WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #66

Reporting Period: July 01 to September 30, 2018

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http://www.nstb.tc.faa.gov/

Executive Summary

Since 1999, the Wide Area Augmentation System (WAAS) Test Team at the FAA William J. Hughes Technical Center has reported GPS performance as measured against the GPS Standard Positioning Service (SPS) Signal Specification in quarterly GPS Performance Analysis Network (PAN) Reports. In addition to the GPS PAN reports, the WAAS Test Team has provided quarterly reports on WAAS performance. The current WAAS PAN Report #66 provides WAAS performance data from the July 1 through September 30, 2018 reporting period.

This report provides the following results: accuracy, availability, coverage, safety index, range accuracy, WAAS broadcast message rates, geostationary satellite ranging availability, WAAS airport availability, WAAS Code Noise and Multipath analysis, WAAS reference station survey validation, and WAAS Signal Quality Monitoring.

The following table shows observations for accuracy and availability made during the reporting period for Continental United States (CONUS) and Alaska sites (the international sites are presented in the body of this report). Localizer Performance (LP) service is available when the calculated horizontal protection level (HPL) is less than 40 meters. Localizer Performance with Vertical Guidance (LPV) service is available when the calculated HPL is less than 40 meters and the Vertical Protection Level (VPL) is less than 50 meters. Localizer Performance with Vertical Guidance to 200-foot decision height (LPV200) service is available when the calculated HPL is less than 40 meters and the VPL is less than 35 meters. The FAA's National Satellite Test Bed sites—Grand Forks, North Dakota, Atlantic City, New Jersey, and Arcata, California—are outliers due to receiver quality issues, and not because of the WAAS signal in space quality.

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.179 meters	Dallas 0.507 meters	Anchorage 0.694 meters	Kotzebue 0.532 meters
95% Vertical Accuracy (VPL <= 50 meters)	Atlantic City 1.522 meters	Billings 0.766 meters	Barrow 1.212 meters	Bethel 0.819 meters
LP Availability (HPL <= 40 meters)	All Sites 100%	All Sites 100%	All Sites 100%	All Sites 100%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	All Sites 100%	All Sites 100%	All Sites 100%	All Sites 100%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Oakland 99.6%	Multiple Sites 100%	Barrow 99.26%
99% HPL	Atlantic City 16.458 meters	Denver 11.08 meters	Cold Bay 20.76 meters	Juneau 12.762 meters
99% VPL	Oakland 32.507 meters	Billings 19.585 meters	Barrow 32.337 meters	Anchorage 22.306 meters

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1.0 INTRODUCTION

The FAA monitors the Wide Area Augmentation System (WAAS) and GPS Standard Positioning Service (SPS) performance to ensure the safe and effective use of the satellite navigation system in the National Airspace System (NAS). The WAAS augments timely integrity monitoring and improves GPS position accuracy and availability within the WAAS coverage area.

The objectives of this report are:

1. To evaluate and monitor the WAAS ability to augment GPS by characterizing important performance parameters.
2. To analyze the effects of GPS satellite operation and maintenance as well as ionospheric activity on WAAS performance.
3. To investigate GPS and WAAS anomalies and determine potential user impact.
4. To archive GPS and WAAS performance for future evaluations.

The evaluation uses the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN) 131 (SM9), PRN135 (CRW), and PRN138 (CRE). SM9, CRE, and CRW GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service.

In this report, the terms "PA" and "NPA" are used in reference of the two modes of user equipment operation. These terms were used in the original WAAS specification, FAA-E-2892. See Table 1-1 for a mapping of PA and NPA to the user service levels.

Table 1-1 WAAS Service Levels

User Service	NPA or PA	WAAS Protection Levels
RNP 0.3	NPA	HPL <= 0.3 nmi
RNP 0.1	NPA	HPL <= 0.1 nmi
LNAV	NPA	HPL <= 556 m
LNAV/VNAV	PA	HPL <= 556 m VPL <= 50 m
LP	PA	HPL <= 40 m
LPV	PA	HPL <= 40 m VPL <= 50 m
LPV200	PA	HPL <= 40 m VPL <= 35 m

The receivers in PA mode are required to: (1) use all WAAS corrections, (2) use only corrected satellites, (3) never mix corrections from multiple GEOs, (4) exclusively use the designated Space Based Augmentation System (SBAS) for the published approach procedure, and (5) never use ranging from a GPS or GEO satellite with a User Differential Range Error (UDRE) status of greater than 15 meters. The receivers in NPA mode are allowed to: (1) mix corrected and uncorrected satellites, (2) mix corrections from different GEOs or SBASs, (3) use either the WAAS ionosphere corrections or the GPS Klobuchar model for ionosphere corrections, and (4) use ranging from a GPS or GEO satellite with a UDRE status of greater than 15 meters. The receivers in NPA mode can also operate using Fault Detection/Fault Detection Exclusion (FD/FDE) in the absence of an SBAS. The data presented in this report does not take credit for the additional NPA mode availability and continuity through use of either full or partial FD/FDE, which allowed the mixing of corrected and uncorrected satellites. To remain conservative, the NPA accuracy data presented in this report uses Klobuchar ionosphere corrections.

The results in this report are based on the application of the WAAS corrections to receiver data from the WAAS network and the FAA's National Satellite Test Bed (NSTB) network, and from analyses based on the WAAS-broadcasted correction data. Table 1-2 lists the receivers used in the PA analyses, and Table 1-3 lists the receivers used in the NPA analyses.

Table 1-2 PA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	71	6116134
Atlantic City	88	7613059
Oklahoma City	67	5767913
WAAS:		
Albuquerque	92	7930754
Anchorage	92	7944316
Atlanta	92	7947233
Barrow	87	7506356
Bethel	92	7947997
Billings	92	7947606
Boston	92	7947914
Chicago	92	7946727
Cleveland	91	7889350
Cold Bay	92	7948042
Dallas	92	7943155
Denver	92	7942471
Fairbanks	92	7943062
Gander	92	7944837
Goose Bay	92	7946708
Houston	92	7914037
Iqaluit	91	7841183
Jacksonville	92	7947737
Juneau	92	7945065
Kansas City	92	7940881
Kotzebue	92	7944118
Los Angeles	92	7945693
Memphis	92	7945969
Merida	92	7941124
Mexico City	90	7758505
Miami	92	7943731
Minneapolis	92	7947702
New York	92	7947532
Oakland	92	7943920
Puerto Vallarta	92	7936453
Salt Lake City	92	7944594
San Jose Del Cabo	90	7789386
Seattle	92	7944259
Washington DC	92	7944776
Winnipeg	92	7947530

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7933307
Anchorage	92	7929897
Atlanta	92	7925650
Barrow	87	7543758
Bethel	92	7933233
Billings	92	7933007
Boston	92	7928197
Cleveland	92	7933311
Cold Bay	92	7933283
Fairbanks	92	7931750
Gander	92	7933236
Honolulu	92	7928928
Houston	92	7933310
Iqaluit	91	7878781
Juneau	92	7933159
Kansas City	92	7933309
Kotzebue	92	7931315
Los Angeles	92	7933307
Merida	91	7888354
Miami	92	7933312
Minneapolis	92	7929229
Oakland	92	7933313
Salt Lake City	92	7933297
San Jose Del Cabo	91	7852346
San Juan	91	7897596
Seattle	92	7933304
Tapachula	90	7749559
Washington DC	92	7929861

The report is divided by the performance category:

1. WAAS Position Accuracy
2. WAAS Operational Service Availability
3. WAAS Coverage
4. WAAS Integrity
5. WAAS Range Domain Accuracy
6. WAAS GEO Ranging Performance
7. WAAS Airport Availability
8. WAAS Code Noise and Multipath (CNMP) Analysis
9. WAAS Antenna Survey Validation
10. WAAS Signal Quality Monitor (SQM) Analysis

Table 1-4 lists the evaluated WAAS performance parameters for this report. Note that these are the performance parameters associated with the WAAS system, and that these requirements are extracted from FAA Specifications FAA-E-2892C and FAA-E-2976, as applicable.

Table 1-4 WAAS Performance Parameters

Performance Parameter	Expected WAAS Performance
LPV Accuracy Horizontal	≤ 1.5m error 95% of the time
LPV Accuracy Vertical	≤ 2m error 95% of the time
LNAV Accuracy Horizontal	≤ 36m error 95% of the time
Availability LPV CONUS	99% availability of 100% of CONUS
Availability LPV Alaska	95% availability of 75% of Alaska
Availability LNAV CONUS	99.99% availability with HPL < 556m
Availability LNAV Alaska	99.9% availability with HPL < 556m
Availability En Route OCONUS	99.9% availability with HPL < 2nmi
Probability of Hazardous Misleading Information	<10e-7 per approach

1.1 Event Summary

Table 1-5 lists events that affected WAAS performance or the ability to determine the WAAS performance during the reporting period. The events include GPS or WAAS anomalies, relevant receiver malfunctions, receiver maintenance, and ionospheric activity. The reporting of ionospheric activity includes reference to the planetary index (Kp) for the event time period. The Kp index quantifies the disturbance in the Earth's magnetic field and is an indicator of solar storms causing geomagnetic disturbances resulting in an unpredictable ionosphere. The detection of an ionospheric disturbance causes the WAAS to increase Grid Ionospheric Vertical Error (GIVE) values, making PA service unavailable.

Analyses of events that merit more detailed investigations are documented in the Discrepancy Reports (DRs). The DRs are available at http://www.nstb.tc.faa.gov under “WAAS Technical Reports” and also accessible via hyperlink in Table 1-5. Note that “TOW” is the time of GPS week, which is the cumulative number of seconds beginning 00:00:00 Sunday (GMT without leap seconds). Table 1-6 lists events related to WAAS upgrades during this reporting period, and Table 1-7 lists events related to ground uplink station (GUS) switchovers, which are transitions from one GEO uplink site to another GEO uplink site.

Table 1-5 Events

Start Date	End Date	Location Satellite	Service Affected	Event Description
7/6/2018	7/10/2018	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3)	LPV200_Alaska	The BRW reference station went offline from 02:33:00 GMT on 7/6 to 23:19:00 GMT on 7/10 to repair the HVAC system. The lack of observations from this WRS caused moderate degradation of LPV200 service coverage in Alaska from approximately 23:30:00 GMT to 23:50:00 GMT each day. Please see plots for coverage and duration of event: Cov_vs_Time_Alaska_7/8/2018 LPV200_7/9/2018

Start Date	End Date	Location Satellite	Service Affected	Event Description
7/7/2018	7/10/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	From 7/7 to 7/10, IGPs at Latitude 70 and Longitudes -70 to -50 were set to Not-Monitored from 15:30:00 GMT to 16:45:00 GMT. The WAAS performance monitor reported at the time IGPs were set to Not-Monitored state that the Iqaluit WRS experienced subframe reasonability warnings and YFB PID Down faults which removed Iqaluit WRS from the WAAS correction processing. The elevated GIVE values caused moderate degradation of LPV200 service coverage in Canada from 16:12:00 GMT to 16:40:00 GMT. The elevated GIVE values also caused minor degradation of LPV service coverage in Canada from 15:30:00 GMT to 16:45:00 GMT. See DR 133. Please see plots for coverage and duration of event: LPV200_7/7/2018
7/7/2018	7/8/2018	GEO135,Littleton (APA)	LPV200_CONUS	The uplink for the CRW GEO, PRN135 switched from the Littleton uplink site to the Napa uplink site at 16:58:06 GMT. This caused an 11-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. The elevated UDRE for GEO 135 caused moderate degradation of LPV200 service coverage in CONUS from 18:56:00 GMT to 19:12:00 GMT on 7/7. TOW 579503-579515. Please see plots for coverage and duration of event: LPV200_7/7/2018 Cov_vs_Time_Conus_7/7/2018
7/16/2018	7/23/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	From 7/16 to 7/23, IGPs at Latitude 70 and Longitudes -70 to -50 were set to Not-Monitored between 03:30:00 GMT and 04:30:00 GMT and between 15:30:00 GMT to 16:45:00 GMT. The WAAS performance monitor reported at the time IGPs were set to Not-Monitored state that the Iqaluit WRS experienced subframe reasonability warnings and YFB PID Down faults which removed Iqaluit WRS from the WAAS correction processing. The elevated GIVE values caused moderate degradation of LPV200 service coverage in Canada from 15:33:00 GMT to 16:02:00 GMT. The elevated GIVE values also caused minor degradation of LPV service coverage in Canada from 03:30:00 GMT to 04:30:00 GMT and from 15:30:00 GMT to 16:45:00 GMT. See DR 133 Please see plots for coverage and duration of event: LPV200_7/16/2018

Start Date	End Date	Location Satellite	Service Affected	Event Description
7/28/2018	7/28/2018	PRN21	LPV200_Alaska, LPV200_Canada	There was an SV Alert on PRN21 to not monitored at 11:24:00 GMT and again at 23:13:00 GMT. This elevated the UDREs on PRN21. The elevated UDREs caused minor degradation of LPV200 service coverage in Canada and Alaska at 23:14:00 GMT. Please see plots for coverage and duration of event: LPV200_7/28/2018.
7/29/2018	7/29/2018	PRN21	LPV200_CONUS	There was an SV Alert on PRN21 to not monitored at 21:30:00 GMT. This elevated the UDREs on PRN21. The elevated UDREs caused moderate degradation of LPV200 service coverage in CONUS from 21:31:00 GMT to 21:39:00 GMT. Please see plots for coverage and duration of event: LPV200_7/29/2018.
7/30/2018	7/31/2018	Merida (MMD1), Merida (MMD2), Merida (MMD3), Mexico City (MMX1), Mexico City (MMX2), Mexico City (MMX3), Puerto Vallarta (MPR1), Puerto Vallarta (MPR2), Puerto Vallarta (MPR3), San Jose Del Cabo (MSD1	LPV200_CONUS	A number of Mexico sites experienced frequent data outages from 07/30 to 07/31. The lack of observations caused IGP GIVEs to be elevated in the region. The elevated GIVE values caused moderate degradation of LPV200 service coverage in CONUS (AZ, NM, CO, CA) from 20:15:00 GMT to 20:44:00 GMT. Please see plots for coverage and duration of event: LPV200_7/30/2018.
7/31/2018	7/31/2018	GEO131,Santa_Paula (SZ1)	LPV200_Alaska	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site at 03:11:26 GMT. This caused a 7-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. The elevated UDRE for GEO 131 caused minor degradation of LPV200 service coverage in Alaska from 22:04:00 GMT to 22:18:00 GMT on 7/31 and from 21:59:00 GMT to 22:07:00 GMT on 8/1. TOW 184286-184294.
8/2/2018	8/2/2018	PRN21	LPV200_Canada	There was an SV Alert on PRN21 to not monitored at 22:50:30 GMT. This elevated the UDREs on PRN21. The elevated UDREs caused minor degradation of LPV200 service coverage in Canada at the time of the alert. This also caused degradation of LPV200 service coverage in CONUS (Montana). Please see plots for coverage and duration of event: LPV200_8/2/2018.
8/12/2018	8/12/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada	Geomagnetic activity (Kp = 2) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada 09:52:00 GMT to 09:57:00 and from 15:38:00 GMT to 16:02:00 GMT.

Start Date	End Date	Location Satellite	Service Affected	Event Description
8/16/2018	8/16/2018	PRN12	LPV200_CONUS	The reduction in LPV200 service CONUS was due to a GPS NANU on PRN12 (see NANU2018032) which was unusable from 17:21:00 GMT to 23:06:00 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 18:58:00 GMT to 19:29:00 GMT (CA) and from 20:50:00 GMT to 21:00:00 GMT (FL). Please see plots for coverage and duration of event: LPV200_8/16/2018.
8/17/2018	8/17/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in CONUS (So. California) from 18:21:00 GMT to 19:25:00 GMT.
8/19/2018	8/19/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	On 8/19 and 8/20 IGPs at Latitude 70 and Longitudes -70 to -50 were set to Not-Monitored between 16:15:00 GMT to 16:55:00 GMT. The WAAS performance monitor reported at the time IGPs were set to Not-Monitored state that the Iqaluit WRS experienced subframe reasonability warnings and YFB PID Down faults which removed Iqaluit WRS from the WAAS correction processing. The elevated GIVE values caused moderate degradation of LPV200 service coverage in Canada from 16:15:00 GMT to 16:55:00 GMT. See DR 133. Please see plots for coverage and duration of event: LPV200_8/19/2018.
8/24/2018	8/25/2018	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	The YFB reference station went offline from 08:34:00 GMT on 8/24 to 09:32:00 GMT on 8/25. The lack of observations from the Iqaluit WRS caused severe degradation of LPV200 service coverage in Canada from 00:00:00 GMT to 01:56:00 GMT, 04:10:00 GMT to 05:13:00 GMT, 06:04:00 GMT to 06:16:00 GMT, and from 06:58:00 GMT to 09:40:00 GMT on 8/25. This also caused moderate degradation of LPV service coverage in Canada from 01:19:00 GMT to 01:32:00 GMT, 07:25:00 GMT to 07:51:00 GMT, and from 08:18:00 GMT to 09:06:00 GMT. Please see plots for coverage and duration of event: LPV_8/25/2018 LPV200_8/25/2018
9/2/2018	9/2/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp = 2) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada from 07:25:00 GMT to 07:32:00 GMT.

Start Date	End Date	Location Satellite	Service Affected	Event Description
9/6/2018	9/6/2018	PRN2	LPV_CONUS, LPV200_CONUS, LPV200_Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN2 (see NANU2018037) which was unusable from 15:21:00 GMT to 21:26:00 GMT. The NANU caused moderate degradation of (1) LPV200 service coverage in CONUS from 17:30:00 GMT to 18:30:00 GMT and from 18:43:00 GMT to 19:32:00 GMT; and (2) LPV200 service coverage in Canada from 16:52:00 GMT to 18:20:00 GMT and from 20:10:00 GMT to 21:00:00 GMT. The NANU also caused minor degradation of LPV service coverage in CONUS from 18:56:00 GMT to 19:15:00 GMT. Please see plots for coverage and duration of event: LPV200_9/6/2018 Cov_vs_Time_Conus_9/6/2018.
9/7/2018	9/7/2018	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV200_Canada	The YFB reference station went offline at 22:45:00 GMT. This caused a 360-second outage of the Iqaluit reference station. The lack of observations from the Iqaluit WRS elevated IGP GIVEs and caused minor degradation of LPV200 service coverage in Canada from 22:49:00 GMT to 22:54:00 GMT.
9/11/2018	9/11/2018	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada from 19:32:00 GMT to 20:40:00 GMT.
9/12/2018	9/12/2018	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV200_Canada	The Iqaluit WRS had data outages from 01:47:00 to 01:56:00 and from 02:05:00 GMT to 02:13:00 GMT. The lack of observations caused moderate degradation of LPV200 service coverage in Canada from 01:54:00 GMT to 02:13:00 GMT.
9/14/2018	9/14/2018	Southbury (DX1), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Southbury had a C&V selected source change from Los Angeles to Atlanta. Following the switch to the upgraded Atlanta C&V, GIVE values decreased on the 131 GEO Stream. The increased GIVE values improved LPV200 service coverage in Canada and CONUS (So. California). TOW 435624 – 435624.

Table 1-6 WAAS Upgrades

Start Date	End Date	Location/Satellite	Event Description
07/02/2018	07/02/2018	NAPA (APC)	SSM-49: This system support modification (SSM) upgrades the software at the Napa legacy GUS to Build W7.222L.
07/03/2018	07/03/2018	Woodbine (QWE)	SSM-49: This system support modification (SSM) upgrades the software at the Woodbine legacy GUS to Build W7.222L.
09/11/2018	09/11/2018	Atlanta (CnV)	SSM-50: This system support modification (SSM) supports the cutover to CY18. The Atlanta (ZTL) C&V was upgraded to CY18 Executive Build W7.235L.
09/12/2018	09/12/2018	Washington D.C. (CnV)	SSM-50: This system support modification (SSM) supports the cutover to CY18. The Washington D.C. (ZDC) C&V was upgraded to CY18 Executive Build W7.235L.

Start Date	End Date	Location/Satellite	Event Description
09/14/2018	09/14/2018	Los Angeles (CnV)	SSM-50: This system support modification (SSM) supports the cutover to CY18. The Los Angeles (ZLA) C&V was upgraded to CY18 Executive Build W7.235L.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/02/2018	07/02/2018	Manual	GEO135 Napa (APC)	None	The uplink for the CRW GEO PRN135 switched from the Napa uplink site to the Littleton uplink site at 07:20:18 GMT. This caused a 4-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no effect on coverage. TOW 112835-112840.
07/03/2018	07/03/2018	Manual	GEO138 Woodbine (QWE)	None	The uplink for the CRE GEO PRN138 switched from the Woodbine uplink site to the Brewster-B uplink site at 07:07:09 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 198446-198451.
07/07/2018	07/08/2018	Faulted	GEO135 Littleton (APA)	LPV200_CONUS	The uplink for the CRW GEO PRN135 switched from the Littleton uplink site to the Napa uplink site at 16:58:06 GMT. This caused an 11-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. The elevated UDRE for GEO 135 caused moderate degradation of LPV200 service coverage in CONUS from 18:56:00 GMT to 19:12:00 GMT on 7/7. TOW 579503-579515.

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/20/2018	07/20/2018	Faulted	GEO131 Southbury (DX1)	None	The uplink for the SM9 GEO PRN131 switched from the Southbury uplink site to the Santa Paula uplink site at 07:01:51 GMT. This caused an 18-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no effect on coverage. TOW 457328-457347.
07/31/2018	07/31/2018	Manual	GEO131 Santa_Paula (SZ1)	LPV200_Alaska	The uplink for the SM9 GEO PRN131 switched from the Santa Paula uplink site to the Southbury uplink site at 03:11:26 GMT. This caused a 7-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. The elevated UDRE for GEO 131 caused minor degradation of LPV200 service coverage in Alaska from 22:04:00 GMT to 22:18:00 GMT on 7/31 and from 21:59:00 GMT to 22:07:00 GMT on 8/1. TOW 184286-184294.
08/14/2018	08/14/2018	Faulted	GEO138 Brewster-B (BRE-B)	None	The uplink for the CRE GEO PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 22:50:01 GMT. This caused a 16-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 255001-255018.
08/29/2018	08/29/2018	Missed Navigation Message	GEO131 Southbury (DX1) Atlanta (CnV)	None	Southbury had CnV Source Select from Atlanta to Los Angeles. TOW 283702-283704.
09/25/2018	09/25/2018	Manual	GEO138 Brewster-B (BRE-B)		GEO 138 manual switchover from Brewster-B to Woodbine. TOW 223231-223236 manual switchover from Brewster-B to Woodbine. TOW 223231-223236.
09/25/2018	09/25/2018	Manual	GEO138 Woodbine (QWE)		GEO 138 manual switchover from Woodbine to Brewster-B. TOW 198194-198199.

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
09/25/2018	09/25/2018	Manual	GEO135 Napa (APC)		GEO 135 manual switchover from Napa to Littleton. TOW 195912-195917.
09/26/2018	09/26/2018	Manual	GEO138 Woodbine (QWE)		GEO 138 manual switchover from Woodbine to Brewster-B. TOW 266472-266477.
07/02/2018	07/02/2018	Manual	GEO135 Napa (APC)		GEO 135 manual switchover from Napa to Littleton. TOW 112835-112840.
09/24/2018	09/24/2018	Manual	GEO131 Santa_Paula (SZ1)		GEO 131 manual switchover from Santa_Paula to Southbury. TOW 112670-112678.
09/14/2018	09/14/2018	Manual	GEO131 Southbury (DX1)		GEO 131 manual switchover from Southbury to Santa_Paula. TOW 460873-460881.

1.2 Report Overview

Section 2.0 provides the observed Localizer Performance with Vertical Guidance (LPV) and NPA performance for the evaluated receiver locations (see Table 1-2 and Table 1-3). This section also shows tabulated data for the 95% accuracy and the maximum inaccuracy. In addition, the daily 95% accuracy for each receiver and the histograms of vertical and horizontal error are shown.

Section 3.0 provides the summary of the WAAS instantaneous availability performance at each receiver for three operational service levels. In addition, the daily availability, number of outages, and outage rate for each evaluated receiver are also reported.

Section 4.0 provides geographic plots of the WAAS service availability. Also shown in this section are plots of the percentage of the Continental United States (CONUS) and Alaska service areas covered by various levels of service availability.

Section 5.0 provides the summary of the Hazardous Misleading Information (HMI) analysis as well as a safety margin index for each receiver. This section also shows update rates of WAAS messages transmitted from SM9, CRW, and CRE.

Section 6.0 provides the UDRE and GIVE bounding percentages and the 95% index of the range and ionospheric accuracy for each satellite tracked by the WAAS receiver at 12 locations.

Section 7.0 provides the GEO ranging performance for CRE and CRW.

Section 8.0 provides the WAAS LPV availability and outages at selected airports.

Section 9.0 provides the assessment of WAAS CNMP bounding for 114 WAAS receivers.

Section 10.0 provides surveyed positions of all Wide-Area Reference Equipment (WRE) and the difference between the WRE survey positions and the survey positions using both the National Geodetic Survey (NGS) Online Positioning Use Server (OPUS) and the Canadian Spatial Reference System (CSRS) Precise Point Positioning (PPP) service.

Section 11.0 provides the daily and quarterly average of SQM PRN type biases and PRN biases.

2.0 WAAS POSITION ACCURACY

Navigation error data, collected from WAAS and NSTB reference stations, was processed to determine position accuracy at each location. This was accomplished by using the GPS/WAAS position solution tool to compute a RTCA

DO-229D-weighted least squares user navigation solution and WAAS horizontal protection level (HPL) and vertical protection level (VPL) once every second. The user position calculated for each receiver was compared to the surveyed position of the antenna to assess position error associated with the WAAS signal in space (SIS) over time. The position errors were analyzed and statistics were generated for the operational service levels shown in Table 1-1.

Table 2-1 shows PA horizontal and vertical position accuracy maintained for 95% of the time at LP, LPV and lateral navigation (LNAV)/vertical navigation (VNAV) operational service levels as well as 95% SPS accuracy for certain locations. Note that WAAS accuracy statistics presented are compiled only when all WAAS corrections (i.e., fast, long term, and ionospheric corrections) for at least four satellites are available; this is referred to as PA navigation mode. Table 2-1 also shows the percentage of time PA navigation mode was supported by WAAS at each receiver. The maximum and minimum LPV errors for this reporting period are:

- The maximum 95% CONUS horizontal LPV error was 1.179 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.522 meters observed at Atlantic City.
- The minimum 95% CONUS horizontal LPV errors was 0.507 meters observed at Dallas.
- The minimum 95% CONUS vertical LPV error was 0.766 meters observed at Billings.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40) (Meters)	Horizontal (HAL=556m) (Meters)	Vertical (VAL=50m) (Meters)	Percentage in PA mode (%)	SPS Accuracy	
					95% Horizontal (Meters)	95% Vertical (Meters)
Arcata	1.179	1.179	1.390	100	*	*
Atlantic City	1.094	1.094	1.522	100	*	*
Oklahoma City	0.642	0.642	0.923	100	*	*
Albuquerque	0.593	0.593	0.851	100	1.411	3.747
Anchorage	0.694	0.694	1.177	100	*	*
Atlanta	0.662	0.662	0.972	100	1.453	3.564
Barrow	0.567	0.567	1.212	100	*	*
Bethel	0.574	0.574	0.819	100	1.361	3.505
Billings	0.591	0.591	0.766	100	1.481	3.380
Boston	0.754	0.754	1.321	100	1.599	3.343
Chicago	0.751	0.751	0.933	100	*	*
Cleveland	0.648	0.648	1.033	100	1.612	3.661
Cold Bay	0.624	0.624	0.855	100	*	*
Dallas	0.507	0.507	1.074	100	*	*
Denver	0.534	0.534	0.839	100	*	*
Fairbanks	0.618	0.618	1.110	100	1.415	3.420
Gander	0.919	0.919	1.297	100	*	*
Goose Bay	0.723	0.723	0.960	100	*	*
Houston	0.550	0.550	1.116	100	*	*
Iqaluit	0.805	0.806	1.134	100	*	*
Jacksonville	0.642	0.642	0.846	100	*	*
Juneau	0.611	0.611	1.094	100	*	*
Kansas City	0.686	0.686	1.085	100	1.494	3.560
Kotzebue	0.532	0.532	1.136	100	1.523	3.626
Los Angeles	0.762	0.762	1.340	100	1.591	4.240
Memphis	0.574	0.574	1.033	100	*	*
Merida	0.578	0.578	1.083	100	*	*
Mexico City	0.556	0.556	1.322	100	*	*
Miami	0.669	0.669	1.048	100	1.729	3.636
Minneapolis	0.695	0.695	1.025	100	1.509	3.528
New York	0.616	0.616	1.045	100	*	*
Oakland	0.635	0.635	1.496	100	1.661	4.533
Puerto Vallarta	0.610	0.610	1.065	100	*	*
Salt Lake City	0.577	0.577	0.778	100	1.451	3.732
San Jose Del Cabo	0.585	0.585	1.110	100	*	*
Seattle	0.566	0.566	0.774	100	1.461	3.615
Washington DC	0.754	0.754	1.176	100	1.553	3.405
Winnipeg	0.525	0.525	0.952	100	*	*

* SPS data not available

NPA navigation mode is when only WAAS fast and long term corrections are available to a user (i.e., no ionospheric corrections). Table 2-2 shows the 95%, 99.999%, and maximum NPA horizontal position accuracy. The maximum and minimum NPA errors for this reporting period are as below:

- The maximum 95% horizontal error was 2.696 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 6.345 meters observed at Merida.
- The minimum 95% horizontal error was 0.803 meters observed at Iqaluit.
- The minimum 99.999% horizontal error was 1.729 meters observed at Albuquerque.

Table 2-2 NPA 95% and 99.999% Horizontal Accuracy

Location	95% Horizontal (Meters)	99.999% Horizontal (Meters)	Percentage in NPA Mode (%)	Maximum Horizontal Error (Meters)
Albuquerque	0.864	1.729	100	1.934
Anchorage	1.090	2.083	100	2.415
Atlanta	0.969	1.862	100	2.037
Barrow	0.810	1.810	100	3.530
Bethel	1.063	2.381	100	2.797
Billings	1.190	2.292	100	2.512
Boston	1.128	2.566	100	2.974
Cleveland	0.987	2.846	100	3.468
Cold Bay	1.084	1.878	100	2.061
Fairbanks	0.989	2.204	100	2.568
Gander	1.159	3.447	100	4.194
Honolulu	2.696	5.535	100	5.871
Houston	1.227	4.266	100	4.455
Iqaluit	0.803	1.926	100	2.729
Juneau	0.937	2.583	100	3.194
Kansas City	1.400	2.613	100	2.951
Kotzebue	0.920	2.118	100	2.396
Los Angeles	1.263	1.983	100	2.169
Merida	1.482	6.345	100	6.601
Miami	1.274	4.797	100	5.046
Minneapolis	1.273	3.310	100	3.649
Oakland	1.249	2.072	100	2.669
Salt Lake City	1.092	1.935	100	2.141
San Jose Del Cabo	1.477	4.178	100	4.414
San Juan	1.172	3.026	100	3.918
Seattle	1.074	2.020	100	2.274
Tapachula	1.987	6.291	100	6.514
Washington DC	1.168	2.685	100	2.926

Table 2-3 shows the quarterly maximum LPV error statistics: (1) the column Horizontal Error column shows the maximum position errors while the calculated HPL meets the LPV service level defined in Table 1-1, (2) the Vertical Error column shows the maximum position errors while the calculated VPL meets the LPV service level, (3) the Horizontal Error/HPL column and the Vertical Error/VPL column show the ratio of position error to protection level at the time the maximum error occurred, (4) the Horizontal Maximum Ratio column and the Vertical Maximum Ratio column show the maximum position error to protection level ratio for the quarter. During this reporting period, the maximum LPV horizontal error was 3.015 meters occurred at Juneau and maximum vertical LPV error was 7.537 meters occurred at Anchorage.

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/HPL Ratio	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL Ratio	Vertical Maximum Ratio
Arcata	2.507	0.192	0.207	3.377	0.140	0.167
Atlantic City-a	2.269	0.133	0.192	3.736	0.196	0.205
Grand Forks	0.000		0.000	0.000		0.000
Oklahoma City	1.438	0.100	0.154	2.377	0.102	0.138
Albuquerque	1.743	0.104	0.137	3.765	0.080	0.123
Anchorage	1.836	0.172	0.173	7.537	0.266	0.266
Atlanta	1.467	0.134	0.142	2.718	0.103	0.141
Barrow	2.346	0.149	0.149	4.867	0.135	0.161
Bethel	2.763	0.163	0.195	5.906	0.187	0.219
Billings	1.636	0.174	0.174	1.981	0.127	0.131
Boston	1.472	0.107	0.139	2.700	0.156	0.156
Chicago	1.485	0.096	0.155	2.611	0.133	0.146
Cleveland	1.558	0.093	0.148	2.663	0.187	0.187
Cold Bay	1.919	0.071	0.134	2.663	0.124	0.124
Dallas	1.244	0.130	0.130	3.107	0.134	0.180
Denver	1.252	0.120	0.139	2.368	0.130	0.134
Fairbanks	2.755	0.242	0.242	4.782	0.185	0.253
Gander	2.769	0.104	0.136	2.948	0.139	0.139
Goose Bay	2.215	0.166	0.173	3.106	0.140	0.141
Houston	1.271	0.074	0.148	3.210	0.127	0.183
Iqaluit	2.732	0.150	0.197	4.290	0.149	0.163
Jacksonville	1.538	0.131	0.137	2.473	0.092	0.126
Juneau	3.015	0.283	0.283	3.927	0.183	0.199
Kansas City	2.310	0.149	0.153	3.955	0.167	0.209
Kotzebue	2.172	0.135	0.163	5.665	0.165	0.202
Los Angeles	1.521	0.137	0.137	2.795	0.141	0.158
Memphis	2.106	0.137	0.137	4.277	0.156	0.159
Merida	1.665	0.065	0.131	3.871	0.078	0.122
Mexico City	1.787	0.054	0.113	2.999	0.060	0.113
Miami	1.585	0.115	0.136	2.865	0.069	0.125
Minneapolis	1.644	0.183	0.183	2.807	0.140	0.173
New York	1.401	0.120	0.144	2.237	0.119	0.146
Oakland	1.580	0.055	0.135	2.902	0.141	0.158
Puerto Vallarta	2.131	0.066	0.100	2.585	0.084	0.113
Salt Lake City	1.542	0.103	0.146	2.024	0.106	0.138
San Jose Del Cabo	2.470	0.077	0.128	3.294	0.102	0.125
Seattle	1.398	0.130	0.131	2.096	0.111	0.131
Washington DC	1.602	0.160	0.160	2.642	0.137	0.155
Winnipeg	2.160	0.207	0.214	4.118	0.228	0.228

Figure 2-1 through Figure 2-3 show the daily LPV 95% horizontal accuracy at the PA evaluation sites, and Figure 2-4 through Figure 2-6 show the daily LPV 95% vertical accuracy. Noteworthy increases in the 95% PA position errors over multiple evaluation sites due to geomagnetic activity in Figure 2-1 through Figure 2-6 are listed below.

- August 26, 2018—Position errors in CONUS, Alaska, and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 1.206 meters and 1.819 meters at Goose Bay and Kotzebue, respectively. The Kp index was 7.
- September 10-11, 2018—Position errors in CONUS, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.306 meters and 1.720 meters at Gander and Atlantic City. The Kp index range was 5 and 6, respectively

Figure 2-1 LPV 95% Horizontal Accuracy

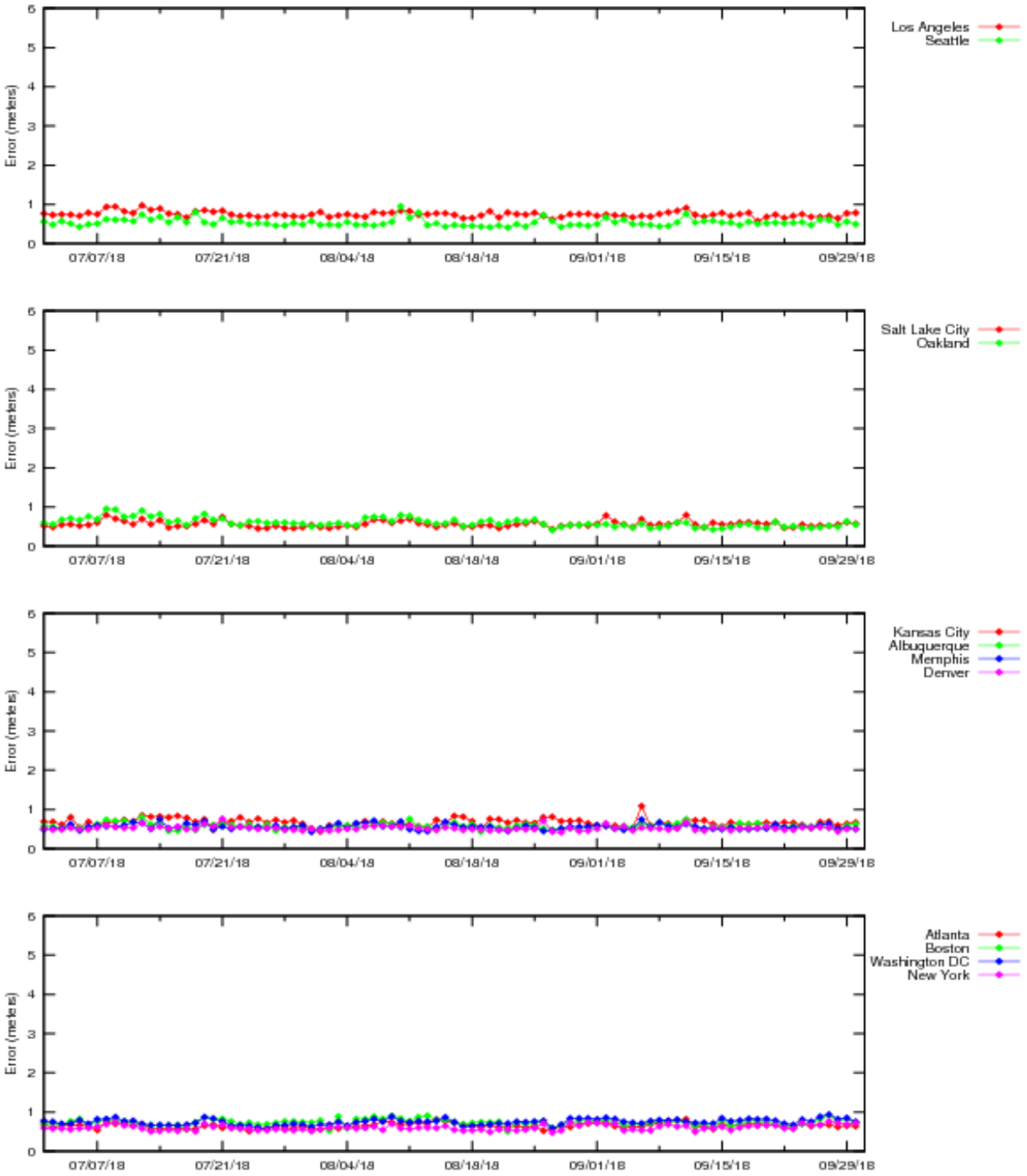


Figure 2-2 LPV 95% Horizontal Accuracy

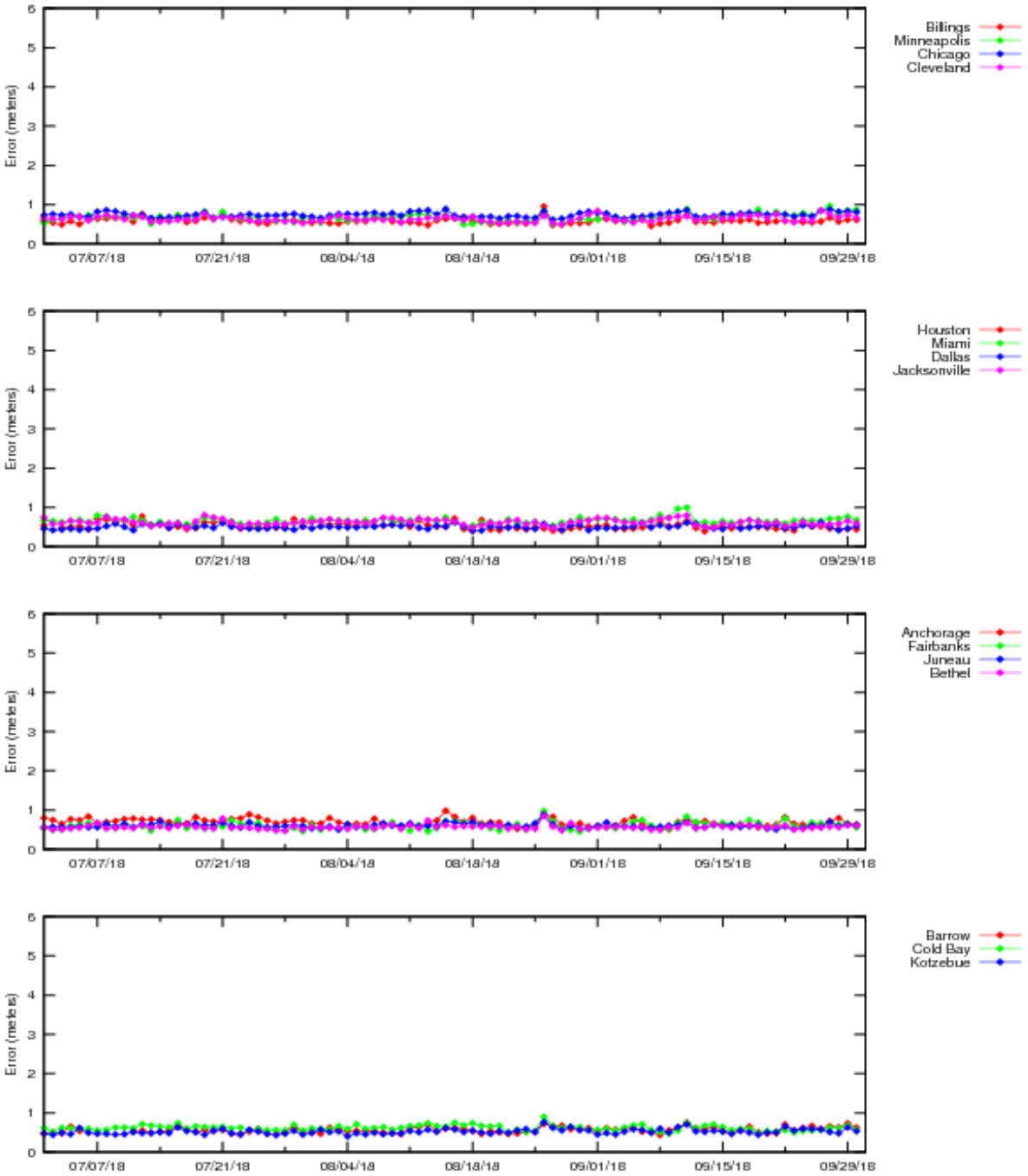


Figure 2-3 LPV 95% Horizontal Accuracy

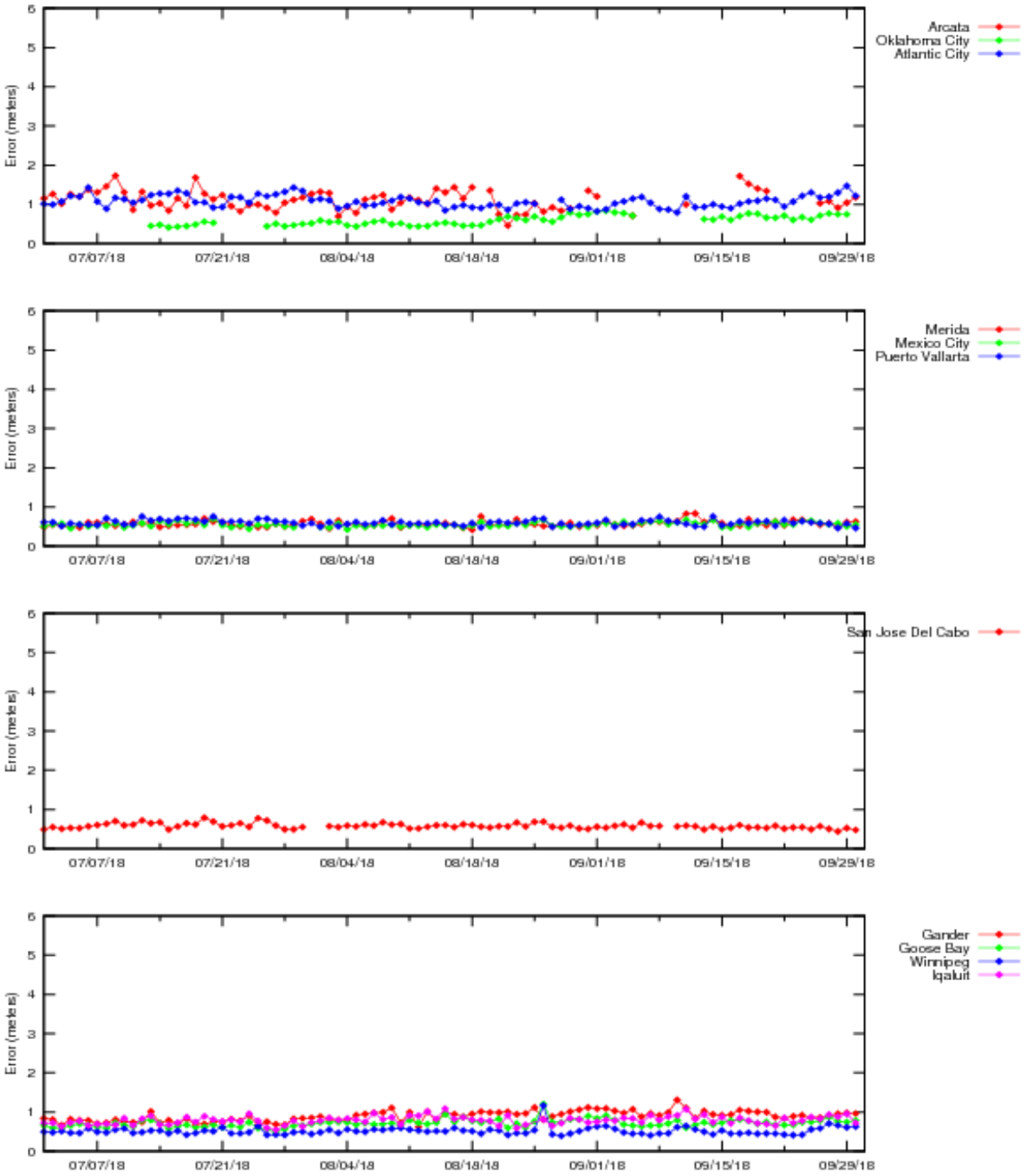


Figure 2-4 LPV 95% Vertical Accuracy

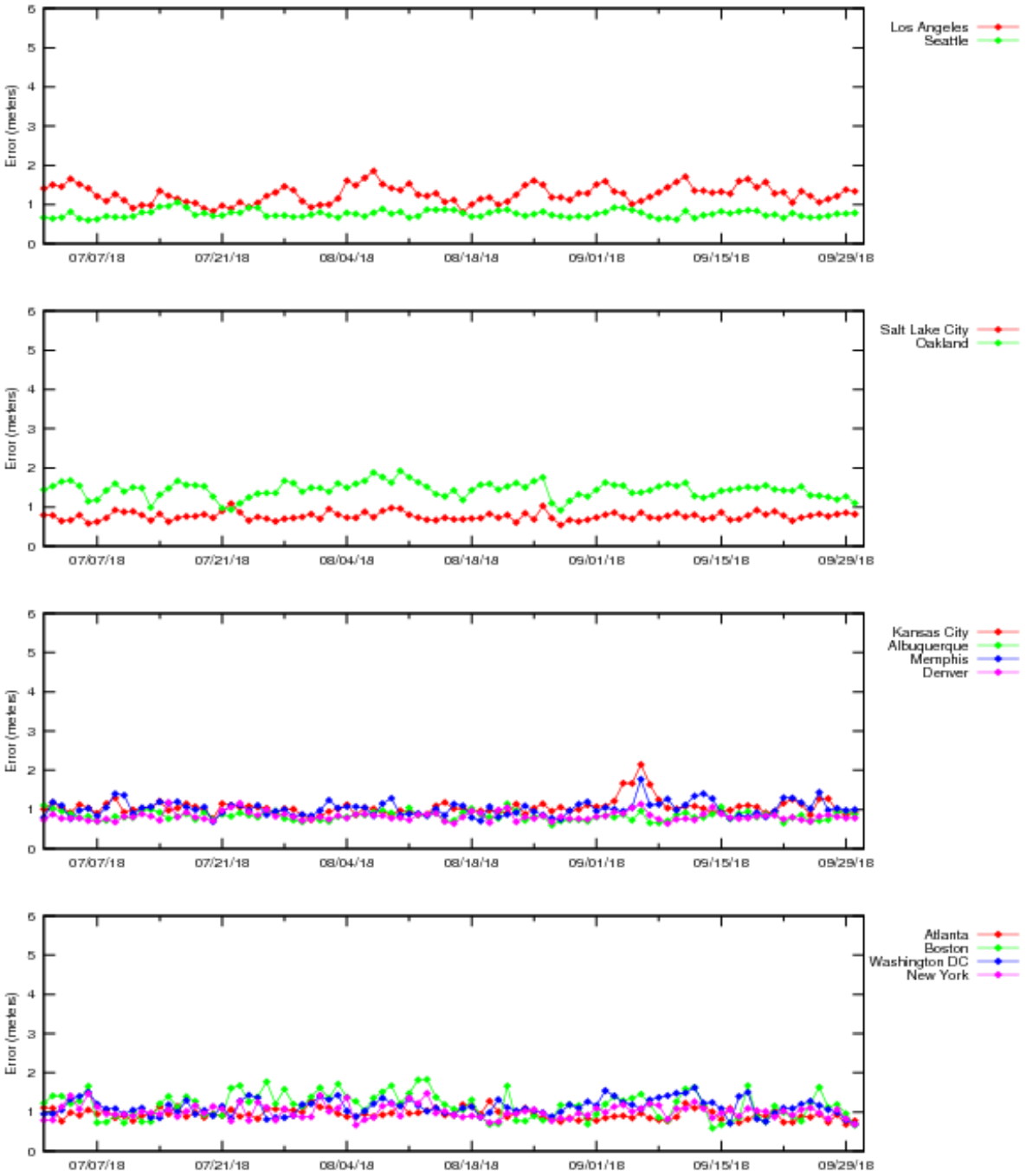


Figure 2-5 LPV 95% Vertical Accuracy

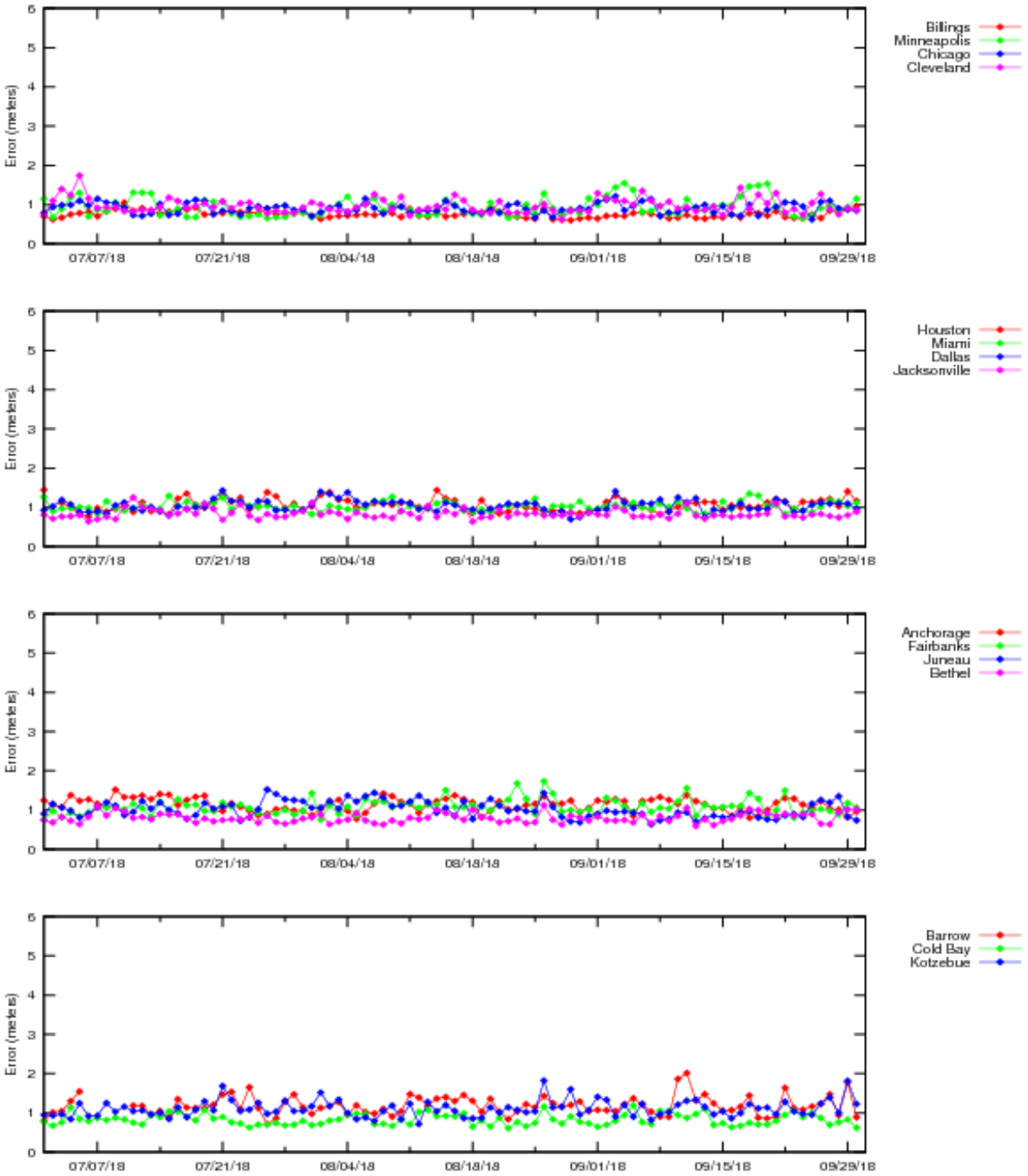


Figure 2-6 LPV 95% Vertical Accuracy

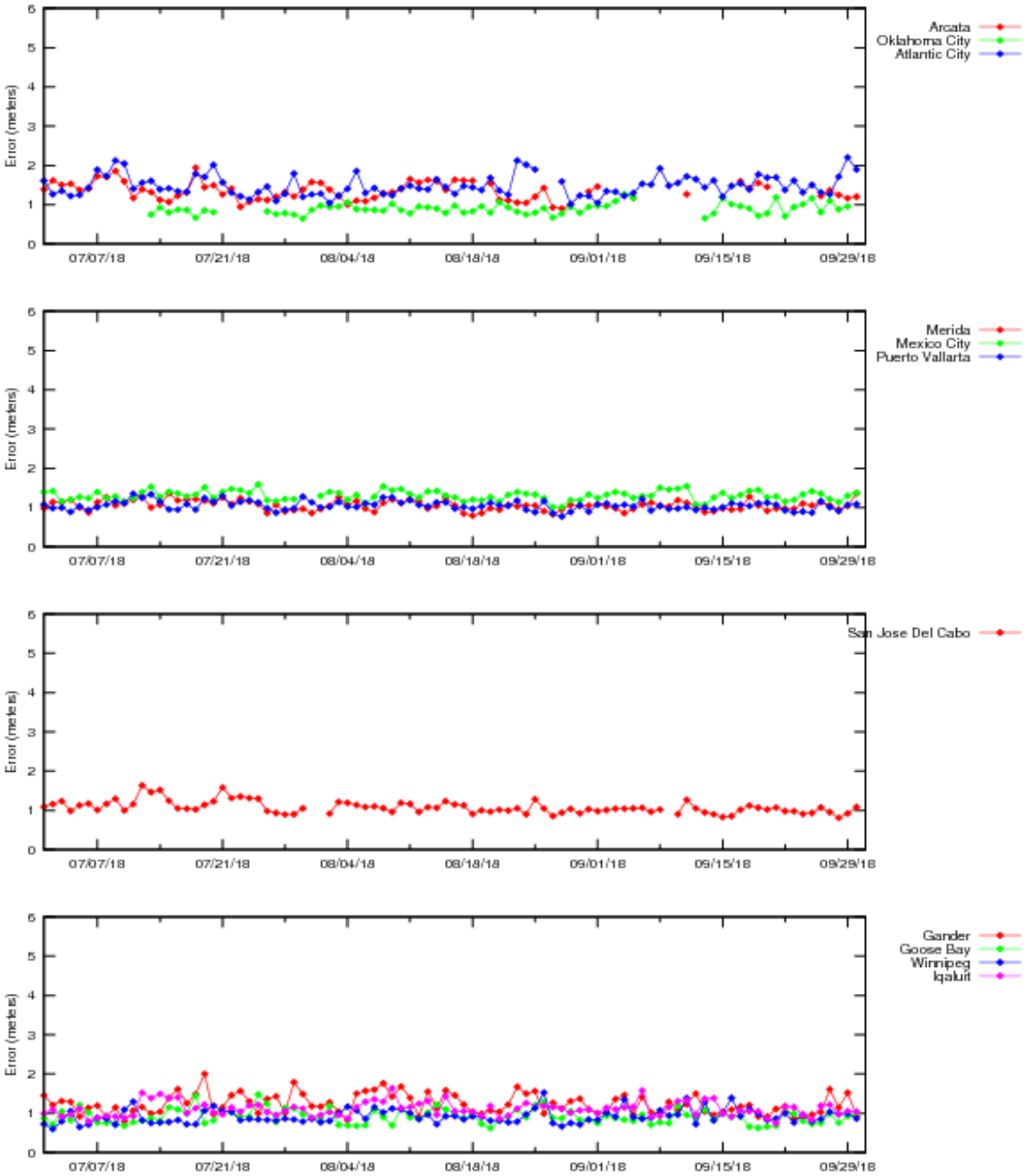


Figure 2-7 and Figure 2-8 show the daily NPA 95% horizontal accuracy at the NPA evaluation sites for the reporting period. The increases in 95% NPA position errors due to geomagnetic activity occurred on August 25–26 and September 10–11, 2018.

Figure 2-7 NPA 95% Horizontal Accuracy

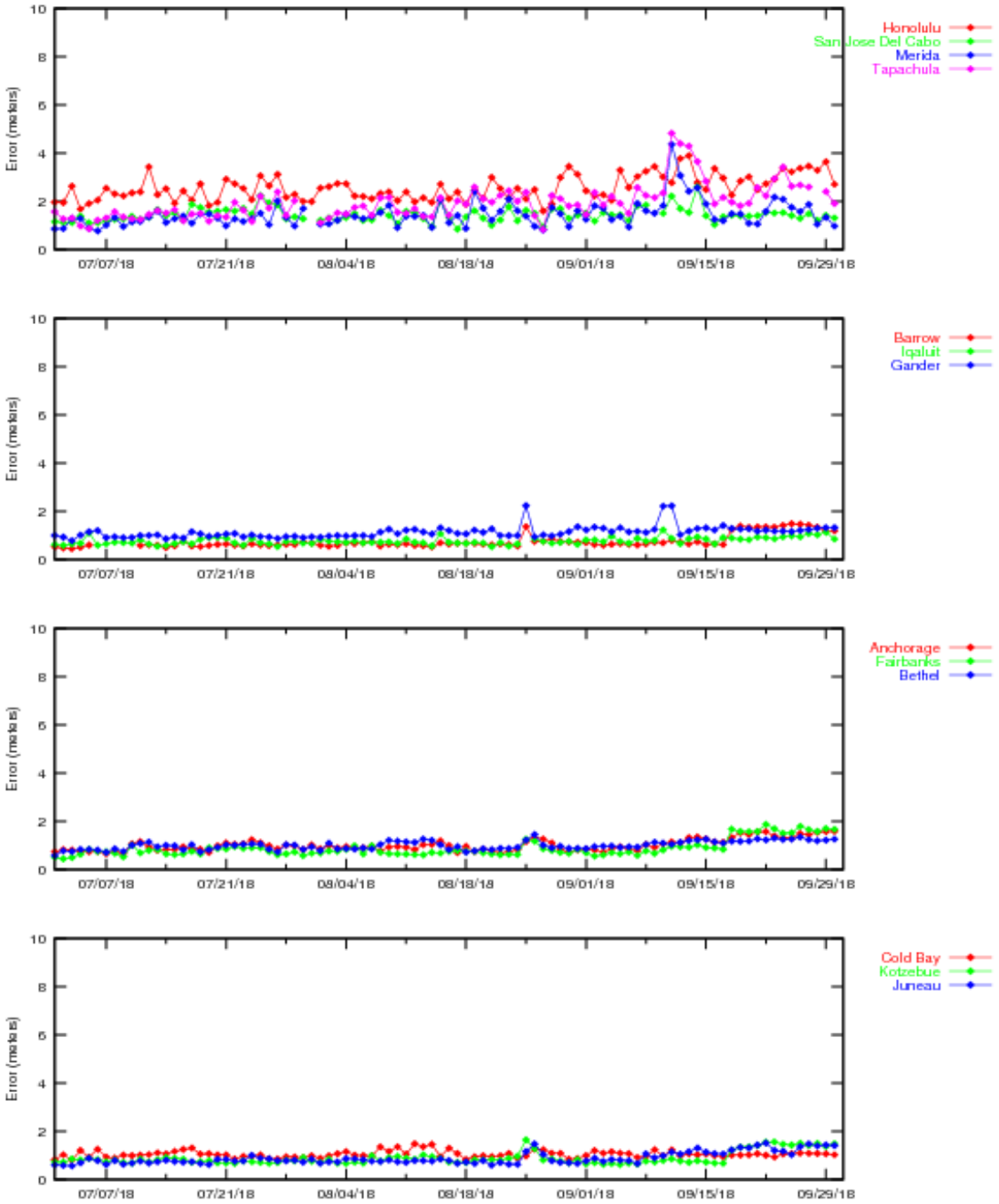


Figure 2-8 NPA 95% Horizontal Accuracy

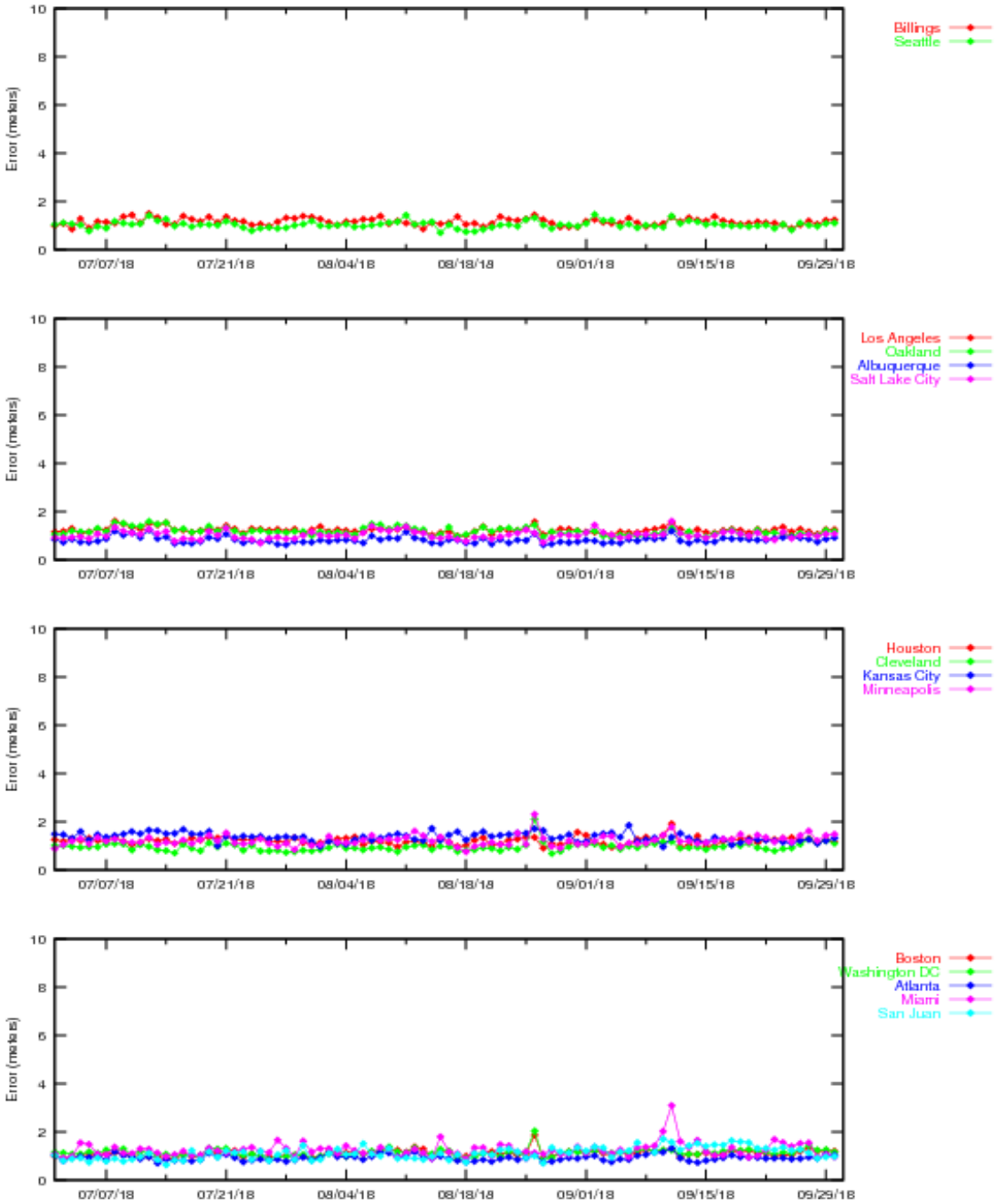


Figure 2-9 through Figure 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver for the quarter. Figure 2-9 and Figure 2-10 show the triangular distributions of vertical position error (VPE) versus VPL and horizontal position error (HPE) versus HPL: (1) the horizontal axis is the position error, (2) the vertical axis is the WAAS protection level where lower protection levels equate to better availability, (3) the diagonal line shows the point where error equals protection level, (4) above and to the left of the diagonal line show where errors are bounded (WAAS is providing integrity in the position domain), and (5) below and to the right show where errors are not bounded (HMI could be present). Figure 2-11 and Figure 2-12 show the 2-D histograms of HPE, VPE, and normalized position errors: (1) the blue trace shows the distributions of the actual HPE and VPE; (2) the horizontal

axis is the position errors and the vertical axis is the total count of data samples (log scale) in each 0.1-meter bin; (3) the magenta trace shows the distributions of the actual horizontal and vertical errors normalized by one-sigma value of the protection level: horizontal protection level (HPL/6.0) and vertical protection level (VPL/5.33); (4) the horizontal axis is the standard units and vertical axis is the observed distribution of normalized errors data samples in each 0.1-sigma bin. The narrowness of the normalized error distributions indicates good safety performance.

