

Memo

Date: October 10, 2014
To: Kevin Stewart
From: Markus Ritsch
Subject: September 2014 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, 2014.

II. General System Analysis Summary

In 2014 data will be received at the District through both the legacy ALERT channel and through the ALERT2 (concentrator plus A2 self-reports) channel. The following (Table 1) quantifies the data reception through each telemetry source. The West Creek repeater in Douglas County processes both incoming legacy and ALERT2 but passes on only concentrator ALERT2 format messages to Diamond Hill. All other repeaters in the system send data on both legacy and ALERT2 channels.

Table 1. Reception of A1/A2 Data at Diamond Hill

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Legacy	320,303	214,698	279,782	293,137	351,946	318,434	308,775	282,598	271,188			
Concentrator	508,306	370,222	495,874	515,526	537,996	430,118	475,605	453,331	440,796			
ALERT2	129,855	86,506	110,086	107,478	113,674	109,244	130,087	354,119	354,822			
TOTAL	958,464	671,426	885,742	916,141	1,003,616	857,796	914,467	1,090,048	1,066,806	0	0	0
Conc+A2	638,161	456,728	605,960	623,004	651,670	539,362	605,692	807,450	795,618			
Conc/Leg	1.59	1.72	1.77	1.76	1.53	1.35	1.54	1.60	1.63			
DataChron	498,846	444,211	599,923	630,962	663,576	583,568	654,910	705,565	694,923			

The daily ratio of concentrator reports received versus legacy ALERT reports received is shown (Figure 1). The data show a decrease in the computed ratio on September 30th. The reason for this decrease is discussed later in this report.

The District operates two redundant NovaStar5 base stations: a primary base station (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 short periods this month are shown below.

Table 2. Comparison of Data Reception by ns5a and ns5b

NS5A (Diamond Hill)	Sep 27	Sept 28	Sept 29	Sep 30	Oct 1	Oct 2	Oct 3	Oct 4	Oct 5
Legacy	8684	9095	13341	10431	9909	10217	9267	9251	9042
Concentrator	14030	14786	19480	14590	14239	15448	14698	14587	14244
ALERT2	11781	11917	12464	10748	10852	11933	11879	11647	11703
NS5B (Greenhouse)									
Legacy	8686	9093	13348	10496	9900	10221	9267	9251	9042
Concentrator	14127	14912	19833	14682	14347	15571	14803	14713	14360
ALERT2	11934	12043	12620	10925	11025	12030	11986	11733	11786
Diff (NS5a-NS5b)									
Legacy	-2.00	2.00	-7.00	-65.00	9.00	-4.00	0.00	0.00	0.00
Concentrator	-97.00	-126.00	-353.00	-92.00	-108.00	-123.00	-105.00	-126.00	-116.00
ALERT2	-153.00	-126.00	-156.00	-177.00	-173.00	-97.00	-107.00	-86.00	-83.00

Each day the base station located at Greenhouse Data in Wyoming receives roughly 150 more ALERT2 reports and roughly 100 more concentrator reports than does the base station at Diamond Hill. The difference shows up primarily in the 6600

series of IDs which is the weather station operated by Don Van Wie. This weather station reports data every 5 minutes which yields a total of 288 reports for a 24 hour period for each sensor. None of the ALERT2 repeaters are pass listed so data is received at Diamond Hill from four separate repeaters (6502-Smoky Hill, 6503-Blue Mountain, 6505-Lee Hill and 6506-Gold Hill). Each repeater passes 288 reports per day which yields a total of 8,640 reports for each sensor for the month. The successful reception of ALERT2 data reports through each repeater is quantified (Table 3) for each base station. The source of lost ALERT2 reports at Diamond Hill relative to Greenhouse is the Blue Mountain repeater. Both Diamond Hill and Greenhouse run the NovaStar5 base station software. The same version of NovaStar5 runs on both servers. Both servers receive data from the IP output on the ALERT2 decoder located at Diamond Hill. It is unlikely that the IP output of the ALERT2 decoder is the problem. It is also unlikely that the NovaStar5 software is the problem as it receives almost exactly the same number of legacy reports on both servers.

Table 3. Successful Reception of ALERT2 Self Reports for the Month (Percent)

August	Smoky Hill (6502)	Blue Mt. (6503)	Lee Hill (6505)	Gold Hill (6506)
Diamond Hill (UDFCD)	94.5%	96.4%	99.8%	99.5%
Greenhouse Data (Wyoming)	94.1%	99.4%	99.8%	99.7%
Difference	-0.1%	3.0%	0.0%	0.2%
September	Smoky Hill (6502)	Blue Mt. (6503)	Lee Hill (6505)	Gold Hill (6506)
Contrail				
Diamond Hill (UDFCD)	96.5%	93.3%	99.0%	97.1%
Greenhouse Data (Wyoming)	96.6%	98.7%	99.3%	98.3%
Difference	0.1%	5.4%	0.3%	1.2%

A comparison between NS5A, NS5B and Contrail is made of the received concentrator reports in order to better understand the difference (Table 4). The difference in received reports is primarily attributed to the following weather sensors. It is interesting to note that the sensors accounting for the difference in received concentrator reports between Diamond Hill and Greenhouse Data all come from Blue Mountain.

Table 4. Received Concentrator Reports from Blue Mountain Sensors at each Base Station

Sensor ID	Diamond Hill (NS5A)	Greenhouse (NS5B)	Contrail
142	2545	2801	2840
141	2565	2807	2837
143	2612	2817	2838
144	2633	2816	2838
137	2655	2816	2773
138	2687	2825	2844
139	2686	2803	2764

