

Memo



Date: March 2, 2010
To: Kevin Stewart
From: Markus Ritsch
Subject: February 2010 ALERT Data Analysis

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's Nova Star 4.0 base station (ALERT 2) were analyzed for the period February 1 through February 28, 2010.

II. General System Analysis Summary

A total of 262,656 ALERT data reports were analyzed from the ALERT 2 base station. Meteorological sensors account for 83 percent, water level sensors 3 percent, and rain sensors 3 percent of the total monthly records.

The system-wide radio traffic loading was 9,381 reports per day with an average hourly loading of 391 reports. The peak hourly traffic loading was 631 reports, which occurred on February 27, between 8:00 AM and 9:00 AM. A plot of monthly average and peak hourly traffic loading is provided.

A. Specific Issues Identified this Month

Performance of the following sensors (Table 1) was unacceptable this month.

Table 1. Rain Sensors with Unacceptable Performance Characteristics

Rain ID	Description	Timer	Event	Comments
120	West Woods	0.09	--	Runaway sensor reporting on Feb 28, 2010
700	Toll Gate at 6th	0.39	0.7	Poor performance
1000	Maple Grove Reservoir	0.61	0.96	Poor performance
1530	Bear Creek at Lowell	0	0	Sporadic reporting, large number of invalid reports
1600	Englewood Dam	0.32	1.0	Transmitting undefined IDs (1601, 1602, 1604, 1606, 1607, 1608)
4030	Red Garden	0.80	0.79	Large number of invalid reports
4250	Geer Canyon	0.93	0.60	Missing data from 2/21 through 2/23
4290	Red Hill	0.91	0.71	Missing data from 2/21 through 2/23
4330	Indian Ruins	0.52	0.74	Poor performance
4470	Little Narrows	0.63	0.59	Missing data from 2/21 through 2/23

III. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-hour timer-reporting interval. System-wide, the ALERT 2 base station received approximately 65 percent of the non-incrementing timer reports. The worst performing rain sensors for the month are summarized (Table 2).

Table 2. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
1460	1460										
4710	1520										
--	--										
--	--										
--	--										
--	--										

*-Timer statistics are evaluated only for weather stations in these months because system start-up/shut-down occurs. The rain/stage network is operational between April 1 and October 15. Only the weather stations remain operational throughout the year.

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.

IV. 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 3).

Table 3. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	11.90	Only the 1-mm rain sensors were included in the analysis
Median	11	Only the 1-mm rain sensors were included in the analysis
Standard deviation	7.36	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	33.99	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	Numerous IDs
Maximum total count	27	ID 4110, 4140, 4310, 4350, 4510

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 4).

Table 4. 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											

*-Event statistics are skewed in these months because system start-up/shut-down occurs. The rain network is operational between April 1 and October 15. Only the weather stations remain operational throughout the year.

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 5).

Table 5. Sensors with a Jump of More than 6 in Sequential Count

Sensor Description	Sensor ID	Comment
Red Hill	4290	Large jump occurred between 2/21 and 2/23
Little Narrows	4470	Large jump occurred between 2/18 and 2/23
Geer Canyon	4250	Large jump occurred between 2/21 and 2/23
West Woods	120	Multiple large jumps in count on 2/28, count series is not consistent

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 90 percent. A total of 1,321 incrementing reports were received and a total of 1,463 were expected. The total loss of incrementing reports for the month was approximately 10 percent. Those sensors with the worst event transmission performance are summarized (Table 6).

Table 6. Monthly Summary of Sensors with the Most Missed Tips

Jan	Feb*	Mar*	Apr*	May	Jun	Jul	Aug	Sep	Oct*	Nov	Dec
1530	1520										
4750	4520										
1000	4470										
4110	4250										
4170	1330										
4330	700										

* - Event statistics are poor in February, March, and October due to system start-up.

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.

V. Heavy Radio Traffic Analysis

Periods exceeding 500 messages per hour were analyzed independently in an attempt to quantify data loss rates from rain sensors using the sequential tip count series.