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

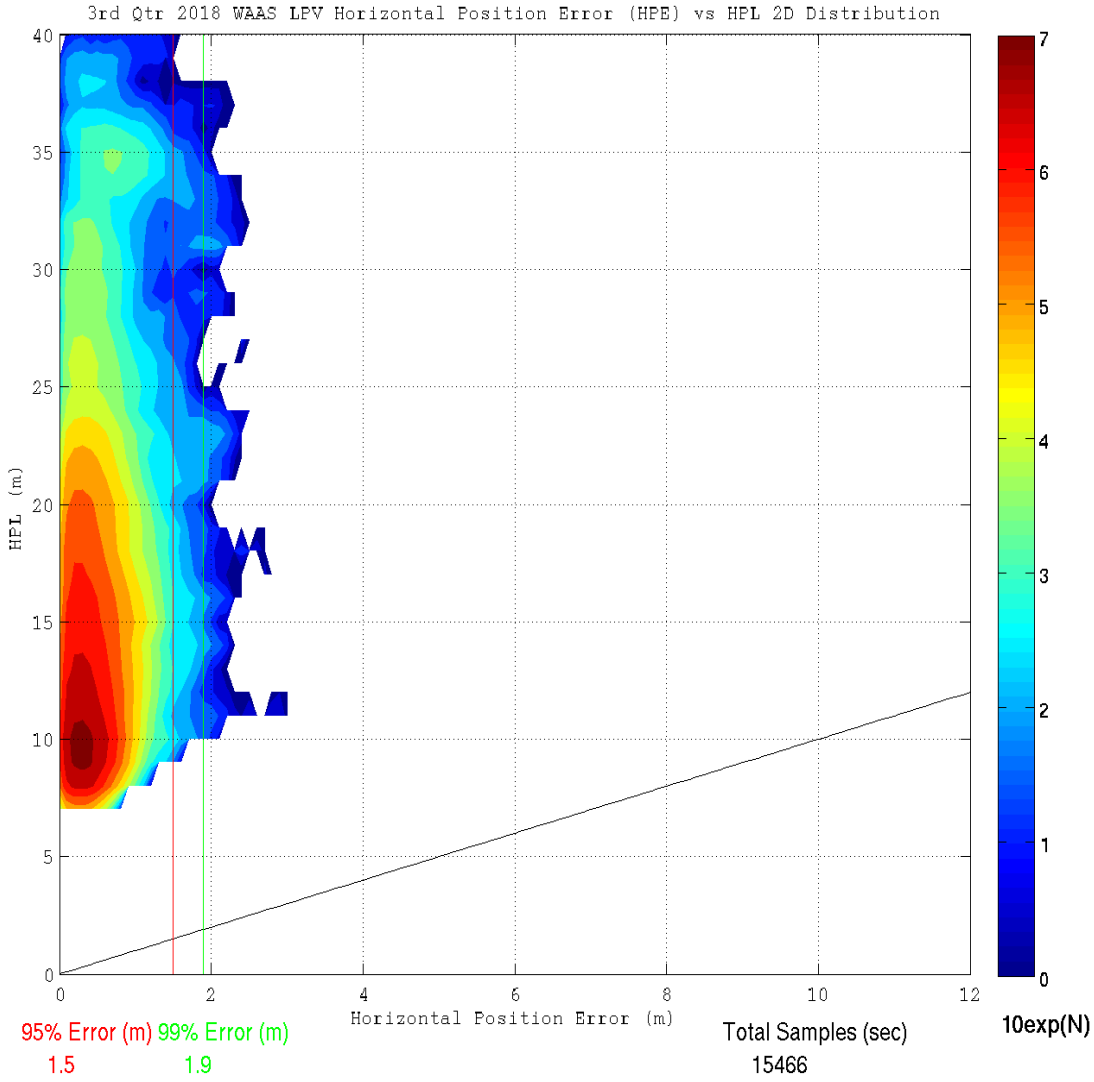


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

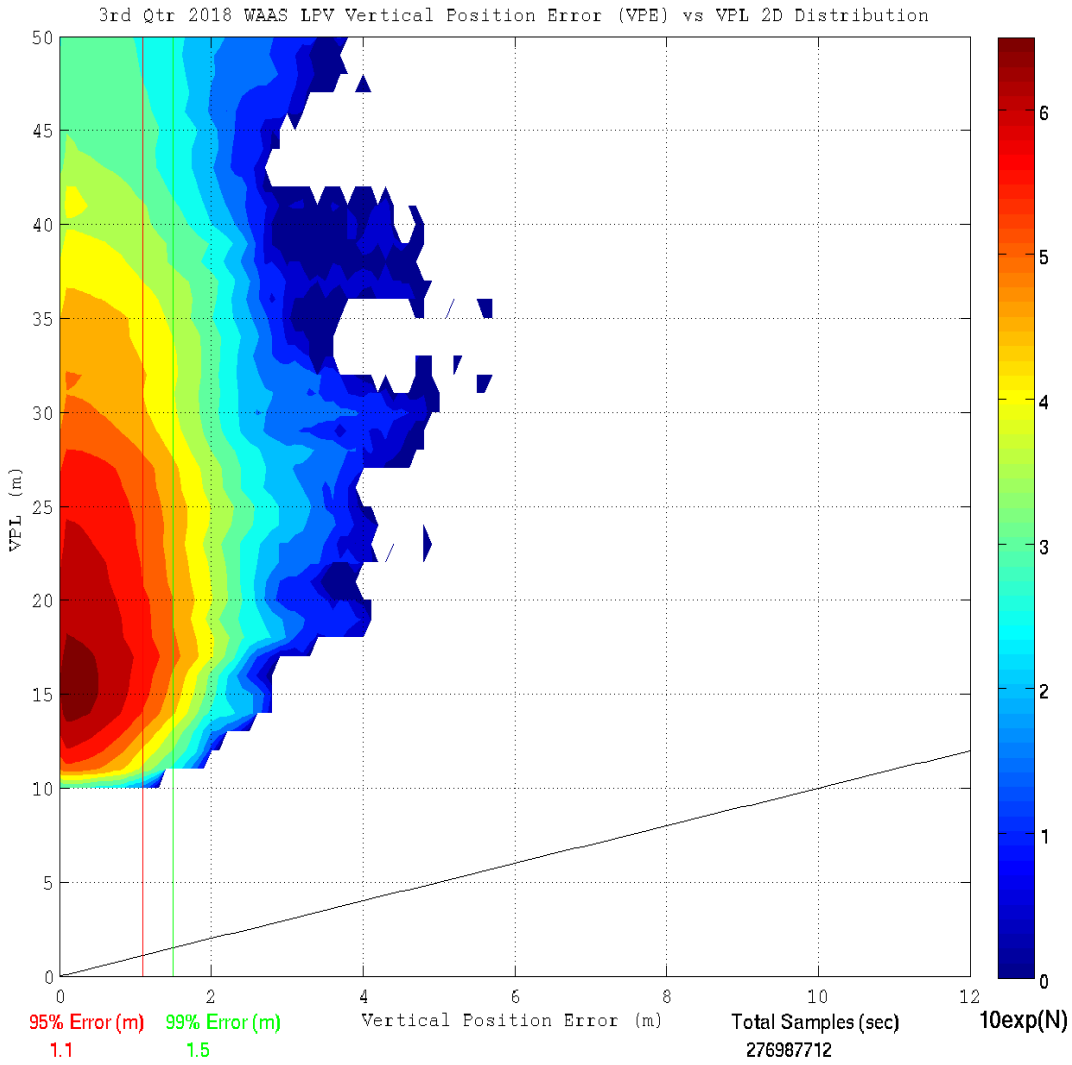


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

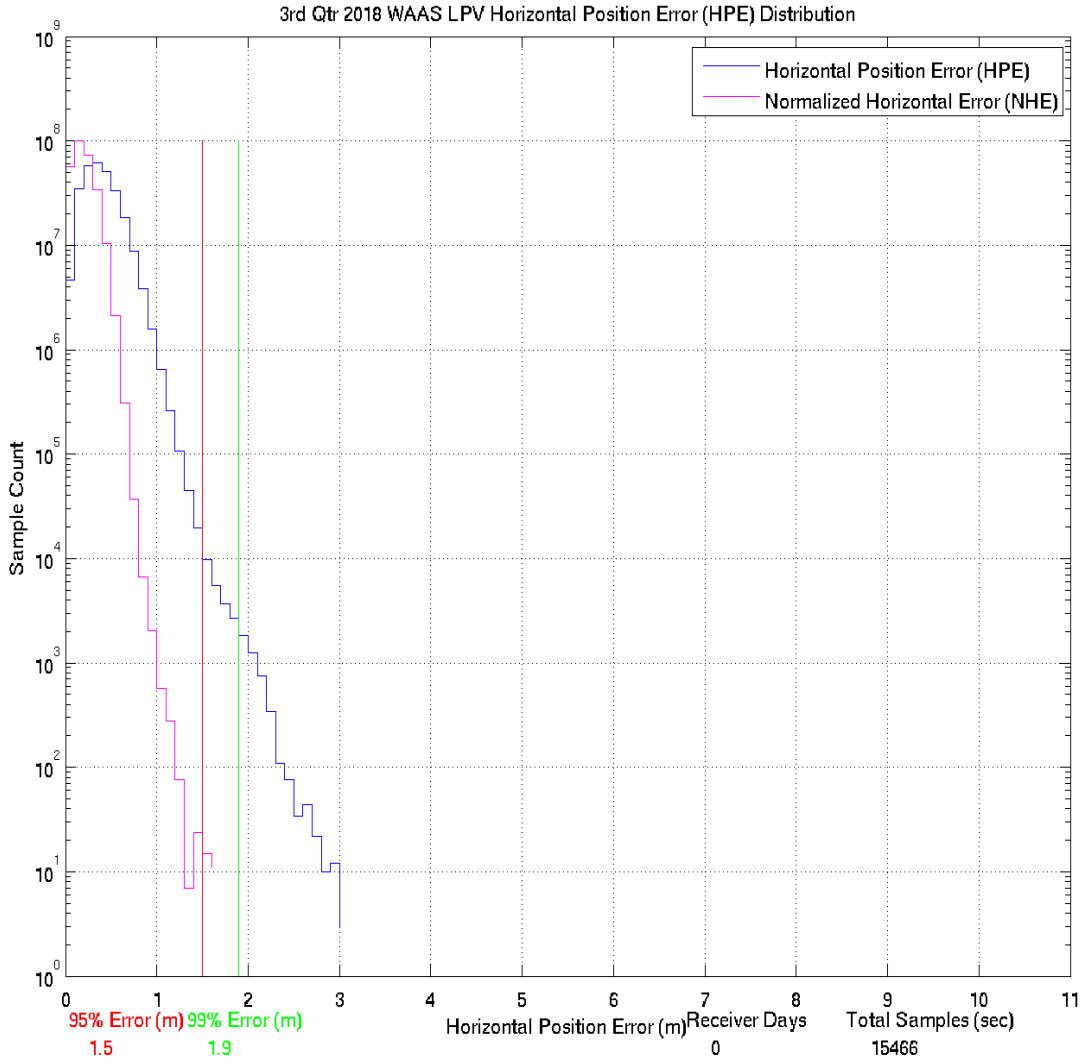
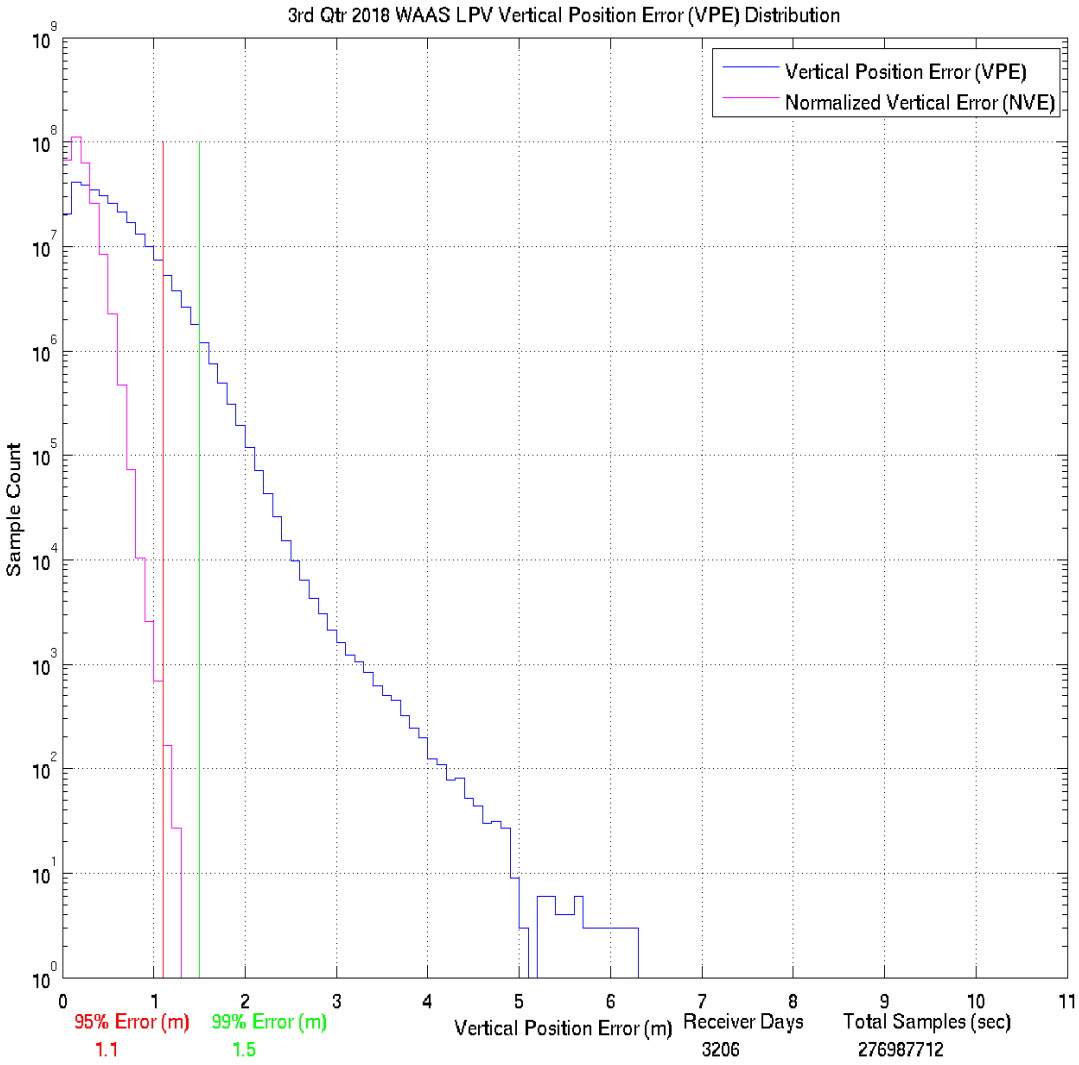


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

The WAAS availability evaluation documents the percentage of time the WAAS provided service for the operational service levels defined in Table 1-1. The RTCA DO-229D VPL and HPL were computed for each evaluated receiver. Table 3-1 shows the evaluated receivers, the 99% maintained protection levels, and the percentage in PA mode (described in Section 2.0). The maximum and minimum VPL and HPL for this reporting period are listed as:

- The maximum 99% CONUS HPL was 16.458 meters observed at Atlantic City
- The maximum 99% CONUS VPL was 32.507 meters observed at Oakland
- The minimum 99% CONUS HPL was 11.08 meters observed at Denver
- The minimum 99% CONUS VPL was 19.585 meters observed at Billings
- The maximum 99% Alaska HPL was 20.76 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 32.337 meters observed at Barrow
- The minimum 99% Alaska HPL was 12.762 meters observed at Juneau
- The minimum 99% Alaska VPL was 22.306 meters observed at Anchorage

Table 3-1 99% Protection Level

Location	99% HPL (Meters)	99% VPL (Meters)	Percentage in PA mode
Arcata	13.367	29.664	100
Atlantic City	16.458	23.398	100
Oklahoma City	11.498	22.573	100
Albuquerque	11.234	20.835	100
Anchorage	13.584	22.306	100
Atlanta	13.082	24.773	100
Barrow	16.187	32.337	100
Bethel	15.762	24.356	100
Billings	12.472	19.585	100
Boston	15.889	20.694	100
Chicago	13.024	20.104	100
Cleveland	16.261	23.960	100
Cold Bay	20.760	30.227	100
Dallas	11.232	23.321	100
Denver	11.080	21.129	100
Fairbanks	13.656	23.939	100
Gander	26.917	35.496	100
Goose Bay	19.686	26.665	100
Houston	11.753	24.799	100
Iqaluit	32.471	39.667	100
Jacksonville	13.475	24.971	100
Juneau	12.762	23.832	100
Kansas City	11.531	19.906	100
Kotzebue	16.587	29.674	100
Los Angeles	14.037	31.874	100
Memphis	11.852	24.004	100
Merida	20.043	50.806	100
Mexico City	22.714	41.013	100
Miami	16.163	26.976	100
Minneapolis	12.509	20.005	100
New York	15.074	21.143	100
Oakland	13.849	32.507	100
Puerto Vallarta	23.628	40.242	100
Salt Lake City	11.238	21.456	100
San Jose Del Cabo	21.162	38.066	100
Seattle	12.180	21.535	100
Washington DC	15.824	24.051	100
Winnipeg	13.836	21.259	100

Availability of LP, LPV, and LPV200 services are evaluated by monitoring the WAAS protection levels at receiver locations. Service is available when the VPL is less than the vertical alert limit (VAL) and the HPL is less than the horizontal alert limit (HAL). When the protection level exceeds the alert limit, the service is unavailable and an outage in service is recorded along with its duration. The operational service is not available again until both protection levels are within the alert limits for at least 15 minutes. Although this will cause minimal reduction in operational service availability, it will substantially reduce the number of service outages and prevent excessive switching in/out of service availability.

Table 3-2 shows the percentage of time LP, LPV, and LPV200 service is available using the 15-minute window criteria. Table 3-3 shows LP, LPV, and LPV200 service outages and associated outage rates. The outage rate is the percentage of theoretically interrupted approaches through a loss of operational service once the approach had started. Figure 3-1 through Figure 3-6 show the daily availability of LPV and LPV200 service levels. Figure 3-7 through Figure 3-12 show the daily interruptions of LPV and LPV200 service levels.

Table 3-2 PA Availability (15-minute window)

Location	LP WAAS With 15 Minute Window (%)	LPV WAAS With 15 Minute Window (%)	LPV200 WAAS With 15 Minute Window (%)
Arcata	100	100	100
Atlantic City-a	100	100	100
Oklahoma City	100	100	100
Albuquerque	100	100	99.99
Anchorage	100	100	100
Atlanta	100	100	99.95
Barrow	100	100	99.26
Bethel	100	100	100
Billings	100	100	100
Boston	100	100	100
Chicago	100	100	100
Cleveland	100	100	100
Cold Bay	100	100	99.98
Dallas	100	100	100
Denver	100	100	100
Fairbanks	100	100	99.94
Gander	100	100	98.25
Goose Bay	100	100	99.97
Houston	100	100	100
Iqaluit	99.79	99.78	94.72
Jacksonville	100	100	99.9
Juneau	100	100	100
Kansas City	100	100	100
Kotzebue	100	100	99.51
Los Angeles	100	100	99.83
Memphis	100	100	99.98
Merida	100	98.78	96.41
Mexico City	100	99.86	95.47
Miami	100	100	99.98
Minneapolis	100	100	100
New York	100	100	100
Oakland	100	100	99.6
Puerto Vallarta	100	99.95	94.87
Salt Lake City	100	100	100
San Jose Del Cabo	100	99.98	96.01
Seattle	100	100	100
Washington DC	100	100	100
Winnipeg	100	100	100

Table 3-3 LPV and LPV200 Outage Rate (Per 150 sec approach)

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	0	0	0	0	0	0
Atlantic City-a	0	0	0	0	0	0
Oklahoma City	0	0	0	0	1	0.000026
Albuquerque	0	0	0	0	4	0.000076
Anchorage	0	0	1	0.000019	3	0.000057
Atlanta	0	0	0	0	52	0.000982
Barrow	1	0.000020	3	0.000060	121	0.002436
Bethel	0	0	0	0	5	0.000094
Billings	0	0	0	0	0	0
Boston	0	0	0	0	0	0
Chicago	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0
Cold Bay	1	0.000019	1	0.000019	32	0.000604
Dallas	0	0	0	0	1	0.000019
Denver	0	0	0	0	1	0.000019
Fairbanks	0	0	0	0	23	0.000435
Gander	0	0	0	0	231	0.004439
Goose Bay	0	0	0	0	6	0.000113
Houston	0	0	0	0	1	0.000019
Iqaluit	18	0.000345	22	0.000422	292	0.005898
Jacksonville	0	0	0	0	71	0.001341
Juneau	0	0	0	0	0	0
Kansas City	0	0	0	0	1	0.000019
Kotzebue	0	0	0	0	98	0.001859
Los Angeles	0	0	0	0	71	0.001343
Memphis	0	0	0	0	35	0.000661
Merida	0	0	94	0.001797	198	0.003879
Mexico City	1	0.000019	70	0.001355	372	0.007533
Miami	0	0	0	0	6	0.000113
Minneapolis	0	0	0	0	0	0
New York	0	0	0	0	0	0
Oakland	0	0	0	0	102	0.001934
Puerto Vallarta	0	0	8	0.000151	486	0.009682
Salt Lake City	0	0	0	0	0	0
San Jose Del Cabo	1	0.000019	4	0.000077	254	0.005094
Seattle	0	0	0	0	1	0.000019
Washington DC	0	0	0	0	0	0
Winnipeg	0	0	0	0	1	0.000019

Figure 3-1 LPV Instantaneous Availability

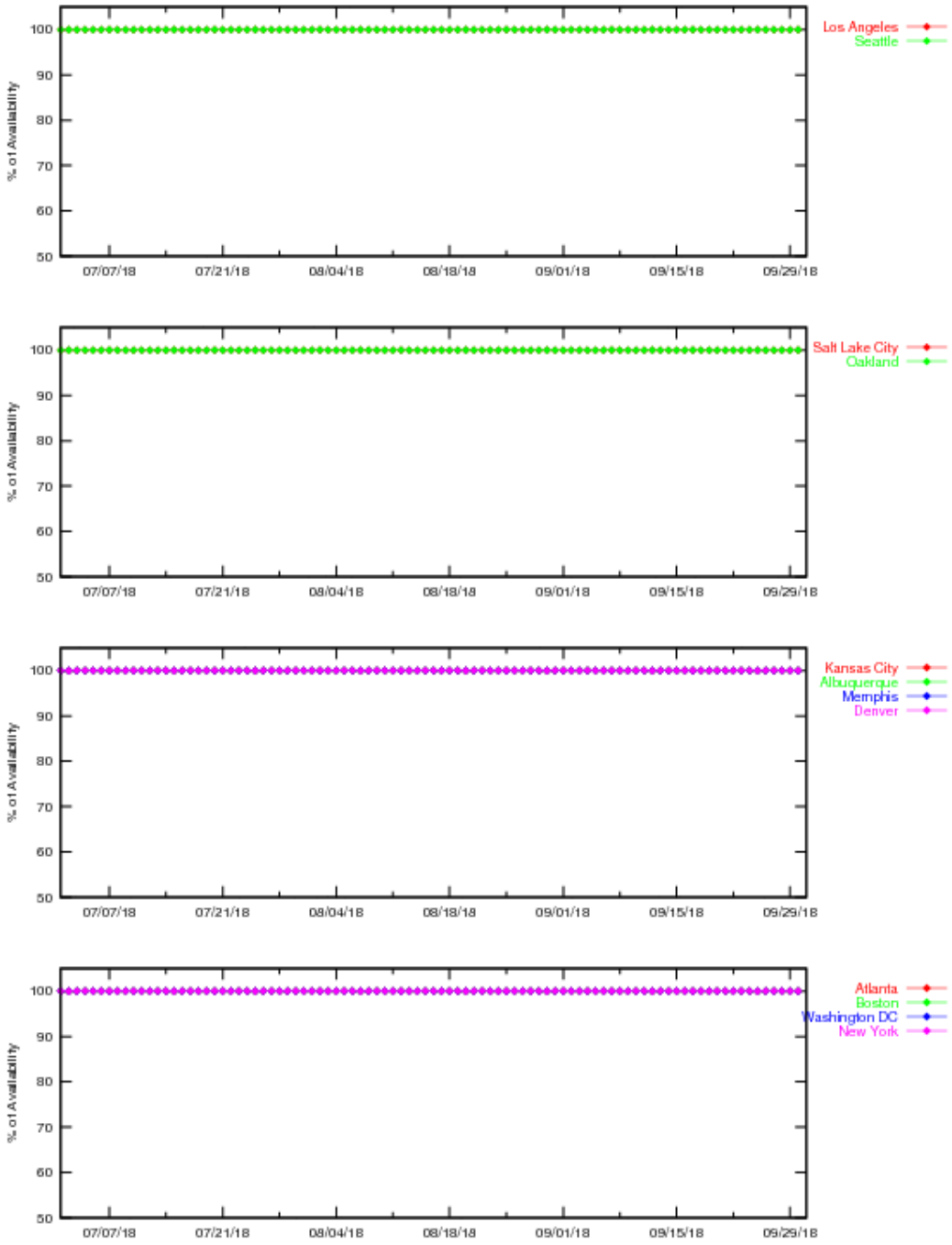


Figure 3-2 LPV Instantaneous Availability

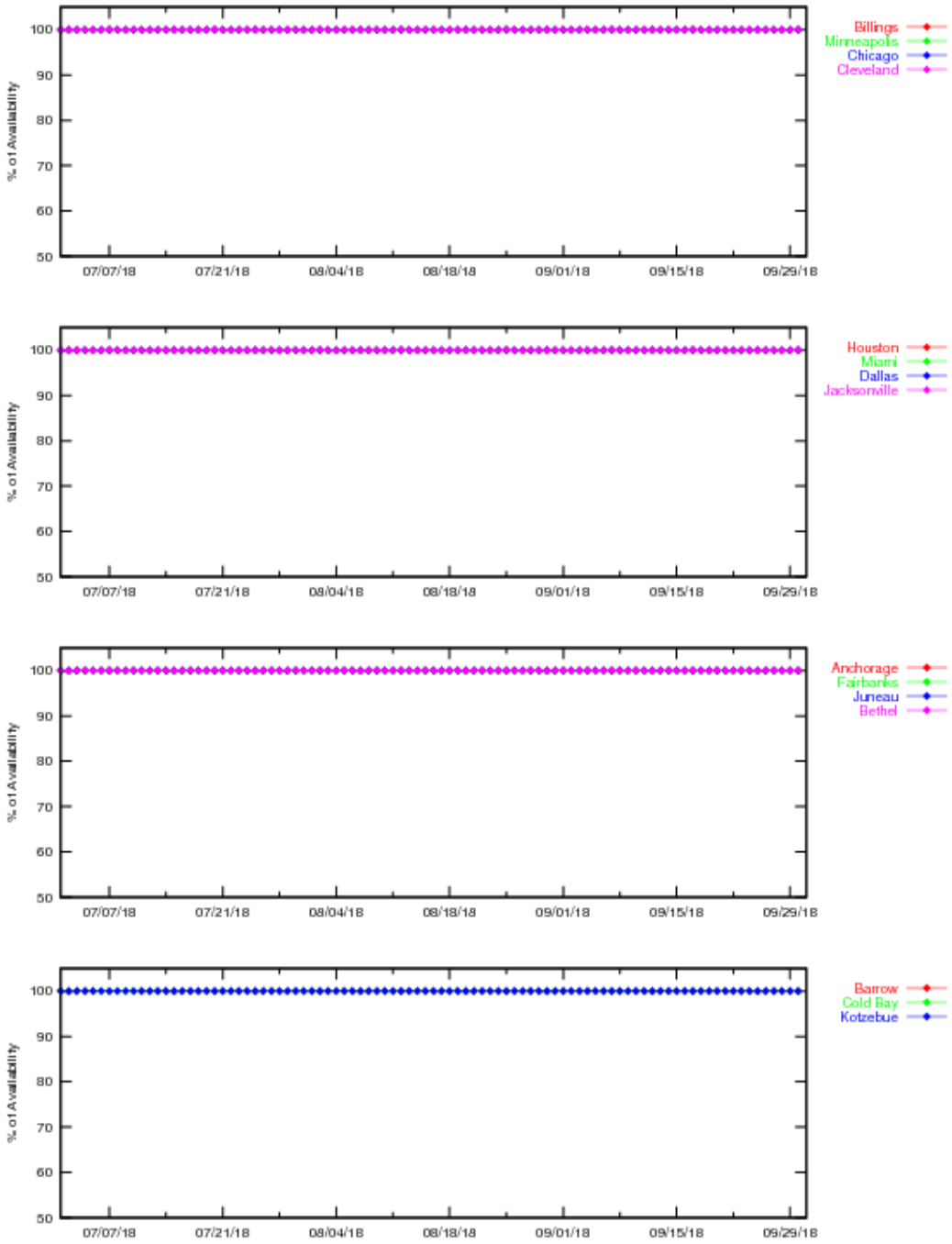


Figure 3-3 LPV Instantaneous Availability

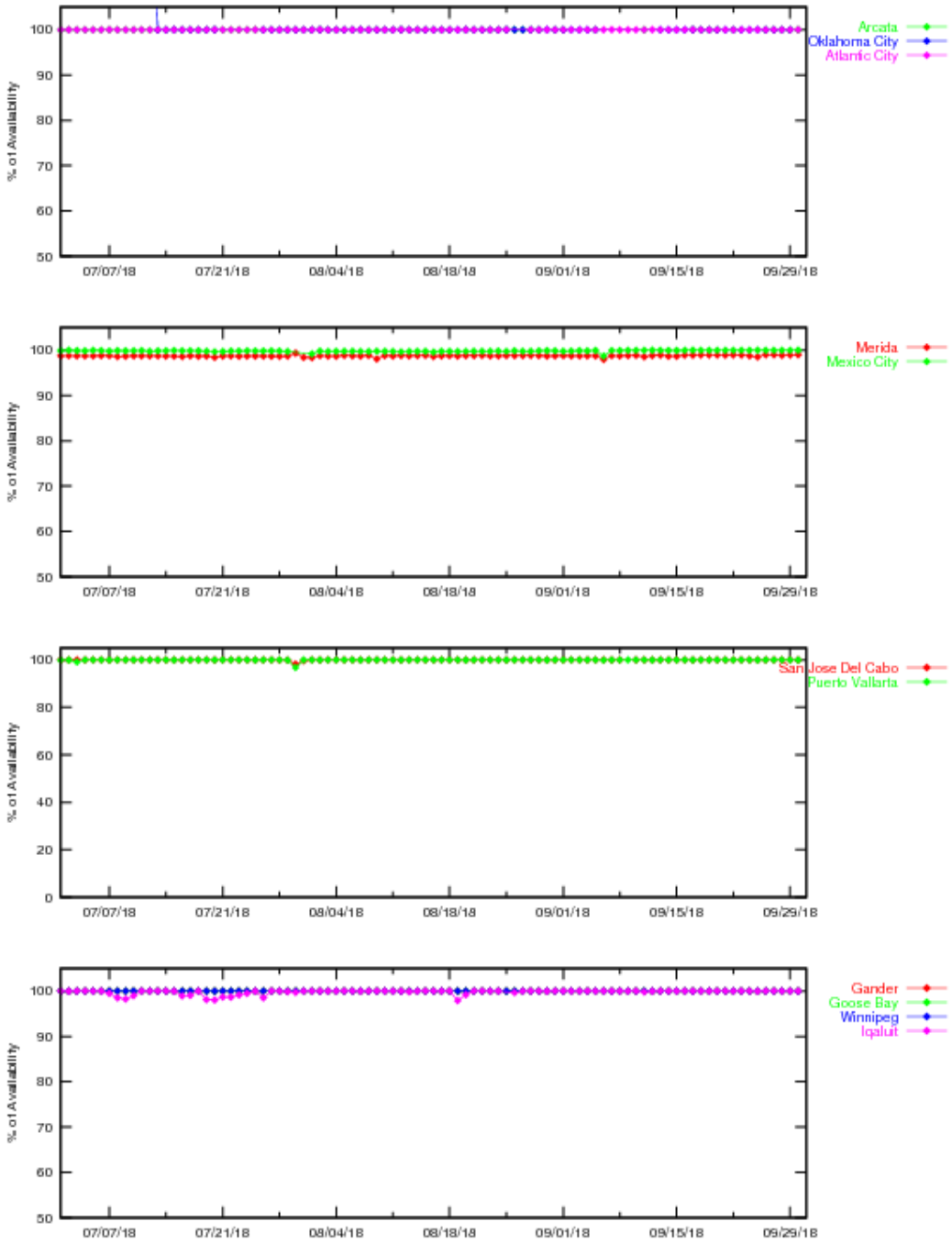


Figure 3-4 LPV200 Instantaneous Availability

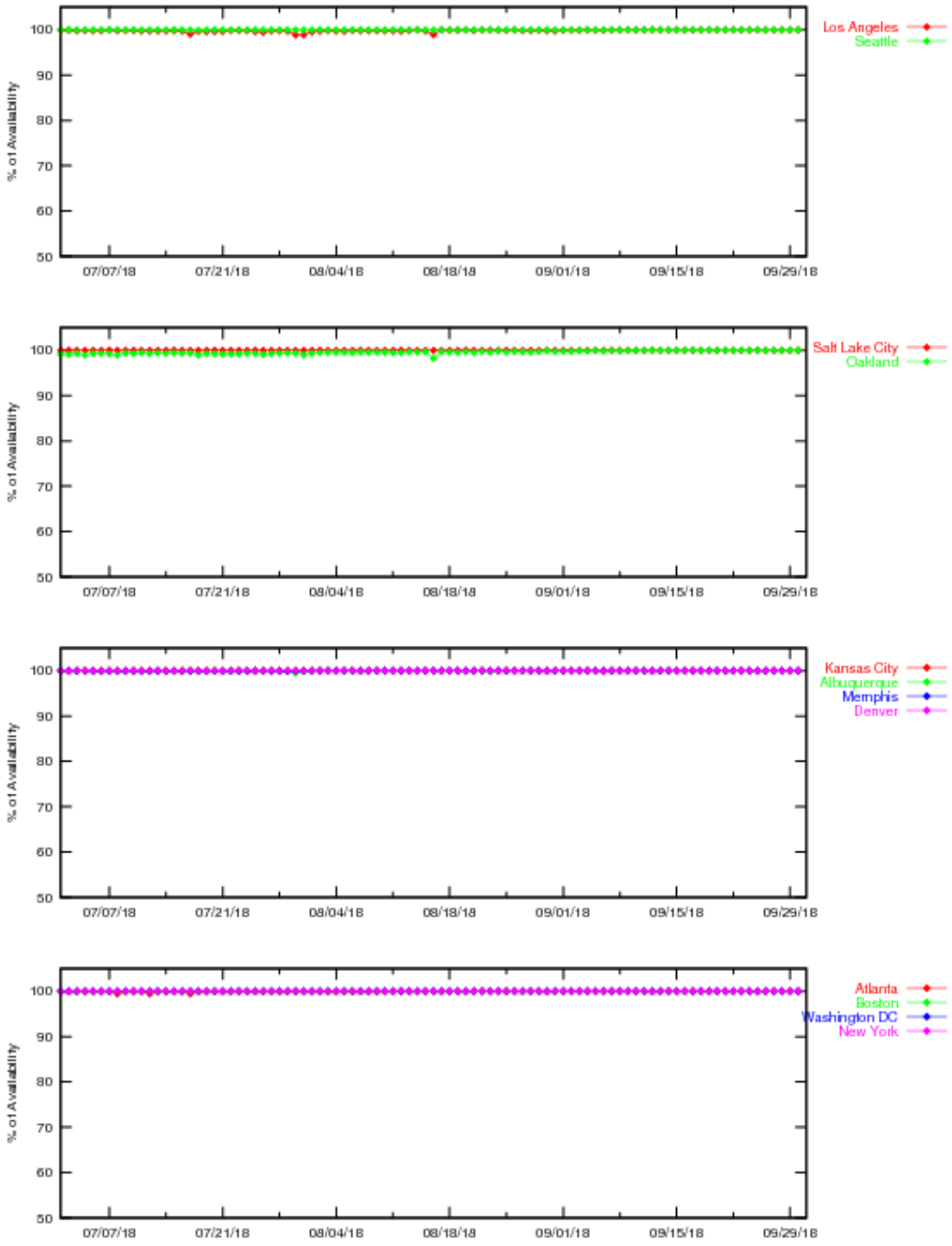


Figure 3-5 LPV200 Instantaneous Availability

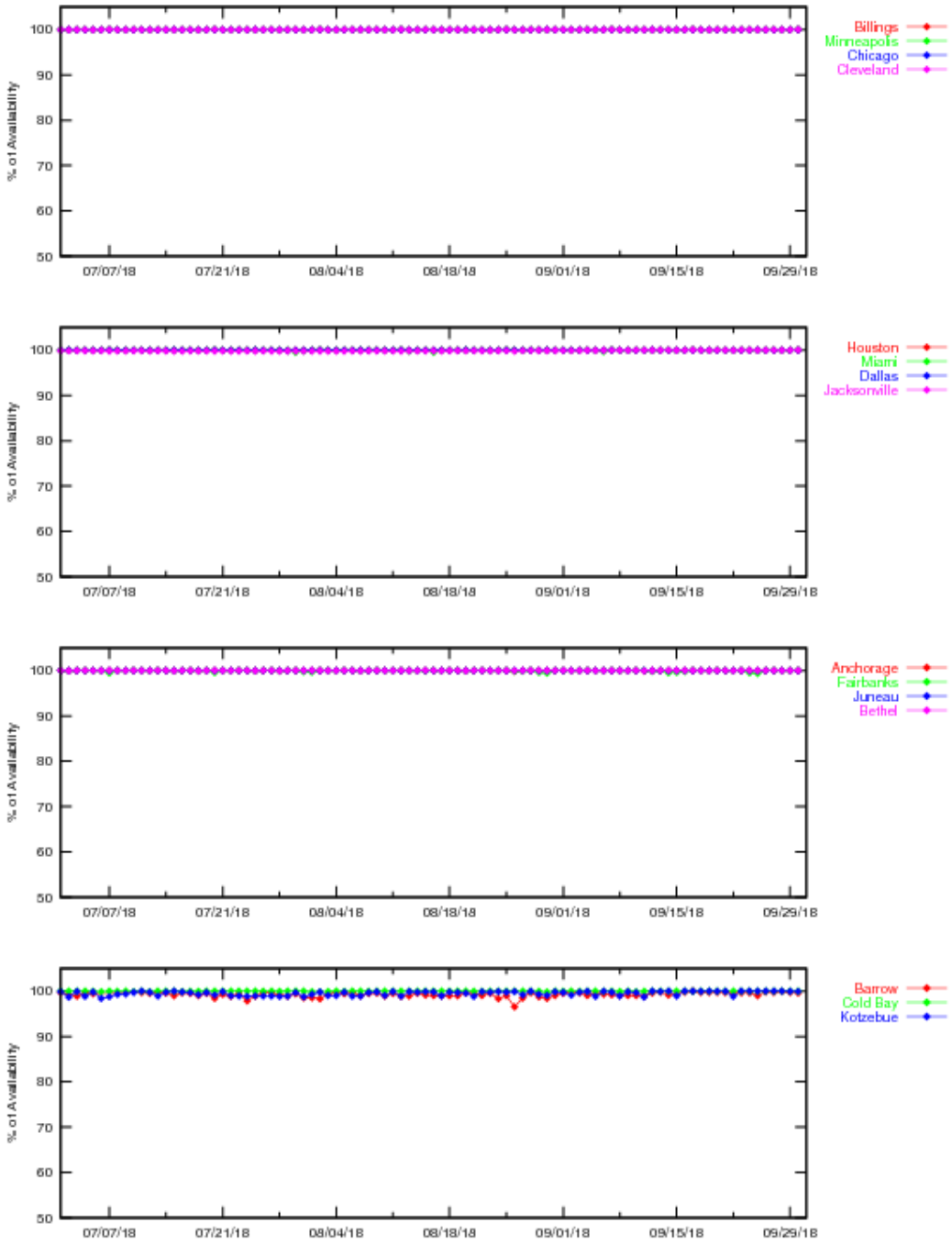


Figure 3-6 LPV200 Instantaneous Availability

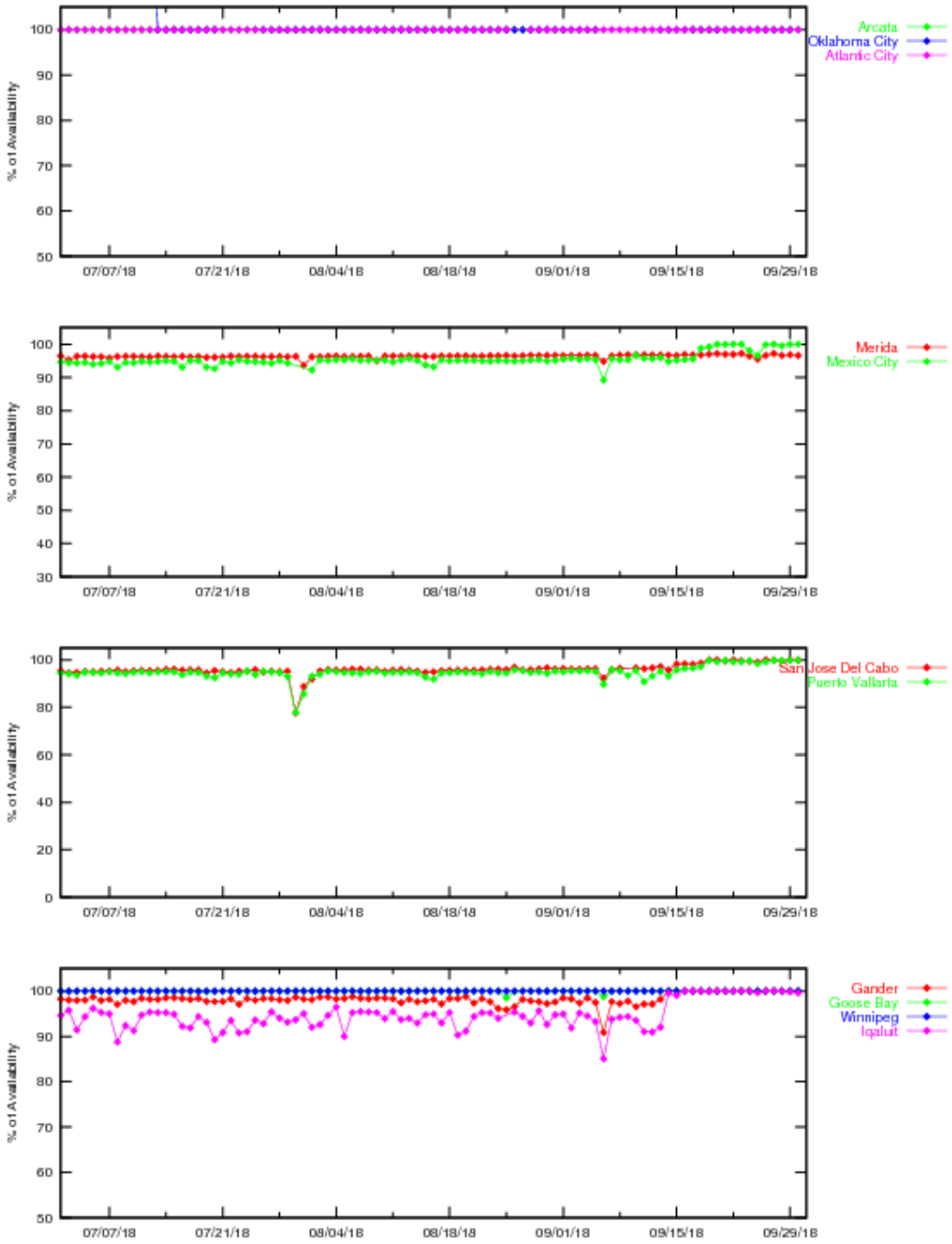


Figure 3-7 LPV Outages

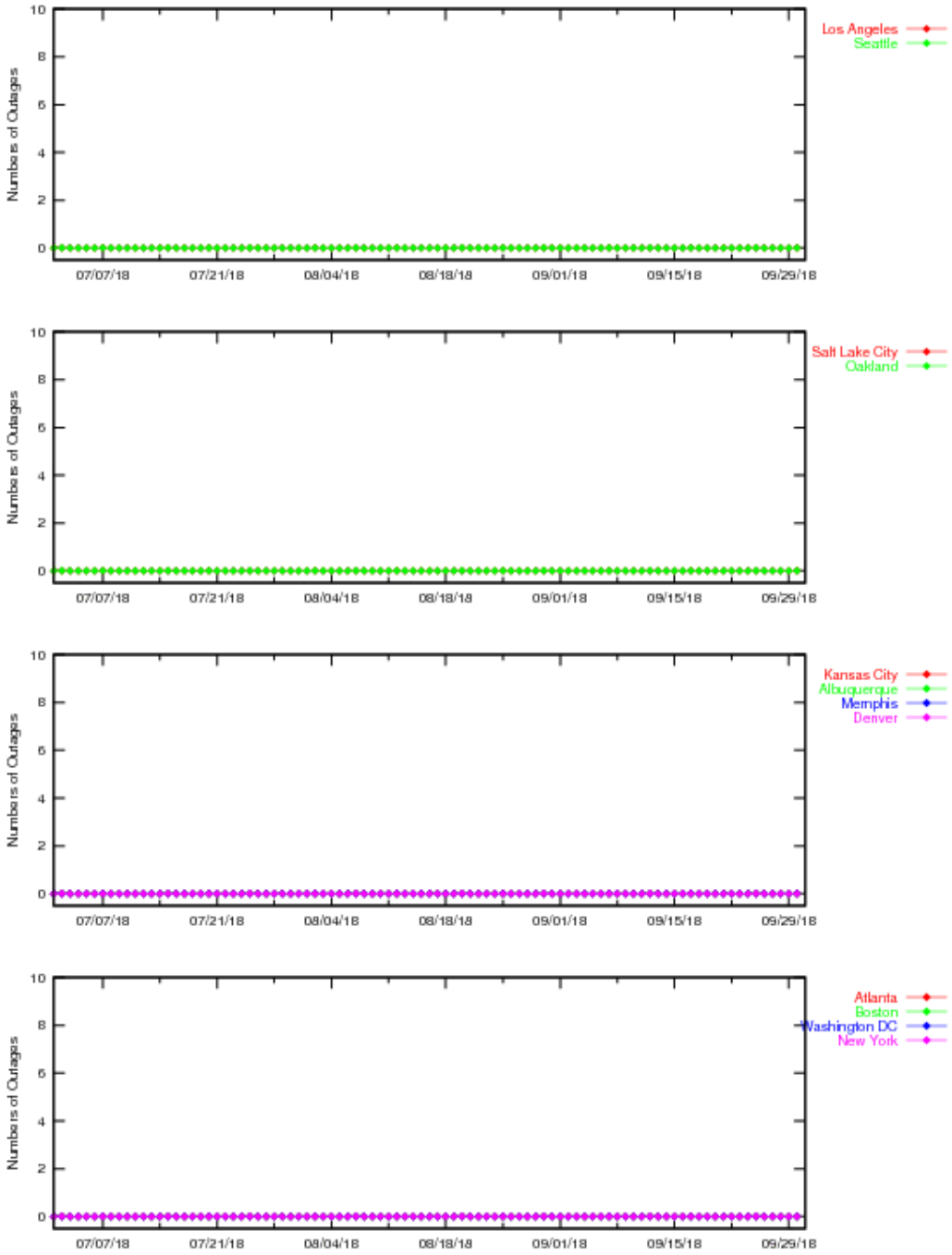


Figure 3-8 LPV Outages

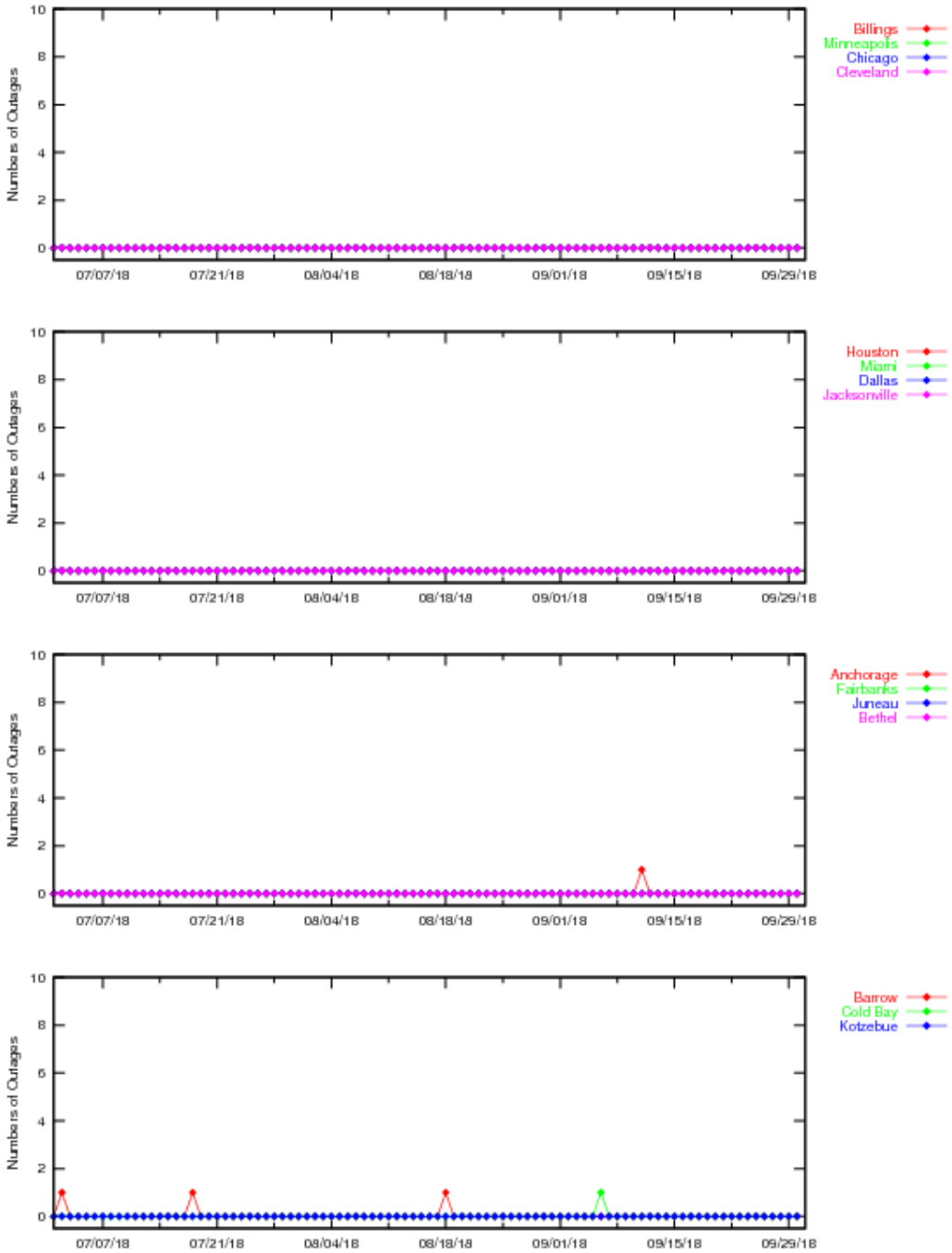


Figure 3-9 LPV Outages

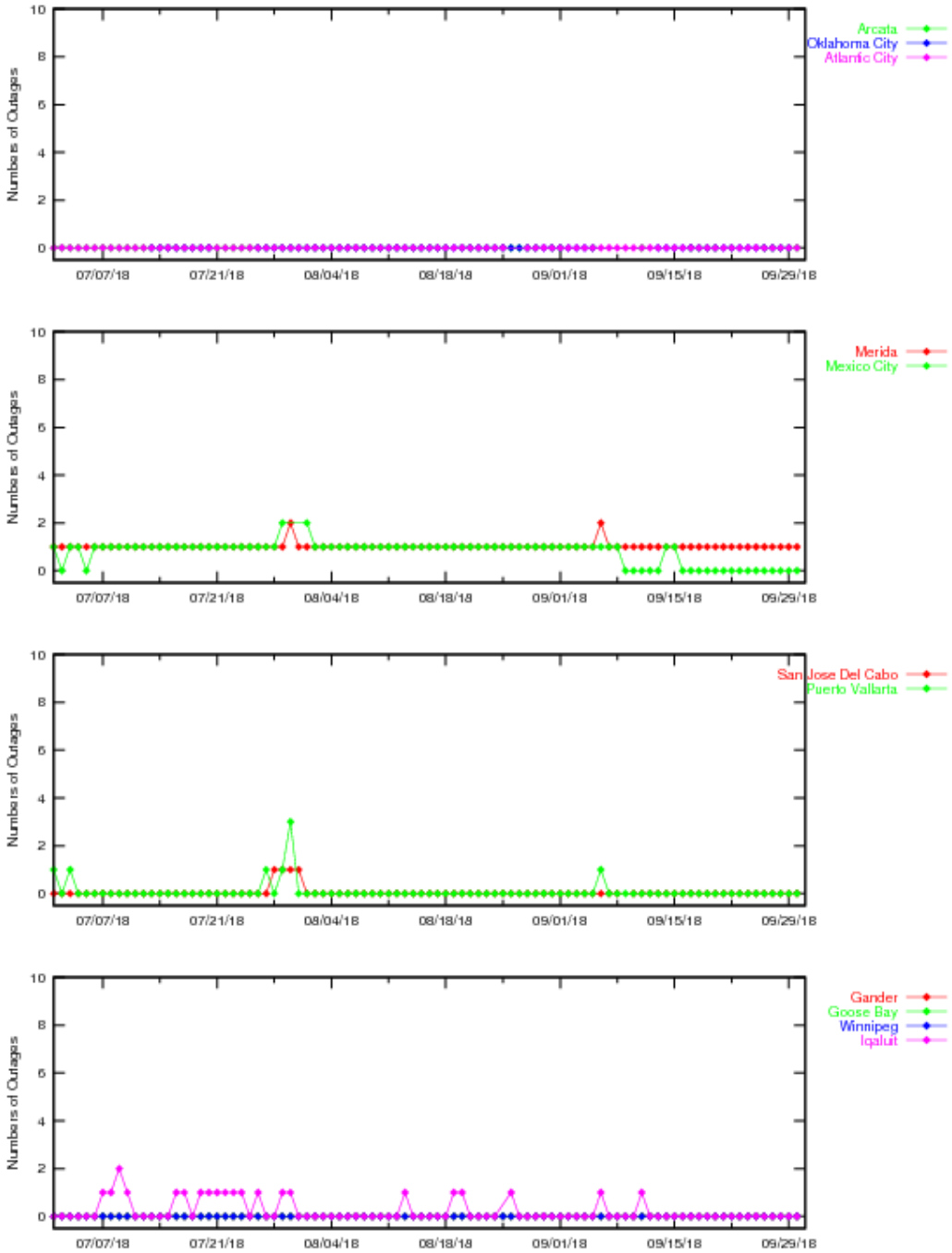


Figure 3-10 LPV200 Outages

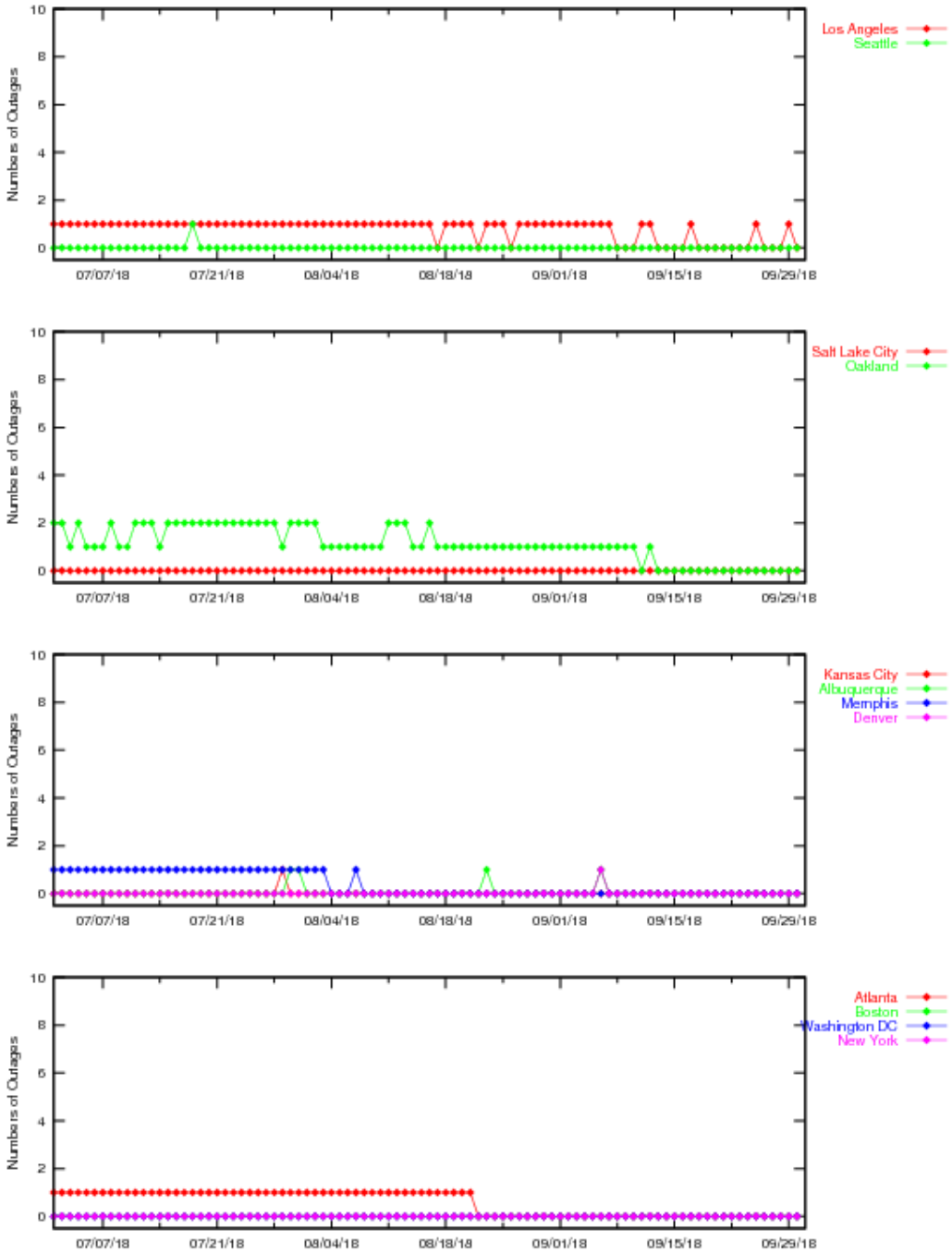


Figure 3-11 LPV200 Outages

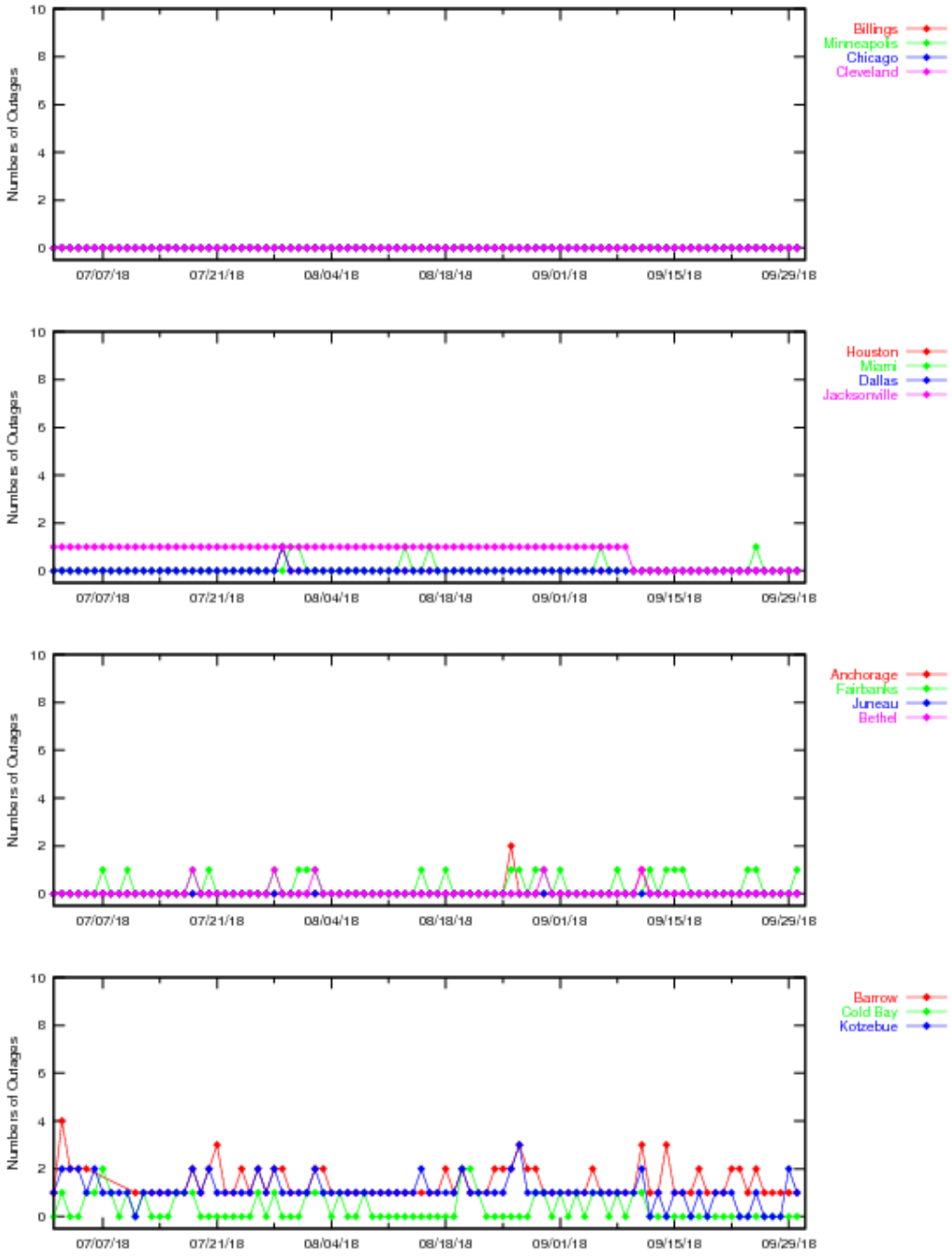
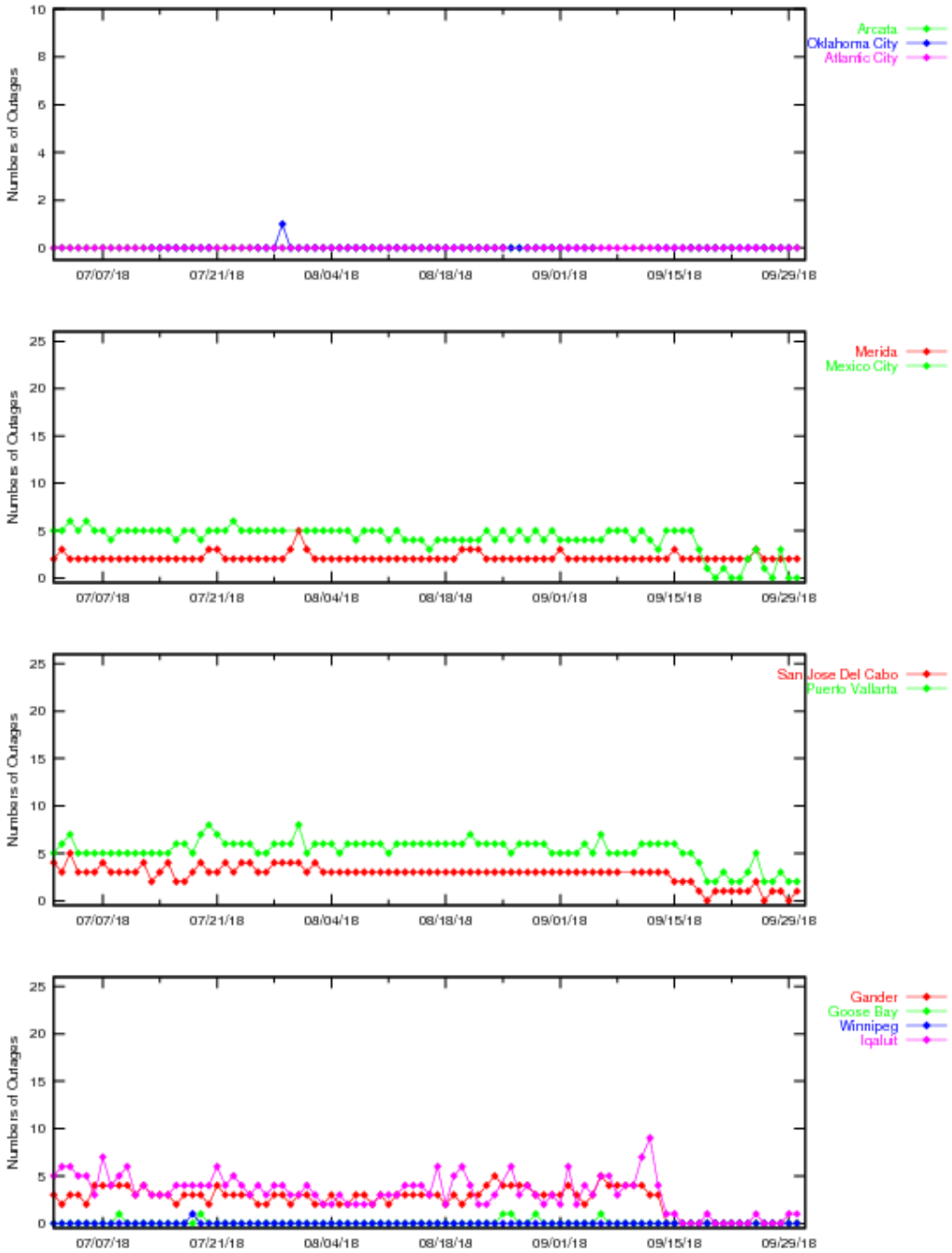


Figure 3-12 LPV200 Outages



Availability of NPA service is evaluated by monitoring the WAAS HPL at receiver locations. Service is available when the HPL is less than a HAL of 556 meters. The service is unavailable when HPL exceeds the HAL or when a WAAS navigation message is not received, and the service outage and its duration are recorded. NPA service is not available again until the HPL is within the HAL for at least 15 minutes. Table 3-4 shows the percentage of time that NPA service is available using the 15-minute window criteria. Table 3-5 shows the NPA service outages and associated outage rates. The outage rate is the percentage of theoretically interrupted NPA approaches through a loss of operational service once the approach had started.

