WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #70

Reporting Period: July 01 to September 30, 2019

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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 #70 provides WAAS performance data from the July 01 through September 30, 2019 reporting period.

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

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

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.416 meters	Dallas 0.435 meters	Barrow 0.564 meters	Bethel 0.515 meters
95% Vertical Accuracy (VPL <= 50 meters)	Arcata 1.439 meters	Seattle 0.740 meters	Barrow 1.138 meters	Cold Bay 0.793 meters
LP Availability (HPL <= 40 meters)	All Sites 100%	All Sites 100%	All Sites 100%	All Sites 100%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	All Sites 100%	All Sites 100%	Multiple Sites 100%	Barrow 99.99%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Miami 99.82%	Multiple Sites 100%	Barrow 99.35%
99% HPL	Cleveland 16.434 meters	Denver 11.034 meters	Cold Bay 20.899 meters	Juneau 13.190 meters
99% VPL	Arcata 30.602 meters	Billings 19.669 meters	Barrow 32.711 meters	Anchorage 22.178 meters

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1.0 INTRODUCTION

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

The objectives of this report are:

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

The evaluation uses the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN) 131 (SM9), 133 (S15), 135 (CRW), and 138 (CRE). SM9, CRE and CRW GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service. Note that CRW was decommissioned from WAAS service on 7/25/2019. S15 was operational on 7/15/2019.

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

Table 1-1. WAAS Service Levels

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

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

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

Table 1-2. PA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	88	7619648
Atlantic City	90	7737497
Oklahoma City	92	7937068
WAAS:		
Albuquerque	92	7920953
Anchorage	92	7935288
Atlanta	92	7945777
Barrow	92	7936775
Bethel	92	7946124
Billings	92	7945784
Boston	92	7945221
Chicago	92	7941622
Cleveland	91	7837034
Cold Bay	92	7945682
Dallas	92	7942674
Denver	92	7940997
Fairbanks	92	7939603
Gander	92	7941351
Goose Bay	92	7945647
Houston	92	7944007
Iqaluit	92	7942773
Jacksonville	92	7945135
Juneau	92	7943949
Kansas City	92	7942904
Kotzebue	92	7940377
Los Angeles	92	7924621
Memphis	92	7940835
Merida	91	7853667
Mexico City	92	7943924
Miami	92	7940147
Minneapolis	92	7946054
New York	92	7945923
Oakland	92	7934420
Puerto Vallarta	92	7940581
Salt Lake City	92	7945438
San Jose Del Cabo	90	7809310
Seattle	92	7939935
Washington DC	92	7946253
Winnipeg	92	7945655

Table 1-3. NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7945364
Anchorage	92	7945577
Atlanta	92	7945587
Barrow	92	7934876

Location	Number of Days Evaluated	Number of Samples
Bethel	92	7945407
Billings	92	7945387
Boston	78	6758855
Cleveland	92	7945585
Cold Bay	92	7944901
Fairbanks	92	7943105
Gander	92	7945138
Honolulu	92	7945470
Houston	92	7945584
Iqaluit	73	6289486
Juneau	92	7945580
Kansas City	92	7945584
Kotzebue	92	7944730
Los Angeles	92	7916071
Merida	92	7917561
Miami	92	7945526
Minneapolis	92	7945584
Oakland	92	7945587
Salt Lake City	92	7945523
San Jose Del Cabo	89	7706866
San Juan	92	7945580
Seattle	92	7945548
Tapachula	92	7924662
Washington DC	92	7945582

The report is divided by the performance category:

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

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

Table 1-4. WAAS Performance Parameters

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

1.1 Event Summary

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

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

Table 1-5. Events

Start Date	End Date	Location Satellite	Service Affected	Event Description
04/07/2019	07/09/2019		LPV200 CONUS	WJHTC observed an Increased Dilution of Precision (DOP) over Arizona. The increased DOPs caused degradation of LPV200 service coverage in Arizona. Please see plot(s): LPV200_4/7/2019 LPV200_6/30/2019
05/15/2019	07/09/2019		LPV200 CONUS	The Southern tip of the Florida panhandle began experiencing a brief LPV200 service outage on 5/15/2019. This was caused by PRN24 setting before PRN25 comes into view of the area. A similar occurrence happened between December 2017 to June 2018. Please see plot(s): LPV200_5/15/2019 LPV200_6/30/2019

Start Date	End Date	Location Satellite	Service Affected	Event Description
06/08/2019	07/09/2019		LPV CONUS, LPV200 CONUS	Beginning 06/08/2019, WJHTC began observing degradation of LPV200 service in the Gulf of Mexico. This was due to an increase of dilution of precision in the region. When GEO 131 UDREs were elevated and ranging was turned off of GEO 131, degradation of LPV service as well started on 06/17/2019. Please see plot(s): LPV200_6/8/2019 LPV_6/30/2019 LPV200_6/30/2019
06/17/2019	08/01/2019	PRN131	LPV200 Alaska, LPV200 Canada	ZLA (GE0 138) and ZTL (GEOs 131 and 135) C&Vs were setting PRN131 UDREi to NM and DNU (multiple times a day) after each GEO source switch to C&V Release 5 upgrade. ZLA and ZTL UDREi profiles were different. Fast corrections after the source switch did not grow even though UDREi set to NM and DNU. Fast corrections for PRN131 grew exceedingly high (> 100m ? 200m) on all GEOs starting when the last GEO (131) was switched to C&V R5 (ZTL) (June 17 1:02 GMT) As a result, ranging was turned off of PRN131 until fast corrections returned to normal. The removal of PRN131 from ranging reduced the number of satellites visible and caused minor degradation of LPV200 service coverage in Alaska and Canada as well as very minor degradation in CONUS (Gulf of Mexico). Ranging was turned back on for PRN131 on 8/1/2019. UDREis reached the floor at 20:43 GMT Please see plot(s): LPV200_6/30/2019
07/11/2019	07/14/2019	Brewster (BR1)	None	The Ground Uplink Station (GUS) for GEO 133 (S15) at Brewster (BR1) was initialized. It came into maintenance mode at 05:50 GMT on 7/11/2019 and became fully operational in primary mode at 22:10 GMT on 7/14/2019.
07/15/2019	07/15/2019	PRN25	LPV CONUS, LPV200 CONUS, LPV200 Alaska	The reduction in LPV200 service in CONUS and Alaska was due to a GPS NANU on PRN25 (see NANU2019105) which was Unusable from 17:22 GMT to 22:28 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS (West Coast) from 17:35 GMT to 18:00 GMT and from 20:14 GMT to 20:49 GMT. The NANU also caused minor degradation of (1) LPV200 service coverage in Alaska from 18:54 GMT to 19:19 GMT and (2) LPV service coverage in CONUS from 20:14 GMT to 20:33 GMT Please see plot(s): LPV_7/15/2019 LPV200_7/15/2019
7/15/2019	7/15/2019	GEO133	None	SSM-53: GEO133 (S15) became operational as of 22:37:12 GMT on 7/15/2019.

Start Date	End Date	Location Satellite	Service Affected	Event Description
07/19/2019	07/19/2019	PRN23	LPV200 CONUS, LPV200 Alaska, LPV200 Canada	The reduction in LPV200 service in CONUS, Alaska, and Canada was due to a GPS NANU on PRN23 (see NANU2019109) which was Unusable from 04:47 GMT to 09:55 GMT. The NANU caused moderate degradation of (1) LPV200 service coverage in CONUS (West Coast) from 08:10 GMT to 08:40 GMT; (2) LPV200 service coverage in Alaska from 07:15 GMT to 08:00 GMT; and (3) LPV200 service coverage in Canada from 07:35 GMT to 08:16 GMT.
07/19/2019	07/19/2019	PRN6	LPV200 CONUS, LPV200 Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN6 (see NANU2019110) which was Unusable from 14:56 GMT to 19:20 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS (West Coast) from 16:45 GMT to 17:36 GMT. The NANU also caused minor degradation of LPV200 service coverage in Canada from 18:28 GMT to 18:53 GMT and from 19:10 GMT to 19:25 GMT. Please see plot(s): LPV200_7/19/2019
07/23/2019	07/24/2019	PRN20	LPV200 Canada	The reduction in LPV200 service in Canada was due to a GPS NANU on PRN20 (see NANU2019114) which was Unusable from 23:25 GMT on 7/23/2019 to 05:14 GMT on 7/24/2019. The NANU caused minor degradation of LPV200 service coverage in Canada from 00:23 GMT to 01:21 GMT and from 02:12 GMT to 02:30 GMT on 7/24/2019.
07/25/2019	07/25/2019	GEO135	LPV200 Alaska, LPV200 Canada	SSM-53: This system support modification (SSM) removed CRW GEO 135 from the PRN Mask. The GEO is decommissioned from WAAS service. TOW 412588-431999
07/25/2019	07/25/2019	NAPA (APC), Littleton (APA)	None	SSM-53: This system support modification (SSM) removed NAPA (APC) and Littleton (APA) Ground Uplink Stations from the WAAS system.
07/26/2019	07/26/2019	GEO133, South Mountain (CM1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 07:01:46 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 caused minor degradation of LPV200 service coverage in Alaska from 12:32 GMT to 12:51 GMT. TOW 457323-457328 Please see plot(s): LPV200_7/26/2019

Start Date	End Date	Location Satellite	Service Affected	Event Description
07/31/2019	07/31/2019	PRN24	LPV200 Alaska	The reduction in LPV200 service in Alaska was due to a GPS NANU on PRN24 (see NANU2019127) which was Unusable from 11:48 GMT to 15:08 GMT. The NANU caused moderate degradation of LPV200 service coverage in Alaska from 13:54 GMT to 14:51 GMT. Please see plot(s): LPV200_7/31/2019
08/02/2019	08/02/2019	GEO133, South Mountain (CM1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 14:32:47 GMT. This caused an 18-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was very minor degradation of LPV200 service coverage in Alaska. TOW 484365-484384 Please see plot(s): LPV200_8/2/2019
08/05/2019	08/05/2019		LPV200 Alaska	Geomagnetic activity (Kp = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Alaska from 09:00 GMT to 09:10 GMT. Please see plot(s): LPV200_8/5/2019
08/06/2019	08/06/2019	GEO131, Southbury (DX1), Santa Paula (SZ1)	LPV200 Alaska	The Southbury and Santa Paula Ground Uplink Stations (GUS) for GEO 131 were cold started on 8/6/2019. Southbury was taken offline at 15:28:36 GMT and returned to backup at 18:19:54 GMT. Santa Paula was cold-started at 15:39:30 GMT and returned at 17:49:27 GMT. This caused a 7807-second gap in the GEO broadcast. This caused very minor degradation of LPV200 service coverage in Alaska. TOW 229187-236995
08/08/2019	08/08/2019	PRN17	LPV200 CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN17 (see NANU2019132) which was unusable from 14:31 GMT to 20:36 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 15:57 GMT to 16:14 GMT. Please see plot(s): LPV200_8/8/2019
08/14/2019	08/14/2019	GEO133, Brewster (BR1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 10:44:25 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 as well as PRN138 (see event 15041) caused very minor degradation of LPV200 service coverage in Alaska. TOW 297882-297887

Start Date	End Date	Location Satellite	Service Affected	Event Description
08/14/2019	08/14/2019	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 08:00:18 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 UDREs on PRN138 and PRN133 (see event 15040) caused very minor degradation of LPV200 service coverage in Alaska. TOW 288030-288035
08/15/2019	08/17/2019	GEO138, Woodbine (QWE)	LPV200 CONUS	On 8/13/2019, an upgrade was planned at Woodbine and GEO 138 had a manual switchover to Brewster-B (BRE-B). Because of a cabling issue, the upgrade was cancelled and BRE-B was to be upgraded instead. At this point, GEO 138 had a manual switchover back to Woodbine on 8/14/2019. On 8/15/2019, after the upgrade, a switchover set BRE-B to primary. There was a loss of SIS as BRE-B went directly to doppler search. There were several switchovers following this in an attempt to troubleshoot the issue. Eventually, BRE-B fell back to the previous build. Both GUS upgrades have been postponed. Woodbine has been rescheduled to the week of 9/3/2019 and Brewster-B has been rescheduled to the week of 9/9/2019. On 8/13/2019, the GUS switchover from Woodbine to Brewster-B occurred at 14:05:51 GMT and caused a 4-second outage of the GEO 138 broadcast. On 8/14/2019, the GUS switchover from Brewster-B to Woodbine occurred at 08:00:13 GMT and caused a 4-second outage of the GEO 138 broadcast. On 8/15/2019, the first GUS switchover from Woodbine to Brewster-B occurred at 07:27:57 GMT and caused a 229-second outage of the GEO 138 broadcast. The second GUS switchover from Brewster-B to Woodbine occurred at 15:24:01 GMT and caused a 4-second outage of the GEO 138 broadcast. The third GUS switchover from Woodbine to Brewster-B occurred at 16:42:50 GMT and caused a 222-second outage of the GEO 138 broadcast. The fourth GUS switchover from Brewster-B to Woodbine occurred at 16:57:40 GMT and caused a 4-second outage of the GEO 138 broadcast. The fifth GUS switchover from Woodbine to Brewster-B occurred at 22:32:30 GMT and caused a 4-second outage of the GEO 138 broadcast. GEO 138 UDREs were set to Not Monitored for most of the day on 8/15/2019. The elevated UDREs on PRN138 caused very minor degradation of LPV and LPV200 service coverage in the Gulf of Mexico.

Start Date	End Date	Location Satellite	Service Affected	Event Description
08/18/2019	08/18/2019	GEO133, South Mountain (CM1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133, switched from the South Mountain uplink site to the Brewster uplink site at 16:19:53 GMT. This caused an 18-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 caused very minor degradation of LPV200 service coverage in Alaska. TOW 58810-58829
08/29/2019	08/29/2019	PRN2	LPV CONUS, LPV200 CONUS, LPV200 Canada	The reduction in LPV service in CONUS and LPV200 service in CONUS and Canada was due to a GPS NANU on PRN2 (see NANU2019143) which was unusable from 15:23 GMT to 21:33 GMT. The NANU caused moderate degradation of: (1) LPV service coverage in CONUS from 18:25 GMT to 18:55 GMT; (2) LPV200 service coverage in CONUS from 17:30 GMT to 17:55 GMT; and (3) LPV200 service coverage from 16:55 GMT to 18:00 GMT. Please see plot(s): LPV_8/29/2019 LPV200_8/29/2019
09/05/2019	09/06/2019	PRN15	LPV200 CONUS, LPV200 Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN15 (see NANU2019145) which was unusable from 20:23 GMT on 9/5/2019 to 01:35 GMT on 9/6/2019. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 22:35 GMT to 23:00 GMT. The NANU also caused minor degradation of LPV200 service coverage in Canada from 23:07 GMT to 23:26 GMT. Please see plot(s): LPV200_9/5/2019

Table 1-6. WAAS Upgrades

Start Date	End Date	Location Satellite	Event Description
07/25/2019	07/25/2019	GEO135	SSM-53: This system support modification (SSM) removed CRW GEO 135 from the PRN Mask. The GEO is decommissioned from WAAS service. TOW 412588-431999
07/25/2019	07/25/2019	NAPA (APC), Littleton (APA)	SSM-53: This system support modification (SSM) removed NAPA (APC) and Littleton (APA) Ground Uplink Stations from the WAAS system.
08/27/2019	08/27/2019	Santa Paula (SZ1)	SSM-56: This software support modification supports the cutover to Release 4 and upgrades the Santa Paula (SZ1) GUS to Build W7.271L.
08/28/2019	08/28/2019	South Mountain (CM1)	SSM-56: This software support modification supports the cutover to Release 4 and upgrades the South Mountain (CM1) GUS to Build W7.271L.
09/03/2019	09/03/2019	Woodbine (QWE)	SSM-053: This software support modification supports the cutover to Release 4 and upgrades the Woodbine (WBN) GUS to Build W7.271L.
09/13/2019	09/13/2019	Atlanta (CnV)	SSM-056: This software support modification supports the cutover to Release 5 and upgrades the Atlanta C&V (ZTL) to build W7.283L.

Start Date	End Date	Location Satellite	Event Description
09/16/2019	09/16/2019	Los Angeles (CnV)	SSM-056: This software support modification supports the cutover to Release 5 and upgrades the Los Angeles C&V (ZLA) to build W7.283L.
09/17/2019	09/17/2019	Washington D.C. (CnV)	SSM-056: This software support modification supports the cutover to Release 5 and upgrades the Washington DC C&V (ZDC) to build W7.283L.
09/18/2019	09/18/2019		SSM-056: This software support modification supports the cutover to Release 5 and upgrades the POCC O&M to build W7.283L.
09/18/2019	09/18/2019		SSM-056: This software support modification supports the cutover to Release 5 and upgrades the NOCC O&M to build W7.283L.

Table 1-7. GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/08/2019	07/08/2019	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131, switched from the Southbury uplink site to the Santa Paula uplink site at 14:33:53 GMT. This caused a 4-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 138850-138855
07/11/2019	07/14/2019	New GUS	South Mountain (CM1)	None	The Ground Uplink Station (GUS) for GEO 133 (S15) at South Mountain (CM1) was initialized. It came into maintenance mode at 03:51 GMT on 7/11/2019 and became fully operational in backup mode at 22:17 GMT on 7/14/2019.
07/11/2019	07/14/2019	New GUS	Brewster (BR1)	None	The Ground Uplink Station (GUS) for GEO 133 (S15) at Brewster (BR1) was initialized. It came into maintenance mode at 05:50 GMT on 7/11/2019 and became fully operational in primary mode at 22:10 GMT on 7/14/2019.
07/22/2019	07/22/2019	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133, switched from the Brewster uplink site to the South Mountain uplink site at 18:02:18 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 151355-151360

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/26/2019	07/26/2019	Manual	GEO133, South Mountain (CM1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 07:01:46 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 caused minor degradation of LPV200 service coverage in Alaska from 12:32 GMT to 12:51 GMT. TOW 457323-457328
07/30/2019	07/30/2019	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133, switched from the Brewster uplink site to the South Mountain uplink site at 07:01:46 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on WAAS coverage. TOW 184763-184768
08/02/2019	08/02/2019	Missed Navigation Message	GEO133, South Mountain (CM1), Washington DC (CnV)	None	South Mountain had CnV Source Select from Washington DC to Atlanta. TOW 446554-446556
08/02/2019	08/02/2019	Faulted	GEO133, South Mountain (CM1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 14:32:47 GMT. This caused an 18-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was very minor degradation of LPV200 service coverage in Alaska. TOW 484365-484384
08/13/2019	08/13/2019	Manual	GEO138, Woodbine (QWE)	LPV CONUS	The uplink for the CRE GEO, PRN138, switched from the Woodbine uplink site to the Brewster-B uplink site at 14:04:46 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 UDREs on PRN138 caused minor degradation of LPV service coverage in CONUS from 19:38 GMT to 19:43 GMT. TOW 223563-223568

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
08/14/2019	08/14/2019	Manual	GEO133, Brewster (BR1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133, switched from the Brewster uplink site to the South Mountain uplink site at 10:44:25 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 as well as PRN138 (see event 15041) caused very minor degradation of LPV200 service coverage in Alaska. TOW 297882-297887
08/14/2019	08/14/2019	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 08:00:18 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 UDREs on PRN138 as well as PRN133 (see event 15040) caused very minor degradation of LPV200 service coverage in Alaska. TOW 288030-288035

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
08/15/2019	08/17/2019	Manual	GEO138, Woodbine (QWE)	LPV200 CONUS	On 8/13/2019, an upgrade was planned at Woodbine and GEO 138 had a manual switchover to Brewster-B (BRE-B). Because of a cabling issue, the upgrade was cancelled and BRE-B was to be upgraded instead. At this point, GEO 138 had a manual switchover back to Woodbine on 8/14/2019. On 8/15/2019, after the upgrade, a switchover set BRE-B to primary. There was a loss of SIS as BRE-B went directly to doppler search. There were several switchovers following this in an attempt to troubleshoot the issue. Eventually, BRE-B fell back to the previous build. Both GUS upgrades have been postponed. Woodbine has been rescheduled to the week of 9/3/2019 and Brewster-B has been rescheduled to the week of 9/9/2019. On 8/13/2019 the GUS switchover from Woodbine to Brewster-B occurred at 14:05:51 GMT and caused a 4-second outage of the GEO 138 broadcast. On 8/14/2019 the GUS switchover from Brewster-B to Woodbine occurred at 08:00:13 GMT and caused a 4-second outage of the GEO 138 broadcast. On 8/15/2019, the first GUS switchover from Woodbine to Brewster-B occurred at 07:27:57 GMT and caused a 229-second outage of the GEO 138 broadcast. The second GUS switchover from Brewster-B to Woodbine occurred at 15:24:01 GMT and caused a 4-second outage of the GEO 138 broadcast. The third GUS switchover from Woodbine to Brewster-B occurred at 16:42:50 GMT and caused a 222-second outage of the GEO 138 broadcast. The fourth GUS switchover from Brewster-B to Woodbine occurred at 16:57:40 GMT and caused a 4-second outage of the GEO 138 broadcast. The fifth GUS switchover from Woodbine to Brewster-B occurred at 22:32:30 GMT and caused a 4-second outage of the GEO 138 broadcast. GEO 138 UDREs were set to Not Monitored for most of the day on 8/15/2019. The elevated UDREs on PRN138 caused very minor degradation of LPV and LPV200 service coverage in the Gulf of Mexico.

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
08/18/2019	08/18/2019	Faulted	GEO133, South Mountain (CM1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 16:19:53 GMT. This caused an 18-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 caused very minor degradation of LPV200 service coverage in Alaska. TOW 58810-58829
08/27/2019	08/27/2019	Manual	GEO131, Santa_Paula (SZ1)	None	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site at 07:00:08 GMT. This caused a 4-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 198025-198030
09/05/2019	09/05/2019	Manual	GEO138, Brewster-B (BRE-B)	None	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 03:25:43 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 357960-357965
09/10/2019	09/10/2019	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133, switched from the Brewster uplink site to the South Mountain uplink site at 04:32:40 GMT. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 189177-189182
09/11/2019	09/11/2019	Manual	GEO138, Woodbine (QWE)	None	The uplink for the CRE GEO, PRN138, switched from the Woodbine uplink site to the Brewster-B uplink site at 04:31:19 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 275496-275501
09/24/2019	09/24/2019	Manual	GEO138, Brewster-B (BRE-B)	None	The uplink for the CRE GEO, PRN138, switched from the Brewster-B uplink site to the Woodbine uplink site at 02:14:59 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 180916-180921

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, SM9, and S15.

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, CRW, SM9, and S15.

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 1.416 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.439 meters observed at Arcata.
- The minimum 95% CONUS horizontal LPV errors was 0.435 meters observed at Dallas.
- The minimum 95% CONUS vertical LPV error was 0.740 meters observed at Seattle.

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	95% Vertical
Arcata	1.416	1.416	1.439	100	*	*
Atlantic City	0.952	0.952	1.346	100	*	*
Oklahoma City	0.593	0.593	0.995	100	*	*
Albuquerque	0.478	0.478	0.818	100	1.347	3.693
Anchorage	0.528	0.528	1.052	100	1.349	3.318
Atlanta	0.679	0.679	1.002	100	1.530	3.890
Barrow	0.564	0.564	1.138	100	1.308	3.758
Bethel	0.515	0.515	0.823	100	1.367	3.480
Billings	0.611	0.611	0.761	100	1.506	3.325
Boston	0.661	0.661	0.950	100	1.649	3.601
Chicago	0.752	0.752	1.068	100	*	*
Cleveland	0.562	0.562	1.084	100	1.367	3.724
Cold Bay	0.548	0.548	0.793	100	1.414	3.218
Dallas	0.435	0.435	0.969	100	*	*
Denver	0.462	0.462	0.773	100	*	*
Fairbanks	0.526	0.526	1.074	100	1.408	3.412
Gander	0.760	0.760	1.013	100	1.570	3.014
Goose Bay	0.561	0.561	0.861	100	*	*
Houston	0.548	0.548	1.097	100	1.525	4.091
Iqaluit	0.687	0.688	1.015	100	1.403	3.412
Jacksonville	0.528	0.528	0.947	100	*	*
Juneau	0.537	0.537	0.928	100	1.322	2.976
Kansas City	0.470	0.470	0.946	100	1.461	3.584
Kotzebue	0.548	0.548	1.119	100	1.495	3.624
Los Angeles	0.711	0.711	1.436	100	1.528	4.211
Memphis	0.610	0.610	0.979	100	*	*
Merida	0.552	0.552	1.104	100	2.150	3.915
Mexico City	0.596	0.596	1.075	100	*	*
Miami	0.667	0.667	1.029	100	1.651	3.863
Minneapolis	0.624	0.624	1.012	100	1.487	3.547
New York	0.558	0.558	0.952	100	*	*
Oakland	0.625	0.625	1.424	100	1.573	4.340
Puerto Vallarta	0.629	0.629	1.021	100	*	*
Salt Lake City	0.524	0.524	0.744	100	1.354	3.680
San Jose Del Cabo	0.588	0.588	1.233	100	2.160	3.769
Seattle	0.585	0.585	0.740	100	1.530	3.409
Washington DC	0.785	0.785	1.047	100	1.571	3.703
Winnipeg	0.551	0.551	0.793	100	*	*

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 2.222 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 5.130 meters observed at Honolulu.
- The minimum 95% horizontal error was 0.760 meters observed at Barrow.
- The minimum 99.999% horizontal error was 1.663 meters observed at Atlanta.

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

Location	95% Horizontal (Meters)	99.999% Horizontal (Meters)	Percentage in NPA Mode (%)	Maximum Horizontal Error (Meters)
Albuquerque	0.778	1.866	100	2.154
Anchorage	1.089	2.016	100	2.126
Atlanta	0.899	1.663	100	1.911
Barrow	0.760	2.599	100	3.002
Bethel	1.060	2.152	100	2.608
Billings	1.158	2.289	100	3.197
Boston	1.085	2.033	100	2.514
Cleveland	0.977	2.171	100	2.583
Cold Bay	1.021	2.078	100	2.228
Fairbanks	0.905	2.382	100	7.865
Gander	1.149	2.239	100	2.350
Honolulu	2.222	5.130	100	5.339
Houston	1.296	2.389	100	2.558
Iqaluit	0.856	1.830	100	2.310
Juneau	0.930	2.064	100	2.220
Kansas City	1.066	3.192	100	3.633
Kotzebue	0.925	2.256	100	2.356
Los Angeles	1.358	2.656	100	4.393
Merida	1.383	4.050	100	4.321
Miami	1.183	2.836	100	3.145
Minneapolis	1.118	2.651	100	3.016
Oakland	1.310	2.690	100	2.902
Salt Lake City	0.994	1.828	100	2.497
San Jose Del Cabo	1.565	3.216	100	3.362
San Juan	0.940	2.911	100	3.176
Seattle	1.081	2.369	100	2.587
Tapachula	1.961	5.003	100	5.282
Washington DC	1.190	1.925	100	2.093

Table 2-3 shows the quarterly maximum LPV error statistics: (1) the column Horizontal Error column shows the maximum position errors while the calculated HPL meets the LPV service level defined in Table 1-1, (2) the Vertical Error column shows the maximum position errors while the calculated VPL meets the LPV service level, (3) the Horizontal Error/HPL column and the Vertical Error/VPL column show the ratio of position error to protection level at the time the maximum error occurred, (4) the Horizontal Maximum Ratio column and the Vertical Maximum Ratio column show the maximum position error to protection level ratio for the quarter. During this reporting period, the maximum LPV horizontal error was 3.231 meters occurred at Barrow and maximum vertical LPV error was 6.324 meters occurred at Barrow.

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/HPL Ratio	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL Ratio	Vertical Maximum Ratio
Arcata	2.765	0.217	0.243	4.691	0.101	0.192
Atlantic City-a	2.215	0.158	0.179	3.433	0.185	0.185
Oklahoma City	1.438	0.079	0.140	2.901	0.123	0.150
Albuquerque	1.161	0.107	0.117	2.116	0.065	0.137
Anchorage	1.447	0.108	0.119	2.954	0.123	0.137
Atlanta	1.328	0.125	0.139	2.370	0.090	0.143
Barrow	3.231	0.173	0.174	6.324	0.165	0.175

Location	Horizontal Error (m)	Horizontal Error/HPL Ratio	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL Ratio	Vertical Maximum Ratio
Bethel	2.534	0.113	0.154	2.462	0.107	0.110
Billings	1.430	0.125	0.162	1.919	0.096	0.138
Boston	1.465	0.108	0.126	2.807	0.110	0.142
Chicago	1.511	0.101	0.149	2.768	0.127	0.175
Cleveland	1.369	0.105	0.118	2.571	0.100	0.170
Cold Bay	1.523	0.065	0.088	2.104	0.069	0.103
Dallas	1.124	0.120	0.120	2.398	0.103	0.159
Denver	1.630	0.089	0.132	2.172	0.128	0.128
Fairbanks	2.346	0.186	0.186	5.439	0.216	0.265
Gander	1.786	0.105	0.109	2.465	0.082	0.113
Goose Bay	1.366	0.130	0.130	2.639	0.129	0.129
Houston	1.157	0.121	0.124	3.089	0.129	0.193
Iqaluit	2.373	0.096	0.147	3.395	0.148	0.148
Jacksonville	1.313	0.107	0.119	2.498	0.135	0.135
Juneau	1.952	0.145	0.145	2.817	0.126	0.134
Kansas City	1.381	0.092	0.132	2.759	0.171	0.171
Kotzebue	2.731	0.131	0.139	4.850	0.164	0.171
Los Angeles	1.368	0.109	0.136	2.683	0.154	0.172
Memphis	1.266	0.133	0.139	2.703	0.112	0.161
Merida	1.395	0.058	0.120	3.456	0.069	0.151
Mexico City	1.520	0.112	0.116	3.594	0.100	0.125
Miami	1.392	0.101	0.118	2.820	0.156	0.156
Minneapolis	1.453	0.163	0.163	2.780	0.137	0.167
New York	1.200	0.107	0.110	2.373	0.129	0.177
Oakland	1.704	0.145	0.145	3.136	0.084	0.158
Puerto Vallarta	1.631	0.124	0.133	2.757	0.075	0.101
Salt Lake City	1.279	0.120	0.127	2.211	0.084	0.127
San Jose Del Cabo	1.814	0.046	0.115	3.259	0.151	0.152
Seattle	1.395	0.076	0.125	2.055	0.120	0.121
Washington DC	1.502	0.093	0.141	2.796	0.133	0.150
Winnipeg	1.590	0.164	0.164	2.512	0.128	0.139

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

- August 5, 2019—Position errors in Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 1.023 meters and 1.714 meters at Fairbanks and Kotzebue, respectively. The Kp index was 5.
- August 31, 2019—Position errors in Alaska and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 0.857 meters and 1.577 meters at Iqaluit. The Kp index was 6.