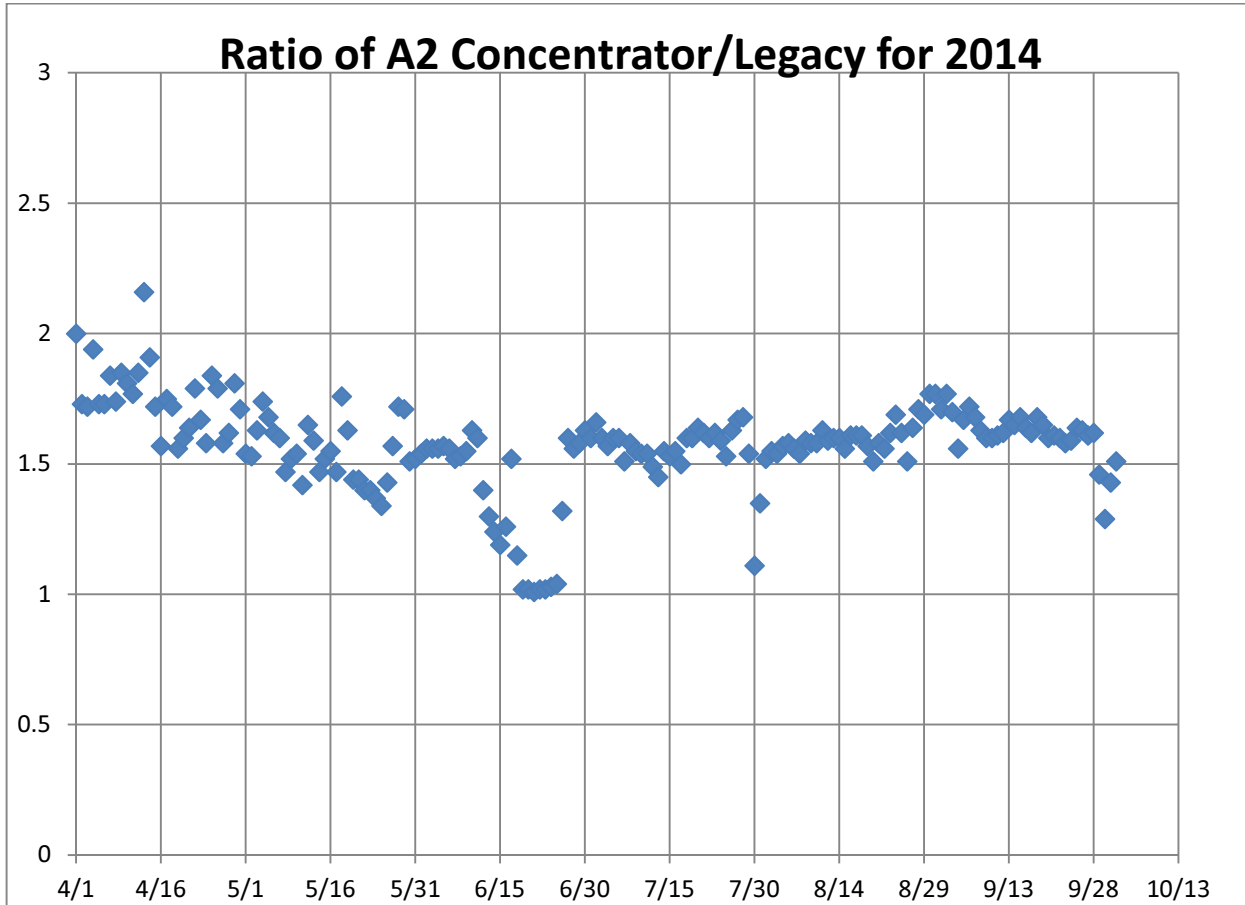


Figure 1. Daily Ratio of Concentrator/Legacy Reports

On September 30th the ratio of concentrator to legacy reports decreases significantly. Intermittent latency from the ALERT2 decoder was identified as the problem. On October 1, the following email was received from OneRain.

“We have isolated the problem to the B2010 receiver/decoder. The B2010 is getting hung up with writing logs to the internal SD card and outputting data to our servers. We have been in contact with BWD and they will be further looking into the situation and possibly applying diagnostic tools.”

Another issue identified last month was the deterioration of legacy data reception at Diamond Hill. The reception of concentrator and legacy reports for three sensors is shown below (Table 5). Since last month the reception of legacy data from sensors 1525 and 4714 has improved to the point that their ratio is again near 1.0. The reception of legacy data from sensor 921 remains poor. Note that the script that automatically generates the report summary shown below was implemented on September 10 and that is why the table does not show data prior to the 10th.

Of additional interest is the fact that sensor 1525 reports every 15 minutes which yields a total of 96 reports per day. Early in the month the base station was indeed receiving close to 96 reports per day on the ALERT2 channel confirmed by day 11 and 12 in the table below. Later in the month the base received only 3 reports per hour from sensor 1525 and was consistently missing the report at the top of the hour, specifically the report at 59 min and 55 sec each hour.

Table 5. Daily Ratio of Concentrator vs Legacy Reports at Diamond Hill

September	Sensor 921			Sensor 1525			Sensor 4714		
	Day	Legacy	Concentrator	Ratio	Legacy	Concentrator	Ratio	Legacy	Concentrator
11	0	24	Na	70	93	1.32	94	97	1.03
12	1	24	24	71	93	1.31	97	97	1.00
13	1	24	24	71	89	1.25	97	99	1.02
14	0	24	Na	70	81	1.16	95	97	1.02
15	1	23	23	72	80	1.11	96	96	1.00
16	7	24	3.4	71	75	1.05	96	96	1.00
17	0	24	Na	72	78	1.08	95	96	1.01
18	3	24	8	71	76	1.07	96	98	1.02
19	5	24	4.8	75	81	1.08	93	96	1.03
20	3	24	8	71	77	1.08	94	96	1.02
21	2	24	12	69	74	1.07	94	97	1.03
22	6	24	4	71	78	1.09	96	96	1.00
23	2	24	12	71	75	1.06	98	98	1.00
24	4	24	6	72	79	1.10	96	96	1.00
25	5	24	4.8	70	78	1.10	95	96	1.01
26	1	24	24	69	78	1.10	96	97	1.01
27	5	24	4.8	71	75	1.05	97	97	1.00
28	5	24	4.8	70	76	1.08	95	96	1.01
29	4	24	6	66	72	1.09	98	101	1.03
30	7	22	3.1	69	72	1.04	98	95	0.97

A. Continuous Operation of Base Receiver/Decoder

The NS5 base stations were NOT in continuous operation for the entire month. Intermittent reception of concentrator and A2 reports was identified on September 30, 2014 beginning at 13:10 in the afternoon. Periods of intermittent data reception on the concentrator and A2 channel continued through October 1 at 13:15 in the afternoon. Heavy rain was not observed on this day. The intermittent data is assumed to be linked to a problem with the A2 decoder and the network IP feed to both District base stations as well as the OneRain base station in Longmont.

According to OneRain, the source of the problem is likely the linux board on the A2 decoder.

Both OneRain and WET have implemented alarm criteria to notify when the latency issues are again observed.

B. Specific Issues Identified this Month

Performance of the following sensors (Table 6) was questionable this month.

Table 6. Sensors with Poor Performance Characteristics

Sensor ID	Description	Timer	Event	Comments
4330	Hansen Rain	62%	79%	Poor timer and event reporting
2360	Indian Hills	58%	73%	Poor timer and event reporting
4770	WX-Cal-Wood Ranch	17%	100%	Only poor timer reporting
2330	Morrison	65%	68%	Poor timer and event reporting
4470	Little Narrows	78%	76%	Poor timer and event reporting
1523	Marston Lake North	Increasingly large number of invalid reports		

The Marston Lake North (1523) sensor reported valid data each day from the 1st of September through the 19th of September. Beginning on September 20th this sensor begins to report invalid data each day through the end of the month. Currently this sensor is reporting two to four invalid reports per day.

C. Performance of New A2 Sites

Currently there are only a handful of remote sites operating on the new A2 protocol. The “event” performance of these sites is tracked throughout the 2014 flood season below (Table 7).

