

Memo

Date: August 15, 2014
To: Kevin Stewart
From: Markus Ritsch
Subject: July 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 July 1 through July 31, 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 data on A1 and A2 but passes on only A2 format messages to Diamond Hill. All other repeaters in the system send data on both legacy and A2 channels. In August 2014 a new repeater will be installed at the Castle Rock weather station to forward legacy ALERT reports from Douglas County on to Diamond Hill.

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					
Concentrator	508,306	370,222	495,874	515,526	537,996	430,118	475,605					
ALERT2	129,855	86,506	110,086	107,478	113,674	109,244	130,087					
TOTAL	958,464	671,426	885,742	916,141	1,003,616	857,796	914,467	0	0	0	0	0
Conc+A2	638,161	456,728	605,960	623,004	651,670	539,362	605,692					
Conc/Leg	1.59	1.72	1.77	1.76	1.53	1.35	1.54					
DataChron	498,846	444,211	599,923	630,962	663,576	583,568	654,910					

The daily ratio of ALERT2 reports received versus legacy ALERT reports received is shown (Figure 1). The data show a decrease in the computed ratio on July 30 and 31. The reason for this decrease is described later in this report.

Beginning in June of 2014 the District will operate two redundant NovaStar5 base stations: a primary base station (ns5a) at Diamond Hill and the redundant base (ns5b) at Greenhouse Data. Additional analyses will be conducted on the data received by these two base stations. 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

NSSA (DiamondHill)	July 1	July 2	July 3	July 4	July 5	July 27	July 28	July 29	July 30	July 31
Legacy	8518	9088	9233	9606	8938	8542	8858	11258	18416	10213
Concentrator	13642	15157	14823	15099	14352	14305	14912	17351	20357	13811
ALERT2	3692	3774	3730	3759	3647	4645	4685	5197	5263	6105
NSSB (Greenhouse)										
Legacy	8517	9082	9234	9605	8942	8543	8860	11256	18422	9066
Concentrator	13651	15166	14823	15106	14353	14316	14931	17423	20506	12703
ALERT2	3709	3785	3790	3780	3648	4650	4687	5251	5350	5780
Diff (NS5a-NS5b)										
Legacy	1.00	6.00	-1.00	1.00	-4.00	-1.00	-2.00	2.00	-6.00	1147.00
Concentrator	-9.00	-9.00	0.00	-7.00	-1.00	-11.00	-19.00	-72.00	-149.00	1108.00
ALERT2	-17.00	-11.00	-60.00	-21.00	-1.00	-5.00	-2.00	-54.00	-87.00	325.00

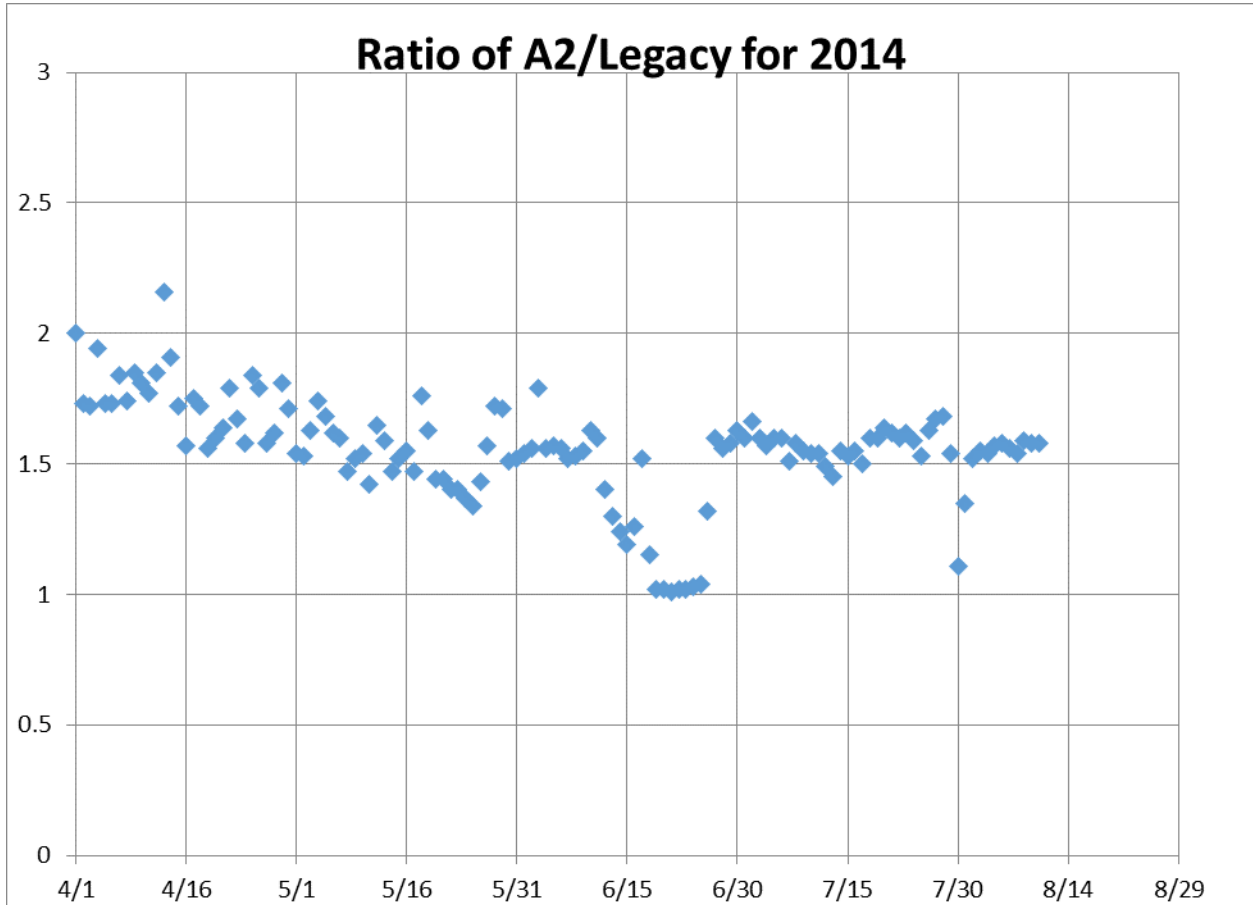


Figure 1. Daily Ratio of ALERT2/Legacy Reports

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 July 30, 2014. The intermittent data was traced 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.

As of August 13, 2014 the problem has not been exactly determined. According to OneRain, the source of the problem is likely one of the following:

- The linux board on the A2 decoder has latency
- The cat5 cable from the A2 decoder on the roof to the server room is damaged
- The network at Diamond Hill has latency issues

Both OneRain and WET have implemented alarm criteria to notify when the latency issues are again observed. Another rain event is likely needed to reproduce the latency issue to pin-point the problem.

On July 31 data reception issues were also identified on the legacy ALERT feed to ns5a and ns5b. The legacy ALERT feed also employs an IP routing device but it is completely separate from the A2 IP routing mechanism. Since problems were noticed on both the A2 and legacy data channels a problem with the network may have played a role in the data interruption experienced on July 31. The legacy ALERT channel however experienced no interruption on July 30.

B. Specific Issues Identified this Month

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

Table 3. Sensors with Poor Performance Characteristics

Sensor ID	Description	Timer	Event	Comments
4330	Hansen Rain	50%	88%	Poor timer and event reporting
2360	Indian Hills	69%	71%	Poor timer and event reporting
650	Iliff Pond	89%	57%	Poor timer and event reporting
4470	Little Narrows	81%	65%	Poor timer and event reporting
2320	Choke Cherry Res	82%	65%	Poor timer and event reporting
1486, 1487, 1482, 1481	A large number of reports from unknown IDs.....likely from Third Creek at DIA (1480)			

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 4).

