This report was revised on November 6, 2017 to correct data in Tables 5-4 through 5-18.
This report was revised on December 14, 2017 to correct figure captions 4-5 and 4-6.

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #62

Reporting Period: July 01 to September 30, 2017

October 2017

FAA William J. Hughes Technical Center
NSTB/WAAS T&E Team
Atlantic City International Airport, NJ 08405
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 #62 provides WAAS performance data from the July 1 through September 30, 2017 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/Maximu	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.445 meters	Oklahoma City 0.519 meters	Anchorage 0.738 meters	Barrow 0.587 meters
95% Vertical Accuracy (VPL <= 50 meters)	Atlantic City 1.558 meters	Salt Lake City 0.809 meters	Barrow 1.315 meters	Cold Bay 0.94 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Miami 99.89%	All Sites 100%	All Sites 100%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites 100%	Miami 99.89%	Multiple Sites 100%	Barrow 99.97%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Oakland 99.49 %	Anchorage 100%	Barrow 97.87%
99% HPL	Cleveland 17.118 meters	Oklahoma City 10.895 meters	Cold Bay 21.612 meters	Juneau 13.396 meters
99% VPL	Oakland 32.441 meters	Oklahoma City 18.246 meters	Barrow 35.968 meters	Anchorage 23.846 meters

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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) 135 (CRW), PRN 138 (CRE), and PRN 133 (AMR). CRE and CRW GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service. As of January 18, 2015, the AMR GEO indefinitely discontinued non-precision approach (NPA) ranging 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
NTSB:		
Arcata	88	7585342
Atlantic City	91	7890271
Oklahoma City	83	7178481
WAAS:		
Albuquerque	92	7933867
Anchorage	92	7931289
Atlanta	92	7937364
Barrow	92	7925999
Bethel	92	7930058
Billings	92	7937092
Boston	92	7934181
Chicago	92	7936505
Cleveland	91	7892149
Cold Bay	92	7930985
Dallas	92	7936208
Denver	92	7923603
Fairbanks	92	7928997
Gander	92	7935934
Goose Bay	92	7923783
Houston	92	7931342
Iqaluit	92	7931734
Jacksonville	92	7937254
Juneau	92	7926532
Kansas City	92	7935635
Kotzebue	85	7312209
Los Angeles	91	7881995
Memphis	92	7937161
Merida	89	7712482
Mexico City	92	7930082
Miami	92	7935173
Minneapolis	92	7937129
New York	92	7935934
Oakland	92	7933994
Puerto Vallarta	92	7935847
Salt Lake City	18	1554179
San Jose Del Cabo	91	7832179
Seattle	89	7698724
Washington DC	91	7853164
Winnipeg	92	7937087

Table 1-3 NPA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7939336
Anchorage	92	7937816
Atlanta	92	7939198
Barrow	92	7937296
Bethel	92	7938798
Billings	92	7938930
Boston	92	7937755
Cleveland	92	7939151
Cold Bay	92	7940659
Fairbanks	92	7939485
Gander	92	7937453
Honolulu	92	7940679
Houston	92	7938934
Iqaluit	92	7938545
Juneau	92	7940301
Kansas City	92	7939298
Kotzebue	85	7306466
Los Angeles	91	7889027
Merida	91	7840013
Miami	92	7940669
Minneapolis	92	7940672
Oakland	92	7939236
Salt Lake City	19	1606462
San Jose Del Cabo	91	7893434
San Juan	82	7090007
Seattle	90	7757172
Tapachula	92	7929653
Washington DC	92	7939081

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/Satellites	Service Affected	Event Description
7/6/2017	7/7/2017	PRN2	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service coverage in CONUS, Alaska, and Canada was due to a GPS NANU on PRN2 (see NANU2017066) which was unusable from 18:41 GMT on 7/6 to 00:09 GMT 7/7. The NANU caused significant degradation of service coverage in Canada from 22:20 GMT to 23:17 GMT on 7/6. The NANU also caused moderate degradation of LPV200 service coverage in CONUS from 19:58 GMT to 20:08 GMT, from 20:51 GMT to 20:56 GMT, and from 23:05 GMT to 23:35 GMT on 7/6. The NANU also caused minor degradation of (1) LPV200 service coverage in CONUS from 00:03 GMT to 00:26 GMT on 7/7; and (2) LPV200 service coverage in Alaska from 21:58 GMT to 22:47 GMT on 7/6. Please see plot(s): LPV200_7/6/2017 Cov_vs_Time_Alaska_7/6/2017 Cov_vs_Time_Canada_7/6/2017 Cov_vs_Time_Conus_7/6/2017 LPV200_7/7/2017
7/11/2017	7/11/2017	GEO138, Brewster (BRE-B)	LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 10:50:23 GMT on 7/11. This caused an 18-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of LPV200 service coverage in Canada from 12:43 GMT to 12:54 GMT and from 15:49 GMT to 15:53 GMT. TOW 211840-211859
7/13/2017	7/14/2017	PRN5	LPV200_CONUS, LPV200_Canada	The reduction in LPV200 service coverage in CONUS and Canada was due to a GPS NANU on PRN5 (see NANU2017069) which was unusable from 21:36 GMT on 7/13 to 00:20 GMT on 7/14. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 22:48 GMT to 23:45 GMT on 7/13. The NANU also caused minor degradation of LPV200 service coverage in Canada from 00:10 GMT to 00:30 GMT on 7/14. Please see plot(s): LPV200_7/13/2017
7/16/2017	7/16/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of: (1) LPV200 service coverage in CONUS from 19:17 GMT to 19:26 GMT; (2) LPV200 service coverage in Alaska from 16:45 GMT to 17:03 GMT; (3) LPV200 service coverage in Canada from 20:30 GMT to 21:07 GMT.

Start Date	End Date	Location/Satellites	Service Affected	Event Description
7/17/2017	7/17/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of: (1) LPV200 service coverage in CONUS from 19:17 GMT to 19:23 GMT; (2) LPV200 service coverage in Alaska from 16:36 GMT to 16:59 GMT; and (3) LPV200 service coverage in Canada from 09:43 GMT to 09:56 GMT and from 12:36 GMT to 12:41 GMT.
7/28/2017	7/28/2017	GEO135	LPV200_Alaska	The uplink for the CRW GEO, PRN135 switched from the Littleton Uplink site to the NAPA uplink site at 15:42:48 GMT on 7/28. This caused a 16-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 minor degradation of LPV200 service coverage in Alaska from 15:43 GMT to 15:55 GMT. Please see plot(s): LPV200_7/28/2017 Cov_vs_Time_Alaska_7/28/2017
7/31/2017	8/2/2017	Seattle (ZSE1), Seattle (ZSE2), Seattle (ZSE3)	LPV200_CONUS	ZSE was taken offline for equipment relocation from 07:27 on 7/31 to 22:17 GMT on 8/2. The WRS outage caused moderate degradation of LPV200 service coverage in CONUS from 18:17 GMT to 18:32 GMT on 8/1 and from 18:13 GMT to 18:26 GMT. Please see plot(s): LPV200_8/1/2017 LPV200_8/2/2017
8/3/2017	8/3/2017	GEO138,Woodbine (QWE)	LPV200_Alaska, LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Woodbine uplink site to the Brewster-B uplink site at 21:42:10 GMT on 8/3. This caused a 17-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of (1) LPV200 service coverage in Alaska from 22:44 GMT to 22:53 GMT on 8/3; and (2) LPV200 service coverage in Canada from 00:46 GMT to 00:56 GMT. TOW 423747-423765

Start Date	End Date	Location/Satellites	Service Affected	Event Description
8/3/2017	8/3/2017	PRN25	LPV_CONUS, LPV200_CONUS, LPV200_Alaska, LPV200_Canada, RNP1_CONUS	The reduction in LPV200 service coverage in CONUS, Alaska, and Canada and LPV service coverage in CONUS was due to a GPS NANU on PRN25 (see NANU2017075) which was unusable from 16:14 GMT to 21:28 GMT. The NANU caused significant degradation of LPV200 service coverage in CONUS from 18:19 GMT to 18:36 GMT, from 19:49 GMT to 20:03 GMT, and 20:51 GMT to 21:32 GMT. The NANU also caused moderate degradation of LPV200 service coverage in Alaska from 19:34 GMT to 20:21 GMT. The NANU also caused minor degradation of (1) LPV service coverage in CONUS from 21:03 GMT to 21:16 GMT; (2) LPV200 service coverage in Canada from 19:17 GMT to 19:54 GMT. The NANU also caused a 900-second RNP0.1 outage at LatLng(20, -150) from 18:10 GMT to 18:25 GMT. Please see plot(s): LPV_8/3/2017 LPV200_8/3/2017 RNP1_8/3/2017 Cov_vs_Time_Alaska_8/3/2017 Cov_vs_Time_Conus_8/3/2017
8/10/2017	8/10/2017	PRN15	LPV200_Alaska	The reduction in LPV200 service coverage in Alaska was due to a GPS NANU on PRN15 (see NANU2017079) which was unusable from 14:39:00 GMT to 17:52:00 GMT. The NANU along with a UDREi spike on PRN24 caused minor degradation of LPV200 service coverage in Alaska from 15:06 GMT to 15:22 GMT. Please see plot(s): LPV200_8/10/2017 Cov_vs_Time_Alaska_8/10/2017
8/21/2017	8/24/2017	Los Angeles (ZLA1), Los Angeles (ZLA2), Los Angeles (ZLA3)	None	A NOTAM was published for GPS testing. The period of testing was 8/7 - 8/21 and 8/24 - 8/27 from 0800Z-1300Z. On 8/21 localized RFI caused degraded tracking at the ZLA reference station. This caused: (1) A 175-second LPV service outage from 08:30:40 GMT to 08:33:34 GMT; and (2) A 1100-second LPV200 outage from 08:15:15 GMT to 08:33:34 GMT. On 8/24, localized RFI caused degraded tracking at the ZLA reference station. This caused: (1) A 61-second LPV outage from 08:06:05 GMT to 08:07:05 GMT; (2) A 61-second LPV200 outage from 08:06:05 GMT to 08:07:05 GMT; and (3) A 279-second LPV200 outage from 08:41:17 GMT to 08:45:55 GMT. (see DR 140)

Start Date	End Date	Location/Satellites	Service Affected	Event Description
8/22/2017	8/22/2017	PRN29	LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service coverage in Alaska and Canada was due to a GPS NANU on PRN29 (see NANU2017091) which was unusable from 20:08 GMT to 22:21:00 GMT. The NANU caused moderate degradation of: (1) LPV200 service coverage in Alaska from 20:10 GMT to 20:47 GMT; and (2) LPV200 service coverage in Canada from 20:11 GMT to 20:47 GMT. Please see plot(s): LPV200_8/22/2017 Cov_vs_Time_Alaska_8/22/2017 Cov_vs_Time_Canada_8/22/2017
8/23/2017	8/23/2017	GEO138,Brewster-B (BRE-B)	LPV200_Alaska	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 15:09:31 GMT. This caused an 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of LPV200 service coverage in Alaska from 21:24 GMT to 21:30 GMT. TOW 313788-313793. Please see plot(s): LPV200_8/23/2017
8/24/2017	8/24/2017	GEO135,Napa (APC)	LPV200_Alaska, LPV200_Canada	The uplink for the CRW GEO, PRN135 switched from the Napa uplink site to the Littleton uplink site at 07:27:09 GMT. This caused a 4-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 minor degradation of: (1) LPV200 service coverage in Alaska from 13:59 GMT to 14:16 GMT; and (2) LPV200 service coverage in Canada from 08:35 GMT to 08:55 GMT. TOW 372446-372451
8/25/2017	8/25/2017	PRN9	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service coverage in CONUS, Alaska, and Canada was due to a GPS NANU on PRN9 (see NANU2017093) which was unusable from 08:47:00 GMT to 13:58:00 GMT. The NANU caused minor degradation of: (1) LPV200 service coverage in CONUS from 10:23 GMT to 10:36 GMT; (2) LPV200 service coverage in Alaska from 08:48 GMT to 09:09 GMT; and (3) LPV200 service coverage in Canada from 08:48 GMT to 08:57 GMT. Please see plot(s): LPV200_8/25/2017 Cov_vs_Time_Alaska_8/25/2017
8/25/2017	8/25/2017	GEO138,Woodbine (QWE)	LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Woodbine uplink site to the Brewster-B uplink site at 04:00:06 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of LPV200 service coverage in Canada from 05:06 GMT to 05:18 GMT. TOW 446423-446428 Please see plot(s): LPV200_8/25/2017

Start Date	End Date	Location/Satellites	Service Affected	Event Description
8/29/2017	8/29/2017	PRN21	LPV200_CONUS	The reduction in LPV200 service coverage in CONUS was due to a GPS NANU on PRN21 (see NANU2017094) which was unusable from 17:38 GMT to 20:07:00 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 19:21 GMT to 19:58 GMT. Please see plot(s): LPV200_8/29/2017 Cov_vs_Time_Conus_8/29/2017
8/31/2017	9/1/2017	PRN5	LPV200_Canada	The reduction in LPV200 service coverage in Canada was due to a GPS NANU on PRN5 (see NANU2017096) which was unusable from 19:56 GMT on 8/31 to 01:13 GMT on 9/1. The NANU caused minor degradation of LPV200 service coverage in Canada from 20:50 GMT to 20:56 GMT and from 22:48 GMT to 23:00 GMT on 8/31. Please see plot(s): LPV200_8/31/2017
8/31/2017	8/31/2017	PRN6	LPV200_CONUS	The reason for the CONUS LPV200 service outage is a GPS UDRE internal threshold trip on PRN 6 (IIF) from YFB WRS. This occurs on high elevation IIF satellites due to loss of L2 track (iono activity) and fast CNMP algorithm (see DR 137). The UDREi bump on PRN 6 caused minor degradation of LPV200 service coverage in CONUS from 19:27 GMT to 19:35 GMT. Please see plot(s): LPV200_8/31/2017
8/31/2017	8/31/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 08:43 GMT to 08:57 GMT and from 13:28 GMT to 13:46 GMT; and (2) LPV200 service coverage in Canada from 19:31 GMT to 20:05 GMT. Please see plot(s): LPV200_8/31/2017 Cov_vs_Time_Alaska_8/31/2017 Cov_vs_Time_Canada_8/31/2017
9/2/2017	9/2/2017	GEO135,Littleton (APA)	LPV200_Alaska, LPV200_Canada	The uplink for the CRW GEO, PRN135 switched from the Littleton uplink site to the Napa uplink site at 07:27:09 GMT. This caused a 15-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 minor degradation of: (1) LPV200 service coverage in Alaska from 08:29 GMT to 08:49 GMT; and (2) LPV200 service coverage in Canada from 08:58 GMT to 09:22 GMT. TOW 548031-548047 Please see plot(s): LPV200_9/2/2017

Start Date	End Date	Location/Satellites	Service Affected	Event Description
9/4/2017	9/8/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	On 9/4 the sun emitted a mid-level solar flare (M5.5) at 20:33 UTC. This caused L2 and L5 signals on thread A for all receivers to experience an AGC increase and a decrease in C/No (0.5dB-6dB Severity 1). On 9/6 the sun emitted a significant coronal mass ejection (CME X2.2) at 09:10 UTC and a larger CME (X9.3) at 12:02 UTC. This caused L1, L2, and L5 signals on all WREs to experience an increase in AGC and a decrease in C/No (0.5dB-6dB Severity 1 and 6dB-12dB Severity 2). on 9/7 the sun emitted a significant coronal mass ejection (CME M7.3) at 10:15 UTC and a larger CME (X1.3) at 14:36 UTC. This caused L1, L2, and L5 signals on all WREs to experience an increase in AGC and a decrease in C/No (0.5dB-6dB Severity 1). Several IGPs in CONUS experienced elevated GIVE values towards the end of 9/7 which resulted in a significant geomagnetic event on 9/8. (see Event 13898)
9/8/2017	9/8/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 8) disturbed the ionosphere causing elevated GIVE values. The geomagnetic activity was caused by a coronal mass ejection. (see event 13854) This resulted in significant degradation of: (1) LPV service coverage in CONUS from 00:21 GMT to 02:50 GMT; and (2) LPV200 service coverage in CONUS from 00:17 GMT to 02:50 GMT and from 15:55 GMT to 16:07 GMT. The elevated GIVE values also caused moderate degradation of: (1) LPV200 service coverage in Alaska from 12:46 GMT to 13:19 GMT and from 15:36 GMT to 15:47 GMT; and (2) LPV200 service coverage in Canada from 17:06 GMT to 17:23 GMT. Please see plot(s): LPV_9/8/2017 LPV200_9/8/2017 Cov_vs_Time_Alaska_9/8/2017 Cov_vs_Time_Conus_9/8/2017
9/11/2017	9/11/2017	GEO138,Brewster-B (BRE-B)	LPV200_Alaska, LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 07:46:01 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused moderate degradation of LPV200 service coverage in Canada from 08:22 GMT to 08:59 GMT. The elevated UDRE for GEO 138 also caused minor degradation of LPV200 service coverage in Alaska from 12:52:30 GMT to 13:10:00 GMT. TOW 114378-114383. Please see plot(s): LPV200_9/11/2017

Start Date	End Date	Location/Satellites	Service Affected	Event Description
9/11/2017	9/11/2017	PRN138	LPV200_Canada	Missed maneuvers caused PRN 138 to alert to not monitored from 05:55 GMT to 06:32 GMT and from 06:55 GMT to 07:39 GMT. The elevated UDREs caused minor degradation of LPV200 service coverage in Canada from 07:30 GMT to 07:40 GMT. TOW 107734-109994 (10-15) and TOW 111362 - 114011 (10 - 15). Please see plot(s): LPV200_9/11/2017
9/12/2017	9/15/2017	PRN7	LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service coverage in Alaska and Canada was due to a GPS NANU on PRN7 (see NANU2017104) which was unusable from 13:42:00 GMT on 9/12 to 20:09:00 GMT on 9/15. The NANU caused moderate degradation of (1) LPV200 service coverage in Alaska from 07:50 GMT to 09:05 GMT on 9/13, and from 07:48 GMT to 07:58 GMT on 9/14, and from 07:34 GMT to 08:57 GMT on 9/15; and (2) LPV200 service coverage in Canada from 08:23:00 GMT to 09:20 GMT on 9/13, from 08:38 GMT to 09:02 on 9/14 and from 08:08 GMT to 09:10 GMT on 9/15. Please see plot(s): LPV200_9/13/2017 Cov_vs_Time_Alaska_9/13/2017 Cov_vs_Time_Canada_9/13/2017 LPV200_9/14/2017 Cov_vs_Time_Alaska_9/14/2017 Cov_vs_Time_Canada_9/14/2017 LPV200_9/15/2017 Cov_vs_Time_Alaska_9/15/2017 Cov_vs_Time_Canada_9/15/2017
9/12/2017	9/12/2017	PRN7	LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service coverage in Alaska and Canada was due to a GPS NANU on PRN7 (see NANU2017100) which was unusable from 06:25:00 GMT to 10:07:00 GMT. The NANU caused moderate degradation of (1) LPV200 service coverage in Alaska from 07:56 GMT to 09:06 GMT; and (2) LPV200 service coverage in Canada from 08:27:00 GMT to 09:22 GMT. Please see plot(s): LPV200_9/12/2017 Cov_vs_Time_Alaska_9/12/2017 Cov_vs_Time_Canada_9/12/2017
9/13/2017	9/13/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 5) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values (along with NANU2017104 on PRN7) resulted in minor degradation of (1) LPV200 service coverage in Alaska from 20:16 GMT to 20:25 GMT; and (2) LPV200 service coverage in Canada from 08:43 GMT to 08:50 GMT. Please see plot(s): LPV200_9/13/2017 Cov_vs_Time_Alaska_9/13/2017

Start Date	End Date	Location/Satellites	Service Affected	Event Description
9/14/2017	9/22/2017	Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	LPV200_Alaska	The OTZ reference station was brought offline from 18:54:31 GMT on 9/14to repair the HVAC system. Repairs were completed and OTZ came back online at 01:04:10 GMT on 9/22. The WRS outage caused minor degradation of the LPV200 service coverage in Alaska from approximately 12:30 GMT to 13:00 GMT and from 19:00 GMT to 20:30 GMT during this outage. Please see plot(s): LPV200_9/16/2017 Cov_vs_Time_Alaska_9/16/2017
9/15/2017	9/15/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values (along with OTZ HVAC repairs) resulted in minor degradation of (1) LPV200 service coverage in Alaska from 07:33 GMT to 08:12 GMT and from 09:50 GMT to 09:52 GMT; and (2) LPV200 service coverage in Canada from 03:41 GMT to 03:46 GMT, from 08:29 GMT to 08:55 GMT, and from 23:19 GMT to 23:28 GMT. Please see plot(s): LPV200_9/15/2017 Cov_vs_Time_Alaska_9/15/2017 Cov_vs_Time_Canada_9/15/2017
9/17/2017	9/17/2017	PRN25	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service coverage in CONUS, Alaska, and Canada was due to a GPS NANU on PRN25 (see NANU2017106) which was unusable from 15:00:00 GMT to 18:13:00 GMT. The NANU caused significant degradation of LPV200 service coverage in CONUS from 16:33 GMT to 17:02 GMT and from 17:50 GMT to 18:20 GMT. The NANU also caused moderate degradation of LPV200 service coverage in Alaska from 16:14 GMT to 17:27 GMT. The NANU also caused minor degradation of LPV200 service coverage in Canada from 16:19 GMT to 16:46 GMT. Please see plot(s): LPV200_9/17/2017 Cov_vs_Time_Alaska_9/17/2017 Cov_vs_Time_Conus_9/17/2017
9/19/2017	9/19/2017	Mexico City (MMX1), Mexico City (MMX2), Mexico City (MMX3)	None	A magnitude 7.1 earthquake struck Mexico City on September 19, 2017. Following this earthquake: (1) MMX1 faulted once on 9/22; (2) MMX2 faulted ten times between 9/23 and 9/26; (3) MMX3 faulted six times between 9/23 and 9/26.
9/21/2017	10/4/2017	San Juan (ZSU1), San Juan (ZSU2), San Juan (ZSU3)	LPV200_CONUS	The ZSU WRS experienced an outage due to damage from Hurricane Maria. The outage lasted from 03:55:16 GMT on 9/21 to 20:24:45 GMT on 10/4. This caused minor degradation of LPV200 service coverage in the southern tip of the Florida panhandle. Please see plot(s): LPV200_9/22/2017

Start Date	End Date	Location/Satellites	Service Affected	Event Description
9/27/2017	9/27/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values resulted in minor degradation of (1) LPV200 service coverage in Alaska from 11:43 GMT to 12:04 GMT; and (2) LPV200 service coverage in Canada from 21:00 GMT to 21:09 GMT. Please see plot(s): LPV200_9/27/2017
9/28/2017	9/28/2017	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (Kp = 7) disturbed the ionosphere causing elevated GIVE values. The elevated GIVE values resulted in minor degradation of (1) LPV200 service coverage in CONUS from 17:22 GMT to 17:28 GMT and from 22:52 GMT to 22:58 GMT; and (2) LPV200 service coverage in Canada from 06:06 GMT to 06:12 GMT and from 07:44 GMT to 07:48 GMT. Please see plot(s): LPV200_9/28/2017 Cov_vs_Time_Canada_9/28/2017 Cov_vs_Time_Conus_9/28/2017

Table 1-6 WAAS Upgrades

START DATE	END DATE	LOCATION	EVENT DESCRIPTION
08/17/2017	08/18/2017	Atlanta (CnV)	SSM-48: This system support modification (SSM) upgrades the software at the ZTL CnV. This upgrade supports the cutover to WAAS CY 17.
08/19/2017	08/22/2017	Washington D.C. (CnV)	SSM-48: This system support modification (SSM) upgrades the software at the ZDC CnV. This upgrade supports the cutover to WAAS CY 17.
08/22/2017	08/22/2017	Los Angeles (CnV)	SSM-48: This system support modification (SSM) upgrades the software at the ZLA CnV. This upgrade supports the cutover to WAAS CY 17.
08/23/2017	08/23/2017	Paumalu (HDH)	SSM-48: This system support modification (SSM) upgrades the software at the HDH GUS. This upgrade supports the cutover to WAAS CY 17.
08/23/2017	08/23/2017	Littleton (APA)	SSM-48: This system support modification (SSM) upgrades the software at the APC GUS. This upgrade supports the cutover to WAAS CY 17.
08/24/2017	08/24/2017	Brewster (BRE-B)	SSM-48: This system support modification (SSM) upgrades the software at the BRE-B GUS. This upgrade supports the cutover to WAAS CY 17.
08/24/2017	08/24/2017	Brewster (BRE-B)	SSM-48: This system support modification (SSM) upgrades the software at the BRE-B GUS. This upgrade supports the cutover to WAAS CY 17.

START DATE	END DATE	LOCATION	EVENT DESCRIPTION
08/24/2017	08/24/2017	Santa Paula (SZP)	SSM-48: This system support modification (SSM) upgrades the software at the SZP GUS. This upgrade supports the cutover to WAAS CY 17.
08/25/2017	08/25/2017	NAPA (APC)	SSM-48: This system support modification (SSM) upgrades the software at the APC GUS. This upgrade supports the cutover to WAAS CY 17.
08/25/2017	08/25/2017	Woodbine (QWE)	SSM-48: This system support modification (SSM) upgrades the software at the QWE GUS. This upgrade supports the cutover to WAAS CY 17.
08/28/2017	08/29/2017	Tapachula (MTP1), Tapachula (MTP2), Tapachula (MTP3)	SSM-48: This system support modification (SSM) upgrades the software at the MTP WRS. This upgrade supports the cutover to WAAS CY 17.
08/29/2017	08/30/2017	San Jose Del Cabo (MSD1), San Jose Del Cabo (MSD2), San Jose Del Cabo (MSD3)	SSM-48: This system support modification (SSM) upgrades the software at the MSD WRS. This upgrade supports the cutover to WAAS CY 17.
08/30/2017	08/31/2017	Puerto Vallarta (MPR1), Puerto Vallarta (MPR2), Puerto Vallarta (MPR3)	SSM-48: This system support modification (SSM) upgrades the software at the MPR WRS. This upgrade supports the cutover to WAAS CY 17.
08/31/2017	09/01/2017	Mexico City (MMX1), Mexico City (MMX2), Mexico City (MMX3)	SSM-48: This system support modification (SSM) upgrades the software at the MMX WRS. This upgrade supports the cutover to WAAS CY 17.
09/01/2017	09/02/2017	Merida (MMD1), Merida (MMD2), Merida (MMD3)	SSM-48: This system support modification (SSM) upgrades the software at the MMD WRS. This upgrade supports the cutover to WAAS CY 17.
09/05/2017	09/06/2017	Atlanta (ZTL1), Atlanta (ZTL2), Atlanta (ZTL3)	SSM-48: This system support modification (SSM) upgrades the software at the ZTL WRS. This upgrade supports the cutover to WAAS CY 17.
09/05/2017	09/05/2017	Denver (ZDV1), Denver (ZDV2), Denver (ZDV3)	SSM-48: This system support modification (SSM) upgrades the software at the ZDV WRS. This upgrade supports the cutover to WAAS CY 17. ZDV-C came back online 8/17.
09/06/2017	09/07/2017	Los Angeles (ZLA1), Los Angeles (ZLA2), Los Angeles (ZLA3)	SSM-48: This system support modification (SSM) upgrades the software at the ZLA WRS. This upgrade supports the cutover to WAAS CY 17.

START DATE	END DATE	LOCATION	EVENT DESCRIPTION
09/07/2017	09/08/2017	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	SSM-48: This system support modification (SSM) upgrades the software at the ZLA WRS. This upgrade supports the cutover to WAAS CY 17.
09/08/2017	09/09/2017	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	SSM-48: This system support modification (SSM) upgrades the software at the YYR WRS. This upgrade supports the cutover to WAAS CY 17.
09/08/2017	09/09/2017	Goose Bay (YYR1), Goose Bay (YYR2), Goose Bay (YYR3)	SSM-48: This system support modification (SSM) upgrades the software at the YYR WRS. This upgrade supports the cutover to WAAS CY 17.
09/11/2017	09/12/2017	Gander (YQX1), Gander (YQX2), Gander (YQX3)	SSM-48: This system support modification (SSM) upgrades the software at the YQX WRS. This upgrade supports the cutover to WAAS CY 17.
09/12/2017	09/13/2017	Winnipeg (YWG1), Winnipeg (YWG2), Winnipeg (YWG3)	SSM-48: This system support modification (SSM) upgrades the software at the YWG WRS. This upgrade supports the cutover to WAAS CY 17.
09/13/2017	09/13/2017	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	SSM-48: This system support modification (SSM) upgrades the software at the YFB WRS. This upgrade supports the cutover to WAAS CY 17.
09/13/2017	09/14/2017	Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	SSM-48: This system support modification (SSM) upgrades the software at the OTZ WRS. This upgrade supports the cutover to WAAS CY 17. The reference station was brought offline for HVAC repairs. OTZ returned to service on 9/22.
09/15/2017	09/15/2017	Kansas City (ZKC1), Kansas City (ZKC2), Kansas City (ZKC3)	SSM-48: This system support modification (SSM) upgrades the software at the ZKC WRS. This upgrade supports the cutover to WAAS CY 17.
09/18/2017	09/19/2017	Cleveland (ZOB1), Cleveland (ZOB2), Cleveland (ZOB3)	SSM-48: This system support modification (SSM) upgrades the software at the ZOB WRS. This upgrade supports the cutover to WAAS CY 17.
09/19/2017	09/20/2017	Billings (BIL1), Billings (BIL2), Billings (BIL3)	SSM-48: This system support modification (SSM) upgrades the software at the BIL WRS. This upgrade supports the cutover to WAAS CY 17.
09/20/2017	09/21/2017	Oakland (ZOA1), Oakland (ZOA2), Oakland (ZOA3)	SSM-48: This system support modification (SSM) upgrades the software at the ZKC WRS. This upgrade supports the cutover to WAAS CY 17.

START DATE	END DATE	LOCATION	EVENT DESCRIPTION
09/21/2017	09/22/2017	Albuquerque (ZAB1), Albuquerque (ZAB2), Albuquerque (ZAB3)	SSM-48: This system support modification (SSM) upgrades the software at the ZAB WRS. This upgrade supports the cutover to WAAS CY 17.
09/22/2017	09/23/2017	Memphis (ZME1), Memphis (ZME2), Memphis (ZME3)	SSM-48: This system support modification (SSM) upgrades the software at the ZME WRS. This upgrade supports the cutover to WAAS CY 17.
09/25/2017	09/26/2017	Dallas (ZFW1), Dallas (ZFW2), Dallas (ZFW3)	SSM-48: This system support modification (SSM) upgrades the software at the ZFW WRS. This upgrade supports the cutover to WAAS CY 17.
09/26/2017	09/27/2017	New York (ZNY1), New York (ZNY2), New York (ZNY3)	SSM-48: This system support modification (SSM) upgrades the software at the ZNY WRS. This upgrade supports the cutover to WAAS CY 17.
09/27/2017	09/27/2017	Boston (ZBW1), Boston (ZBW2), Boston (ZBW3)	SSM-48: This system support modification (SSM) upgrades the software at the ZBW WRS. This upgrade supports the cutover to WAAS CY 17.
09/28/2017	09/29/2017	Jacksonville (ZJX1), Jacksonville (ZJX2), Jacksonville (ZJX3)	SSM-48: This system support modification (SSM) upgrades the software at the ZJX WRS. This upgrade supports the cutover to WAAS CY 17.
09/29/2017	09/30/2017	Houston (ZHU1), Houston (ZHU2), Houston (ZHU3)	SSM-48: This system support modification (SSM) upgrades the software at the ZHU WRS. This upgrade supports the cutover to WAAS CY 17.
09/30/2017	09/30/2017	Anchorage (ZAN1), Anchorage (ZAN2), Anchorage (ZAN3)	SSM-48: This system support modification (SSM) upgrades the software at the ZAN WRS. This upgrade supports the cutover to WAAS CY 17.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
8/3/2017	8/3/2017	Faulted	GEO138,Woodbine (QWE)	LPV200_Alaska, LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Woodbine uplink site to the Brewster-B uplink site at 21:42:10 GMT on 8/3. This caused a 17-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of (1) LPV200 service coverage in Alaska from 22:44 GMT to 22:53 GMT on 8/3; and (2) LPV200 service coverage in Canada from 00:46 GMT to 00:56 GMT. TOW 423747-423765
8/8/2017	8/8/2017	Manual	GEO133,Santa_Paula (SZP)	None	The uplink for the AMR GEO, GEO 133, switched from the Santa Paula uplink site to the Paumalu uplink site at 07:26:53 GMT. This caused a 249-second outage of the GEO 133 broadcast (see event #13806) and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 199630-199880
8/8/2017	8/8/2017	Manual	GEO133,Paumalu (HDH)	None	The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 07:11:12 GMT. This caused a 189-second outage of the GEO 133 broadcast (see event #13806) and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated.
8/12/2017	8/12/2017	Manual	GEO133,Paumalu (HDH)	None	The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 01:28:54 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 523751-523756
8/19/2017	8/19/2017	Missed Navigation Message	GEO133,Santa_Paula (SZP),Washington DC (CnV)	None	Santa_Paula had CnV Source Select from Washington DC to Atlanta following the CnV SSM-48 software upgrade. TOW 519736-519738

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
8/23/2017	8/23/2017	Manual	GEO138,Brewster-B (BRE-B)	LPV200_Alaska	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 15:09:31 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of LPV200 service coverage in Alaska from 21:24 GMT to 21:30 GMT. TOW 313788-313793. Please see plot(s): LPV200_8/23/2017
8/24/2017	8/24/2017	Manual	GEO133,Santa_Paula (SZP)	None	The uplink for the AMR GEO, GEO 133, switched from the Santa Paula uplink site to the Paumalu uplink site at 04:01:00 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 360077-360082
8/24/2017	8/24/2017	Manual	GEO135,Napa (APC)	LPV200_Alaska, LPV200_Canada	The uplink for the CRW GEO, PRN135 switched from the Napa uplink site to the Littleton uplink site at 07:27:09 GMT. This caused a 4-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 minor degradation of: (1) LPV200 service coverage in Alaska from 13:59 GMT to 14:16 GMT; and (2) LPV200 service coverage in Canada from 08:35 GMT to 08:55 GMT. TOW 372446-372451
8/25/2017	8/25/2017	Manual	GEO138,Woodbine (QWE)	LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Woodbine uplink site to the Brewster-B uplink site at 04:00:06 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused minor degradation of LPV200 service coverage in Canada from 05:06 GMT to 05:18 GMT. TOW 446423-446428 Please see plot(s): LPV200_8/25/2017

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
8/30/2017	8/30/2017	Faulted	GEO133,Paumalu (HDH)	None	The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 03:34:43 GMT. This caused a 2900-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. HDH faulted from primary mode on 8/30 at 03:04:46 GMT with an RFU Equipment Uplink Fault and C1 KPA failure. SZP was automatically switched into primary mode and faulted 4 seconds after being primary. SZP faulted with a C1 KPA Power Control Fault. SIS was off the air until SZP recovered and was transitioned into primary mode at 04:22:52 GMT. HDH recovered to backup mode at 05:16:43. TOW 272100-275001
9/2/2017	9/2/2017	Faulted	GEO135,Littleton (APA)	LPV200_Alaska, LPV200_Canada	The uplink for the CRW GEO, PRN135 switched from the Littleton uplink site to the Napa uplink site at 07:27:09 GMT. This caused a 15-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 minor degradation of: (1) LPV200 service coverage in Alaska from 08:29 GMT to 08:49 GMT; and (2) LPV200 service coverage in Canada from 08:58 GMT to 09:22 GMT. TOW 548031-548047 Please see plot(s): LPV200_9/2/2017
9/11/2017	9/11/2017	Manual	GEO138,Brewster-B (BRE-B)	LPV200_Alaska, LPV200_Canada	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 07:46:01 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. The elevated UDRE for GEO 138 caused moderate degradation of LPV200 service coverage in Canada from 08:22 GMT to 08:59 GMT. The elevated UDRE for GEO 138 also caused minor degradation of LPV200 service coverage in Alaska from 12:52:30 GMT to 13:10:00 GMT. TOW 114378-114383. Please see plot(s): LPV200_9/11/2017

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
9/26/2017	9/26/2017	Faulted	GEO133,Santa_Paula (SZP)	None	GEO 133 switched to Paumalu, Santa_Paula faulted. The uplink for the AMR GEO, GEO 133, switched from the Santa Paula uplink site to the Paumalu uplink site at 04:16:59 GMT. This caused a 20-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 188236-188257

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 CRE, CRW, and AMR.

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 1.445 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.558 meters observed at Atlantic City.
- The minimum 95% CONUS horizontal LPV errors was 0.519 meters observed at Oklahoma City.
- The minimum 95% CONUS vertical LPV error was 0.809 meters observed at Salt Lake City.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40m) (Meters)	Horizontal (HAL=556m) (Meters)	Vertical (VAL=50m) (Meters)	Percentage in PA mode (%)	SPS Accuracy	
					95% Horizontal (Meters)	95% Vertical (Meters)
Arcata	1.445	1.445	1.271	100	*	*
Atlantic City	1.293	1.293	1.558	100	*	*
Oklahoma City	.519	.519	.867	100	*	*
Albuquerque	.598	.598	.852	100	1.513	3.838
Anchorage	.738	.738	1.163	100	*	*
Atlanta	.646	.646	.99	100	1.519	3.973
Barrow	.587	.587	1.315	99.999	*	*
Bethel	.619	.619	.937	100	1.603	3.975
Billings	.639	.639	.848	100	1.513	3.705
Boston	.734	.734	1.121	100	1.615	3.501
Chicago	.737	.737	.999	100	*	*
Cleveland	.642	.642	.899	100	1.608	3.862
Cold Bay	.666	.666	.94	100	*	*
Dallas	.582	.582	.999	100	*	*
Denver	.548	.548	.857	100	*	*
Fairbanks	.667	.667	1.148	100	1.664	3.467
Gander	.724	.724	1.066	100	*	*
Goose Bay	.752	.752	.881	100	*	*
Houston	.678	.678	1.228	100	*	*
Iqaluit	.852	.852	1.088	100	*	*
Jacksonville	.648	.649	.951	100	*	*
Juneau	.655	.655	1.121	100	*	*
Kansas City	.532	.532	.877	100	1.475	3.822
Kotzebue	.608	.608	1.202	99.999	1.802	3.737
Los Angeles	.827	.827	1.351	100	1.665	4.488
Memphis	.532	.533	.953	100	*	*
Merida	.653	.653	1.064	100	*	*
Mexico City	.678	.678	2.627	100	*	*
Miami	.687	.69	1.105	100	1.898	3.654
Minneapolis	.699	.699	.942	100	1.529	3.618
New York	.676	.676	1.002	100	*	*
Oakland	.75	.75	1.442	100	1.724	4.719
Puerto Vallarta	.726	.726	1.084	100	*	*
Salt Lake City	.581	.581	.809	100	1.360	3.574
San Jose Del Cabo	.917	.917	1.26	100	*	*
Seattle	.612	.612	.865	100	1.501	4.026
Washington DC	.668	.668	1.009	100	1.551	3.855
Winnipeg	.575	.575	.925	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 2.546 meters observed at Tapachula.
- The maximum 99.999% horizontal error was 11.241 meters observed at Tapachula.
- The minimum 95% horizontal error was 0.928 meters observed at Kansas City.
- The minimum 99.999% horizontal error was 1.856 meters observed at Salt Lake City.

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
Albuquerque	0.955	2.626	100	3.031
Anchorage	1.827	3.845	100	4.017
Atlanta	1.031	4.293	100	5.086
Barrow	1.281	2.962	100	3.59
Bethel	1.495	3.613	100	3.78
Billings	1.306	2.532	100	2.744
Boston	1.16	3.089	100	3.337
Cleveland	1.002	3.251	100	3.498
Cold Bay	1.225	3.026	100	3.211
Fairbanks	1.724	3.561	100	4.844
Gander	1.186	2.949	100	3.321
Honolulu	2.301	8.402	100	8.686
Houston	1.46	3.288	100	3.465
Iqaluit	0.968	2.477	100	3.283
Juneau	1.487	3.379	100	3.595
Kansas City	0.928	4.047	100	4.44
Kotzebue	1.618	3.124	100	9.462
Los Angeles	1.414	4.311	100	5.798
Merida	1.886	5.941	100	6.207
Miami	1.472	4.951	100	5.229
Minneapolis	1.274	3.188	100	3.354
Oakland	1.244	2.368	100	2.532
Salt Lake City	0.957	1.856	100	1.945
San Jose Del Cabo	1.921	5.809	100	6.251
San Juan	1.524	4.852	100	5.097
Seattle	1.148	2.839	100	3.72
Tapachula	2.546	11.241	100	11.384
Washington DC	1.118	2.601	100	2.962

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 4.877 meters occurred at Memphis and maximum vertical LPV error was 7.971 meters occurred at Juneau.

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error VPL	Vertical Maximum Ratio
Arcata	3.154	0.209	0.256	4.531	0.109	0.181
Atlantic City	2.327	0.204	0.218	4.021	0.126	0.205
Grand Forks	0.000	0.000	0.000	0.000	0.000	0.000
Oklahoma City	2.797	0.090	0.214	4.656	0.195	0.195
Albuquerque	2.029	0.145	0.161	3.437	0.246	0.246
Anchorage	2.201	0.133	0.175	5.709	0.281	0.281
Atlanta	2.981	0.104	0.152	4.683	0.095	0.227
Barrow	3.452	0.160	0.160	7.083	0.198	0.198
Bethel	2.414	0.151	0.164	3.889	0.119	0.158
Billings	1.641	0.137	0.145	3.318	0.204	0.204
Boston	2.662	0.169	0.182	3.810	0.194	0.194
Chicago	3.459	0.281	0.281	2.945	0.179	0.228
Cleveland	3.141	0.145	0.184	2.862	0.142	0.160
Cold Bay	1.745	0.093	0.104	2.850	0.074	0.109
Dallas	2.431	0.175	0.174	4.201	0.225	0.225
Denver	2.659	0.185	0.210	2.725	0.150	0.150
Fairbanks	2.728	0.122	0.167	5.571	0.179	0.222
Gander	2.595	0.099	0.116	3.895	0.142	0.142
Goose Bay	2.289	0.101	0.131	3.051	0.140	0.144
Houston	2.567	0.083	0.173	4.301	0.251	0.251
Iqaluit	4.504	0.133	0.190	3.899	0.109	0.180
Jacksonville	1.567	0.040	0.142	3.842	0.161	0.168
Juneau	2.361	0.130	0.156	7.971	0.160	0.243
Kansas City	3.877	0.115	0.153	2.610	0.152	0.169
Kotzebue	3.373	0.185	0.185	7.751	0.289	0.289
Los Angeles	2.447	0.103	0.156	3.744	0.122	0.147
Memphis	4.877	0.123	0.147	6.765	0.207	0.230
Merida	1.832	0.085	0.148	5.210	0.138	0.158
Mexico City	1.934	0.147	0.148	4.753	0.158	0.185
Miami	3.185	0.081	0.139	4.783	0.133	0.152

Location	Horizontal Error (m)	Horizontal Error HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error VPL	Vertical Maximum Ratio
Minneapolis	2.113	0.210	0.212	2.909	0.183	0.183
New York	1.886	0.113	0.147	3.480	0.178	0.178
Oakland	1.812	0.128	0.157	3.071	0.121	0.163
Puerto Vallarta	3.097	0.189	0.189	6.945	0.336	0.336
Salt Lake City	1.290	0.123	0.129	2.088	0.127	0.127
San Jose Del Cabo	1.921	0.146	0.147	3.503	0.115	0.145
Seattle	1.600	0.155	0.158	2.800	0.147	0.147
Washington DC	1.767	0.102	0.146	3.265	0.145	0.175
Winnipeg	2.428	0.170	0.170	3.467	0.163	0.184

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.

- July 16–17, 2017—Position errors in CONUS, Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.570 meters and 2.823 meters at Arcata and Mexico City, respectively. The Kp index was 6.
- August 4, 2017—Position errors in Alaska and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 1.107 meters and 2.158 meters at Iqaluit and Fairbanks, respectively. The Kp index was 4.
- August 17, 2017—Position errors in CONUS and Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 1.536 meters and 1.462 meters at Arcata and Anchorage, respectively. The Kp index was 5.
- August 23, 2017—Position errors in CONUS and Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 1.780 meters and 1.578 meters at Arcata and Fairbanks, respectively. The Kp index was 5.
- August 31–September 2, 2017—Position errors in CONUS were elevated. The maximum 95% horizontal and vertical LPV errors were 1.588 meters and 1.694 meters at Arcata and Oakland, respectively. The Kp index range was 5, 4, and 5 respectively.
- September 7–8, 2017—Position errors in CONUS, Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.724 meters and 2.868 meters at Arcata and Mexico City, respectively. The Kp index was 8.
- September 12, 2017—Position errors in CONUS and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.425 meters and 3.140 meters at Arcata and Mexico City, respectively. The Kp index was 5.
- September 13–15, 2017—Position errors in Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.214 meters and 3.331 meters at San Jose Del Cabo and Mexico City, respectively. The Kp index range was 5, 6, and 6 respectively.
- September 27–28, 2017—Position errors in CONUS Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.002 meters and 2.942 meters at Arcata and Mexico City, respectively. The Kp index range was 6 and 7 respectively.