Table 7. Event Performance of New A2 Sites (percent)

Description	ID	Install Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heritage Regional Park	3090	03/14/2013	n/a	n/a	100	100	100	100	80	62	94			
ETG @ Hampden	100110	05/01/2013	n/a	n/a	83	97	100	100	96	92	100			
Blackstone	100100	05/03/2013	n/a	n/a	100	100	100	100	94	100	100			
Newlin Gulch	3070	05/24/2013	100	83	100	100	100	74	99	98	98			
Carr Street	100	05/31/2013	n/a	n/a	100	100	100	100	96	100	100			
Maple Grove	1000	05/20/2013	100	90	97	100	100	100	89	96	100			
Upper Sellers	100140	05/22/2014	n/a	n/a	n/a	n/a	75	93	97	100	97			
Haystack Road	100150	02/26/2014	n/a	n/a	100	79	79	94	91	100	97			
Sand Cr at Colfax	100160	05/01/2014	n/a	n/a	n/a	n/a	n/a	100	91	96	100			
Murphy Creek	870	06/30/2014	n/a	n/a	n/a	n/a	n/a	n/a	97	100	100			

D. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-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*
4470	2710	2790	2810	1700	2810	4330	4330	4770			
2710	4470	2710	2330	4330	100150	2360	2360	2360			
2330	2730	4470	2360	2330	100140	1660	1660	4330			
4870	4550	4870	420	1710	2750	2330	3090	2330			
920	3010	3010	1700	940	4330	2280	540	2790			
3010	4330	4330	1710	100150	2330	100150	2330	1710			

*- 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	50.96	Only the 1-mm rain sensors were included in the analysis
Median	50	Only the 1-mm rain sensors were included in the analysis
Standard deviation	16.84	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	101.49	Only the 1-mm rain sensors were included in the analysis
Mean minus two standard deviations	17.36	Only the 1-mm rain sensors were included in the analysis
Minimum total count	17	Sand Creek Park (1800)
Maximum total count	102	Temple Pond at DTC (630)
Sensors showing NO rain for the month		None this month
Sensors greater than 3 SD (over reporting)	102	Temple Pond at DTC (630)
Sensors less than 2 SD (under reporting)	17	Sand Creek Park (1800)

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				

*- 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

Several 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
Parker/Mississippi	5401	Looks to be a jump in early September caused by maintenance.
Hansen	4330	Bad data decode on September 5.....

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 94 percent. A total of 8,897 incrementing reports were received and a total of 9,479 reports were expected. The total loss of incrementing reports for the month was approximately 6 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*
4520	2730	2790	2980	4330	5940	650	3090	2330			
4010	4330	4790	2230	100150	310	4470	2360	2360			
4170	4200	4530	4510	4470	2980	2320	2980	4470			
3030	4240	4510	3050	2980	1620	2970	2800	2970			
1460	4870	4240	2330	2330	2790	2360	310	1660			
1700	4470	4870	100150	5900	4470	2980	2330	4330			

*-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. Heavy Radio Traffic Analysis

Periods exceeding 1,000 messages per hour are analyzed independently in an attempt to quantify data loss rates from rain sensors using their sequential tip count series.

A. The Heaviest Hourly Traffic Periods This Month

The hourly periods of highest radio traffic this month are shown (Table 13). The five heaviest hours of radio traffic are analyzed to quantify the number of missing rain reports for that hour.

Table 13. Periods of Heavy Radio Traffic (total load includes Concentrator and A2 and Legacy reports)

Day	Hour	Expected	Received	Total Load	Loss
29	14	860	778	3,721	9.53%
29	15	203	192	3,011	5.42%
29	17	242	240	2,854	0.83%
29	16	317	317	2,796	0.00%
29	21	277	277	2,615	0.00%

V. 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 14).

Table 14. Summary of Unknown IDs

Description	Conc & A2	Legacy
Total number of unknown IDs (IDs without a device definition)	218	238
Total reports from unknown IDs	369	319
Unknown IDs with only a single received report (potential noise)	149	192
Total reports from all IDs – RecData Log entire month	1,066,806	271,188
Unknown reports as a fraction of total reports	0.03%	0.12%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 15) are the total reports received from unknown sensor IDs for each month of the year.

Table 15. Monthly Summary of Total Reports from Unknown IDs (Conc & A2)

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			

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 16).

Table 16. Monthly Percent of Unknown Sensor Reports (Conc & A2)

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%			

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 17).

It is not clear why there are reports from unknown IDs on the Concentrator/ALERT2 channel with no corresponding report on the legacy channel as seen by below for sensor 1534 and 4739.

Table 17. Reports Received by Unknown IDs

Conc + A2		Legacy ALERT		Comment
Unknown ID	Reports	Unknown ID	Reports	
1534	15	1534	2	Primarily on the ALERT2 channel
1661	7	1661	7	
3053	7	3053	0	Only see this ID on the ALERT2 channel as it is a Douglas County site
4739	7	4739	0	Only see this ID on the ALERT2 channel.....no reports on the legacy channel
1631	6	1631	6	
2239	6	2239	7	
4031	6	4031	6	

VI. Sensors with Invalid Reports

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

Sensor ID	Description	Invalid Reports	Comments
1530	Bear Creek @ Lowell	9	Random bad decodes
920	WX-Aurora Town Hall	4	Random bad decodes
4030	Red Garden	4	Random bad decodes
1383	Ferril Lake	719	Bubbler that has failed...OneRain to address with Denver
1523	Marston Lake North	21	Beginning Sep 20 this sensor reports invalid data each day
953	Piney at Liverpool	169	Failed PT on June 13
853	Flying J	56	Out of service

VII. 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.

ID	Description	Alarm Description	Date/Time	Threshold (in)	Total Rain (in)
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.4" in 1 Hour Rainfall	9/9/2014 14:00	0.4	0.4330711
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	9/9/2014 14:00	0.2	0.4330711
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.4" in 1 Hour Rainfall	9/9/2014 15:30	0.4	0.5511814
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	9/10/2014 6:45	0.2	0.2362206
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	9/21/2014 23:00	0.2	0.2362206
2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	9/28/2014 16:30	0.2	0.2362206

2970	Rampart Range Road Precipitation-DG	2970 Rampart Range Road 0.2" in 30 Minutes Rainfall	9/29/2014 14:15	0.2	0.2362206
1300	Hidden Lake Precipitation-AD	Plains 10 minute rainfall	9/29/2014 14:28	0.5	0.5118113
630	Temple Pond at DTC Precipitation-DN	Plains 10 minute rainfall	9/29/2014 14:40	0.5	0.5511814
440	Fire Station #7 Precipitation-AR	Plains 10 minute rainfall	9/29/2014 14:47	0.5	0.5118113
650	Iilff Pond Precipitation-DN	Plains 10 minute rainfall	9/29/2014 14:47	0.5	0.5118113
810	Granby Ditch @ 6th Precipitation-AR	Plains 10 minute rainfall	9/29/2014 14:50	0.5	0.5118113
540	Parker/Mississippi Precipitation-DN	Plains 10 minute rainfall	9/29/2014 14:51	0.5	0.5511814
530	Fire Station #19 Precipitation-DN	Plains 10 minute rainfall	9/29/2014 14:54	0.5	0.5118113
1660	SPR at Henderson Precipitation	Plains 10 minute rainfall	9/29/2014 14:54	0.5	0.5118113
410	Kelly Dam Precipitation-DN	Plains 10 minute rainfall	9/29/2014 14:56	0.5	0.5118113
1920	Brighton Precipitation	Plains 10 minute rainfall	9/29/2014 15:03	0.5	0.5511814
1920	Brighton Precipitation	Plains 1 hour rainfall	9/29/2014 15:14	1	1.0236226
2820	East Plum Creek at Haskins Gulch Precipitation-DG	Douglas County 10 minute rainfall	9/29/2014 21:09	0.5	0.5118113
2750	Castle Rock Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	9/29/2014 21:36	1	1.0236226