Table 3-4 NPA Availability (15-minute window)

Location	NPA Availability (Excluding RAIM/FDE) (%)
Arcata	100
Oklahoma City	100
Albuquerque	100
Anchorage	100
Atlanta	100
Barrow	100
Bethel	100
Billings	100
Boston	100
Cleveland	100
Cold Bay	100
Fairbanks	100
Gander	100
Honolulu	100
Houston	100
Iqaluit	100
Juneau	100
Kansas City	100
Kotzebue	100
Los Angeles	100
Merida	100
Miami	100
Minneapolis	100
Oakland	100
Salt Lake City	100
San Jose Del Cabo	100
San Juan	100
Seattle	100
Tapachula	100
Washington DC	100

Table 3-5 NPA Outage Rates (Excluding FD/FDE)

Location	NPA Outages (Number)	NPA Outage Rates
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	0	0
Bethel	0	0
Billings	0	0
Boston	0	0
Cleveland	0	0
Cold Bay	0	0
Fairbanks	0	0
Gander	0	0
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0
Kotzebue	0	0
Los Angeles	0	0
Merida	0	0
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	0	0
San Juan	0	0
Seattle	0	0
Tapachula	0	0
Washington DC	0	0

The availability decreases for this quarter were due to satellite outages, geomagnetic activity, communication outages, radio frequency interference (RFI), and elevated UDRE and GIVE values. Noteworthy events that affected availability are:

- Jul 6–10–The Barrow WRS was taken offline for HVAC repairs. The lack of observations from BRW reduced LPV200 availability in Alaska.
- Jul 7–10–A sub-frame reasonability warning and YFB PID Down fault removed Iqaluit WRS from WAAS correction processing and reduced LPV200 availability in Canada. See DR 133.
- Jul 7–8–A GUS switchover on CRW caused a reduction of LPV200 availability in CONUS.
- Jul 16–23 - A sub-frame reasonability warning and YFB PID Down fault removed Iqaluit WRS from WAAS correction processing and reduced LPV200 availability in Canada. See DR 133.
- Jul 28–An SV alert on PRN21 elevated UDREs and reduced LPV200 availability in Alaska and Canada.
- Jul 29–An SV alert on PRN21 elevated UDREs and reduced LPV200 availability in CONUS.
- Jul 30–31–Communication outages from a number of Mexico sites reduced observations in the region and reduced LPV200 availability in CONUS.
- Jul 31–A GUS switchover on SM9 caused a reduction of LPV200 availability in Alaska.
- Aug 2–An SV alert on PRN21 elevated UDREs and reduced LPV200 availability in CONUS (Montana) and Canada.
- Aug 12–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in Canada.
- Aug 16–Satellite maintenance elevated UDREs on PRN12 and reduced LPV200 availability in CONUS.
- Aug 17–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in CONUS.

- Aug 19–20–A sub-frame reasonability warning and YFB PID Down fault removed Iqaluit WRS from WAAS correction processing and reduced LPV200 availability in Canada. See DR 133.
- Aug 24–25–The Iqaluit WRS went offline. The lack of observations from the region caused a reduction of LPV200 availability in Canada.
- Sep 2–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in Canada.
- Sep 6–Satellite maintenance elevated UDREs on PRN2 and reduced LPV availability in CONUS as well as LPV200 availability in CONUS and Canada.
- Sep 7–The Iqaluit WRS went offline. The lack of observations from the region caused a reduction of LPV200 coverage in Canada.
- Sep 11–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in Canada.
- Sep 11–18–Upgrades at the Washington DC, Atlanta, and Los Angeles C&V's reduced GIVE values and increased LPV200 availability in CONUS and Canada.
- Sep 12–The Iqaluit WRS went offline. The lack of observations from the region caused a reduction of LPV200 coverage in Canada.

4.0 COVERAGE

The WAAS coverage area evaluation estimates the percent of service volume where WAAS provided service for the operational service levels defined in Table 1-1. The WAAS message and GPS/GEO satellite status are used to determine WAAS availability across North America. For PA coverage, protection levels were calculated at 30-second intervals at 1-degree spacing over the PA service volume, whereas for NPA coverage, the protection levels were calculated at 30-second intervals at 5-degree spacing over the NPA service volume.

Daily PA analysis was conducted for LP, LPV, and LPV200 service levels. The PA coverage plots provide 100%, 99.9%, 99%, 98%, and 95% availability contours. Figure 4-1 shows the rollup LP North America coverage, Figure 4-2 shows the rollup LPV North America coverage, Figure 4-3 shows the rollup LPV200 North America coverage, Figure 4-4 shows the daily LPV and LPV200 CONUS coverage, Figure 4-5 shows the daily LPV Alaska coverage at 99% availability and ionosphere Kp index values, and Figure 4-6 shows the daily LPV and LPV200 Canada coverage at 99% availability and ionosphere Kp index values. See Appendix B for coverage plots of 98% LP and LPV availability contour and 99% LPV200 availability contour. Kp quantifies the disturbance in the Earth's magnetic field and is an indicator of solar storms causing geomagnetic disturbances, which can cause an unpredictable ionosphere. When the WAAS detects a disturbed ionosphere, it increases GIVE values that may result in unavailable PA service.

Figure 4-1 LP North America Coverage for the Quarter

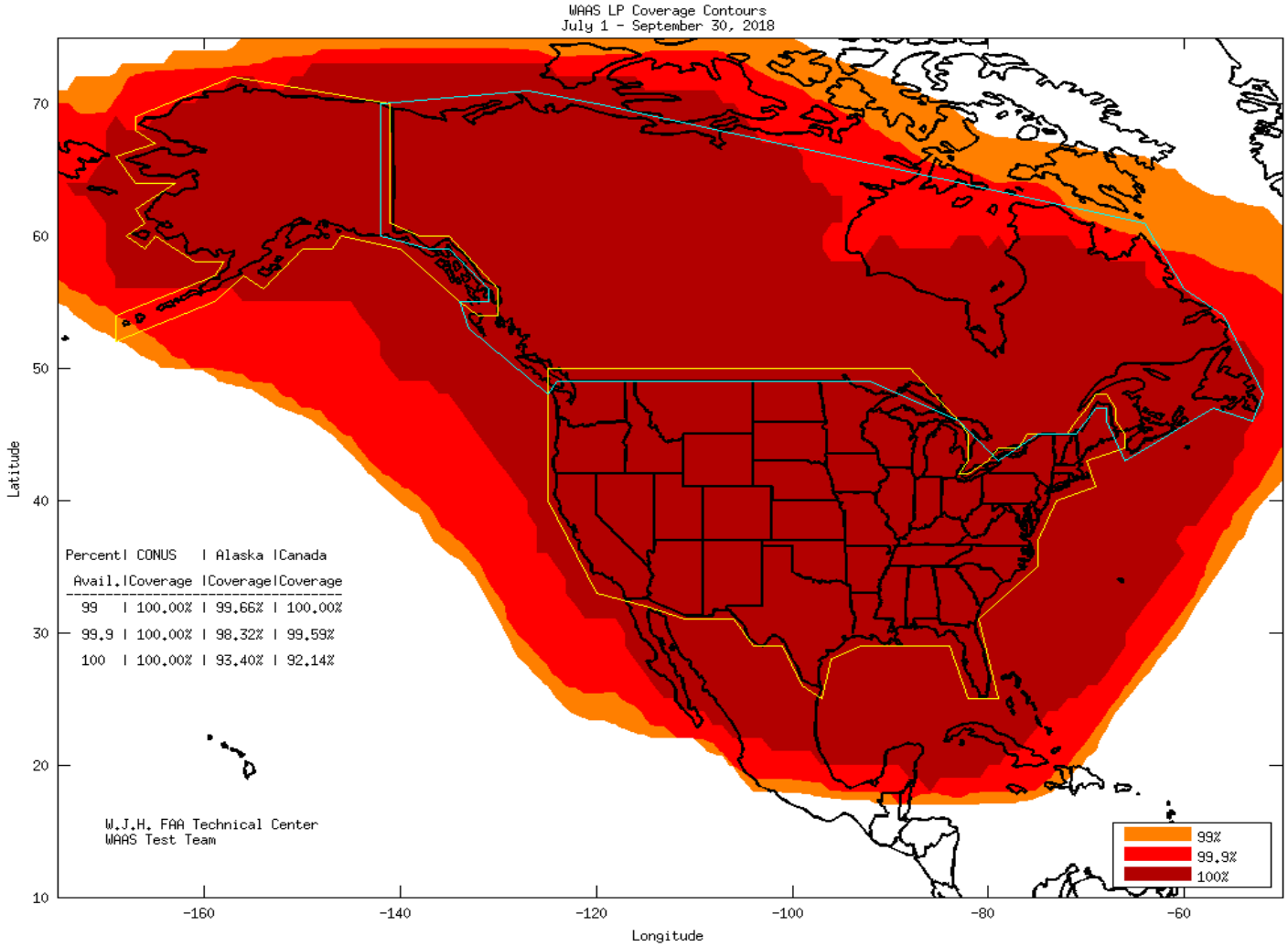


Figure 4-2 LPV North America Coverage for the Quarter

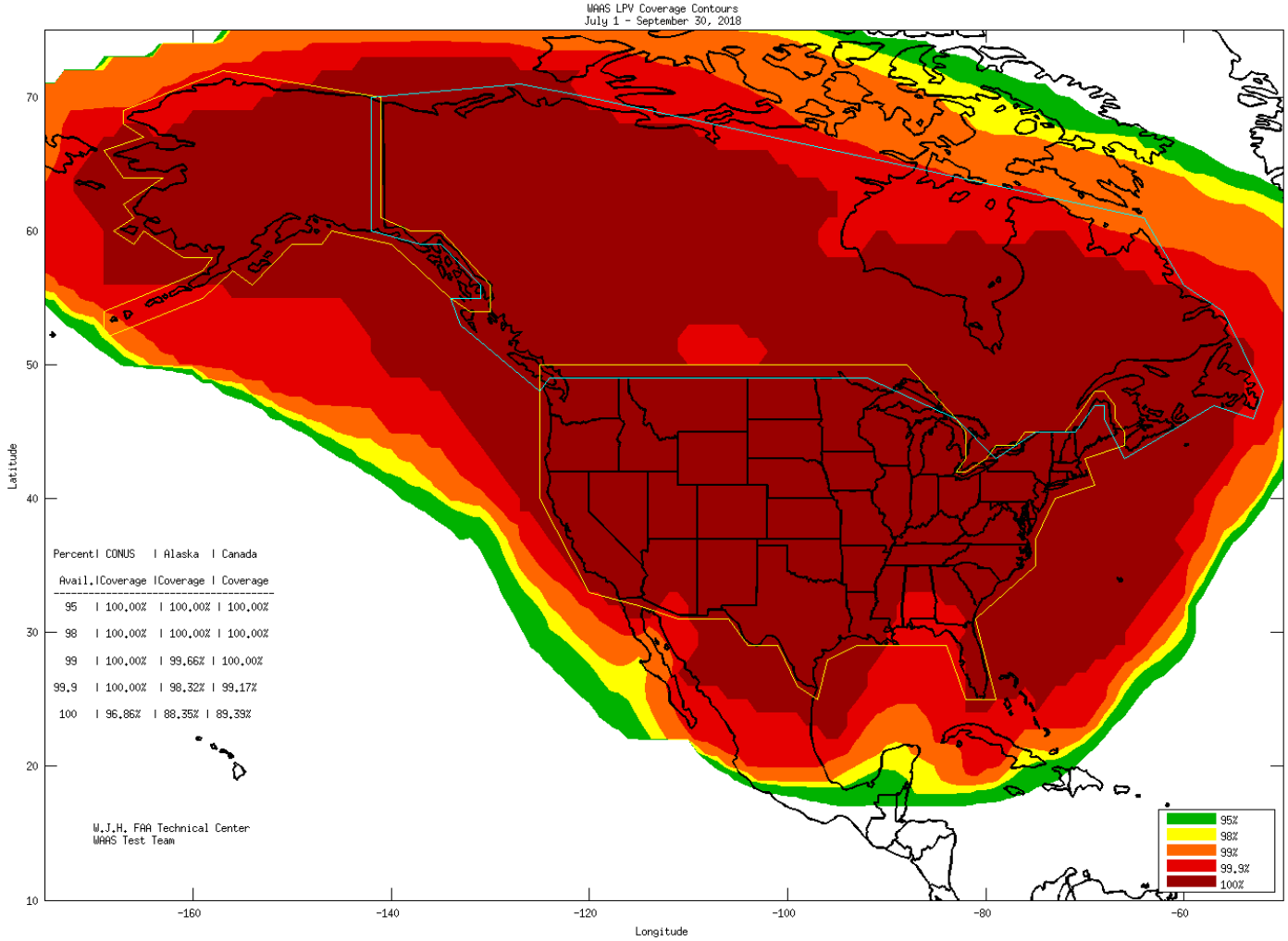


Figure 4-3 LPV200 North America Coverage for the Quarter

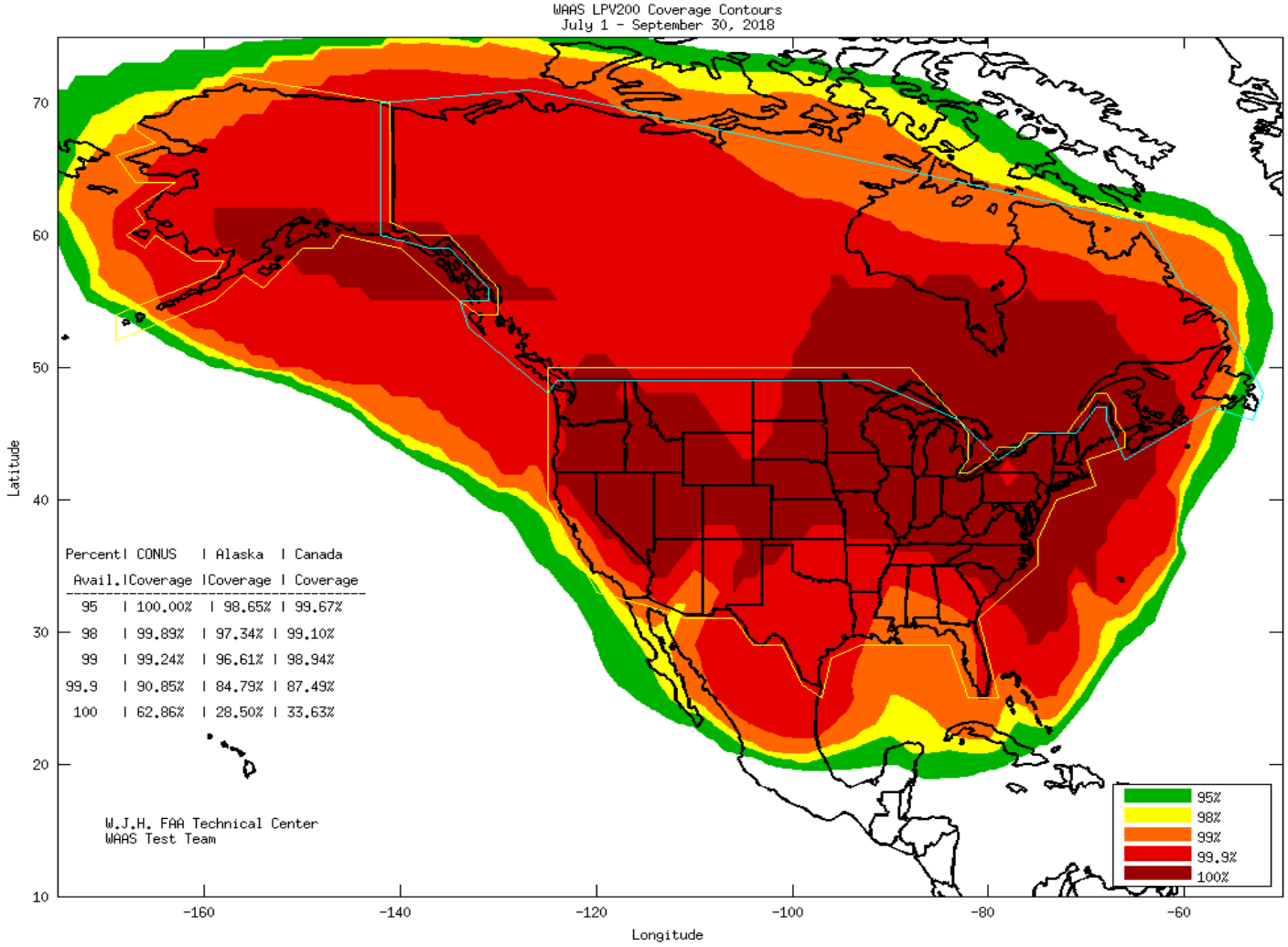


Figure 4-4 Daily LPV and LPV200 CONUS Coverage

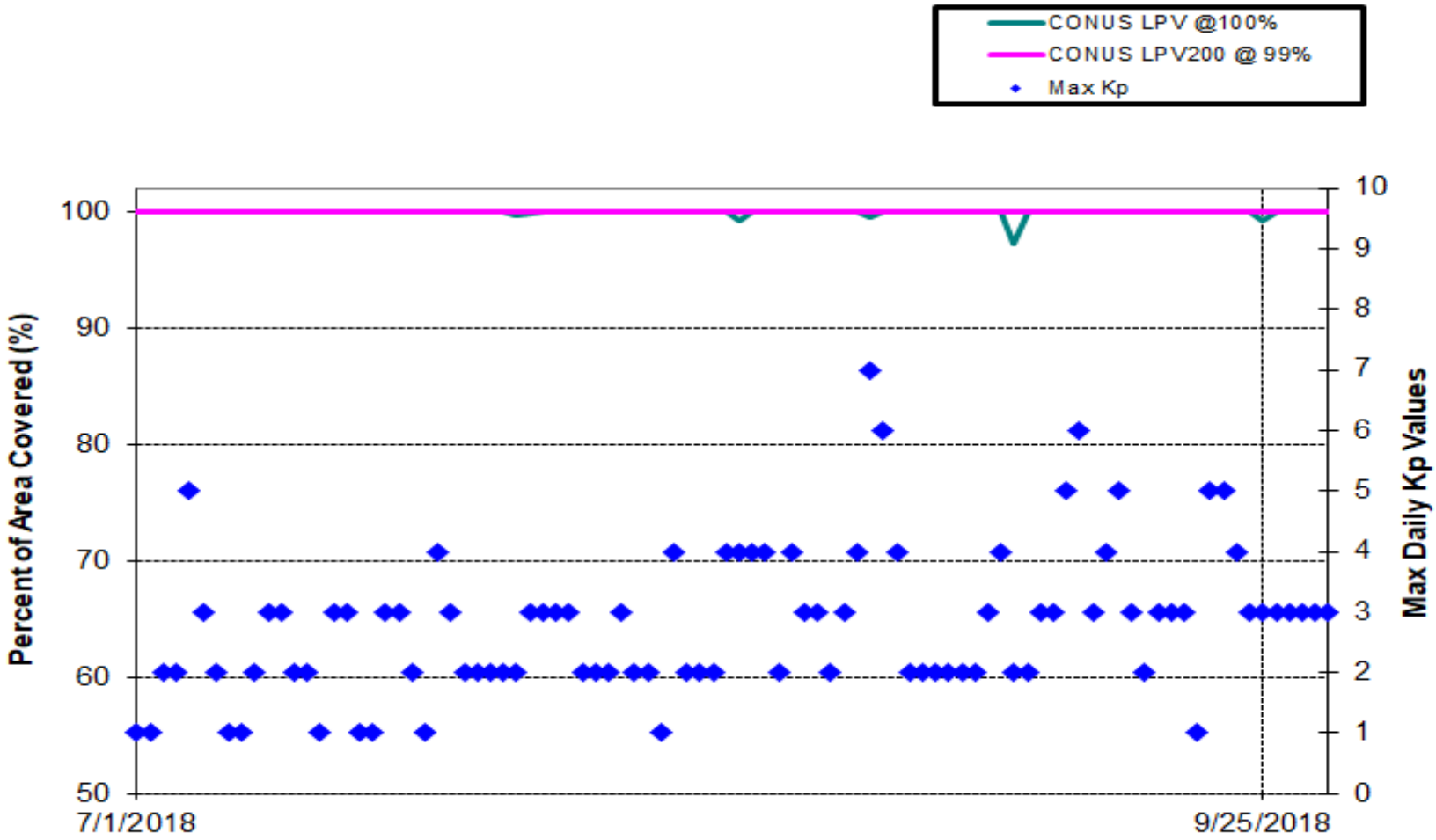


Figure 4-5 Daily LPV and LPV200 Alaska Coverage

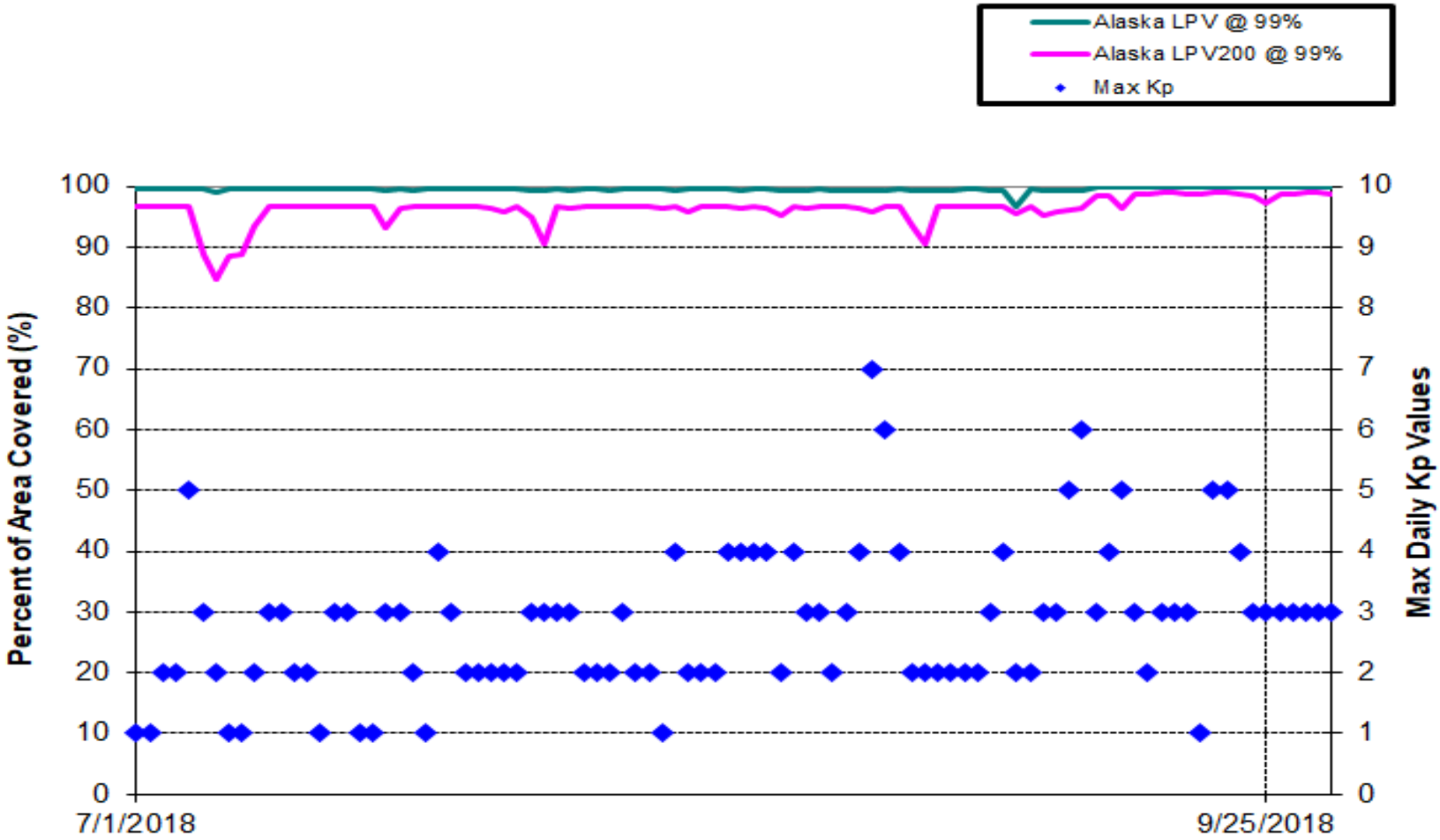
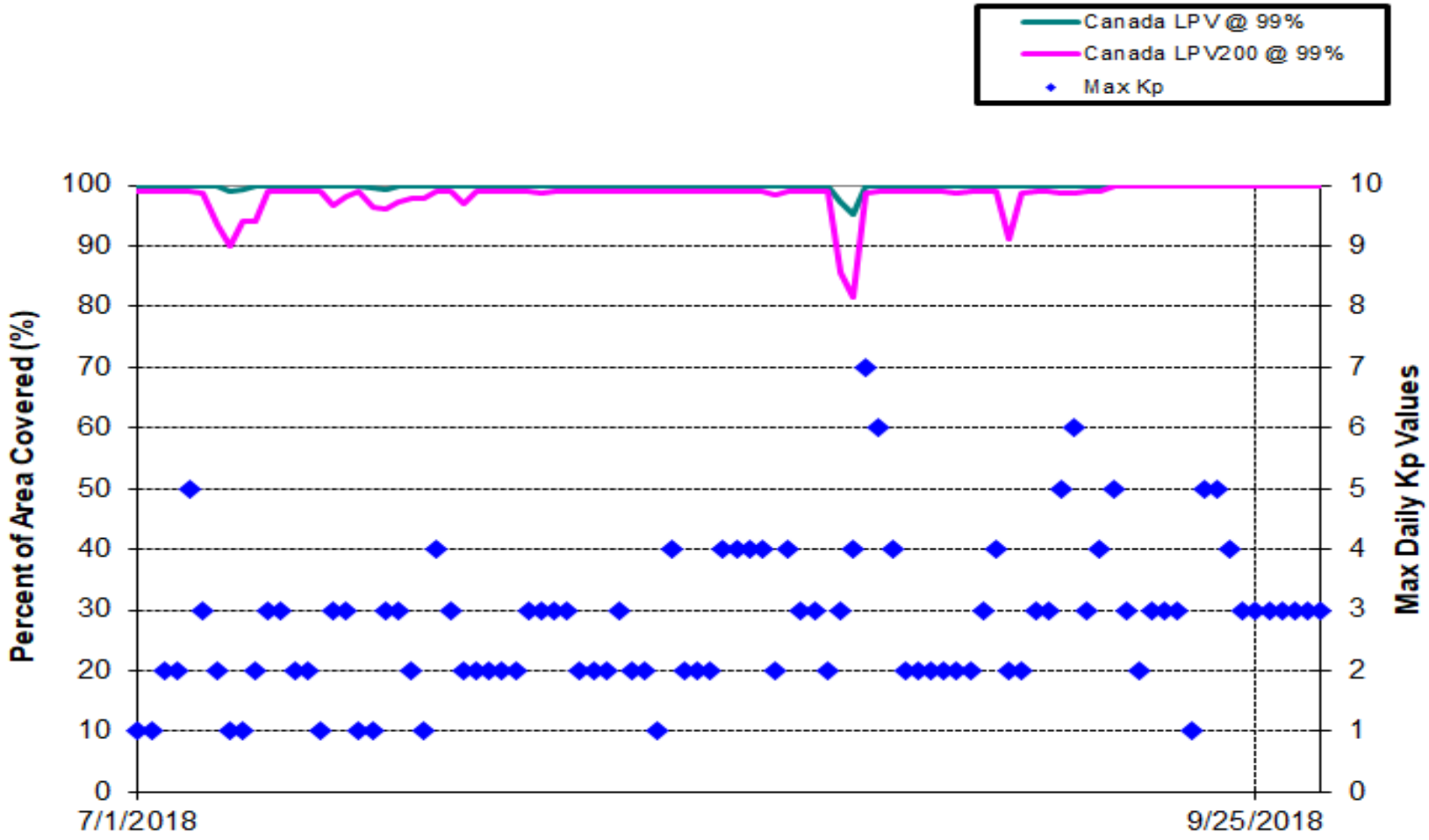


Figure 4-6 Daily LPV and LPV200 Canada Coverage



Daily analysis for NPA was conducted for the Required Navigation Performance (RNP) 0.1 and RNP 0.3 service levels based on a 100% availability requirement. The NPA coverage plots provide 100%, 99.9%, and 99% availability contours. Figure 4-7 shows the rollup RNP 0.1 coverage and Figure 4-8 shows the rollup RNP 0.3 coverage for the quarter. Figure 4-9 shows the daily RNP coverage at 100% availability and ionosphere Kp index values for this quarter.

Figure 4-7 RNP 0.1 Coverage for the Quarter

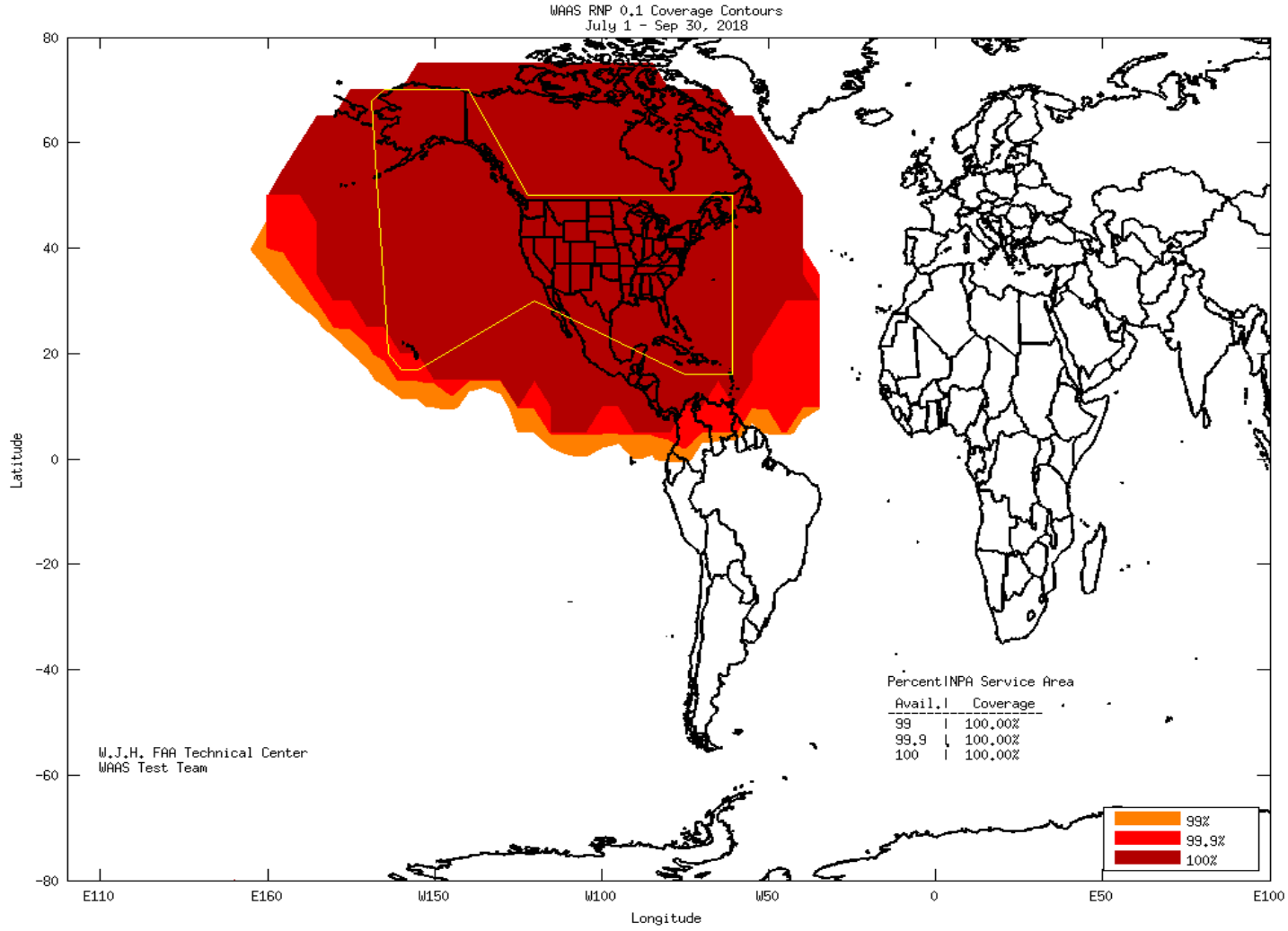


Figure 4-8 RNP 0.3 Coverage for the Quarter

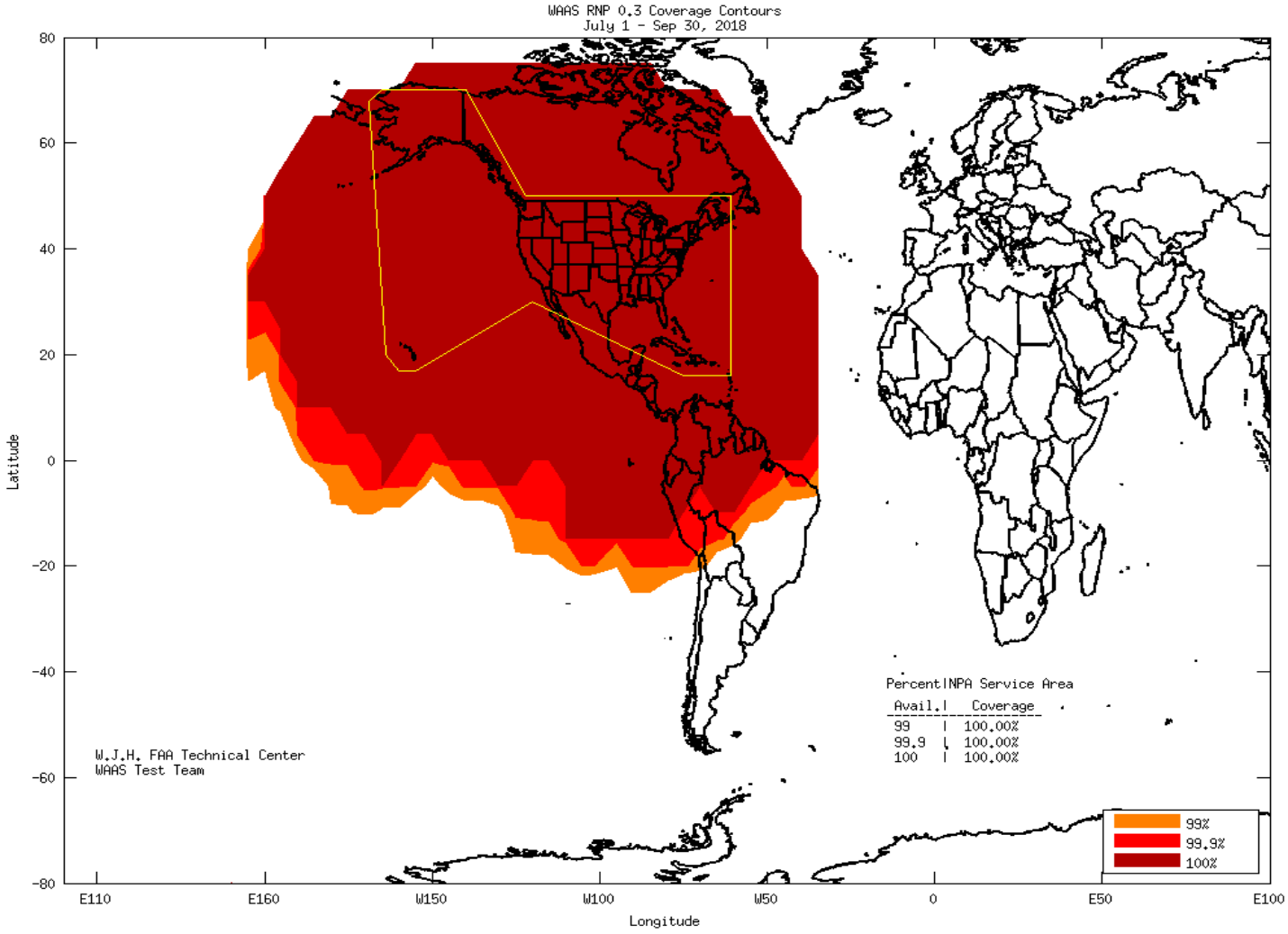
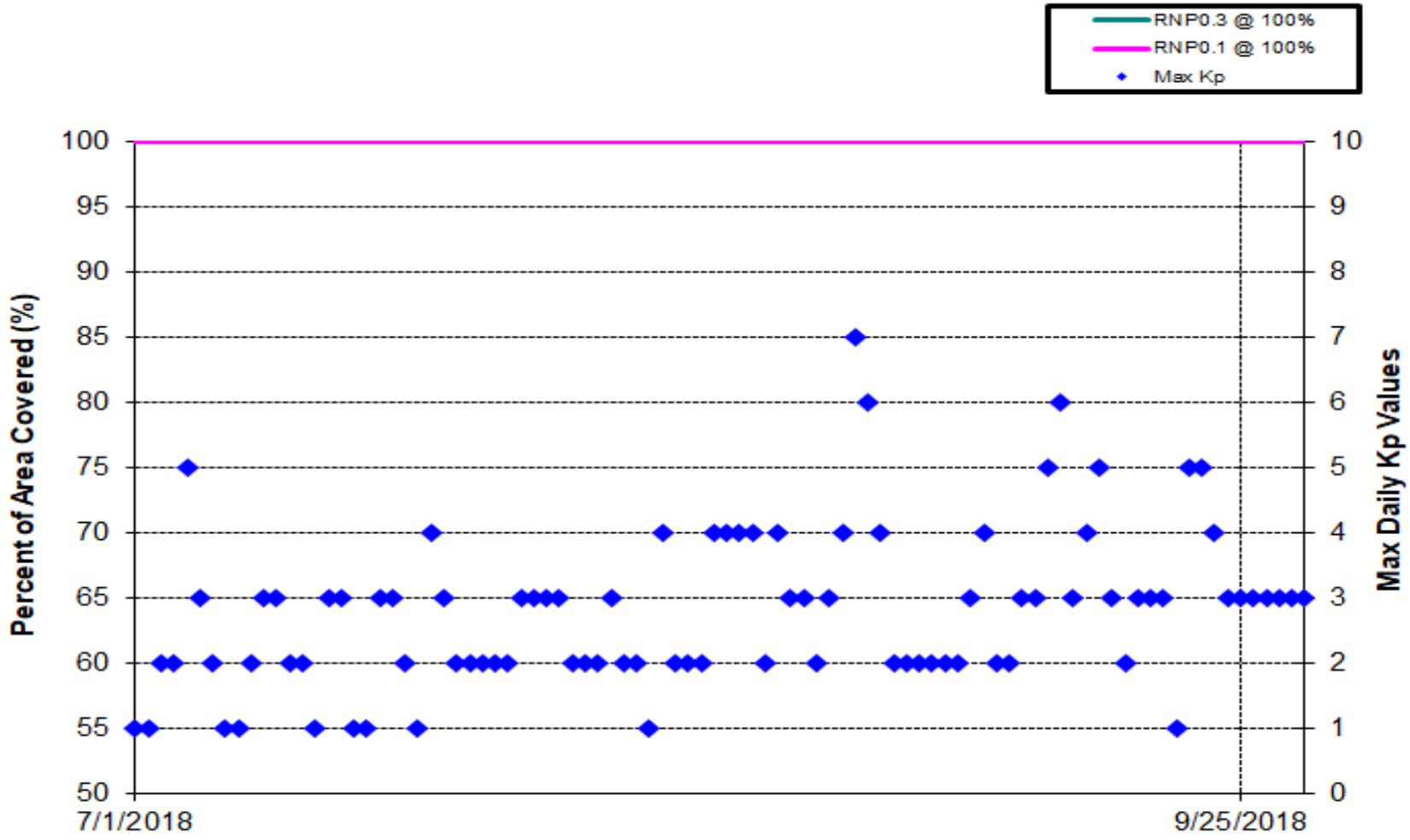


Figure 4-9 Daily RNP Coverage



The coverage decreases for this quarter were due to satellite outages, geomagnetic activity, communication outages, and elevated UDRE and GIVE values. Noteworthy events that affected coverage are:

- Jul 6–10–The Barrow WRS was taken offline for HVAC repairs. The lack of observations from BRW reduced LPV200 coverage in Alaska.
- Jul 7–10–A sub-frame reasonability warning and YFB PID Down fault removed Iqaluit WRS from WAAS correction processing and reduced LPV200 coverage in Canada. See DR 133.
- Jul 7–8–A GUS switchover on CRW caused a reduction of LPV200 coverage in CONUS.
- Jul 16–23 - A sub-frame reasonability warning and YFB PID Down fault removed Iqaluit WRS from WAAS correction processing and reduced LPV200 coverage in Canada. See DR 133.
- Jul 28–An SV alert on PRN21 elevated UDREs and reduced LPV200 coverage in Alaska and Canada.
- Jul 29–An SV alert on PRN21 elevated UDREs and reduced LPV200 coverage in CONUS.
- Jul 30–31–Communication outages from a number of Mexico sites reduced observations in the region and reduced LPV200 coverage in CONUS.
- Jul 31–A GUS switchover on SM9 caused a reduction of LPV200 coverage in Alaska.
- Aug 2–An SV alert on PRN21 elevated UDREs and reduced LPV200 coverage in CONUS (Montana) and Canada.
- Aug 12–Geomagnetic activity elevated GIVE values which reduced LPV200 coverage in Canada.
- Aug 16–Satellite maintenance elevated UDREs on PRN12 and reduced LPV200 coverage in CONUS.
- Aug 17–Geomagnetic activity elevated GIVE values which reduced LPV200 coverage in CONUS.
- Aug 19–20–A sub-frame reasonability warning and YFB PID Down fault removed Iqaluit WRS from WAAS correction processing and reduced LPV200 coverage in Canada. See DR 133.
- Aug 24–25–The Iqaluit WRS went offline. The lack of observations from the region caused a reduction of LPV200 coverage in Canada.
- Sep 2–Geomagnetic activity elevated GIVE values which reduced LPV200 coverage in Canada.
- Sep 6–Satellite maintenance elevated UDREs on PRN2 and reduced LPV coverage in CONUS as well as LPV200 coverage in CONUS and Canada.
- Sep 7–The Iqaluit WRS went offline. The lack of observations from the region caused a reduction of LPV200 coverage in Canada.
- Sep 11–Geomagnetic activity elevated GIVE values which reduced LPV200 coverage in Canada.
- Sep 11–18–Upgrades at the Washington DC, Atlanta, and Los Angeles C&V's reduced GIVE values and increased LPV200 coverage in CONUS and Canada.
- Sep 12–The Iqaluit WRS went offline. The lack of observations from the region caused a reduction of LPV200 coverage in Canada.

5.0 INTEGRITY

5.1 HMI Analysis

Integrity analysis includes the identification and evaluation of HMI as well as the generation of the safety index to illustrate the safety margin provided by WAAS protection levels. The safety index is a metric that shows how well the protection levels are bounding the maximum observed error when LPV service is available. The horizontal and vertical safety margin index is the ratio of HPL/HPE and VPL/VPE, respectively, at the time the maximum position error occurred. Section 2.0 provides a detailed description of the methodology for computing HPL, VPL, and position errors.

A computed safety margin index of greater than one indicates safe bounding of the greatest observed error, less than one indicates that the maximum error was not bounded, and a result equal to one means that the maximum position error was equal to the protection level. An HMI event occurs if the position error exceeds the protection level in the vertical or horizontal dimensions at any time and coupled with the passage of 6.2 seconds before this event is corrected by WAAS.

Table 5-1 lists the safety margin index and the number of HMI events. For this reporting period, the lowest safety margin index is 3.539 at Juneau and there were no HMI events. There has not been an HMI event since WAAS was

made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Horizontal Safety Index (meters)	Vertical Safety Index (meters)	Number of HMIs
Arcata	5.199	7.138	0
Atlantic City	7.495	5.110	0
Oklahoma City	10.043	9.838	0
Albuquerque	9.577	12.532	0
Anchorage	5.824	3.759	0
Atlanta	7.441	9.681	0
Barrow	6.709	7.432	0
Bethel	6.137	5.343	0
Billings	5.737	7.888	0
Boston	9.344	6.429	0
Chicago	10.434	7.503	0
Cleveland	10.752	5.358	0
Cold Bay	14.075	8.079	0
Dallas	7.675	7.450	0
Denver	8.338	7.679	0
Fairbanks	4.139	5.409	0
Gander	9.611	7.179	0
Goose Bay	6.028	7.135	0
Houston	13.550	7.869	0
Iqaluit	6.671	6.731	0
Jacksonville	7.643	10.886	0
Juneau	3.539	5.464	0
Kansas City	6.713	5.972	0
Kotzebue	7.418	6.066	0
Los Angeles	7.313	7.104	0
Memphis	7.273	6.403	0
Merida	15.333	12.899	0
Mexico City	18.588	16.672	0
Miami	8.700	14.407	0
Minneapolis	5.470	7.153	0
New York	8.325	8.406	0
Oakland	18.174	7.099	0
Puerto Vallarta	15.244	11.834	0
Salt Lake City	9.684	9.440	0
San Jose Del Cabo	12.906	9.844	0
Seattle	7.695	9.003	0
Washington DC	6.238	7.296	0
Winnipeg	4.821	4.378	0

5.2 Broadcast Alerts

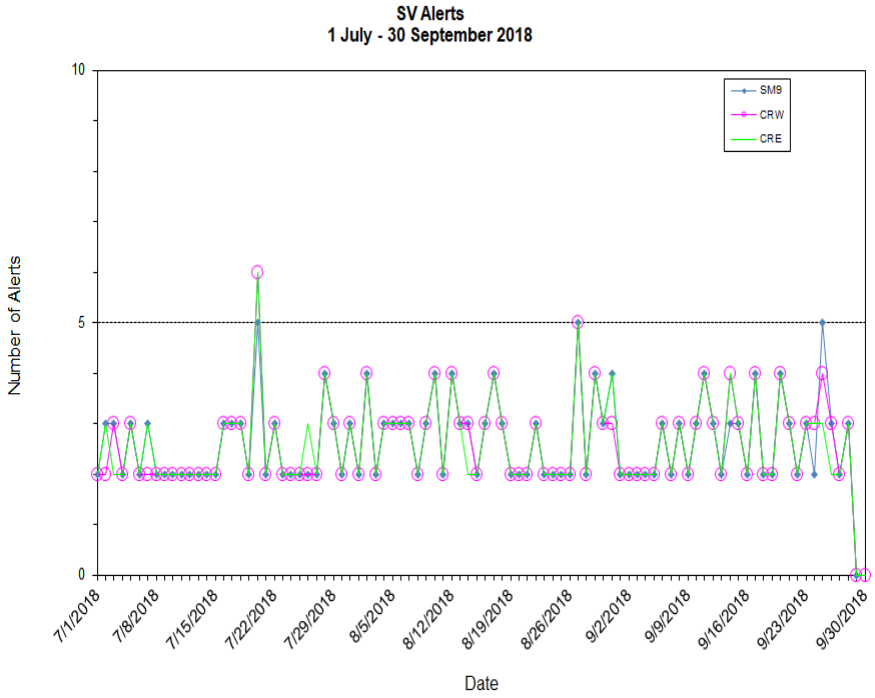
The WAAS transmits alert messages for user protection when the active WAAS corrections are no longer bound by the UDREs. Alerts increase the UDRE for one or more PRNs, which can reduce the weighting of the satellite or exclude the satellite from the navigation solution. An increase in UDREs after an alert effectively increases the user protection levels (HPL and VPL), which affects the availability. Additionally, if an alert message sequence lasts for more than 12 seconds, the WAAS fast corrections can time out and cause a loss of continuity. Table 5-2 shows the total number of alerts and the average number of alerts per day.

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**SM9**	**CRW**	**CRE**	**SM9**	**CRW**	**CRE**
T2	182	180	182	1.9783	1.9565	1.9783
T3	33	33	34	0.3587	0.3587	0.3696
T4	7	8	7	0.0761	0.0870	0.0761
T5	0	0	0	0.0000	0.0000	0.0000
T6	0	0	0	0.0000	0.0000	0.0000
T24	0	0	0	0.0000	0.0000	0.0000
T26	0	0	0	0.0000	0.0000	0.0000
Total SV Alerts	222	221	223	2.4130	2.4022	2.4239
Days in Service	92	92	92			

Figure 5-1 provides the daily SV alerts. The number of alerts on one GEO is often the same as the number of alerts on the other GEO, therefore, lines tend to overlap in most points on this plot.

Figure 5-1 SV Daily Alert Trend



5.3 Availability of WAAS Messages (SM9, CRW, and CRE)

Accurate and current calculations of user position are dependent on the broadcast and receipt of the WAAS message within precise time specifications. This aspect of the WAAS is critical to maintaining continuity requirements. Each message type in the WAAS SIS has a specific timeout interval and expected worst-case broadcast interval. Table 5-3 lists the maximum intervals at which each message must broadcast to meet system requirements.

Table 5-3 Update Rates for WAAS Messages

Data	Associated Message Types	Maximum Update Interval (seconds)	En Route, Terminal, NPA Timeout (seconds)	Precision Approach Timeout (seconds)
WAAS in Test Mode	0	6	N/A	N/A
PRN Mask	1	60	None	None
UDREI	2-6, 24	6	18	12
Fast Corrections	2-5, 24	See Table A-8 in RTCA DO-229C	See Table A-8 in RTCA DO-229C	See Table A-8 in RTCA DO-229C
Long Term Corrections	24, 25	120	360	240
GEO Nav. Data	9	120	360	240
Fast Correction Degradation	7	120	360	240
Weighting Factors	8	120	240	240
Degradation Parameters	10	120	360	240
Ionospheric Grid Mask	18	300	None	None
Ionospheric Corrections	26	300	600	600
UTC Timing Data	12	300	None	None
Almanac Data	17	300	None	None

GUS switchovers and broadcast WAAS alerts can interrupt the normal broadcast message stream. If these events occur when the maximum interval of a specific message is approaching, that message may be delayed, resulting in its late transmittal.

For this quarter, statistics reported for late messages were mainly caused by GEO SIS outages, GUS switchovers, and SV alerts; excluding message type 7 and 10. Furthermore, the delay of message types 7 and 10 had little or no impact on user performance and safety, and were not caused by GEO SIS outages, GUS switchovers, or SV alerts. Table 5-4 through Table 5-8 show statistics for fast correction, long correction, ephemeris covariance, ionosphere correction, and ionospheric mask message rates broadcasted on SM9 GEO. Table 5-9 through Table 5-13 show statistics for message rates broadcasted on CRW GEO. Table 5-14 through Table 5-18 show statistics for message rates broadcasted on CRE GEO.

Table 5-4 WAAS Fast Correction and Degradation Message Rates–SM9

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	98670	2	133
2	1224469	39	25
3	1224014	48	28
4	1223895	80	22
7	91900	7	137
9	86055	2	179
10	91940	18	183
17	29259	1	510

Table 5-5 WAAS Long Correction Message Rates (Type 24 and 25)–SM9

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	45343	2	168
2	43903	0	0
3	44828	0	0
5	44302	0	0
6	44207	0	0
7	43815	1	179
8	45001	1	170
9	42875	0	0
10	42770	0	0
11	45209	1	166
12	43377	0	0
13	45563	0	0
14	43460	0	0
15	44459	1	168
16	44401	0	0
17	44008	0	0
18	45694	0	0
19	42513	1	150
20	42724	1	180
21	44580	1	180
22	44862	0	0
23	43911	1	170
24	45988	0	0
25	45267	0	0
26	44801	0	0
27	45555	0	0
28	44207	0	0
29	43930	0	0
30	43787	0	0
31	44367	0	0
32	43102	0	0

Table 5-6 WAAS Ephemeris Covariance Message Rates (Type 28)–SM9

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	37260	1	138
2	36073	1	176
3	36810	1	174
5	36349	0	0
6	36234	0	0
7	35981	0	0
8	36944	1	212
9	35181	1	179
10	35102	0	0
11	37114	0	0
12	35632	0	0
13	37456	3	176
14	35740	1	152
15	36485	0	0
16	36418	0	0
17	36140	1	174
18	37493	2	226
19	34900	0	0
20	35075	0	0
21	36630	1	147
22	36900	0	0
23	36073	1	178
24	37815	0	0
25	37201	0	0
26	36792	0	0
27	37438	5	212
28	36296	0	0
29	36101	0	0
30	35968	1	129
31	36397	1	126
32	35373	0	0
131	70554	1	4643
135	70553	1	136
138	70543	2	208

Table 5-7 WAAS Ionospheric Correction Message Rates (Type 26)–SM9

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	25500	6	305
0	1	25489	5	305
0	2	25485	9	306
1	0	25482	8	306
1	1	25501	5	305
1	2	25480	12	495
1	3	25486	9	513
1	4	25486	6	529
2	0	25479	13	501
2	1	25485	8	512
2	2	25494	7	501
2	3	25485	8	509
2	4	25482	4	365
3	0	25486	8	342
3	1	25484	5	548
3	2	25494	11	548
9	0	25479	14	525
9	1	25494	7	529
9	2	25495	5	576
9	3	25491	10	349
9	4	25486	3	348
9	5	25504	5	341
9	6	25480	5	355

Table 5-8 WAAS Ionospheric Mask Message Rates (Type 18)–SM9

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	33351	1	314
1	33356	0	0
2	33358	1	311
3	33311	1	439
9	33312	0	0

Table 5-9 WAAS Fast Correction and Degradation Message Rates–CRW

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	97071	1	128
2	1224458	39	24
3	1224003	52	24
4	1223887	84	21
7	90558	12	130
9	86050	0	0
10	90512	11	162
17	29131	4	351

Table 5-10 WAAS Long Correction Message Rates (Type 24 and 25)–CRW

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	45346	0	0
2	43901	0	0
3	44822	0	0
5	44291	0	0
6	44203	1	182
7	43811	0	0
8	44991	1	163
9	42864	0	0
10	42767	0	0
11	45219	1	172
12	43375	0	0
13	45552	0	0
14	43449	0	0
15	44443	1	170
16	44404	0	0
17	44009	0	0
18	45696	0	0
19	42510	0	0
20	42709	0	0
21	44562	0	0
22	44855	1	182
23	43910	0	0
24	45980	1	163
25	45257	0	0
26	44790	0	0
27	45532	0	0
28	44183	0	0
29	43920	0	0
30	43778	1	170
31	44371	0	0
32	43093	0	0

Table 5-11 WAAS Ephemeris Covariance Message Rates (Type 28)–CRW

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	37265	2	152
2	36050	0	0
3	36817	3	209
5	36349	0	0
6	36233	2	209
7	35979	0	0
8	36931	0	0
9	35158	1	154
10	35083	4	176
11	37115	4	176
12	35634	1	169
13	37424	3	216
14	35730	0	0
15	36490	1	129
16	36432	0	0
17	36131	2	178
18	37495	5	216
19	34901	1	142
20	35049	8	222
21	36617	1	176
22	36908	0	0
23	36071	0	0
24	37779	2	162
25	37189	1	141
26	36797	0	0
27	37398	3	210
28	36283	4	171
29	36081	0	0
30	35956	0	0
31	36398	0	0
32	35363	2	169
131	70524	3	4625
135	70533	2	195
138	70555	4	209

Table 5-12 WAAS Ionospheric Correction Message Rates (Type 26)–CRW

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	25486	6	367
0	1	25491	9	356
0	2	25468	8	357
1	0	25470	14	350
1	1	25482	9	531
1	2	25466	12	582
1	3	25471	12	508
1	4	25480	7	512
2	0	25474	9	496
2	1	25495	8	514
2	2	25468	10	537
2	3	25481	5	526
2	4	25478	6	509
3	0	25480	8	513
3	1	25474	7	320
3	2	25486	3	511
9	0	25487	5	500
9	1	25478	9	507
9	2	25476	6	489
9	3	25471	8	489
9	4	25478	6	512
9	5	25472	9	368
9	6	25489	3	368

Table 5-13 WAAS Ionospheric Mask Message Rates (Type 18)–CRW

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	33182	0	0
1	33135	1	325
2	33122	0	0
3	33145	2	328
9	33142	1	345

Table 5-14 WAAS Fast Correction and Degradation Message Rates–CRE

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	95726	3	145
2	1224463	40	21
3	1224006	51	26
4	1223887	82	25
7	89355	13	134
9	86045	2	177
10	89259	14	131
17	28988	3	351

Table 5-15 WAAS Long Correction Message Rates (Type 24 and 25)–CRE

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	45337	0	0
2	43893	0	0
3	44819	0	0
5	44285	1	169
6	44200	1	169
7	43814	0	0
8	44998	0	0
9	42866	0	0
10	42781	0	0
11	45197	0	0
12	43371	0	0
13	45559	0	0
14	43462	0	0
15	44452	0	0
16	44398	0	0
17	44009	0	0
18	45696	0	0
19	42516	0	0
20	42698	1	169
21	44555	0	0
22	44852	1	169
23	43911	0	0
24	45981	0	0
25	45263	0	0
26	44786	0	0
27	45553	0	0
28	44192	0	0
29	43917	0	0
30	43776	0	0
31	44374	0	0
32	43099	0	0

Table 5-16 WAAS Ephemeris Covariance Message Rates (Type 28)–CRE

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	37258	1	128
2	36057	0	0
3	36811	0	0
5	36347	0	0
6	36240	1	121
7	35967	3	168
8	36936	2	190
9	35175	0	0
10	35093	11	205
11	37107	2	190
12	35624	1	199
13	37426	1	187
14	35737	0	0
15	36470	0	0
16	36416	1	121
17	36135	0	0
18	37493	4	144
19	34903	1	160
20	35064	7	206
21	36631	0	0
22	36900	1	145
23	36080	2	186
24	37798	2	205
25	37192	1	168
26	36776	0	0
27	37434	4	202
28	36285	2	129
29	36082	1	208
30	35969	0	0
31	36408	1	199
32	35346	2	144
131	70475	3	4691
135	70565	1	168
138	70561	2	4256

Table 5-17 WAAS Ionospheric Correction Message Rates (Type 26)–CRE

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	25480	5	464
0	1	25484	5	449
0	2	25482	6	445
1	0	25482	4	305
1	1	25476	6	305
1	2	25490	7	464
1	3	25476	5	477
1	4	25479	6	483
2	0	25494	7	504
2	1	25482	6	578
2	2	25472	7	583
2	3	25485	7	484
2	4	25474	14	480
3	0	25476	8	464
3	1	25480	8	431
3	2	25472	5	432
9	0	25475	6	445
9	1	25484	8	476
9	2	25488	7	530
9	3	25478	9	547
9	4	25471	9	548
9	5	25486	7	451
9	6	25481	4	451

Table 5-18 WAAS Ionospheric Mask Message Rates (Type 18)–CRE

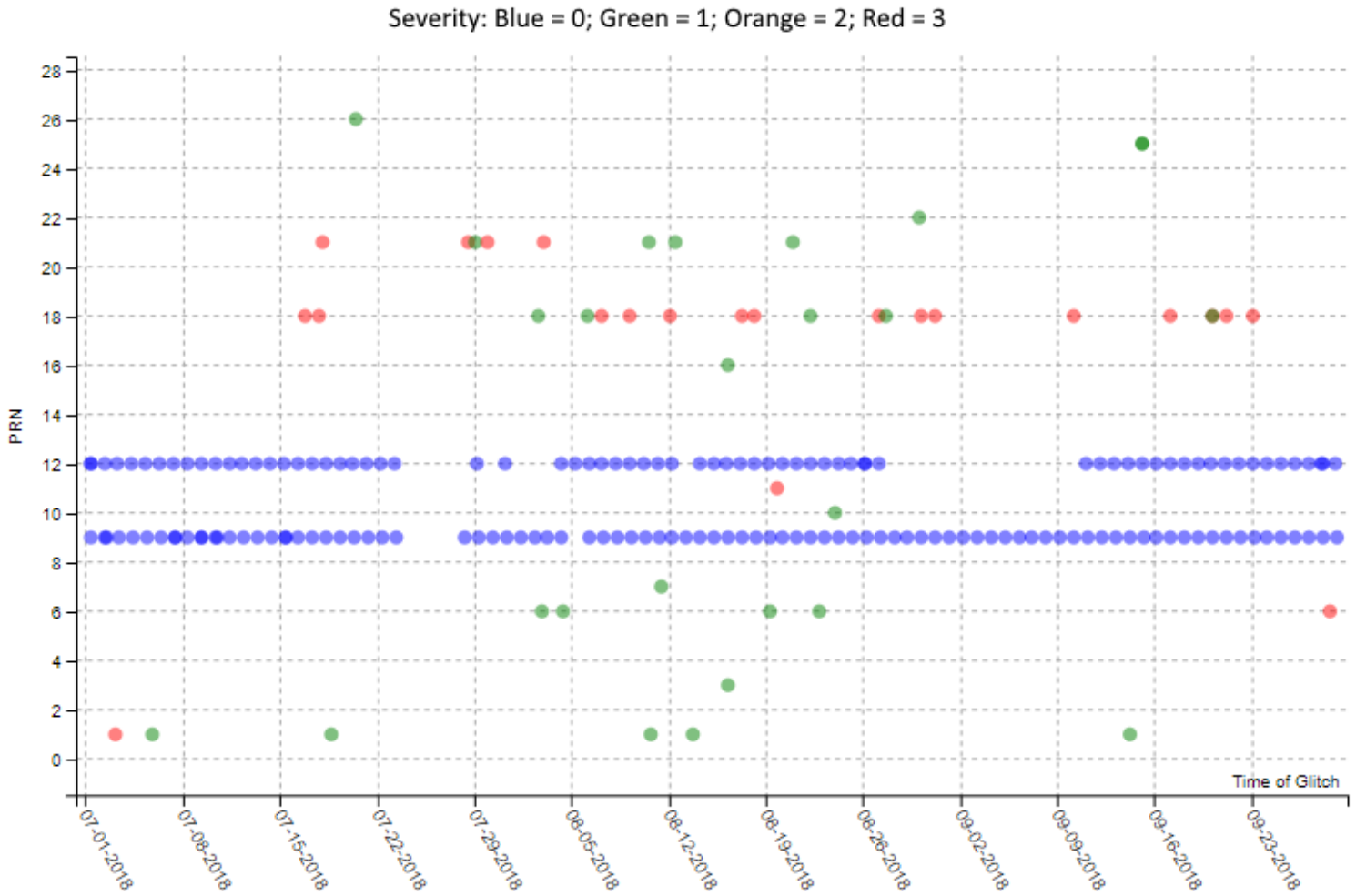
Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	32918	0	0
1	32983	0	0
2	32969	1	361
3	33010	2	354
9	32971	2	379

5.4 Satellite Glitches

The GPS satellites will occasionally experience periods of signal carrier stability glitches of varying magnitude. These glitches are short degradations in the signal, which in severe cases may cause WAAS to lose track or cycle slip for some or all of the WAAS receivers. The more severe glitches will cause the WAAS-reported UDRE to increase to "Not Monitor" and result in an alert.

Figure 5-2 shows satellite glitches visible to WAAS for the quarter. Glitches are categorized into four severity levels. Severity zero glitches occur when a WAAS reference station receiver tracks more than 14 satellites. The WAAS reference station software is limited to sending data for no more than 14 satellites. Severity one glitches cause a significant number of the receivers to report bad subframe parity data, cycle slips, or when the receivers lose track of L1 and/or L2. Severity two glitches cause all of the receivers to report bad subframe parity data and no SQM data. Severity three glitches cause all of the receivers to lose track of both L1 and L2. For this reporting period, severity zero glitches were observed for a short period of time daily on PRN9 and PRN12 when more than 14 GPS satellites were visible to the Alaska region.

Figure 5-2 SV Glitch Trend



6.0 SV RANGE ACCURACY

Range accuracy evaluation computes the probability that the WAAS UDRE and GIVE statistically bound 99.9% of the range residuals for each satellite tracked by the receiver. A UDRE is broadcasted by the WAAS for each monitored satellite and the 99.9% bound (3.29 sigma) of the pseudorange residual error after application of fast and long-term corrections is checked. The pseudorange residual error is determined by taking the difference between the raw pseudorange and a calculated reference range. The reference range is equal to the true range between the corrected satellite position and surveyed user antenna plus all corrections (i.e., WAAS fast clock, WAAS long-term clock, WAAS ionospheric delay, tropospheric delay, receiver clock bias, and multipath). Because the true ionospheric delay and multipath error are not precisely known, the estimated variance in these error sources are added to the UDRE before comparing it to the residual error.

The GPS satellite range residual errors were calculated for 12 WAAS receivers during the quarter. Table 6-1 and Table 6-2 show the range error 95% index and 99.9% bounding statistics for each SV at the selected locations. Figure 6-1 and Figure 6-2 show the 95% range error for each SV measured by the WAAS receivers at the Chicago reference station.

Table 6-1 Range Error 95% Index and 99.9% Bounding

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1*	1.774	100	1.355	100	1.321	100	0.716	100	0.873	100	0.880	100
2	1.529	100	1.669	100	0.827	100	1.184	100	1.439	100	1.060	100
3*	1.355	100	1.904	100	1.640	100	0.956	100	1.232	100	1.412	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	1.817	100	1.327	100	0.834	100	1.384	100	1.136	100	0.819	100
6*	1.344	100	0.999	100	0.889	100	0.936	100	1.009	100	1.025	100
7	2.098	100	1.199	100	1.367	100	1.412	100	1.322	100	0.766	100
8*	1.922	100	1.496	100	1.217	100	1.335	100	1.031	100	0.932	100
9*	2.125	100	1.715	100	1.416	100	1.344	100	0.957	100	0.776	100
10	1.904	100	1.599	100	1.102	100	1.343	100	0.844	100	0.888	100
11	1.908	100	1.425	100	1.350	100	1.220	100	0.962	100	1.172	100
12	2.081	100	1.271	100	1.359	100	1.222	100	1.182	100	1.060	100
13	2.137	100	1.172	100	1.659	100	1.239	100	1.007	100	0.761	100
14	1.863	100	2.050	100	1.023	100	1.225	100	1.342	100	1.062	100
15	1.897	100	1.224	100	0.967	100	1.241	100	0.990	100	0.831	100
16	1.635	100	1.112	100	1.367	100	1.132	100	0.833	100	0.812	100
17	1.637	100	1.744	100	1.323	100	1.155	100	1.611	100	1.188	100
18	3.431	100	2.410	100	2.190	100	2.659	100	1.804	100	1.881	100
19	1.883	100	1.955	100	1.119	100	1.182	100	1.339	100	1.218	100
20	2.006	100	1.173	100	0.909	100	1.239	100	1.073	100	0.997	100
21	1.773	100	1.959	100	1.299	100	1.180	100	0.963	100	0.952	100
22	1.850	100	1.510	100	1.103	100	1.539	100	1.105	100	0.927	100
23	1.738	100	1.405	100	1.263	100	1.138	100	1.613	100	0.783	100
24*	1.626	100	1.041	100	1.007	100	1.249	100	1.262	100	0.905	100
25*	1.981	100	1.335	100	1.147	100	1.223	100	1.348	100	1.314	100
26*	1.974	100	1.182	100	1.081	100	1.178	100	0.742	100	0.999	100
27*	2.116	100	1.275	100	1.342	100	1.020	100	0.724	100	0.781	100
28	2.216	100	1.939	100	1.548	100	1.707	100	1.083	100	0.957	100
29	1.886	100	1.012	100	0.771	100	1.217	100	1.260	100	0.951	100
30*	2.037	100	1.289	100	1.148	100	1.203	100	0.963	100	0.746	100
31	1.623	100	1.206	100	0.807	100	1.021	100	1.017	100	0.865	100
32	2.008	100	1.412	100	1.142	100	1.207	100	1.265	100	1.160	100
131	1.956	100	2.101	100	1.659	100	1.720	100	2.072	100	1.614	100
135	2.455	100	2.511	100	1.631	100	1.732	100	2.154	100	2.195	100
138	1.615	100	1.283	100	1.710	100	1.653	100	1.526	100	1.180	100

*Note: Reduced ranging bounding on Block IIF space vehicles is due to the difference between L1 C/A and L1P satellite signal delays.