Figure 2-1 LPV 95% Horizontal Accuracy

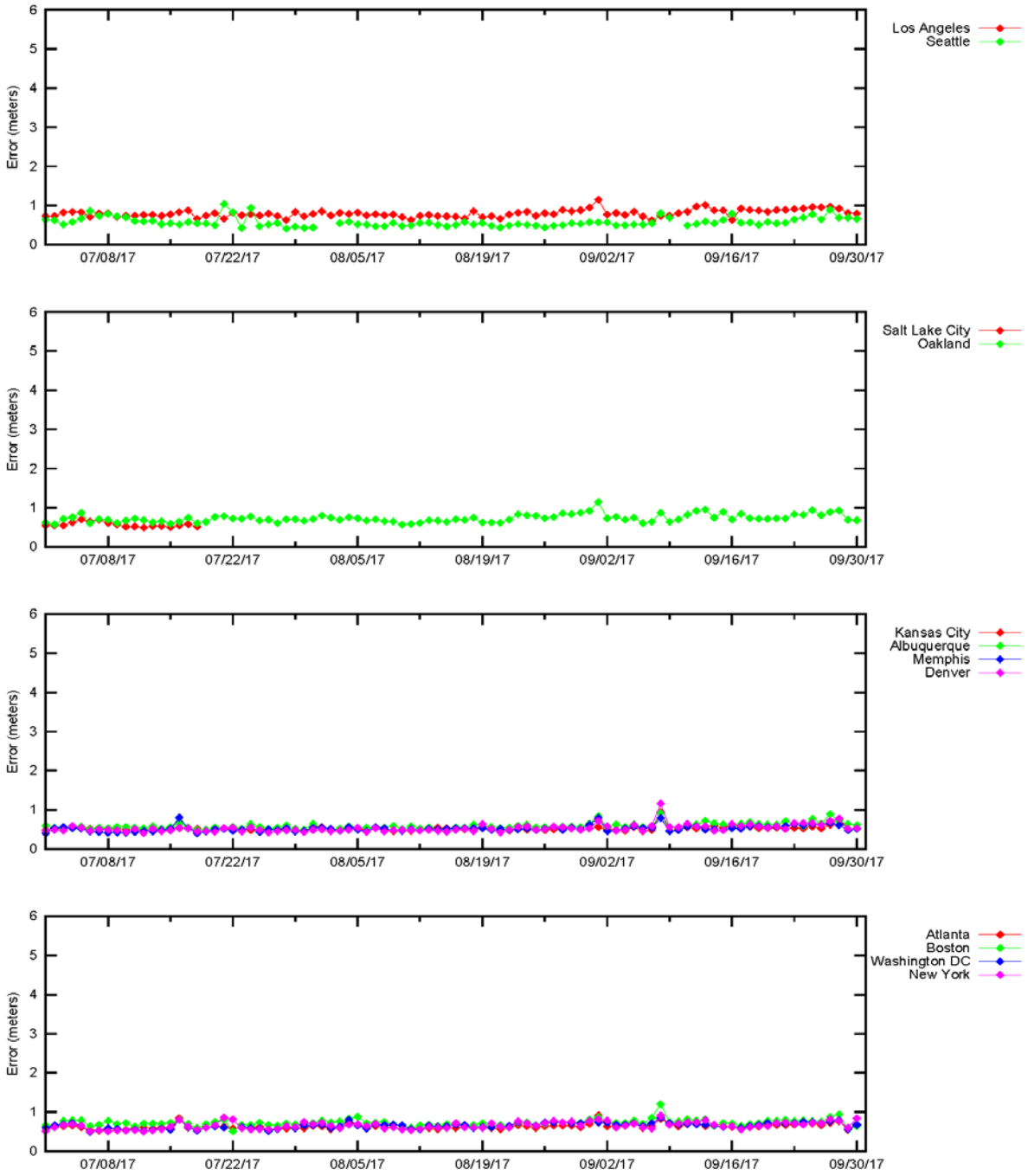


Figure 2-2 LPV 95% Horizontal Accuracy

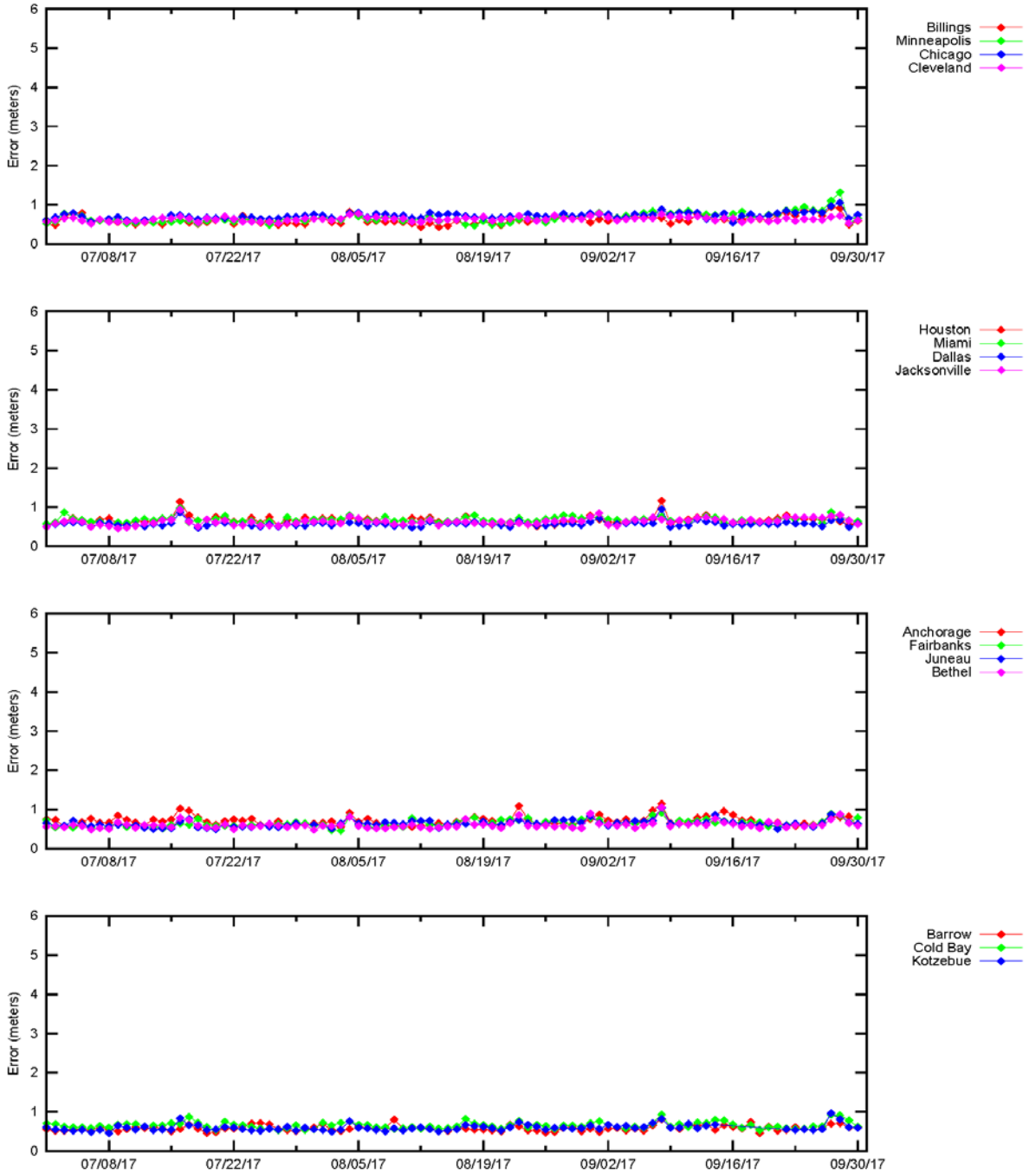


Figure 2-3 LPV 95% Horizontal Accuracy

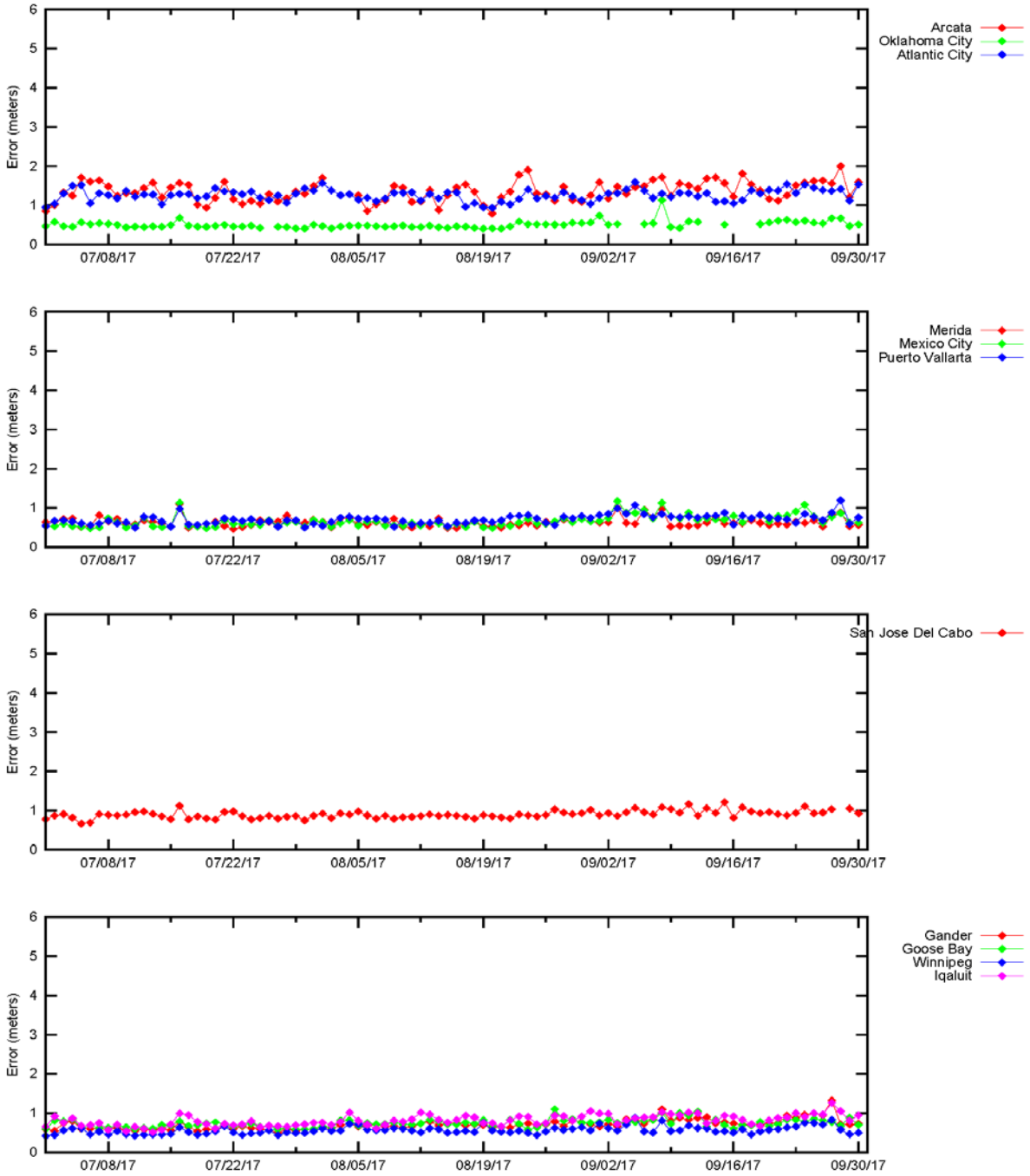


Figure 2-4 LPV 95% Vertical Accuracy

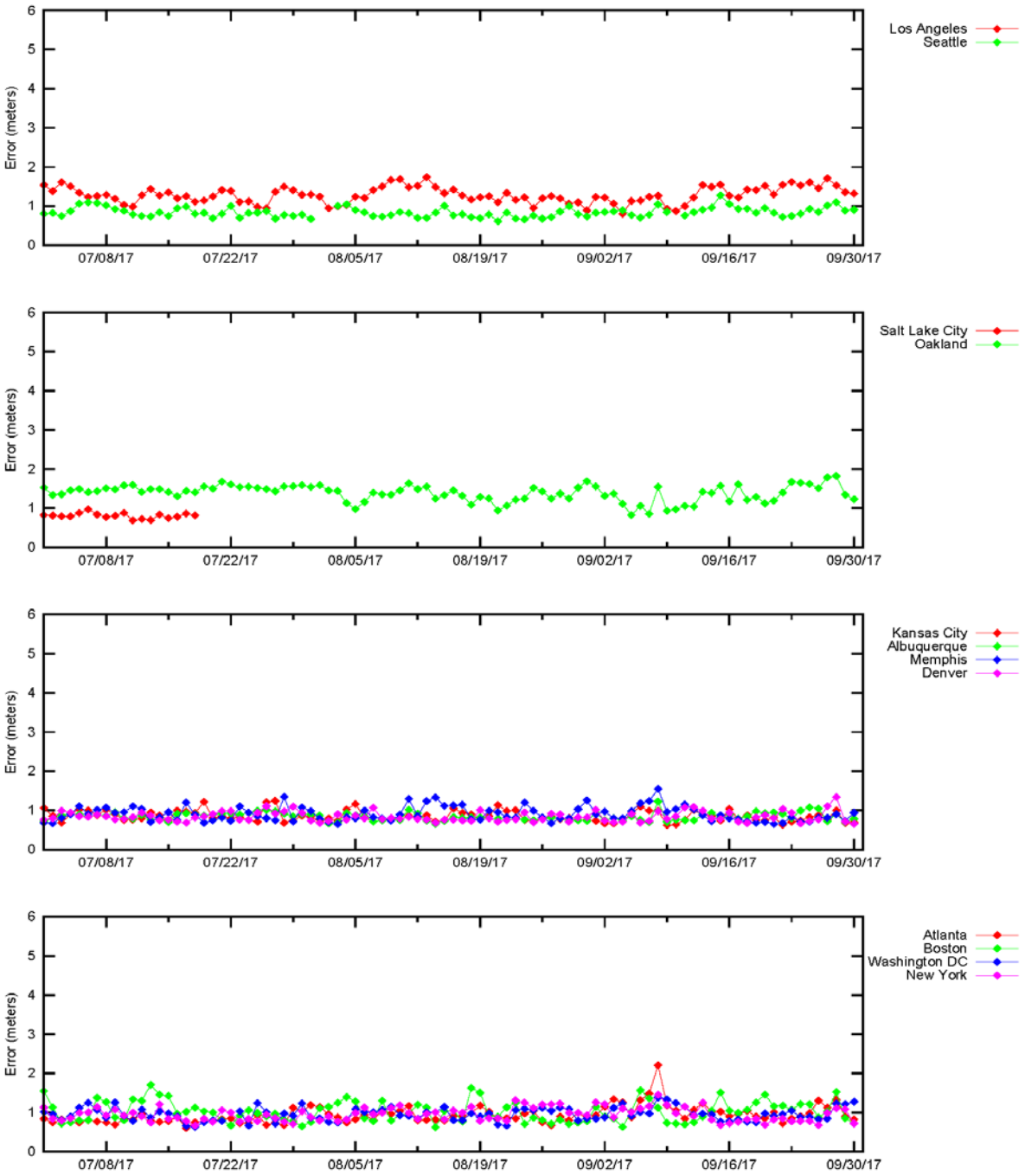


Figure 2-5 LPV 95% Vertical Accuracy

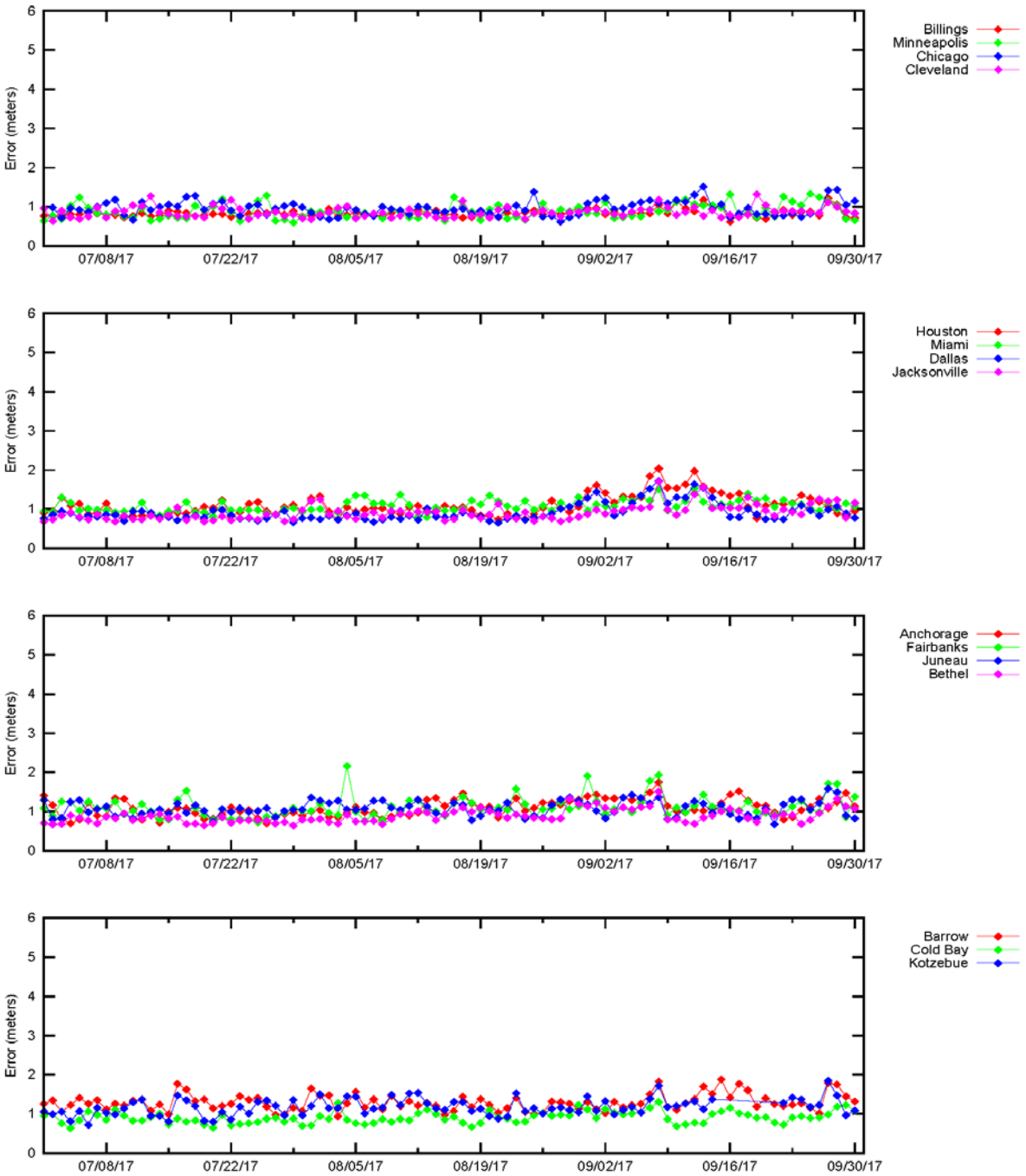


Figure 2-6 LPV 95% Vertical Accuracy

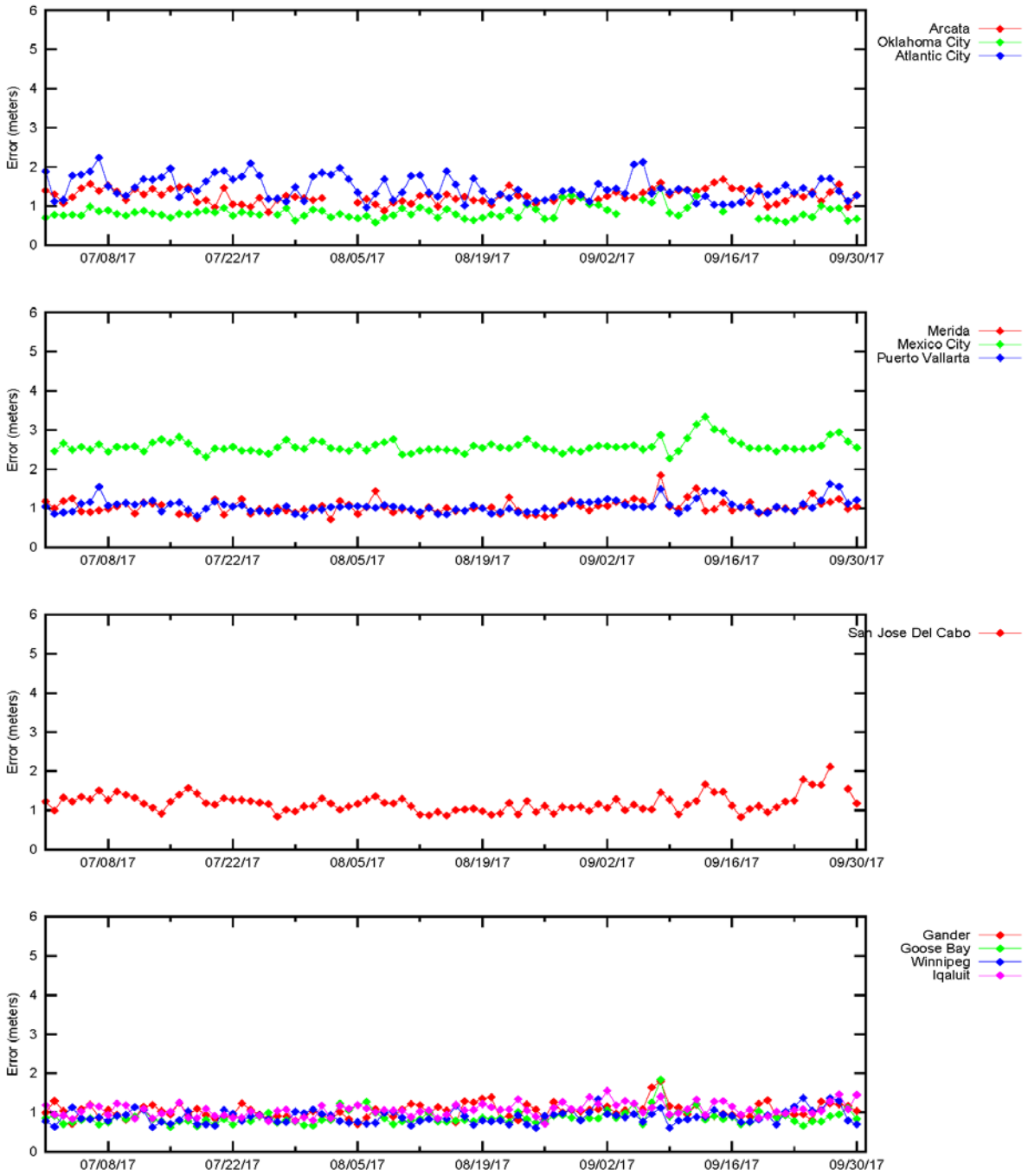


Figure 2-7 and Figure 2-8 show the daily NPA 95% horizontal accuracy at the NPA evaluation sites for the reporting period. The increases in 95% NPA position errors due to geomagnetic activity occurred on July 9–10, August 3–4, 17–18, 23–24, and September 1–12, 27–28, 2017.

Figure 2-7 NPA 95% Horizontal Accuracy

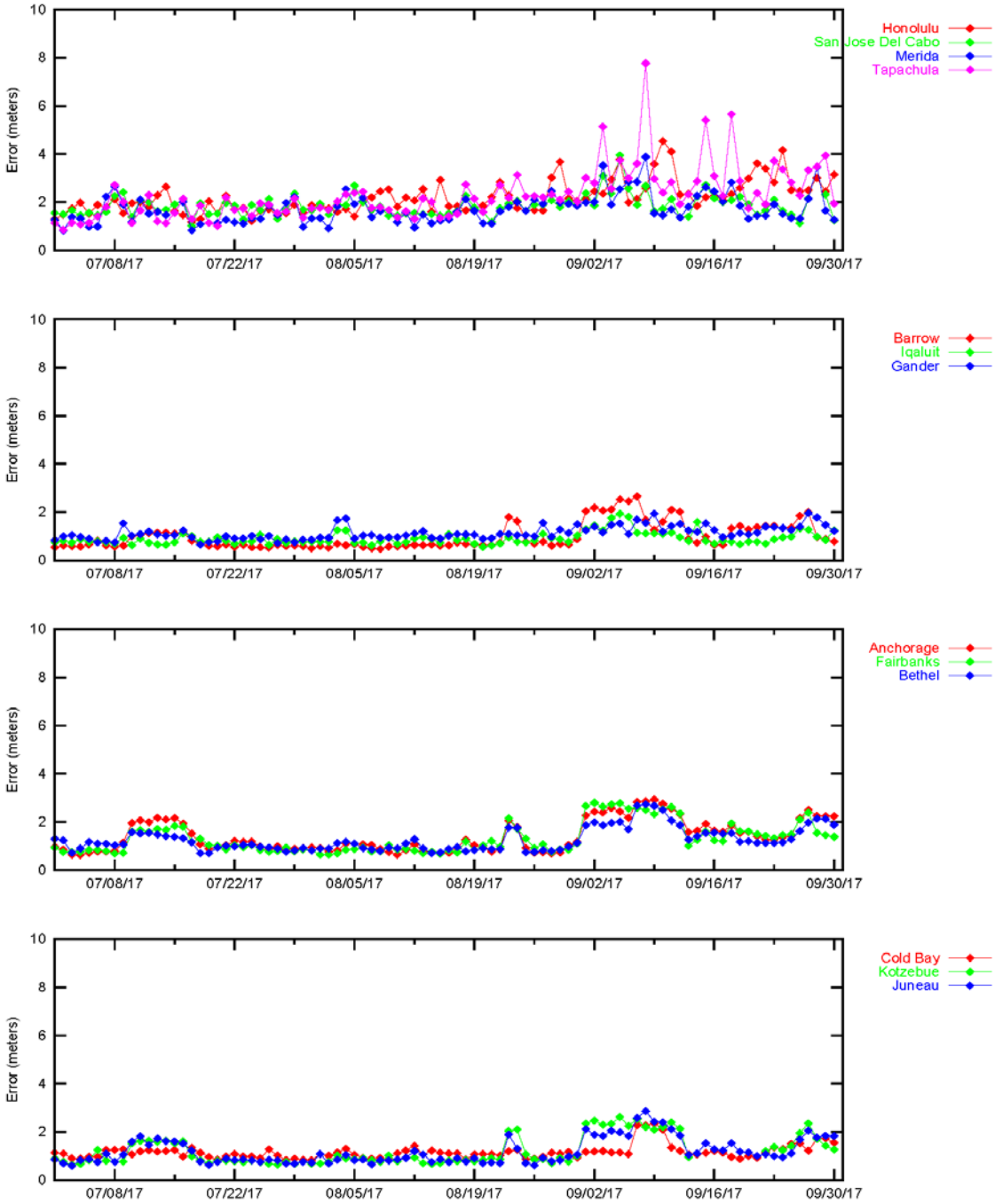


Figure 2-8 NPA 95% Horizontal Accuracy

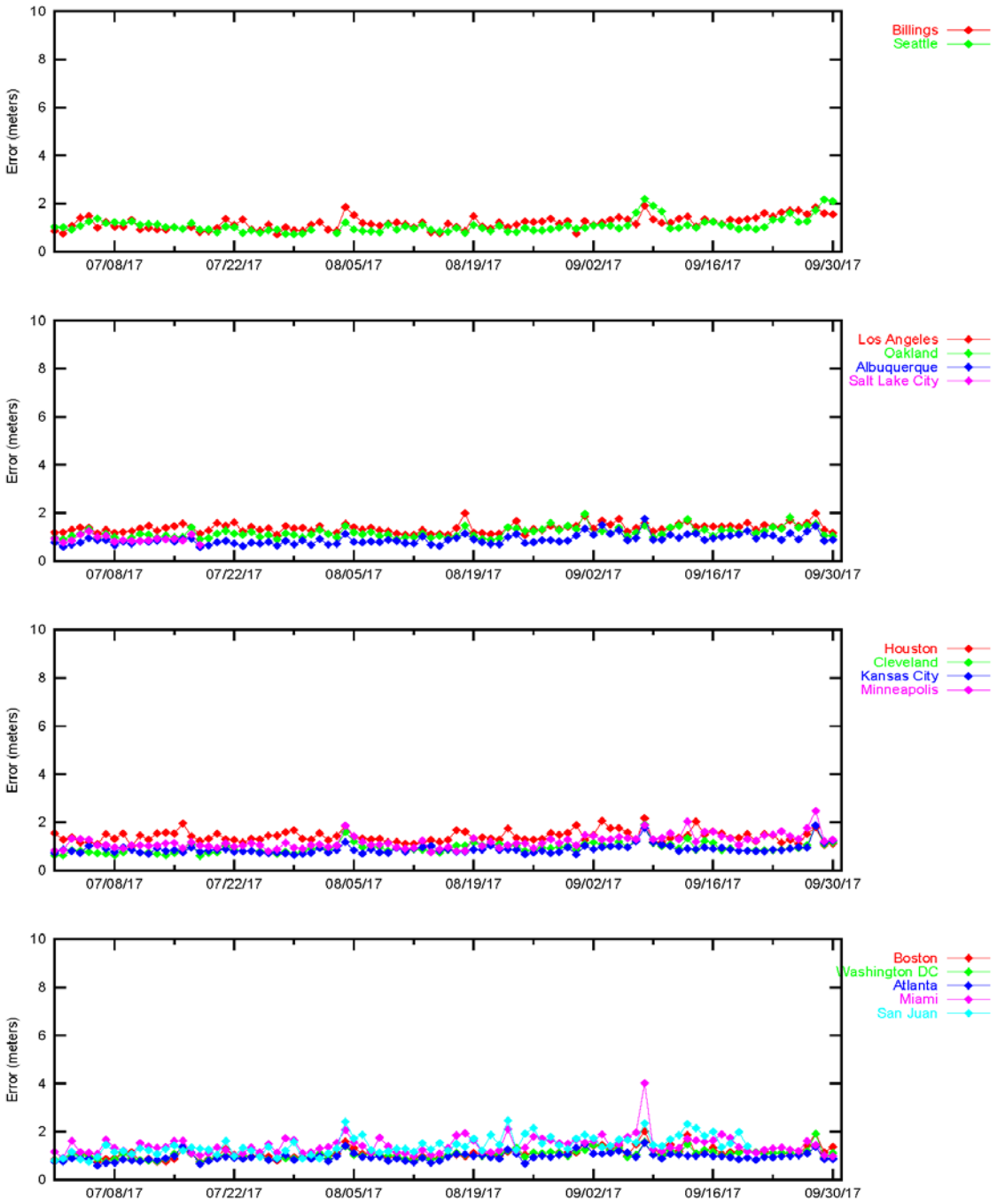


Figure 2-9 through Figure 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver for the quarter. Figure 2-9 and Figure 2-10 show the triangular distributions of vertical position error (VPE) versus VPL and horizontal position error (HPE) versus HPL: (1) the horizontal 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

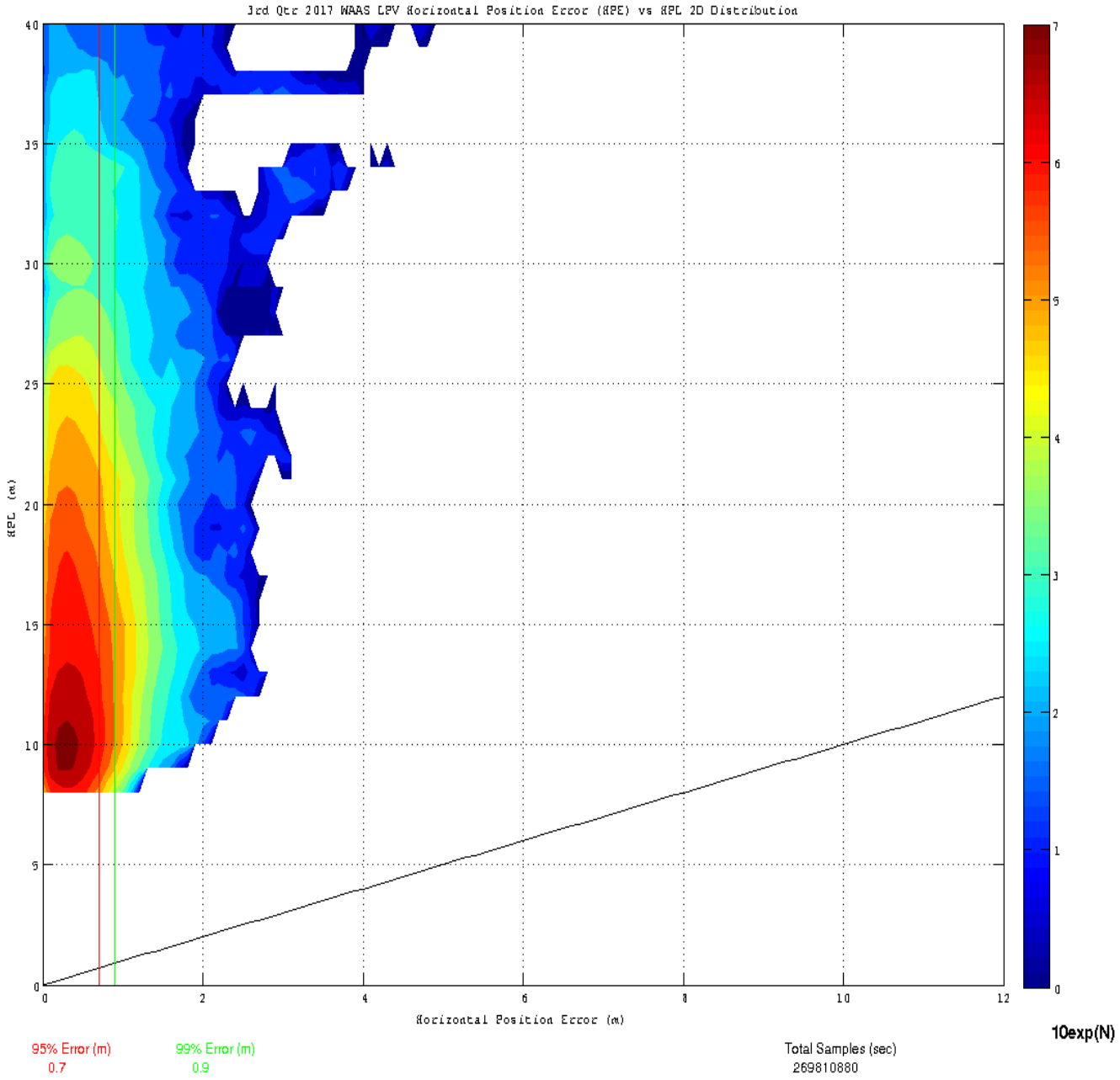


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

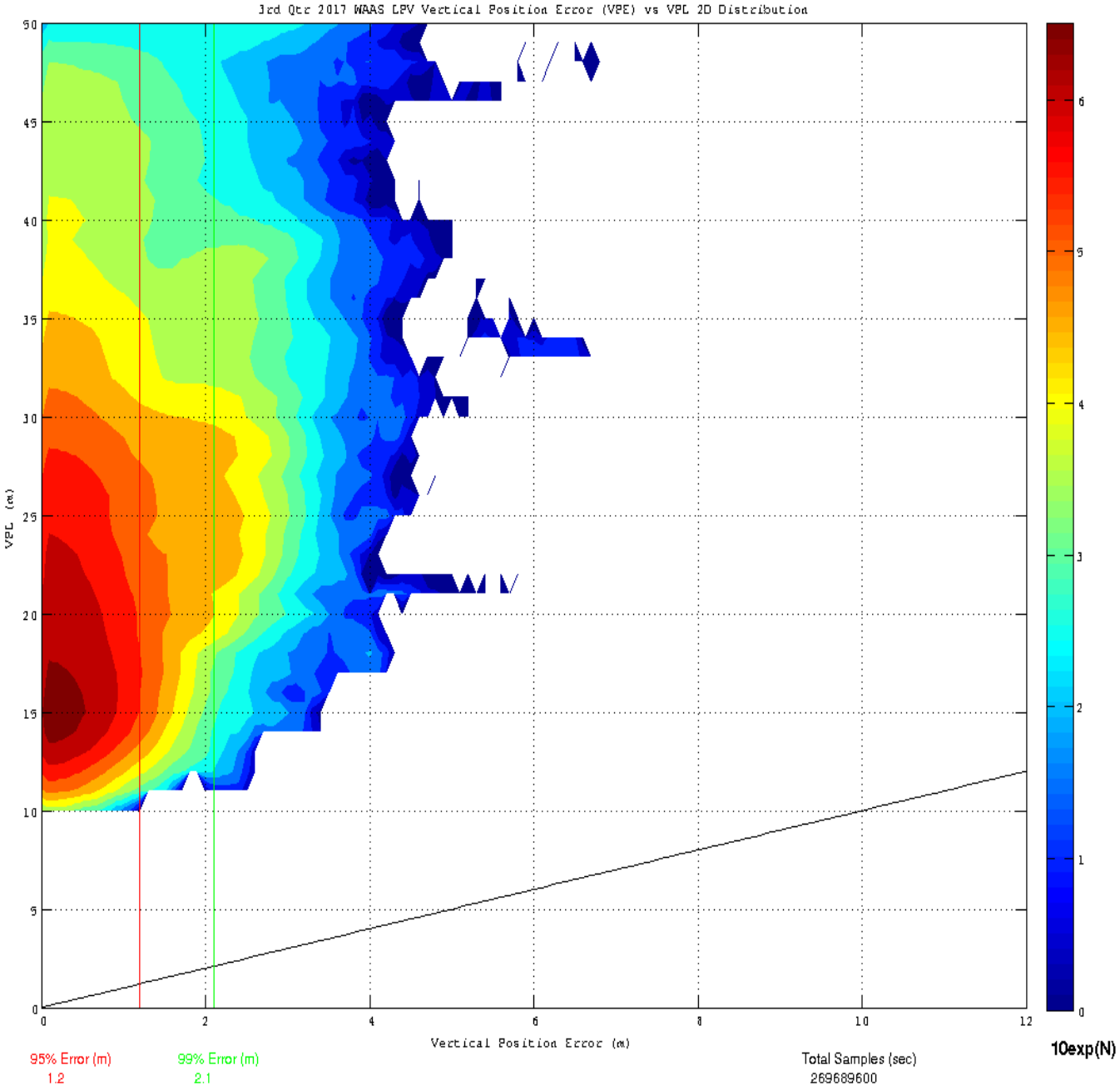


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

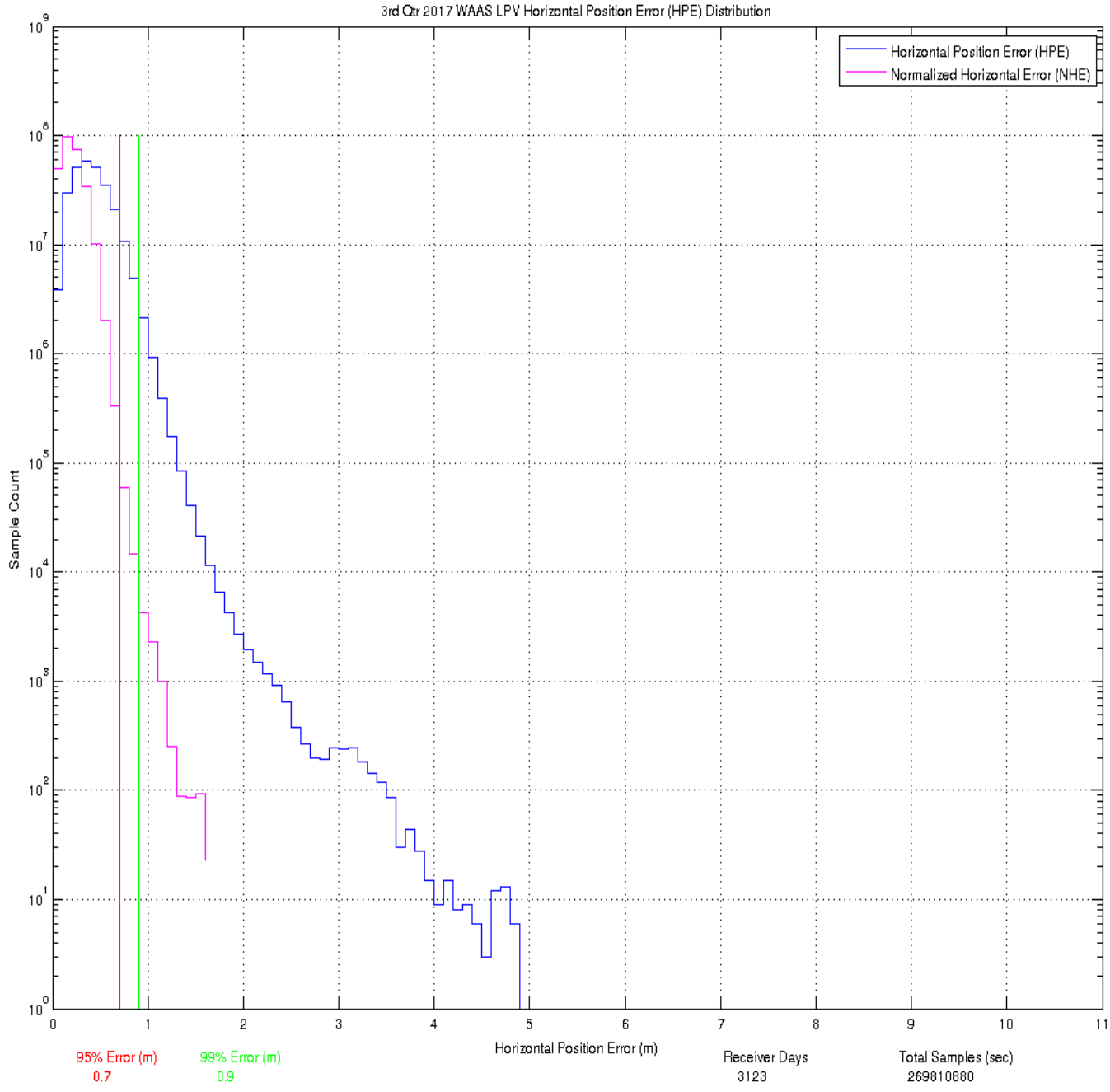
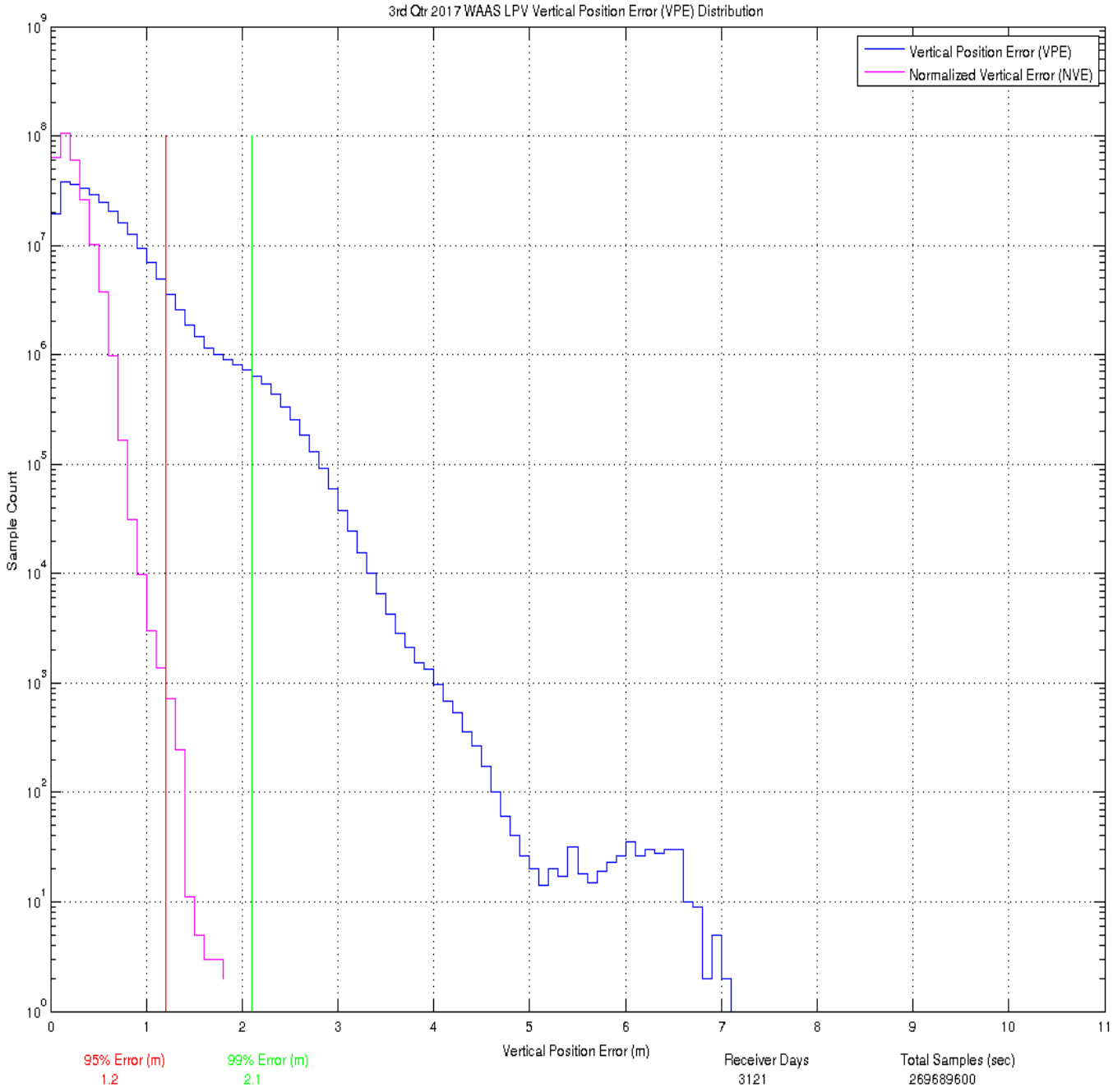


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



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 when in PA mode for this reporting period are listed as:

- The maximum 99% CONUS HPL was 17.118 meters observed at Cleveland
- The maximum 99% CONUS VPL was 32.441 meters observed at Oakland
- The minimum 99% CONUS HPL was 10.895 meters observed at Oklahoma City
- The minimum 99% CONUS VPL was 18.246 meters observed at Oklahoma City
- The maximum 99% Alaska HPL was 21.612 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 35.968 meters observed at Barrow
- The minimum 99% Alaska HPL was 13.396 meters observed at Juneau
- The minimum 99% Alaska VPL was 23.846 meters observed at Anchorage

Table 3-1 99% Protection Level

Location	99% HPL (meters)	99% VPL (meters)	Percentage in PA mode
Arcata	13.977	29.087	100
Atlantic City	16.801	23.158	100
Oklahoma City	10.895	18.246	100
Albuquerque	11.291	21.787	100
Anchorage	14.094	23.846	100
Atlanta	12.552	22.663	100
Barrow	16.55	35.968	99.999
Bethel	16.331	27.116	100
Billings	12.679	19.774	100
Boston	14.538	20.977	100
Chicago	13.523	20.66	100
Cleveland	17.118	22.59	100
Cold Bay	21.612	31.65	100
Dallas	10.943	19.369	100
Denver	11.981	21.395	100
Fairbanks	13.889	25.778	100
Gander	24.866	34.71	100
Goose Bay	23.027	26.946	100
Houston	11.445	20.972	100
Iqaluit	27.875	39.181	100
Jacksonville	12.607	23.477	100
Juneau	13.396	23.931	100
Kansas City	11.464	18.411	100
Kotzebue	16.278	31.177	99.999
Los Angeles	14.678	28.562	100
Memphis	11.576	19.817	100
Merida	21.472	39.897	100
Mexico City	24.854	49.042	100
Miami	13.797	28.071	100
Minneapolis	12.684	20.745	100
New York	14.065	21.207	100
Oakland	14.404	32.441	100
Puerto Vallarta	24.373	46.683	100
Salt Lake City	11.585	21.25	100
San Jose Del Cabo	21.451	44.73	100
Seattle	13.213	21.715	100
Washington DC	16.2	23.394	100
Winnipeg	14.133	20.72	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	99.97
Atlantic City	100	100	100
Oklahoma City	100	100	100
Albuquerque	100	100	100
Anchorage	100	100	100
Atlanta	99.93	99.93	99.92
Barrow	100	99.97	97.87
Bethel	100	100	99.93
Billings	100	100	100
Boston	100	100	100
Chicago	100	100	100
Cleveland	100	100	100
Cold Bay	100	99.98	99.66
Dallas	100	99.99	99.97
Denver	100	100	100
Fairbanks	100	100	99.96
Gander	100	100	98.66
Goose Bay	100	100	99.98
Houston	100	100	99.98
Iqaluit	99.99	99.98	95.56
Jacksonville	99.93	99.92	99.92
Juneau	100	99.99	99.96
Kansas City	100	100	100
Kotzebue	100	100	99.75
Los Angeles	100	100	99.92
Memphis	99.96	99.95	99.95
Merida	99.94	99.89	96.86
Mexico City	99.98	99.01	94.62
Miami	99.89	99.89	99.84

Location	LP WAAS With 15 minute window	LPV WAAS With 15 minute window	LPV200 WAAS With 15 minute window
Minneapolis	100	100	100
New York	100	100	100
Oakland	100	100	99.49
Puerto Vallarta	99.98	99.57	94.54
Salt Lake City	100	100	100
San Jose Del Cabo	100	99.73	94.38
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	LP Outage Rates	LPV Outages	LPV Outage Rates	LPV200 Outages	LPV200 Outage Rates
Arcata	0	0	0	0	3	0.000059
Atlantic City	0	0	0	0	0	0
Oklahoma City	0	0	0	0	0	0
Albuquerque	0	0	0	0	2	0.000038
Anchorage	0	0	0	0	3	0.000057
Atlanta	1	0.000019	1	0.000019	1	0.000019
Barrow	4	0.000076	20	0.000379	224	0.004331
Bethel	0	0	0	0	7	0.000133
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	1	0.000019
Cold Bay	1	0.000019	4	0.000076	33	0.000626
Dallas	0	0	1	0.000019	1	0.000019
Denver	0	0	0	0	1	0.000019
Fairbanks	1	0.000019	2	0.000038	20	0.000379
Gander	3	0.000057	3	0.000057	204	0.003908
Goose Bay	0	0	0	0	1	0.000019
Houston	0	0	0	0	1	0.000019

Location	LP Outages	LP Outage Rates	LPV Outages	LPV Outage Rates	LPV200 Outages	LPV200 Outage Rates
Iqaluit	3	0.000057	37	0.0007	370	0.007322
Jacksonville	1	0.000019	1	0.000019	1	0.000019
Juneau	1	0.000019	2	0.000038	7	0.000133
Kansas City	1	0.000019	1	0.000019	1	0.000019
Kotzebue	4	0.000082	5	0.000103	109	0.002242
Los Angeles	3	0.000057	4	0.000076	13	0.000248
Memphis	1	0.000019	1	0.000019	1	0.000019
Merida	1	0.000019	4	0.000078	280	0.005622
Mexico City	3	0.000057	193	0.003687	626	0.012514
Miami	1	0.000019	1	0.000019	5	0.000095
Minneapolis	0	0	0	0	0	0
New York	0	0	0	0	0	0
Oakland	0	0	0	0	96	0.001824
Puerto Vallarta	2	0.000038	129	0.002449	312	0.006238
Salt Lake City	0	0	0	0	0	0
San Jose Del Cabo	0	0	32	0.000615	242	0.004911
Seattle	0	0	0	0	1	0.000019
Washington DC	0	0	0	0	0	0
Winnipeg	0	0	0	0	0	0