Table 4. 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					
ETG @ Hampden	100110	05/01/2013	n/a	n/a	83	97	100	100	96					
Blackstone	100100	05/03/2013	n/a	n/a	100	100	100	100	94					
Newlin Gulch	3070	05/24/2013	100	83	100	100	100	74	99					
Carr Street	100	05/31/2013	n/a	n/a	100	100	100	100	96					
Maple Grove	1000	05/20/2013	100	90	97	100	100	100	89					
Upper Sellers	100140	05/22/2014	n/a	n/a	n/a	n/a	75	93	97					
Haystack Road	100150	02/26/2014	n/a	n/a	100	79	79	94	91					
Sand Cr at Colfax	100160	05/01/2014	n/a	n/a	n/a	n/a	n/a	100	91					
Murphy Creek	870	06/30/2014	n/a	n/a	n/a	n/a	n/a	n/a	97					
New site 2014														

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 5).

Table 5. 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					
2710	4470	2710	2330	4330	100150	2360					
2330	2730	4470	2360	2330	100140	1660					
4870	4550	4870	420	1710	2750	2330					
920	3010	3010	1700	940	4330	2280					
3010	4330	4330	1710	100150	2330	100150					

*- 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 6). 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 6. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	99.73	Only the 1-mm rain sensors were included in the analysis
Median	95	Only the 1-mm rain sensors were included in the analysis
Standard deviation	27.61	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	182.5	Only the 1-mm rain sensors were included in the analysis
Mean minus two standard deviations	44.51	Only the 1-mm rain sensors were included in the analysis
Minimum total count	20	Justice Center (4360)
Maximum total count	237	Brook Forest (2260)
Sensors showing NO rain for the month		None this month
Sensors greater than 3 SD (over reporting)		Brook Forest (2260)
Sensors less than 2 SD (under reporting)		Justice Center (4360), CC bl Bayou Gulch (2850), Salisbury Park (2730), Parker/Mississippi (540)

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 7).

Table 7. 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						

*- 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 8).

Table 8. Sensors with a Jump of 6 or More in Sequential Count

Sensor Description	Sensor ID	Comment
Illiff Pond	650	All the large jumps occurred on July 30 between 8 AM and 7 PM
Choke Cherry Reservoir	2320	One large jump occurred on July 30 at 1:44 AM
Indian Hills	2360	One large jump occurred on July 30 at 1:17 AM

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 92 percent. A total of 16,834 incrementing reports were received and a total of 18,250 reports were expected. The total loss of incrementing reports for the month was approximately 8 percent. Those sensors with the worst event transmission performance are summarized (Table 9).

Table 9. 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					
4010	4330	4790	2230	100150	310	4470					
4170	4200	4530	4510	4470	2980	2320					
3030	4240	4510	3050	2980	1620	2970					
1460	4870	4240	2330	2330	2790	2360					
1700	4470	4870	100150	5900	4470	2980					

*-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 10). The five heaviest hours of radio traffic are analyzed to quantify the number of missing rain reports for that hour.

Table 10. Periods of Heavy Radio Traffic (total load includes Concentrator and A2 and Legacy reports)

Day	Hour	Expected	Received	Total Load	Loss
7	21	380	349	2,955	8.16%
12	17	447	441	2,758	1.34%
30	0	305	305	2,463	0.00%
30	19	318	318	2,417	0.00%
29	23	332	325	2,360	2.11%

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 11).

Table 11. Summary of Unknown IDs

Description	Conc & A2	Legacy
Total number of unknown IDs (IDs without a device definition)	224	237
Total reports from unknown IDs	3,983	2,852
Unknown IDs with only a single received report (potential noise)	157	188
Total reports from all IDs – RecData Log entire month	605,692	308,775
Unknown reports as a fraction of total reports	0.66%	0.92%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 12) are the total reports received from unknown sensor IDs for each month of the year.

Table 12. 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					

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 13).

Table 13. 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%					

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 14).

Table 14. Reports Received by Unknown IDs

Conc + A2		Legacy ALERT		Comment
Unknown ID	Reports	Unknown ID	Reports	
878	1,052	878	0	Old Murphy Creek Battery ID
1487	674	1487	661	Possibly coming from DIA at Third Street (1480)
1486	673	1486	662	Possibly coming from DIA at Third Street (1480)
1482	633	1482	626	Possibly coming from DIA at Third Street (1480)
1481	577	1481	573	Possibly coming from DIA at Third Street (1480)
2239	16	2239	16	
2786	10	2786	0	Antelope Creek Battery ID
2809	9	2809	0	Douglas County A2 GPS Lock ID
1661	8	1661	8	

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
2810	Pine Cliff Road	5	Site maintenance occurred in July
1530	Bear Cr at Lowell	4	
4290	Red Hill	4	
3050	East/West Trailhead	4	
1383	Ferril Lake	483	Bubbler that has failed....OneRain to address with Denver
4330	Hansen Rain	3	Marginal radio path
953	Piney at Liverpool	151	Failed PT on June 13
2883	Happy Canyon at N Surrey Drive	128	Zero stage.....negative reference level

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.

2250	Rosedale Precipitation-JF	Jefferson County 10 minute rainfall	7/4/2014 16:49
2240	Cold Spring Gulch C Precipitation-JF	Jefferson County 10 minute rainfall	7/4/2014 17:00
120	West Woods Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 20:38
200	Leyden Reservoir Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 20:38
1400	Upper Sloan Detention Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 20:55
1550	Lakewood CC Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 20:55
1340	Sanderson at Xavier Precipitation-DN	Plains 10 minute rainfall	7/7/2014 20:59
830	Side Creek Park Precipitation-AR	Plains 10 minute rainfall	7/7/2014 21:31
2260	Brook Forest Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 22:34
2260	Brook Forest Precipitation-JF	Jefferson County 1 hour rainfall	7/7/2014 22:39
2260	Brook Forest Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 22:45
330	Van Bibber @ Hwy 93 Precipitation-JF	Jefferson County 1 hour rainfall	7/7/2014 23:14
220	Upper Leyden Precipitation-JF	Jefferson County 1 hour rainfall	7/7/2014 23:24
220	Upper Leyden Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 23:31
100	Carr Street Precipitation-JF	Jefferson County 10 minute rainfall	7/7/2014 23:54
2950	DC Public Works Precipitation-DG	Douglas County 10 minute rainfall	7/11/2014 14:58
2950	DC Public Works Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/11/2014 15:03
2950	DC Public Works Precipitation-DG	Douglas County 10 minute rainfall	7/11/2014 15:09
2820	East Plum Creek at Haskins Gulch Precipitation-DG	Douglas County 10 minute rainfall	7/11/2014 15:15
2880	Happy Canyon at North Surrey Drive Precip-DG	Douglas County 10 minute rainfall	7/11/2014 15:32
2880	Happy Canyon at North Surrey Drive Precip-DG	Douglas County 1 hour-1 Inch rainfall	7/11/2014 15:36
2820	East Plum Creek at Haskins Gulch Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/11/2014 15:42
2880	Happy Canyon at North Surrey Drive Precip-DG	Douglas County 10 minute rainfall	7/11/2014 15:43
2260	Brook Forest Precipitation-JF	Jefferson County 10 minute rainfall	7/11/2014 15:55
1480	Third Creek at DIA Precipitation-DN	Plains 10 minute rainfall	7/11/2014 15:58
2270	Cub Creek below Blue Creek Precipitation-JF	Jefferson County 10 minute rainfall	7/11/2014 16:04
2280	Kinney Peak Precipitation-JF	Jefferson County 10 minute rainfall	7/11/2014 16:09
2360	Indian Hills Precipitation-JF	Jefferson County 10 minute rainfall	7/11/2014 16:16
2280	Kinney Peak Precipitation-JF	Jefferson County 1 hour rainfall	7/11/2014 16:16
2360	Indian Hills Precipitation-JF	Jefferson County 1 hour rainfall	7/11/2014 16:22
2360	Indian Hills Precipitation-JF	Jefferson County 10 minute rainfall	7/11/2014 16:27
5860	Cedar Mountain Precipitation-TL	Hayman 30 minute rainfall	7/12/2014 16:37
2250	Rosedale Precipitation-JF	Jefferson County 10 minute rainfall	7/12/2014 17:04
2270	Cub Creek below Blue Creek Precipitation-JF	Jefferson County 10 minute rainfall	7/12/2014 17:15
730	No Name @ Quincy Precipitation-AR	Plains 10 minute rainfall	7/12/2014 17:21
730	No Name @ Quincy Precipitation-AR	Plains 1 hour rainfall	7/12/2014 17:25
950	Piney at Liverpool Precipitation-AR	Plains 10 minute rainfall	7/12/2014 17:26
940	Sampson Gulch Precipitation-AR	Plains 10 minute rainfall	7/12/2014 17:31
730	No Name @ Quincy Precipitation-AR	Plains 10 minute rainfall	7/12/2014 17:32
900	Aurora Reservoir Precipitation	Plains 1 hour rainfall	7/12/2014 17:35
950	Piney at Liverpool Precipitation-AR	Plains 1 hour rainfall	7/12/2014 17:36