Table 6-2 Range Error 95% Index and 99.9% Bounding

Site	Billings		Miami		Albuquerque		Kansas City		Los Angeles		Atlanta	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1*	0.790	100	0.895	100	0.763	100	1.686	100	1.084	100	0.853	100
2	1.687	100	1.878	100	0.994	100	1.424	100	0.915	100	0.838	100
3*	0.946	100	0.901	100	0.849	100	1.353	100	1.001	100	1.017	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	1.025	100	0.970	100	1.064	100	2.136	100	0.905	100	0.917	100
6*	1.184	100	1.295	100	1.214	100	1.650	100	0.952	100	0.868	100
7	0.677	100	1.935	100	0.800	100	0.988	100	0.969	100	0.819	100
8*	1.150	100	0.966	100	0.950	100	1.149	100	1.196	100	1.116	100
9*	0.979	100	0.950	100	0.875	100	1.160	100	0.988	100	1.027	100
10	2.427	100	0.828	100	0.828	100	0.950	100	1.019	100	0.825	100
11	1.280	100	1.023	100	1.179	100	1.555	100	1.376	100	1.143	100
12	0.894	100	1.119	100	0.909	100	1.497	100	0.930	100	0.979	100
13	1.225	100	1.180	100	0.774	100	1.166	100	0.814	100	0.960	100
14	0.803	100	0.722	100	0.941	100	1.040	100	0.861	100	0.666	100
15	1.411	100	1.146	100	0.907	100	1.301	100	1.416	100	0.827	100
16	1.230	100	0.918	100	1.131	100	1.306	100	1.229	100	0.766	100
17	1.539	100	1.118	100	0.729	100	1.212	100	0.786	100	0.823	100
18	2.033	100	1.778	100	2.026	100	2.239	100	2.042	100	1.868	100
19	0.893	100	0.884	100	1.059	100	1.083	100	0.854	100	0.934	100
20	0.726	100	2.177	100	0.803	100	1.275	100	0.892	100	0.895	100
21	1.097	100	0.833	100	0.680	100	1.049	100	0.811	100	0.978	100
22	1.438	100	1.032	100	0.933	100	0.979	100	1.003	100	1.004	100
23	0.782	100	1.149	100	0.938	100	1.029	100	1.367	100	0.785	100
24*	0.823	100	1.058	100	0.836	100	1.400	100	1.065	100	0.787	100
25*	1.473	100	1.069	100	0.964	100	1.467	100	1.001	100	0.873	100
26*	0.730	100	0.951	100	0.960	100	1.033	100	1.551	100	0.766	100
27*	0.986	100	1.395	100	1.304	100	1.168	100	0.928	100	0.805	100
28	1.105	100	1.020	100	0.824	100	1.205	100	0.994	100	0.976	100
29	1.113	100	0.788	100	1.070	100	1.493	100	0.905	100	0.976	100
30*	1.569	100	0.796	100	0.674	100	1.033	100	0.980	100	0.736	100
31	1.013	100	0.957	100	0.908	100	2.312	100	1.293	100	0.880	100
32	1.266	100	1.524	100	0.995	100	0.986	100	1.024	100	0.995	100
131	2.359	100	1.690	100	1.639	100	3.235	100	1.428	100	1.458	100
135	1.840	100	2.113	100	1.581	100	2.313	100	1.675	100	1.569	100
138	1.529	100	2.068	100	1.385	100	2.004	100	3.168	100	1.358	100

*Note: Reduced ranging bounding on Block IIF space vehicles is due to the difference between L1 C/A and L1P satellite signal delays.

Figure 6-1 Range Error (PRN1 – PRN16) – Washington D.C.

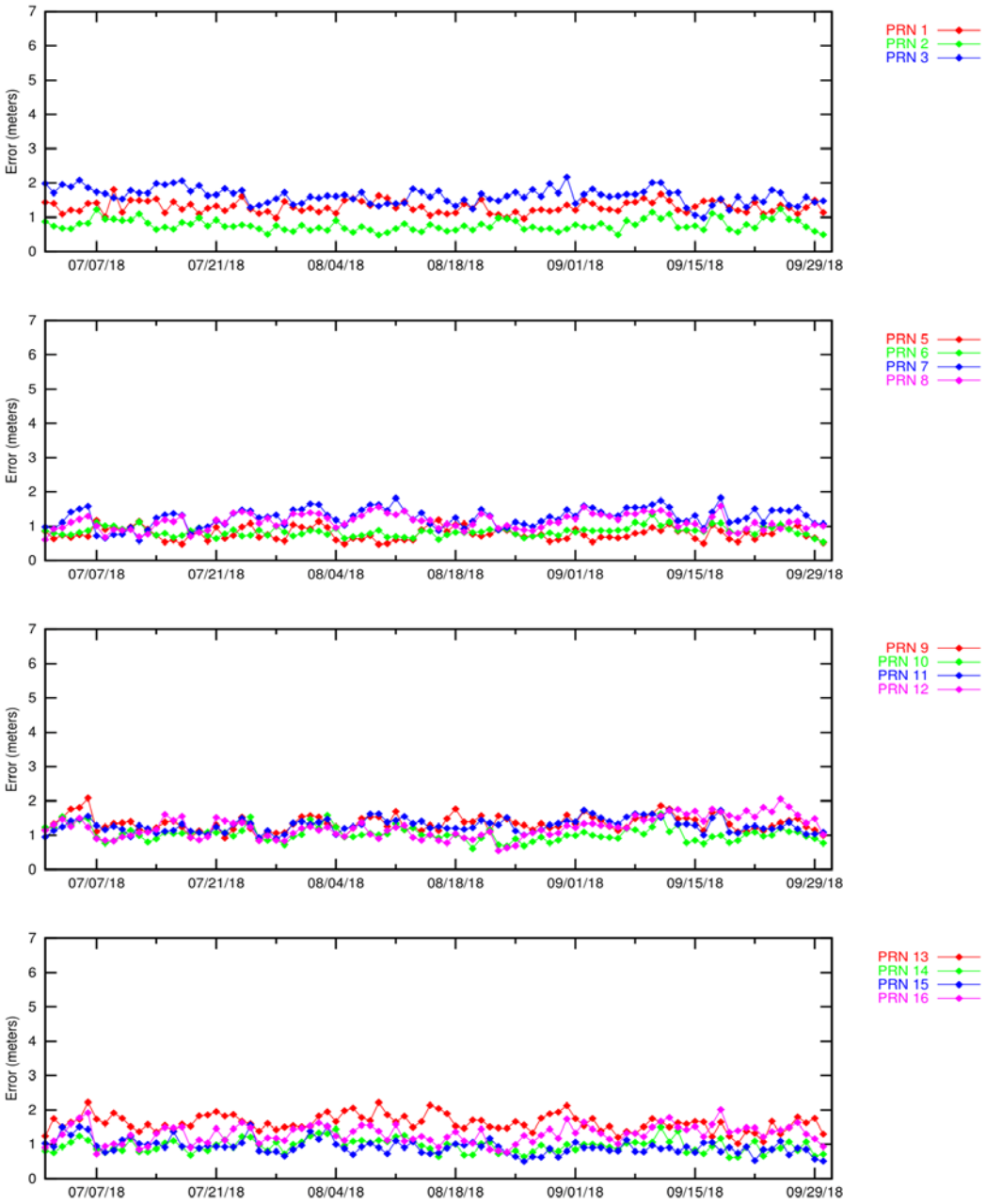
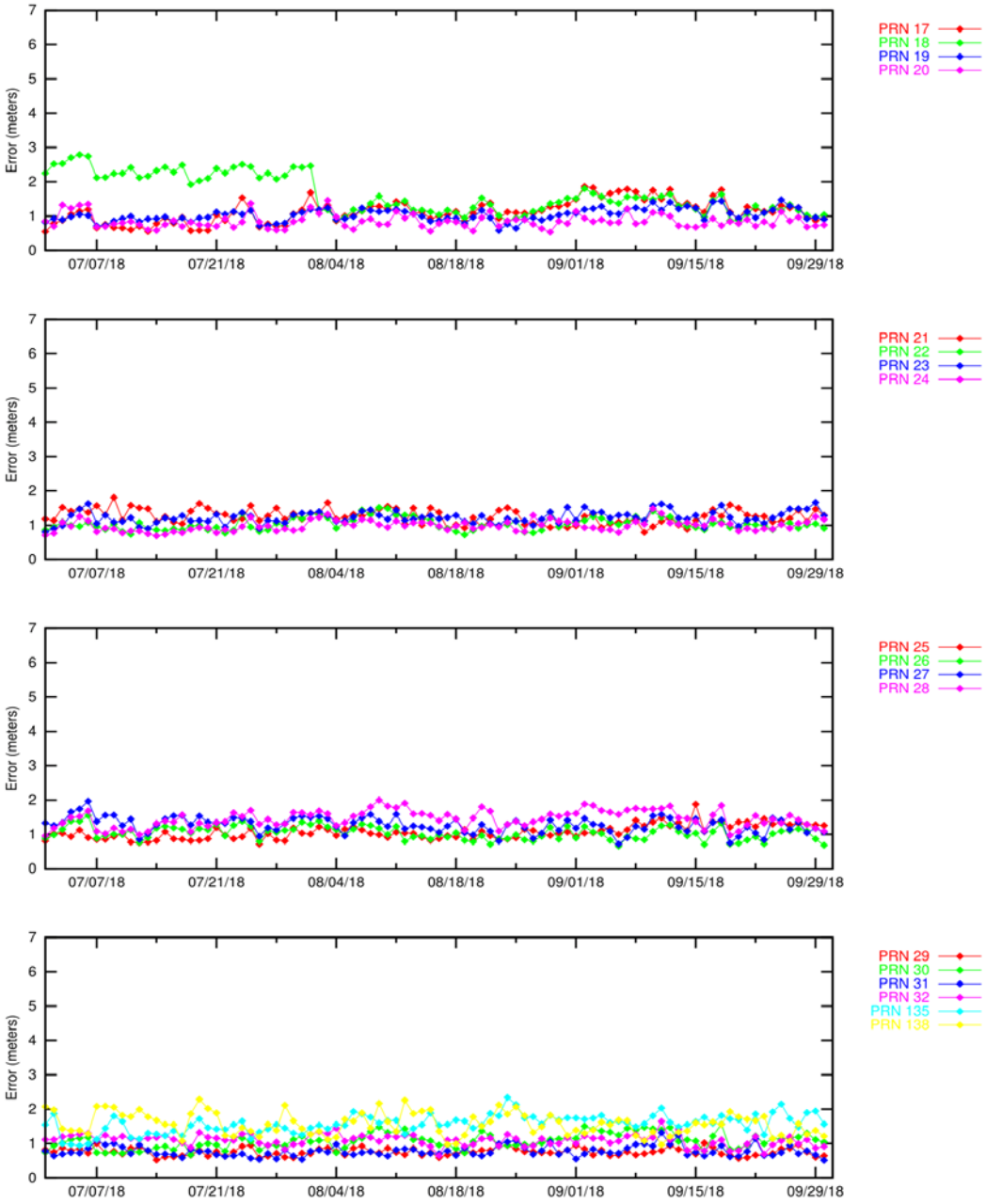


Figure 6-2 Range Error (PRN17 – PRN32) – Washington D.C.



A GIVE is broadcasted by the WAAS for each monitored ionospheric grid point (IGP) and the 99.9% bound of the ionospheric error is checked. The WAAS broadcasts the ionospheric model using IGPs at predefined geographic locations. Each IGP contains the vertical ionospheric delay and the delay error in the form of the GIVE. The ionospheric error is determined by taking the difference between the WAAS vertical ionospheric delay interpolated from the IGP and GPS dual frequency measurement at that GPS satellite.

The GPS satellite ionospheric errors were calculated for 12 WAAS receivers during the quarter. Table 6-3 and Table 6-4 show the ionospheric error 95% index and 99.9% bounding statistics for each SV at the selected locations. Figure 6-3 and Figure 6-4 show the 95% ionospheric error for each SV measured by the WAAS receiver at the Chicago reference station.

Table 6-3 Ionospheric Error 95% Index and 99.9% Sigma Bounding

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1	0.806	100	0.480	100	0.407	100	0.359	100	0.424	100	0.351	100
2	0.889	100	0.876	100	0.259	100	0.462	100	0.771	100	0.459	100
3	0.733	100	1.037	100	0.529	100	0.230	100	0.486	100	0.422	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.969	100	0.557	100	0.259	100	0.488	100	0.519	100	0.334	100
6	0.682	100	0.520	100	0.287	100	0.289	100	0.553	100	0.596	100
7	1.038	100	0.438	100	0.314	100	0.416	100	0.603	100	0.324	100
8	1.022	100	0.572	100	0.259	100	0.496	100	0.711	100	0.303	100
9	1.109	100	0.492	100	0.427	100	0.421	100	0.359	100	0.383	100
10	1.201	100	0.463	100	0.542	100	0.595	100	0.457	100	0.422	100
11	0.929	100	0.425	100	0.202	100	0.393	100	0.348	100	0.359	100
12	1.069	100	0.363	100	0.373	100	0.454	100	0.391	100	0.356	100
13	1.081	100	0.406	100	0.456	100	0.352	100	0.331	100	0.305	100
14	1.227	100	1.097	100	0.512	100	0.599	100	0.834	100	0.513	100
15	1.043	100	0.319	100	0.360	100	0.415	100	0.317	100	0.243	100
16	0.851	100	0.247	100	0.394	100	0.433	100	0.589	100	0.274	100
17	0.943	100	0.849	100	0.403	100	0.439	100	0.795	100	0.583	100
18	1.879	100	1.153	100	1.031	100	1.300	100	0.999	100	1.077	100
19	1.314	100	1.223	100	0.518	100	0.505	100	0.731	100	0.731	100
20	1.030	100	0.493	100	0.317	100	0.423	100	0.548	100	0.311	100
21	1.091	100	0.688	100	0.568	100	0.516	100	0.471	100	0.452	100
22	1.042	100	0.547	100	0.415	100	0.677	100	0.417	100	0.457	100
23	0.967	100	0.619	100	0.573	100	0.459	100	0.847	100	0.378	100
24	0.833	100	0.315	100	0.298	100	0.380	100	0.332	100	0.288	100
25	0.942	100	0.421	100	0.308	100	0.381	100	0.366	100	0.563	100
26	0.975	100	0.348	100	0.321	100	0.389	100	0.541	100	0.268	100
27	0.979	100	0.662	100	0.301	100	0.611	100	0.354	100	0.339	100
28	1.206	100	0.315	100	0.440	100	0.525	100	0.593	100	0.336	100
29	1.069	100	0.385	100	0.434	100	0.476	100	0.676	100	0.373	100
30	0.971	100	0.568	100	0.379	100	0.329	100	0.529	100	0.308	100
31	0.915	100	0.414	100	0.320	100	0.438	100	0.801	100	0.342	100
32	1.333	100	0.549	100	0.616	100	0.643	100	1.058	100	0.745	100

Table 6-4 Ionospheric Error 95% Index and 99.9% Sigma Bounding

Site	Billings		Miami		Albuquerque		Kansas City		Atlanta		Los Angeles	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1	0.380	0.380	0.380	0.380	0.301	0.301	0.642	0.642	0.357	0.357	0.353	0.353
2	1.140	1.140	0.883	0.883	0.434	0.434	0.345	0.345	0.281	0.281	0.449	0.449
3	0.383	0.383	0.409	0.409	0.413	0.413	0.525	0.525	0.603	0.603	0.375	0.375
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.529	0.529	0.435	0.435	0.381	0.381	1.188	1.188	0.266	0.266	0.512	0.512
6	0.604	0.604	0.619	0.619	0.459	0.459	0.642	0.642	0.466	0.466	0.471	0.471
7	0.331	0.331	0.949	0.949	0.376	0.376	0.425	0.425	0.241	0.241	0.423	0.423
8	0.398	0.398	0.380	0.380	0.445	0.445	0.467	0.467	0.358	0.358	0.536	0.536
9	0.603	0.603	0.511	0.511	0.402	0.402	0.328	0.328	0.308	0.308	0.377	0.377
10	1.406	1.406	0.331	0.331	0.358	0.358	0.422	0.422	0.275	0.275	0.628	0.628
11	0.302	0.302	0.210	0.210	0.427	0.427	0.439	0.439	0.370	0.370	0.560	0.560
12	0.495	0.495	0.344	0.344	0.287	0.287	0.426	0.426	0.388	0.388	0.421	0.421
13	0.357	0.357	0.352	0.352	0.253	0.253	0.337	0.337	0.336	0.336	0.421	0.421
14	0.387	0.387	0.370	0.370	0.495	0.495	0.294	0.294	0.292	0.292	0.670	0.670
15	0.467	0.467	0.282	0.282	0.407	0.407	0.345	0.345	0.247	0.247	0.465	0.465
16	0.495	0.495	0.258	0.258	0.424	0.424	0.400	0.400	0.245	0.245	0.411	0.411
17	0.811	0.811	0.495	0.495	0.336	0.336	0.417	0.417	0.246	0.246	0.423	0.423
18	1.034	1.034	1.022	1.022	1.099	1.099	1.072	1.072	0.938	0.938	1.238	1.238
19	0.587	0.587	0.333	0.333	0.635	0.635	0.271	0.271	0.220	0.220	0.621	0.621
20	0.440	0.440	1.139	1.139	0.261	0.261	0.572	0.572	0.437	0.437	0.359	0.359
21	0.504	0.504	0.433	0.433	0.332	0.332	0.332	0.332	0.404	0.404	0.473	0.473
22	0.629	0.629	0.419	0.419	0.441	0.441	0.355	0.355	0.380	0.380	0.423	0.423
23	0.336	0.336	0.540	0.540	0.523	0.523	0.349	0.349	0.330	0.330	0.435	0.435
24	0.298	0.298	0.381	0.381	0.312	0.312	0.453	0.453	0.347	0.347	0.403	0.403
25	0.496	0.496	0.314	0.314	0.337	0.337	0.267	0.267	0.341	0.341	0.360	0.360
26	0.284	0.284	0.284	0.284	0.296	0.296	0.342	0.342	0.287	0.287	0.694	0.694
27	0.317	0.317	0.568	0.568	0.537	0.537	0.337	0.337	0.292	0.292	0.380	0.380
28	0.317	0.317	0.311	0.311	0.312	0.312	0.282	0.282	0.224	0.224	0.513	0.513
29	0.339	0.339	0.472	0.472	0.433	0.433	0.402	0.402	0.451	0.451	0.330	0.330
30	0.710	0.710	0.265	0.265	0.336	0.336	0.285	0.285	0.396	0.396	0.330	0.330
31	0.430	0.430	0.624	0.624	0.286	0.286	1.260	1.260	0.291	0.291	0.429	0.429
32	0.649	0.649	0.562	0.562	0.536	0.536	0.407	0.407	0.589	0.589	0.914	0.914

Figure 6-3 Ionospheric Error (PRN1 – PRN16) – Washington D.C.

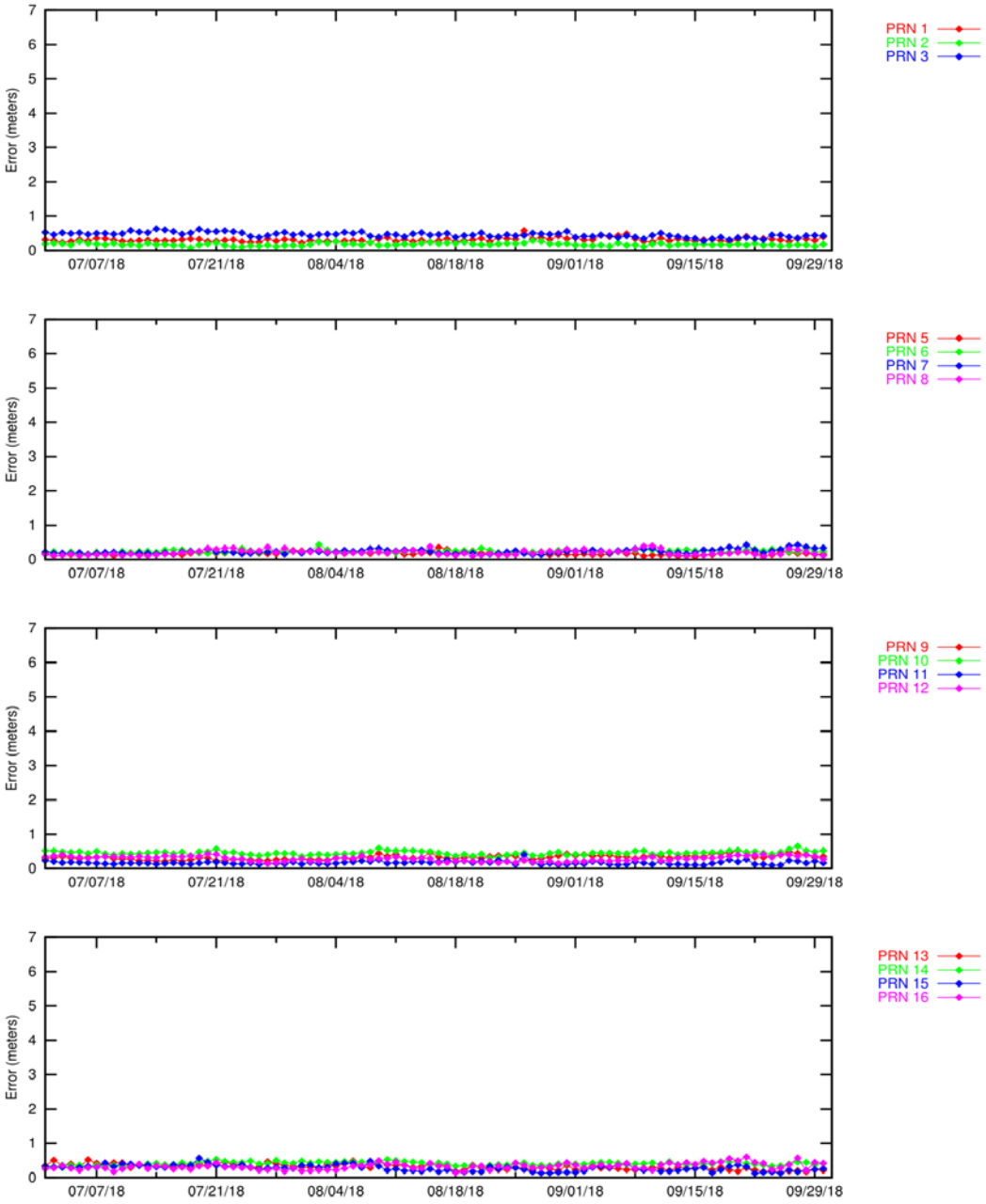
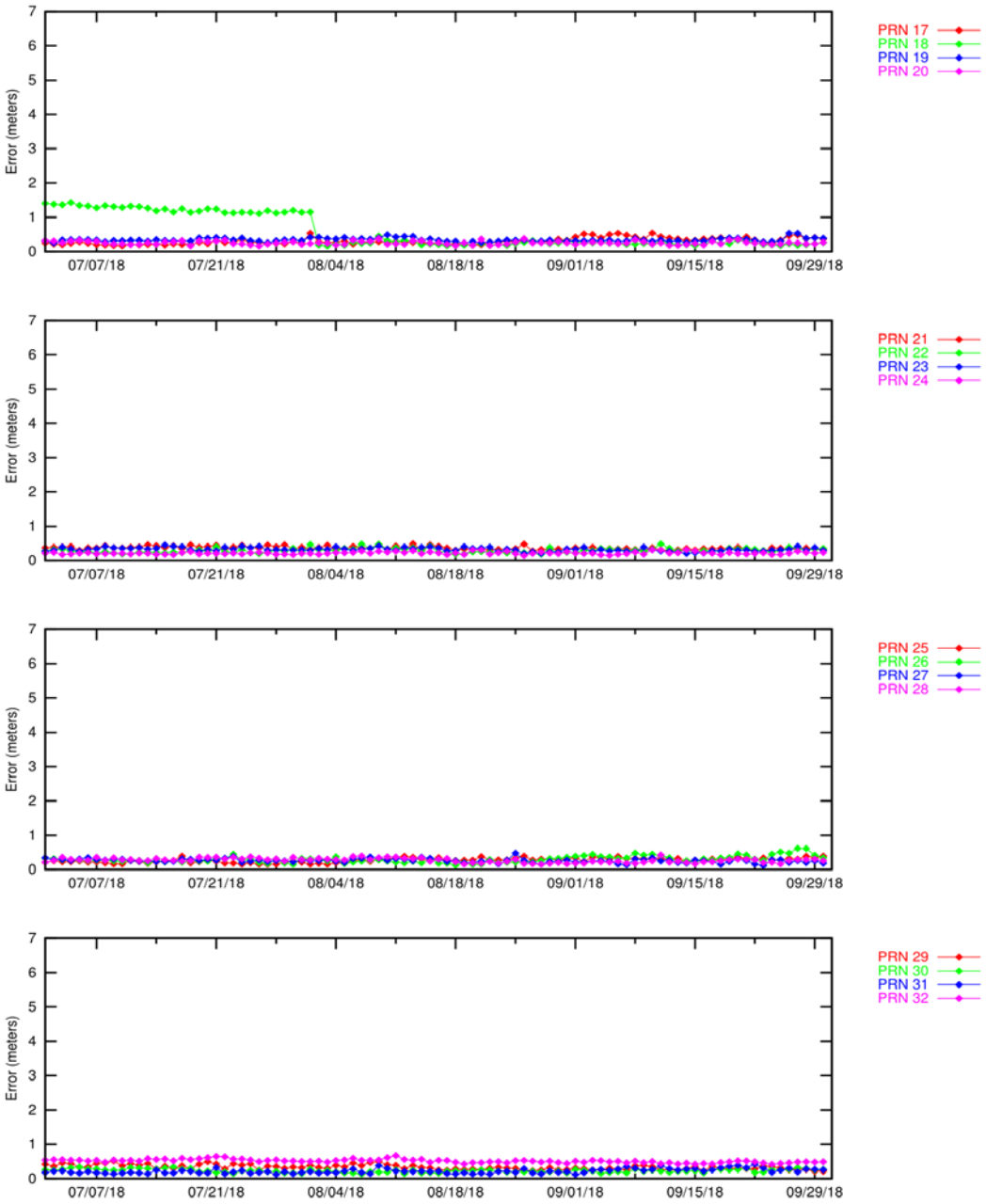


Figure 6-4 Ionospheric Error (PRN17 – PRN32) – Washington D.C.



For this reporting period, most satellite range errors were bounded at least 99.9% of the time by UDRE. Other unbounded errors (i.e., errors bounded less than 100% of the time) were due to geomagnetic activity, noise, and/or multipath. PRN4 was unavailable for the quarter.

7.0 GEO RANGING PERFORMANCE

The WAAS GEO navigation messages provide corrections and UDRE values for each satellite. The GEO ranging availability from each GEO navigation message source was evaluated separately to determine the quality of service provided.

Table 7-1 shows the GEO PA and NPA ranging availability as well as the percentage of time the GEO UDRE was set to "Not Monitored" and "Do Not Use." Figure 7-1 to Figure 7-3 show the trend of SM9, CRW, and CRE GEO PA ranging availability, respectively.

The reductions in CRW GEO PA and CRE GEO PA ranging availability were due to GUS switchovers (see Figure 7-1 to Figure 7-3). Refer to Table 1-7 for detailed information on the GUS switchovers for this reporting period.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	98.75	1.02	0.23	0.00
SM9 131	CRW	99.75	0.04	0.16	0.05
SM9 131	CRE	99.62	0.06	0.29	0.04
CRW 135	SM9	98.68	1.08	0.24	0.00
CRW 135	CRW	99.75	0.04	0.17	0.05
CRW 135	CRE	99.61	0.06	0.29	0.04
CRE 138	SM9	98.75	1.02	0.24	0.00
CRE 138	CRW	99.75	0.04	0.17	0.05
CRE 138	CRE	99.61	0.06	0.29	0.04

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

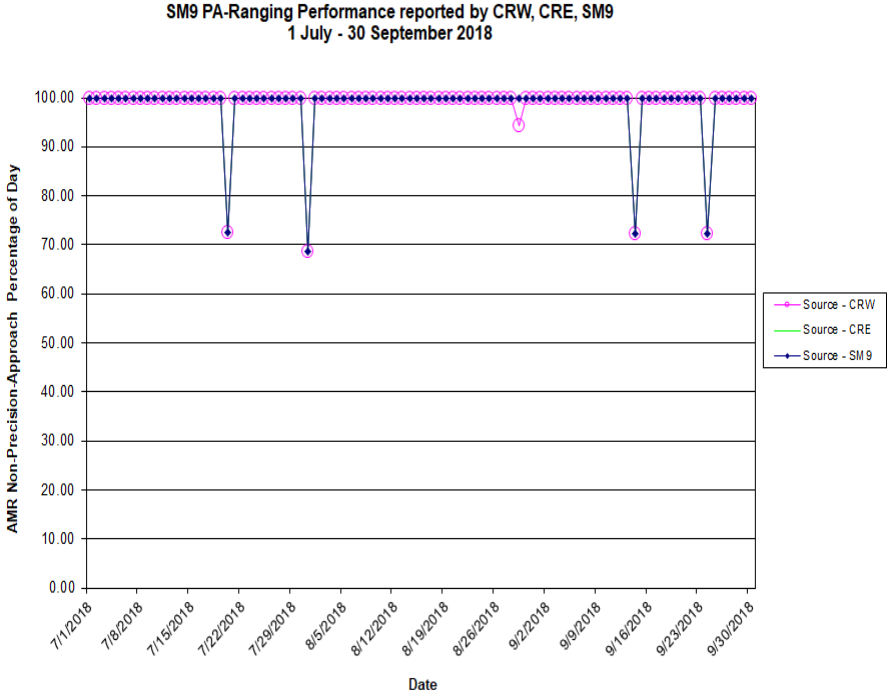


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend

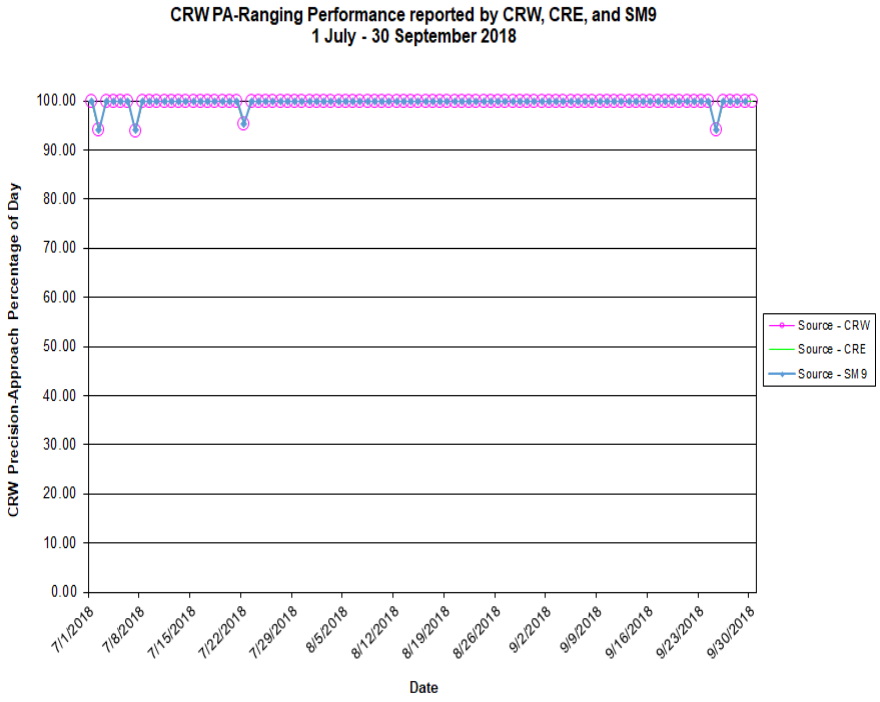
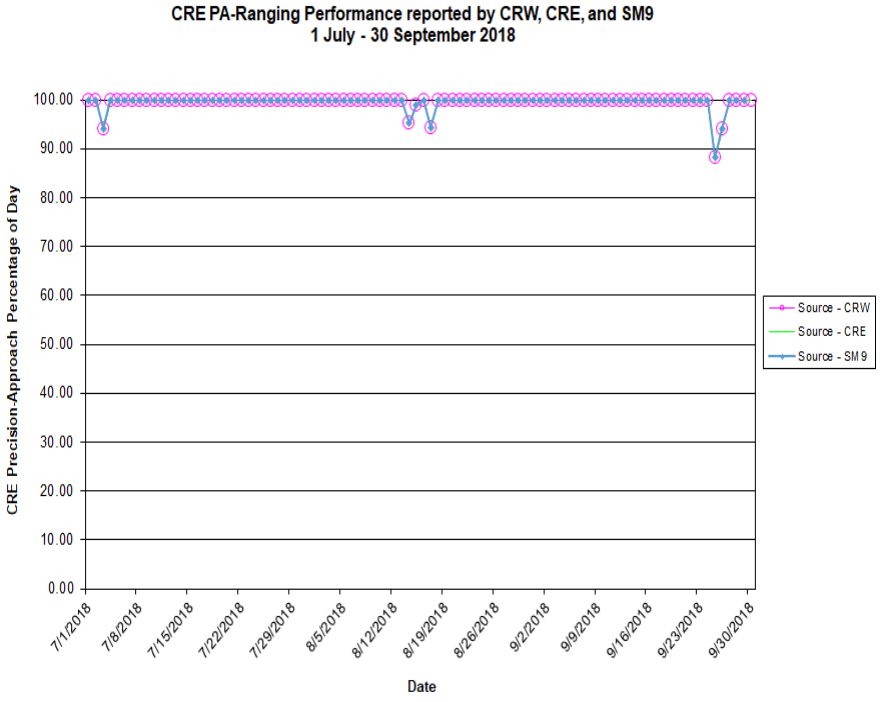


Figure 7-3 Daily PA SM9 GEO Ranging Availability Trend



8.0 WAAS AIRPORT AVAILABILITY

The WAAS airport availability evaluation determines the number and length of LPV service outages at selected airports using the transmitted WAAS navigation message. The navigation messages transmitted from all GEO satellites are processed simultaneously, and WAAS protection levels (VPL and HPL) are computed at each airport once every 30 seconds in accordance with the RTCA DO-229D. The WAAS LPV service is available for a user when the VPL is less than or equal to the VAL of 50 meters and the HPL is less than or equal to the HAL of 40 meters. If both conditions are met, WAAS LPV service is available at that airport. Consequently, if either one of the conditions are not met, the WAAS LPV service outage and its duration is recorded.

When the LPV service becomes unavailable, it is not considered available again until protection levels are below or equal to alert limits for at least 15 minutes. Although this will minimally reduce LPV service availability, it substantially reduces the number of service outages and prevents excessive switching in and out of service availability. Similar service analyses are computed for the LP and LPV200 services in accordance with HAL and VAL shown in Table 1-1. Table 8-1 shows the WAAS LPV service availability and outages at selected airports in the US and Canada. Figure 8-1 through Figure 8-6 provide graphical representation of the LP, LPV, and LPV200 availability and outage counts at airports in the US and Canada that have published GPS area navigation (RNAV) Instrument Approach Procedures (IAPs). These results are geographically depicted on an interactive web page and are accessible at http://www.nstb.tc.faa.gov/AirportOutages/.

To use the interactive web page, select the current quarter from the dropdown menu in the upper left corner, and click “Submit Request”. The WAAS LPV airport layer will appear providing color-coded availability results, as shown in Figure 8-1 and Figure 8-2. Rolling the cursor over any airport will display the LPV availability and outages for the reporting period. The “WAAS Layer” menu in the upper right of the display allows the user to select WAAS LP or LPV200 availability and outage results, as shown in Figure 8-3 through Figure 8-6. Selecting “Show All Airports” displays WAAS availability for US airports with GPS RNAV IAPs; not selecting “Show All Airports” displays only airports with approved LPV approaches, as shown in Table 8-1.

Table 8-1 WAAS LP, LPV, and LPV200 Outages and Availability

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CAL4	FORT MACKAY / ALBIAN AERODROME	AB	LPV	0	100	0	100	2	99.999
CEV3	VEGREVILLE	AB	LPV	0	100	0	100	3	99.998
CYEG	EDMONTON / JOSEPHBURG	AB	LPV	0	100	0	100	3	99.998
CYXD	EDMONTON CITY CTR	AB	LPV	0	100	0	100	3	99.998
2C7	SHAKTOOLIK	AK	LPV	0	100	0	100	7	99.997
6A8	ALLAKAKET	AK	LP	0	100	0	100	6	99.983
7KA	TATITLEK	AK	LP	0	100	0	100	0	100
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	0	100
AFM	AMBLER	AK	LPV	0	100	0	100	10	99.977
AKN	KING SALMON	AK	LPV	0	100	0	100	0	100
AKW	KLAWOCK	AK	LP	0	100	0	100	0	100
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	0	100
ANI	ANIAK	AK	LPV	0	100	0	100	2	99.999
AQH	QUINHAGAK	AK	LPV	0	100	0	100	3	99.998
AQT	NUIQSUT	AK	LPV	0	100	0	100	18	99.96
BET	BETHEL	AK	LPV200	0	100	0	100	3	99.998
BRW	WILEY POST-WILL ROGERS MEMORIA	AK	LPV	0	100	1	99.993	99	99.358
CDB	COLD BAY	AK	LPV200	0	100	0	100	22	99.988
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	0	100
CEM	CENTRAL	AK	LP	0	100	0	100	3	99.992
CLP	CLARKS POINT	AK	LPV	0	100	0	100	1	99.999
CXF	COLDFOOT	AK	LP	0	100	0	100	7	99.978
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	0	100	0	100	68	99.845
DEE	DEERING	AK	LPV	0	100	0	100	54	99.924
DLG	DILLINGHAM	AK	LPV	0	100	0	100	0	100
ELI	ELIM	AK	LPV	0	100	0	100	7	99.995
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	0	100
ENM	EMMONAK	AK	LPV	0	100	0	100	5	99.998
FAI	FAIRBANKS INTL	AK	LPV200	0	100	0	100	8	99.99
FYU	FORT YUKON	AK	LPV	0	100	0	100	5	99.988
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	8	99.995
GAM	GAMBELL	AK	LPV	0	100	0	100	88	99.57
GKN	GULKANA	AK	LPV	0	100	0	100	1	99.998
GST	GUSTAVUS	AK	LP	0	100	0	100	0	100
HLA	HUSLIA	AK	LPV	0	100	0	100	10	99.991

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HOM	HOMER	AK	LPV	0	100	0	100	0	100
HPB	HOOPER BAY	AK	LP	0	100	0	100	5	99.998
HRR	HEALY RIVER	AK	LP	0	100	0	100	7	99.987
ILI	ILIAMNA	AK	LPV	0	100	0	100	0	100
IYS	WASILLA	AK	LPV	0	100	0	100	0	100
KAL	KALTAG	AK	LPV	0	100	0	100	6	99.997
KSM	ST MARY'S	AK	LPV200	0	100	0	100	3	99.998
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	0	100
KTS	BREVIG MISSION	AK	LPV	0	100	0	100	60	99.879
KWT	KWETHLUK	AK	LPV	0	100	0	100	3	99.998
KYU	KOYUKUK	AK	LPV	0	100	0	100	6	99.997
MCG	MC GRATH	AK	LP	0	100	0	100	0	100
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	3	99.998
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	0	100
OME	NOME	AK	LPV	0	100	0	100	57	99.913
OOK	TOKSOOK BAY	AK	LP	0	100	0	100	3	99.998
ORT	NORTHWAY	AK	LP	0	100	0	100	9	99.992
OTZ	RALPH WIEN MEMORIAL	AK	LPV	0	100	0	100	79	99.841
PAQ	PALMER MUNICIPAL	AK	LP	0	100	0	100	0	100
PHO	POINT HOPE	AK	LPV	0	100	0	100	84	99.253
RBY	RUBY	AK	LPV	0	100	0	100	11	99.992
SCC	DEADHORSE	AK	LPV	0	100	0	100	12	99.975
SCM	SCAMMON BAY	AK	LP	0	100	0	100	5	99.998
SHG	SHUNGNAK	AK	LP	0	100	0	100	10	99.977
SHX	SHAGELUK	AK	LPV	0	100	0	100	2	99.999
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	0	100
SMK	ST MICHAEL	AK	LPV	0	100	0	100	6	99.997
SXQ	SOLDOTNA	AK	LP	0	100	0	100	0	100
UNK	UNALAKLEET	AK	LP	0	100	0	100	7	99.997
WLK	SELAWIK	AK	LPV	0	100	0	100	7	99.995
WMO	WHITE MOUNTAIN	AK	LP	0	100	0	100	10	99.994
WNA	NAPAKIAK	AK	LPV	0	100	0	100	3	99.998
WSN	SOUTH NAKNEK NR 2	AK	LPV	0	100	0	100	0	100
YAK	YAKUTAT	AK	LPV200	0	100	0	100	0	100
02A	CHILTON COUNTY	AL	LP	0	100	0	100	64	99.927
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	100	1	99.999	67	99.92
09A	BUTLER-CHOCTAW COUNTY	AL	LPV	0	100	0	100	77	99.855

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	1	99.999	76	99.863
0R1	ATMORE MUNICIPAL	AL	LP	0	100	2	99.998	87	99.781
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	1	99.999	72	99.891
12J	BREWTON MUNICIPAL	AL	LPV	0	100	1	99.998	86	99.794
1M4	POSEY FIELD	AL	LPV	0	100	0	100	49	99.977
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	100	2	99.997	89	99.757
2R5	ST ELMO	AL	LPV	0	100	1	99.998	92	99.712
33J	GENEVA MUNICIPAL	AL	LP	0	100	1	99.998	83	99.825
3M8	NORTH PICKENS	AL	LP	0	100	0	100	64	99.934
4A9	ISBELL FIELD	AL	LPV	0	100	0	100	32	99.987
5R1	ROY WILCOX	AL	LP	0	100	1	99.999	85	99.799
5R4	FOLEY MUNICIPAL	AL	LPV	0	100	2	99.997	92	99.721
71J	BLACKWELL FIELD	AL	LPV	0	100	1	99.999	79	99.858
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	0	100	1	99.998	81	99.831
8A0	ALBERTVILLE RGNL-THOMAS J BRUM	AL	LPV	0	100	0	100	45	99.983
8A1	GUNTERSVILLE MUNICIPAL - JOE STARNE	AL	LPV	0	100	0	100	41	99.984
9A4	COURTLAND	AL	LPV200	0	100	0	100	41	99.984
A08	VAIDEN FIELD	AL	LPV	0	100	1	99.999	72	99.892
ALX	THOMAS C RUSSELL FLD	AL	LPV	0	100	0	100	63	99.938
ANB	ANNISTON RGNL	AL	LPV	0	100	0	100	53	99.969
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	100	0	100	55	99.967
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	100	0	100	65	99.932
BFM	MOBILE DOWNTOWN	AL	LPV200	0	100	1	99.997	92	99.729
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	0	100	0	100	58	99.957
CMD	CULLMAN RGNL-FOLSOM FIELD	AL	LPV	0	100	0	100	47	99.981
CQF	H L SONNY CALLAHAN	AL	LPV200	0	100	2	99.997	92	99.72
DCU	PRYOR FIELD RGNL	AL	LPV200	0	100	0	100	39	99.985
DHN	DOTHAN RGNL	AL	LPV200	0	100	1	99.999	78	99.855
DYA	DEMOPOLIS RGNL	AL	LPV	0	100	0	100	75	99.879
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	100	1	99.999	81	99.843
EET	SHELBY COUNTY	AL	LPV	0	100	0	100	63	99.939
EKY	BESSEMER	AL	LPV	0	100	0	100	61	99.944
EUF	WEEDON FIELD	AL	LPV	0	100	1	99.999	71	99.903
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	100	0	100	49	99.979
GZH	MIDDLETON FIELD	AL	LP	0	100	1	99.998	82	99.824
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	100	0	100	54	99.968
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	0	100	0	100	38	99.985

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	100	0	100	54	99.965
JKA	JACK EDWARDS	AL	LPV200	0	100	2	99.997	92	99.71
M95	RICHARD ARTHUR FIELD	AL	LPV	0	100	0	100	59	99.952
MDQ	HUNTSVILLE EXECUTIVE AIRPORT T	AL	LPV200	0	100	0	100	19	99.992
MGM	MONTGOMERY RGNL (DANNELLY FIEL	AL	LPV200	0	100	1	99.999	72	99.897
MOB	MOBILE RGNL	AL	LPV200	0	100	1	99.998	91	99.732
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	0	100	40	99.984
PLR	ST CLAIR COUNTY	AL	LPV	0	100	0	100	56	99.963
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	0	100	0	100	44	99.983
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	100	0	100	61	99.946
SEM	CRAIG FIELD	AL	LPV200	0	100	1	99.999	73	99.889
TCL	TUSCALOOSA RGNL	AL	LPV	0	100	0	100	66	99.929
TOI	TROY MUNICIPAL AIRPORT AT N KENNETH	AL	LPV	0	100	1	99.999	74	99.878
0M0	BILLY FREE MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	0	100	1	99.999
4A5	SEARCY COUNTY	AR	LPV	0	100	0	100	1	99.999
4M3	CARLISLE MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	0	100	4	99.998
7M1	MC GEHEE MUNICIPAL	AR	LP	0	100	0	100	5	99.998
9M8	SHERIDAN MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
ADF	DEXTER B FLORENCE MEMORIAL FIE	AR	LPV	0	100	0	100	1	99.999
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	100	0	100	1	99.999
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV200	0	100	0	100	21	99.992
BPK	BAXTER COUNTY	AR	LPV	0	100	0	100	1	99.999
BVX	BATESVILLE RGNL	AR	LPV	0	100	0	100	1	99.999
BYH	ARKANSAS INTL	AR	LPV200	0	100	0	100	1	99.999
CDH	HARRELL FIELD	AR	LPV	0	100	0	100	1	99.999
CXW	CANTRELL FLD	AR	LPV	0	100	0	100	1	99.999
DRP	DELTA RGNL	AR	LPV	0	100	0	100	1	99.999
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	0	100	0	100	1	99.999
FLP	MARION COUNTY RGNL	AR	LPV	0	100	0	100	1	99.999
FSM	FORT SMITH RGNL	AR	LPV200	0	100	0	100	1	99.999
FYV	DRAKE FIELD	AR	LPV	0	100	0	100	1	99.999
H34	HUNTSVILLE MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
HRO	BOONE COUNTY	AR	LPV	0	100	0	100	1	99.999
JBR	JONESBORO MUNICIPAL	AR	LPV200	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LIT	BILL AND HILLARY CLINTON NATIO	AR	LPV200	0	100	0	100	1	99.999
M18	HOPE MUNICIPAL	AR	LP	0	100	0	100	1	99.999
M19	NEWPORT MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
M32	LAKE VILLAGE MUNICIPAL	AR	LP	0	100	0	100	13	99.994
M77	HOWARD COUNTY	AR	LP	0	100	0	100	1	99.999
MXA	MANILA MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
PBF	GRIDER FIELD	AR	LPV	0	100	0	100	1	99.999
ROG	ROGERS EXECUTIVE - CARTER FIEL	AR	LPV	0	100	0	100	1	99.999
RUE	RUSSELLVILLE RGNL	AR	LPV	0	100	0	100	1	99.999
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	0	100	0	100	1	99.999
SLG	SMITH FIELD	AR	LPV	0	100	0	100	1	99.999
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
SUZ	SALINE COUNTY RGNL	AR	LPV	0	100	0	100	1	99.999
TXK	TEXARKANA RGNL-WEBB FIELD	AR	LPV	0	100	0	100	1	99.999
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	0	100	0	100	1	99.999
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	0	100	0	100	1	99.999
AVQ	MARANA RGNL	AZ	LP	0	100	1	99.999	92	99.015
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	0	100	2	99.999
FFZ	FALCON FLD	AZ	LP	0	100	0	100	5	99.994
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	0	100	92	99.268
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	0	100
GCN	GRAND CANYON NATIONAL PARK	AZ	LPV	0	100	0	100	0	100
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	0	100	0	100
GYR	PHOENIX GOODYEAR	AZ	LP	0	100	0	100	0	100
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	0	100
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	0	100
IGM	KINGMAN	AZ	LPV	0	100	0	100	0	100
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	0	100	5	99.986
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	0	100	75	99.885
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	0	100
P33	COCHISE COUNTY	AZ	LPV	0	100	0	100	92	99.314
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	0	100
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	0	100	2	99.998
PRC	ERNEST A LOVE FIELD	AZ	LPV200	0	100	0	100	0	100
RQE	WINDOW ROCK	AZ	LP	0	100	0	100	4	99.972
SAD	SAFFORD RGNL	AZ	LPV	0	100	0	100	89	99.458

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	100	0	100	43	99.946
SOW	SHOW LOW RGNL	AZ	LPV	0	100	0	100	75	99.822
TUS	TUCSON INTL	AZ	LPV	0	100	1	99.999	92	99.008
CYBL	CAMPBELL RIVER	BC	LPV	0	100	0	100	1	99.999
CYCD	NANAIMO	BC	LPV	0	100	0	100	1	99.999
CYVR	VANCOUVER INTL	BC	LPV	0	100	0	100	0	100
CYXS	PRINCE GEORGE	BC	LPV	0	100	0	100	1	99.999
CYYJ	VICTORIA INTL	BC	LPV	0	100	0	100	0	100
CZBB	VANCOUVER / BOUNDARY BAY	BC	LPV	0	100	0	100	0	100
AAT	ALTURAS MUNICIPAL	CA	LPV	0	100	0	100	0	100
ACV	ARCATA	CA	LPV	0	100	0	100	1	99.999
APC	NAPA COUNTY	CA	LPV	0	100	0	100	64	99.746
APV	APPLE VALLEY	CA	LPV	0	100	0	100	17	99.975
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	0	100
BFL	MEADOWS FIELD	CA	LPV200	0	100	0	100	44	99.965
BLH	BLYTHE	CA	LP	0	100	0	100	3	99.986
BUR	BOB HOPE	CA	LP	0	100	0	100	78	99.747
C83	BYRON	CA	LPV	0	100	0	100	60	99.821
CCB	CABLE	CA	LP	0	100	0	100	62	99.862
CCR	BUCHANAN FIELD	CA	LPV	0	100	0	100	77	99.703
CEC	JACK MC NAMARA FIELD	CA	LPV	0	100	0	100	1	99.999
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	0	100
CMA	CAMARILLO	CA	LPV	0	100	0	100	126	99.498
CNO	CHINO	CA	LPV	0	100	0	100	65	99.804
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	0	100	78	99.559
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	0	100	99	99.596
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	6	99.997
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	6	99.984
F70	FRENCH VALLEY	CA	LPV	0	100	0	100	66	99.734
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	10	99.994
GOO	NEVADA COUNTY AIR PARK	CA	LPV	0	100	0	100	0	100
HAF	HALF MOON BAY	CA	LPV	0	100	0	100	112	99.308
HHR	JACK NORTHROP FIELD/HAWTHORNE	CA	LPV	0	100	0	100	83	99.61
HWD	HAYWARD EXECUTIVE	CA	LPV	0	100	0	100	99	99.505
L35	BIG BEAR CITY	CA	LP	0	100	0	100	21	99.951
LAX	LOS ANGELES INTL	CA	LPV200	0	100	0	100	85	99.602
LGB	LONG BEACH /DAUGHERTY FIELD/	CA	LPV	0	100	0	100	78	99.612

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LHM	LINCOLN RGNL/KARL HARDER FIELD	CA	LPV200	0	100	0	100	0	100
LLR	LITTLE RIVER	CA	LP	0	100	0	100	45	99.889
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	0	100	69	99.827
LVK	LIVERMORE MUNICIPAL	CA	LPV200	0	100	0	100	86	99.669
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	23	99.978
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	100	0	100	35	99.952
MER	CASTLE	CA	LPV200	0	100	0	100	29	99.957
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	2	99.997
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	100	0	100	42	99.955
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	100	0	100	31	99.937
MRY	MONTEREY RGNL	CA	LPV	0	100	0	100	122	99.329
MYF	MONTGOMERY-GIBBS EXECUTIVE	CA	LPV200	0	100	0	100	81	99.432
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	0	100
O02	NERVINO	CA	LPV	0	100	0	100	0	100
O27	OAKDALE	CA	LPV	0	100	0	100	10	99.987
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	87	99.581
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	22	99.96
OAK	METROPOLITAN OAKLAND INTL	CA	LPV200	0	100	0	100	99	99.48
ONT	ONTARIO INTL	CA	LPV200	0	100	0	100	63	99.855
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	0	100
OXR	OXNARD	CA	LPV	0	100	0	100	137	99.416
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	0	100	53	99.927
POC	BRACKETT FIELD	CA	LPV	0	100	0	100	65	99.838
PRB	PASO ROBLES MUNICIPAL	CA	LPV	0	100	0	100	132	99.505
PVF	PLACERVILLE	CA	LPV	0	100	0	100	0	100
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	0	100	64	99.842
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	0	100
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	0	100
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	0	100	99	99.535
SAC	SACRAMENTO EXECUTIVE	CA	LPV	0	100	0	100	4	99.992
SAN	SAN DIEGO INTL	CA	LPV	0	100	0	100	81	99.36
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	0	100	155	99.198
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	0	100	148	99.288
SCK	STOCKTON METROPOLITAN	CA	LPV200	0	100	0	100	22	99.958
SDM	BROWN FIELD MUNICIPAL	CA	LPV200	0	100	0	100	81	99.32
SEE	GILLESPIE FIELD	CA	LP	0	100	0	100	79	99.48
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	0	100	105	99.381

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	0	100	102	99.501
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	3	99.994
SMO	SANTA MONICA MUNICIPAL	CA	LPV	0	100	0	100	84	99.652
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	0	100	152	99.188
SNA	JOHN WAYNE AIRPORT-ORANGE COUN	CA	LPV200	0	100	0	100	77	99.606
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	0	100	113	99.473
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	73	99.678
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	60	99.829
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	11	99.985
TOA	ZAMPERINI FIELD	CA	LPV	0	100	0	100	87	99.535
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	0	100
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	0	100	27	99.969
VIS	VISALIA MUNICIPAL	CA	LPV200	0	100	0	100	12	99.993
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	0	100	53	99.939
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	100	0	100	0	100
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	0	100	109	99.457
1V6	FREMONT COUNTY	CO	LPV	0	100	0	100	0	100
20V	MC ELROY AIRFIELD	CO	LPV	0	100	0	100	0	100
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	0	100	0	100	0	100
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	0	100	0	100
AJZ	BLAKE FIELD	CO	LPV	0	100	0	100	0	100
AKO	COLORADO PLAINS RGNL	CO	LPV	0	100	0	100	0	100
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	0	100	0	100
APA	CENTENNIAL	CO	LPV200	0	100	0	100	0	100
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	100	0	100	0	100
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	0	100	2	99.998
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	100	0	100	0	100
DEN	DENVER INTL	CO	LPV200	0	100	0	100	0	100
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	100	0	100	2	99.998
FMM	FORT MORGAN MUNICIPAL	CO	LPV	0	100	0	100	0	100
FNL	FORT COLLINS-LOVELAND MUNICIPAL	CO	LPV200	0	100	0	100	0	100
FTG	FRONT RANGE	CO	LPV200	0	100	0	100	0	100
GJT	GRAND JUNCTION REGIONAL	CO	LPV200	0	100	0	100	0	100
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	0	100
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	0	100
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	0	100
LAA	LAMAR MUNICIPAL	CO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	0	100
LMO	VANCE BRAND	CO	LPV	0	100	0	100	0	100
MTJ	MONTROSE RGNL	CO	LPV	0	100	0	100	0	100
PSO	STEVENS FIELD	CO	LP	0	100	0	100	1	99.999
PUB	PUEBLO MEMORIAL	CO	LPV200	0	100	0	100	0	100
RIL	GARFIELD COUNTY RGNL	CO	LPV	0	100	0	100	0	100
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	0	100
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	0	100
4B8	ROBERTSON FIELD	CT	LP	0	100	0	100	0	100
BDL	BRADLEY INTL	CT	LPV200	0	100	0	100	0	100
BDR	IGOR I SIKORSKY MEMORIAL	CT	LPV	0	100	0	100	0	100
GON	GROTON-NEW LONDON	CT	LPV	0	100	0	100	0	100
HVN	TWEED-NEW HAVEN	CT	LPV	0	100	0	100	0	100
IJD	WINDHAM	CT	LP	0	100	0	100	0	100
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	0	100	0	100	0	100
OXC	WATERBURY-OXFORD	CT	LPV	0	100	0	100	0	100
DCA	RONALD REAGAN WASHINGTON NATIO	DC	LPV	0	100	0	100	0	100
HEF	MANASSAS RGNL/HARRY P DAVIS FI	DC	LPV	0	100	0	100	0	100
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	100	0	100	0	100
33N	DELAWARE AIRPARK	DE	LP	0	100	0	100	0	100
EVY	SUMMIT	DE	LPV	0	100	0	100	0	100
GED	DELAWARE COASTAL	DE	LPV	0	100	0	100	0	100
ILG	NEW CASTLE	DE	LPV	0	100	0	100	0	100
1J0	TRI-COUNTY	FL	LP	0	100	1	99.998	84	99.817
24J	SUWANNEE COUNTY	FL	LPV	0	100	1	99.999	77	99.858
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	77	99.894
40J	PERRY-FOLEY	FL	LPV	0	100	1	99.998	81	99.825
54J	DEFUNIAK SPRINGS	FL	LP	0	100	2	99.998	87	99.792
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	3	99.994	90	99.745
APF	NAPLES MUNICIPAL	FL	LPV	0	100	0	100	93	99.814
AVO	AVON PARK EXECUTIVE	FL	LPV	0	100	0	100	90	99.875
BCT	BOCA RATON	FL	LPV	0	100	0	100	3	99.989
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	0	100	91	99.778
BOW	BARTOW MUNICIPAL	FL	LPV	0	100	0	100	92	99.845
CEW	BOB SIKES	FL	LPV	0	100	1	99.998	87	99.786
CGC	CRYSTAL RIVER-CAPTAIN TOM DAVI	FL	LP	0	100	0	100	88	99.79
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	0	100	92	99.82

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	44	99.972
CRG	JACKSONVILLE EXECUTIVE AT CRAI	FL	LPV200	0	100	0	100	70	99.927
CTY	CROSS CITY	FL	LPV	0	100	1	99.999	84	99.81
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	63	99.948
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FI	FL	LPV	0	100	0	100	75	99.926
DTS	DESTIN EXECUTIVE	FL	LPV	0	100	2	99.997	89	99.755
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	3	99.997	88	99.774
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	60	99.957
EYW	KEY WEST INTL	FL	LPV	0	100	0	100	94	99.773
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	0	100	5	99.99
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	0	100	68	99.936
FIN	FLAGLER EXECUTIVE	FL	LPV	0	100	0	100	69	99.939
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	0	100	0	100	4	99.988
FMY	PAGE FIELD	FL	LPV	0	100	0	100	93	99.801
FPR	TREASURE COAST INTL	FL	LPV	0	100	0	100	18	99.986
FXE	FORT LAUDERDALE EXECUTIVE	FL	LPV200	0	100	0	100	4	99.989
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	100	0	100	91	99.854
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	80	99.85
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	72	99.904
IMM	IMMOKALEE RGNL	FL	LPV	0	100	0	100	87	99.891
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	84	99.901
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	69	99.918
LAL	LAKELAND LINDER RGNL	FL	LPV200	0	100	0	100	92	99.815
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	0	100	77	99.864
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	84	99.863
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	0	100	4	99.99
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	1	99.998	81	99.828
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	76	99.919
MIA	MIAMI INTL	FL	LPV200	0	100	0	100	4	99.987
MKY	MARCO ISLAND	FL	LPV	0	100	0	100	91	99.835
MLB	MELBOURNE INTL	FL	LPV200	0	100	0	100	40	99.974
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	0	100	0	100	66	99.897
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	0	100	53	99.963
OCF	OCALA INTL-JIM TAYLOR FIELD	FL	LPV200	0	100	0	100	84	99.833
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	63	99.946
OPF	OPA-LOCKA EXECUTIVE	FL	LPV200	0	100	0	100	6	99.987
ORL	EXECUTIVE	FL	LPV200	0	100	0	100	77	99.916

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PBI	PALM BEACH INTL	FL	LPV200	0	100	0	100	4	99.99
PCM	PLANT CITY	FL	LPV	0	100	0	100	92	99.794
PGD	PUNTA GORDA	FL	LPV200	0	100	0	100	93	99.787
PHK	PALM BEACH CO GLADES	FL	LPV	0	100	0	100	32	99.975
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	0	100	92	99.725
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	0	100	4	99.989
PNS	PENSACOLA INTL	FL	LPV200	0	100	3	99.997	92	99.74
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	0	100	93	99.82
SEF	SEBRING RGNL	FL	LPV	0	100	0	100	87	99.898
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	74	99.929
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	72	99.931
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	0	100	92	99.718
SUA	WITHAM FIELD	FL	LPV	0	100	0	100	8	99.989
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	52	99.967
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	2	99.998	82	99.822
TMB	MIAMI EXECUTIVE	FL	LPV200	0	100	0	100	11	99.984
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	0	100	50	99.96
TPA	TAMPA INTL	FL	LPV200	0	100	0	100	92	99.746
TPF	PETER O KNIGHT	FL	LP	0	100	0	100	92	99.756
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	48	99.974
VDF	TAMPA EXECUTIVE	FL	LPV	0	100	0	100	92	99.772
VNC	VENICE MUNICIPAL	FL	LP	0	100	0	100	92	99.72
VQQ	CECIL	FL	LPV200	0	100	0	100	74	99.897
VRB	VERO BEACH MUNICIPAL	FL	LPV200	0	100	0	100	18	99.986
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	0	100	92	99.867
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	0	100	88	99.886
X23	UMATILLA MUNICIPAL	FL	LP	0	100	0	100	83	99.884
X26	SEBASTIAN MUNICIPAL	FL	LP	0	100	0	100	27	99.983
X35	MARION COUNTY	FL	LP	0	100	0	100	87	99.813
X50	MASSEY RANCH AIRPARK	FL	LP	0	100	0	100	59	99.96
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	0	100	0	100	16	99.97
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	0	100	91	99.804
09J	JEKYLL ISLAND	GA	LPV200	0	100	0	100	62	99.948
15J	COOK COUNTY	GA	LPV	0	100	1	99.999	73	99.895
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	1	99.999	78	99.85
18A	FRANKLIN COUNTY	GA	LPV	0	100	0	100	0	100
19A	JACKSON COUNTY	GA	LPV	0	100	0	100	4	99.998

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2J5	MILLEN	GA	LPV	0	100	0	100	39	99.985
3J7	GREENE COUNTY RGNL	GA	LPV	0	100	0	100	30	99.988
48A	COCHRAN	GA	LPV	0	100	0	100	57	99.96
4A4	POLK COUNTY AIRPORT- CORNELIUS	GA	LPV	0	100	0	100	43	99.983
4J1	BRANTLEY COUNTY	GA	LPV	0	100	0	100	63	99.936
4J2	BERRIEN CO	GA	LPV	0	100	1	99.999	70	99.906
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	1	99.999	77	99.872
52A	MADISON MUNICIPAL	GA	LP	0	100	0	100	36	99.986
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	0	100	60	99.951
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	100	0	100	51	99.975
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	1	99.999	78	99.862
9A5	BARWICK LAFAYETTE	GA	LP	0	100	0	100	9	99.996
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	1	99.999	71	99.9
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	0	100	65	99.93
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	0	100	0	100	11	99.995
AHN	ATHENS/BEN EPPS	GA	LPV200	0	100	0	100	13	99.995
AJR	HABERSHAM COUNTY	GA	LPV	0	100	0	100	0	100
AMG	BACON COUNTY	GA	LPV	0	100	0	100	63	99.938
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	0	100	0	100	44	99.983
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	0	100	66	99.926
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	1	99.999	78	99.853
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	0	100	61	99.948
BIJ	EARLY COUNTY	GA	LPV	0	100	1	99.999	75	99.876
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	0	100	60	99.952
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	0	100	52	99.972
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	0	100	64	99.932
CNI	CHEROKEE COUNTY	GA	LPV	0	100	0	100	15	99.994
CSG	COLUMBUS	GA	LPV	0	100	0	100	63	99.936
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	0	100	49	99.978
CVC	COVINGTON MUNICIPAL	GA	LPV	0	100	0	100	40	99.984
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	100	0	100	50	99.975
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	1	99.999	74	99.881
CZL	TOM B DAVID FLD	GA	LPV	0	100	0	100	17	99.993
D73	MONROE-WALTON COUNTY	GA	LP	0	100	0	100	32	99.987
DBN	W H 'BUD' BARRON	GA	LPV200	0	100	0	100	52	99.97
DNN	DALTON MUNICIPAL	GA	LPV	0	100	0	100	0	100
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	1	99.999	65	99.928