Figure 3-1 LPV Instantaneous Availability

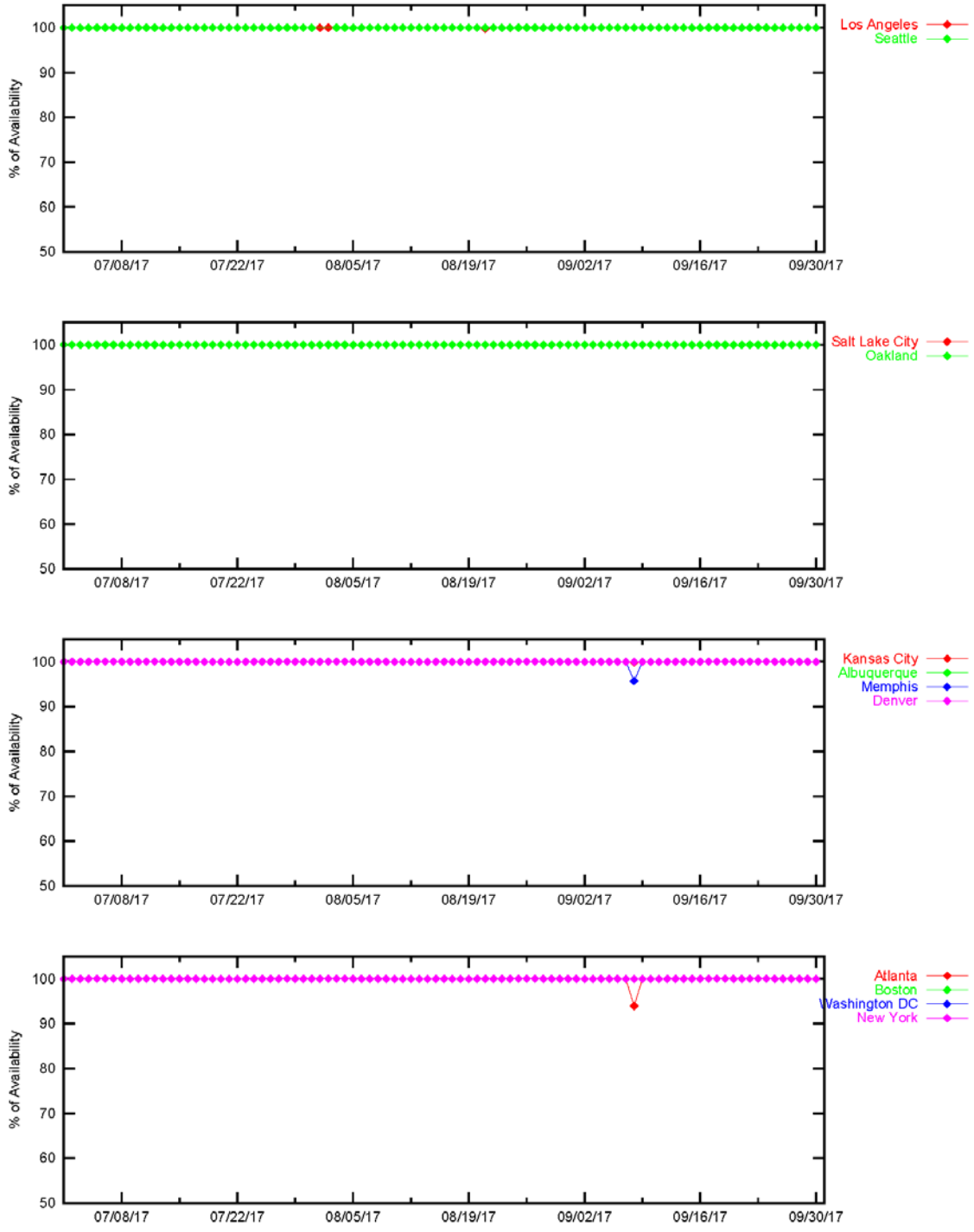


Figure 3-2 LPV Instantaneous Availability

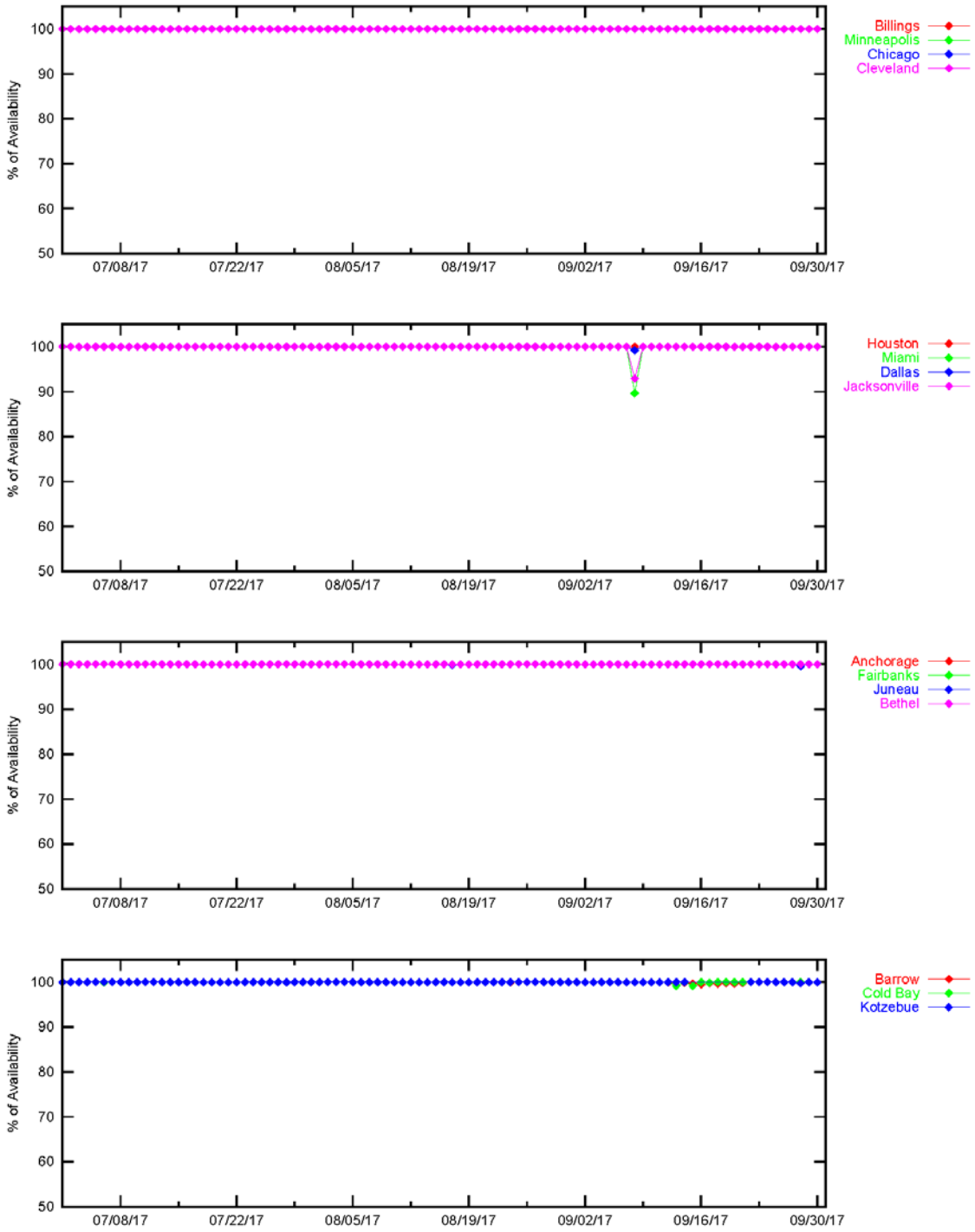


Figure 3-3 LPV Instantaneous Availability

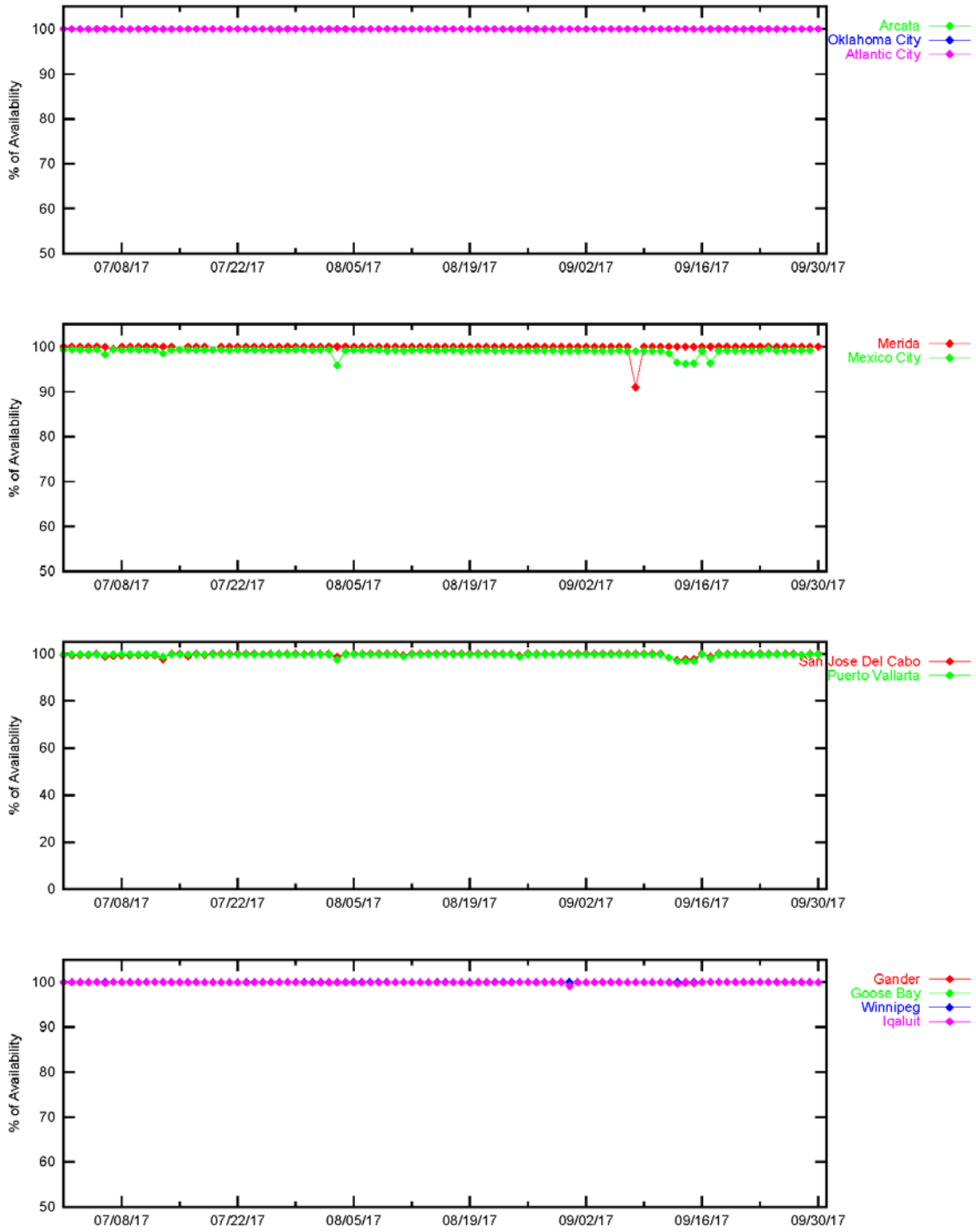


Figure 3-4 LPV200 Instantaneous Availability

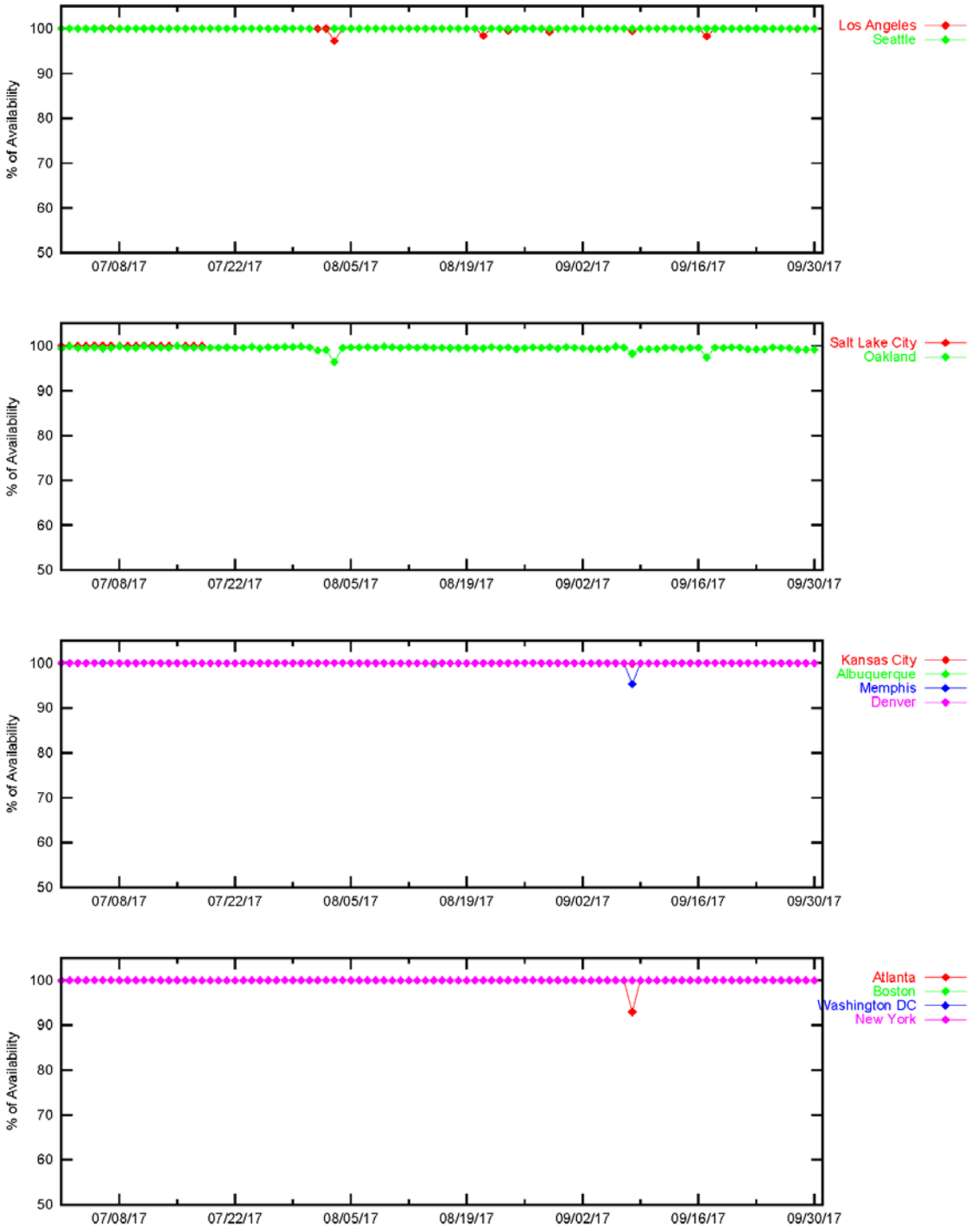


Figure 3-5 LPV200 Instantaneous Availability

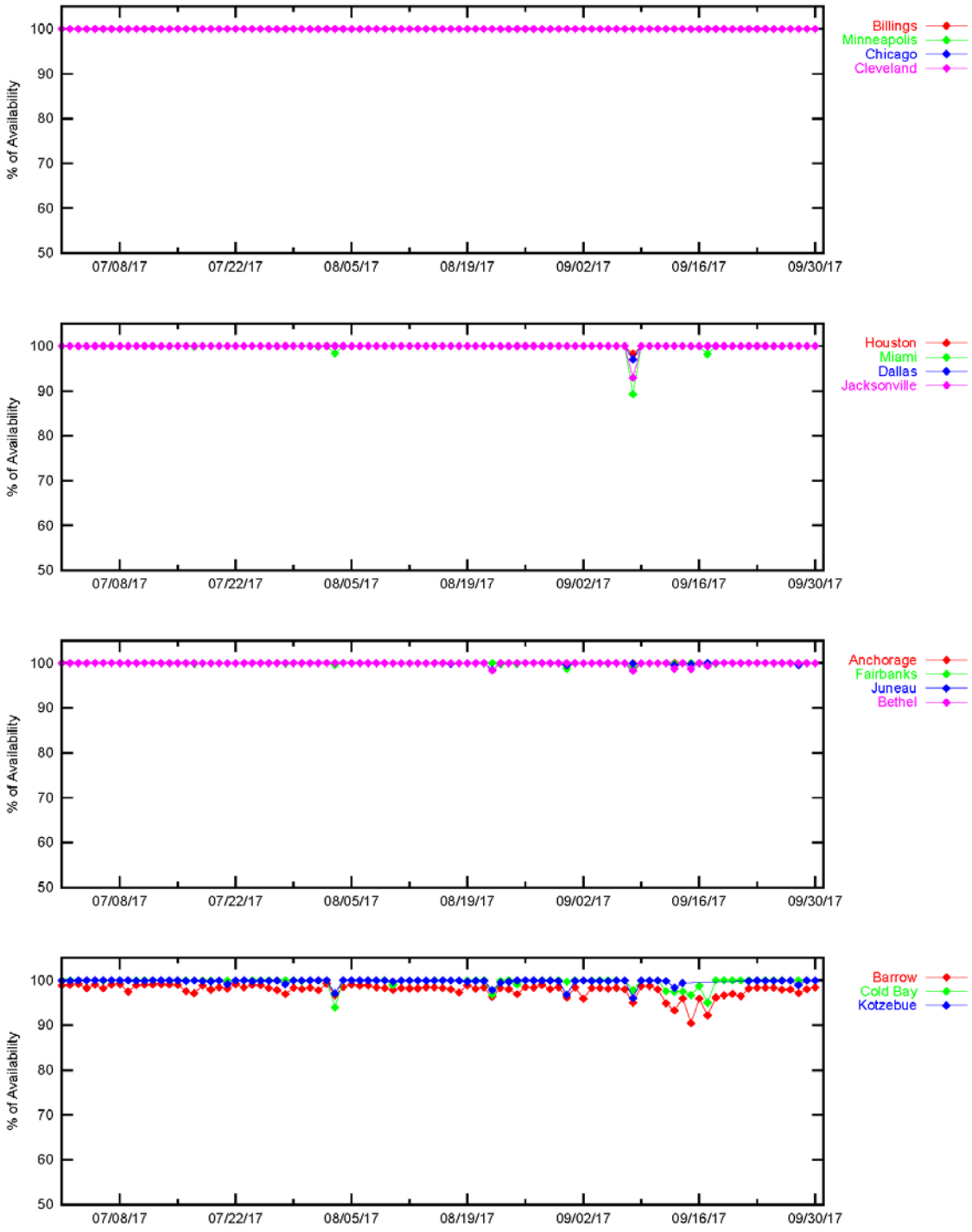


Figure 3-6 LPV200 Instantaneous Availability

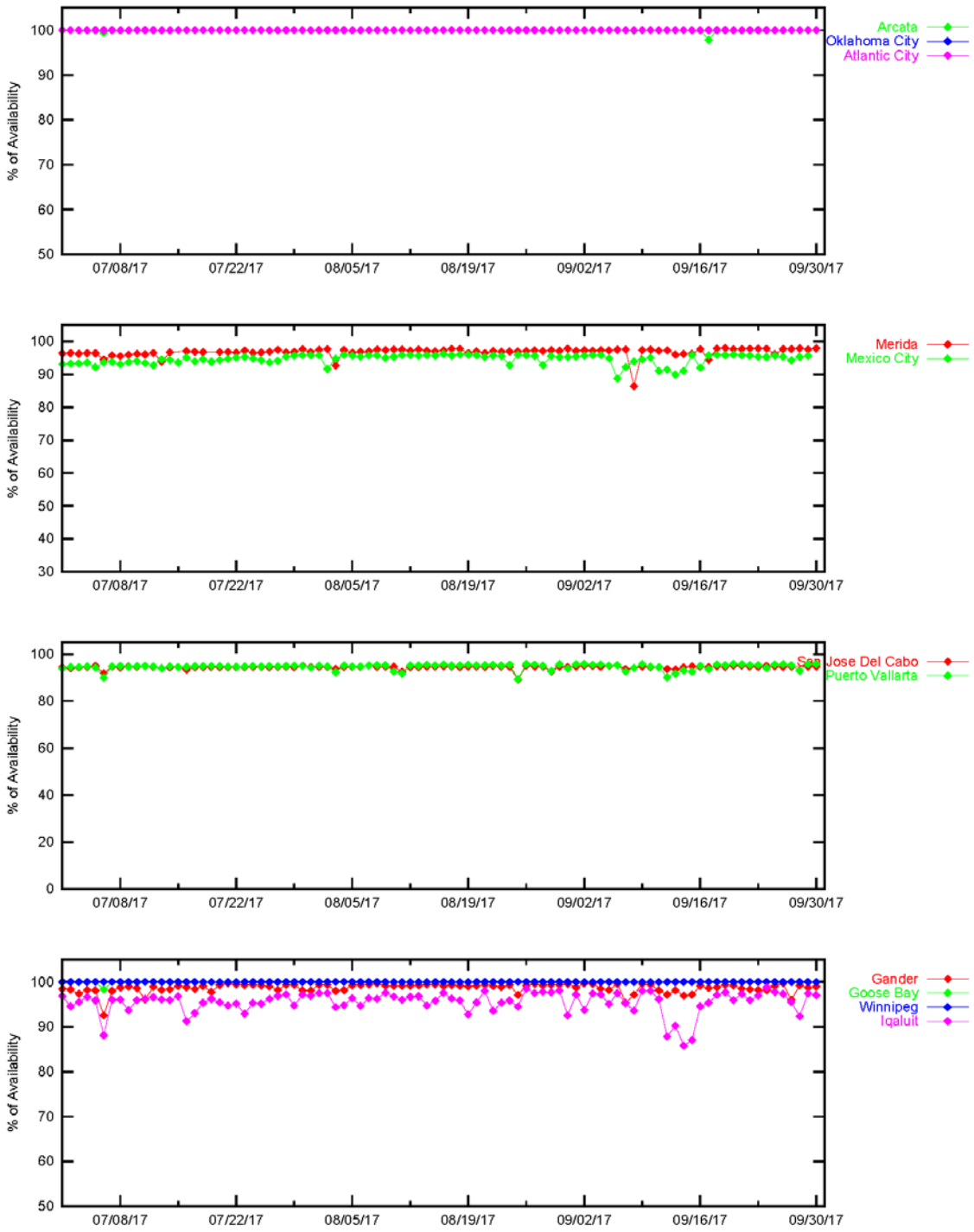


Figure 3-7 LPV Outages

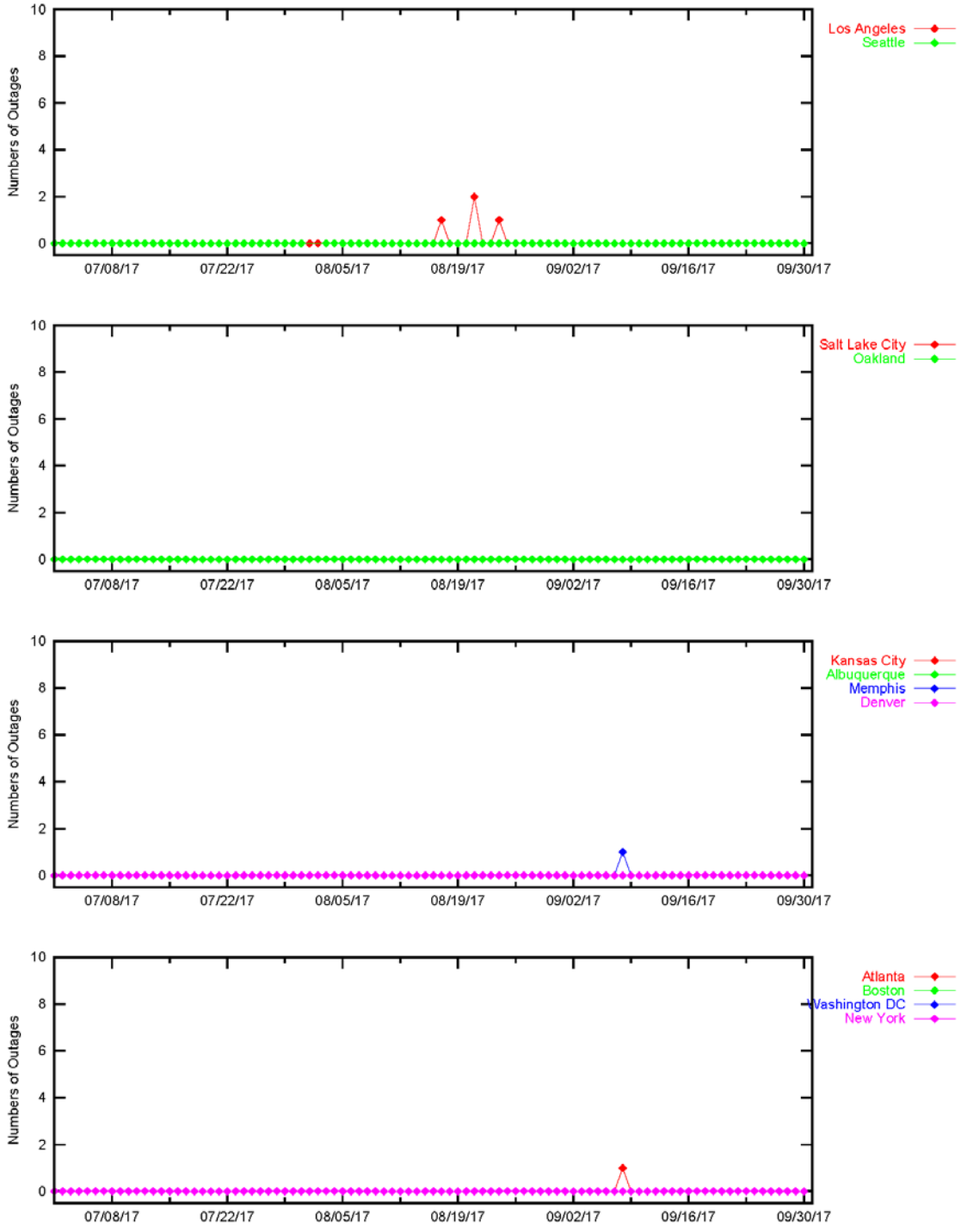


Figure 3-8 LPV Outages

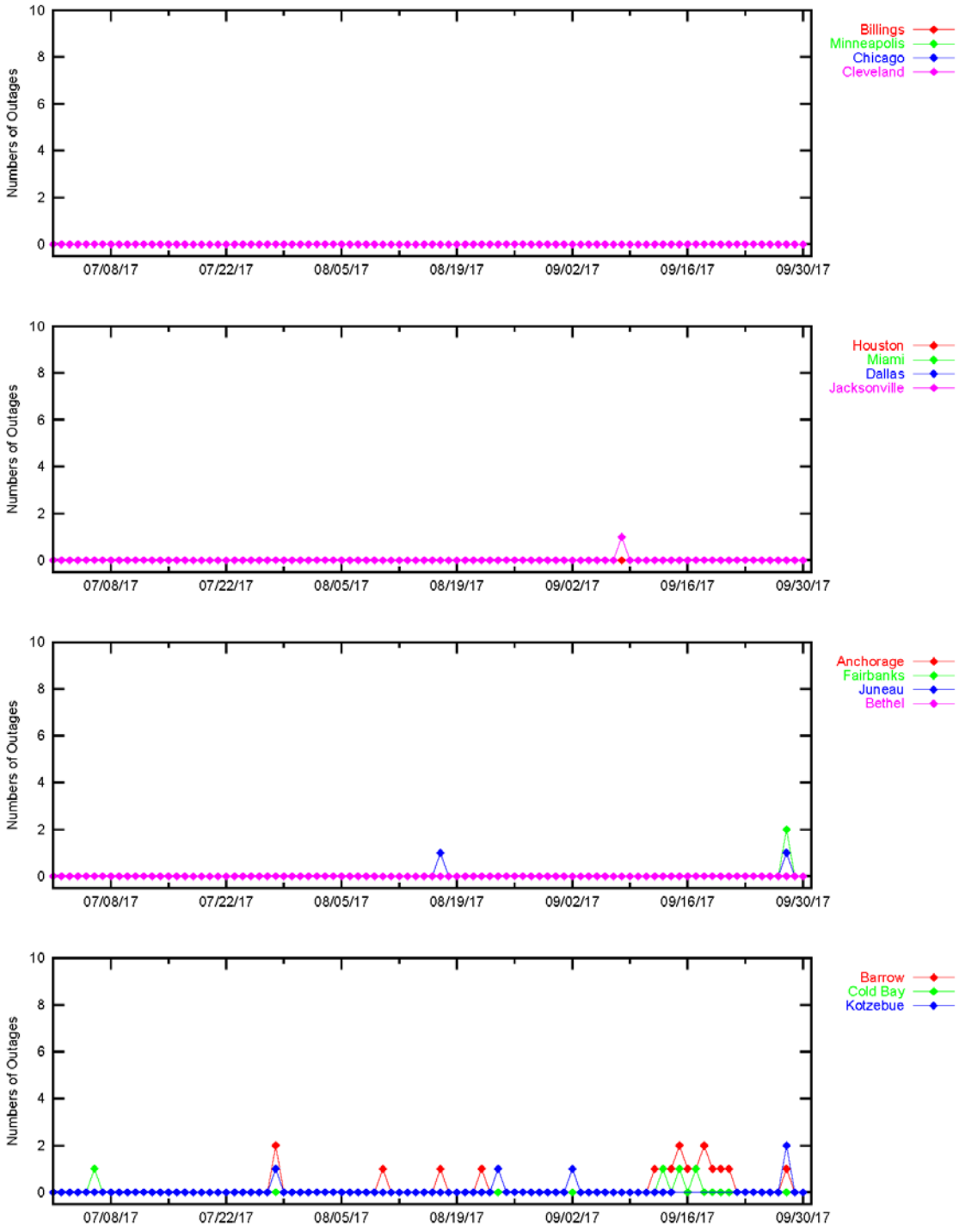


Figure 3-9 LPV Outages

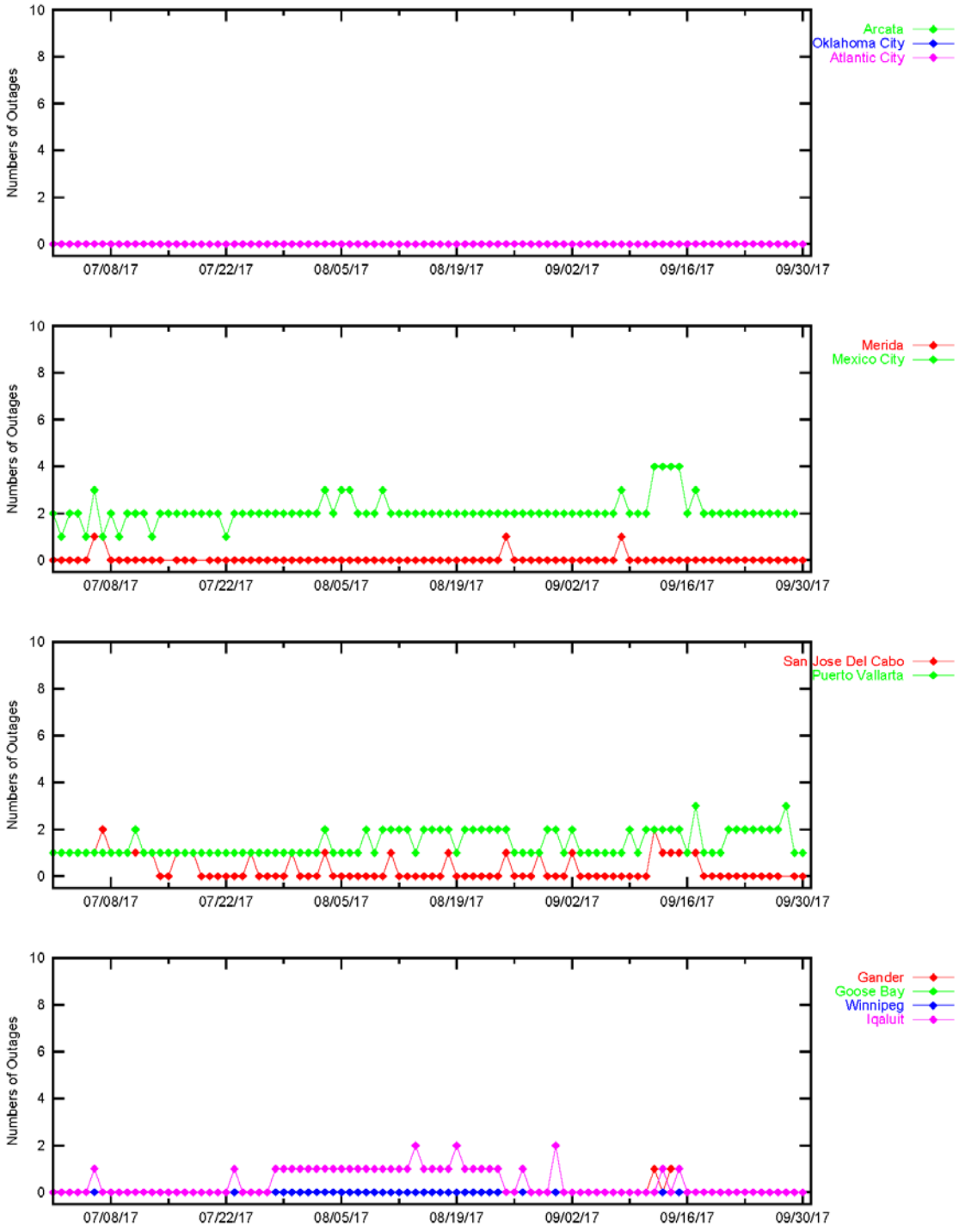


Figure 3-10 LPV200 Outages

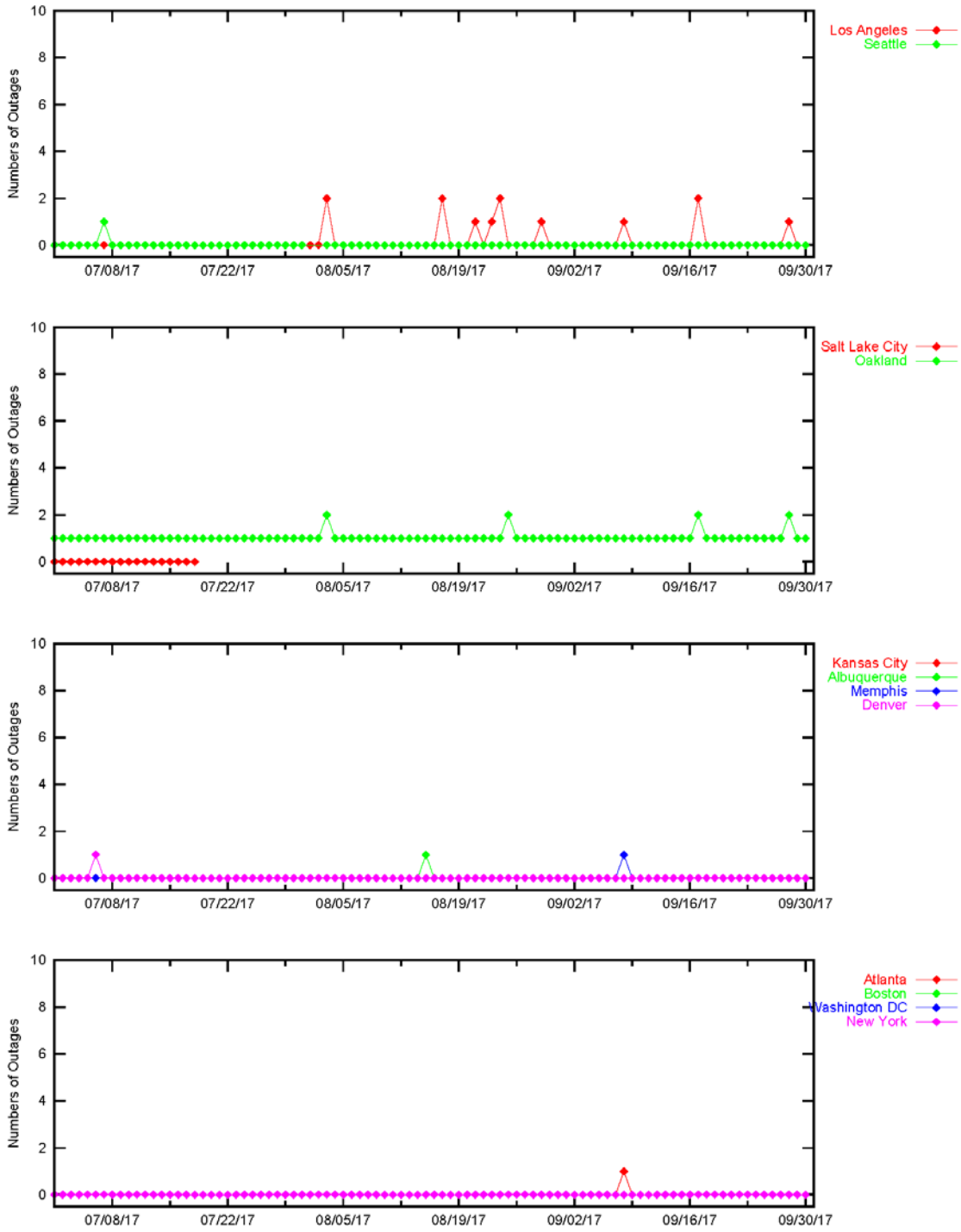


Figure 3-11 LPV200 Outages

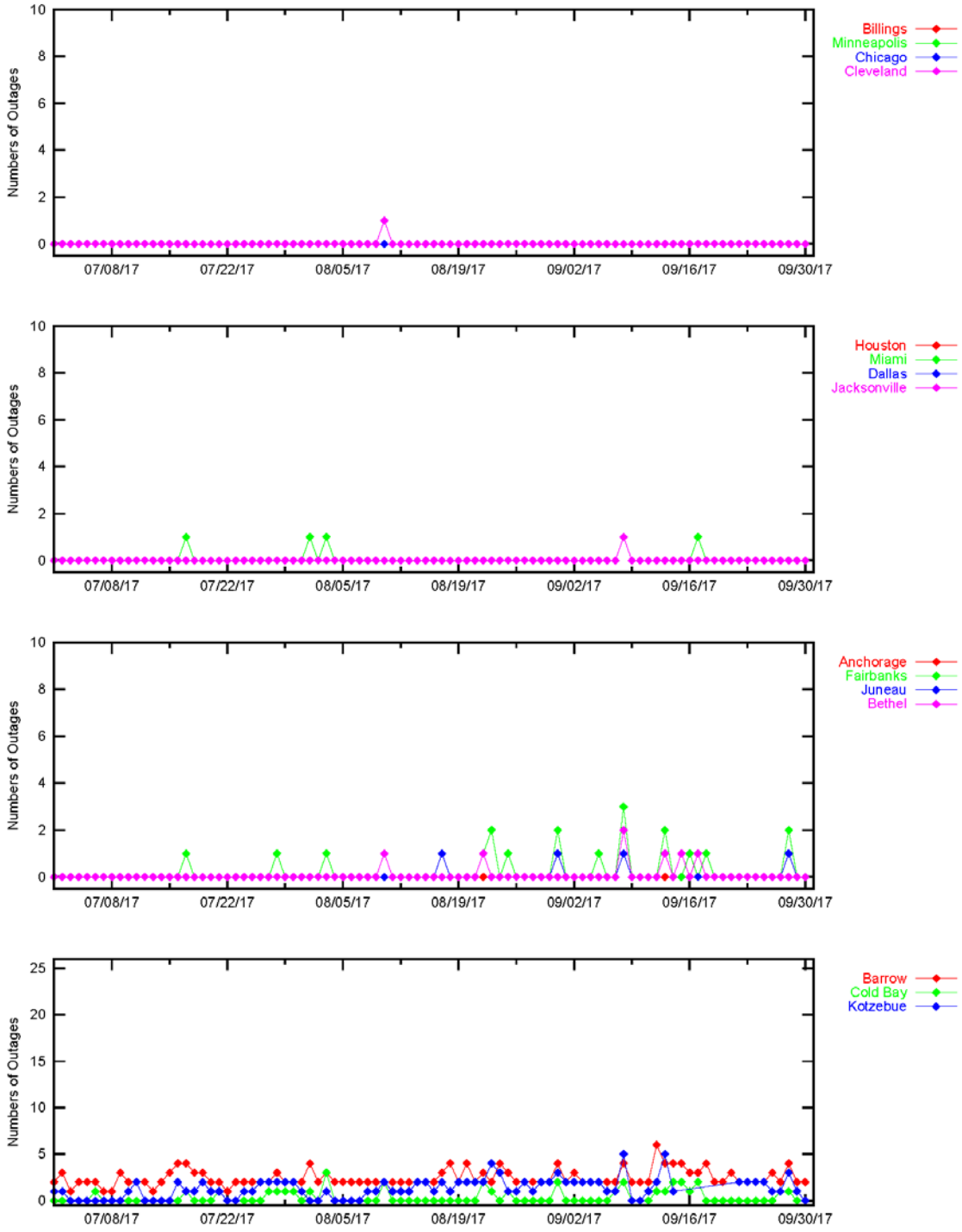
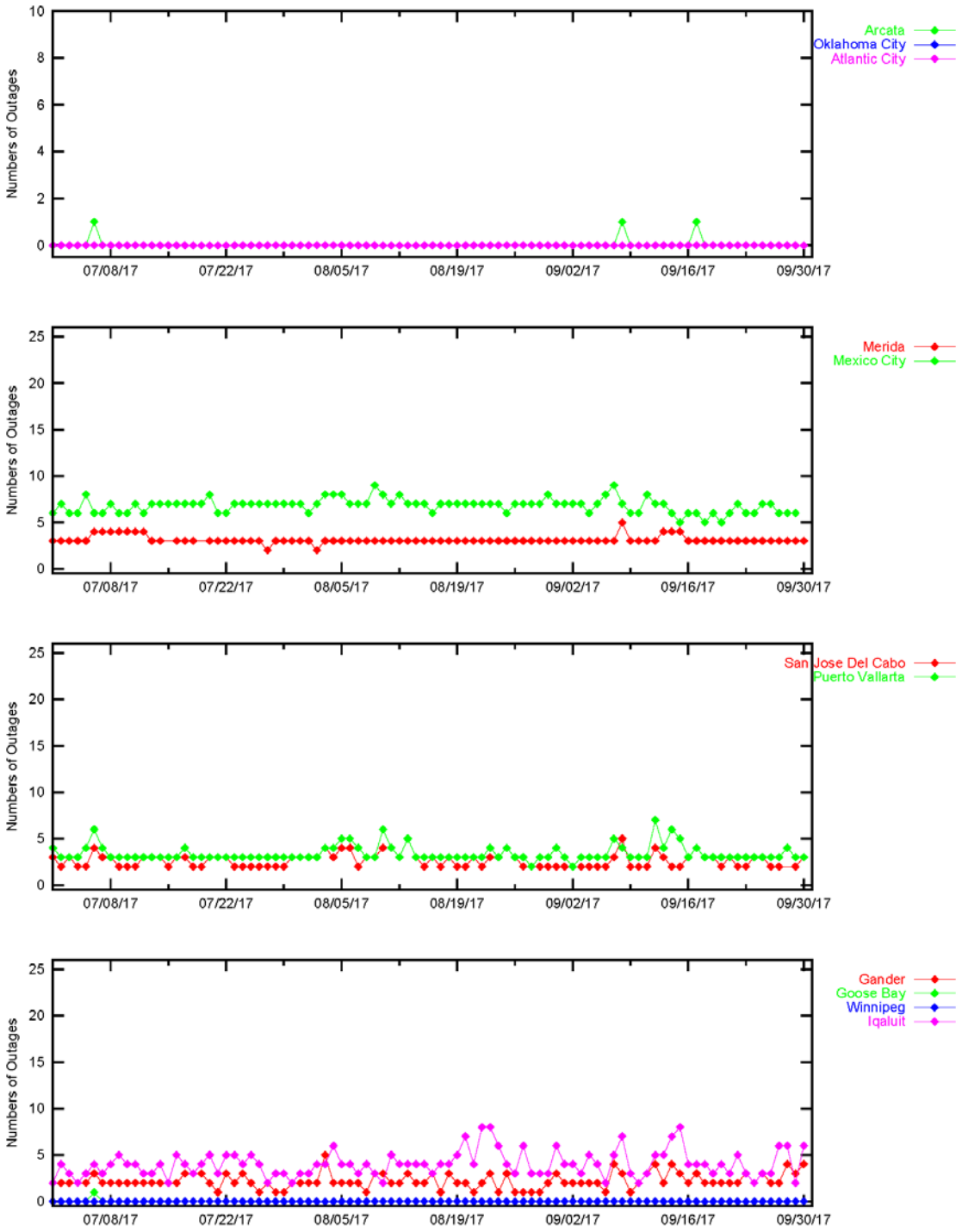


Figure 3-12 LPV200 Outages



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) (%)
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	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	1	0.000019
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	1	0.000019
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:

- July 6–Satellite maintenance elevated UDRES on PRN-2 and reduced LPV200 availability in CONUS, Alaska and Canada.
- July 11–A GUS switchover on CRE caused a reduction in LPV200 availability in Canada.
- July 13–Satellite maintenance elevated UDRES on PRN-5 and reduced LPV200 availability in CONUS and Canada.
- July 16–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in CONUS, Alaska, and Canada.
- July 17–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in CONUS, Alaska, and Canada.
- July 28–A GUS switchover on CRW reduced LPV200 availability in Alaska.
- July 31–August 2–A WRS outage at ZSE reduced LPV200 availability in CONUS.
- August 3–A GUS switchover on CRE reduced LPV200 availability in Alaska and Canada.
- August 3–Satellite maintenance elevated UDRES on PRN-25 and reduced LPV availability in CONUS. The elevated UDRES also reduced LPV200 availability in CONUS, Alaska and Canada.
- August 10–Satellite maintenance elevated UDRES on PRN-15 and reduced LPV200 availability in Alaska.
- August 21–24–A NOTAM was published for GPS testing. The period of testing was 8/7 - 8/21 and 8/24 - 8/27 from 0800Z-1300Z. Local RFI at Los Angeles caused a reduction and eventual loss of space vehicle (SV) tracking. On 8/21 the outage occurred from 08:15 GMT to 08:33 GMT. On 8/24, the outage occurred from 08:06 GMT to 08:07 GMT and from 08:41 GMT to 08:45 GMT. See DR 140
- August 22–Satellite maintenance elevated UDRES on PRN-29 and reduced LPV200 availability in Alaska and Canada.
- August 23–A GUS switchover on CRE reduced LPV200 availability in Alaska.
- August 24–A GUS switchover on CRW reduced LPV200 availability in Alaska and Canada.
- August 25–A GUS switchover on CRE reduced LPV200 availability in Canada.
- August 25–Satellite maintenance elevated UDRES on PRN-9 and reduced LPV200 availability in CONUS, Alaska and Canada.
- August 29–Satellite maintenance elevated UDRES on PRN-21 and reduced LPV200 availability in CONUS.
- August 31–September 1–Satellite maintenance elevated UDRES on PRN-5 and reduced LPV200 availability in Canada.
- August 31–L2 Carrier Phase Scintillation caused a GPS UDRE internal threshold trip on PRN-6. YFB WRS received bad L2 measurements and bumped UDRES on PRN-6 and reduced LPV200 availability in CONUS. See DR 137
- August 31–Geomagnetic activity elevated GIVE values, which reduced LPV200 availability in Alaska and Canada.
- September 2–A GUS switchover on CRW reduced LPV200 availability in Alaska and Canada.
- September 8–Geomagnetic activity elevated GIVE values, which reduced LPV availability in CONUS. The elevated GIVE values also reduced LPV200 availability in CONUS, Alaska and Canada.
- September 11–Missed Maneuvers caused an alert to Not-Monitored and raised UDRE on PRN-138 causing a reduction in the LPV200 availability in Canada.
- September 11–A GUS switchover on CRE reduced LPV200 availability in Alaska and Canada.
- September 12–Satellite maintenance elevated UDRES on PRN-7 and reduced LPV200 availability in Alaska and Canada.
- September 12–15–Satellite maintenance elevated UDRES on PRN-7 and reduced LPV200 availability in Alaska and Canada.
- September 13–Geomagnetic activity elevated GIVE values, which reduced LPV200 availability in Alaska and Canada.
- September 14–22–A WRS outage at OTZ reduced LPV200 availability in Alaska.
- September 15–Geomagnetic activity elevated GIVE values, which reduced LPV200 availability in Alaska and Canada.

- September 17–Satellite maintenance caused elevated UDRES on PRN-25 and reduced LPV200 availability in CONUS, Alaska and Canada.
- September 21–October 4–A WRS outage at ZSU reduced LPV200 availability in CONUS.
- September 27–Geomagnetic activity elevated GIVE values, which reduced LPV200 availability in Alaska and Canada.
- September 28–Geomagnetic activity elevated GIVE values, which reduced LPV200 availability in CONUS and 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

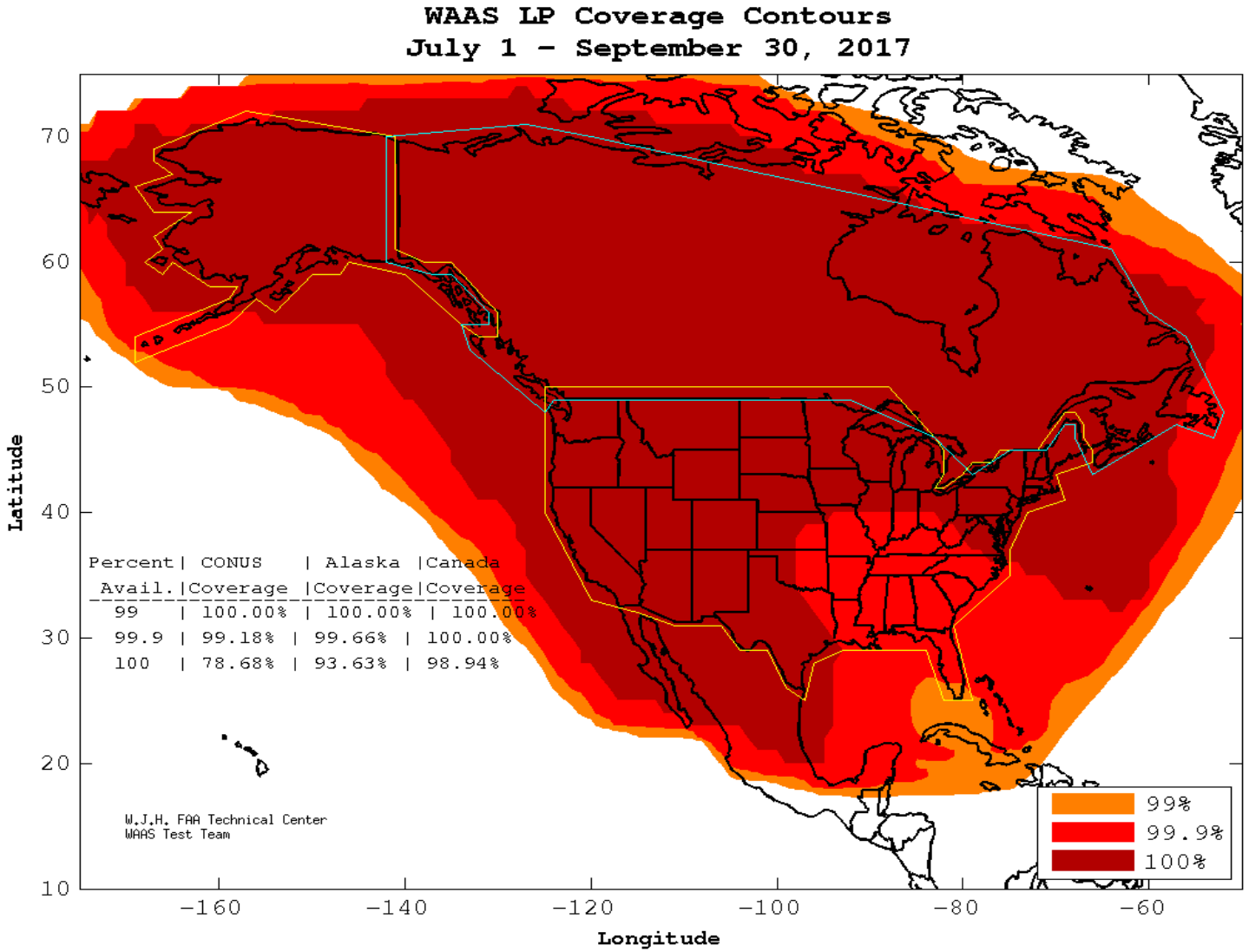


Figure 4-2 LPV North America Coverage for the Quarter

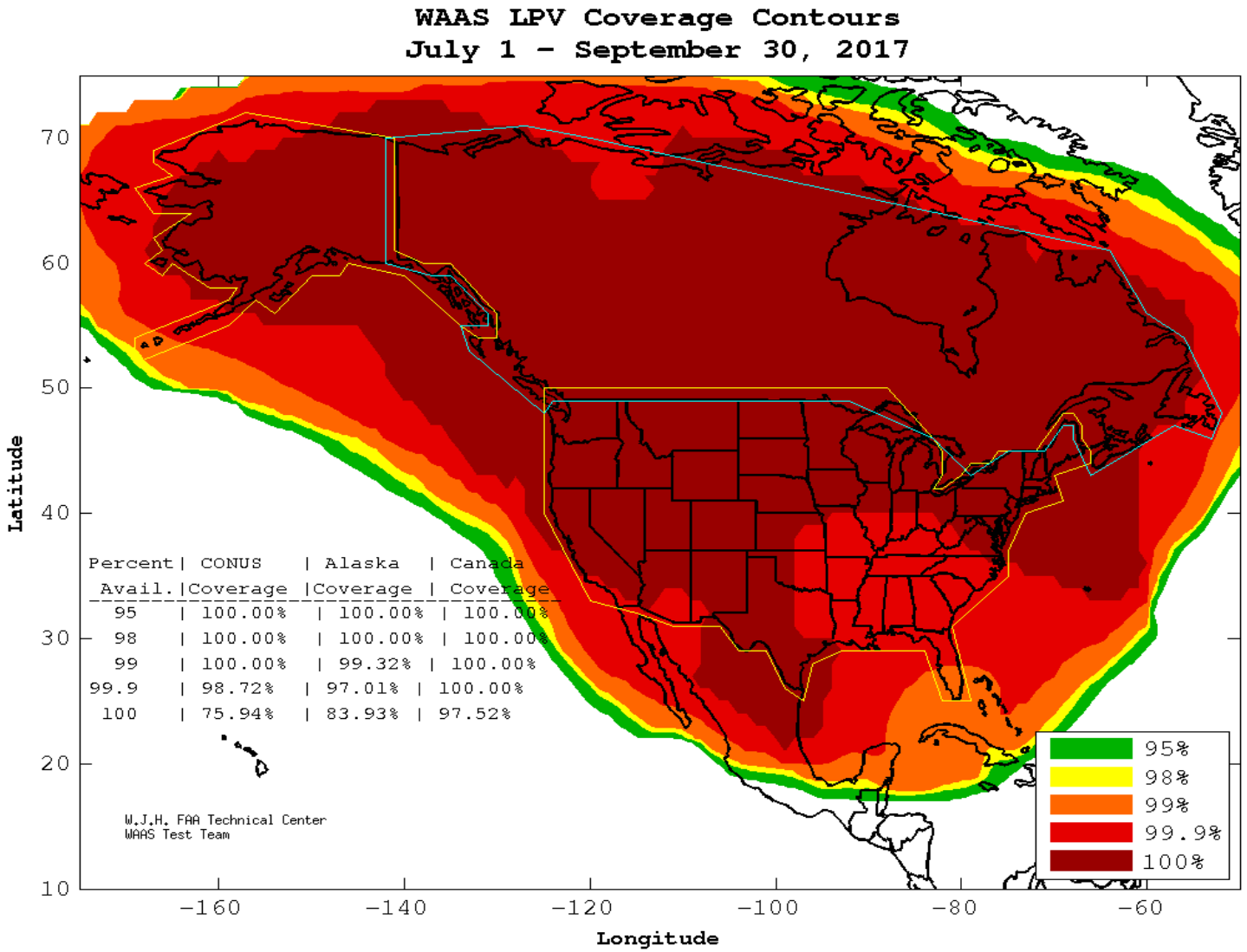


Figure 4-3 LPV200 North America Coverage for the Quarter

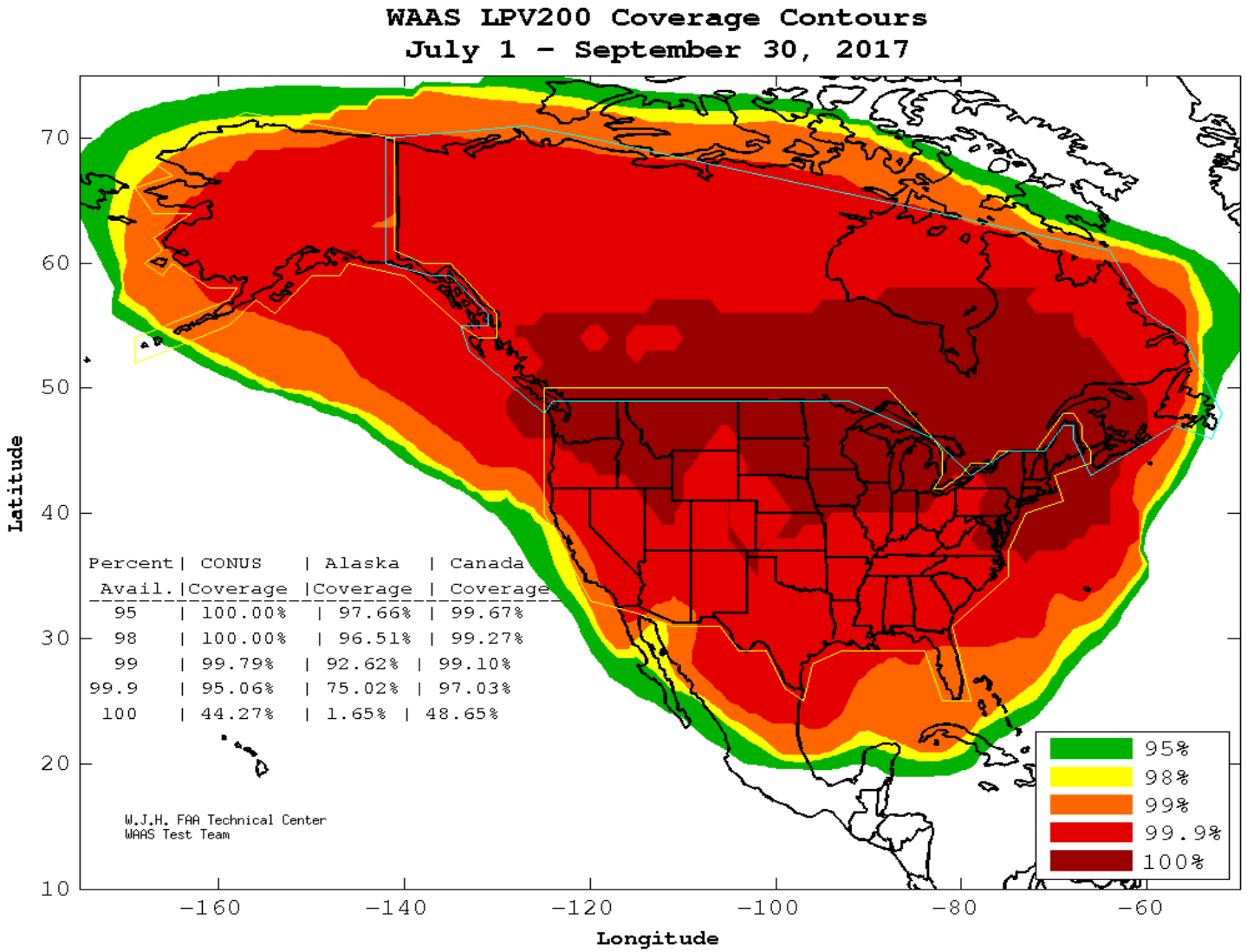


Figure 4-4 Daily LPV and LPV200 CONUS Coverage

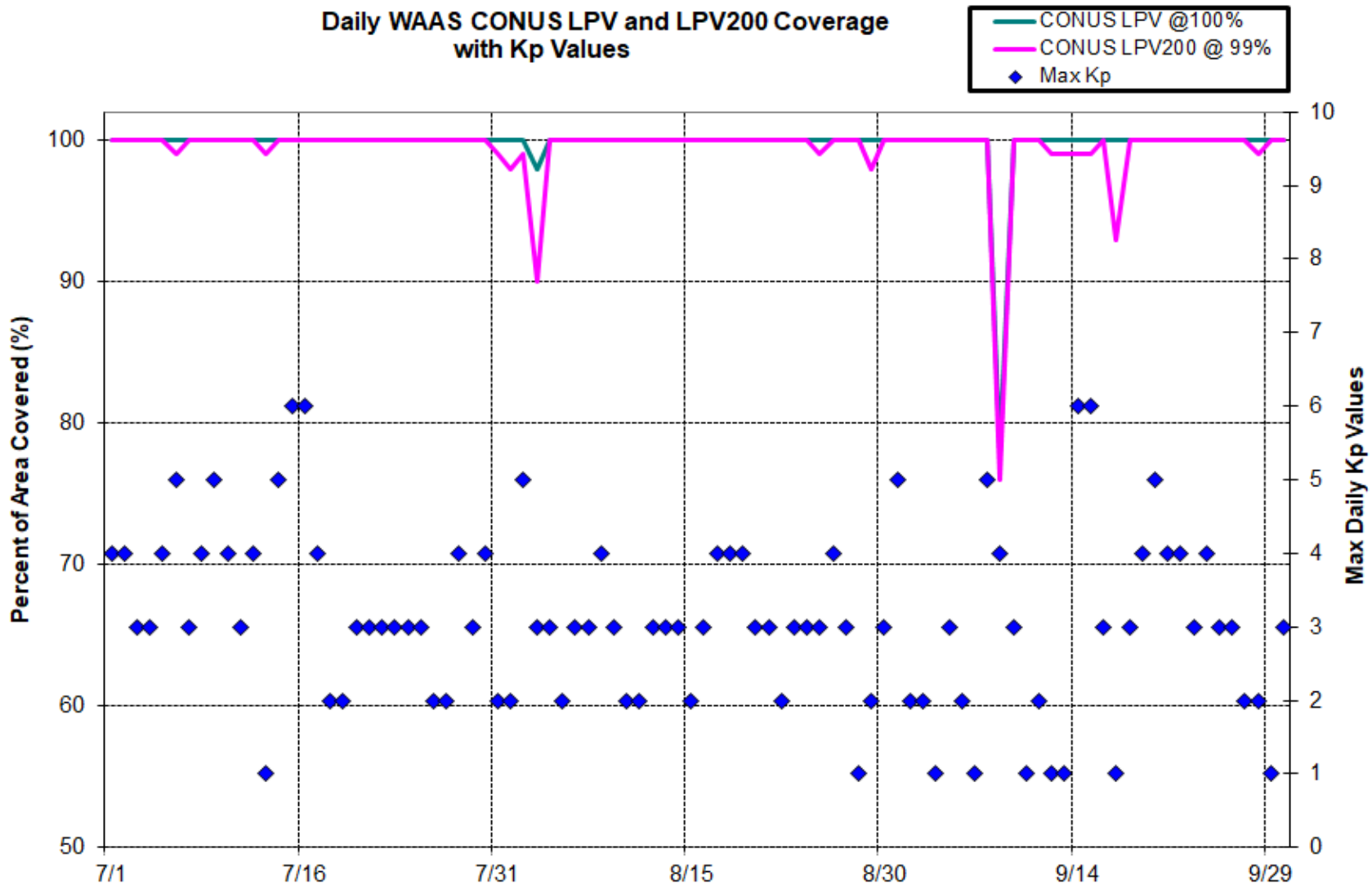


Figure 4-5 Daily LPV and LPV200 Alaska Coverage

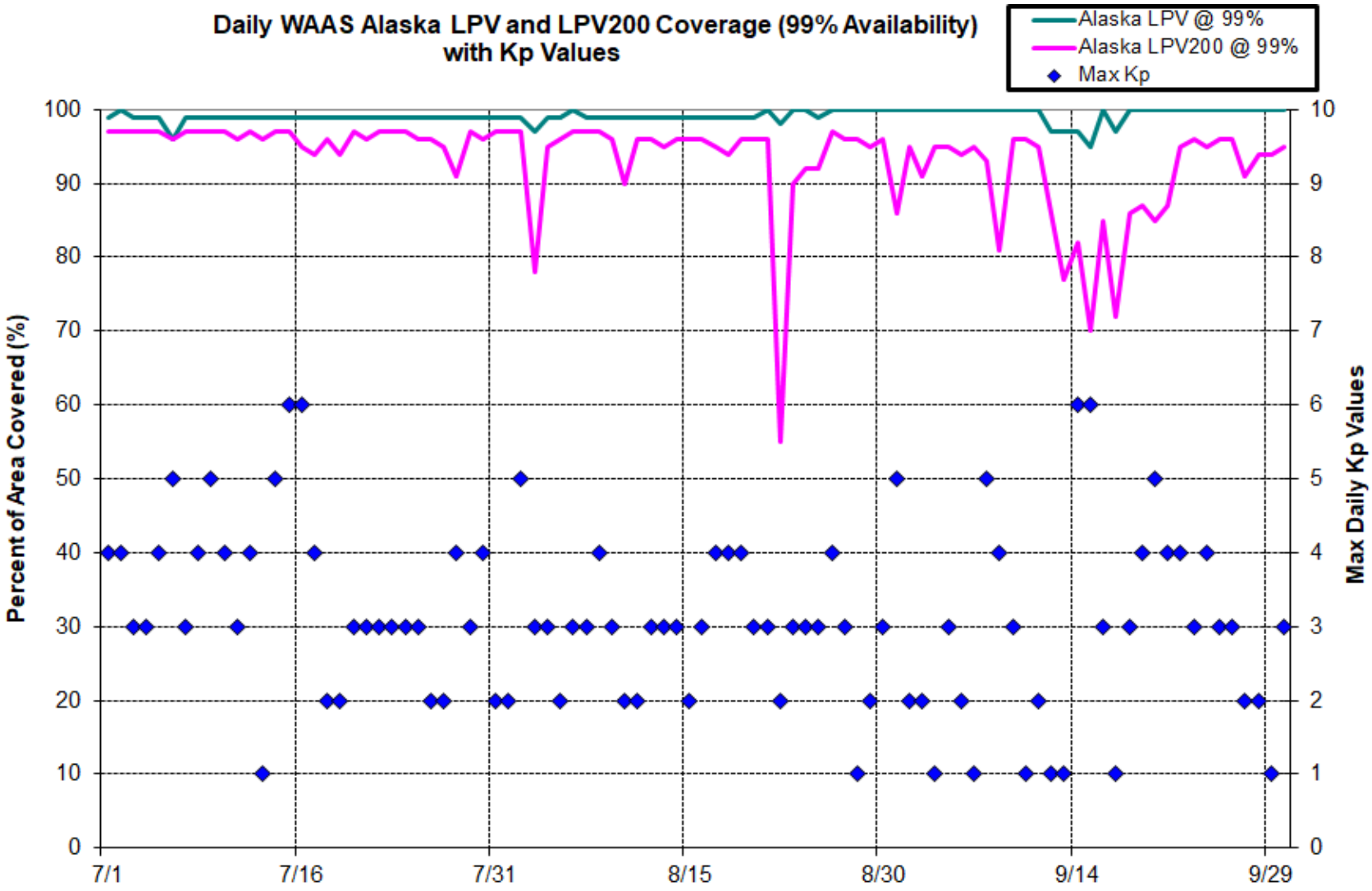
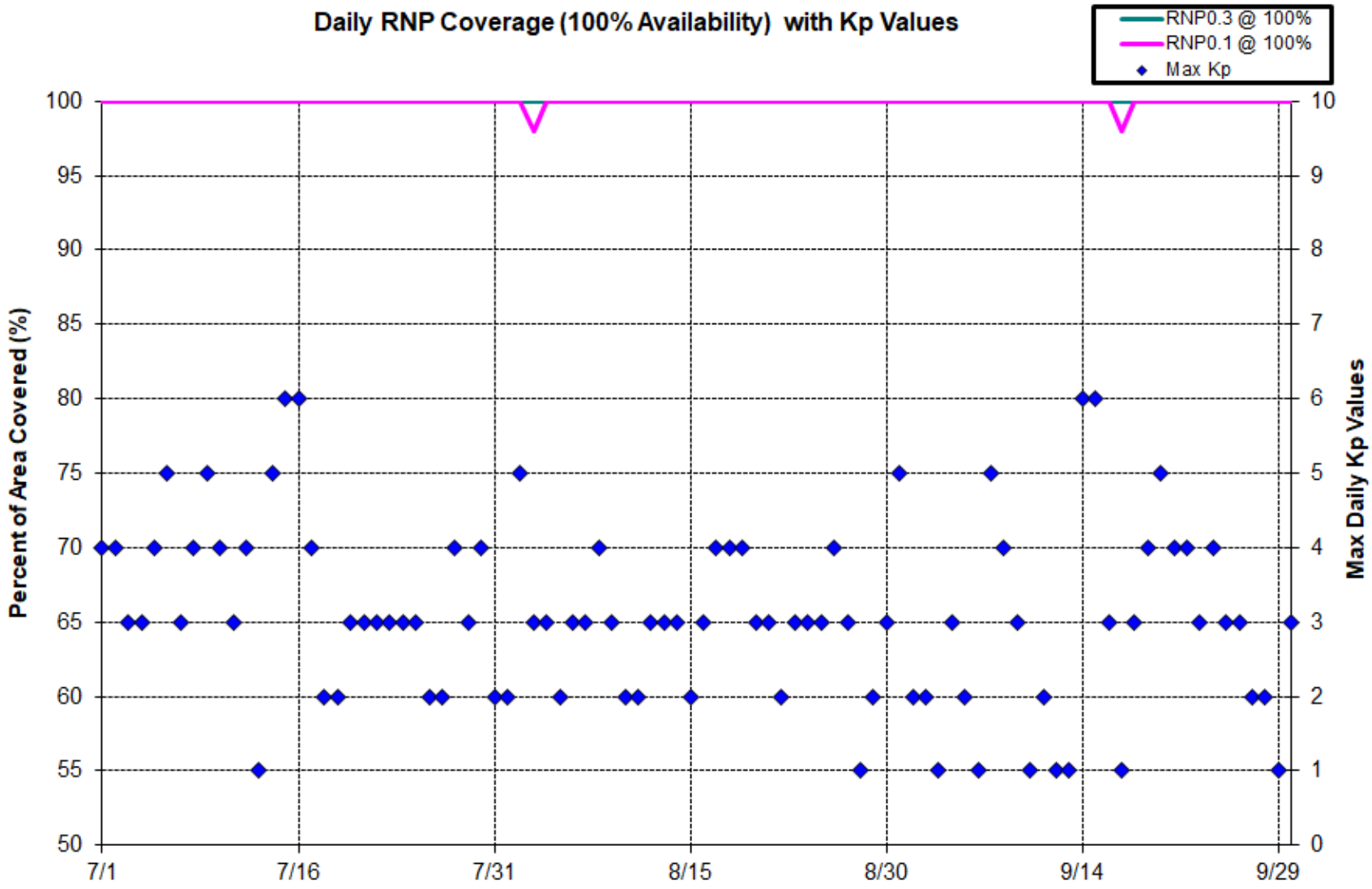


Figure 4-6 Daily RNP Coverage



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

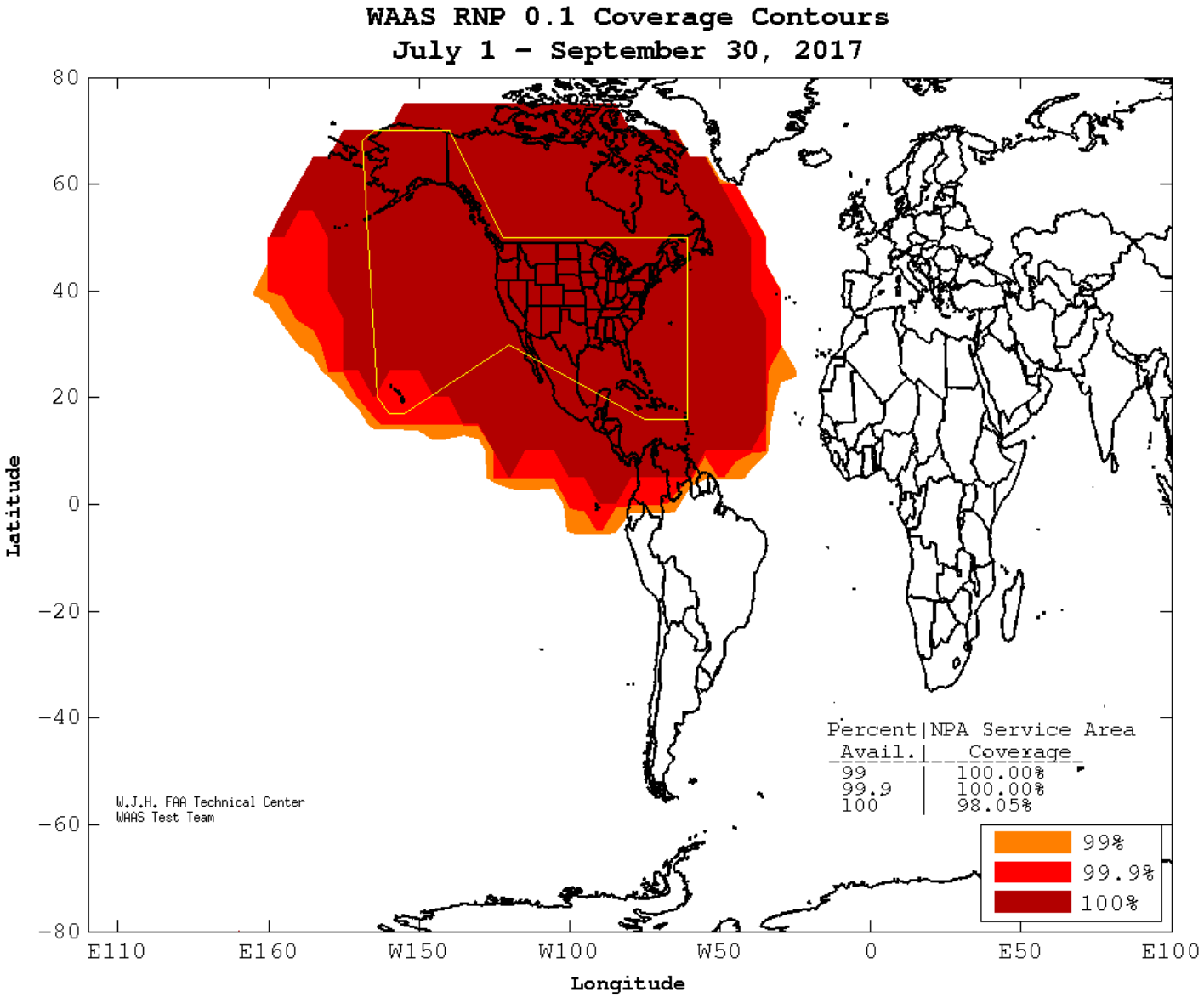


Figure 4-8 RNP 0.3 Coverage for the Quarter

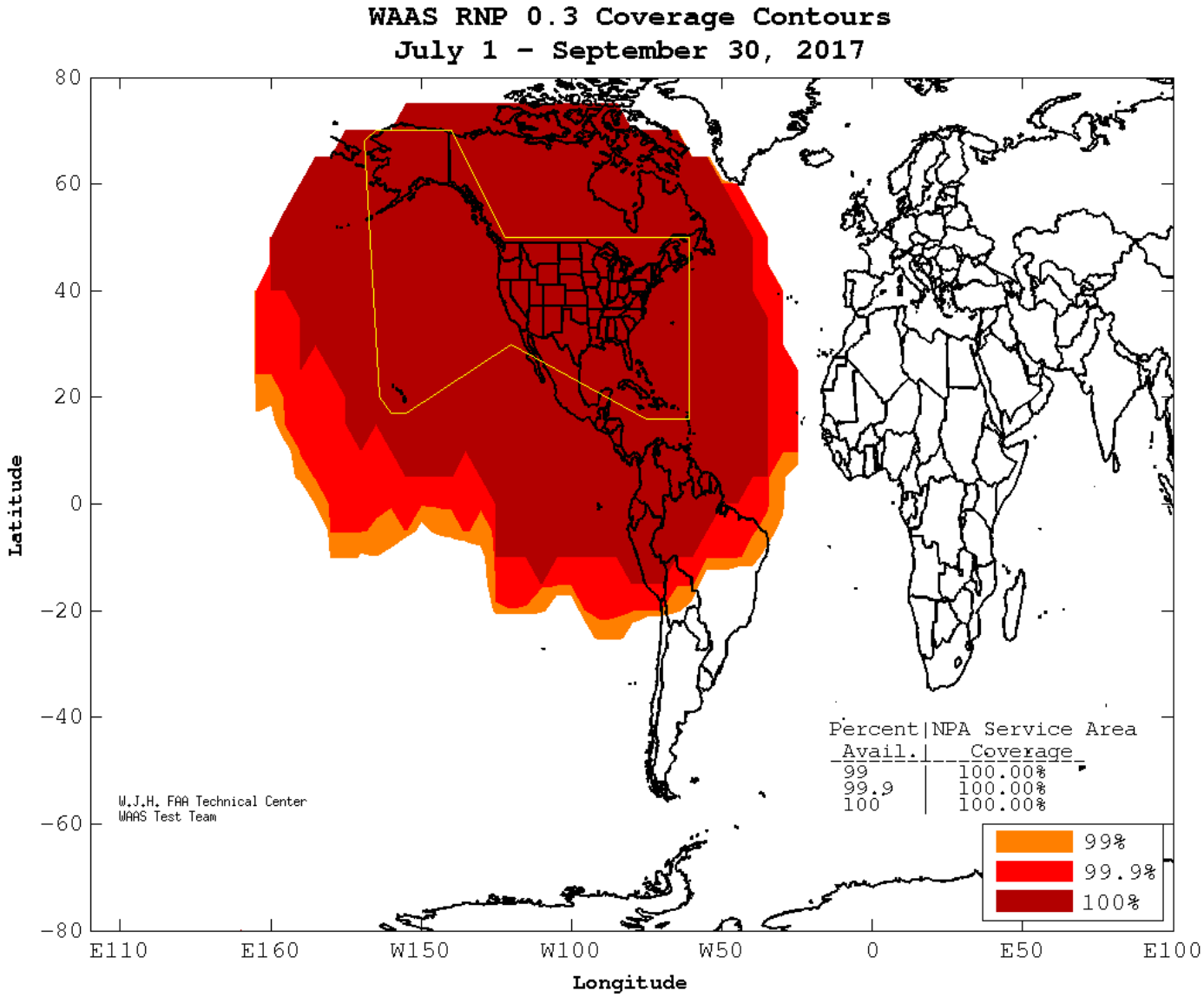
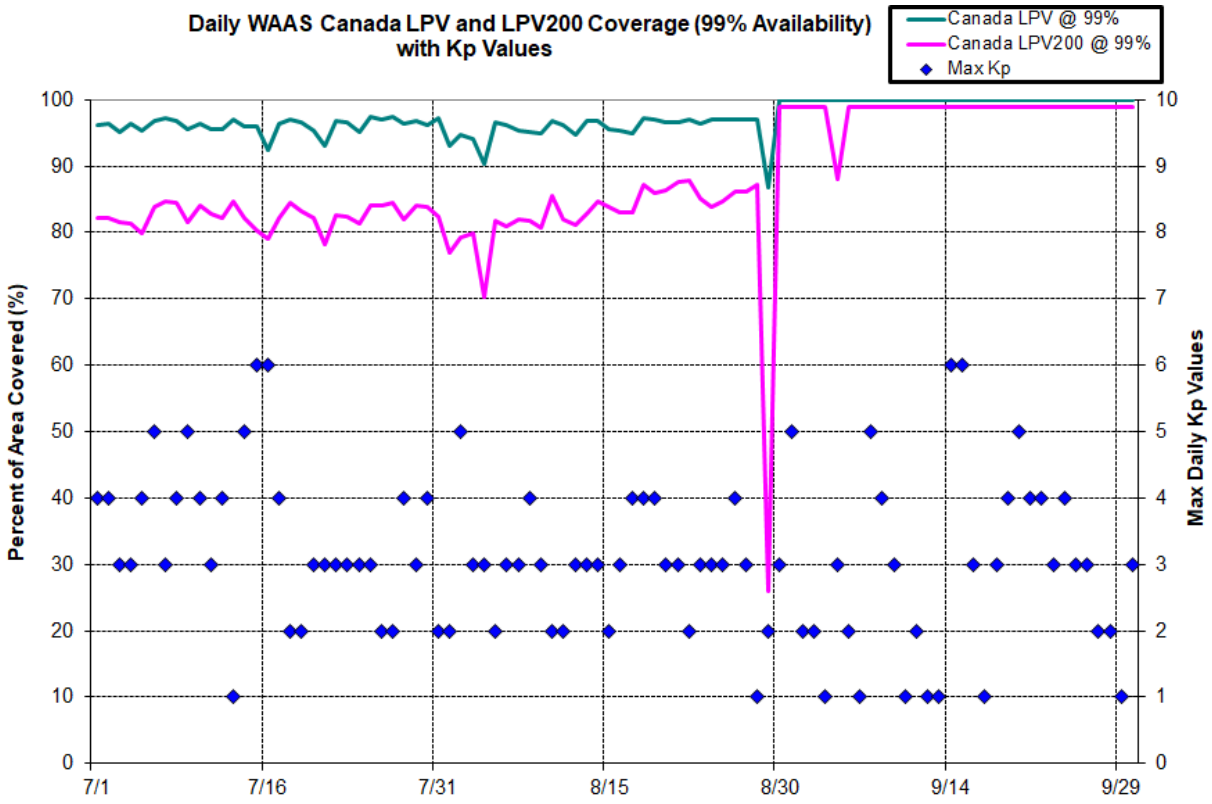


Figure 4-9 Daily LPV and LPV200 Canada Coverage



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:

- July 6–Satellite maintenance elevated UDRES on PRN-2 and reduced LPV200 coverage in CONUS, Alaska and Canada.
- July 11–A GUS switchover on CRE caused a reduction in LPV200 coverage in Canada.
- July 13–Satellite maintenance elevated UDRES on PRN-5 and reduced LPV200 coverage in CONUS and Canada.
- July 16–Geomagnetic activity elevated GIVE values which reduced LPV200 coverage in CONUS, Alaska, and Canada.
- July 17–Geomagnetic activity elevated GIVE values which reduced LPV200 coverage in CONUS, Alaska, and Canada.
- July 28–A GUS switchover on CRW reduced LPV200 coverage in Alaska.
- July 31–August 2–A WRS outage at ZSE reduced LPV200 coverage in CONUS.
- August 3–A GUS switchover on CRE reduced LPV200 coverage in Alaska and Canada.
- August 3–Satellite maintenance elevated UDRES on PRN-25 and reduced LPV coverage in CONUS. The elevated UDRES also reduced LPV200 coverage in CONUS, Alaska and Canada.
- August 10–Satellite maintenance elevated UDRES on PRN-15 and reduced LPV200 coverage in Alaska.
- August 21–24–A NOTAM was published for GPS testing. The period of testing was 8/7 - 8/21 and 8/24 - 8/27 from 0800Z-1300Z. Local RFI at Los Angeles caused a reduction and eventual loss of space vehicle (SV) tracking. On 8/21 the outage occurred from 08:15 GMT to 08:33 GMT. On 8/24, the outage occurred from 08:06 GMT to 08:07 GMT and from 08:41 GMT to 08:45 GMT. See DR 140
- August 22–Satellite maintenance elevated UDRES on PRN-29 and reduced LPV200 availability in Alaska and Canada.
- August 23–A GUS switchover on CRE reduced LPV200 availability in Alaska.
- August 24–A GUS switchover on CRW reduced LPV200 availability in Alaska and Canada.