General System Analysis

Database Name

P:\A207-UDFCD-Data-Analysis\2014\9-2014\Novastar_extract_2014Sep.mdb

First Date in Database

9/1/14 12:00 AM

Total Days

30.0

Last Date in Database

9/30/14 11:59 PM

Total Hours

720.0

Total Records Analyzed

795,618

Concentrator + A2 Self Reports

Records by Group	Concentrator + A2	Percent	Legacy ALERT	Percent
Wind Data	263,537	33.12%	92,188	33.99%
Temperature	105,126	13.21%	37,760	13.92%
Relative Humidity	97,632	12.27%	37,945	13.99%
Battery Voltage	76,945	9.67%	13,929	5.14%
Water Level	48,943	6.15%	24,955	9.20%
Barometric Pressure	35,250	4.43%	20,406	7.52%
Dew Point Temperature	33,741	4.24%	0	0.00%
Wind Chill	33,722	4.24%	0	0.00%
Precipitation	33,689	4.23%	14,901	5.49%
Peak Wind	33,363	4.19%	0	0.00%
Solar Radiation	10,545	1.33%	10,063	3.71%
Fuel Moisture	5,673	0.71%	5,714	2.11%
Fuel Temperature	5,634	0.71%	5,726	2.11%
Wind Direction	3,356	0.42%	1	0.00%
Soil Moisture	2,841	0.36%	2,816	1.04%
Repeater Status Report	1,761	0.22%	2,456	0.91%
Unknown	369	0.05%	319	0.12%
GPS Lock	1,249	0.16%	0	0.00%
ET-Hourly	714	0.09%	712	0.26%
12Hr Status Report	403	0.05%	400	0.15%
Hayman Battery	402	0.05%	0	0.00%
Not Used	291	0.04%	277	0.10%
Flasher Status	277	0.03%	0	0.00%
Repeater Pass List	61	0.01%	527	0.19%
Handar 585 ALARM Status	59	0.01%	58	0.02%
ET-Daily	31	0.00%	31	0.01%
Solar Power	3	0.00%	3	0.00%
ALERT/A2 Testing	1	0.00%	1	0.00%
Total	795,618	100%	271,188	100%

Traffic Loading Summary

Concentrator + A2

Legacy ALERT

Total Reports	795,618		271,188	
Average Daily Traffic	26,521		9,040	
Average Hourly Traffic	1,105		377	
Median Hourly Traffic	1,087	hour beginning	366	hour beginning
Peak Hourly Traffic	2,384	Sep 29, 2:00 PM	1,337	Sep 29, 2:00 PM
2nd Max	1,998	Sep 29, 3:00 PM	1,013	Sep 29, 3:00 PM
3rd Max	1,923	Sep 29, 4:00 PM	997	Sep 29, 5:00 PM
4th Max	1,857	Sep 29, 5:00 PM	873	Sep 29, 4:00 PM
5th Max	1,789	Sep 29, 9:00 PM	826	Sep 29, 9:00 PM

Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance	Comment
4770	Wx-Cal-Wood Ranch	10	10:00	60	17%	
2360	Indian Hills	35	14:36	60	58%	
4330	Hansen Rain	37	18:24	60	62%	
2330	Morrison	39	15:18	60	65%	
2790	Wx-W. Cherry Creek	43	14:16	60	72%	
1710	Shop Creek	44	14:44	60	73%	
1660	SPR at Henderson	46	15:04	60	77%	
4470	Little Narrows	47	13:32	60	78%	
4870	SBC @ SB Road	47	12:55	60	78%	
2280	Kinney Peak	48	13:45	60	80%	
4510	Pinewood Springs	50	13:50	60	83%	
2320	Choke Cherry Resvr	51	13:50	60	85%	
2940	Willow Creek - DougCnty	51	13:10	60	85%	
4790	Wx-Button Rock	51	12:52	60	85%	
4850	Porphyry Mtn	51	12:00	60	85%	
2230	Bear Cr below Cub	52	12:34	60	87%	
3090	A2-Highland Heritage Park	52	12:54	60	87%	
100150	A2-Sellers Gulch at Haystack Precip	52	12:34	60	87%	
310	Guy Hill Ranch	53	12:46	60	88%	
2370	Red Rocks Park	53	12:14	60	88%	
2980	Dakan Rd	53	12:49	60	88%	
100140	A2-Upper Sellers Gulch Precip	53	13:21	60	88%	
100160	A2-Sand Creek at Colfax Precip	637		720	88%	
1030	NREL/S. Table Mtn.	54	12:48	60	90%	
1530	Bear Creek @ Lowell	54	11:57	60	90%	
1620	Slaughterhouse Glch	54	12:15	60	90%	
2800	Columbine Open Space	54	13:20	60	90%	
3030	WX-Bingham Lake Park	54	13:06	60	90%	
4180	Gold Lake	54	12:45	60	90%	
4290	Red Hill	54	12:50	60	90%	
410	Kelly Dam	55	12:29	60	92%	
2870	Cottonwood (Apache)	55	12:16	60	92%	
2890	Spruce Mt - Douglas	55	12:17	60	92%	
2990	Wx-Tomah Rd-DougCnty	55	12:46	60	92%	
4060	Lakeshore	55	12:27	60	92%	
4270	Cannon Mountain	55	12:28	60	92%	
4570	St. Antons	55	12:29	60	92%	
420	Expo Park	56	12:17	60	93%	
510	Virginia Court	56	12:14	60	93%	
630	Temple Pond at DTC	56	12:39	60	93%	
650	Iliff Pond	56	12:49	60	93%	
760	Mission Viejo Park	56	12:29	60	93%	
850	Flying J	56	12:35	60	93%	
940	Aurora Regional Pond	56	11:57	60	93%	
1340	Sanderson at Xavier	56	12:13	60	93%	
1400	Upper Sloan Det.	56	11:57	60	93%	
1700	Cherry Cr @ Champa	56	12:46	60	93%	
2270	Cub Cr below Blue	56	12:14	60	93%	
2340	EI Rancho	56	12:29	60	93%	
2710	Wx-Highlands Ranch WTP	56	12:17	60	93%	
2920	West Cherry Head-Douglas Cnty	56	12:32	60	93%	
2930	Wx-Spring Valley Rd-DougCnty	56	12:16	60	93%	
3080	Tallman Gulch	56	12:16	60	93%	
4040	Martin Gulch	56	11:57	60	93%	

