,097	742	0
Unknown IDs with only a single received report (potential noise)	180	160	0
Total reports from all IDs – RecData Log entire month	363,887	236,829	664,041
Unknown reports as a fraction of total reports	1.40%	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	780	5,097		

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%	0.21%	1.40%		

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	57,58,94	Legacy reports for IDs 0,1,2 only
2101	4,344			Unknown ID sending large amounts of data
2272	16	2272	16	Cub Creek Below Blue possibly sending invalid ID
2274	16	2274	16	Cub Creek Below Blue possibly sending invalid ID
4371	15	1470	15	Urban Farm possibly sending invalid ID
2239	15	2271	15	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	--	--	--	1	2		
630-Temple Pond DTC	--	--	--	--	--	--	--	20**	--	--		
1100-Louisville Rec Ctr	--	--	--	--	--	--	--	152*	--	--		
2810-Pine Cliff Rd.	41	32	9	9	2	2	1	4	4	1		
2880-Happy Canyon	--	--	--	--	--	--	4	--	--	1461***		
3010-Wx-EPC @ 105	6	7	2	4	--	2	3	3	1	5		
3050-E/W Trailhead	23	18	7	5	3	5	1	2	2	3		
4030-Red Garden	--	10	5	--	4	2	2	3	2	1		
4330-Hansen	--	--	--	--	--	--	4	2	2	2		
4240-Sunset	--	9	5	2	--	--	--	5	1	1		
4790-Wx-Button Rock	--	--	5	4	2	5	2	4	--	2		

*-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.

***-Happy Canyon (2880) was put into maintenance mode on October 3, 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	--	1		
403-Montview Park	--	--	--	--	--	--	--	833*	775*	788*		
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	1	3		
1649-SPR at 19 th Street	152	--	1	1	2	--	--	2	--	2		
2223-Evergreen Lake	--	--	--	--	--	--	8	2	--	3		
2273-Cub Cr below Blue	--	--	--	--	--	--	8	4	--	--		
2803-Columbine Open Space								86**	--	--		
2813-Pine Cliff Road	16	12	11	7	1	3	--	2	2	--		
3013-EPC@Hwy 105	3	--	4	9	10	7	5	9	9	13		
4383-Eldorado Springs	16	2	2	--	1	--	--	--	1	1		
4593-Green Ditch	--	--	16	1	2	9	3	3	--	--		

*-Montview Park (403) had an upper limit set of zero feet which was questioning data values. The upper limit was removed on November 3, 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.

Point Numid	Point Name	Trigger Name	Alarm Time
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	10/10/2017 13:30
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.4" in 1 Hour Rainfall	10/10/2017 13:45
4770	Cal-Wood Ranch Precipitation-BO	Boulder County 10 minute rainfall	10/18/2017 11:48

General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2017\10-2017\2017Oct.mdb

Summarize

First Date in Database	10/1/17 12:00 AM	Total Days	31.0
Last Date in Database	10/31/17 11:59 PM	Total Hours	744.0

Total Records Analyzed 1,264,757

Records by Group	Legacy	Concentrator	ALERT
Wind Data	81,649	34%	141,437 39%
Temperature	34,843	15%	235,913 36%
Relative Humidity	34,658	15%	57,343 12%
Barometric Pressure	18,659	8%	50,595 14%
Water Level	16,021	7%	25,760 7%
Precipitation	13,051	6%	17,390 5%
Battery Voltage	10,355	4%	19,240 5%
Solar Radiation	7,950	3%	18,251 5%
Fuel Temperature	5,938	3%	8,120 2%
Fuel Moisture	5,928	3%	5,966 2%
Soil Moisture	2,914	1%	5,999 2%
Repeater Status Report	2,246	1%	2,977 1%
Unknown	742	0%	1,839 1%
ET-Hourly	738	0%	5,097 1%
Repeater Pass List	553	0%	740 0%
12Hr Status Report	274	0%	72 0%
Water Temp	121	0%	284 0%
Not Used	83	0%	126 0%
Handar 585 ALARM Status	64	0%	86 0%
ET-Daily	30	0%	66 0%
Solar Power	12	0%	31 0%
Hayman Battery	0	0%	12 0%
GPS Lock	0	0%	2,317 1%
Dew Point Temperature	0	0%	139 0%
Flasher Status	0	0%	0 0%
Total	236,829		363,887 664,041