Figure 2-1 LPV 95% Horizontal Accuracy

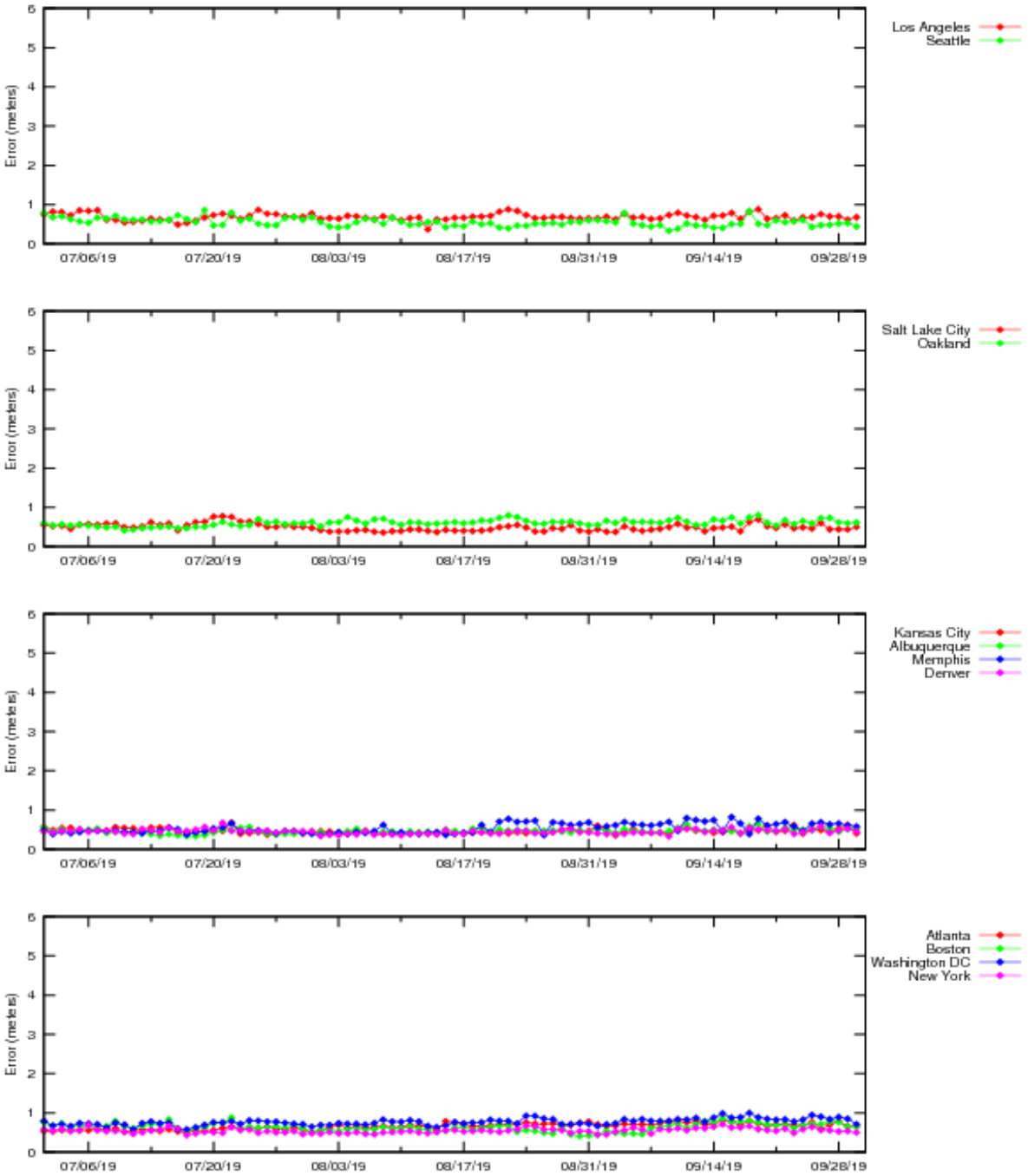


Figure 2-2 LPV 95% Horizontal Accuracy

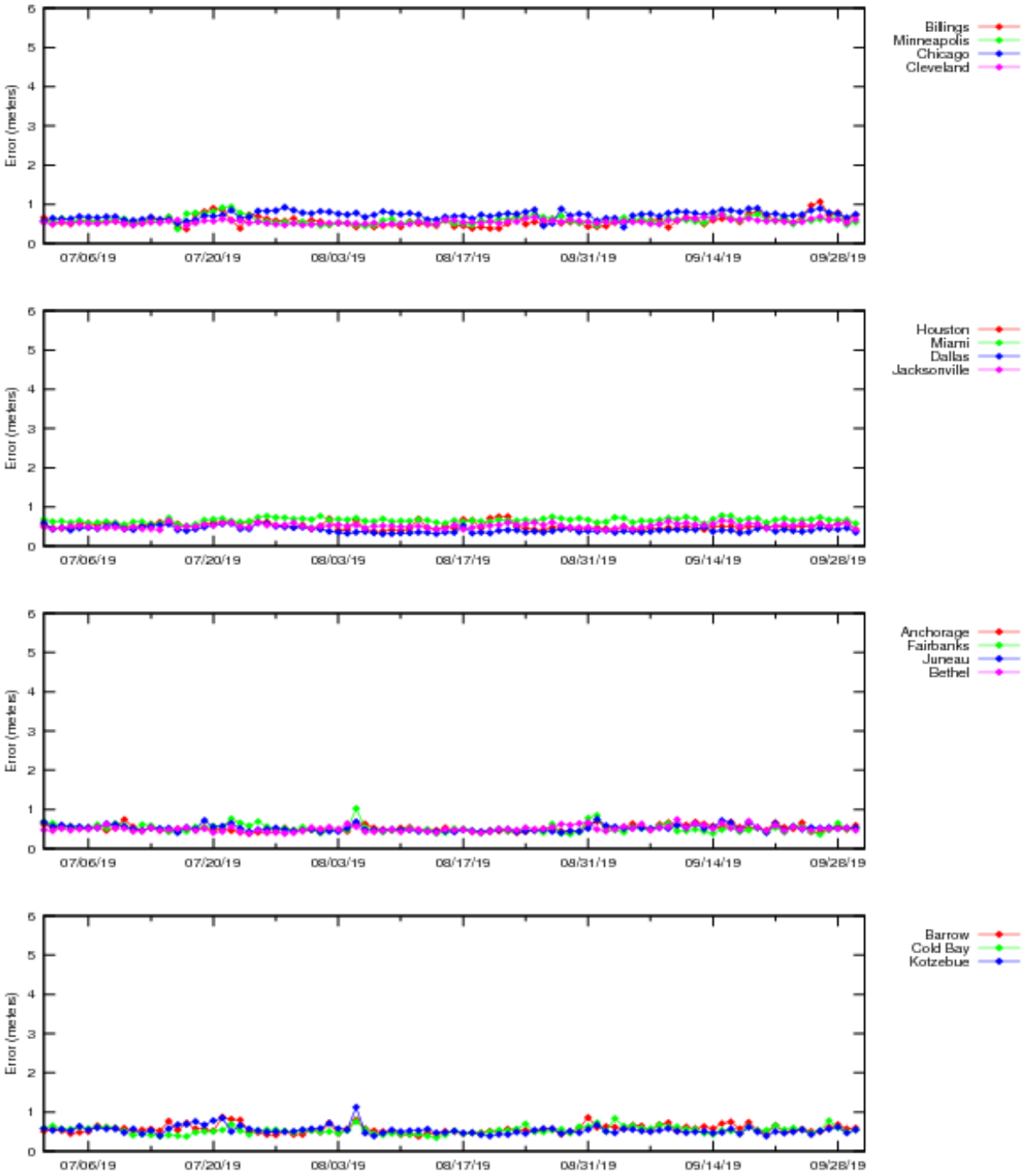


Figure 2-3 LPV 95% Horizontal Accuracy

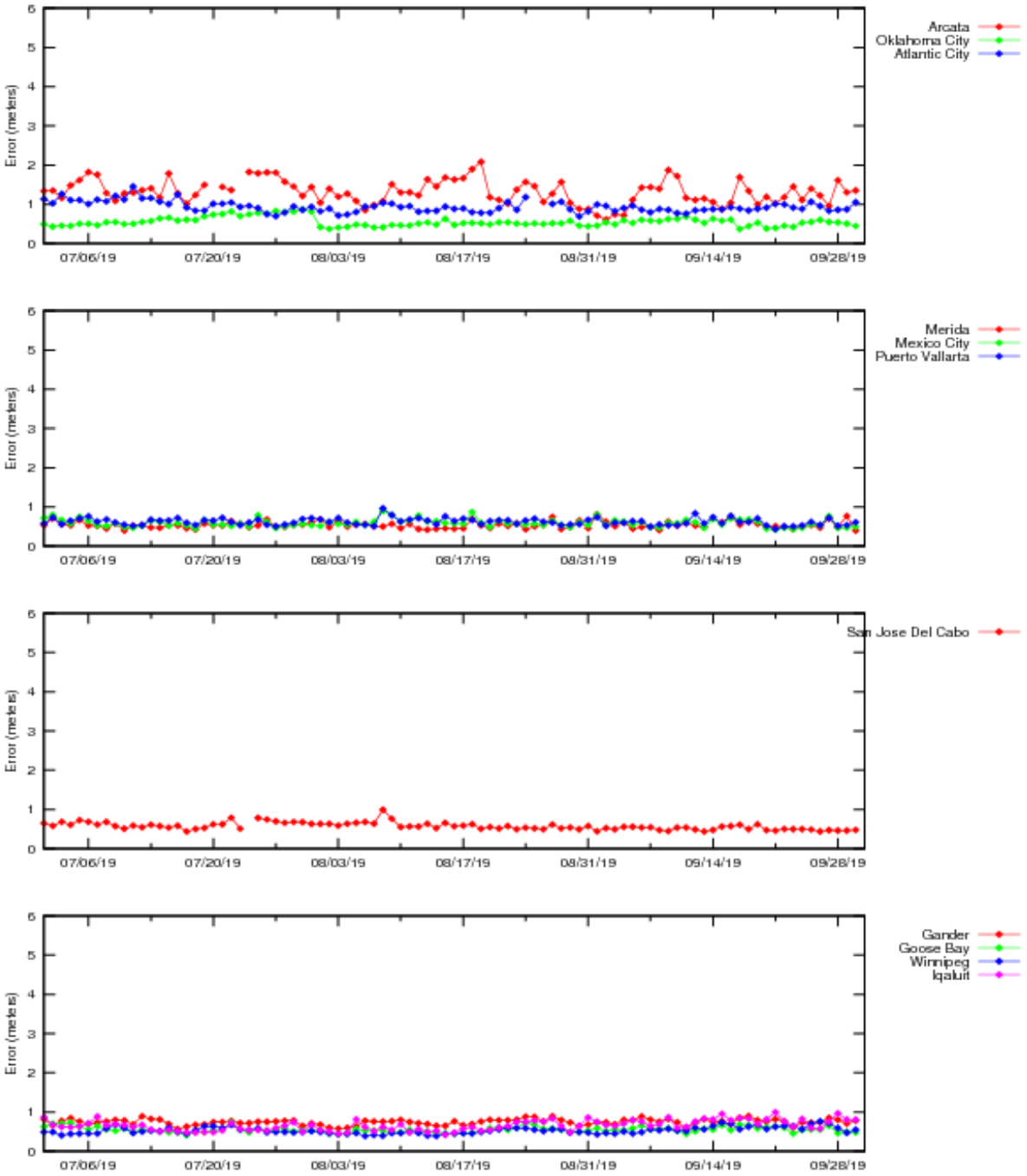


Figure 2-4 LPV 95% Vertical Accuracy

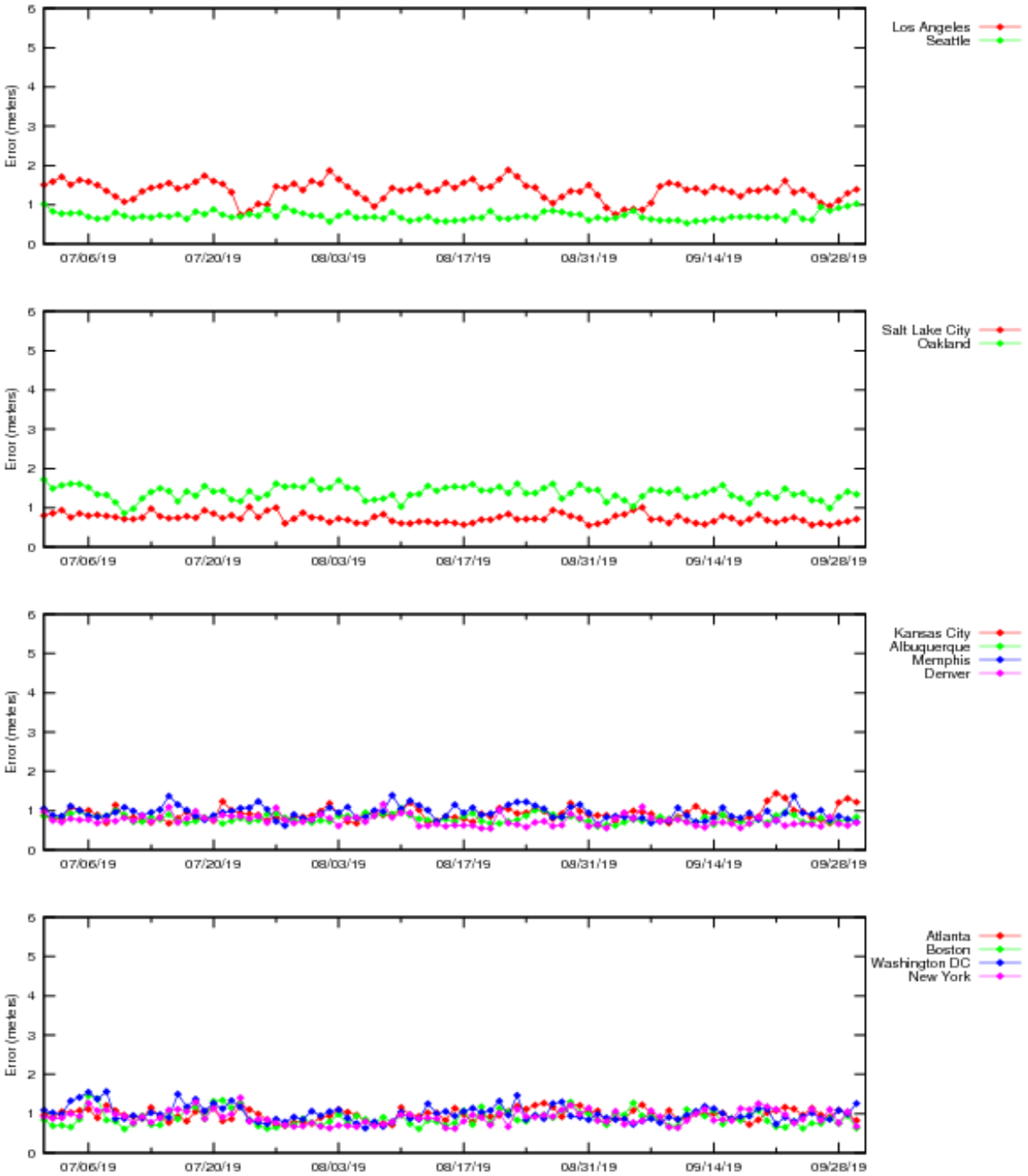


Figure 2-5 LPV 95% Vertical Accuracy

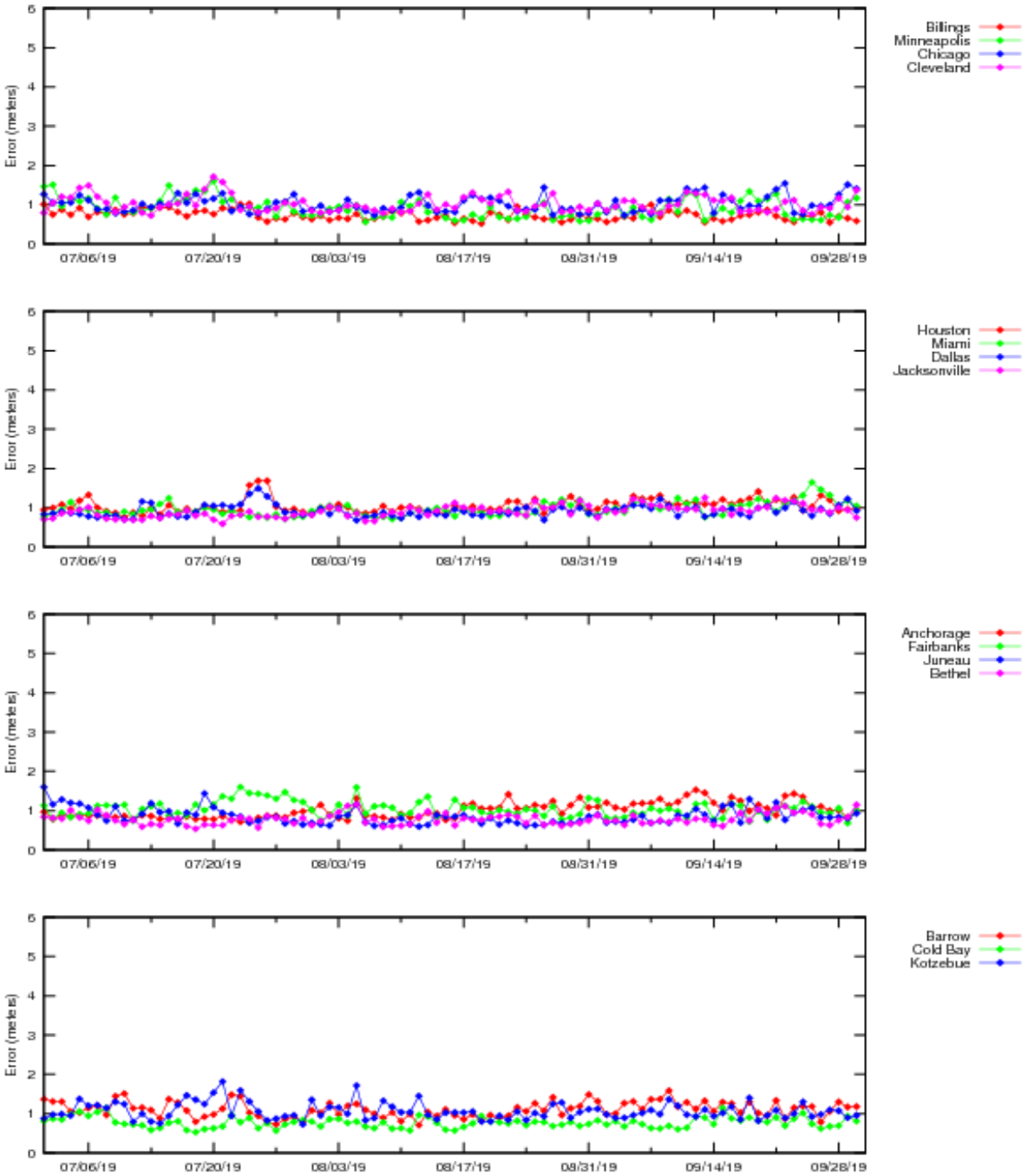


Figure 2-6 LPV 95% Vertical Accuracy

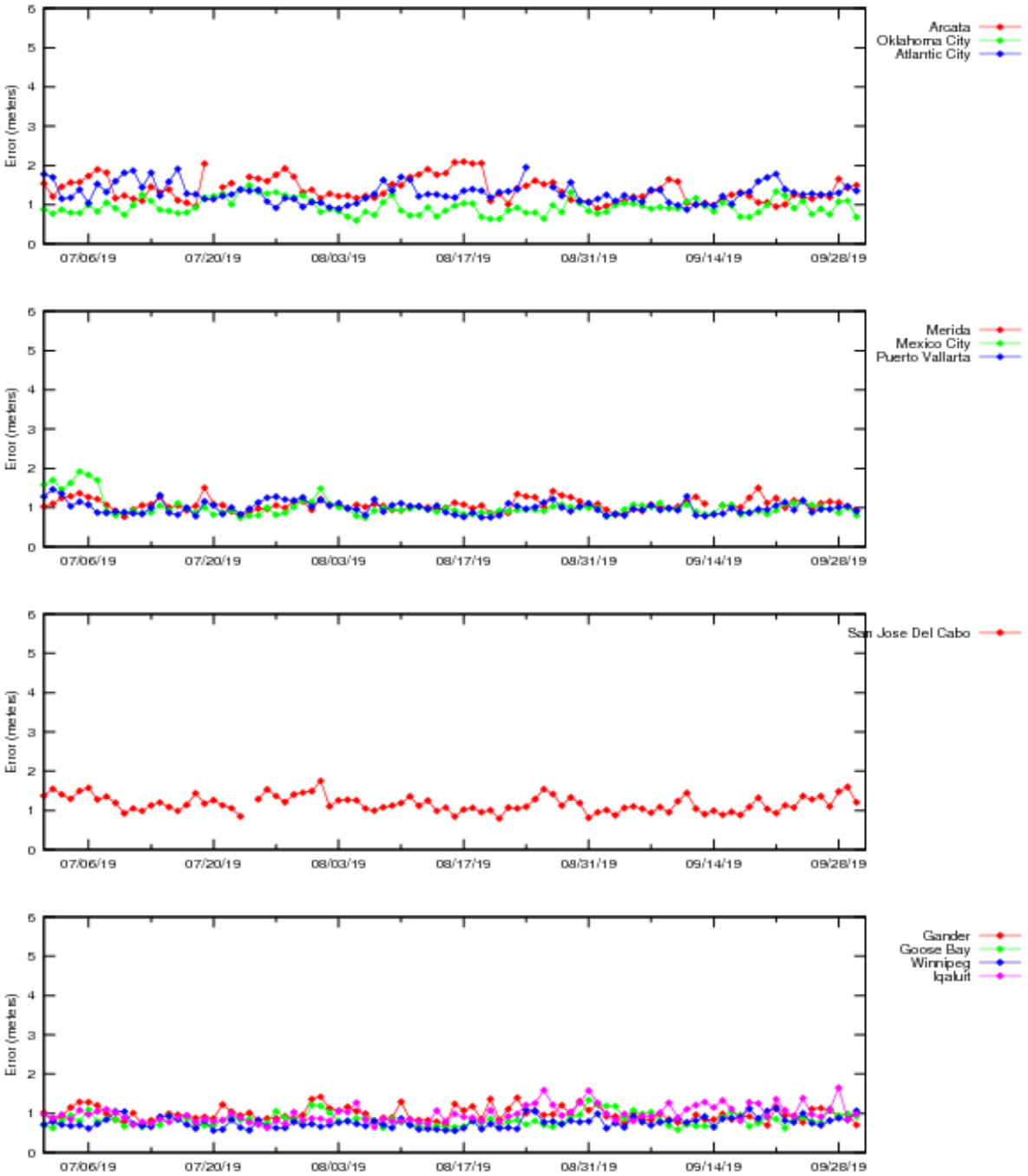


Figure 2-7 and Figure 2-8 show the daily NPA 95% horizontal accuracy at the NPA evaluation sites for the reporting period. The increases in 95% NPA position errors due to geomagnetic activity occurred on September 27, 2019.

Figure 2-7 NPA 95% Horizontal Accuracy

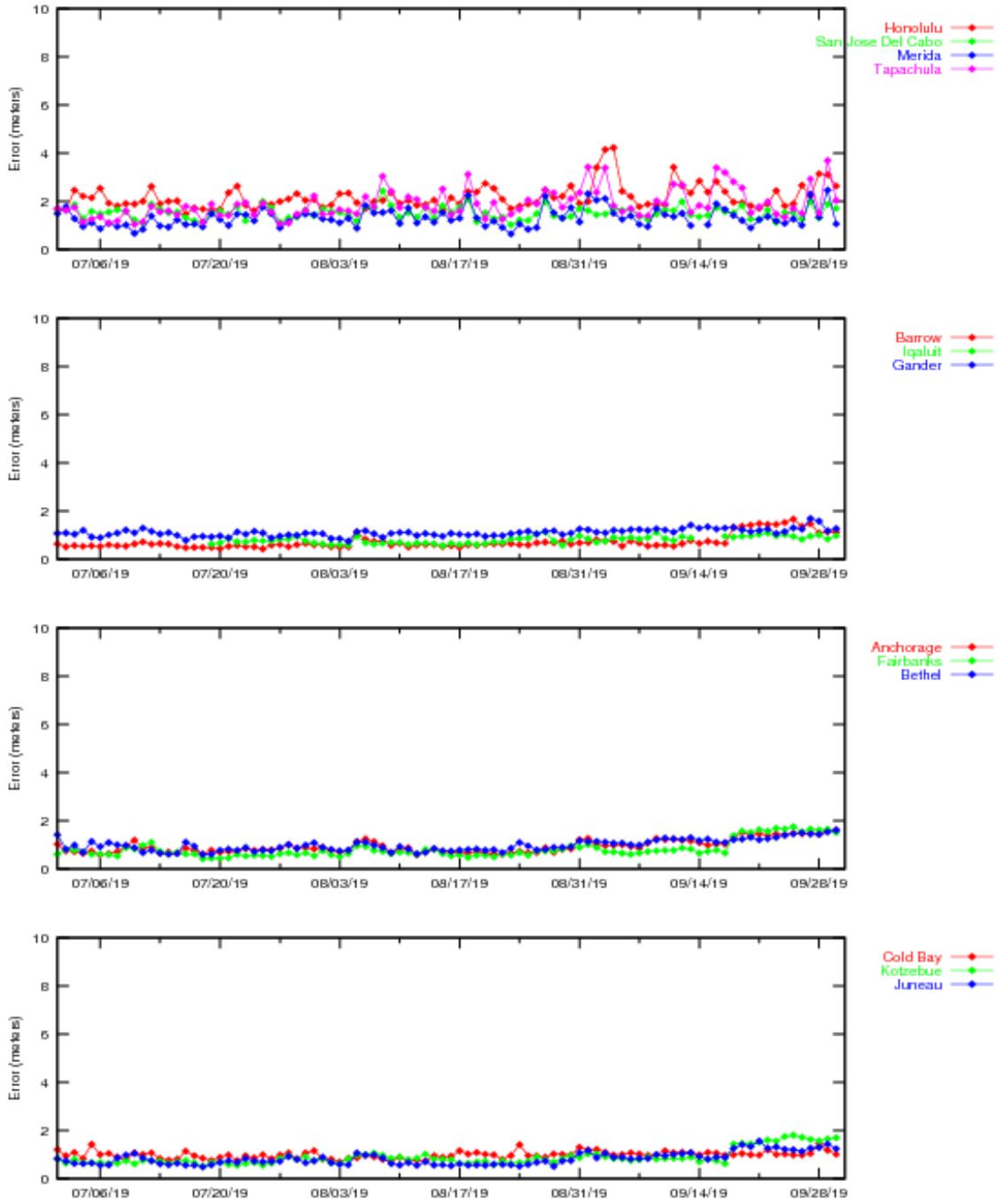


Figure 2-8 NPA 95% Horizontal Accuracy

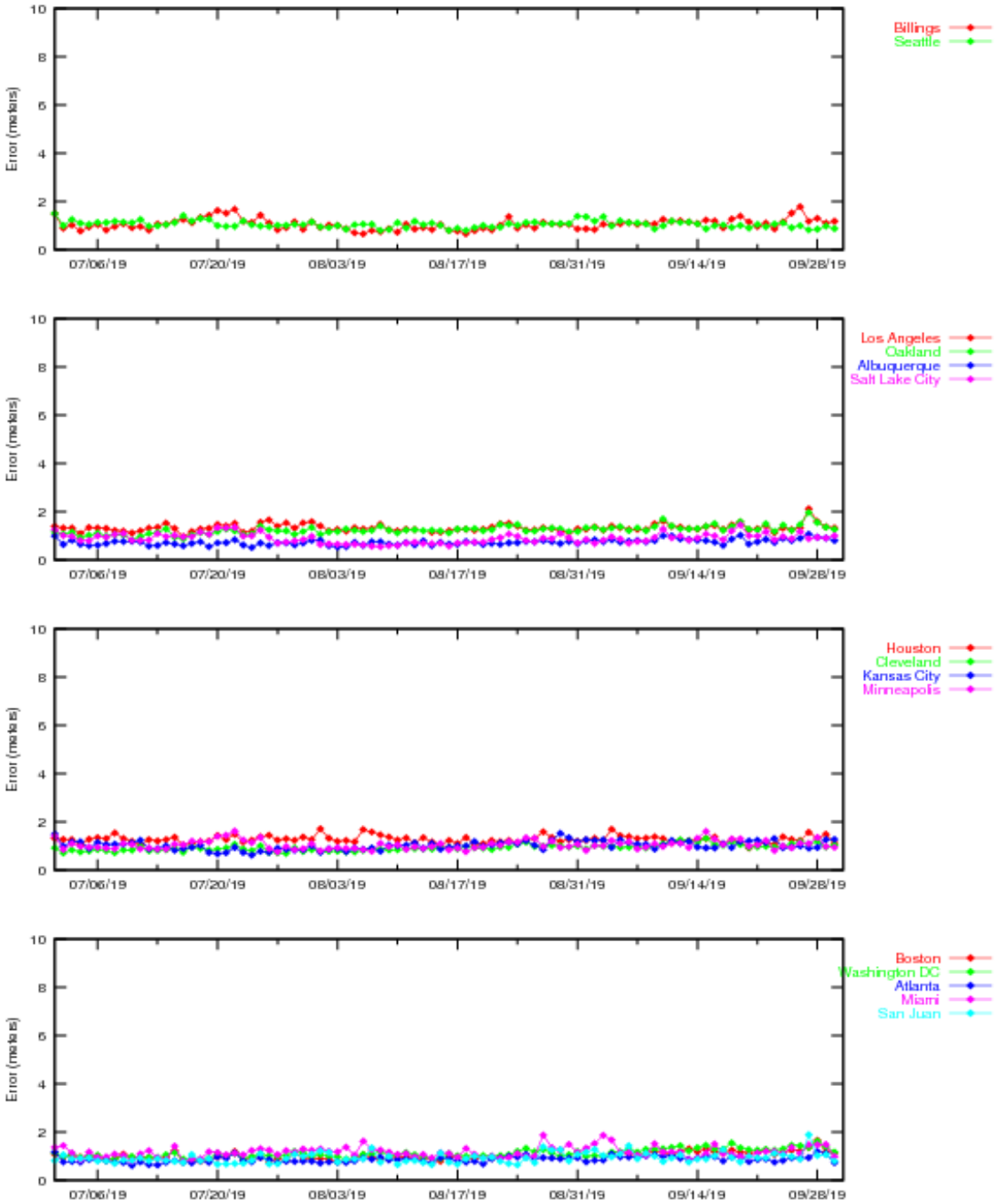


Figure 2-9 through Figure 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver for the quarter. Figure 2-9 and Figure 2-10 show the triangular distributions of vertical position error (VPE) versus VPL and horizontal position error (HPE) versus HPL: (1) the horizontal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

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

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

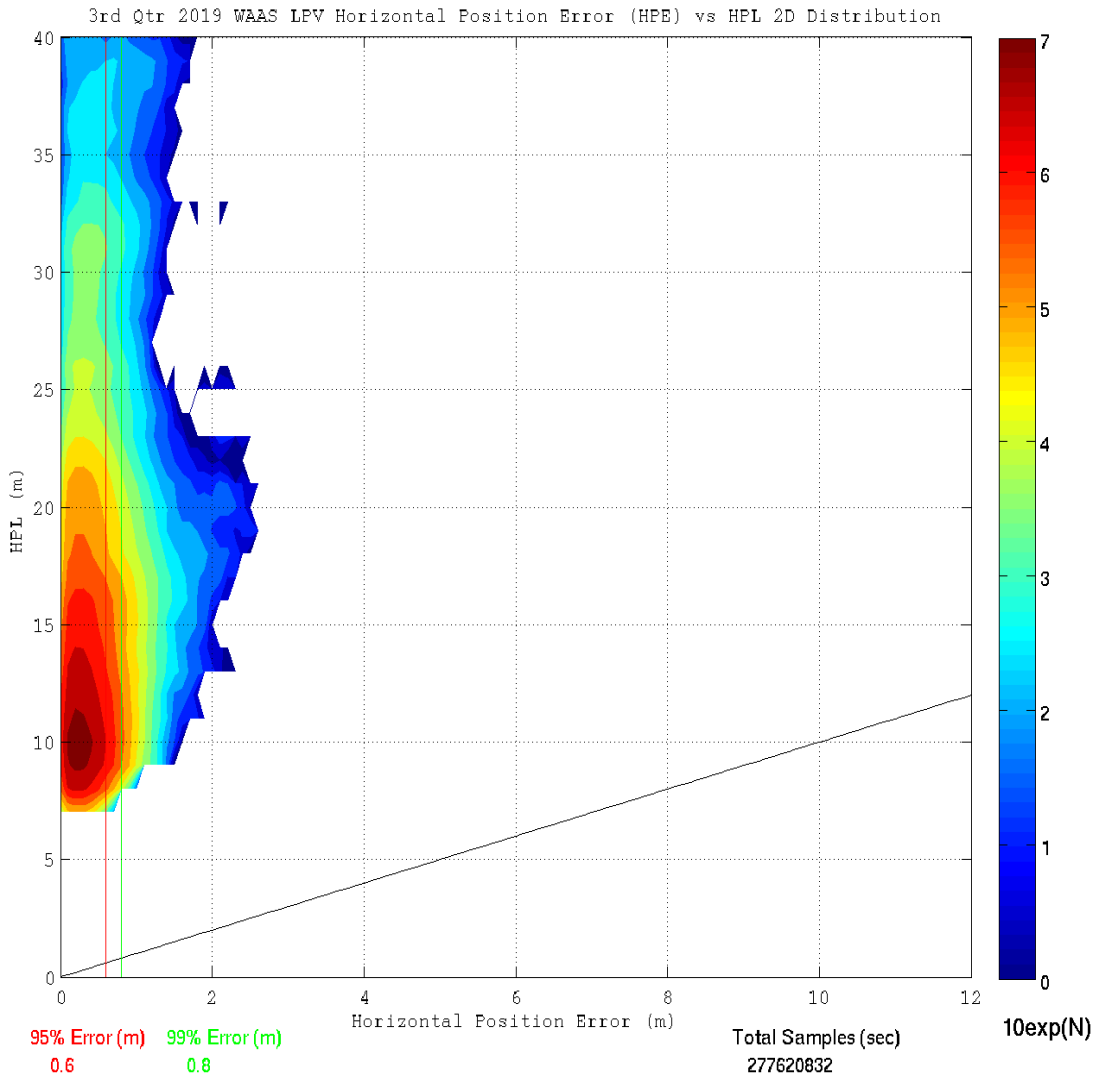


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

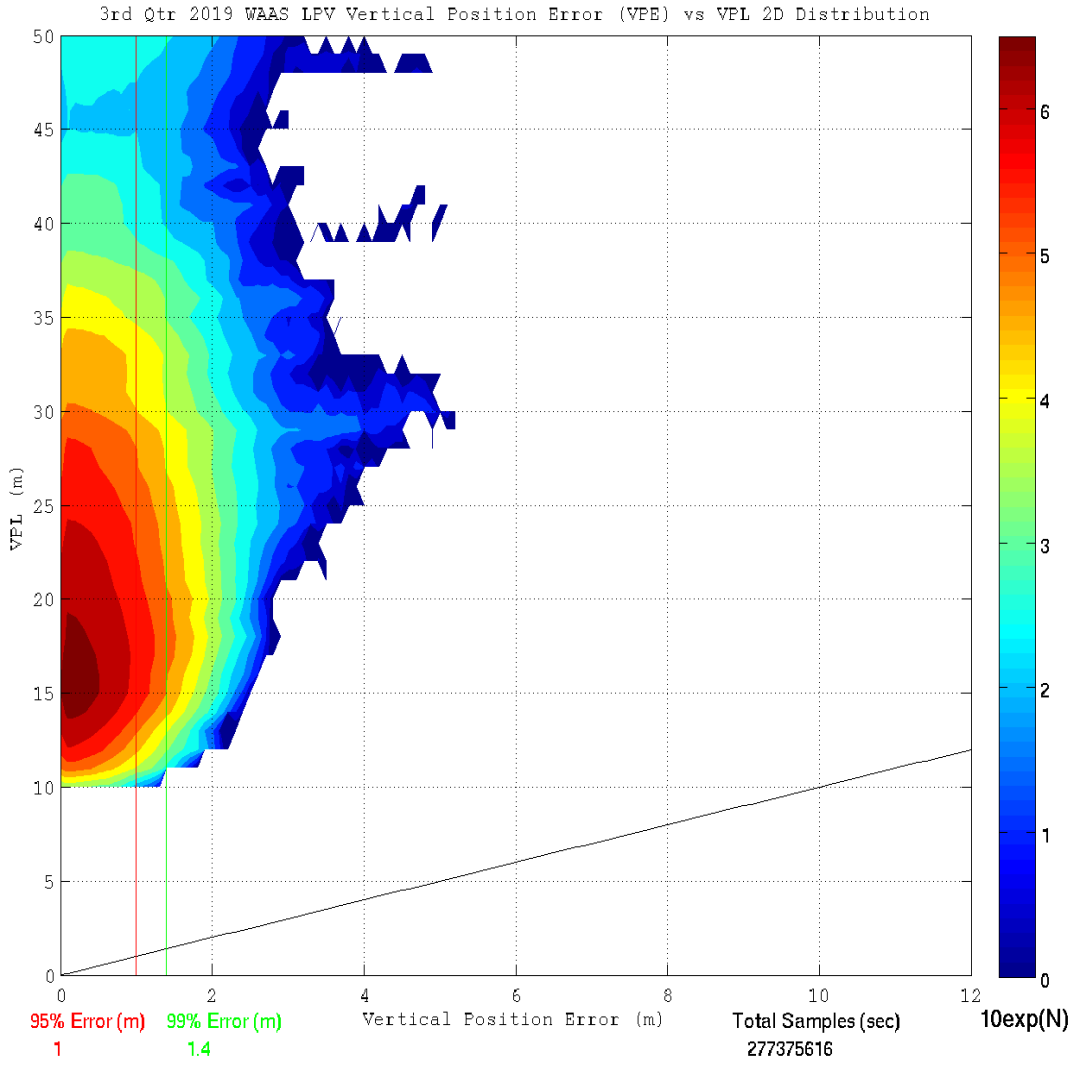


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

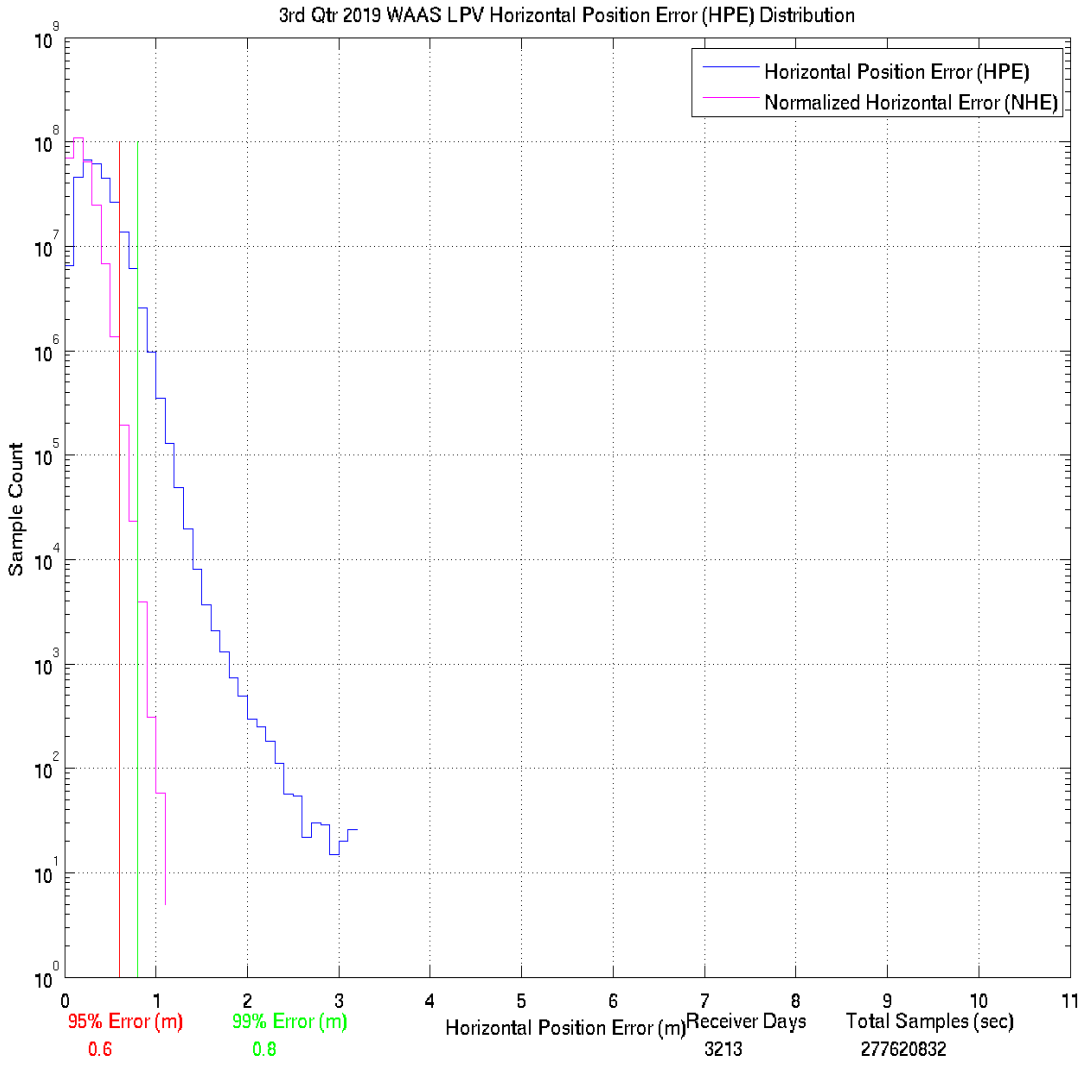
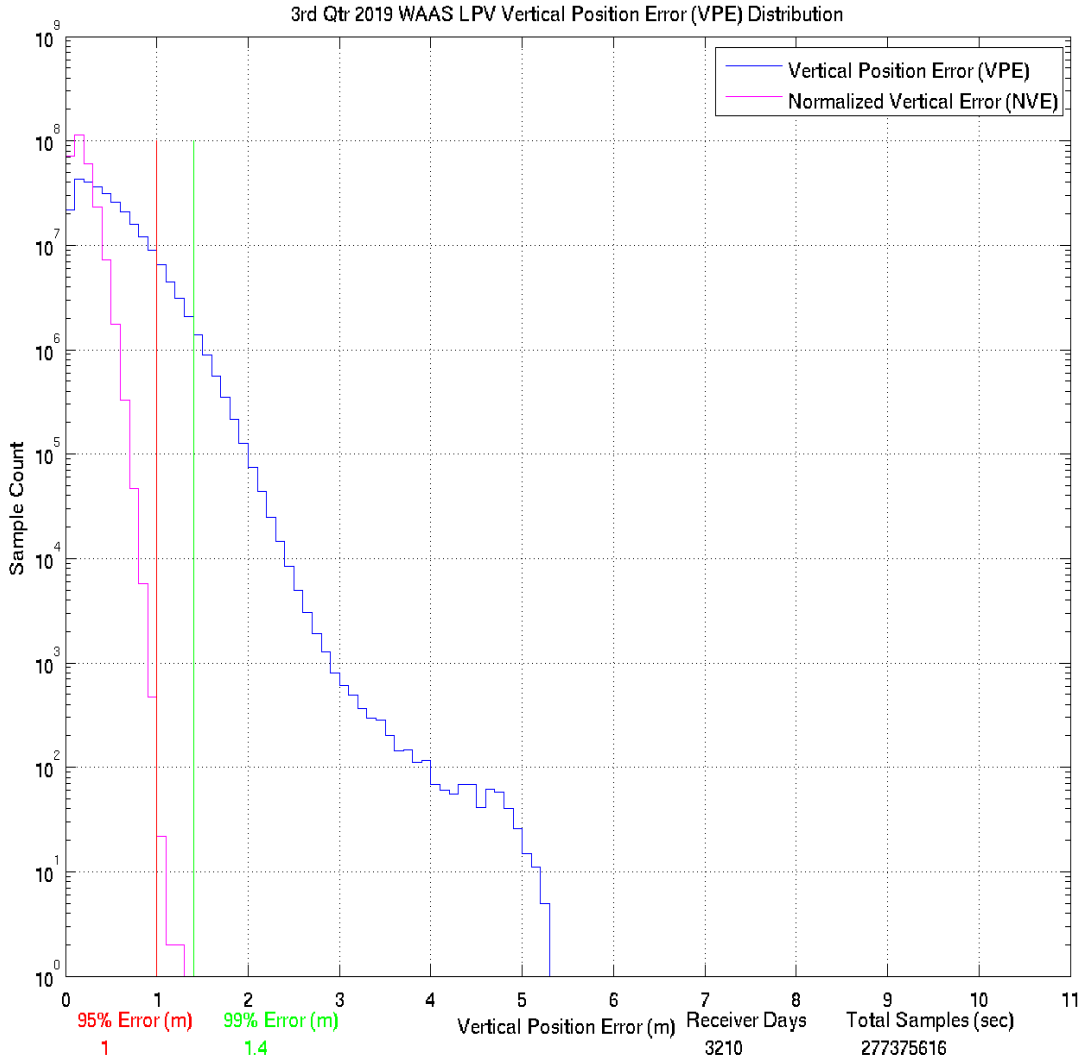


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

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

- The maximum 99% CONUS HPL was 16.434 meters observed at Cleveland
- The maximum 99% CONUS VPL was 30.136 meters observed at Oakland
- The minimum 99% CONUS HPL was 11.034 meters observed at Denver
- The minimum 99% CONUS VPL was 19.669 meters observed at Billings
- The maximum 99% Alaska HPL was 20.899 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 32.711 meters observed at Barrow
- The minimum 99% Alaska HPL was 13.19 meters observed at Juneau
- The minimum 99% Alaska VPL was 22.178 meters observed at Anchorage

