

# Memo

**Date:** October 5, 2017  
**To:** Kevin Stewart  
**From:** Markus Ritsch  
**Subject:** September 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 September 1 through September 30, 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)**

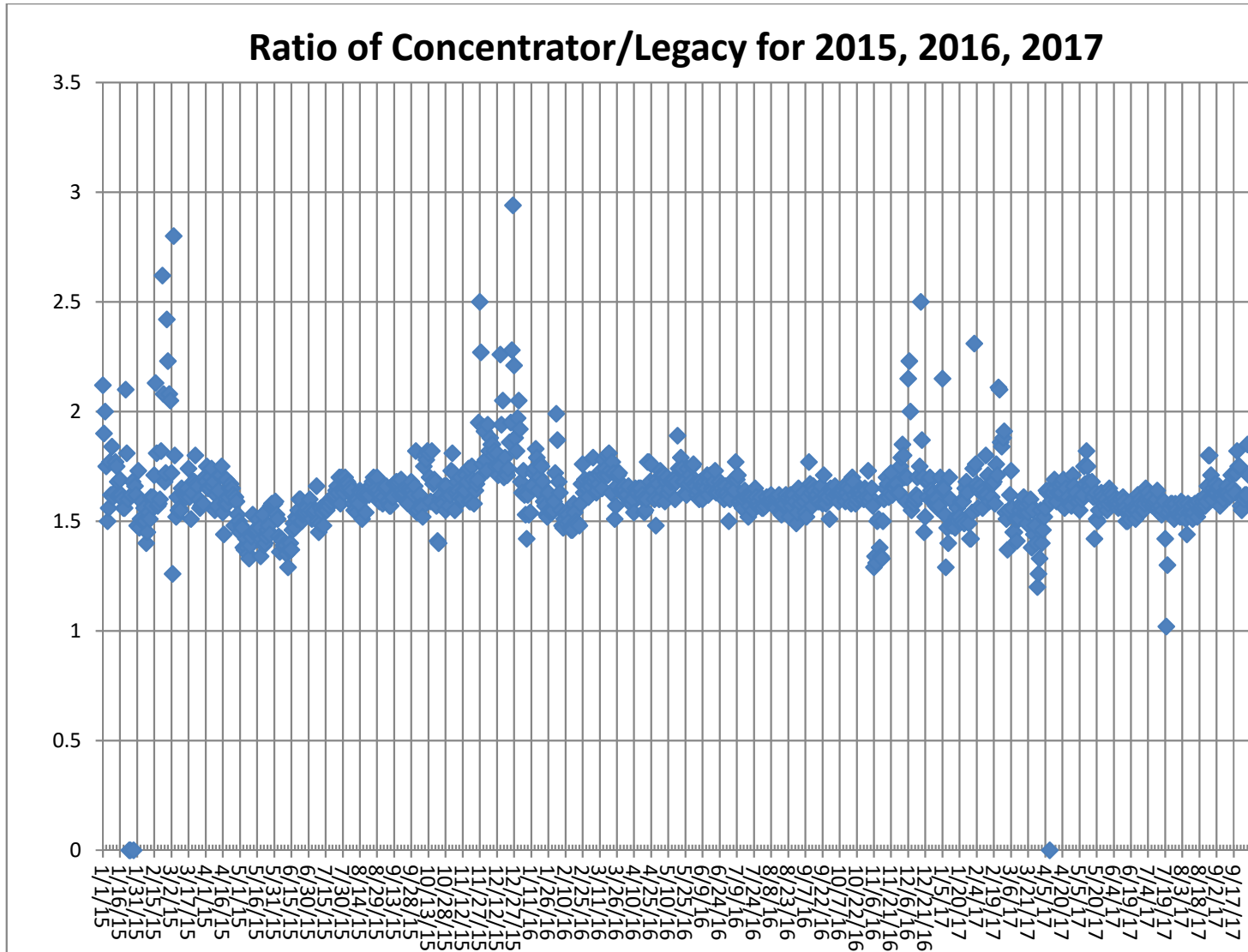
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Legacy	234,074	212,539	255,638	218,706	286,772	253,292	257,529	260,532	223,927				2,203,009
Concentrator	361,187	367,684	388,156	352,903	463,501	398,350	397,942	413,748	371,481				3,514,952
ALERT2	327,977	422,710	422,580	480,051	562,023	600,824	612,240	610,314	648,789				4,687,508
<b>TOTAL</b>	<b>923,238</b>	<b>1,002,933</b>	<b>1,066,374</b>	<b>1,051,660</b>	<b>1,312,296</b>	<b>1,252,466</b>	<b>1,267,711</b>	<b>1,284,594</b>	<b>1,244,197</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10,405,469</b>
Conc/Leg	1.54	1.73	1.52	1.61	1.62	1.57	1.55	1.59	1.66	0.00	0.00	0.00	1.60
DataChron	668,091	637,926	741,413	693,903	830,649	793,158	800,743	812,069	769,715				6,747,667

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				2,203,009
Concentrator	361,187	367,684	388,156	352,903	463,501	398,350	397,942	413,748	371,481				3,514,952
ALERT2	327,977	422,710	422,580	480,051	562,023	600,824	612,240	610,314	648,789				4,687,508
<b>NS5B (Greenhouse)</b>													
Legacy	234,037	211,806	255,357	259,950	287,868	252,952	255,279	260,663	223,907				2,241,819
Concentrator	360,898	364,788	387,844	381,946	464,402	398,240	394,334	412,914	371,155				3,536,521
ALERT2	327,807	419,042	422,268	519,970	564,128	600,850	606,870	609,854	648,457				4,719,246
<b>Diff (NS5a-NS5b)</b>													
Legacy (Digi One)	37	733	281	-41,244	-1096	340	2250	-131	20	0	0	0	-38,810
Concentrator (B2010)	289	2,896	312	-29,043	-901	110	3608	834	326	0	0	0	-21,569
ALERT2 (B2010)	170	3,668	312	-39,919	-2105	-26	5370	460	332	0	0	0	-31,738
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 21<sup>st</sup>. No data was collected through the West Creek repeater on July 20<sup>th</sup>. Interesting to note in the figure above that the ratio of legacy to ALERT2 traffic on July 20<sup>th</sup> 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 720 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 performance
4270	Cannon Mountain	Consistently poor event performance
3020	West Creek WX	ALERT2 station with drifting clock (negative latency)
2271-4	Unknown	Consistently sending unknown IDs
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**