4220	Fling's	56	12:48	60	93%
4350	Conifer Hill	56	12:44	60	93%
110	Ralston Reservoir	57	11:57	60	95%
220	Upper Leyden	57	12:16	60	95%
330	Van Bibber @ Hwy 93	57	12:12	60	95%
440	Fire Station #7	57	12:13	60	95%
520	Jewell Detention	57	12:13	60	95%
700	Toll Gate @ 6th	57	12:16	60	95%
730	No Name @ Quincy	57	12:13	60	95%
800	Sable Ditch @ 18th	57	11:57	60	95%
810	Granby Ditch @ 6th	57	12:43	60	95%
840	Fire Station 12	57	12:00	60	95%
900	Wx-Aurora Reservoir	57	12:31	60	95%
1040	Lena @ U.S. Hwy 6	57	12:15	60	95%
1050	Jeffco Fairgrounds	57	12:12	60	95%
1300	Hidden Lake	57	12:14	60	95%
1350	Chatfield COE	57	11:59	60	95%
1360	Denver Zoo	57	12:15	60	95%
1640	SPR at Union Ave.	57	12:13	60	95%
1720	Cherry Cr @ Steele	57	12:28	60	95%
2240	Cold Sprg Glch conf	57	12:15	60	95%
2250	Rosedale	57	12:47	60	95%
2820	Haskins Gulch Conf	57	12:15	60	95%
2840	Sulphur Gulch	57	12:15	60	95%
2850	Cherry Cr bl Bayou Glch	57	12:00	60	95%
2900	Russelville Gulch-Douglas	57	12:15	60	95%
3010	WX-EPC at Hwy 105	57	12:32	60	95%
3020	Wx-West Creek WX	57	12:00	60	95%
3060	Fire Sta 47	57	12:30	60	95%
4070	Bear Peak	57	12:28	60	95%
4190	Slaughterhouse	57	12:28	60	95%
4260	Taylor Mountain	57	12:15	60	95%
4300	Big Elk Park	57	12:27	60	95%
4360	Justice Center	57	12:26	60	95%
100110	A2-ETG @ Hampden Precip	57	12:00	60	95%
140	Wx-Blue Mountain	58	12:14	60	97%
150	Nott Creek	58	11:57	60	97%
400	Montview Park	58	12:27	60	97%
430	Utah Park	58	12:35	60	97%
530	Fire Station #19	58	12:28	60	97%
540	Parker/Mississippi	58	11:42	60	97%
600	Harvard Gulch Park	58	11:57	60	97%
640	Goldsmith @ Eastman	58	11:58	60	97%
720	Confluence Pond	58	11:58	60	97%
830	Side Creek Park	58	12:13	60	97%
1010	Denver West	58	11:57	60	97%
1200	Broomfield 3207	58	12:29	60	97%
1420	Wx-Diamond Hill	58	12:00	60	97%
1440	Wx-Elbert	58	12:00	60	97%
1550	Lakewood CC	58	12:12	60	97%
1800	Sand Creek Park	58	12:25	60	97%
1900	Niver Detention	58	11:58	60	97%
2350	Idledale	58	11:56	60	97%
2750	Wx-Castle Rock	58	12:00	60	97%
2860	CC at Stroh Rd	58	12:13	60	97%
2960	Indian Creek	58	12:00	60	97%
4010	Crescent	58	12:11	60	97%
4030	Red Garden	58	12:11	60	97%
4050	Walker Ranch	58	12:13	60	97%

4100	Filter Plant	58	12:11	60	97%
4150	Gold Hill	58	11:57	60	97%
4160	Sunshine	58	11:57	60	97%
4230	Golden Age	58	12:12	60	97%
4250	Geer Canyon	58	12:14	60	97%
4310	Johnny Park	58	11:58	60	97%
4340	Riverside	58	12:13	60	97%
4520	Eagle Ridge	58	12:14	60	97%
4550	Boulder Jail	58	12:10	60	97%
4750	Wx-Louisville Lake	58	12:30	60	97%
4810	Shanahan Ridge	58	11:57	60	97%
4820	Doudy Draw	58	12:13	60	97%
200	Leyden Reservoir	59	11:57	60	98%
210	Leyden Confluence	59	11:57	60	98%
610	Harvard @ Jackson	59	12:12	60	98%
620	Quincy/Highline	59	12:12	60	98%
750	Wx-Quincy Reservoir	59	11:56	60	98%
820	ETG @ Buckley	59	11:57	60	98%
950	Piney at Liverpool	59	11:57	60	98%
1060	Heritage Square	59	11:57	60	98%
1100	Louisville Rec Ctr	59	11:59	60	98%
1110	Gunbarrel	59	11:58	60	98%
1310	LDC at 64th	59	12:11	60	98%
1320	SPR at 3rd Ave	59	11:58	60	98%
1370	West Metro FS13	59	12:13	60	98%
1460	Wx-Urban Farm	59	12:00	60	98%
1480	Third Creek at DIA	59	11:57	60	98%
1500	Powers Park	59	11:57	60	98%
1520	Wx-Marston Lake North	59	12:00	60	98%
1570	Wx-Brighton Ditch	59	11:45	60	98%
1600	Englewood Dam	59	11:57	60	98%
1920	Wx-Brighton	59	12:00	60	98%
2210	Wx-Hiwan G.C.	59	12:00	60	98%
2310	Genesee Village	59	11:56	60	98%
2730	Wx-Salisbury Park	59	12:00	60	98%
2810	Pine Cliff Road	59	12:00	60	98%
2880	Happy Canyon at N Surrey Dr	59	12:00	60	98%
2910	East Cherry Cr-Douglas	59	12:00	60	98%
2950	DC Public Works	59	12:00	60	98%
3040	CC @ Russelville Road Precip	59	12:00	60	98%
3050	East/West Trailhead	59	12:00	60	98%
4020	Rio Grande	59	11:57	60	98%
4110	Betasso	59	11:57	60	98%
4130	Swiss Peaks	59	11:57	60	98%
4170	Pine Brook	59	11:57	60	98%
4200	Lazy Acres	59	11:57	60	98%
4240	Sunset	59	11:58	60	98%
4490	Apple Valley	59	11:57	60	98%
4530	Winiger Ridge	59	11:58	60	98%
4710	Wx-Ward C-1	59	12:00	60	98%
4880	Whispering Pines	59	11:57	60	98%
100100	A2-Blackstone Precip	59	12:00	60	98%
100	A2-Carr Street	715		720	99%
870	A2-Murphy Creek GC	715		720	99%
1000	A2-Maple Grove Resv.	718		720	100%
120	West Woods	60	11:58	60	100%
300	Van Bibber Park	60	11:57	60	100%
320	Sports Complex	60	11:58	60	100%
500	Havana Park	60	11:57	60	100%

710	Horseshoe Park Drop	60	11:57	60	100%
2970	Rampart Range Rd-Satellite	264		264	100%
4080	Twin Sisters	60	11:57	60	100%
4090	Magnolia	60	11:57	60	100%
4140	Logan Mill	60	11:57	60	100%
4320	Lee Hill Rain 2012	60	11:57	60	100%
4730	Wx-Sugarloaf	60	11:45	60	100%
4830	SBC @ San Souci	60	11:57	60	100%
4860	Fairview Peak	60	12:00	60	100%
920	Wx-Aurora Town Hall	61	11:44	60	102%
2260	Brook Forest	61	11:48	60	102%
4840	SBC@S Boulder Ditch	61	11:43	60	102%
970	Pump Sta 3	64	11:02	60	107%
3070	A2-Newlin Gulch Precip	116	6:10	60	193%
5720	Four Mile Creek	42	13:30	60	70%
5730	West Creek	57	12:00	60	95%
5740	Trail Creek	58	12:00	60	97%
5810	Stump Bump	55	12:18	60	92%
5860	Cedar Mountain	58	12:16	60	97%
5880	Hackett Mountain	59	12:00	60	98%
5900	Horse Creek-Satellite	1155		1155	100%
5940	Log Jumper	57	12:16	60	95%