Traffic Loading Summary	Legacy	Concentrator	ALERT
Alert Reports	236,829	363,887	664,041
Average Daily Traffic	7,640	11,371	21,421
Average Hourly Traffic	318	474	893
Median Hourly Traffic	313	hour beginning 470	hour beginning 878
Peak Hourly Traffic	642	Oct 2, 5:00 PM 1,013	Oct 4, 8:00 AM 1,131
2nd Max	616	Oct 2, 6:00 PM 972	Oct 8, 10:00 PM 1,114
3rd Max	602	Oct 8, 10:00 PM 957	Oct 9, 1:00 PM 1,103
4th Max	572	Oct 1, 10:00 PM 900	Oct 10, 2:00 PM 1,096
5th Max	561	Oct 1, 9:00 PM 864	Oct 21, 8:00 AM 1,093
			Oct 3, 11:00 PM 1,093
			Oct 10, 12:00 PM

Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
2790	Wx-W. Cherry Creek	3	0:00	62	5%
2880	Happy Canyon at N Surrey Dr	4	12:00	62	6%
4470	Little Narrows	4	11:57	62	6%
2360	Indian Hills	15	14:20	62	24%
2230	Bear Cr below Cub	17	11:58	62	27%
2900	Russelville Gulch-Douglas	17	13:50	62	27%
2250	Rosedale	18	13:03	62	29%
2270	Cub Cr below Blue	18	11:58	62	29%
2280	Kinney Peak	18	11:57	62	29%
2310	Genesee Village	19	11:57	62	31%
2260	Brook Forest	20	11:56	62	32%
2340	El Rancho	20	11:57	62	32%
2890	Spruce Mt - Douglas	21	12:40	62	34%
2910	East Cherry Cr-Douglas	21	12:00	62	34%
2920	West Cherry Head-Douglas Cnty	21	12:00	62	34%
100140	A2-Upper Sellers Gulch Precip	255		744	34%
2850	Cherry Cr bl Bayou Glch	22	12:00	62	35%
2860	CC at Stroh Rd	22	11:57	62	35%
2940	Willow Creek - DougCnty	22	12:00	62	35%
3040	CC @ Russelville Road Precip	22	12:00	62	35%
100150	A2-Sellers Gulch at Haystack Precip	264		744	35%
3080	Tallman Gulch	23	12:00	62	37%
4550	Boulder Jail	26	22:44	62	42%
2960	Indian Creek	27	12:00	62	44%
2810	Pine Cliff Road	29	12:00	62	47%
2840	Sulphur Gulch	29	11:59	62	47%
2950	DC Public Works	29	12:00	62	47%
1420	Wx-A2-Diamond Hill	30	12:00	62	48%
2820	Haskins Gulch Conf	30	12:00	62	48%
2870	Cottonwood (Apache)	30	12:00	62	48%
2800	Columbine Open Space	368		744	49%
3070	A2-Newlin Gulch Precip	369		744	50%
3060	Fire Sta 47	370		744	50%
3050	East/West Trailhead	371		744	50%
3030	WX-Bingham Lake Park	33	2:10	62	53%
2930	Wx-Spring Valley Rd-DougCnty	35	22:11	62	56%
3020	Wx-West Creek WX	465		744	63%
2730	Wx-Salisbury Park	40	12:21	62	65%
2330	Morrison	41	17:33	62	66%
1710	Shop Creek	43	16:32	62	69%
2710	Wx-Highlands Ranch WTP	45	16:40	62	73%
5720	Four Mile Creek	46	15:37	62	74%
1660	SPR at Henderson	47	15:18	62	76%
4510	Pinewood Springs	47	14:16	62	76%
940	Aurora Regional Pond	48	15:04	62	77%
1200	Broomfield 3207	49	12:31	62	79%
1620	Slaughterhouse Glch	49	14:08	62	79%
2990	Wx-Tomah Rd-DougCnty	49	11:09	62	79%
4870	SBC @ SB Road	49	14:00	62	79%
2980	Dakan Rd	50	13:35	62	81%
4270	Cannon Mountain	50	13:24	62	81%
210	Leyden Confluence	51	11:58	62	82%
1110	Gunbarrel	51	12:14	62	82%
1300	Hidden Lake	51	12:14	62	82%