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EBA	ELBERT COUNTY-PATZ FIELD	GA	LP	0	100	0	100	0	100
EZM	HEART OF GEORGIA RGNL	GA	LPV200	0	100	0	100	58	99.956
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV200	0	100	0	100	51	99.977
FTY	FULTON COUNTY AIRPORT-BROWN FI	GA	LPV	0	100	0	100	42	99.984
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	1	99.999	65	99.929
GVL	LEE GILMER MEMORIAL	GA	LPV	0	100	0	100	5	99.998
HOE	HOMERVILLE	GA	LPV	0	100	0	100	69	99.909
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	100	0	100	19	99.992
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	100	0	100	12	99.995
JCA	JACKSON COUNTY	GA	LPV	0	100	0	100	3	99.998
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	0	100	59	99.952
JYL	PLANTATION ARPK	GA	LPV	0	100	0	100	41	99.984
JZP	PICKENS COUNTY	GA	LPV	0	100	0	100	6	99.997
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	100	0	100	58	99.957
LZU	GWINNETT COUNTY - BRISCOE FIEL	GA	LPV200	0	100	0	100	28	99.989
MAC	MACON DOWNTOWN	GA	LPV	0	100	0	100	52	99.97
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	100	0	100	55	99.965
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	1	99.999	73	99.884
MHP	METTER MUNICIPAL	GA	LPV	0	100	0	100	49	99.978
MLJ	BALDWIN COUNTY	GA	LPV	0	100	0	100	46	99.982
MQW	TELFAIR-WHEELER	GA	LPV	0	100	0	100	58	99.956
OKZ	KAOLIN FIELD	GA	LPV	0	100	0	100	46	99.982
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	0	100	54	99.966
PIM	HARRIS COUNTY	GA	LPV	0	100	0	100	60	99.952
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	100	0	100	42	99.984
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	0	100	58	99.956
RMG	RICHARD B RUSSELL REGIONAL - J	GA	LPV	0	100	0	100	30	99.988
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	0	100	0	100	55	99.966
RYY	COBB COUNTY INTL-MCCOLLUM FIEL	GA	LPV200	0	100	0	100	37	99.986
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	100	0	100	46	99.981
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	100	0	100	49	99.98
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	100	0	100	45	99.983
TMA	HENRY TIFT MYERS	GA	LPV	0	100	1	99.999	69	99.91
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	100	0	100	0	100
TVI	THOMASVILLE RGNL	GA	LPV	0	100	1	99.999	77	99.869
VDI	VIDALIA RGNL	GA	LPV200	0	100	0	100	54	99.967
VLD	VALDOSTA RGNL	GA	LPV	0	100	1	99.999	74	99.881

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VPC	CARTERSVILLE	GA	LPV	0	100	0	100	36	99.986
WDR	BARROW COUNTY	GA	LPV	0	100	0	100	18	99.993
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	0	100	0	100	0	100
4C8	ALBIA MUNICIPAL	IA	LPV	0	100	0	100	0	100
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	100	0	100	0	100
ALO	WATERLOO RGNL	IA	LPV	0	100	0	100	0	100
AMW	AMES MUNICIPAL	IA	LPV	0	100	0	100	0	100
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
BNW	BOONE MUNICIPAL	IA	LPV	0	100	0	100	0	100
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	100	0	100	0	100
CAV	CLARION MUNICIPAL	IA	LPV	0	100	0	100	0	100
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	100	0	100	0	100
CCY	NORTHEAST IOWA RGNL	IA	LPV	0	100	0	100	0	100
CID	THE EASTERN IOWA	IA	LPV200	0	100	0	100	0	100
CIN	ARTHUR N NEU	IA	LPV	0	100	0	100	0	100
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
CSQ	CRESTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
CWI	CLINTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
DBQ	DUBUQUE RGNL	IA	LPV200	0	100	0	100	0	100
DEH	DECORAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
DNS	DENISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
DSM	DES MOINES INTL	IA	LPV	0	100	0	100	0	100
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	100	0	100	0	100
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	0	100	0	100	0	100
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	100	0	100	0	100
EOK	KEOKUK MUNICIPAL	IA	LPV	0	100	0	100	0	100
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
FOD	FORT DODGE RGNL	IA	LPV200	0	100	0	100	0	100
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
GCT	GUTHRIE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
GGI	GRINNELL RGNL	IA	LPV	0	100	0	100	0	100
HPT	HAMPTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
I75	OSCEOLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ICL	SCHENCK FIELD	IA	LPV	0	100	0	100	0	100
IFA	IOWA FALLS MUNICIPAL	IA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IIB	INDEPENDENCE MUNICIPAL	IA	LP	0	100	0	100	0	100
IKV	ANKENY RGNL	IA	LPV200	0	100	0	100	0	100
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
LRJ	LE MARS MUNICIPAL	IA	LPV	0	100	0	100	0	100
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	0	100	0	100	0	100
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	100	0	100	0	100
MUT	MUSCATINE MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MXO	MONTICELLO RGNL	IA	LP	0	100	0	100	0	100
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	100	0	100	0	100
OQW	MAQUOKETA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ORC	ORANGE CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
OTM	OTTUMWA RGNL	IA	LPV	0	100	0	100	0	100
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
PEA	PELLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	100	0	100	0	100
PRO	PERRY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
RDK	RED OAK MUNICIPAL	IA	LPV	0	100	0	100	0	100
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
SHL	SHELDON RGNL	IA	LPV	0	100	0	100	0	100
SKI	SAC CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	100	0	100	0	100
SPW	SPENCER MUNICIPAL	IA	LPV200	0	100	0	100	0	100
SUX	SIOUX GATEWAY/COL BUD DAY FIEL	IA	LPV200	0	100	0	100	0	100
TNU	NEWTON MUNICIPAL-EARL JOHNSON FIELD	IA	LPV	0	100	0	100	0	100
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	100	0	100	0	100
VTI	VINTON VETERANS MEMORIAL ARPK	IA	LPV	0	100	0	100	0	100
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV200	0	100	0	100	0	100
COE	COEUR D'ALENE - PAPPY BOYINGTO	ID	LPV200	0	100	0	100	0	100
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	100	0	100	0	100
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	100	0	100	0	100
GNG	GOODING MUNICIPAL	ID	LPV	0	100	0	100	0	100
IDA	IDAHO FALLS RGNL	ID	LPV200	0	100	0	100	0	100
JER	JEROME COUNTY	ID	LPV	0	100	0	100	0	100
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	100	0	100	0	100
MAN	NAMPA MUNICIPAL	ID	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	0	100
PIH	POCATELLO RGNL	ID	LPV200	0	100	0	100	0	100
SUN	FRIEDMAN MEMORIAL	ID	LP	0	100	0	100	0	100
TWF	JOSLIN FIELD - MAGIC VALLEY RG	ID	LPV200	0	100	0	100	0	100
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	100	0	100	0	100
1H2	EFFINGHAM COUNTY MEMORIAL	IL	LPV	0	100	0	100	0	100
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	100	0	100	0	100
3MY	MOUNT HAWLEY AUXILIARY	IL	LP	0	100	0	100	0	100
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	100	0	100	0	100
ALN	ST LOUIS RGNL	IL	LPV200	0	100	0	100	0	100
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	0	100
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	100	0	100	0	100
BMI	CENTRAL IL RGNL ARPT AT BLOOMI	IL	LPV	0	100	0	100	0	100
C15	PEKIN MUNICIPAL	IL	LPV	0	100	0	100	0	100
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	0	100	0	100	0	100
C75	MARSHALL COUNTY	IL	LP	0	100	0	100	0	100
CIR	CAIRO RGNL	IL	LP	0	100	0	100	0	100
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	100	0	100	0	100
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	100	0	100	0	100
CTK	INGERSOLL	IL	LPV	0	100	0	100	0	100
CUL	CARMI MUNICIPAL	IL	LP	0	100	0	100	0	100
DEC	DECATUR	IL	LPV200	0	100	0	100	0	100
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	100	0	100	0	100
DNV	VERMILION REGIONAL	IL	LPV	0	100	0	100	0	100
DPA	DUPAGE	IL	LPV200	0	100	0	100	0	100
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	100	0	100	0	100
EZI	KEWANEE MUNICIPAL	IL	LPV	0	100	0	100	0	100
FEP	ALBERTUS	IL	LPV	0	100	0	100	0	100
FOA	FLORA MUNICIPAL	IL	LPV	0	100	0	100	0	100
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	100	0	100	0	100
GRE	GREENVILLE	IL	LPV	0	100	0	100	0	100
HSB	HARRISBURG-RALEIGH	IL	LPV	0	100	0	100	0	100
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IGQ	LANSING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IKK	GREATER KANKAKEE	IL	LPV200	0	100	0	100	0	100
LOT	LEWIS UNIVERSITY	IL	LPV200	0	100	0	100	0	100
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	100	0	100	0	100
MLI	QUAD CITY INTL	IL	LPV200	0	100	0	100	0	100
MQB	MACOMB MUNICIPAL	IL	LPV200	0	100	0	100	0	100
MTO	COLES COUNTY MEMORIAL	IL	LPV200	0	100	0	100	0	100
MVN	MOUNT VERNON	IL	LPV	0	100	0	100	0	100
MWA	WILLIAMSON COUNTY RGNL	IL	LPV200	0	100	0	100	0	100
OLY	OLNEY-NOBLE	IL	LPV	0	100	0	100	0	100
ORD	CHICAGO O'HARE INTL	IL	LPV200	0	100	0	100	0	100
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	0	100	0	100	0	100
PJY	PINCKNEYVILLE-DU QUOIN	IL	LPV	0	100	0	100	0	100
PNT	PONTIAC MUNICIPAL	IL	LPV	0	100	0	100	0	100
PRG	EDGAR COUNTY	IL	LPV	0	100	0	100	0	100
PWK	CHICAGO EXECUTIVE	IL	LPV	0	100	0	100	0	100
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	100	0	100	0	100
RPJ	ROCHELLE MUNICIPAL AIRPORT-KORITZ F	IL	LPV	0	100	0	100	0	100
RSV	CRAWFORD CO	IL	LPV	0	100	0	100	0	100
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	0	100	0	100	0	100
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	0	100
SLO	SALEM-LECKRONE	IL	LPV200	0	100	0	100	0	100
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	100	0	100	0	100
SQI	WHITESIDE CO ARPT-JOS H BITTOR	IL	LPV	0	100	0	100	0	100
TIP	RANTOUL NATL AVN CNTR-FRANK EL	IL	LPV	0	100	0	100	0	100
UGN	WAUKEGAN RGNL	IL	LPV	0	100	0	100	0	100
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	0	100	0	100	0	100
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	0	100	0	100	0	100
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	0	100	0	100	0	100
AID	ANDERSON MUNICIPAL-DARLINGTON FIELD	IN	LPV	0	100	0	100	0	100
ASW	WARSAW MUNICIPAL	IN	LPV	0	100	0	100	0	100
BAK	COLUMBUS MUNICIPAL	IN	LPV	0	100	0	100	0	100
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	0	100	0	100	0	100
BMG	MONROE COUNTY	IN	LPV200	0	100	0	100	0	100
C62	KENDALLVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
C65	PLYMOUTH MUNICIPAL	IN	LPV	0	100	0	100	0	100
CEV	METTEL FIELD	IN	LPV	0	100	0	100	0	100
CFJ	CRAWFORDSVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
DCY	DAVIESS COUNTY	IN	LPV	0	100	0	100	0	100
EKM	ELKHART MUNICIPAL	IN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EVV	EVANSVILLE RGNL	IN	LPV200	0	100	0	100	0	100
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	100	0	100	0	100
FKR	FRANKFORT MUNICIPAL	IN	LPV	0	100	0	100	0	100
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	100	0	100	0	100
FWA	FORT WAYNE INTL	IN	LPV200	0	100	0	100	0	100
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	100	0	100	0	100
GPC	PUTNAM COUNTY RGNL	IN	LPV	0	100	0	100	0	100
GSH	GOSHEN MUNICIPAL	IN	LPV	0	100	0	100	0	100
GWB	DE KALB COUNTY	IN	LPV	0	100	0	100	0	100
GYY	GARY/CHICAGO INTL	IN	LPV200	0	100	0	100	0	100
HFY	GREENWOOD MUNICIPAL	IN	LPV	0	100	0	100	0	100
HNB	HUNTINGBURG	IN	LPV	0	100	0	100	0	100
HUF	TERRE HAUTE INTL-HULMAN FIELD	IN	LPV200	0	100	0	100	0	100
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	0	100
I76	PERU MUNICIPAL	IN	LPV	0	100	0	100	0	100
IMS	MADISON MUNICIPAL	IN	LPV	0	100	0	100	0	100
IND	INDIANAPOLIS INTL	IN	LPV200	0	100	0	100	0	100
JVY	CLARK RGNL	IN	LPV200	0	100	0	100	0	100
LAF	PURDUE UNIVERSITY	IN	LPV	0	100	0	100	0	100
MCX	WHITE COUNTY	IN	LP	0	100	0	100	0	100
MIE	DELAWARE COUNTY RGNL	IN	LPV	0	100	0	100	0	100
MQJ	INDIANAPOLIS RGNL	IN	LPV200	0	100	0	100	0	100
MZZ	MARION MUNICIPAL	IN	LPV	0	100	0	100	0	100
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	100	0	100	0	100
OVO	NORTH VERNON	IN	LPV	0	100	0	100	0	100
OXI	STARKE COUNTY	IN	LPV	0	100	0	100	0	100
PLD	PORTLAND MUNICIPAL	IN	LPV	0	100	0	100	0	100
PPO	LA PORTE MUNICIPAL	IN	LPV	0	100	0	100	0	100
RCR	FULTON COUNTY	IN	LPV	0	100	0	100	0	100
RID	RICHMOND MUNICIPAL	IN	LPV200	0	100	0	100	0	100
RWN	ARENS FIELD	IN	LPV	0	100	0	100	0	100
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	0	100
SBN	SOUTH BEND INTL	IN	LPV	0	100	0	100	0	100
SER	FREEMAN MUNICIPAL	IN	LPV	0	100	0	100	0	100
SIV	SULLIVAN COUNTY	IN	LPV	0	100	0	100	0	100
SMD	SMITH FIELD	IN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	100	0	100	0	100
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	100	0	100	0	100
UWL	NEW CASTLE-HENRY CO MUNICIPAL	IN	LPV	0	100	0	100	0	100
VPZ	PORTER COUNTY RGNL	IN	LPV	0	100	0	100	0	100
3AU	AUGUSTA MUNICIPAL	KS	LP	0	100	0	100	1	99.999
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
3K8	COMANCHE COUNTY	KS	LPV	0	100	0	100	0	100
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	0	100
AAO	COLONEL JAMES JABARA	KS	LPV	0	100	0	100	0	100
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	0	100
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	1	99.999
BEC	BEECH FACTORY	KS	LPV	0	100	0	100	0	100
CBK	SHALZ FIELD	KS	LPV	0	100	0	100	0	100
CNK	BLOSSER MUNICIPAL	KS	LP	0	100	0	100	0	100
DDC	DODGE CITY RGNL	KS	LPV200	0	100	0	100	0	100
EGT	WELLINGTON MUNICIPAL	KS	LPV	0	100	0	100	1	99.999
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	100	0	100	0	100
EMP	EMPORIA MUNICIPAL	KS	LPV	0	100	0	100	0	100
EQA	EL DORADO/CAPTAIN JACK THOMAS	KS	LPV200	0	100	0	100	0	100
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	100	0	100	0	100
FOE	TOPEKA RGNL	KS	LPV	0	100	0	100	0	100
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	100	0	100	0	100
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	100	0	100	0	100
GCK	GARDEN CITY RGNL	KS	LPV	0	100	0	100	0	100
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	0	100	0	100	0	100
HLC	HILL CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
HQG	HUGOTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
HRU	HERINGTON RGNL	KS	LPV	0	100	0	100	0	100
HUT	HUTCHINSON RGNL	KS	LPV	0	100	0	100	0	100
HYS	HAYS RGNL	KS	LPV200	0	100	0	100	0	100
ICT	WICHITA DWIGHT D EISENHOWER NA	KS	LPV200	0	100	0	100	0	100
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	0	100	0	100	1	99.999
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	100	0	100	0	100
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	0	100	0	100	0	100
K78	ABILENE MUNICIPAL	KS	LPV	0	100	0	100	0	100
K79	JETMORE MUNICIPAL	KS	LPV	0	100	0	100	0	100
K81	MIAMI COUNTY	KS	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
K82	SMITH CENTER MUNICIPAL	KS	LPV200	0	100	0	100	0	100
K88	ALLEN COUNTY	KS	LPV	0	100	0	100	0	100
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	0	100	0	100	0	100
LQR	LARNED-PAWNEE COUNTY	KS	LPV	0	100	0	100	0	100
LWC	LAWRENCE MUNICIPAL	KS	LPV200	0	100	0	100	0	100
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
MHK	MANHATTAN RGNL	KS	LPV200	0	100	0	100	0	100
MPR	MC PHERSON	KS	LPV	0	100	0	100	0	100
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
NRN	NORTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	0	100
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	0	100
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	100	0	100	0	100
OWI	OTTAWA MUNICIPAL	KS	LPV	0	100	0	100	0	100
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	0	100	0	100	0	100
PPF	TRI-CITY	KS	LPV	0	100	0	100	0	100
PTS	ATKINSON MUNICIPAL	KS	LPV	0	100	0	100	0	100
PTT	PRATT RGNL	KS	LPV	0	100	0	100	0	100
RCP	ROOKS COUNTY RGNL	KS	LPV	0	100	0	100	0	100
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
RSL	RUSSELL MUNICIPAL	KS	LPV	0	100	0	100	0	100
SLN	SALINA RGNL	KS	LPV	0	100	0	100	0	100
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV200	0	100	0	100	0	100
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
UKL	COFFEY COUNTY	KS	LPV	0	100	0	100	0	100
ULS	ULYSSES	KS	LPV	0	100	0	100	0	100
WLD	STROTHER FIELD	KS	LPV	0	100	0	100	1	99.999
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	0	100	0	100	0	100
18I	MC CREARY COUNTY	KY	LP	0	100	0	100	0	100
27K	GEORGETOWN SCOTT COUNTY - MARS	KY	LPV200	0	100	0	100	0	100
2I0	MADISONVILLE RGNL	KY	LPV	0	100	0	100	0	100
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	0	100	0	100	0	100
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	0	100	0	100	0	100
5M9	MARION-CRITTENDEN COUNTY	KY	LPV	0	100	0	100	0	100
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	0	100	0	100	0	100
AAS	TAYLOR COUNTY	KY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BRY	SAMUELS FIELD	KY	LPV	0	100	0	100	0	100
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	0	100	0	100	0	100
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	0	100	0	100	0	100
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	100	0	100	0	100
CPF	WENDELL H FORD	KY	LPV200	0	100	0	100	0	100
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	0	100	0	100	0	100
DVK	STUART POWELL FIELD	KY	LPV	0	100	0	100	0	100
DWU	ASHLAND RGNL	KY	LP	0	100	0	100	0	100
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	100	0	100	0	100
EKQ	WAYNE COUNTY	KY	LPV	0	100	0	100	0	100
EKX	ADDINGTON FIELD	KY	LPV	0	100	0	100	0	100
FFT	CAPITAL CITY	KY	LPV	0	100	0	100	0	100
FGX	FLEMING-MASON	KY	LPV	0	100	0	100	0	100
GLW	GLASGOW MUNICIPAL	KY	LPV	0	100	0	100	0	100
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	100	0	100	0	100
IOB	MOUNT STERLING-MONTGOMERY COUN	KY	LPV	0	100	0	100	0	100
JQD	OHIO COUNTY	KY	LPV	0	100	0	100	0	100
K24	RUSSELL COUNTY	KY	LPV	0	100	0	100	0	100
K62	GENE SNYDER	KY	LP	0	100	0	100	0	100
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	100	0	100	0	100
LEX	BLUE GRASS	KY	LPV	0	100	0	100	0	100
LOU	BOWMAN FIELD	KY	LPV	0	100	0	100	0	100
LOZ	LONDON-CORBIN ARPT-MAGEE FIELD	KY	LPV	0	100	0	100	0	100
M21	MUHLENBERG COUNTY	KY	LP	0	100	0	100	0	100
M25	MAYFIELD GRAVES COUNTY	KY	LPV	0	100	0	100	0	100
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	0	100	0	100	0	100
PAH	BARKLEY RGNL	KY	LPV	0	100	0	100	0	100
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	0	100	0	100	0	100
SDF	LOUISVILLE INTL-STANDIFORD FIE	KY	LPV200	0	100	0	100	0	100
SJS	BIG SANDY RGNL	KY	LPV	0	100	0	100	0	100
SME	LAKE CUMBERLAND RGNL	KY	LPV	0	100	0	100	0	100
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	0	100	0	100	0	100
TWT	STURGIS MUNICIPAL	KY	LPV	0	100	0	100	0	100
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	0	100	0	100	0	100
0R4	CONCORDIA PARISH	LA	LPV	0	100	0	100	51	99.935
3R4	HART	LA	LPV	0	100	0	100	1	99.999
3R7	JENNINGS	LA	LPV	0	100	0	100	32	99.976

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	0	100	0	100	1	99.999
ACP	ALLEN PARISH	LA	LPV	0	100	0	100	13	99.994
AEX	ALEXANDRIA INTL	LA	LPV200	0	100	0	100	4	99.997
APS	PORT OF SOUTH LOUISIANA EXECUT	LA	LPV	0	100	0	100	89	99.645
ARA	ACADIANA RGNL	LA	LPV200	0	100	0	100	71	99.864
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	100	0	100	4	99.998
BTR	BATON ROUGE METROPOLITAN` RYAN	LA	LPV200	0	100	0	100	82	99.783
BXA	GEORGE R CARR MEMORIAL AIR FLD	LA	LPV	0	100	0	100	92	99.707
CWF	CHENNAULT INTL	LA	LPV200	0	100	0	100	5	99.997
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	100	0	100	1	99.999
ESF	ESLER RGNL	LA	LPV200	0	100	0	100	14	99.993
F88	JONESBORO	LA	LP	0	100	0	100	1	99.999
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	0	100	0	100	92	99.552
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	100	0	100	92	99.674
HUM	HOUMA-TERREBONNE	LA	LPV200	0	100	0	100	92	99.573
HZR	FALSE RIVER RGNL	LA	LPV	0	100	0	100	72	99.86
IER	NATCHITOCHES RGNL	LA	LPV	0	100	0	100	1	99.999
IYA	ABBEVILLE CHRIS CRUSTA MEMORIA	LA	LPV	0	100	0	100	66	99.894
L39	LEESVILLE	LA	LPV	0	100	0	100	1	99.999
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	4	99.998
LFT	LAFAYETTE RGNL/PAUL FOURNET FI	LA	LPV	0	100	0	100	64	99.895
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	100	0	100	13	99.994
MLU	MONROE RGNL	LA	LPV200	0	100	0	100	3	99.998
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	0	100	0	100	92	99.614
NEW	LAKEFRONT	LA	LPV	0	100	0	100	92	99.624
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	100	0	100	48	99.939
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	100	0	100	87	99.722
REG	LOUISIANA RGNL	LA	LPV	0	100	0	100	87	99.705
RSN	RUSTON RGNL	LA	LPV	0	100	0	100	1	99.999
SHV	SHREVEPORT RGNL	LA	LPV200	0	100	0	100	1	99.999
SPH	SPRINGHILL	LA	LPV	0	100	0	100	1	99.999
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	0	100	0	100	52	99.932
UXL	SOUTHLAND FIELD	LA	LPV	0	100	0	100	3	99.998
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	100	0	100	0	100
BAF	WESTFIELD-BARNES RGNL	MA	LPV	0	100	0	100	0	100
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	0	100	0	100	0	100
BVY	BEVERLY RGNL	MA	LPV	0	100	0	100	0	100
EWB	NEW BEDFORD RGNL	MA	LPV200	0	100	0	100	0	100
GBR	WALTER J KOLADZA	MA	LP	0	100	0	100	0	100
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	0	100	0	100	0	100
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLAN	MA	LPV200	0	100	0	100	0	100
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	100	0	100	0	100
MVY	MARTHA'S VINEYARD	MA	LPV200	0	100	0	100	0	100
ORE	ORANGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ORH	WORCESTER RGNL	MA	LPV200	0	100	0	100	0	100
OWD	NORWOOD MEMORIAL	MA	LPV	0	100	0	100	0	100
PSF	PITTSFIELD MUNICIPAL	MA	LPV	0	100	0	100	0	100
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	0	100	0	100	0	100
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	0	100
TAN	TAUNTON MUNICIPAL - KING FIELD	MA	LPV	0	100	0	100	0	100
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	0	100
2W5	MARYLAND	MD	LP	0	100	0	100	0	100
2W6	ST MARY'S COUNTY RGNL	MD	LPV	0	100	0	100	0	100
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	0	100	0	100	0	100
CBE	GREATER CUMBERLAND RGNL	MD	LPV	0	100	0	100	0	100
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	0	100	0	100	0	100
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	0	100	0	100	0	100
ESN	EASTON/NEWNAM FIELD	MD	LPV200	0	100	0	100	0	100
FDK	FREDERICK MUNICIPAL	MD	LPV	0	100	0	100	0	100
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	100	0	100	0	100
HGR	HAGERSTOWN RGNL-RICHARD A HENS	MD	LPV200	0	100	0	100	0	100
MTN	MARTIN STATE	MD	LPV	0	100	0	100	0	100
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	100	0	100	0	100
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	0	100	0	100	0	100
W29	BAY BRIDGE	MD	LPV	0	100	0	100	0	100
1B0	DEXTER RGNL	ME	LP	0	100	0	100	0	100
3B1	GREENVILLE MUNICIPAL	ME	LPV	0	100	0	100	0	100
81B	OXFORD COUNTY RGNL	ME	LP	0	100	0	100	0	100
AUG	AUGUSTA STATE	ME	LPV200	0	100	0	100	0	100
BGR	BANGOR INTL	ME	LPV200	0	100	0	100	0	100
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	100	0	100	0	100
BST	BELFAST MUNICIPAL	ME	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BXM	BRUNSWICK EXECUTIVE	ME	LPV200	0	100	0	100	0	100
CAR	CARIBOU MUNICIPAL	ME	LPV	0	100	0	100	0	100
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV	0	100	0	100	0	100
HUL	HOULTON INTL	ME	LP	0	100	0	100	0	100
IZG	EASTERN SLOPES RGNL	ME	LPV	0	100	0	100	0	100
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	0	100	0	100	0	100
LRG	LINCOLN RGNL	ME	LP	0	100	0	100	0	100
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	100	0	100	0	100
OWK	CENTRAL MAINE ARPT OF NORRIDGE	ME	LPV	0	100	0	100	0	100
PQI	NORTHERN MAINE RGNL ARPT AT PR	ME	LPV200	0	100	0	100	0	100
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	100	0	100	0	100
RKD	KNOX COUNTY RGNL	ME	LPV200	0	100	0	100	0	100
SFM	SANFORD SEACOAST RGNL	ME	LPV200	0	100	0	100	0	100
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	100	0	100	0	100
48D	CLARE MUNICIPAL	MI	LP	0	100	0	100	0	100
4D0	ABRAMS MUNICIPAL	MI	LP	0	100	0	100	0	100
6Y1	BOIS BLANC ISLAND	MI	LP	0	100	0	100	0	100
77G	MARLETTE	MI	LPV	0	100	0	100	0	100
9D9	HASTINGS	MI	LPV	0	100	0	100	0	100
ACB	ANTRIM COUNTY	MI	LPV	0	100	0	100	0	100
ADG	LENAWEE COUNTY	MI	LPV	0	100	0	100	0	100
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	0	100	0	100	0	100
APN	ALPENA COUNTY RGNL	MI	LPV	0	100	0	100	0	100
ARB	ANN ARBOR MUNICIPAL	MI	LPV	0	100	0	100	0	100
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV	0	100	0	100	0	100
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	0	100
BIV	WEST MICHIGAN RGNL	MI	LPV	0	100	0	100	0	100
BTL	W K KELLOGG	MI	LPV200	0	100	0	100	0	100
C04	OCEANA COUNTY	MI	LPV	0	100	0	100	0	100
CAD	WEXFORD COUNTY	MI	LPV200	0	100	0	100	0	100
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	100	0	100	0	100
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	100	0	100	0	100
D95	DUPONT-LAPEER	MI	LP	0	100	0	100	0	100
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
DTW	DETROIT METROPOLITAN WAYNE COU	MI	LPV200	0	100	0	100	0	100
ERY	LUCE COUNTY	MI	LPV	0	100	0	100	0	100
ESC	DELTA COUNTY	MI	LPV200	0	100	0	100	0	100
FFX	FREMONT MUNICIPAL	MI	LPV	0	100	0	100	0	100
FNT	BISHOP INTL	MI	LPV200	0	100	0	100	0	100
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	0	100	0	100	0	100
GLR	GAYLORD RGNL	MI	LPV	0	100	0	100	0	100
GRR	GERALD R FORD INTL	MI	LPV200	0	100	0	100	0	100
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	0	100	0	100	0	100
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV	0	100	0	100	0	100
IKW	JACK BARSTOW	MI	LPV	0	100	0	100	0	100
IMT	FORD	MI	LPV	0	100	0	100	0	100
IRS	KIRSCH MUNICIPAL	MI	LPV	0	100	0	100	0	100
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	100	0	100	0	100
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	100	0	100	0	100
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	LPV200	0	100	0	100	0	100
JYM	HILLSDALE MUNICIPAL	MI	LPV	0	100	0	100	0	100
LAN	CAPITAL REGION INTL	MI	LPV200	0	100	0	100	0	100
LDM	MASON COUNTY	MI	LPV	0	100	0	100	0	100
MBL	MANISTEE CO-BLACKER	MI	LPV200	0	100	0	100	0	100
MBS	MBS INTL	MI	LPV200	0	100	0	100	0	100
MCD	MACKINAC ISLAND	MI	LPV	0	100	0	100	0	100
MKG	MUSKEGON COUNTY	MI	LPV200	0	100	0	100	0	100
MNM	MENOMINEE-MARINETTE TWIN COUNT	MI	LPV200	0	100	0	100	0	100
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	0	100	0	100	0	100
N98	BOYNE CITY MUNICIPAL	MI	LP	0	100	0	100	0	100
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
OSC	OSCODA-WURTSMITH	MI	LPV200	0	100	0	100	0	100
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	0	100	0	100	0	100
PHN	ST CLAIR COUNTY INTL	MI	LPV200	0	100	0	100	0	100
PLN	PELLSTON RGNL AIRPORT OF EMMET	MI	LPV200	0	100	0	100	0	100
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	100	0	100	0	100
RMY	BROOKS FIELD	MI	LP	0	100	0	100	0	100
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
RQB	ROBEN-HOOD	MI	LPV200	0	100	0	100	0	100
SAW	SAWYER INTL	MI	LPV200	0	100	0	100	0	100
SLH	CHEBOYGAN COUNTY	MI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TEW	MASON JEWETT FIELD	MI	LP	0	100	0	100	0	100
TTF	CUSTER	MI	LPV	0	100	0	100	0	100
TVC	CHERRY CAPITAL	MI	LPV200	0	100	0	100	0	100
YIP	WILLOW RUN	MI	LPV	0	100	0	100	0	100
16D	PERHAM MUNICIPAL	MN	LPV	0	100	0	100	0	100
3N8	MAHNOMEN COUNTY	MN	LPV	0	100	0	100	0	100
ACQ	WASECA MUNICIPAL	MN	LPV	0	100	0	100	0	100
ADC	WADENA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AIT	AITKIN MUNICIPAL-STEVE KURTZ FIELD	MN	LPV	0	100	0	100	0	100
ANE	ANOKA COUNTY-BLAINE ARPT (JANE	MN	LPV	0	100	0	100	0	100
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	100	0	100	0	100
AXN	CHANDLER FIELD	MN	LPV	0	100	0	100	0	100
BBB	BENSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
BDE	BAUDETTE INTL	MN	LPV	0	100	0	100	0	100
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV200	0	100	0	100	0	100
BJI	BEMIDJI RGNL	MN	LPV200	0	100	0	100	0	100
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	100	0	100	0	100
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	100	0	100	0	100
CFE	BUFFALO MUNICIPAL	MN	LPV	0	100	0	100	0	100
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	100	0	100	0	100
CKN	CROOKSTON MUNICIPAL KIRKWOOD FLD	MN	LPV	0	100	0	100	0	100
CNB	MYERS FIELD	MN	LPV	0	100	0	100	0	100
COQ	CLOQUET CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
CQM	COOK MUNICIPAL	MN	LP	0	100	0	100	0	100
D39	SAUK CENTRE MUNICIPAL	MN	LPV	0	100	0	100	0	100
D42	SPRINGFIELD MUNICIPAL	MN	LP	0	100	0	100	0	100
DLH	DULUTH INTL	MN	LPV200	0	100	0	100	0	100
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	0	100	0	100	0	100
DVP	SLAYTON MUNICIPAL	MN	LP	0	100	0	100	0	100
DXX	LAC QUI PARLE COUNTY	MN	LPV200	0	100	0	100	0	100
ELO	ELY MUNICIPAL	MN	LPV200	0	100	0	100	0	100
ETH	WHEATON MUNICIPAL	MN	LP	0	100	0	100	0	100
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	0	100	0	100	0	100
FBL	FARIBAULT MUNICIPAL	MN	LPV	0	100	0	100	0	100
FCM	FLYING CLOUD	MN	LPV200	0	100	0	100	0	100
FFM	FERGUS FALLS MUNICIPAL-EINAR MICKEL	MN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FKA	FILLMORE COUNTY	MN	LPV	0	100	0	100	0	100
FOZ	BIGFORK MUNICIPAL	MN	LP	0	100	0	100	0	100
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	100	0	100	0	100
FSE	FOSSTON MUNICIPAL	MN	LP	0	100	0	100	0	100
GHW	GLENWOOD MUNICIPAL	MN	LPV	0	100	0	100	0	100
GPZ	GRAND RAPIDS/ITASCA CO-GORDON	MN	LPV	0	100	0	100	0	100
GYL	GLENCOE MUNICIPAL	MN	LPV	0	100	0	100	0	100
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	0	100	0	100	0	100
HCO	HALLOCK MUNICIPAL	MN	LPV	0	100	0	100	0	100
HIB	RANGE RGNL	MN	LPV200	0	100	0	100	0	100
INL	FALLS INTL-EINARSON FIELD	MN	LPV	0	100	0	100	0	100
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	100	0	100	0	100
JMR	MORA MUNICIPAL	MN	LPV	0	100	0	100	0	100
JYG	ST JAMES MUNICIPAL	MN	LPV	0	100	0	100	0	100
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	100	0	100	0	100
LVN	AIRLAKE	MN	LPV200	0	100	0	100	0	100
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	0	100	0	100	0	100
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	100	0	100	0	100
MGG	MAPLE LAKE MUNICIPAL-BILL MAVENCAMP	MN	LP	0	100	0	100	0	100
MJQ	JACKSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
MKT	MANKATO RGNL	MN	LPV200	0	100	0	100	0	100
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	0	100	0	100	0	100
MOX	MORRIS MUNICIPAL - CHARLIE SCHMIDT	MN	LPV	0	100	0	100	0	100
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	0	100	0	100	0	100
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	0	100	0	100	0	100
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	0	100	0	100	0	100
ORB	ORR RGNL	MN	LP	0	100	0	100	0	100
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	100	0	100	0	100
OWA	OWATONNA DEGNER RGNL	MN	LPV200	0	100	0	100	0	100
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	0	100	0	100	0	100
PQN	PIPESTONE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
RGK	RED WING RGNL	MN	LPV200	0	100	0	100	0	100
ROS	RUSH CITY RGNL	MN	LPV	0	100	0	100	0	100
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIEL	MN	LPV	0	100	0	100	0	100
RRT	WARROAD INTL MEMORIAL	MN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RST	ROCHESTER INTL	MN	LPV200	0	100	0	100	0	100
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	100	0	100	0	100
SAZ	STAPLES MUNICIPAL	MN	LPV	0	100	0	100	0	100
SBU	BLUE EARTH MUNICIPAL	MN	LPV	0	100	0	100	0	100
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LP	0	100	0	100	0	100
STC	ST CLOUD RGNL	MN	LPV200	0	100	0	100	0	100
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	100	0	100	0	100
TOB	DODGE CENTER	MN	LPV	0	100	0	100	0	100
TVF	THIEF RIVER FALLS RGNL	MN	LPV	0	100	0	100	0	100
TWM	RICHARD B HELGESON	MN	LPV	0	100	0	100	0	100
ULM	NEW ULM MUNICIPAL	MN	LPV200	0	100	0	100	0	100
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIEL	MN	LP	0	100	0	100	0	100
Y49	WALKER MUNICIPAL	MN	LP	0	100	0	100	0	100
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	0	100	0	100	0	100
03D	MEMPHIS MEMORIAL	MO	LPV	0	100	0	100	0	100
1H0	CREVE COEUR	MO	LPV	0	100	0	100	0	100
1MO	MOUNTAIN GROVE MEMORIAL	MO	LP	0	100	0	100	0	100
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	100	0	100	0	100
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	0	100
8WC	WASHINGTON COUNTY	MO	LPV	0	100	0	100	0	100
94K	CASSVILLE MUNICIPAL	MO	LPV	0	100	0	100	1	99.999
AIZ	LEE C FINE MEMORIAL	MO	LPV	0	100	0	100	0	100
BBG	BRANSON	MO	LPV200	0	100	0	100	1	99.999
BUM	BUTLER MEMORIAL	MO	LPV	0	100	0	100	0	100
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	0	100	0	100	0	100
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	100	0	100	0	100
COU	COLUMBIA RGNL	MO	LPV	0	100	0	100	0	100
DMO	SEDALIA RGNL	MO	LPV	0	100	0	100	0	100
DXE	DEXTER MUNICIPAL	MO	LPV	0	100	0	100	0	100
EIW	COUNTY MEMORIAL	MO	LPV	0	100	0	100	0	100
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	100	0	100	1	99.999
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
EZZ	CAMERON MEMORIAL	MO	LPV	0	100	0	100	0	100
FAM	FARMINGTON RGNL	MO	LPV	0	100	0	100	0	100
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	0	100	0	100	0	100
FWB	BRANSON WEST MUNICIPAL - EMERSON FI	MO	LPV200	0	100	0	100	0	100
FYG	WASHINGTON RGNL	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GLY	CLINTON RGNL	MO	LPV	0	100	0	100	0	100
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	100	0	100	0	100
H79	ELDON MODEL AIRPARK	MO	LP	0	100	0	100	0	100
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	0	100	0	100	0	100
HAE	HANNIBAL RGNL	MO	LPV	0	100	0	100	0	100
HFJ	MONETT RGNL	MO	LPV	0	100	0	100	0	100
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
IRK	KIRKSVILLE RGNL	MO	LPV200	0	100	0	100	0	100
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	0	100	0	100	0	100
JLN	JOPLIN RGNL	MO	LPV	0	100	0	100	0	100
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	0	100	0	100	0	100
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	100	0	100	0	100
K89	MACON-FOWER MEMORIAL	MO	LPV	0	100	0	100	0	100
LLU	LAMAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	100	0	100	0	100
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	100	0	100	0	100
M05	CARUTHERSVILLE MEMORIAL	MO	LPV	0	100	0	100	1	99.999
M12	STEELE MUNICIPAL	MO	LPV	0	100	0	100	1	99.999
M17	BOLIVAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
M48	HOUSTON MEMORIAL	MO	LPV	0	100	0	100	0	100
MAW	MALDEN RGNL	MO	LPV	0	100	0	100	0	100
MBY	OMAR N BRADLEY	MO	LPV	0	100	0	100	0	100
MCI	KANSAS CITY INTL	MO	LPV200	0	100	0	100	0	100
MHL	MARSHALL MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV200	0	100	0	100	0	100
MNF	MOUNTAIN VIEW	MO	LP	0	100	0	100	0	100
MO3	STOCKTON MUNICIPAL	MO	LP	0	100	0	100	0	100
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
MYJ	MEXICO MEMORIAL	MO	LPV	0	100	0	100	0	100
NVD	NEVADA MUNICIPAL	MO	LPV200	0	100	0	100	0	100
OZS	CAMDENTON MEMORIAL-LAKE RGNL	MO	LPV	0	100	0	100	0	100
PCD	PERRYVILLE RGNL	MO	LPV	0	100	0	100	0	100
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	0	100	0	100	0	100
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	100	0	100	0	100
RAW	WARSAW MUNICIPAL	MO	LPV200	0	100	0	100	0	100
RCM	SKYHAVEN	MO	LPV	0	100	0	100	0	100
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SIK	SIKESTON MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	100	0	100	0	100
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	0	100	0	100	0	100
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	100	0	100	0	100
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	0	100	0	100	0	100
TKX	KENNETT MEMORIAL	MO	LPV	0	100	0	100	0	100
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	0	100
UBX	CUBA MUNICIPAL	MO	LPV	0	100	0	100	0	100
UNO	WEST PLAINS RGNL	MO	LPV	0	100	0	100	0	100
UUV	SULLIVAN RGNL	MO	LPV	0	100	0	100	0	100
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	100	0	100	0	100
VIH	ROLLA NATIONAL	MO	LPV200	0	100	0	100	0	100
0R0	COLUMBIA-MARION COUNTY	MS	LPV	0	100	0	100	91	99.754
17M	MAGEE MUNICIPAL	MS	LP	0	100	0	100	86	99.804
5A4	OKOLONA MUNICIPAL-RICHARD STOVALL F	MS	LPV	0	100	0	100	58	99.957
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	0	100	68	99.918
87I	YAZOO COUNTY	MS	LPV	0	100	0	100	63	99.908
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	0	100	49	99.98
CKM	FLETCHER FIELD	MS	LPV	0	100	0	100	31	99.983
CRX	ROSCOE TURNER	MS	LPV200	0	100	0	100	40	99.984
GLH	GREENVILLE MID-DELTA	MS	LPV200	0	100	0	100	29	99.984
GNF	GRENADA MUNICIPAL	MS	LPV200	0	100	0	100	63	99.94
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	100	1	99.999	92	99.684
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	0	100	65	99.93
GWO	GREENWOOD-LEFLORE	MS	LPV	0	100	0	100	65	99.924
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	0	100	0	100	89	99.761
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADA	MS	LPV200	0	100	0	100	60	99.913
HKS	HAWKINS FIELD	MS	LPV	0	100	0	100	76	99.845
HSA	STENNIS INTL	MS	LPV200	0	100	0	100	92	99.671
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	100	0	100	42	99.963
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	0	100	0	100	79	99.839
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	100	0	100	74	99.856
LMS	LOUISVILLE WINSTON COUNTY	MS	LPV	0	100	0	100	70	99.907
LUL	HESLER-NOBLE FIELD	MS	LPV	0	100	0	100	84	99.8
M40	MONROE COUNTY	MS	LPV	0	100	0	100	59	99.952
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	0	100	0	100	45	99.981
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	0	100	0	100	88	99.781