A. The Heaviest Hourly Traffic Periods This Month

The hours of highest radio traffic this month are shown (Table 7).

Table 7. Heavy Radio Traffic Periods

Peak Traffic Periods	Reports/hour	Hour Beginning
Peak Hourly Traffic	631	2/27/2010 8:00 AM
2nd Max	580	2/27/2010 5:00 AM
3rd Max	555	2/12/2010 5:00 PM
4th Max	553	2/18/2010 3:00 PM
5th Max	525	2/27/2010 6:00 AM

Each hour exceeding 500 reports was analyzed to quantify the number of missing rain reports for that hour (Figure 1). The following plot shows the loss of data as a function of data loading.

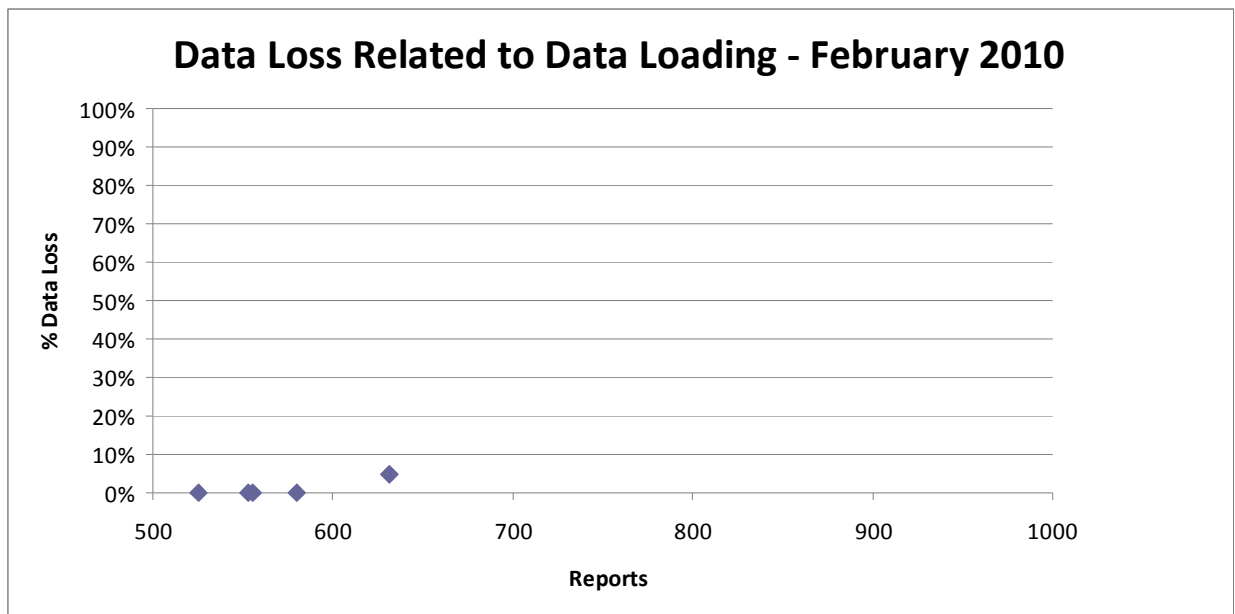


Figure 1. Data Loss vs. Data Loading

VI. 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 8).

Table 8. Summary of Unknown IDs

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	327
Total reports from unknown IDs	1,474
Unknown IDs with only a single received report (potential noise)	169
Total reports from all IDs – RecData Log entire month	262,656
Unknown reports as a fraction of total reports	0.56%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 9) are the total reports received from unknown sensor IDs for each month of the year.

Table 9. Monthly Summary of Total Reports from Unknown IDs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
2010	1,220	1,474											

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 10).