100260	Wx-A2-Trumbull (Hayman) - Precip	612		744	82%
1100	Louisville Rec Ctr	52	11:59	62	84%
1900	Niver Detention	52	11:57	62	84%
4490	Apple Valley	52	13:16	62	84%
1310	LDC at 64th	632		744	85%
100	A2-Carr Street	633		744	85%
300	Van Bibber Park	53	11:56	62	85%
4290	Red Hill	54	12:43	62	87%
2350	Idledale	55	12:57	62	89%
2370	Red Rocks Park	55	12:42	62	89%
3010	WX-EPC at Hwy 105	55	13:23	62	89%
4030	Red Garden	55	12:30	62	89%
4790	Wx-Button Rock	55	12:57	62	89%
310	Guy Hill Ranch	56	12:27	62	90%
110	Ralston Reservoir	57	12:42	62	92%
540	Parker/Mississippi	57	12:54	62	92%
4330	Hansen Rain	57	12:43	62	92%
4350	Conifer Hill	57	12:58	62	92%
4570	St. Antons	57	13:02	62	92%
4710	Wx-Ward C-1	57	12:14	62	92%
320	Sports Complex	58	12:11	62	94%
330	Van Bibber @ Hwy 93	58	12:28	62	94%
410	Kelly Dam	58	12:41	62	94%
1500	Powers Park	58	12:25	62	94%
1550	Lakewood CC	58	11:57	62	94%
2320	Choke Cherry Resvr	58	11:58	62	94%
4180	Gold Lake	58	12:59	62	94%
4260	Taylor Mountain	58	12:56	62	94%
4360	Justice Center	58	12:12	62	94%
4770	Wx-Cal-Wood Ranch	58	12:14	62	94%
140	Wx-Blue Mountain	59	12:30	62	95%
220	Upper Leyden	59	12:00	62	95%
520	Jewell Detention	59	11:57	62	95%
530	Fire Station #19	59	12:10	62	95%
720	Confluence Pond	59	12:25	62	95%
800	Sable Ditch @ 18th	59	12:24	62	95%
1040	Lena @ U.S. Hwy 6	59	12:26	62	95%
1400	Upper Sloan Det.	59	12:12	62	95%
1440	Wx-Elbert	59	12:26	62	95%
1480	Third Creek at DIA	59	12:13	62	95%
1530	Bear Creek @ Lowell	59	12:10	62	95%
1570	Wx-Brighton Ditch	59	12:13	62	95%
1700	Cherry Cr @ Champa	59	12:13	62	95%
1800	Sand Creek Park	59	12:10	62	95%
2240	Cold Sprg Glch conf	59	12:27	62	95%
4040	Martin Gulch	59	12:26	62	95%
4060	Lakeshore	59	11:57	62	95%
4070	Bear Peak	59	12:11	62	95%
4110	Betasso	59	12:14	62	95%
4190	Slaughterhouse	59	12:41	62	95%
4200	Lazy Acres	59	11:58	62	95%
4230	Golden Age	59	12:12	62	95%
4300	Big Elk Park	59	12:40	62	95%
5860	Cedar Mountain	59	12:25	62	95%
5940	Log Jumper	59	12:26	62	95%
420	Expo Park	60	11:57	62	97%
440	Fire Station #7	60	12:10	62	97%
500	Havana Park	60	11:57	62	97%
510	Virginia Court	60	12:10	62	97%

620	Quincy/Highline	60	12:11	62	97%
700	Toll Gate @ 6th	60	12:13	62	97%
710	Horseshoe Park Drop	60	11:57	62	97%
730	No Name @ Quincy	60	12:11	62	97%
820	ETG @ Buckley	60	12:11	62	97%
840	Fire Station 12	60	12:13	62	97%
1010	Denver West	60	12:11	62	97%
1030	NREL/S. Table Mtn.	60	12:24	62	97%
1320	SPR at 3rd Ave	60	12:11	62	97%
1360	Denver Zoo	60	12:10	62	97%
1370	West Metro FS13	60	11:57	62	97%
1460	Wx-Urban Farm	60	12:13	62	97%
1640	SPR at Union Ave.	60	12:10	62	97%
1720	Cherry Cr @ Steele	60	12:11	62	97%
2210	Wx-Hiwan G.C.	60	12:13	62	97%
2750	Wx-Castle Rock	60	12:12	62	97%
4010	Crescent	60	12:11	62	97%
4020	Rio Grande	60	12:25	62	97%
4050	Walker Ranch	60	11:57	62	97%
4240	Sunset	60	11:58	62	97%
4310	Johnny Park	60	12:26	62	97%
4320	Lee Hill Rain 2012	60	11:57	62	97%
4520	Eagle Ridge	60	12:12	62	97%
4750	Wx-Louisville Lake	60	12:14	62	97%
4830	SBC @ San Souci	60	12:11	62	97%
4860	Fairview Peak	60	12:14	62	97%
5730	West Creek	60	12:12	62	97%
5740	Trail Creek	60	12:13	62	97%
100200	Wx-A2-OneRain Weather - Precipitation	60	12:00	62	97%
100270	Wx-A2-WestCreek (Hayman) - Precip	731		744	98%
120	West Woods	61	11:58	62	98%
150	Nott Creek	61	11:57	62	98%
200	Leyden Reservoir	61	11:58	62	98%
400	Montview Park	61	12:00	62	98%
430	Utah Park	61	11:57	62	98%
600	Harvard Gulch Park	61	11:58	62	98%
610	Harvard @ Jackson	61	11:57	62	98%
630	Temple Pond at DTC	61	11:57	62	98%
650	Iliff Pond	61	11:59	62	98%
760	Mission Viejo Park	61	11:57	62	98%
810	Granby Ditch @ 6th	61	12:11	62	98%
830	Side Creek Park	61	12:00	62	98%
850	Flying J	61	12:00	62	98%
920	Wx-Aurora Town Hall	61	12:00	62	98%
950	Piney at Liverpool	61	11:57	62	98%
970	Pump Sta 3	61	12:00	62	98%
1050	Jeffco Fairgrounds	61	12:10	62	98%
1350	Chatfield COE	61	11:57	62	98%
1520	Wx-Marston Lake North	61	12:00	62	98%
1600	Englewood Dam	61	11:57	62	98%
1920	Wx-Brighton	61	12:00	62	98%
4090	Magnolia	61	11:57	62	98%
4170	Pine Brook	61	11:57	62	98%
4250	Geer Canyon	61	12:11	62	98%
4340	Riverside	61	12:12	62	98%
4730	Wx-Sugarloaf	61	12:14	62	98%
4820	Doudy Draw	61	12:12	62	98%
5810	Stump Bump	61	12:00	62	98%
100110	A2-ETG @ Hampden Precip	61	12:00	62	98%