940	Sampson Gulch Precipitation-AR	Plains 1 hour rainfall	7/12/2014 17:37
3060	Fire Station #47 Precipitation-DG	Douglas County 10 minute rainfall	7/12/2014 17:40
3060	Fire Station #47 Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 17:50
3060	Fire Station #47 Precipitation-DG	Douglas County 10 minute rainfall	7/12/2014 17:50
2960	Indian Creek Precipitation-DG	Douglas County 10 minute rainfall	7/12/2014 18:15
1440	Elbert Precipitation	Douglas County 1 hour-1 Inch rainfall	7/12/2014 18:32
2820	East Plum Creek at Haskins Gulch Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 18:42
2960	Indian Creek Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 18:42
1350	Chatfield COE Precipitation-JF	Jefferson County 10 minute rainfall	7/12/2014 18:44
2950	DC Public Works Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 18:49
2960	Indian Creek Precipitation-DG	Douglas County 10 minute rainfall	7/12/2014 18:50
1350	Chatfield COE Precipitation-JF	Jefferson County 1 hour rainfall	7/12/2014 18:50
2950	DC Public Works Precipitation-DG	Douglas County 10 minute rainfall	7/12/2014 18:54
1350	Chatfield COE Precipitation-JF	Jefferson County 10 minute rainfall	7/12/2014 18:55
2960	Indian Creek Precipitation-DG	Douglas County 10 minute rainfall	7/12/2014 19:01
2910	East Cherry Creek Road Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 19:11
2750	Castle Rock Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 19:17
2960	Indian Creek Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 19:44
2820	East Plum Creek at Haskins Gulch Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 19:44
8801	USGS 06708800 East Plum Creek above Haskins Gulch Discharge	Douglas County Haskins Gulch above 500 cfs	7/12/2014 19:45
2950	DC Public Works Precipitation-DG	Douglas County 1 hour-1 Inch rainfall	7/12/2014 20:01
8801	USGS 06708800 East Plum Creek above Haskins Gulch Discharge	Douglas County Haskins Gulch above 1000 cfs	7/12/2014 20:15
8801	USGS 06708800 East Plum Creek above Haskins Gulch Discharge	Douglas County Haskins Gulch above 500 cfs	7/14/2014 8:30
8801	USGS 06708800 East Plum Creek above Haskins Gulch Discharge	Douglas County Haskins Gulch above 1000 cfs	7/14/2014 8:30
610	Harvard Gulch @ Jackson Precipitation-DN	Plains 10 minute rainfall	7/14/2014 22:12
630	Temple Pond at DTC Precipitation-DN	Plains 10 minute rainfall	7/14/2014 22:17
640	Goldsmith @ Eastman Precipitation-DN	Plains 10 minute rainfall	7/14/2014 22:20
630	Temple Pond at DTC Precipitation-DN	Plains 1 hour rainfall	7/14/2014 22:28
970	Pump Station 3 Precipitation-AR	Plains 1 hour rainfall	7/14/2014 22:28
3075	Newlin Gulch at Jordan Road Flasher 2 (East) Status	Parker Flasher Alarm	7/14/2014 23:12
3074	Newlin Gulch at Jordan Road Flasher 1 (West) Status	Parker Flasher Alarm	7/14/2014 23:12
2900	Russellville Gulch Precipitation-DG	Douglas County 10 minute rainfall	7/14/2014 23:29
3040	East Cherry Creek at Russellville Road Precip-DG	Douglas County 10 minute rainfall	7/14/2014 23:41
3040	East Cherry Creek at Russellville Road Precip-DG	Douglas County 1 hour-1 Inch rainfall	7/14/2014 23:48
4140	Logan Mill Precipitation-BO	FMC-BA 0.25" in 10 Min Rainfall	7/15/2014 14:00
4320	Lee Hill Rain Precipitation-BO	FMC-BA 0.25" in 10 Min Rainfall	7/15/2014 14:00
2260	Brook Forest Precipitation-JF	Jefferson County 10 minute rainfall	7/16/2014 14:36
2260	Brook Forest Precipitation-JF	Jefferson County 1 hour rainfall	7/16/2014 14:40
2260	Brook Forest Precipitation-JF	Jefferson County 10 minute rainfall	7/16/2014 14:47
2270	Cub Creek below Blue Creek Precipitation-JF	Jefferson County 10 minute rainfall	7/16/2014 14:49
2280	Kinney Peak Precipitation-JF	Jefferson County 10 minute rainfall	7/16/2014 14:57
5740	Trail Creek Precipitation-TL	Hayman 30 minute rainfall	7/16/2014 19:00
5740	Trail Creek Precipitation-TL	Hayman 1 hour rainfall	7/16/2014 19:03
5740	Trail Creek Precipitation-TL	Hayman 90 minute rainfall	7/16/2014 19:11
5740	Trail Creek Precipitation-TL	Hayman 30 minute rainfall	7/16/2014 19:11
2890	Spruce Mountain Open Space Precip-DG	Douglas County 10 minute rainfall	7/16/2014 19:14