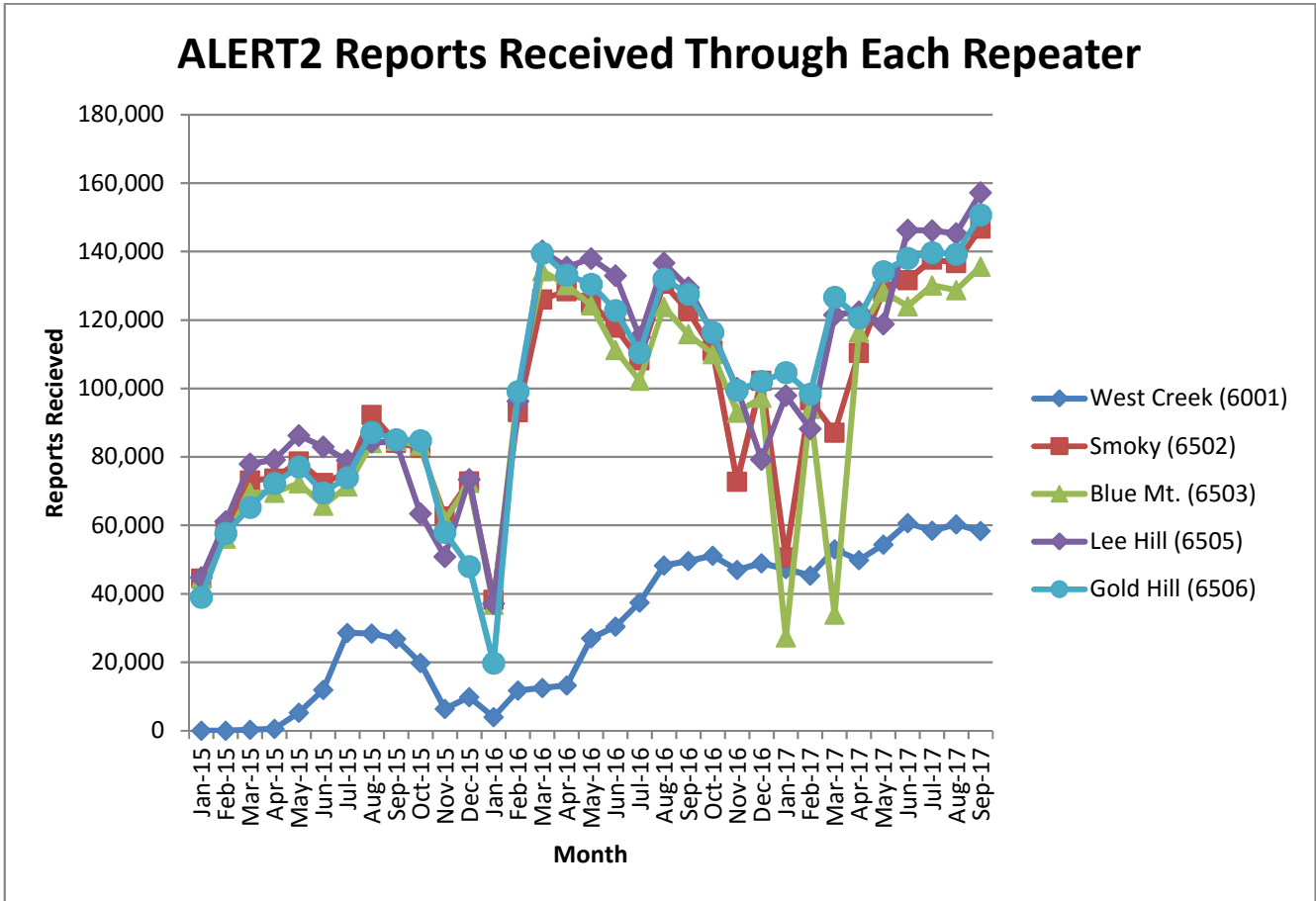
Repeater	Slot Size (sec)	Slot Offset (sec)	Source Address	ALERT2 Input Frequency (MHz)	ALERT2 Output Frequency (MHz) – received at Diamond Hill
West Creek	2	0	6001	169.425	170.300
Smoky	3	2	6502	169.525	170.300
Blue Mt.	4	5	6503	169.525	170.300
Lee Hill	3	9	6505	169.525	170.300
Gold Hill	3	12	6506	169.525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

\*\* - 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	50.28	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			
Minimum	-29	-23	-23	-4	-23	-23	-23	-23	-23			
Maximum	286	12,946	43,177	43,197	43,177	43,177	320	43,177	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	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			
5720	4100	100150	2800	3090	630	420	3010	1710			
4510	4330	2360	4100	5810	3090	2360	2330	4340			
100260	4040	2970	3050	1360	2330	3090	2360	2330			
4870	4270	2270	920	2330	5810	5810	100260	4550			
5940	4510	2350	1710	100270	4270	2330	4270	5720			

\*- 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	40.74	Only the 1-mm rain sensors were included in the analysis
Median	40	Only the 1-mm rain sensors were included in the analysis
Standard deviation	12.81	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	79.16	Only the 1-mm rain sensors were included in the analysis
Mean minus two standard deviations	15.13	Only the 1-mm rain sensors were included in the analysis
Minimum total count	4	Swiss Peaks (4130)
Maximum total count	99	Powers Park (1500)
Sensors showing <b>NO</b> rain for the month		
Sensors greater than 3 SD (over reporting)	3	Powers Park (1500), Utah Park (430), Brook Forest (2260)

## 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	<b>24.19</b>
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	<b>29.00</b>
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	<b>25.08</b>
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	<b>30.89</b>
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	<b>27.67</b>
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	<b>32.03</b>
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	<b>22.66</b>
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	<b>42.46</b>
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	<b>35.45</b>
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	<b>44.39</b>
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	<b>23.23</b>
2017	13.3	5.84	27.70	39.10	99.60	15.33	40.80	44.58	40.74				
<b>Ave</b>	<b>6.83</b>	<b>10.09</b>	<b>20.23</b>	<b>43.85</b>	<b>66.04</b>	<b>35.57</b>	<b>56.45</b>	<b>38.65</b>	<b>44.94</b>	<b>25.54</b>	<b>8.08</b>	<b>7.94</b>	<b>28.09</b>