100420	A2-Thorncreek - Precip	734		744	99%
100320	A2-Weir Gulch - Precip	738		744	99%
100290	A2-PlumCr at Sedalia - Precip	739		744	99%
100300	A2-CoalCreek at McCaslin - Precip	739		744	99%
1340	Sanderson at Xavier	740		744	99%
4850	Porphory Mtn	740		744	99%
100240	A2-Westerly Cr Dam Precip	740		744	99%
870	A2-Murphy Creek GC	741		744	100%
1000	A2-Maple Grove Resv.	741		744	100%
100100	A2-Blackstone Precip	741		744	100%
100160	A2-Sand Creek at Colfax Precip	741		744	100%
100230	A2-Havana Pond Precip	741		744	100%
100410	A2-Brantner Gulch - Precip	741		744	100%
640	Goldsmith @ Eastman	62	11:57	62	100%
750	Wx-Quincy Reservoir	62	12:00	62	100%
1060	Heritage Square	62	11:56	62	100%
2970	Rampart Range Rd-Satellite	123			100%
4080	Twin Sisters	62	11:57	62	100%
4100	Filter Plant	62	12:00	62	100%
4130	Swiss Peaks	62	11:57	62	100%
4140	Logan Mill	62	11:57	62	100%
4150	Gold Hill	62	11:57	62	100%
4160	Sunshine	62	11:57	62	100%
4220	Fling's	62	11:58	62	100%
4530	Winiger Ridge	62	11:57	62	100%
4840	SBC@S Boulder Ditch	63	11:57	62	100%
4880	Whispering Pines	62	11:57	62	100%
5880	Hackett Mountain	62	12:00	62	100%
4810	Shanahan Ridge	63	11:43	62	102%
900	Wx-Aurora Reservoir	64	11:06	62	103%
6601	Wx-A2-Magnolia WX-Precip	92	8:00	62	148%