5810	Stump Bump Precipitation-TL	Hayman 30 minute rainfall	7/16/2014 19:18
5730	West Creek Precipitation-TL	Hayman 30 minute rainfall	7/25/2014 15:17
5730	West Creek Precipitation-TL	Hayman 30 minute rainfall	7/25/2014 15:30
2990	Tomah Road Precipitation-DG	Douglas County 10 minute rainfall	7/26/2014 14:37
5860	Cedar Mountain Precipitation-TL	Hayman 30 minute rainfall	7/27/2014 18:46
5880	Hackett Mountain Precipitation-TL	Hayman 30 minute rainfall	7/27/2014 18:48
5880	Hackett Mountain Precipitation-TL	Hayman 30 minute rainfall	7/27/2014 19:00
5880	Hackett Mountain Precipitation-TL	Hayman 1 hour rainfall	7/27/2014 19:00
5880	Hackett Mountain Precipitation-TL	Hayman 30 minute rainfall	7/28/2014 14:35
5880	Hackett Mountain Precipitation-TL	Hayman 30 minute rainfall	7/28/2014 14:46
5880	Hackett Mountain Precipitation-TL	Hayman 1 hour rainfall	7/28/2014 14:46
5810	Stump Bump Precipitation-TL	Hayman 30 minute rainfall	7/28/2014 15:13
3090	Big Dry Creek at Heritage Regional Park Precipitation-DG	Douglas County 10 minute rainfall	7/28/2014 15:24
5810	Stump Bump Precipitation-TL	Hayman 30 minute rainfall	7/28/2014 15:25
5810	Stump Bump Precipitation-TL	Hayman 1 hour rainfall	7/28/2014 15:38
1800	Sand Creek Park Precipitation-AD	Plains 10 minute rainfall	7/28/2014 16:03
1800	Sand Creek Park Precipitation-AD	Plains 1 hour rainfall	7/28/2014 16:18
600	Harvard Gulch Park Precipitation-DN	Plains 10 minute rainfall	7/29/2014 15:06
600	Harvard Gulch Park Precipitation-DN	Plains 1 hour rainfall	7/29/2014 15:27
610	Harvard Gulch @ Jackson Precipitation-DN	Plains 1 hour rainfall	7/29/2014 16:05
1530	Bear Creek at Lowell Precipitation-AR	Plains 1 hour rainfall	7/31/2014 2:04
1530	Bear Creek at Lowell Precipitation-AR	Plains 10 minute rainfall	7/31/2014 2:16
750	Quincy Reservoir Precipitation	Plains 10 minute rainfall	7/31/2014 9:48
750	Quincy Reservoir Precipitation	Plains 1 hour rainfall	7/31/2014 9:56
750	Quincy Reservoir Precipitation	Plains 10 minute rainfall	7/31/2014 9:59
410	Kelly Dam Precipitation-DN	Plains 10 minute rainfall	7/31/2014 11:41

General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2014\7-2014\Novastar_extract_2014July.mdb

First Date in Database	7/1/14 12:00 AM	Total Days	31.0
Last Date in Database	7/31/14 11:59 PM	Total Hours	744.0

[Summarize](#)

Total Records Analyzed 605,692

Records by Group	Conc+A2 Self Reports	Percent	ALERT Legacy Reports	Percent	Percent
Wind Data	199,635	33%	Wind Data	99,600	32%
Temperature	86,484	14%	Temperature	41,180	13%
Relative Humidity	78,000	13%	Relative Humidity	40,201	13%
Battery Voltage	48,618	8%	Battery Voltage	14,982	5%
Water Level	47,169	8%	Water Level	36,714	12%
Barometric Pressure	36,613	6%	Barometric Pressure	21,702	7%
Precipitation	36,596	6%	Precipitation	22,407	7%
Dew Point Temperature	11,734	2%	Dew Point Temperature	0	0%
Wind Chill	11,727	2%	Wind Chill	0	0%
Peak Wind	11,667	2%	Peak Wind	0	0%
Solar Radiation	10,446	2%	Solar Radiation	10,160	3%
Fuel Temperature	5,905	1%	Fuel Temperature	5,906	2%
Fuel Moisture	5,903	1%	Fuel Moisture	5,881	2%
Wind Direction	4,255	1%	Wind Direction	0	0%
Unknown	3,983	1%	Unknown	2,852	1%
Soil Moisture	2,923	0%	Soil Moisture	2,887	1%
Repeater Status Report	1,801	0%	Repeater Status Report	2,273	1%
ET-Hourly	713	0%	ET-Hourly	712	0%
12Hr Status Report	400	0%	12Hr Status Report	382	0%
Hayman Battery	376	0%	Hayman Battery	0	0%
Not Used	296	0%	Not Used	286	0%
Flasher Status	291	0%	Flasher Status	0	0%
Handar 585 ALARM Status	64	0%	Handar 585 ALARM Status	67	0%
Repeater Pass List	61	0%	Repeater Pass List	550	0%
ET-Daily	32	0%	ET-Daily	33	0%
Total	605,692	100%	Total	308,775	100%

Traffic Loading Summary	Conc+A2 Self Reports		ALERT Legacy Reports	
Alert Reports	605,692		308,775	
Average Daily Traffic	19,538		9,960	
Average Hourly Traffic	814		415	
Median Hourly Traffic	780	hour beginning	384	hour beginning
Peak Hourly Traffic	1,837	Jul 7, 9:00 PM	1,118	Jul 7, 9:00 PM
2nd Max	1,798	Jul 12, 5:00 PM	1,033	Jul 30, 10:00 AM
3rd Max	1,530	Jul 30, 7:00 PM	1,004	Jul 30, 7:00 PM
4th Max	1,518	Jul 16, 6:00 PM	960	Jul 12, 5:00 PM
5th Max	1,514	Jul 30, 12:00 AM	949	Jul 30, 12:00 AM

Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
4330	Hansen Rain	31	18:35	62	50%
2360	Indian Hills	43	13:33	62	69%
1660	SPR at Henderson	44	13:24	62	71%
2330	Morrison	44	15:44	62	71%
2280	Kinney Peak	45	14:22	62	73%
100150	A2-Sellers Gulch at Haystack Precip	46	12:00	62	74%
2270	Cub Cr below Blue	47	13:31	62	76%
310	Guy Hill Ranch	48	12:57	62	77%
1710	Shop Creek	48	16:00	62	77%
4850	Porphory Mtn	48	12:00	62	77%
3090	A2-Highland Heritage Park	49	11:14	62	79%
2790	Wx-W. Cherry Creek	50	13:20	62	81%
4470	Little Narrows	50	13:37	62	81%
4870	SBC @ SB Road	50	14:06	62	81%
2320	Choke Cherry Resvr	51	13:37	62	82%
2810	Pine Cliff Road	51	11:41	62	82%
620	Quincy/Highline	54	12:32	62	87%
2340	El Rancho	54	13:37	62	87%
2870	Cottonwood (Apache)	54	12:50	62	87%
4290	Red Hill	54	13:18	62	87%
4510	Pinewood Springs	54	12:41	62	87%
410	Kelly Dam	55	12:45	62	89%
540	Parker/Mississippi	55	12:34	62	89%
650	Iliff Pond	55	11:59	62	89%
1440	Wx-Elbert	55	13:00	62	89%
2820	Haskins Gulch Conf	55	12:32	62	89%
2890	Spruce Mt - Douglas	55	12:18	62	89%
610	Harvard @ Jackson	56	12:13	62	90%
830	Side Creek Park	56	12:30	62	90%
2230	Bear Cr below Cub	56	12:16	62	90%
2250	Rosedale	56	12:17	62	90%
2310	Genesee Village	56	12:34	62	90%
2850	Cherry Cr bl Bayou Glch	56	13:00	62	90%
2980	Dakan Rd	56	13:03	62	90%
3010	WX-EPC at Hwy 105	56	12:19	62	90%
4270	Cannon Mountain	56	12:54	62	90%
400	Montview Park	57	12:29	62	92%
420	Expo Park	57	12:26	62	92%
1200	Broomfield 3207	57	12:14	62	92%
1620	Slaughterhouse Glch	57	13:03	62	92%
4040	Martin Gulch	57	12:16	62	92%
4260	Taylor Mountain	57	12:35	62	92%
4570	St. Antons	57	12:17	62	92%
4790	Wx-Button Rock	57	12:35	62	92%
110	Ralston Reservoir	58	11:58	62	94%
520	Jewell Detention	58	12:13	62	94%
840	Fire Station 12	58	12:16	62	94%
850	Flying J	58	12:00	62	94%
940	Aurora Regional Pond	58	12:13	62	94%
1010	Denver West	58	12:13	62	94%
1350	Chatfield COE	58	12:33	62	94%
1500	Powers Park	58	11:57	62	94%
2260	Brook Forest	58	11:57	62	94%
2350	Idledale	58	11:57	62	94%