Table 3-1 99% Protection Level

Location	99% HPL (Meters)	99% VPL (Meters)	Percentage in PA mode
Arcata	14.738	30.602	100
Atlantic City	16.255	23.859	100
Oklahoma City	11.483	22.537	100
Albuquerque	11.828	25.036	100
Anchorage	13.700	22.178	100
Atlanta	12.859	25.245	100
Barrow	16.496	32.711	100
Bethel	15.766	24.353	100
Billings	12.184	19.669	100
Boston	15.983	21.863	100
Chicago	12.745	21.067	100
Cleveland	16.434	24.048	100
Cold Bay	20.899	26.645	100
Dallas	11.036	23.518	100
Denver	11.034	22.493	100
Fairbanks	13.734	24.020	100
Gander	20.823	29.353	100
Goose Bay	19.340	26.992	100
Houston	11.308	25.238	100
Iqaluit	18.370	29.468	100
Jacksonville	13.648	25.649	100
Juneau	13.190	23.938	100
Kansas City	11.864	21.225	100
Kotzebue	16.303	28.439	100
Los Angeles	14.678	28.724	100
Memphis	12.223	24.109	100
Merida	19.844	53.633	100
Mexico City	22.004	35.448	100
Miami	16.197	27.516	100
Minneapolis	12.202	20.473	100
New York	15.138	21.898	100
Oakland	14.739	30.136	100
Puerto Vallarta	24.488	36.385	100
Salt Lake City	11.275	21.870	100
San Jose Del Cabo	25.443	50.744	100
Seattle	12.942	22.379	100
Washington DC	15.773	24.364	100
Winnipeg	13.542	21.481	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	99.93
Atlantic City-a	100	100	100
Oklahoma City	100	100	100
Albuquerque	100	100	100
Anchorage	100	100	99.99
Atlanta	100	100	99.98
Barrow	100	99.99	99.35
Bethel	100	100	100
Billings	100	100	100
Boston	100	100	100
Chicago	100	100	100
Cleveland	100	100	100
Cold Bay	100	100	99.99
Dallas	100	100	100
Denver	100	100	100
Fairbanks	100	100	100
Gander	100	100	99.96
Goose Bay	100	100	100
Houston	100	100	100
Iqaluit	99.93	99.93	99.75
Jacksonville	100	100	99.91
Juneau	100	100	100
Kansas City	100	100	100
Kotzebue	100	100	99.89
Los Angeles	100	100	99.86
Memphis	100	100	99.99
Merida	100	98.48	96.63
Mexico City	99.99	99.53	97.49
Miami	100	100	99.82
Minneapolis	100	100	100
New York	100	100	100
Oakland	100	100	99.93
Puerto Vallarta	99.99	99.74	98.01
Salt Lake City	100	100	100
San Jose Del Cabo	99.99	98.93	98.5
Seattle	100	100	100
Washington DC	100	100	100
Winnipeg	100	100	100

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	0	0.000000	0	0.000000	6	0.000118
Atlantic City-a	0	0.000000	0	0.000000	0	0.000000
Oklahoma City	0	0.000000	0	0.000000	0	0.000000
Albuquerque	0	0.000000	0	0.000000	1	0.000019

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Anchorage	0	0.000000	0	0.000000	3	0.000057
Atlanta	0	0.000000	1	0.000019	44	0.000831
Barrow	0	0.000000	7	0.000132	113	0.002150
Bethel	0	0.000000	0	0.000000	0	0.000000
Billings	0	0.000000	0	0.000000	0	0.000000
Boston	0	0.000000	0	0.000000	1	0.000019
Chicago	0	0.000000	0	0.000000	0	0.000000
Cleveland	0	0.000000	0	0.000000	0	0.000000
Cold Bay	0	0.000000	0	0.000000	6	0.000113
Dallas	0	0.000000	0	0.000000	0	0.000000
Denver	0	0.000000	0	0.000000	1	0.000019
Fairbanks	1	0.000019	1	0.000019	4	0.000076
Gander	0	0.000000	0	0.000000	6	0.000113
Goose Bay	0	0.000000	0	0.000000	1	0.000019
Houston	0	0.000000	0	0.000000	0	0.000000
Iqaluit	7	0.000132	8	0.000151	29	0.000549
Jacksonville	0	0.000000	0	0.000000	66	0.001247
Juneau	0	0.000000	0	0.000000	1	0.000019
Kansas City	0	0.000000	0	0.000000	0	0.000000
Kotzebue	1	0.000019	2	0.000038	30	0.000567
Los Angeles	0	0.000000	1	0.000019	58	0.001099
Memphis	0	0.000000	0	0.000000	25	0.000472
Merida	0	0.000000	91	0.001765	217	0.004289
Mexico City	2	0.000038	94	0.001783	234	0.004532
Miami	0	0.000000	0	0.000000	93	0.001760
Minneapolis	0	0.000000	0	0.000000	0	0.000000
New York	0	0.000000	0	0.000000	0	0.000000
Oakland	0	0.000000	1	0.000019	6	0.000114
Puerto Vallarta	2	0.000038	96	0.001818	402	0.007748
Salt Lake City	0	0.000000	0	0.000000	0	0.000000
San Jose Del Cabo	3	0.000058	91	0.001767	199	0.003881
Seattle	0	0.000000	0	0.000000	0	0.000000
Washington DC	0	0.000000	0	0.000000	0	0.000000
Winnipeg	0	0.000000	0	0.000000	0	0.000000