Rain Event Performance																
	Reports Received	Reports Received	6,007	Analyze Rain Sensors							<<show stations with zero rain (1=yes, 0=no)					
	Systemwide Avg	Total Tips	6,273													
	95.84%	Data Loss	4.24%													
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket		
Dakan Rd	2980	61%	8	4	1	1	0	0	0	14	23	9	0	0.0393701		
Indian Hills	2360	71%	25	4	2	0	0	1	1	32	45	13	0	0.0393701 Mean 31.88		
Four Mile Creek	5720	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701 Median 32		
Morrison	2330	76%	23	11	0	0	0	0	0	34	45	11	0	0.0393701 St. Dev 16.16		
Aurora Regional Pond	940	78%	13	0	0	0	1	0	0	14	18	4	0	0.0393701 Mean plus 3 SD 80.37		
Bear Cr below Cub	2230	78%	33	1	1	0	0	0	1	35	45	3	0	0.0393701 Mean minus 2 SD -0.45		
Red Hill	4290	79%	29	2	1	0	0	1	0	33	42	9	0	0.0393701 Min 1		
Wx-Cal-Wood Ranch	4770	79%	31	4	1	0	1	0	0	37	47	10	1	0.0393701 Max 84		
Wx-Button Rock	4790	79%	21	5	1	0	0	0	0	27	34	7	0	0.0393701		
Little Narrows	4470	81%	10	3	0	0	0	0	0	13	16	3	0	0.0393701		
WX-EPC at Hwy 105	3010	82%	7	2	0	0	0	0	0	9	11	2	0	0.0393701		
Slaughterhouse Glich	1620	82%	21	0	1	1	0	0	0	23	28	5	0	0.0393701		
SPR at Henderson	1660	83%	21	3	1	0	0	0	0	25	30	5	0	0.0393701		
A2-Upper Sellers Gulch Precip	100140	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701		
SBC @ SB Road	4870	84%	48	1	3	1	0	0	0	53	63	10	0	0.0393701		
WX-Bingham Lake Park	3030	85%	9	2	0	0	0	0	0	11	13	2	0	0.0393701		
Shop Creek	1710	86%	16	1	1	0	0	0	0	18	21	3	0	0.0393701		
Hackett Mountain	5880	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701		
Kelly Dam	410	87%	23	4	0	0	0	0	0	27	31	4	0	0.0393701		
Pinewood Springs	4510	87%	29	5	0	0	0	0	0	34	39	5	0	0.0393701		
Confluence Pond	720	88%	13	2	0	0	0	0	0	15	17	2	0	0.0393701		
Apple Valley	4490	88%	27	2	1	0	0	0	0	30	34	4	0	0.0393701		
Wx-A2-Trumbull (Hayman) - Precip	100260	88%	13	2	0	0	0	0	0	15	17	2	0	0.0393701		
Kinney Peak	2280	89%	29	2	1	0	0	0	1	32	36	4	0	0.0393701		
DC Public Works	2950	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701		
Boulder Jail	4550	89%	7	1	0	0	0	0	2	8	9	1	0	0.0393701		
Parker/Mississippi	540	89%	22	3	0	0	0	0	0	25	28	3	0	0.0393701		
Rampart Range Rd-Satellite	2970	89%	22	3	0	0	0	0	0	25	28	3	0	0.0393701		
Shanahan Ridge	4810	89%	70	4	0	0	0	1	0	75	84	9	1	0.0393701		
Lakeshore	4060	89%	31	2	1	0	0	0	0	34	38	4	0	0.0393701		
Cub Cr below Blue	2270	90%	41	2	0	1	0	0	0	44	49	5	0	0.0393701		
Genesee Village	2310	90%	41	5	0	0	0	0	0	46	51	5	0	0.0393701		
ETG @ Buckley	820	91%	18	2	0	0	0	0	0	20	22	2	0	0.0393701		
Cannon Mountain	4270	92%	33	3	0	0	0	0	0	36	39	3	0	0.0393701		
West Woods	120	93%	46	4	0	0	0	0	0	50	54	4	0	0.0393701		
Rio Grande	4020	93%	47	2	1	0	0	0	0	50	54	4	0	0.0393701		
Russelville Gulch-Douglas	2900	93%	12	1	0	0	0	0	0	13	14	1	0	0.0393701		
West Metro FS13	1370	93%	25	2	0	0	0	0	0	27	29	2	0	0.0393701		
Cherry Cr @ Steele	1720	93%	25	2	0	0	0	0	0	27	29	2	0	0.0393701		
Powers Park	1500	93%	26	2	0	0	0	0	0	28	30	2	0	0.0393701		
Iliff Pond	650	94%	27	2	0	0	0	0	0	29	31	2	0	0.0393701		
Cold Sprg Glich conf	2240	94%	41	3	0	0	0	0	0	44	47	3	0	0.0393701		
Rosedale	2250	94%	42	1	1	0	0	0	0	44	47	3	1	0.0393701		
Van Bibber Park	300	94%	45	0	0	1	0	0	0	46	49	3	1	0.0393701		
Utah Park	430	94%	30	2	0	0	0	0	0	32	34	2	0	0.0393701		
Broomfield 3207	1200	94%	47	0	0	1	0	0	0	48	51	3	0	0.0393701		
Cresent	4010	94%	45	3	0	0	0	0	0	48	51	3	0	0.0393701		
Twin Sisters	4080	94%	30	2	0	0	0	0	0	32	34	2	0	0.0393701		
Brook Forest	2260	94%	47	1	1	0	0	0	1	49	52	3	0	0.0393701		
Jeffco Fairgrounds	1050	95%	33	2	0	0	0	0	0	35	37	2	0	0.0393701		
Leyden Confluence	210	95%	50	3	0	0	0	0	0	53	56	3	0	0.0393701		
Justice Center	4360	95%	50	3	0	0	0	0	0	53	56	3	0	0.0393701		
Upper Sloan Det.	1400	95%	37	2	0	0	0	0	0	39	41	2	0	0.0393701		
NREL/S. Table Mtn.	1030	95%	38	2	0	0	0	0	0	40	42	2	0	0.0393701		
Wx-Highlands Ranch WTP	2710	95%	19	1	0	0	0	0	0	20	21	1	0	0.0393701		
Cottonwood (Apache)	2870	95%	19	1	0	0	0	0	0	20	21	1	0	0.0393701		