2710	Wx-Highlands Ranch WTP	58	12:37	62	94%
2750	Wx-Castle Rock	58	12:00	62	94%
2800	Columbine Open Space	58	12:20	62	94%
2840	Sulphur Gulch	58	12:15	62	94%
2860	CC at Stroh Rd	58	12:14	62	94%
2990	Wx-Tomah Rd-DougCnty	58	12:00	62	94%
3030	WX-Bingham Lake Park	58	12:00	62	94%
3060	Fire Sta 47	58	12:16	62	94%
4010	Crescent	58	12:14	62	94%
4020	Rio Grande	58	12:13	62	94%
4030	Red Garden	58	12:16	62	94%
4060	Lakeshore	58	11:58	62	94%
4070	Bear Peak	58	12:15	62	94%
4490	Apple Valley	58	12:29	62	94%
100140	A2-Upper Sellers Gulch Precip	58	12:48	62	94%
630	Temple Pond at DTC	59	12:42	62	95%
800	Sable Ditch @ 18th	59	12:13	62	95%
1310	LDC at 64th	59	12:13	62	95%
1340	Sanderson at Xavier	59	11:58	62	95%
1530	Bear Creek @ Lowell	59	12:38	62	95%
1550	Lakewood CC	59	12:12	62	95%
1720	Cherry Cr @ Steele	59	11:57	62	95%
1920	Wx-Brighton	59	12:15	62	95%
2370	Red Rocks Park	59	12:14	62	95%
2900	Russelville Gulch-Douglas	59	12:20	62	95%
2920	West Cherry Head-Douglas Cnty	59	12:32	62	95%
2930	Wx-Spring Valley Rd-DougCnty	59	12:31	62	95%
2940	Willow Creek - DougCnty	59	12:16	62	95%
3050	East/West Trailhead	59	12:00	62	95%
3080	Tallman Gulch	59	12:16	62	95%
4050	Walker Ranch	59	11:58	62	95%
4110	Betasso	59	11:59	62	95%
4340	Riverside	59	11:58	62	95%
4360	Justice Center	59	12:25	62	95%
4530	Winiger Ridge	59	11:58	62	95%
4770	Wx-Cal-Wood Ranch	59	12:00	62	95%
100100	A2-Blackstone Precip	59	12:00	62	95%
100110	A2-ETG @ Hampden Precip	59	12:00	62	95%
150	Nott Creek	60	11:57	62	97%
200	Leyden Reservoir	60	11:58	62	97%
210	Leyden Confluence	60	12:13	62	97%
440	Fire Station #7	60	11:57	62	97%
510	Virginia Court	60	12:17	62	97%
530	Fire Station #19	60	12:13	62	97%
640	Goldsmith @ Eastman	60	11:58	62	97%
700	Toll Gate @ 6th	60	12:00	62	97%
750	Wx-Quincy Reservoir	60	12:27	62	97%
760	Mission Viejo Park	60	11:57	62	97%
810	Granby Ditch @ 6th	60	11:57	62	97%
900	Wx-Aurora Reservoir	60	12:15	62	97%
970	Pump Sta 3	60	12:00	62	97%
1030	NREL/S. Table Mtn.	60	12:12	62	97%
1040	Lena @ U.S. Hwy 6	60	11:59	62	97%
1300	Hidden Lake	60	11:58	62	97%
1320	SPR at 3rd Ave	60	11:58	62	97%
1370	West Metro FS13	60	11:57	62	97%
1420	Wx-Diamond Hill	60	12:00	62	97%
1460	Wx-Urban Farm	60	12:00	62	97%
1570	Wx-Brighton Ditch	60	12:00	62	97%

1600	Englewood Dam	60	12:13	62	97%
1700	Cherry Cr @ Champa	60	11:59	62	97%
1800	Sand Creek Park	60	12:12	62	97%
2210	Wx-Hiwan G.C.	60	12:00	62	97%
2910	East Cherry Cr-Douglas	60	12:16	62	97%
2950	DC Public Works	60	12:00	62	97%
2960	Indian Creek	60	12:00	62	97%
3040	CC @ Prairie Canyon Ranch	60	12:16	62	97%
4080	Twin Sisters	60	11:58	62	97%
4100	Filter Plant	60	11:59	62	97%
4180	Gold Lake	60	11:57	62	97%
4190	Slaughterhouse	60	12:13	62	97%
4200	Lazy Acres	60	11:59	62	97%
4250	Geer Canyon	60	12:13	62	97%
4310	Johnny Park	60	11:57	62	97%
4320	Lee Hill Rain 2012	60	11:58	62	97%
100160	A2-Sand Creek at Colfax Precip	60	12:00	62	97%
120	West Woods	61	11:58	62	98%
140	Wx-Blue Mountain	61	12:00	62	98%
220	Upper Leyden	61	12:00	62	98%
300	Van Bibber Park	61	11:58	62	98%
330	Van Bibber @ Hwy 93	61	11:57	62	98%
430	Utah Park	61	11:57	62	98%
710	Horseshoe Park Drop	61	11:58	62	98%
730	No Name @ Quincy	61	11:57	62	98%
820	ETG @ Buckley	61	11:57	62	98%
950	Piney at Liverpool	61	11:58	62	98%
1050	Jeffco Fairgrounds	61	11:57	62	98%
1060	Heritage Square	61	11:57	62	98%
1110	Gunbarrel	61	11:58	62	98%
1360	Denver Zoo	61	12:00	62	98%
1400	Upper Sloan Det.	61	11:57	62	98%
1480	Third Creek at DIA	61	11:59	62	98%
1520	Wx-Marston Lake North	61	12:00	62	98%
2730	Wx-Salisbury Park	61	12:00	62	98%
2880	Happy Canyon at N Surrey Dr	61	12:15	62	98%
4090	Magnolia	61	11:58	62	98%
4130	Swiss Peaks	61	11:59	62	98%
4140	Logan Mill	61	11:58	62	98%
4150	Gold Hill	61	11:58	62	98%
4160	Sunshine	61	11:58	62	98%
4170	Pine Brook	61	12:12	62	98%
4220	Fling's	61	12:09	62	98%
4230	Golden Age	61	12:13	62	98%
4300	Big Elk Park	61	11:57	62	98%
4350	Conifer Hill	61	11:58	62	98%
4520	Eagle Ridge	61	12:00	62	98%
4550	Boulder Jail	61	11:57	62	98%
4710	Wx-Ward C-1	61	12:00	62	98%
4730	Wx-Sugarloaf	61	12:00	62	98%
4810	Shanahan Ridge	61	11:57	62	98%
4820	Doudy Draw	61	11:48	62	98%
4830	SBC @ San Souci	61	11:58	62	98%
4860	Fairview Peak	61	12:00	62	98%
320	Sports Complex	62	11:42	62	100%
500	Havana Park	62	11:57	62	100%
600	Harvard Gulch Park	62	11:33	62	100%
920	Wx-Aurora Town Hall	62	11:28	62	100%
1100	Louisville Rec Ctr	62	11:46	62	100%