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MBO	BRUCE CAMPBELL FIELD	MS	LP	0	100	0	100	77	99.85
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV	0	100	0	100	88	99.75
MEI	KEY FIELD	MS	LPV200	0	100	0	100	79	99.857
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	100	0	100	92	99.678
MMS	SELFS	MS	LPV	0	100	0	100	39	99.969
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	0	100	75	99.884
OLV	OLIVE BRANCH	MS	LPV200	0	100	0	100	42	99.983
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	100	0	100	88	99.778
PMU	PANOLA COUNTY	MS	LPV	0	100	0	100	51	99.965
PQL	TRENT LOTT INTL	MS	LPV200	0	100	1	99.998	92	99.703
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	100	0	100	32	99.98
STF	GEORGE M BRYAN	MS	LPV200	0	100	0	100	66	99.926
TUP	TUPELO RGNL	MS	LPV200	0	100	0	100	54	99.967
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	0	100	55	99.965
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	0	100	27	99.987
VKS	VICKSBURG MUNICIPAL	MS	LP	0	100	0	100	60	99.912
1S3	TILLITT FIELD	MT	LPV	0	100	0	100	1	99.999
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	0	100	2	99.999
6S8	LAUREL MUNICIPAL	MT	LPV	0	100	0	100	0	100
7S0	RONAN	MT	LPV	0	100	0	100	0	100
BHK	BAKER MUNICIPAL	MT	LPV	0	100	0	100	1	99.999
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	100	0	100	0	100
BTM	BERT MOONEY	MT	LPV	0	100	0	100	0	100
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	0	100	0	100	0	100
CTB	CUT BANK INTL	MT	LPV200	0	100	0	100	1	99.999
DLN	DILLON	MT	LPV	0	100	0	100	0	100
EKS	ENNIS - BIG SKY	MT	LPV	0	100	0	100	0	100
GDV	DAWSON COMMUNICIPALTY	MT	LPV	0	100	0	100	2	99.999
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	0	100	0	100	2	99.999
GPI	GLACIER PARK INTL	MT	LPV	0	100	0	100	0	100
GTF	GREAT FALLS INTL	MT	LPV200	0	100	0	100	0	100
HLN	HELENA RGNL	MT	LPV	0	100	0	100	0	100
HVR	HAVRE CITY-COUNTY	MT	LPV	0	100	0	100	1	99.999
LVM	MISSION FIELD	MT	LP	0	100	0	100	0	100
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	0	100	0	100	0	100
M75	MALTA	MT	LP	0	100	0	100	1	99.999
MLS	FRANK WILEY FIELD	MT	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MSO	MISSOULA INTL	MT	LPV	0	100	0	100	0	100
OLF	L M CLAYTON	MT	LPV200	0	100	0	100	2	99.999
PO1	POPLAR MUNICIPAL	MT	LPV200	0	100	0	100	2	99.999
PWD	SHER-WOOD	MT	LPV200	0	100	0	100	2	99.999
RPX	ROUNDUP	MT	LPV	0	100	0	100	0	100
SBX	SHELBY	MT	LPV	0	100	0	100	1	99.999
SDY	SIDNEY-RICHLAND MUNICIPAL	MT	LPV	0	100	0	100	2	99.999
WYS	YELLOWSTONE	MT	LPV200	0	100	0	100	0	100
CYCL	CHARLO	NB	LPV	0	100	0	100	0	100
CYQM	MONCTON INTL	NB	LPV	0	100	0	100	0	100
43A	MONTGOMERY COUNTY	NC	LP	0	100	0	100	0	100
ACZ	HENDERSON FIELD	NC	LPV	0	100	0	100	0	100
AFP	ANSON COUNTY - JEFF CLOUD FIEL	NC	LPV	0	100	0	100	0	100
AKH	GASTONIA MUNICIPAL	NC	LPV	0	100	0	100	0	100
ASJ	TRI-COUNTY	NC	LPV	0	100	0	100	0	100
AVL	ASHEVILLE RGNL	NC	LPV200	0	100	0	100	0	100
BUY	BURLINGTON-ALAMANCE RGNL	NC	LPV	0	100	0	100	0	100
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	100	0	100	0	100
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	0	100	0	100	0	100
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	100	0	100	0	100
DPL	DUPLIN CO	NC	LPV200	0	100	0	100	0	100
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	0	100	0	100	0	100
EDE	NORTHEASTERN RGNL	NC	LPV200	0	100	0	100	0	100
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	100	0	100	0	100
EQY	CHARLOTTE-MONROE EXECUTIVE	NC	LPV200	0	100	0	100	0	100
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	100	0	100	0	100
EXX	DAVIDSON COUNTY	NC	LPV	0	100	0	100	0	100
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	0	100	0	100	0	100
FAY	FAYETTEVILLE RGNL/GRANNIS FIEL	NC	LPV200	0	100	0	100	0	100
FFA	FIRST FLIGHT	NC	LP	0	100	0	100	0	100
FQD	RUTHERFORD CO - MARCHMAN FIELD	NC	LPV	0	100	0	100	0	100
GEV	ASHE COUNTY	NC	LP	0	100	0	100	0	100
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	100	0	100	0	100
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	0	100	0	100	0	100
HBI	ASHEBORO RGNL	NC	LPV	0	100	0	100	0	100
HKY	HICKORY RGNL	NC	LPV200	0	100	0	100	0	100
HNZ	HENDERSON-OXFORD	NC	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HRJ	HARNETT RGNL JETPORT	NC	LPV	0	100	0	100	0	100
ILM	WILMINGTON INTL	NC	LPV200	0	100	0	100	0	100
INT	SMITH REYNOLDS	NC	LPV200	0	100	0	100	0	100
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	0	100	0	100	0	100
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	0	100	0	100	0	100
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	0	100
JNX	JOHNSTON REGIONAL	NC	LPV	0	100	0	100	0	100
JQF	CONCORD RGNL	NC	LPV	0	100	0	100	0	100
LBT	LUMBERTON RGNL	NC	LPV	0	100	0	100	0	100
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	0	100	0	100	0	100
MCZ	MARTIN COUNTY	NC	LPV	0	100	0	100	0	100
MEB	LAURINBURG-MAXTON	NC	LPV200	0	100	0	100	0	100
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	0	100
MRH	MICHAEL J SMITH FIELD	NC	LPV	0	100	0	100	0	100
MRN	FOOTHILLS REGIONAL	NC	LPV	0	100	0	100	0	100
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	100	0	100	0	100
OAJ	ALBERT J ELLIS	NC	LPV200	0	100	0	100	0	100
OCW	WASHINGTON-WARREN	NC	LPV	0	100	0	100	0	100
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	0	100
PGV	PITT-GREENVILLE	NC	LPV	0	100	0	100	0	100
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	100	0	100	0	100
RCZ	RICHMOND COUNTY	NC	LPV	0	100	0	100	0	100
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	100	0	100	0	100
RHP	WESTERN CAROLINA RGNL	NC	LP	0	100	0	100	0	100
RUQ	ROWAN COUNTY	NC	LPV200	0	100	0	100	0	100
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	0	100	0	100	0	100
SCR	SILER CITY MUNICIPAL	NC	LPV	0	100	0	100	0	100
SOP	MOORE COUNTY	NC	LPV200	0	100	0	100	0	100
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	0	100	0	100	0	100
SVH	STATESVILLE RGNL	NC	LPV200	0	100	0	100	0	100
TDF	PERSON COUNTY	NC	LPV200	0	100	0	100	0	100
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	0	100	0	100	0	100
VUJ	STANLY COUNTY	NC	LPV200	0	100	0	100	0	100
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	0	100	0	100	0	100
ZEF	ELKIN MUNICIPAL	NC	LP	0	100	0	100	0	100
06D	ROLLA MUNICIPAL	ND	LPV	0	100	0	100	0	100
20U	BEACH	ND	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2C8	CAVALIER MUNICIPAL	ND	LPV	0	100	0	100	0	100
3H4	HILLSBORO MUNICIPAL	ND	LPV	0	100	0	100	0	100
46D	CARRINGTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
51D	EDGELEY MUNICIPAL	ND	LPV	0	100	0	100	0	100
5L0	LAKOTA MUNICIPAL	ND	LPV	0	100	0	100	0	100
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	100	0	100	0	100
6L3	LISBON MUNICIPAL	ND	LPV	0	100	0	100	0	100
7L2	LINTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
9D7	CANDO MUNICIPAL	ND	LPV	0	100	0	100	0	100
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	100	0	100	0	100
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	100	0	100	0	100
BWP	HARRY STERN	ND	LPV	0	100	0	100	0	100
BWW	BOWMAN RGNL	ND	LPV	0	100	0	100	1	99.999
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	100	0	100	0	100
D55	ROBERTSON FIELD	ND	LPV	0	100	0	100	0	100
D60	TIOGA MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
DIK	DICKINSON - THEODORE ROOSEVELT	ND	LPV200	0	100	0	100	1	99.999
DVL	DEVILS LAKE RGNL	ND	LPV200	0	100	0	100	0	100
FAR	HECTOR INTL	ND	LPV200	0	100	0	100	0	100
GAF	HUTSON FIELD	ND	LPV	0	100	0	100	0	100
GFK	GRAND FORKS INTL	ND	LPV	0	100	0	100	0	100
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV200	0	100	0	100	0	100
HEI	HETTINGER MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
HZE	MERCER COUNTY RGNL	ND	LPV	0	100	0	100	0	100
ISN	SLOULIN FLD INTL	ND	LPV200	0	100	0	100	1	99.999
JMS	JAMESTOWN RGNL	ND	LPV200	0	100	0	100	0	100
K74	ROBERT ODEGAARD FIELD	ND	LP	0	100	0	100	0	100
MOT	MINOT INTL	ND	LPV	0	100	0	100	0	100
RUG	RUGBY MUNICIPAL	ND	LP	0	100	0	100	0	100
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
Y19	MANDAN MUNICIPAL	ND	LPV	0	100	0	100	0	100
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	0	100	0	100	0	100
08K	HARVARD STATE	NE	LPV	0	100	0	100	0	100
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	0	100	0	100	0	100
0C4	PENDER MUNICIPAL	NE	LPV	0	100	0	100	0	100
0F4	LOUP CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
0G3	TECUMSEH MUNICIPAL	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	100	0	100	0	100
12K	SUPERIOR MUNICIPAL	NE	LPV	0	100	0	100	0	100
47V	CURTIS MUNICIPAL	NE	LPV	0	100	0	100	0	100
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	0	100
4V9	ANTELOPE COUNTY	NE	LPV	0	100	0	100	0	100
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	100	0	100	0	100
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	100	0	100	0	100
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	100	0	100	0	100
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
9V5	MODISETT	NE	LPV	0	100	0	100	0	100
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
AHQ	WAHOO MUNICIPAL	NE	LPV	0	100	0	100	0	100
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
ANW	AINSWORTH RGNL	NE	LPV200	0	100	0	100	0	100
AUH	AURORA MUNICIPAL - AL POTTER FIELD	NE	LPV	0	100	0	100	0	100
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	0	100	0	100	0	100
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	0	100	0	100	0	100
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
BTA	BLAIR MUNICIPAL	NE	LPV	0	100	0	100	0	100
BUB	CRAM FIELD	NE	LPV	0	100	0	100	0	100
BVN	ALBION MUNICIPAL	NE	LPV	0	100	0	100	0	100
CDR	CHADRON MUNICIPAL	NE	LPV200	0	100	0	100	0	100
CEK	CRETE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	0	100
EAR	KEARNEY RGNL	NE	LPV200	0	100	0	100	0	100
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	100	0	100	0	100
FET	FREMONT MUNICIPAL	NE	LPV	0	100	0	100	0	100
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	100	0	100	0	100
FNB	BRENNER FIELD	NE	LPV	0	100	0	100	0	100
GGF	GRANT MUNICIPAL	NE	LPV	0	100	0	100	0	100
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	100	0	100	0	100
GRN	GORDON MUNICIPAL	NE	LPV	0	100	0	100	0	100
HDE	BREWSTER FIELD	NE	LPV	0	100	0	100	0	100
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	0	100
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	100	0	100	0	100
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JYR	YORK MUNICIPAL	NE	LPV	0	100	0	100	0	100
LBF	NORTH PLATTE RGNL AIRPORT LEE	NE	LPV200	0	100	0	100	0	100
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	0	100	0	100	0	100
LNK	LINCOLN	NE	LPV200	0	100	0	100	0	100
LXN	JIM KELLY FIELD	NE	LPV	0	100	0	100	0	100
MCK	MC COOK BEN NELSON RGNL	NE	LPV	0	100	0	100	0	100
MLE	MILLARD	NE	LPV	0	100	0	100	0	100
ODX	EVELYN SHARP FIELD	NE	LPV	0	100	0	100	0	100
OFK	NORFOLK RGNL/KARL STEFAN MEMOR	NE	LPV	0	100	0	100	0	100
OGA	SEARLE FIELD	NE	LPV	0	100	0	100	0	100
OKS	GARDEN COUNTY	NE	LPV	0	100	0	100	0	100
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	100	0	100	0	100
OMA	EPPLEY AIRFIELD	NE	LPV200	0	100	0	100	0	100
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	0	100	0	100	0	100
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	0	100	0	100	0	100
RBE	ROCK COUNTY	NE	LPV	0	100	0	100	0	100
SCB	SCRIBNER STATE	NE	LPV	0	100	0	100	0	100
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FIELD	NE	LPV	0	100	0	100	0	100
SWT	SEWARD MUNICIPAL	NE	LPV	0	100	0	100	0	100
TIF	THOMAS COUNTY	NE	LPV	0	100	0	100	0	100
TQE	TEKAMAH MUNICIPAL	NE	LPV	0	100	0	100	0	100
VTN	MILLER FIELD	NE	LPV	0	100	0	100	0	100
ASH	BOIRE FIELD	NH	LPV200	0	100	0	100	0	100
CON	CONCORD MUNICIPAL	NH	LPV	0	100	0	100	0	100
DAW	SKYHAVEN	NH	LPV	0	100	0	100	0	100
EEN	DILLANT-HOPKINS	NH	LPV	0	100	0	100	0	100
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	100	0	100	0	100
LCI	LACONIA MUNICIPAL	NH	LPV	0	100	0	100	0	100
LEB	LEBANON MUNICIPAL	NH	LPV	0	100	0	100	0	100
MHT	MANCHESTER	NH	LPV200	0	100	0	100	0	100
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	100	0	100	0	100
47N	CENTRAL JERSEY RGNL	NJ	LP	0	100	0	100	0	100
4N1	GREENWOOD LAKE	NJ	LP	0	100	0	100	0	100
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	100	0	100	0	100
CDW	ESSEX COUNTY	NJ	LPV	0	100	0	100	0	100
EWR	NEWARK LIBERTY INTL	NJ	LPV200	0	100	0	100	0	100
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MJX	OCEAN COUNTY	NJ	LPV	0	100	0	100	0	100
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
N12	LAKEWOOD	NJ	LP	0	100	0	100	0	100
N14	FLYING W	NJ	LPV	0	100	0	100	0	100
N40	SKY MANOR	NJ	LP	0	100	0	100	0	100
TEB	TETERBORO	NJ	LPV	0	100	0	100	0	100
TTN	TRENTON MERCER	NJ	LPV	0	100	0	100	0	100
VAY	SOUTH JERSEY RGNL	NJ	LP	0	100	0	100	0	100
WWD	CAPE MAY COUNTY	NJ	LPV	0	100	0	100	0	100
CYDF	DEER LAKE	NL	LPV	0	100	0	100	29	99.948
0.00E+00	MORIARTY	NM	LPV	0	100	0	100	0	100
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	0	100	0	100	3	99.997
AEG	DOUBLE EAGLE II	NM	LPV200	0	100	0	100	3	99.994
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	0	100	0	100	0	100
ATS	ARTESIA MUNICIPAL	NM	LPV	0	100	0	100	1	99.999
CAO	CLAYTON MUNICIPAL ARPK	NM	LPV	0	100	0	100	0	100
CNM	CAVERN CITY AIR TRML	NM	LPV200	0	100	0	100	1	99.999
CVN	CLOVIS MUNICIPAL	NM	LPV200	0	100	0	100	0	100
DMN	DEMING MUNICIPAL	NM	LPV	0	100	0	100	49	99.94
E06	LEA COUNTY-ZIP FRANKLIN MEMORI	NM	LPV	0	100	0	100	1	99.999
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	3	99.989
HOB	LEA COUNTY RGNL	NM	LPV	0	100	0	100	1	99.999
LAM	LOS ALAMOS	NM	LP	0	100	0	100	3	99.998
LRU	LAS CRUCES INTL	NM	LPV200	0	100	0	100	0	100
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	0	100	4	99.996
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	100	0	100	1	99.999
SAF	SANTA FE MUNICIPAL	NM	LPV200	0	100	0	100	2	99.999
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	100	0	100	0	100
SVC	GRANT COUNTY	NM	LPV	0	100	0	100	75	99.769
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	0	100	0	100	0	100
CYEV	INUVIK	NT	LPV	0	100	0	100	4	99.998
05U	EUREKA	NV	LP	0	100	0	100	0	100
CXP	CARSON	NV	LP	0	100	0	100	0	100
ELY	ELY ARPT /YELLAND FLD/	NV	LPV	0	100	0	100	0	100
LAS	MC CARRAN INTL	NV	LPV	0	100	0	100	0	100
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	0	100
RTS	RENO/STEAD	NV	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SPZ	SILVER SPRINGS	NV	LPV	0	100	0	100	0	100
TPH	TONOPAH	NV	LP	0	100	0	100	0	100
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	0	100
06N	RANDALL	NY	LP	0	100	0	100	0	100
0G7	FINGER LAKES RGNL	NY	LPV	0	100	0	100	0	100
1B1	COLUMBIA COUNTY	NY	LPV	0	100	0	100	0	100
20N	KINGSTON-ULSTER	NY	LPV	0	100	0	100	0	100
44N	SKY ACRES	NY	LPV	0	100	0	100	0	100
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	100	0	100	0	100
5B2	SARATOGA COUNTY	NY	LPV	0	100	0	100	0	100
5G0	LE ROY	NY	LP	0	100	0	100	0	100
9G0	BUFFALO AIRFIELD	NY	LP	0	100	0	100	1	99.999
9G3	AKRON	NY	LP	0	100	0	100	1	99.999
ALB	ALBANY INTL	NY	LPV200	0	100	0	100	0	100
ART	WATERTOWN INTL	NY	LPV200	0	100	0	100	0	100
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	0	100	0	100	0	100
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	100	0	100	0	100
D38	CANANDAIGUA	NY	LPV	0	100	0	100	0	100
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	100	0	100	0	100
ELZ	WELLSVILLE MUNICIPAL ARPT`TARANTINE	NY	LPV	0	100	0	100	1	99.999
FOK	FRANCIS S GABRESKI	NY	LPV200	0	100	0	100	0	100
FRG	REPUBLIC	NY	LPV200	0	100	0	100	0	100
FZY	OSWEGO COUNTY	NY	LPV	0	100	0	100	0	100
GFL	FLOYD BENNETT MEMORIAL	NY	LPV200	0	100	0	100	0	100
GVQ	GENESEE COUNTY	NY	LPV200	0	100	0	100	0	100
HPN	WESTCHESTER COUNTY	NY	LPV	0	100	0	100	0	100
HTF	HORNELL MUNICIPAL	NY	LPV	0	100	0	100	0	100
HTO	EAST HAMPTON	NY	LPV	0	100	0	100	0	100
HWV	BROOKHAVEN	NY	LPV	0	100	0	100	0	100
IAG	NIAGARA FALLS INTL	NY	LPV	0	100	0	100	0	100
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	100	0	100	0	100
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	100	0	100	0	100
JFK	JOHN F KENNEDY INTL	NY	LPV200	0	100	0	100	0	100
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	100	0	100	0	100
K09	PISECO	NY	LP	0	100	0	100	0	100
LGA	LAGUARDIA	NY	LPV	0	100	0	100	0	100
MAL	MALONE-DUFORT	NY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MGJ	ORANGE COUNTY	NY	LPV	0	100	0	100	0	100
MSS	MASSENA INTL-RICHARDS FIELD	NY	LPV	0	100	0	100	0	100
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	100	0	100	0	100
N23	SIDNEY MUNICIPAL	NY	LP	0	100	0	100	0	100
N66	ONEONTA MUNICIPAL	NY	LPV	0	100	0	100	0	100
NY0	FULTON COUNTY	NY	LPV	0	100	0	100	0	100
OGS	OGDENSBURG INTL	NY	LPV	0	100	0	100	0	100
OIC	LT WARREN EATON	NY	LP	0	100	0	100	0	100
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	100	0	100	1	99.998
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	0	100
PEO	PENN YAN	NY	LPV	0	100	0	100	0	100
POU	HUDSON VALLEY RGNL	NY	LPV	0	100	0	100	0	100
RME	GRIFFISS INTL	NY	LPV200	0	100	0	100	0	100
ROC	GREATER ROCHESTER INTL	NY	LPV200	0	100	0	100	0	100
SCH	SCHENECTADY COUNTY	NY	LPV200	0	100	0	100	0	100
SDC	WILLIAMSON-SODUS	NY	LPV	0	100	0	100	0	100
SLK	ADIRONDACK RGNL	NY	LPV200	0	100	0	100	0	100
SWF	STEWART INTL	NY	LPV200	0	100	0	100	0	100
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	100	0	100	0	100
VGC	HAMILTON MUNICIPAL	NY	LPV	0	100	0	100	0	100
0G6	WILLIAMS COUNTY	OH	LPV	0	100	0	100	0	100
10G	HOLMES COUNTY	OH	LP	0	100	0	100	0	100
16G	SENECA COUNTY	OH	LPV	0	100	0	100	0	100
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	0	100	0	100	0	100
1G0	WOOD COUNTY	OH	LPV	0	100	0	100	0	100
1G3	KENT STATE UNIV	OH	LPV	0	100	0	100	0	100
2G2	JEFFERSON COUNTY AIRPARK	OH	LPV	0	100	0	100	0	100
4G5	MONROE COUNTY	OH	LP	0	100	0	100	0	100
4I3	KNOX COUNTY	OH	LPV200	0	100	0	100	0	100
5A1	NORWALK-HURON COUNTY	OH	LP	0	100	0	100	0	100
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	100	0	100	0	100
7G8	GEAUGA COUNTY	OH	LP	0	100	0	100	0	100
AKR	AKRON FULTON INTL	OH	LP	0	100	0	100	0	100
AOH	LIMA ALLEN COUNTY	OH	LPV200	0	100	0	100	0	100
AXV	NEIL ARMSTRONG	OH	LPV	0	100	0	100	0	100
BJJ	WAYNE COUNTY	OH	LPV	0	100	0	100	0	100
BKL	BURKE LAKEFRONT	OH	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CAK	AKRON-CANTON RGNL	OH	LPV200	0	100	0	100	0	100
CDI	CAMBRIDGE MUNICIPAL	OH	LP	0	100	0	100	0	100
CGF	CUYAHOGA COUNTY	OH	LPV	0	100	0	100	0	100
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	0	100
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	0	100	0	100	0	100
CQA	LAKEFIELD	OH	LPV	0	100	0	100	0	100
CYO	PICKAWAY COUNTY MEMORIAL	OH	LPV	0	100	0	100	0	100
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	100	0	100	0	100
DLZ	DELAWARE MUNICIPAL - JIM MOORE FIEL	OH	LPV	0	100	0	100	0	100
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	0	100
EOP	PIKE COUNTY	OH	LP	0	100	0	100	0	100
FDY	FINDLAY	OH	LPV	0	100	0	100	0	100
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	100	0	100	0	100
GQQ	GALION MUNICIPAL	OH	LP	0	100	0	100	0	100
HAO	BUTLER CO RGNL-HOGAN FIELD	OH	LPV	0	100	0	100	0	100
HOC	HIGHLAND COUNTY	OH	LP	0	100	0	100	0	100
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	0	100
I19	GREENE COUNTY-LEWIS A JACKSON	OH	LPV	0	100	0	100	0	100
I40	RICHARD DOWNING	OH	LPV	0	100	0	100	0	100
I66	CLINTON FIELD	OH	LPV	0	100	0	100	0	100
I68	WARREN COUNTY/JOHN LANE FIELD	OH	LPV	0	100	0	100	0	100
I69	CLERMONT COUNTY	OH	LP	0	100	0	100	0	100
I74	GRIMES FIELD	OH	LPV	0	100	0	100	0	100
ILN	WILMINGTON AIR PARK	OH	LPV200	0	100	0	100	0	100
LCK	RICKENBACKER INTL	OH	LPV200	0	100	0	100	0	100
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	100	0	100	0	100
LNN	WILLOUGHBY LOST NATION MUNICIPAL	OH	LPV	0	100	0	100	0	100
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	100	0	100	0	100
LUK	CINCINNATI MUNICIPAL AIRPORT LUNKEN	OH	LPV	0	100	0	100	0	100
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	100	0	100	0	100
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	100	0	100	0	100
MNN	MARION MUNICIPAL	OH	LPV	0	100	0	100	0	100
MRT	UNION COUNTY	OH	LP	0	100	0	100	0	100
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	0	100	0	100	0	100
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	0	100
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	0	100
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PCW	ERIE-OTTAWA INTL	OH	LPV	0	100	0	100	0	100
PHD	HARRY CLEVER FIELD	OH	LP	0	100	0	100	0	100
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	0	100	0	100	0	100
POV	PORTAGE COUNTY	OH	LPV	0	100	0	100	0	100
RZT	ROSS COUNTY	OH	LPV	0	100	0	100	0	100
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	100	0	100	0	100
SCA	SIDNEY MUNICIPAL	OH	LPV	0	100	0	100	0	100
SGH	SPRINGFIELD-BECKLEY MUNICIPAL	OH	LPV200	0	100	0	100	0	100
TDZ	TOLEDO EXECUTIVE	OH	LPV	0	100	0	100	0	100
TOL	TOLEDO EXPRESS	OH	LPV200	0	100	0	100	0	100
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	100	0	100	0	100
TZR	BOLTON FIELD	OH	LPV200	0	100	0	100	0	100
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	0	100
USE	FULTON COUNTY	OH	LPV	0	100	0	100	0	100
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	0	100
VTA	NEWARK-HEATH	OH	LP	0	100	0	100	0	100
YNG	YOUNGSTOWN-WARREN RGNL	OH	LPV	0	100	0	100	0	100
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	0	100	0	100	0	100
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	100	0	100	1	99.999
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	0	100	0	100	1	99.999
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
2K4	SCOTT FIELD	OK	LPV	0	100	0	100	1	99.999
80F	ANTLERS MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
ADH	ADA MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
ADM	ARDMORE MUNICIPAL	OK	LPV200	0	100	0	100	1	99.999
AVK	ALVA RGNL	OK	LPV	0	100	0	100	1	99.999
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	100	0	100	1	99.999
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	100	0	100	1	99.999
CLK	CLINTON RGNL	OK	LPV	0	100	0	100	1	99.999
CSM	CLINTON-SHERMAN	OK	LPV200	0	100	0	100	1	99.999
DUA	DURANT RGNL - EAKER FIELD	OK	LPV	0	100	0	100	1	99.999
DUC	HALLIBURTON FIELD	OK	LPV	0	100	0	100	1	99.999
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	100	0	100	1	99.999
F22	PERRY MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
FDR	FREDERICK RGNL	OK	LPV200	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GCM	CLAREMORE RGNL	OK	LPV	0	100	0	100	1	99.999
GMJ	GROVE MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	100	0	100	1	99.999
GUY	GUYMON MUNICIPAL	OK	LPV	0	100	0	100	0	100
GZL	STIGLER RGNL	OK	LPV	0	100	0	100	1	99.999
H71	MID-AMERICA INDUSTRIAL	OK	LPV	0	100	0	100	1	99.999
HBR	HOBART RGNL	OK	LPV	0	100	0	100	1	99.999
HHW	STAN STAMPER MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
HSD	SUNDANCE	OK	LPV	0	100	0	100	1	99.999
MKO	DAVIS FIELD	OK	LPV	0	100	0	100	1	99.999
MLC	MC ALESTER RGNL	OK	LPV	0	100	0	100	1	99.999
OJA	THOMAS P STAFFORD	OK	LPV	0	100	0	100	1	99.999
OKC	WILL ROGERS WORLD	OK	LPV200	0	100	0	100	1	99.999
OKM	OKMULGEE RGNL	OK	LPV	0	100	0	100	1	99.999
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	0	100	0	100	1	99.999
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
PNC	PONCA CITY RGNL	OK	LPV	0	100	0	100	1	99.999
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	100	0	100	1	99.999
PWA	WILEY POST	OK	LPV200	0	100	0	100	1	99.999
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
RVS	RICHARD LLOYD JONES JR	OK	LPV200	0	100	0	100	1	99.999
SNL	SHAWNEE RGNL	OK	LPV200	0	100	0	100	1	99.999
SWO	STILLWATER RGNL	OK	LPV200	0	100	0	100	1	99.999
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	100	0	100	1	99.999
TUL	TULSA INTL	OK	LPV200	0	100	0	100	1	99.999
WDG	ENID WOODRING RGNL	OK	LPV200	0	100	0	100	1	99.999
WWR	WEST WOODWARD	OK	LPV	0	100	0	100	0	100
CNS7	KINCARDINE	ON	LPV	0	100	0	100	0	100
CYHD	DRYDEN REGIONAL	ON	LPV	0	100	0	100	0	100
CYKF	KITCHENER / WATERLOO	ON	LPV	0	100	0	100	0	100
CYOW	OTTAWA / MACDONALDCARTIER INTL	ON	LPV	0	100	0	100	0	100
CYQT	THUNDER BAY	ON	LPV	0	100	0	100	0	100
CYTS	TIMMINS / VICTOR M POWER	ON	LPV	0	100	0	100	0	100
CYXL	SIOUX LOOKOUT	ON	LPV	0	100	0	100	0	100
AST	ASTORIA RGNL	OR	LPV	0	100	0	100	0	100
BDN	BEND MUNICIPAL	OR	LPV	0	100	0	100	0	100
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	0	100
EUG	MAHLON SWEET FIELD	OR	LPV200	0	100	0	100	0	100
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	100	0	100	0	100
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	100	0	100	0	100
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	100	0	100	0	100
LKV	LAKE COUNTY	OR	LPV	0	100	0	100	0	100
LMT	CRATER LAKE-KLAMATH RGNL	OR	LPV	0	100	0	100	0	100
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	0	100
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	0	100
ONP	NEWPORT MUNICIPAL	OR	LPV	0	100	0	100	1	99.999
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	1	99.999
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	0	100	0	100	0	100
PDX	PORTLAND INTL	OR	LPV200	0	100	0	100	0	100
RDM	ROBERTS FIELD	OR	LPV200	0	100	0	100	0	100
S33	MADRAS MUNICIPALCIPAL	OR	LPV	0	100	0	100	0	100
S39	PRINEVILLE	OR	LP	0	100	0	100	0	100
SLE	MCNARY FLD	OR	LPV200	0	100	0	100	0	100
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	100	0	100	0	100
UAO	AURORA STATE	OR	LPV	0	100	0	100	0	100
22N	JAKE ARNER MEMORIAL	PA	LP	0	100	0	100	0	100
29D	GROVE CITY	PA	LP	0	100	0	100	0	100
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	0	100
6G1	TITUSVILLE	PA	LPV	0	100	0	100	0	100
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	0	100
8N8	DANVILLE	PA	LP	0	100	0	100	0	100
9D4	DECK	PA	LPV	0	100	0	100	0	100
ABE	LEHIGH VALLEY INTL	PA	LPV200	0	100	0	100	0	100
AFJ	WASHINGTON COUNTY	PA	LPV200	0	100	0	100	0	100
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	0	100
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	100	0	100	0	100
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	0	100	0	100	0	100
AXQ	CLARION COUNTY	PA	LPV	0	100	0	100	0	100
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	0	100
BTP	BUTLER COUNTY/K W SCHOLTER FIE	PA	LPV	0	100	0	100	0	100
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	0	100
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	0	100
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	0	100	0	100	0	100
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	100	0	100	0	100
FKL	VENANGO RGNL	PA	LPV	0	100	0	100	0	100
FWQ	ROSTRAVER	PA	LPV	0	100	0	100	0	100
GKJ	PORT MEADVILLE	PA	LP	0	100	0	100	0	100
HMZ	BEDFORD COUNTY	PA	LPV	0	100	0	100	0	100
HZL	HAZLETON RGNL	PA	LPV	0	100	0	100	0	100
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	0	100	0	100	0	100
IPT	WILLIAMSPORT RGNL	PA	LPV	0	100	0	100	0	100
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA	PA	LPV200	0	100	0	100	0	100
LBE	ARNOLD PALMER RGNL	PA	LPV200	0	100	0	100	0	100
LNS	LANCASTER	PA	LPV200	0	100	0	100	0	100
LOM	WINGS FIELD	PA	LPV	0	100	0	100	0	100
MDT	HARRISBURG INTL	PA	LPV	0	100	0	100	0	100
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	0	100	0	100	0	100
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	100	0	100	0	100
N38	WELLSBORO JOHNSTON	PA	LP	0	100	0	100	0	100
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	100	0	100	0	100
N96	BELLEFONTE	PA	LPV	0	100	0	100	0	100
OQN	BRANDYWINE	PA	LP	0	100	0	100	0	100
OYM	ST MARYS MUNICIPAL	PA	LPV	0	100	0	100	0	100
PHL	PHILADELPHIA INTL	PA	LPV200	0	100	0	100	0	100
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	0	100
PNE	NORTHEAST PHILADELPHIA	PA	LPV	0	100	0	100	0	100
PSB	MID-STATE	PA	LPV	0	100	0	100	0	100
PTW	HERITAGE FIELD	PA	LPV	0	100	0	100	0	100
RDG	READING RGNL/CARL A SPAATZ FIE	PA	LPV	0	100	0	100	0	100
RVL	MIFFLIN COUNTY	PA	LPV	0	100	0	100	0	100
THV	YORK	PA	LP	0	100	0	100	0	100
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	100	0	100	0	100
UKT	QUAKERTOWN	PA	LP	0	100	0	100	0	100
UNV	UNIVERSITY PARK	PA	LPV200	0	100	0	100	0	100
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	0	100	0	100	0	100
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	0	100
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	100	0	100	0	100
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	100	0	100	0	100
ZER	SCHUYLKILL COUNTY /JOE ZERBEY/	PA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CPN8	OPINACA	QC	LPV	0	100	0	100	0	100
CSR3	VICTORIAVILLE	QC	LPV	0	100	0	100	0	100
CTP9	KATTINIQ / DONALDSON	QC	LPV	2	99.957	4	99.944	33	99.494
CYEY	AMOS	QC	LPV	0	100	0	100	0	100
CYHU	MONTREAL / STHUBERT	QC	LPV	0	100	0	100	0	100
CYIF	STAUGUSTIN	QC	LPV	0	100	0	100	3	99.975
CYMX	MONTREAL (MIRABEL INTL)	QC	LPV	0	100	0	100	0	100
CYQB	QUEBEC / JEAN LESAGE INTL	QC	LPV	0	100	0	100	0	100
CYRI	RIVIEREDULOUP	QC	LPV	0	100	0	100	0	100
CYRQ	TROISRIVIERES	QC	LPV	0	100	0	100	0	100
CYVB	BONAVENTURE	QC	LPV	0	100	0	100	0	100
CYVP	KUUJJUAQ	QC	LPV	0	100	0	100	17	99.78
CYYY	MONTJOLI	QC	LPV	0	100	0	100	0	100
BID	BLOCK ISLAND STATE	RI	LPV	0	100	0	100	0	100
OQU	QUONSET STATE	RI	LPV	0	100	0	100	0	100
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	0	100	0	100	0	100
SFZ	NORTH CENTRAL STATE	RI	LPV	0	100	0	100	0	100
35A	UNION COUNTY` TROY SHELTON FIE	SC	LP	0	100	0	100	0	100
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	100	0	100	0	100
AIK	AIKEN MUNICIPAL	SC	LPV200	0	100	0	100	0	100
AND	ANDERSON RGNL	SC	LPV200	0	100	0	100	0	100
AQX	ALLENDALE COUNTY	SC	LPV	0	100	0	100	17	99.993
ARW	BEAUFORT COUNTY	SC	LPV200	0	100	0	100	25	99.99
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	0	100	0	100	0	100
BNL	BARNWELL RGNL	SC	LPV	0	100	0	100	4	99.998
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	100	0	100	0	100
CDN	WOODWARD FIELD	SC	LPV	0	100	0	100	0	100
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	100	0	100	0	100
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	100	0	100	0	100
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FI	SC	LPV	0	100	0	100	0	100
CRE	GRAND STRAND	SC	LPV200	0	100	0	100	0	100
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	100	0	100	0	100
DYB	SUMMERVILLE	SC	LPV200	0	100	0	100	0	100
FDW	FAIRFIELD COUNTY	SC	LPV	0	100	0	100	0	100
FLO	FLORENCE RGNL	SC	LPV	0	100	0	100	0	100
GGE	GEORGETOWN COUNTY	SC	LPV	0	100	0	100	0	100
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GRD	GREENWOOD COUNTY	SC	LPV	0	100	0	100	0	100
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	0	100	0	100	0	100
GYH	DONALDSON FIELD	SC	LPV	0	100	0	100	0	100
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	100	0	100	0	100
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	100	0	100	0	100
LKR	LANCASTER COUNTY-MC WHIRTER FI	SC	LPV200	0	100	0	100	0	100
LQK	PICKENS COUNTY	SC	LPV	0	100	0	100	0	100
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	100	0	100	0	100
LUX	LAURENS COUNTY	SC	LPV	0	100	0	100	0	100
MAO	MARION COUNTY	SC	LPV	0	100	0	100	0	100
MKS	BERKELEY COUNTY	SC	LPV	0	100	0	100	0	100
MYR	MYRTLE BEACH INTL	SC	LPV200	0	100	0	100	0	100
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	0	100	0	100	0	100
PYG	PAGELAND	SC	LPV	0	100	0	100	0	100
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	100	0	100	4	99.998
SMS	SUMTER	SC	LPV200	0	100	0	100	0	100
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	0	100	0	100	0	100
UDG	DARLINGTON COUNTY	SC	LPV	0	100	0	100	0	100
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	0	100	0	100	0	100
0D8	GETTYSBURG MUNICIPAL	SD	LP	0	100	0	100	0	100
49B	STURGIS MUNICIPAL	SD	LPV	0	100	0	100	2	99.998
8D3	SISSETON MUNICIPAL	SD	LPV	0	100	0	100	0	100
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D0	HIGHMORE MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	0	100	0	100	0	100
9V6	MARTIN MUNICIPAL	SD	LPV	0	100	0	100	0	100
ABR	ABERDEEN RGNL	SD	LPV200	0	100	0	100	0	100
AGZ	WAGNER MUNICIPAL	SD	LPV	0	100	0	100	0	100
ATY	WATERTOWN RGNL	SD	LPV200	0	100	0	100	0	100
BKX	BROOKINGS RGNL	SD	LPV200	0	100	0	100	0	100
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	0	100	0	100	1	99.998
FSD	JOE FOSS FIELD	SD	LPV200	0	100	0	100	0	100
HON	HURON RGNL	SD	LPV200	0	100	0	100	0	100
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	100	0	100	0	100
ICR	WINNER RGNL	SD	LPV	0	100	0	100	0	100
LEM	LEMMON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MDS	MADISON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MHE	MITCHELL MUNICIPAL	SD	LPV	0	100	0	100	0	100
MKA	MILLER MUNICIPAL	SD	LPV	0	100	0	100	0	100
PHP	PHILIP	SD	LPV	0	100	0	100	0	100
PIR	PIERRE RGNL	SD	LPV	0	100	0	100	0	100
RAP	RAPID CITY RGNL	SD	LPV200	0	100	0	100	0	100
SPF	BLACK HILLS-CLYDE ICE FIELD	SD	LPV	0	100	0	100	1	99.998
VMR	HAROLD DAVIDSON FIELD	SD	LPV	0	100	0	100	0	100
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	0	100	0	100	0	100
CKQ8	MCARTHUR RIVER	SK	LPV	0	100	0	100	3	99.998
CYKJ	KEY LAKE	SK	LPV	0	100	0	100	2	99.999
0A3	SMITHVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
0M3	JOHN A BAKER FLD	TN	LP	0	100	0	100	0	100
0M4	BENTON COUNTY	TN	LPV	0	100	0	100	0	100
0M5	HUMPHREYS COUNTY	TN	LP	0	100	0	100	0	100
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	100	0	100	0	100
1M5	PORTLAND MUNICIPAL	TN	LPV	0	100	0	100	0	100
2A0	MARK ANTON	TN	LPV	0	100	0	100	0	100
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	0	100	0	100	8	99.997
2M8	CHARLES W BAKER	TN	LPV	0	100	0	100	30	99.988
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	0	100	0	100	0	100
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	100	0	100	0	100
8A3	LIVINGSTON MUNICIPAL	TN	LP	0	100	0	100	0	100
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	100	0	100	0	100
BNA	NASHVILLE INTL	TN	LPV200	0	100	0	100	0	100
CHA	LOVELL FIELD	TN	LPV200	0	100	0	100	0	100
CKV	OUTLAW FIELD	TN	LPV	0	100	0	100	0	100
CSV	CROSSVILLE MEMORIAL-WHITSON FI	TN	LPV200	0	100	0	100	0	100
DYR	DYERSBURG RGNL	TN	LPV	0	100	0	100	0	100
FYE	FAYETTE COUNTY	TN	LPV	0	100	0	100	38	99.985
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	100	0	100	8	99.997
GCY	GREENEVILLE-GREENE COUNTY MUNICIPAL	TN	LPV	0	100	0	100	0	100
GHM	CENTERVILLE MUNICIPAL	TN	LP	0	100	0	100	0	100
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	100	0	100	0	100
GZS	ABERNATHY FIELD	TN	LPV	0	100	0	100	11	99.995
HZD	CARROLL COUNTY	TN	LPV	0	100	0	100	0	100
JAU	CAMPBELL COUNTY	TN	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JWN	JOHN C TUNE	TN	LPV	0	100	0	100	0	100
LUG	ELLINGTON	TN	LPV	0	100	0	100	0	100
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	0	100	28	99.989
M08	WILLIAM L WHITEHURST FIELD	TN	LP	0	100	0	100	36	99.986
M33	SUMNER COUNTY RGNL	TN	LPV	0	100	0	100	0	100
M53	HUMBOLDT MUNICIPAL	TN	LPV	0	100	0	100	0	100
M54	LEBANON MUNICIPAL	TN	LPV	0	100	0	100	0	100
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	100	0	100	0	100
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	100	0	100	0	100
MEM	MEMPHIS INTL	TN	LPV200	0	100	0	100	33	99.987
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	100	0	100	5	99.998
MMI	MCMINN COUNTY	TN	LPV	0	100	0	100	0	100
MNV	MONROE COUNTY	TN	LPV	0	100	0	100	0	100
MOR	MOORE-MURRELL	TN	LPV	0	100	0	100	0	100
MQY	SMYRNA	TN	LPV200	0	100	0	100	0	100
MRC	MAURY COUNTY	TN	LPV	0	100	0	100	0	100
NQA	MILLINGTON RGNL JETPORT	TN	LPV200	0	100	0	100	30	99.988
PHT	HENRY COUNTY	TN	LPV200	0	100	0	100	0	100
PVE	BEECH RIVER RGNL	TN	LPV	0	100	0	100	0	100
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	100	0	100	0	100
RNC	WARREN COUNTY MEMORIAL	TN	LPV	0	100	0	100	0	100
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	0	100	0	100	0	100
SCX	SCOTT MUNICIPAL	TN	LPV	0	100	0	100	0	100
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	0	100	27	99.989
SRB	UPPER CUMBERLAND RGNL	TN	LPV	0	100	0	100	0	100
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
SZY	ROBERT SIBLEY	TN	LPV	0	100	0	100	26	99.99
TGC	GIBSON COUNTY	TN	LP	0	100	0	100	0	100
THA	TULLAHOMA RGNL ARPT/WM NORTHER	TN	LPV	0	100	0	100	0	100
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	0	100	0	100	0	100
TYS	MC GHEE TYSON	TN	LPV200	0	100	0	100	0	100
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	100	0	100	0	100
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
2F5	LAMESA MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
2R9	KARNES COUNTY	TX	LP	0	100	0	100	1	99.994
3R9	LAKEWAY AIRPARK	TX	LP	0	100	0	100	1	99.999
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
45R	HAWTHORNE FIELD	TX	LP	0	100	0	100	1	99.999
4T2	KENNETH COPELAND	TX	LPV	0	100	0	100	1	99.999
50R	LOCKHART MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
5C1	BOERNE STAGE FIELD	TX	LP	0	100	0	100	1	99.999
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	100	0	100	1	99.994
60R	NAVASOTA MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
77F	WINTERS MUNICIPAL	TX	LP	0	100	0	100	1	99.999
8F3	CROSBYTON MUNICIPAL	TX	LP	0	100	0	100	1	99.999
ABI	ABILENE RGNL	TX	LPV200	0	100	0	100	1	99.999
ACT	WACO RGNL	TX	LPV200	0	100	0	100	1	99.999
ADS	ADDISON	TX	LPV	0	100	0	100	1	99.999
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	100	0	100	1	99.999
ALI	ALICE INTL	TX	LPV	0	100	0	100	1	99.994
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	100	0	100	0	100
ARM	WHARTON RGNL	TX	LPV	0	100	0	100	1	99.999
ASL	HARRISON COUNTY	TX	LPV	0	100	0	100	1	99.999
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	100	0	100	1	99.999
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	100	0	100	1	99.999
BAZ	NEW BRAUNFELS RGNL	TX	LPV	0	100	0	100	1	99.999
BBD	CURTIS FIELD	TX	LPV	0	100	0	100	1	99.999
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	1	99.999
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	0	100	1	99.999
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	1	99.999
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	0	100	0	100	1	99.994
BWD	BROWNWOOD RGNL	TX	LPV	0	100	0	100	1	99.999
BYY	BAY CITY RGNL	TX	LPV	0	100	0	100	1	99.999
CDS	CHILDRESS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.999
CFD	COULTER FIELD	TX	LPV	0	100	0	100	1	99.999
CLL	EASTERWOOD FIELD	TX	LPV200	0	100	0	100	1	99.999
CNW	TSTC WACO	TX	LPV200	0	100	0	100	1	99.999
COM	COLEMAN MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
COT	COTULLA-LA SALLE COUNTY	TX	LPV	0	100	0	100	1	99.994
CPT	CLEBURNE RGNL	TX	LPV	0	100	0	100	1	99.999
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	100	0	100	1	99.994
CVB	CASTROVILLE MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
CWC	KICKAPOO DOWNTOWN	TX	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CXO	CONROE-NORTH HOUSTON RGNL	TX	LPV200	0	100	0	100	1	99.999
CZT	DIMMIT COUNTY	TX	LPV	0	100	0	100	1	99.994
DAL	DALLAS LOVE FIELD	TX	LPV200	0	100	0	100	1	99.999
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	0	100	0	100	1	99.999
DHT	DALHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
DKR	HOUSTON COUNTY	TX	LP	0	100	0	100	1	99.999
DRT	DEL RIO INTL	TX	LPV	0	100	0	100	1	99.999
DTO	DENTON ENTERPRISE	TX	LPV200	0	100	0	100	1	99.999
DUX	MOORE COUNTY	TX	LPV200	0	100	0	100	0	100
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	100	0	100	1	99.999
E01	ROY HURD MEMORIAL	TX	LP	0	100	0	100	1	99.999
E11	ANDREWS COUNTY	TX	LPV	0	100	0	100	1	99.999
E19	GRUVER MUNICIPAL	TX	LP	0	100	0	100	0	100
E30	BRUCE FIELD	TX	LPV	0	100	0	100	1	99.999
E38	ALPINE-CASPARIS MUNICIPAL	TX	LP	0	100	0	100	1	99.999
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	0	100	1	99.994
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	100	0	100	1	99.999
EFD	ELLINGTON	TX	LPV200	0	100	0	100	1	99.999
ELA	EAGLE LAKE	TX	LP	0	100	0	100	1	99.999
ELP	EL PASO INTL	TX	LP	0	100	0	100	1	99.999
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	0	100	0	100	1	99.999
ETN	EASTLAND MUNICIPAL	TX	LP	0	100	0	100	1	99.999
F00	JONES FIELD	TX	LPV	0	100	0	100	1	99.999
F05	WILBARGER COUNTY	TX	LPV	0	100	0	100	1	99.999
F49	SLATON MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
F98	YOAKUM COUNTY	TX	LPV	0	100	0	100	1	99.999
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	0	100	0	100	1	99.999
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	100	0	100	1	99.999
FWS	FORT WORTH SPINKS	TX	LPV200	0	100	0	100	1	99.999
GDJ	GRANBURY RGNL	TX	LPV	0	100	0	100	1	99.999
GGG	EAST TEXAS RGNL	TX	LPV	0	100	0	100	1	99.999
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	100	0	100	1	99.999
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	100	0	100	1	99.999
GNC	GAINES COUNTY	TX	LPV	0	100	0	100	1	99.999
GRK	ROBERT GRAY AAF	TX	LPV200	0	100	0	100	1	99.999
GTU	GEORGETOWN MUNICIPAL	TX	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GVT	MAJORS	TX	LPV200	0	100	0	100	1	99.999
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	100	0	100	1	99.999
HBV	JIM HOGG COUNTY	TX	LPV	0	100	0	100	1	99.994
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	0	100	0	100	1	99.999
HHF	HEMPHILL COUNTY	TX	LPV	0	100	0	100	1	99.999
HOU	WILLIAM P HOBBY	TX	LPV200	0	100	0	100	1	99.999
HQZ	MESQUITE METRO	TX	LPV	0	100	0	100	1	99.999
HRL	VALLEY INTL	TX	LPV200	0	100	0	100	1	99.994
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	100	0	100	0	100
HYI	SAN MARCOS REGIONAL	TX	LPV200	0	100	0	100	1	99.999
IAH	GEORGE BUSH INTERCONTINENTAL/H	TX	LPV200	0	100	0	100	1	99.999
IKG	KLEBERG COUNTY	TX	LPV	0	100	0	100	1	99.994
ILE	SKYLARK FIELD	TX	LPV200	0	100	0	100	1	99.999
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
INK	WINKLER COUNTY	TX	LPV200	0	100	0	100	1	99.999
IWS	WEST HOUSTON	TX	LP	0	100	0	100	1	99.999
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	100	0	100	1	99.999
JSO	CHEROKEE COUNTY	TX	LPV200	0	100	0	100	1	99.999
JWY	MID-WAY RGNL	TX	LPV200	0	100	0	100	1	99.999
JXI	FOX STEPHENS FIELD - GILMER MU	TX	LP	0	100	0	100	1	99.999
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	100	0	100	1	99.999
LBX	TEXAS GULF COAST RGNL	TX	LPV	0	100	0	100	1	99.999
LFK	ANGELINA COUNTY	TX	LPV	0	100	0	100	1	99.999
LHB	HEARNE MUNICIPAL	TX	LPV200	0	100	0	100	1	99.999
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
LNC	LANCASTER RGNL	TX	LPV200	0	100	0	100	1	99.999
LRD	LAREDO INTL	TX	LPV200	0	100	0	100	1	99.994
LUD	DECATUR MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
LVJ	PEARLAND RGNL	TX	LPV	0	100	0	100	1	99.999
LXY	MEXIA-LIMESTONE CO	TX	LP	0	100	0	100	1	99.999
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	0	100	0	100	1	99.999
MDD	MIDLAND AIRPARK	TX	LPV	0	100	0	100	1	99.999
MFE	MC ALLEN MILLER INTL	TX	LPV200	0	100	0	100	1	99.994
MKN	COMANCHE COUNTY-CITY	TX	LPV	0	100	0	100	1	99.999
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
MWL	MINERAL WELLS	TX	LPV200	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	0	100	0	100	1	99.999
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	100	0	100	1	99.999
ONY	OLNEY MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
ORG	ORANGE COUNTY	TX	LPV	0	100	0	100	1	99.999
PEQ	PECOS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.999
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	100	0	100	1	99.994
PKV	CALHOUN COUNTY	TX	LPV	0	100	0	100	1	99.994
PPA	PERRY LEFORS FIELD	TX	LPV	0	100	0	100	0	100
PRX	COX FIELD	TX	LPV	0	100	0	100	1	99.999
PSX	PALACIOS MUNICIPAL	TX	LPV	0	100	0	100	1	99.994
PVW	HALE COUNTY	TX	LPV	0	100	0	100	1	99.999
PWG	MC GREGOR EXECUTIVE	TX	LPV	0	100	0	100	1	99.999
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	0	100	0	100	0	100
RAS	MUSTANG BEACH	TX	LPV	0	100	0	100	1	99.994
RBD	DALLAS EXECUTIVE	TX	LPV	0	100	0	100	1	99.999
RBO	NUECES COUNTY	TX	LPV	0	100	0	100	1	99.994
RKP	ARANSAS CO	TX	LPV	0	100	0	100	1	99.994
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LPV	0	100	0	100	1	99.999
SAT	SAN ANTONIO INTL	TX	LPV200	0	100	0	100	1	99.999
SGR	SUGAR LAND RGNL	TX	LPV200	0	100	0	100	1	99.999
SJT	SAN ANGELO RGNL/MATHIS FIELD	TX	LPV	0	100	0	100	1	99.999
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.999
SNK	WINSTON FIELD	TX	LPV200	0	100	0	100	1	99.999
SWI	SHERMAN MUNICIPAL	TX	LP	0	100	0	100	1	99.999
SWW	AVENGER FIELD	TX	LPV	0	100	0	100	1	99.999
T23	ALBANY MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
T41	LA PORTE MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
T65	MID VALLEY	TX	LPV	0	100	0	100	1	99.994
T74	TAYLOR MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
T78	LIBERTY MUNICIPAL	TX	LP	0	100	0	100	1	99.999
T82	GILLESPIE COUNTY	TX	LPV	0	100	0	100	1	99.999
TDW	TRADEWIND	TX	LPV	0	100	0	100	0	100
TFP	MCCAMPBELL-PORTER	TX	LPV	0	100	0	100	1	99.994
TKI	MCKINNEY NATIONAL	TX	LPV200	0	100	0	100	1	99.999
TME	HOUSTON EXECUTIVE	TX	LPV	0	100	0	100	1	99.999
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	0	100	0	100	1	99.999
TRL	TERRELL MUNICIPAL	TX	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TYR	TYLER POUNDS RGNL	TX	LPV200	0	100	0	100	1	99.999
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
VCT	VICTORIA RGNL	TX	LPV200	0	100	0	100	1	99.994
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
41U	MANTI-EPHRAIM	UT	LPV	0	100	0	100	0	100
74V	ROOSEVELT MUNICIPAL	UT	LPV	0	100	0	100	0	100
BCE	BRYCE CANYON	UT	LPV	0	100	0	100	0	100
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	0	100	0	100
BMC	BRIGHAM CITY	UT	LP	0	100	0	100	0	100
CDC	CEDAR CITY RGNL	UT	LPV	0	100	0	100	0	100
DTA	DELTA MUNICIPAL	UT	LP	0	100	0	100	0	100
ENV	WENDOVER	UT	LPV	0	100	0	100	0	100
FOM	FILLMORE MUNICIPAL	UT	LPV	0	100	0	100	0	100
LGU	LOGAN-CACHE	UT	LPV	0	100	0	100	0	100
OGD	OGDEN-HINCKLEY	UT	LPV	0	100	0	100	0	100
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	0	100	0	100	0	100
PVU	PROVO MUNICIPAL	UT	LPV200	0	100	0	100	0	100
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	0	100	0	100
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	0	100
SLC	SALT LAKE CITY INTL	UT	LPV200	0	100	0	100	0	100
TVY	BOLINDER FIELD-TOOELE VALLEY	UT	LPV200	0	100	0	100	0	100
U14	NEPHI MUNICIPAL	UT	LPV	0	100	0	100	0	100
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	0	100	0	100
VEL	VERNAL RGNL	UT	LP	0	100	0	100	0	100
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	0	100
0VG	LEE COUNTY	VA	LPV	0	100	0	100	0	100
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	0	100
BCB	VIRGINIA TECH/MONTGOMERY EXECU	VA	LPV	0	100	0	100	0	100
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	0	100	0	100	0	100
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	0	100	0	100	0	100
CJR	CULPEPER RGNL	VA	LPV	0	100	0	100	0	100
CPK	CHESAPEAKE RGNL	VA	LPV200	0	100	0	100	0	100
DAN	DANVILLE RGNL	VA	LPV200	0	100	0	100	0	100
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	0	100	0	100	0	100
FCI	RICHMOND EXECUTIVE-CHESTERFIEL	VA	LPV	0	100	0	100	0	100
FKN	FRANKLIN MUNICIPAL-JOHN BEVERLY ROS	VA	LPV	0	100	0	100	0	100
FVX	FARMVILLE RGNL	VA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	100	0	100	0	100
HLX	TWIN COUNTY	VA	LPV	0	100	0	100	0	100
HSP	INGALLS FIELD	VA	LPV	0	100	0	100	0	100
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	100	0	100	0	100
JFZ	TAZEWELL COUNTY	VA	LPV	0	100	0	100	0	100
JYO	LEESBURG EXECUTIVE	VA	LPV	0	100	0	100	0	100
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	0	100	0	100	0	100
LNP	LONESOME PINE	VA	LPV	0	100	0	100	0	100
LUA	LURAY CAVERNS	VA	LP	0	100	0	100	0	100
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	0	100	0	100	0	100
MFV	ACCOMACK COUNTY	VA	LPV	0	100	0	100	0	100
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	100	0	100	0	100
MTV	BLUE RIDGE	VA	LPV	0	100	0	100	0	100
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	100	0	100	0	100
OKV	WINCHESTER RGNL	VA	LPV200	0	100	0	100	0	100
ORF	NORFOLK INTL	VA	LPV200	0	100	0	100	0	100
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	0	100	0	100	0	100
PSK	NEW RIVER VALLEY	VA	LPV200	0	100	0	100	0	100
PTB	DINWIDDIE COUNTY	VA	LPV	0	100	0	100	0	100
PVG	HAMPTON ROADS EXECUTIVE	VA	LPV200	0	100	0	100	0	100
RIC	RICHMOND INTL	VA	LPV200	0	100	0	100	0	100
RMN	STAFFORD RGNL	VA	LPV	0	100	0	100	0	100
ROA	ROANOKE-BLACKSBURG RGNL/WOODRU	VA	LPV	0	100	0	100	0	100
SFQ	SUFFOLK EXECUTIVE	VA	LPV	0	100	0	100	0	100
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	0	100
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	100	0	100	0	100
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	0	100
W96	NEW KENT COUNTY	VA	LP	0	100	0	100	0	100
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	0	100	0	100	0	100
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	100	0	100	0	100
BTV	BURLINGTON INTL	VT	LPV200	0	100	0	100	0	100
EFK	NEWPORT STATE	VT	LP	0	100	0	100	0	100
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	100	0	100	0	100
MPV	EDWARD F KNAPP STATE	VT	LPV	0	100	0	100	0	100
MVL	MORRISVILLE-STOWE STATE	VT	LPV	0	100	0	100	0	100
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	0	100	0	100	0	100
ALW	WALLA WALLA RGNL	WA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	100	0	100	0	100
BLI	BELLINGHAM INTL	WA	LPV200	0	100	0	100	0	100
BVS	SKAGIT RGNL	WA	LPV	0	100	0	100	0	100
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	100	0	100	0	100
CLS	CHEHALIS-CENTRALIA	WA	LPV	0	100	0	100	0	100
DEW	DEER PARK	WA	LPV	0	100	0	100	1	99.999
EPH	EPHRATA MUNICIPAL	WA	LPV	0	100	0	100	0	100
FHR	FRIDAY HARBOR	WA	LPV	0	100	0	100	0	100
GEG	SPOKANE INTL	WA	LPV200	0	100	0	100	1	99.999
HQM	BOWERMAN	WA	LPV200	0	100	0	100	1	99.999
MWH	GRANT CO INTL	WA	LPV200	0	100	0	100	0	100
OLM	OLYMPIA RGNL	WA	LPV	0	100	0	100	0	100
ORS	ORCAS ISLAND	WA	LP	0	100	0	100	0	100
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	0	100	0	100	0	100
PLU	PIERCE COUNTY - THUN FIELD	WA	LPV	0	100	0	100	0	100
PSC	TRI-CITIES	WA	LPV200	0	100	0	100	0	100
PWT	BREMERTON NATIONAL	WA	LPV200	0	100	0	100	0	100
RLD	RICHLAND	WA	LPV	0	100	0	100	0	100
RNT	RENTON MUNICIPAL	WA	LPV	0	100	0	100	0	100
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	100	0	100	0	100
SFF	FELTS FIELD	WA	LPV	0	100	0	100	1	99.999
SHN	SANDERSON FIELD	WA	LPV	0	100	0	100	0	100
TDO	ED CARLSON MEMORIAL FIELD - SO	WA	LPV	0	100	0	100	0	100
TIW	TACOMA NARROWS	WA	LPV	0	100	0	100	0	100
YKM	YAKIMA AIR TERMINAL/MCALLISTER	WA	LPV200	0	100	0	100	0	100
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
57C	EAST TROY MUNICIPAL	WI	LPV	0	100	0	100	0	100
82C	MAUSTON-NEW LISBON UNION	WI	LP	0	100	0	100	0	100
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	100	0	100	0	100
AHH	AMERY MUNICIPAL	WI	LP	0	100	0	100	0	100
AIG	LANGLADE COUNTY	WI	LPV	0	100	0	100	0	100
ARV	LAKELAND/NOBLE F LEE MEMORIAL	WI	LPV	0	100	0	100	0	100
ASX	JOHN F KENNEDY MEMORIAL	WI	LPV	0	100	0	100	0	100
ATW	APPLETON INTL	WI	LPV200	0	100	0	100	0	100
AUW	WAUSAU DOWNTOWN	WI	LPV200	0	100	0	100	0	100
BCK	BLACK RIVER FALLS AREA	WI	LPV	0	100	0	100	0	100
BUU	BURLINGTON MUNICIPAL	WI	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
C29	MIDDLETON MUNICIPAL - MOREY FIELD	WI	LPV	0	100	0	100	0	100
C35	REEDSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
C47	PORTAGE MUNICIPAL	WI	LP	0	100	0	100	0	100
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
CMY	SPARTA/FORT MC COY	WI	LPV	0	100	0	100	0	100
CWA	CENTRAL WISCONSIN	WI	LPV200	0	100	0	100	0	100
DLL	BARABOO WISCONSIN DELLS	WI	LPV	0	100	0	100	0	100
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	100	0	100	0	100
EGV	EAGLE RIVER UNION	WI	LPV	0	100	0	100	0	100
ENW	KENOSHA RGNL	WI	LPV200	0	100	0	100	0	100
ETB	WEST BEND MUNICIPAL	WI	LPV	0	100	0	100	0	100
EZS	SHAWANO MUNICIPAL	WI	LPV	0	100	0	100	0	100
FLD	FOND DU LAC COUNTY	WI	LPV	0	100	0	100	0	100
GRB	GREEN BAY-AUSTIN STRAUBEL INTL	WI	LPV200	0	100	0	100	0	100
GTG	GRANTSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
HXF	HARTFORD MUNICIPAL	WI	LPV	0	100	0	100	0	100
HYR	SAWYER COUNTY	WI	LPV	0	100	0	100	0	100
ISW	ALEXANDER FIELD SOUTH WOOD COU	WI	LPV	0	100	0	100	0	100
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	0	100	0	100	0	100
LNR	TRI-COUNTY RGNL	WI	LPV	0	100	0	100	0	100
LSE	LA CROSSE RGNL	WI	LPV	0	100	0	100	0	100
LUM	MENOMONIE MUNICIPAL-SCORE FIELD	WI	LPV	0	100	0	100	0	100
MDZ	TAYLOR COUNTY	WI	LPV	0	100	0	100	0	100
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	100	0	100	0	100
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	100	0	100	0	100
MRJ	IOWA COUNTY	WI	LPV200	0	100	0	100	0	100
MSN	DANE COUNTY RGNL-TRUAX FIELD	WI	LPV200	0	100	0	100	0	100
MTW	MANITOWOC COUNTY	WI	LPV200	0	100	0	100	0	100
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	100	0	100	0	100
OCQ	OCONTO-J DOUGLAS BAKE MUNICIPAL	WI	LP	0	100	0	100	0	100
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	0	100	0	100	0	100
OSH	WITTMAN RGNL	WI	LPV200	0	100	0	100	0	100
OVS	BOSCOBEL	WI	LPV	0	100	0	100	0	100
PBH	PRICE COUNTY	WI	LPV	0	100	0	100	0	100
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	100	0	100	0	100
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
RAC	BATTEN INTL	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RCX	RUSK COUNTY	WI	LPV	0	100	0	100	0	100
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	0	100	0	100	0	100
RNH	NEW RICHMOND RGNL	WI	LPV	0	100	0	100	0	100
RPD	RICE LAKE RGNL - CARL'S FIELD	WI	LPV	0	100	0	100	0	100
RRL	MERRILL MUNICIPAL	WI	LPV	0	100	0	100	0	100
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	0	100	0	100	0	100
STE	STEVENS POINT MUNICIPAL	WI	LPV	0	100	0	100	0	100
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	100	0	100	0	100
SUW	RICHARD I BONG	WI	LP	0	100	0	100	0	100
TKV	TOMAHAWK RGNL	WI	LP	0	100	0	100	0	100
UBE	CUMBERLAND MUNICIPAL	WI	LPV	0	100	0	100	0	100
UES	WAUKESHA COUNTY	WI	LPV200	0	100	0	100	0	100
UNU	DODGE COUNTY	WI	LPV	0	100	0	100	0	100
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y50	WAUTOMA MUNICIPAL	WI	LP	0	100	0	100	0	100
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y72	BLOYER FIELD	WI	LP	0	100	0	100	0	100
3I2	MASON COUNTY	WV	LPV	0	100	0	100	0	100
6L4	LOGAN COUNTY	WV	LPV	0	100	0	100	0	100
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	100	0	100	0	100
BLF	MERCER COUNTY	WV	LPV	0	100	0	100	0	100
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	0	100
CRW	YEAGER	WV	LPV200	0	100	0	100	0	100
HLG	WHEELING OHIO CO	WV	LPV200	0	100	0	100	0	100
HTS	TRI-STATE/MILTON J FERGUSON FI	WV	LPV200	0	100	0	100	0	100
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	0	100
LWB	GREENBRIER VALLEY	WV	LPV	0	100	0	100	0	100
MGW	MORGANTOWN MUNICIPAL-WALTER L BILL	WV	LPV200	0	100	0	100	0	100
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	0	100	0	100	0	100
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	100	0	100	0	100
SXL	SUMMERSVILLE	WV	LP	0	100	0	100	0	100
USW	BOGGS FIELD	WV	LPV	0	100	0	100	0	100
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	0	100
W35	POTOMAC AIRPARK	WV	LP	0	100	0	100	0	100
W99	GRANT COUNTY	WV	LPV	0	100	0	100	0	100
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	0	100
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	0	100
CYS	CHEYENNE RGNL/JERRY OLSON FIEL	WY	LPV	0	100	0	100	0	100
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	0	100
ECS	MONDELL FIELD	WY	LPV	0	100	0	100	1	99.997
EMM	KEMMERER MUNICIPAL	WY	LPV	0	100	0	100	0	100
EVW	EVANSTON-UINTA COUNTY BURNS FI	WY	LPV	0	100	0	100	0	100
FBR	FORT BRIDGER	WY	LP	0	100	0	100	0	100
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	100	0	100	1	99.999
GEY	SOUTH BIG HORN COUNTY	WY	LP	0	100	0	100	0	100
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	0	100
HSG	HOT SPRINGS COUNTY	WY	LPV	0	100	0	100	0	100
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	0	100
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	0	100
PNA	RALPH WENZ FIELD	WY	LPV	0	100	0	100	0	100
POY	POWELL MUNICIPAL	WY	LPV	0	100	0	100	0	100
RIW	RIVERTON RGNL	WY	LPV200	0	100	0	100	0	100
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	0	100	0	100	0	100
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	100	0	100	0	100
SAA	SHIVELY FIELD	WY	LPV	0	100	0	100	0	100
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	0	100
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
W43	HULETT MUNICIPAL	WY	LPV	0	100	0	100	1	99.998
WRL	WORLAND MUNICIPAL	WY	LPV	0	100	0	100	0	100
CYQH	WATSON LAKE	YT	LPV	0	100	0	100	2	99.999
CYXY	WHITEHORSE / ERIK NIELSEN INTL	YT	LPV	0	100	0	100	0	100

Figure 8-1 WAAS LP Availability at Airports in the US and Canada with GPS RNAV IAPs

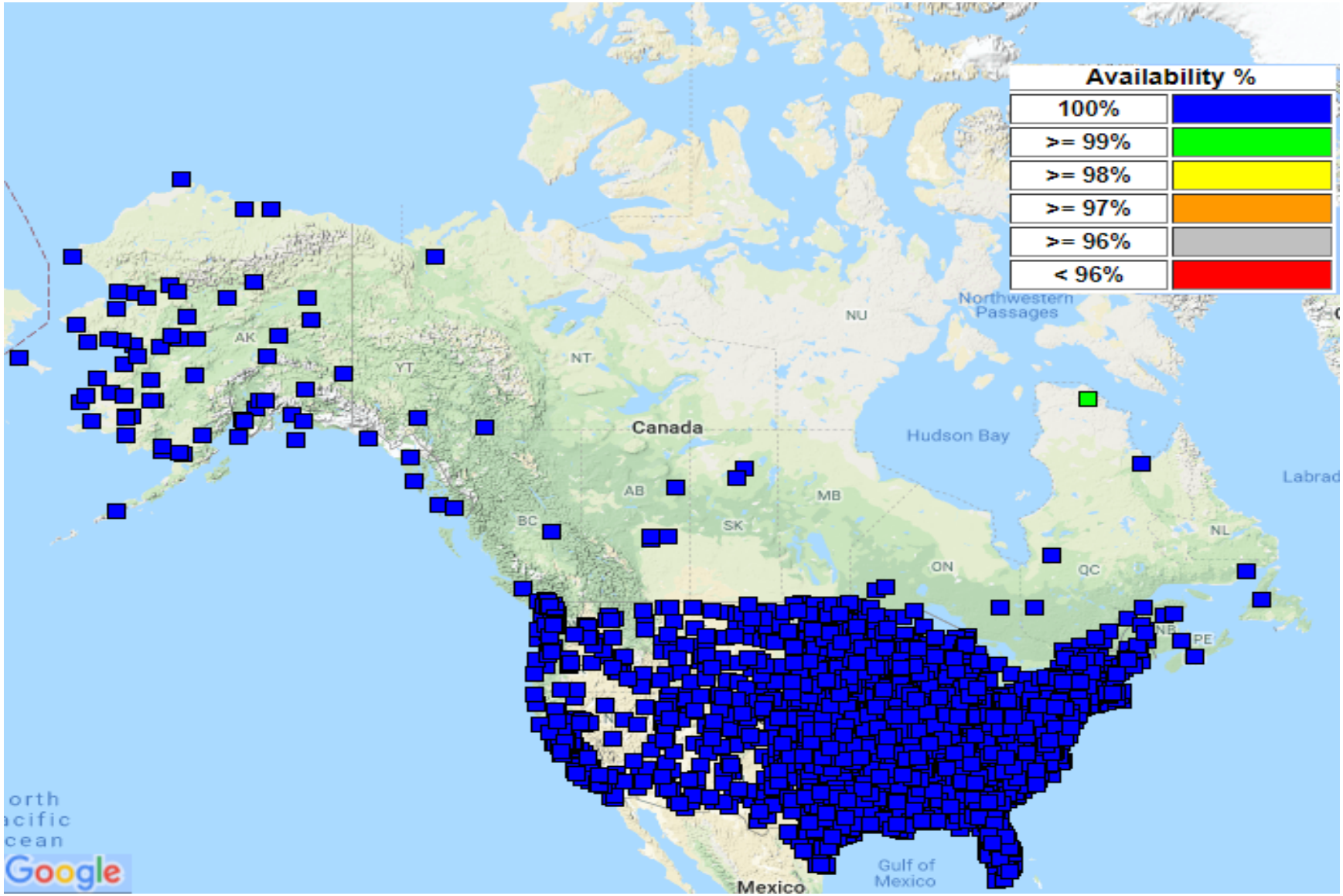


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV IAPs

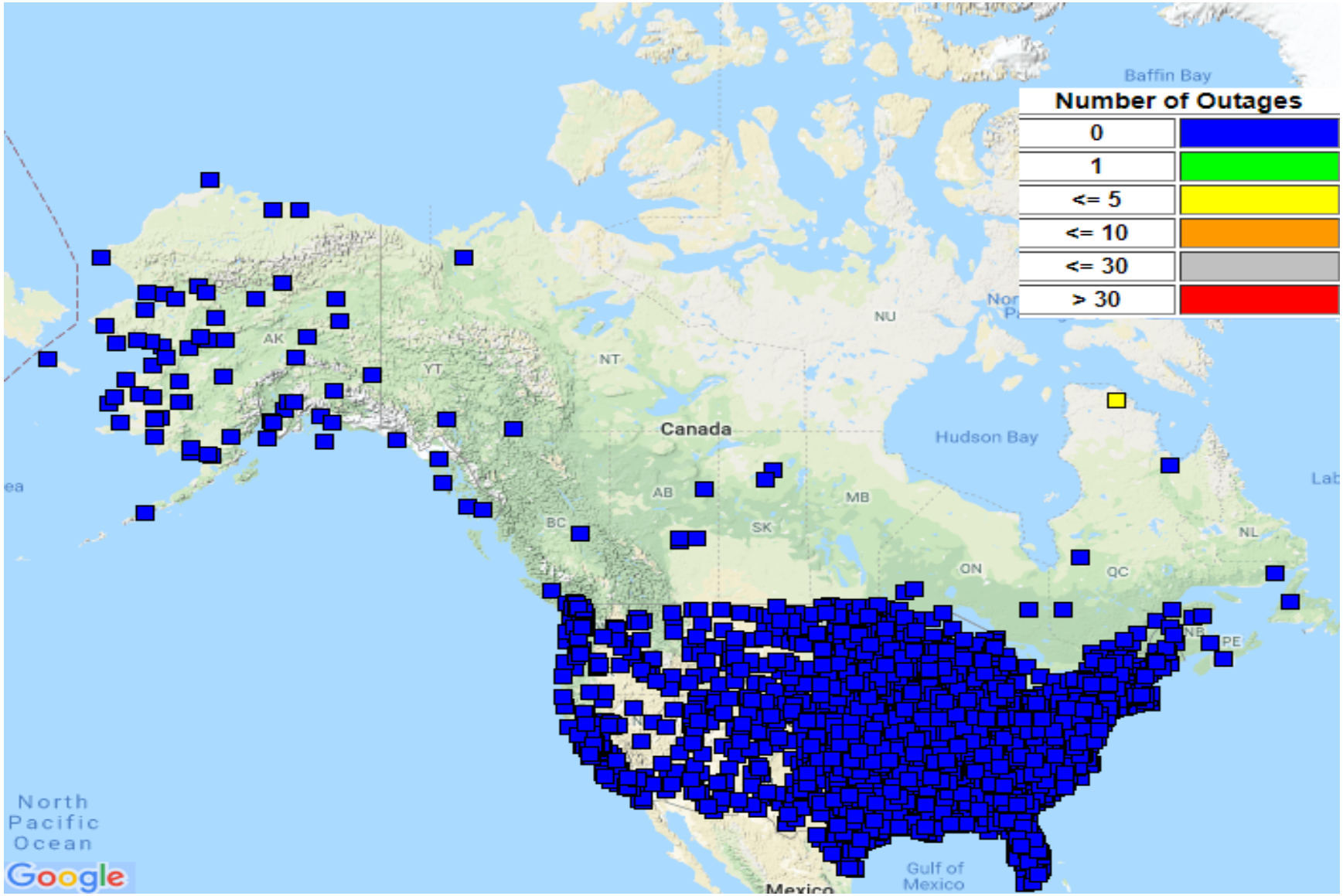


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV IAPs

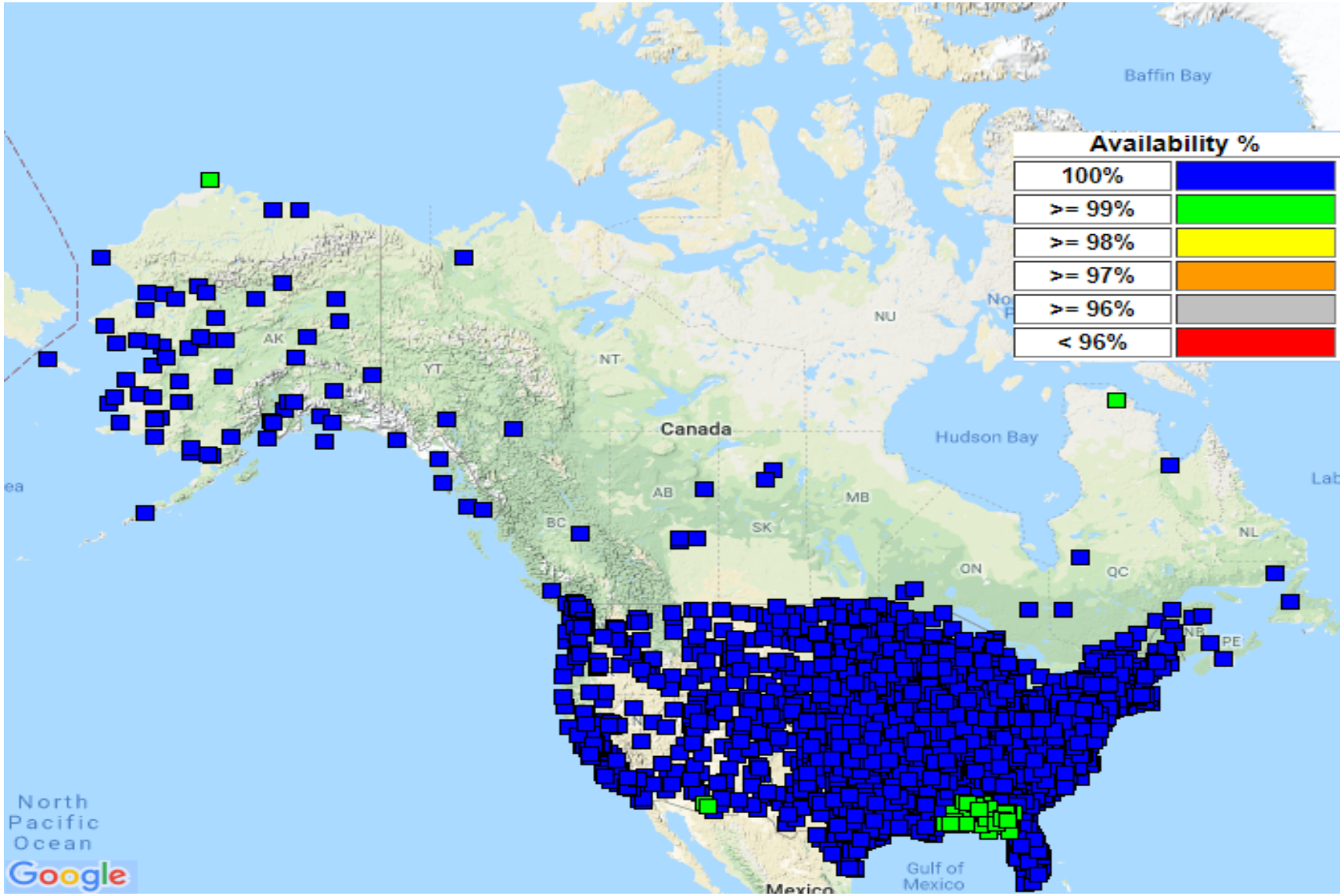


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV IAPs

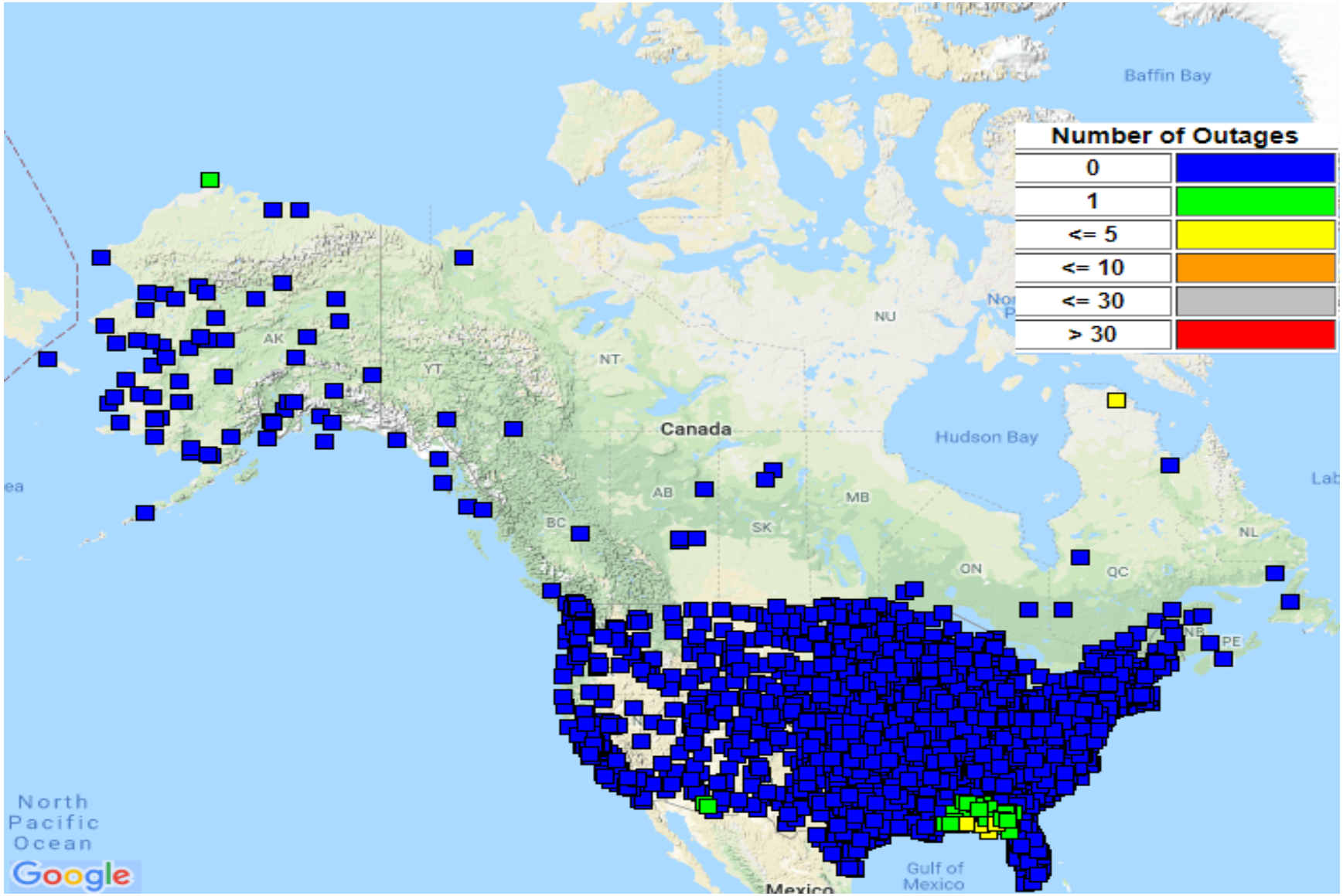


Figure 8-5 WAAS LPV200 Availability at Airports in the US and Canada with GPS RNAV IAPs

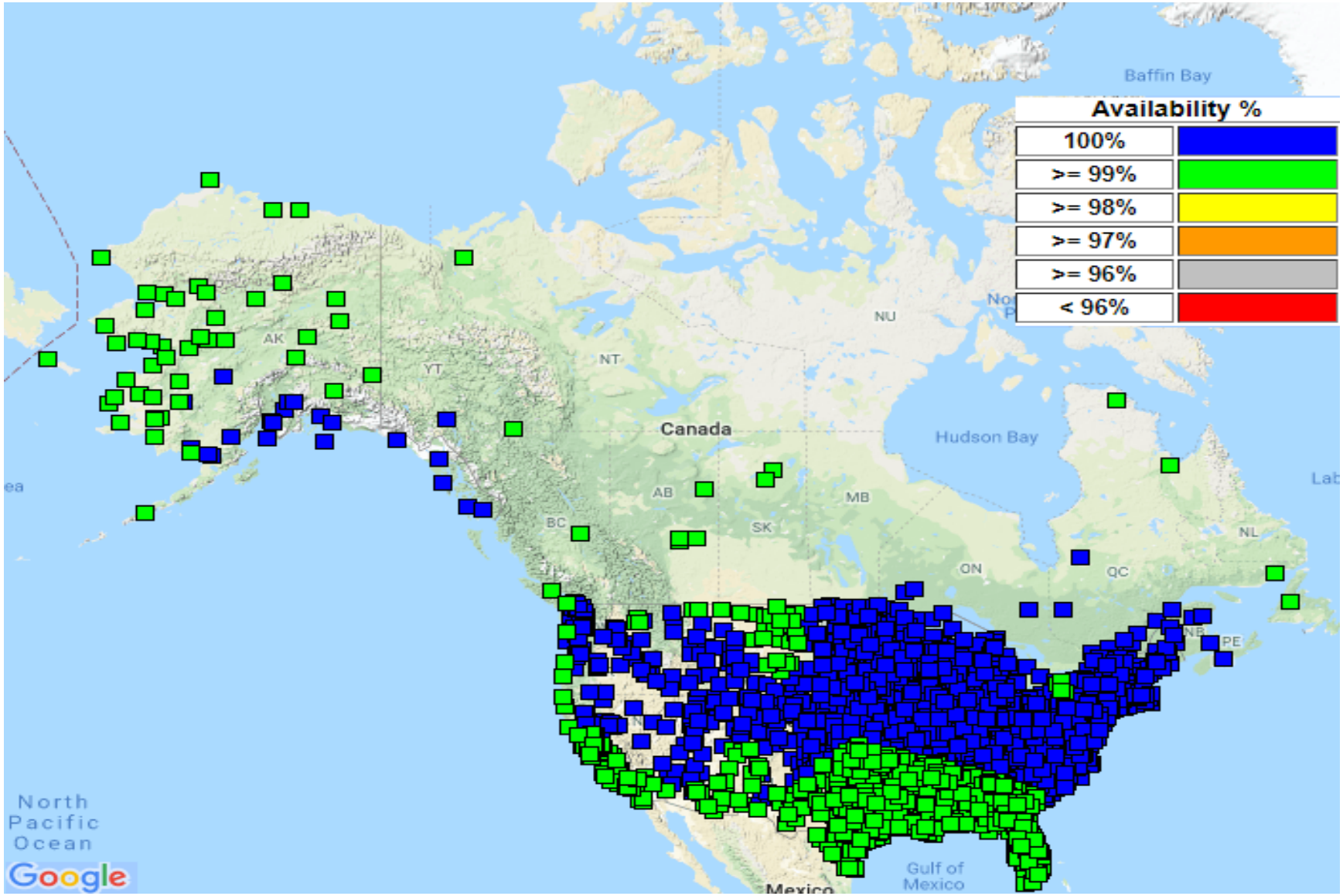
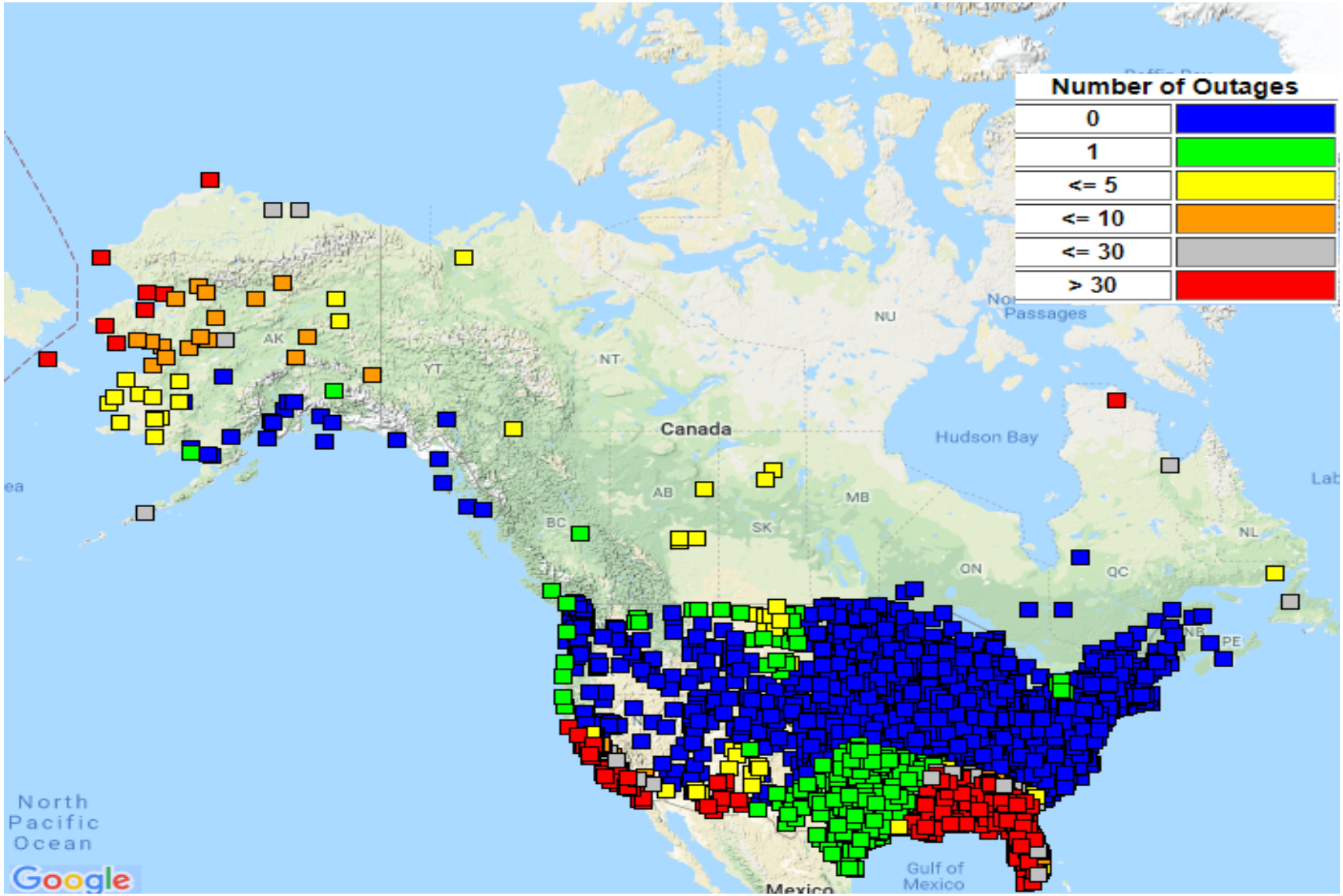


Figure 8-6 WAAS LPV200 Outages at Airports in the US and Canada with GPS RNAV IAPs



9.0 WAAS CNMP BOUNDING ANALYSIS

The purpose of the WAAS CNMP Bounding Analysis is to evaluate the performance of the CNMP algorithm and identify any undetected anomalous events to limit exposure to faulted receivers and persistent large multipath errors. The identification of undetected anomalous events ensures that the probability of more than one WAAS reference station (WRS)-producing persistent unbounded measurement errors is negligible. This offline analysis is critical to ensure that CNMP bounding is not invalidated by changes in WRE environmental conditions.