Table 10. Reports Received by Unknown IDs

Unknown IDs	Reports
1602	107
1601	106
1607	105
1608	102
1604	95
1606	94
2841	58
1423	18
1486	18
1470	16
1454	14
1926	14
1446	12
1923	12
1934	11
1954	11
2748	11
2776	11
1501	10
1502	10
1506	10
1933	10
1443	9
1953	9
207	7
429	7
1430	7
1453	7
1511	7
1528	7
1949	7
2811	7
4047	7
4646	7
1415	6
1457	6
1481	6
1531	6
1534	6
1918	6
2753	6
154	5
206	5
1930	5
2745	5
2746	5
2775	5
2808	5
4031	5
145	4
152	4
319	4
487	4
1059	4
1165	4
1433	4
1451	4
1955	4
1965	4
2716	4
2812	4

4643	4
4742	4
151	3
202	3
1007	3
1166	3
1227	3
1419	3
1424	3
1445	3
1456	3
1458	3
1478	3
1499	3
1529	3
1590	3
1653	3
1702	3
1929	3
1937	3
2364	3
2365	3
2705	3
2706	3
2708	3
2714	3
2768	3
2777	3
2784	3
2839	3
2859	3
2869	3
3018	3
4029	3
4838	3
5951	3

The “unknown” device reports are analyzed temporally to understand when they are received during the day (Table 11). The goal of this analysis is to determine a pattern of occurrence that may correspond to a source of noise in the system, such as the use of a wireless microphone nearby.

Table 11. Temporal Distribution of Unknown Reports

Hour (AM)	Reports	Hour (PM)	Reports
0:00-00:59	26	12:00-12:59	49
1:00-1:59	30	1:00-1:59	18
2:00-2:59	18	2:00-2:59	35
3:00-3:59	11	3:00-3:59	26
4:00-4:59	11	4:00-4:59	51
5:00-5:59	233	5:00-5:59	86
6:00-6:59	182	6:00-6:59	81
7:00-7:59	99	7:00-7:59	45
8:00-8:59	213	8:00-8:59	52
9:00-9:59	50	9:00-9:59	39
10:00-10:59	21	10:00-10:59	24
11:00-11:59	31	11:00-11:59	43

VII. Sensors with Invalid Reports

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

Sensor ID	Description	Dec 09 Reports	Jan 10 Reports	Feb 10 Reports				
120	West Woods	0	0	47				
220	Upper Leyden	0	5	2				
1420	Diamond Hill	6	1	2				
1460	Urban Farm	1	0	1				
1530	Bear Creek at Lowell	7	13	12				
2210	Hiwan G.C.	4	5	1				
2320	Choke Cherry Resvr	5	4	1				
4030	Red Garden	1	7	6				
4330	Indian Ruins	2	3	2				
4830	SBC at San Souci	0	4	1				

VIII. Rainfall Alarms and Intensity Analysis

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

Urban Drainage and Flood Control District
ALERT Web Server

RAINFALL RATE ALARMS

Historical alarm log: All alarm actions

TYPE and cause	ID/Tag	Name	Date	Time
Rainfall rate alarm	120	West Woods	02/28/2010	05:14:20
Rainfall rate alarm	120	West Woods	02/28/2010	05:11:31
Rainfall rate alarm	120	West Woods	02/28/2010	03:26:15
Rainfall rate alarm	120	West Woods	02/28/2010	03:22:54
Rainfall rate alarm	120	West Woods	02/28/2010	03:17:30
Rainfall rate alarm	120	West Woods	02/28/2010	03:17:30
Rainfall rate alarm	120	West Woods	02/28/2010	03:05:27

General System Analysis

P:\A207-UDFCD-Data-Analysis\2010\02-2010\Novastar_extract_2010Feb.mdb

Database Name

First Date in Database

2/1/10 12:00 AM

Total Days

28.0

Last Date in Database

2/28/10 11:59 PM

Total Hours

672.0

Total Records Analyzed

262656

Records by Group

Temperature	48710	19%
Relative Humidity	48505	18%
Wind Gust	36552	14%
Barometric Pressure	22386	9%
Wind Direction	19046	7%
Wind Speed Average	18337	7%
Wind Speed Average & Azimuth	15826	6%
Solar Radiation	8058	3%
Precipitation	6824	3%
Fuel Temperature	5231	2%
Fuel Moisture	5220	2%
Water Level PT-HSE	5127	2%
Battery Voltage HSE	4590	2%
Battery Voltage Digital	3256	1%
Battery Voltage Analog	3173	1%
Water Level Float	2884	1%
Soil Moisture	2233	1%
Repeater Status Report	2176	1%
Battery	1202	0%
Water Level PT	792	0%
Repeater Pass List	549	0%
12Hr Status Report	321	0%
Water Level	60	0%
Wing Gust	49	0%
Handar 585 ALARM Status	33	0%
Solar Power	27	0%
Battery Voltage	15	0%
Total	261182	