Figure 3-1 LPV Instantaneous Availability

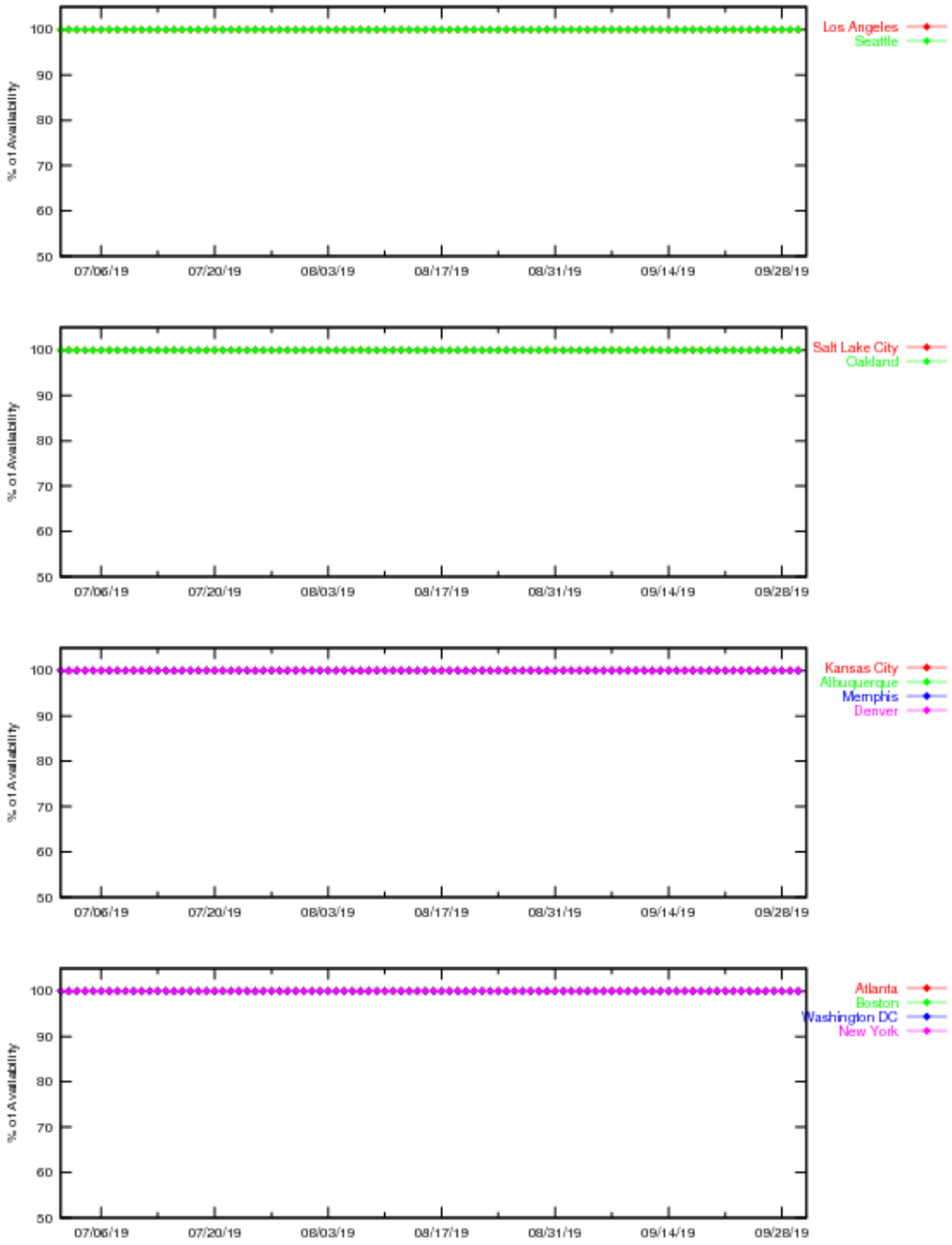


Figure 3-2 LPV Instantaneous Availability

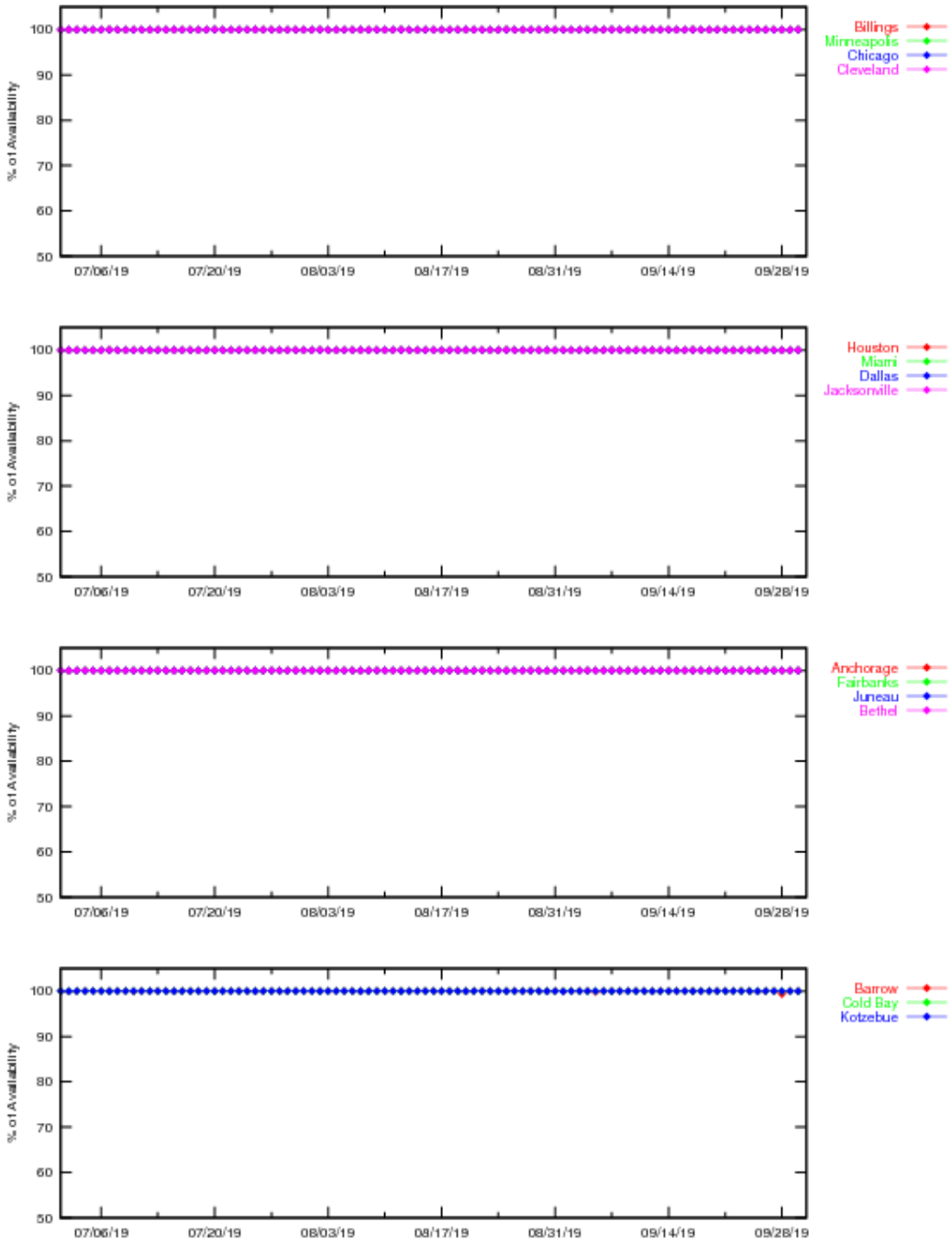


Figure 3-3 LPV Instantaneous Availability

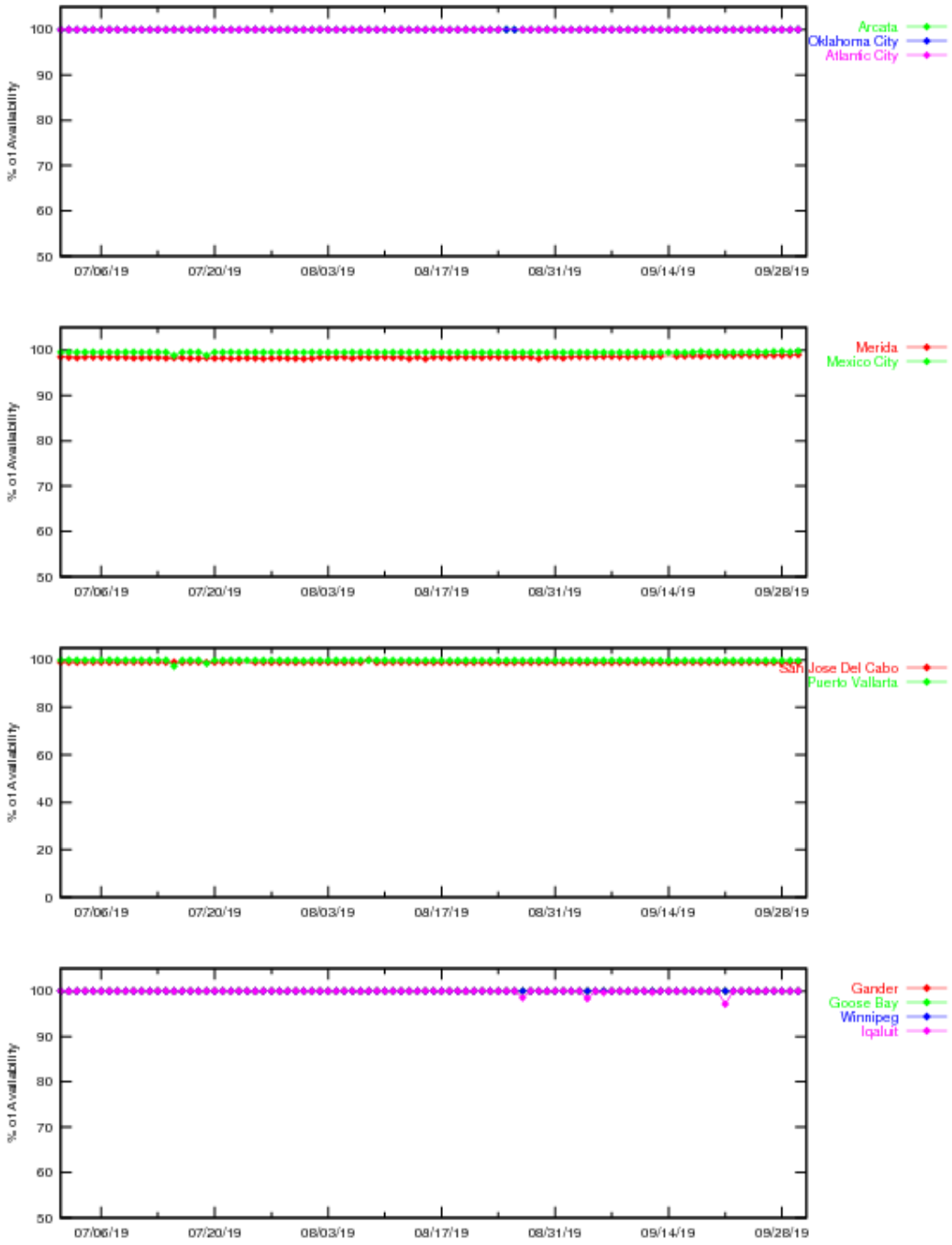


Figure 3-4 LPV200 Instantaneous Availability

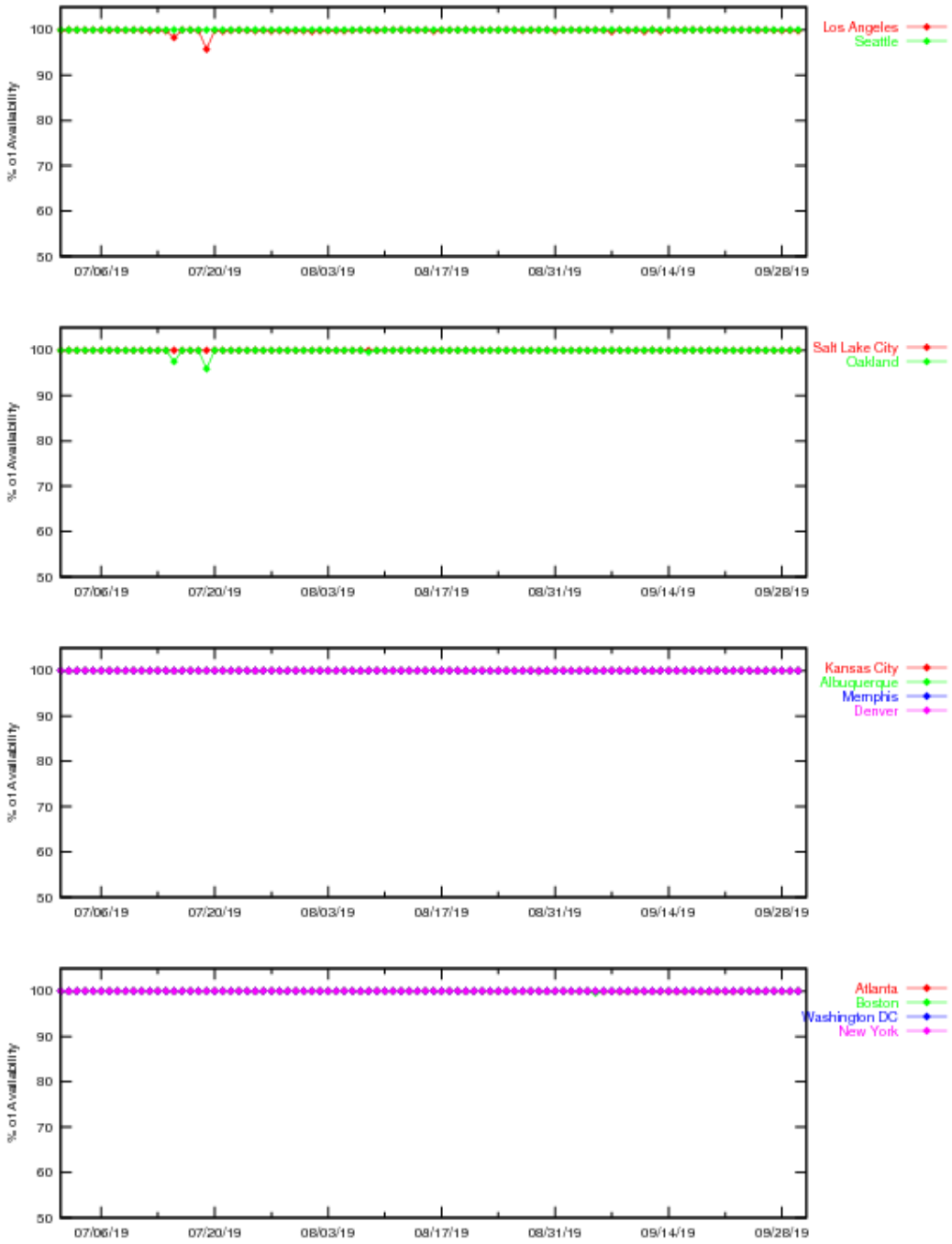


Figure 3-5 LPV200 Instantaneous Availability

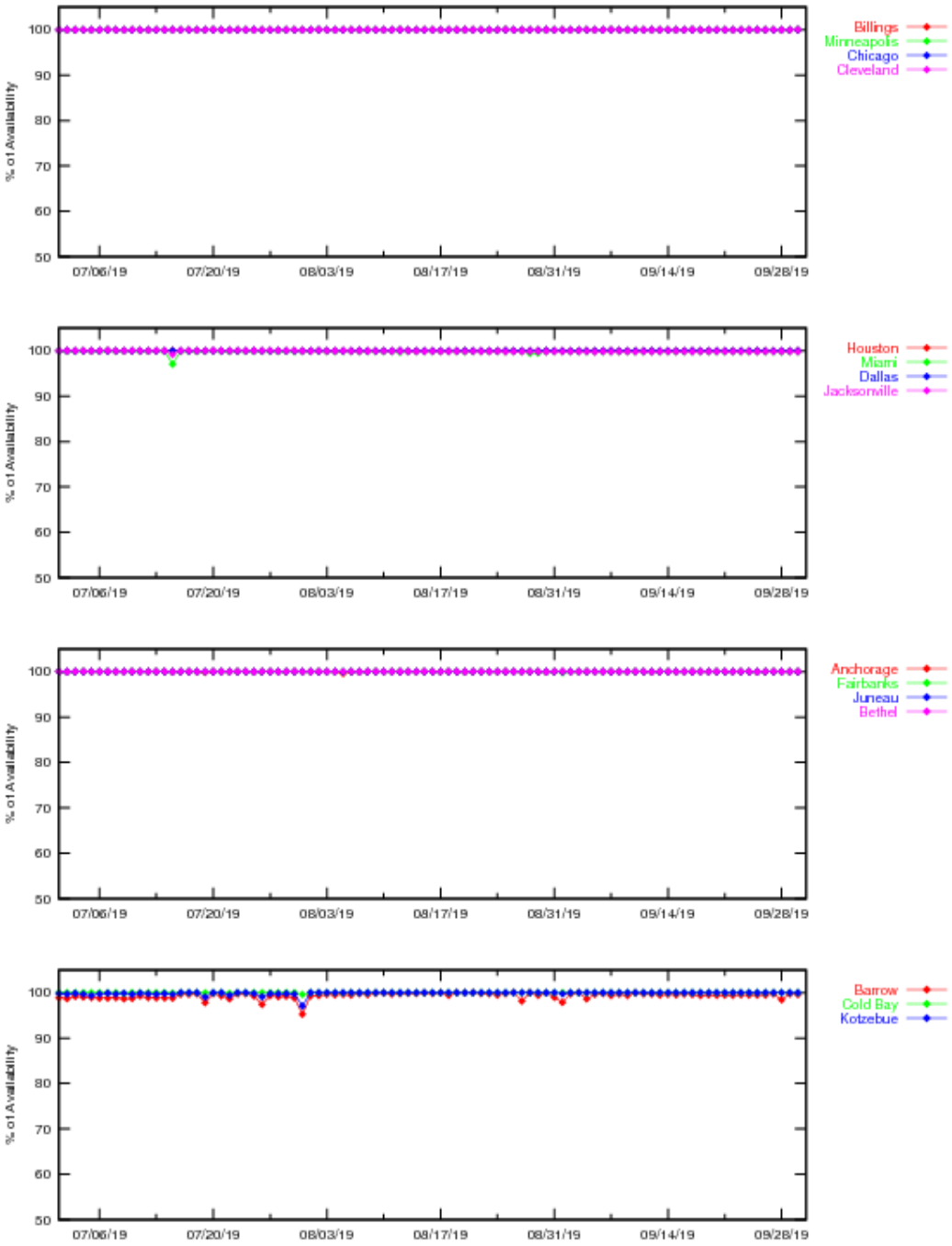


Figure 3-6 LPV200 Instantaneous Availability

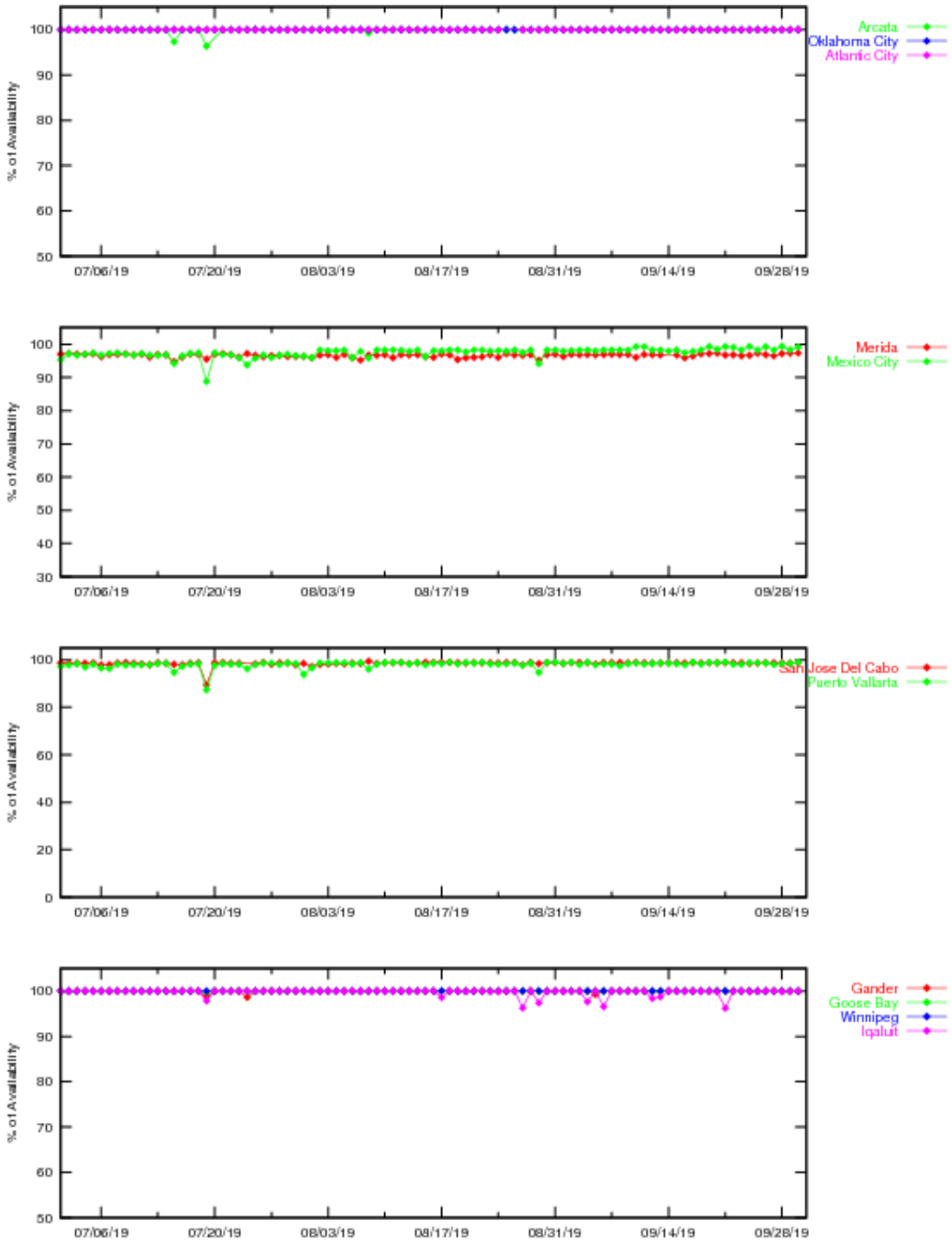


Figure 3-7 LPV Outages

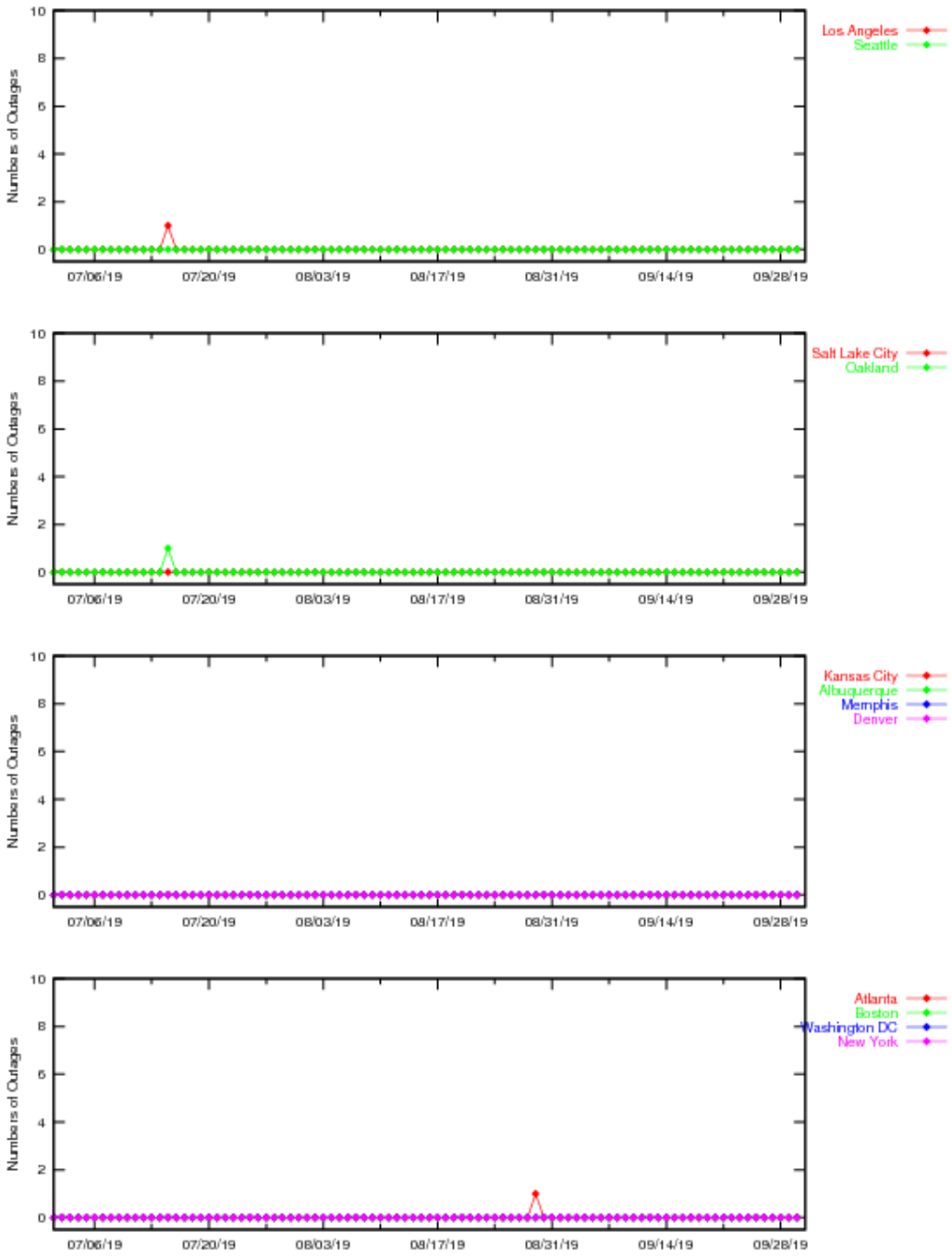


Figure 3-8 LPV Outages

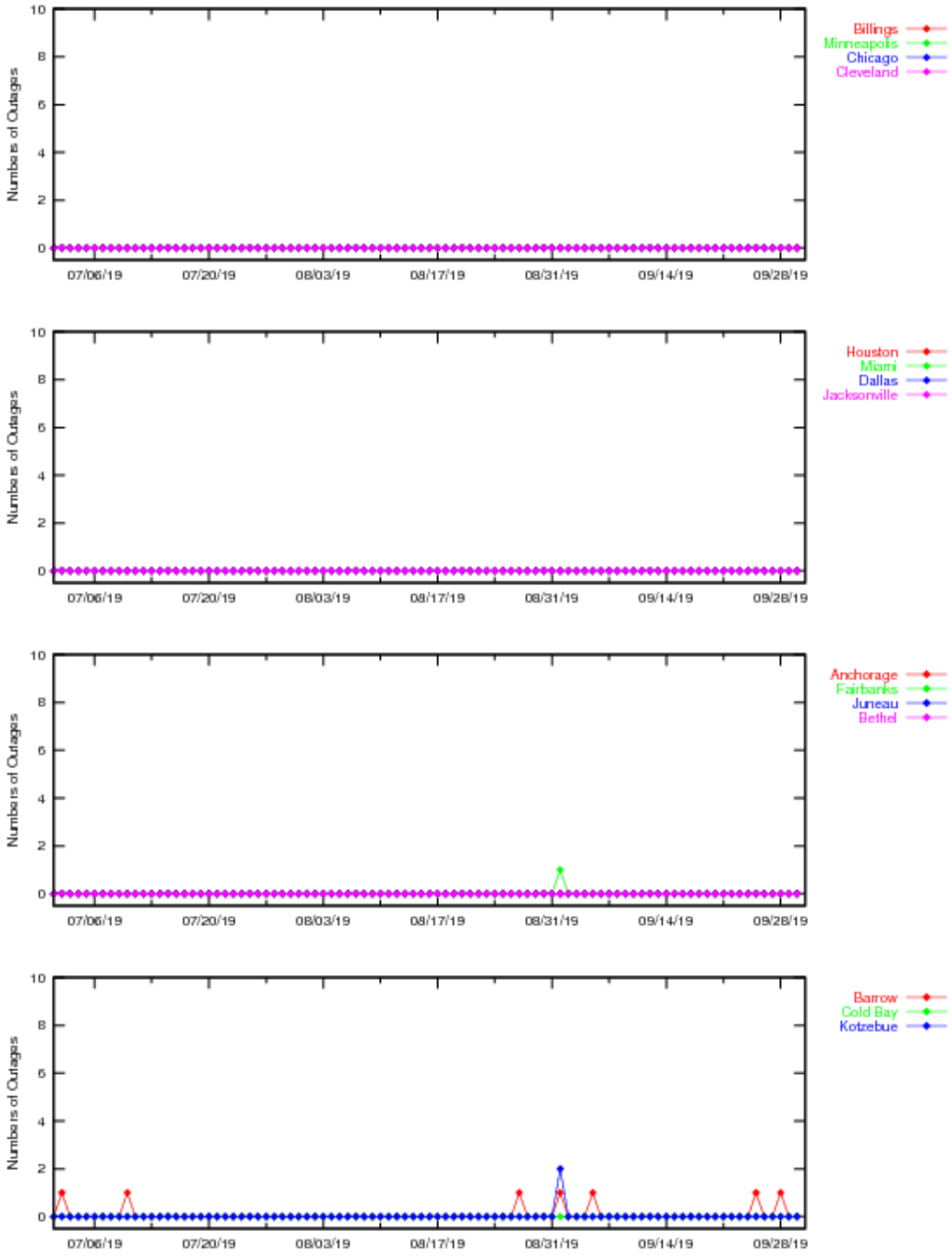


Figure 3-9 LPV Outages

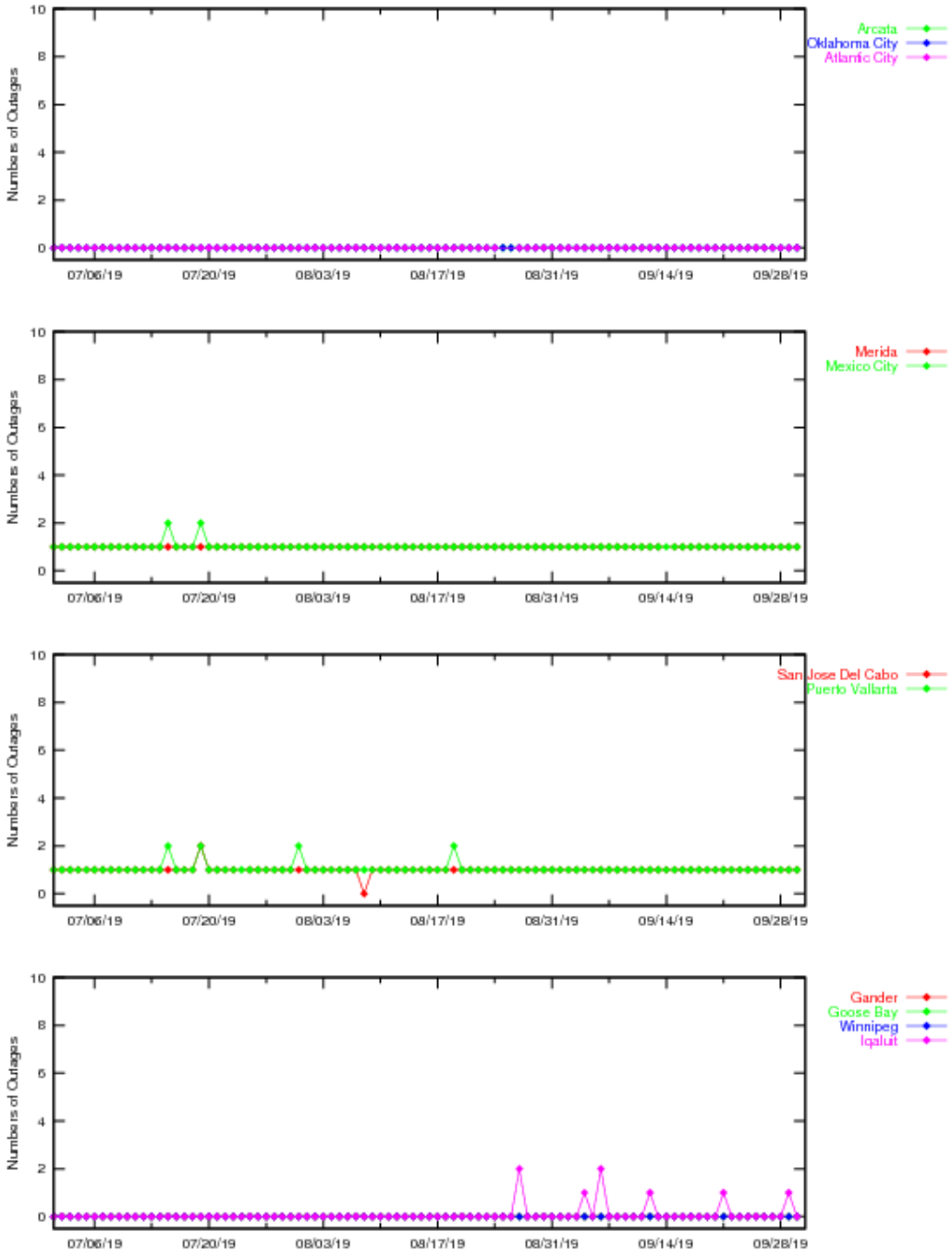


Figure 3-10 LPV200 Outages

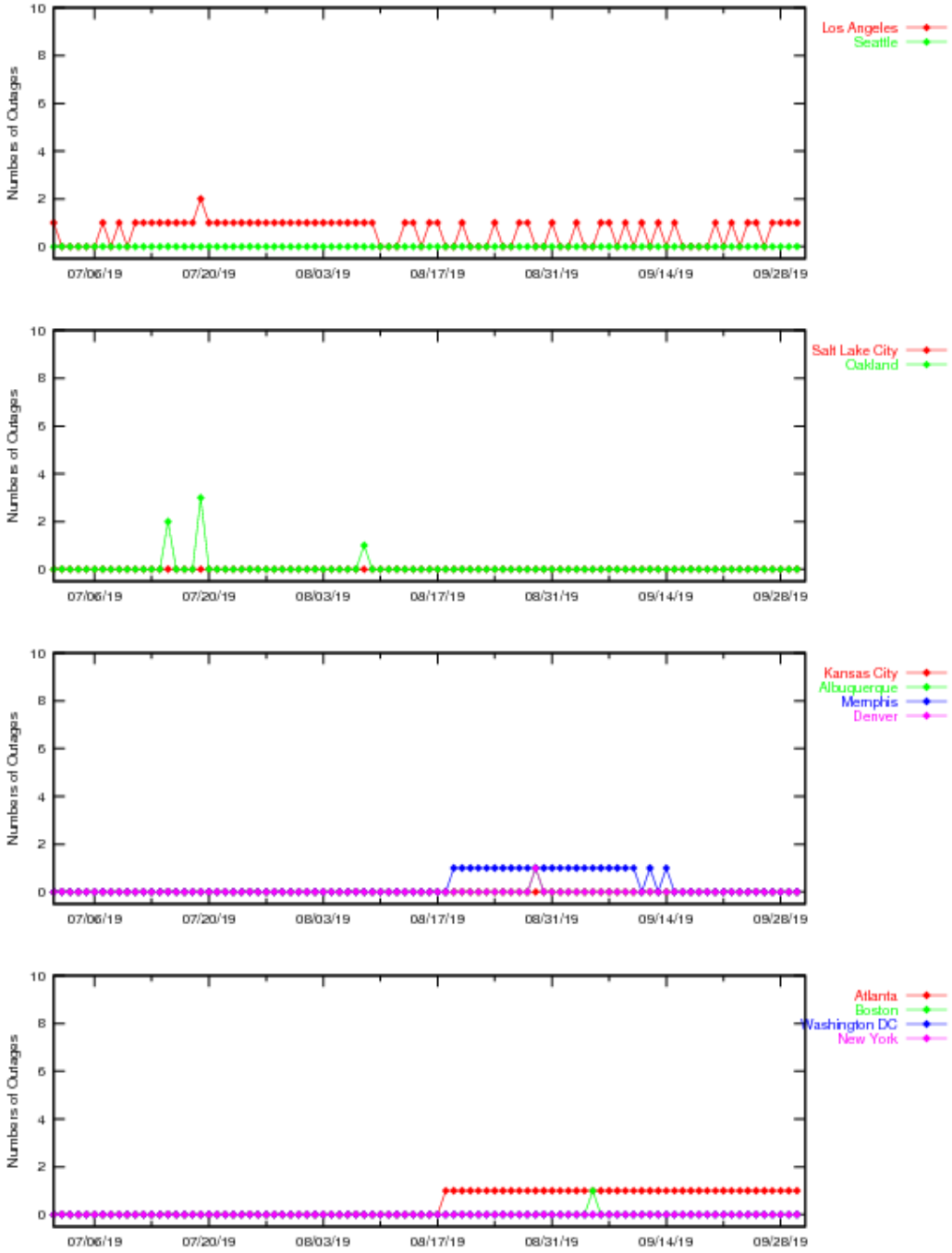


Figure 3-11 LPV200 Outages

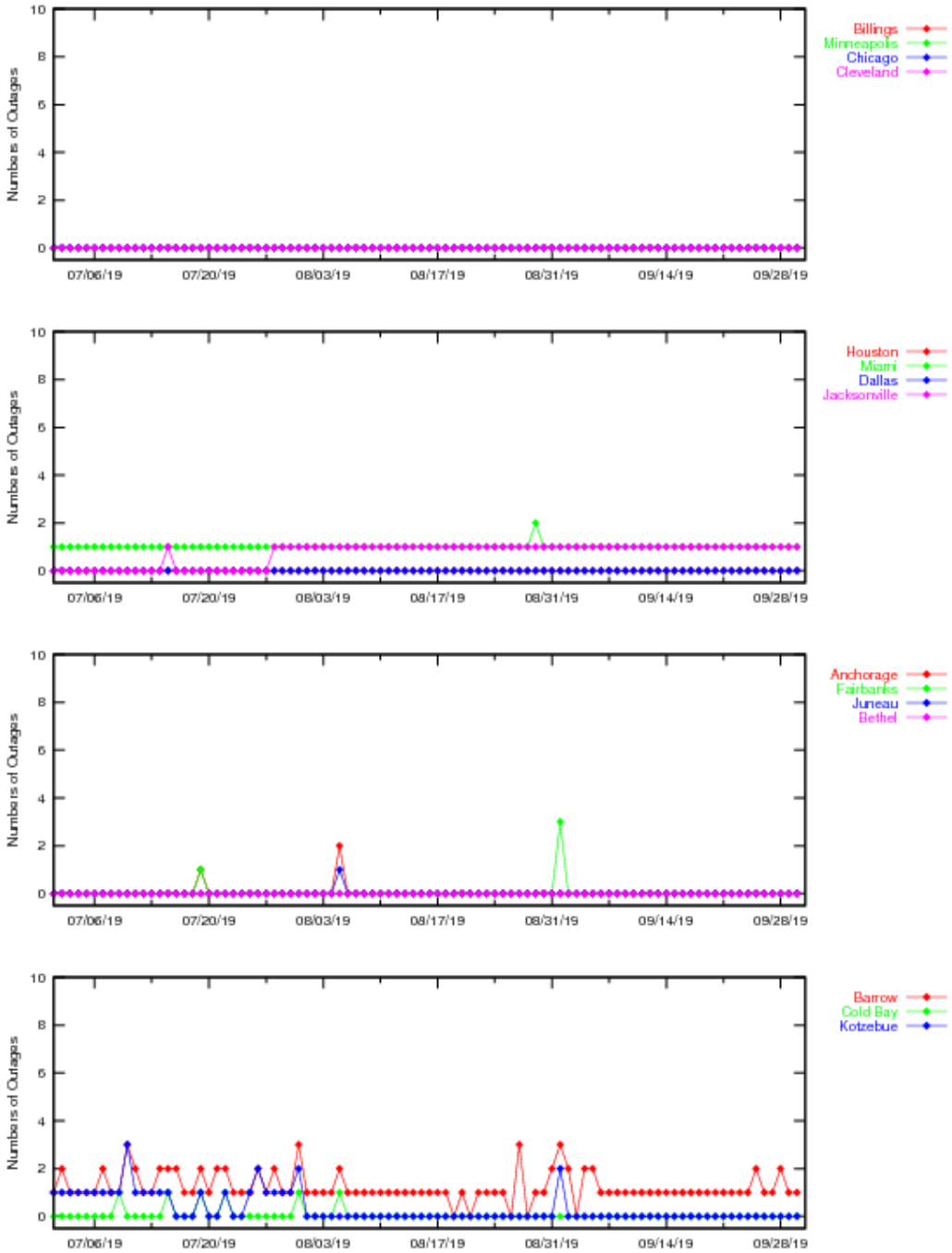
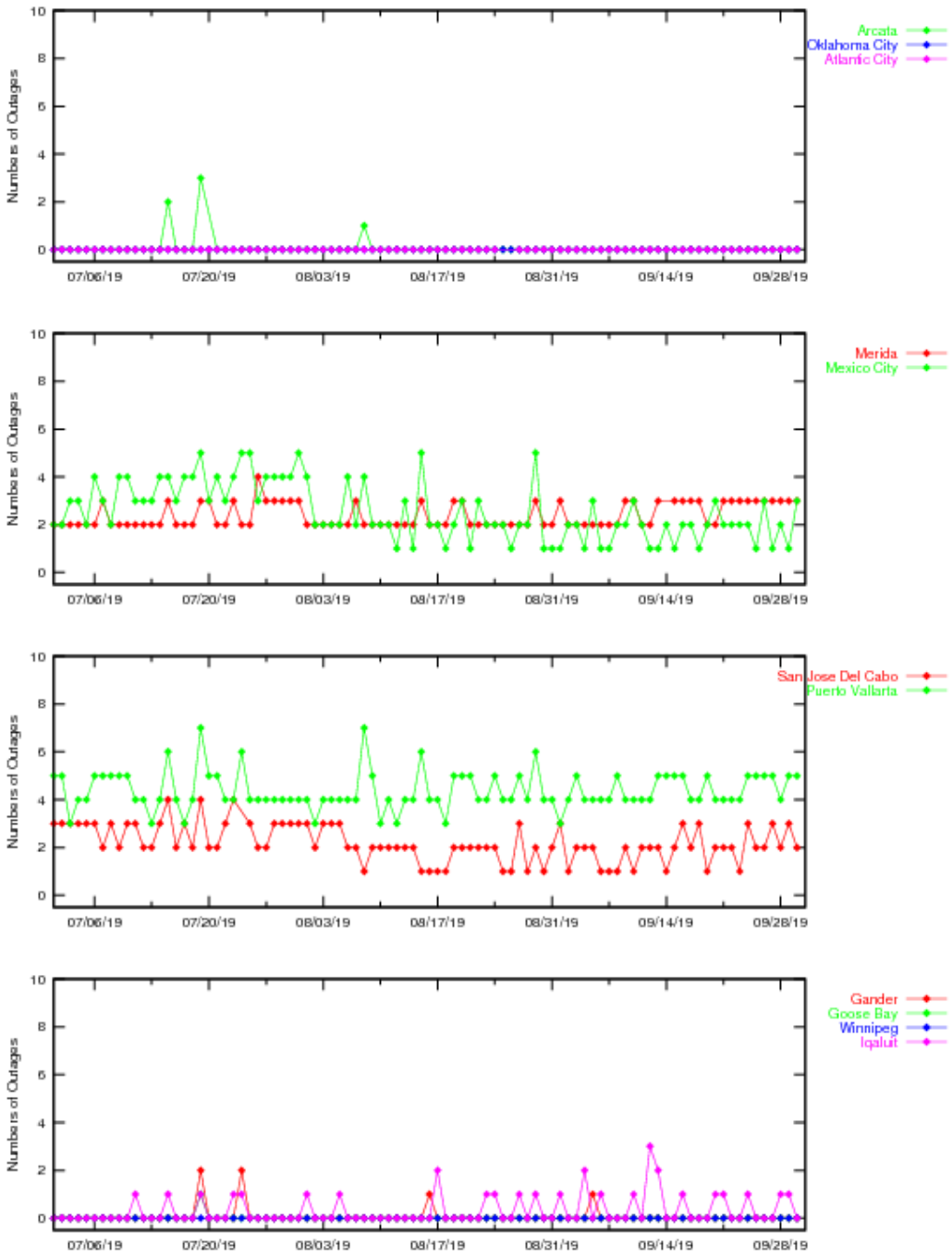


Figure 3-12 LPV200 Outages



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

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

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

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

Location	NPA Outages (Number)	NPA Outage Rates
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	0	0
Bethel	0	0
Billings	0	0
Boston	0	0
Cleveland	0	0
Cold Bay	0	0
Fairbanks	0	0
Gander	0	0
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0

Location	NPA Outages (Number)	NPA Outage Rates
Kotzebue	0	0
Los Angeles	0	0
Merida	0	0
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	0	0
San Juan	0	0
Seattle	0	0
Tapachula	0	0
Washington DC	0	0

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

- Apr 7–Sep 30–An increase in DOPs over Arizona reduced LPV200 availability in the region.
- May 15–Sep 30–PRN24 set before PRN25 came into view over the Florida panhandle, reducing LPV200 availability in the region.
- May 15–Sep 30–An increase in DOPs over the Gulf of Mexico reduced LPV200 availability in the region.
- Jul 1–Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking.
- Jul 9–Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking.
- Jul 10–Local RFI at caused a reduction and eventual loss of space vehicle (SV) tracking.
- Jul 15–Satellite Maintenance elevated UDREs on PRN25 and reduced LPV availability in CONUS as well as LPV200 availability in CONUS and Alaska.
- Jul 19–Satellite Maintenance elevated UDREs on PRN6 and reduced LPV200 availability in CONUS, Alaska, and Canada.
- Jul 23–Jul 24–Satellite Maintenance elevated UDREs on PRN20 and reduced LPV200 availability in Canada.
- Jul 25–GEO 135 was decommissioned. The lack of GEO ranging reduced LPV200 availability in Alaska and Canada.
- Jul 26–A GUS switchover on S15 caused a reduction of LPV200 availability in Alaska.
- Jul 31–Satellite Maintenance elevated UDREs on PRN24 and reduced LPV200 availability in Alaska.
- Aug 2–A GUS switchover on S15 caused a reduction of LPV200 availability in Alaska.
- Aug 2–Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking.
- Aug 5–Geomagnetic activity elevated GIVE values which reduced LPV200 availability in Alaska.
- Aug 6–A cold start of Southbury and Santa Paula Ground Uplink Stations caused a lack of GEO ranging and reduced LPV200 availability in Alaska.
- Aug 6–Local RFI at Denver caused a reduction and eventual loss of space vehicle (SV) tracking.
- Aug 8–Satellite Maintenance elevated UDREs on PRN17 and reduced LPV200 availability in CONUS.
- Aug 9–Local RFI at Seattle caused a reduction and eventual loss of space vehicle (SV) tracking.
- Aug 13–Local RFI at Denver caused a reduction and eventual loss of space vehicle (SV) tracking.
- Aug 14–17–Several GUS switchovers during this period on QWE reduced LPV200 availability in Alaska and CONUS.
- Aug 16–Local RFI at Denver caused a reduction and eventual loss of space vehicle (SV) tracking.
- Aug 18–A GUS switchover on S15 caused a reduction of LPV200 availability in Alaska.
- Aug 26–Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking.
- Aug 29–Satellite maintenance elevated UDREs on PRN2 and reduced LPV availability in CONUS as well as LPV200 availability in CONUS and Canada.
- Sep 5–Sep 6–Satellite Maintenance elevated UDREs on PRN15 and reduced LPV200 availability in CONUS and Canada.

- Sep 17–Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking.
- Sep 19–Local RFI at Denver caused a reduction and eventual loss of space vehicle (SV) tracking.
- Sep 24–Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking.

4.0 COVERAGE

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

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

Figure 4-1 LP North America Coverage for the Quarter

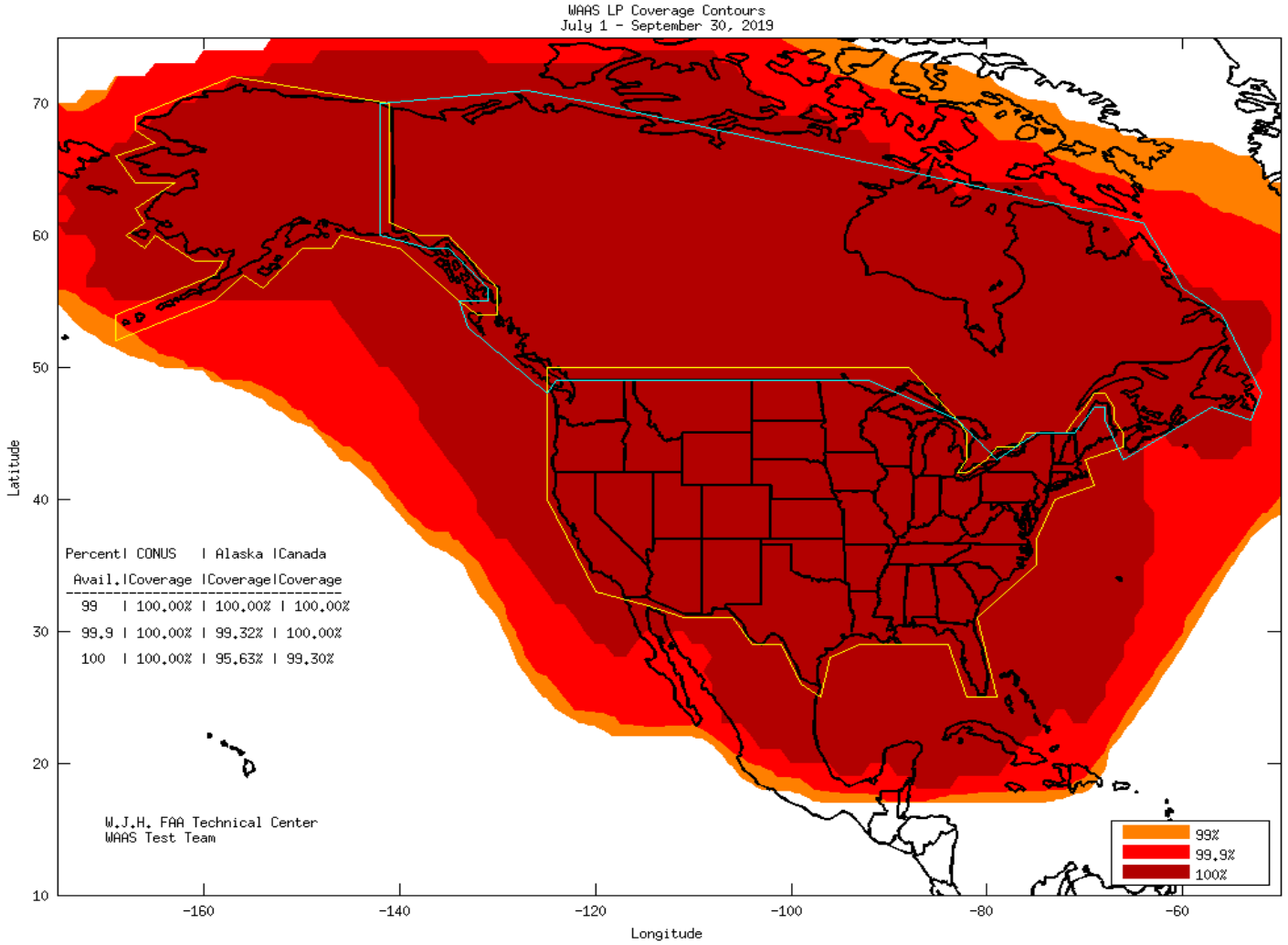


Figure 4-2 LPV North America Coverage for the Quarter

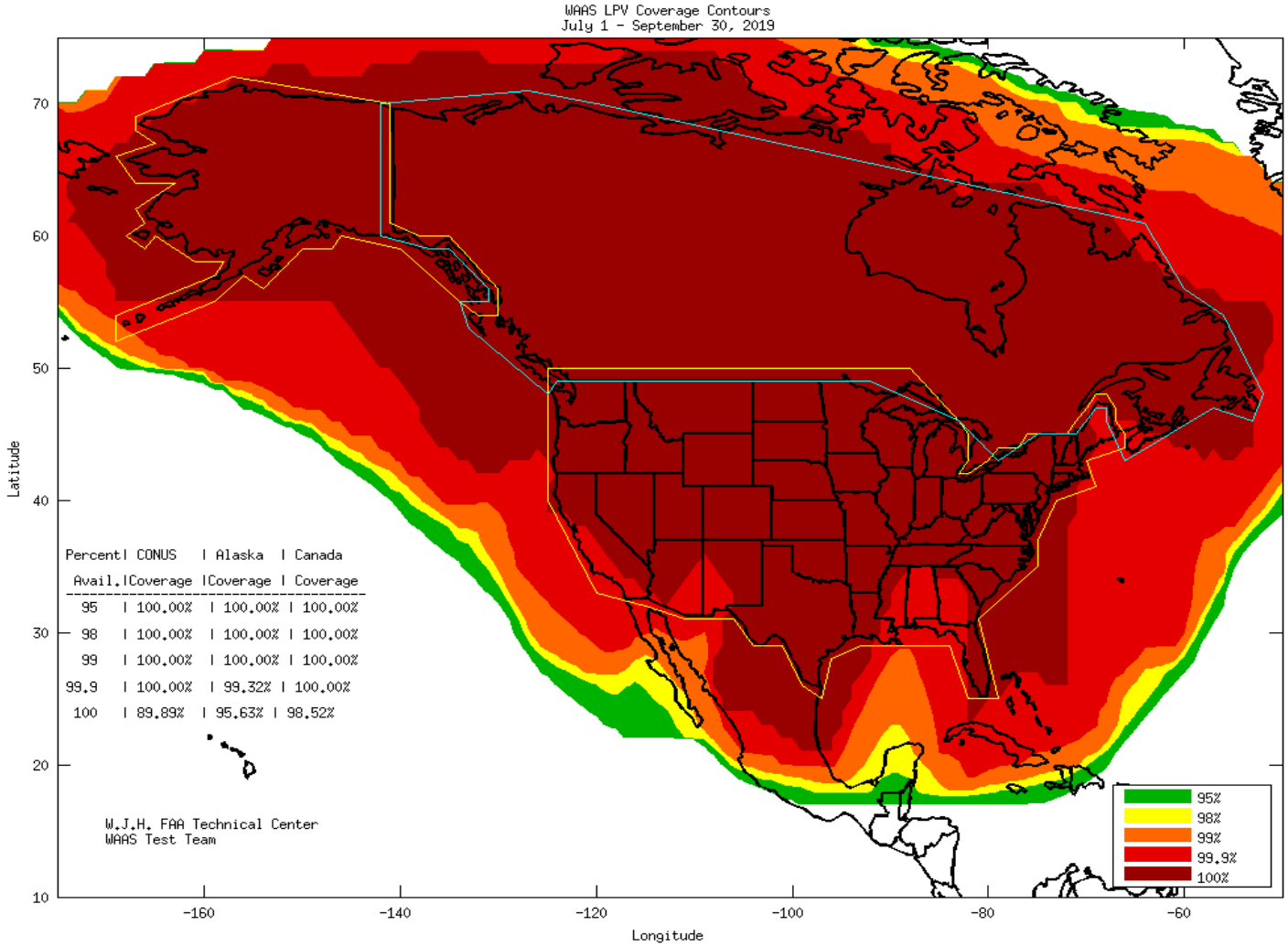


Figure 4-3 LPV200 North America Coverage for the Quarter

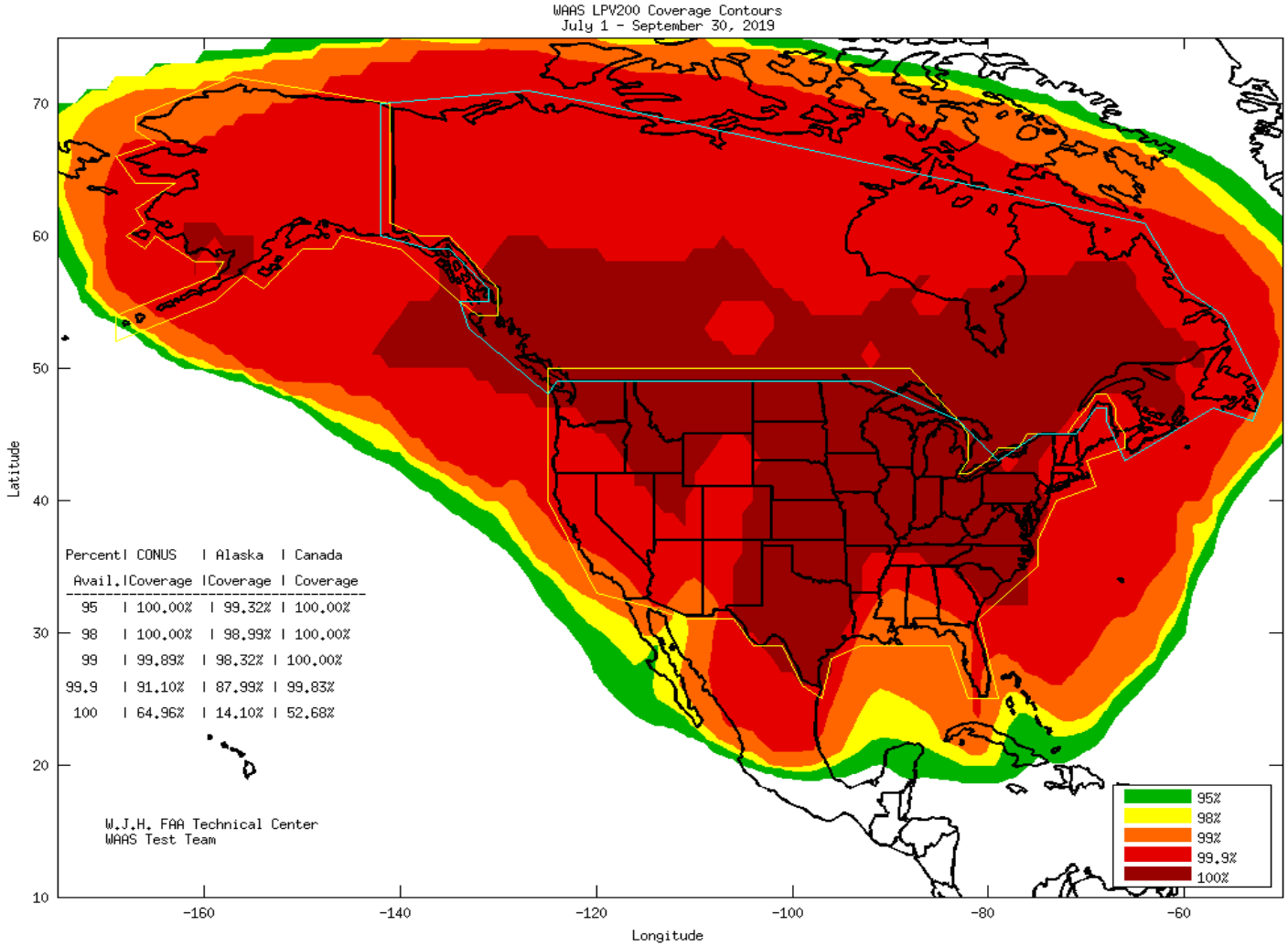


Figure 4-4 Daily LPV and LPV200 CONUS Coverage

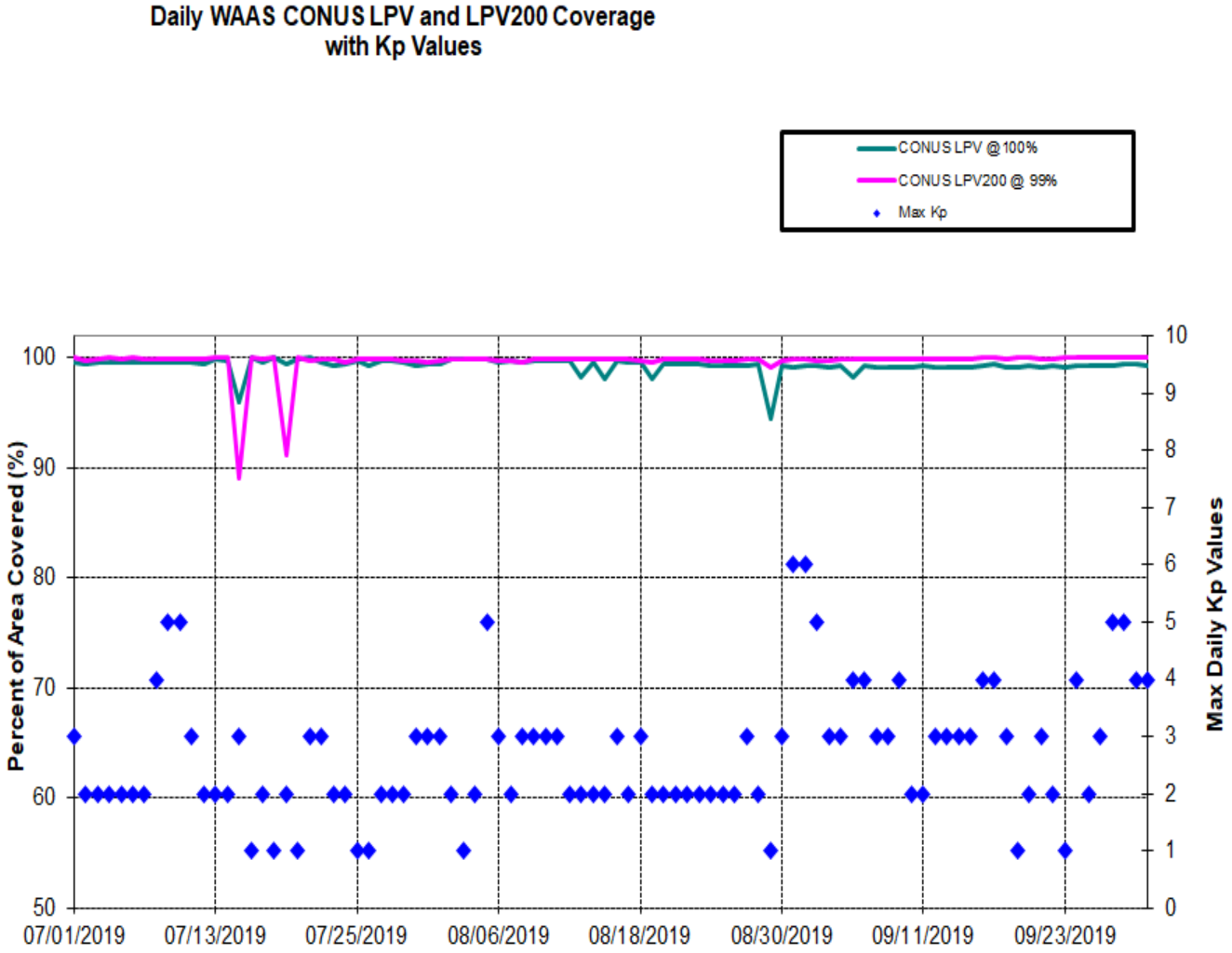


Figure 4-5 Daily LPV and LPV200 Alaska Coverage

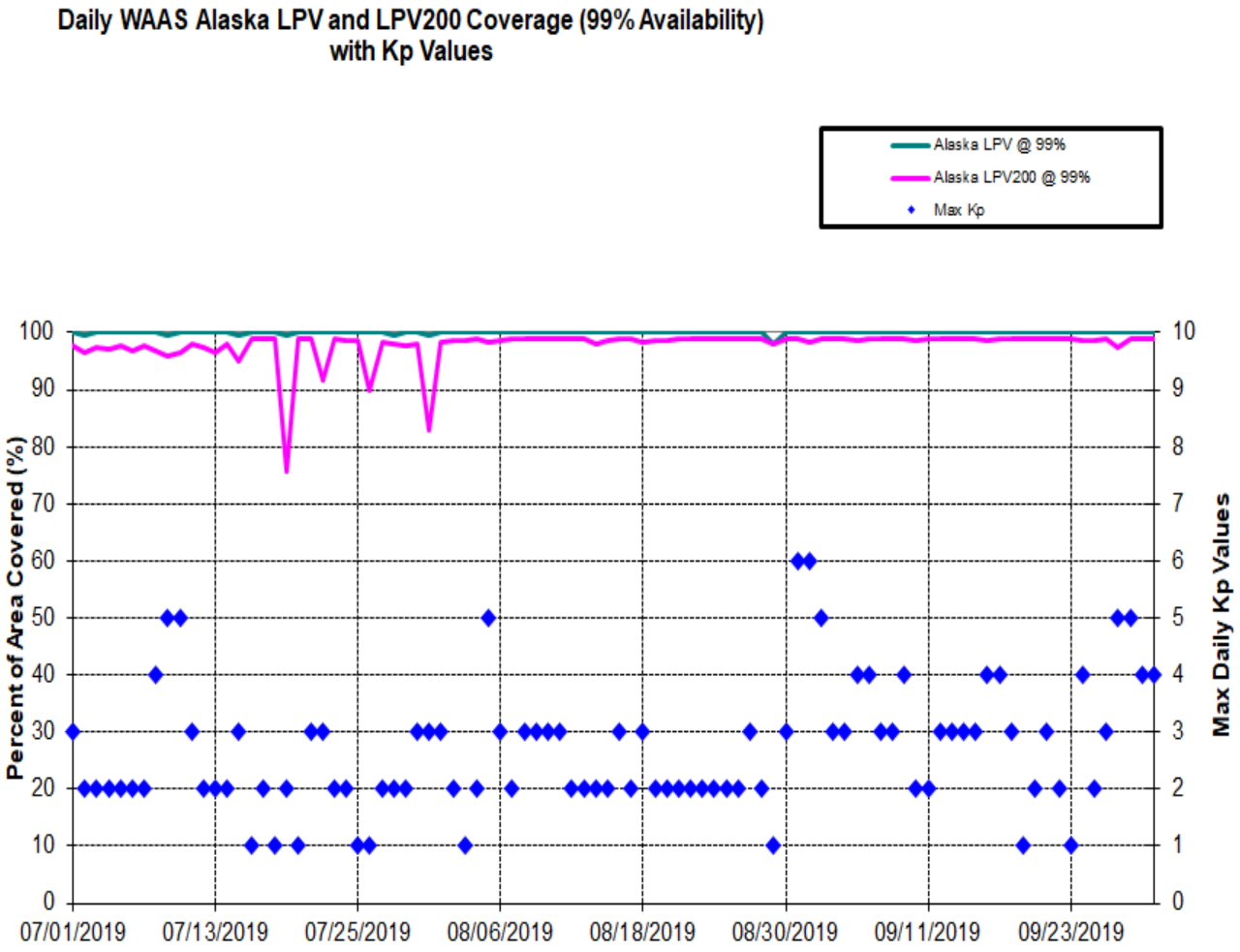
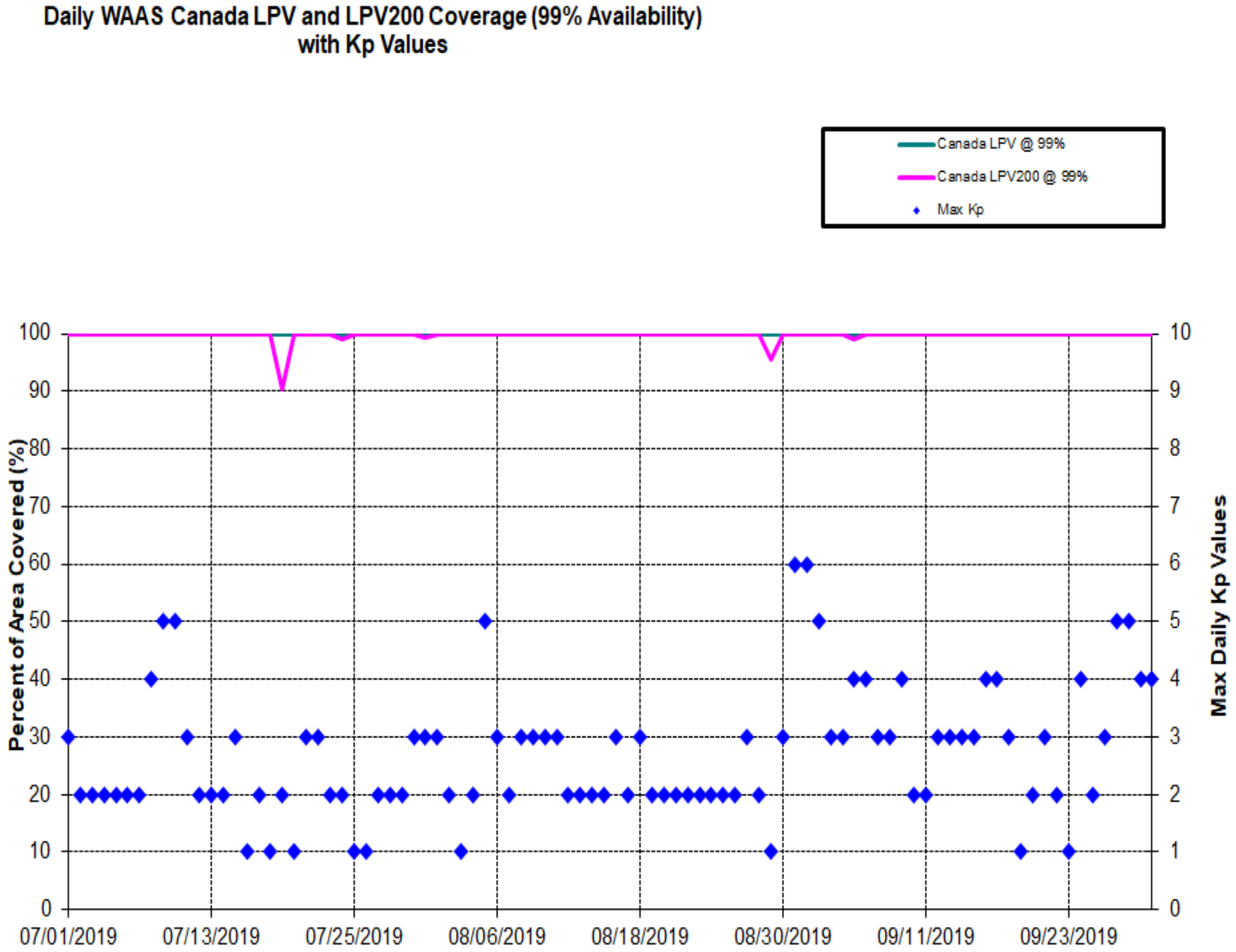