The operational CNMP functionality resides in the WAAS safety processor. The CNMP algorithm estimates, and corrects for, observed code noise and multipath and provides confidence estimates for residual error in multipath-corrected pseudorange measurements. These confidence terms provide a conservative Gaussian overbound of the true error distribution, which integrity monitors use in the weighting of the measurements.

The measurement data from the offline analysis is post-processed to estimate the carrier phase ambiguity of each entire arc of measurements for each satellite pass. The ambiguity estimate is used to level the carrier measurement, which is then used as a multipath-free truth estimate. The WAAS real-time CNMP smoothing algorithm is then applied to the original measurements, and the difference between the smoothed measurements and the multipath-free truth estimates is the observed residual error. To minimize the impacts of non-zero mean multipath biasing the truth estimates, only arcs with a continuous carrier phase greater than 7200 seconds are used for this analysis. The WAAS dual frequency cycle slip detector algorithm is used to detect any discontinuities in the carrier phase.

Statistics are calculated based on how well Gaussian distributions with 0.1 multiples of the CNMP standard deviation bound the observed residual error. Subsequently, these statistics are compared to a theoretical Gaussian distribution and an extensive set of plots are generated and manually reviewed. Figure 9-1 shows the analysis results for the previous 12 months for all three threads of WRE at each WAAS reference station. The color coding represents four levels of performance based on the magnitude and probability distribution of the residual error and the bounding performance of the CNMP algorithm.

Figure 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18
Albuquerque	A												
	B												
	C												
Anchorage	A												
	B												
	C												
Atlanta	A												
	B												
	C												
Barrow	A												
	B												
	C												
Bethel	A												
	B												
	C												
Billings	A												
	B												
	C												
Boston	A												
	B												
	C												
Chicago	A												
	B												
	C												
Cleveland	A												
	B												
	C												
Cold Bay	A												
	B												
	C												
Dallas	A												
	B												
	C												
Denver	A												
	B												
	C												
Fairbanks	A												
	B												
	C												
Gander	A												
	B												
	C												
Goose Bay	A												
	B												
	C												
Honolulu	A												
	B												
	C												
Houston	A												
	B												
	C												
Iqaluit	A												
	B												
	C												
Jacksonville	A												
	B												
	C												

WAAS Site	WRE	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18
Juneau	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Kansas City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Kotzebue	A	●	●	●	●	●	●	-	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Los Angeles	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Memphis	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Merida	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Mexico City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Miami	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Minneapolis	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
New York	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Oakland	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Puerto Vallarta	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Salt Lake City	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
San Jose Del Cabo	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
San Juan	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Seattle	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Tapachula	A	-	-	●	●	●	●	●	●	●	●	●	●
	B	-	-	●	●	●	●	●	●	●	●	●	●
	C	-	-	●	●	●	●	●	●	●	●	●	●
Washington, DC	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Winnipeg	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●

● **Excellent** - 3.29σ bounded 100%
● **Good** - 4σ bounded 100%
● **Fair** - 4σ bounded 100% with one worst satellite excluded (Requires manual review if symptoms repeat from month to month)
● **Poor** - Requires manual review
- **N/A** - No data available

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 24 hour sets on 09/29/18. Each WAAS WRS has three independent threads of WRE: (1) Thread A is also referred to as Thread 1, (2) Thread B is also referred to as Thread 2, and (3) Thread C is referred to as Thread 3.

Duplicate surveys were performed using both the NGS OPUS and the CSRS PPP services. The International GPS Service (IGS) 08 reference frame is used for the OPUS solutions. A value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing of the data.

The OPUS-reported RMS quality metrics were 2.5 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 15 mm or less. The OPUS and CSRS surveys agreed to an average of 1.6 cm with a standard deviation of 8.3 mm. The maximum of difference was 3.97 cm for Atlanta Thread A (ZTL1).

The OPUS positions were compared to the WAAS SSM 48 Field Coordinates which were surveyed in October 2017. The OPUS surveys agree with the WAAS SSM 48 Field Coordinates to better or equal to 6.94 cm. The maximum difference was 6.94 cm at Mexico City Thread B (MMX2).

Table 10-1 lists the WAAS antenna L1 phase center positions using the OPUS data.

Table 10-1 WAAS Antenna Positions (OPUS IGS08)

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.132	-972576.617	5543892.838	60.78791458	-161.8417256	52.17
BET2	-2965385.901	-972580.341	5543891.781	60.78789513	-161.841665	52.17
BET3	-2965388.468	-972577.471	5543890.912	60.78787923	-161.8417297	52.166
BIL1	-1416445.959	-4223577.01	4550862.112	45.80370648	-108.5397241	1112.228
BIL2	-1416450.041	-4223574.865	4550862.842	45.8037158	-108.5397826	1112.238
BIL3	-1416441.656	-4223574.267	4550865.971	45.80375627	-108.5396828	1112.228
BRW1	-1886759.03	-809058.67	6018494.446	71.28276398	-156.7899258	15.575
BRW2	-1886756.438	-809055.92	6018495.624	71.28279679	-156.7899678	15.579
BRW3	-1886755.345	-809059.701	6018495.445	71.28279215	-156.7898588	15.565
CDB1	-3484099.155	-1084748.77	5213678.58	55.19237319	-162.7064054	49.71
CDB2	-3484105.793	-1084741.575	5213675.638	55.19232714	-162.7065442	49.692
CDB3	-3484112.074	-1084734.8	5213672.888	55.19228366	-162.7066751	49.707
FAI1	-2304741.933	-1448715.314	5748843.701	64.80962908	-147.8473416	150.002
FAI2	-2304741.473	-1448706.505	5748846.094	64.80967943	-147.8474934	150.006
FAI3	-2304732.95	-1448707.442	5748849.254	64.80974601	-147.8473813	150.006
HNL1	-5508637.157	-2234492.924	2303722.392	21.31299226	-157.9208312	24.656
HNL2	-5508656.323	-2234483.249	2303687.148	21.31264935	-157.920987	25.004
HNL3	-5508647.744	-2234497.178	2303694.25	21.31271801	-157.9208315	25.057
JNU1	-2354255.03	-2388549.681	5407043.146	58.36257386	-134.5857083	16.19
JNU2	-2354252.941	-2388565.791	5407036.992	58.36246838	-134.5854897	16.199
JNU3	-2354239.714	-2388568.637	5407041.445	58.36254483	-134.5852946	16.184
MMD1	35070.38	-5959686.668	2264365.779	20.93190936	-89.66284107	29.124
MMD2	35065.454	-5959687.042	2264364.998	20.93190166	-89.66288845	29.168
MMD3	35065.118	-5959685.243	2264369.649	20.93194671	-89.66289158	29.147
MMX1	-948700.878	-5943933.928	2109212.154	19.43165391	-99.06839009	2233.816
MMX2	-948696.444	-5943933.753	2109214.58	19.43167719	-99.06834868	2233.801
MMX3	-948705.311	-5943934.119	2109209.724	19.43163056	-99.06843148	2233.845
MPR1	-1570142.255	-5759530.576	2238184.752	20.67900335	-105.2492036	10.96
MPR2	-1570139.429	-5759530.085	2238188.797	20.67904141	-105.2491787	11.25
MPR3	-1570143.541	-5759527.959	2238190.561	20.67905941	-105.2492221	10.965
MSD1	-1979520.014	-5523222.895	2493106.939	23.16044831	-109.7176513	104.298
MSD2	-1979521.582	-5523225.223	2493100.528	23.16038543	-109.717658	104.277

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
MSD3	-1979526.025	-5523221.954	2493104.198	23.1604215	-109.7177096	104.27
MTP1	-254854.397	-6162909.166	1617805.077	14.79136609	-92.36799959	54.946
MTP2	-254850.782	-6162910.187	1617801.641	14.79133406	-92.36796564	54.911
MTP3	-254855.55	-6162910.297	1617800.117	14.79132003	-92.36800985	54.819
OTZ1	-2396056.121	-750356.168	5843502.464	66.88733118	-162.6113735	10.877
OTZ2	-2396052.948	-750354.339	5843503.986	66.88736602	-162.6113916	10.873
OTZ3	-2396052.925	-750358.28	5843503.502	66.88735478	-162.6113057	10.882
YFB1	1035381.342	-2634289.655	5696539.574	63.73149086	-68.54318552	10.047
YFB2	1035372.13	-2634296.074	5696538.208	63.73146448	-68.5434066	9.974
YFB3	1035366.053	-2634306.833	5696534.438	63.73138685	-68.54360075	10.041
YQX1	2430424.557	-3419640.414	4788223.887	48.96649051	-54.59763319	146.902
YQX2	2430432.506	-3419639.071	4788220.837	48.9664487	-54.59753408	146.906
YQX3	2430440.409	-3419637.712	4788217.843	48.96640748	-54.59743535	146.926
YWG1	-520164.487	-4083475.963	4855843.026	49.90057401	-97.25939911	222.114
YWG2	-520150.615	-4083468.901	4855850.414	49.90067702	-97.25922	222.124
YWG3	-520152.488	-4083478.022	4855842.594	49.90056789	-97.25922982	222.122
YYR1	1885341.327	-3321428.375	5091171.704	53.30864762	-60.41946968	37.864
YYR2	1885344.292	-3321419.899	5091176.129	53.30871394	-60.41936822	37.883
YYR3	1885340.01	-3321413.083	5091182.132	53.30880411	-60.41937361	37.892
ZAB1	-1488636.918	-5003946.534	3654557.687	35.17357515	-106.5673506	1620.127
ZAB2	-1488631.58	-5003948.215	3654557.662	35.17357451	-106.5672892	1620.185
ZAB3	-1488632.362	-5003950.804	3654553.811	35.1735321	-106.5672893	1620.177
ZAN1	-2659536.73	-1549114.746	5567750.735	61.22920123	-149.7802521	80.704
ZAN2	-2659548.486	-1549110.791	5567746.241	61.22911757	-149.7804258	80.696
ZAN3	-2659541.438	-1549106.666	5567750.721	61.22920116	-149.7804262	80.693
ZAU1	138704.035	-4761244.14	4227763.928	41.78265805	-88.33133766	195.883
ZAU2	138704.293	-4761248.761	4227758.769	41.78259566	-88.33133618	195.895
ZAU3	138710.998	-4761248.493	4227758.848	41.78259663	-88.33125546	195.894
ZBW1	1490299.134	-4448983.174	4306010.512	42.73572075	-71.48042687	39.107
ZBW2	1490304.249	-4448981.167	4306010.86	42.73572476	-71.48035986	39.139
ZBW3	1490305.959	-4448984.795	4306006.551	42.73567193	-71.48035413	39.141
ZDC1	1069125.688	-4839598.994	4001126.519	39.10159603	-77.54274739	80.064
ZDC2	1069128.084	-4839603.623	4001120.315	39.10152405	-77.54273189	80.06
ZDV1	-1273628.687	-4711375.568	4094890.086	40.18730302	-105.1272252	1541.35
ZDV2	-1273622.984	-4711377.087	4094890.102	40.18730326	-105.1271559	1541.343
ZDV3	-1273624.994	-4711380.277	4094885.812	40.18725281	-105.127169	1541.328
ZFW1	-659983.256	-5324060.766	3438276.453	32.83064961	-97.06647241	155.606
ZFW2	-659988.544	-5324063.328	3438271.467	32.83059622	-97.06652509	155.585
ZFW3	-659983.555	-5324063.843	3438271.662	32.8305982	-97.06647154	155.605
ZHU1	-513864.532	-5506451.67	3166720.458	29.96189637	-95.33142693	10.816
ZHU2	-513867.177	-5506455.065	3166714.292	29.96183184	-95.33145095	10.878
ZHU3	-513873.457	-5506457.706	3166708.693	29.96177361	-95.33151319	10.866
ZJX1	772646.377	-5434462.179	3237231.75	30.6988598	-81.90818579	2.123
ZJX2	772649.7	-5434463.733	3237228.35	30.69882419	-81.90815373	2.113
ZJX3	772645.642	-5434466.159	3237225.244	30.69879167	-81.90819923	2.101
ZKC1	-415247.583	-4954556.382	3982161.112	38.88015939	-94.7908346	305.894
ZKC2	-415231.191	-4954557.703	3982161.167	38.88016007	-94.79064509	305.888
ZKC3	-415237.31	-4954561.053	3982155.973	38.88010189	-94.79071213	305.624
ZLA1	-2474410.049	-4637294.543	3602183.561	34.60351871	-118.083897	763.494
ZLA2	-2474404.772	-4637297.352	3602183.566	34.60351878	-118.0838318	763.492
ZLA3	-2474411.378	-4637297.034	3602179.602	34.60347489	-118.083897	763.569
ZLC1	-1808273.312	-4486410.798	4145302.989	40.78604301	-111.9521787	1287.423
ZLC2	-1808274.701	-4486414.431	4145298.497	40.78598951	-111.9521779	1287.433
ZLC3	-1808270.493	-4486416.125	4145298.492	40.78598949	-111.9521242	1287.428
ZMA1	966042.245	-5662999.796	2761581.502	25.82461236	-80.31919029	-7.619

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZMA2	966029.266	-5662999.096	2761585.989	25.82466011	-80.31931672	-8.25
ZMA3	966037.352	-5662997.944	2761586.339	25.82466208	-80.31923529	-7.896
ZME1	4070.823	-5226189.286	3644028.429	35.06739421	-89.95537075	68.597
ZME2	4070.852	-5226186.745	3644032.539	35.06743769	-89.95537041	68.879
ZME3	4064.658	-5226186.61	3644032.698	35.06743959	-89.95543831	68.856
ZMP1	-249978.47	-4539297.501	4458955.048	44.6374632	-93.1520866	262.656
ZMP2	-249972.664	-4539297.846	4458955.049	44.63746305	-93.15201329	262.675
ZMP3	-249973.762	-4539302.123	4458950.57	44.63740699	-93.15202415	262.609
ZNY1	1406144.55	-4627343.992	4144322.066	40.78432874	-73.09716668	6.443
ZNY2	1406146.348	-4627347.026	4144317.287	40.78427601	-73.09715675	5.915
ZNY3	1406140.787	-4627348.68	4144317.326	40.78427648	-73.09722548	5.914
ZOA1	-2684436.986	-4293337.282	3865351.915	37.54305449	-122.0159496	-3.505
ZOA2	-2684433.978	-4293341.368	3865349.493	37.54302692	-122.0158963	-3.498
ZOA3	-2684438.353	-4293342.242	3865345.636	37.54298257	-122.015933	-3.422
ZOB1	650770.106	-4754715.676	4187420.758	41.29715454	-82.20644566	223.681
ZOB2	650777.785	-4754714.85	4187422.775	41.29716686	-82.20635349	225.18
ZOB3	650776.114	-4754719.674	4187414.982	41.29708709	-82.20638106	223.458
ZSE1	-2308930.32	-3668169.67	4663526.448	47.28699294	-122.1883734	82.092
ZSE2	-2308934.714	-3668175.218	4663520.045	47.28690738	-122.1883835	82.16
ZSE3	-2308935.775	-3668179.493	4663516.101	47.28685567	-122.1883653	82.1
ZSU1	2462589.478	-5529372.098	2003724.541	18.43133635	-65.99347634	-28.081
ZSU2	2462587.55	-5529377.465	2003712.247	18.43121922	-65.99351368	-28.061
ZSU3	2462594.177	-5529375.2	2003710.166	18.43119959	-65.99344765	-28.124
ZTL1	529840.342	-5305248.833	3489342.872	33.37968867	-84.29672669	261.161
ZTL2	529846.717	-5305247.989	3489343.148	33.37969178	-84.29665762	261.141
ZTL3	529847.405	-5305251.426	3489337.92	33.37963511	-84.29665393	261.177

Figure 10-1 through Figure 10-3 show the RSS of the ECEF differences between the OPUS survey antenna phase center locations and the locations in the Build WAAS SSM 48 software. Figure 10-4 through Figure 10-6 shows the OPUS surveys overall RMS quality indications.

Figure 10-1 Build WE7164c Antenna Positions Deltas OPUS Survey

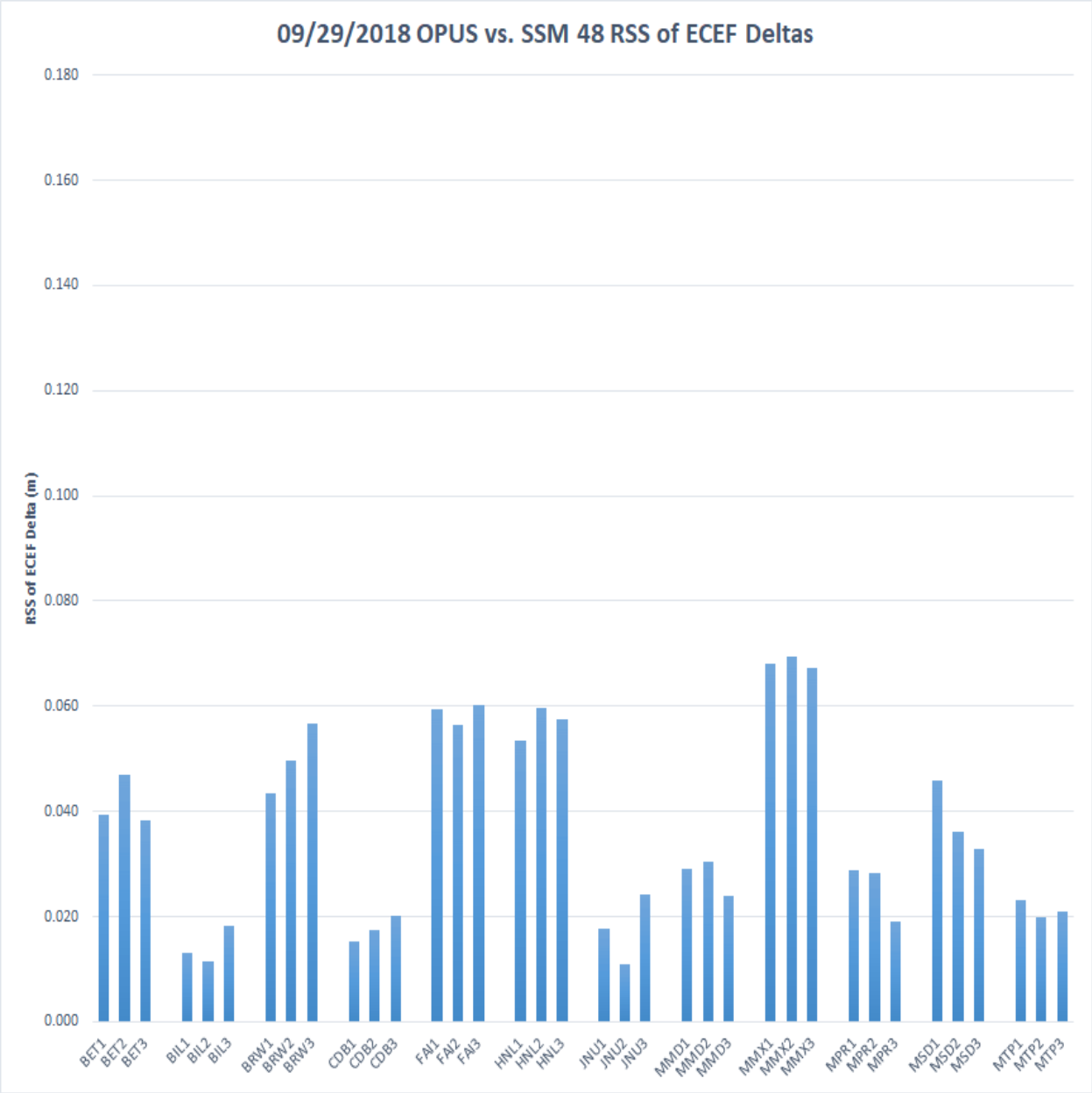


Figure 10-2 Build WE7.164c Antenna Positions Deltas OPUS Survey

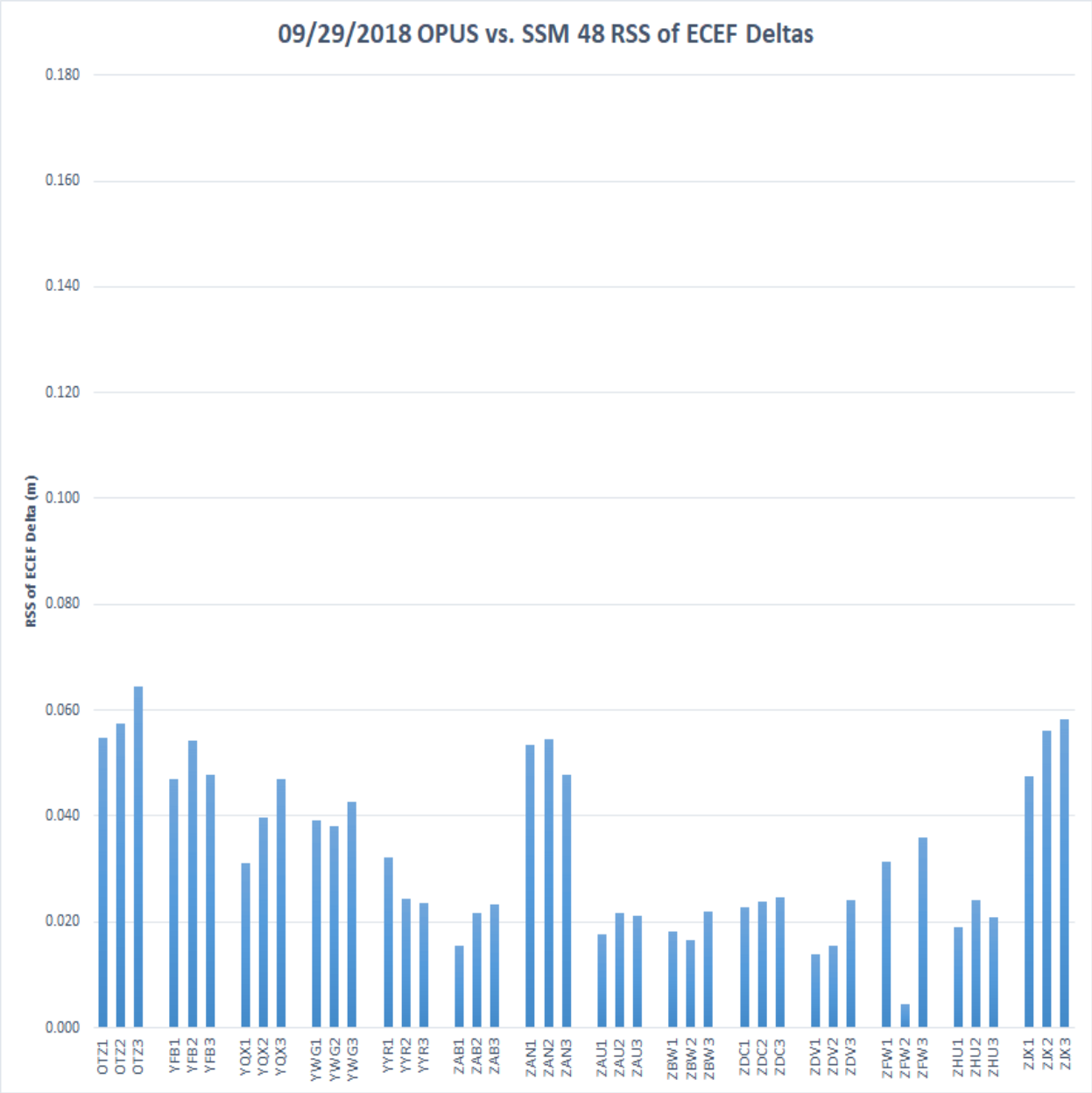


Figure 10-3 Build WE7.164c Antenna Positions Deltas OPUS Survey

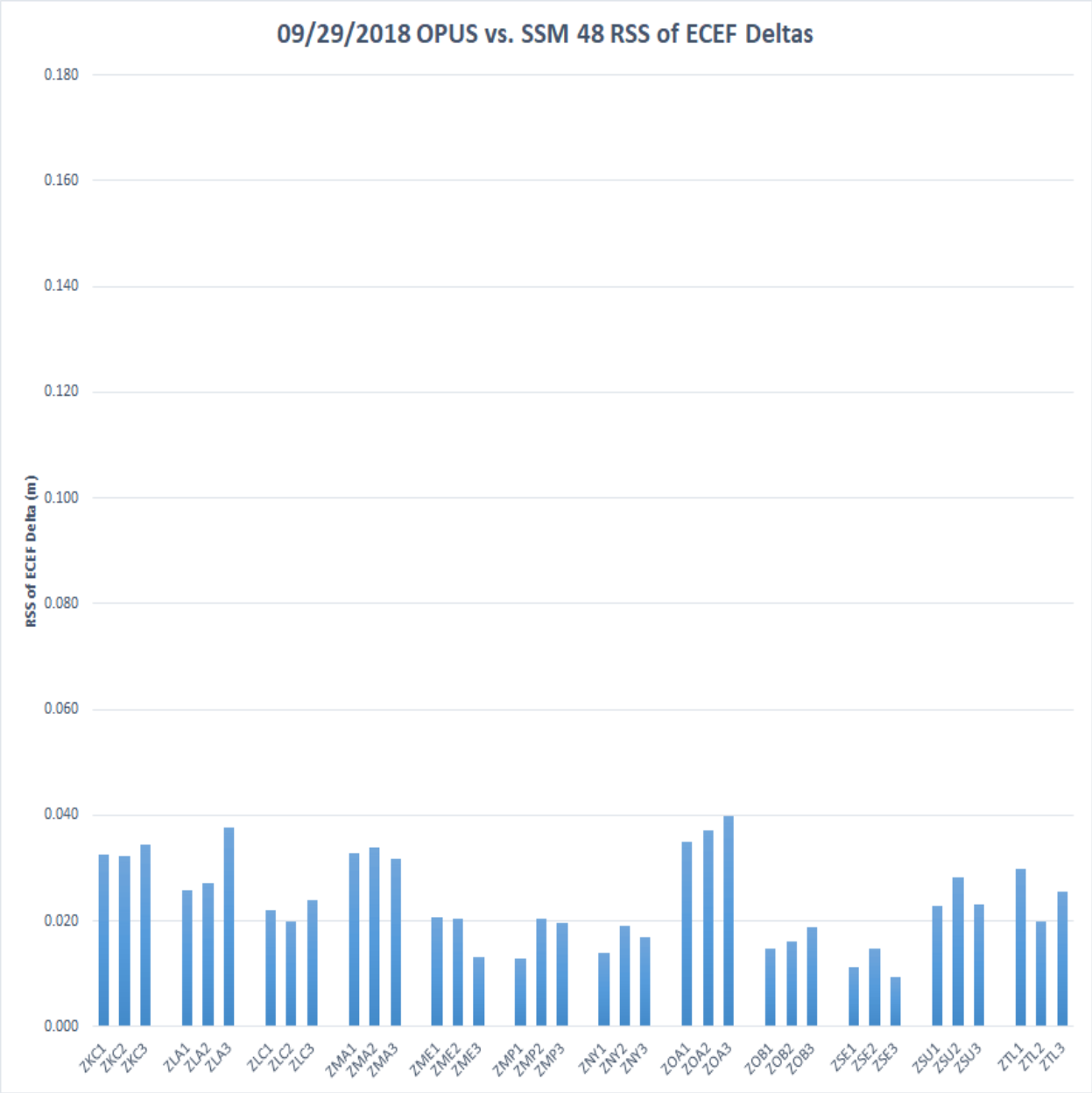


Figure 10-4 OPUS Survey Overall RMS Qualities

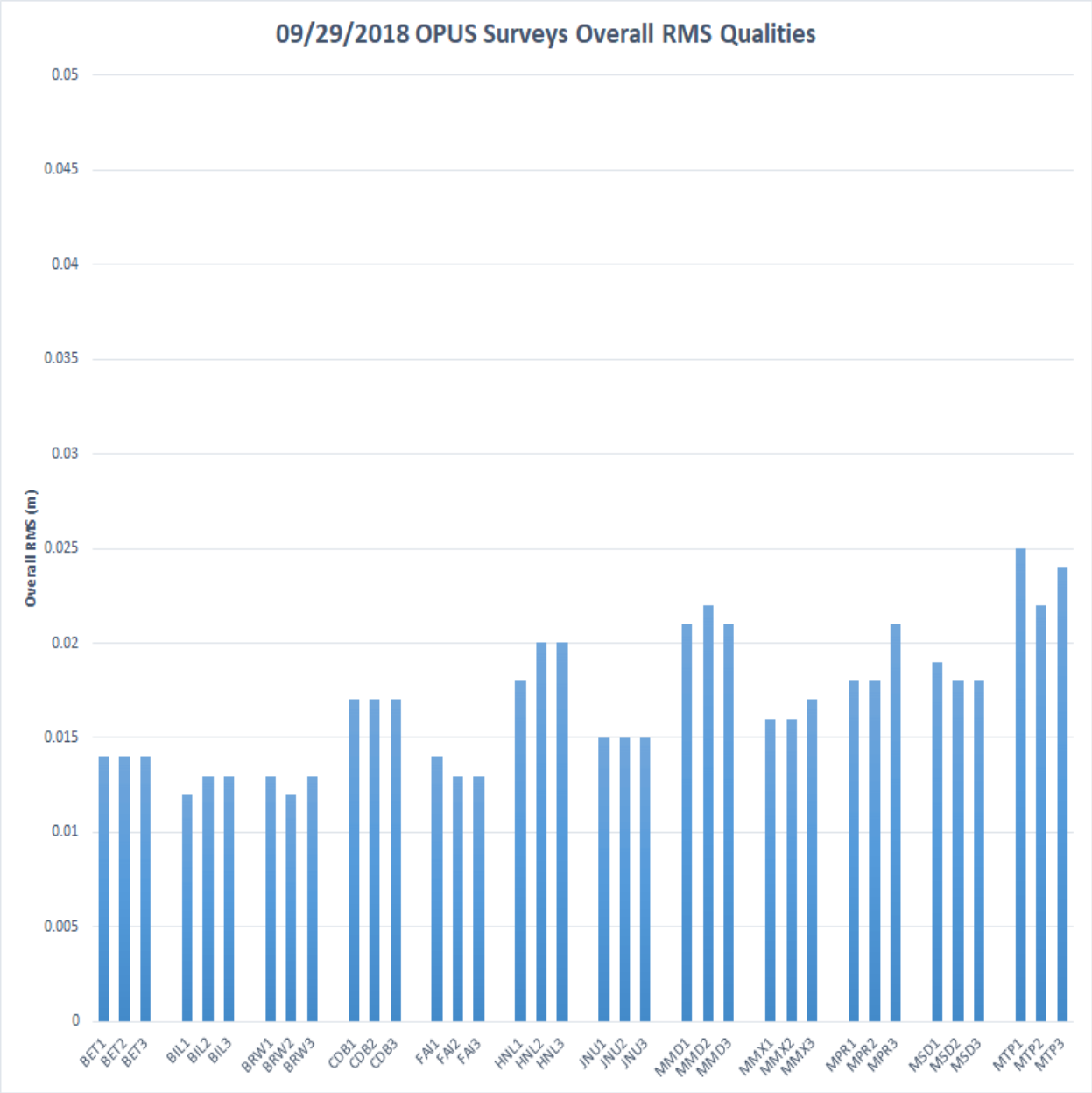


Figure 10-5 OPUS Survey Overall RMS Qualities

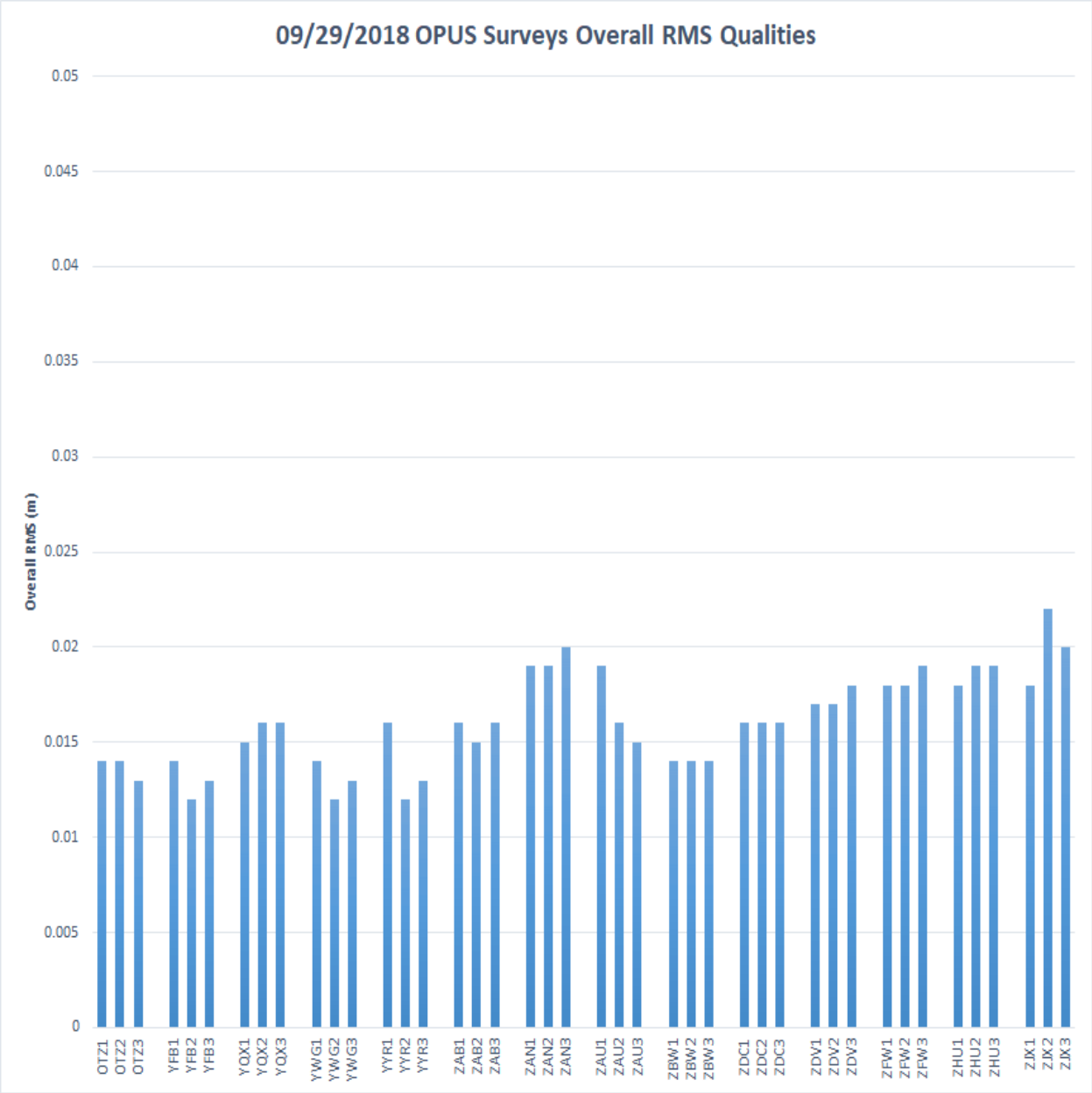
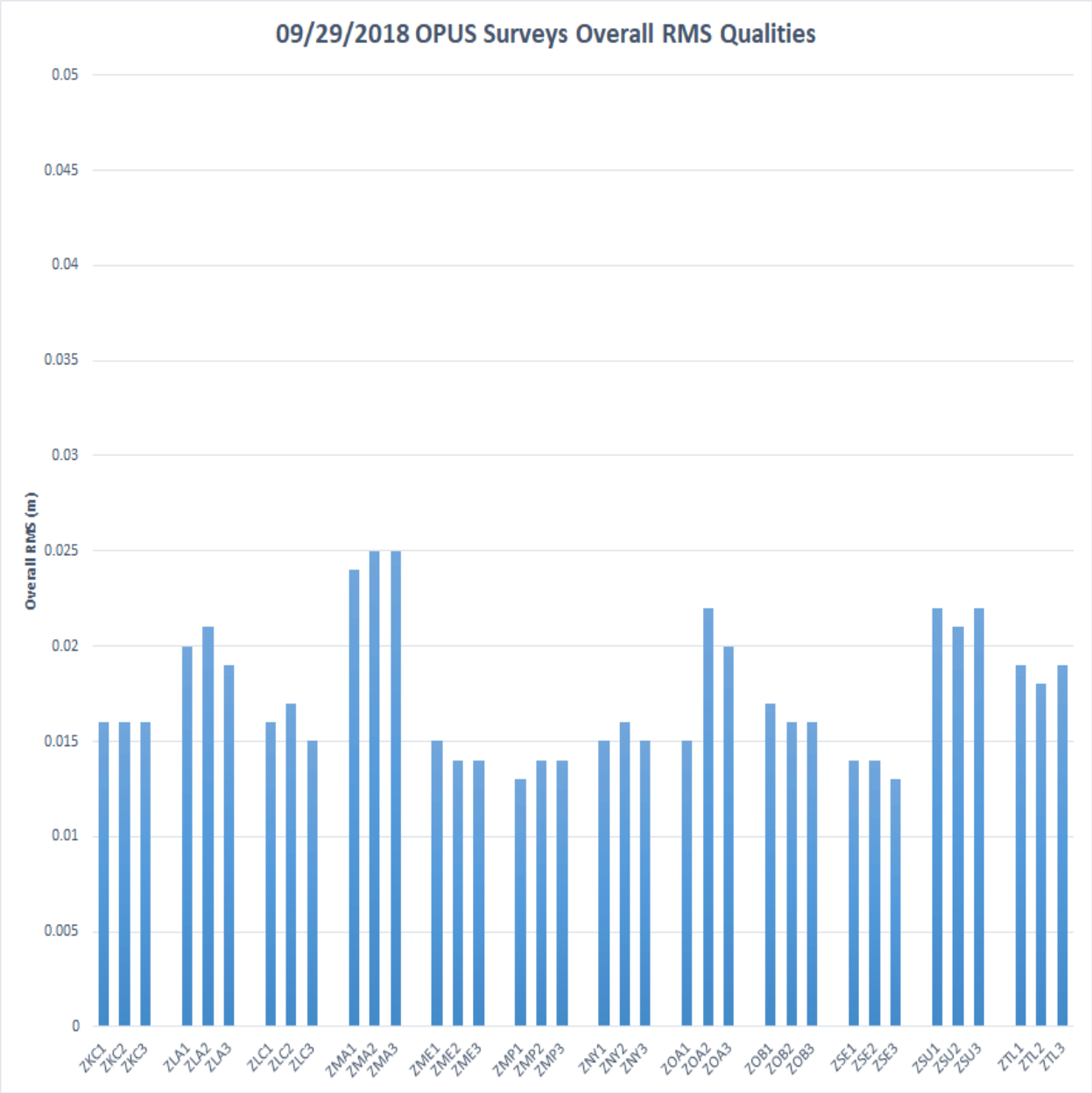


Figure 10-6 OPUS Survey Overall RMS Qualities



The “take action” threshold established by the WAAS Integrity Performance Panel (WIPP) is 25 cm for Mexico City and 10 cm for the remaining sites. The large MMX allowance is required because of the rapid subsidence in Mexico City (approximately 28 to 30 cm/year).

Figure 10-7 through Figure 10-9 show the RSS of the ECEF difference between the OPUS positions and the CSRS positions. Note that the OPUS positions are in IGS08 and the CSRS positions are in ITRF-2008.

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

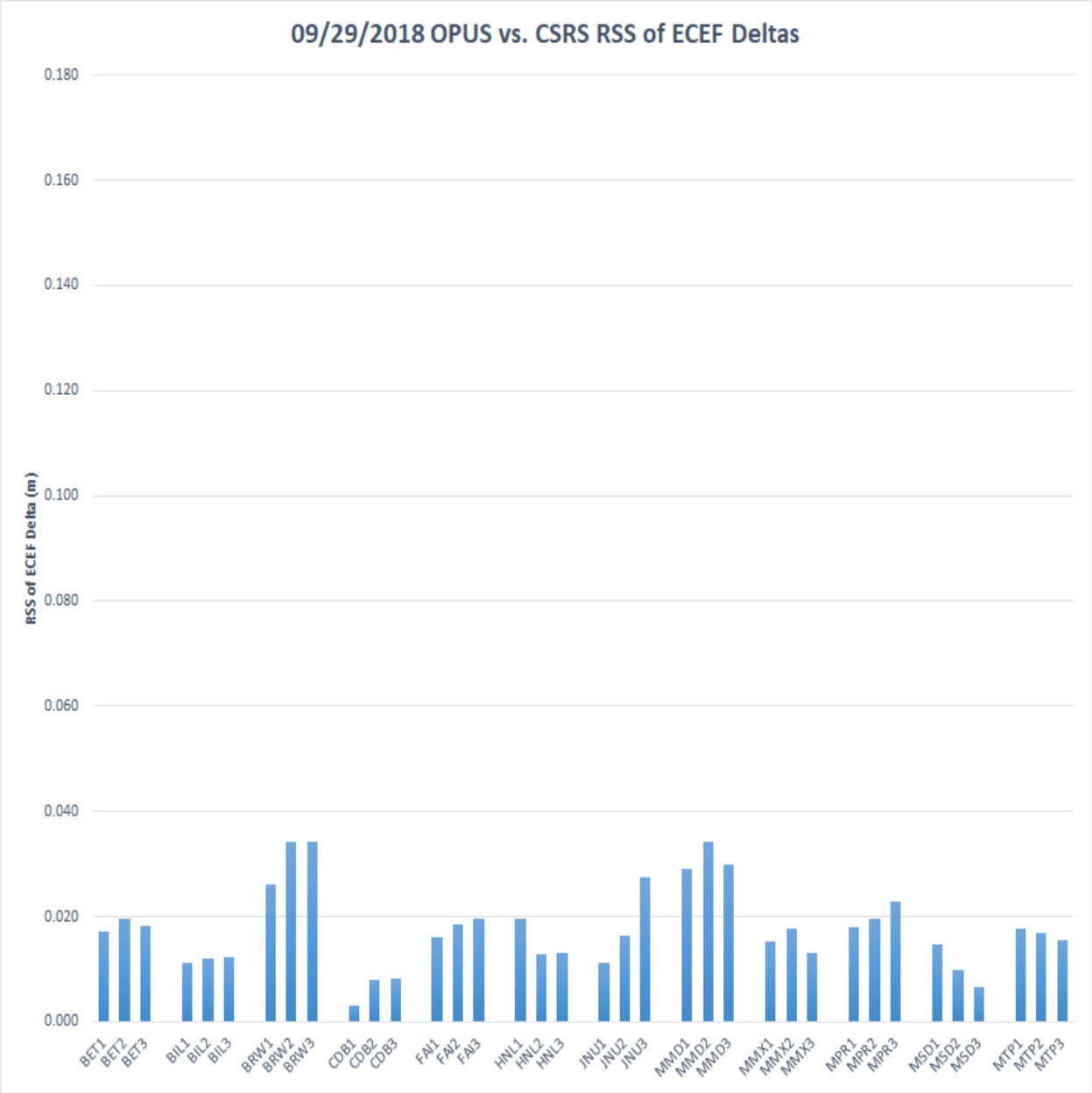


Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

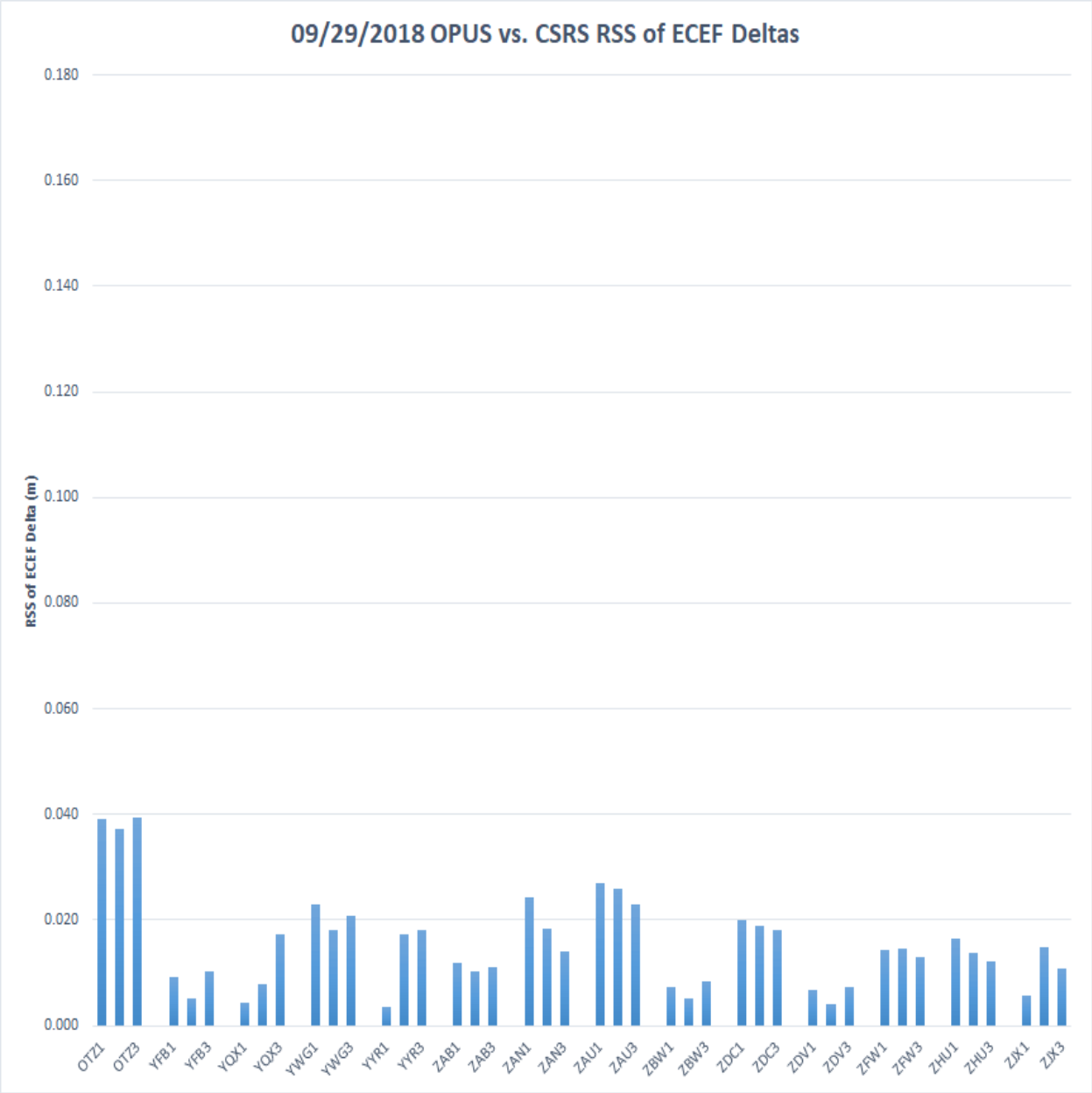


Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

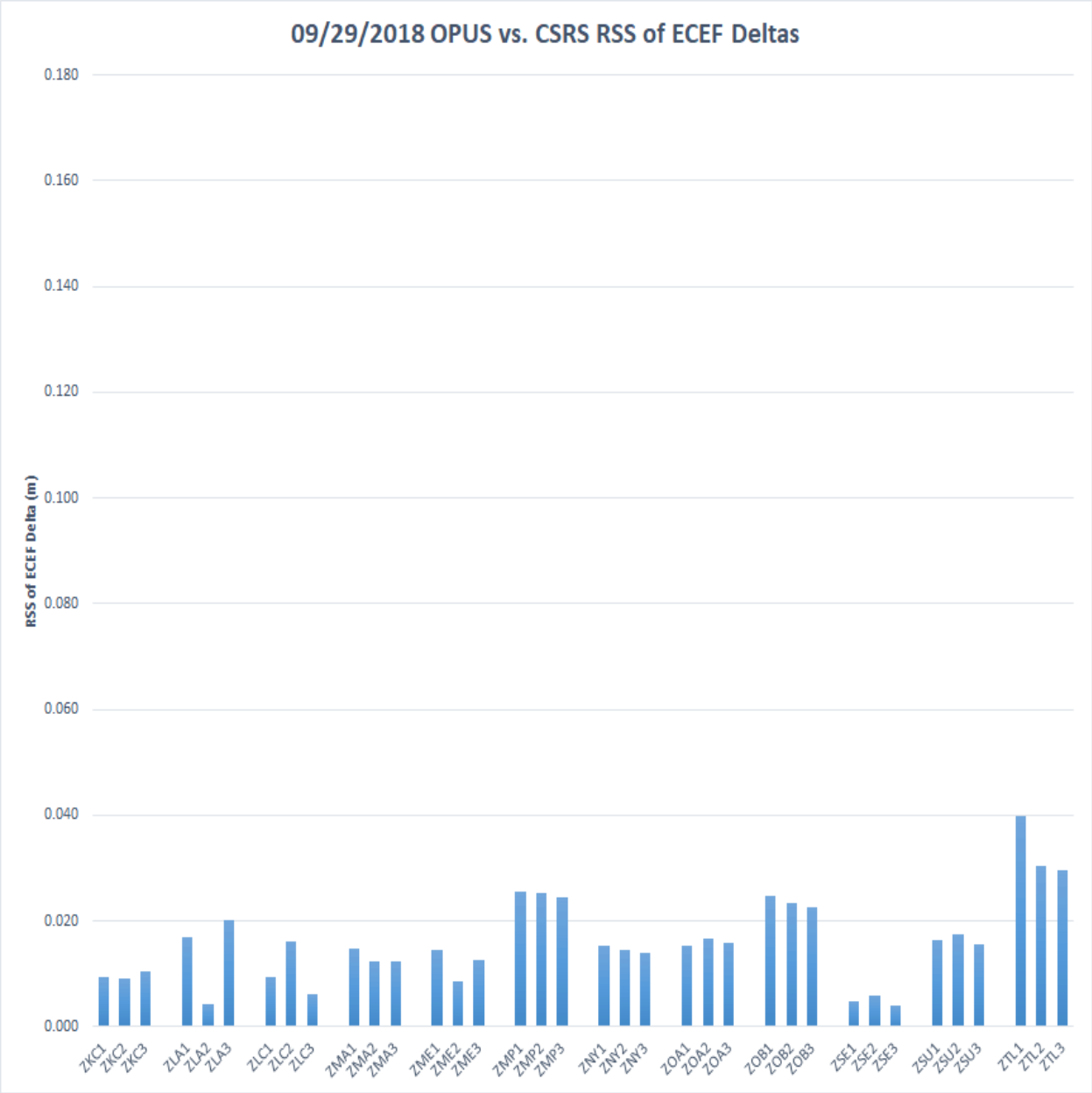


Figure 10-10 through Figure 10-12 show the RSS of the ECEF sigma's survey qualities reported by CSRS.

Figure 10-10 CSRS Survey Qualities

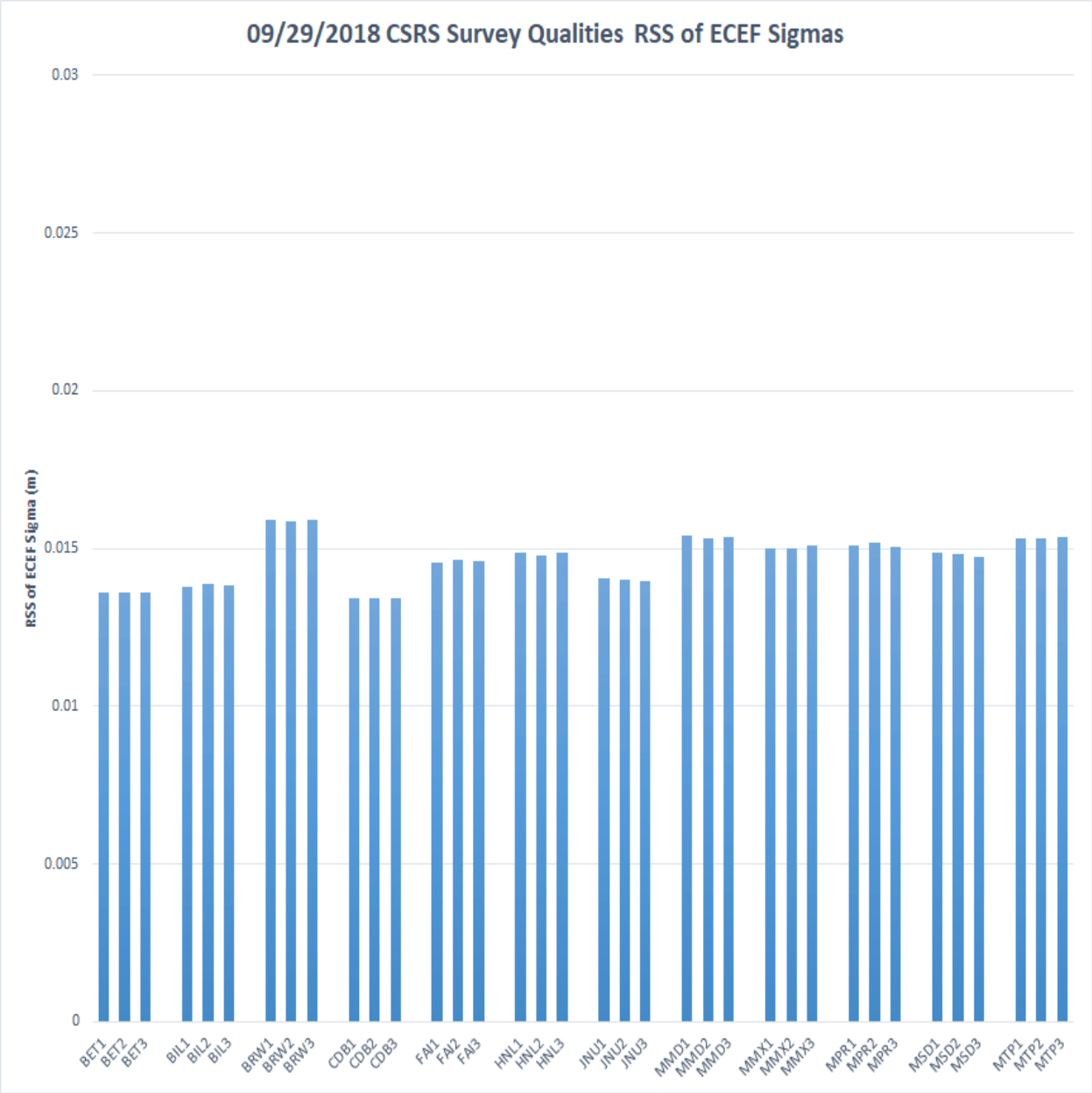


Figure 10-11 CSRS Survey Qualities

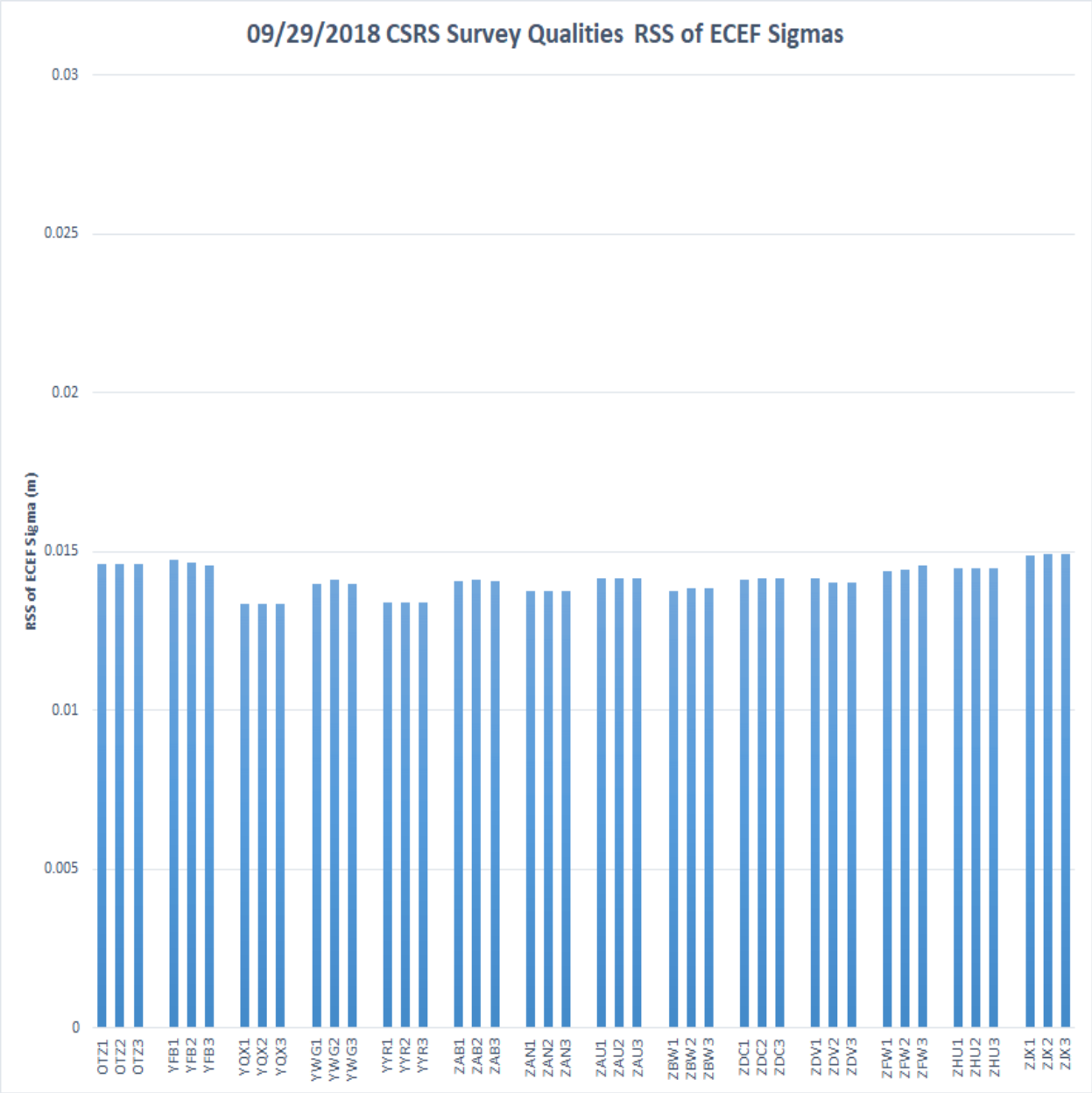
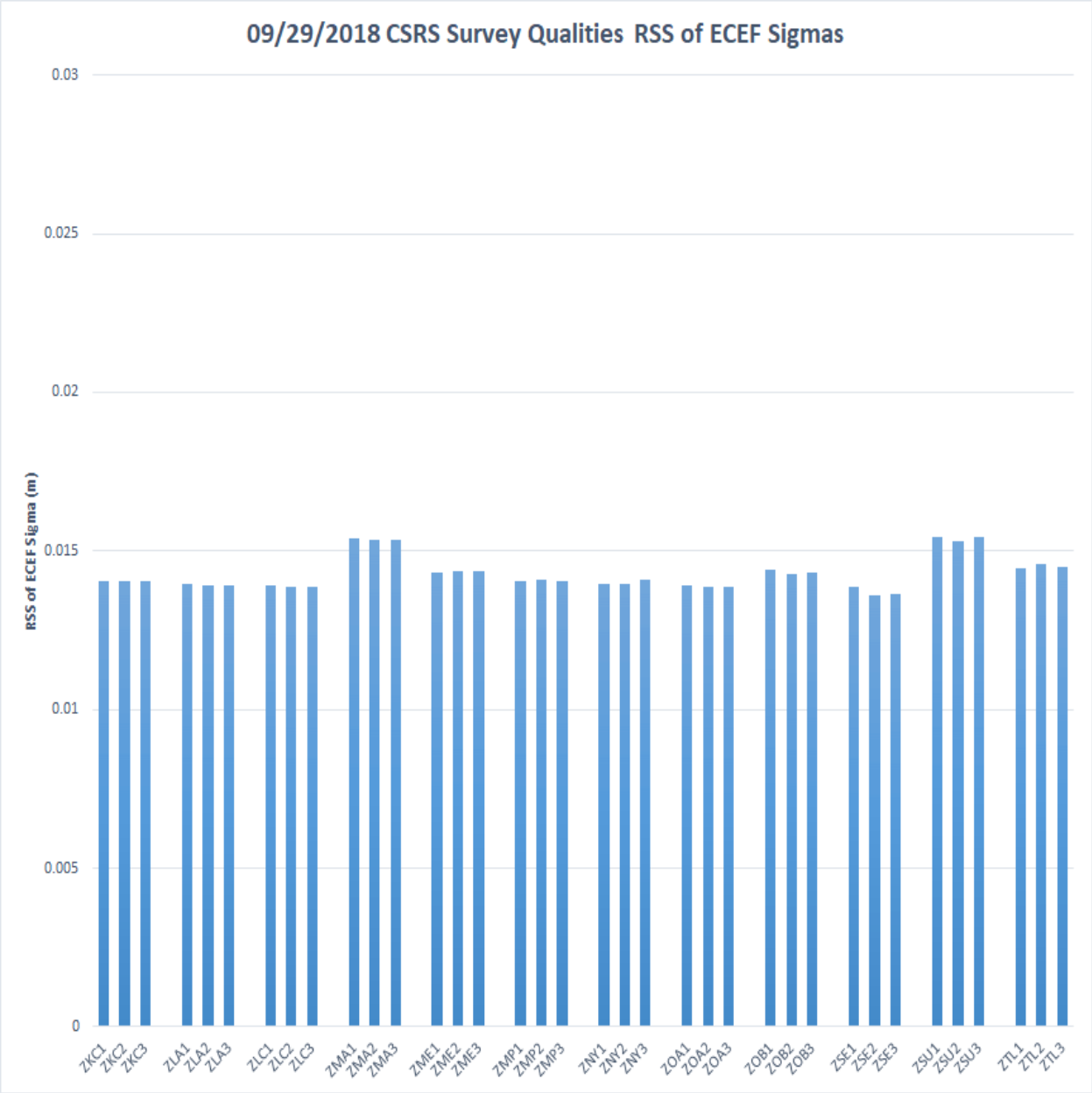


Figure 10-12 CSRS Survey Qualities



11.0 SQM

The SQM is designed to detect signal deformations originating from the GPS or GEO satellites and to ensure that the UDRE values are sufficiently inflated given the monitor's current observations. The SQM processes various correlator spacing measurements produced by the reference station receivers. These measurements are used to form four detection metrics for each receiver, and statistics are calculated based on the observed performance against "ideal" signal correlation peaks, resulting in an overall estimated deformation per satellite. The estimated deformation is compared against threshold values, which includes the acceptable error levels per UDRE value. If the estimated deformation exceeds threshold, the SQM trips for the given satellite and the UDRE value is set to "Don't Use". Currently, all 114 WAAS WREs are being used in the SQM computations because SQM depends on the entire ground network to ensure the satellite is the source of any detected problem rather than a localized affect.

The WAAS SQM offline monitoring effort includes the monitoring of the PRN type biases, trips, and the estimated deformation for each satellite (referred to as PRN bias in this report).

11.1 Alpha Metrics

The alpha metrics values are pre-determined by offline integrity analysis and are defined as constants in the SQM algorithm. These values remained unchanged for this reporting period and are listed in Table 11-1. Currently there are four sets of alpha metrics in the WAAS SQM algorithm that form four detection metrics for each receiver channel. For this report, the four detection metrics (DM) will be referred to as: DM1, DM2, DM3, and DM4.

Table 11-1 Alpha Metrics

Correlator Spacing	DM1	DM2	DM3	DM4
-0.1	0	0.43407318	0	-0.36110353
-0.075	0	0.48570652	-0.0058771682	-0.74860302
-0.05	-0.4071265	-0.69931105	-0.011382325	0.23726003
-0.025	1	-0.010099034	0.00037033029	-0.0076011735
0	0	0	0	0
0.025	-0.25	0.13317879	0.99991788	-0.062414070
0.05	1.008525	-0.22851782	0	0.25177272
0.075	0	0.10209042	0	0.42875623
0.1	0	0.078436452	0	0.41602138

11.2 Type Bias

The PRN type biases are evaluated as part of the WAAS SQM offline monitoring effort. Depending on the PRN number of any given GPS satellite, it can be classified into three categories of correlation function shapes: skinny (Type 0), nominal (Type 1), and broad (Type 2). Note that wideband GEOs are considered a different type (Type 3). The PRN type biases are estimates that are computed at each epoch, and daily averages are computed for each type, for four detection metrics.

For this reporting period, the GEO-type biases were not evaluated. Table 11-2 shows the rollup averages for the quarter. Table 11-3 shows the rollup averages since January 1, 2008. Figure 11-1 shows the daily averages of the four detection metrics for the quarter.