Records by Major Group

Meteorologic Sensors	217420	83%
Sensor Status Transmissions	14125	5%
Soil and Fuel Sensors	12684	5%
Water Level Sensors	8803	3%
Rain Sensors	6824	3%
Total	259856	

Traffic Loading Summary

Alert Reports	262656	
Average Daily Traffic	9381	
Average Hourly Traffic	391	
Median Hourly Traffic	393	hour beginning
Peak Hourly Traffic	631	2/27/10 8:00 AM
2nd Max	580	2/27/10 5:00 AM
3rd Max	555	2/12/10 5:00 PM
4th Max	553	2/18/10 3:00 PM
5th Max	525	2/27/10 6:00 AM

Rain Timer Performance

Analyze Rain Sensors

n Timer Performance

Rain ID	Description	Rcv	Average Timer Interval	Ave Exp	65% Performance
110	Ralston Reservoir	20	13:33	56.00	36%
120	West Woods	5	11:58	56.00	9%
140	Wx-Blue Mountain	52	12:15	56.00	93%
150	Nott Creek	24	12:37	56.00	43%
210	Leyden Confluence	6	11:58	56.00	11%
220	Upper Leyden	21	12:02	56.00	38%
300	Van Bibber Park	23	13:17	56.00	41%
310	Guy Hill Ranch	16	14:57	56.00	29%
320	Sports Complex	8	8:00	56.00	14%
330	Van Bibber @ Hwy 93	19	13:40	56.00	34%
400	Montview Park	4	15:57	56.00	7%
420	Expo Park	3	11:58	56.00	5%
430	Utah Park	8	5:59	56.00	14%
440	Fire Station #7	20	12:42	56.00	36%
500	Havana Park	22	12:40	56.00	39%
510	Virginia Court	24	11:57	56.00	43%
520	Jewell Detention	23	12:35	56.00	41%
530	Fire Station #19	21	11:57	56.00	38%
540	Parker/Mississippi	22	12:40	56.00	39%
600	Harvard Gulch Park	5	11:58	56.00	9%
620	Quincy/Highline	20	12:42	56.00	36%
630	Temple Pond at DTC	20	11:57	56.00	36%
700	Toll Gate @ 6th	22	1:30	56.00	39%
750	Wx-Quincy Reservoir	53	12:25	56.00	95%
760	Mission Viejo Park	21	12:40	56.00	38%
800	Sable Ditch @ 18th	23	12:35	56.00	41%
820	ETG @ Buckley	21	13:57	56.00	38%
830	Side Creek Park	25	11:57	56.00	45%
840	Fire Station 12	29	10:47	56.00	52%
900	Wx-Aurora Reservoir	51	13:01	56.00	91%
920	Wx-Aurora Town Hall	52	12:42	56.00	93%
970	Pump Sta 3	55	12:00	56.00	98%
1000	Maple Grove Resv.	34	14:51	56.00	61%
1010	Denver West	21	11:57	56.00	38%
1030	NREL/S. Table Mtn.	2	11:58	56.00	4%
1040	Lena @ U.S. Hwy 6	6	11:59	56.00	11%
1050	Jeffco Fairgrounds	19	14:21	56.00	34%
1060	Heritage Square	21	12:43	56.00	38%
1330	Roslyn	16	15:16	56.00	29%
1350	Chatfield COE	8	12:00	56.00	14%
1360	Denver Zoo	4	20:00	56.00	7%
1420	Wx-Diamond Hill	52	12:17	56.00	93%
1440	Wx-Elbert	47	13:36	56.00	84%
1460	Wx-Urban Farm	45	11:55	56.00	80%
1480	Third Creek at DIA	51	12:28	56.00	91%
1500	Powers Park	7	11:58	56.00	13%
1520	Wx-Marston Lake North	45	12:20	56.00	80%
1570	Wx-Brighton Ditch	53	12:27	56.00	95%
1600	Englewood Dam	18	12:45	56.00	32%
1620	Slaughterhouse GIch	6	11:58	56.00	11%
1640	SPR at Union Ave.	54	12:00	56.00	96%
1660	SPR at Henderson	53	12:28	56.00	95%
1700	Cherry Cr @ Champa	34	12:24	56.00	61%
1810	Sand Creek at mouth	51	13:01	56.00	91%