Figure 4-6 Daily LPV and LPV200 Canada Coverage



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

Figure 4-7 RNP 0.1 Coverage for the Quarter

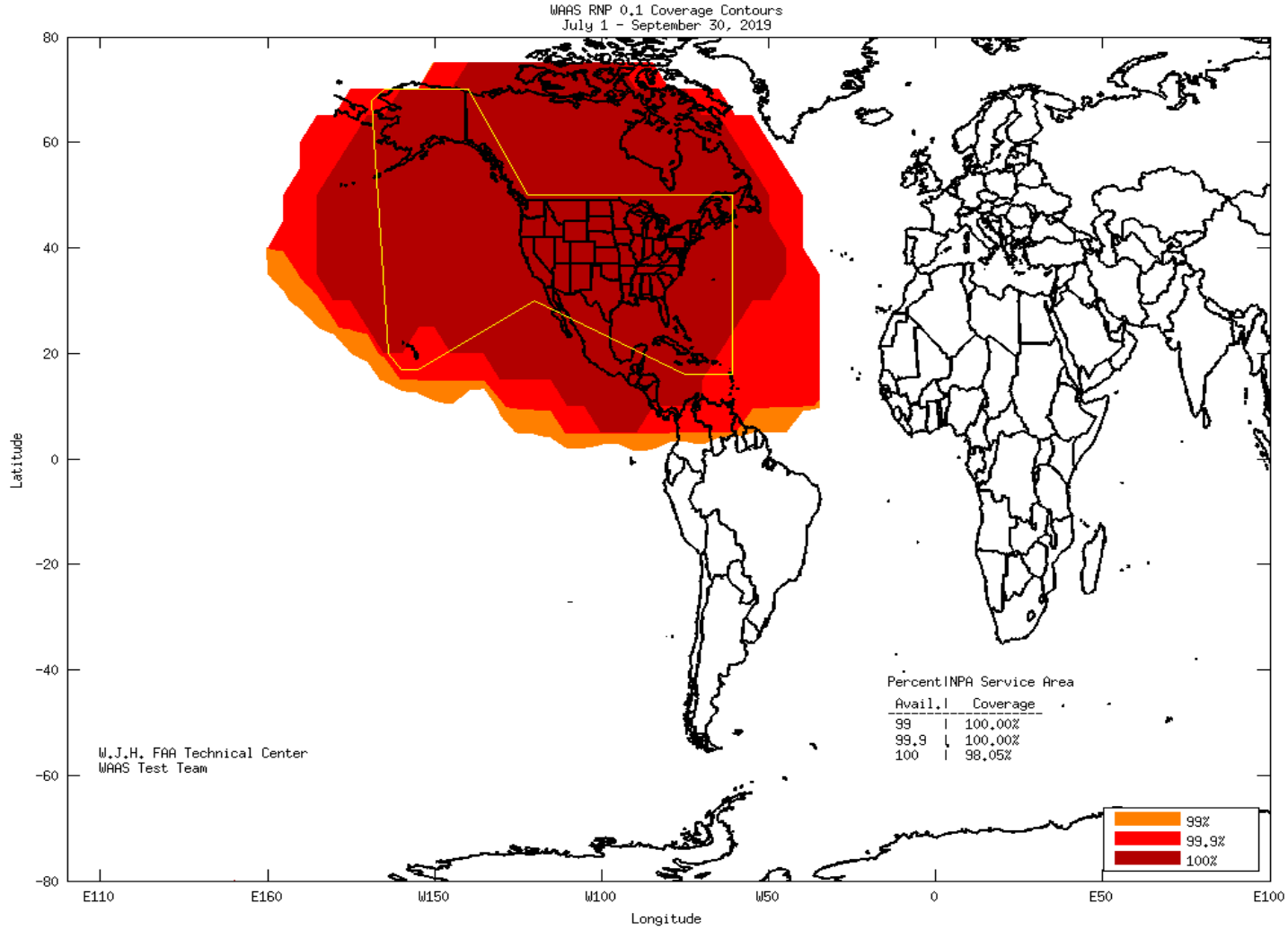


Figure 4-8 RNP 0.3 Coverage for the Quarter

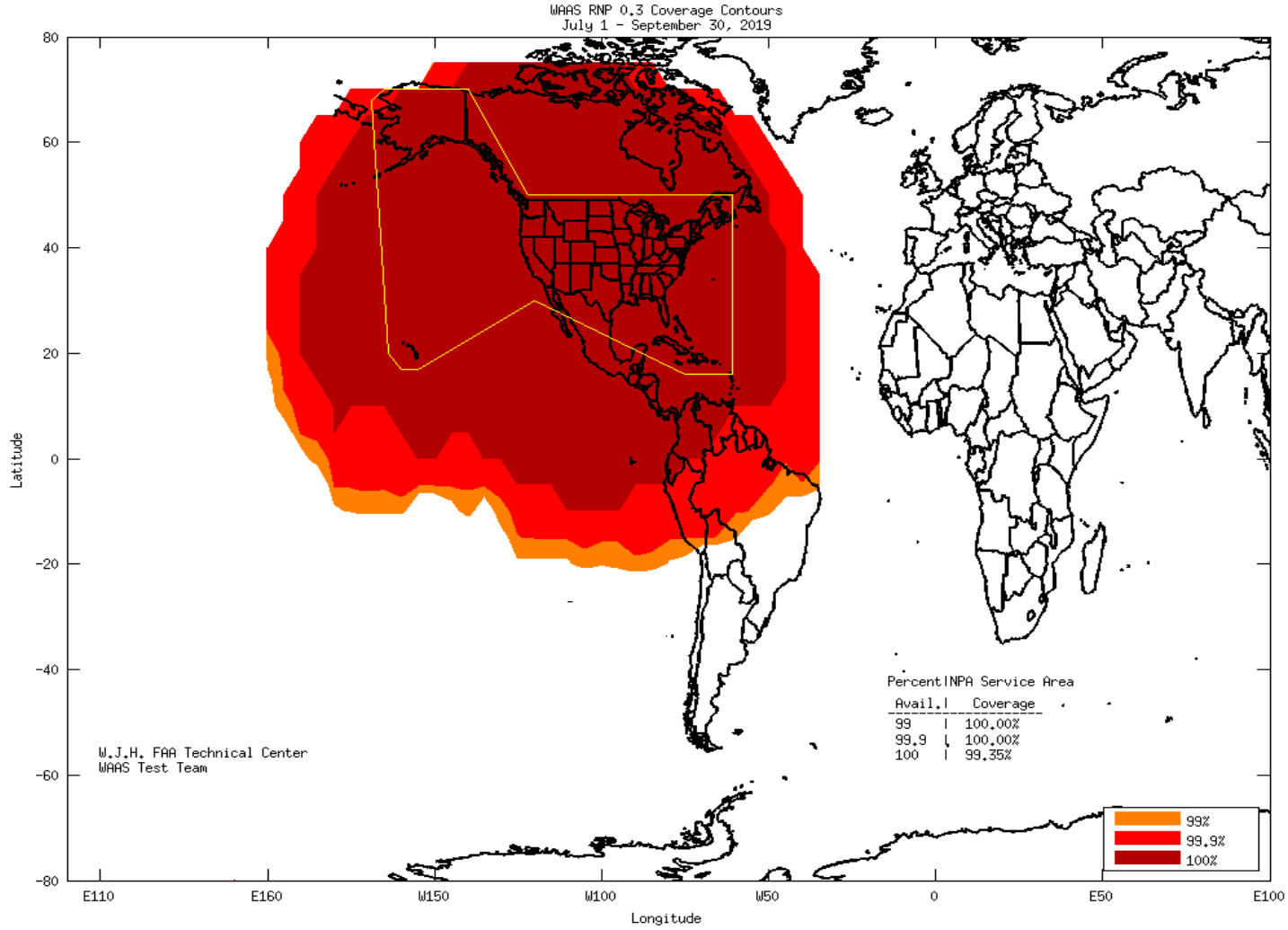
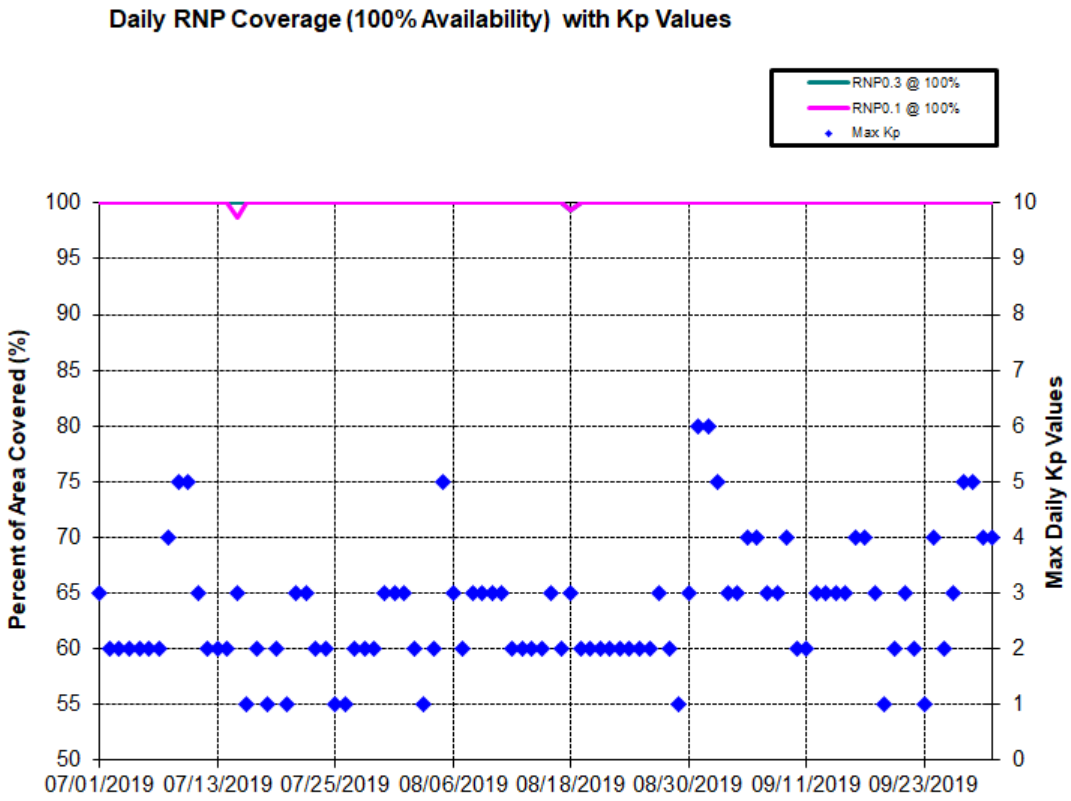


Figure 4-9 Daily RNP Coverage



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

- Apr 7–Jun 30–An increase in DOPs over Arizona reduced LPV200 coverage in the region.
- May 15–Jun 30–PRN24 set before PRN25 came into view over the Florida panhandle, reducing LPV200 coverage in the region.
- Jun 8–Jun 30–An increase in DOPs over the Gulf of Mexico along with the loss of ranging on PRN131 reduced LPV200 coverage in the region.
- Jun 11–Jun 30–Elevated UDREs on PRN21 reduced LPV200 coverage over California.
- Jun 17–Jun 30–Ranging was disabled on PRN131 which reduced LPV200 coverage in Alaska 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 4.605 at Arcata and there were no HMI events. There has not been an HMI event since WAAS was made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Horizontal Safety Index (meters)	Vertical Safety Index (meters)	Number of HMIs
Arcata	4.605	9.861	0
Atlantic City	6.311	5.410	0
Oklahoma City	12.694	8.110	0
Albuquerque	9.367	15.328	0
Anchorage	9.264	8.101	0
Atlanta	7.969	11.058	0
Barrow	5.783	6.077	0
Bethel	8.845	9.379	0
Billings	8.013	10.364	0
Boston	9.292	9.094	0
Chicago	9.876	7.848	0
Cleveland	9.503	10.019	0
Cold Bay	15.349	14.408	0
Dallas	8.324	9.673	0
Denver	11.278	7.807	0
Fairbanks	5.376	4.626	0
Gander	9.554	12.172	0
Goose Bay	7.671	7.724	0
Houston	8.268	7.776	0
Iqaluit	10.445	6.744	0
Jacksonville	9.321	7.432	0
Juneau	6.918	7.917	0
Kansas City	10.877	5.858	0
Kotzebue	7.641	6.112	0
Los Angeles	9.163	6.491	0
Memphis	7.535	8.912	0
Merida	17.373	14.448	0
Mexico City	8.914	10.012	0
Miami	9.935	6.403	0
Minneapolis	6.145	7.287	0
New York	9.364	7.766	0
Oakland	6.919	11.872	0
Puerto Vallarta	8.064	13.405	0
Salt Lake City	8.349	11.953	0
San Jose Del Cabo	21.734	6.614	0
Seattle	13.112	8.322	0
Washington DC	10.699	7.540	0
Winnipeg	6.103	7.822	0

5.2 Broadcast Alerts

The WAAS transmits alert messages for user protection when the active WAAS corrections are no longer bound by the UDREs. Alerts increase the UDRE for one or more PRNs, which can reduce the weighting of the satellite or

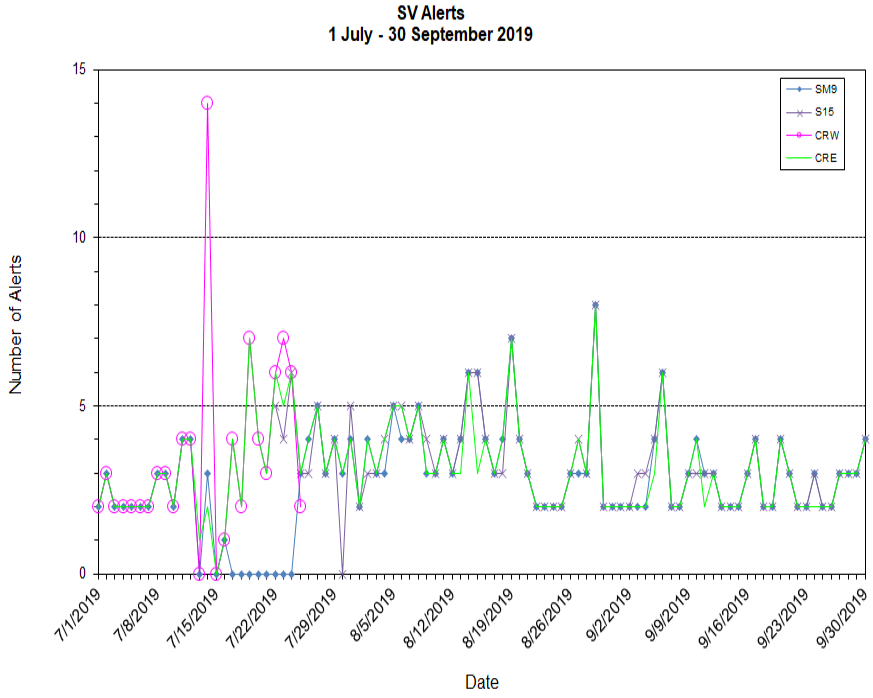
exclude the satellite from the navigation solution. An increase in UDREs after an alert effectively increases the user protection levels (HPL and VPL), which affects the availability. Additionally, if an alert message sequence lasts for more than 12 seconds, the WAAS fast corrections can time out and cause a loss of continuity. Table 5-2 shows the total number of alerts and the average number of alerts per day.

Table 5-2 WAAS SV Alert

	Number of Alerts				Average Alerts Per Day			
Message Type	SM9	S15	CRW	CRE	SM9	S15	CRW	CRE
T2	208	174	83	210	2.2609	2.4507	3.3200	2.2826
T3	61	49	55	62	0.6630	0.6901	2.2000	0.6739
T4	27	17	14	21	0.2935	0.2394	0.5600	0.8400
T5	0	0	0	0	0	0	0	0
T6	0	0	17	0	0	0	0.6800	0
T24	0	0	0	0	0	0	0	0
T26	0	0	0	0	0	0	0	0
Total SV Alerts :	296	240	169	293	3.2174	3.3803	6.7600	3.7965
Days in Service	92	71	25	92				

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

Figure 5-1 SV Daily Alert Trend



5.3 Availability of WAAS Messages (SM9, SM15, CRW, and CRE)

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

Table 5-3 Update Rates for WAAS Messages

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

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

For this quarter, statistics reported for late messages were mainly caused by GEO SIS outages, GUS switchovers, and SV alerts; excluding message type 7 and 10. Furthermore, the delay of message types 7 and 10 had little or no impact on user performance and safety. Table 5-4 through Table 5-8 show statistics for fast correction, long correction, ephemeris covariance, ionosphere correction, and ionospheric mask message rates broadcasted on SM9 GEO. Table 5-9 through Table 5-13 show statistics for message rates broadcasted on S15 GEO. CRW GEO. Table 5-14 through Table 5-18 show statistics for message rates broadcasted on CRW GEO. Table 5-19 through Table 5-23 show statistics for message rates broadcasted on CRE GEO.

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

Message Type	**On Time (number received)**	**Late (number received)**	**Max Late Length (seconds)**
1	104186	4	7928
2	1323979	82	7814
3	1323575	63	7814
4	1323395	119	7811
7	97344	15	7874
9	93046	3	7943
10	97352	7	7955
17	36012	1	8105

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	49171	0	0
2	47835	0	0
3	48300	0	0
5	47796	0	0
6	47579	0	0
7	47487	0	0
8	48484	0	0
9	46262	0	0
10	47446	0	0
11	49054	0	0
12	47228	0	0
13	49310	0	0
14	46935	0	0
15	47950	0	0
16	47938	0	0
17	47324	0	0
18	49199	0	0
19	46330	1	178
20	46013	0	0
21	48284	0	0
22	48703	0	0
23	47204	0	0
24	49683	0	0
25	48688	0	0
26	48428	0	0
27	49204	0	0
28	48031	0	0
29	47431	0	0
30	47173	0	0
31	48005	0	0
32	46531	0	0

*Note: Statistics not included when satellite UDREi is “Not Monitored” or “Do Not Use.”

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	40404	2	141
2	39264	1	128
3	39692	1	7903
5	39222	1	128
6	38999	0	0
7	38974	1	122
8	39818	0	0
9	38012	0	0
10	38924	0	0
11	40277	0	0
12	38810	2	157
13	40508	7	216
14	38568	1	164
15	39350	0	0
16	39341	1	176

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
17	38875	2	7908
18	40401	4	210
19	38028	2	7993
20	37767	3	160
21	39672	2	240
22	40053	1	152
23	38781	2	128
24	40788	3	184
25	40000	2	176
26	39764	0	0
27	40441	3	192
28	39463	1	134
29	38964	0	0
30	38720	0	0
31	39382	2	186
32	38181	0	0
131	49834	1	13193
133	64369	6	7824
135	20576	1	152
138	75826	5	4277

*Note: Statistics not included when satellite UDREi is “Not Monitored” or “Do Not Use.”

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	27550	12	7825
0	1	27552	9	8352
0	2	27573	9	8070
1	0	27544	14	8066
1	1	27554	13	8064
1	2	27545	15	8077
1	3	27558	14	8078
1	4	27552	9	8078
2	0	27549	12	8082
2	1	27550	11	8083
2	2	27568	11	8067
2	3	27552	8	8072
2	4	27568	11	8070
3	0	27546	9	8064
3	1	27562	12	8065
3	2	27556	10	8065
9	0	27564	6	8076
9	1	27553	8	8077
9	2	27546	10	8070
9	3	27554	10	8066
9	4	27562	10	8067
9	5	27549	11	8066
9	6	27547	13	8065

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35741	1	7908
1	35764	1	7945
2	35721	2	8136
3	35803	3	8175
9	35775	3	8127

Table 5-9 WAAS Fast Correction and Degradation Message Rates–S15

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	80291	4	182
2	1022802	66	26
3	1022444	62	20
4	1022281	111	23
7	75002	13	139
9	71880	0	0
10	74869	12	169
17	25542	6	523

Table 5-10 WAAS Long Correction Message Rates (Type 24 and 25)–S15

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	37981	0	0
2	36897	1	162
3	37389	1	175
5	36898	0	0
6	36936	0	0
7	36605	0	0
8	37373	1	165
9	35732	0	0
10	36605	0	0
11	37892	0	0
12	36525	0	0
13	38018	1	170
14	36335	0	0
15	36950	1	152
16	36961	0	0
17	36564	1	162
18	37993	0	0
19	35857	0	0
20	35483	0	0
21	37247	0	0
22	37662	0	0
23	36693	0	0
24	38402	1	165
25	37853	0	0
26	37348	0	0
27	37945	0	0
28	37162	1	170
29	36620	0	0
30	36472	1	152

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
31	37125	2	183
32	36027	2	183

Table 5-11 WAAS Ephemeris Covariance Message Rates (Type 28)–S15

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	31209	5	209
2	30293	1	203
3	30719	1	206
5	30272	1	130
6	30275	2	206
7	30040	3	176
8	30693	2	125
9	29355	2	152
10	30042	2	136
11	31097	3	176
12	30017	2	204
13	31250	1	154
14	29855	2	129
15	30310	1	122
16	30341	1	144
17	30033	0	0
18	31195	4	212
19	29445	0	0
20	29119	8	209
21	30608	1	184
22	30979	0	0
23	30144	2	208
24	31500	5	202
25	31100	0	0
26	30649	1	207
27	31213	2	187
28	30544	1	212
29	30075	0	0
30	29955	0	0
31	30458	1	130
32	29563	4	204
131	49833	2	13217
133	58659	5	4260
135	3135	0	0
138	58409	4	32798

Table 5-12 WAAS Ionospheric Correction Message Rates (Type 26)–S15

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	21290	7	407
0	1	21280	12	547
0	2	21284	9	401
1	0	21289	11	460
1	1	21276	11	578
1	2	21276	15	498
1	3	21282	12	504

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	4	21281	13	504
2	0	21280	14	498
2	1	21280	11	498
2	2	21282	10	512
2	3	21280	9	483
2	4	21288	10	490
3	0	21284	10	471
3	1	21289	9	466
3	2	21287	4	338
9	0	21283	8	345
9	1	21280	5	508
9	2	21275	8	491
9	3	21283	11	578
9	4	21287	11	582
9	5	21281	10	497
9	6	21274	9	507

Table 5-13 WAAS Ionospheric Mask Message Rates (Type 18)–S15

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	27562	2	415
1	27579	0	0
2	27587	1	361
3	27567	0	0
9	27543	2	405

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	29173	5	172
2	356924	62	10
3	356855	52	11
4	356689	79	11
7	27201	7	146
9	25080	0	0
10	27093	6	150
17	13134	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	13353	0	0
2	12914	0	0
3	13089	0	0
5	12820	0	0
6	12698	0	0
7	12795	0	0
8	13172	0	0
9	12482	0	0
10	12825	0	0
11	13264	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
12	12709	0	0
13	13240	0	0
14	12703	0	0
15	12924	0	0
16	12886	0	0
17	12860	0	0
18	13310	0	0
19	12498	0	0
20	12160	0	0
21	12949	0	0
22	13221	0	0
23	12551	0	0
24	13463	0	0
25	12881	0	0
26	12964	0	0
27	13278	0	0
28	13014	0	0
29	12713	0	0
30	12622	0	0
31	12904	0	0
32	12590	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	10966	2	129
2	10597	0	0
3	10754	0	0
5	10519	3	166
6	10407	0	0
7	10500	1	200
8	10821	0	0
9	10252	1	179
10	10494	0	0
11	10923	1	200
12	10442	0	0
13	10869	0	0
14	10436	0	0
15	10609	0	0
16	10577	0	0
17	10572	1	170
18	10933	0	0
19	10261	1	144
20	9991	1	146
21	10633	0	0
22	10870	1	178
23	10315	1	144
24	11074	2	141
25	10580	0	0
26	10649	1	193
27	10908	2	188
28	10691	0	0
29	10447	1	179

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
30	10359	0	0
31	10589	0	0
32	10342	1	123
133	8866	0	0
135	20578	0	0
138	20607	1	177

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	7409	8	422
0	1	7414	7	439
0	2	7410	7	447
1	0	7428	5	484
1	1	7419	3	518
1	2	7420	2	518
1	3	7415	3	518
1	4	7417	5	548
2	0	7420	2	547
2	1	7425	2	444
2	2	7422	4	421
2	3	7419	3	427
2	4	7410	8	389
3	0	7415	7	402
3	1	7414	7	416
3	2	7416	6	393
9	0	7415	7	416
9	1	7417	5	416
9	2	7420	6	416
9	3	7414	8	434
9	4	7409	9	429
9	5	7411	10	433
9	6	7414	7	422

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	9760	1	412
1	9727	0	0
2	9777	0	0
3	9765	2	313
9	9750	3	391

Table 5-19 WAAS Fast Correction and Degradation Message Rates–CRE

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	107455	3	306
2	1325205	80	237
3	1324776	72	242
4	1324578	131	241
7	100064	14	351

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
9	93124	2	352
10	99937	13	337
17	36257	4	526

Table 5-20 WAAS Long Correction Message Rates (Type 24 and 25)–CRE

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	49190	0	0
2	47921	0	0
3	48379	0	0
5	47845	0	0
6	47655	0	0
7	47473	0	0
8	48472	1	167
9	46319	3	344
10	47434	0	0
11	49039	0	0
12	47306	2	330
13	49298	0	0
14	47025	1	257
15	47936	0	0
16	47930	0	0
17	47413	0	0
18	49204	0	0
19	46427	0	0
20	46005	0	0
21	48258	0	0
22	48760	0	0
23	47273	2	253
24	49776	2	256
25	48768	1	329
26	48426	1	325
27	49190	1	344
28	48088	0	0
29	47484	2	258
30	47154	0	0
31	48058	0	0
32	46590	0	0

Table 5-21 WAAS Ephemeris Covariance Message Rates (Type 28)–CRE

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	40411	1	176
2	39326	2	312
3	39766	1	312
5	39279	1	171
6	39072	0	0
7	38954	1	123
8	39807	2	316
9	38047	4	418
10	38915	0	0
11	40257	2	184

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
12	38875	4	310
13	40506	2	184
14	38622	3	311
15	39331	0	0
16	39332	0	0
17	38939	3	171
18	40398	1	192
19	38114	2	312
20	37763	1	136
21	39684	2	310
22	40089	2	312
23	38848	4	316
24	40854	3	345
25	40072	1	311
26	39764	1	312
27	40437	1	312
28	39527	1	128
29	39004	4	316
30	38721	0	0
31	39421	0	0
32	38233	0	0
131	49798	4	312
133	64458	7	4249
135	20574	1	172
138	75879	3	32870

Table 5-22 WAAS Ionospheric Correction Message Rates (Type 26)–CRE

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	27570	13	579
0	1	27573	12	583
0	2	27569	12	583
1	0	27547	17	584
1	1	27550	19	584
1	2	27566	16	581
1	3	27573	10	578
1	4	27562	10	578
2	0	27580	10	579
2	1	27553	12	579
2	2	27580	13	577
2	3	27569	11	577
2	4	27577	8	577
3	0	27557	11	577
3	1	27570	10	584
3	2	27579	8	588
9	0	27579	7	591
9	1	27566	12	577
9	2	27553	13	577
9	3	27567	16	580
9	4	27565	10	576
9	5	27568	10	581
9	6	27569	10	581

Table 5-23 WAAS Ionospheric Mask Message Rates (Type 18)–CRE

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	36175	4	464
1	36123	3	459
2	36147	4	474
3	36150	4	469
9	36145	4	462

5.4 Satellite Glitches

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

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

For this reporting period, severity zero glitches were observed for a short period of time daily on PRN9 and PRN12 when more than 14 GPS satellites were visible to the Alaska region. An unusually high number of severity three glitches were observed on PRN18; however, PRN18 occupies a redundant slot in the constellation and had no impact on WAAS performance.

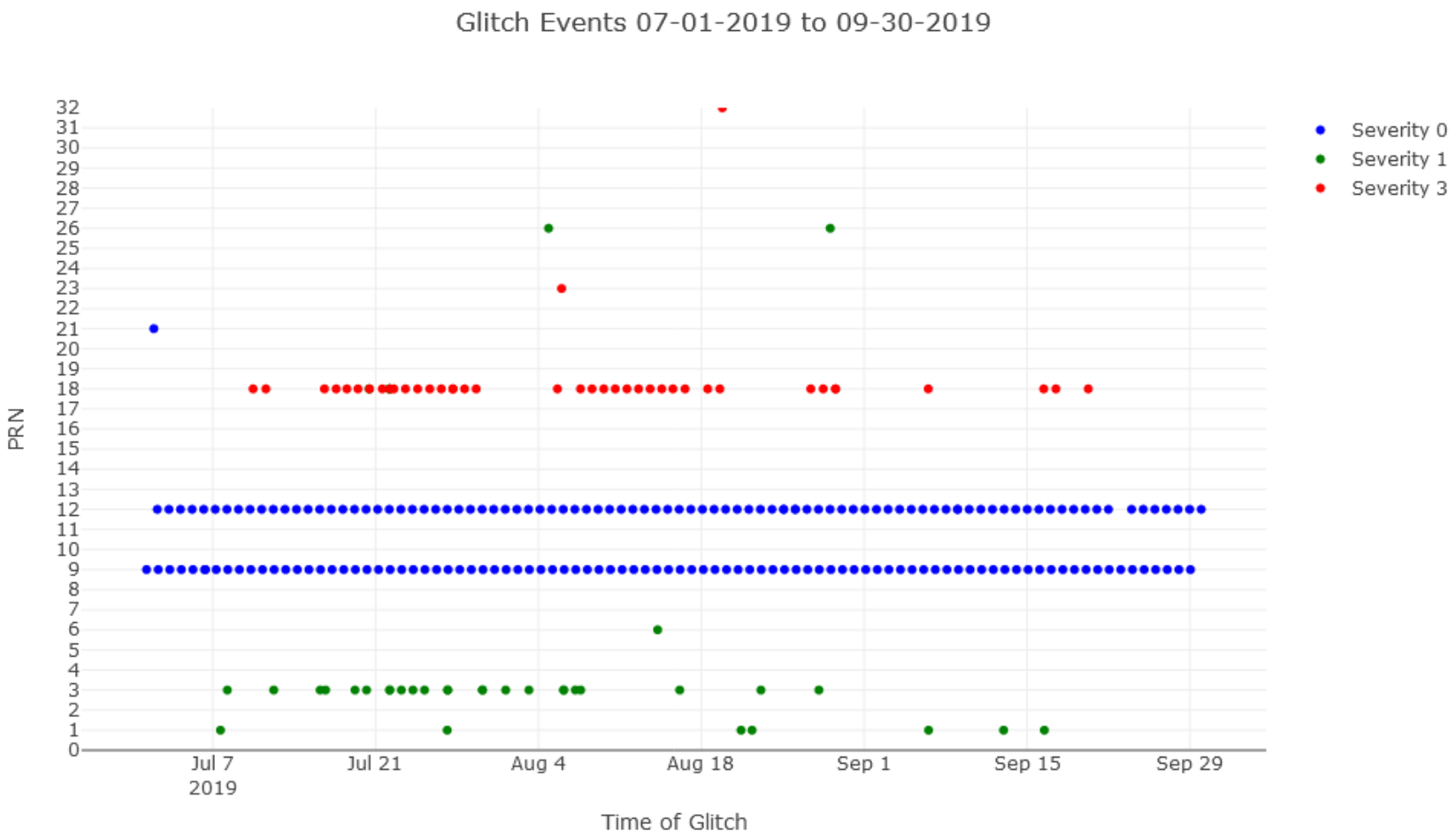


Figure 5-2. SV Glitch Trend

6.0 SV RANGE ACCURACY

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

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

Table 6-1. Range Error 95% Index and 3.29 Sigma Bounding

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1*	0.802	100	0.875	100	1.100	100	0.877	100	1.396	100	0.903	100
2	0.785	100	0.900	100	0.792	100	0.913	100	1.253	100	1.088	100
3*	0.940	100	2.006	100	1.536	100	0.832	100	1.313	100	1.624	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.827	100	1.247	100	0.978	100	1.076	100	1.038	100	0.731	100
6*	0.783	100	1.007	100	0.759	100	0.833	100	0.859	100	1.042	100
7	0.945	100	0.858	100	1.174	100	1.007	100	1.426	100	1.096	100
8*	0.967	100	0.926	100	1.120	100	1.250	100	0.899	100	0.873	100
9*	1.059	100	0.898	100	1.059	100	1.020	100	1.040	100	0.843	100
10	0.830	100	1.066	100	0.785	100	1.143	100	1.293	100	1.303	100
11	1.141	100	1.140	100	1.212	100	0.971	100	0.996	100	1.339	100
12	0.975	100	1.039	100	1.977	100	1.084	100	1.158	100	1.124	100
13	1.024	100	0.978	100	1.211	100	1.305	100	0.873	100	0.977	100
14	1.128	100	1.455	100	0.782	100	1.081	100	0.877	100	1.192	100
15	1.463	100	1.192	100	1.145	100	1.002	100	0.959	100	0.756	100
16	0.980	100	0.820	100	1.234	100	1.016	100	0.893	100	0.775	100
17	0.872	100	1.626	100	0.909	100	1.038	100	1.199	100	1.177	100
18	1.348	100	1.104	100	1.092	100	1.239	100	1.166	100	0.771	100
19	0.764	100	0.828	100	0.911	100	0.925	100	1.272	100	1.028	100
20	1.149	100	1.146	100	0.904	100	1.131	100	1.099	100	1.194	100
21	0.839	100	1.039	100	1.164	100	1.000	100	1.067	100	0.778	100
22	0.979	100	1.103	100	1.137	100	1.273	100	1.288	100	1.222	100
23	0.942	100	1.162	100	1.060	100	1.013	100	1.571	100	0.718	100
24*	0.833	100	0.956	100	0.925	100	1.387	100	1.282	100	1.080	100
25*	0.978	100	1.292	100	0.994	100	1.002	100	1.491	100	1.728	100
26*	1.135	100	0.749	100	0.879	100	0.923	100	0.914	100	0.911	100
27*	1.152	100	0.943	100	1.314	100	0.958	100	0.747	100	0.800	100
28	1.135	100	1.195	100	1.552	100	1.563	100	0.827	100	1.389	100
29	1.048	100	0.948	100	0.815	100	0.973	100	1.224	100	1.245	100
30*	1.202	100	1.217	100	0.976	100	1.008	100	1.119	100	0.683	100
31	0.848	100	0.803	100	0.943	100	0.906	100	0.894	100	0.807	100
32	1.358	100	0.933	100	1.072	100	1.067	100	1.205	100	1.020	100
131	1.626	100	1.344	100	1.167	100	1.847	100	1.489	100	1.137	100

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
135	3.400	100	2.581	100	1.583	100	1.394	100	1.761	100	2.004	100
138	1.804	100	1.619	100	2.007	100	1.550	100	1.450	100	1.146	100

*Note: Reduced ranging bounding on Block IIF space vehicles 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		LosAngeles		Atlanta	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1*	0.872	100	1.288	100	0.889	100	1.106	100	1.297	100	0.744	100
2	0.887	100	1.394	100	0.889	100	1.477	100	1.045	100	0.786	100
3*	0.920	100	0.942	100	1.117	100	0.887	100	1.327	100	1.173	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	1.096	100	1.104	100	0.874	100	2.022	100	1.078	100	0.834	100
6*	0.962	100	2.645	100	0.907	100	0.995	100	1.223	100	0.824	100
7	0.821	100	2.352	100	0.766	100	0.686	100	1.158	100	0.844	100
8*	1.197	100	1.163	100	0.928	100	1.949	100	1.432	100	1.035	100
9*	0.949	100	1.067	100	0.887	100	0.916	100	1.235	100	0.859	100
10	1.361	100	0.783	100	0.824	100	0.765	100	0.886	100	0.735	100
11	1.601	100	1.000	100	1.031	100	1.124	100	1.513	100	1.193	100
12	1.166	100	1.108	100	1.068	100	1.157	100	1.114	100	0.950	100
13	0.952	100	1.043	100	0.847	100	0.914	100	0.923	100	0.904	100
14	0.977	100	0.876	100	1.032	100	0.727	100	0.827	100	0.831	100
15	1.047	100	1.099	100	0.854	100	1.240	100	1.497	100	0.784	100
16	1.710	100	0.880	100	0.866	100	2.774	100	1.301	100	0.802	100
17	1.834	100	1.365	100	0.825	100	1.722	100	1.125	100	0.865	100
18	0.905	100	1.071	100	1.517	100	1.093	100	1.030	100	0.911	100
19	1.851	100	0.843	100	1.257	100	0.866	100	0.880	100	0.926	100
20	1.037	100	2.012	100	1.047	100	1.012	100	1.085	100	0.966	100
21	1.269	100	0.826	100	0.691	100	0.998	100	0.871	100	1.097	100
22	1.199	100	1.193	100	0.764	100	1.162	100	1.297	100	1.255	100
23	1.202	100	0.867	100	0.831	100	0.973	100	1.155	100	0.839	100

Site	Billings		Miami		Albuquerque		Kansas City		LosAngeles		Atlanta	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
24*	0.996	100	1.052	100	1.011	100	1.433	100	1.097	100	0.854	100
25*	1.420	100	0.834	100	0.943	100	0.942	100	1.028	100	0.733	100
26*	0.828	100	0.743	100	0.827	100	0.757	100	1.339	100	0.757	100
27*	1.182	100	1.053	100	1.393	100	1.094	100	1.035	100	0.811	100
28	0.825	100	1.498	100	1.120	100	0.818	100	0.954	100	1.129	100
29	0.838	100	0.883	100	0.847	100	0.992	100	1.040	100	0.908	100
30*	1.293	100	0.854	100	0.798	100	0.714	100	1.159	100	0.892	100
31	0.876	100	1.206	100	0.855	100	1.754	100	1.209	100	0.820	100
32	1.373	100	0.899	100	1.339	100	0.877	100	0.916	100	0.871	100
131	1.637	100	1.082	100	1.843	100	1.670	100	1.951	100	1.504	100
135	1.690	100	1.812	100	1.416	100	1.469	100	1.692	100	1.442	100
138	1.204	100	2.001	100	1.359	100	2.212	100	3.037	100	1.259	100