\*- 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
Little Narrows	4470	Tips went with sequential tip count
Taylor Mountain	4260	Tips went with sequential tip count
Haskins Gulch Conf	2820	All >6 reports were breaks in the data
Boulder Jail	4550	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 7,619 incrementing reports were received and a total of 8,011 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	1620			
4870	750	1620	4270	4330	2790	2320	1340	4290			
1920	2790	2940	4100	5810	3090	4270	2330	4470			
3010	100260	2750	2330	3090	4270	2970	4270	4270			
4510	4270	2980	920	5900	5720	2880	100260	4490			
4330	4490	5900	1710	1500	630	2360	330	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)	220	195	0
Total reports from unknown IDs	780	743	0
Unknown IDs with only a single received report (potential noise)	146	142	0
Total reports from all IDs – RecData Log entire month	371,481	223,927	648,789
Unknown reports as a fraction of total reports	0.21%	0.33%	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			

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%			

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	60,58,100	Legacy reports for IDs 0,1,2 only
2271	51	2271	51	Cub Creek Below Blue possibly sending invalid ID
2274	51	2274	51	Cub Creek Below Blue possibly sending invalid ID
2272	50	2272	50	Cub Creek Below Blue possibly sending invalid ID
4378	17	4378	16	Gross Reservoir possibly sending invalid ID
1430	16	1430	15	Elbert 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			
630-Temple Pond DTC	--	--	--	--	--	--	--	20**	--			
1100-Louisville Rec Ctr	--	--	--	--	--	--	--	152*	--			
2810-Pine Cliff Rd.	41	32	9	9	2	2	1	4	4			
2880-Happy Canyon	--	--	--	--	--	--	4	--	--			
3010-Wx-EPC @ 105	6	7	2	4	--	2	3	3	1			
3050-E/W Trailhead	23	18	7	5	3	5	1	2	2			
4030-Red Garden	--	10	5	--	4	2	2	3	2			
4330-Hansen	--	--	--	--	--	--	4	2	2			
4240-Sunset	--	9	5	2	--	--	--	5	1			
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*	775*			
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			
1649-SPR at 19 <sup>th</sup> 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	2			
3013-EPC@Hwy 105	3	--	4	9	10	7	5	9	9			
4383-Eldorado Springs	16	2	2	--	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 October 5, 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>
5940	Log Jumper Precipitation-DG	Hayman 30 minute rainfall	9/23/2017 17:35

# General System Analysis

**Database Name** P:\A207-UDFCD-Data-Analysis\2017\09-2017\All\_Data.mdb

Summarize

<b>First Date in Database</b>	9/1/17 12:00 AM	<b>Total Days</b>	30.0
<b>Last Date in Database</b>	10/1/17 12:00 AM	<b>Total Hours</b>	720.0

**Total Records Analyzed** 1,244,197

Records by Group	Legacy	%	Concentrator	%	ALERT	%
Wind Data	72,168	32%	139,378	38%	216,729	33%
Temperature	34,592	15%	63,055	17%	83,135	13%
Relative Humidity	33,575	15%	55,163	15%	82,563	13%
Barometric Pressure	18,314	8%	28,333	8%	1,268	0%
Precipitation	13,647	6%	17,410	5%	54,238	8%
Water Level	13,621	6%	15,501	4%	62,829	10%
Battery Voltage	10,822	5%	23,743	6%	77,691	12%
Solar Radiation	7,818	3%	7,963	2%	23,450	4%
Fuel Temperature	5,758	3%	5,749	2%	0	0%
Fuel Moisture	5,752	3%	5,755	2%	0	0%
Soil Moisture	2,871	1%	2,875	1%	0	0%
Repeater Status Report	2,184	1%	1,746	0%	0	0%
Unknown	743	0%	780	0%	0	0%
ET-Hourly	716	0%	717	0%	0	0%
Repeater Pass List	532	0%	61	0%	0	0%
12Hr Status Report	325	0%	337	0%	2,848	0%
Not Used	268	0%	289	0%	0	0%
Water Temp	119	0%	119	0%	0	0%
Handar 585 ALARM Status	62	0%	62	0%	0	0%
ET-Daily	30	0%	30	0%	0	0%
Solar Power	9	0%	9	0%	0	0%
GPS Lock	1	0%	176	0%	29,479	5%
Hayman Battery	0	0%	2,230	1%	0	0%
Dew Point Temperature	0	0%	0	0%	8,351	1%
Flasher Status	0	0%	0	0%	6,208	1%
<b>Total</b>	<b>223,927</b>		<b>371,481</b>		<b>648,789</b>	

Traffic Loading Summary	Legacy	Concentrator	ALERT
Alert Reports	260,532	413,748	648,789
Average Daily Traffic	8,404	13,347	21,626
Average Hourly Traffic	350	556	901
Median Hourly Traffic	341	544	879
Peak Hourly Traffic	795	1,111	1,689
2nd Max	751	1,057	1,554
3rd Max	729	988	1,320
4th Max	646	979	1,236
5th Max	606	963	1,191
		hour beginning	hour beginning
		Aug 7, 6:00 PM	Aug 7, 6:00 PM
		Aug 3, 2:00 AM	Aug 3, 2:00 AM
		Aug 7, 7:00 PM	Aug 3, 3:00 AM
		Aug 3, 3:00 AM	Aug 7, 7:00 PM
		Aug 7, 3:00 PM	Aug 12, 4:00 PM
			Sep 23, 6:00 PM
			Sep 23, 5:00 PM
			Sep 23, 7:00 PM
			Sep 23, 4:00 PM
			Sep 28, 4:00 AM

# Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
750	Wx-Quincy Reservoir	31	12:00	60	52%
1710	Shop Creek	39	17:27	60	65%
4340	Riverside	39	11:59	60	65%
2330	Morrison	40	15:31	60	67%
4550	Boulder Jail	42	12:35	60	70%
5720	Four Mile Creek	44	16:14	60	73%
100260	Wx-A2-Trumbull (Hayman) - Precip	545		720	76%
1620	Slaughterhouse Glch	48	13:54	60	80%
2360	Indian Hills	49	14:20	60	82%
4870	SBC @ SB Road	49	13:10	60	82%
2230	Bear Cr below Cub	50	12:51	60	83%
2280	Kinney Peak	51	13:27	60	85%
4270	Cannon Mountain	51	13:24	60	85%
4490	Apple Valley	51	13:42	60	85%
1660	SPR at Henderson	52	12:46	60	87%
2270	Cub Cr below Blue	52	12:35	60	87%
2980	Dakan Rd	52	13:19	60	87%
4510	Pinewood Springs	52	13:08	60	87%
2870	Cottonwood (Apache)	53	13:36	60	88%
4330	Hansen Rain	53	13:11	60	88%
4470	Little Narrows	53	12:30	60	88%
100150	A2-Sellers Gulch at Haystack Precip	647		720	90%
940	Aurora Regional Pond	54	12:28	60	90%
2350	Idledale	54	13:06	60	90%
3010	WX-EPC at Hwy 105	54	13:01	60	90%
3080	Tallman Gulch	54	13:15	60	90%
310	Guy Hill Ranch	55	12:30	60	92%
320	Sports Complex	55	13:01	60	92%
540	Parker/Mississippi	55	13:09	60	92%
2320	Choke Cherry Resvr	55	13:04	60	92%
2810	Pine Cliff Road	55	12:45	60	92%
2820	Haskins Gulch Conf	55	12:45	60	92%
2850	Cherry Cr bl Bayou Glch	55	12:00	60	92%
2900	Russelville Gulch-Douglas	55	12:45	60	92%
4180	Gold Lake	55	12:13	60	92%
650	Iliff Pond	56	12:29	60	93%
1350	Chatfield COE	56	12:44	60	93%
1360	Denver Zoo	56	12:26	60	93%
1420	Wx-A2-Diamond Hill	56	11:45	60	93%
2240	Cold Sprg Glch conf	56	12:13	60	93%
2840	Sulphur Gulch	56	12:42	60	93%
2960	Indian Creek	56	12:30	60	93%
4060	Lakeshore	56	11:57	60	93%
4190	Slaughterhouse	56	11:57	60	93%
4790	Wx-Button Rock	56	12:00	60	93%
5810	Stump Bump	56	12:00	60	93%
5940	Log Jumper	56	12:45	60	93%
100110	A2-ETG @ Hampden Precip	56	11:59	60	93%
110	Ralston Reservoir	57	12:14	60	95%
410	Kelly Dam	57	12:40	60	95%
530	Fire Station #19	57	12:26	60	95%
630	Temple Pond at DTC	57	11:57	60	95%
840	Fire Station 12	57	12:00	60	95%
1300	Hidden Lake	57	12:14	60	95%

1550	Lakewood CC	57	11:57	60	95%
1700	Cherry Cr @ Champa	57	12:28	60	95%
1800	Sand Creek Park	57	12:41	60	95%
2750	Wx-Castle Rock	57	12:30	60	95%
2860	CC at Stroh Rd	57	12:40	60	95%
2880	Happy Canyon at N Surrey Dr	57	12:14	60	95%
4010	Crescent	57	12:29	60	95%
4080	Twin Sisters	57	11:57	60	95%
4250	Geer Canyon	57	12:13	60	95%
4290	Red Hill	57	11:58	60	95%
4360	Justice Center	57	12:13	60	95%
5730	West Creek	57	12:15	60	95%
5740	Trail Creek	57	12:00	60	95%
150	Nott Creek	58	11:57	60	97%
200	Leyden Reservoir	58	11:58	60	97%
210	Leyden Confluence	58	11:58	60	97%
420	Expo Park	58	11:57	60	97%
430	Utah Park	58	11:57	60	97%
440	Fire Station #7	58	12:11	60	97%
510	Virginia Court	58	12:14	60	97%
640	Goldsmith @ Eastman	58	11:57	60	97%
700	Toll Gate @ 6th	58	12:14	60	97%
720	Confluence Pond	58	12:11	60	97%
800	Sable Ditch @ 18th	58	12:12	60	97%
810	Granby Ditch @ 6th	58	12:12	60	97%
970	Pump Sta 3	58	12:00	60	97%
1030	NREL/S. Table Mtn.	58	11:57	60	97%
1050	Jeffco Fairgrounds	58	11:57	60	97%
1110	Gunbarrel	58	12:12	60	97%
1200	Broomfield 3207	58	12:13	60	97%
1440	Wx-Elbert	58	12:00	60	97%
1460	Wx-Urban Farm	58	12:13	60	97%
1480	Third Creek at DIA	58	12:13	60	97%
1520	Wx-Marston Lake North	58	12:13	60	97%
1530	Bear Creek @ Lowell	58	11:57	60	97%
1640	SPR at Union Ave.	58	11:57	60	97%
1900	Niver Detention	58	12:11	60	97%
2250	Rosedale	58	12:30	60	97%
2310	Genesee Village	58	11:57	60	97%
2340	El Rancho	58	12:13	60	97%
2730	Wx-Salisbury Park	58	12:13	60	97%
2890	Spruce Mt - Douglas	58	12:14	60	97%
2910	East Cherry Cr-Douglas	58	12:00	60	97%
2930	Wx-Spring Valley Rd-DougCnty	58	12:14	60	97%
2940	Willow Creek - DougCnty	58	12:00	60	97%
2950	DC Public Works	58	12:00	60	97%
2990	Wx-Tomah Rd-DougCnty	58	12:00	60	97%
3040	CC @ Russelville Road Precip	58	12:14	60	97%
4020	Rio Grande	58	11:57	60	97%
4030	Red Garden	58	12:26	60	97%
4040	Martin Gulch	58	11:57	60	97%
4050	Walker Ranch	58	12:11	60	97%
4110	Betasso	58	11:57	60	97%
4130	Swiss Peaks	58	11:57	60	97%
4220	Fling's	58	12:13	60	97%
4300	Big Elk Park	58	12:12	60	97%
4310	Johnny Park	58	12:13	60	97%
4520	Eagle Ridge	58	12:14	60	97%
4530	Winiger Ridge	58	12:12	60	97%