1920	Wx-Brighton	54	12:15	56.00	96%
2190	Wx-Squaw Mountain	51	12:57	56.00	91%
2210	Wx-Hiwan G.C.	53	12:27	56.00	95%
2320	Choke Cherry Resvr	205	0:00	224.00	92%
2330	Morrison	51	12:49	56.00	91%
2710	Wx-Highlands Ranch WTP	52	12:16	56.00	93%
2730	Wx-Salisbury Park	52	12:00	56.00	93%
2750	Wx-Castle Rock	57	11:46	56.00	102%
2810	Pine Cliff Road	17	12:00	56.00	30%
2840	Sulphur Gulch	19	11:59	56.00	34%
2850	Cherry Cr bl Bayou Glch	16	11:59	56.00	29%
2860	CC at Stroh Rd	21	11:16	56.00	38%
2870	Cottonwood (Apache)	19	11:06	56.00	34%
2900	Russelville Gulch-Douglas	58	11:08	56.00	104%
2910	East Cherry Cr-Douglas	14	13:20	56.00	25%
2920	Vest Cherry Head-Douglas Cnt	16	12:00	56.00	29%
2930	Wx-Spring Valley Rd-DougCnty	49	13:26	56.00	88%
2940	Willow Creek - DougCnty	19	12:39	56.00	34%
2960	Indian Creek	17	12:00	56.00	30%
2970	Rampart Range Rd	47	12:28	56.00	84%
2980	Dakan Rd	13	12:00	56.00	23%
2990	Wx-Tomah Rd-DougCnty	55	11:30	56.00	98%
3020	Wx-West Creek WX	51	12:52	56.00	91%
4010	Crescent	50	12:47	56.00	89%
4020	Rio Grande	49	13:38	56.00	88%
4030	Red Garden	45	13:37	56.00	80%
4040	Martin Gulch	41	13:43	56.00	73%
4050	Walker Ranch	48	13:08	56.00	86%
4060	Lakeshore	44	14:13	56.00	79%
4070	Bear Peak	49	12:13	56.00	88%
4080	Twin Sisters	48	13:06	56.00	86%
4090	Magnolia	50	13:04	56.00	89%
4100	Filter Plant	48	13:08	56.00	86%
4110	Betasso	50	12:34	56.00	89%
4130	Swiss Peaks	48	12:56	56.00	86%
4140	Logan Mill	50	12:48	56.00	89%
4150	Gold Hill	47	12:54	56.00	84%
4160	Sunshine	51	12:15	56.00	91%
4170	Pine Brook	47	13:15	56.00	84%
4180	Gold Lake	47	13:52	56.00	84%
4190	Slaughterhouse	51	12:14	56.00	91%
4200	Lazy Acres	50	11:59	56.00	89%
4220	Fling's	49	13:11	56.00	88%
4230	Golden Age	50	12:46	56.00	89%
4240	Sunset	45	14:18	56.00	80%
4250	Geer Canyon	52	11:58	56.00	93%
4260	Taylor Mountain	49	11:58	56.00	88%
4270	Cannon Mountain	48	12:49	56.00	86%
4290	Red Hill	51	12:14	56.00	91%
4300	Big Elk Park	49	12:48	56.00	88%
4310	Johnny Park	48	13:11	56.00	86%
4330	Indian Ruins	29	19:15	56.00	52%
4340	Riverside	51	11:58	56.00	91%
4350	Conifer Hill	50	12:51	56.00	89%
4360	Justice Center	46	12:42	56.00	82%
4470	Little Narrows	35	16:14	56.00	63%
4490	Apple Valley	50	12:13	56.00	89%
4510	Pinewood Springs	48	12:18	56.00	86%
4520	Eagle Ridge	47	12:52	56.00	84%