Horseshoe Park Drop	710	95%	20	1	0	0	0	0	0	0	21	22	1	0	0.0393701		
Louisville Rec Ctr	1100	96%	22	1	0	0	0	0	0	0	23	24	1	0	0.0393701		
Idledale	2350	96%	46	2	0	0	0	0	0	0	48	50	2	0	0.0393701		
Choke Cherry Resv	2320	96%	48	2	0	0	0	0	0	0	50	52	2	0	0.0393701		
Bear Peak	4070	96%	48	2	0	0	0	0	0	0	50	52	2	0	0.0393701		
Hansen Rain	4330	96%	48	2	0	0	0	0	0	0	50	52	2	0	0.0393701		
Sports Complex	320	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Jewell Detention	520	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Toll Gate @ 6th	700	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Fire Station 12	840	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Chatfield COE	1350	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Sand Creek Park	1800	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Martin Gulch	4040	96%	52	2	0	0	0	0	0	0	54	56	2	0	0.0393701		
Eagle Ridge	4520	96%	26	1	0	0	0	0	0	0	27	28	1	0	0.0393701		
Sunshine	4160	96%	53	2	0	0	0	0	0	0	55	57	2	0	0.0393701		
Fire Station #7	440	97%	27	1	0	0	0	0	0	0	28	29	1	0	0.0393701		
Virginia Court	510	97%	27	1	0	0	0	0	0	0	28	29	1	0	0.0393701		
Doudy Draw	4820	97%	55	2	0	0	0	0	0	0	57	59	2	0	0.0393701		
Granby Ditch @ 6th	810	97%	29	1	0	0	0	0	0	0	30	31	1	0	0.0393701		
SBC@S Boulder Ditch	4840	97%	60	0	1	0	0	0	0	0	61	63	2	0	0.0393701		
Quincy/Highline	620	97%	30	1	0	0	0	0	0	0	31	32	1	0	0.0393701		
Big Elk Park	4300	97%	30	1	0	0	0	0	0	0	31	32	1	0	0.0393701		
Heritage Square	1060	97%	32	1	0	0	0	0	0	0	33	34	1	0	0.0393701		
Wx-Brighton Ditch	1570	97%	32	1	0	0	0	0	0	0	33	34	1	0	0.0393701		
Red Garden	4030	97%	65	0	1	0	0	0	0	0	66	68	2	0	0.0393701		
Harvard Gulch Park	600	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Hidden Lake	1300	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Riverside	4340	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Conifer Hill	4350	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
A2-Brantner Gulch - Precip	100410	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701		
Sunset	4240	97%	36	1	0	0	0	0	0	0	37	38	1	0	0.0393701		
Taylor Mountain	4260	97%	37	1	0	0	0	0	0	0	38	39	1	0	0.0393701		
Bear Creek @ Lowell	1530	98%	40	1	0	0	0	0	0	0	41	42	1	0	0.0393701		
Ralston Reservoir	110	98%	41	1	0	0	0	0	0	0	42	43	1	0	0.0393701		
Sanderson at Xavier	1340	98%	41	1	0	0	0	0	0	0	42	43	1	0	0.0393701		
Johnny Park	4310	98%	42	1	0	0	0	0	0	0	43	44	1	0	0.0393701		
Van Bibber @ Hwy 93	330	98%	44	1	0	0	0	0	0	0	45	46	1	0	0.0393701		
A2-Maple Grove Resv.	1000	98%	44	1	0	0	0	0	0	0	45	46	1	0	0.0393701		
Lee Hill Rain 2012	4320	98%	44	1	0	0	0	0	0	0	45	46	1	0	0.0393701		
St. Antons	4570	98%	44	1	0	0	0	0	0	0	45	46	1	0	0.0393701		
Nott Creek	150	98%	46	1	0	0	0	0	0	0	47	48	1	0	0.0393701		
Wx-Ward C-1	4710	98%	46	1	0	0	0	0	0	0	47	48	1	0	0.0393701		
Whispering Pines	4880	98%	47	1	0	0	0	0	0	0	48	49	1	0	0.0393701		
Red Rocks Park	2370	98%	48	1	0	0	0	0	0	0	49	50	1	0	0.0393701		
Magnolia	4090	98%	48	1	0	0	0	0	0	0	49	50	1	0	0.0393701		
Lazy Acres	4200	98%	49	1	0	0	0	0	0	0	50	51	1	0	0.0393701		
Gold Hill	4150	98%	51	1	0	0	0	0	0	0	52	53	1	0	0.0393701		
SBC @ San Souci	4830	98%	53	1	0	0	0	0	0	0	54	55	1	0	0.0393701		
A2-Carr Street	100	100%	49	0	0	0	0	0	0	0	49	49	0	0	0.0393701		
Wx-Blue Mountain	140	100%	41	0	0	0	0	0	0	0	41	41	0	0	0.0393701		
Leyden Reservoir	200	100%	45	0	0	0	0	0	0	0	45	45	0	0	0.0393701		
Upper Leyden	220	100%	47	0	0	0	0	0	0	0	47	47	0	0	0.0393701		
Guy Hill Ranch	310	100%	35	0	0	0	0	0	0	0	35	35	0	0	0.0393701		
Montview Park	400	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.0393701		
Expo Park	420	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701		
Havana Park	500	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701		
Fire Station #19	530	100%	35	0	0	0	0	0	0	0	35	35	0	0	0.0393701		
Harvard @ Jackson	610	100%	32	0	0	0	0	0	0	0	32	32	0	0	0.0393701		
Temple Pond at DTC	630	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.0393701		
Goldsmith @ Eastman	640	100%	23	0	0	0	0	0	0	0	23	23	0	0	0.0393701		
No Name @ Quincy	730	100%	23	0	0	0	0	0	0	0	23	23	0	0	0.0393701		