1640	SPR at Union Ave.	62	11:44	62	100%
4240	Sunset	62	11:58	62	100%
4840	SBC@S Boulder Ditch	62	11:58	62	100%
4880	Whispering Pines	62	11:55	62	100%
720	Confluence Pond	63	11:53	62	102%
3020	Wx-West Creek WX	63	11:27	62	102%
4750	Wx-Louisville Lake	63	11:45	62	102%
2240	Cold Sprg Glch conf	67	10:27	62	108%
3070	A2-Newlin Gulch Precip	113	6:25	62	182%
1900	Niver Detention	120	5:04	62	194%
100	A2-Carr Street	284	0:00	62	
870	Murphy Creek GC	349		62	
1000	A2-Maple Grove Resv.	286		62	
2970	Rampart Range Rd-Satellite	301		62	
5720	Four Mile Creek	46	14:57	62	74%
5730	West Creek	61	11:48	62	98%
5740	Trail Creek	63	11:40	62	102%
5810	Stump Bump	60	11:43	62	97%
5860	Cedar Mountain	59	11:58	62	95%
5880	Hackett Mountain	62	11:42	62	100%
5900	Horse Creek-Satellite	1190		62	
5940	Log Jumper	59	11:48	62	95%

Rain Event Performance																		
		Reports Received	16,834				Analyze Rain Sensors											
	Systemwide Avg	Total Tips	18,250															
	92.24%	Data Loss	7.76%															
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket				
Iliff Pond	650	57%	45	9	4	2	0	0	3	60	105	23	0	0.03937				
Little Narrows	4470	65%	44	10	4	1	2	1	0	62	96	34	0	0.03937	Mean		99.727	
Choke Cherry Resvr	2320	65%	50	10	0	2	0	0	1	62	95	16	0	0.03937	Median		95	
Rampart Range Rd-Satellite	2970	70%	70	14	7	0	3	0	0	94	134	40	0	0.03937	St. Dev		27.607	
Indian Hills	2360	71%	75	19	4	0	1	0	1	99	140	31	0	0.03937	Mean plus 3 SD		182.55	
Dakan Rd	2980	71%	47	18	3	0	1	0	0	69	97	28	0	0.03937	Mean minus 2 SD		44.513	
Morrison	2330	73%	55	11	7	1	0	0	0	74	102	28	0	0.03937	Min		20	
Wx-Quincy Reservoir	750	77%	72	7	3	3	1	0	0	86	112	26	2	0.03937	Max		237	
SPR at Henderson	1660	78%	61	15	4	0	0	0	0	80	103	23	0	0.03937				
Wx-Highlands Ranch WTP	2710	78%	59	3	0	0	0	0	1	62	79	3	0	0.03937				
Columbine Open Space	2800	79%	102	12	1	0	0	0	1	115	145	14	0	0.03937				
A2-Highland Heritage Park	3090	80%	75	4	0	1	0	0	1	80	100	7	1	0.03937				
Kelly Dam	410	82%	41	2	0	0	2	0	0	45	55	10	1	0.03937				
Bear Creek @ Lowell	1530	82%	65	9	1	2	0	0	0	77	94	17	2	0.03937				
Parker/Mississippi	540	83%	33	4	0	0	1	0	0	38	46	8	0	0.03937				
Pinewood Springs	4510	83%	79	14	3	0	0	0	0	96	116	20	0	0.03937				
Wx-W. Cherry Creek	2790	83%	71	8	3	1	0	0	0	83	100	17	0	0.03937				
Red Rocks Park	2370	83%	64	8	2	1	0	0	0	75	90	15	0	0.03937				
Wx-Button Rock	4790	84%	53	10	1	0	0	0	0	64	76	12	0	0.03937				
Guy Hill Ranch	310	85%	53	5	1	0	1	0	0	60	71	11	0	0.03937				
SBC @ SB Road	4870	85%	67	10	2	0	0	0	0	79	93	14	0	0.03937				
Shop Creek	1710	86%	80	8	2	1	0	0	0	91	106	15	2	0.03937				
Van Bibber @ Hwy 93	330	87%	116	19	1	0	0	0	0	136	157	21	0	0.03937				
Pine Cliff Road	2810	87%	106	4	0	1	0	0	1	111	128	7	0	0.03937				
Haskins Gulch Conf	2820	87%	114	17	0	1	0	0	0	132	152	20	0	0.03937				
Kinney Peak	2280	87%	104	13	1	1	0	0	0	119	137	18	0	0.03937				
Cub Cr below Blue	2270	88%	130	13	4	0	0	0	0	147	168	21	0	0.03937				
Hansen Rain	4330	88%	78	6	1	0	1	0	0	86	98	12	0	0.03937				
Lazy Acres	4200	88%	64	8	1	0	0	0	0	73	83	10	0	0.03937				
Apple Valley	4490	88%	66	8	1	0	0	0	0	75	85	10	0	0.03937				
Sand Creek Park	1800	88%	75	8	0	1	0	0	0	84	95	11	0	0.03937				
Eagle Ridge	4520	89%	83	12	0	0	0	0	0	95	107	12	2	0.03937				
Wx-Tomah Rd-DougCnty	2990	89%	124	4	1	0	0	0	1	129	145	6	0	0.03937				
A2-Maple Grove Resv.	1000	89%	78	0	0	2	1	0	0	81	91	10	0	0.03937				
Wx-Castle Rock	2750	89%	94	3	1	0	0	0	1	98	110	5	0	0.03937				
Slaughterhouse	4190	89%	73	8	1	0	0	0	0	82	92	10	0	0.03937				
Indian Creek	2960	89%	146	9	1	1	0	1	0	158	177	19	0	0.03937				
Lakewood CC	1550	89%	82	9	1	0	0	0	0	92	103	11	0	0.03937				
Quincy/Highline	620	89%	82	11	0	0	0	0	0	93	104	11	0	0.03937				
Spruce Mt - Douglas	2890	90%	102	9	0	0	1	0	0	112	125	13	0	0.03937				
Walker Ranch	4050	90%	61	3	2	0	0	0	0	66	73	7	0	0.03937				
Toll Gate @ 6th	700	90%	68	8	0	0	0	0	0	76	84	8	1	0.03937				
Happy Canyon at N Surrey Dr	2880	90%	88	6	0	0	1	0	0	95	105	10	1	0.03937				
Upper Sloan Det.	1400	91%	73	2	3	0	0	0	0	78	86	8	1	0.03937				
St. Antons	4570	91%	73	6	1	0	0	0	0	80	88	8	0	0.03937				
Cherry Cr @ Champa	1700	91%	65	5	1	0	0	0	0	71	78	7	0	0.03937				
Granby Ditch @ 6th	810	91%	77	3	1	1	0	0	0	82	90	8	0	0.03937				
A2-Sand Creek at Colfax Precip	100160	91%	103	1	0	0	0	0	1	104	114	1	0	0.03937				
A2-Sellers Gulch at Haystack Precip	100150	91%	112	1	2	1	0	0	1	116	127	8	0	0.03937				
Lena @ U.S. Hwy 6	1040	91%	78	8	0	0	0	0	0	86	94	8	0	0.03937				
Denver West	1010	92%	89	9	0	0	0	0	0	98	107	9	0	0.03937				
Denver Zoo	1360	92%	70	7	0	0	0	0	0	77	84	7	0	0.03937				
Harvard @ Jackson	610	92%	117	7	2	0	0	0	0	126	137	11	0	0.03937				