Rain Event Performance						Analyze Rain Sensors											
		Reports Received	8,897														
	Systemwide Avg	Total Tips	9,479														
	93.86%	Data Loss	6.14%														
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket			
Morrison	2330	68%	20	10	1	1	0	0	0	32	47	15	0	0.03937			
Indian Hills	2360	73%	27	8	3	0	0	0	0	38	52	14	0	0.03937	Mean		50.962
Little Narrows	4470	76%	21	7	1	0	0	0	0	29	38	9	0	0.03937	Median		50
Rampart Range Rd-Satellite	2970	77%	64	7	4	1	0	1	0	77	100	23	0	0.03937	St. Dev		16.842
SPR at Henderson	1660	77%	27	5	1	1	0	0	0	34	44	10	0	0.03937	Mean plus 3 SD		101.49
Columbine Open Space	2800	78%	32	13	0	0	0	0	0	45	58	13	0	0.03937	Min		17
Dakan Rd	2980	78%	20	4	0	1	0	0	0	25	32	7	0	0.03937	Max		102
Hansen Rain	4330	79%	45	8	1	0	0	1	0	55	70	15	0	0.03937			
Cub Cr below Blue	2270	79%	39	6	2	1	0	0	0	48	61	13	0	0.03937			
Eagle Ridge	4520	82%	22	6	0	0	0	0	0	28	34	6	0	0.03937			
Iliff Pond	650	83%	42	9	1	0	0	0	0	52	63	11	0	0.03937			
Wx-Button Rock	4790	84%	26	4	1	0	0	0	0	31	37	6	0	0.03937			
Porphory Mtn	4850	84%	79	12	3	0	0	0	0	23.5	28	18	0	0.01			
NREL/S. Table Mtn.	1030	84%	36	4	2	0	0	0	0	42	50	8	0	0.03937			
Kinney Peak	2280	85%	53	3	1	0	0	1	0	58	68	10	0	0.03937			
Martin Gulch	4040	86%	32	4	1	0	0	0	0	37	43	6	0	0.03937			
Wx-W. Cherry Creek	2790	87%	39	7	0	0	0	0	0	46	53	7	0	0.03937			
Slaughterhouse Glch	1620	87%	31	0	1	1	0	0	0	33	38	5	0	0.03937			
Quincy/Highline	620	87%	48	4	2	0	0	0	0	54	62	8	0	0.03937			
Wx-Brighton	1920	87%	42	5	1	0	0	0	0	48	55	7	1	0.03937			
Fire Station #19	530	89%	49	5	1	0	0	0	0	55	62	7	0	0.03937			
Wx-Salisbury Park	2730	89%	21	3	0	0	0	0	0	24	27	3	0	0.03937			
Sunset	4240	89%	15	0	1	0	0	0	0	16	18	2	0	0.03937			
Virginia Court	510	89%	53	5	1	0	0	0	0	59	66	7	0	0.03937			
Montview Park	400	90%	46	6	0	0	0	0	0	52	58	6	0	0.03937			
CC @ Russelville Road Precip	3040	90%	47	4	1	0	0	0	0	52	58	6	0	0.03937			
Aurora Regional Pond	940	90%	40	3	1	0	0	0	0	44	49	5	0	0.03937			
Cherry Cr bl Bayou Glch	2850	90%	64	6	1	0	0	0	0	71	79	8	0	0.03937			
Walker Ranch	4050	90%	25	1	1	0	0	0	0	27	30	3	0	0.03937			
SBC @ SB Road	4870	90%	49	6	0	0	0	0	0	55	61	6	0	0.03937			
Wx-Urban Farm	1460	90%	41	5	0	0	0	0	0	46	51	5	0	0.03937			
Shop Creek	1710	90%	41	5	0	0	0	0	0	46	51	5	0	0.03937			
Cannon Mountain	4270	90%	17	2	0	0	0	0	0	19	21	2	0	0.03937			
Wx-Brighton Ditch	1570	91%	44	3	1	0	0	0	0	48	53	5	0	0.03937			
Tallman Gulch	3080	91%	53	6	0	0	0	0	0	59	65	6	0	0.03937			
Jeffco Fairgrounds	1050	91%	27	3	0	0	0	0	0	30	33	3	0	0.03937			
Chatfield COE	1350	91%	64	5	1	0	0	0	0	70	77	7	0	0.03937			
Wx-Castle Rock	2750	91%	65	7	0	0	0	0	0	72	79	7	0	0.03937			
Kelly Dam	410	91%	57	4	1	0	0	0	0	62	68	6	0	0.03937			
Harvard @ Jackson	610	91%	56	6	0	0	0	0	0	62	68	6	0	0.03937			
Parker/Mississippi	540	91%	48	3	1	0	0	0	0	52	57	5	0	0.03937			
Toll Gate @ 6th	700	91%	47	5	0	0	0	0	0	52	57	5	0	0.03937			
Havana Park	500	91%	67	5	1	0	0	0	0	73	80	7	0	0.03937			
Taylor Mountain	4260	91%	20	0	1	0	0	0	0	21	23	2	0	0.03937			
Indian Creek	2960	91%	77	8	0	0	0	0	0	85	93	8	0	0.03937			
Pump Sta 3	970	91%	40	2	1	0	0	0	0	43	47	4	0	0.03937			
Cherry Cr @ Steele	1720	91%	40	2	1	0	0	0	0	43	47	4	0	0.03937			
Pinewood Springs	4510	92%	50	3	1	0	0	0	0	54	59	5	0	0.03937			
Fire Station 12	840	92%	40	4	0	0	0	0	0	44	48	4	0	0.03937			
Apple Valley	4490	92%	30	3	0	0	0	0	0	33	36	3	0	0.03937			
Niver Detention	1900	92%	31	3	0	0	0	0	0	34	37	3	0	0.03937			
Red Hill	4290	92%	42	4	0	0	0	0	0	46	50	4	0	0.03937			
Big Elk Park	4300	92%	21	2	0	0	0	0	0	23	25	2	0	0.03937			
Goldsmith @ Eastman	640	92%	53	5	0	0	0	0	0	58	63	5	0	0.03937			