- August 25–A GUS switchover on CRE reduced LPV200 availability in Canada.
- August 25–Satellite maintenance elevated UDRES on PRN-9 and reduced LPV200 August 22–Satellite maintenance elevated UDRES on PRN-29 and reduced LPV200 coverage in Alaska and Canada.
- August 23–A GUS switchover on CRE reduced LPV200 coverage in Alaska.
- August 24–A GUS switchover on CRW reduced LPV200 coverage in Alaska and Canada.
- August 25–A GUS switchover on CRE reduced LPV200 coverage in Canada.
- August 25–Satellite maintenance elevated UDRES on PRN-9 and reduced LPV200 coverage in CONUS, Alaska and Canada.
- August 29–Satellite maintenance elevated UDRES on PRN-21 and reduced LPV200 coverage in CONUS.
- August 31-September 1–Satellite maintenance elevated UDRES on PRN-5 and reduced LPV200 coverage in Canada.
- August 31–L2 Carrier Phase Scintillation caused a GPS UDRE internal threshold trip on PRN-6. YFB WRS received bad L2 measurements and bumped UDRES on PRN-6 and reduced LPV200 coverage in CONUS. See DR 137
- August 31–Geomagnetic activity elevated GIVE values, which reduced LPV200 coverage in Alaska and Canada.
- September 2–A GUS switchover on CRW reduced LPV200 coverage in Alaska and Canada.
- September 8–Geomagnetic activity elevated GIVE values, which reduced LPV coverage in CONUS. The elevated GIVE values also reduced LPV200 coverage in CONUS, Alaska and Canada.
- September 11–Missed Maneuvers caused an alert to Not-Monitored and raised UDRE on PRN-138 causing a reduction in the LPV200 coverage in Canada.
- September 11–A GUS switchover on CRE reduced LPV200 coverage in Alaska and Canada.
- September 12–Satellite maintenance elevated UDRES on PRN-7 and reduced LPV200 coverage in Alaska and Canada.
- September 12–15–Satellite maintenance elevated UDRES on PRN-7 and reduced LPV200 coverage in Alaska and Canada.
- September 13–Geomagnetic activity elevated GIVE values, which reduced LPV200 coverage in Alaska and Canada.
- September 14–22–A WRS outage at OTZ reduced LPV200 coverage in Alaska.
- September 15–Geomagnetic activity elevated GIVE values, which reduced LPV200 coverage in Alaska and Canada.
- September 17–Satellite maintenance caused elevated UDRES on PRN-25 and reduced LPV200 coverage in CONUS, Alaska and Canada.
- September 21–October 4–A WRS outage at ZSU reduced LPV200 coverage in CONUS.
- September 27–Geomagnetic activity elevated GIVE values, which reduced LPV200 coverage in Alaska and Canada.
- September 28–Geomagnetic activity elevated GIVE values, which reduced LPV200 coverage in CONUS and 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 2.97480202 at Puerto Vallarta 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	Safety Index		NUMBER OF HMIS
	Horizontal	Vertical	
Arcata	4.77742549	9.18516884	0
Atlantic City	4.88998711	7.91295698	0
Oklahoma City	11.110833	5.13445017	0
Albuquerque	6.90290784	4.06982834	0
Anchorage	7.49613812	3.56437204	0
Atlanta	9.6222744	10.4992526	0
Barrow	6.2589803	5.05887336	0
Bethel	6.63794532	8.3743893	0
Billings	7.28641073	4.91320072	0
Boston	5.918858	5.14225722	0
Chicago	3.56172304	5.59456706	0
Cleveland	6.91658707	7.05345912	0
Cold Bay	10.7203438	13.5585965	0
Dallas	5.7301522	4.44941681	0
Denver	5.39526138	6.68880734	0
Fairbanks	8.20417889	5.57135164	0
Gander	10.1240848	7.02849807	0
Goose Bay	9.85321101	7.12684366	0
Houston	12.0537593	3.98930481	0
Iqaluit	7.51953819	9.20620672	0
Jacksonville	24.8876835	6.19312858	0
Juneau	7.69504447	6.24764772	0
Kansas City	8.66907403	6.58735632	0
Kotzebue	5.40616662	3.4644562	0
Los Angeles	9.75521046	8.16987179	0
Memphis	8.10600779	4.82039911	0
Merida	11.7581878	7.26449136	0
Mexico City	6.80041365	6.33705028	0
Miami	12.3522763	7.53941041	0
Minneapolis	4.75532418	5.45720179	0
New York	8.88282078	5.6295977	0
Oakland	7.81456954	8.28199284	0
Puerto Vallarta	5.28414595	2.97480202	0
Salt Lake City	8.13100775	7.8802682	0
San Jose Del Cabo	6.84591359	8.67827576	0
Seattle	6.449375	6.80142857	0
Washington DC	9.78947368	6.8848392	0
Winnipeg	5.89744646	6.12143063	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

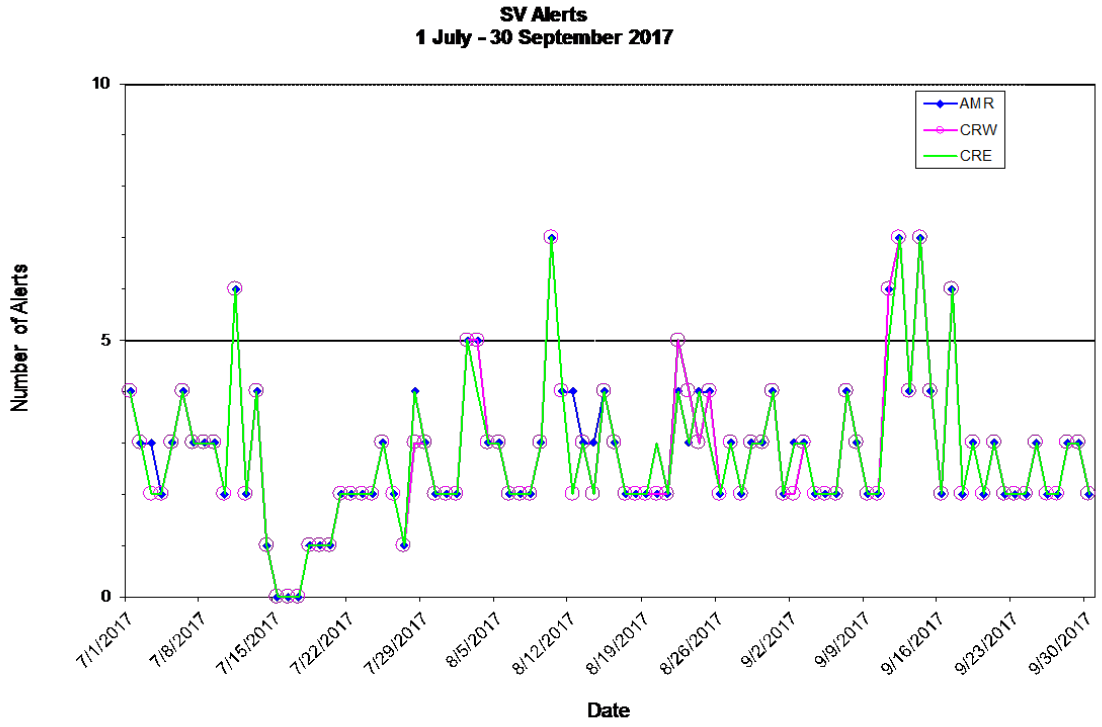
more than 12 seconds, the WAAS fast corrections can time out and cause a loss of continuity. Table 5-2 shows the total number of alerts and the average number of alerts per day.

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**AMR**	**CRW**	**CRE**	**AMR**	**CRW**	**CRE**
2	228	228	229	2.478	2.478	2.489
3	17	15	14	0.184	0.163	0.152
4	15	12	10	0.163	0.130	0.108
5	0	0	0	0.000	0.000	0.000
6	0	0	0	0.000	0.000	0.000
24	0	0	0	0.000	0.000	0.000
26	0	0	0	0.000	0.000	0.000
Total SV Alerts	260	255	253	2.826	2.771	2.750
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 (CRE, CRW, and AMR)

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 AMR 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–AMR

Message Type	**On Time**	**Late**	**Max Late Length (seconds)**
1	105658	6	2906
2	1324866	38	2898
3	1324186	74	2904
4	1324169	80	2904
7	98932	11	2940
9	93108	4	2975
10	98975	7	2952
17	31621	4	3055

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

SV	On Time	Late	Max Late Length (seconds)
1	48926	3	338
2	47419	1	257
3	48548	1	293
5	47685	0	0
6	47848	1	256
7	45522	1	179
8	48712	0	0
9	47511	0	0
10	47579	1	162
11	49116	0	0
12	47260	0	0
13	49180	0	0
14	46949	1	161
15	48235	0	0
16	48201	2	338
17	47467	3	257
18	47016	0	0
19	46370	1	330
20	47363	0	0
21	48105	0	0
22	48444	1	256
23	47434	0	0
24	49789	0	0
25	48544	1	162
26	48432	0	0
27	49410	0	0
28	47772	0	0
29	47465	1	161
30	47350	0	0
31	48058	2	344
32	46325	2	344

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

SV	On Time	Late	Max Late Length (seconds)
1	40185	2	312
2	38946	1	312
3	39924	5	416
5	39136	1	205
6	39217	1	313
7	37378	2	144
8	39987	2	128
9	39008	3	418
10	39030	1	126
11	40361	0	0
12	38842	2	3016
13	40415	1	154
14	38560	4	310
15	39610	0	0
16	39560	2	313
17	39005	3	418
18	38611	2	158
19	38038	4	418
20	38881	0	0
21	39530	1	130
22	39782	2	3016
23	38951	2	416
24	40915	1	122
25	39873	1	413
26	39780	2	209
27	40591	0	0
28	39246	0	0
29	38980	2	205
30	38893	2	134
31	39426	2	413
32	38038	3	312
135	76357	6	3018
138	76191	6	3019

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27579	10	3456
0	1	27583	10	3168
0	2	27580	10	3168
1	0	27572	10	3168
1	1	27581	9	3180
1	2	27593	9	3175
1	3	27579	7	3174
1	4	27585	10	3168
2	0	27577	10	3181
2	1	27593	8	3168
2	2	27582	7	3168
2	3	27586	6	3168
2	4	27591	10	3168
3	0	27584	9	3168
3	1	27570	7	3168
3	2	27589	12	3168
9	0	27580	8	3168
9	1	27594	7	3168
9	2	27586	10	3168
9	3	27572	12	3168
9	4	27584	8	3168
9	5	27584	7	3168
9	6	27571	9	3168

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

Band	On Time	Late	Max Late Length (seconds)
0	36012	5	3101
1	36030	4	3137
2	36001	5	3043
3	35975	4	3024
9	36009	6	3007

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

Type	On Time	Late	Max Late Length (seconds)
1	100608	3	160
2	1325436	25	39
3	1324752	60	39
4	1324738	64	36
7	94375	13	192
9	93148	1	171
10	94351	5	133
17	31181	1	396

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

SV	On Time	Late	Max Late Length (seconds)
1	48955	0	0
2	47419	0	0
3	48586	1	161
5	47686	0	0
6	47858	1	161
7	45522	1	179
8	48716	1	180
9	47507	1	151
10	47627	0	0
11	49153	0	0
12	47298	0	0
13	49175	0	0
14	47029	0	0
15	48232	1	176
16	48197	0	0
17	47510	0	0
18	47048	0	0
19	46415	0	0
20	47362	0	0
21	48099	1	161
22	48488	0	0
23	47464	0	0
24	49827	0	0
25	48592	0	0
26	48472	1	166
27	49403	0	0
28	47767	0	0
29	47470	0	0
30	47341	1	176
31	48088	0	0
32	46395	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40243	1	162
2	38953	0	0
3	39967	0	0
5	39145	1	212
6	39229	1	210
7	37395	1	126
8	39992	3	206
9	39013	2	206
10	39057	0	0
11	40389	1	144
12	38850	0	0
13	40417	4	212
14	38610	2	210
15	39596	0	0
16	39563	0	0
17	39045	1	208
18	38642	1	149
19	38073	1	208
20	38872	0	0
21	39553	1	212
22	39805	1	132
23	38990	0	0
24	40938	2	154
25	39924	0	0
26	39832	0	0
27	40568	3	167
28	39242	2	210
29	39013	0	0
30	38880	0	0
31	39475	0	0
32	38093	0	0
135	76372	1	152
138	76196	3	4373

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27603	2	337
0	1	27591	3	301
0	2	27616	6	396
1	0	27594	7	400
1	1	27601	8	407
1	2	27599	2	401
1	3	27598	3	401
1	4	27600	1	401
2	0	27603	2	397
2	1	27604	1	371
2	2	27601	3	389
2	3	27606	2	384
2	4	27598	2	358
3	0	27599	4	577
3	1	27581	5	579
3	2	27611	4	577
9	0	27609	2	577
9	1	27598	2	354
9	2	27613	3	359
9	3	27611	2	305
9	4	27609	0	0
9	5	27591	2	301
9	6	27595	1	577

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

Band	On Time	Late	Max Late Length (seconds)
0	35356	1	417
1	35349	1	314
2	35312	2	474
3	35323	0	0
9	35342	1	311

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

Type	On Time	Late	Max Late Length (seconds)
1	106515	1	181
2	1325438	25	25
3	1324748	62	25
4	1324736	66	22
7	99582	3	173
9	93148	1	178
10	99772	2	131
17	31659	2	458

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

SV	On Time	Late	Max Late Length (seconds)
1	48956	0	0
2	47419	1	167
3	48584	0	0
5	47687	0	0
6	47856	0	0
7	45519	1	179
8	48717	0	0
9	47510	0	0
10	47621	0	0
11	49143	0	0
12	47305	0	0
13	49184	0	0
14	47023	1	166
15	48238	0	0
16	48204	0	0
17	47509	0	0
18	47052	0	0
19	46413	0	0
20	47366	0	0
21	48106	0	0
22	48488	0	0
23	47470	0	0
24	49835	0	0
25	48589	0	0
26	48478	0	0
27	49405	0	0
28	47766	0	0
29	47470	1	166
30	47340	0	0
31	48104	0	0
32	46384	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40228	0	0
2	38952	0	0
3	39972	0	0
5	39139	0	0
6	39228	0	0
7	37377	1	166
8	39993	0	0
9	39024	2	208
10	39061	0	0
11	40379	1	144
12	38849	0	0
13	40390	0	0
14	38624	1	124
15	39606	1	206
16	39576	0	0
17	39039	0	0
18	38635	1	155
19	38078	0	0
20	38876	1	208
21	39540	2	206
22	39807	1	208
23	38983	1	206
24	40944	1	128
25	39916	0	0
26	39826	1	208
27	40580	0	0
28	39236	1	124
29	39012	1	176
30	38879	1	206
31	39449	1	176
32	38116	0	0
135	76399	3	208
138	76219	2	160

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27597	6	411
0	1	27582	7	581
0	2	27584	10	576
1	0	27593	7	319
1	1	27596	6	579
1	2	27598	9	312
1	3	27591	4	336
1	4	27604	3	348
2	0	27594	10	307
2	1	27610	5	400
2	2	27596	3	395
2	3	27594	8	532
2	4	27609	4	525
3	0	27588	5	529
3	1	27584	6	430
3	2	27615	3	435
9	0	27590	3	431
9	1	27611	5	577
9	2	27588	8	576
9	3	27583	6	418
9	4	27592	5	412
9	5	27600	5	412
9	6	27607	7	576

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

Band	On Time	Late	Max Late Length (seconds)
0	36121	0	0
1	36065	0	0
2	36099	2	385
3	36062	2	451
9	36155	0	0

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.

No satellite glitches were visible to WAAS during the quarter.

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 3.29 Sigma Bounding

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
SV ↓	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)
1*	0.922	100	1.222	100	1.114	100	0.669	100	1.127	100	0.738	100
2	0.917	100	1.516	100	1.253	100	1.227	100	1.478	100	1.388	100
3*	0.692	100	1.544	100	1.734	100	0.884	100	1.229	100	1.100	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.988	100	1.100	100	1.500	100	1.483	100	1.054	100	0.916	100
6*	0.796	100	0.875	100	1.369	100	0.906	100	1.586	100	0.894	100
7	0.960	100	1.102	100	0.941	100	1.451	100	1.181	100	0.875	100
8*	1.136	100	1.308	100	1.082	100	1.252	100	1.347	100	0.836	100
9*	1.222	100	1.365	100	1.242	100	1.237	100	1.252	100	0.779	100
10	1.020	100	1.687	100	0.895	100	1.271	100	1.009	100	1.073	100
11	1.125	100	1.592	100	1.166	100	1.254	100	1.247	100	1.186	100
12	1.490	100	1.447	100	1.142	100	1.330	100	1.171	100	1.109	100
13	1.492	100	1.249	100	1.391	100	1.273	100	1.090	100	0.796	100
14	1.083	100	1.473	100	0.937	100	1.285	100	0.994	100	1.404	100
15	1.467	100	1.231	100	1.680	100	1.247	100	1.090	100	0.847	100
16	0.877	100	1.041	100	1.002	100	1.149	100	1.118	100	1.006	100
17	1.125	100	1.390	100	0.797	100	1.179	100	1.466	100	0.605	100
18	1.086	100	1.268	100	1.173	100	1.354	100	1.176	100	0.644	100
19	0.879	100	1.393	100	0.810	100	1.089	100	1.474	100	2.071	100
20	0.936	100	1.389	100	1.199	100	1.222	100	1.597	100	1.845	100
21	0.890	100	1.703	100	1.549	100	1.146	100	1.163	100	0.804	100
22	1.543	100	1.002	100	1.167	100	1.365	100	1.089	100	1.101	100
23	0.895	100	1.174	100	0.916	100	1.226	100	1.562	100	0.923	100
24*	1.025	100	1.022	100	1.513	100	1.565	100	0.939	100	1.518	100
25*	1.175	100	1.218	100	0.935	100	1.265	100	1.675	100	1.349	100
26*	1.085	100	1.260	100	1.267	100	1.271	100	1.062	100	0.984	100
27*	1.669	100	0.973	100	0.949	100	0.886	100	1.091	100	0.751	100
28	1.330	100	1.824	100	1.060	100	1.673	100	1.202	100	0.867	100
29	1.326	100	1.010	100	1.108	100	1.443	100	1.128	100	1.581	100
30*	1.401	100	1.094	100	1.011	100	1.293	100	1.034	100	0.848	100
31	0.781	100	0.853	100	1.072	100	1.161	100	1.101	100	0.768	100
32	1.271	100	1.248	100	1.208	100	1.207	100	1.240	100	1.247	100
135	2.303	100	2.831	100	1.897	100	1.478	100	2.217	100	1.572	100
138	1.527	100	1.343	100	1.646	100	1.439	100	1.747	100	1.332	100

***Note: Reduced range 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	
SV ↓	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)	0.95 Range Error	3.29 Sigma Bounding(%)
1*	0.726	100	0.835	100	1.066	100	1.412	100	1.931	100	1.127	100
2	1.495	100	1.400	100	1.301	100	1.444	100	1.407	100	1.061	100
3*	0.874	100	1.163	100	1.480	100	1.230	100	1.615	100	1.549	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.974	100	1.258	100	1.317	100	2.023	100	1.621	100	1.114	100
6*	0.940	100	2.171	100	1.705	100	1.428	100	1.598	100	1.256	100
7	0.678	100	1.726	100	1.015	100	0.980	100	1.462	100	0.843	100
8*	0.903	100	1.267	100	1.363	100	1.256	100	1.762	100	1.257	100
9*	0.993	100	0.869	100	0.906	100	1.257	100	1.544	100	0.901	100
10	1.889	100	1.144	100	0.791	100	0.840	100	1.155	100	0.747	100
11	1.277	100	1.575	100	1.131	100	1.358	100	1.653	100	1.170	100
12	1.156	100	1.172	100	1.047	100	1.133	100	1.260	100	1.012	100
13	1.220	100	1.353	100	1.459	100	1.385	100	1.087	100	1.035	100
14	0.980	100	0.961	100	1.162	100	1.894	100	1.108	100	0.915	100
15	1.176	100	1.185	100	1.107	100	1.261	100	1.457	100	1.280	100
16	1.417	100	0.911	100	1.218	100	1.396	100	1.549	100	1.008	100
17	2.178	100	1.358	100	0.781	100	0.992	100	1.226	100	0.793	100
18	0.846	100	0.984	100	1.189	100	1.297	100	1.194	100	0.995	100
19	1.211	100	1.201	100	1.025	100	1.068	100	1.342	100	0.901	100
20	1.634	100	1.225	100	1.086	100	1.353	100	1.250	100	1.026	100
21	0.787	100	0.991	100	1.006	100	1.191	100	1.137	100	1.503	100
22	1.882	100	1.331	100	1.038	100	1.004	100	1.433	100	0.888	100
23	0.901	100	1.118	100	1.029	100	0.948	100	1.938	100	0.823	100
24*	0.842	100	0.740	100	1.398	100	1.413	100	1.196	100	1.011	100
25*	1.335	100	0.964	100	1.071	100	1.164	100	1.444	100	1.521	100
26*	1.601	100	1.046	100	1.216	100	1.224	100	1.892	100	1.098	100
27*	1.174	100	0.855	100	1.627	100	0.909	100	1.478	100	0.714	100
28	1.053	100	1.363	100	0.913	100	1.234	100	1.309	100	0.838	100
29	1.108	100	0.860	100	0.984	100	1.318	100	1.299	100	1.098	100
30*	1.291	100	1.140	100	0.955	100	1.028	100	1.374	100	0.745	100
31	1.433	100	1.190	100	1.247	100	1.786	100	1.595	100	1.104	100
32	1.288	100	1.192	100	1.032	100	1.305	100	1.322	100	0.940	100

***Note: Reduced range 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 (PRN-1 – PRN-16) – Washington D.C.

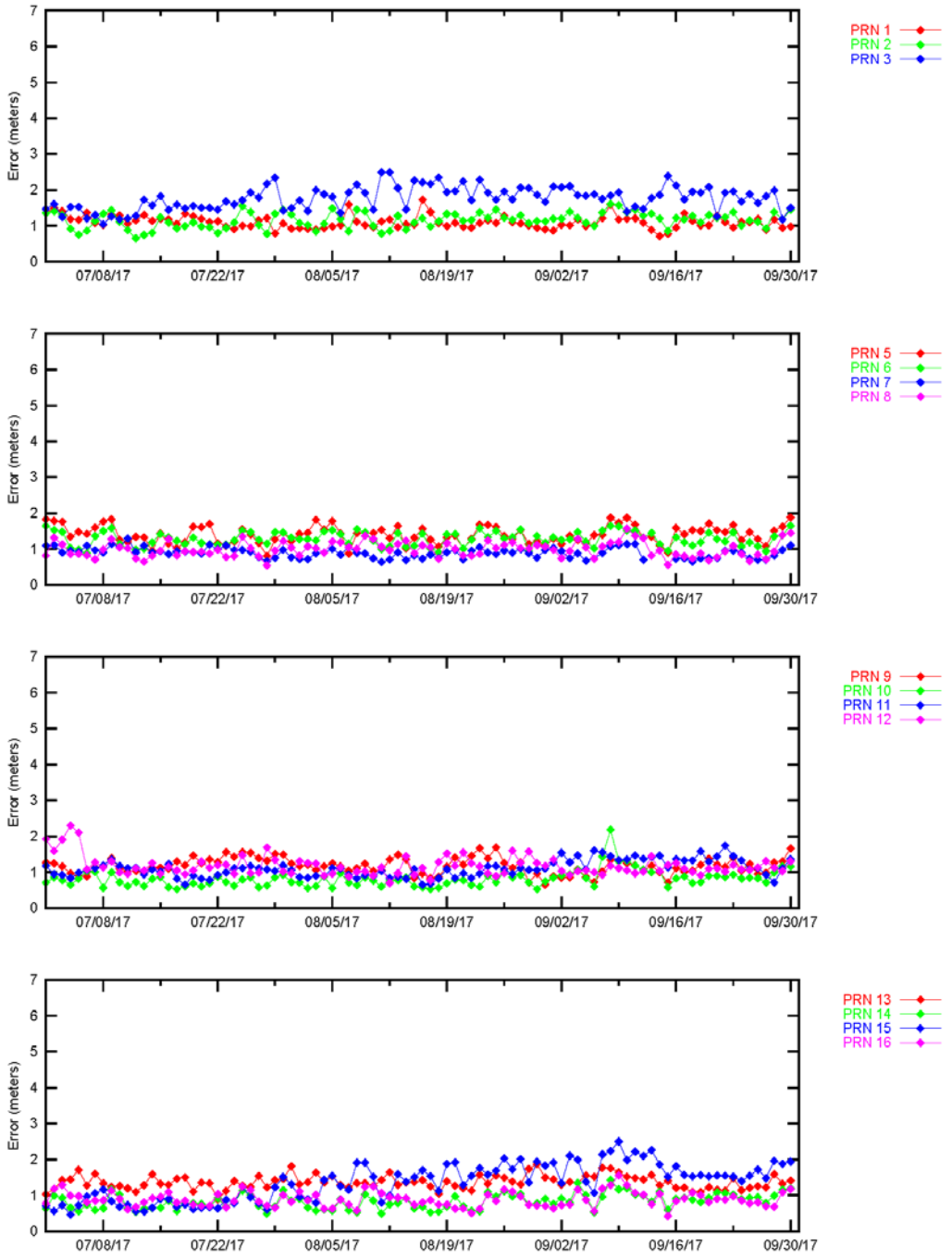
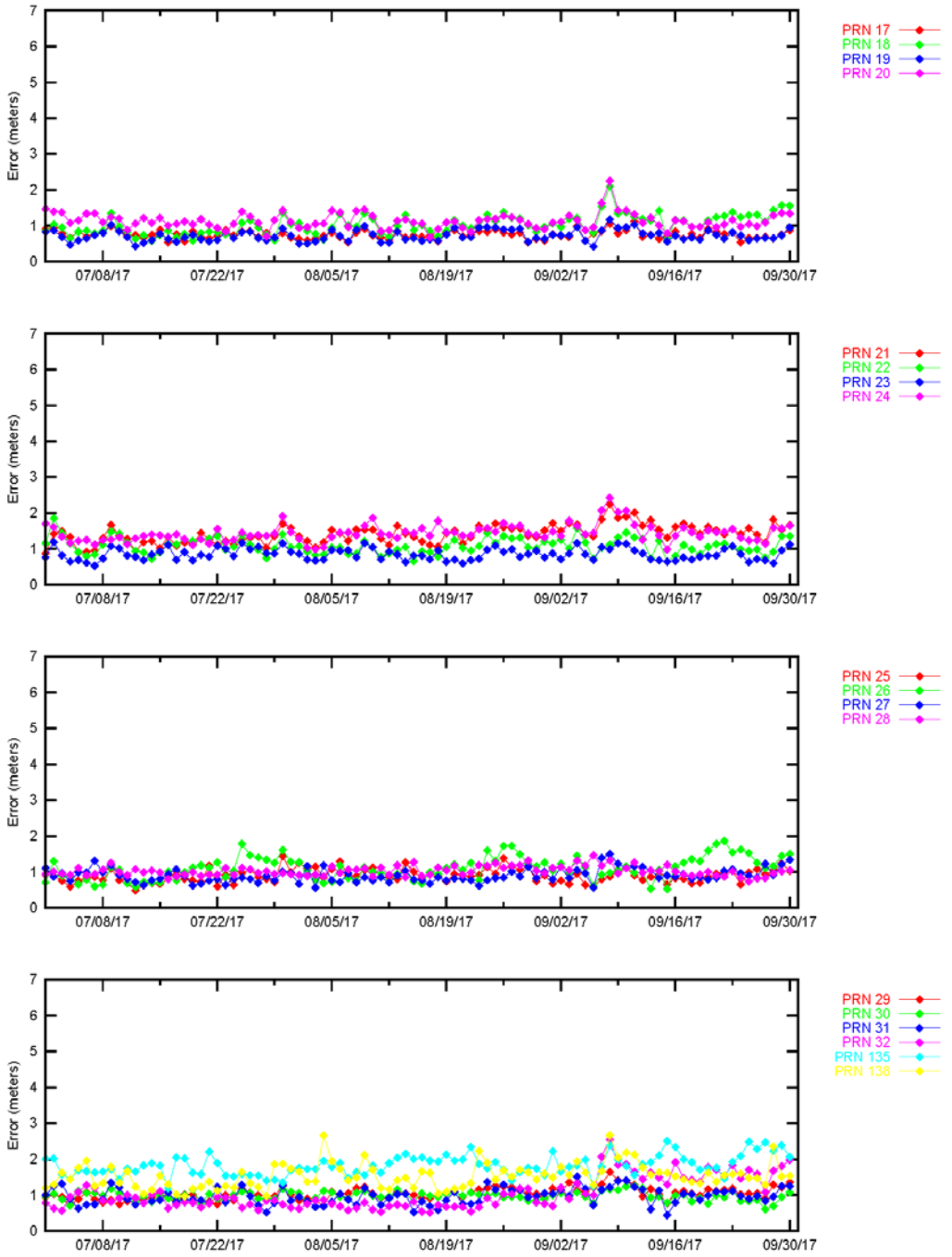


Figure 6-2 Range Error (PRN-17 – PRN-32) – Washington D.C.



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 6-1 and Figure 6-2 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	
SV ↓	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)
1	0.271	100	0.472	100	0.475	100	0.434	100	0.365	100	0.335	100
2	0.323	100	0.830	100	0.463	100	0.532	100	0.738	100	0.725	100
3	0.351	100	0.863	100	0.519	100	0.270	100	0.424	100	0.380	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.366	100	0.489	100	0.570	100	0.556	100	0.462	100	0.530	100
6	0.241	100	0.416	100	0.641	100	0.287	100	0.918	100	0.532	100
7	0.312	100	0.294	100	0.421	100	0.500	100	0.388	100	0.446	100
8	0.371	100	0.576	100	0.374	100	0.532	100	0.779	100	0.300	100
9	0.418	100	0.409	100	0.557	100	0.427	100	0.359	100	0.417	100
10	0.531	100	0.591	100	0.301	100	0.657	100	0.644	100	0.569	100
11	0.350	100	0.402	100	0.340	100	0.482	100	0.520	100	0.355	100
12	0.475	100	0.537	100	0.406	100	0.634	100	0.450	100	0.413	100
13	0.617	100	0.400	100	0.485	100	0.410	100	0.433	100	0.219	100
14	0.542	100	0.702	100	0.273	100	0.700	100	0.634	100	0.897	100
15	0.511	100	0.297	100	0.581	100	0.410	100	0.422	100	0.237	100
16	0.312	100	0.357	100	0.373	100	0.462	100	0.746	100	0.309	100
17	0.551	100	0.749	100	0.287	100	0.488	100	0.644	100	0.359	100
18	0.397	100	0.339	100	0.527	100	0.553	100	0.591	100	0.332	100
19	0.290	100	0.751	100	0.278	100	0.493	100	0.839	100	1.489	100
20	0.388	100	0.978	100	0.485	100	0.442	100	0.866	100	0.866	100
21	0.363	100	0.643	100	0.780	100	0.514	100	0.541	100	0.323	100
22	0.531	100	0.359	100	0.430	100	0.627	100	0.411	100	0.466	100
23	0.359	100	0.500	100	0.527	100	0.561	100	0.713	100	0.494	100
24	0.286	100	0.383	100	0.596	100	0.578	100	0.331	100	0.566	100
25	0.355	100	0.375	100	0.229	100	0.446	100	0.674	100	0.490	100
26	0.355	100	0.484	100	0.403	100	0.405	100	0.530	100	0.262	100
27	0.629	100	0.482	100	0.371	100	0.474	100	0.541	100	0.316	100
28	0.525	100	0.437	100	0.373	100	0.568	100	0.644	100	0.324	100
29	0.486	100	0.360	100	0.328	100	0.522	100	0.678	100	0.614	100
30	0.504	100	0.571	100	0.764	100	0.409	100	0.400	100	0.251	100
31	0.282	100	0.212	100	0.376	100	0.520	100	0.830	100	0.336	100
32	0.629	100	0.521	100	0.499	100	0.654	100	0.686	100	0.502	100

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

Site	Billings		Miami		Albuquerque		Kansas City		Atlanta		Los Angeles	
SV ↓	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)	0.95 Iono Error	3.29 Sigma Bounding(%)
1	0.342	100	0.310	100	0.548	100	0.722	100	0.635	100	0.992	100
2	0.901	100	0.676	100	0.734	100	0.585	100	0.452	100	0.568	100
3	0.433	100	0.410	100	0.814	100	0.546	100	0.852	100	0.599	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.488	100	0.695	100	0.655	100	0.920	100	0.509	100	0.989	100
6	0.540	100	1.045	100	0.814	100	0.693	100	0.751	100	0.695	100
7	0.378	100	0.685	100	0.634	100	0.506	100	0.586	100	0.498	100
8	0.353	100	0.754	100	0.768	100	0.754	100	0.425	100	0.922	100
9	0.582	100	0.510	100	0.586	100	0.469	100	0.505	100	0.504	100
10	1.116	100	0.716	100	0.328	100	0.270	100	0.321	100	0.339	100
11	0.296	100	0.424	100	0.408	100	0.412	100	0.498	100	0.732	100
12	0.475	100	0.546	100	0.549	100	0.429	100	0.506	100	0.397	100
13	0.322	100	0.561	100	0.675	100	0.491	100	0.472	100	0.481	100
14	0.520	100	0.618	100	0.523	100	0.773	100	0.351	100	0.342	100
15	0.379	100	0.395	100	0.585	100	0.618	100	0.490	100	0.698	100
16	0.573	100	0.540	100	0.634	100	0.553	100	0.441	100	0.658	100
17	1.378	100	0.502	100	0.508	100	0.426	100	0.440	100	0.518	100
18	0.429	100	0.612	100	0.576	100	0.367	100	0.606	100	0.319	100
19	0.781	100	0.588	100	0.613	100	0.393	100	0.428	100	0.400	100
20	0.796	100	0.496	100	0.593	100	0.529	100	0.454	100	0.545	100
21	0.298	100	0.618	100	0.763	100	0.450	100	0.756	100	0.450	100
22	0.854	100	0.637	100	0.487	100	0.388	100	0.442	100	0.577	100
23	0.292	100	0.542	100	0.612	100	0.333	100	0.476	100	0.790	100
24	0.223	100	0.296	100	0.707	100	0.535	100	0.565	100	0.565	100
25	0.495	100	0.473	100	0.535	100	0.307	100	0.791	100	0.579	100
26	0.496	100	0.492	100	0.525	100	0.524	100	0.420	100	0.962	100
27	0.453	100	0.403	100	0.744	100	0.278	100	0.343	100	0.494	100
28	0.342	100	0.509	100	0.547	100	0.479	100	0.444	100	0.386	100
29	0.394	100	0.528	100	0.444	100	0.451	100	0.566	100	0.631	100
30	0.517	100	0.391	100	0.659	100	0.465	100	0.534	100	0.455	100
31	0.690	100	0.862	100	0.545	100	0.908	100	0.516	100	0.651	100
32	0.661	100	0.794	100	0.473	100	0.350	100	0.286	100	0.366	100

Figure 6-3 Ionospheric Error (PRN-1 – PRN-16) – Washington D.C.

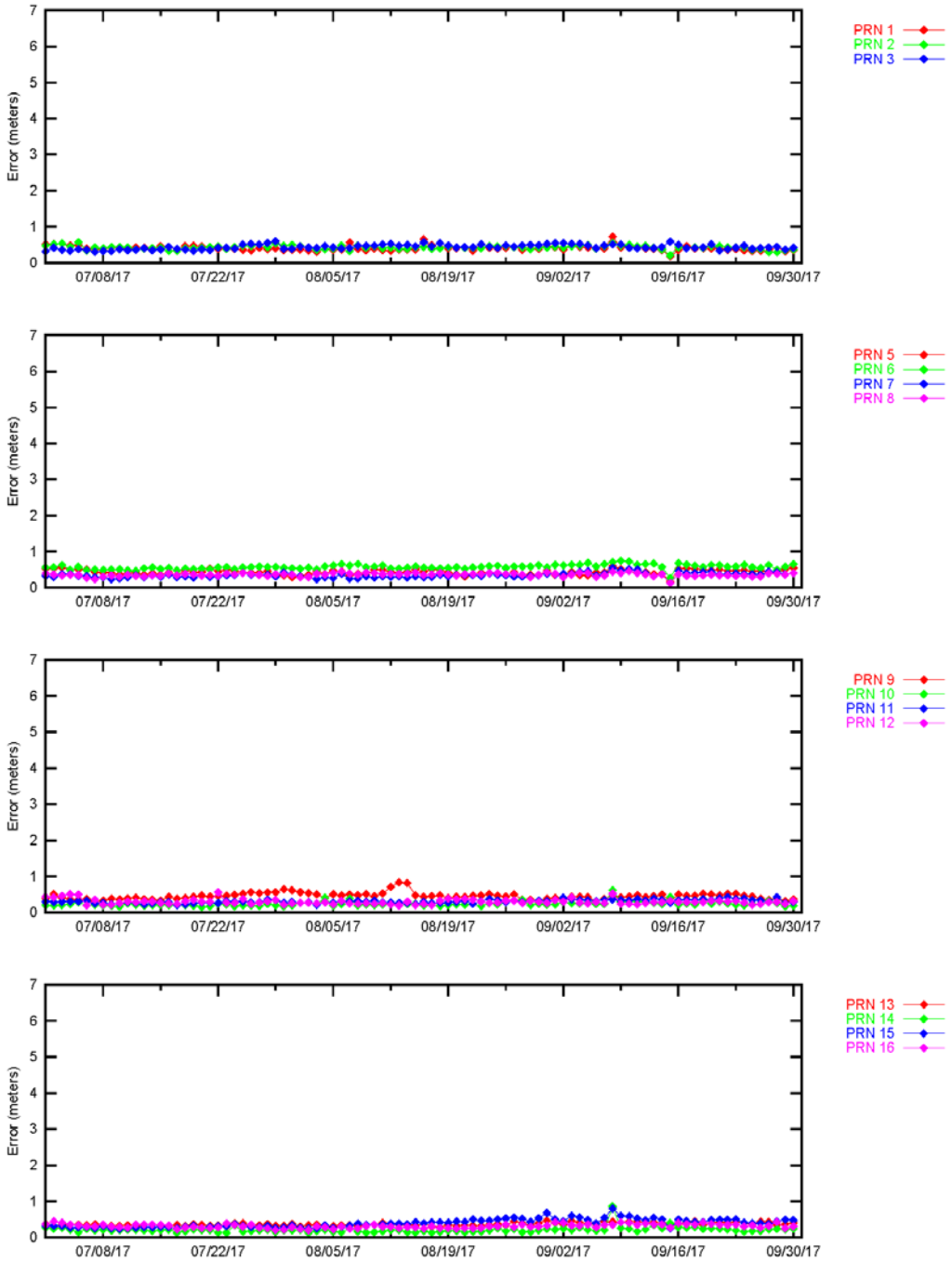
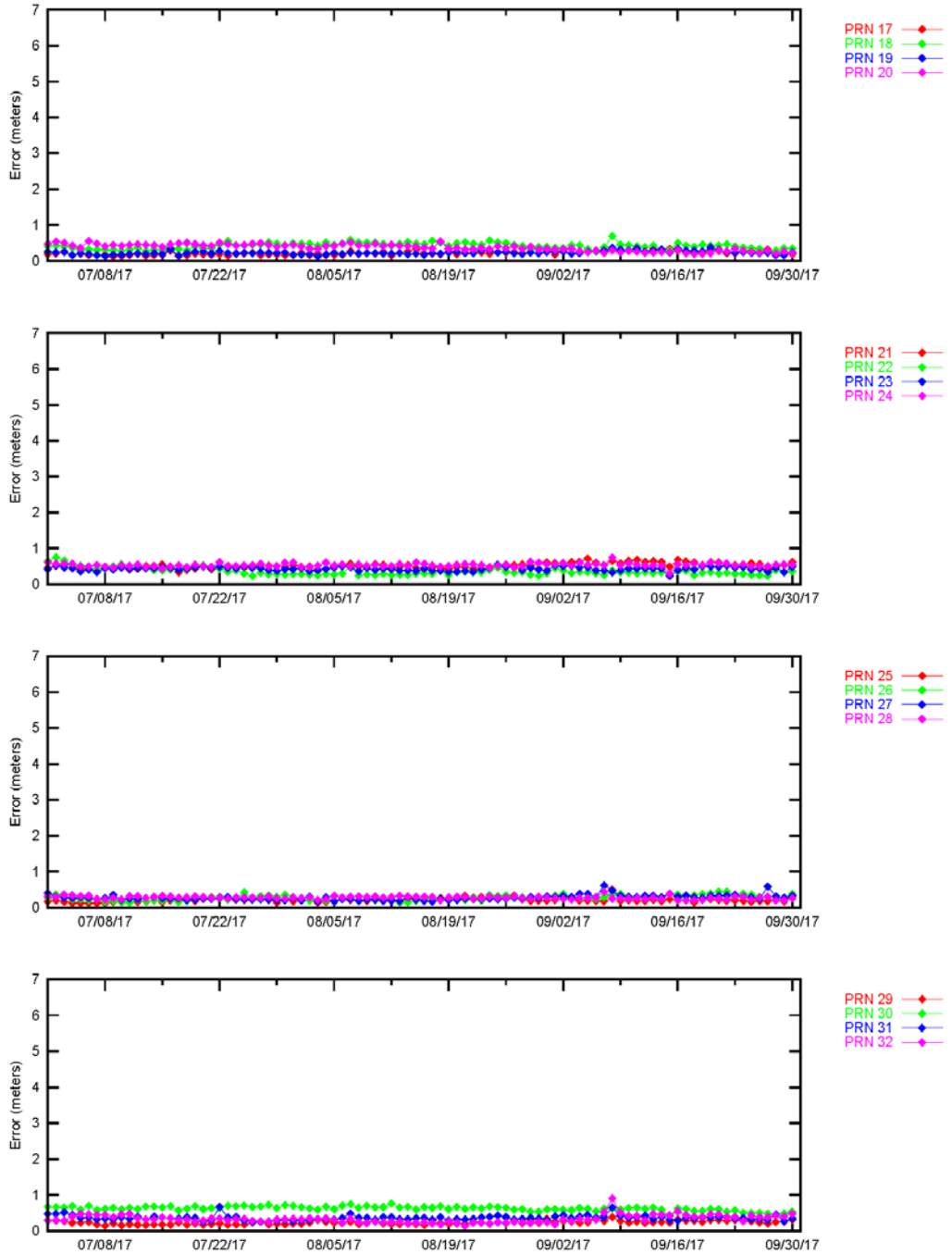


Figure 6-4 Ionospheric Error (PRN-17 – PRN-32) – Washington D.C.



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. PRN-4 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 and Figure 7-2 show the trend of CRW GEO PA 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 and Figure 7-2). 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 (%)
CRW 135	CRW	99.71	0.03	0.15	0.00
CRW 135	CRE	99.46	0.05	0.32	0.06
CRW 135	AMR	0.00	0.00	99.86	0.03
CRE 138	CRW	99.71	0.03	0.15	0.00
CRE 138	CRE	99.46	0.05	0.32	0.06
CRE 138	AMR	0.00	0.00	99.86	0.03
AMR 133	CRW	99.67	0.03	0.16	0.00
AMR 133	CRE	99.42	0.05	0.32	0.06
AMR 133	AMR	0.00	0.00	99.82	0.03

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

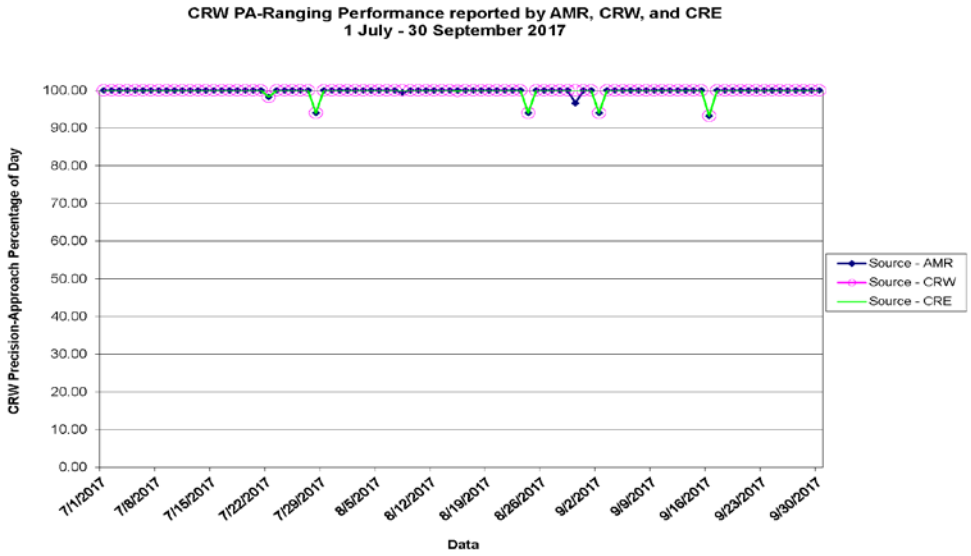
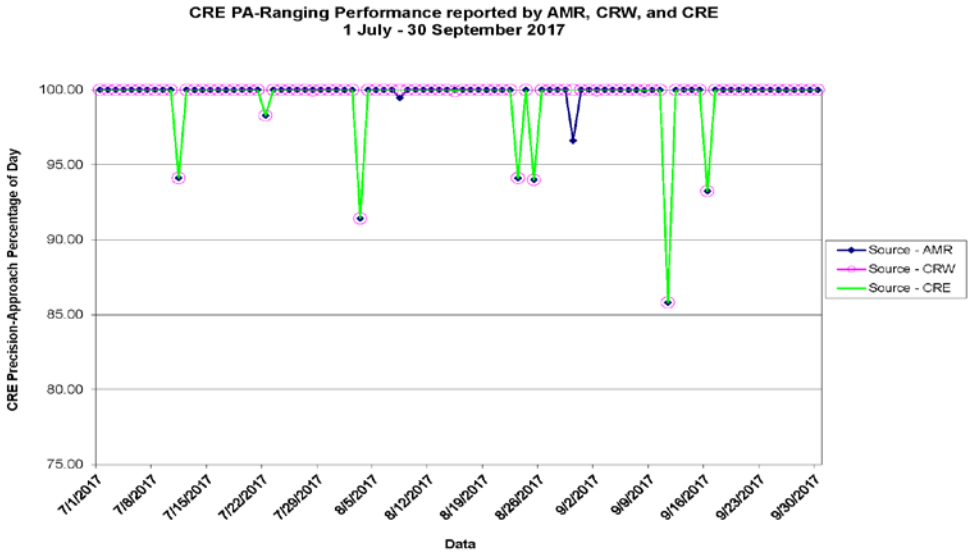


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend



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 ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
CAL4	FORT MACKAY/ALBIAN AERODROME	AB	LPV	0	100	0	100	0	100
CEV3	VEGREVILLE	AB	LPV	0	100	0	100	1	99.9989
CYEG	EDMONTON/JOSEPHBURG	AB	LPV	0	100	0	100	1	99.9989
CYXD	EDMONTON CITY CTR	AB	LPV	0	100	0	100	1	99.9985
2C7	SHAKTOOLIK	AK	LPV	0	100	0	100	7	99.9536
6A8	ALLAKAKET	AK	LP	0	100	0	100	5	99.9887
7KA	TATITLEK	AK	LP	0	100	0	100	0	100
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	5	99.9819
AKN	KING SALMON	AK	LPV	0	100	0	100	5	99.9853
AKW	KLAWOCK	AK	LP	0	100	0	100	2	99.9966
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	2	99.9992
AQH	QUINHAGAK	AK	LPV	0	100	0	100	7	99.9392
AQT	NUIQSUT	AK	LPV	0	100	0	100	59	99.7913
BET	BETHEL	AK	LPV200	0	100	0	100	6	99.9528
BRW	WILEY POST-WILL ROGERS MEMORIA	AK	LPV	0	100	10	99.9785	202	98.0763
CDB	COLD BAY	AK	LPV200	1	99.9996	4	99.9804	20	99.6928
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	0	100
CEM	CENTRAL	AK	LP	0	100	0	100	12	99.9728
CLP	CLARKS POINT	AK	LPV	0	100	0	100	6	99.966
CXF	COLDFOOT	AK	LP	0	100	0	100	10	99.9758
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	0	100	0	100	58	99.7645
DLG	DILLINGHAM	AK	LPV	0	100	0	100	6	99.966
ELI	ELIM	AK	LPV	0	100	0	100	7	99.946
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	1	99.9996
ENM	EMMONAK	AK	LPV	0	100	0	100	9	99.9347
FAI	FAIRBANKS INTL	AK	LPV200	0	100	0	100	7	99.9955
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	4	99.9906
GAM	GAMBELL	AK	LPV	0	100	3	99.9657	237	97.7566
GKN	GULKANA	AK	LPV	0	100	0	100	27	99.9872
GST	GUSTAVUS	AK	LP	0	100	0	100	2	99.9838
HLA	HUSLIA	AK	LPV	0	100	0	100	4	99.9909
HOM	HOMER	AK	LPV	0	100	0	100	1	99.9996
HPB	HOOPER BAY	AK	LP	0	100	0	100	12	99.8694

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
ILI	ILIAMNA	AK	LPV	0	100	0	100	3	99.9989
IYS	WASILLA	AK	LPV	0	100	0	100	1	99.9996
KAL	KALTAG	AK	LPV	0	100	0	100	5	99.9815
KSM	ST MARY'S	AK	LPV200	0	100	0	100	7	99.94
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	2	99.9989
KTS	BREVIG MISSION	AK	LPV	0	100	1	99.9996	135	99.4327
KWT	KWETHLUK	AK	LPV	0	100	0	100	6	99.9558
KYU	KOYUKUK	AK	LPV	0	100	0	100	5	99.9857
MCG	MC GRATH	AK	LP	0	100	0	100	2	99.9992
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	6	99.9551
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	1	99.9992
OME	NOME	AK	LPV	0	100	0	100	58	99.7603
OOK	TOKSOOK BAY	AK	LP	0	100	0	100	11	99.8687
ORT	NORTHWAY	AK	LP	0	100	0	100	74	99.9007
OTZ	RALPH WIEN MEMORIAL	AK	LPV	0	100	0	100	84	99.6867
PAQ	PALMER MUNICIPAL	AK	LP	0	100	0	100	1	99.9996
PHO	POINT HOPE	AK	LPV	0	100	1	99.9996	172	98.5341
RBY	RUBY	AK	LPV	0	100	0	100	2	99.9992
SCC	DEADHORSE	AK	LPV	0	100	0	100	46	99.8588
SCM	SCAMMON BAY	AK	LP	0	100	0	100	9	99.9038
SHG	SHUNGNAK	AK	LP	0	100	0	100	5	99.9732
SHX	SHAGELUK	AK	LPV	0	100	0	100	7	99.974
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	1	99.9841
SMK	ST MICHAEL	AK	LPV	0	100	0	100	8	99.9562
SXQ	SOLDOTNA	AK	LP	0	100	0	100	1	99.9996
UNK	UNALAKLEET	AK	LP	0	100	0	100	6	99.9649
WLK	SELAWIK	AK	LPV	0	100	0	100	7	99.9509
WMO	WHITE MOUNTAIN	AK	LP	0	100	0	100	7	99.9415
WNA	NAPAKIAK	AK	LPV	0	100	0	100	6	99.9506
YAK	YAKUTAT	AK	LPV200	0	100	0	100	3	99.9849
06A	MOTON FIELD MUNICIPAL	AL	LPV	1	99.9347	1	99.9317	1	99.9241
0J6	HEADLAND MUNICIPAL	AL	LPV	1	99.9347	1	99.9241	2	99.9238
0R1	ATMORE MUNICIPAL	AL	LP	1	99.9506	1	99.9321	2	99.923
11A	CLAYTON MUNICIPAL	AL	LPV	1	99.9347	1	99.9279	2	99.9238
12J	BREWTON MUNICIPAL	AL	LPV	1	99.9385	1	99.9313	2	99.9234
1M4	POSEY FIELD	AL	LPV	1	99.9498	1	99.9498	1	99.946
1R8	BAY MINETTE MUNICIPAL	AL	LPV	1	99.9536	1	99.9362	3	99.9234

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
2R5	ST ELMO	AL	LPV	1	99.9547	1	99.9419	3	99.9226
33J	GENEVA MUNICIPAL	AL	LP	1	99.9347	1	99.9241	2	99.9234
3M8	NORTH PICKENS	AL	LP	1	99.9498	1	99.9498	1	99.94
4A9	ISBELL FIELD	AL	LPV	1	99.9498	1	99.946	1	99.946
5R1	ROY WILCOX	AL	LP	1	99.9498	1	99.9419	3	99.934
5R4	FOLEY MUNICIPAL	AL	LPV	1	99.946	1	99.9279	3	99.9211
71J	BLACKWELL FIELD	AL	LPV	1	99.9347	1	99.9241	2	99.9238
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	1	99.9347	1	99.9313	2	99.9234
8A0	ALBERTVILLE RGNL-THOMAS J BRUM	AL	LPV	1	99.9498	1	99.946	1	99.946
9A4	COURTLAND	AL	LPV200	1	99.9498	1	99.9498	1	99.946
A08	VAIDEN FIELD	AL	LPV	1	99.9498	1	99.9362	1	99.9362
ALX	THOMAS C RUSSELL FLD	AL	LPV	1	99.9385	1	99.934	1	99.9241
ANB	ANNISTON RGNL	AL	LPV	1	99.9472	1	99.9381	1	99.9355
ASN	TALLADEGA MUNICIPAL	AL	LPV200	1	99.9498	1	99.9381	1	99.9358
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	1	99.9347	1	99.9317	1	99.9241
BFM	MOBILE DOWNTOWN	AL	LPV200	1	99.9547	1	99.9362	3	99.9226
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	1	99.9498	1	99.9381	1	99.9377
CMD	CULLMAN RGNL-FOLSOM FIELD	AL	LPV	1	99.9498	1	99.946	1	99.946
CQF	H L SONNY CALLAHAN	AL	LPV200	1	99.9536	1	99.9355	3	99.9219
DCU	PRYOR FIELD RGNL	AL	LPV200	1	99.9498	1	99.9498	1	99.946
DHN	DOTHAN RGNL	AL	LPV200	1	99.9347	1	99.9241	2	99.9238
DYA	DEMOPOLIS RGNL	AL	LPV	1	99.9498	1	99.9419	2	99.937
EDN	ENTERPRISE MUNICIPAL	AL	LPV	1	99.9347	1	99.9279	2	99.9238
EET	SHELBY COUNTY	AL	LPV	1	99.9498	1	99.9381	1	99.9366
EKY	BESSEMER	AL	LPV	1	99.9498	1	99.9381	1	99.9373
EUF	WEEDON FIELD	AL	LPV	1	99.9347	1	99.9249	1	99.9241
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	1	99.9498	1	99.946	1	99.9373
GZH	MIDDLETON FIELD	AL	LP	1	99.9498	1	99.9321	2	99.9238
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	1	99.9498	1	99.9498	1	99.946
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	1	99.9498	1	99.946	1	99.946
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	1	99.9498	1	99.9498	1	99.9396
JKA	JACK EDWARDS	AL	LPV200	1	99.946	1	99.9279	3	99.9211
M95	RICHARD ARTHUR FIELD	AL	LPV	1	99.9498	1	99.9498	1	99.9404
MDQ	HUNTSVILLE EXECUTIVE AIRPORT T	AL	LPV200	1	99.9498	1	99.946	1	99.946