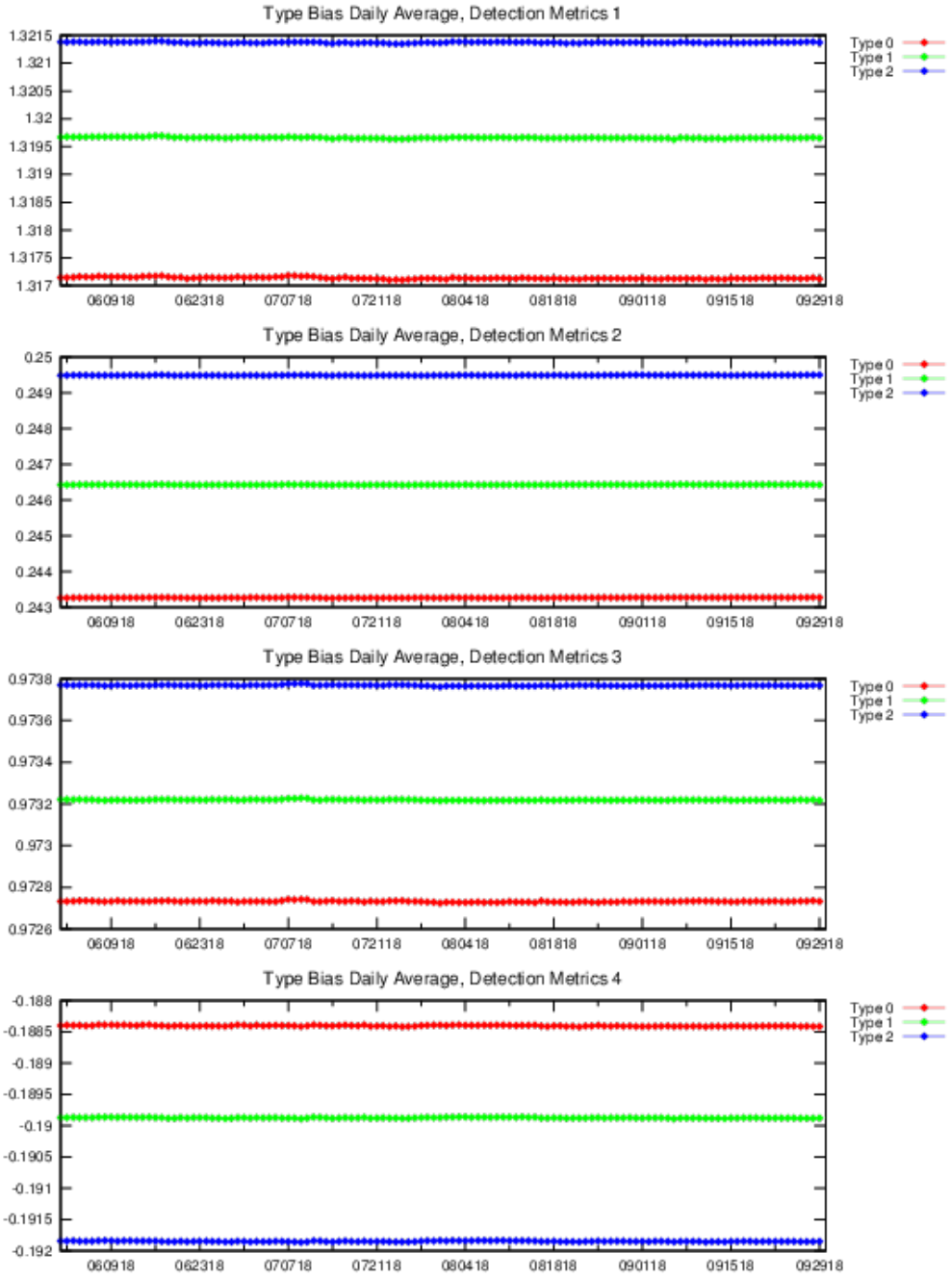
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3171400	1.3196600	1.3213700
DM 2	0.2432690	0.2464300	0.2494940
DM 3	0.9727320	0.9732190	0.9737680
DM 4	-0.1884030	-0.1898740	-0.1918480

Table 11-3 Type Bias Average since January 1, 2008

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3198900	1.3220400	1.3237400
DM 2	0.2414730	0.2446990	0.2478490
DM 3	0.9730670	0.9735810	0.9741450
DM 4	-0.1868190	-0.1885330	-0.1905610

Figure 11-1 Type Bias Average Trend



11.3 PRN Bias

The PRN biases are evaluated as part of the WAAS SQM offline monitoring effort. A PRN bias is the overall estimated deformation per satellite across receivers. Detection metrics are adjusted for inter-receiver bias, corrected for PRN type bias, and combined across receivers for each satellite. Relying on the assertion that the majority of the SV signals are healthy and normal, detection metrics are normalized over all the orbiting satellites, which results in an overall PRN bias for each satellite. PRN biases are collected at each epoch and daily averages are computed for each satellite for four detection metrics.

Table 11-4 and Figure 11-2 show the rollup PRN bias averages for the quarter with the maximum values for each detection metrics as followed: (1) the maximum average for DM1 is 0.0011567 observed on PRN11, (2) the maximum average for DM2 is 0.0001997 observed on PRN23, (3) the maximum average for DM3 is 0.0002059 observed on PRN29, (4) the maximum average for DM4 is 0.0004806 observed on PRN23.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.0002677	0.0000701	0.0000579	0.0001123
2	0.0005225	0.0001514	0.0000724	0.0001559
3	0.0001691	0.0000482	0.0000592	0.0001088
4	Offline	Offline	Offline	Offline
5	0.0002134	0.0000563	0.0001402	0.0001326
6	0.0005278	0.0001056	0.0000870	0.0001171
7	0.0001743	0.0001058	0.0000611	0.0000932
8	0.0004380	0.0001263	0.0000943	0.0001443
9	0.0001926	0.0000500	0.0001329	0.0002195
10	0.0001801	0.0000525	0.0000895	0.0001937
11	0.0011567	0.0001948	0.0001018	0.0002791
12	0.0001701	0.0000448	0.0000900	0.0001016
13	0.0005107	0.0000421	0.0000601	0.0002596
14	0.0007590	0.0001412	0.0000498	0.0001899
15	0.0002811	0.0000831	0.0000527	0.0001140
16	0.0001734	0.0000567	0.0001179	0.0002264
17	0.0002147	0.0000591	0.0000510	0.0000895
18	0.0001907	0.0000873	0.0000616	0.0001109
19	0.0005926	0.0001942	0.0001031	0.0001163
20	0.0001816	0.0000582	0.0000677	0.0001472
21	0.0003445	0.0000643	0.0000823	0.0004456
22	0.0001549	0.0000410	0.0000882	0.0002616
23	0.0010607	0.0001997	0.0001261	0.0004806
24	0.0002299	0.0000653	0.0001434	0.0002271
25	0.0006080	0.0001097	0.0000538	0.0002237
26	0.0002693	0.0001101	0.0000594	0.0001434
27	0.0004447	0.0001880	0.0001239	0.0002529
28	0.0003328	0.0000441	0.0000817	0.0001527
29	0.0002728	0.0000876	0.0002059	0.0003514
30	0.0002296	0.0000700	0.0000721	0.0001012
31	0.0003509	0.0001221	0.0000560	0.0001683
32	0.0001963	0.0000529	0.0000789	0.0001231

Figure 11-2 PRN Bias Average for the Quarter

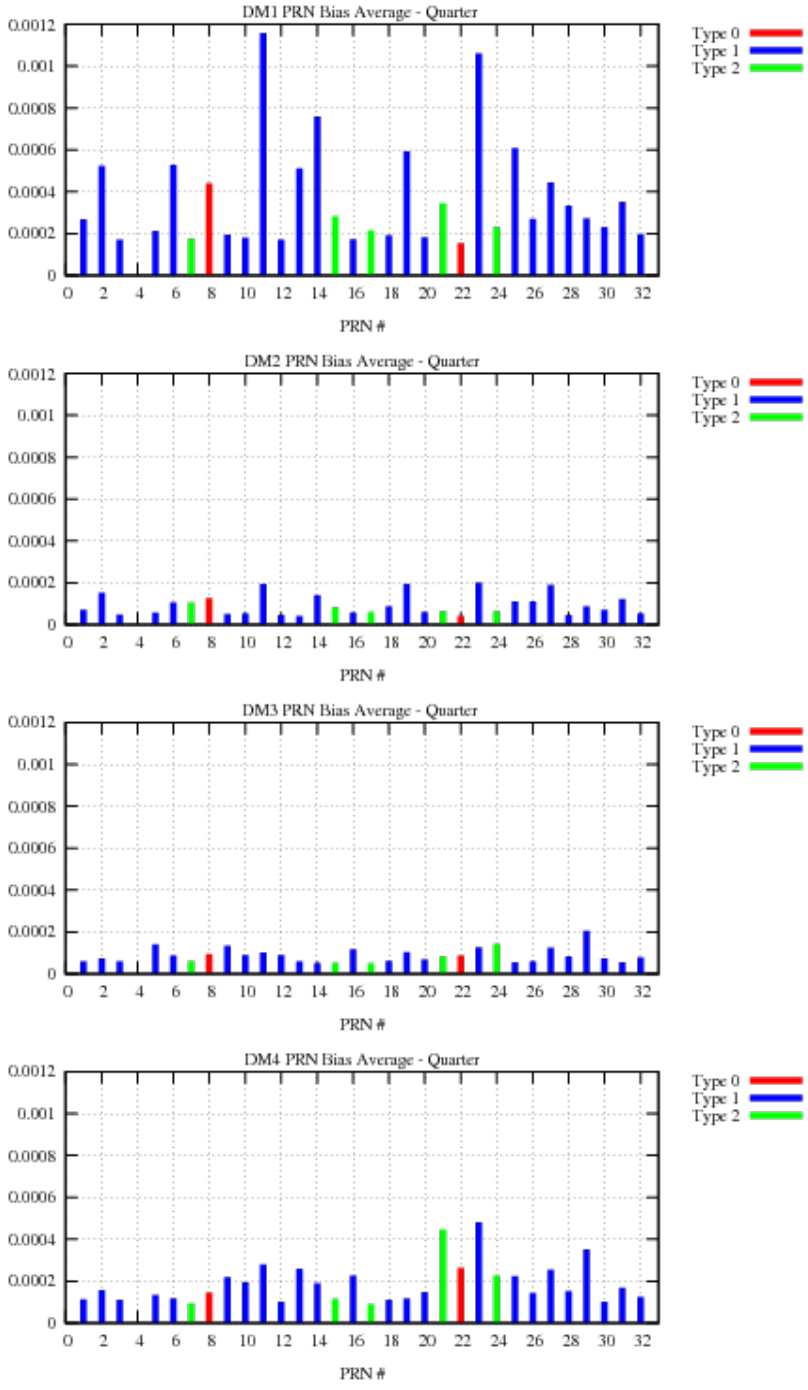


Figure 11-3 to Figure 11-10 show the daily PRN bias for each PRN, for four detection metrics. Small bumps were due to NANU's.

Figure 11-3 PRN Bias Average Trend (PRN1–PRN4)

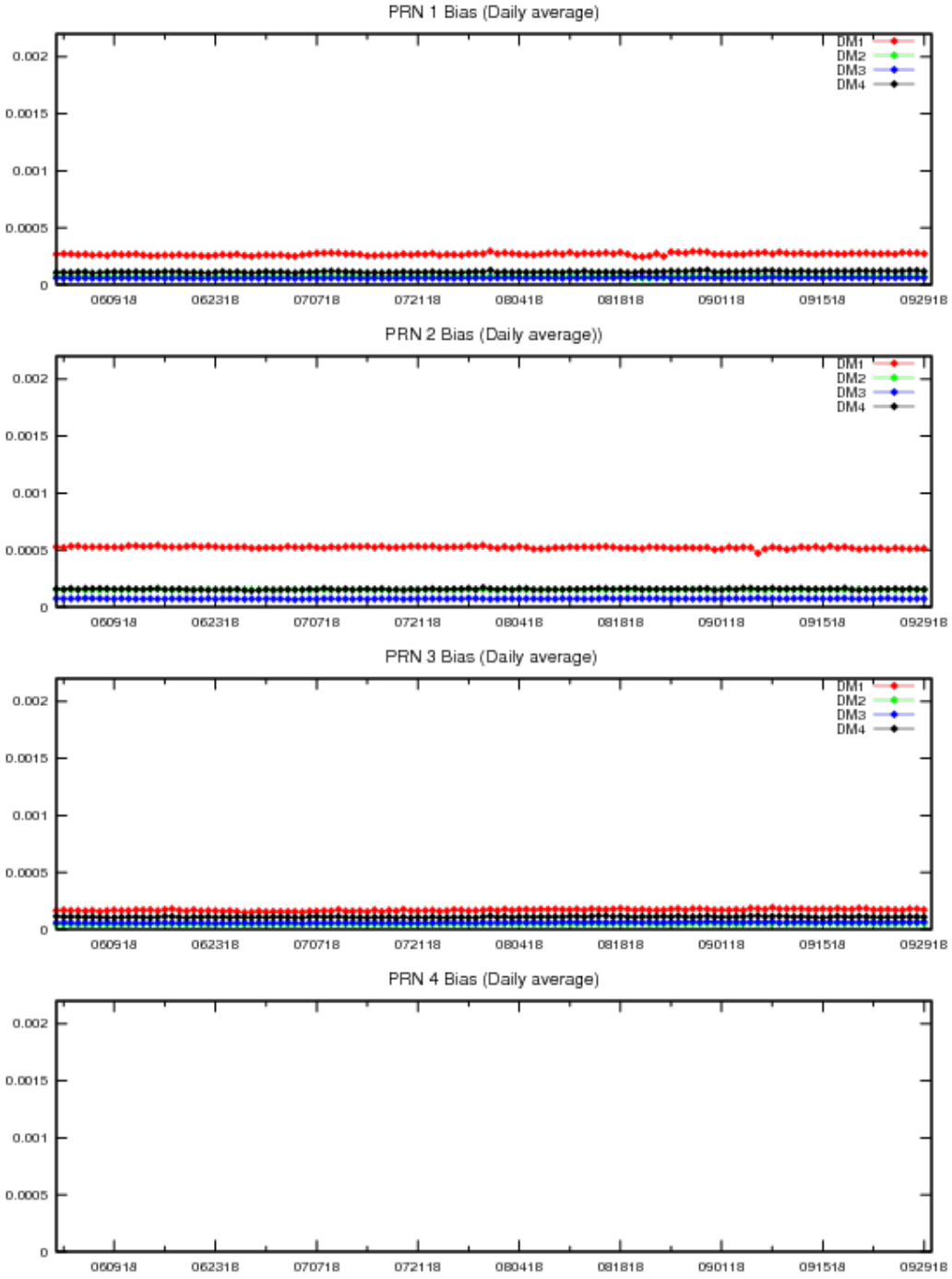


Figure 11-4 PRN Bias Average Trend (PRN5–PRN8)

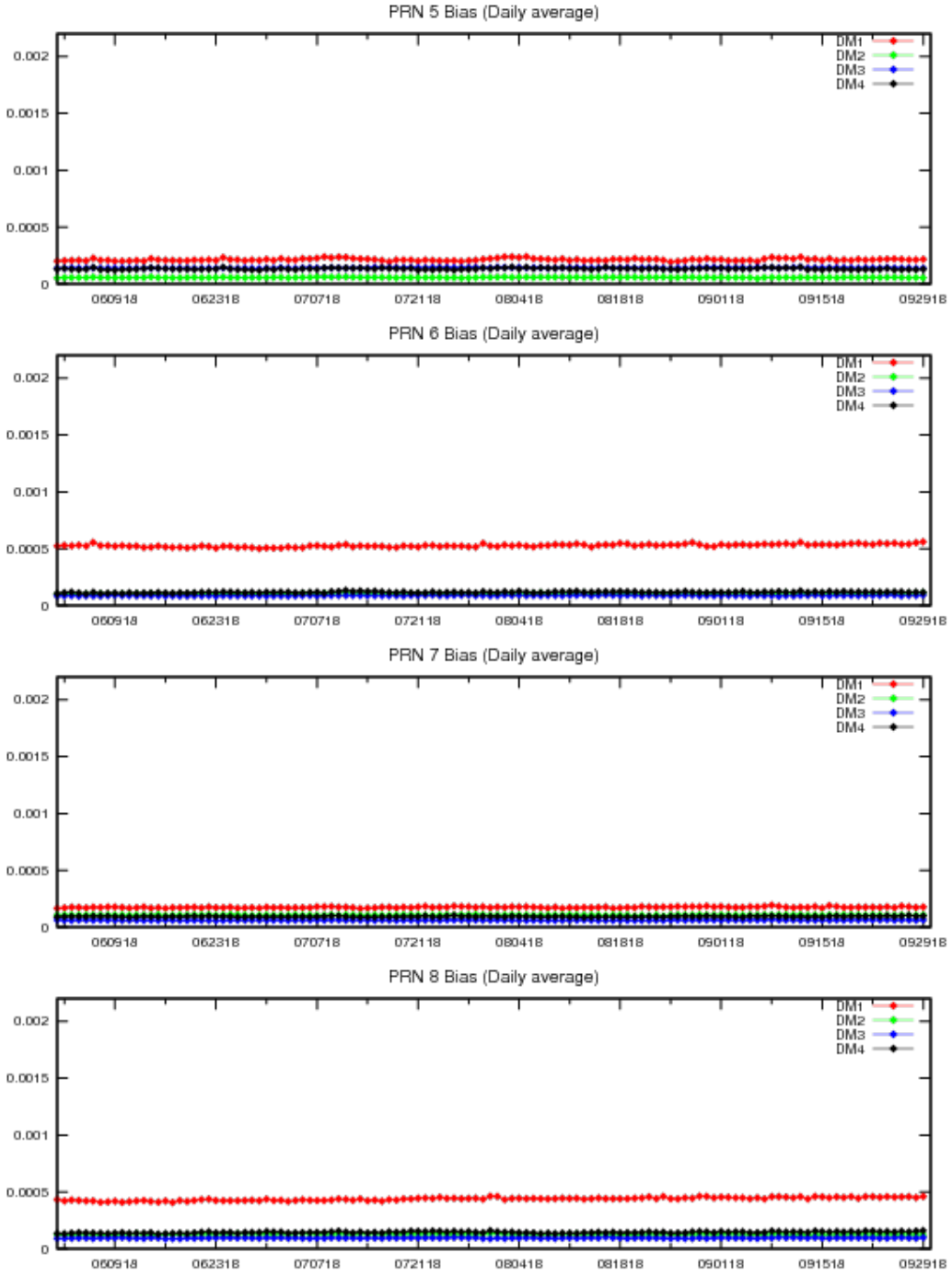


Figure 11-5 PRN Bias Average Trend (PRN9–PRN12)

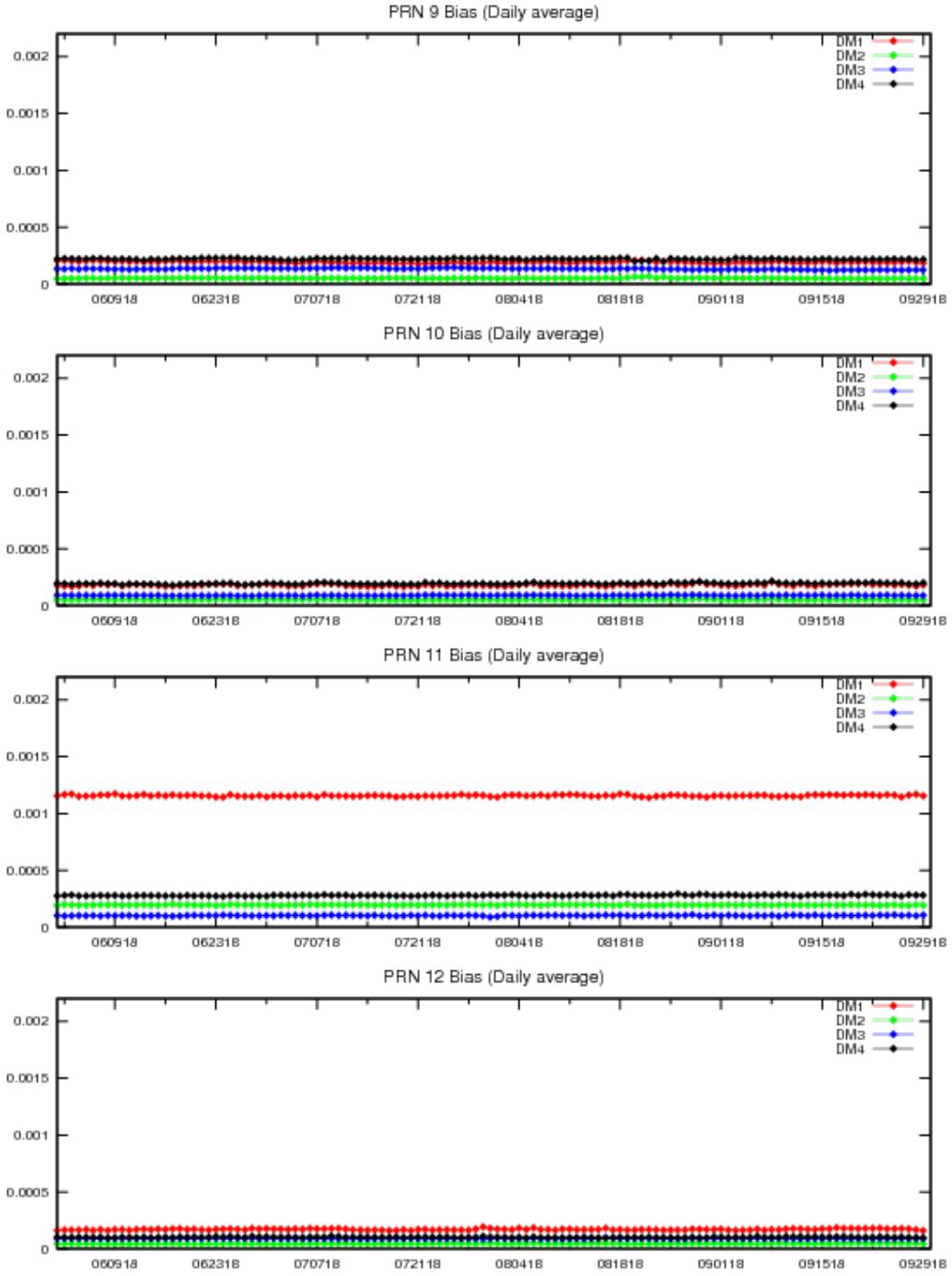


Figure 11-6 PRN Bias Average Trend (PRN13–PRN16)

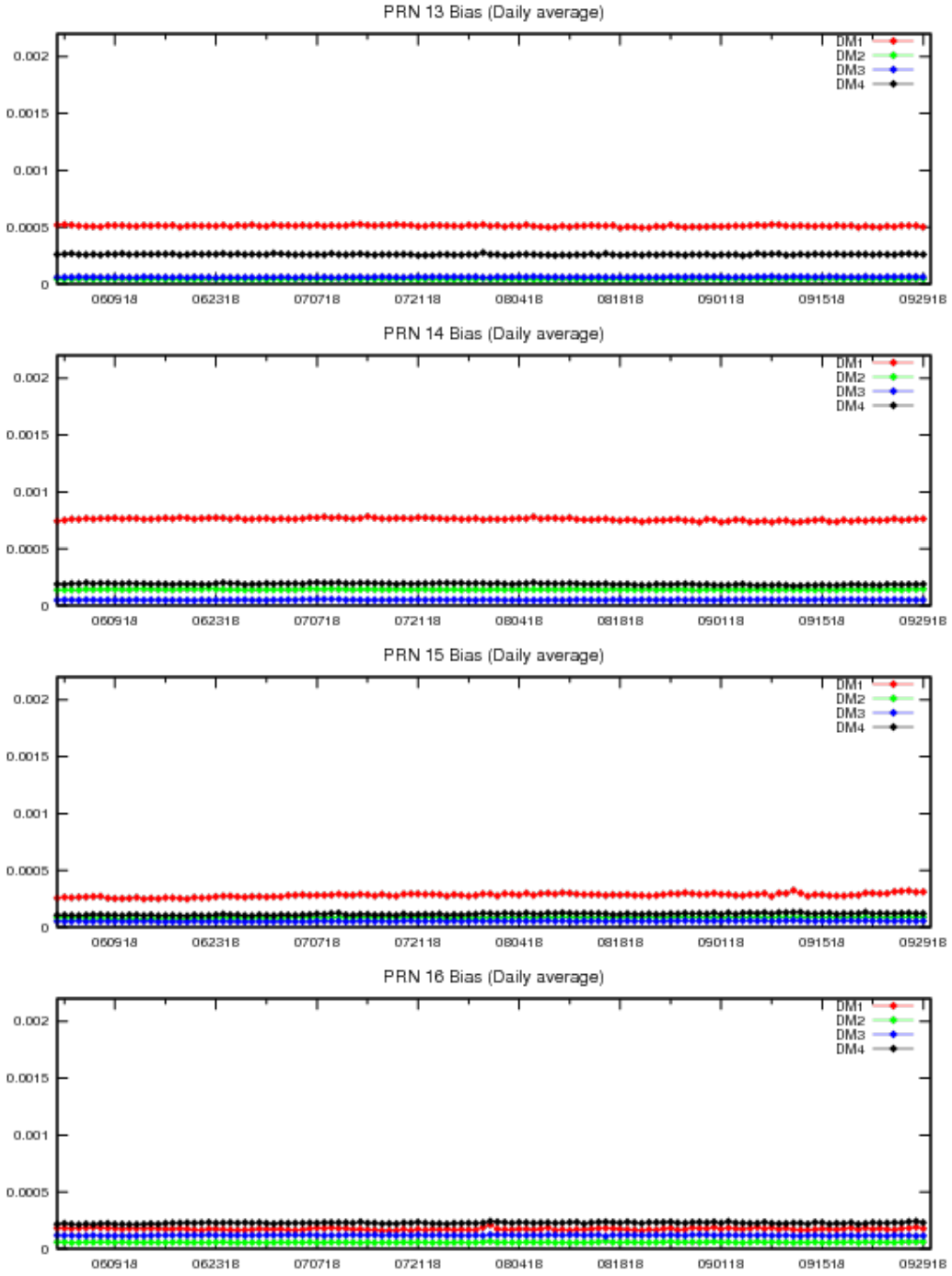


Figure 11-7 PRN Bias Average Trend (PRN17–PRN20)

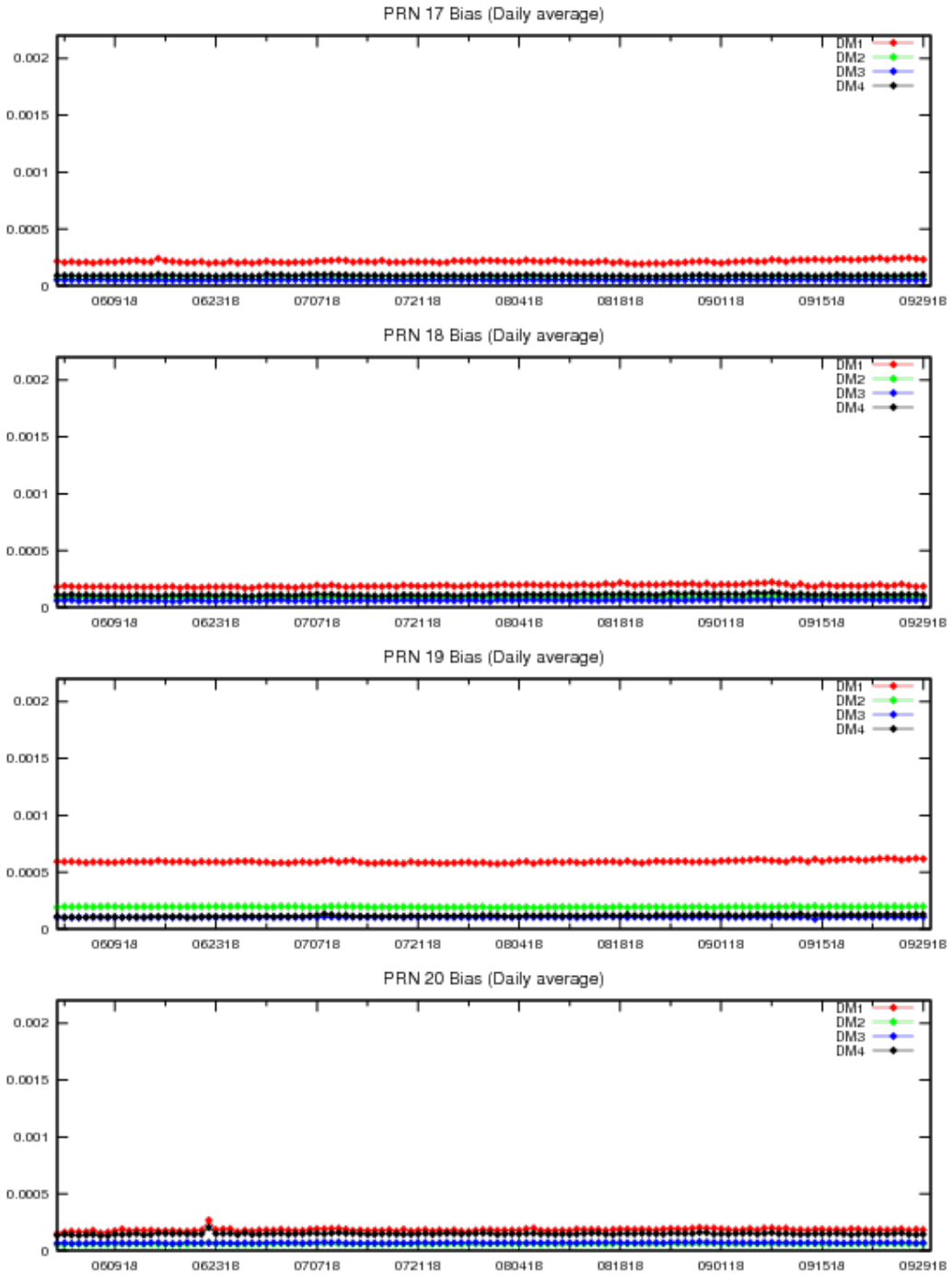


Figure 11-8 PRN Bias Average Trend (PRN21–PRN24)

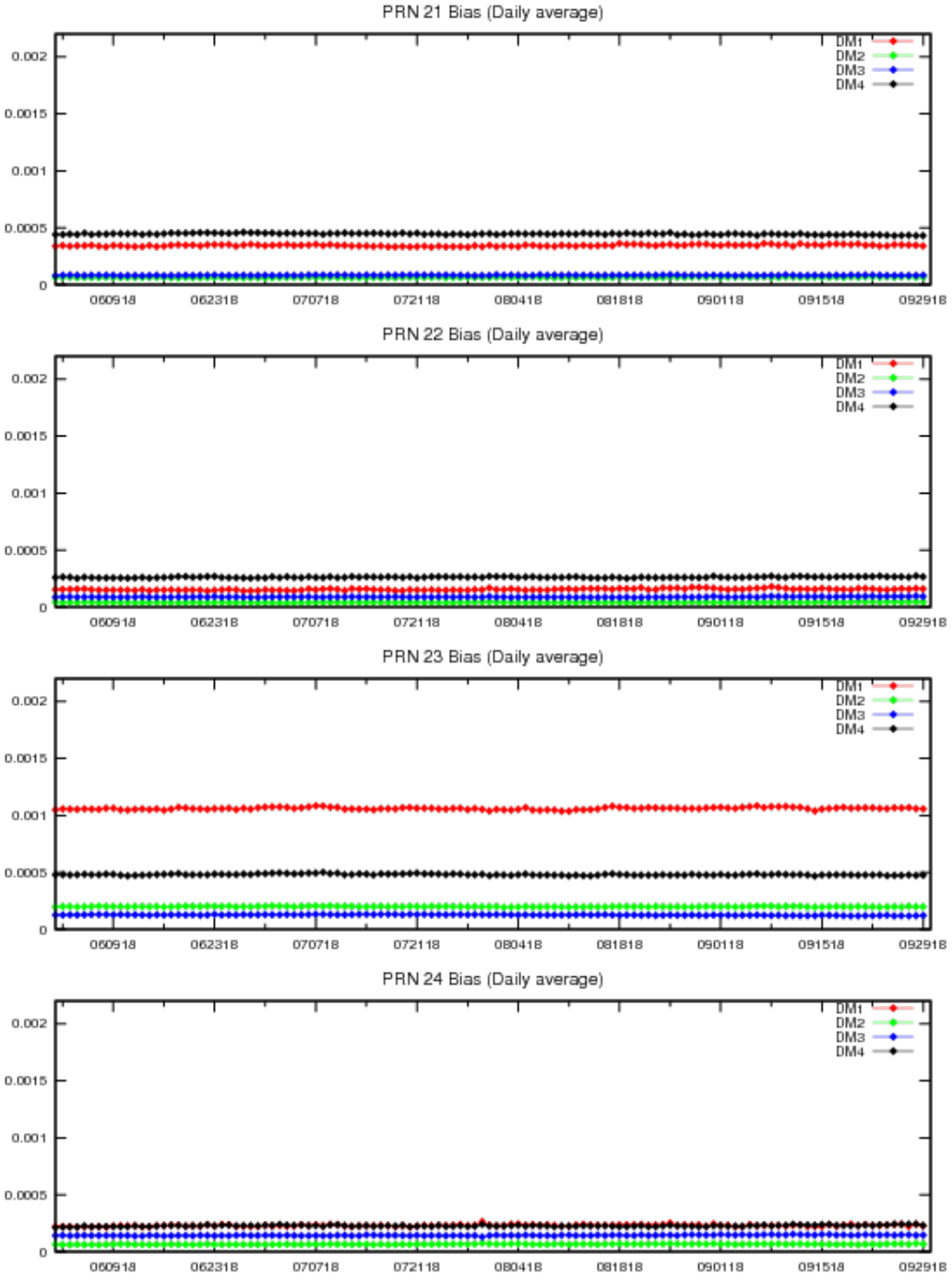


Figure 11-9 PRN Bias Average Trend (PRN25–PRN28)

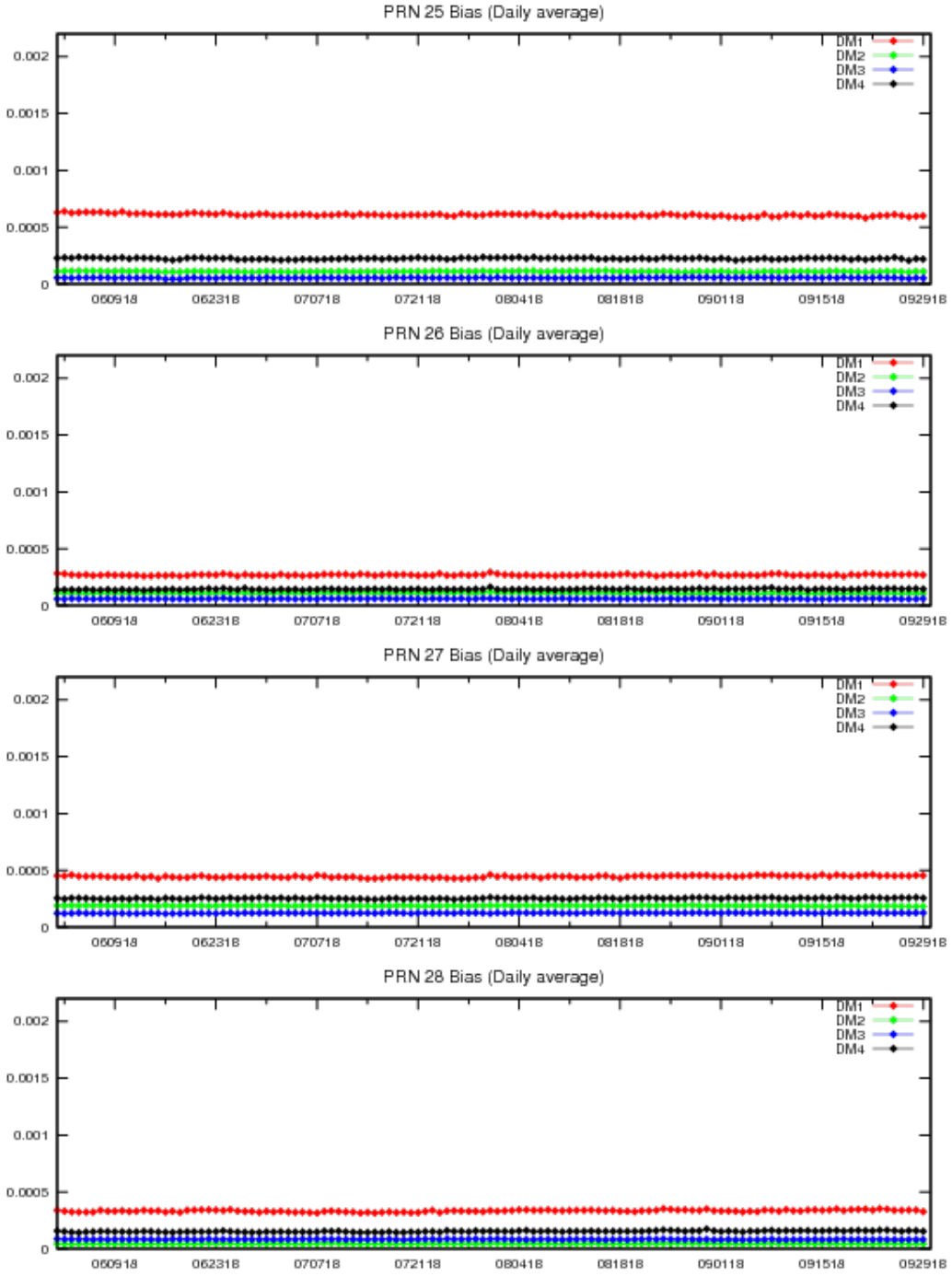
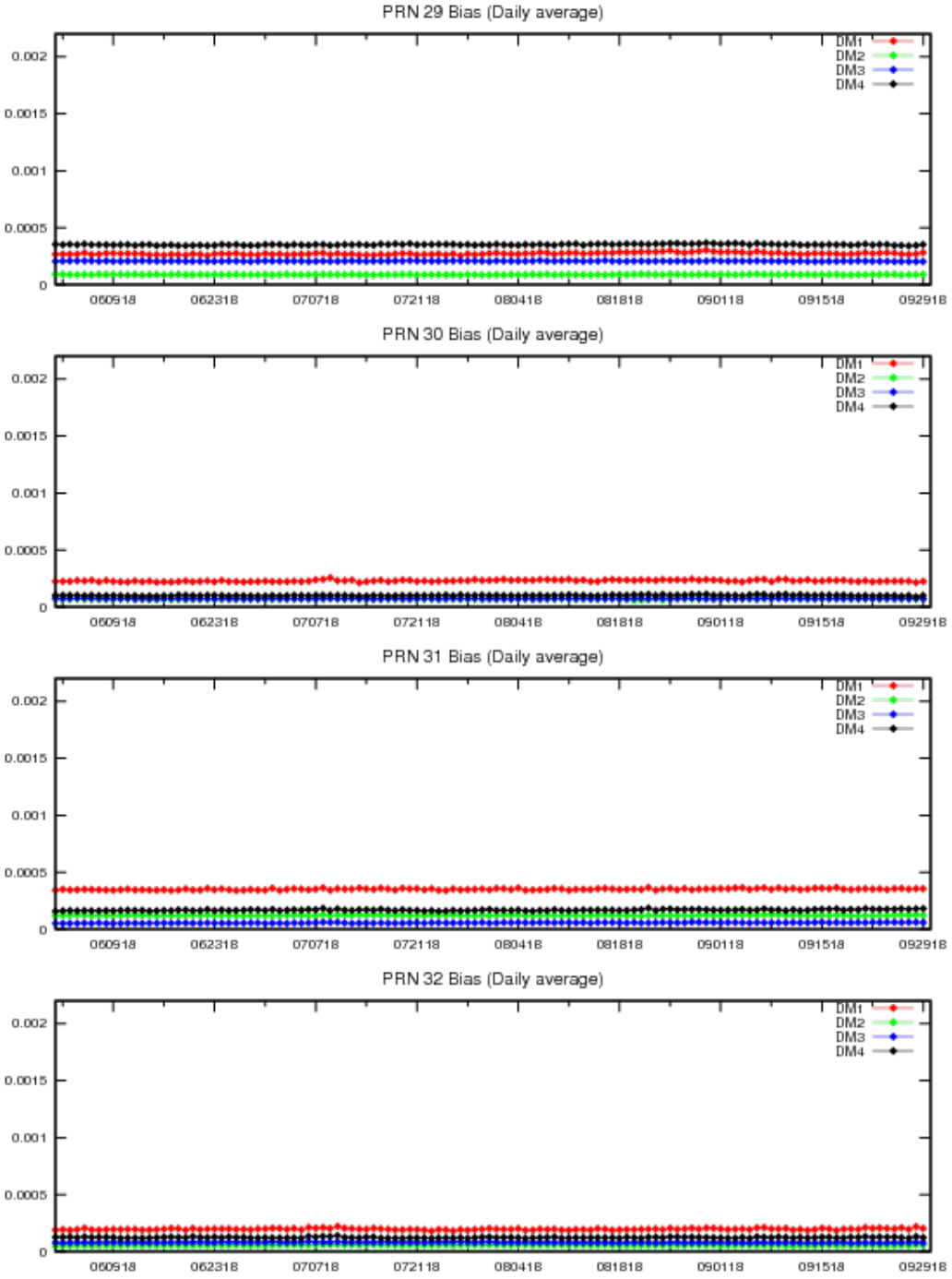


Figure 11-10 PRN Bias Average Trend (PRN29–PRN32)



11.4 SQM Trips

A SQM trip occurs when the estimated deformation exceeds threshold. For this reporting quarter, there were no trips reported.

Appendix A: Glossary and Acronyms

General Terms and Definitions

Alert. An alert is an indication provided by the GPS/WAAS equipment to inform the user when the positioning performance achieved by the equipment does not meet the integrity requirements.

APC. Antenna phase center

ARP. Antenna reference point

Availability. The availability of a navigation system is the ability of the system to provide the required function and performance at the initiation of the intended operation. Availability is an indication of the ability of the system to provide usable service within the specified coverage area.

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

Continuity. The continuity of a system is the ability of the total system (comprising all elements necessary to maintain aircraft position within the defined airspace) to perform its function without interruption during the intended operation. More specifically, continuity is the probability that the specified system performance will be maintained for the duration of a phase of operation, presuming that the system was available at the beginning of that phase of operation.

Coverage. The coverage provided by a radio navigation system is the surface area or space volume in which the signals are adequate to permit the user to determine position to a specified level of accuracy. Coverage is influenced by system geometry, signal power levels, receiver sensitivity, atmospheric noise conditions, and other factors that affect signal availability.

CRE. GEO PRN138

CRW. GEO PRN135

CSRS. Canadian Spatial Reference System

DM. Detection metrics

DR. Discrepancy Report.

ECEF. Earth-centered, Earth-fixed.

FAA. Federal Aviation Administration

FD. Fault Detection

FDE. Fault Detection and Exclusion. A receiver processing scheme that autonomously provides integrity monitoring for the position solution using redundant range measurements. The FDE consists of two distinct parts: fault detection and fault exclusion. The fault detection part detects the presence of an unacceptably large position error for a given mode of flight. Upon the detection, fault exclusion follows and excludes the source of the unacceptably large position error, thereby allowing navigation to return to normal performance without an interruption in service.

GEO. Geostationary satellite

GMT. Greenwich Mean Time

GPS. Global Positioning System. A space-based positioning, velocity, and time system composed of space, control, and user segments. The space segment, when fully operational, will be composed of 24 satellites in six orbital planes. The control segment consists of five monitor stations, three ground antennas, and a master control station. The user segment consists of antennas and receiver-processors that provide positioning, velocity, and precise timing to the user.

GIVE. Grid Ionospheric Vertical Error. Indicate the accuracy of ionospheric vertical delay correction at a geographically defined IGP. WAAS transmits one GIVE for each IGP in the mask.

GUS. Ground uplink station

HMI. Hazardous Misleading Information. Any position data that has an error larger than the current protection level (HPL/VPL), without any indication of the error (e.g., alert message sequence).

HAL. Horizontal alert limit. The radius of a circle in the horizontal plane (the local plane tangent to the WGS-84 ellipsoid), with its center being at the true position, which describes the region that is required to contain the indicated horizontal position with a probability of $1\text{-}10^{-7}$ per flight hour, for a particular navigation mode, assuming the probability of a GPS satellite integrity failure being included in the position solution is less than or equal to 10^{-4} per hour.

HPE. Horizontal position error

HPL. Horizontal protection level. The radius of a circle in the horizontal plane (the plane tangent to the WGS-84 ellipsoid), with its center being at the true position, which describes the region that is assured to contain the indicated horizontal position. It is based on the error estimates provided by WAAS.

IAP. Instrument Approach Procedures

IGS. International GPS Service.

IGP. Ionsopheric grid point. A geographically defined point for which the WAAS provides the vertical ionospheric delay.

Kp. Planetary index

LNAV. Lateral navigation

LP. Localizer Performance. A WAAS operational service level with a HAL equal to 40 meters.

LPV. Localizer Performance with Vertical Guidance. A WAAS operational service level with a HAL equal to 40 meters and a VAL equal to 50 meters.

LPV200. Localizer Performance with Vertical Guidance to 200 ft decision height. A WAAS operational service level with a HAL equal to 40 meters and a VAL equal to 35 meters.

NANU. Notice Advisory to Navstar Users. NANU is an advisory message to inform users of a change in the GPS constellation. These messages inform users in advance of planned maintenance and also notify users of unscheduled outages.

NAS. National Airspace System

Navigation Message. Message structure designed to carry navigation data.

NGS. National Geodetic Survey

NPA Navigation Mode. Non-precision approach navigation mode. Refers to the navigation solution operating with a minimum of four satellites with fast and long term WAAS corrections (no WAAS ionospheric corrections) available.

NTSB. National Satellite Test Bed

OCONUS. Outside Contiguous United States

OPUS. Online Positioning Use Server

PAN. Performance Analysis Network

Position Solution. The use of ranging signal measurements and navigation data from at least four satellites to solve for three position coordinates and a time offset.

PPP. Precise Point Positioning.

PA Navigation Mode. Precision approach navigation mode. Refers to the navigation solution operating with a minimum of four satellites with all WAAS corrections (fast, long term, and ionospheric) available.

PRN. Pseudo-random noise

RAIM. Receiver autonomous integrity monitoring

RFI. Radio frequency interference

RNAV. Area navigation

RNP. Required Navigation Performance

RSS. Residual sum of squares.

SBAS. Space Based Augmentation System

SIS. Signal in space

SM9. GEO PRN131

SQM. Signal quality monitor. Monitors correlator measurements to detect signal deformations that originate in the GPS or GEO satellites and ensures that the UDREs are sufficiently inflated to protect given the monitor's current observations.

SSM. System support modification

SPS. Standard positioning service. Three-dimensional position and time determination capability provided to a user equipped with a minimum capability GPS SPS receiver in accordance with GPS national policy and the performance specifications.

SV. Space vehicle.

SVN. Space Vehicle Number.

TOW. Time of GPS week

UDRE. User differential range error. Indicates the accuracy of combined fast and slow error corrections. WAAS transmits one UDRE for each satellite in the mask.

VAL. Vertical alert limit. Half the length of a segment on the vertical axis (perpendicular to the horizontal plane of WGS-84 ellipsoid), with its center being at the true position, which describes the region that is required to contain the indicated vertical position with a probability of $1\text{-}10^{-7}$ per flight hour, for a particular navigation mode, assuming the probability of a GPS satellite integrity failure being included in the position solution is less than or equal to 10^{-4} per hour.

VPE. Vertical position error

VPL. Vertical protection level. Half the length of a segment on the vertical axis (perpendicular to the horizontal plane of WGS-84 ellipsoid), with its center being at the true position, which describes the region that is assured to contain the indicated vertical position. It is based upon the error estimates provided by WAAS.

VNAV. Vertical navigation

WAAS. Wide Area Augmentation System. Made up of an integrity reference monitoring network, processing facilities, geostationary satellites, and control facilities. Wide-area reference stations and integrity monitors are widely dispersed data collection sites that contain GPS/WAAS ranging receivers that monitor all signals from the GPS and the WAAS geostationary satellites. The reference stations collect measurements from the GPS and WAAS satellites so that differential corrections, ionospheric delay information, GPS/WAAS accuracy, WAAS network time, GPS time, and UTC can be determined. The wide-area reference station and integrity monitor data are forwarded to the central data processing sites. These sites process the data to determine differential corrections, ionospheric delay information, and GPS/WAAS accuracy, as well as verify residual error bounds for each monitored satellite. The central data processing sites also generate navigation messages for the geostationary satellites and WAAS messages. This information is modulated on the GPS-like signal and broadcast to the users from geostationary satellites.

WIPP. WAAS Integrity Performance Panel

WJHTC. William J. Hughes Technical Center

WRE. Wide-Area Reference Equipment

WRS. WAAS reference station

Appendix B: Additional Coverage Plots

Appendix B includes the coverage plots with 99% LPV200 availability contour, 98% LPV availability contours, and 98% LP availability contours for the quarter. Figure B-1 shows CONUS coverage with 98% LP availability contour. Figure B-2 shows Alaska coverage with 98% LP availability contour. Figure B-3 shows CONUS coverage with 98% LPV availability contour. Figure B-4 shows Alaska coverage with 98% LPV availability contour. Figure B-5 shows CONUS coverage with 99% LPV200 availability contour. Figure B-6 shows Alaska coverage with 99% LPV200 availability contour.

Figure B-1 98% CONUS LP Availability Contour

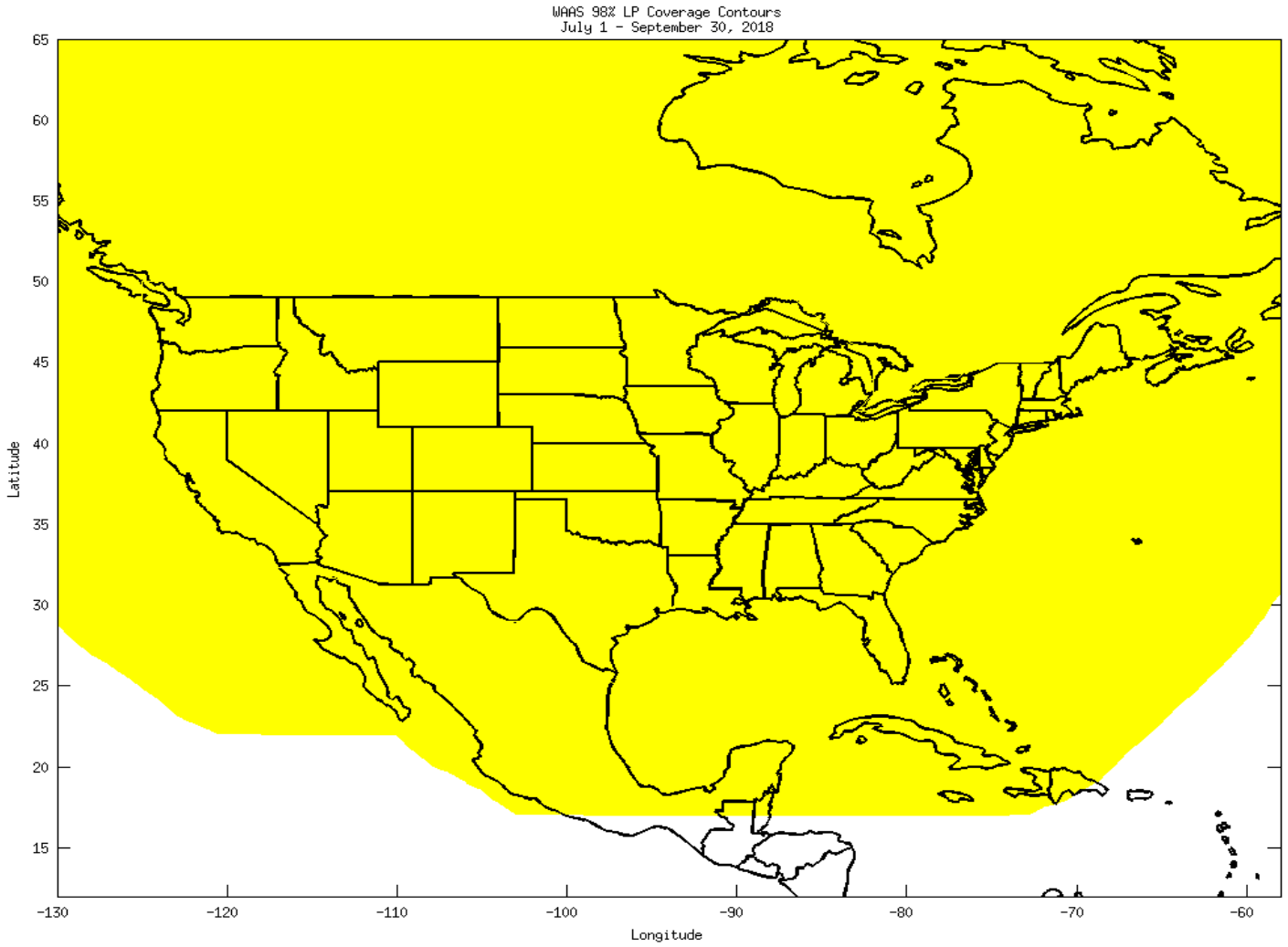


Figure B-2 98% Alaska LP Availability Contour

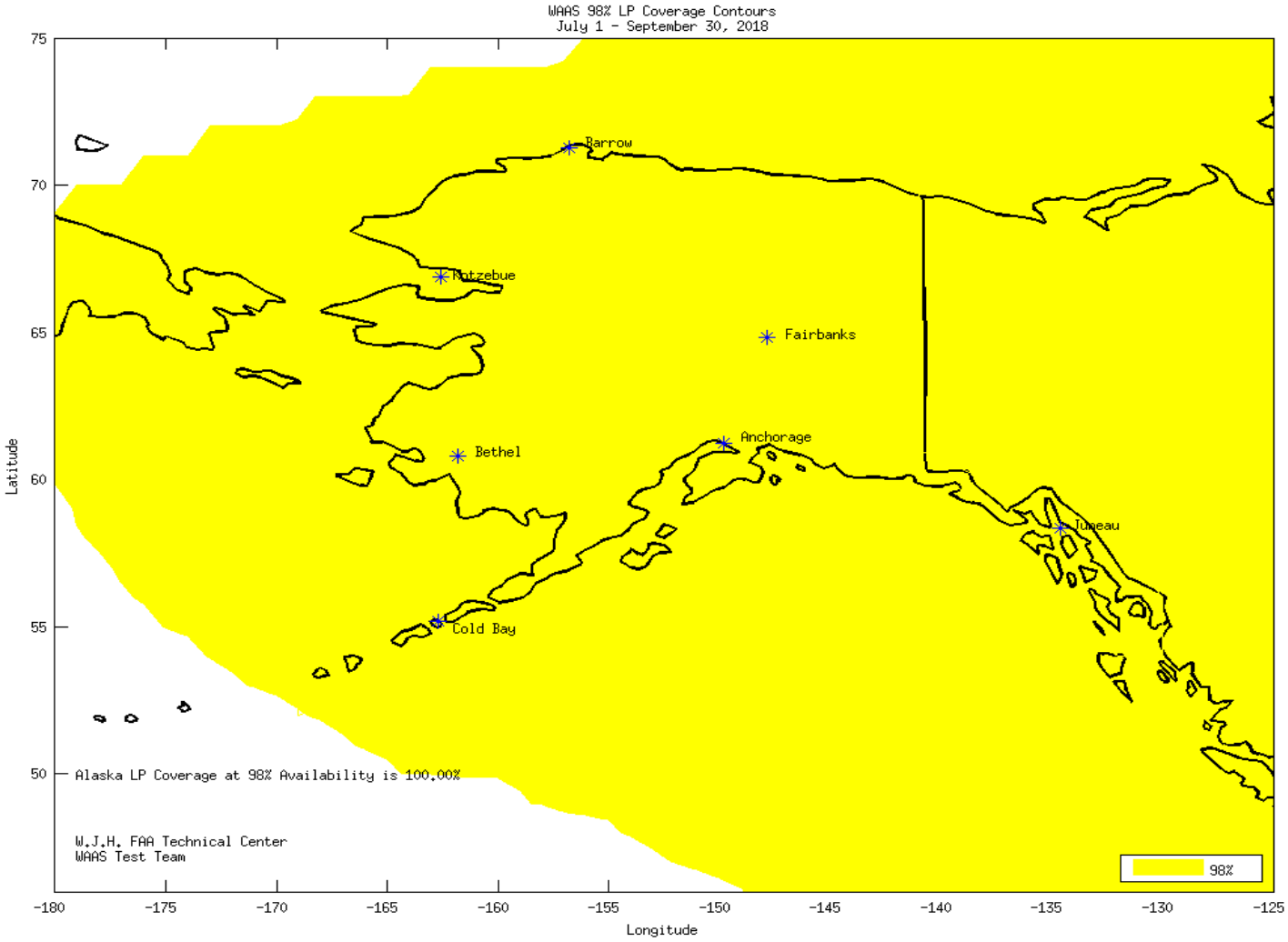


Figure B-3 98% CONUS LPV Availability Contour

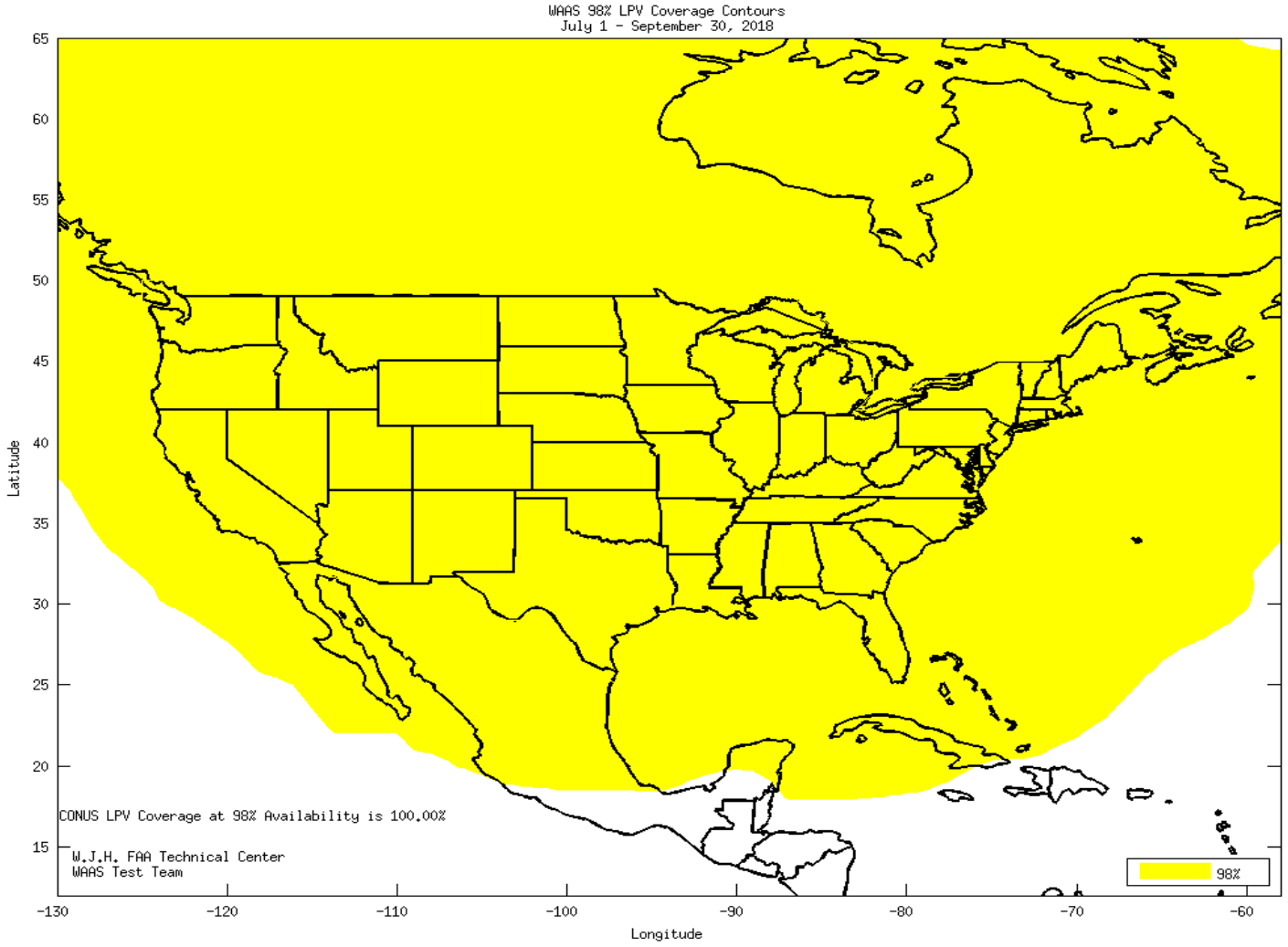


Figure B-4 98% Alaska LPV Availability Contour

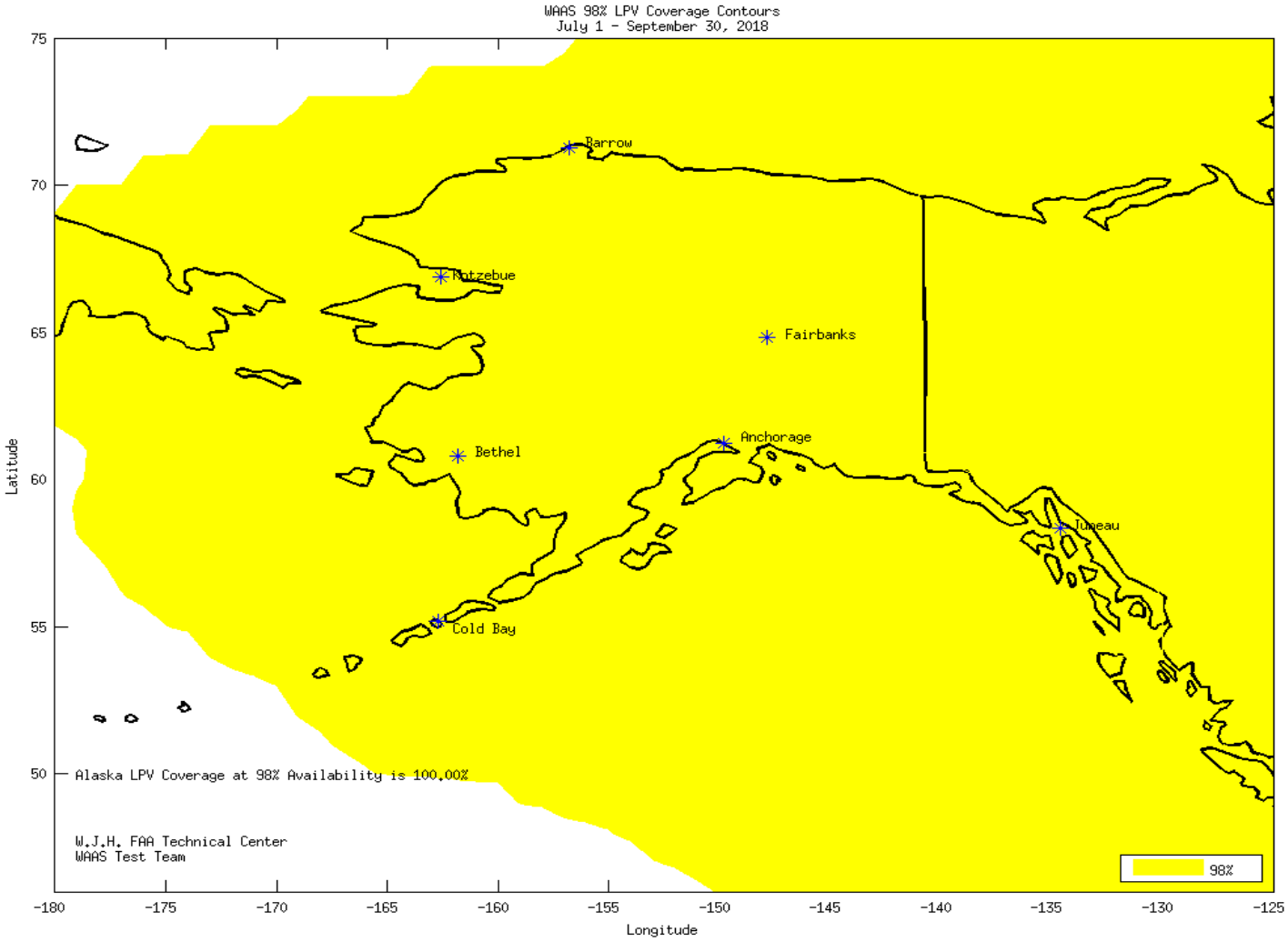


Figure B-5 98% CONUS LPV200 Availability Contour

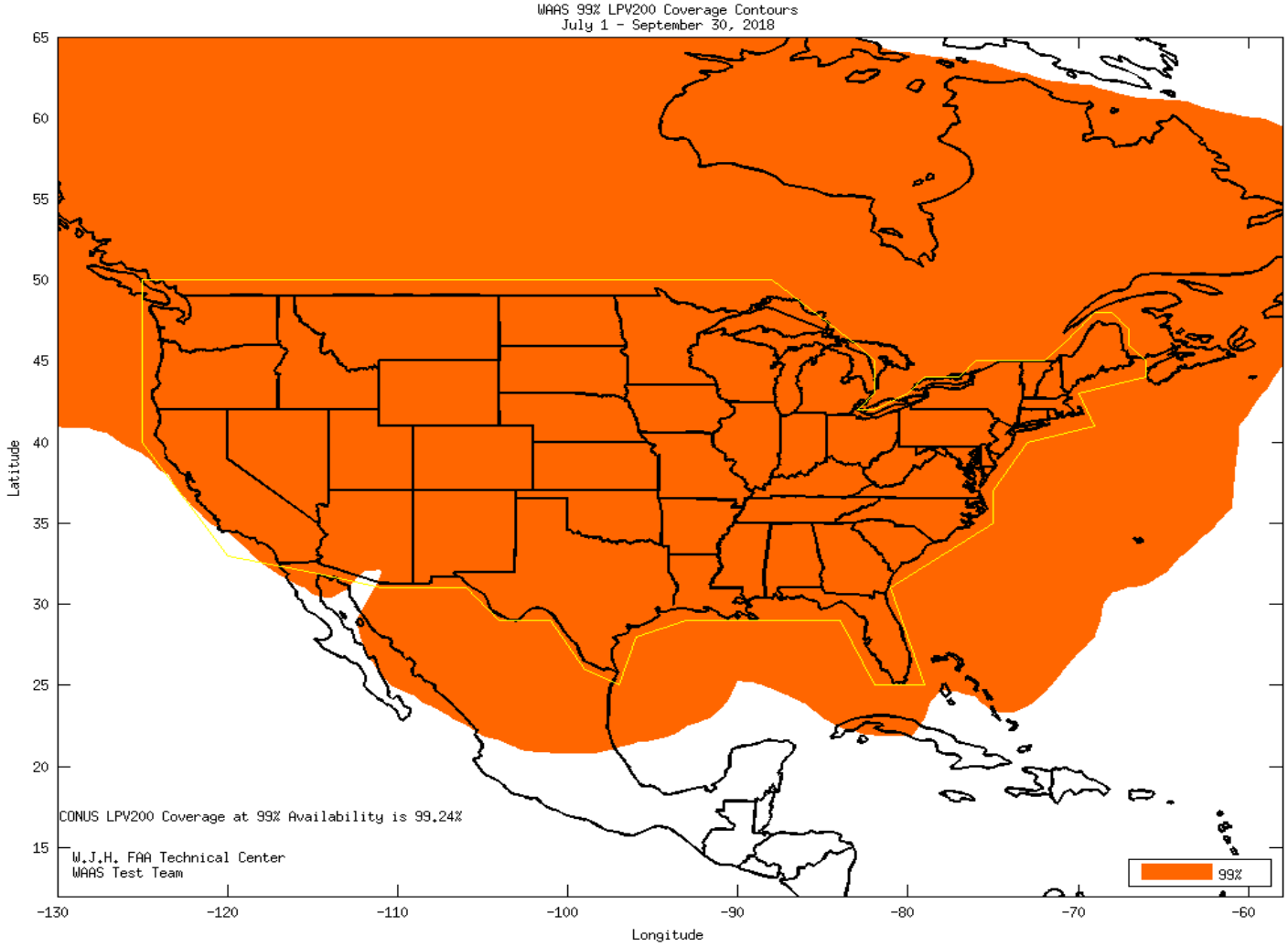


Figure B-6 98% Alaska LPV200 Availability Contour