4810	Shanahan Ridge	58	12:12	60	97%
4860	Fairview Peak	58	12:19	60	97%
100140	A2-Upper Sellers Gulch Precip	706		720	98%
120	West Woods	59	12:12	60	98%
140	Wx-Blue Mountain	59	12:00	60	98%
220	Upper Leyden	59	12:00	60	98%
300	Van Bibber Park	59	11:57	60	98%
330	Van Bibber @ Hwy 93	59	12:13	60	98%
400	Montview Park	59	12:00	60	98%
500	Havana Park	59	11:57	60	98%
610	Harvard @ Jackson	59	11:57	60	98%
730	No Name @ Quincy	59	11:58	60	98%
820	ETG @ Buckley	59	12:11	60	98%
830	Side Creek Park	59	12:00	60	98%
850	Flying J	59	12:00	60	98%
920	Wx-Aurora Town Hall	59	12:00	60	98%
950	Piney at Liverpool	59	11:57	60	98%
1010	Denver West	59	11:57	60	98%
1040	Lena @ U.S. Hwy 6	59	11:58	60	98%
1060	Heritage Square	59	11:57	60	98%
1100	Louisville Rec Ctr	59	11:59	60	98%
1320	SPR at 3rd Ave	59	11:58	60	98%
1400	Upper Sloan Det.	59	11:57	60	98%
1500	Powers Park	59	11:57	60	98%
1570	Wx-Brighton Ditch	59	12:00	60	98%
1600	Englewood Dam	59	11:58	60	98%
1920	Wx-Brighton	59	12:00	60	98%
2210	Wx-Hiwan G.C.	59	12:00	60	98%
2260	Brook Forest	59	12:14	60	98%
2370	Red Rocks Park	59	12:11	60	98%
2710	Wx-Highlands Ranch WTP	59	12:00	60	98%
2920	West Cherry Head-Douglas Cnty	59	12:00	60	98%
3030	WX-Bingham Lake Park	59	12:00	60	98%
4090	Magnolia	59	12:13	60	98%
4100	Filter Plant	59	12:00	60	98%
4140	Logan Mill	59	12:12	60	98%
4150	Gold Hill	59	11:57	60	98%
4200	Lazy Acres	59	11:59	60	98%
4230	Golden Age	59	11:58	60	98%
4240	Sunset	59	12:13	60	98%
4260	Taylor Mountain	59	11:57	60	98%
4320	Lee Hill Rain 2012	59	11:58	60	98%
4350	Conifer Hill	59	11:57	60	98%
4570	St. Antons	59	11:59	60	98%
4730	Wx-Sugarloaf	59	12:00	60	98%
4750	Wx-Louisville Lake	59	12:00	60	98%
4770	Wx-Cal-Wood Ranch	59	12:00	60	98%
4820	Doudy Draw	59	11:57	60	98%
4830	SBC @ San Souci	59	12:12	60	98%
4840	SBC@S Boulder Ditch	59	11:57	60	98%
4880	Whispering Pines	59	11:57	60	98%
5860	Cedar Mountain	59	12:00	60	98%
5880	Hackett Mountain	59	12:00	60	98%
100200	Wx-A2-OneRain Weather - Precipitation	59	12:00	60	98%
3050	East/West Trailhead	710		720	99%
100290	A2-PlumCr at Sedalia - Precip	711		720	99%
2800	Columbine Open Space	713		720	99%
100420	A2-Thorncreek - Precip	716		720	99%
3060	Fire Sta 47	717		720	100%



4850	Porphory Mtn	717		720	100%
3070	A2-Newlin Gulch Precip	718		720	100%
100100	A2-Blackstone Precip	718		720	100%
100270	Wx-A2-WestCreek (Hayman) - Precip	718		720	100%
100410	A2-Brantner Gulch - Precip	718		720	100%
100	A2-Carr Street	719		720	100%
870	A2-Murphy Creek GC	719		720	100%
1000	A2-Maple Grove Resv.	719		720	100%
1310	LDC at 64th	719		720	100%
1340	Sanderson at Xavier	719		720	100%
100160	A2-Sand Creek at Colfax Precip	719		720	100%
100230	A2-Havana Pond Precip	719		720	100%
100240	A2-Westerly Cr Dam Precip	719		720	100%
100300	A2-CoalCreek at McCaslin - Precip	719		720	100%
100320	A2-Weir Gulch - Precip	719		720	100%
520	Jewell Detention	60	11:57	60	100%
600	Harvard Gulch Park	60	11:58	60	100%
620	Quincy/Highline	60	11:57	60	100%
710	Horseshoe Park Drop	60	11:58	60	100%
760	Mission Viejo Park	60	11:57	60	100%
1370	West Metro FS13	60	11:57	60	100%
1720	Cherry Cr @ Steele	60	11:57	60	100%
2970	Rampart Range Rd-Satellite	225			100%
3020	Wx-West Creek WX	728		720	100%
4070	Bear Peak	60	11:57	60	100%
4160	Sunshine	60	11:57	60	100%
4170	Pine Brook	60	11:57	60	100%
4710	Wx-Ward C-1	61	11:42	60	100%
6601	Wx-A2-Magnolia WX-Precip	90	7:53	90	100%
900	Wx-Aurora Reservoir	67	10:31	60	100%