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

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

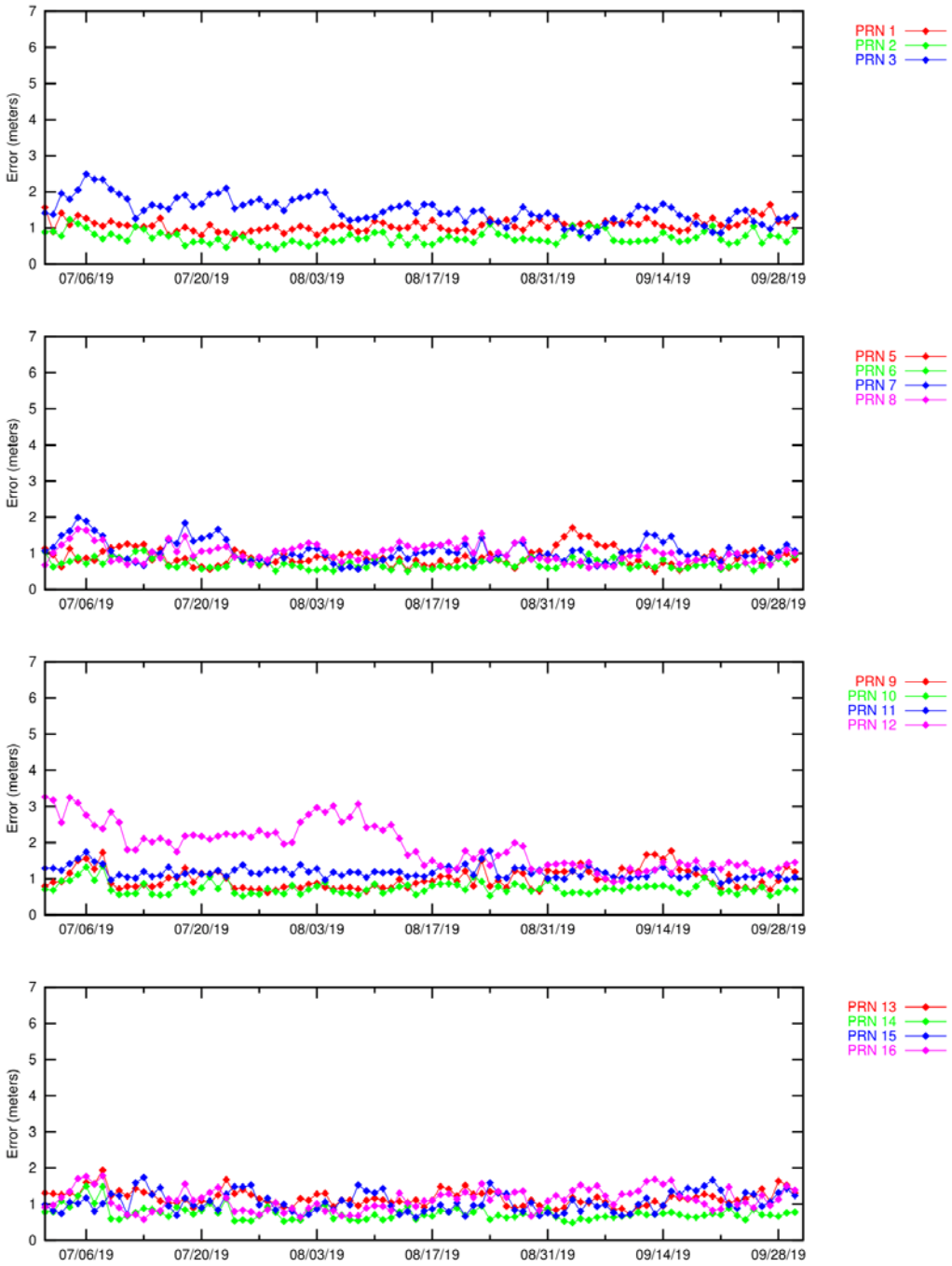
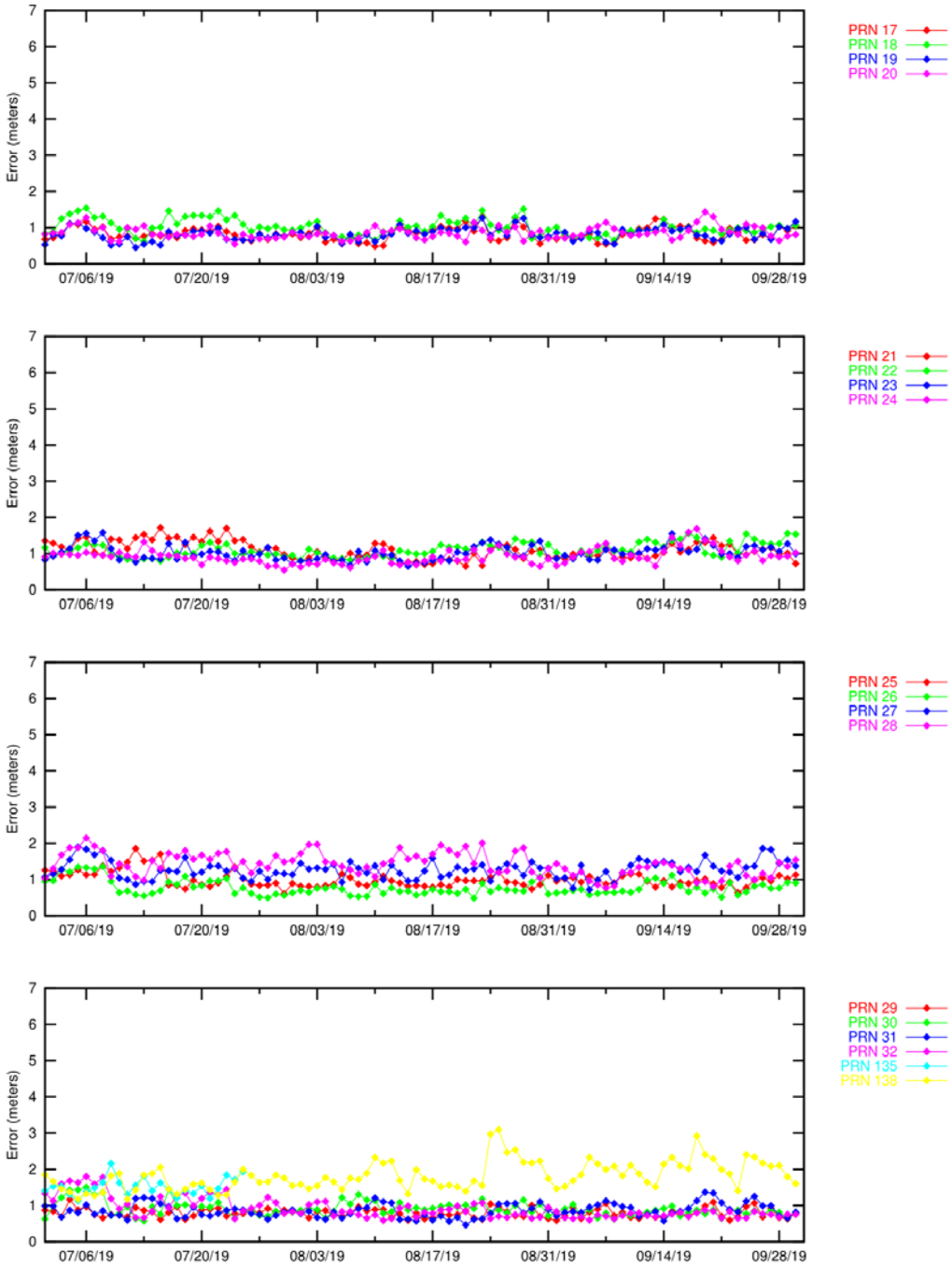


Figure 6-2. Range Error (PRN17 – PRN32) – Washington D.C.



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

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

6-3 and Figure 6-4 show the 95% ionospheric error for each SV measured by the WAAS receiver at the Chicago reference station.

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

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1	0.335	100	0.435	100	0.383	100	0.462	100	0.639	100	0.288	100
2	0.385	100	0.577	100	0.292	100	0.353	100	0.688	100	0.457	100
3	0.499	100	1.042	100	0.448	100	0.361	100	0.551	100	0.494	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.227	100	0.469	100	0.410	100	0.332	100	0.450	100	0.331	100
6	0.347	100	0.562	100	0.345	100	0.319	100	0.533	100	0.599	100
7	0.339	100	0.366	100	0.269	100	0.350	100	0.579	100	0.540	100
8	0.305	100	0.334	100	0.297	100	0.395	100	0.522	100	0.259	100
9	0.316	100	0.453	100	0.346	100	0.280	100	0.424	100	0.351	100
10	0.354	100	0.425	100	0.389	100	0.454	100	0.737	100	0.741	100
11	0.319	100	0.333	100	0.234	100	0.355	100	0.407	100	0.402	100
12	0.293	100	0.410	100	0.632	100	0.403	100	0.395	100	0.557	100
13	0.390	100	0.350	100	0.320	100	0.315	100	0.367	100	0.396	100
14	0.603	100	0.866	100	0.352	100	0.478	100	0.751	100	0.818	100
15	0.476	100	0.351	100	0.309	100	0.369	100	0.397	100	0.284	100
16	0.321	100	0.405	100	0.478	100	0.342	100	0.527	100	0.270	100
17	0.269	100	0.869	100	0.260	100	0.330	100	0.664	100	0.535	100
18	0.505	100	0.305	100	0.267	100	0.400	100	0.463	100	0.353	100
19	0.297	100	0.367	100	0.388	100	0.277	100	0.510	100	0.585	100
20	0.332	100	0.487	100	0.335	100	0.380	100	0.506	100	0.396	100
21	0.287	100	0.432	100	0.581	100	0.432	100	0.484	100	0.338	100
22	0.302	100	0.336	100	0.392	100	0.454	100	0.414	100	0.553	100
23	0.294	100	0.658	100	0.651	100	0.402	100	0.849	100	0.376	100
24	0.325	100	0.347	100	0.311	100	0.425	100	0.309	100	0.313	100
25	0.329	100	0.491	100	0.215	100	0.251	100	0.604	100	0.823	100
26	0.395	100	0.286	100	0.367	100	0.333	100	0.294	100	0.293	100
27	0.378	100	0.539	100	0.320	100	0.576	100	0.355	100	0.321	100
28	0.542	100	0.306	100	0.396	100	0.525	100	0.309	100	0.572	100
29	0.315	100	0.471	100	0.349	100	0.354	100	0.654	100	0.487	100
30	0.296	100	0.612	100	0.549	100	0.391	100	0.519	100	0.290	100
31	0.256	100	0.412	100	0.271	100	0.313	100	0.644	100	0.343	100
32	0.718	100	0.430	100	0.603	100	0.476	100	0.811	100	0.558	100

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

Site	Billings		Miami		Albuquerque		Kansas City		Atlanta		Los Angeles	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1	0.368	100	0.574	100	0.342	100	0.433	100	0.311	100	0.494	100
2	0.476	100	0.631	100	0.389	100	0.553	100	0.310	100	0.323	100
3	0.335	100	0.372	100	0.447	100	0.480	100	0.684	100	0.335	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.585	100	0.435	100	0.365	100	0.975	100	0.278	100	0.548	100
6	0.506	100	1.044	100	0.422	100	0.538	100	0.447	100	0.548	100
7	0.384	100	1.137	100	0.313	100	0.293	100	0.297	100	0.237	100
8	0.464	100	0.288	100	0.493	100	0.736	100	0.345	100	0.522	100
9	0.503	100	0.500	100	0.477	100	0.433	100	0.281	100	0.250	100
10	0.695	100	0.296	100	0.383	100	0.422	100	0.205	100	0.391	100
11	0.376	100	0.294	100	0.440	100	0.340	100	0.358	100	0.610	100
12	0.453	100	0.362	100	0.403	100	0.397	100	0.364	100	0.371	100
13	0.423	100	0.332	100	0.342	100	0.275	100	0.283	100	0.362	100
14	0.388	100	0.367	100	0.551	100	0.281	100	0.311	100	0.604	100
15	0.327	100	0.329	100	0.318	100	0.596	100	0.238	100	0.505	100
16	0.602	100	0.303	100	0.331	100	1.203	100	0.294	100	0.352	100
17	1.048	100	0.546	100	0.397	100	0.800	100	0.264	100	0.376	100
18	0.283	100	0.479	100	0.493	100	0.445	100	0.247	100	0.446	100
19	1.079	100	0.275	100	0.765	100	0.388	100	0.268	100	0.413	100
20	0.738	100	1.083	100	0.347	100	0.533	100	0.350	100	0.359	100
21	0.544	100	0.441	100	0.314	100	0.287	100	0.474	100	0.420	100
22	0.460	100	0.464	100	0.451	100	0.445	100	0.425	100	0.354	100
23	0.505	100	0.429	100	0.477	100	0.520	100	0.402	100	0.377	100
24	0.236	100	0.428	100	0.445	100	0.540	100	0.266	100	0.326	100
25	0.534	100	0.276	100	0.404	100	0.184	100	0.319	100	0.300	100
26	0.277	100	0.208	100	0.321	100	0.359	100	0.257	100	0.445	100
27	0.336	100	0.499	100	0.559	100	0.359	100	0.260	100	0.348	100
28	0.481	100	0.675	100	0.570	100	0.400	100	0.290	100	0.487	100
29	0.414	100	0.452	100	0.398	100	0.368	100	0.465	100	0.386	100
30	0.460	100	0.376	100	0.368	100	0.272	100	0.333	100	0.252	100
31	0.365	100	0.885	100	0.349	100	0.891	100	0.259	100	0.332	100
32	0.799	100	0.498	100	0.728	100	0.531	100	0.471	100	0.651	100

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

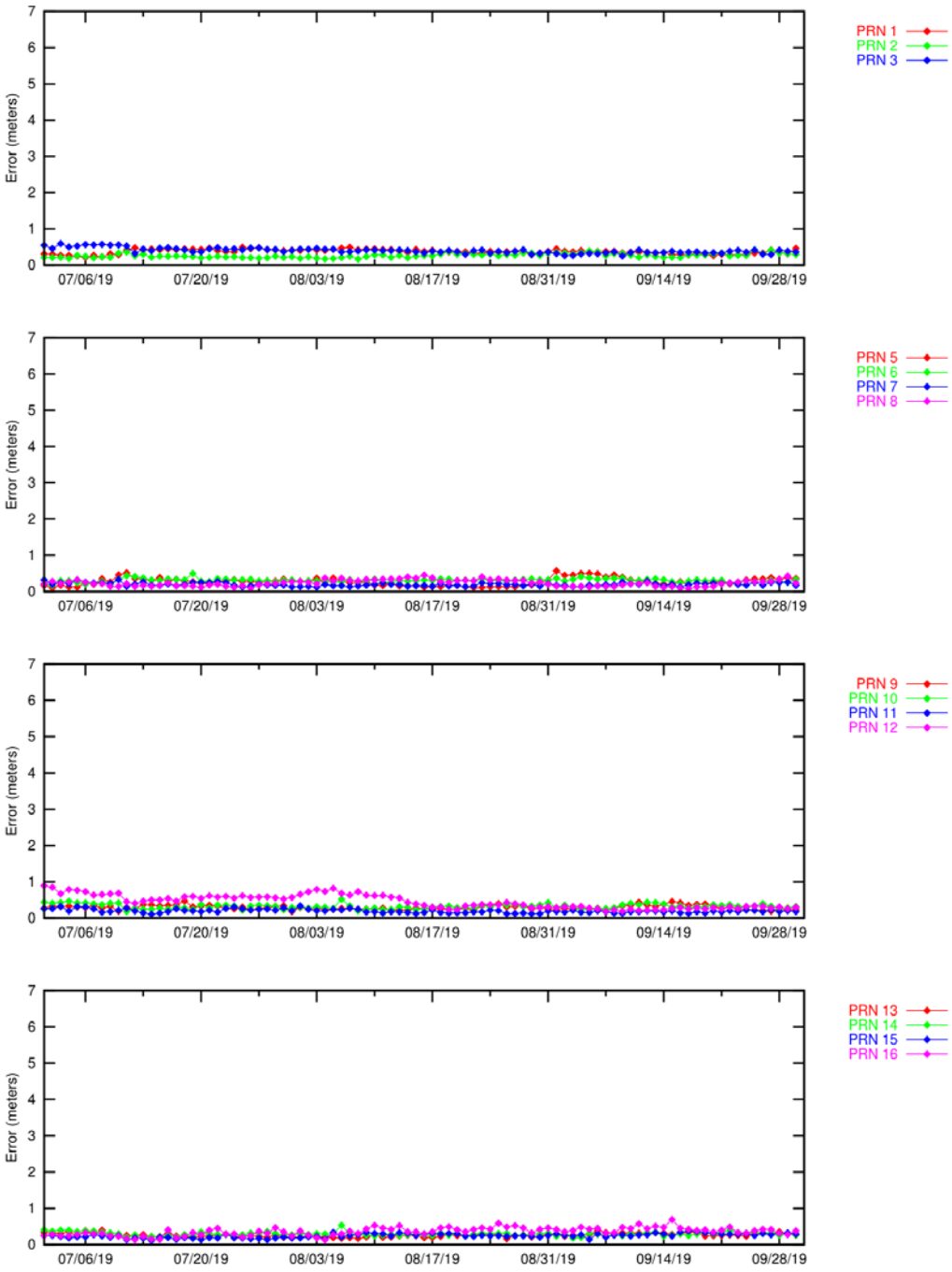
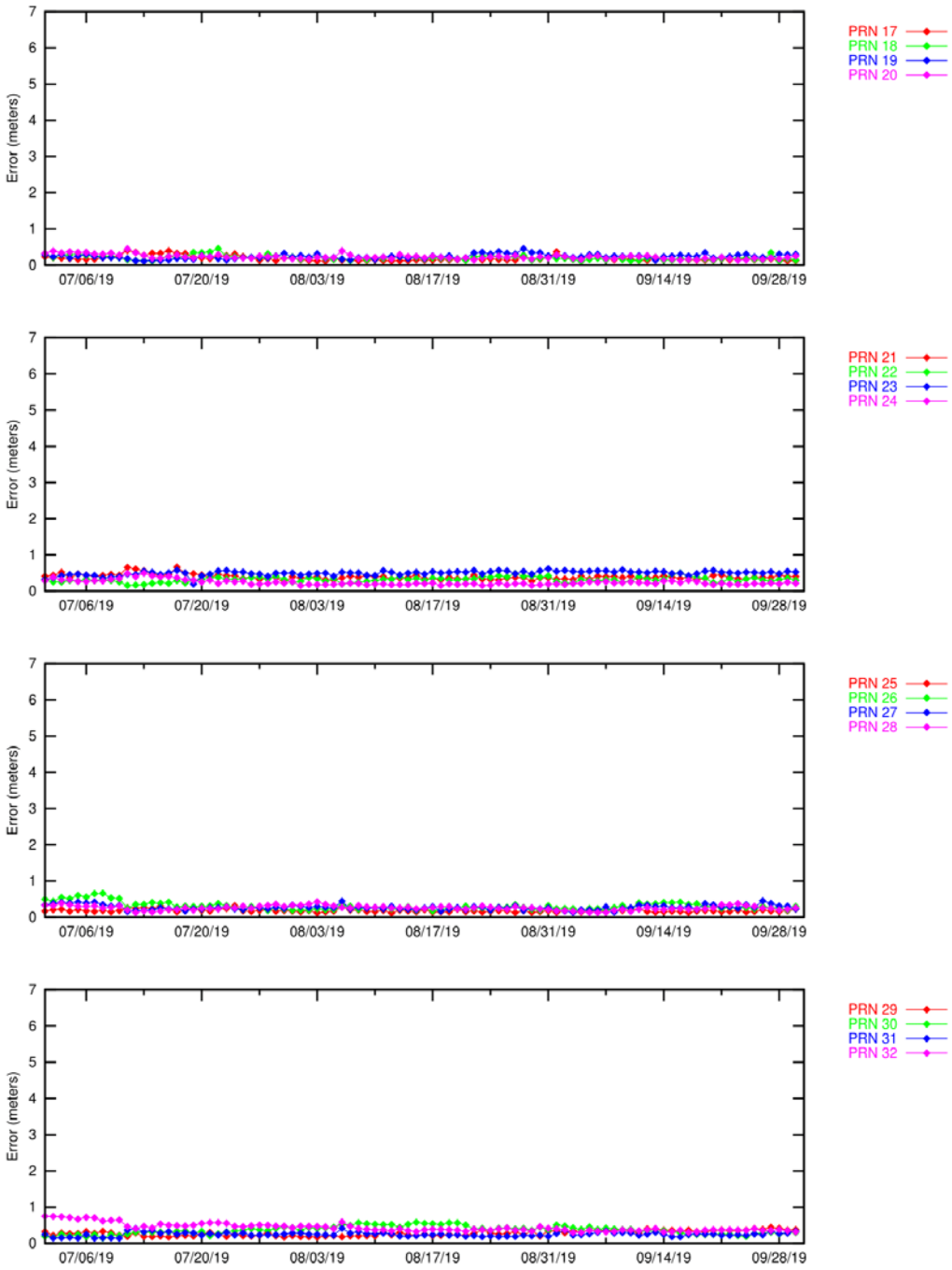


Figure 6-4. Ionospheric Error (PRN17 – PRN32) – Washington D.C.



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

7.0 GEO RANGING PERFORMANCE

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

Table 7-1 shows the GEO PA and NPA ranging availability as well as the percentage of time the GEO UDRE was set to "Not Monitored" and "Do Not Use." Figure 7-1 to Figure 7-4 show the trend of SM9, SM15, CRW, and CRE GEO PA ranging availability, respectively. Note that CRW was decommissioned from WAAS service on 7/25/2019. S15 was operational on 7/15/2019.

The reductions in SM9 GEO PA, CRW GEO PA and CRE GEO PA ranging availability were due to GUS switchovers (see Figure 7-1 to Figure 7-4). Refer to Table 1-7 for detailed information on the GUS switchovers for this reporting period.

Table 7-1. GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	65.12	0.03	34.81	0.04
SM9 131	S15	99.12	0.11	0.62	0.15
SM9 131	CRW	99.99	0.00	0.01	0.00
SM9 131	CRE	99.00	0.08	0.92	0.00
S15 133	SM9	84.38	0.04	15.57	0.00
S15 133	S15	99.25	0.11	0.49	0.15
S15 133	CRW	99.99	0.00	0.01	0.00
S15 133	CRE	98.83	0.11	1.06	0.00
CRW 135	SM9	0.00	0.00	99.86	0.14
CRW 135	S15	97.38	0.30	1.30	1.02
CRW 135	CRW	99.99	0.00	0.01	0.00
CRW 135	CRE	99.99	0.00	0.01	0.00
CRE 138	SM9	65.12	0.03	34.81	0.04
CRE 138	S15	99.24	0.11	0.50	0.15
CRE 138	CRW	99.99	0.00	0.01	0.00
CRE 138	CRE	99.00	0.08	0.92	0.00

Figure 7-1. Daily PA SM9 GEO Ranging Availability Trend

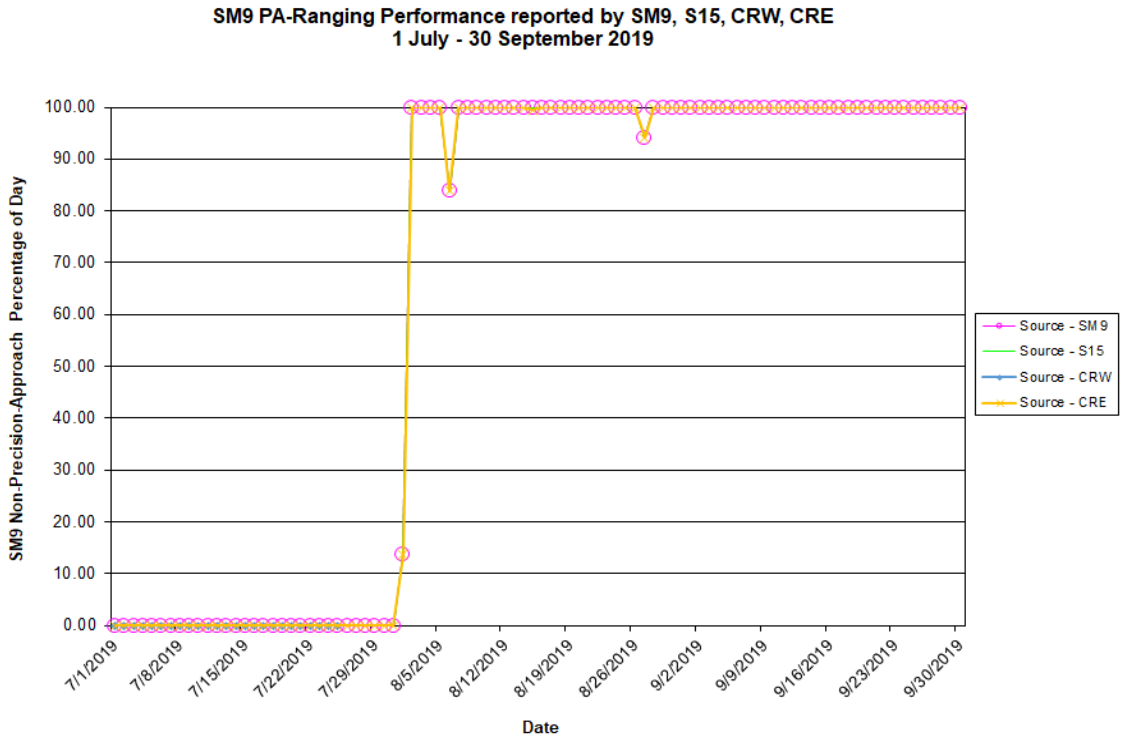


Figure 7-2. Daily PA SM15 GEO Ranging Availability Trend

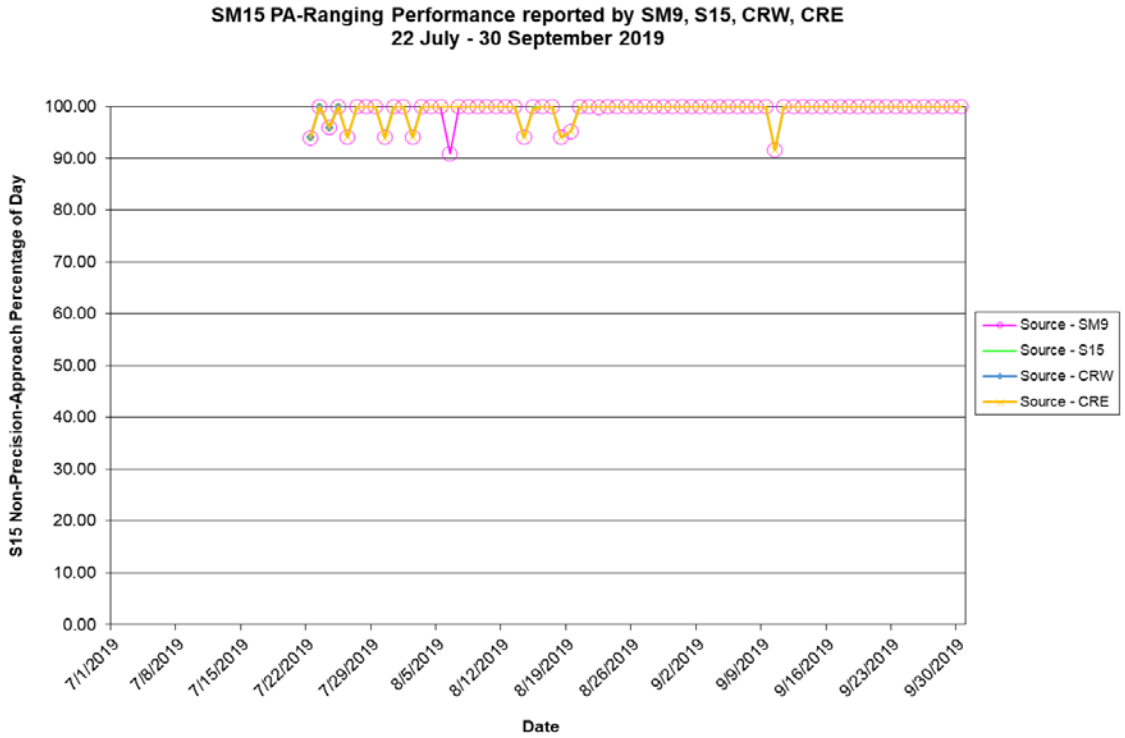


Figure 7-3. Daily PA CRW GEO Ranging Availability Trend

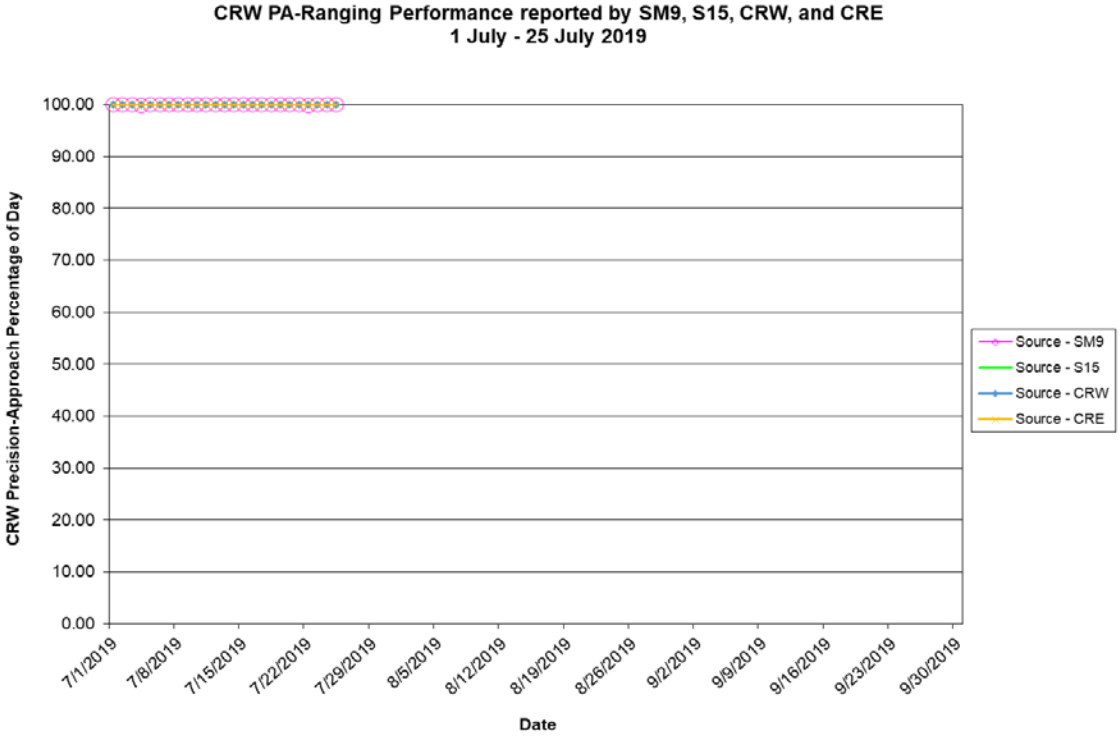
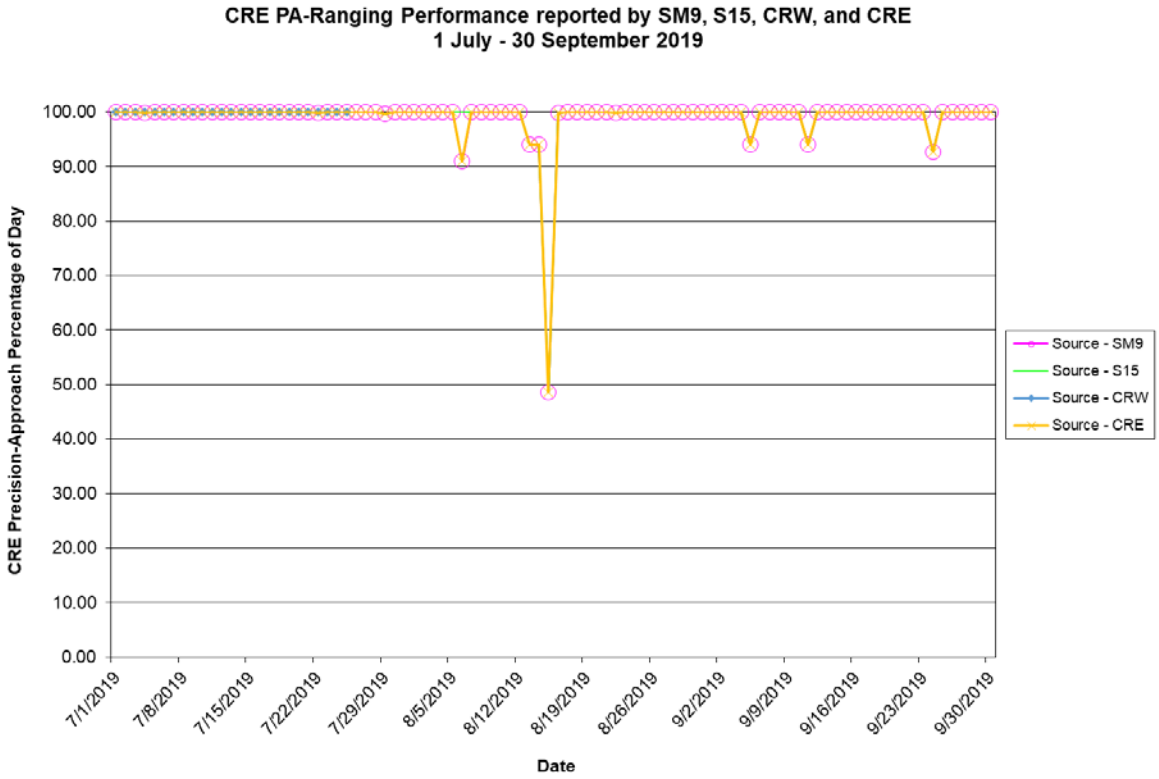


Figure 7-4. Daily PA CRE GEO Ranging Availability Trend



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	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	0	100
CYEG	EDMONTON / JOSEPHBURG	AB	LPV	0	100	0	100	0	100
CYXD	EDMONTON CITY CTR	AB	LPV	0	100	0	100	0	100
2C7	SHAKTOOLIK	AK	LPV	0	100	0	100	1	99.994
6A8	ALLAKAKET	AK	LP	0	100	0	100	1	99.990
7KA	TATITLEK	AK	LP	0	100	0	100	2	99.996
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	1	99.999
ADQ	KODIAK	AK	LPV	0	100	0	100	1	99.998
AFM	AMBLER	AK	LPV	0	100	0	100	1	99.989
AKN	KING SALMON	AK	LPV	0	100	0	100	0	100
AKW	KLAWOCK	AK	LP	0	100	0	100	1	99.999
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	2	99.995
ANI	ANIAK	AK	LPV	0	100	0	100	1	99.999
AQH	QUINHAGAK	AK	LPV	0	100	0	100	0	100
AQT	NUIQSUT	AK	LPV	0	100	0	100	24	99.908
BET	BETHEL	AK	LPV200	0	100	0	100	0	100
BRW	WILEY POST-WILL ROGERS MEMORIA	AK	LPV	0	100	0	100	88	99.467
BVK	BUCKLAND	AK	LPV	0	100	0	100	2	99.987
CDB	COLD BAY	AK	LPV200	0	100	0	100	6	99.993
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	2	99.996
CEM	CENTRAL	AK	LP	0	100	0	100	1	99.994
CLP	CLARKS POINT	AK	LPV	0	100	0	100	0	100
CXF	COLDFOOT	AK	LP	0	100	0	100	1	99.989
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	0	100	0	100	26	99.891
DEE	DEERING	AK	LPV	0	100	0	100	24	99.944
DLG	DILLINGHAM	AK	LPV	0	100	0	100	0	100
ELI	ELIM	AK	LPV	0	100	0	100	2	99.990
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	2	99.996
ENM	EMMONAK	AK	LPV	0	100	0	100	2	99.993

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FAI	FAIRBANKS INTL	AK	LPV200	0	100	0	100	1	99.999
FYU	FORT YUKON	AK	LPV	0	100	0	100	1	99.992
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	1	99.993
GAM	GAMBELL	AK	LPV	0	100	0	100	49	99.758
GKN	GULKANA	AK	LPV	0	100	0	100	2	99.998
GST	GUSTAVUS	AK	LP	0	100	0	100	0	100
HLA	HUSLIA	AK	LPV	0	100	0	100	1	99.991
HOM	HOMER	AK	LPV	0	100	0	100	1	99.996
HPB	HOOPER BAY	AK	LP	0	100	0	100	2	99.993
HRR	HEALY RIVER	AK	LP	0	100	0	100	1	99.999
IIK	KIPNUK	AK	LPV	0	100	0	100	1	99.997
ILI	ILIAMNA	AK	LPV	0	100	0	100	0	100
IWK	WALES	AK	LP	0	100	0	100	26	99.893
IYS	WASILLA	AK	LPV	0	100	0	100	2	99.994
KAL	KALTAG	AK	LPV	0	100	0	100	1	99.994
KGX	GRAYLING	AK	LP	0	100	0	100	1	99.997
KSM	ST MARY'S	AK	LPV200	0	100	0	100	2	99.995
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	0	100
KTS	BREVIG MISSION	AK	LPV	0	100	0	100	25	99.925
KWT	KWETHLUK	AK	LPV	0	100	0	100	0	100
KYU	KOYUKUK	AK	LPV	0	100	0	100	1	99.993
MCG	MC GRATH	AK	LP	0	100	0	100	1	99.997
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	1	99.999
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	1	99.996
MLY	MANLEY HOT SPRINGS	AK	LP	0	100	0	100	1	99.995
OME	NOME	AK	LPV	0	100	0	100	24	99.948
OOK	TOKSOOK BAY	AK	LP	0	100	0	100	2	99.996
ORT	NORTHWAY	AK	LP	0	100	0	100	2	99.997
OTZ	RALPH WIEN MEMORIAL	AK	LPV	0	100	0	100	26	99.903
PAQ	WARREN BUD WOODS PALMER MUNICIPAL	AK	LP	0	100	0	100	2	99.994
PBV	ST GEORGE	AK	LPV	0	100	0	100	19	99.875
PHO	POINT HOPE	AK	LPV	0	100	0	100	40	99.844
PTU	PLATINUM	AK	LPV	0	100	0	100	0	100
RBY	RUBY	AK	LPV	0	100	0	100	1	99.995
SCC	DEADHORSE	AK	LPV200	0	100	0	100	24	99.912

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SCM	SCAMMON BAY	AK	LP	0	100	0	100	2	99.993
SDP	SAND POINT	AK	LPV	0	100	0	100	3	99.998
SHG	SHUNGNAK	AK	LP	0	100	0	100	1	99.989
SHX	SHAGELUK	AK	LPV	0	100	0	100	1	99.997
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	0	100
SMK	ST MICHAEL	AK	LPV	0	100	0	100	2	99.992
SXQ	SOLDOTNA	AK	LP	0	100	0	100	1	99.996
TKA	TALKEETNA	AK	LPV	0	100	0	100	2	99.995
TOG	TOGIAK	AK	LP	0	100	0	100	0	100
WLK	SELAWIK	AK	LPV	0	100	0	100	1	99.990
WMO	WHITE MOUNTAIN	AK	LP	0	100	0	100	2	99.990
WNA	NAPAKIAK	AK	LPV	0	100	0	100	0	100
WSN	SOUTH NAKNEK NR 2	AK	LPV	0	100	0	100	0	100
WTK	NOATAK	AK	LPV	0	100	0	100	24	99.882
YAK	YAKUTAT	AK	LPV200	0	100	0	100	1	99.996
02A	CHILTON COUNTY	AL	LP	0	100	1	99.998	62	99.938
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	100	1	99.998	63	99.935
09A	BUTLER-CHOCTAW COUNTY	AL	LPV	0	100	1	99.997	75	99.866
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	1	99.998	72	99.881
0R1	ATMORE MUNICIPAL	AL	LPV	0	100	3	99.992	84	99.796
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	1	99.998	68	99.909
12J	BREWTON MUNICIPAL	AL	LPV	0	100	3	99.992	82	99.810
1A9	PRATTVILLE - GROUBY FIELD	AL	LPV	0	100	1	99.998	66	99.918
1M4	POSEY FIELD	AL	LPV	0	100	1	99.999	44	99.983
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	100	4	99.991	86	99.773
2R5	ST ELMO	AL	LPV	0	100	6	99.991	92	99.726
33J	GENEVA MUNICIPAL	AL	LP	0	100	3	99.996	77	99.844
3M8	NORTH PICKENS	AL	LP	0	100	1	99.999	60	99.944
4A9	ISBELL FIELD	AL	LPV	0	100	0	100	6	99.997
5R1	ROY WILCOX	AL	LP	0	100	2	99.996	82	99.813
5R4	FOLEY MUNICIPAL	AL	LPV	0	100	5	99.988	91	99.735
71J	OZARK-BLACKWELL FIELD	AL	LPV	0	100	1	99.998	74	99.877
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	0	100	3	99.995	77	99.848