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
MGM	MONTGOMERY RGNL (DANNELLY FIEL	AL	LPV200	1	99.9385	1	99.9332	1	99.9241
MOB	MOBILE RGNL	AL	LPV200	1	99.9547	1	99.9419	3	99.9238
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	1	99.9498	1	99.9498	1	99.946
PLR	ST CLAIR COUNTY	AL	LPV	1	99.9498	1	99.9381	1	99.9366
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	1	99.9498	1	99.946	1	99.937
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	1	99.9419	1	99.9381	1	99.9355
SEM	CRAIG FIELD	AL	LPV200	1	99.9498	1	99.9347	1	99.9347
TCL	TUSCALOOSA RGNL	AL	LPV	1	99.9498	1	99.9498	1	99.9385
TOI	TROY MUNICIPAL AIRPORT AT N KENNETH	AL	LPV	1	99.9347	1	99.9313	1	99.9241
0M0	BILLY FREE MUNICIPAL	AR	LPV	1	99.9713	1	99.9607	1	99.946
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	1	99.9755	1	99.9713	1	99.9607
4M3	CARLISLE MUNICIPAL	AR	LPV	1	99.9713	1	99.9607	1	99.9604
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	1	99.9645	1	99.954	1	99.9494
7M1	MC GEHEE MUNICIPAL	AR	LP	1	99.9709	1	99.9604	1	99.946
ADF	DEXTER B FLORENCE MEMORIAL FIE	AR	LPV	1	99.9713	1	99.9713	1	99.9607
ARG	WALNUT RIDGE RGNL	AR	LPV200	1	99.9713	1	99.9607	1	99.954
ASG	SPRINGDALE MUNICIPAL	AR	LPV	1	99.9762	1	99.9713	1	99.9713
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV200	1	99.9645	1	99.954	1	99.9498
BPK	BAXTER COUNTY	AR	LPV	1	99.9785	1	99.9713	1	99.9607
BVX	BATESVILLE RGNL	AR	LPV	1	99.9724	1	99.9713	1	99.9607
BYH	ARKANSAS INTL	AR	LPV200	1	99.9709	1	99.9604	1	99.9521
CDH	HARRELL FIELD	AR	LPV	1	99.9713	1	99.9713	1	99.9604
CXW	CANTRELL FLD	AR	LPV	1	99.9713	1	99.9713	1	99.9607
DRP	DELTA RGNL	AR	LPV	1	99.9709	1	99.9604	1	99.9498
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	1	99.9713	1	99.9607	1	99.9604
FSM	FORT SMITH RGNL	AR	LPV200	1	99.9743	1	99.9713	1	99.9713
FYV	DRAKE FIELD	AR	LPV	1	99.9747	1	99.9713	1	99.9713
H34	HUNTSVILLE MUNICIPAL	AR	LPV	1	99.9758	1	99.9713	1	99.9713
HRO	BOONE COUNTY	AR	LPV	1	99.9774	1	99.9713	1	99.9713

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
JBR	JONESBORO MUNICIPAL	AR	LPV200	1	99.9713	1	99.9607	1	99.9506
LIT	BILL AND HILLARY CLINTON NATIO	AR	LPV200	1	99.9713	1	99.9713	1	99.9607
M18	HOPE MUNICIPAL	AR	LP	1	99.9713	1	99.9713	1	99.9607
M19	NEWPORT MUNICIPAL	AR	LPV	1	99.9713	1	99.9607	1	99.9524
M77	HOWARD COUNTY	AR	LP	1	99.9713	1	99.9713	1	99.9607
MXA	MANILA MUNICIPAL	AR	LPV	1	99.9709	1	99.9604	1	99.9506
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	1	99.9713	1	99.9713	1	99.9607
PBF	GRIDER FIELD	AR	LPV	1	99.9713	1	99.9607	1	99.9562
ROG	ROGERS EXECUTIVE - CARTER FIEL	AR	LPV	1	99.9792	1	99.9713	1	99.9713
RUE	RUSSELLVILLE RGNL	AR	LPV	1	99.9713	1	99.9713	1	99.9607
SGT	STUTTGART MUNICIPAL	AR	LPV	1	99.9713	1	99.9607	1	99.9536
SLG	SMITH FIELD	AR	LPV	1	99.9792	1	99.9713	1	99.9713
SRC	SEARCY MUNICIPAL	AR	LPV	1	99.9713	1	99.9713	1	99.9607
SUZ	SALINE COUNTY RGNL	AR	LPV	1	99.9713	1	99.9713	1	99.9607
TXK	TEXARKANA RGNL-WEBB FIELD	AR	LPV	1	99.9713	1	99.9713	1	99.9607
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	1	99.9792	1	99.9713	1	99.9713
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	1	99.9792	1	99.9713	1	99.9713
AVQ	MARANA RGNL	AZ	LP	0	100	1	99.9925	48	99.6652
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	0	100	3	99.9653
FFZ	FALCON FLD	AZ	LP	0	100	0	100	5	99.9536
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	1	99.9917	65	99.5354
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	3	99.9917
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	0	100	3	99.9653
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	2	99.9849
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	2	99.9864
IGM	KINGMAN	AZ	LPV	0	100	0	100	1	99.9906
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	1	99.9958	6	99.9524
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	0	100	5	99.9649
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	2	99.9838
P33	COCHISE COUNTY	AZ	LPV	0	100	1	99.9962	39	99.7834
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	2	99.9989
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	0	100	5	99.9555
PRC	ERNEST A LOVE FIELD	AZ	LPV200	0	100	0	100	2	99.9928
RQE	WINDOW ROCK	AZ	LP	0	100	0	100	5	99.974
SAD	SAFFORD RGNL	AZ	LPV	0	100	1	99.9985	25	99.909

Airport ID	Airport Name	State/ Province	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	5	99.9645
SOW	SHOW LOW RGNL	AZ	LPV	0	100	0	100	5	99.9536
TUS	TUCSON INTL	AZ	LPV	0	100	1	99.9925	56	99.5856
CYBL	CAMPBELL RIVER	BC	LPV	0	100	0	100	0	100
CYCD	NANAIMO	BC	LPV	0	100	0	100	0	100
CYVR	VANCOUVER INTL	BC	LPV	0	100	0	100	0	100
CYXS	PRINCE GEORGE	BC	LPV	0	100	0	100	0	100
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	3	99.977
ACV	ARCATA	CA	LPV200	0	100	0	100	5	99.9177
APC	NAPA COUNTY	CA	LPV	0	100	0	100	94	99.572
APV	APPLE VALLEY	CA	LPV	0	100	0	100	6	99.9623
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	7	99.9385
BFL	MEADOWS FIELD	CA	LPV200	0	100	0	100	9	99.9309
BLH	BLYTHE	CA	LP	0	100	0	100	2	99.9789
C83	BYRON	CA	LPV	0	100	0	100	83	99.7581
CCB	CABLE	CA	LP	0	100	0	100	8	99.9309
CCR	BUCHANAN FIELD	CA	LPV	0	100	0	100	93	99.6018
CEC	JACK MC NAMARA FIELD	CA	LPV	0	100	0	100	4	99.9211
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	5	99.9468
CMA	CAMARILLO	CA	LPV	0	100	1	99.9989	23	99.8747
CNO	CHINO	CA	LPV	0	100	0	100	8	99.9272
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	1	99.9921	6	99.9207
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	0	100	96	99.5139
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	4	99.9691
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	14	99.8977
F70	FRENCH VALLEY	CA	LPV	0	100	0	100	6	99.9321
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	9	99.9377
HAF	HALF MOON BAY	CA	LPV	0	100	0	100	99	99.1161
HHR	JACK NORTHROP FIELD/HAWTHORNE	CA	LPV	0	100	1	99.9989	10	99.9019
HWD	HAYWARD EXECUTIVE	CA	LPV	0	100	0	100	96	99.4018
L35	BIG BEAR CITY	CA	LP	0	100	0	100	4	99.9641
LAX	LOS ANGELES INTL	CA	LPV	0	100	1	99.9989	10	99.9004
LGB	LONG BEACH /DAUGHERTY FIELD/	CA	LPV	0	100	1	99.9985	9	99.9045

Airport ID	Airport Name	State/ Province	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	7	99.9294
LLR	LITTLE RIVER	CA	LP	0	100	0	100	93	99.3818
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	0	100	76	99.8215
LVK	LIVERMORE MUNICIPAL	CA	LPV	0	100	0	100	94	99.6128
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	9	99.9272
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	100	0	100	18	99.909
MER	CASTLE	CA	LPV200	0	100	0	100	15	99.909
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	8	99.9219
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	100	0	100	10	99.9287
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	100	0	100	27	99.8943
MRY	MONTEREY RGNL	CA	LPV	0	100	0	100	100	99.2191
MYF	MONTGOMERY FIELD	CA	LPV200	0	100	1	99.9913	7	99.9215
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	7	99.9279
O02	NERVINO	CA	LPV	0	100	0	100	4	99.9611
O27	OAKDALE	CA	LPV	0	100	0	100	10	99.9094
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	94	99.3863
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	62	99.8471
OAK	METROPOLITAN OAKLAND INTL	CA	LPV200	0	100	0	100	96	99.3678
ONT	ONTARIO INTL	CA	LPV	0	100	0	100	8	99.9306
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	5	99.9472
OXR	OXNARD	CA	LPV	0	100	1	99.997	40	99.8543
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	0	100	8	99.9419
POC	BRACKETT FIELD	CA	LPV	0	100	0	100	8	99.9264
PRB	PASO ROBLES MUNICIPAL	CA	LPV200	0	100	0	100	99	99.5388
PVF	PLACERVILLE	CA	LPV	0	100	0	100	7	99.9389
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	0	100	7	99.9332
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	4	99.9445
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	4	99.946
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	0	100	96	99.4463
SAC	SACRAMENTO EXECUTIVE	CA	LPV	0	100	0	100	10	99.9189
SAN	SAN DIEGO INTL	CA	LPV	0	100	1	99.9909	8	99.9155
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	1	99.9985	109	99.6577
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	0	100	102	99.4467
SCK	STOCKTON METROPOLITAN	CA	LPV	0	100	0	100	28	99.8902
SDM	BROWN FIELD MUNICIPAL	CA	LPV200	0	100	1	99.9906	9	99.9162

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
SEE	GILLESPIE FIELD	CA	LP	0	100	1	99.9917	6	99.9256
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	0	100	96	99.2214
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	0	100	96	99.3916
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	9	99.9189
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	0	100	108	99.458
SNA	JOHN WAYNE AIRPORT-ORANGE COUN	CA	LPV200	0	100	1	99.9981	9	99.9124
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	0	100	98	99.3433
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	94	99.3893
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	74	99.7879
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	4	99.9709
TOA	ZAMPERINI FIELD	CA	LPV	0	100	1	99.9966	10	99.9011
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	3	99.9649
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	0	100	6	99.9562
VIS	VISALIA MUNICIPAL	CA	LPV200	0	100	0	100	8	99.9377
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	0	100	8	99.9396
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	100	0	100	7	99.9309
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	0	100	97	99.3271
1V6	FREMONT COUNTY	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	1	99.9996
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	3	99.9875
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	3	99.9936
FMM	FORT MORGAN MUNICIPAL	CO	LP	0	100	0	100	1	99.9989
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	1	99.9921
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	2	99.9955
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	1	99.997
LAA	LAMAR MUNICIPAL	CO	LPV	0	100	0	100	1	99.9992
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	1	99.9992
LMO	VANCE BRAND	CO	LPV	0	100	0	100	0	100
MTJ	MONTROSE RGNL	CO	LPV	0	100	0	100	2	99.994
PUB	PUEBLO MEMORIAL	CO	LPV200	0	100	0	100	0	100
RIL	GARFIELD COUNTY RGNL	CO	LPV	0	100	0	100	1	99.994
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	1	99.9977
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	2	99.9936
4B8	ROBERTSON FIELD	CT	LP	0	100	0	100	0	100
BDL	BRADLEY INTL	CT	LPV200	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	1	99.9336	1	99.9241	2	99.9234
24J	SUWANNEE COUNTY	FL	LPV	1	99.9275	1	99.9241	1	99.9241
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	1	99.9275	1	99.9241	2	99.917
40J	PERRY-FOLEY	FL	LPV	1	99.9275	1	99.9241	2	99.9238
54J	DEFUNIAK SPRINGS	FL	LP	1	99.9347	1	99.9241	2	99.923
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	1	99.9275	1	99.9241	2	99.9226
APF	NAPLES MUNICIPAL	FL	LPV	1	99.8917	1	99.8917	3	99.8649
AVO	AVON PARK EXECUTIVE	FL	LPV	2	99.92	1	99.8947	3	99.863
BCT	BOCA RATON	FL	LPV	1	99.889	1	99.8879	3	99.8471
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	1	99.9241	1	99.9139	3	99.8807

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
BOW	BARTOW MUNICIPAL	FL	LPV	2	99.92	1	99.8951	3	99.869
CEW	BOB SIKES	FL	LPV	1	99.9347	1	99.9241	2	99.9234
CGC	CRYSTAL RIVER-CAPTAIN TOM DAVI	FL	LP	1	99.9241	1	99.9241	3	99.886
CHN	WAUCHULA MUNICIPAL	FL	LP	2	99.92	1	99.8951	3	99.8671
COI	MERRITT ISLAND	FL	LPV	2	99.9234	2	99.909	3	99.869
CRG	JACKSONVILLE EXECUTIVE AT CRAI	FL	LPV200	1	99.9279	1	99.9241	1	99.9241
CTY	CROSS CITY	FL	LPV	1	99.9275	1	99.9241	2	99.9234
DAB	DAYTONA BEACH INTL	FL	LPV200	1	99.9241	1	99.9241	3	99.8841
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FI	FL	LPV	1	99.9241	1	99.9241	3	99.8781
DTS	DESTIN EXECUTIVE	FL	LPV	1	99.9347	1	99.9241	2	99.9226
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	1	99.9313	1	99.9241	2	99.923
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	1	99.9241	1	99.9241	3	99.8834
EYW	KEY WEST INTL	FL	LPV	1	99.8879	1	99.8879	13	99.7717
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	2	99.9155	1	99.8905	3	99.8456
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	1	99.9279	1	99.9241	1	99.9241
FIN	FLAGLER COUNTY	FL	LPV	1	99.9241	1	99.9241	3	99.8932
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV	1	99.8883	1	99.8879	3	99.846
FMY	PAGE FIELD	FL	LPV	1	99.8928	1	99.8928	3	99.8638
FPR	ST LUCIE COUNTY INTL	FL	LPV	2	99.92	1	99.8924	3	99.8468
FXE	FORT LAUDERDALE EXECUTIVE	FL	LPV200	1	99.8887	1	99.8879	3	99.8468
GIF	WINTER HAVEN'S GILBERT	FL	LPV	2	99.92	1	99.8951	3	99.869
GNV	GAINESVILLE RGNL	FL	LPV	1	99.9275	1	99.9241	2	99.9162
HEG	HERLONG RECREATIONAL	FL	LPV	1	99.9279	1	99.9241	2	99.9238
IMM	IMMOKALEE RGNL	FL	LPV	1	99.8917	1	99.8917	3	99.8604
ISM	KISSIMMEE GATEWAY	FL	LPV200	2	99.9211	2	99.9087	3	99.8675
JAX	JACKSONVILLE INTL	FL	LPV200	1	99.9279	1	99.9241	1	99.9241
LAL	LAKELAND LINDER RGNL	FL	LPV200	2	99.92	1	99.8951	3	99.8713
LCQ	LAKE CITY GATEWAY	FL	LPV	1	99.9275	1	99.9241	2	99.923
LEE	LEESBURG INTL	FL	LPV	1	99.9241	1	99.9241	3	99.8751
LNA	PALM BEACH COUNTY PARK	FL	LP	1	99.8894	1	99.8879	3	99.846
MCO	ORLANDO INTL	FL	LPV200	1	99.9241	1	99.9132	3	99.8664
MIA	MIAMI INTL	FL	LPV200	1	99.8879	1	99.8879	7	99.8434

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
MKY	MARCO ISLAND	FL	LPV	1	99.8909	1	99.8909	3	99.8619
MLB	MELBOURNE INTL	FL	LPV200	2	99.92	1	99.8951	3	99.8641
MTH	THE FLORIDA KEYS MARATHON	FL	LPV	1	99.8879	1	99.8879	13	99.7671
OBE	OKEECHOBEE COUNTY	FL	LPV	2	99.92	1	99.8928	3	99.8494
OCF	OCALA INTL-JIM TAYLOR FIELD	FL	LPV200	1	99.9264	1	99.9241	3	99.8849
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	1	99.9241	1	99.9241	3	99.889
OPF	OPA-LOCKA EXECUTIVE	FL	LPV200	1	99.8883	1	99.8879	4	99.8468
ORL	EXECUTIVE	FL	LPV200	1	99.9241	1	99.9147	3	99.8671
PBI	PALM BEACH INTL	FL	LPV200	2	99.9102	1	99.8879	3	99.8449
PCM	PLANT CITY	FL	LPV	2	99.92	1	99.8951	3	99.8721
PGD	PUNTA GORDA	FL	LPV200	1	99.8951	1	99.8939	3	99.863
PHK	PALM BEACH CO GLADES	FL	LPV	2	99.9038	1	99.8913	3	99.8509
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	2	99.92	1	99.8951	3	99.8758
PMP	POMPANO BEACH AIRPARK	FL	LPV	1	99.8887	1	99.8879	3	99.8456
PNS	PENSACOLA INTL	FL	LPV200	1	99.9347	1	99.9241	3	99.9223
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	1	99.8924	1	99.8924	3	99.8626
SEF	SEBRING RGNL	FL	LPV	2	99.92	1	99.8939	3	99.8543
SFB	ORLANDO SANFORD INTL	FL	LPV200	1	99.9241	1	99.9241	3	99.8717
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	1	99.9275	1	99.9241	2	99.9223
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	2	99.917	1	99.8951	3	99.8773
SUA	WITHAM FIELD	FL	LPV	2	99.9162	1	99.8913	3	99.8456
TIX	SPACE COAST RGNL	FL	LPV200	1	99.9241	1	99.9147	3	99.8717
TLH	TALLAHASSEE INTL	FL	LPV200	1	99.9275	1	99.9241	2	99.9238
TMB	MIAMI EXECUTIVE	FL	LPV200	1	99.8879	1	99.8879	8	99.8388
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	1	99.8894	1	99.8879	3	99.8536
TPA	TAMPA INTL	FL	LPV200	2	99.92	1	99.8951	3	99.8747
TPF	PETER O KNIGHT	FL	LP	2	99.92	1	99.8951	3	99.8743
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	1	99.9241	1	99.9158	3	99.8751
VDF	TAMPA EXECUTIVE	FL	LPV	2	99.92	1	99.8951	3	99.8732
VNC	VENICE MUNICIPAL	FL	LP	1	99.8951	1	99.8951	3	99.866
VQQ	CECIL	FL	LPV200	1	99.9275	1	99.9241	2	99.9238
VRB	VERO BEACH MUNICIPAL	FL	LPV200	2	99.92	1	99.8928	3	99.8536
X07	LAKE WALES MUNICIPAL	FL	LP	2	99.92	1	99.8951	3	99.8675
X14	LA BELLE MUNICIPAL	FL	LPV	1	99.8924	1	99.8924	3	99.8585
X23	UMATILLA MUNICIPAL	FL	LP	1	99.9241	1	99.9241	3	99.8736
X26	SEBASTIAN MUNICIPAL	FL	LP	2	99.92	1	99.8936	3	99.8562

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
X35	MARION COUNTY	FL	LP	1	99.9253	1	99.9241	3	99.8853
X50	MASSEY RANCH AIRPARK	FL	LP	1	99.9241	1	99.9241	3	99.8822
X51	HOMESTEAD GENERAL AVIATION	FL	LPV	1	99.8879	1	99.8879	11	99.8287
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	2	99.92	2	99.9075	3	99.8717
09J	JEKYLL ISLAND	GA	LPV200	1	99.9321	1	99.9241	1	99.9241
15J	COOK COUNTY	GA	LPV	1	99.9309	1	99.9241	1	99.9241
17J	DONALSONVILLE MUNICIPAL	GA	LPV	1	99.9313	1	99.9241	2	99.9238
18A	FRANKLIN COUNTY	GA	LPV	1	99.9528	1	99.949	1	99.946
19A	JACKSON COUNTY	GA	LPV	1	99.9502	1	99.946	1	99.9347
2J5	MILLEN	GA	LPV	1	99.9472	1	99.9347	1	99.9241
3J7	GREENE COUNTY RGNL	GA	LPV	1	99.9483	1	99.9347	1	99.9245
48A	COCHRAN	GA	LPV	1	99.934	1	99.9241	1	99.9241
4A4	POLK COUNTY AIRPORT-CORNELIUS	GA	LPV	1	99.9498	1	99.946	1	99.9351
4J1	BRANTLEY COUNTY	GA	LPV	1	99.9343	1	99.9241	1	99.9241
4J5	QUITMAN BROOKS COUNTY	GA	LP	1	99.9279	1	99.9241	2	99.9238
52A	MADISON MUNICIPAL	GA	LP	1	99.946	1	99.9347	1	99.9245
6A1	BUTLER MUNICIPAL	GA	LPV	1	99.9347	1	99.9313	1	99.9241
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	1	99.9347	1	99.9347	1	99.9241
70J	CAIRO-GRADY COUNTY	GA	LPV	1	99.9306	1	99.9241	2	99.9238
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	1	99.9313	1	99.9241	2	99.9238
ACJ	JIMMY CARTER RGNL	GA	LPV	1	99.9347	1	99.9241	1	99.9241
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	1	99.9528	1	99.9347	1	99.9241
AHN	ATHENS/BEN EPPS	GA	LPV200	1	99.9498	1	99.9381	1	99.9313
AJR	HABERSHAM COUNTY	GA	LPV	1	99.9528	1	99.9475	1	99.946
AMG	BACON COUNTY	GA	LPV	1	99.9347	1	99.9241	1	99.9241
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	1	99.946	1	99.9381	1	99.9253
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	1	99.934	1	99.9241	1	99.9241
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	1	99.9313	1	99.9241	2	99.9238
BHC	BAXLEY MUNICIPAL	GA	LPV	1	99.9347	1	99.9241	1	99.9241
BIJ	EARLY COUNTY	GA	LPV	1	99.9347	1	99.9241	2	99.9238
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	1	99.9328	1	99.9275	1	99.9241
CCO	NEWNAN COWETA COUNTY	GA	LPV	1	99.9347	1	99.9347	1	99.9249
CKF	CRISP COUNTY-CORDELE	GA	LPV	1	99.9321	1	99.9241	1	99.9241
CNI	CHEROKEE COUNTY	GA	LPV	1	99.9498	1	99.946	1	99.946
CSG	COLUMBUS	GA	LPV	1	99.9347	1	99.9313	1	99.9241
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	1	99.9419	1	99.9381	1	99.934

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
CVC	COVINGTON MUNICIPAL	GA	LPV	1	99.946	1	99.9381	1	99.9245
CWV	CLAXTON-EVANS COUNTY	GA	LPV	1	99.9347	1	99.9275	1	99.9241
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	1	99.9313	1	99.9241	1	99.9241
CZL	TOM B DAVID FLD	GA	LPV	1	99.9498	1	99.946	1	99.946
D73	MONROE-WALTON COUNTY	GA	LP	1	99.946	1	99.9381	1	99.9268
DNN	DALTON MUNICIPAL	GA	LPV	1	99.9498	1	99.946	1	99.946
DQH	DOUGLAS MUNICIPAL	GA	LPV200	1	99.9347	1	99.9241	1	99.9241
EBA	ELBERT COUNTY-PATZ FIELD	GA	LP	1	99.9528	1	99.9494	1	99.9313
EZM	HEART OF GEORGIA RGNL	GA	LPV200	1	99.9313	1	99.9241	1	99.9241
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV200	1	99.9347	1	99.9347	1	99.9245
FTY	FULTON COUNTY AIRPORT-BROWN FI	GA	LPV	1	99.9498	1	99.9381	1	99.9328
FZG	FITZGERALD MUNICIPAL	GA	LPV	1	99.9313	1	99.9241	1	99.9241
GVL	LEE GILMER MEMORIAL	GA	LPV	1	99.9532	1	99.946	1	99.9381
HOE	HOMERVILLE	GA	LPV	1	99.9328	1	99.9241	1	99.9241
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	1	99.9528	1	99.9347	1	99.9241
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	1	99.9528	1	99.9347	1	99.9245
JES	JESUP-WAYNE COUNTY	GA	LPV	1	99.9347	1	99.9241	1	99.9241
JYL	PLANTATION ARPK	GA	LPV	1	99.9441	1	99.9279	1	99.9241
JZP	PICKENS COUNTY	GA	LPV	1	99.9498	1	99.946	1	99.946
LGC	LAGRANGE-CALLAWAY	GA	LPV200	1	99.9347	1	99.9317	1	99.9241
LZU	GWINNETT COUNTY - BRISCOE FIEL	GA	LPV200	1	99.946	1	99.9381	1	99.9347
MAC	MACON DOWNTOWN	GA	LP	1	99.9347	1	99.9313	1	99.9241
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	1	99.9347	1	99.9313	1	99.9241
MGR	MOULTRIE MUNICIPAL	GA	LPV200	1	99.9313	1	99.9241	1	99.9241
MLJ	BALDWIN COUNTY	GA	LPV	1	99.946	1	99.9313	1	99.9241
MQW	TELFAIR-WHEELER	GA	LPV	1	99.9347	1	99.9241	1	99.9241
OKZ	KAOLIN FIELD	GA	LPV	1	99.946	1	99.9313	1	99.9241
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	1	99.9347	1	99.9347	1	99.9241
PIM	HARRIS COUNTY	GA	LPV	1	99.9347	1	99.9313	1	99.9241
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	1	99.9498	1	99.9381	1	99.9343
PXE	PERRY-HOUSTON COUNTY	GA	LPV	1	99.9347	1	99.9245	1	99.9241
RMG	RICHARD B RUSSELL REGIONAL - J	GA	LPV	1	99.9498	1	99.946	1	99.946
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	1	99.9347	1	99.9241	1	99.9241
RYY	COBB COUNTY-MC COLLUM FIELD	GA	LPV200	1	99.9498	1	99.9381	1	99.934
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	1	99.9332	1	99.9275	1	99.9241
SBO	EAST GEORGIA REGIONAL	GA	LPV	1	99.946	1	99.9245	1	99.9241

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	1	99.9355	1	99.9275	1	99.9241
TMA	HENRY TIFT MYERS	GA	LPV	1	99.9313	1	99.9241	1	99.9241
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	1	99.9528	1	99.9494	1	99.946
TVI	THOMASVILLE RGNL	GA	LPV	1	99.9302	1	99.9241	2	99.9238
VDI	VIDALIA RGNL	GA	LPV200	1	99.9347	1	99.9241	1	99.9241
VLD	VALDOSTA RGNL	GA	LPV	1	99.9279	1	99.9241	1	99.9241
VPC	CARTERSVILLE	GA	LPV	1	99.9498	1	99.946	1	99.9347
WDR	BARROW COUNTY	GA	LPV	1	99.9487	1	99.9381	1	99.9313
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
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
IIB	INDEPENDENCE MUNICIPAL	IA	LP	0	100	0	100	0	100
IKV	ANKENY RGNL	IA	LPV	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
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 MUNICIPAL	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	LPV	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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	0	100
PIH	POCATELLO RGNL	ID	LPV200	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	1	99.9879	1	99.9879	1	99.9857
3LF	LITCHFIELD MUNICIPAL	IL	LPV	1	99.9921	1	99.9921	1	99.9921
3MY	MOUNT HAWLEY AUXILIARY	IL	LP	0	100	0	100	0	100
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	1	99.9819	1	99.9819	1	99.9819
ALN	ST LOUIS RGNL	IL	LPV200	1	99.9841	1	99.9841	1	99.9841
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	0	100
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	1	99.9808	1	99.9808	1	99.9808
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	1	99.9702	1	99.9596	1	99.9532
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	100	0	100	0	100
CPS	ST LOUIS DOWNTOWN	IL	LPV200	1	99.9815	1	99.9815	1	99.9815
CTK	INGERSOLL	IL	LPV	0	100	0	100	0	100
CUL	CARMI MUNICIPAL	IL	LP	1	99.9785	1	99.9785	1	99.9543
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	1	99.9804	1	99.9804	1	99.9804
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	1	99.9823	1	99.9823	1	99.9823
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	100	0	100	0	100
HSB	HARRISBURG-RALEIGH	IL	LPV	1	99.977	1	99.977	1	99.9543
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	1	99.9838	1	99.9838	1	99.9838
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	LPV	0	100	0	100	0	100
MVN	MOUNT VERNON	IL	LPV	1	99.9792	1	99.9792	1	99.9713
MWA	WILLIAMSON COUNTY RGNL	IL	LPV200	1	99.9766	1	99.9766	1	99.9551
OLY	OLNEY-NOBLE	IL	LPV	1	99.983	1	99.983	1	99.983
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	1	99.9785	1	99.9785	1	99.9607
PNT	PONTIAC MUNICIPAL	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	LPV200	0	100	0	100	0	100
RSV	CRAWFORD CO	IL	LPV	1	99.9875	1	99.9875	1	99.9864
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	1	99.9792	1	99.9792	1	99.9607
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	0	100
SLO	SALEM-LECKRONE	IL	LPV200	1	99.9819	1	99.9819	1	99.9819
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	1	99.9966	1	99.9966	2	99.9928

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	2	99.9849	2	99.9849	2	99.9838
BMG	MONROE COUNTY	IN	LPV200	2	99.9947	2	99.9947	2	99.9917
C62	KENDALLVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
CEV	METTEL FIELD	IN	LPV	0	100	0	100	0	100
DCY	DAVIESS COUNTY	IN	LPV	2	99.9838	2	99.9838	2	99.9834
EKM	ELKHART MUNICIPAL	IN	LPV	0	100	0	100	0	100
EVV	EVANSVILLE RGNL	IN	LPV200	1	99.9785	1	99.9785	1	99.9547
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	2	99.9808	2	99.9808	2	99.9808
FWA	FORT WAYNE INTL	IN	LPV200	0	100	0	100	0	100
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	100	0	100	1	99.9996
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	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	2	99.98	2	99.98	1	99.9619
HUF	TERRE HAUTE INTL-HULMAN FIELD	IN	LPV200	1	99.9966	1	99.9966	1	99.9966
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	0	100
IMS	MADISON MUNICIPAL	IN	LPV	2	99.9841	2	99.9841	2	99.98
IND	INDIANAPOLIS INTL	IN	LPV200	0	100	0	100	0	100
JVY	CLARK RGNL	IN	LPV200	1	99.9675	1	99.9675	1	99.9675
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	1	99.9955	1	99.9955	2	99.9883
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
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	0	100
SBN	SOUTH BEND INTL	IN	LPV	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
SER	FREEMAN MUNICIPAL	IN	LPV	2	99.9849	2	99.9849	2	99.9834
SIV	SULLIVAN COUNTY	IN	LPV	1	99.9936	1	99.9936	1	99.9913
SMD	SMITH FIELD	IN	LPV	0	100	0	100	0	100
TEL	PERRY COUNTY MUNICIPAL	IN	LP	1	99.9649	1	99.9649	1	99.9532
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	1	99.9996	1	99.9996	1	99.9834
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	1	99.9992
AAO	COLONEL JAMES JABARA	KS	LPV	1	99.9996	1	99.9996	1	99.9849
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	1	99.9974
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	1	99.9868
BEC	BEECH FACTORY	KS	LPV	1	99.9996	1	99.9996	1	99.9849
CBK	SHALZ FIELD	KS	LPV	0	100	0	100	1	99.9981
CNK	BLOSSER MUNICIPAL	KS	LP	0	100	0	100	0	100
DDC	DODGE CITY RGNL	KS	LPV	0	100	0	100	0	100
EGT	WELLINGTON MUNICIPAL	KS	LPV	1	99.9996	1	99.9996	1	99.9841
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	100	0	100	0	100
EMP	EMPORIA MUNICIPAL	KS	LPV	1	99.9996	1	99.9996	2	99.9943
EQA	EL DORADO/CAPTAIN JACK THOMAS	KS	LPV200	1	99.9996	2	99.9992	1	99.983
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	100	0	100	1	99.9966
FOE	FORBES FIELD	KS	LPV	0	100	0	100	0	100
FSK	FORT SCOTT MUNICIPAL	KS	LPV	1	99.9845	1	99.9845	1	99.9724
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	1	99.9974
HLC	HILL CITY MUNICIPAL	KS	LPV	0	100	0	100	1	99.9996
HQG	HUGOTON MUNICIPAL	KS	LPV	0	100	0	100	1	99.9996
HRU	HERINGTON RGNL	KS	LPV	0	100	0	100	1	99.9966
HUT	HUTCHINSON RGNL	KS	LPV	0	100	0	100	0	100
HYS	HAYS RGNL	KS	LPV200	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
ICT	WICHITA DWIGHT D EISENHOWER NA	KS	LPV200	1	99.9996	1	99.9996	1	99.9857
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	2	99.9989	2	99.9989	1	99.9713
IXD	NEW CENTURY AIRCENTER	KS	LPV	1	99.9989	1	99.9989	1	99.9989
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
K81	MIAMI COUNTY	KS	LPV	2	99.9955	2	99.9955	2	99.9902
K82	SMITH CENTER MUNICIPAL	KS	LPV200	0	100	0	100	1	99.9996
K88	ALLEN COUNTY	KS	LPV	2	99.9985	2	99.9985	1	99.9713
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	0	100	0	100	1	99.9928
LQR	LARNED-PAWNEE COUNTY	KS	LPV	0	100	0	100	0	100
LWC	LAWRENCE MUNICIPAL	KS	LPV200	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	1	99.9985
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	1	99.9989
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	1	99.9977
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	2	99.9977	2	99.9977	2	99.9977
OWI	OTTAWA MUNICIPAL	KS	LPV	2	99.9985	2	99.9985	2	99.9932
PPF	TRI-CITY	KS	LPV	2	99.9989	2	99.9989	1	99.9713
PTS	ATKINSON MUNICIPAL	KS	LPV	1	99.9853	1	99.9815	1	99.9728
PTT	PRATT RGNL	KS	LPV	0	100	0	100	1	99.9962
RCP	ROOKS COUNTY RGNL	KS	LPV	0	100	0	100	1	99.9996
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
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	1	99.9996	1	99.9996	1	99.9785
ULS	ULYSSES	KS	LPV	0	100	0	100	0	100
WLD	STROTHER FIELD	KS	LPV	1	99.9996	1	99.9864	1	99.9841
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	1	99.9732	1	99.9732	1	99.9675
18I	MC CREARY COUNTY	KY	LP	1	99.9566	1	99.9543	1	99.946
27K	GEORGETOWN SCOTT COUNTY - MARS	KY	LPV200	1	99.9706	1	99.9706	1	99.9668

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
2I0	MADISONVILLE RGNL	KY	LPV	1	99.9607	1	99.9585	1	99.9528
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	1	99.9596	1	99.9528	1	99.9528
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	1	99.9566	1	99.9566	1	99.9464
5M9	MARION-CRITTENDEN COUNTY	KY	LPV	1	99.9596	1	99.9547	1	99.954
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LP	1	99.9615	1	99.9615	1	99.9494
AAS	TAYLOR COUNTY	KY	LPV	1	99.9596	1	99.9596	1	99.946
BRY	SAMUELS FIELD	KY	LPV	1	99.963	1	99.963	1	99.9532
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	1	99.9566	1	99.9566	1	99.9464
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	1	99.9566	1	99.9566	1	99.9494
CEY	KYLE-OAKLEY FIELD	KY	LPV	1	99.9566	1	99.9528	1	99.9513
CPF	WENDELL H FORD	KY	LPV200	1	99.9623	1	99.9604	1	99.9528
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	1	99.9958	1	99.9958	2	99.9845
DVK	STUART POWELL FIELD	KY	LPV	1	99.9611	1	99.9611	1	99.9528
DWU	ASHLAND RGNL	KY	LP	1	99.9943	1	99.9943	1	99.9679
EHR	HENDERSON CITY-COUNTY	KY	LPV	2	99.974	2	99.974	1	99.9543
EKQ	WAYNE COUNTY	KY	LPV	1	99.9566	1	99.9566	1	99.946
EKX	ADDINGTON FIELD	KY	LPV	1	99.9615	1	99.9615	1	99.9513
FFT	CAPITAL CITY	KY	LPV	1	99.9675	1	99.966	1	99.966
FGX	FLEMING-MASON	KY	LPV	1	99.9932	1	99.9932	2	99.9823
GLW	GLASGOW MUNICIPAL	KY	LPV	1	99.957	1	99.9566	1	99.946
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	1	99.957	1	99.9517	1	99.9517
IOB	MOUNT STERLING-MONTGOMERY COUN	KY	LPV	1	99.9691	1	99.9691	1	99.9653
JQD	OHIO COUNTY	KY	LPV	1	99.9607	1	99.9607	1	99.9532
K24	RUSSELL COUNTY	KY	LPV	1	99.9566	1	99.9566	1	99.946
K62	GENE SNYDER	KY	LP	1	99.977	1	99.977	1	99.9679
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	1	99.9645	1	99.9645	1	99.9536
LEX	BLUE GRASS	KY	LPV	1	99.9664	1	99.9649	1	99.9566
LOU	BOWMAN FIELD	KY	LPV	1	99.9664	1	99.9664	1	99.9664
LOZ	LONDON-CORBIN ARPT-MAGEE FIELD	KY	LPV	1	99.957	1	99.957	1	99.9528
M21	MUHLENBERG COUNTY	KY	LP	1	99.9596	1	99.9566	1	99.9521
M25	MAYFIELD GRAVES COUNTY	KY	LPV	1	99.9577	1	99.9532	1	99.9513
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	1	99.963	1	99.963	1	99.9536

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
PAH	BARKLEY RGNL	KY	LPV	1	99.9672	1	99.957	1	99.9498
SDF	LOUISVILLE INTL-STANDIFORD FIE	KY	LPV200	1	99.966	1	99.966	1	99.9615
SJS	BIG SANDY RGNL	KY	LPV	1	99.9747	1	99.9747	1	99.9638
SME	LAKE CUMBERLAND RGNL	KY	LPV	1	99.9566	1	99.9566	1	99.9494
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	1	99.9743	1	99.9743	1	99.9672
TWT	STURGIS MUNICIPAL	KY	LPV	1	99.96	1	99.9596	1	99.9543
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	1	99.9566	1	99.9566	1	99.946
3R4	HART	LA	LPV	1	99.9717	1	99.9713	1	99.9607
3R7	JENNINGS	LA	LPV	2	99.9804	2	99.9804	2	99.9475
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	1	99.9992	2	99.9989	1	99.9607
ACP	ALLEN PARISH	LA	LPV	1	99.9717	1	99.9713	2	99.9483
AEX	ALEXANDRIA INTL	LA	LPV200	1	99.9717	1	99.9607	2	99.949
ARA	ACADIANA RGNL	LA	LPV	1	99.9641	1	99.9532	2	99.9472
BQP	MOREHOUSE MEMORIAL	LA	LPV	1	99.9709	1	99.9604	1	99.9498
BTR	BATON ROUGE METROPOLITAN` RYAN	LA	LPV200	1	99.9604	1	99.9532	2	99.9445
BXA	GEORGE R CARR MEMORIAL AIR FLD	LA	LPV	1	99.957	1	99.9498	3	99.9355
CWF	CHENNAULT INTL	LA	LPV200	1	99.9981	1	99.9981	2	99.9596
DTN	SHREVEPORT DOWNTOWN	LA	LPV	1	99.9713	1	99.9713	1	99.9607
ESF	ESLER RGNL	LA	LPV200	1	99.9641	1	99.9532	2	99.9487
F88	JONESBORO	LA	LP	1	99.9713	1	99.9607	1	99.96
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	1	99.96	1	99.9498	4	99.9215
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	1	99.9604	1	99.9498	2	99.9366
HUM	HOUMA-TERREBONNE	LA	LPV200	1	99.9604	1	99.9498	3	99.9309
HZR	FALSE RIVER RGNL	LA	LPV	1	99.9641	1	99.9532	2	99.946
IER	NATCHITOCHES RGNL	LA	LPV	1	99.9717	1	99.9713	1	99.9604
IYA	ABBEVILLE CHRIS CRUSTA MEMORIA	LA	LPV	2	99.9785	3	99.9777	2	99.9472
L39	LEESVILLE	LA	LPV	1	99.9717	1	99.9713	1	99.9607
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	2	99.9679
LFT	LAFAYETTE RGNL/PAUL FOURNET FI	LA	LPV	1	99.966	1	99.9532	2	99.9472
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	1	99.9645	1	99.954	1	99.9498
MLU	MONROE RGNL	LA	LPV200	1	99.9709	1	99.9604	1	99.9498

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	1	99.9604	1	99.9498	3	99.9332
NEW	LAKEFRONT	LA	LPV	1	99.9604	1	99.9498	4	99.9313
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	1	99.9641	1	99.9532	2	99.9479
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	1	99.9604	1	99.9532	2	99.9419
RSN	RUSTON RGNL	LA	LPV	1	99.9713	1	99.9607	1	99.96
SHV	SHREVEPORT RGNL	LA	LPV200	1	99.9713	1	99.9713	1	99.9607
SPH	SPRINGHILL	LA	LPV	1	99.9713	1	99.9713	1	99.9607
TVR	VICKSBURG TALLULAH RGNL	LA	LPV	1	99.946	1	99.946	1	99.9423
UXL	SOUTHLAND FIELD	LA	LPV	0	100	0	100	2	99.9683
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
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	0	100	0	100	0	100
BVY	BEVERLY MUNICIPAL	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
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	0	100
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	1	99.9996
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	LP	0	100	0	100	1	99.9996

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	0	100	0	100	0	100
ESN	EASTON/NEWNAM FIELD	MD	LPV	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
1B0	DEXTER RGNL	ME	LP	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	LPV	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
BXM	BRUNSWICK EXECUTIVE	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
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	LPV	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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
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
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
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(JANES	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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
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
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
JMR	MORA 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	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	LPV	0	100	0	100	0	100
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
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	1	99.983	1	99.983	1	99.983
1MO	MOUNTAIN GROVE MEMORIAL	MO	LP	1	99.9823	1	99.9732	1	99.9607
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	1	99.9834	1	99.9724	1	99.9713
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	0	100
8WC	WASHINGTON COUNTY	MO	LPV	1	99.9804	1	99.9804	1	99.9607
94K	CASSVILLE MUNICIPAL	MO	LPV	1	99.9808	1	99.9713	1	99.9713
AIZ	LEE C FINE MEMORIAL	MO	LPV	1	99.9808	1	99.9808	1	99.9713
BBG	BRANSON	MO	LPV200	1	99.9774	1	99.9713	1	99.9713
BUM	BUTLER MEMORIAL	MO	LPV	1	99.9834	1	99.9834	1	99.9736
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	1	99.9713	1	99.9634	1	99.9547
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	100	0	100	0	100
COU	COLUMBIA RGNL	MO	LPV	1	99.9815	1	99.9815	1	99.9815
DMO	SEDALIA RGNL	MO	LPV	1	99.9823	1	99.9823	1	99.9785
DXE	DEXTER MUNICIPAL	MO	LPV	1	99.9713	1	99.9607	1	99.9532
EIW	COUNTY MEMORIAL	MO	LPV	1	99.9657	1	99.9551	1	99.9498
EOS	NEOSHO HUGH ROBINSON	MO	LPV	1	99.9838	1	99.9724	1	99.9713
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	1	99.9804	1	99.9804	1	99.9607
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	1	99.9815	1	99.9815	1	99.9815
FWB	BRANSON WEST MUNICIPAL - EMERSON FI	MO	LPV200	1	99.9792	1	99.9713	1	99.9713
FYG	WASHINGTON RGNL	MO	LPV	1	99.9823	1	99.9823	1	99.9823
GLY	CLINTON RGNL	MO	LPV	1	99.983	1	99.983	1	99.9751
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	100	0	100	0	100
H79	ELDON MODEL AIRPARK	MO	LP	1	99.9815	1	99.9815	1	99.9781

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	1	99.9808	1	99.9808	1	99.9607
HAE	HANNIBAL RGNL	MO	LPV	0	100	0	100	0	100
HFJ	MONETT RGNL	MO	LPV	1	99.9834	1	99.9724	1	99.9713
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	2	99.9943	2	99.9943	2	99.9943
IRK	KIRKSVILLE RGNL	MO	LPV200	0	100	0	100	0	100
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	1	99.9819	1	99.9819	1	99.9819
JLN	JOPLIN RGNL	MO	LPV	1	99.9834	1	99.9736	1	99.9713
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	1	99.9808	1	99.9808	1	99.9717
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	1	99.9826	1	99.9766	1	99.9724
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	1	99.983	1	99.983	1	99.9774
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	2	99.997	2	99.997	2	99.997
M05	CARUTHERSVILLE MEMORIAL	MO	LPV	1	99.9645	1	99.954	1	99.9498
M12	STEELE MUNICIPAL	MO	LPV	1	99.9709	1	99.9604	1	99.9524
M17	BOLIVAR MUNICIPAL	MO	LPV	1	99.9819	1	99.9762	1	99.9713
M48	HOUSTON MEMORIAL	MO	LPV	1	99.9819	1	99.9743	1	99.9607
MAW	MALDEN RGNL	MO	LPV	1	99.9713	1	99.9607	1	99.9498
MBY	OMAR N BRADLEY	MO	LPV	1	99.9936	1	99.9936	1	99.9936
MCI	KANSAS CITY INTL	MO	LPV200	0	100	0	100	0	100
MHL	MARSHALL MEMORIAL MUNICIPAL	MO	LPV	2	99.9932	2	99.9932	2	99.9932
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV200	0	100	0	100	0	100
MNF	MOUNTAIN VIEW	MO	LP	1	99.9823	1	99.9721	1	99.9607
MO3	STOCKTON MUNICIPAL	MO	LP	1	99.9823	1	99.9785	1	99.9721
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
MYJ	MEXICO MEMORIAL	MO	LPV	1	99.9815	1	99.9815	1	99.9815
NVD	NEVADA MUNICIPAL	MO	LPV200	1	99.9838	1	99.9838	1	99.9732
OZS	CAMDENTON MEMORIAL-LAKE RGNL	MO	LPV	1	99.9811	1	99.9811	1	99.9713
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	1	99.9785	1	99.9713	1	99.9713
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	1	99.9713	1	99.9607	1	99.9547
RAW	WARSAW MUNICIPAL	MO	LPV200	1	99.983	1	99.983	1	99.9762
RCM	SKYHAVEN	MO	LPV	1	99.9823	1	99.9823	1	99.9808
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV200	1	99.9826	1	99.9743	1	99.9713
SIK	SIKESTON MEMORIAL MUNICIPAL	MO	LPV	1	99.9713	1	99.9607	1	99.9532

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	100	0	100	0	100
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	1	99.9834	1	99.9834	1	99.9834
SUS	SPIRIT OF ST LOUIS	MO	LPV200	1	99.9826	1	99.9826	1	99.9826
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	1	99.9811	1	99.9811	1	99.9713
TKX	KENNETT MEMORIAL	MO	LPV	1	99.9713	1	99.9604	1	99.9528
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	0	100
UBX	CUBA MUNICIPAL	MO	LPV	1	99.9804	1	99.9804	1	99.9713
UNO	WEST PLAINS RGNL	MO	LPV	1	99.9826	1	99.9713	1	99.9607
UUV	SULLIVAN RGNL	MO	LPV	1	99.98	1	99.98	1	99.9713
VER	JESSE VIERTEL MEMORIAL	MO	LPV	1	99.9815	1	99.9815	1	99.9815
VIH	ROLLA NATIONAL	MO	LPV200	1	99.9804	1	99.9804	1	99.9713
0R0	COLUMBIA-MARION COUNTY	MS	LPV	1	99.9498	1	99.9498	2	99.9373
17M	MAGEE MUNICIPAL	MS	LP	1	99.9498	1	99.9498	2	99.9392
5A4	OKOLONA MUNICIPAL-RICHARD STOVALL F	MS	LPV	1	99.9498	1	99.9498	1	99.946
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	1	99.9498	1	99.9498	1	99.946
87I	YAZOO COUNTY	MS	LPV	1	99.9475	1	99.9475	1	99.9438
8M1	BOONEVILLE/BALDWYN	MS	LPV	1	99.9498	1	99.9498	1	99.9498
CKM	FLETCHER FIELD	MS	LPV	1	99.9532	1	99.9532	1	99.946
CRX	ROSCOE TURNER	MS	LPV200	1	99.9498	1	99.9498	1	99.9498
GLH	GREENVILLE MID-DELTA	MS	LPV200	1	99.9532	1	99.9532	1	99.946
GNF	GRENADA MUNICIPAL	MS	LPV200	1	99.9483	1	99.9483	1	99.9445
GPT	GULFPORT-BILOXI INTL	MS	LPV200	1	99.9604	1	99.9419	3	99.9238
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	1	99.9498	1	99.9498	1	99.9411
GWO	GREENWOOD-LEFLORE	MS	LPV	1	99.9479	1	99.9479	1	99.9438
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	1	99.9498	1	99.9498	3	99.9355
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADA	MS	LPV200	1	99.9638	1	99.9532	2	99.9453
HKS	HAWKINS FIELD	MS	LPV	1	99.9498	1	99.9498	2	99.9457
HSA	STENNIS INTL	MS	LPV200	1	99.9604	1	99.9498	3	99.9313
IDL	INDIANOLA MUNICIPAL	MS	LPV	1	99.9532	1	99.9532	1	99.946
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	1	99.9498	1	99.9498	2	99.9457
JVW	JOHN BELL WILLIAMS	MS	LPV200	1	99.9475	1	99.9475	1	99.9438
LMS	LOUISVILLE WINSTON COUNTY	MS	LPV	1	99.9498	1	99.9498	1	99.9411

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
LUL	HESLER-NOBLE FIELD	MS	LPV	1	99.9498	1	99.9498	3	99.9366
M40	MONROE COUNTY	MS	LPV	1	99.9498	1	99.9498	1	99.946
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	1	99.9498	1	99.9498	2	99.9389
MBO	BRUCE CAMPBELL FIELD	MS	LP	1	99.9498	1	99.9498	1	99.946
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV	1	99.957	1	99.9498	2	99.9453
MEI	KEY FIELD	MS	LPV200	1	99.9498	1	99.9498	2	99.9381
MJD	PICAYUNE MUNICIPAL	MS	LPV	1	99.9604	1	99.9498	3	99.9328
MMS	SELFS	MS	LPV	1	99.9498	1	99.9498	1	99.946
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	1	99.9498	1	99.9498	1	99.9404
OLV	OLIVE BRANCH	MS	LPV200	1	99.9638	1	99.9521	1	99.9498
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	1	99.9498	1	99.9498	3	99.9366
PMU	PANOLA COUNTY	MS	LPV	1	99.9498	1	99.9498	1	99.946
PQL	TRENT LOTT INTL	MS	LPV200	1	99.9604	1	99.9419	3	99.923
RNV	CLEVELAND MUNICIPAL	MS	LPV	1	99.9532	1	99.9532	1	99.946
STF	GEORGE M BRYAN	MS	LPV200	1	99.9498	1	99.9498	1	99.9415
TUP	TUPELO RGNL	MS	LPV200	1	99.9498	1	99.9498	1	99.946
UOX	UNIVERSITY-OXFORD	MS	LPV	1	99.9513	1	99.9513	1	99.9475
UTA	TUNICA MUNICIPAL	MS	LPV200	1	99.9645	1	99.9536	1	99.9494
VKS	VICKSBURG MUNICIPAL	MS	LP	1	99.946	1	99.946	2	99.9419
1S3	TILLITT FIELD	MT	LPV	0	100	0	100	0	100
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	0	100	0	100
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	0	100
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	0	100
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	0	100
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	0	100	0	100	0	100
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	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	0	100
MLS	FRANK WILEY FIELD	MT	LPV	0	100	0	100	0	100
MSO	MISSOULA INTL	MT	LPV	0	100	0	100	0	100
OLF	L M CLAYTON	MT	LPV200	0	100	0	100	0	100
PO1	POPLAR MUNICIPAL	MT	LPV200	0	100	0	100	0	100
PWD	SHER-WOOD	MT	LPV200	0	100	0	100	0	100
RPX	ROUNDUP	MT	LPV	0	100	0	100	0	100
SBX	SHELBY	MT	LPV	0	100	0	100	0	100
SDY	SIDNEY-RICHLAND MUNICIPAL	MT	LPV	0	100	0	100	0	100
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	1	99.9804	1	99.9804	1	99.9589
ACZ	HENDERSON FIELD	NC	LPV	1	99.9819	1	99.9819	1	99.946
AFP	ANSON COUNTY -JEFF CLOUD FIE	NC	LPV	1	99.9623	1	99.9623	1	99.9528
AKH	GASTONIA MUNICIPAL	NC	LPV	1	99.9566	1	99.9566	1	99.9528
ASJ	TRI-COUNTY	NC	LPV	0	100	0	100	1	99.9947
AVL	ASHEVILLE RGNL	NC	LPV	1	99.9528	1	99.9528	1	99.9528
BUY	BURLINGTON-ALAMANCE RGNL	NC	LPV	1	99.9841	1	99.9841	1	99.9755
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	1	99.9566	1	99.9566	1	99.9528
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	1	99.9815	1	99.9815	2	99.9657
DPL	DUPLIN CO	NC	LPV200	1	99.9819	1	99.9819	2	99.966
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	0	100	0	100	1	99.9966
EDE	NORTHEASTERN RGNL	NC	LPV200	0	100	0	100	1	99.9947
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	1	99.9528	1	99.9528	1	99.9528
EQY	CHARLOTTE-MONROE EXECUTIVE	NC	LPV	1	99.9566	1	99.9566	1	99.9528
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	1	99.9838	1	99.9838	1	99.9713
EXX	DAVIDSON COUNTY	NC	LPV	2	99.9755	2	99.9755	1	99.9566
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	1	99.9781	1	99.9781	1	99.946
FAY	FAYETTEVILLE RGNL/GRANNIS FIEL	NC	LPV200	1	99.9804	1	99.9804	2	99.9649
FQD	RUTHERFORD CO - MARCHMAN FIELD	NC	LPV	1	99.9528	1	99.9528	1	99.9528
GSO	PIEDMONT TRIAD INTL	NC	LPV200	1	99.9819	1	99.9819	2	99.9619
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	1	99.9868	1	99.9868	1	99.9713

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
HKY	HICKORY RGNL	NC	LPV200	1	99.9566	1	99.9566	1	99.9528
HNZ	HENDERSON-OXFORD	NC	LPV	0	100	0	100	1	99.9872
HRJ	HARNETT RGNL JETPORT	NC	LPV	1	99.9819	1	99.9819	1	99.9819
ILM	WILMINGTON INTL	NC	LPV200	1	99.9781	2	99.9728	1	99.946
INT	SMITH REYNOLDS	NC	LPV200	1	99.9811	1	99.9811	2	99.9592
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	1	99.9566	1	99.9566	1	99.9528
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	1	99.9868	1	99.9868	1	99.9713
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	1	99.9947
JNX	JOHNSTON REGIONAL	NC	LPV	1	99.9838	1	99.9838	1	99.9819
JQF	CONCORD RGNL	NC	LPV	1	99.9566	1	99.9566	1	99.9528
LBT	LUMBERTON RGNL	NC	LPV	2	99.9766	2	99.9766	1	99.946
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	1	99.9996	1	99.9996	1	99.9857
MCZ	MARTIN COUNTY	NC	LPV	1	99.9996	1	99.9996	1	99.9928
MEB	LAURINBURG-MAXTON	NC	LPV200	1	99.9781	1	99.9781	1	99.946
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	1	99.9841
MRH	MICHAEL J SMITH FIELD	NC	LP	1	99.9819	1	99.9819	2	99.9623
MRN	FOOTHILLS REGIONAL	NC	LPV200	1	99.9558	1	99.9558	1	99.9528
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	1	99.9811	1	99.9811	2	99.9611
OAJ	ALBERT J ELLIS	NC	LPV200	1	99.9819	1	99.9819	2	99.9611
OCW	WASHINGTON-WARREN	NC	LPV	1	99.9902	1	99.9902	1	99.9713
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	1	99.997
PGV	PITT-GREENVILLE	NC	LPV	1	99.9879	1	99.9879	1	99.9713
PMZ	PLYMOUTH MUNICIPAL	NC	LP	1	99.9996	1	99.9996	1	99.9823
RCZ	RICHMOND COUNTY	NC	LPV	1	99.9781	1	99.9781	1	99.9528
RDU	RALEIGH-DURHAM INTL	NC	LPV200	1	99.9849	1	99.9849	1	99.9819
RUQ	ROWAN COUNTY	NC	LPV200	1	99.9592	1	99.9592	1	99.9532
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	1	99.9996	1	99.9996	1	99.9819
SCR	SILER CITY MUNICIPAL	NC	LPV	1	99.9819	1	99.9819	1	99.9747
SOP	MOORE COUNTY	NC	LPV200	1	99.9804	1	99.9804	1	99.9589
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	2	99.9709	2	99.9623	1	99.9279
SVH	STATESVILLE RGNL	NC	LPV200	1	99.9566	1	99.9566	1	99.9532
TDF	PERSON COUNTY	NC	LPV200	1	99.9868	1	99.9868	1	99.9819
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	1	99.9823	1	99.9823	1	99.9819
VUJ	STANLY COUNTY	NC	LPV200	1	99.9634	1	99.9634	1	99.9532
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	1	99.9823	1	99.9823	1	99.9713
ZEF	ELKIN MUNICIPAL	NC	LP	1	99.963	1	99.963	2	99.9562