Nott Creek	150	92%	76	5	1	0	0	0	0	82	89	7	0	0.03937
Horseshoe Park Drop	710	92%	76	5	1	0	0	0	0	82	89	7	0	0.03937
East/West Trailhead	3050	92%	79	1	0	2	0	0	0	82	89	7	0	0.03937
Third Creek at DIA	1480	92%	87	6	1	0	0	0	0	94	102	8	0	0.03937
Ralston Reservoir	110	92%	97	9	0	0	0	0	0	106	115	9	0	0.03937
Powers Park	1500	92%	58	0	0	0	0	1	0	59	64	5	0	0.03937
Wx-Brighton	1920	92%	57	2	0	1	0	0	0	60	65	5	0	0.03937
CC at Stroh Rd	2860	92%	66	6	0	0	0	0	0	72	78	6	0	0.03937
SBC @ San Souci	4830	92%	100	7	1	0	0	0	0	108	117	9	0	0.03937
Cottonwood (Apache)	2870	92%	56	5	0	0	0	0	0	61	66	5	0	0.03937
Cannon Mountain	4270	92%	79	7	0	0	0	0	0	86	93	7	0	0.03937
Sable Ditch @ 18th	800	93%	81	5	1	0	0	0	0	87	94	7	0	0.03937
Genesee Village	2310	93%	81	5	1	0	0	0	0	87	94	7	0	0.03937
Cold Sprg Glch conf	2240	93%	95	6	1	0	0	0	0	102	110	8	0	0.03937
Chatfield COE	1350	93%	120	8	1	0	0	0	0	129	139	10	0	0.03937
Shanahan Ridge	4810	93%	109	9	0	0	0	0	0	118	127	9	0	0.03937
Russelville Gulch-Douglas	2900	93%	100	4	2	0	0	0	0	106	114	8	0	0.03937
West Cherry Head-Douglas Cnty	2920	93%	75	4	1	0	0	0	0	80	86	6	0	0.03937
SPR at Union Ave.	1640	93%	63	3	1	0	0	0	0	67	72	5	0	0.03937
ETG @ Buckley	820	93%	76	6	0	0	0	0	0	82	88	6	0	0.03937
Wx-West Creek WX	3020	93%	79	2	0	0	1	0	0	82	88	6	0	0.03937
Jewell Detention	520	93%	64	5	0	0	0	0	0	69	74	5	0	0.03937
Willow Creek - DougCnty	2940	93%	132	6	2	0	0	0	0	140	150	10	0	0.03937
DC Public Works	2950	93%	148	9	1	0	0	0	0	158	169	11	0	0.03937
Idledale	2350	94%	84	6	0	0	0	0	0	90	96	6	0	0.03937
Filter Plant	4100	94%	71	5	0	0	0	0	0	76	81	5	0	0.03937
Fire Station 12	840	94%	103	5	1	0	0	0	0	109	116	7	2	0.03937
Wx-Marston Lake North	1520	94%	74	3	1	0	0	0	0	78	83	5	0	0.03937
West Metro FS13	1370	94%	103	7	0	0	0	0	0	110	117	7	0	0.03937
Tallman Gulch	3080	94%	75	3	1	0	0	0	0	79	84	5	0	0.03937
Wx-Louisville Lake	4750	94%	74	5	0	0	0	0	0	79	84	5	0	0.03937
A2-Blackstone Precip	100100	94%	92	1	1	1	0	0	0	95	101	6	0	0.03937
Upper Leyden	220	94%	106	3	2	0	0	0	0	111	118	7	1	0.03937
Brook Forest	2260	94%	209	14	0	0	0	0	0	223	237	14	0	0.03937
Temple Pond at DTC	630	94%	153	8	1	0	0	0	0	162	172	10	0	0.03937
Slaughterhouse Glch	1620	94%	49	1	1	0	0	0	0	51	54	3	0	0.03937
CC @ Prairie Canyon Ranch	3040	95%	115	5	1	0	0	0	0	121	128	7	0	0.03937
Utah Park	430	95%	132	6	1	0	0	0	0	139	147	8	0	0.03937
Flying J	850	95%	101	6	0	0	0	0	0	107	113	6	0	0.03937
Virginia Court	510	95%	85	5	0	0	0	0	0	90	95	5	0	0.03937
Wx-Diamond Hill	1420	95%	103	6	0	0	0	0	0	109	115	6	2	0.03937
Conifer Hill	4350	95%	69	4	0	0	0	0	0	73	77	4	0	0.03937
Sulphur Gulch	2840	95%	72	2	1	0	0	0	0	75	79	4	0	0.03937
Jeffco Fairgrounds	1050	95%	89	5	0	0	0	0	0	94	99	5	0	0.03937
WX-Bingham Lake Park	3030	95%	73	4	0	0	0	0	0	77	81	4	0	0.03937
Aurora Regional Pond	940	95%	92	5	0	0	0	0	0	97	102	5	0	0.03937
Fire Sta 47	3060	95%	112	4	1	0	0	0	0	117	123	6	0	0.03937
NREL/S. Table Mtn.	1030	95%	93	5	0	0	0	0	0	98	103	5	0	0.03937
Expo Park	420	95%	113	6	0	0	0	0	0	119	125	6	0	0.03937
Cherry Cr bl Bayou Glch	2850	95%	19	1	0	0	0	0	0	20	21	1	0	0.03937
SPR at 3rd Ave	1320	95%	95	5	0	0	0	0	0	100	105	5	0	0.03937
Side Creek Park	830	95%	114	6	0	0	0	0	0	120	126	6	0	0.03937
Fling's	4220	95%	97	3	1	0	0	0	0	101	106	5	0	0.03937
Leyden Confluence	210	95%	98	5	0	0	0	0	0	103	108	5	0	0.03937
Big Elk Park	4300	96%	81	4	0	0	0	0	0	85	89	4	0	0.03937
Broomfield 3207	1200	96%	62	3	0	0	0	0	0	65	68	3	0	0.03937
Fire Station #19	530	96%	83	4	0	0	0	0	0	87	91	4	0	0.03937
A2-ETG @ Hampden Precip	100110	96%	128	1	1	1	0	0	0	131	137	6	0	0.03937
Red Hill	4290	96%	84	4	0	0	0	0	0	88	92	4	0	0.03937