Temple Pond at DTC	630	92%	87	6	1	0	0	0	0	94	102	8	0	0.03937
Bear Creek @ Lowell	1530	92%	44	4	0	0	0	0	0	48	52	4	0	0.03937
Spruce Mt - Douglas	2890	93%	34	3	0	0	0	0	0	37	40	3	0	0.03937
Ralston Reservoir	110	93%	46	4	0	0	0	0	0	50	54	4	0	0.03937
Wx-Highlands Ranch WTP	2710	93%	59	5	0	0	0	0	0	64	69	5	0	0.03937
DC Public Works	2950	93%	74	2	2	0	0	0	0	78	84	6	0	0.03937
Flying J	850	93%	50	2	1	0	0	0	0	53	57	4	0	0.03937
Sports Complex	320	93%	37	3	0	0	0	0	0	40	43	3	0	0.03937
Lakeshore	4060	93%	25	2	0	0	0	0	0	27	29	2	0	0.03937
Slaughterhouse	4190	93%	26	0	1	0	0	0	0	27	29	2	0	0.03937
Denver Zoo	1360	93%	40	1	1	0	0	0	0	42	45	3	0	0.03937
Third Creek at DIA	1480	93%	26	2	0	0	0	0	0	28	30	2	0	0.03937
Red Garden	4030	93%	40	3	0	0	0	0	0	43	46	3	0	0.03937
Jewell Detention	520	94%	54	4	0	0	0	0	0	58	62	4	0	0.03937
Choke Cherry Resvr	2320	94%	54	4	0	0	0	0	0	58	62	4	0	0.03937
Wx-Marston Lake North	1520	94%	41	3	0	0	0	0	0	44	47	3	0	0.03937
A2-Highland Heritage Park	3090	94%	84	2	2	0	0	0	0	88	94	6	0	0.03937
Betasso	4110	94%	41	3	0	0	0	0	0	44	47	3	0	0.03937
Fire Station #7	440	94%	56	2	1	0	0	0	0	59	63	4	0	0.03937
Granby Ditch @ 6th	810	94%	56	2	1	0	0	0	0	59	63	4	0	0.03937
Brook Forest	2260	94%	70	3	1	0	0	0	0	74	79	5	0	0.03937
WX-Bingham Lake Park	3030	94%	73	5	0	0	0	0	0	78	83	5	0	0.03937
Sand Creek Park	1800	94%	15	1	0	0	0	0	0	16	17	1	0	0.03937
East Cherry Cr-Douglas	2910	94%	30	2	0	0	0	0	0	32	34	2	0	0.03937
Boulder Jail	4550	94%	45	3	0	0	0	0	0	48	51	3	0	0.03937
St. Antons	4570	94%	30	2	0	0	0	0	0	32	34	2	0	0.03937
Bear Cr below Cub	2230	94%	46	3	0	0	0	0	0	49	52	3	0	0.03937
Cold Sprg Glch conf	2240	94%	47	3	0	0	0	0	0	50	53	3	0	0.03937
SBC @ San Souci	4830	95%	49	3	0	0	0	0	0	52	55	3	0	0.03937
Ruselville Gulch-Douglas	2900	95%	67	2	1	0	0	0	0	70	74	4	0	0.03937
ETG @ Buckley	820	95%	50	3	0	0	0	0	0	53	56	3	0	0.03937
Cresent	4010	95%	34	2	0	0	0	0	0	36	38	2	0	0.03937
Geer Canyon	4250	95%	51	3	0	0	0	0	0	54	57	3	0	0.03937
Guy Hill Ranch	310	95%	36	2	0	0	0	0	0	38	40	2	0	0.03937
Expo Park	420	95%	73	2	1	0	0	0	0	76	80	4	0	0.03937
West Metro FS13	1370	95%	37	2	0	0	0	0	0	39	41	2	0	0.03937
Filter Plant	4100	95%	38	2	0	0	0	0	0	40	42	2	0	0.03937
Wx-Louisville Lake	4750	95%	38	2	0	0	0	0	0	40	42	2	0	0.03937
Upper Sloan Det.	1400	95%	39	2	0	0	0	0	0	41	43	2	0	0.03937
Pine Cliff Road	2810	96%	81	4	0	0	0	0	0	85	89	4	0	0.03937
Hidden Lake	1300	96%	41	2	0	0	0	0	0	43	45	2	0	0.03937
Utah Park	430	96%	83	4	0	0	0	0	0	87	91	4	0	0.03937
Denver West	1010	96%	43	2	0	0	0	0	0	45	47	2	0	0.03937
SPR at Union Ave.	1640	96%	45	2	0	0	0	0	0	47	49	2	0	0.03937
Wx-Aurora Town Hall	920	96%	69	3	0	0	0	0	0	72	75	3	0	0.03937
Englewood Dam	1600	96%	71	1	1	0	0	0	0	73	76	3	0	0.03937
Side Creek Park	830	96%	47	2	0	0	0	0	0	49	51	2	0	0.03937
Broomfield 3207	1200	96%	47	2	0	0	0	0	0	49	51	2	0	0.03937
Lazy Acres	4200	96%	47	2	0	0	0	0	0	49	51	2	0	0.03937
Justice Center	4360	96%	47	2	0	0	0	0	0	49	51	2	0	0.03937
Red Rocks Park	2370	96%	48	2	0	0	0	0	0	50	52	2	0	0.03937
Logan Mill	4140	96%	25	1	0	0	0	0	0	26	27	1	0	0.03937
Shanahan Ridge	4810	96%	75	3	0	0	0	0	0	78	81	3	0	0.03937
West Woods	120	96%	51	2	0	0	0	0	0	53	55	2	0	0.03937
Sable Ditch @ 18th	800	96%	51	2	0	0	0	0	0	53	55	2	0	0.03937
WX-EPC at Hwy 105	3010	96%	182	7	0	0	0	0	0	47.25	49	7	0	0.01
Golden Age	4230	96%	26	1	0	0	0	0	0	27	28	1	0	0.03937
Haskins Gulch Conf	2820	96%	79	3	0	0	0	0	0	82	85	3	0	0.03937
Sulphur Gulch	2840	96%	53	2	0	0	0	0	0	55	57	2	0	0.03937