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
8A0	ALBERTVILLE RGNL-THOMAS J BRUM	AL	LPV	0	100	1	99.999	35	99.986
8A1	GUNTERSVILLE MUNICIPAL - JOE STARNE	AL	LPV	0	100	0	100	23	99.991
9A4	COURTLAND	AL	LPV200	0	100	0	100	29	99.989
A08	VAIDEN FIELD	AL	LPV	0	100	1	99.998	69	99.905
ALX	THOMAS C RUSSELL FLD	AL	LPV	0	100	1	99.999	58	99.953
ANB	ANNISTON RGNL	AL	LPV	0	100	1	99.999	47	99.980
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	100	1	99.999	48	99.977
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	100	1	99.998	59	99.947
BFM	MOBILE DOWNTOWN	AL	LPV200	0	100	5	99.991	90	99.744
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	0	100	1	99.999	52	99.970
CMD	CULLMAN RGNL-FOLSOM FIELD	AL	LPV	0	100	1	99.999	40	99.984
CQF	H L SONNY CALLAHAN	AL	LPV200	0	100	5	99.988	90	99.732
DCU	PRYOR FIELD RGNL	AL	LPV200	0	100	1	99.999	19	99.992
DHN	DOTHAN RGNL	AL	LPV200	0	100	1	99.998	75	99.875
DYA	DEMOPOLIS RGNL	AL	LPV	0	100	1	99.998	72	99.892
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	100	2	99.997	75	99.861
EET	SHELBY COUNTY	AL	LPV	0	100	1	99.999	57	99.952
EKY	BESSEMER	AL	LPV	0	100	1	99.999	56	99.957
EUF	WEEDON FIELD	AL	LPV	0	100	1	99.998	67	99.920
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	100	1	99.999	41	99.984
GZH	EVERGREEN RGNL/MIDDLETON FIELD	AL	LP	0	100	3	99.996	79	99.839
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	100	1	99.999	48	99.975
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	0	100	1	99.999	18	99.993
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	100	1	99.999	50	99.975
JKA	JACK EDWARDS NATIONAL	AL	LPV200	0	100	6	99.987	91	99.724
M95	RICHARD ARTHUR FIELD	AL	LPV	0	100	1	99.999	55	99.961
MDQ	HUNTSVILLE EXECUTIVE AIRPORT T	AL	LPV200	0	100	0	100	1	99.999

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MGM	MONTGOMERY RGNL (DANNELLY FIEL	AL	LPV200	0	100	1	99.998	67	99.913
MOB	MOBILE RGNL	AL	LPV200	0	100	4	99.993	89	99.743
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	1	99.999	28	99.989
PLR	ST CLAIR COUNTY	AL	LPV	0	100	1	99.999	50	99.975
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	0	100	1	99.999	33	99.987
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	100	1	99.999	56	99.958
SEM	CRAIG FIELD	AL	LPV200	0	100	1	99.998	70	99.903
TCL	TUSCALOOSA RGNL	AL	LPV	0	100	1	99.998	61	99.942
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	0	100	2	99.998	71	99.895
0M0	BILLY FREE MUNICIPAL	AR	LPV	0	100	0	100	9	99.995
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	0	100	0	100
4A5	SEARCY COUNTY	AR	LPV	0	100	0	100	0	100
4M1	CARROLL COUNTY	AR	LP	0	100	0	100	0	100
4M3	CARLISLE MUNICIPAL	AR	LPV	0	100	0	100	2	99.999
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	0	100	8	99.997
7M1	MC GEHEE MUNICIPAL	AR	LP	0	100	0	100	27	99.987
9M8	SHERIDAN MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
ADF	DEXTER B FLORENCE MEMORIAL FIE	AR	LPV	0	100	0	100	0	100
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	100	0	100	0	100
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	100	0	100	0	100
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	0	100	0	100	13	99.995
BPK	BAXTER COUNTY	AR	LPV	0	100	0	100	0	100
BVX	BATESVILLE RGNL	AR	LPV	0	100	0	100	0	100
BYH	ARKANSAS INTL	AR	LPV200	0	100	0	100	0	100
CDH	HARRELL FIELD	AR	LPV	0	100	0	100	0	100
CXW	CANTRELL FLD	AR	LPV	0	100	0	100	0	100
DRP	DELTA RGNL	AR	LPV	0	100	0	100	1	99.999
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FLP	MARION COUNTY RGNL	AR	LPV	0	100	0	100	0	100
FSM	FORT SMITH RGNL	AR	LPV200	0	100	0	100	0	100
FYV	DRAKE FIELD	AR	LPV	0	100	0	100	0	100
H34	HUNTSVILLE MUNICIPAL	AR	LPV	0	100	0	100	0	100
HEE	THOMPSON-ROBBINS	AR	LPV	0	100	0	100	24	99.990
HRO	BOONE COUNTY	AR	LPV	0	100	0	100	0	100
JBR	JONESBORO MUNICIPAL	AR	LPV200	0	100	0	100	0	100
LIT	BILL AND HILLARY CLINTON NATIO	AR	LPV200	0	100	0	100	1	99.999
LLQ	MONTICELLO MUNICIPAL/ELLIS FIELD	AR	LPV	0	100	0	100	13	99.992
M18	HOPE MUNICIPAL	AR	LP	0	100	0	100	0	100
M19	NEWPORT RGNL	AR	LPV	0	100	0	100	0	100
M32	LAKE VILLAGE MUNICIPAL	AR	LP	0	100	0	100	40	99.977
M70	POCAHONTAS MUNICIPAL	AR	LPV	0	100	0	100	0	100
M77	HOWARD COUNTY	AR	LP	0	100	0	100	0	100
MXA	MANILA MUNICIPAL	AR	LPV	0	100	0	100	0	100
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
PBF	PINE BLUFF RGNL AIRPORT GRIDER	AR	LPV	0	100	0	100	3	99.998
ROG	ROGERS EXECUTIVE - CARTER FIEL	AR	LPV	0	100	0	100	0	100
RUE	RUSSELLVILLE RGNL	AR	LPV	0	100	0	100	0	100
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	0	100	0	100	3	99.998
SLG	SMITH FIELD	AR	LPV	0	100	0	100	0	100
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	0	100	1	99.999
SUZ	SALINE COUNTY RGNL	AR	LPV	0	100	0	100	1	99.999
TXK	TEXARKANA RGNL-WEBB FIELD	AR	LPV	0	100	0	100	0	100
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	0	100	0	100	0	100
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	0	100	0	100	0	100
AVQ	MARANA RGNL	AZ	LP	0	100	2	99.994	94	99.329

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	0	100	0	100	1	99.995
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	0	100	0	100	4	99.963
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	0	100	2	99.975
FFZ	FALCON FLD	AZ	LP	0	100	0	100	3	99.974
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	24	99.986	94	99.183
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	1	99.994
GCN	GRAND CANYON NATIONAL PARK	AZ	LPV	0	100	0	100	1	99.994
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	0	100	2	99.973
GYR	PHOENIX GOODYEAR	AZ	LP	0	100	0	100	2	99.973
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	3	99.966
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	3	99.967
IGM	KINGMAN	AZ	LPV	0	100	0	100	2	99.976
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	0	100	3	99.973
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	1	99.999	35	99.960
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	2	99.962
P33	COCHISE COUNTY	AZ	LPV	0	100	4	99.996	93	99.480
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	1	99.998
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	0	100	2	99.972
PRC	ERNEST A LOVE FIELD	AZ	LPV200	0	100	0	100	2	99.988
RQE	WINDOW ROCK	AZ	LP	0	100	1	99.999	3	99.981
SAD	SAFFORD RGNL	AZ	LPV	0	100	2	99.998	93	99.699
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	100	1	99.999	15	99.974
SOW	SHOW LOW RGNL	AZ	LPV200	0	100	1	99.999	60	99.930
TUS	TUCSON INTL	AZ	LPV	0	100	2	99.994	94	99.267
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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AAT	ALTURAS MUNICIPAL	CA	LPV	0	100	0	100	4	99.978
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	0	100	0	100	6	99.933
APC	NAPA COUNTY	CA	LPV	0	100	0	100	6	99.926
APV	APPLE VALLEY	CA	LPV	0	100	0	100	32	99.924
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	6	99.947
BFL	MEADOWS FIELD	CA	LPV	0	100	1	99.999	38	99.902
BLH	BLYTHE	CA	LP	0	100	0	100	10	99.952
BUR	BOB HOPE	CA	LP	0	100	1	99.999	74	99.787
C83	BYRON	CA	LPV	0	100	0	100	6	99.929
CCB	CABLE	CA	LP	0	100	1	99.999	61	99.857
CCR	BUCHANAN FIELD	CA	LPV	0	100	0	100	6	99.927
CEC	JACK MC NAMARA FIELD	CA	LPV	0	100	0	100	6	99.941
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	6	99.947
CMA	CAMARILLO	CA	LPV	0	100	1	99.996	90	99.674
CNO	CHINO	CA	LPV	0	100	1	99.999	63	99.845
CPU	CALAVERAS CO-MAURY RASMUSSEN F	CA	LP	0	100	0	100	5	99.943
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	1	99.997	82	99.752
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	1	99.998	10	99.924
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	9	99.941
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	6	99.936
F70	FRENCH VALLEY	CA	LPV	0	100	0	100	66	99.854
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	5	99.937
GOO	NEVADA COUNTY	CA	LPV	0	100	0	100	5	99.952
HAF	HALF MOON BAY	CA	LPV	0	100	1	99.998	6	99.918
HHR	JACK NORTHROP FIELD/HAWTHORNE	CA	LPV	0	100	1	99.997	76	99.740
HWD	HAYWARD EXECUTIVE	CA	LPV	0	100	1	99.999	6	99.924
L35	BIG BEAR CITY	CA	LP	0	100	0	100	38	99.917
LAX	LOS ANGELES INTL	CA	LPV200	0	100	1	99.997	76	99.732
LGB	LONG BEACH /DAUGHERTY FIELD/	CA	LPV	0	100	1	99.997	78	99.753
LHM	LINCOLN RGNL/KARL HARDER FIELD	CA	LPV200	0	100	0	100	6	99.945
LLR	LITTLE RIVER	CA	LP	0	100	0	100	6	99.924
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	1	99.999	6	99.932

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LVK	LIVERMORE MUNICIPAL	CA	LPV200	0	100	0	100	6	99.926
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	5	99.936
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	100	0	100	6	99.936
MER	CASTLE	CA	LPV200	0	100	0	100	6	99.937
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	6	99.941
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	100	1	99.999	34	99.905
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	100	0	100	6	99.935
MRY	MONTEREY RGNL	CA	LPV	0	100	1	99.998	18	99.902
MYF	MONTGOMERY-GIBBS EXECUTIVE	CA	LPV200	0	100	1	99.995	87	99.699
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	6	99.944
NUQ	MOFFETT FEDERAL AFLD	CA	LPV	0	100	1	99.998	6	99.923
O02	NERVINO	CA	LPV	0	100	0	100	4	99.966
O08	COLUSA COUNTY	CA	LPV	0	100	0	100	6	99.940
O27	OAKDALE	CA	LPV	0	100	0	100	6	99.937
O32	REEDLEY MUNICIPAL	CA	LPV	0	100	0	100	6	99.938
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	6	99.924
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	6	99.935
OAK	METROPOLITAN OAKLAND INTL	CA	LPV200	0	100	1	99.999	6	99.924
ONT	ONTARIO INTL	CA	LPV200	0	100	1	99.999	61	99.860
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	6	99.948
OXR	OXNARD	CA	LPV	0	100	1	99.996	93	99.654
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	0	100	52	99.895
POC	BRACKETT FIELD	CA	LPV	0	100	1	99.999	63	99.844
PRB	PASO ROBLES MUNICIPAL	CA	LPV	0	100	1	99.998	51	99.866
PVF	PLACERVILLE	CA	LPV	0	100	0	100	5	99.949
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	0	100	64	99.858
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	6	99.947
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	6	99.949
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	1	99.998	6	99.924
RIV	MARCH ARB	CA	LPV200	0	100	0	100	62	99.867
SAC	SACRAMENTO EXECUTIVE	CA	LPV	0	100	0	100	6	99.940
SAN	SAN DIEGO INTL	CA	LPV	0	100	1	99.994	88	99.667

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	1	99.995	94	99.590
SBD	SAN BERNARDINO INTL	CA	LPV	0	100	0	100	55	99.881
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	1	99.997	90	99.728
SCK	STOCKTON METROPOLITAN	CA	LPV200	0	100	0	100	6	99.935
SDM	BROWN FIELD MUNICIPAL	CA	LPV200	0	100	1	99.994	92	99.648
SEE	GILLESPIE FIELD	CA	LP	0	100	1	99.995	85	99.732
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	1	99.998	6	99.921
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	1	99.998	6	99.924
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	6	99.940
SMO	SANTA MONICA MUNICIPAL	CA	LPV	0	100	1	99.997	76	99.738
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	1	99.997	98	99.633
SNA	JOHN WAYNE AIRPORT-ORANGE COUN	CA	LPV200	0	100	1	99.997	79	99.770
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	1	99.998	15	99.910
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	6	99.924
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	6	99.930
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	20	99.935
TOA	ZAMPERINI FIELD	CA	LPV	0	100	1	99.997	81	99.717
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	4	99.963
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	0	100	0	100	43	99.909
VCB	NUT TREE	CA	LPV	0	100	0	100	6	99.933
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	0	100	38	99.918
VIS	VISALIA MUNICIPAL	CA	LPV	0	100	0	100	10	99.933
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	1	99.999	49	99.895
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	100	0	100	6	99.940
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	1	99.998	10	99.919
1V6	FREMONT COUNTY	CO	LPV	0	100	0	100	0	100
20V	MC ELROY AIRFIELD	CO	LPV	0	100	0	100	1	99.995
2V5	WRAY MUNICIPAL	CO	LPV200	0	100	0	100	0	100
2V6	YUMA MUNICIPALCIPAL	CO	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4V0	RANGELY	CO	LPV	0	100	0	100	1	99.996
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	0	100	0	100	0	100
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	0	100	1	99.997
AJZ	BLAKE FIELD	CO	LPV	0	100	0	100	2	99.989
AKO	COLORADO PLAINS RGNL	CO	LPV	0	100	0	100	0	100
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	0	100	1	99.999
APA	CENTENNIAL	CO	LPV200	0	100	0	100	0	100
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	100	0	100	1	99.999
CAG	CRAIG-MOFFAT	CO	LP	0	100	0	100	2	99.993
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	0	100	2	99.984
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	100	0	100	0	100
DEN	DENVER INTL	CO	LPV200	0	100	0	100	0	100
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	100	0	100	2	99.988
FMM	FORT MORGAN MUNICIPAL	CO	LPV	0	100	0	100	0	100
FNL	NORTHERN COLORADO RGNL	CO	LPV200	0	100	0	100	1	99.999
FTG	FRONT RANGE	CO	LPV200	0	100	0	100	0	100
GJT	GRAND JUNCTION REGIONAL	CO	LPV200	0	100	0	100	1	99.995
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	1	99.999
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	1	99.992
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	0	100
LAA	LAMAR MUNICIPAL	CO	LPV	0	100	0	100	0	100
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	0	100
LMO	VANCE BRAND	CO	LPV	0	100	0	100	1	99.998
MTJ	MONTROSE RGNL	CO	LPV	0	100	0	100	2	99.988
MVI	MONTE VISTA MUNICIPAL	CO	LPV	0	100	0	100	1	99.998
PSO	STEVENS FIELD	CO	LP	0	100	0	100	2	99.992
PUB	PUEBLO MEMORIAL	CO	LPV200	0	100	0	100	0	100
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	0	100	0	100	2	99.996
RIL	RIFLE GARFIELD COUNTY	CO	LPV	0	100	0	100	2	99.990
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	2	99.987
4B8	ROBERTSON FIELD	CT	LP	0	100	0	100	1	99.994
BDL	BRADLEY INTL	CT	LPV200	0	100	0	100	1	99.994
BDR	IGOR I SIKORSKY MEMORIAL	CT	LPV	0	100	0	100	1	99.994
DXR	DANBURY MUNICIPAL	CT	LP	0	100	0	100	1	99.994
GON	GROTON-NEW LONDON	CT	LPV	0	100	0	100	1	99.993
HVN	TWEED-NEW HAVEN	CT	LPV	0	100	0	100	1	99.993
IJD	WINDHAM	CT	LP	0	100	0	100	1	99.994
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	0	100	0	100	1	99.993
OXC	WATERBURY-OXFORD	CT	LPV	0	100	0	100	1	99.994
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
DOV	DOVER AFB	DE	LPV200	0	100	0	100	0	100
EVY	SUMMIT	DE	LPV	0	100	0	100	0	100
GED	DELAWARE COASTAL	DE	LPV	0	100	0	100	0	100
ILG	NEW CASTLE	DE	LPV	0	100	0	100	0	100
1J0	TRI-COUNTY	FL	LP	0	100	1	99.997	80	99.838
24J	SUWANNEE COUNTY	FL	LPV	0	100	1	99.999	74	99.876
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	59	99.909
40J	PERRY-FOLEY	FL	LPV	0	100	1	99.997	79	99.845
54J	DEFUNIAK SPRINGS	FL	LP	0	100	3	99.995	83	99.812
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	1	99.996	88	99.769
APF	NAPLES MUNICIPAL	FL	LPV	0	100	0	100	54	99.907
AVO	AVON PARK EXECUTIVE	FL	LPV	0	100	0	100	47	99.935
BCT	BOCA RATON	FL	LPV	0	100	0	100	93	99.788
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	0	100	77	99.816
BOW	BARTOW MUNICIPAL	FL	LPV	0	100	0	100	56	99.911
CEW	BOB SIKES	FL	LPV	0	100	3	99.994	84	99.803

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CGC	CRYSTAL RIVER-CAPTAIN TOM DAVI	FL	LP	0	100	0	100	81	99.802
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	0	100	60	99.896
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	7	99.971
CRG	JACKSONVILLE EXECUTIVE AT CRAI	FL	LPV200	0	100	0	100	56	99.928
CTY	CROSS CITY	FL	LPV	0	100	1	99.999	81	99.829
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	33	99.964
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FI	FL	LPV	0	100	0	100	43	99.952
DTS	DESTIN EXECUTIVE	FL	LPV	0	100	3	99.993	86	99.773
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	3	99.996	84	99.793
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	24	99.969
EYW	KEY WEST INTL	FL	LPV	0	100	0	100	52	99.902
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	0	100	91	99.866
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	0	100	56	99.936
FIN	FLAGLER EXECUTIVE	FL	LPV	0	100	0	100	43	99.955
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	0	100	0	100	93	99.793
FMY	PAGE FIELD	FL	LPV	0	100	0	100	58	99.895
FPR	TREASURE COAST INTL	FL	LPV	0	100	0	100	67	99.943
FXE	FORT LAUDERDALE EXECUTIVE	FL	LPV200	0	100	0	100	93	99.809
GIF	WINTER HAVEN RGNL	FL	LPV	0	100	0	100	56	99.913
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	73	99.861
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	65	99.910
IMM	IMMOKALEE RGNL	FL	LPV	0	100	0	100	45	99.943
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	46	99.946
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	62	99.924
LAL	LAKELAND LINDER INTL	FL	LPV200	0	100	0	100	65	99.882
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	1	99.999	72	99.882
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	62	99.899

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	0	100	93	99.789
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	1	99.997	77	99.850
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	41	99.953
MIA	MIAMI INTL	FL	LPV200	0	100	0	100	94	99.848
MKY	MARCO ISLAND EXECUTIVE	FL	LPV	0	100	0	100	49	99.917
MLB	MELBOURNE INTL	FL	LPV200	0	100	0	100	6	99.970
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	0	100	0	100	19	99.957
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	0	100	6	99.967
OCF	OCALA INTL-JIM TAYLOR FIELD	FL	LPV200	0	100	0	100	74	99.846
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	37	99.960
OPF	MIAMI-OPA LOCKA EXECUTIVE	FL	LPV200	0	100	0	100	94	99.847
ORL	EXECUTIVE	FL	LPV200	0	100	0	100	43	99.950
PBI	PALM BEACH INTL	FL	LPV200	0	100	0	100	93	99.800
PCM	PLANT CITY	FL	LPV	0	100	0	100	71	99.862
PGD	PUNTA GORDA	FL	LPV200	0	100	0	100	64	99.876
PHK	PALM BEACH CO GLADES	FL	LPV	0	100	0	100	5	99.967
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	0	100	82	99.777
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	0	100	93	99.783
PNS	PENSACOLA INTL	FL	LPV200	0	100	4	99.989	90	99.755
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	0	100	54	99.908
SEF	SEBRING RGNL	FL	LPV	0	100	0	100	44	99.948
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	42	99.954
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	47	99.940
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	0	100	77	99.795
SUA	WITHAM FIELD	FL	LPV	0	100	0	100	89	99.889
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	9	99.970
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	1	99.997	79	99.844
TMB	MIAMI EXECUTIVE	FL	LPV200	0	100	0	100	88	99.906
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	0	100	7	99.964
TPA	TAMPA INTL	FL	LPV200	0	100	0	100	77	99.801

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TPF	PETER O KNIGHT	FL	LP	0	100	0	100	75	99.817
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	7	99.972
VDF	TAMPA EXECUTIVE	FL	LPV	0	100	0	100	74	99.833
VNC	VENICE MUNICIPAL	FL	LP	0	100	0	100	75	99.812
VQQ	CECIL	FL	LPV200	0	100	0	100	68	99.904
VRB	VERO BEACH RGNL	FL	LPV200	0	100	0	100	44	99.954
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	0	100	47	99.927
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	0	100	44	99.942
X23	UMATILLA MUNICIPAL	FL	LP	0	100	0	100	55	99.916
X35	MARION COUNTY	FL	LP	0	100	0	100	77	99.828
X50	MASSEY RANCH AIRPARK	FL	LP	0	100	0	100	20	99.969
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	0	100	0	100	69	99.941
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	0	100	72	99.860
09J	JEKYLL ISLAND	GA	LPV200	0	100	0	100	52	99.957
15J	COOK COUNTY	GA	LPV	0	100	1	99.998	67	99.917
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	1	99.997	74	99.870
18A	FRANKLIN COUNTY	GA	LPV	0	100	0	100	0	100
19A	JACKSON COUNTY	GA	LPV	0	100	0	100	0	100
2J3	LOUISVILLE MUNICIPAL	GA	LPV	0	100	0	100	15	99.994
2J5	MILLEN	GA	LPV	0	100	0	100	8	99.997
3J7	GREENE COUNTY RGNL	GA	LPV	0	100	0	100	2	99.999
48A	COCHRAN	GA	LPV	0	100	1	99.999	49	99.977
49A	GILMER COUNTY	GA	LPV	0	100	0	100	0	100
4A4	POLK COUNTY AIRPORT-CORNELIUS	GA	LPV	0	100	1	99.999	25	99.990
4J1	BRANTLEY COUNTY	GA	LPV	0	100	0	100	56	99.955
4J2	BERRIEN CO	GA	LPV	0	100	1	99.998	64	99.927
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	1	99.998	70	99.895
52A	MADISON MUNICIPAL	GA	LP	0	100	0	100	7	99.997
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	1	99.999	53	99.966
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	100	1	99.999	43	99.983
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	1	99.997	73	99.884
75J	TURNER COUNTY	GA	LP	0	100	1	99.998	61	99.941

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
9A5	BARWICK LAFAYETTE	GA	LP	0	100	0	100	0	100
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	1	99.998	66	99.921
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	1	99.998	59	99.949
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	0	100	0	100	0	100
AHN	ATHENS/BEN EPPS	GA	LPV200	0	100	0	100	0	100
AJR	HABERSHAM COUNTY	GA	LPV	0	100	0	100	0	100
AMG	BACON COUNTY	GA	LPV	0	100	1	99.999	56	99.959
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	0	100	1	99.999	30	99.988
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	0	100	59	99.949
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	1	99.998	75	99.876
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	0	100	53	99.968
BIJ	EARLY COUNTY	GA	LPV	0	100	1	99.998	71	99.895
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	0	100	53	99.964
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	1	99.999	45	99.982
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	1	99.999	58	99.950
CNI	CHEROKEE COUNTY	GA	LPV	0	100	0	100	0	100
CSG	COLUMBUS	GA	LPV	0	100	1	99.999	57	99.952
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	1	99.999	42	99.984
CVC	COVINGTON MUNICIPAL	GA	LPV	0	100	0	100	15	99.994
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	100	0	100	40	99.984
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	1	99.998	70	99.901
CZL	TOM B DAVID FLD	GA	LPV	0	100	0	100	0	100
D73	MONROE-WALTON COUNTY	GA	LP	0	100	0	100	4	99.998
DBN	W H 'BUD' BARRON	GA	LPV200	0	100	1	99.999	44	99.983
DNL	DANIEL FIELD	GA	LPV	0	100	0	100	0	100
DNN	DALTON MUNICIPAL	GA	LPV	0	100	0	100	0	100
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	1	99.999	59	99.948
EBA	ELBERT COUNTY-PATZ FIELD	GA	LP	0	100	0	100	0	100
EZM	HEART OF GEORGIA RGNL	GA	LPV200	0	100	1	99.999	50	99.973

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV	0	100	1	99.999	42	99.984
FTY	FULTON COUNTY AIRPORT-BROWN FI	GA	LPV	0	100	1	99.999	28	99.989
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	1	99.999	59	99.948
GVL	LEE GILMER MEMORIAL	GA	LPV	0	100	0	100	0	100
HOE	HOMERVILLE	GA	LPV	0	100	1	99.999	63	99.932
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	100	0	100	0	100
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	100	0	100	0	100
JCA	JACKSON COUNTY	GA	LPV	0	100	0	100	0	100
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	0	100	51	99.972
JYL	PLANTATION ARPK	GA	LPV	0	100	0	100	10	99.996
JZP	PICKENS COUNTY	GA	LPV	0	100	0	100	0	100
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	100	1	99.999	52	99.969
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	0	100	0	100	43	99.983
LZU	GWINNETT COUNTY - BRISCOE FIEL	GA	LPV200	0	100	0	100	0	100
MAC	MACON DOWNTOWN	GA	LPV	0	100	1	99.999	44	99.983
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	100	1	99.999	47	99.980
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	1	99.998	70	99.904
MHP	METTER MUNICIPAL	GA	LPV	0	100	0	100	39	99.985
MLJ	BALDWIN COUNTY RGNL	GA	LPV	0	100	1	99.999	34	99.987
MQW	TELFAIR-WHEELER	GA	LPV	0	100	1	99.999	51	99.973
OKZ	KAOLIN FIELD	GA	LPV	0	100	1	99.999	31	99.988
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	1	99.999	47	99.978
PIM	HARRIS COUNTY	GA	LPV	0	100	1	99.999	53	99.966
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	100	0	100	27	99.989
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	1	99.999	50	99.971
RMG	RICHARD B RUSSELL REGIONAL - J	GA	LPV	0	100	0	100	4	99.998
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	0	100	0	100	45	99.982

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RYY	COBB COUNTY INTL-MCCOLLUM FIEL	GA	LPV200	0	100	0	100	10	99.996
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	100	0	100	29	99.989
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	100	0	100	36	99.986
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	100	0	100	25	99.990
TMA	HENRY TIFT MYERS	GA	LPV	0	100	1	99.998	64	99.930
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	100	0	100	0	100
TVI	THOMASVILLE RGNL	GA	LPV	0	100	1	99.998	71	99.893
VDI	VIDALIA RGNL	GA	LPV200	0	100	1	99.999	45	99.982
VLD	VALDOSTA RGNL	GA	LPV	0	100	1	99.998	71	99.901
VPC	CARTERSVILLE	GA	LPV	0	100	0	100	10	99.996
WDR	BARROW COUNTY	GA	LPV	0	100	0	100	0	100
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	0	100	0	100	0	100
4C8	ALBIA MUNICIPAL	IA	LPV	0	100	0	100	0	100
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	100	0	100	0	100
ALO	WATERLOO RGNL	IA	LPV200	0	100	0	100	0	100
AMW	AMES MUNICIPAL	IA	LPV	0	100	0	100	0	100
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
BNW	BOONE MUNICIPAL	IA	LPV	0	100	0	100	0	100
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	100	0	100	0	100
CAV	CLARION MUNICIPAL	IA	LPV	0	100	0	100	0	100
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	100	0	100	0	100
CCY	NORTHEAST IOWA RGNL	IA	LPV	0	100	0	100	0	100
CID	THE EASTERN IOWA	IA	LPV200	0	100	0	100	0	100
CIN	ARTHUR N NEU	IA	LPV	0	100	0	100	0	100
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
CSQ	CRESTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
CWI	CLINTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
DBQ	DUBUQUE RGNL	IA	LPV200	0	100	0	100	0	100
DEH	DECORAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
DNS	DENISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
DSM	DES MOINES INTL	IA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
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
FSW	FORT MADISON MUNICIPAL	IA	LPV	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
GFZ	GREENFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
GGI	GRINNELL RGNL	IA	LPV	0	100	0	100	0	100
HPT	HAMPTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
I75	OSCEOLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ICL	SCHENCK FIELD	IA	LPV	0	100	0	100	0	100
IFA	IOWA FALLS MUNICIPAL	IA	LPV	0	100	0	100	0	100
IIB	INDEPENDENCE MUNICIPAL	IA	LPV	0	100	0	100	0	100
IKV	ANKENY RGNL	IA	LPV200	0	100	0	100	0	100
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
LRJ	LE MARS MUNICIPAL	IA	LPV	0	100	0	100	0	100
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	0	100	0	100	0	100
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	100	0	100	0	100
MUT	MUSCATINE MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MXO	MONTICELLO RGNL	IA	LP	0	100	0	100	0	100
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	100	0	100	0	100
OQW	MAQUOKETA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ORC	ORANGE CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
OTM	OTTUMWA RGNL	IA	LPV	0	100	0	100	0	100
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
PEA	PELLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	100	0	100	0	100
PRO	PERRY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
RDK	RED OAK MUNICIPAL	IA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
SHL	SHELDON RGNL	IA	LPV	0	100	0	100	0	100
SKI	SAC CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	100	0	100	0	100
SPW	SPENCER MUNICIPAL	IA	LPV200	0	100	0	100	0	100
SUX	SIOUX GATEWAY/COL BUD DAY FIEL	IA	LPV200	0	100	0	100	0	100
TNU	NEWTON MUNICIPAL-EARL JOHNSON FIELD	IA	LPV200	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
1U7	BEAR LAKE COUNTY	ID	LPV	0	100	0	100	0	100
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV200	0	100	0	100	0	100
COE	COEUR D'ALENE - PAPPY BOYINGTO	ID	LPV200	0	100	0	100	0	100
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	100	0	100	0	100
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	100	0	100	0	100
GNG	GOODING MUNICIPAL	ID	LPV	0	100	0	100	0	100
IDA	IDAHO FALLS RGNL	ID	LPV200	0	100	0	100	0	100
JER	JEROME COUNTY	ID	LPV	0	100	0	100	0	100
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	100	0	100	0	100
MAN	NAMPA MUNICIPAL	ID	LPV	0	100	0	100	0	100
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	0	100
PIH	POCATELLO RGNL	ID	LPV200	0	100	0	100	0	100
SUN	FRIEDMAN MEMORIAL	ID	LP	0	100	0	100	0	100
TWF	JOSLIN FIELD - MAGIC VALLEY RG	ID	LPV200	0	100	0	100	0	100
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	100	0	100	0	100
1H2	EFFINGHAM COUNTY MEMORIAL	IL	LPV	0	100	0	100	0	100
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	0	100	0	100	0	100
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	100	0	100	0	100
ALN	ST LOUIS RGNL	IL	LPV200	0	100	0	100	0	100
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	0	100
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	100	0	100	0	100
BMI	CENTRAL IL RGNL ARPT AT BLOOMI	IL	LPV	0	100	0	100	0	100
C15	PEKIN MUNICIPAL	IL	LPV	0	100	0	100	0	100
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	0	100	0	100	0	100
C75	MARSHALL COUNTY	IL	LP	0	100	0	100	0	100
CIR	CAIRO RGNL	IL	LP	0	100	0	100	0	100
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	100	0	100	0	100
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	100	0	100	0	100
CTK	INGERSOLL	IL	LPV	0	100	0	100	0	100
CUL	CARMI MUNICIPAL	IL	LP	0	100	0	100	0	100
DEC	DECATUR	IL	LPV200	0	100	0	100	0	100
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	100	0	100	0	100
DNV	VERMILION REGIONAL	IL	LPV	0	100	0	100	0	100
DPA	DUPAGE	IL	LPV200	0	100	0	100	0	100
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	100	0	100	0	100
EZI	KEWANEE MUNICIPAL	IL	LPV	0	100	0	100	0	100
FEP	ALBERTUS	IL	LPV	0	100	0	100	0	100
FOA	FLORA MUNICIPAL	IL	LPV	0	100	0	100	0	100
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	100	0	100	0	100
GRE	GREENVILLE	IL	LPV	0	100	0	100	0	100
HSB	HARRISBURG-RALEIGH	IL	LPV	0	100	0	100	0	100
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IGQ	LANSING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IKK	GREATER KANKAKEE	IL	LPV200	0	100	0	100	0	100
LOT	LEWIS UNIVERSITY	IL	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	100	0	100	0	100
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	100	0	100	0	100
MLI	QUAD CITY INTL	IL	LPV200	0	100	0	100	0	100
MQB	MACOMB MUNICIPAL	IL	LPV200	0	100	0	100	0	100
MTO	COLES COUNTY MEMORIAL	IL	LPV200	0	100	0	100	0	100
MVN	MOUNT VERNON	IL	LPV	0	100	0	100	0	100
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	0	100	0	100	0	100
OLY	OLNEY-NOBLE	IL	LPV	0	100	0	100	0	100
ORD	CHICAGO O'HARE INTL	IL	LPV200	0	100	0	100	0	100
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	0	100	0	100	0	100
PJY	PINCKNEYVILLE-DU QUOIN	IL	LPV	0	100	0	100	0	100
PNT	PONTIAC MUNICIPAL	IL	LPV	0	100	0	100	0	100
PRG	EDGAR COUNTY	IL	LPV	0	100	0	100	0	100
PWK	CHICAGO EXECUTIVE	IL	LPV	0	100	0	100	0	100
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	100	0	100	0	100
RPJ	ROCHELLE MUNICIPAL AIRPORT-KORITZ F	IL	LPV	0	100	0	100	0	100
RSV	CRAWFORD CO	IL	LPV	0	100	0	100	0	100
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	0	100	0	100	0	100
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	0	100
SLO	SALEM-LECKRONE	IL	LPV200	0	100	0	100	0	100
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	100	0	100	0	100
SQI	WHITESIDE CO ARPT-JOS H BITTOR	IL	LPV200	0	100	0	100	0	100
TIP	RANTOUL NATL AVN CNTR-FRANK EL	IL	LPV	0	100	0	100	0	100
UGN	WAUKEGAN NATIONAL	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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	0	100	0	100	0	100
50I	KENTLAND MUNICIPAL	IN	LPV	0	100	0	100	0	100
AID	ANDERSON MUNICIPAL-DARLINGTON FIELD	IN	LPV	0	100	0	100	0	100
ASW	WARSAW MUNICIPAL	IN	LPV	0	100	0	100	0	100
BAK	COLUMBUS MUNICIPAL	IN	LPV	0	100	0	100	0	100
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	0	100	0	100	0	100
BMG	MONROE COUNTY	IN	LPV200	0	100	0	100	0	100
C62	KENDALLVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
C65	PLYMOUTH MUNICIPAL	IN	LPV	0	100	0	100	0	100
CEV	METTEL FIELD	IN	LPV	0	100	0	100	0	100
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	0	100	0	100	0	100
DCY	DAVIESS COUNTY	IN	LPV	0	100	0	100	0	100
EKM	ELKHART MUNICIPAL	IN	LPV	0	100	0	100	0	100
EVV	EVANSVILLE RGNL	IN	LPV200	0	100	0	100	0	100
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	100	0	100	0	100
FKR	FRANKFORT MUNICIPAL	IN	LPV	0	100	0	100	0	100
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	100	0	100	0	100
FWA	FORT WAYNE INTL	IN	LPV200	0	100	0	100	0	100
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	100	0	100	0	100
GPC	PUTNAM COUNTY RGNL	IN	LPV	0	100	0	100	0	100
GSH	GOSHEN MUNICIPAL	IN	LPV	0	100	0	100	0	100
GWB	DE KALB COUNTY	IN	LPV	0	100	0	100	0	100
GYY	GARY/CHICAGO INTL	IN	LPV200	0	100	0	100	0	100
HFY	INDY SOUTH GREENWOOD	IN	LPV	0	100	0	100	0	100
HNB	HUNTINGBURG	IN	LPV	0	100	0	100	0	100
HUF	TERRE HAUTE RGNL	IN	LPV200	0	100	0	100	0	100
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	0	100
I76	PERU MUNICIPAL	IN	LPV	0	100	0	100	0	100
IMS	MADISON MUNICIPAL	IN	LPV	0	100	0	100	0	100
IND	INDIANAPOLIS INTL	IN	LPV200	0	100	0	100	0	100
JVY	CLARK RGNL	IN	LPV200	0	100	0	100	0	100
LAF	PURDUE UNIVERSITY	IN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MCX	WHITE COUNTY	IN	LP	0	100	0	100	0	100
MIE	DELAWARE COUNTY RGNL	IN	LPV	0	100	0	100	0	100
MQJ	INDIANAPOLIS RGNL	IN	LPV200	0	100	0	100	0	100
MZZ	MARION MUNICIPAL	IN	LPV	0	100	0	100	0	100
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	100	0	100	0	100
OVO	NORTH VERNON	IN	LPV	0	100	0	100	0	100
OXI	STARKE COUNTY	IN	LPV	0	100	0	100	0	100
PLD	PORTLAND MUNICIPAL	IN	LPV	0	100	0	100	0	100
PPO	LA PORTE MUNICIPAL	IN	LPV	0	100	0	100	0	100
RCR	FULTON COUNTY	IN	LPV	0	100	0	100	0	100
RID	RICHMOND MUNICIPAL	IN	LPV200	0	100	0	100	0	100
RWN	ARENS FIELD	IN	LPV	0	100	0	100	0	100
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	0	100
SBN	SOUTH BEND INTL	IN	LPV200	0	100	0	100	0	100
SER	FREEMAN MUNICIPAL	IN	LPV	0	100	0	100	0	100
SIV	SULLIVAN COUNTY	IN	LPV	0	100	0	100	0	100
SMD	SMITH FIELD	IN	LPV	0	100	0	100	0	100
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	100	0	100	0	100
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	100	0	100	0	100
UWL	NEW CASTLE-HENRY CO MUNICIPAL	IN	LPV	0	100	0	100	0	100
VPZ	PORTER COUNTY RGNL	IN	LPV	0	100	0	100	0	100
3AU	AUGUSTA MUNICIPAL	KS	LP	0	100	0	100	0	100
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
3K8	COMANCHE COUNTY	KS	LPV	0	100	0	100	0	100
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	0	100
9K8	KINGMAN AIRPORT - CLYDE CESSNA	KS	LP	0	100	0	100	0	100
AAO	COLONEL JAMES JABARA	KS	LPV	0	100	0	100	0	100
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	0	100
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	0	100
BEC	BEECH FACTORY	KS	LPV	0	100	0	100	0	100
CBK	SHALZ FIELD	KS	LPV	0	100	0	100	0	100
CNK	BLOSSER MUNICIPAL	KS	LP	0	100	0	100	0	100
DDC	DODGE CITY RGNL	KS	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EGT	WELLINGTON MUNICIPAL	KS	LPV200	0	100	0	100	0	100
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	100	0	100	0	100
EMP	EMPORIA MUNICIPAL	KS	LPV	0	100	0	100	0	100
EQA	EL DORADO/CAPTAIN JACK THOMAS	KS	LPV200	0	100	0	100	0	100
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	100	0	100	0	100
FOE	TOPEKA RGNL	KS	LPV	0	100	0	100	0	100
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	100	0	100	0	100
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	100	0	100	0	100
GCK	GARDEN CITY RGNL	KS	LPV	0	100	0	100	0	100
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	0	100	0	100	0	100
HLC	HILL CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
HQG	HUGOTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
HRU	HERINGTON RGNL	KS	LPV	0	100	0	100	0	100
HUT	HUTCHINSON RGNL	KS	LPV200	0	100	0	100	0	100
HYS	HAYS RGNL	KS	LPV200	0	100	0	100	0	100
ICT	WICHITA DWIGHT D EISENHOWER NA	KS	LPV200	0	100	0	100	0	100
IDP	INDEPENDENCE MUNICIPAL	KS	LPV200	0	100	0	100	0	100
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	100	0	100	0	100
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	0	100	0	100	0	100
K78	ABILENE MUNICIPAL	KS	LPV	0	100	0	100	0	100
K79	JETMORE MUNICIPAL	KS	LPV	0	100	0	100	0	100
K81	MIAMI COUNTY	KS	LPV	0	100	0	100	0	100
K82	SMITH CENTER MUNICIPAL	KS	LPV200	0	100	0	100	0	100
K88	ALLEN COUNTY	KS	LPV	0	100	0	100	0	100
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	0	100	0	100	0	100
LQR	LARNED-PAWNEE COUNTY	KS	LPV	0	100	0	100	0	100
LWC	LAWRENCE MUNICIPAL	KS	LPV200	0	100	0	100	0	100
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
MHK	MANHATTAN RGNL	KS	LPV200	0	100	0	100	0	100
MPR	MC PHERSON	KS	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
NRN	NORTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	0	100
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	0	100
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	100	0	100	0	100
OWI	OTTAWA MUNICIPAL	KS	LPV	0	100	0	100	0	100
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	0	100	0	100	0	100
PPF	TRI-CITY	KS	LPV	0	100	0	100	0	100
PTS	ATKINSON MUNICIPAL	KS	LPV	0	100	0	100	0	100
PTT	PRATT RGNL	KS	LPV	0	100	0	100	0	100
RCP	ROOKS COUNTY RGNL	KS	LPV	0	100	0	100	0	100
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
RSL	RUSSELL MUNICIPAL	KS	LPV	0	100	0	100	0	100
SLN	SALINA RGNL	KS	LPV	0	100	0	100	0	100
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	0	100	0	100	0	100
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
UKL	COFFEY COUNTY	KS	LPV	0	100	0	100	0	100
ULS	ULYSSES	KS	LPV	0	100	0	100	0	100
WLD	STROTHER FIELD	KS	LPV	0	100	0	100	0	100
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	0	100	0	100	0	100
18I	MC CREARY COUNTY	KY	LP	0	100	0	100	0	100
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	0	100	0	100	0	100
2I0	MADISONVILLE RGNL	KY	LPV	0	100	0	100	0	100
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	0	100	0	100	0	100
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	0	100	0	100	0	100
5M9	MARION-CRITTENDEN COUNTY	KY	LPV	0	100	0	100	0	100
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	0	100	0	100	0	100
AAS	TAYLOR COUNTY	KY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BRY	SAMUELS FIELD	KY	LPV	0	100	0	100	0	100
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	0	100	0	100	0	100
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	0	100	0	100	0	100
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	100	0	100	0	100
CPF	WENDELL H FORD	KY	LPV200	0	100	0	100	0	100
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	0	100	0	100	0	100
DVK	STUART POWELL FIELD	KY	LPV	0	100	0	100	0	100
DWU	ASHLAND RGNL	KY	LP	0	100	0	100	0	100
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	100	0	100	0	100
EKQ	WAYNE COUNTY	KY	LPV	0	100	0	100	0	100
EKX	ADDINGTON FIELD	KY	LPV	0	100	0	100	0	100
FFT	CAPITAL CITY	KY	LPV	0	100	0	100	0	100
FGX	FLEMING-MASON	KY	LPV	0	100	0	100	0	100
GLW	GLASGOW MUNICIPAL	KY	LPV	0	100	0	100	0	100
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	100	0	100	0	100
IOB	MOUNT STERLING-MONTGOMERY COUN	KY	LPV	0	100	0	100	0	100
JQD	OHIO COUNTY	KY	LPV	0	100	0	100	0	100
K24	RUSSELL COUNTY	KY	LPV	0	100	0	100	0	100
K62	GENE SNYDER	KY	LP	0	100	0	100	0	100
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	100	0	100	0	100
LEX	BLUE GRASS	KY	LPV	0	100	0	100	0	100
LOU	BOWMAN FIELD	KY	LPV	0	100	0	100	0	100
LOZ	LONDON-CORBIN ARPT-MAGEE FIELD	KY	LPV	0	100	0	100	0	100
M21	MUHLENBERG COUNTY	KY	LP	0	100	0	100	0	100
M25	MAYFIELD GRAVES COUNTY	KY	LPV	0	100	0	100	0	100
OWB	OWENSBORO-DAVIESS COUNTY RGNL	KY	LPV200	0	100	0	100	0	100
PAH	BARKLEY RGNL	KY	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PBX	PIKE COUNTY-HATCHER FIELD	KY	LPV200	0	100	0	100	0	100
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	0	100	0	100	0	100
SDF	LOUISVILLE INTL-STANDIFORD FIE	KY	LPV200	0	100	0	100	0	100
SJS	BIG SANDY RGNL	KY	LPV	0	100	0	100	0	100
SME	LAKE CUMBERLAND RGNL	KY	LPV	0	100	0	100	0	100
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	0	100	0	100	0	100
TWT	STURGIS MUNICIPAL	KY	LPV	0	100	0	100	0	100
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	0	100	0	100	0	100
0R4	CONCORDIA PARISH	LA	LPV	0	100	0	100	83	99.862
3R4	HART	LA	LPV	0	100	0	100	7	99.997
3R7	JENNINGS	LA	LPV	0	100	0	100	76	99.867
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	0	100	0	100	36	99.974
ACP	ALLEN PARISH	LA	LPV	0	100	0	100	69	99.915
AEX	ALEXANDRIA INTL	LA	LPV200	0	100	0	100	58	99.943
APS	PORT OF SOUTH LOUISIANA EXECUT	LA	LPV	0	100	1	99.999	92	99.630
ARA	ACADIANA RGNL	LA	LPV200	0	100	0	100	92	99.732
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	100	0	100	37	99.977
BTR	BATON ROUGE METROPOLITAN` RYAN	LA	LPV200	0	100	0	100	92	99.710
BXA	GEORGE R CARR MEMORIAL AIR FLD	LA	LPV	0	100	1	99.998	92	99.713
CWF	CHENNAULT INTL	LA	LPV200	0	100	0	100	60	99.927
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	100	0	100	0	100
ESF	ESLER RGNL	LA	LPV200	0	100	0	100	69	99.924
F88	JONESBORO	LA	LP	0	100	0	100	25	99.986
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	0	100	3	99.997	92	99.554
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	100	1	99.999	92	99.678
HUM	HOUMA-TERREBONNE	LA	LPV200	0	100	1	99.999	92	99.567
HZR	FALSE RIVER RGNL	LA	LPV	0	100	0	100	92	99.763