Rain Event Performance																	
	Reports Received	Reports Received	7,619	Analyze Rain Sensors							<<show stations with zero rain (1=yes, 0=no)						
	Systemwide Avg	Total Tips	8,011														
	95.08%	Data Loss	4.89%														
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket			
Slaughterhouse GIch	1620	65%	11	5	0	0	1	0	0	17	26	9	0	0.0393701			
Red Hill	4290	71%	28	10	2	1	0	0	0	41	58	17	0	0.0393701	Mean	40.74	
Little Narrows	4470	71%	33	5	2	0	0	0	1	40	56	9	0	0.0393701	Median	40	
Cannon Mountain	4270	77%	27	7	2	0	0	0	0	36	47	11	0	0.0393701	St. Dev	12.81	
Apple Valley	4490	77%	26	5	1	1	0	0	0	33	43	10	0	0.0393701	Mean plus 3 SD	79.16	
Bear Cr below Cub	2230	78%	36	9	2	0	0	0	0	47	60	13	0	0.0393701	Mean minus 2 SD	15.13	
Pinewood Springs	4510	79%	37	4	1	2	0	0	0	44	56	12	0	0.0393701	Min	4	
Morrison	2330	80%	27	7	1	0	0	0	0	35	44	9	0	0.0393701	Max	99	
Wx-Brighton Ditch	1570	81%	18	3	1	0	0	0	0	22	27	5	0	0.0393701			
Upper Sloan Det.	1400	83%	20	5	0	0	0	0	0	25	30	5	0	0.0393701			
Taylor Mountain	4260	84%	41	0	0	0	0	0	1	41	49	0	0	0.0393701			
SBC @ SB Road	4870	84%	25	6	0	0	0	0	0	31	37	6	0	0.0393701			
Iliff Pond	650	85%	19	2	1	0	0	0	0	22	26	4	0	0.0393701			
Indian Hills	2360	85%	38	6	1	0	0	0	0	45	53	8	0	0.0393701			
Wx-A2-Trumbull (Hayman) - Precip	100260	85%	34	5	1	0	0	0	0	40	47	7	0	0.0393701			
Boulder Jail	4550	86%	11	0	1	0	0	0	1	12	14	2	0	0.0393701			
Eagle Ridge	4520	86%	37	7	0	0	0	0	0	44	51	7	0	0.0393701			
Leyden Reservoir	200	86%	32	6	0	0	0	0	0	38	44	6	0	0.0393701			
Wx-Button Rock	4790	87%	41	5	1	0	0	0	0	47	54	7	0	0.0393701			
Martin Gulch	4040	87%	29	5	0	0	0	0	0	34	39	5	0	0.0393701			
Chatfield COE	1350	88%	27	2	1	0	0	0	0	30	34	4	0	0.0393701			
Kinney Peak	2280	89%	43	6	0	0	0	0	0	49	55	6	0	0.0393701			
Sulphur Gulch	2840	89%	29	4	0	0	0	0	0	33	37	4	0	0.0393701			
Kelly Dam	410	89%	23	1	1	0	0	0	0	25	28	3	0	0.0393701			
ETG @ Buckley	820	89%	22	3	0	0	0	0	0	25	28	3	0	0.0393701			
Haskins Gulch Conf	2820	90%	23	3	0	0	0	0	1	26	29	3	0	0.0393701			
Sports Complex	320	90%	32	2	1	0	0	0	0	35	39	4	0	0.0393701			
Dakan Rd	2980	90%	25	1	1	0	0	0	0	27	30	3	0	0.0393701			
St. Antons	4570	90%	43	1	2	0	0	0	0	46	51	5	0	0.0393701			
Bear Creek @ Lowell	1530	90%	25	3	0	0	0	0	0	28	31	3	0	0.0393701			
Lakewood CC	1550	90%	25	3	0	0	0	0	0	28	31	3	0	0.0393701			
Wx-Elbert	1440	91%	35	4	0	0	0	0	0	39	43	4	0	0.0393701			
Cub Cr below Blue	2270	91%	64	7	0	0	0	0	0	71	78	7	0	0.0393701			
Sunset	4240	91%	47	3	1	0	0	0	0	51	56	5	0	0.0393701			
Aurora Regional Pond	940	91%	38	4	0	0	0	0	0	42	46	4	0	0.0393699			
Havana Park	500	91%	29	3	0	0	0	0	0	32	35	3	0	0.0393701			
Parker/Mississippi	540	92%	20	2	0	0	0	0	0	22	24	2	0	0.0393701			
WX-EPC at Hwy 105	3010	92%	30	3	0	0	0	0	0	33	36	3	0	0.0393701			
WX-Bingham Lake Park	3030	92%	40	4	0	0	0	0	0	44	48	4	0	0.0393701			
Rio Grande	4020	92%	40	4	0	0	0	0	0	44	48	4	0	0.0393701			
Lena @ U.S. Hwy 6	1040	92%	42	2	1	0	0	0	0	45	49	4	0	0.0393701			
Russelville Gulch-Douglas	2900	92%	42	4	0	0	0	0	0	46	50	4	0	0.0393701			
Conifer Hill	4350	92%	42	4	0	0	0	0	0	46	50	4	0	0.0393701			
Wx-Highlands Ranch WTP	2710	92%	32	3	0	0	0	0	0	35	38	3	0	0.0393701			
Wx-Castle Rock	2750	92%	32	3	0	0	0	0	0	35	38	3	0	0.0393701			
Harvard @ Jackson	610	92%	22	2	0	0	0	0	0	24	26	2	0	0.0393701			
Wx-Urban Farm	1460	92%	22	2	0	0	0	0	0	24	26	2	0	0.0393701			
SPR at Union Ave.	1640	92%	22	2	0	0	0	0	0	24	26	2	0	0.0393701			
Sand Creek Park	1800	92%	22	2	0	0	0	0	0	24	26	2	0	0.0393701			
West Metro FS13	1370	93%	34	3	0	0	0	0	0	37	40	3	0	0.0393701			
Ralston Reservoir	110	93%	46	4	0	0	0	0	0	50	54	4	0	0.0393701			
Toll Gate @ 6th	700	93%	23	2	0	0	0	0	0	25	27	2	0	0.0393701			
Sable Ditch @ 18th	800	93%	23	2	0	0	0	0	0	25	27	2	0	0.0393701			
Van Bibber Park	300	93%	36	1	1	0	0	0	0	38	41	3	0	0.0393701			
Quincy/Highline	620	93%	24	2	0	0	0	0	0	26	28	2	0	0.0393701			
Denver West	1010	93%	36	3	0	0	0	0	0	39	42	3	0	0.0393701			