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
06D	ROLLA MUNICIPAL	ND	LPV	0	100	0	100	0	100
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
5N8	CASSELTON ROBERT MILLER RGNL	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
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	0	100
DIK	DICKINSON - THEODORE ROOSEVELT	ND	LPV200	0	100	0	100	0	100
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
HZE	MERCER COUNTY RGNL	ND	LPV	0	100	0	100	0	100
ISN	SLOULIN FLD INTL	ND	LPV200	0	100	0	100	0	100
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	0	100
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 ID	Airport Name	State/ Province	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	1	99.9962
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	1	99.9985
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	1	99.9996
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	1	99.9974
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	1	99.9981
BIE	BEATRICE MUNICIPAL	NE	LPV200	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
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	1	99.9981
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	1	99.9951
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	1	99.9992
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	100	0	100	1	99.9985
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	1	99.9955
JYR	YORK MUNICIPAL	NE	LPV	0	100	0	100	0	100
LBF	NORTH PLATTE RGNL AIRPORT LEE	NE	LPV200	0	100	0	100	1	99.997
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	0	100	0	100	0	100
LNK	LINCOLN	NE	LPV	0	100	0	100	0	100
LXN	JIM KELLY FIELD	NE	LPV	0	100	0	100	1	99.9985
MCK	MC COOK BEN NELSON RGNL	NE	LPV	0	100	0	100	1	99.997
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	1	99.9951
OKS	GARDEN COUNTY	NE	LPV	0	100	0	100	1	99.9958
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	1	99.9974
SWT	SEWARD MUNICIPAL	NE	LPV	0	100	0	100	0	100
TIF	THOMAS COUNTY	NE	LPV	0	100	0	100	1	99.9992
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	LPV	0	100	0	100	0	100
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
MJX	OCEAN COUNTY	NJ	LPV	0	100	0	100	0	100
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	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	LPV200	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	3	99.9566
ATS	ARTESIA MUNICIPAL	NM	LPV	0	100	0	100	1	99.9996
CAO	CLAYTON MUNICIPAL ARPK	NM	LPV	0	100	0	100	0	100
CNM	CAVERN CITY AIR TRML	NM	LPV200	0	100	0	100	1	99.9996
CVN	CLOVIS MUNICIPAL	NM	LPV200	0	100	0	100	1	99.9996
DMN	DEMING MUNICIPAL	NM	LPV	0	100	0	100	21	99.986
E06	LEA COUNTY-ZIP FRANKLIN MEMORI	NM	LPV	0	100	0	100	1	99.9996
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	3	99.9849
HOB	LEA COUNTY RGNL	NM	LPV	0	100	0	100	1	99.9996
LAM	LOS ALAMOS	NM	LP	0	100	0	100	1	99.9996
LRU	LAS CRUCES INTL	NM	LPV	0	100	0	100	0	100
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	0	100	1	99.9996
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	100	0	100	1	99.9996
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	100	0	100	0	100
SVC	GRANT COUNTY	NM	LPV	0	100	0	100	18	99.9777
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	0	100	0	100	0	100
CYEV	INUVIK	NT	LPV	0	100	0	100	14	99.934
05U	EUREKA	NV	LP	0	100	0	100	1	99.9943
CXP	CARSON	NV	LP	0	100	0	100	3	99.9687
ELY	ELY ARPT /YELLAND FLD/	NV	LPV	0	100	0	100	1	99.9958
LAS	MC CARRAN INTL	NV	LPV	0	100	0	100	2	99.9883
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	3	99.9683

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
RTS	RENO/STEAD	NV	LPV	0	100	0	100	3	99.9679
TPH	TONOPAH	NV	LP	0	100	0	100	2	99.9898
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	1	99.994
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	99.9996
9G3	AKRON	NY	LP	0	100	0	100	0	100
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	1	99.9996
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	99.9996
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	LPV	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	1	99.9996

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
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	99.9996
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	0	100
PEO	PENN YAN	NY	LPV	0	100	0	100	0	100
POU	DUTCHESS COUNTY	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	1	99.9996
16G	SENECA COUNTY	OH	LPV	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	2	99.9992
4G5	MONROE COUNTY	OH	LP	0	100	0	100	2	99.9992
4I3	KNOX COUNTY	OH	LPV200	0	100	0	100	1	99.9996
5A1	NORWALK-HURON COUNTY	OH	LP	0	100	0	100	1	99.9996
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	100	0	100	2	99.9992
7G8	GEAUGA COUNTY	OH	LP	0	100	0	100	2	99.9992
AKR	AKRON FULTON INTL	OH	LP	0	100	0	100	2	99.9992
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	2	99.9992

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
BKL	BURKE LAKEFRONT	OH	LPV	0	100	0	100	1	99.9996
CAK	AKRON-CANTON RGNL	OH	LPV200	0	100	0	100	2	99.9992
CDI	CAMBRIDGE MUNICIPAL	OH	LP	0	100	0	100	1	99.9996
CGF	CUYAHOGA COUNTY	OH	LPV	0	100	0	100	1	99.9996
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	1	99.9996
CMH	PORT COLUMBUS INTL	OH	LPV200	0	100	0	100	1	99.9996
CQA	LAKEFIELD	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	1	99.9996
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	0	100
EOP	PIKE COUNTY	OH	LP	1	99.9996	1	99.9996	2	99.9864
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	1	99.9996
HAO	BUTLER CO RGNL-HOGAN FIELD	OH	LPV	1	99.9989	1	99.9989	2	99.9902
HOC	HIGHLAND COUNTY	OH	LP	1	99.9985	1	99.9985	2	99.9868
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	2	99.9992
I19	GREENE COUNTY-LEWIS A JACKSON	OH	LPV	0	100	0	100	0	100
I66	CLINTON FIELD	OH	LPV	0	100	0	100	1	99.9932
I68	WARREN COUNTY/JOHN LANE FIELD	OH	LPV	0	100	0	100	1	99.9932
I69	CLERMONT COUNTY	OH	LP	1	99.9966	1	99.9966	2	99.983
I74	GRIMES FIELD	OH	LPV	0	100	0	100	0	100
ILN	WILMINGTON AIR PARK	OH	LPV200	0	100	0	100	1	99.9917
LCK	RICKENBACKER INTL	OH	LPV200	0	100	0	100	1	99.9996
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	100	0	100	1	99.9996
LNN	WILLOUGHBY LOST NATION MUNICIPAL	OH	LPV	0	100	0	100	1	99.9996
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	100	0	100	1	99.9996
LUK	CINCINNATI MUNICIPAL AIRPORT LUNKEN	OH	LPV	1	99.9966	1	99.9966	2	99.9872
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	100	0	100	1	99.9996
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	100	0	100	1	99.9966
MNN	MARION MUNICIPAL	OH	LPV	0	100	0	100	0	100
MRT	UNION COUNTY	OH	LP	0	100	0	100	1	99.9996

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	0	100	0	100	1	99.9951
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	1	99.9996
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	0	100
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	1	99.9955
PCW	ERIE-OTTAWA INTL	OH	LPV	0	100	0	100	0	100
PHD	HARRY CLEVER FIELD	OH	LP	0	100	0	100	2	99.9992
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	1	99.9966	1	99.9966	1	99.9713
POV	PORTAGE COUNTY	OH	LPV	0	100	0	100	2	99.9992
RZT	ROSS COUNTY	OH	LPV	0	100	0	100	1	99.9925
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	100	0	100	1	99.9996
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	LP	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	2	99.9992
TZR	BOLTON FIELD	OH	LPV200	0	100	0	100	1	99.9996
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	2	99.9917
USE	FULTON COUNTY	OH	LPV	0	100	0	100	0	100
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	0	100
YNG	YOUNGSTOWN-WARREN RGNL	OH	LPV	0	100	0	100	2	99.9992
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	1	99.9921	1	99.9898	1	99.9792
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	1	99.9962
80F	ANTLERS MUNICIPAL	OK	LPV	1	99.9736	1	99.9713	1	99.9713
ADH	ADA MUNICIPAL	OK	LPV	1	99.9909	1	99.9887	1	99.9713
ADM	ARDMORE MUNICIPAL	OK	LPV200	1	99.9917	1	99.9894	1	99.9792
AVK	ALVA RGNL	OK	LPV	0	100	0	100	1	99.9958
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	100	0	100	1	99.9962
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	1	99.9996	1	99.9875	1	99.9853
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	2	99.9985	2	99.9962	1	99.9713
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	100	0	100	1	99.9883
CLK	CLINTON RGNL	OK	LPV200	0	100	0	100	1	99.9962
CSM	CLINTON-SHERMAN	OK	LPV200	0	100	0	100	1	99.9958
DUA	DURANT RGNL - EAKER FIELD	OK	LPV	1	99.9996	1	99.9906	1	99.9713
DUC	HALLIBURTON FIELD	OK	LPV	0	100	0	100	1	99.9894
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	100	0	100	1	99.9955
F22	PERRY MUNICIPAL	OK	LPV	1	99.9879	1	99.9879	1	99.9857

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
FDR	FREDERICK RGNL	OK	LPV200	0	100	0	100	1	99.9966
GCM	CLAREMORE RGNL	OK	LPV	1	99.9875	1	99.9717	1	99.9713
GMJ	GROVE MUNICIPAL	OK	LPV	1	99.9845	1	99.9717	1	99.9713
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	1	99.9891	1	99.9891	1	99.9868
GUY	GUYMON MUNICIPAL	OK	LPV	0	100	0	100	0	100
GZL	STIGLER RGNL	OK	LPV	1	99.9721	1	99.9713	1	99.9713
HBR	HOBART RGNL	OK	LPV	0	100	0	100	1	99.9962
HSD	SUNDANCE	OK	LPV	0	100	0	100	1	99.9875
MKO	DAVIS FIELD	OK	LPV	1	99.9815	1	99.9713	1	99.9713
MLC	MC ALESTER RGNL	OK	LPV	2	99.9932	1	99.9792	1	99.9713
OJA	THOMAS P STAFFORD	OK	LPV	0	100	0	100	1	99.9966
OKC	WILL ROGERS WORLD	OK	LPV200	1	99.9996	1	99.9996	1	99.9879
OKM	OKMULGEE RGNL	OK	LPV	1	99.9891	1	99.9868	1	99.9713
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	1	99.9902	1	99.9902	1	99.9879
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	1	99.9879	1	99.9857	1	99.9713
PNC	PONCA CITY RGNL	OK	LPV	1	99.9872	1	99.9872	1	99.9849
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	1	99.9913	1	99.9913	1	99.9792
PWA	WILEY POST	OK	LPV200	0	100	0	100	1	99.9875
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	1	99.9875
RVS	RICHARD LLOYD JONES JR	OK	LPV	1	99.9883	1	99.986	1	99.9713
SNL	SHAWNEE RGNL	OK	LPV200	1	99.9898	1	99.9875	1	99.9792
SWO	STILLWATER RGNL	OK	LPV200	1	99.9883	1	99.9883	1	99.986
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	1	99.9792	1	99.9713	1	99.9713
TUL	TULSA INTL	OK	LPV200	1	99.9879	1	99.9857	1	99.9713
WDG	ENID WOODRING RGNL	OK	LPV200	0	100	0	100	1	99.986
WWR	WEST WOODWARD	OK	LPV	0	100	0	100	1	99.9947
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	0	100
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	3	99.9974
EUG	MAHLON SWEET FIELD	OR	LPV200	0	100	0	100	3	99.9921
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	3	99.9913
LMT	KLAMATH FALLS	OR	LPV	0	100	0	100	3	99.9758
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	0	100
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	0	100
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	3	99.9657
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	2	99.9992
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	1	99.9996
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	2	99.9992
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	2	99.9992
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	1	99.9996
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	1	99.9996
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	1	99.9996
BTP	BUTLER COUNTY/K W SCHOLTER FIE	PA	LPV	0	100	0	100	1	99.9996
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	2	99.9992
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	1	99.9996
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	0	100	0	100	2	99.9992
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	100	0	100	1	99.9996
FKL	VENANGO RGNL	PA	LPV	0	100	0	100	2	99.9992
FWQ	ROSTRAVER	PA	LPV	0	100	0	100	1	99.9996
GKJ	PORT MEADVILLE	PA	LP	0	100	0	100	2	99.9992
HMZ	BEDFORD COUNTY	PA	LPV	0	100	0	100	1	99.9996
IPT	WILLIAMSPORT RGNL	PA	LPV	0	100	0	100	0	100
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA	PA	LPV200	0	100	0	100	1	99.9996
LBE	ARNOLD PALMER RGNL	PA	LPV	0	100	0	100	1	99.9996
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	1	99.9996
PHL	PHILADELPHIA INTL	PA	LPV	0	100	0	100	0	100
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	2	99.9992
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	2	99.9992
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	1	99.9996
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	1	99.9996
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
ZER	SCHUYLKILL COUNTY /JOE ZERBEY/	PA	LPV200	0	100	0	100	0	100
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	0	100	0	100	8	99.9294
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	2	99.9792
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	2	99.9781
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	1	99.9528	1	99.9528	1	99.9528
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	1	99.9528	1	99.9347	1	99.9279
AIK	AIKEN MUNICIPAL	SC	LPV200	1	99.9528	1	99.9347	1	99.9279
AND	ANDERSON RGNL	SC	LPV200	1	99.9528	1	99.9528	1	99.946
AQX	ALLENDALE COUNTY	SC	LPV	1	99.9506	1	99.9324	1	99.9241
ARW	BEAUFORT COUNTY	SC	LPV200	2	99.9457	1	99.9275	1	99.9241
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	1	99.9566	1	99.9566	1	99.946
BNL	BARNWELL RGNL	SC	LPV	1	99.9521	1	99.934	1	99.9264
CAE	COLUMBIA METROPOLITAN	SC	LPV200	1	99.9528	1	99.9347	1	99.9279
CDN	WOODWARD FIELD	SC	LPV	1	99.9528	1	99.9528	2	99.9423
CEU	OCONEE COUNTY RGNL	SC	LPV200	1	99.9528	1	99.9528	1	99.946
CHS	CHARLESTON AFB/INTL	SC	LPV200	1	99.946	1	99.9279	1	99.9264
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FI	SC	LPV	1	99.9566	1	99.9566	1	99.9528
CRE	GRAND STRAND	SC	LPV200	2	99.9653	1	99.9279	1	99.9279
DCM	CHESTER CATAWBA RGNL	SC	LPV	1	99.9528	1	99.9528	1	99.9528
DYB	SUMMERVILLE	SC	LPV200	1	99.9464	1	99.9283	1	99.9272
FDW	FAIRFIELD COUNTY	SC	LPV	1	99.9528	1	99.9528	2	99.9506
FLO	FLORENCE RGNL	SC	LPV	1	99.9566	1	99.9528	1	99.9279

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
GGE	GEORGETOWN COUNTY	SC	LPV	1	99.9498	1	99.9279	1	99.9275
GMU	GREENVILLE DOWNTOWN	SC	LPV200	1	99.9528	1	99.9528	1	99.9487
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	1	99.9528	1	99.9528	1	99.9528
GYH	DONALDSON FIELD	SC	LPV	1	99.9528	1	99.9528	1	99.9479
HYW	CONWAY-HORRY COUNTY	SC	LPV	2	99.9619	1	99.9279	1	99.9279
JZI	CHARLESTON EXECUTIVE	SC	LPV200	1	99.946	1	99.9279	1	99.9241
LKR	LANCASTER COUNTY-MC WHIRTER FI	SC	LPV200	1	99.9532	1	99.9532	1	99.9528
LQK	PICKENS COUNTY	SC	LPV	1	99.9528	1	99.9528	1	99.946
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	1	99.946	1	99.9279	1	99.9275
LUX	LAURENS COUNTY	SC	LPV	1	99.9528	1	99.9528	1	99.9528
MAO	MARION COUNTY	SC	LPV	2	99.9672	2	99.9668	1	99.9279
MKS	BERKELEY COUNTY	SC	LPV	1	99.946	1	99.9279	1	99.9275
MYR	MYRTLE BEACH INTL	SC	LPV200	2	99.9619	1	99.9279	1	99.9279
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	1	99.9502	1	99.9321	1	99.9275
RBW	LOWCOUNTRY RGNL	SC	LPV	1	99.9479	1	99.9298	1	99.9241
SMS	SUMTER	SC	LPV200	1	99.9521	2	99.9479	1	99.9279
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	1	99.9528	1	99.9528	1	99.9528
UDG	DARLINGTON COUNTY JETPORT	SC	LPV	1	99.9566	1	99.9566	1	99.946
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	1	99.9566	1	99.9566	1	99.9528
0D8	GETTYSBURG MUNICIPAL	SD	LP	0	100	0	100	0	100
49B	STURGIS MUNICIPAL	SD	LPV	0	100	0	100	0	100
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D1	GREGORY MUNICIPAL - FLYNN FLD	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	0	100
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
MDS	MADISON MUNICIPAL	SD	LPV	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	99.9996
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	4	99.9955
CYKJ	KEY LAKE	SK	LPV	0	100	0	100	1	99.9992
0A3	SMITHVILLE MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.946
0M3	JOHN A BAKER FLD	TN	LP	1	99.9506	1	99.9498	1	99.946
0M4	BENTON COUNTY	TN	LPV	1	99.9506	1	99.9506	1	99.9498
0M5	HUMPHREYS COUNTY	TN	LP	1	99.9528	1	99.9502	1	99.946
1A3	MARTIN CAMPBELL FIELD	TN	LP	1	99.9566	1	99.9528	1	99.946
1M5	PORTLAND MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.946
2A0	MARK ANTON	TN	LPV	1	99.9566	1	99.9528	1	99.946
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	1	99.9498	1	99.9498	1	99.946
2M8	CHARLES W BAKER	TN	LPV	1	99.9641	1	99.9536	1	99.9498
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	1	99.9566	1	99.9528	1	99.9528
3M7	LAFAYETTE MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.946
8A3	LIVINGSTON MUNICIPAL	TN	LP	1	99.9566	1	99.9566	1	99.946
BGF	WINCHESTER MUNICIPAL	TN	LPV	1	99.9566	1	99.946	1	99.946
BNA	NASHVILLE INTL	TN	LPV200	1	99.9566	1	99.9566	1	99.946
CHA	LOVELL FIELD	TN	LPV200	1	99.9566	1	99.9464	1	99.946
CKV	OUTLAW FIELD	TN	LPV	1	99.9566	1	99.9509	1	99.9472
CSV	CROSSVILLE MEMORIAL-WHITSON FI	TN	LPV200	1	99.9566	1	99.9528	1	99.946
DYR	DYERSBURG RGNL	TN	LPV	1	99.9638	1	99.9532	1	99.9498
FYE	FAYETTE COUNTY	TN	LPV	1	99.9596	1	99.9509	1	99.9509
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	1	99.9498	1	99.9498	1	99.946
GCY	GREENEVILLE-GREENE COUNTY MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.9528
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	1	99.9566	1	99.9528	1	99.9494
GZS	ABERNATHY FIELD	TN	LPV	1	99.9498	1	99.9498	1	99.946
HZD	CARROLL COUNTY	TN	LPV	1	99.9536	1	99.9513	1	99.9498

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
JAU	CAMPBELL COUNTY	TN	LP	1	99.9566	1	99.9528	1	99.946
JWN	JOHN C TUNE	TN	LPV	1	99.9566	1	99.9566	1	99.946
LUG	ELLINGTON	TN	LPV	1	99.9566	1	99.9566	1	99.946
M01	GENERAL DEWITT SPAIN	TN	LPV	1	99.9645	1	99.954	1	99.9498
M08	WILLIAM L WHITEHURST FIELD	TN	LP	1	99.9551	1	99.9513	1	99.9513
M33	SUMNER COUNTY RGNL	TN	LPV	1	99.9566	1	99.9566	1	99.946
M54	LEBANON MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.946
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	1	99.9566	1	99.9566	1	99.946
MBT	MURFREESBORO MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.946
MEM	MEMPHIS INTL	TN	LPV200	1	99.9638	1	99.9532	1	99.9498
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	1	99.9551	1	99.9513	1	99.9513
MMI	MCMINN COUNTY	TN	LPV	1	99.9566	1	99.9528	1	99.946
MNV	MONROE COUNTY	TN	LPV	1	99.9566	1	99.9528	1	99.946
MOR	MOORE-MURRELL	TN	LPV	1	99.9566	1	99.9528	1	99.9528
MQY	SMYRNA	TN	LPV200	1	99.9566	1	99.9566	1	99.946
MRC	MAURY COUNTY	TN	LPV	1	99.9528	1	99.9513	1	99.946
NQA	MILLINGTON RGNL JETPORT	TN	LPV200	1	99.9638	1	99.9532	1	99.9498
PHT	HENRY COUNTY	TN	LPV200	1	99.9547	1	99.9521	1	99.9498
PVE	BEECH RIVER RGNL	TN	LPV	1	99.9498	1	99.9498	1	99.9498
RKW	ROCKWOOD MUNICIPAL	TN	LPV	1	99.9566	1	99.9528	1	99.946
RNC	WARREN COUNTY MEMORIAL	TN	LPV	1	99.9566	1	99.9528	1	99.946
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	1	99.9566	1	99.9528	1	99.946
SCX	SCOTT MUNICIPAL	TN	LPV	1	99.9566	1	99.9528	1	99.946
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	1	99.9498	1	99.9498	1	99.9498
SRB	UPPER CUMBERLAND RGNL	TN	LPV200	1	99.9566	1	99.9528	1	99.946
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	1	99.9566	1	99.9566	1	99.946
SZY	ROBERT SIBLEY	TN	LPV	1	99.9498	1	99.9498	1	99.9498
THA	TULLAHOMA RGNL ARPT/WM NORTHER	TN	LPV	1	99.9566	1	99.9528	1	99.946
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	1	99.9566	1	99.9566	1	99.9528
TYS	MC GHEE TYSON	TN	LPV200	1	99.9566	1	99.9528	1	99.946
UCY	EVERETT-STEWART RGNL	TN	LPV200	1	99.9623	1	99.9532	1	99.9498
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	0	100	1	99.9811
2F5	LAMESA MUNICIPAL	TX	LP	0	100	0	100	1	99.9977
2R9	KARNES COUNTY	TX	LP	0	100	0	100	2	99.9857
3R9	LAKEWAY AIRPARK	TX	LP	0	100	0	100	1	99.983

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	100	0	100	1	99.9815
45R	HAWTHORNE FIELD	TX	LP	0	100	0	100	1	99.9781
50R	LOCKHART MUNICIPAL	TX	LPV	0	100	0	100	1	99.9834
5C1	BOERNE STAGE FIELD	TX	LP	0	100	0	100	2	99.9936
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	100	0	100	2	99.997
60R	NAVASOTA MUNICIPAL	TX	LPV	0	100	0	100	1	99.9808
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	100	0	100	1	99.9785
77F	WINTERS MUNICIPAL	TX	LP	0	100	0	100	1	99.9977
8F3	CROSBYTON MUNICIPAL	TX	LP	0	100	0	100	1	99.9974
ABI	ABILENE RGNL	TX	LPV200	0	100	0	100	1	99.9981
ACT	WACO RGNL	TX	LPV200	0	100	1	99.9996	1	99.9804
ADS	ADDISON	TX	LPV	0	100	1	99.9917	1	99.9611
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	100	1	99.9992	1	99.9687
ALI	ALICE INTL	TX	LPV	0	100	0	100	2	99.9947
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	100	0	100	0	100
ARM	WHARTON RGNL	TX	LPV	0	100	0	100	1	99.9815
ASL	HARRISON COUNTY	TX	LPV	1	99.9713	1	99.9713	1	99.9607
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	100	0	100	1	99.9826
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	100	0	100	1	99.9811
BAZ	NEW BRAUNFELS RGNL	TX	LPV	0	100	0	100	1	99.9864
BBD	CURTIS FIELD	TX	LPV	0	100	0	100	1	99.9947
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	1	99.9917
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	0	100	1	99.9977
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	1	99.9838
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	0	100	0	100	3	99.9902
BWD	BROWNWOOD RGNL	TX	LPV	0	100	0	100	1	99.9928
BYY	BAY CITY MUNICIPAL	TX	LPV	0	100	0	100	1	99.9815
CDS	CHILDRESS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.9951
CFD	COULTER FIELD	TX	LPV	0	100	1	99.9996	1	99.9792
CLL	EASTERWOOD FIELD	TX	LPV200	0	100	1	99.9996	1	99.9796
CNW	TSTC WACO	TX	LPV200	0	100	1	99.9977	1	99.98
COM	COLEMAN MUNICIPAL	TX	LPV	0	100	0	100	1	99.9966
COT	COTULLA-LA SALLE COUNTY	TX	LPV	0	100	0	100	2	99.9962
CPT	CLEBURNE RGNL	TX	LPV	0	100	0	100	1	99.9811
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	100	0	100	2	99.9932

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
CVB	CASTROVILLE MUNICIPAL	TX	LPV	0	100	0	100	2	99.994
CXO	LONE STAR EXECUTIVE	TX	LPV200	0	100	0	100	1	99.9789
CZT	DIMMIT COUNTY	TX	LPV	0	100	0	100	2	99.9966
DAL	DALLAS LOVE FIELD	TX	LPV200	0	100	1	99.9917	1	99.9611
DFW	DALLAS/FORT WORTH INTL	TX	LPV200	0	100	1	99.9917	1	99.9687
DHT	DALHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
DKR	HOUSTON COUNTY	TX	LP	0	100	1	99.9917	1	99.9607
DRT	DEL RIO INTL	TX	LPV	0	100	0	100	2	99.9977
DTO	DENTON ENTERPRISE	TX	LPV200	0	100	1	99.9917	1	99.9687
DUX	MOORE COUNTY	TX	LPV200	0	100	0	100	0	100
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	100	0	100	1	99.9811
E01	ROY HURD MEMORIAL	TX	LP	0	100	0	100	1	99.9996
E11	ANDREWS COUNTY	TX	LPV	0	100	0	100	1	99.9996
E19	GRUVER MUNICIPAL	TX	LP	0	100	0	100	1	99.9989
E30	BRUCE FIELD	TX	LPV	0	100	0	100	1	99.9977
E38	ALPINE-CASPARIS MUNICIPAL	TX	LP	0	100	0	100	1	99.9996
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	0	100	3	99.9928
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	100	0	100	1	99.9811
EFD	ELLINGTON	TX	LPV200	0	100	0	100	1	99.9811
ELA	EAGLE LAKE	TX	LP	0	100	0	100	1	99.9811
ELP	EL PASO INTL	TX	LP	0	100	0	100	0	100
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	0	100	0	100	2	99.9943
ETN	EASTLAND MUNICIPAL	TX	LP	0	100	0	100	1	99.9917
F00	JONES FIELD	TX	LPV	1	99.9996	1	99.9906	1	99.9607
F05	WILBARGER COUNTY	TX	LPV	0	100	0	100	1	99.9966
F98	YOAKUM COUNTY	TX	LPV	0	100	0	100	1	99.9996
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	0	100	0	100	1	99.9996
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	100	0	100	2	99.9804
FWS	FORT WORTH SPINKS	TX	LPV200	0	100	1	99.9996	2	99.98
GDJ	GRANBURY RGNL	TX	LPV	0	100	0	100	1	99.9811
GGG	EAST TEXAS RGNL	TX	LPV	1	99.974	1	99.974	1	99.9607
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	100	1	99.9917	1	99.9687
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	100	1	99.9996	1	99.9792
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	100	0	100	1	99.9811
GNC	GAINES COUNTY	TX	LPV	0	100	0	100	1	99.9996
GRK	ROBERT GRAY AAF	TX	LPV200	0	100	0	100	1	99.9811

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
GVT	MAJORS	TX	LPV200	1	99.9996	1	99.9917	1	99.9607
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	1	99.9928	1	99.9906	1	99.9641
HBV	JIM HOGG COUNTY	TX	LPV	0	100	0	100	2	99.9947
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	0	100	0	100	2	99.9955
HHF	HEMPHILL COUNTY	TX	LPV	0	100	0	100	1	99.994
HOU	WILLIAM P HOBBY	TX	LPV200	0	100	0	100	1	99.9811
HQZ	MESQUITE METRO	TX	LPV	0	100	1	99.9917	1	99.9607
HRL	VALLEY INTL	TX	LPV200	0	100	0	100	3	99.9917
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	100	0	100	1	99.9996
HYI	SAN MARCOS REGIONAL	TX	LPV200	0	100	0	100	1	99.9834
IAH	GEORGE BUSH INTERCONTINENTAL/H	TX	LPV200	0	100	0	100	1	99.9811
IKG	KLEBERG COUNTY	TX	LPV	0	100	0	100	2	99.9947
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	100	1	99.9977	1	99.98
INK	WINKLER COUNTY	TX	LPV200	0	100	0	100	1	99.9996
IWS	WEST HOUSTON	TX	LP	0	100	0	100	1	99.9811
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	2	99.9955	1	99.9792	1	99.9607
JSO	CHEROKEE COUNTY	TX	LPV200	2	99.997	1	99.9792	1	99.9607
JWY	MID-WAY RGNL	TX	LPV200	0	100	1	99.9917	1	99.9687
JXI	FOX STEPHENS FIELD - GILMER MU	TX	LP	1	99.9713	1	99.9713	1	99.9607
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	100	0	100	1	99.9989
LBX	TEXAS GULF COAST RGNL	TX	LPV	0	100	0	100	1	99.9811
LFK	ANGELINA COUNTY	TX	LPV	2	99.9966	1	99.9792	1	99.9607
LHB	HEARNE MUNICIPAL	TX	LPV200	0	100	1	99.9996	1	99.9796
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	0	100	0	100	1	99.9996
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	100	0	100	1	99.9996
LNC	LANCASTER RGNL	TX	LPV200	0	100	1	99.9917	1	99.9607
LRD	LAREDO INTL	TX	LPV200	0	100	0	100	2	99.9955
LUD	DECATUR MUNICIPAL	TX	LPV	0	100	0	100	1	99.9845
LVJ	PEARLAND RGNL	TX	LPV	0	100	0	100	1	99.9811
LXY	MEXIA-LIMESTONE CO	TX	LP	0	100	1	99.9917	1	99.9687
MAF	MIDLAND INTL	TX	LPV200	0	100	0	100	1	99.9996
MDD	MIDLAND AIRPARK	TX	LPV	0	100	0	100	1	99.9996
MFE	MC ALLEN MILLER INTL	TX	LPV	0	100	0	100	3	99.9925
MKN	COMANCHE COUNTY-CITY	TX	LPV	0	100	0	100	1	99.9845
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	100	0	100	1	99.9811

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
OCH	A L MANGHAM JR RGNL	TX	LPV200	2	99.9925	1	99.9785	1	99.9607
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	100	0	100	1	99.9996
ONY	OLNEY MUNICIPAL	TX	LPV	0	100	0	100	1	99.997
ORG	ORANGE COUNTY	TX	LPV	0	100	0	100	2	99.9834
PEQ	PECOS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.9996
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	100	0	100	3	99.9909
PKV	CALHOUN COUNTY	TX	LPV	0	100	0	100	2	99.9841
PPA	PERRY LEFORS FIELD	TX	LPV	0	100	0	100	1	99.9947
PRX	COX FIELD	TX	LPV	1	99.9713	1	99.9713	1	99.9607
PSX	PALACIOS MUNICIPAL	TX	LPV	0	100	0	100	1	99.9838
PVW	HALE COUNTY	TX	LPV	0	100	0	100	1	99.9996
PWG	MC GREGOR EXECUTIVE	TX	LPV	0	100	1	99.9996	1	99.9808
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	0	100	0	100	1	99.9951
RAS	MUSTANG BEACH	TX	LPV	0	100	0	100	2	99.9932
RBD	DALLAS EXECUTIVE	TX	LPV	0	100	1	99.9917	1	99.9687
RBO	NUECES COUNTY	TX	LP	0	100	0	100	2	99.9932
RKP	ARANSAS CO	TX	LPV	0	100	0	100	2	99.986
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LP	0	100	0	100	1	99.9826
SAT	SAN ANTONIO INTL	TX	LPV200	0	100	0	100	2	99.986
SGR	SUGAR LAND RGNL	TX	LPV200	0	100	0	100	1	99.9811
SJT	SAN ANGELO RGNL/MATHIS FIELD	TX	LPV	0	100	0	100	1	99.9966
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV200	1	99.9713	1	99.9713	1	99.9607
SNK	WINSTON FIELD	TX	LPV200	0	100	0	100	1	99.9977
SWI	SHERMAN MUNICIPAL	TX	LP	1	99.9928	1	99.9906	1	99.9641
SWW	AVENGER FIELD	TX	LPV	0	100	0	100	1	99.9981
T23	ALBANY MUNICIPAL	TX	LPV	0	100	0	100	1	99.9958
T41	LA PORTE MUNICIPAL	TX	LPV	0	100	0	100	1	99.9811
T74	TAYLOR MUNICIPAL	TX	LPV	0	100	0	100	1	99.9811
T78	LIBERTY MUNICIPAL	TX	LP	0	100	0	100	1	99.9811
T82	GILLESPIE COUNTY	TX	LPV	0	100	0	100	2	99.9943
TDW	TRADEWIND	TX	LPV	0	100	0	100	0	100
TFP	MCCAMPBELL-PORTER	TX	LPV	0	100	0	100	2	99.9936
TKI	MCKINNEY NATIONAL	TX	LPV200	1	99.9996	1	99.9928	1	99.9607
TME	HOUSTON EXECUTIVE	TX	LPV	0	100	0	100	1	99.9811
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	0	100	0	100	1	99.9811
TRL	TERRELL MUNICIPAL	TX	LPV	1	99.9996	1	99.9917	1	99.9607

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
TYR	TYLER POUNDS RGNL	TX	LPV200	2	99.9955	1	99.9792	1	99.9607
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	100	1	99.9917	1	99.9607
VCT	VICTORIA RGNL	TX	LPV200	0	100	0	100	2	99.9826
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	100	0	100	1	99.9845
BCE	BRYCE CANYON	UT	LPV	0	100	0	100	1	99.9989
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	0	100	2	99.9925
BMC	BRIGHAM CITY	UT	LP	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	1	99.9996
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	1	99.9996
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	1	99.9943
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	1	99.9985
VEL	VERNAL RGNL	UT	LP	0	100	0	100	2	99.9977
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	1	99.9996
0VG	LEE COUNTY	VA	LPV	1	99.9566	1	99.9566	1	99.9528
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	1	99.9966
BCB	VIRGINIA TECH/MONTGOMERY EXECU	VA	LPV	1	99.9868	1	99.9868	2	99.9751
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	1	99.9992
DAN	DANVILLE RGNL	VA	LPV200	1	99.9898	1	99.9898	1	99.9819
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV200	0	100	0	100	1	99.9977
FCI	RICHMOND EXECUTIVE-CHESTERFIEL	VA	LPV	0	100	0	100	0	100

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
FKN	FRANKLIN MUNICIPAL-JOHN BEVERLY ROS	VA	LPV	0	100	0	100	1	99.9996
FVX	FARMVILLE RGNL	VA	LPV	0	100	0	100	0	100
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	100	0	100	0	100
HLX	TWIN COUNTY	VA	LPV	1	99.9819	1	99.9819	2	99.9672
HSP	INGALLS FIELD	VA	LPV	0	100	0	100	1	99.9996
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	100	0	100	0	100
JFZ	TAZEWELL COUNTY	VA	LPV	1	99.963	1	99.963	1	99.9566
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	1	99.9596	1	99.9596	1	99.9566
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	1	99.9641	1	99.9641	2	99.96
MTV	BLUE RIDGE	VA	LPV	1	99.9853	1	99.9853	2	99.9743
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	1	99.9845	1	99.9845	2	99.9755
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	1	99.9917	1	99.9917	2	99.9838
SFQ	SUFFOLK EXECUTIVE	VA	LPV	0	100	0	100	1	99.9996
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	0	100
VJI	VIRGINIA HIGHLANDS	VA	LPV	1	99.9604	1	99.9604	1	99.9528
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	1	99.9872
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	LP	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
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	0	100
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	0	100
HQM	BOWERMAN	WA	LPV200	0	100	0	100	0	100
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	0	100
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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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
C29	MIDDLETON MUNICIPAL - MOREY FIELD	WI	LPV	0	100	0	100	0	100
C35	REEDSBURG 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	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

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
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	JOHN H BATTEN	WI	LPV	0	100	0	100	0	100
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	LPV200	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
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
3I2	MASON COUNTY	WV	LPV	1	99.9996	1	99.9996	2	99.9762
6L4	LOGAN COUNTY	WV	LPV	1	99.9823	1	99.9823	2	99.9668
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	1	99.9928	1	99.9928	2	99.9819
BLF	MERCER COUNTY	WV	LPV	1	99.9857	1	99.9857	2	99.9709
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	1	99.9996
CRW	YEAGER	WV	LPV200	1	99.9947	1	99.9947	2	99.9713
HLG	WHEELING OHIO CO	WV	LPV200	0	100	0	100	2	99.9992
HTS	TRI-STATE/MILTON J FERGUSON FI	WV	LPV200	1	99.9928	1	99.9928	1	99.9675
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	2	99.9955

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
LWB	GREENBRIER VALLEY	WV	LPV	1	99.994	1	99.994	2	99.9936
MGW	MORGANTOWN MUNICIPAL-WALTER L BILL	WV	LPV200	0	100	0	100	1	99.9996
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	1	99.9996
SXL	SUMMERSVILLE	WV	LP	1	99.9962	1	99.9962	2	99.9928
USW	BOGGS FIELD	WV	LPV	0	100	0	100	1	99.9996
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	1	99.9996
W99	GRANT COUNTY	WV	LP	0	100	0	100	1	99.9996
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	2	99.9925
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	0	100
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	2	99.9943
CYS	CHEYENNE RGNL/JERRY OLSON FIEL	WY	LPV	0	100	0	100	0	100
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	2	99.9974
ECS	MONDELL FIELD	WY	LPV	0	100	0	100	1	99.9977
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	2	99.9958
GEY	SOUTH BIG HORN COUNTY	WY	LP	0	100	0	100	1	99.9992
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	2	99.9992
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	0	100
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	1	99.9996
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	1	99.9977
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	0	100	0	100	2	99.9977
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	100	0	100	2	99.9921
SAA	SHIVELY FIELD	WY	LPV	0	100	0	100	2	99.9947
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	2	99.9951
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
WRL	WORLAND MUNICIPAL	WY	LPV	0	100	0	100	1	99.9966
CYQH	WATSON LAKE	YT	LPV	0	100	0	100	2	99.9849

Airport ID	Airport Name	State/ Province	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV200 Outages	LPV200 Avail
CYXY	WHITEHORSE / ERIK NIELSEN INTL	YT	LPV	0	100	0	100	3	99.9845

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

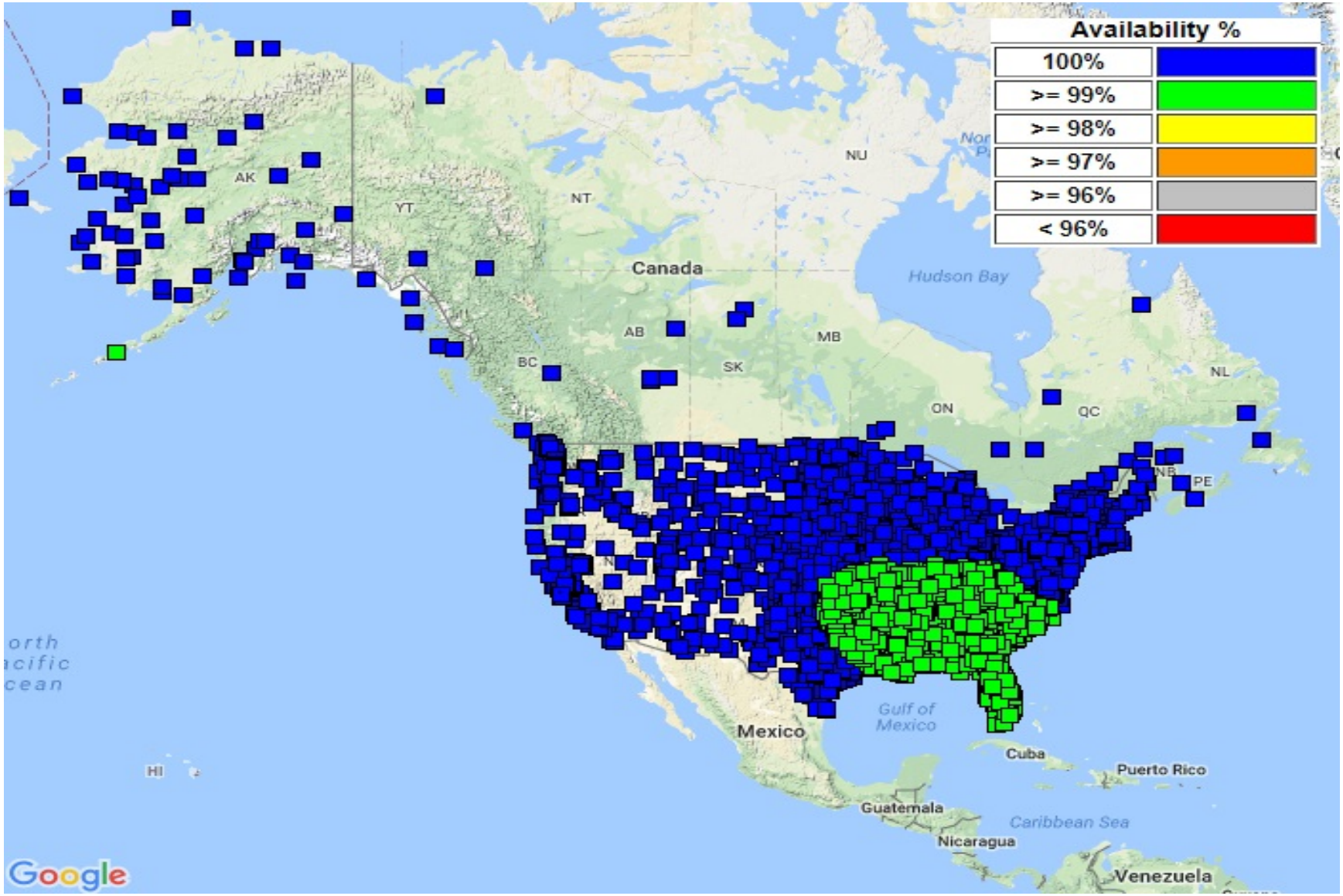


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV IAPs

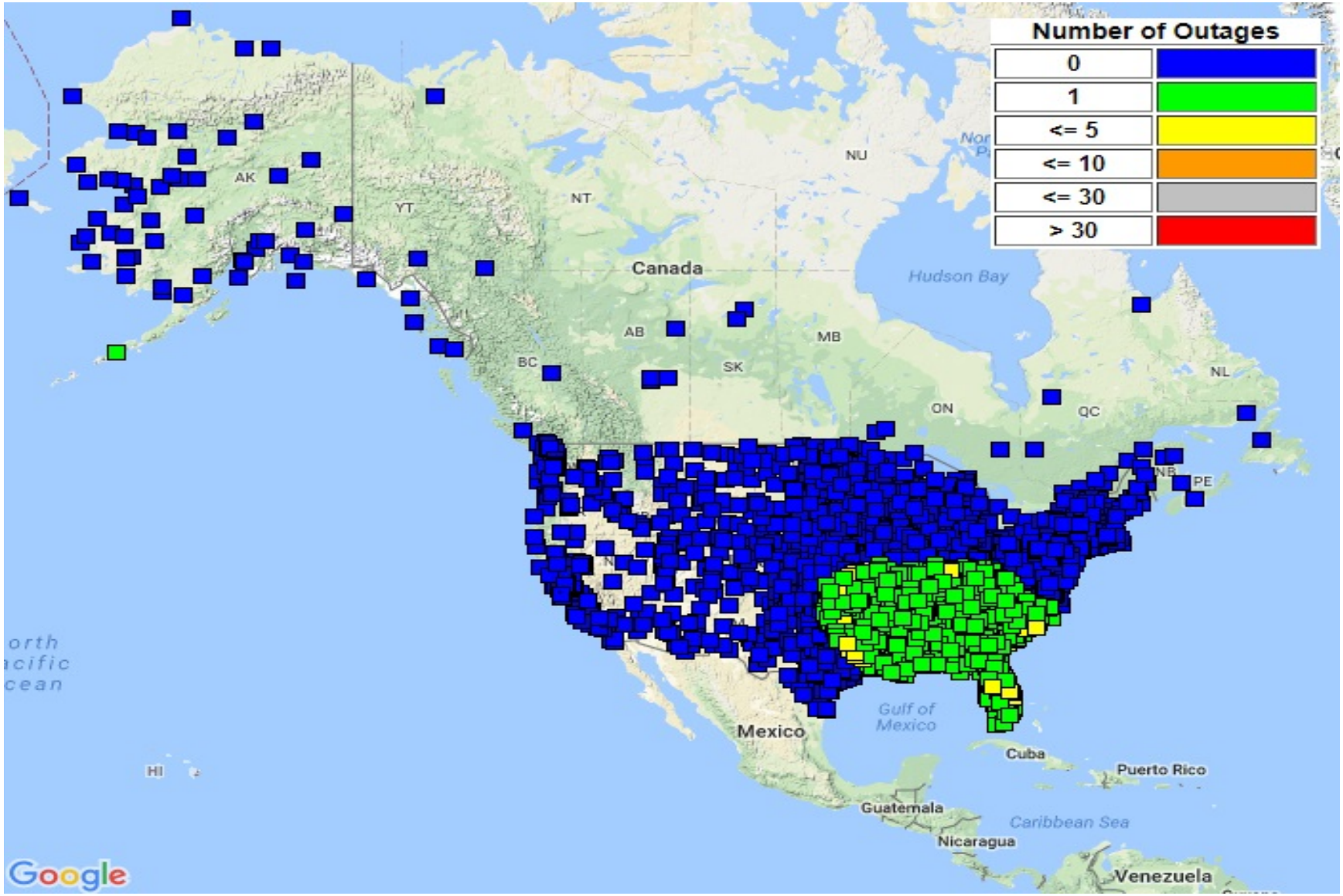


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV IAPs

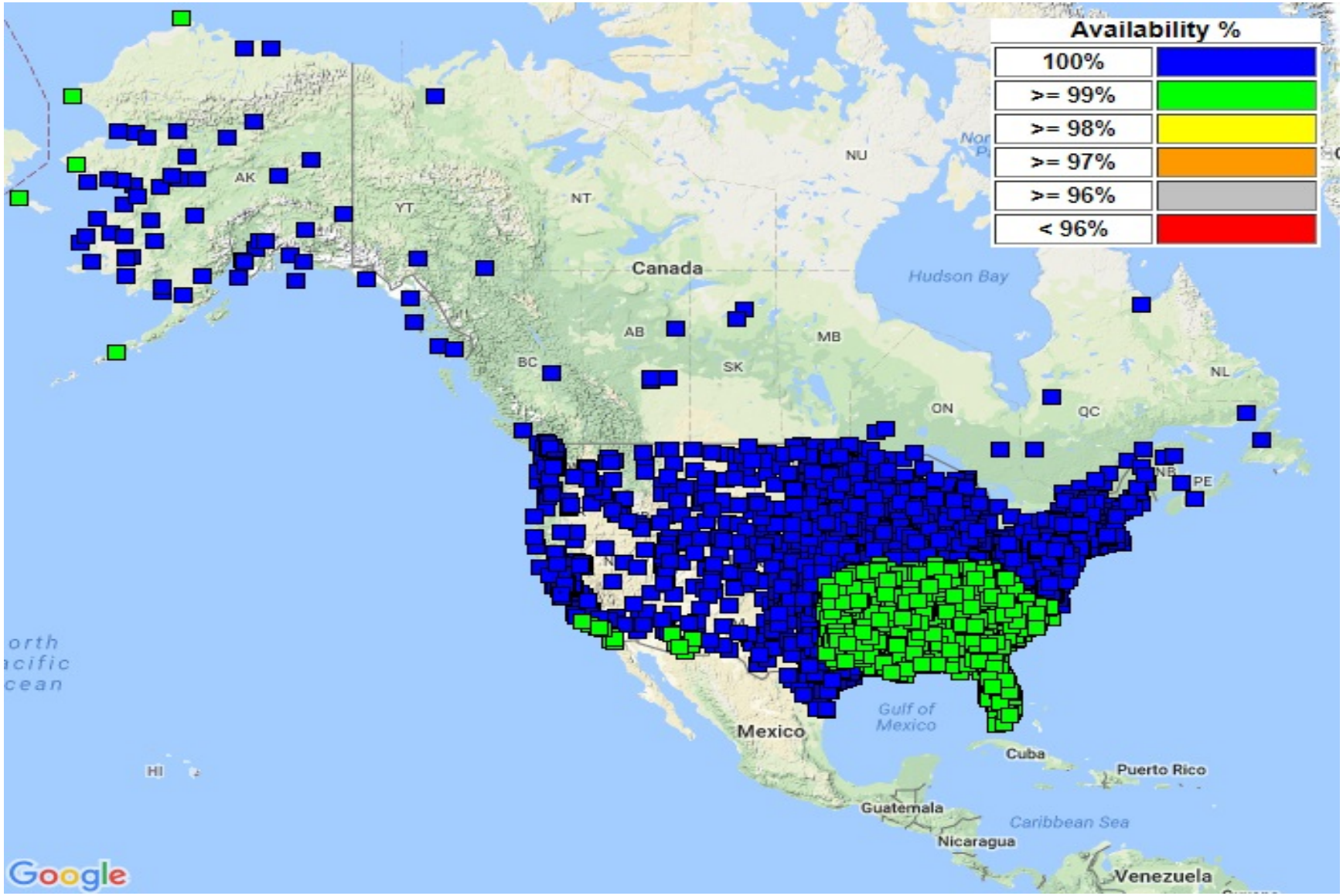


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV IAPs

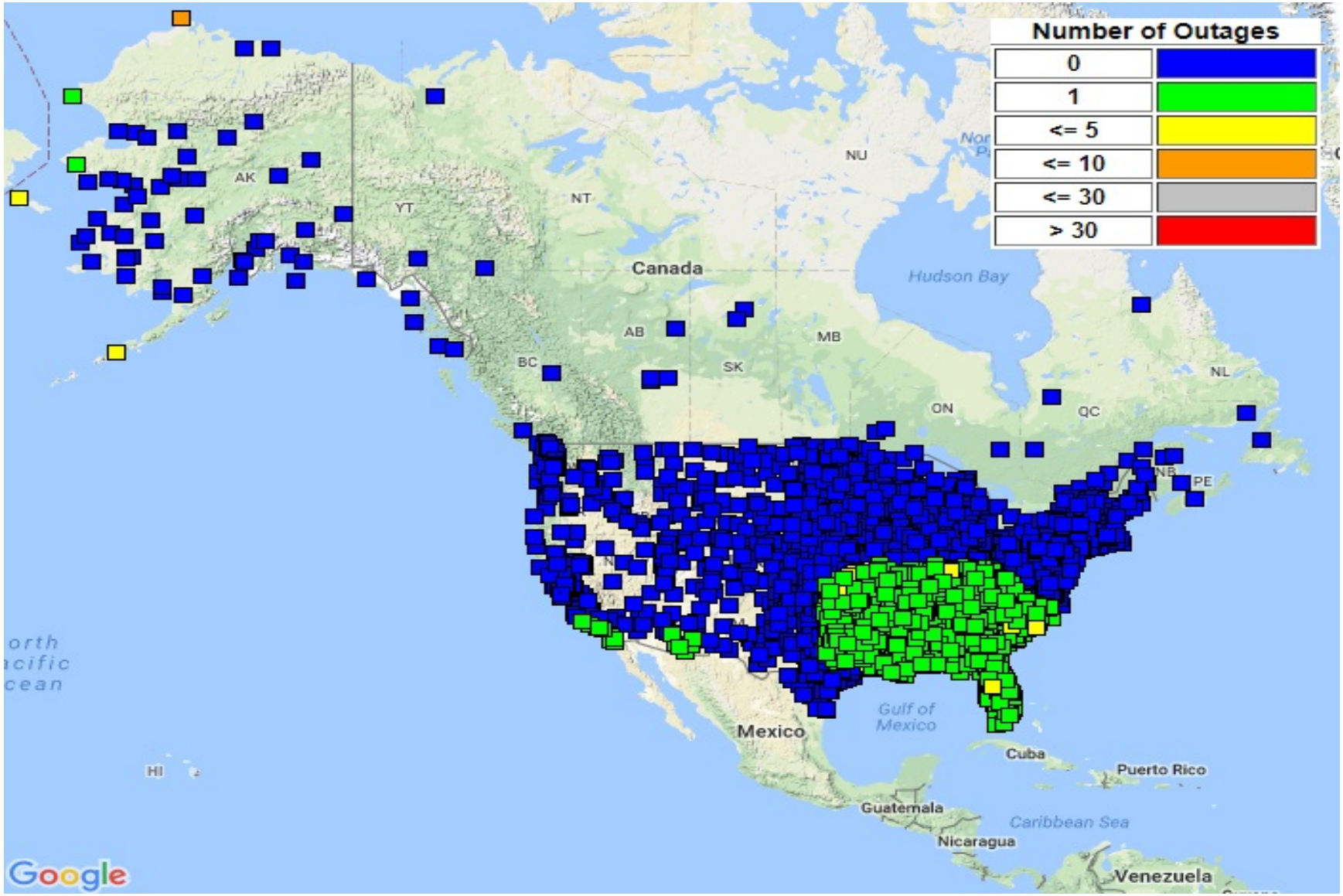


Figure 8-5 WAAS LPV200 Availability at Airports in the US and Canada with GPS RNAV IAPs

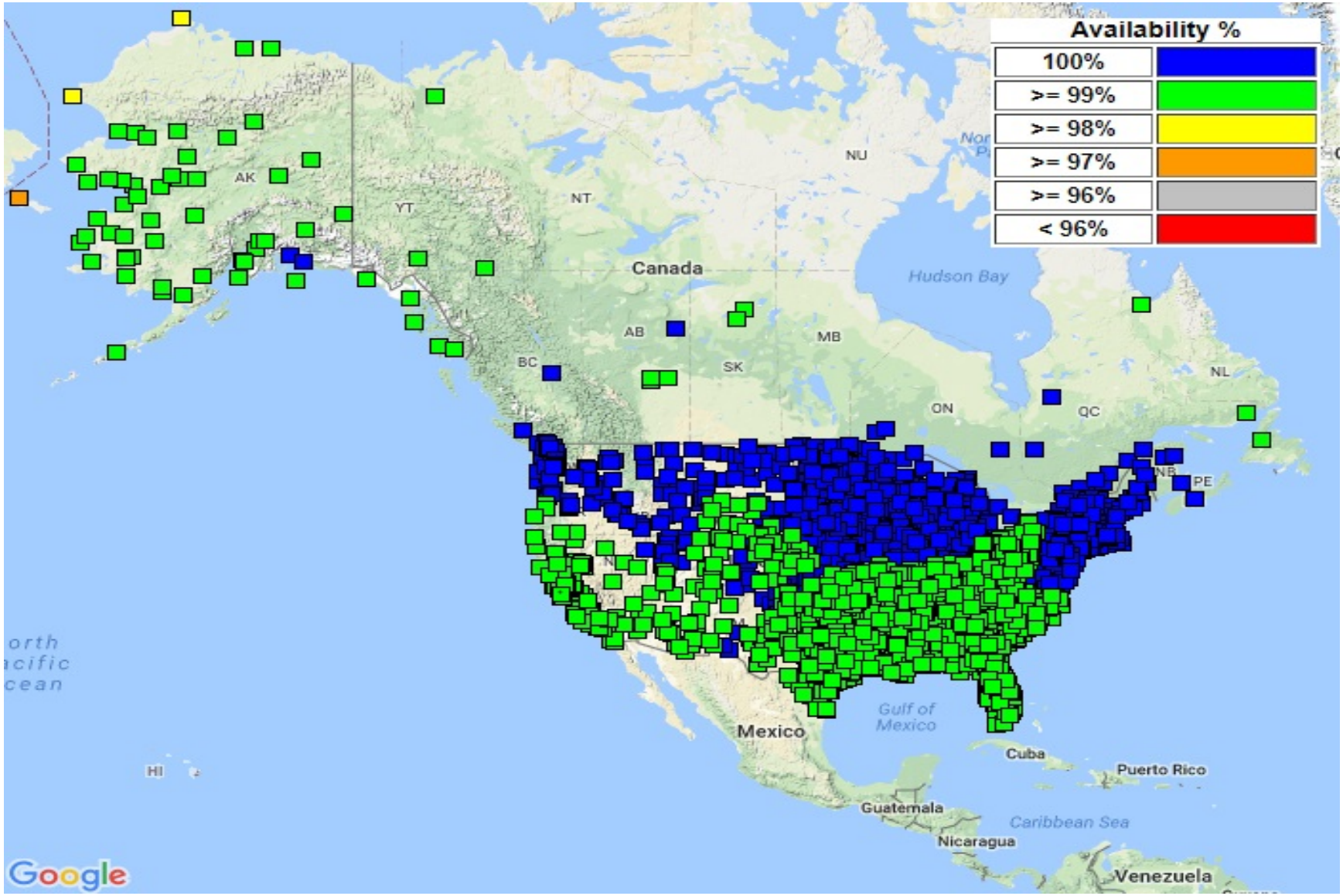
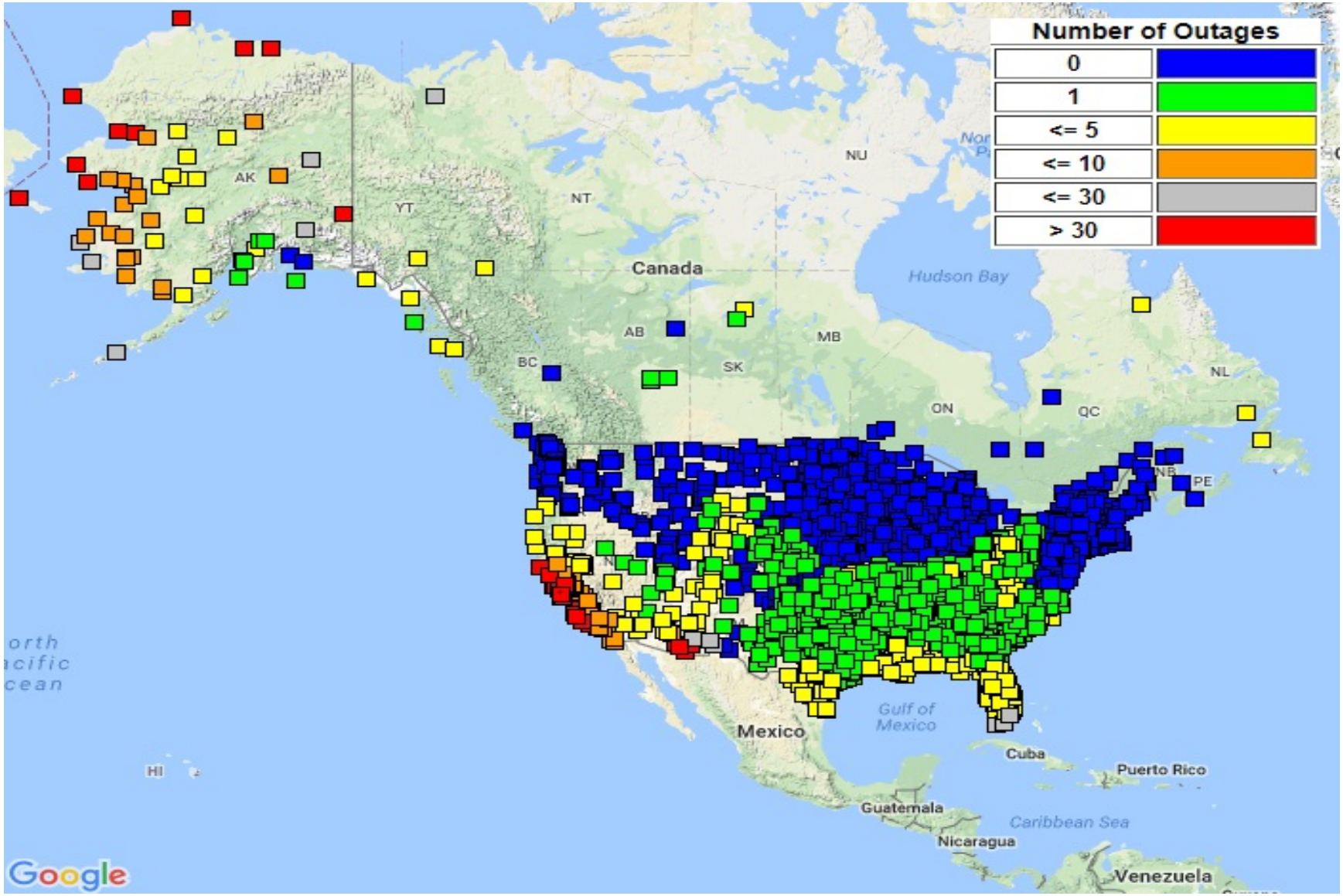


Figure 8-6 WAAS LPV200 Outages at Airports in the US and Canada with GPS RNAV IAPs



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. Table 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.