Wx-Quincy Reservoir	750	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Mission Viejo Park	760	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701		
Sable Ditch @ 18th	800	100%	28	0	0	0	0	0	0	0	28	28	0	0	0.0393701		
Side Creek Park	830	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Flying J	850	100%	26	0	0	0	0	0	0	0	26	26	0	0	0.0393701		
A2-Murphy Creek GC	870	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701		
Wx-Aurora Reservoir	900	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701		
Wx-Aurora Town Hall	920	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Piney at Liverpool	950	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701		
Pump Sta 3	970	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Denver West	1010	100%	43	0	0	0	0	0	0	0	43	43	0	0	0.0393701		
Lena @ U.S. Hwy 6	1040	100%	50	0	0	0	0	0	0	0	50	50	0	0	0.0393701		
Gunbarrel	1110	100%	49	0	0	0	0	0	0	0	49	49	0	0	0.0393701		
LDC at 64th	1310	100%	40	0	0	0	0	0	0	0	40	40	0	0	0.0393701		
SPR at 3rd Ave	1320	100%	43	0	0	0	0	0	0	0	43	43	0	0	0.0393701		
Denver Zoo	1360	100%	41	0	0	0	0	0	0	0	41	41	0	0	0.0393701		
Wx-Elbert	1440	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701		
Wx-Urban Farm	1460	100%	33	0	0	0	0	0	0	0	33	33	0	0	0.0393701		
Third Creek at DIA	1480	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701		
Wx-Marston Lake North	1520	100%	34	0	0	0	0	0	0	0	34	34	0	0	0.0393701		
Lakewood CC	1550	100%	39	0	0	0	0	0	0	0	39	39	0	0	0.0393701		
Englewood Dam	1600	100%	27	0	0	0	0	0	0	0	27	27	0	0	0.0393701		
SPR at Union Ave.	1640	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.0393701		
Cherry Cr @ Champa	1700	100%	23	0	0	0	0	0	0	0	23	23	0	0	0.0393701		
Niver Detention	1900	100%	13	0	0	0	0	0	0	0	13	13	0	0	0.0393701		
Wx-Brighton	1920	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701		
Wx-Hiwan G.C.	2210	100%	41	0	0	0	0	0	0	0	41	41	0	0	0.0393701		
El Rancho	2340	100%	32	0	0	0	0	0	0	0	32	32	0	0	0.0393701		
Wx-Salisbury Park	2730	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701		
Wx-Castle Rock	2750	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701		
Columbine Open Space	2800	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701		
Pine Cliff Road	2810	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Haskins Gulch Conf	2820	100%	17	0	0	0	0	0	0	0	17	17	0	0	0.0393701		
Sulphur Gulch	2840	100%	13	0	0	0	0	0	0	0	13	13	0	0	0.0393701		
Cherry Cr bl Bayou Gich	2850	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701		
CC at Stroh Rd	2860	100%	15	0	0	0	0	0	0	0	15	15	0	0	0.0393701		
Happy Canyon at N Surrey Dr	2880	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701		
Spruce Mt - Douglas	2890	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701		
East Cherry Cr-Douglas	2910	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701		
West Cherry Head-Douglas Cnty	2920	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701		
Wx-Spring Valley Rd-DougCnty	2930	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701		
Willow Creek - DougCnty	2940	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701		
Indian Creek	2960	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.0393701		
Wx-Tomah Rd-DougCnty	2990	100%	15	0	0	0	0	0	0	0	15	15	0	0	0.0393701		
Wx-West Creek WX	3020	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701		
CC @ Russelville Road Precip	3040	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701		
East/West Trailhead	3050	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Fire Sta 47	3060	100%	15	0	0	0	0	0	0	0	15	15	0	0	0.0393701		
A2-Newlin Gulch Precip	3070	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701		
Tallman Gulch	3080	100%	17	0	0	0	0	0	0	0	17	17	0	0	0.0393701		
Walker Ranch	4050	100%	35	0	0	0	0	0	0	0	35	35	0	0	0.0393701		
Filter Plant	4100	100%	48	0	0	0	0	0	0	0	48	48	0	0	0.0393701		
Betasso	4110	100%	57	0	0	0	0	0	0	0	57	57	0	0	0.0393701		
Swiss Peaks	4130	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.0393701		
Logan Mill	4140	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701		
Pine Brook	4170	100%	43	0	0	0	0	0	0	0	43	43	0	0	0.0393701		
Gold Lake	4180	100%	47	0	0	0	0	0	0	0	47	47	0	0	0.0393701		
Slaughterhouse	4190	100%	51	0	0	0	0	0	0	0	51	51	0	0	0.0393701		
Fling's	4220	100%	48	0	0	0	0	0	0	0	48	48	0	0	0.0393701		
Golden Age	4230	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.0393701		
Geer Canyon	4250	100%	47	0	0	0	0	0	0	0	47	47	0	0	0.0393701		