Denver Zoo	1360	93%	24	2	0	0	0	0	0	0	26	28	2	0	0.0393701
Red Rocks Park	2370	93%	36	3	0	0	0	0	0	0	39	42	3	0	0.0393701
Bear Peak	4070	93%	37	3	0	0	0	0	0	0	40	43	3	0	0.0393701
Third Creek at DIA	1480	93%	25	2	0	0	0	0	0	0	27	29	2	0	0.0393701
Happy Canyon at N Surrey Dr	2880	93%	40	1	1	0	0	0	0	0	42	45	3	0	0.0393701
Van Bibber @ Hwy 93	330	94%	41	3	0	0	0	0	0	0	44	47	3	0	0.0393701
Geer Canyon	4250	94%	55	4	0	0	0	0	0	0	59	63	4	0	0.0393701
Louisville Rec Ctr	1100	94%	14	1	0	0	0	0	0	0	15	16	1	0	0.0393701
Walker Ranch	4050	94%	30	0	1	0	0	0	0	0	31	33	2	0	0.0393701
Upper Leyden	220	94%	44	3	0	0	0	0	0	0	47	50	3	0	0.0393701
Spruce Mt - Douglas	2890	94%	31	0	1	0	0	0	0	0	32	34	2	0	0.0393701
East/West Trailhead	3050	94%	32	2	0	0	0	0	0	0	34	36	2	0	0.0393701
Wx-Tomah Rd-DougCnty	2990	95%	49	3	0	0	0	0	0	0	52	55	3	0	0.0393701
Genesee Village	2310	95%	52	1	1	0	0	0	0	0	54	57	3	0	0.0393701
Tallman Gulch	3080	95%	37	0	1	0	0	0	0	0	38	40	2	0	0.0393701
Riverside	4340	95%	36	2	0	0	0	0	0	0	38	40	2	0	0.0393701
Jeffco Fairgrounds	1050	95%	39	2	0	0	0	0	0	0	41	43	2	0	0.0393701
Sunshine	4160	96%	41	2	0	0	0	0	0	0	43	45	2	0	0.0393701
Wx-Cal-Wood Ranch	4770	96%	41	2	0	0	0	0	0	0	43	45	2	0	0.0393701
West Woods	120	96%	42	2	0	0	0	0	0	0	44	46	2	0	0.0393701
Goldsmith @ Eastman	640	96%	21	1	0	0	0	0	0	0	22	23	1	0	0.0393701
SPR at Henderson	1660	96%	21	1	0	0	0	0	0	0	22	23	1	0	0.0393701
Betasso	4110	96%	44	2	0	0	0	0	0	0	46	48	2	0	0.0393701
Golden Age	4230	96%	44	2	0	0	0	0	0	0	46	48	2	0	0.0393701
West Cherry Head-Douglas Cnty	2920	96%	45	2	0	0	0	0	0	0	47	49	2	0	0.0393701
Justice Center	4360	96%	45	2	0	0	0	0	0	0	47	49	2	1	0.0393701
NREL/S. Table Mtn.	1030	96%	46	2	0	0	0	0	0	0	48	50	2	0	0.0393701
Cherry Cr @ Steele	1720	96%	23	1	0	0	0	0	0	0	24	25	1	0	0.0393701
SPR at 3rd Ave	1320	96%	24	1	0	0	0	0	0	0	25	26	1	0	0.0393701
Gold Lake	4180	96%	49	2	0	0	0	0	0	0	51	53	2	0	0.0393701
Shop Creek	1710	96%	25	1	0	0	0	0	0	0	26	27	1	0	0.0393701
Cold Sprg Glch conf	2240	96%	50	2	0	0	0	0	0	0	52	54	2	0	0.0393701
Choke Cherry Resvr	2320	96%	50	2	0	0	0	0	0	0	52	54	2	0	0.0393701
Slaughterhouse	4190	96%	50	2	0	0	0	0	0	0	52	54	2	0	0.0393701
Idledale	2350	96%	51	2	0	0	0	0	0	0	53	55	2	0	0.0393701
Guy Hill Ranch	310	96%	53	2	0	0	0	0	0	0	55	57	2	0	0.0393701
Granby Ditch @ 6th	810	97%	27	1	0	0	0	0	0	0	28	29	1	0	0.0393701
Wx-A2-Diamond Hill	1420	97%	27	1	0	0	0	0	0	0	28	29	1	0	0.0393701
Wx-Marston Lake North	1520	97%	28	1	0	0	0	0	0	0	29	30	1	0	0.0393701
Fire Station 12	840	97%	29	1	0	0	0	0	0	0	30	31	1	0	0.0393701
Wx-Louisville Lake	4750	97%	29	1	0	0	0	0	0	0	30	31	1	0	0.0393701
Pine Cliff Road	2810	97%	30	1	0	0	0	0	0	0	31	32	1	0	0.0393701
Rampart Range Rd-Satellite	2970	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
Hidden Lake	1300	97%	32	1	0	0	0	0	0	0	33	34	1	0	0.0393701
Wx-Salisbury Park	2730	97%	32	1	0	0	0	0	0	0	33	34	1	0	0.0393701
Jewell Detention	520	97%	66	2	0	0	0	0	0	0	68	70	2	0	0.0393701
DC Public Works	2950	97%	33	1	0	0	0	0	0	0	34	35	1	0	0.0393701
Wx-Aurora Town Hall	920	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701
Log Jumper	5940	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701
Broomfield 3207	1200	97%	35	1	0	0	0	0	0	0	36	37	1	0	0.0393701
SBC @ San Souci	4830	97%	36	1	0	0	0	0	0	0	37	38	1	0	0.0393701
Four Mile Creek	5720	97%	36	1	0	0	0	0	0	0	37	38	1	0	0.0393701
Virginia Court	510	97%	37	1	0	0	0	0	0	0	38	39	1	0	0.0393701
Stump Bump	5810	97%	37	1	0	0	0	0	0	0	38	39	1	0	0.0393701
Expo Park	420	98%	38	1	0	0	0	0	0	0	39	40	1	0	0.0393701
Willow Creek - DougCnty	2940	98%	38	1	0	0	0	0	0	0	39	40	1	0	0.0393701
Nott Creek	150	98%	39	1	0	0	0	0	0	0	40	41	1	0	0.0393701
Piney at Liverpool	950	98%	39	1	0	0	0	0	0	0	40	41	1	0	0.0393701
East Cherry Cr-Douglas	2910	98%	39	1	0	0	0	0	0	0	40	41	1	0	0.0393701
Crescent	4010	98%	39	1	0	0	0	0	0	0	40	41	1	0	0.0393701