Powers Park	1500	97%	80	3	0	0	0	0	0	83	86	3	0	0.03937
Willow Creek - DougCnty	2940	97%	56	2	0	0	0	0	0	58	60	2	0	0.03937
Winiger Ridge	4530	97%	28	1	0	0	0	0	0	29	30	1	0	0.03937
A2-Upper Sellers Gulch Precip	100140	97%	60	0	1	0	0	0	0	61	63	2	0	0.03937
Conifer Hill	4350	97%	30	1	0	0	0	0	0	31	32	1	0	0.03937
Doudy Draw	4820	97%	61	2	0	0	0	0	0	63	65	2	0	0.03937
A2-Sellers Gulch at Haystack Precip	100150	97%	67	2	0	0	0	0	0	69	71	2	0	0.03937
Wx-Blue Mountain	140	97%	34	1	0	0	0	0	0	35	36	1	0	0.03937
Nott Creek	150	97%	34	1	0	0	0	0	0	35	36	1	0	0.03937
Wx-Elbert	1440	97%	34	1	0	0	0	0	0	35	36	1	0	0.03937
CC at Stroh Rd	2860	97%	69	2	0	0	0	0	0	71	73	2	0	0.03937
Wx-Spring Valley Rd-DougCnty	2930	97%	35	1	0	0	0	0	0	36	37	1	0	0.03937
Lee Hill Rain 2012	4320	97%	35	1	0	0	0	0	0	36	37	1	0	0.03937
Fairview Peak	4860	97%	140	4	0	0	0	0	0	36	37	4	2	0.01
LDC at 64th	1310	97%	36	1	0	0	0	0	0	37	38	1	0	0.03937
Bear Peak	4070	97%	36	1	0	0	0	0	0	37	38	1	0	0.03937
SPR at 3rd Ave	1320	97%	37	1	0	0	0	0	0	38	39	1	0	0.03937
East/West Trailhead	3050	98%	76	2	0	0	0	0	0	78	80	2	0	0.03937
Confluence Pond	720	98%	39	1	0	0	0	0	0	40	41	1	0	0.03937
Piney at Liverpool	950	98%	41	1	0	0	0	0	0	42	43	1	0	0.03937
Wx-Diamond Hill	1420	98%	41	1	0	0	0	0	0	42	43	1	0	0.03937
Wx-Hiwan G.C.	2210	98%	42	1	0	0	0	0	0	43	44	1	1	0.03937
El Rancho	2340	98%	42	1	0	0	0	0	0	43	44	1	0	0.03937
Lena @ U.S. Hwy 6	1040	98%	43	1	0	0	0	0	0	44	45	1	0	0.03937
Leyden Reservoir	200	98%	45	1	0	0	0	0	0	46	47	1	0	0.03937
Sanderson at Xavier	1340	98%	46	1	0	0	0	0	0	47	48	1	0	0.03937
Wx-Aurora Reservoir	900	98%	48	1	0	0	0	0	0	49	50	1	0	0.03937
Idledale	2350	98%	50	1	0	0	0	0	0	51	52	1	0	0.03937
Wx-Tomah Rd-DougCnty	2990	98%	50	1	0	0	0	0	0	51	52	1	0	0.03937
Cottonwood (Apache)	2870	98%	51	1	0	0	0	0	0	52	53	1	0	0.03937
A2-Newlin Gulch Precip	3070	98%	59	1	0	0	0	0	0	60	61	1	0	0.03937
Upper Leyden	220	98%	61	1	0	0	0	0	0	62	63	1	0	0.03937
Horseshoe Park Drop	710	98%	62	1	0	0	0	0	0	63	64	1	0	0.03937
Fire Sta 47	3060	98%	62	1	0	0	0	0	0	63	64	1	0	0.03937
Happy Canyon at N Surrey Dr	2880	98%	64	1	0	0	0	0	0	65	66	1	0	0.03937
A2-Carr Street	100	100%	47	0	0	0	0	0	0	47	47	0	0	0.03937
Leyden Confluence	210	100%	42	0	0	0	0	0	0	42	42	0	0	0.03937
Van Bibber Park	300	100%	46	0	0	0	0	0	0	46	46	0	1	0.03937
Van Bibber @ Hwy 93	330	100%	42	0	0	0	0	0	0	42	42	0	0	0.03937
Harvard Gulch Park	600	100%	62	0	0	0	0	0	0	62	62	0	0	0.03937
No Name @ Quincy	730	100%	49	0	0	0	0	0	0	49	49	0	0	0.03937
Wx-Quincy Reservoir	750	100%	53	0	0	0	0	0	0	53	53	0	0	0.03937
Mission Viejo Park	760	100%	45	0	0	0	0	0	0	45	45	0	0	0.03937
A2-Murphy Creek GC	870	100%	51	0	0	0	0	0	0	51	51	0	0	0.03937
A2-Maple Grove Resv.	1000	100%	39	0	0	0	0	0	0	39	39	0	1	0.03937
Heritage Square	1060	100%	55	0	0	0	0	0	0	55	55	0	0	0.03937
Louisville Rec Ctr	1100	100%	45	0	0	0	0	0	0	45	45	0	0	0.03937
Gunbarrel	1110	100%	36	0	0	0	0	0	0	36	36	0	0	0.03937
Lakewood CC	1550	100%	41	0	0	0	0	0	0	41	41	0	0	0.03937
Cherry Cr @ Champa	1700	100%	32	0	0	0	0	0	0	32	32	0	0	0.03937
Rosedale	2250	100%	55	0	0	0	0	0	0	55	55	0	0	0.03937
Genesee Village	2310	100%	64	0	0	0	0	0	0	64	64	0	0	0.03937
West Cherry Head-Douglas Cnty	2920	100%	38	0	0	0	0	0	0	38	38	0	0	0.03937
Wx-West Creek WX	3020	100%	51	0	0	0	0	0	0	51	51	0	0	0.03937
Rio Grande	4020	100%	38	0	0	0	0	0	0	38	38	0	0	0.03937
Twin Sisters	4080	100%	32	0	0	0	0	0	0	32	32	0	0	0.03937
Magnolia	4090	100%	41	0	0	0	0	0	0	41	41	0	0	0.03937
Swiss Peaks	4130	100%	34	0	0	0	0	0	0	34	34	0	0	0.03937
Gold Hill	4150	100%	35	0	0	0	0	0	0	35	35	0	0	0.03937

Sunshine	4160	100%	32	0	0	0	0	0	0	0	32	32	0	0	0.03937
Pine Brook	4170	100%	49	0	0	0	0	0	0	0	49	49	0	0	0.03937
Gold Lake	4180	100%	22	0	0	0	0	0	0	0	22	22	0	0	0.03937
Fling's	4220	100%	23	0	0	0	0	0	0	0	23	23	0	0	0.03937
Johnny Park	4310	100%	40	0	0	0	0	0	0	0	40	40	0	0	0.03937
Riverside	4340	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.03937
Wx-Ward C-1	4710	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.03937
Wx-Sugarloaf	4730	100%	34	0	0	0	0	0	0	0	34	34	0	0	0.03937
Wx-Cal-Wood Ranch	4770	100%	26	0	0	0	0	0	0	0	26	26	0	0	0.03937
SBC@S Boulder Ditch	4840	100%	59	0	0	0	0	0	0	0	59	59	0	0	0.03937
Whispering Pines	4880	100%	31	0	0	0	0	0	0	0	31	31	0	0	0.03937
A2-Blackstone Precip	100100	100%	52	0	0	0	0	0	0	0	52	52	0	0	0.03937
A2-ETG @ Hampden Precip	100110	100%	55	0	0	0	0	0	0	0	55	55	0	0	0.03937
A2-Sand Creek at Colfax Precip	100160	100%	60	0	0	0	0	0	0	0	60	60	0	1	0.03937
		Total Tips	8694	457	57	6	0	3	0	8896.8	9479	604	7		
Four Mile Creek	5720	92%	44	1	0	1	0	0	0	0	46	50	4	0	0.03937
West Creek	5730	96%	53	2	0	0	0	0	0	0	55	57	2	0	0.03937
Trail Creek	5740	98%	41	1	0	0	0	0	0	0	42	43	1	0	0.03937
Stump Bump	5810	96%	44	2	0	0	0	0	0	0	46	48	2	0	0.03937
Cedar Mountain	5860	96%	42	2	0	0	0	0	0	0	44	46	2	0	0.03937
Hackett Mountain	5880	100%	57	0	0	0	0	0	0	0	57	57	0	0	0.03937
Horse Creek-Satellite	5900	100%	61	0	0	0	0	0	0	0	61	61	0	0	0.03937
Log Jumper	5940	98%	53	1	0	0	0	0	0	0	54	55	1	0	0.03937

2014 Monthly Peak Hour ALERT Radio Traffic Summary