Table 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17
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	●	●	●	●	●	●	●	●	●	●	●	●

WAAS Site	WRE	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17
Iqaluit	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
Jacksonville	A	●	●	●	●	●	●	●	●	●	●	●	●
	B	●	●	●	●	●	●	●	●	●	●	●	●
	C	●	●	●	●	●	●	●	●	●	●	●	●
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	●	●	●	●	●	●	●	●	●	●	●	●

WAAS Site	WRE	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17
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
– No data available

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas with the exception of ZLC and ZSU using 24-hour sets on 10/01/17. ZLC was taken offline 7/19/17 through the end of the quarter. ZLC antenna positions are omitted in this report. ZSU was taken offline 9/21/17. ZSU antenna positions were calculated from data sets collected on 9/19/17. 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 2.3cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 10mm or less. The OPUS and CSRS surveys agreed to an average of 1.6 cm with a standard deviation of 8.7 mm. The maximum of difference was 3.83 cm for Kotzebue Thread C (OTZ3).

The OPUS positions were compared to the positions in the currently fielded WAAS software Build W7.162L which was fielded starting in August 2017. The OPUS surveys agree with the Build W7.162L to better or equal to 5.64 cm for most sites. Mexico City WREs, MMX1, MMX2, and MMX3, are outliers due to rapid subsidence. MMX1 had a difference of 7.97 cm, MMX2 had a difference of 8.30 cm and MMX3 had a difference of 8.69 cm. Removing outliers, the maximum difference was 5.64 cm at Iqaluit Thread C (YFB3). The antenna positions are interpolated forward in time.

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

Table 10-1 WAAS Antenna Positions (OPUS IGS08) as of 10/01/2017

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.117	-972576.616	5543892.85	60.78791475	-161.8417255	52.173
BET2	-2965385.885	-972580.34	5543891.793	60.78789531	-161.8416649	52.173
BET3	-2965388.452	-972577.471	5543890.926	60.78787941	-161.8417297	52.171
BIL1	-1416445.944	-4223577.015	4550862.122	45.80370654	-108.5397239	1112.235
BIL2	-1416450.026	-4223574.871	4550862.85	45.80371584	-108.5397824	1112.244
BIL3	-1416441.642	-4223574.27	4550865.983	45.80375636	-108.5396826	1112.235
BRW1	-1886759	-809058.658	6018494.457	71.28276428	-156.7899258	15.575
BRW2	-1886756.413	-809055.917	6018495.631	71.28279701	-156.7899676	15.578
BRW3	-1886755.321	-809059.699	6018495.458	71.28279238	-156.7898586	15.57
CDB1	-3484099.14	-1084748.773	5213678.582	55.1923733	-162.7064052	49.704
CDB2	-3484105.776	-1084741.579	5213675.633	55.19232722	-162.7065441	49.679
CDB3	-3484112.06	-1084734.804	5213672.886	55.19228374	-162.706675	49.699
FAI1	-2304741.91	-1448715.31	5748843.715	64.80962931	-147.8473414	150.005
FAI2	-2304741.449	-1448706.502	5748846.107	64.80967965	-147.8474932	150.008
FAI3	-2304732.926	-1448707.439	5748849.267	64.80974624	-147.8473811	150.009
HNL1	-5508637.166	-2234492.992	2303722.375	21.312992	-157.9208306	24.681
HNL2	-5508656.326	-2234483.311	2303687.124	21.31264906	-157.9209865	25.019
HNL3	-5508647.733	-2234497.241	2303694.217	21.31271769	-157.9208309	25.057
JNU1	-2354255.004	-2388549.679	5407043.154	58.36257405	-134.585708	16.186
JNU2	-2354252.909	-2388565.785	5407036.978	58.36246852	-134.5854894	16.174
JNU3	-2354239.703	-2388568.64	5407041.429	58.3625448	-134.5852945	16.167
MMD1	35070.387	-5959686.673	2264365.781	20.93190936	-89.66284101	29.13
MMD2	35065.462	-5959687.049	2264364.999	20.93190165	-89.66288837	29.174
MMD3	35065.124	-5959685.259	2264369.649	20.93194666	-89.66289152	29.162
MMX1	-948700.91	-5943934.224	2109212.263	19.43165395	-99.06838995	2234.133
MMX2	-948696.48	-5943934.045	2109214.685	19.4316772	-99.06834858	2234.113
MMX3	-948705.343	-5943934.407	2109209.838	19.43163066	-99.06843134	2234.155
MPR1	-1570142.247	-5759530.589	2238184.756	20.67900335	-105.2492035	10.971
MPR2	-1570139.421	-5759530.094	2238188.802	20.67904143	-105.2491786	11.257
MPR3	-1570143.535	-5759527.988	2238190.579	20.67905948	-105.249222	10.996
MSD1	-1979519.971	-5523222.884	2493106.904	23.16044811	-109.7176509	104.261
MSD2	-1979521.541	-5523225.221	2493100.502	23.16038527	-109.7176577	104.253
MSD3	-1979525.984	-5523221.95	2493104.173	23.16042135	-109.7177093	104.244
MTP1	-254854.382	-6162909.163	1617805.083	14.79136615	-92.36799945	54.944
MTP2	-254850.764	-6162910.195	1617801.649	14.79133411	-92.36796547	54.92
MTP3	-254855.541	-6162910.282	1617800.121	14.7913201	-92.36800978	54.805

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
OTZ1	-2396056.096	-750356.169	5843502.476	66.88733141	-162.6113733	10.878
OTZ2	-2396052.923	-750354.339	5843503.997	66.88736625	-162.6113915	10.874
OTZ3	-2396052.904	-750358.278	5843503.505	66.88735496	-162.6113056	10.876
YFB1	1035381.362	-2634289.647	5696539.561	63.73149081	-68.54318508	10.035
YFB2	1035372.153	-2634296.067	5696538.194	63.73146441	-68.54340611	9.963
YFB3	1035366.073	-2634306.82	5696534.42	63.73138681	-68.54360028	10.023
YQX1	2430424.556	-3419640.407	4788223.875	48.96649048	-54.59763315	146.889
YQX2	2430432.522	-3419639.064	4788220.821	48.96644858	-54.59753384	146.896
YQX3	2430440.422	-3419637.708	4788217.817	48.9664073	-54.59743517	146.909
YWG1	-520164.464	-4083475.962	4855843.029	49.90057405	-97.2593988	222.113
YWG2	-520150.588	-4083468.896	4855850.428	49.90067716	-97.25921964	222.129
YWG3	-520152.461	-4083478.019	4855842.606	49.900568	-97.25922945	222.127
YYR1	1885341.347	-3321428.38	5091171.693	53.30864746	-60.41946945	37.864
YYR2	1885344.307	-3321419.888	5091176.104	53.30871382	-60.41936795	37.861
YYR3	1885340.028	-3321413.075	5091182.11	53.30880397	-60.41937332	37.875
ZAB1	-1488636.904	-5003946.538	3654557.697	35.17357523	-106.5673504	1620.132
ZAB2	-1488631.566	-5003948.22	3654557.666	35.17357453	-106.567289	1620.188
ZAB3	-1488632.346	-5003950.807	3654553.818	35.17353216	-106.5672891	1620.18
ZAN1	-2659536.732	-1549114.751	5567750.746	61.22920124	-149.780252	80.716
ZAN2	-2659548.489	-1549110.798	5567746.261	61.22911761	-149.7804258	80.717
ZAN3	-2659541.427	-1549106.676	5567750.713	61.22920116	-149.7804259	80.683
ZAU1	138704.045	-4761244.139	4227763.93	41.78265807	-88.33133754	195.884
ZAU2	138704.307	-4761248.758	4227758.769	41.78259568	-88.33133601	195.893
ZAU3	138711.015	-4761248.494	4227758.849	41.78259663	-88.33125526	195.895
ZBW1	1490299.15	-4448983.169	4306010.505	42.73572071	-71.48042667	39.103
ZBW2	1490304.265	-4448981.165	4306010.855	42.7357247	-71.48035967	39.138
ZBW3	1490305.974	-4448984.787	4306006.54	42.73567188	-71.48035393	39.131
ZDC1	1069125.701	-4839599.006	4001126.53	39.10159603	-77.54274728	80.082
ZDC2	1069128.097	-4839603.636	4001120.325	39.10152403	-77.54273178	80.078
ZDV1	-1273628.672	-4711375.571	4094890.098	40.18730311	-105.1272251	1541.357
ZDV2	-1273622.968	-4711377.086	4094890.109	40.18730334	-105.1271558	1541.344
ZDV3	-1273624.983	-4711380.287	4094885.825	40.18725286	-105.1271688	1541.342
ZFW1	-659983.24	-5324060.768	3438276.458	32.83064964	-97.06647224	155.608
ZFW2	-659988.514	-5324063.32	3438271.463	32.83059625	-97.06652478	155.573
ZFW3	-659983.538	-5324063.849	3438271.67	32.83059824	-97.06647135	155.612
ZHU1	-513864.516	-5506451.686	3166720.467	29.96189637	-95.33142675	10.833
ZHU2	-513867.164	-5506455.074	3166714.3	29.96183187	-95.33145081	10.889

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZHU3	-513873.443	-5506457.714	3166708.701	29.96177364	-95.33151303	10.876
ZJX1	772646.395	-5434462.205	3237231.764	30.69885978	-81.90818564	2.155
ZJX2	772649.72	-5434463.737	3237228.355	30.6988242	-81.90815353	2.121
ZJX3	772645.656	-5434466.167	3237225.246	30.69879164	-81.9081991	2.111
ZKC1	-415247.577	-4954556.391	3982161.111	38.88015934	-94.79083452	305.9
ZKC2	-415231.185	-4954557.712	3982161.164	38.88016	-94.79064501	305.893
ZKC3	-415237.303	-4954561.06	3982155.97	38.88010183	-94.79071205	305.627
ZLA1	-2474410.032	-4637294.568	3602183.555	34.6035186	-118.0838967	763.502
ZLA2	-2474404.762	-4637297.376	3602183.571	34.60351873	-118.0838316	763.508
ZLA3	-2474411.362	-4637297.056	3602179.585	34.6034747	-118.0838967	763.57
ZLC1	0	0	0	0	0	0
ZLC2	0	0	0	0	0	0
ZLC3	0	0	0	0	0	0
ZMA1	966042.256	-5662999.797	2761581.499	25.82461233	-80.31919019	-7.617
ZMA2	966029.277	-5662999.097	2761585.982	25.82466004	-80.31931662	-8.25
ZMA3	966037.357	-5662997.936	2761586.335	25.82466207	-80.31923523	-7.904
ZME1	4070.836	-5226189.3	3644028.421	35.06739408	-89.9553706	68.604
ZME2	4070.867	-5226186.75	3644032.536	35.06743765	-89.95537024	68.881
ZME3	4064.672	-5226186.623	3644032.689	35.06743946	-89.95543816	68.861
ZMP1	-249978.455	-4539297.504	4458955.054	44.63746323	-93.15208641	262.662
ZMP2	-249972.649	-4539297.85	4458955.055	44.63746307	-93.1520131	262.681
ZMP3	-249973.747	-4539302.129	4458950.577	44.637407	-93.15202396	262.618
ZNY1	1406144.566	-4627343.992	4144322.066	40.78432872	-73.0971665	6.446
ZNY2	1406146.363	-4627347.021	4144317.283	40.78427598	-73.09715656	5.912
ZNY3	1406140.804	-4627348.68	4144317.322	40.78427642	-73.09722529	5.915
ZOA1	-2684436.962	-4293337.304	3865351.904	37.54305438	-122.0159493	-3.507
ZOA2	-2684433.952	-4293341.383	3865349.478	37.54302682	-122.0158959	-3.508
ZOA3	-2684438.327	-4293342.258	3865345.626	37.5429825	-122.0159326	-3.428
ZOB1	650770.122	-4754715.674	4187420.757	41.29715453	-82.20644546	223.681
ZOB2	650777.799	-4754714.841	4187422.77	41.29716687	-82.20635331	225.171
ZOB3	650776.129	-4754719.67	4187414.983	41.29708711	-82.20638088	223.457
ZSE1	-2308930.308	-3668169.672	4663526.453	47.286993	-122.1883733	82.093
ZSE2	-2308934.705	-3668175.224	4663520.054	47.28690743	-122.1883834	82.167
ZSE3	-2308935.764	-3668179.496	4663516.106	47.28685572	-122.1883651	82.101
ZSU1	2462589.461	-5529372.109	2003724.528	18.43133623	-65.99347653	-28.082
ZSU2	2462587.532	-5529377.459	2003712.234	18.43121914	-65.99351381	-28.077
ZSU3	2462594.161	-5529375.208	2003710.151	18.43119946	-65.99344782	-28.128

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZTL1	529840.344	-5305248.814	3489342.863	33.3796887	-84.29672665	261.14
ZTL2	529846.721	-5305247.97	3489343.147	33.37969186	-84.29665755	261.125
ZTL3	529847.404	-5305251.41	3489337.914	33.37963515	-84.29665392	261.161

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 WE7.164c 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

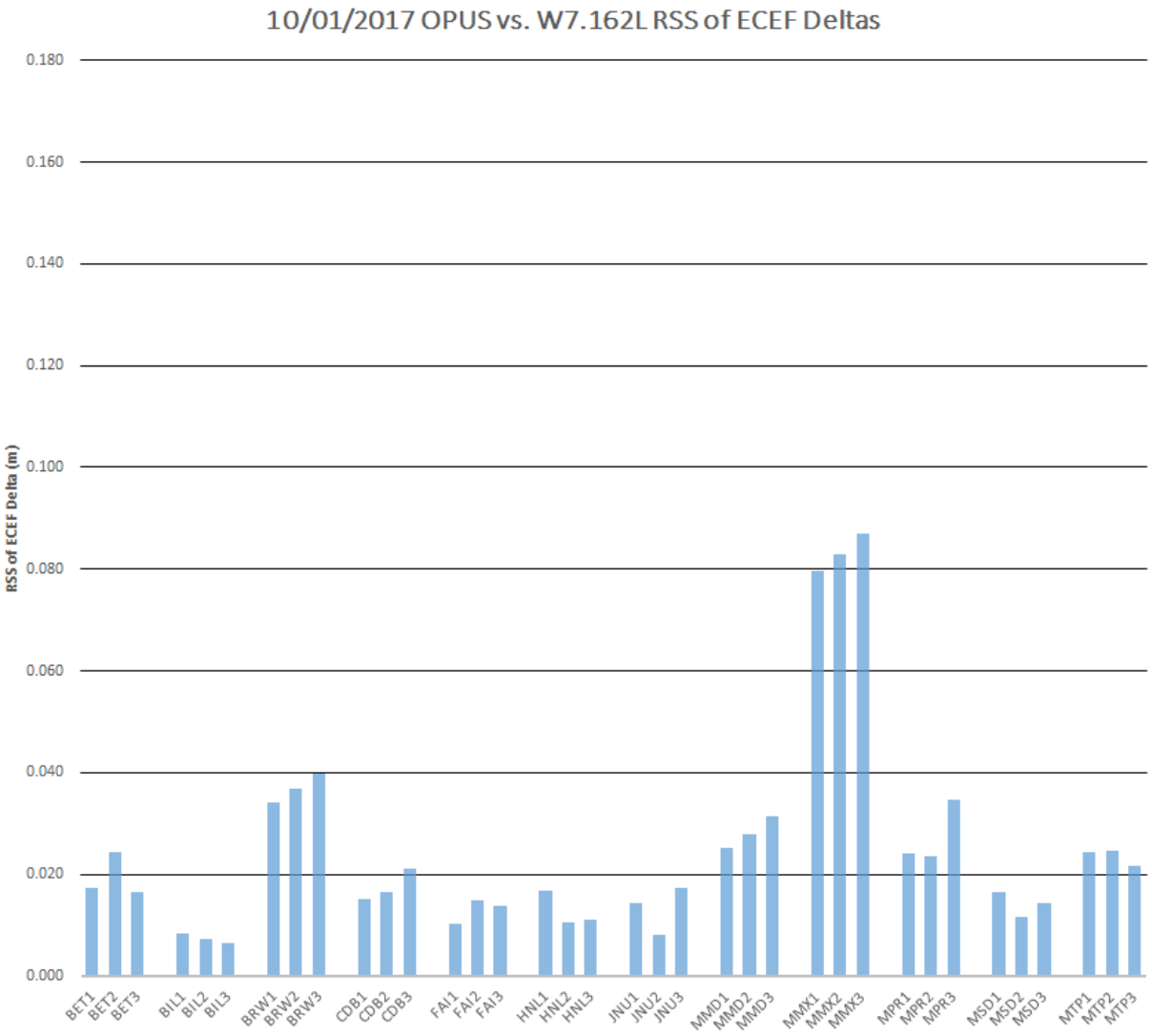


Figure 10-2 Build WE7.164c Antenna Positions Deltas OPUS Survey

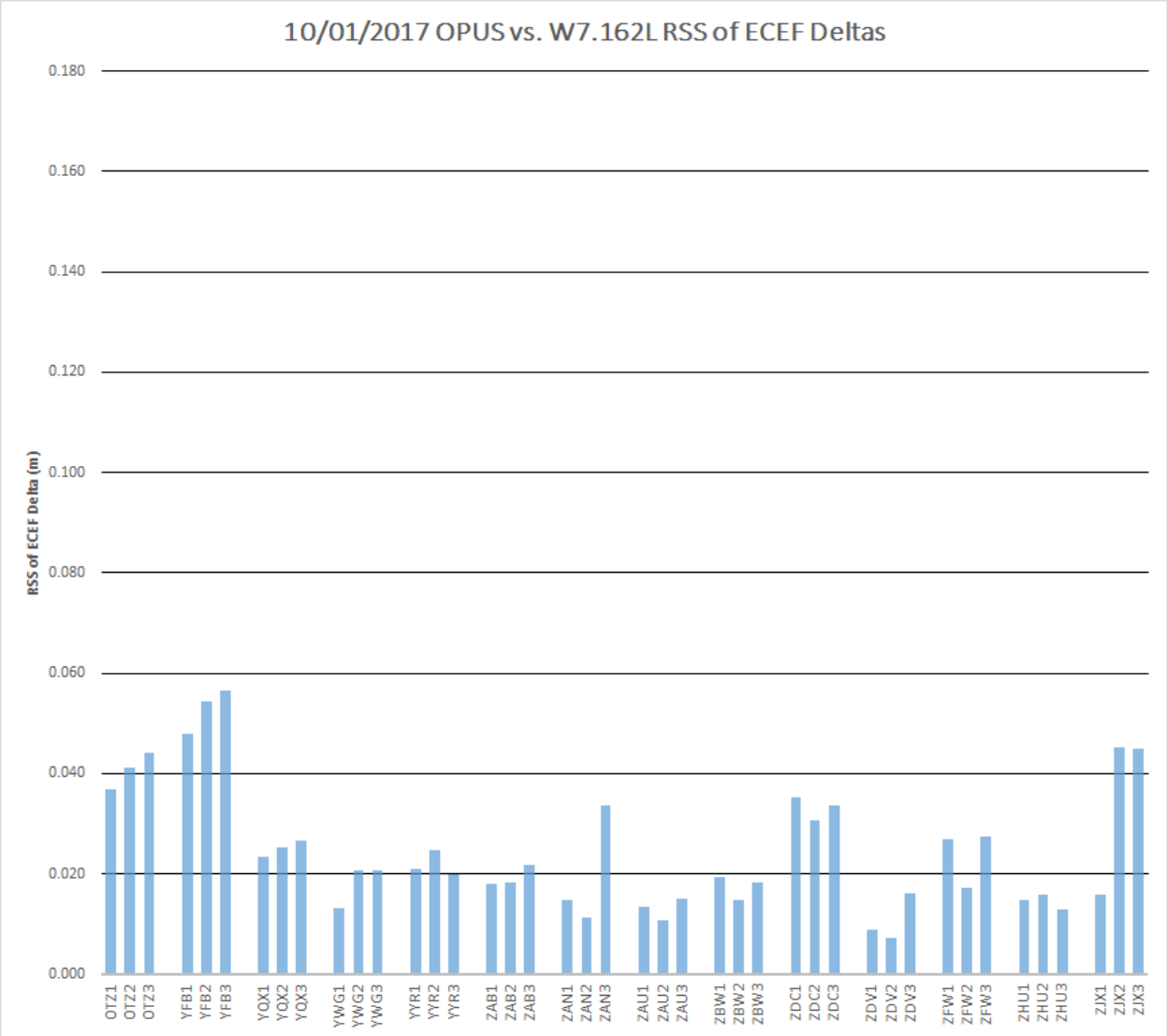


Figure 10-3 Build WE7.164c Antenna Positions Deltas OPUS Survey

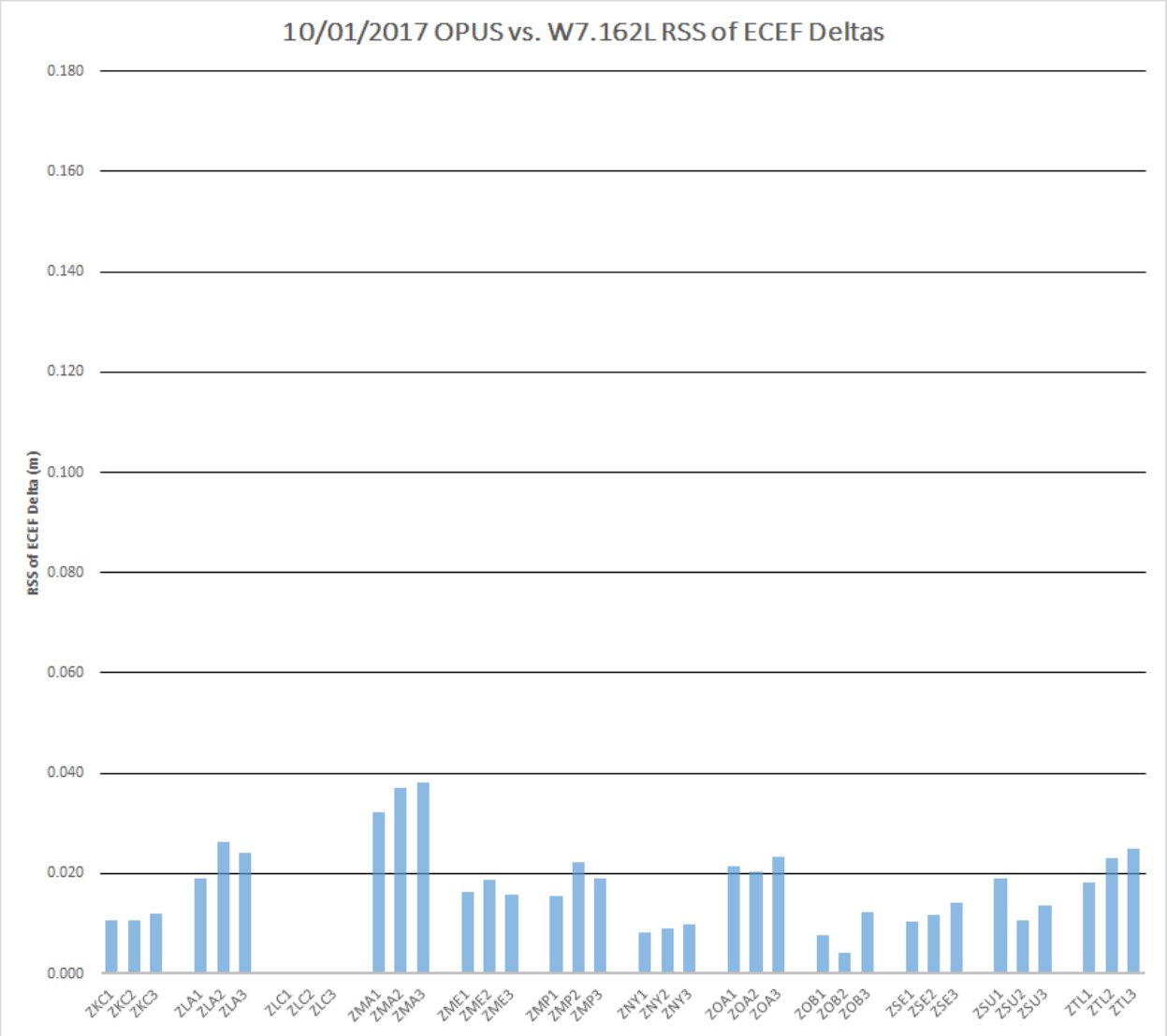


Figure 10-4 OPUS Survey Overall RMS Qualities

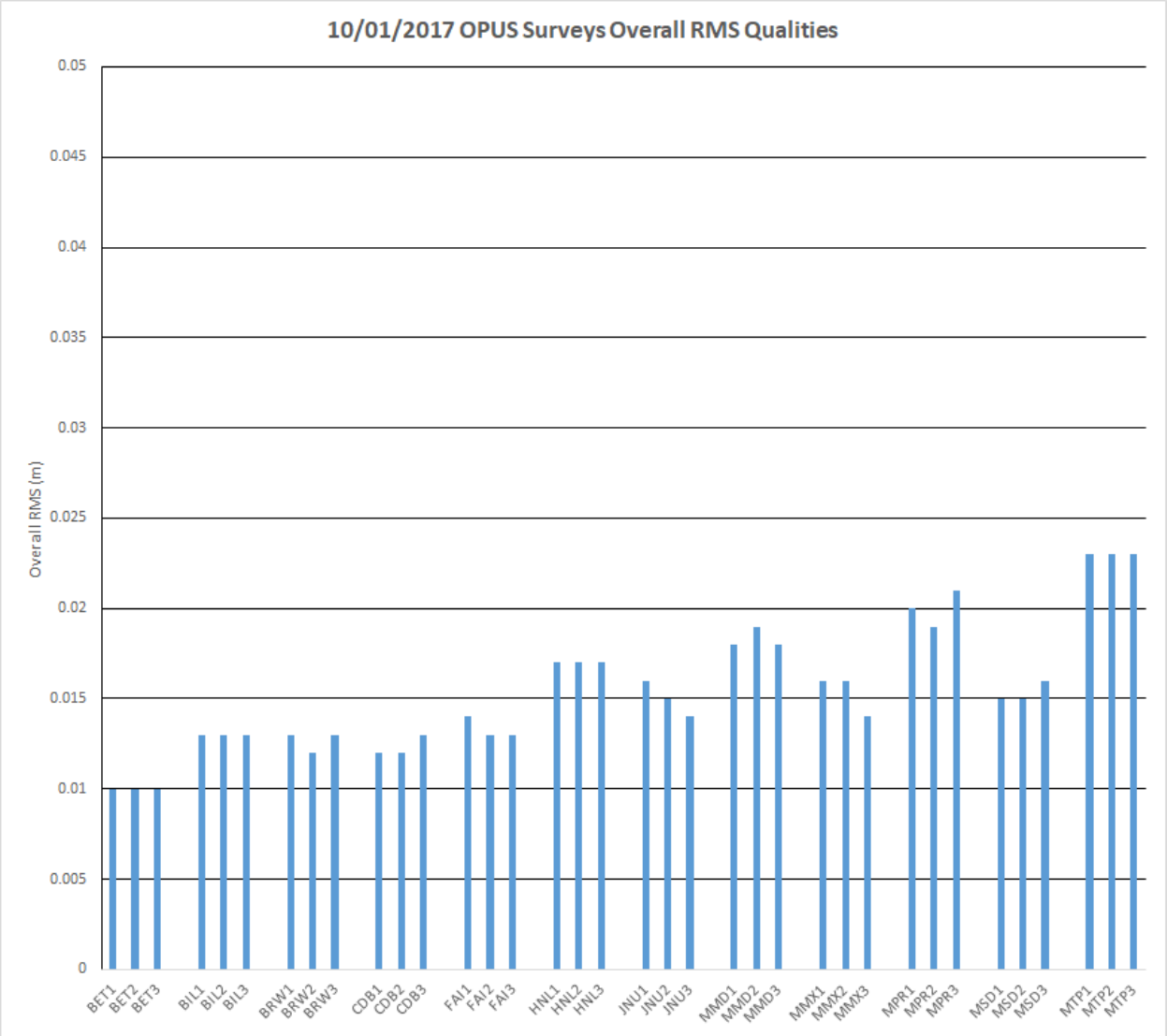


Figure 10-5 OPUS Survey Overall RMS Qualities

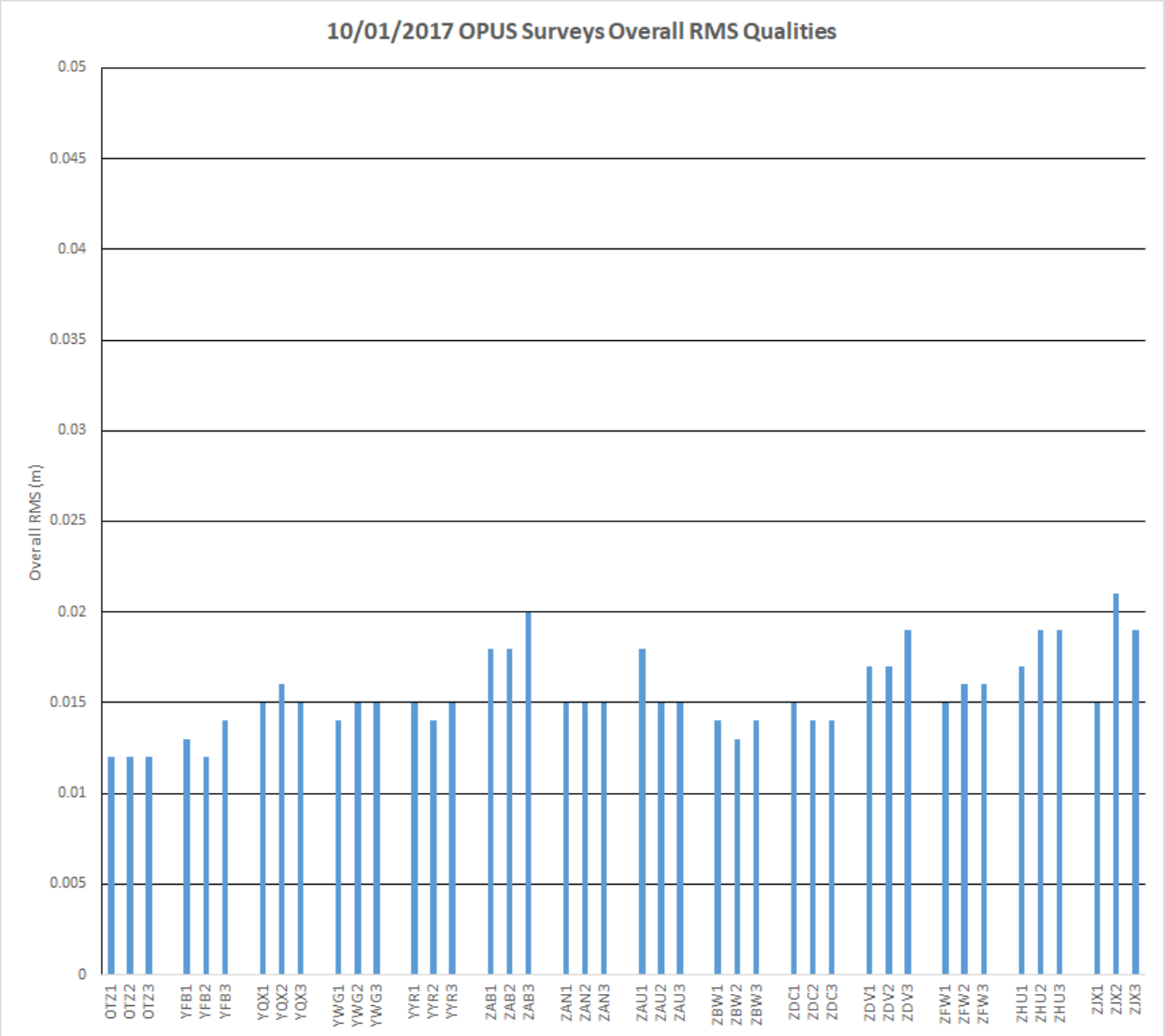
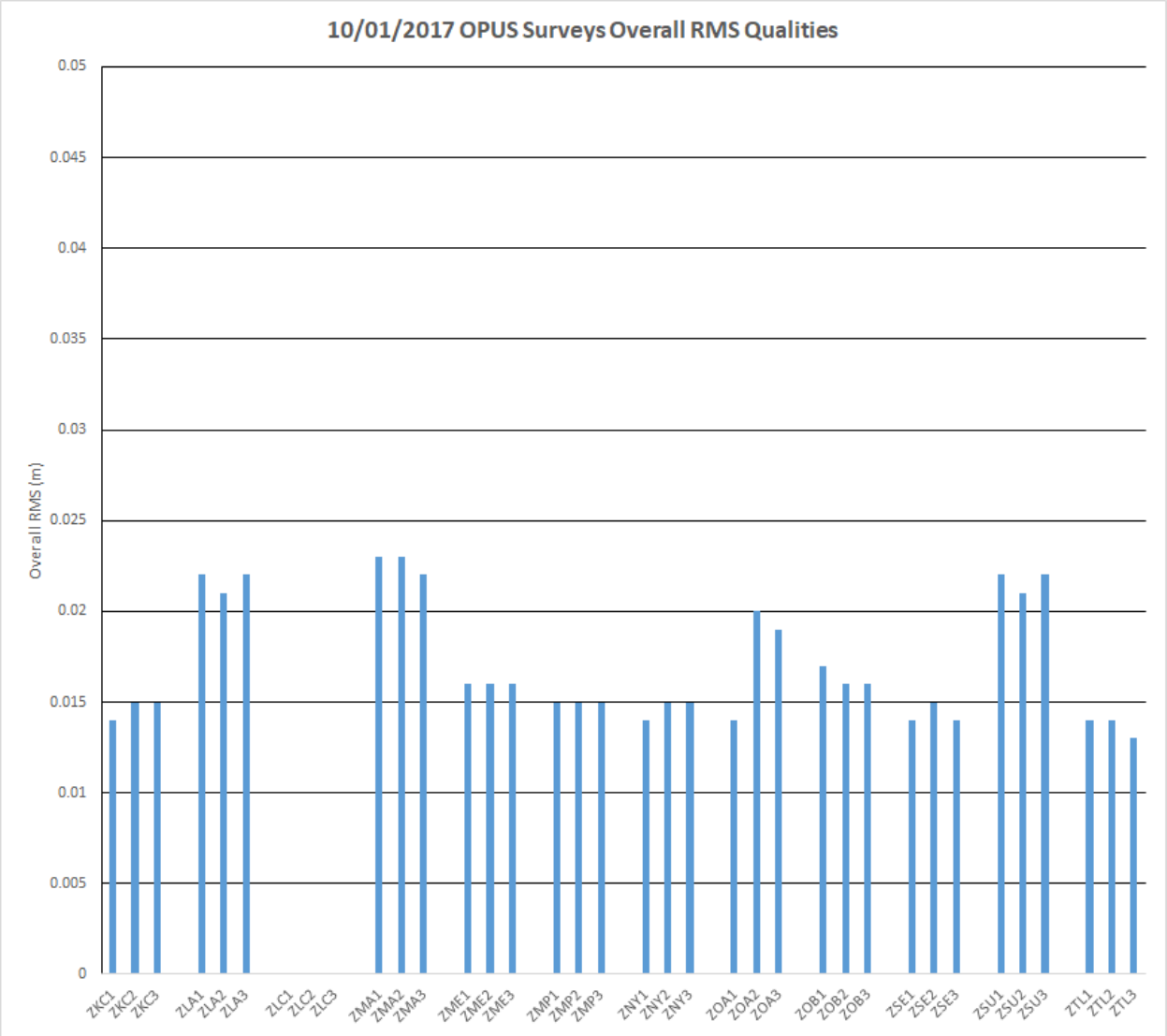


Figure 10-6 OPUS Survey Overall RMS Qualities



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

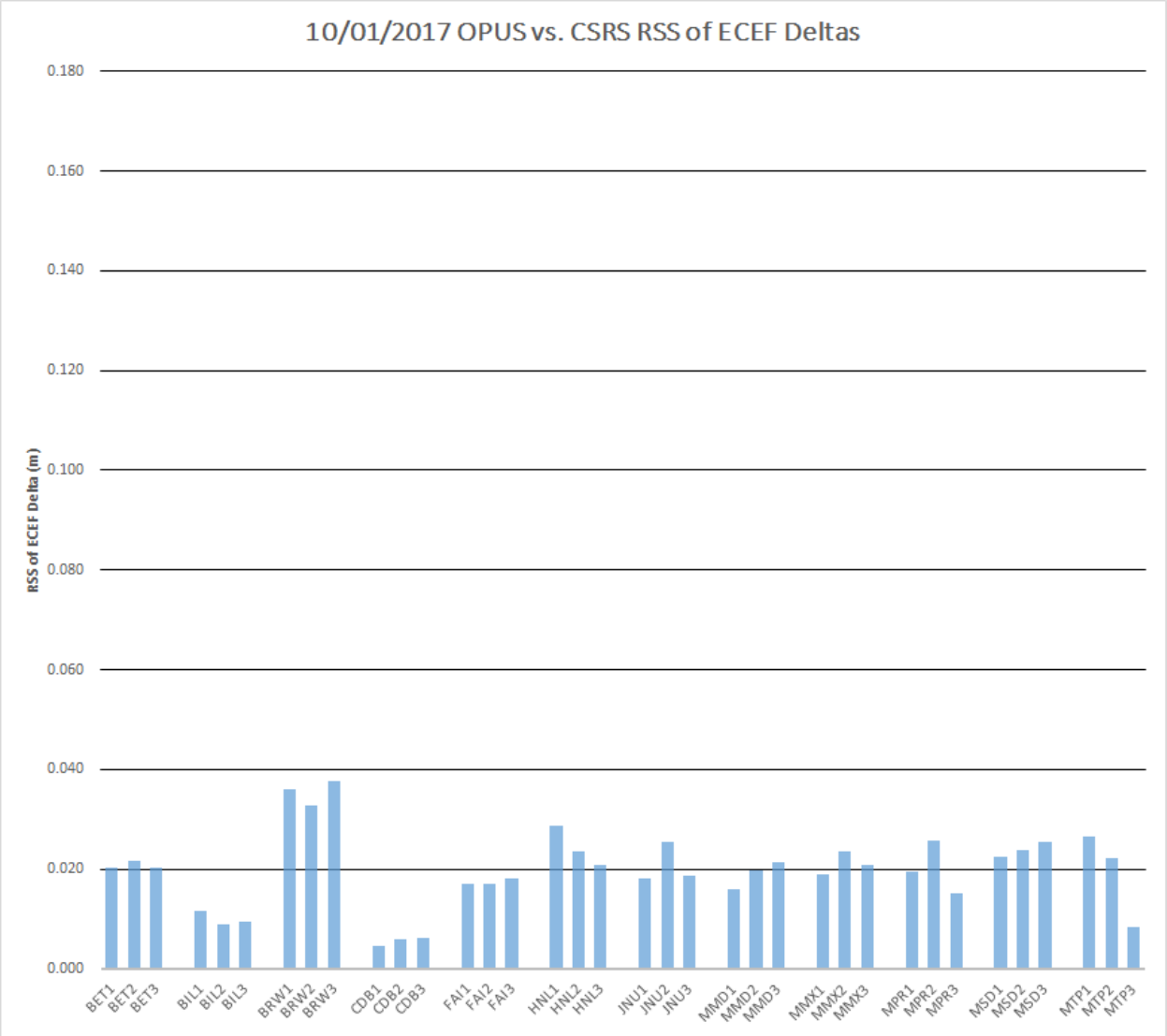


Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

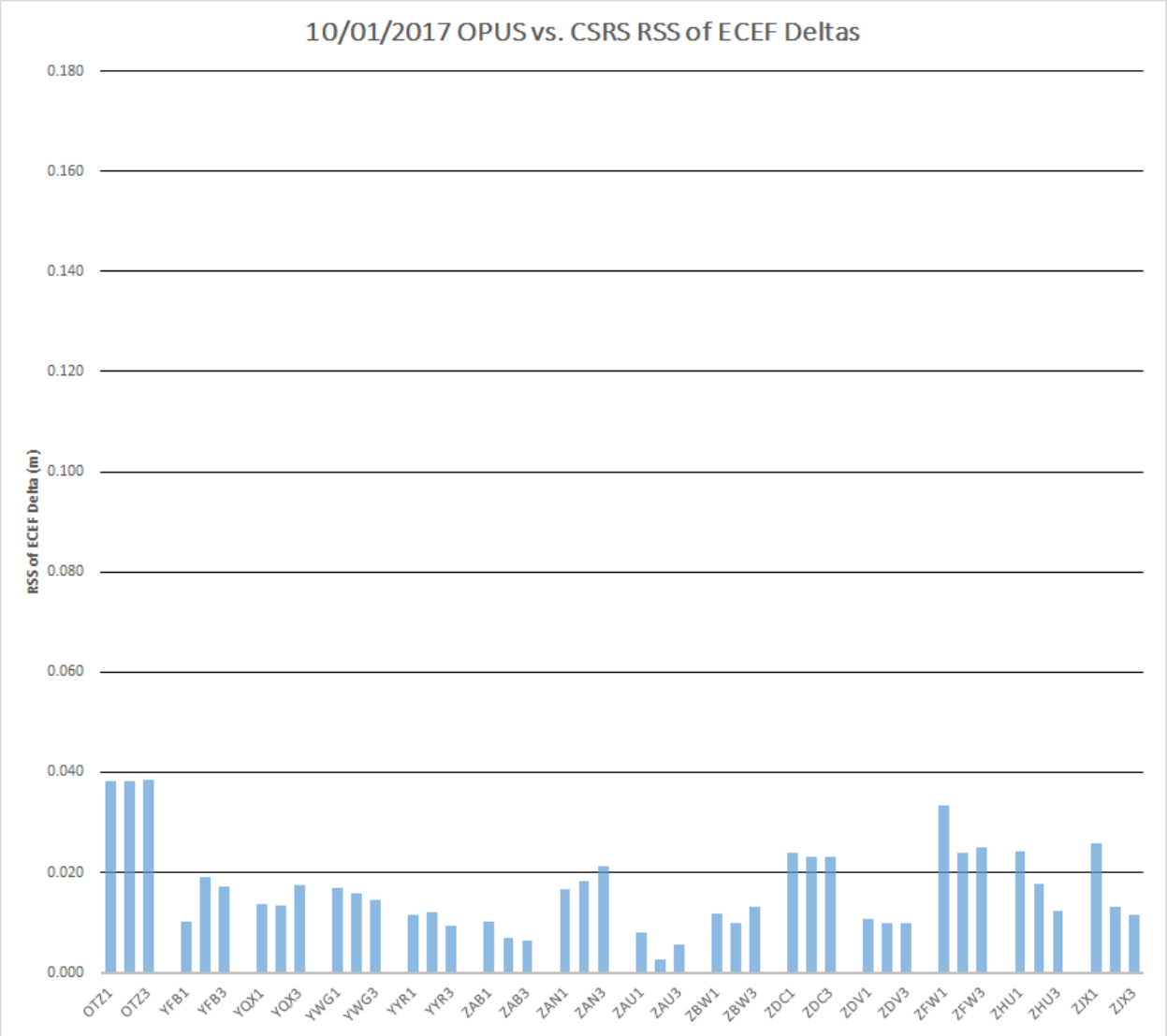


Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

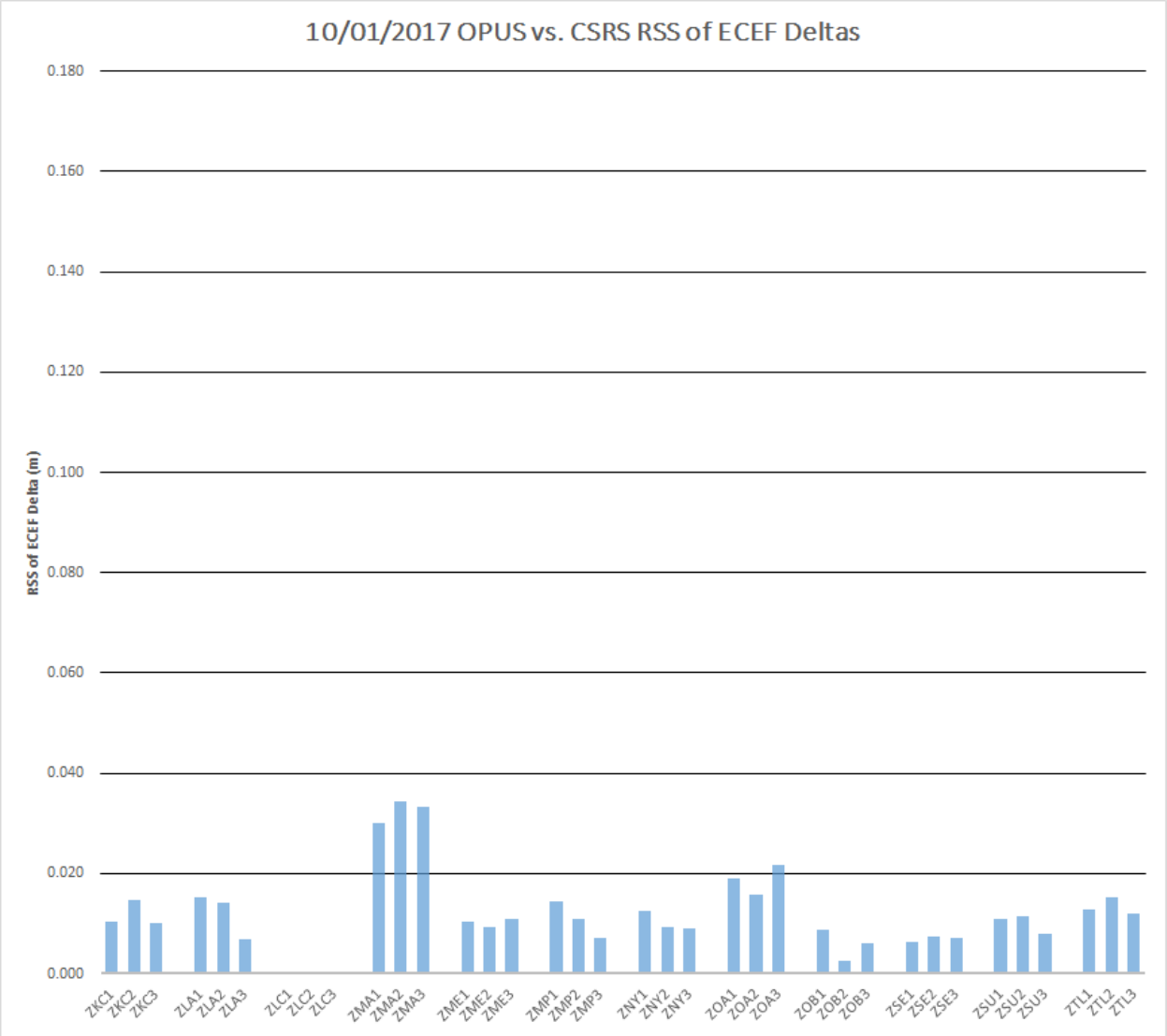


Figure 10-10 through Figure 10-12 show the RSS of the ECEF sigma's survey qualities reported by CSRS.

Figure 10-10 CSRS Survey Qualities

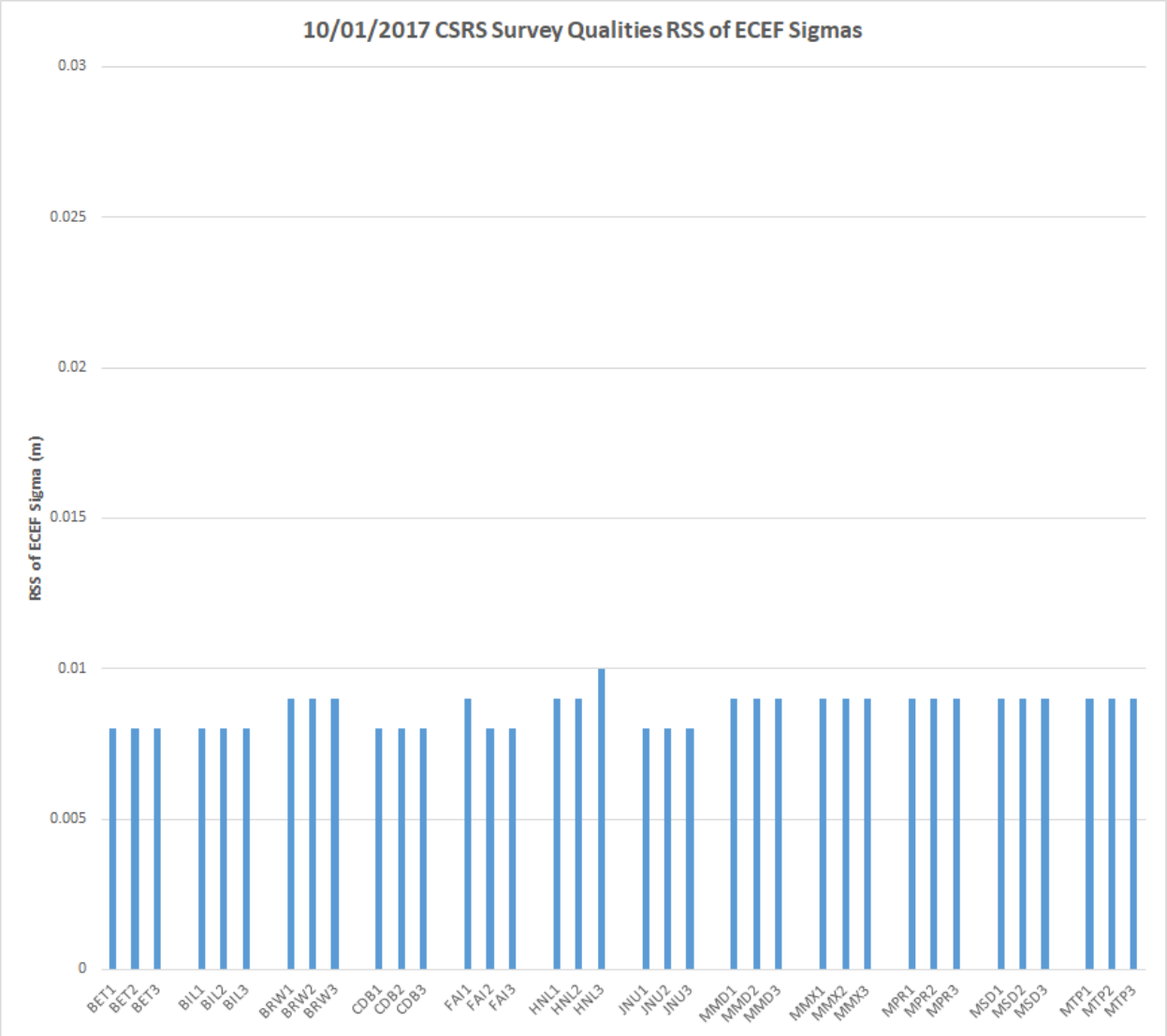


Figure 10-11 CSRS Survey Qualities

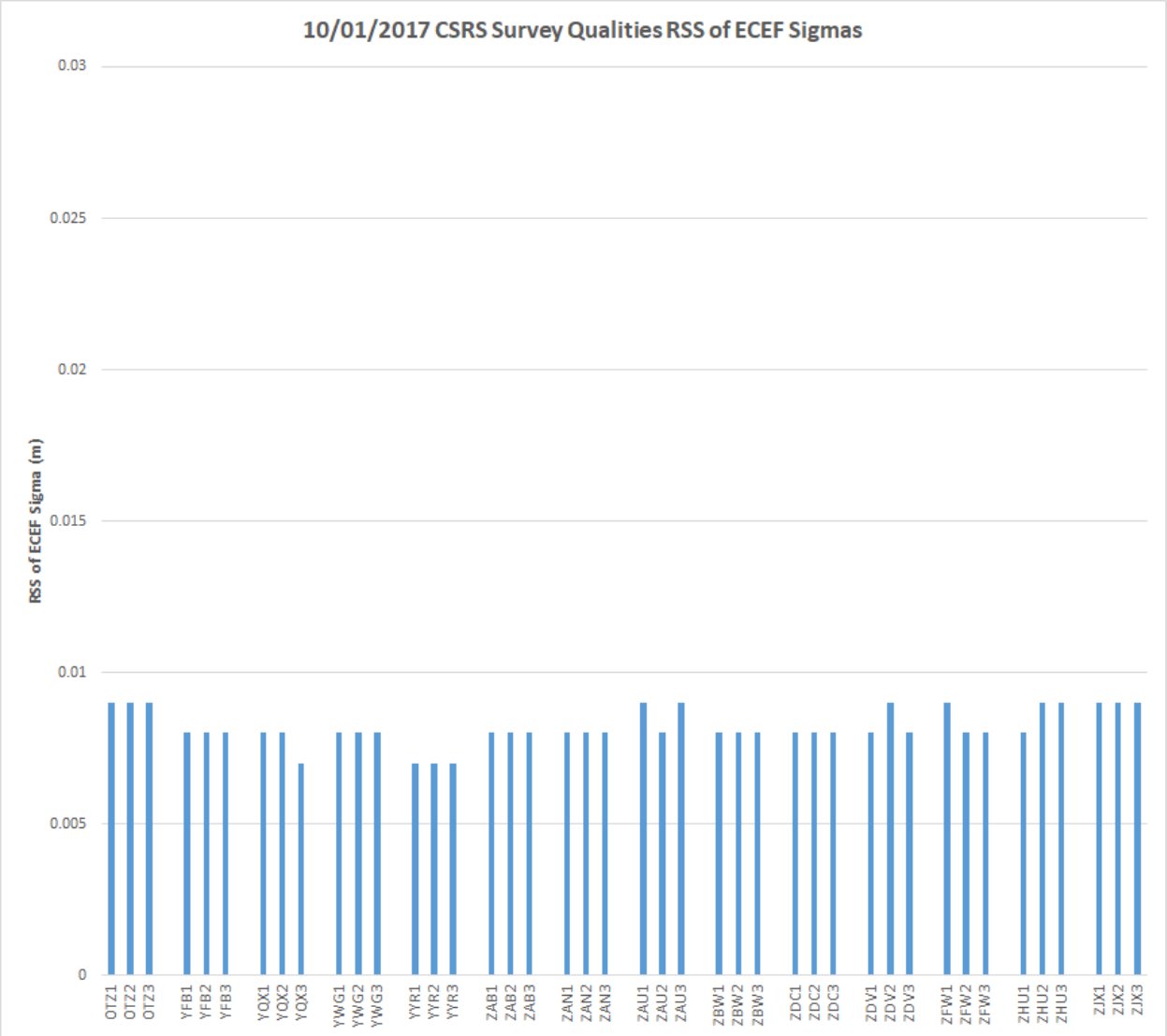
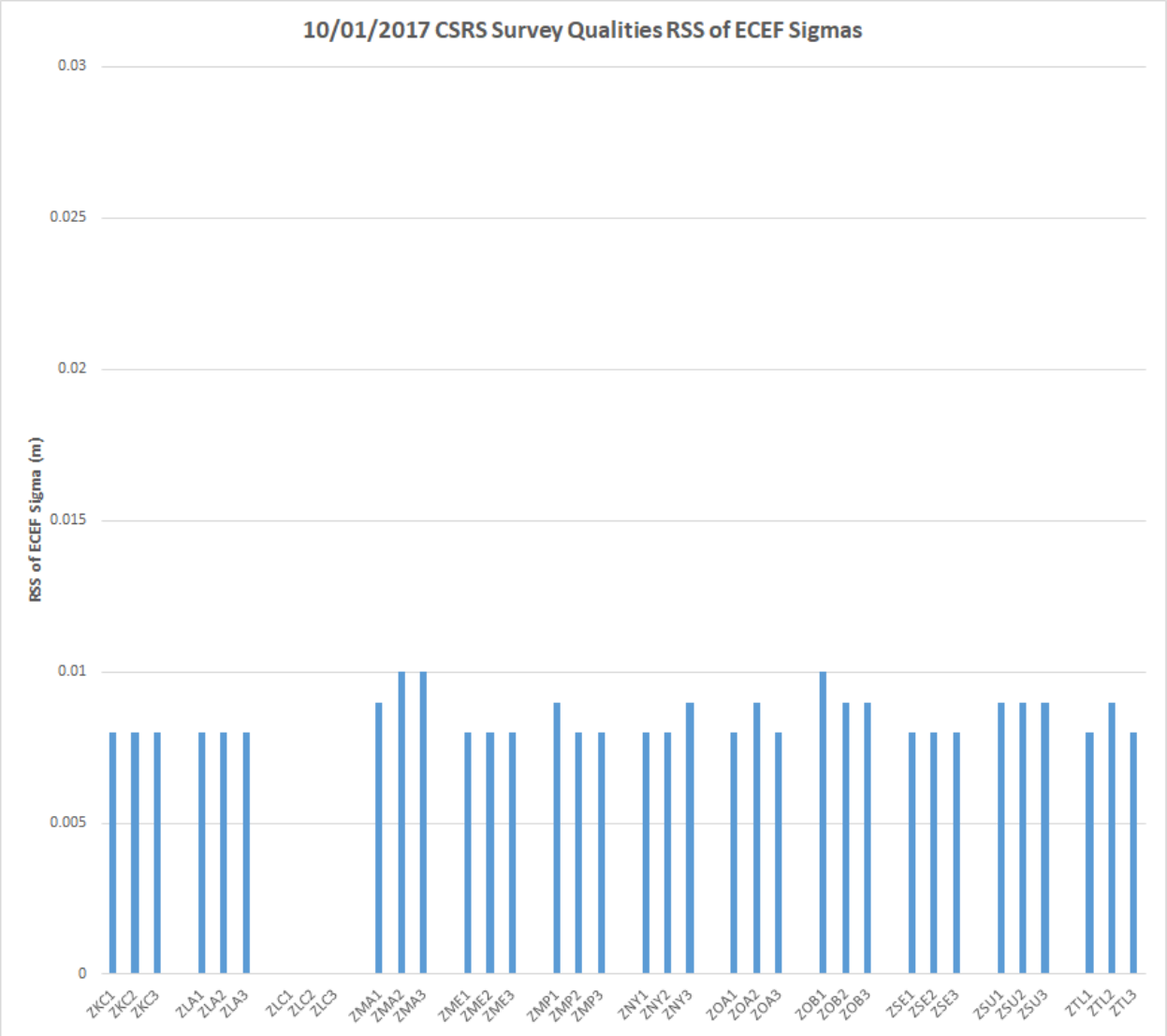


Figure 10-12 CSRS Survey Qualities



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.