4530	Winiger Ridge	49	13:35	56.00	88%
4550	Boulder Jail	54	12:13	56.00	96%
4570	St. Antons	47	13:56	56.00	84%
4710	Wx-Ward C-1	50	11:32	56.00	89%
4730	Wx-Sugarloaf	52	12:32	56.00	93%
4750	Wx-Louisville Lake	47	13:13	56.00	84%
4770	Wx-Cal-Wood Ranch	51	12:16	56.00	91%
4790	Wx-Button Rock	47	13:26	56.00	84%
4810	Shanahan Ridge	53	12:15	56.00	95%
4820	Doudy Draw	54	12:13	56.00	96%
4830	SBC @ San Souci	48	12:36	56.00	86%
4840	SBC@S Boulder Ditch	52	12:34	56.00	93%
4850	Porphory Mtn	49	12:32	56.00	88%
4860	Fairview Peak	51	12:36	56.00	91%

Rain Event Performance		Reports Received	1,321	Analyze Rain Sensors									
	Systemwide Avg	Total Tips	1,463										
	90.29%	Data Loss	9.71%										
Rain ID	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket
120	0%	0	0	0	0	0	0	0	0	0	0	0	0.0393701
1520	47%	3	2	2	1	0	0	0	8	17	9	0	0.0393701
1360	50%	0	1	0	0	0	0	1	1	2	1	0	0.0393701
4520	58%	10	2	0	1	0	1	0	14	24	10	2	0.0393701
4470	59%	12	1	0	0	0	0	1	13	22	1	0	0.0393701
4250	60%	12	0	0	0	0	0	1	12	20	0	0	0.0393701
600	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701
1330	67%	6	1	0	1	0	0	0	8	12	4	0	0.0393701
700	70%	5	1	1	0	0	0	0	7	10	3	0	0.0393701
4230	71%	11	0	0	0	0	1	0	12	17	5	1	0.0393701
4290	71%	17	0	0	0	0	0	1	17	24	0	0	0.0393701
4330	74%	10	3	1	0	0	0	0	14	19	5	0	0.0393701
140	77%	7	3	0	0	0	0	0	10	13	3	0	0.0393701
4200	77%	16	0	0	0	0	1	0	17	22	5	0	0.0393701
4030	79%	11	4	0	0	0	0	0	15	19	4	0	0.0393701
4770	79%	13	1	0	1	0	0	0	15	19	4	0	0.0393701
2940	80%	3	1	0	0	0	0	1	4	5	1	0	0.0393701
4090	82%	15	2	1	0	0	0	0	18	22	4	0	0.0393701
4170	82%	12	1	1	0	0	0	0	14	17	3	0	0.0393701
510	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
1460	83%	9	0	1	0	0	0	0	10	12	2	0	0.0393701
2840	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
2870	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
4530	83%	12	3	0	0	0	0	0	15	18	3	0	0.0393701
4070	85%	16	0	0	1	0	0	0	17	20	3	0	0.0393701
4050	86%	11	0	1	0	0	0	0	12	14	2	0	0.0393701
4490	86%	11	0	1	0	0	0	0	12	14	2	0	0.0393701
4010	87%	11	2	0	0	0	0	0	13	15	2	0	0.0393701
530	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701
4790	88%	18	3	0	0	0	0	0	21	24	3	0	0.0393701
220	89%	7	1	0	0	0	0	0	8	9	1	1	0.0393701
4510	89%	22	1	1	0	0	0	0	24	27	3	0	0.0393701
4820	89%	15	0	1	0	0	0	0	16	18	2	0	0.0393701
2900	90%	8	1	0	0	0	0	0	9	10	1	0	0.0393701
2710	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701
4150	91%	19	0	1	0	0	0	0	20	22	2	0	0.0393701
840	92%	10	1	0	0	0	0	0	11	12	1	1	0.0393701
1050	92%	10	1	0	0	0	0	0	11	12	1	0	0.0393701
4360	92%	20	2	0	0	0	0	0	22	24	2	0	0.0393701
2810	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701
4750	92%	11	1	0	0	0	0	0	12	13	1	0	0.0393701
4110	93%	24	0	1	0	0	0	0	25	27	2	0	0.0393701
4350	93%	24	0	1	0	0	0	0	25	27	2	1	0.0393701
4060	93%	12	1	0	0	0	0	0	13	14	1	0	0.0393701
3020	93%	13	1	0	0	0	0	0	14	15	1	0	0.0393701
4340	93%	13	1	0	0	0	0	0	14	15	1	0	0.0393701
4080	94%	14	1	0	0	0	0	0	15	16	1	0	0.0393701
2980	94%	15	1	0	0	0	0	0	16	17	1	0	0.0393701
2970	95%	17	1	0	0	0	0	0	18	19	1	0	0.0393701
4830	95%	18	1	0	0	0	0	0	19	20	1	0	0.0393701
1420	95%	20	1	0	0	0	0	0	21	22	1	0	0.0393701
2990	95%	20	1	0	0	0	0	0	21	22	1	0	0.0393701
4840	96%	21	1	0	0	0	0	0	22	23	1	0	0.0393701
4040	96%	22	1	0	0	0	0	0	23	24	1	0	0.0393701
4160	96%	22	1	0	0	0	0	0	23	24	1	0	0.0393701
1000	96%	23	1	0	0	0	0	0	24	25	1	0	0.0393701
4140	96%	25	1	0	0	0	0	0	26	27	1	0	0.0393701
4310	96%	25	1	0	0	0	0	0	26	27	1	0	0.0393701
2730	100%	5	0	0	0	0	0	1	5	5	0	0	0.0393701
110	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
150	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
210	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
300	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
310	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
320	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
330	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701
400	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
420	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
430	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
440	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
500	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
520	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
540	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
620	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701