Winiger Ridge	4530	100%	43	0	0	0	0	0	0	0	43	43	0	0	0.0393701		
Wx-Sugarloaf	4730	100%	42	0	0	0	0	0	0	0	42	42	0	0	0.0393701		
Wx-Louisville Lake	4750	100%	42	0	0	0	0	0	0	0	42	42	0	0	0.0393701		
West Creek	5730	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701		
Trail Creek	5740	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701		
Stump Bump	5810	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701		
Cedar Mountain	5860	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701		
Log Jumper	5940	100%	11	0	0	0	0	0	0	0	11	11	0	0	0.0393701		
A2-Blackstone Precip	100100	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701		
A2-ETG @ Hampden Precip	100110	100%	13	0	0	0	0	0	0	0	13	13	0	0	0.0393701		
A2-Sellers Gulch at Haystack Precip	100150	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701		
A2-Sand Creek at Colfax Precip	100160	100%	27	0	0	0	0	0	0	0	27	27	0	0	0.0393701		
A2-Havana Pond Precip	100230	100%	24	0	0	0	0	0	0	0	24	24	0	0	0.0393701		
A2-Westerly Cr Dam Precip	100240	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701		
Wx-A2-WestCreek (Hayman) - Precip	100270	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701		
A2-PlumCr at Sedalia - Precip	100290	100%	30	0	0	0	0	0	0	0	30	30	0	0	0.0393701		
A2-CoalCreek at McCaslin - Precip	100300	100%	52	0	0	0	0	0	0	0	52	52	0	0	0.0393701		
A2-Weir Gulch - Precip	100320	100%	40	0	0	0	0	0	0	0	40	40	0	0	0.0393701		
A2-Thorncreek - Precip	100420	100%	52	0	0	0	0	0	0	0	52	52	0	0	0.0393701		
		Total Tips	5792	183	21	6	2	3									
Fairview Peak	4860	96%	101	4	0	0	0	0	0	0	105	109	4	0	0.01		
Porphory Mtn	4850	98%	140	3	0	0	0	0	0	0	143	146	3	1	0.01		
Wx-A2-OneRain Weather - Precipitation	100200	98%	163	3	0	0	0	0	0	0	166	169	3	0	0.01		
Wx-A2-Magnolia WX-Precip	6601	100%	182	0	0	0	0	0	0	0	182	182	0	0	0.01		

2017 Monthly Peak Hour ALERT Radio Traffic Summary