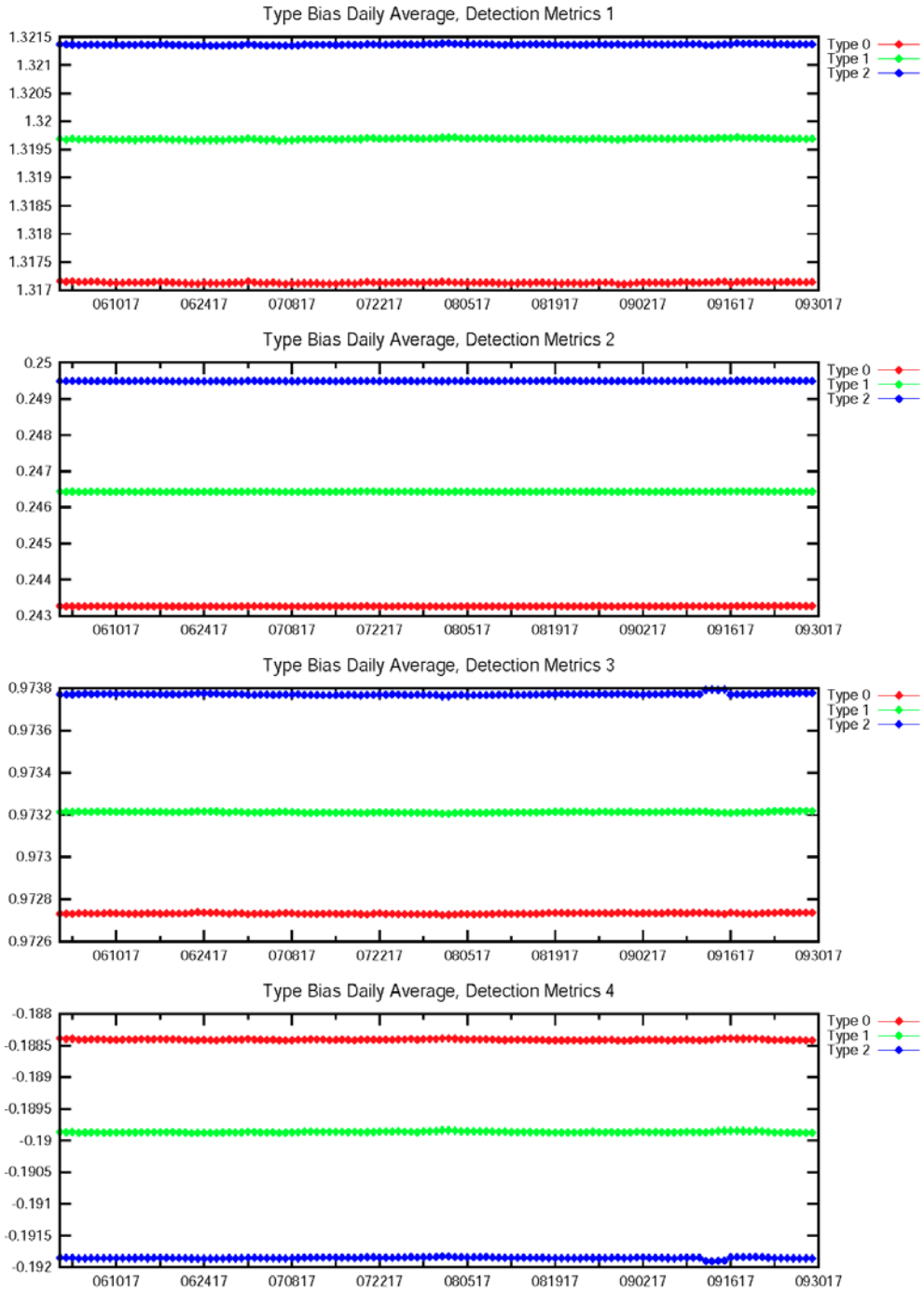
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.317130	1.319690	1.32137
DM 2	0.243265	0.246436	0.24949
DM 3	0.972733	0.973213	0.973771
DM 4	-0.188405	-0.189865	-0.191854

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.317130	1.319690	1.32137
DM 2	0.243265	0.246436	0.24949
DM 3	0.972733	0.973213	0.973771
DM 4	-0.188405	-0.189865	-0.191854

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 0.0011294 observed on PRN-11, (2) the maximum average for DM2 is 0.0001938 observed on PRN-27, (3) the maximum average for DM3 is 0.0002013 observed on PRN-29, (4) the maximum average for DM4 is 0.0004872 observed on PRN-23.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000263645	6.56769e-05	5.3519e-05	0.000101463
2	0.000531171	0.000147574	6.87149e-05	0.000153769
3	0.000153263	4.71298e-05	5.98264e-05	0.000101431
4	offline	offline	offline	offline
5	0.000203756	5.84727e-05	0.000134523	0.000129369
6	0.000519169	0.000105632	8.35769e-05	0.000107925
7	0.000158216	9.36118e-05	5.67975e-05	9.09185e-05
8	0.000431664	0.000128078	9.76405e-05	0.000139903
9	0.000181839	5.29777e-05	0.000136344	0.00021418
10	0.000171191	4.96017e-05	7.88190e-05	0.000163802
11	0.001129370	0.000179534	0.000105583	0.00026846
12	0.000157529	4.96240e-05	8.26917e-05	9.70107e-05
13	0.000499743	3.75281e-05	5.42157e-05	0.000254048
14	0.000757984	0.000135113	4.51231e-05	0.000179211
15	0.000251554	7.42744e-05	4.5095e-05	9.8114e-05
16	0.000153653	6.00264e-05	0.000121372	0.000221298
17	0.000212546	5.37331e-05	4.69306e-05	8.74339e-05
18	0.000700580	0.000136891	0.000107054	0.000298731
19	0.000573970	0.000184904	9.85364e-05	0.000108896
20	0.000161996	4.14223e-05	4.91413e-05	0.000133409
21	0.000343050	5.5957e-05	8.42587e-05	0.000444981
22	0.000155631	4.10223e-05	9.3438e-05	0.000270902
23	0.001056580	0.000192378	0.000125383	0.000487197
24	0.000218388	5.97033e-05	0.000155673	0.000248445
25	0.000596268	0.00011563	4.8014e-05	0.000216049
26	0.000257698	0.000113062	6.14355e-05	0.000135279
27	0.000451253	0.000193814	0.000135536	0.000265399
28	0.000307438	3.85025e-05	7.50107e-05	0.000140908
29	0.000259689	8.07992e-05	0.000201344	0.000346408
30	0.000213183	7.48182e-05	7.59025e-05	9.60215e-05
31	0.000345180	0.000126338	5.14545e-05	0.000165583
32	0.000181857	5.35876e-05	8.53025e-05	0.000108274

Figure 11-2 PRN Bias Average for the Quarter

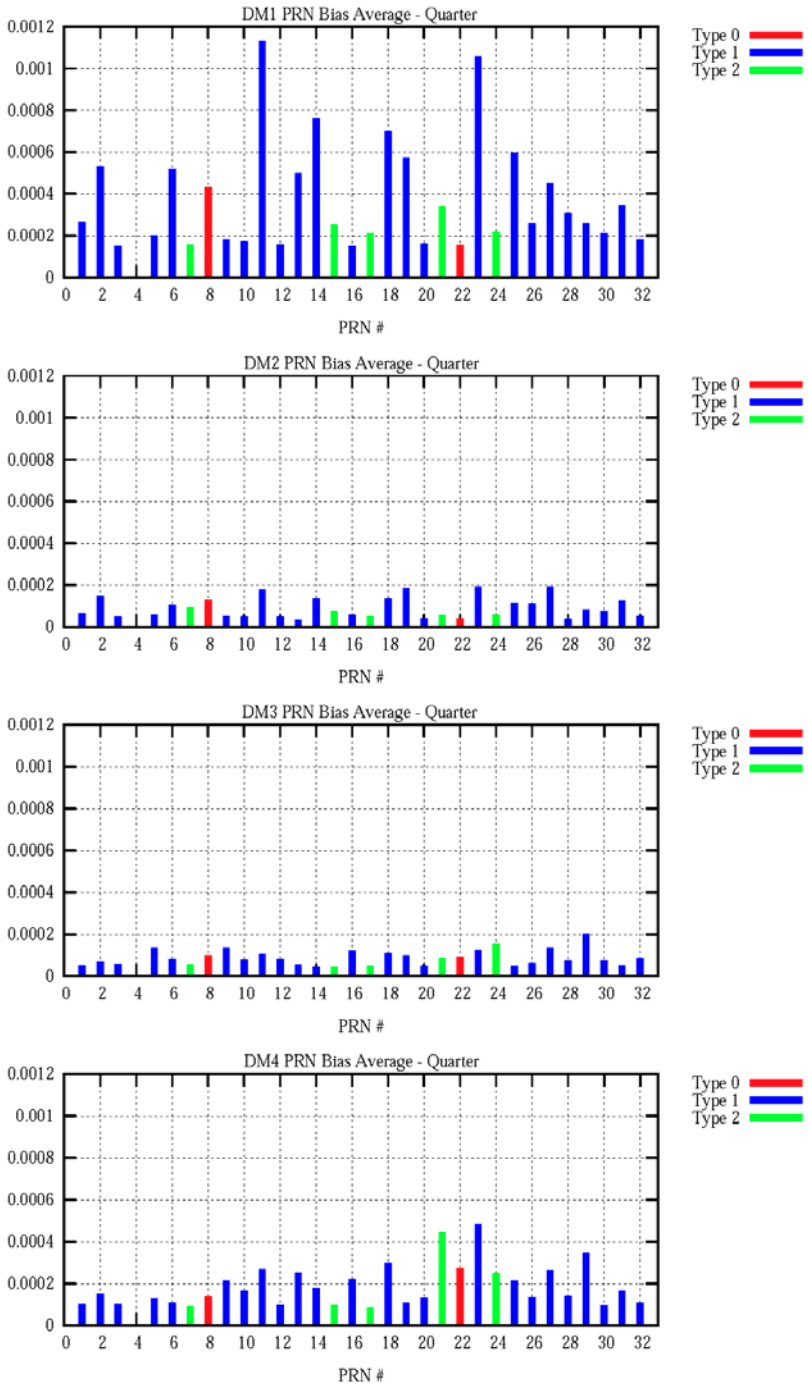


Figure 11-3 through Figure 11-10 show the daily PRN bias for each PRN for four detection metrics. Small bumps were due to NANU's.

Figure 11-3 PRN Bias Average Trend (PRN-1–PRN-4)

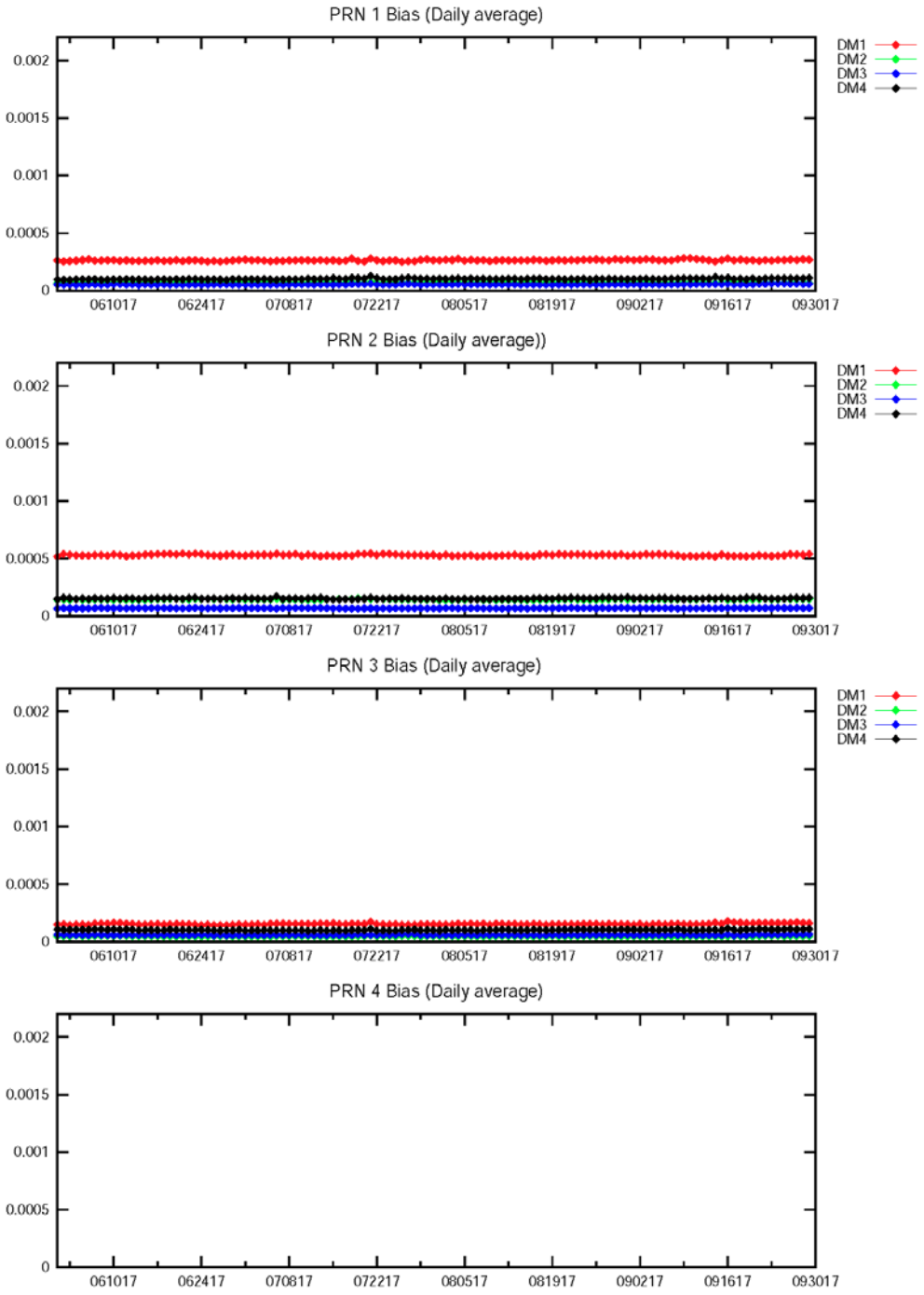


Figure 11-4 PRN Bias Average Trend (PRN-5 – PRN-8)

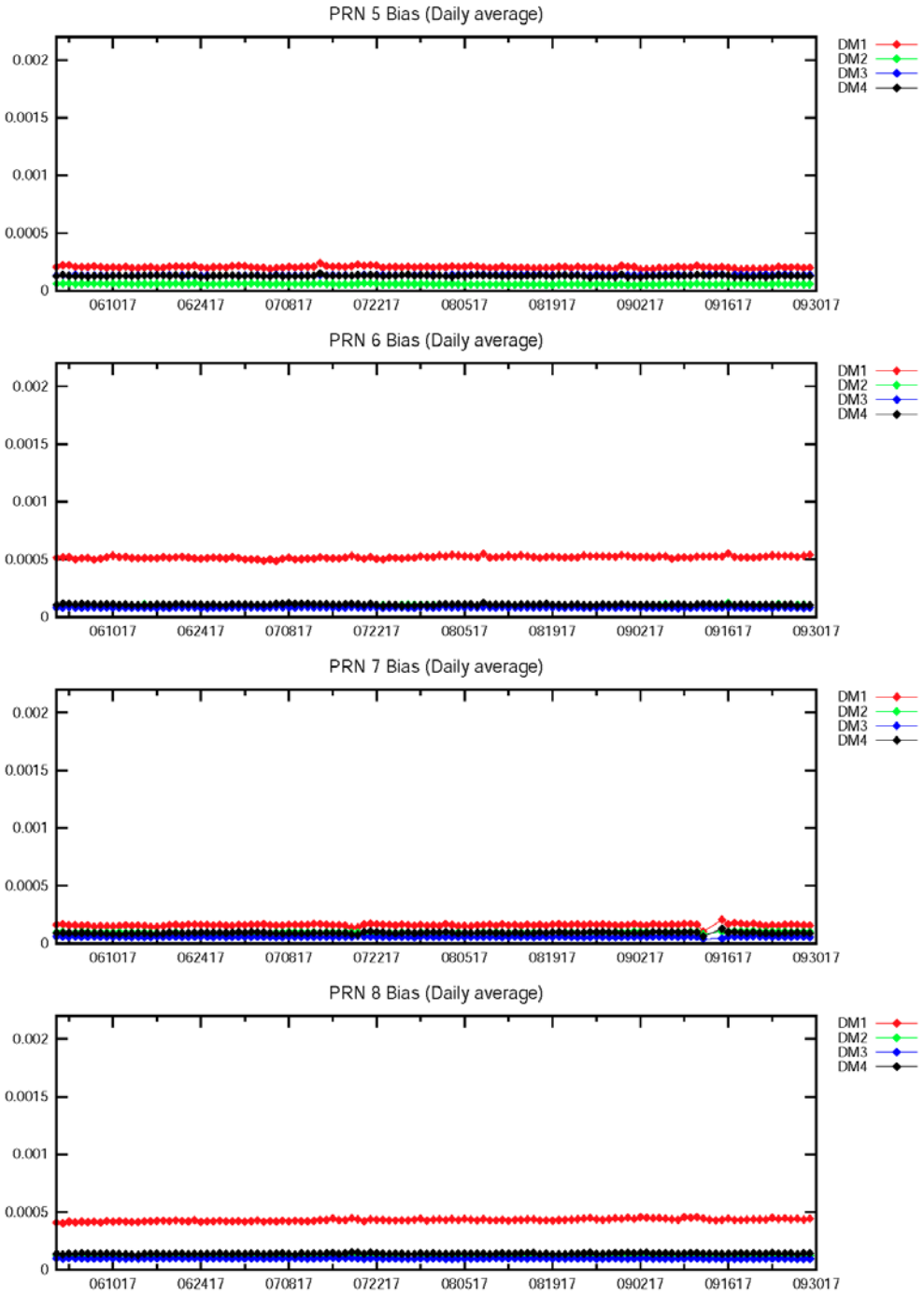


Figure 11-5 PRN Bias Average Trend (PRN-9 – PRN-12)

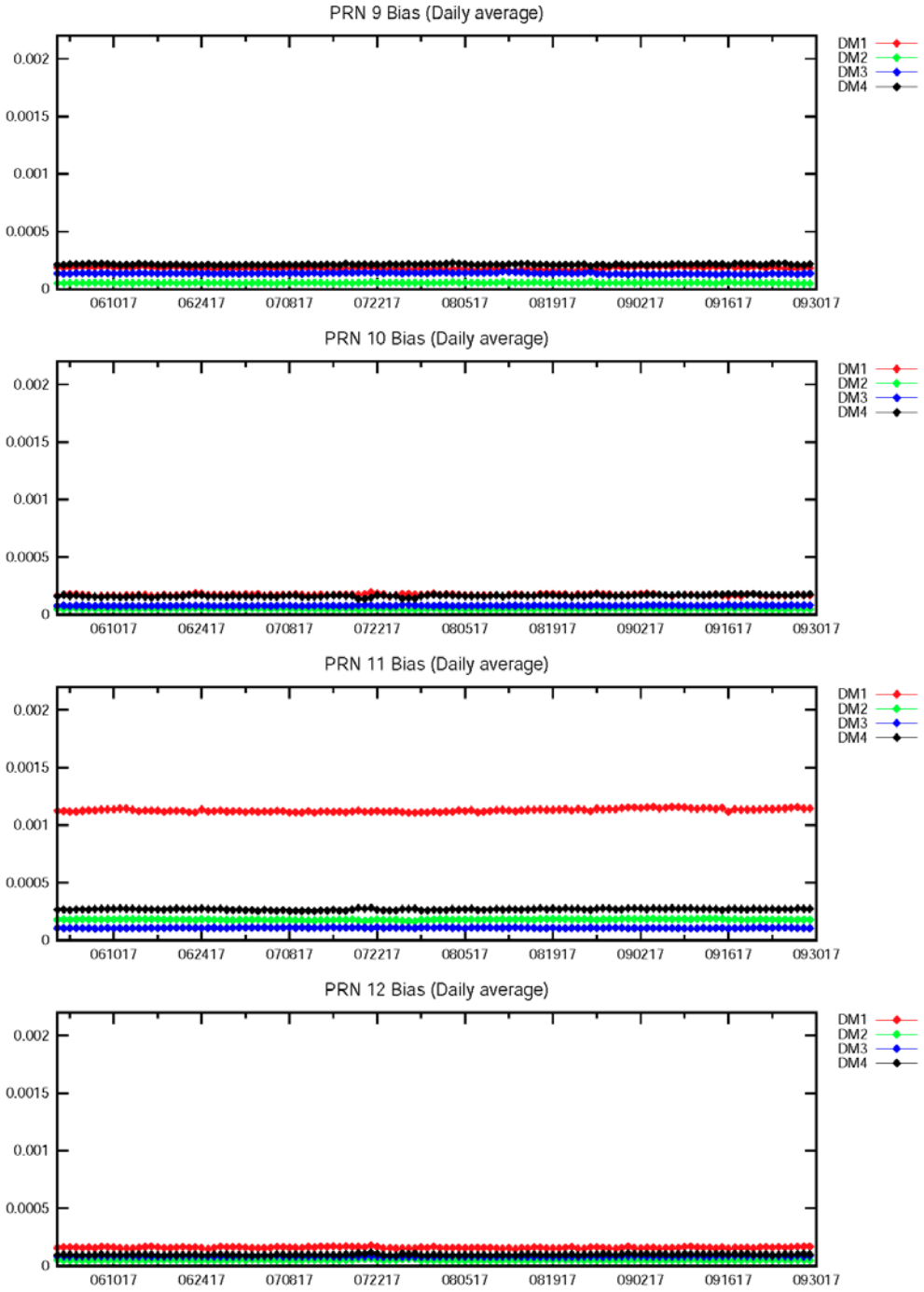


Figure 11-6 PRN Bias Average Trend (PRN-13 – PRN-16)

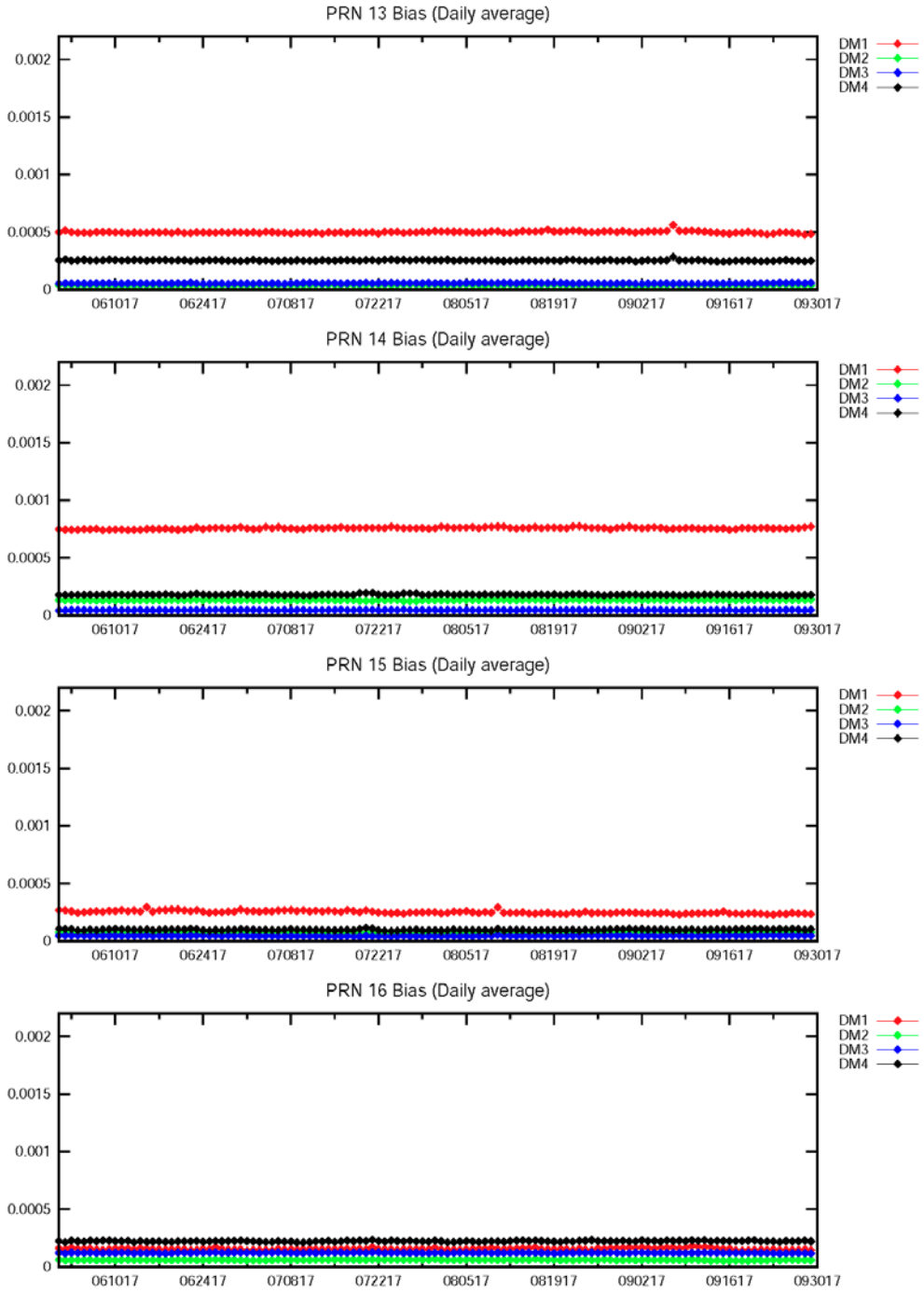


Figure 11-7 PRN Bias Average Trend (PRN-17 – PRN-20)

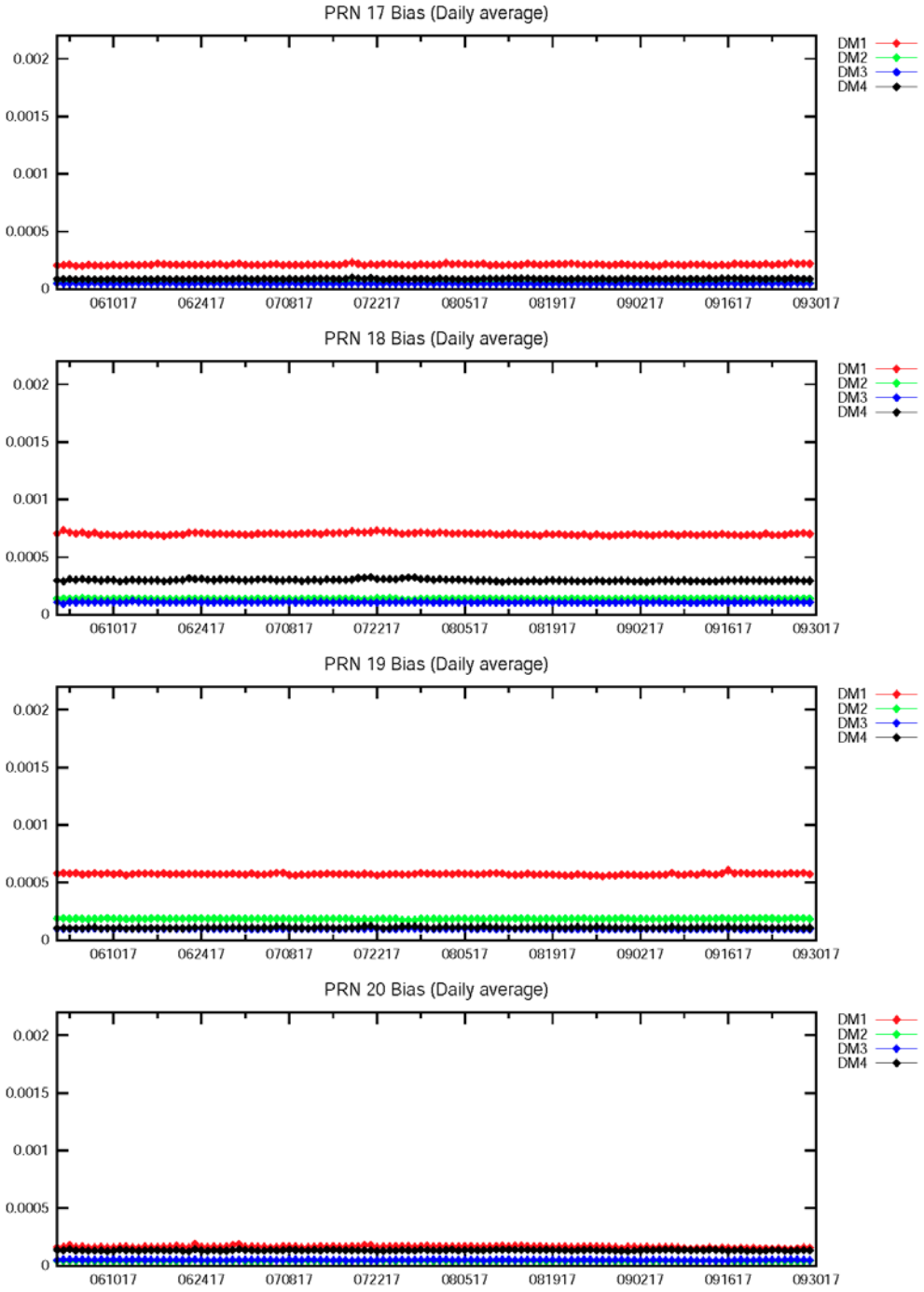


Figure 11-8 PRN Bias Average Trend (PRN-21 – PRN-24)

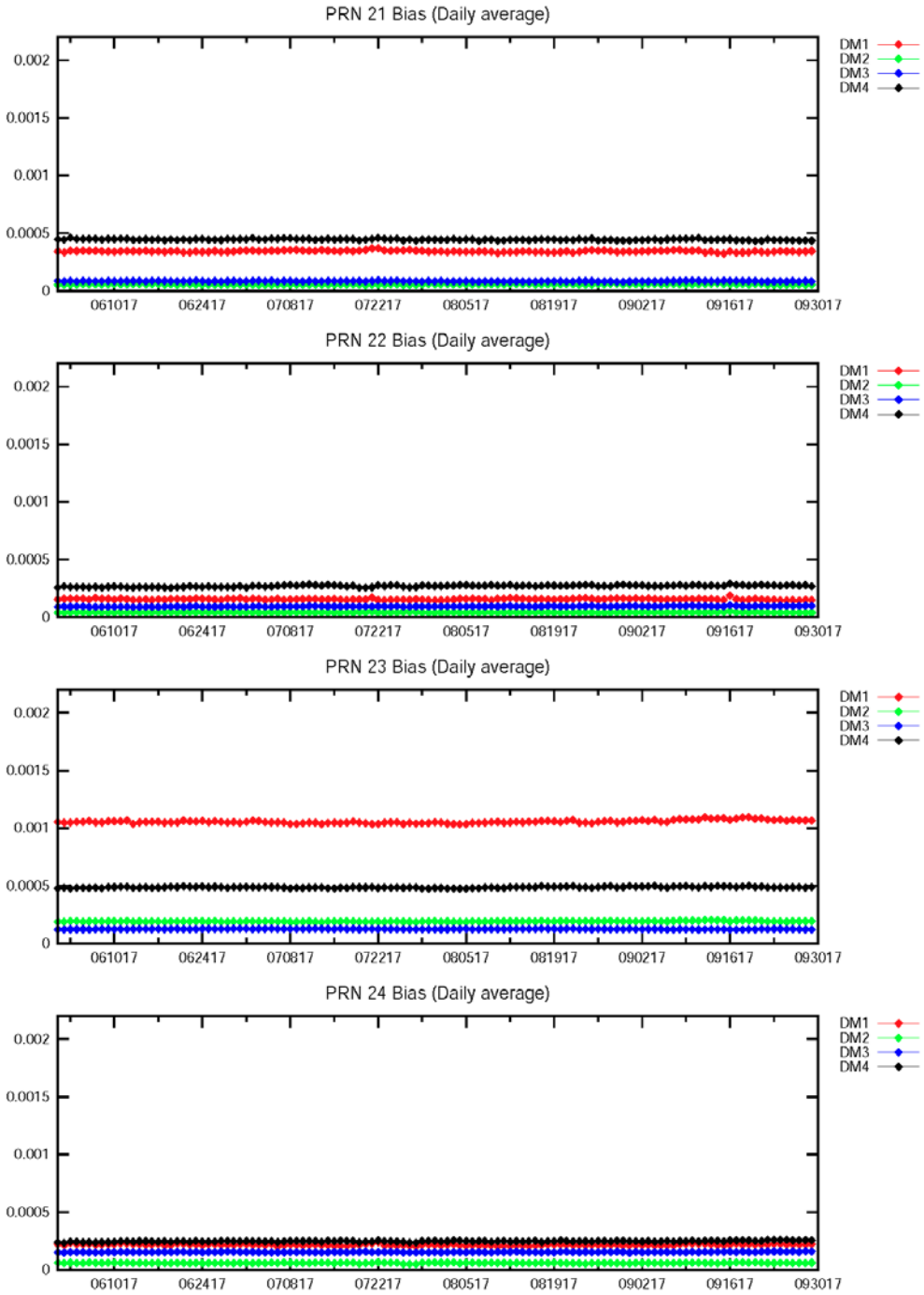


Figure 11-9 PRN Bias Average Trend (PRN-25 – PRN-28)

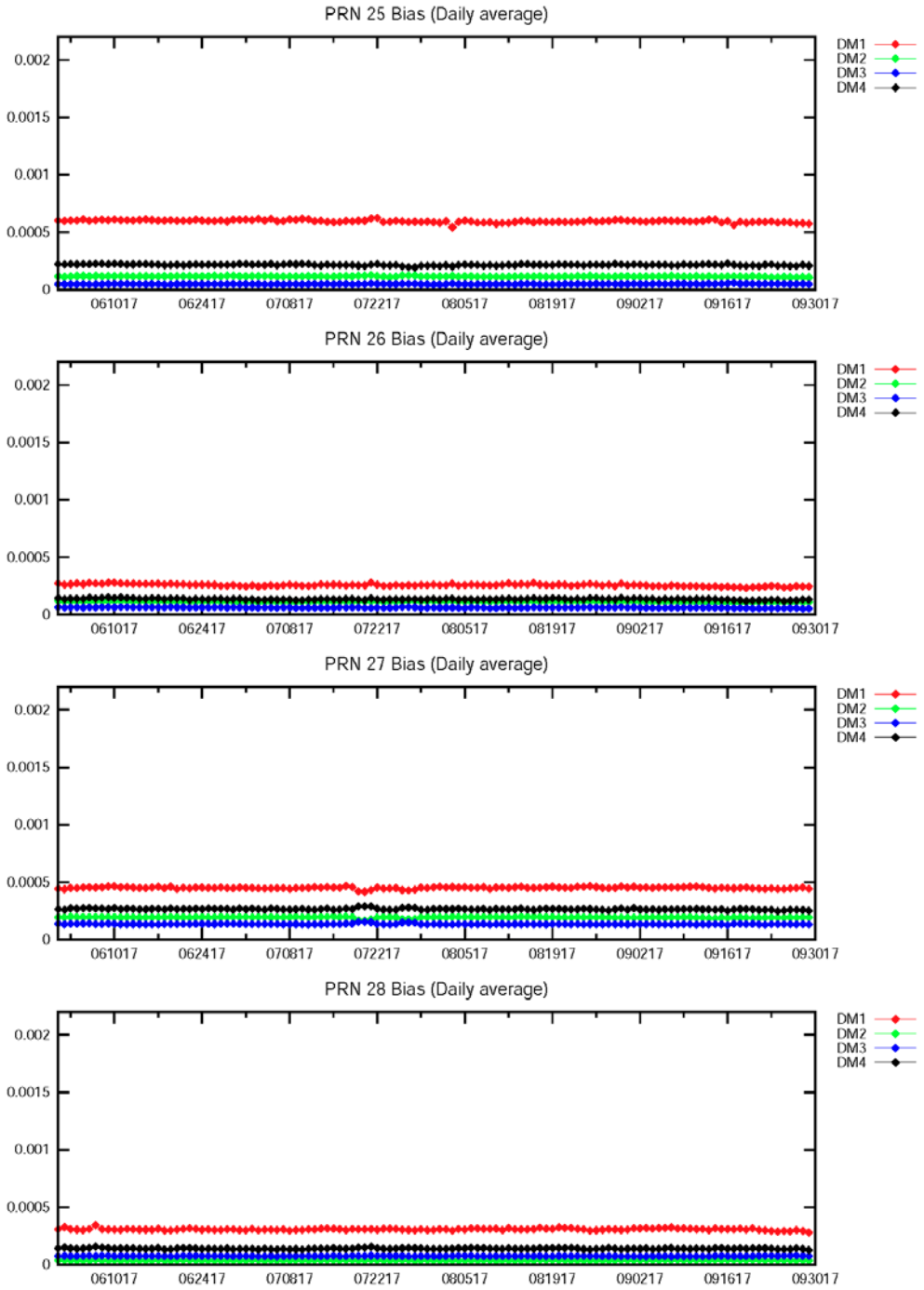
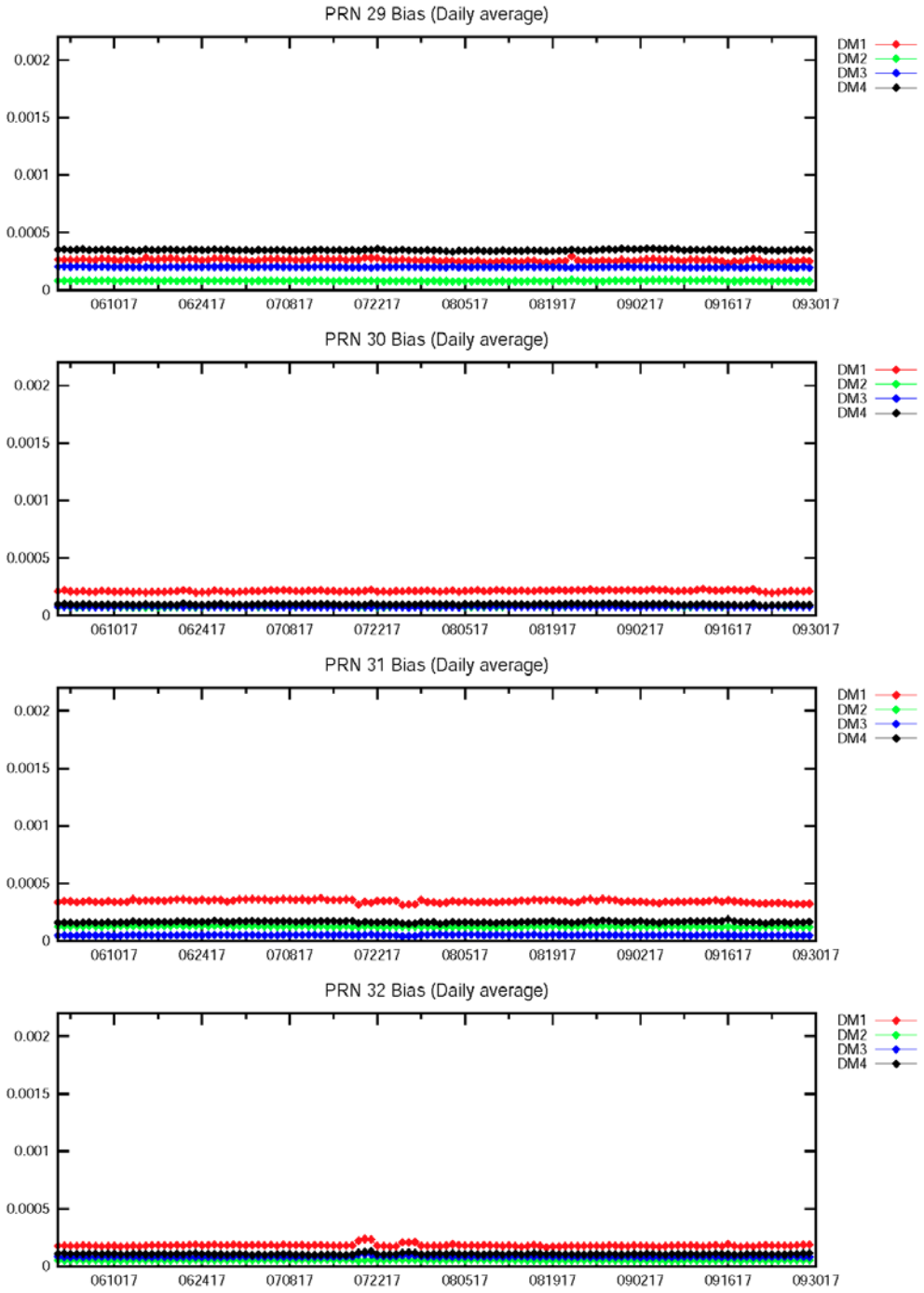


Figure 11-10 PRN Bias Average Trend (PRN-29 – PRN-32)



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.

AMR. GEO PRN-133

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 PRN-138

CRW. GEO PRN-135

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

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

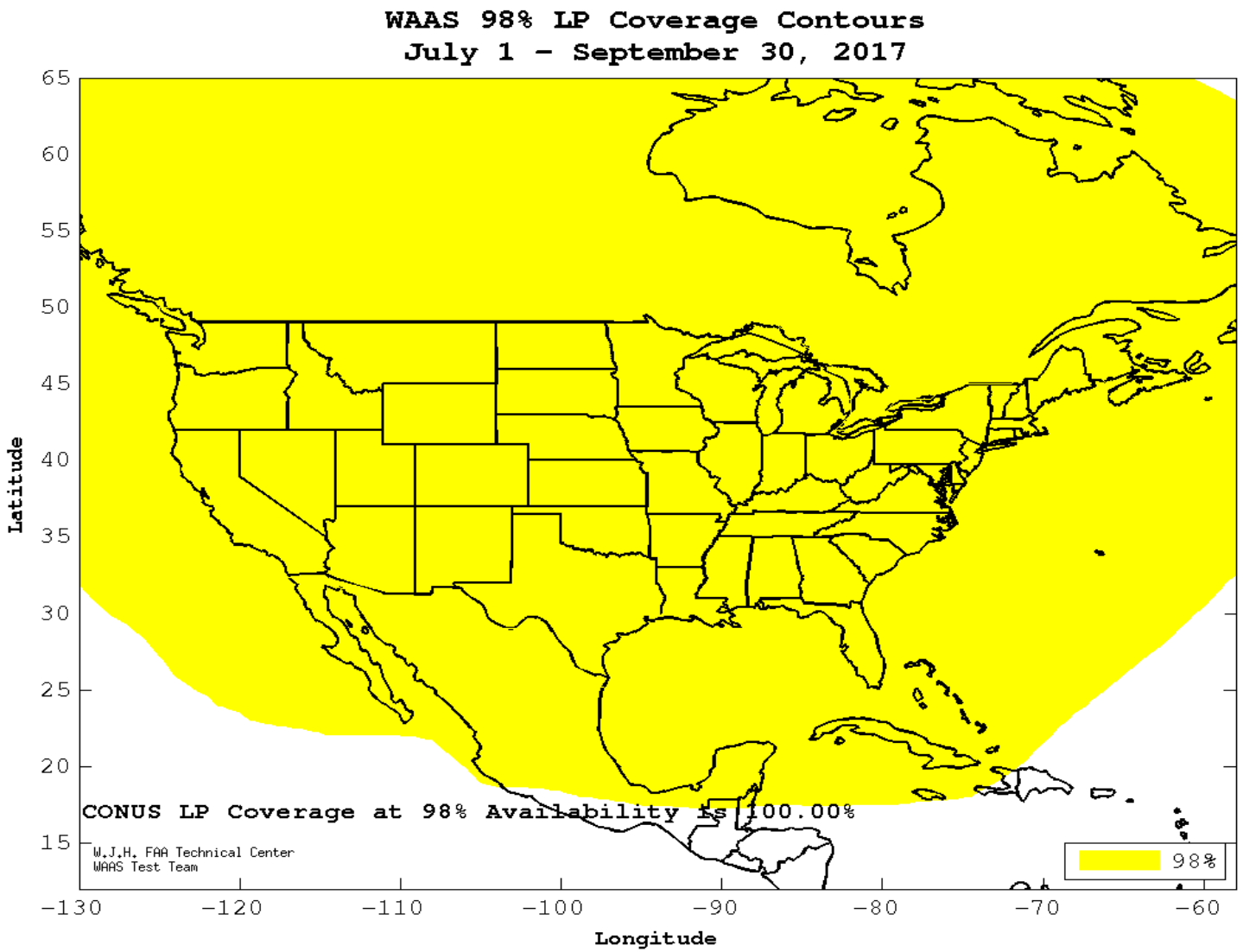


Figure B-2 98% Alaska LP Availability Contour

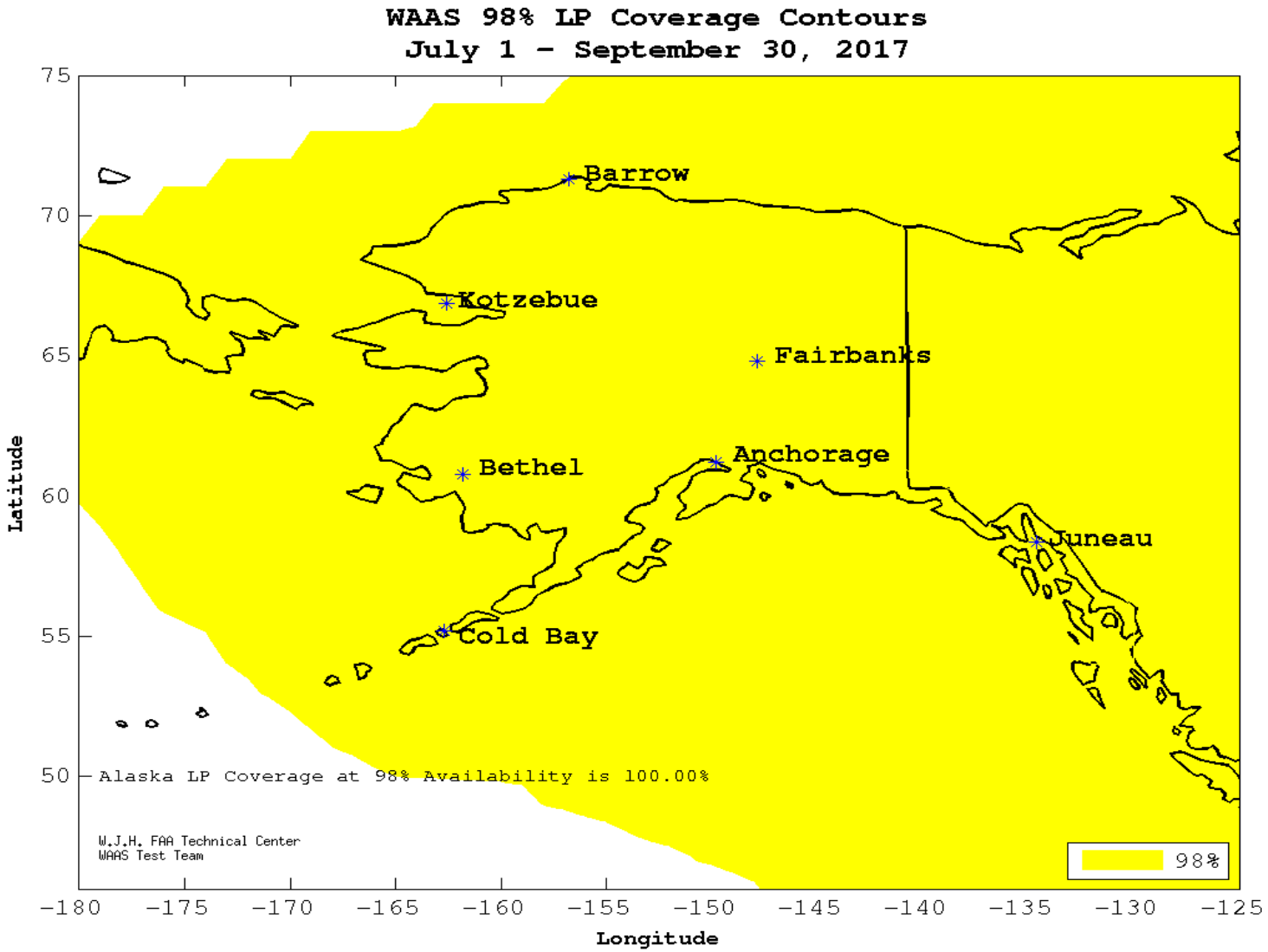


Figure B-3 98% CONUS LPV Availability Contour

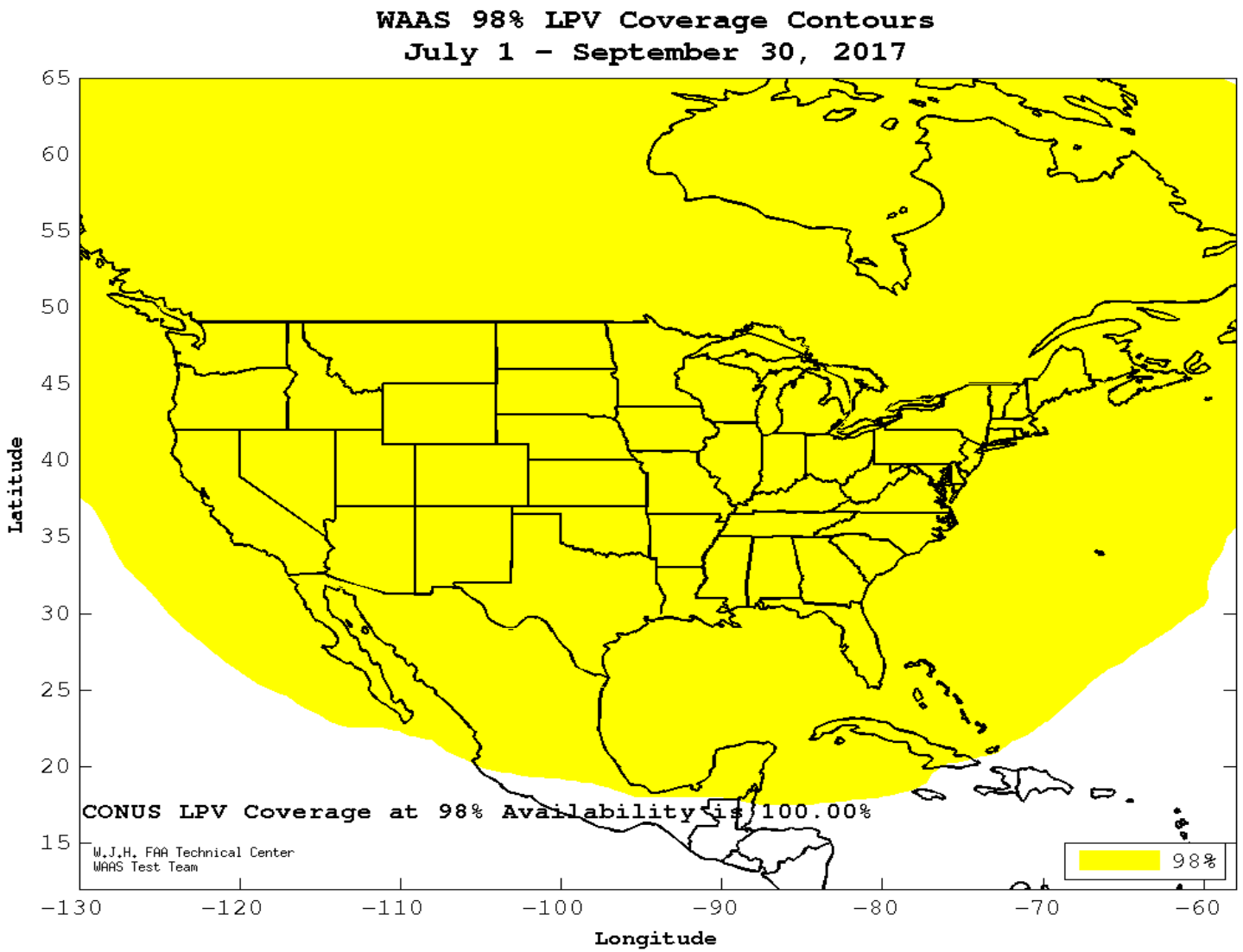


Figure B-4 98% Alaska LPV Availability Contour

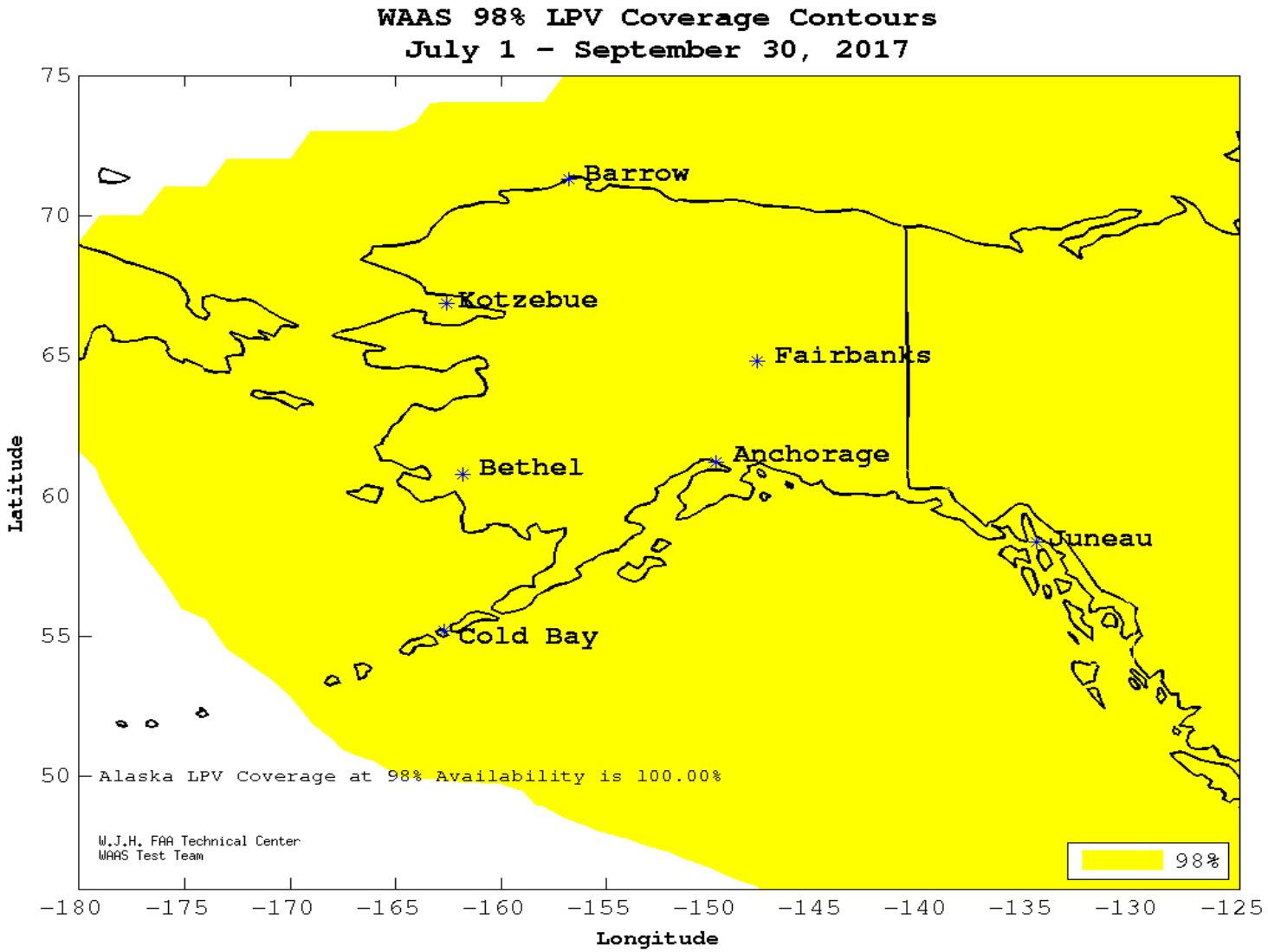


Figure B-5 98% CONUS LPV200 Availability Contour

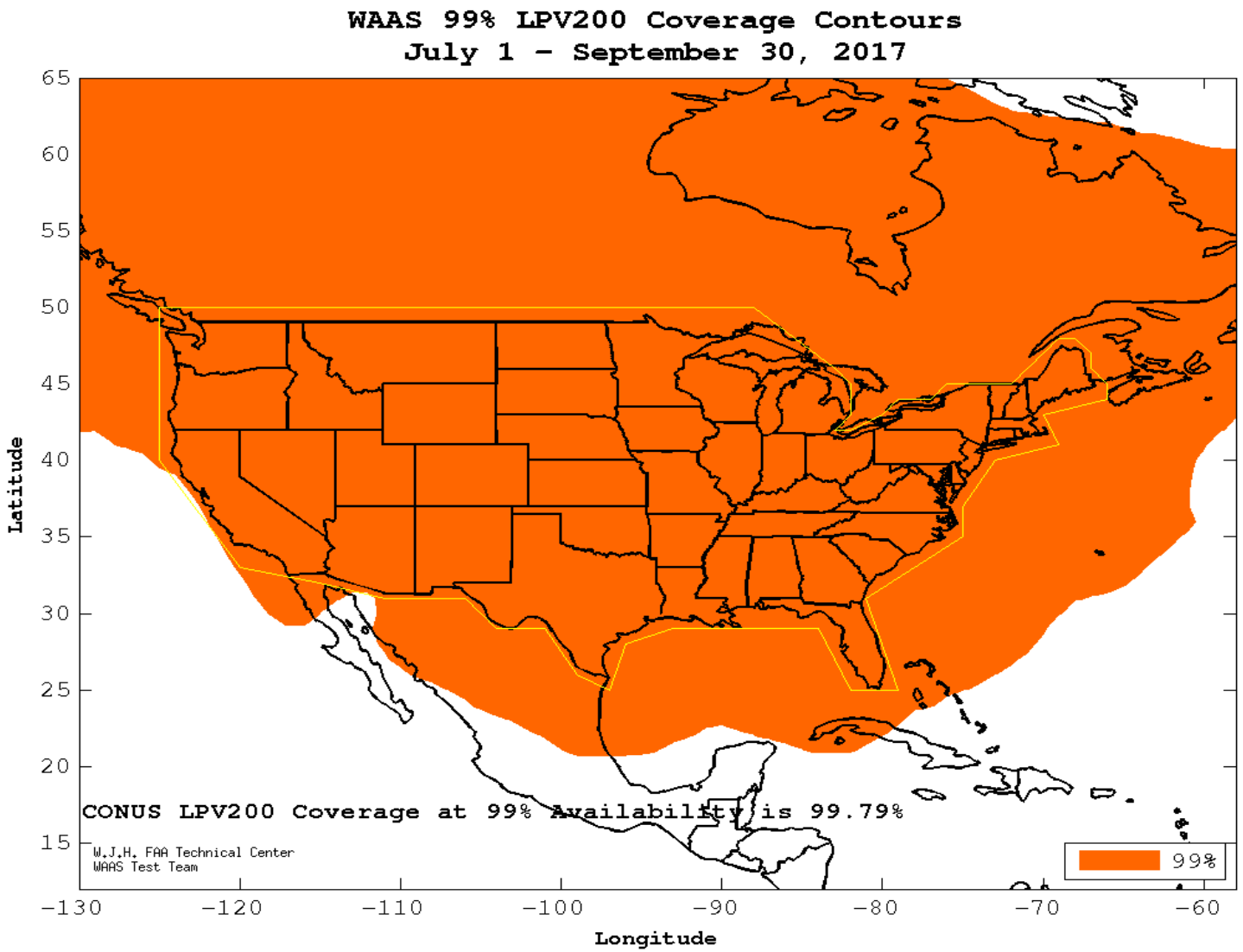


Figure B-6 98% Alaska LPV200 Availability Contour