630	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
750	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
760	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
800	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
820	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
830	100%	5	0	0	0	0	0	0	5	5	0	1	0.0393701
900	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393699
1010	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701
1030	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
1040	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1060	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
1350	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1370	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1440	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1480	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1500	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
1600	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
1620	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1640	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
1660	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
1700	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
1810	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
1920	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
2320	100%	21	0	0	0	0	0	0	21	21	0	0	0.0393701
2330	100%	19	0	0	0	0	0	0	19	19	0	0	0.0393701
2750	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
2850	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
2860	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
2910	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
2920	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
2930	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
2960	100%	12	0	0	0	0	0	0	12	12	0	0	0.0393701
4020	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701
4100	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
4130	100%	20	0	0	0	0	0	0	20	20	0	0	0.0393701
4180	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4190	100%	21	0	0	0	0	0	0	21	21	0	0	0.0393701
4220	100%	12	0	0	0	0	0	0	12	12	0	0	0.0393701
4240	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
4260	100%	12	0	0	0	0	0	0	12	12	0	0	0.0393701
4270	100%	11	0	0	0	0	0	0	11	11	0	0	0.0393701
4300	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701
4550	100%	15	0	0	0	0	0	0	15	15	0	0	0.0393701
4570	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4710	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
4730	100%	12	0	0	0	0	0	0	12	12	0	0	0.0393701
4810	100%	25	0	0	0	0	0	0	25	25	0	0	0.0393701
	Total Tips	1,238	61	14	5	0	3	6	1,321	1,463	119	7	

Monthly Traffic Loading

2010 Monthly ALERT Radio Traffic Summary