Sanderson at Xavier	1340	96%	85	4	0	0	0	0	0	89	93	4	0	0.03937
Magnolia	4090	96%	85	4	0	0	0	0	0	89	93	4	0	0.03937
Doudy Draw	4820	96%	130	6	0	0	0	0	0	136	142	6	0	0.03937
Golden Age	4230	96%	66	3	0	0	0	0	0	69	72	3	0	0.03937
Heritage Square	1060	96%	89	2	1	0	0	0	0	92	96	4	0	0.03937
Lee Hill Rain 2012	4320	96%	88	4	0	0	0	0	0	92	96	4	0	0.03937
Havana Park	500	96%	111	5	0	0	0	0	0	116	121	5	0	0.03937
Taylor Mountain	4260	96%	90	4	0	0	0	0	0	94	98	4	0	0.03937
Leyden Reservoir	200	96%	116	3	1	0	0	0	0	120	125	5	0	0.03937
No Name @ Quincy	730	96%	115	5	0	0	0	0	0	120	125	5	2	0.03937
West Woods	120	96%	139	6	0	0	0	0	0	145	151	6	1	0.03937
Bear Cr below Cub	2230	96%	95	4	0	0	0	0	0	99	103	4	0	0.03937
Montview Park	400	96%	72	3	0	0	0	0	0	75	78	3	0	0.03937
Wx-Aurora Town Hall	920	96%	96	4	0	0	0	0	0	100	104	4	1	0.03937
Red Garden	4030	96%	96	4	0	0	0	0	0	100	104	4	0	0.03937
LDC at 64th	1310	96%	73	3	0	0	0	0	0	76	79	3	0	0.03937
Winiger Ridge	4530	96%	73	3	0	0	0	0	0	76	79	3	0	0.03937
Logan Mill	4140	96%	74	3	0	0	0	0	0	77	80	3	0	0.03937
A2-Carr Street	100	96%	101	1	0	1	0	0	0	103	107	4	0	0.03937
Rio Grande	4020	96%	76	3	0	0	0	0	0	79	82	3	0	0.03937
Lakeshore	4060	96%	76	3	0	0	0	0	0	79	82	3	0	0.03937
Mission Viejo Park	760	96%	77	3	0	0	0	0	0	80	83	3	0	0.03937
Martin Gulch	4040	96%	78	3	0	0	0	0	0	81	84	3	0	0.03937
Riverside	4340	97%	81	3	0	0	0	0	0	84	87	3	0	0.03937
A2-Upper Sellers Gulch Precip	100140	97%	108	4	0	0	0	0	0	112	116	4	0	0.03937
Cherry Cr @ Steele	1720	97%	55	2	0	0	0	0	0	57	59	2	0	0.03937
Fire Station #7	440	97%	85	3	0	0	0	0	0	88	91	3	0	0.03937
Pump Sta 3	970	97%	144	3	1	0	0	0	0	148	153	5	1	0.03937
Wx-Brighton Ditch	1570	97%	87	3	0	0	0	0	0	90	93	3	1	0.03937
Johnny Park	4310	97%	87	3	0	0	0	0	0	90	93	3	0	0.03937
Wx-Cal-Wood Ranch	4770	97%	87	3	0	0	0	0	0	90	93	3	0	0.03937
Boulder Jail	4550	97%	90	3	0	0	0	0	0	93	96	3	0	0.03937
Wx-Elbert	1440	97%	91	3	0	0	0	0	0	94	97	3	0	0.03937
Wx-Ward C-1	4710	97%	91	3	0	0	0	0	0	94	97	3	0	0.03937
Murphy Creek GC	870	97%	125	0	0	0	1	0	0	126	130	4	0	0.03937
Gold Lake	4180	97%	92	3	0	0	0	0	0	95	98	3	0	0.03937
SBC@S Boulder Ditch	4840	97%	92	3	0	0	0	0	0	95	98	3	0	0.03937
Van Bibber Park	300	97%	98	3	0	0	0	0	0	101	104	3	0	0.03937
Rosedale	2250	97%	101	3	0	0	0	0	0	104	107	3	0	0.03937
East Cherry Cr-Douglas	2910	97%	139	4	0	0	0	0	0	143	147	4	0	0.03937
Wx-Spring Valley Rd-DougCnty	2930	97%	106	3	0	0	0	0	0	109	112	3	0	0.03937
Wx-Sugarloaf	4730	97%	71	2	0	0	0	0	0	73	75	2	0	0.03937
Cresent	4010	97%	72	2	0	0	0	0	0	74	76	2	0	0.03937
Twin Sisters	4080	97%	75	2	0	0	0	0	0	77	79	2	0	0.03937
Swiss Peaks	4130	97%	75	2	0	0	0	0	0	77	79	2	0	0.03937
Sunset	4240	98%	82	1	0	0	0	0	1	83	85	1	0	0.03937
Niver Detention	1900	98%	85	2	0	0	0	0	0	87	89	2	0	0.03937
Hidden Lake	1300	98%	86	2	0	0	0	0	0	88	90	2	0	0.03937
Wx-Aurora Reservoir	900	98%	90	2	0	0	0	0	0	92	94	2	1	0.03937
Confluence Pond	720	98%	94	2	0	0	0	0	0	96	98	2	0	0.03937
Goldsmith @ Eastman	640	98%	108	2	0	0	0	0	0	110	112	2	0	0.03937
Bear Peak	4070	98%	110	2	0	0	0	0	0	112	114	2	0	0.03937
Louisville Rec Ctr	1100	98%	64	1	0	0	0	0	0	65	66	1	0	0.03937
Wx-Blue Mountain	140	99%	69	1	0	0	0	0	0	70	71	1	0	0.03937
Geer Canyon	4250	99%	76	1	0	0	0	0	0	77	78	1	0	0.03937
Pine Brook	4170	99%	77	1	0	0	0	0	0	78	79	1	0	0.03937
A2-Newlin Gulch Precip	3070	99%	78	1	0	0	0	0	0	79	80	1	0	0.03937
El Rancho	2340	99%	80	1	0	0	0	0	0	81	82	1	0	0.03937
Sunshine	4160	99%	80	1	0	0	0	0	0	81	82	1	0	0.03937

Gunbarrel	1110	99%	82	1	0	0	0	0	0	0	83	84	1	0	0.03937
Harvard Gulch Park	600	99%	126	1	0	0	0	0	0	0	127	128	1	0	0.03937
Justice Center	4360	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.03937
Wx-Salisbury Park	2730	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.03937
Whispering Pines	4880	100%	75	0	0	0	0	0	0	0	75	75	0	0	0.03937
Sports Complex	320	100%	77	0	0	0	0	0	0	0	77	77	0	0	0.03937
Wx-Hiwan G.C.	2210	100%	82	0	0	0	0	0	0	0	82	82	0	1	0.03937
Englewood Dam	1600	100%	85	0	0	0	0	0	0	0	85	85	0	1	0.03937
Betasso	4110	100%	86	0	0	0	0	0	0	0	86	86	0	0	0.03937
Wx-Urban Farm	1460	100%	87	0	0	0	0	0	0	0	87	87	0	1	0.03937
Gold Hill	4150	100%	87	0	0	0	0	0	0	0	87	87	0	0	0.03937
Piney at Liverpool	950	100%	101	0	0	0	0	0	0	0	101	101	0	0	0.03937
TOTAL			15786	887	110	30	18	3	14	16834	18250	1284	28		
Porphory Mtn	4850	67%	219	40	6	6	1	1	4	273	406	79	10	0.01	
WX-EPC at Hwy 105	3010	75%	302	27	14	6	0	3	3	352	472	88	0	0.01	
Fairview Peak	4860	97%	400	14	0	0	0	0	0	414	428	14	11	0.01	
Four Mile Creek	5720	88%	86	8	1	1	0	0	0	96	109	13	0	0.03937	
West Creek	5730	96%	103	5	0	0	0	0	0	108	113	5	0	0.03937	
Trail Creek	5740	89%	119	8	3	1	0	0	0	131	148	17	2	0.03937	
Stump Bump	5810	97%	117	2	1	0	0	0	0	120	124	4	0	0.03937	
Cedar Mountain	5860	97%	127	4	0	0	0	0	0	131	135	4	0	0.03937	
Hackett Mountain	5880	97%	129	2	1	0	0	0	0	132	136	4	0	0.03937	
Horse Creek-Satellite	5900	95%	106	1	0	0	0	1	0	108	114	6	0	0.03937	
Log Jumper	5940	93%	73	4	1	0	0	0	0	78	84	6	0	0.03937	

2014 Monthly Peak Hour ALERT Radio Traffic Summary