CC at Stroh Rd	2860	98%	40	1	0	0	0	0	0	0	41	42	1	0	0.0393701
Twin Sisters	4080	98%	41	1	0	0	0	0	0	0	42	43	1	0	0.0393701
Wx-Spring Valley Rd-DougCnty	2930	98%	43	1	0	0	0	0	0	0	44	45	1	0	0.0393701
Winiger Ridge	4530	98%	43	1	0	0	0	0	0	0	44	45	1	0	0.0393701
West Creek	5730	98%	44	1	0	0	0	0	0	0	45	46	1	0	0.0393701
Wx-Blue Mountain	140	98%	45	1	0	0	0	0	0	0	46	47	1	0	0.0393701
Lee Hill Rain 2012	4320	98%	45	1	0	0	0	0	0	0	46	47	1	0	0.0393701
Columbine Open Space	2800	98%	47	1	0	0	0	0	0	0	48	49	1	0	0.0393701
Gold Hill	4150	98%	47	1	0	0	0	0	0	0	48	49	1	0	0.0393701
Red Garden	4030	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
Trail Creek	5740	98%	50	1	0	0	0	0	0	0	51	52	1	0	0.0393701
Hansen Rain	4330	98%	63	1	0	0	0	0	0	0	64	65	1	0	0.0393701
Wx-Ward C-1	4710	98%	64	1	0	0	0	0	0	0	65	66	1	0	0.0393701
Brook Forest	2260	99%	80	1	0	0	0	0	0	0	81	82	1	0	0.0393701
Powers Park	1500	99%	97	1	0	0	0	0	0	0	98	99	1	0	0.0393701
A2-Brantner Gulch - Precip	100410	100%	26	0	0	0	0	0	0	0	26	26	0	0	0.0393701
A2-Thorncreek - Precip	100420	100%	30	0	0	0	0	0	0	0	30	30	0	1	0.0393701
A2-Carr Street	100	100%	35	0	0	0	0	0	0	0	35	35	0	0	0.0393701
Leyden Confluence	210	100%	44	0	0	0	0	0	0	0	44	44	0	0	0.0393701
Montview Park	400	100%	25	0	0	0	0	0	0	0	25	25	0	0	0.0393701
Utah Park	430	100%	91	0	0	0	0	0	0	0	91	91	0	0	0.0393701
Fire Station #7	440	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701
Fire Station #19	530	100%	26	0	0	0	0	0	0	0	26	26	0	0	0.0393701
Harvard Gulch Park	600	100%	55	0	0	0	0	0	0	0	55	55	0	0	0.0393701
Temple Pond at DTC	630	100%	51	0	0	0	0	0	0	0	51	51	0	0	0.0393701
Horseshoe Park Drop	710	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701
Confluence Pond	720	100%	30	0	0	0	0	0	0	0	30	30	0	0	0.0393701
No Name @ Quincy	730	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701
Wx-Quincy Reservoir	750	100%	33	0	0	0	0	0	0	0	33	33	0	0	0.0393701
Side Creek Park	830	100%	33	0	0	0	0	0	0	0	33	33	0	0	0.0393701
Flying J	850	100%	34	0	0	0	0	0	0	0	34	34	0	0	0.0393701
A2-Murphy Creek GC	870	100%	38	0	0	0	0	0	0	0	38	38	0	0	0.0393701
Pump Sta 3	970	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701
A2-Maple Grove Resv.	1000	100%	40	0	0	0	0	0	0	0	40	40	0	1	0.0393701
Gunbarrel	1110	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701
LDC at 64th	1310	100%	28	0	0	0	0	0	0	0	28	28	0	0	0.0393701
Sanderson at Xavier	1340	100%	34	0	0	0	0	0	0	0	34	34	0	0	0.0393701
Englewood Dam	1600	100%	30	0	0	0	0	0	0	0	30	30	0	0	0.0393701
Cherry Cr @ Champa	1700	100%	24	0	0	0	0	0	0	0	24	24	0	0	0.0393701
Niver Detention	1900	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
Wx-Brighton	1920	100%	24	0	0	0	0	0	0	0	24	24	0	0	0.0393701
Wx-Hiwan G.C.	2210	100%	51	0	0	0	0	0	0	0	51	51	0	0	0.0393701
Rosedale	2250	100%	59	0	0	0	0	0	0	0	59	59	0	0	0.0393701
El Rancho	2340	100%	44	0	0	0	0	0	0	0	44	44	0	0	0.0393701
Cherry Cr bl Bayou Glch	2850	100%	42	0	0	0	0	0	0	0	42	42	0	0	0.0393701
Cottonwood (Apache)	2870	100%	41	0	0	0	0	0	0	0	41	41	0	0	0.0393701
Indian Creek	2960	100%	33	0	0	0	0	0	0	0	33	33	0	0	0.0393701
Wx-West Creek WX	3020	100%	33	0	0	0	0	0	0	0	33	33	0	0	0.0393701
CC @ Russellville Road Precip	3040	100%	45	0	0	0	0	0	0	0	45	45	0	0	0.0393701
Fire Sta 47	3060	100%	45	0	0	0	0	0	0	0	45	45	0	0	0.0393701
A2-Newlin Gulch Precip	3070	100%	36	0	0	0	0	0	0	0	36	36	0	0	0.0393701
Lakeshore	4060	100%	38	0	0	0	0	0	0	0	38	38	0	0	0.0393701
Filter Plant	4100	100%	47	0	0	0	0	0	0	0	47	47	0	0	0.0393701
Swiss Peaks	4130	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Logan Mill	4140	100%	45	0	0	0	0	0	0	0	45	45	0	0	0.0393701
Pine Brook	4170	100%	52	0	0	0	0	0	0	0	52	52	0	0	0.0393701
Fling's	4220	100%	49	0	0	0	0	0	0	0	49	49	0	0	0.0393701
Big Elk Park	4300	100%	35	0	0	0	0	0	0	0	35	35	0	0	0.0393701
Johnny Park	4310	100%	50	0	0	0	0	0	0	0	50	50	0	0	0.0393701

Wx-Sugarloaf	4730	100%	42	0	0	0	0	0	0	42	42	0	0	0.0393701		
Shanahan Ridge	4810	100%	51	0	0	0	0	0	0	51	51	0	0	0.0393701		
Doudy Draw	4820	100%	43	0	0	0	0	0	0	43	43	0	0	0.0393701		
SBC@S Boulder Ditch	4840	100%	37	0	0	0	0	0	0	37	37	0	0	0.0393701		
Whispering Pines	4880	100%	45	0	0	0	0	0	0	45	45	0	0	0.0393701		
Cedar Mountain	5860	100%	48	0	0	0	0	0	0	48	48	0	0	0.0393701		
Hackett Mountain	5880	100%	59	0	0	0	0	0	0	59	59	0	0	0.0393701		
A2-Blackstone Precip	100100	100%	41	0	0	0	0	0	0	41	41	0	1	0.0393701		
A2-ETG @ Hampden Precip	100110	100%	39	0	0	0	0	0	0	39	39	0	0	0.0393701		
A2-Upper Sellers Gulch Precip	100140	100%	38	0	0	0	0	0	0	38	38	0	0	0.0393701		
A2-Sellers Gulch at Haystack Precip	100150	100%	37	0	0	0	0	0	0	37	37	0	0	0.0393701		
A2-Sand Creek at Colfax Precip	100160	100%	31	0	0	0	0	0	0	31	31	0	1	0.0393701		
A2-Havana Pond Precip	100230	100%	26	0	0	0	0	0	0	26	26	0	0	0.0393701		
A2-Westerly Cr Dam Precip	100240	100%	24	0	0	0	0	0	0	24	24	0	0	0.0393701		
Wx-A2-WestCreek (Hayman) - Precip	100270	100%	34	0	0	0	0	0	0	34	34	0	0	0.0393701		
A2-PlumCr at Sedalia - Precip	100290	100%	32	0	0	0	0	0	0	32	32	0	0	0.0393701		
A2-CoalCreek at McCaslin - Precip	100300	100%	33	0	0	0	0	0	0	33	33	0	0	0.0393701		
A2-Weir Gulch - Precip	100320	100%	29	0	0	0	0	0	0	29	29	0	0	0.0393701		
Wx-Aurora Reservoir	900	100%	35	0	0	0	0	0	0	35	35	0	0	0.0393699		
		Total Tips	7269	314	31	4	1	0								
Wx-A2-OneRain Weather - Precipitation	100200	94%	147	3	3	0	0	0	0	153	162	9	4	0.01		
Fairview Peak	4860	97%	210	6	0	0	0	0	0	216	222	6	0	0.01		
Porphory Mtn	4850	99%	174	2	0	0	0	0	0	176	178	2	0	0.01		
Wx-A2-Magnolia WX-Precip	6601	100%	198	0	0	0	0	0	0	198	198	0	0	0.01		

## 2017 Monthly Peak Hour ALERT Radio Traffic Summary