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IER	NATCHITOCHES RGNL	LA	LPV	0	100	0	100	20	99.991
IYA	ABBEVILLE CHRIS CRUSTA MEMORIA	LA	LPV	0	100	0	100	92	99.749
L39	LEESVILLE	LA	LPV	0	100	0	100	25	99.987
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	57	99.930
LFT	LAFAYETTE RGNL/PAUL FOURNET FI	LA	LPV200	0	100	0	100	92	99.766
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	100	0	100	54	99.960
MLU	MONROE RGNL	LA	LPV200	0	100	0	100	37	99.972
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	0	100	1	99.998	92	99.618
NEW	LAKEFRONT	LA	LPV	0	100	1	99.998	92	99.628
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	100	0	100	87	99.826
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	100	0	100	92	99.624
REG	LOUISIANA RGNL	LA	LPV	0	100	0	100	92	99.653
RSN	RUSTON RGNL	LA	LPV	0	100	0	100	19	99.990
SHV	SHREVEPORT RGNL	LA	LPV200	0	100	0	100	0	100
SPH	SPRINGHILL	LA	LPV	0	100	0	100	0	100
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	0	100	0	100	75	99.895
UXL	SOUTHLAND FIELD	LA	LPV	0	100	0	100	44	99.946
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	100	0	100	1	99.994
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	100	1	99.999	1	99.992
BAF	WESTFIELD-BARNES RGNL	MA	LPV	0	100	0	100	1	99.994
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	100	0	100	1	99.995
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	0	100	0	100	1	99.996
BVY	BEVERLY RGNL	MA	LPV	0	100	0	100	1	99.996
EWB	NEW BEDFORD RGNL	MA	LPV200	0	100	0	100	1	99.995
GBR	WALTER J KOLADZA	MA	LP	0	100	0	100	1	99.994
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	0	100	0	100	1	99.993

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLAN	MA	LPV200	0	100	0	100	1	99.992
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	100	0	100	1	99.996
MVY	MARTHA'S VINEYARD	MA	LPV200	0	100	0	100	1	99.993
ORE	ORANGE MUNICIPAL	MA	LPV	0	100	0	100	1	99.994
ORH	WORCESTER RGNL	MA	LPV200	0	100	0	100	1	99.994
OWD	NORWOOD MEMORIAL	MA	LPV	0	100	0	100	1	99.995
PSF	PITTSFIELD MUNICIPAL	MA	LPV	0	100	0	100	1	99.994
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	0	100	0	100	1	99.992
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	1	99.993
TAN	TAUNTON MUNICIPAL - KING FIELD	MA	LPV	0	100	0	100	1	99.995
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	0	100
2W5	MARYLAND	MD	LP	0	100	0	100	0	100
2W6	ST MARY'S COUNTY RGNL	MD	LPV	0	100	0	100	0	100
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	0	100	0	100	0	100
CBE	GREATER CUMBERLAND RGNL	MD	LPV	0	100	0	100	0	100
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	0	100	0	100	0	100
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	0	100	0	100	0	100
ESN	EASTON/NEWNAM FIELD	MD	LPV200	0	100	0	100	0	100
FDK	FREDERICK MUNICIPAL	MD	LPV	0	100	0	100	0	100
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	100	0	100	0	100
HGR	HAGERSTOWN RGNL-RICHARD A HENS	MD	LPV200	0	100	0	100	0	100
MTN	MARTIN STATE	MD	LPV	0	100	0	100	0	100
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	100	0	100	0	100
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	0	100	0	100	0	100
W29	BAY BRIDGE	MD	LPV	0	100	0	100	0	100
1B0	DEXTER RGNL	ME	LP	0	100	0	100	1	99.990
2B7	PITTSFIELD MUNICIPAL	ME	LPV	0	100	0	100	1	99.990

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
3B1	GREENVILLE MUNICIPAL	ME	LPV	0	100	0	100	1	99.990
81B	OXFORD COUNTY RGNL	ME	LP	0	100	0	100	1	99.995
AUG	AUGUSTA STATE	ME	LPV200	0	100	0	100	1	99.993
BGR	BANGOR INTL	ME	LPV200	0	100	0	100	1	99.990
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	100	1	99.999	1	99.990
BST	BELFAST MUNICIPAL	ME	LPV	0	100	0	100	1	99.990
BXM	BRUNSWICK EXECUTIVE	ME	LPV200	0	100	0	100	1	99.993
CAR	CARIBOU MUNICIPAL	ME	LPV	0	100	0	100	1	99.998
EPM	EASTPORT MUNICIPAL	ME	LPV	0	100	1	99.997	1	99.990
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV	0	100	0	100	1	99.998
HUL	HOULTON INTL	ME	LP	0	100	1	99.999	1	99.992
IZG	EASTERN SLOPES RGNL	ME	LPV	0	100	0	100	1	99.995
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	0	100	0	100	1	99.993
LRG	LINCOLN RGNL	ME	LP	0	100	0	100	1	99.990
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	100	0	100	1	99.990
OWK	CENTRAL MAINE ARPT OF NORRIDGE	ME	LPV	0	100	0	100	1	99.993
PQI	NORTHERN MAINE RGNL ARPT AT PR	ME	LPV200	0	100	1	99.999	1	99.995
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	100	0	100	1	99.993
RKD	KNOX COUNTY RGNL	ME	LPV200	0	100	0	100	1	99.993
SFM	SANFORD SEACOAST RGNL	ME	LPV200	0	100	0	100	1	99.996
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	100	0	100	1	99.993
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	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	LPV200	0	100	0	100	0	100
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	0	100
BIV	WEST MICHIGAN RGNL	MI	LPV	0	100	0	100	0	100
BTL	W K KELLOGG	MI	LPV200	0	100	0	100	0	100
C04	OCEANA COUNTY	MI	LPV	0	100	0	100	0	100
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	0	100	0	100	0	100
CAD	WEXFORD COUNTY	MI	LPV200	0	100	0	100	0	100
CFS	TUSCOLA AREA	MI	LP	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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	0	100	0	100	0	100
IKW	JACK BARSTOW	MI	LPV	0	100	0	100	0	100
IMT	FORD	MI	LPV	0	100	0	100	0	100
IRS	KIRSCH MUNICIPAL	MI	LPV	0	100	0	100	0	100
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	100	0	100	0	100
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	100	0	100	0	100
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	LPV200	0	100	0	100	0	100
JYM	HILLSDALE MUNICIPAL	MI	LPV	0	100	0	100	0	100
LAN	CAPITAL REGION INTL	MI	LPV200	0	100	0	100	0	100
LDM	MASON COUNTY	MI	LPV	0	100	0	100	0	100
MBL	MANISTEE CO-BLACKER	MI	LPV200	0	100	0	100	0	100
MBS	MBS INTL	MI	LPV200	0	100	0	100	0	100
MCD	MACKINAC ISLAND	MI	LPV	0	100	0	100	0	100
MKG	MUSKEGON COUNTY	MI	LPV200	0	100	0	100	0	100
MNM	MENOMINEE RGNL	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
OGM	ONTONAGON COUNTY - SCHUSTER FI	MI	LPV	0	100	0	100	0	100
OSC	OSCODA-WURTSMITH	MI	LPV200	0	100	0	100	0	100
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	0	100	0	100	0	100
PHN	ST CLAIR COUNTY INTL	MI	LPV200	0	100	0	100	0	100
PLN	PELLSTON RGNL AIRPORT OF EMMET	MI	LPV200	0	100	0	100	0	100
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	100	0	100	0	100
RMY	BROOKS FIELD	MI	LP	0	100	0	100	0	100
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
RQB	ROBEN-HOOD	MI	LPV200	0	100	0	100	0	100
SAW	SAWYER INTL	MI	LPV200	0	100	0	100	0	100
SLH	CHEBOYGAN COUNTY	MI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TEW	MASON JEWETT FIELD	MI	LP	0	100	0	100	0	100
TTF	CUSTER	MI	LPV	0	100	0	100	0	100
TVC	CHERRY CAPITAL	MI	LPV200	0	100	0	100	0	100
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	0	100	0	100	0	100
YIP	WILLOW RUN	MI	LPV200	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 (JANES FIE	MN	LPV	0	100	0	100	0	100
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	100	0	100	0	100
AXN	CHANDLER FIELD	MN	LPV	0	100	0	100	0	100
BBB	BENSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
BDE	BAUDETTE INTL	MN	LPV	0	100	0	100	0	100
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV200	0	100	0	100	0	100
BJI	BEMIDJI RGNL	MN	LPV200	0	100	0	100	0	100
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	100	0	100	0	100
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	100	0	100	0	100
CFE	BUFFALO MUNICIPAL	MN	LPV	0	100	0	100	0	100
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	100	0	100	0	100
CKN	CROOKSTON MUNICIPAL KIRKWOOD FLD	MN	LPV	0	100	0	100	0	100
CNB	MYERS FIELD	MN	LPV	0	100	0	100	0	100
COQ	CLOQUET CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
CQM	COOK MUNICIPAL	MN	LP	0	100	0	100	0	100
D39	SAUK CENTRE MUNICIPAL	MN	LPV	0	100	0	100	0	100
D42	SPRINGFIELD MUNICIPAL	MN	LP	0	100	0	100	0	100
DLH	DULUTH INTL	MN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
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-LIZ WALL STROHF	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-ANDERSON FIELD	MN	LP	0	100	0	100	0	100
GHW	GLENWOOD MUNICIPAL	MN	LPV	0	100	0	100	0	100
GPZ	GRAND RAPIDS/ITASCA CO-GORDON	MN	LPV	0	100	0	100	0	100
GYL	GLENCOE MUNICIPAL	MN	LPV	0	100	0	100	0	100
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	0	100	0	100	0	100
HCO	HALLOCK MUNICIPAL	MN	LPV	0	100	0	100	0	100
HIB	RANGE RGNL	MN	LPV200	0	100	0	100	0	100
INL	FALLS INTL-EINARSON FIELD	MN	LPV	0	100	0	100	0	100
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	100	0	100	0	100
JMR	MORA MUNICIPAL	MN	LPV	0	100	0	100	0	100
JYG	ST JAMES MUNICIPAL	MN	LPV	0	100	0	100	0	100
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	100	0	100	0	100
LVN	AIRLAKE	MN	LPV200	0	100	0	100	0	100
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	0	100	0	100	0	100
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	100	0	100	0	100
MJQ	JACKSON MUNICIPAL	MN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MKT	MANKATO RGNL	MN	LPV200	0	100	0	100	0	100
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	0	100	0	100	0	100
MOX	MORRIS MUNICIPAL - CHARLIE SCHMIDT	MN	LPV	0	100	0	100	0	100
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	0	100	0	100	0	100
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	0	100	0	100	0	100
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	0	100	0	100	0	100
ORB	ORR RGNL	MN	LP	0	100	0	100	0	100
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	100	0	100	0	100
OWA	OWATONNA DEGNER RGNL	MN	LPV200	0	100	0	100	0	100
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	0	100	0	100	0	100
PQN	PIPESTONE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
RGK	RED WING RGNL	MN	LPV200	0	100	0	100	0	100
ROS	RUSH CITY RGNL	MN	LPV	0	100	0	100	0	100
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIEL	MN	LPV	0	100	0	100	0	100
RRT	WARROAD INTL MEMORIAL	MN	LPV200	0	100	0	100	0	100
RST	ROCHESTER INTL	MN	LPV200	0	100	0	100	0	100
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	100	0	100	0	100
SAZ	STAPLES MUNICIPAL	MN	LPV	0	100	0	100	0	100
SBU	BLUE EARTH MUNICIPAL	MN	LPV	0	100	0	100	0	100
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	0	100	0	100	0	100
STC	ST CLOUD RGNL	MN	LPV200	0	100	0	100	0	100
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	100	0	100	0	100
TOB	DODGE CENTER	MN	LPV	0	100	0	100	0	100
TVF	THIEF RIVER FALLS RGNL	MN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TWM	RICHARD B HELGESON	MN	LPV	0	100	0	100	0	100
ULM	NEW ULM MUNICIPAL	MN	LPV200	0	100	0	100	0	100
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIEL	MN	LP	0	100	0	100	0	100
Y49	WALKER MUNICIPAL	MN	LP	0	100	0	100	0	100
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	0	100	0	100	0	100
03D	MEMPHIS MEMORIAL	MO	LPV	0	100	0	100	0	100
1H0	CREVE COEUR	MO	LPV	0	100	0	100	0	100
1MO	MOUNTAIN GROVE MEMORIAL	MO	LP	0	100	0	100	0	100
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	100	0	100	0	100
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	0	100
8WC	WASHINGTON COUNTY	MO	LPV	0	100	0	100	0	100
94K	CASSVILLE MUNICIPAL	MO	LPV	0	100	0	100	0	100
AIZ	LEE C FINE MEMORIAL	MO	LPV	0	100	0	100	0	100
BBG	BRANSON	MO	LPV200	0	100	0	100	0	100
BUM	BUTLER MEMORIAL	MO	LPV	0	100	0	100	0	100
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	0	100	0	100	0	100
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	100	0	100	0	100
COU	COLUMBIA RGNL	MO	LPV200	0	100	0	100	0	100
DMO	SEDALIA RGNL	MO	LPV	0	100	0	100	0	100
DXE	DEXTER MUNICIPAL	MO	LPV	0	100	0	100	0	100
EIW	COUNTY MEMORIAL	MO	LPV	0	100	0	100	0	100
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	100	0	100	0	100
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
EZZ	CAMERON MEMORIAL	MO	LPV	0	100	0	100	0	100
FAM	FARMINGTON RGNL	MO	LPV	0	100	0	100	0	100
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	0	100	0	100	0	100
FWB	BRANSON WEST MUNICIPAL - EMERSON FI	MO	LPV200	0	100	0	100	0	100
FYG	WASHINGTON RGNL	MO	LPV	0	100	0	100	0	100
GLY	CLINTON RGNL	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	100	0	100	0	100
H79	ELDON MODEL AIRPARK	MO	LP	0	100	0	100	0	100
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	0	100	0	100	0	100
HAE	HANNIBAL RGNL	MO	LPV	0	100	0	100	0	100
HFJ	MONETT RGNL	MO	LPV	0	100	0	100	0	100
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
IRK	KIRKSVILLE RGNL	MO	LPV200	0	100	0	100	0	100
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	0	100	0	100	0	100
JLN	JOPLIN RGNL	MO	LPV	0	100	0	100	0	100
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	0	100	0	100	0	100
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	100	0	100	0	100
K89	MACON-FOWER MEMORIAL	MO	LPV	0	100	0	100	0	100
LLU	LAMAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	100	0	100	0	100
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	100	0	100	0	100
M05	CARUTHERSVILLE MEMORIAL	MO	LPV	0	100	0	100	0	100
M12	STEELE MUNICIPAL	MO	LPV	0	100	0	100	0	100
M17	BOLIVAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
M48	HOUSTON MEMORIAL	MO	LPV	0	100	0	100	0	100
MAW	MALDEN RGNL	MO	LPV	0	100	0	100	0	100
MBY	OMAR N BRADLEY	MO	LPV	0	100	0	100	0	100
MCI	KANSAS CITY INTL	MO	LPV200	0	100	0	100	0	100
MHL	MARSHALL MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	0	100	0	100	0	100
MNF	MOUNTAIN VIEW	MO	LP	0	100	0	100	0	100
MO3	STOCKTON MUNICIPAL	MO	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
MYJ	MEXICO MEMORIAL	MO	LPV	0	100	0	100	0	100
NVD	NEVADA MUNICIPAL	MO	LPV200	0	100	0	100	0	100
OZS	CAMDENTON MEMORIAL-LAKE RGNL	MO	LPV	0	100	0	100	0	100
PCD	PERRYVILLE RGNL	MO	LPV	0	100	0	100	0	100
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	0	100	0	100	0	100
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	100	0	100	0	100
RAW	WARSAW MUNICIPAL	MO	LPV200	0	100	0	100	0	100
RCM	SKYHAVEN	MO	LPV	0	100	0	100	0	100
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	100	0	100	0	100
SIK	SIKESTON MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	100	0	100	0	100
STL	ST LOUIS LAMBERT INTL	MO	LPV200	0	100	0	100	0	100
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	100	0	100	0	100
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	0	100	0	100	0	100
TKX	KENNETT MEMORIAL	MO	LPV	0	100	0	100	0	100
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	0	100
UBX	CUBA MUNICIPAL	MO	LPV	0	100	0	100	0	100
UNO	WEST PLAINS RGNL	MO	LPV	0	100	0	100	0	100
UUV	SULLIVAN RGNL	MO	LPV	0	100	0	100	0	100
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	100	0	100	0	100
VIH	ROLLA NATIONAL	MO	LPV	0	100	0	100	0	100
0R0	COLUMBIA-MARION COUNTY	MS	LPV	0	100	1	99.999	87	99.761
17M	MAGEE MUNICIPAL	MS	LP	0	100	1	99.999	83	99.812
5A4	OKOLONA MUNICIPAL-RICHARD STOVALL F	MS	LPV	0	100	1	99.999	54	99.966
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	0	100	65	99.929
87I	YAZOO COUNTY	MS	LPV	0	100	0	100	73	99.906
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	0	100	43	99.983

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CKM	FLETCHER FIELD	MS	LPV	0	100	0	100	35	99.981
CRX	ROSCOE TURNER	MS	LPV200	0	100	0	100	31	99.988
GLH	GREENVILLE MID-DELTA	MS	LPV200	0	100	0	100	44	99.970
GNF	GRENADA MUNICIPAL	MS	LPV	0	100	0	100	59	99.952
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	100	3	99.995	92	99.693
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	1	99.998	61	99.940
GWO	GREENWOOD-LEFLORE	MS	LPV	0	100	0	100	63	99.939
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	0	100	1	99.997	87	99.771
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADA	MS	LPV200	0	100	0	100	87	99.848
HKS	HAWKINS FIELD	MS	LPV	0	100	0	100	80	99.854
HSA	STENNIS INTL	MS	LPV200	0	100	1	99.997	92	99.678
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	100	0	100	52	99.955
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	0	100	0	100	80	99.849
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	100	0	100	80	99.858
LMS	LOUISVILLE WINSTON COUNTY	MS	LPV	0	100	1	99.999	67	99.917
LUL	HESLER-NOBLE FIELD	MS	LPV	0	100	1	99.998	82	99.810
M11	COPIAH COUNTY	MS	LPV	0	100	0	100	79	99.825
M40	MONROE COUNTY	MS	LPV	0	100	1	99.999	55	99.962
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	0	100	0	100	38	99.985
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	0	100	1	99.999	86	99.789
MBO	BRUCE CAMPBELL FIELD	MS	LPV	0	100	0	100	77	99.860
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	0	100	0	100	89	99.751
MEI	KEY FIELD	MS	LPV200	0	100	1	99.998	75	99.868
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	100	1	99.997	92	99.687
MMS	SELFS	MS	LPV	0	100	0	100	41	99.977
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	1	99.999	72	99.894
OLV	OLIVE BRANCH	MS	LPV200	0	100	0	100	25	99.990
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	100	1	99.998	86	99.789
PMU	PANOLA COUNTY	MS	LPV	0	100	0	100	46	99.976

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PQL	TRENT LOTT INTL	MS	LPV200	0	100	5	99.992	92	99.713
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	100	0	100	47	99.969
STF	GEORGE M BRYAN	MS	LPV200	0	100	1	99.999	62	99.936
TUP	TUPELO RGNL	MS	LPV200	0	100	1	99.999	49	99.975
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	0	100	1	99.998	60	99.943
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	0	100	50	99.975
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	0	100	27	99.989
VKS	VICKSBURG MUNICIPAL	MS	LP	0	100	0	100	80	99.878
1S3	TILLITT FIELD	MT	LPV	0	100	0	100	0	100
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	0	100	0	100
6S0	BIG TIMBER	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
7S1	TWIN BRIDGES	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
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	LPV200	0	100	0	100	0	100
OLF	L M CLAYTON	MT	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
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 RGNL	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	1	99.999
43A	MONTGOMERY COUNTY	NC	LP	0	100	0	100	0	100
ACZ	HENDERSON FIELD	NC	LPV	0	100	0	100	0	100
AFP	ANSON COUNTY - JEFF CLOUD FIEL	NC	LPV	0	100	0	100	0	100
AKH	GASTONIA MUNICIPAL	NC	LPV	0	100	0	100	0	100
ASJ	TRI-COUNTY	NC	LPV	0	100	0	100	0	100
AVL	ASHEVILLE RGNL	NC	LPV200	0	100	0	100	0	100
BUY	BURLINGTON-ALAMANCE RGNL	NC	LPV	0	100	0	100	0	100
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	100	0	100	0	100
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	0	100	0	100	0	100
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	100	0	100	0	100
DPL	DUPLIN CO	NC	LPV200	0	100	0	100	0	100
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	0	100	0	100	0	100
EDE	NORTHEASTERN RGNL	NC	LPV200	0	100	0	100	0	100
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	100	0	100	0	100
EQY	CHARLOTTE-MONROE EXECUTIVE	NC	LPV200	0	100	0	100	0	100
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	100	0	100	0	100
EXX	DAVIDSON COUNTY	NC	LPV	0	100	0	100	0	100
EYF	CURTIS L BROWN JR FIELD	NC	LPV	0	100	0	100	0	100
FAY	FAYETTEVILLE RGNL/GRANNIS FIEL	NC	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FFA	FIRST FLIGHT	NC	LP	0	100	0	100	0	100
FQD	RUTHERFORD CO - MARCHMAN FIELD	NC	LPV	0	100	0	100	0	100
GEV	ASHE COUNTY	NC	LP	0	100	0	100	0	100
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	100	0	100	0	100
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	0	100	0	100	0	100
HBI	ASHEBORO RGNL	NC	LPV	0	100	0	100	0	100
HKY	HICKORY RGNL	NC	LPV200	0	100	0	100	0	100
HNZ	HENDERSON-OXFORD	NC	LPV	0	100	0	100	0	100
HRJ	HARNETT RGNL JETPORT	NC	LPV	0	100	0	100	0	100
ILM	WILMINGTON INTL	NC	LPV200	0	100	0	100	0	100
INT	SMITH REYNOLDS	NC	LPV200	0	100	0	100	0	100
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	0	100	0	100	0	100
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	0	100	0	100	0	100
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	0	100
JNX	JOHNSTON RGNL	NC	LPV	0	100	0	100	0	100
JQF	CONCORD-PADGETT RGNL	NC	LPV	0	100	0	100	0	100
LBT	LUMBERTON RGNL	NC	LPV	0	100	0	100	0	100
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	0	100	0	100	0	100
MCZ	MARTIN COUNTY	NC	LPV	0	100	0	100	0	100
MEB	LAURINBURG-MAXTON	NC	LPV200	0	100	0	100	0	100
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	0	100
MRH	MICHAEL J SMITH FIELD	NC	LPV	0	100	0	100	0	100
MRN	FOOTHILLS REGIONAL	NC	LPV	0	100	0	100	0	100
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	100	0	100	0	100
OAJ	ALBERT J ELLIS	NC	LPV200	0	100	0	100	0	100
OCW	WASHINGTON-WARREN	NC	LPV	0	100	0	100	0	100
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	0	100
PGV	PITT-GREENVILLE	NC	LPV	0	100	0	100	0	100
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	100	0	100	0	100
RCZ	RICHMOND COUNTY	NC	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	100	0	100	0	100
RHP	WESTERN CAROLINA RGNL	NC	LP	0	100	0	100	0	100
RUQ	MID-CAROLINA RGNL	NC	LPV200	0	100	0	100	0	100
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	0	100	0	100	0	100
SCR	SILER CITY MUNICIPAL	NC	LPV	0	100	0	100	0	100
SOP	MOORE COUNTY	NC	LPV200	0	100	0	100	0	100
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	0	100	0	100	0	100
SVH	STATESVILLE RGNL	NC	LPV200	0	100	0	100	0	100
TDF	PERSON COUNTY	NC	LPV200	0	100	0	100	0	100
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	0	100	0	100	0	100
UKF	WILKES COUNTY	NC	LPV200	0	100	0	100	0	100
VUJ	STANLY COUNTY	NC	LPV200	0	100	0	100	0	100
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	0	100	0	100	0	100
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	0	100	0	100	0	100
ZEF	ELKIN MUNICIPAL	NC	LP	0	100	0	100	0	100
06D	ROLLA MUNICIPAL	ND	LPV	0	100	0	100	0	100
20U	BEACH	ND	LPV	0	100	0	100	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
4E7	ELLENDALE MUNICIPAL	ND	LPV	0	100	0	100	0	100
51D	EDGELEY MUNICIPAL	ND	LPV	0	100	0	100	0	100
5L0	LAKOTA MUNICIPAL	ND	LPV	0	100	0	100	0	100
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	100	0	100	0	100
6L3	LISBON MUNICIPAL	ND	LPV	0	100	0	100	0	100
7L2	LINTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
9D7	CANDO MUNICIPAL	ND	LPV	0	100	0	100	0	100
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	100	0	100	0	100
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	100	0	100	0	100
BWP	HARRY STERN	ND	LPV	0	100	0	100	0	100
BWW	BOWMAN RGNL	ND	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
D05	GARRISON MUNICIPAL	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
D57	GLEN ULLIN RGNL	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	LPV	0	100	0	100	0	100
HEI	HETTINGER MUNICIPAL	ND	LPV	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
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	100	0	100	0	100
12K	SUPERIOR MUNICIPAL	NE	LPV	0	100	0	100	0	100
47V	CURTIS MUNICIPAL	NE	LPV	0	100	0	100	0	100
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	0	100
4V9	ANTELOPE COUNTY	NE	LPV	0	100	0	100	0	100
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	100	0	100	0	100
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	100	0	100	0	100
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
9V5	MODISETT	NE	LPV	0	100	0	100	0	100
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
AHQ	WAHOO MUNICIPAL	NE	LPV	0	100	0	100	0	100
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
ANW	AINSWORTH RGNL	NE	LPV200	0	100	0	100	0	100
AUH	AURORA MUNICIPAL - AL POTTER FIELD	NE	LPV	0	100	0	100	0	100
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	0	100	0	100	0	100
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	0	100	0	100	0	100
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
BTA	BLAIR MUNICIPAL	NE	LPV	0	100	0	100	0	100
BUB	CRAM FIELD	NE	LPV	0	100	0	100	0	100
BVN	ALBION MUNICIPAL	NE	LPV	0	100	0	100	0	100
CDR	CHADRON MUNICIPAL	NE	LPV200	0	100	0	100	0	100
CEK	CRETE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	0	100
EAR	KEARNEY RGNL	NE	LPV200	0	100	0	100	0	100
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	100	0	100	0	100
FET	FREMONT MUNICIPAL	NE	LPV	0	100	0	100	0	100
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	100	0	100	0	100
FNB	BRENNER FIELD	NE	LPV	0	100	0	100	0	100
GGF	GRANT MUNICIPAL	NE	LPV	0	100	0	100	0	100
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	100	0	100	0	100
GRN	GORDON MUNICIPAL	NE	LPV	0	100	0	100	0	100
HDE	BREWSTER FIELD	NE	LPV	0	100	0	100	0	100
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	0	100
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	0	100
JYR	YORK MUNICIPAL	NE	LPV	0	100	0	100	0	100
LBF	NORTH PLATTE RGNL AIRPORT LEE	NE	LPV200	0	100	0	100	0	100
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	0	100	0	100	0	100
LNK	LINCOLN	NE	LPV200	0	100	0	100	0	100
LXN	JIM KELLY FIELD	NE	LPV	0	100	0	100	0	100
MCK	MC COOK BEN NELSON RGNL	NE	LPV	0	100	0	100	0	100
MLE	MILLARD	NE	LPV	0	100	0	100	0	100
ODX	EVELYN SHARP FIELD	NE	LPV	0	100	0	100	0	100
OFK	NORFOLK RGNL/KARL STEFAN MEMOR	NE	LPV	0	100	0	100	0	100
OGA	SEARLE FIELD	NE	LPV	0	100	0	100	0	100
OKS	GARDEN COUNTY	NE	LPV	0	100	0	100	0	100
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	100	0	100	0	100
OMA	EPPLEY AIRFIELD	NE	LPV200	0	100	0	100	0	100
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	0	100	0	100	0	100
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	0	100	0	100	0	100
RBE	ROCK COUNTY	NE	LPV	0	100	0	100	0	100
SCB	SCRIBNER STATE	NE	LPV	0	100	0	100	0	100
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FIELD	NE	LPV	0	100	0	100	0	100
SWT	SEWARD MUNICIPAL	NE	LPV	0	100	0	100	0	100
TIF	THOMAS COUNTY	NE	LPV	0	100	0	100	0	100
TQE	TEKAMAH MUNICIPAL	NE	LPV	0	100	0	100	0	100
VTN	MILLER FIELD	NE	LPV	0	100	0	100	0	100
ASH	BOIRE FIELD	NH	LPV200	0	100	0	100	1	99.995
CON	CONCORD MUNICIPAL	NH	LPV	0	100	0	100	1	99.995
DAW	SKYHAVEN	NH	LPV	0	100	0	100	1	99.996
EEN	DILLANT-HOPKINS	NH	LPV	0	100	0	100	1	99.994
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	100	0	100	1	99.993
LCI	LACONIA MUNICIPAL	NH	LPV	0	100	0	100	1	99.995
LEB	LEBANON MUNICIPAL	NH	LPV	0	100	0	100	1	99.994

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MHT	MANCHESTER	NH	LPV200	0	100	0	100	1	99.995
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	100	0	100	1	99.996
47N	CENTRAL JERSEY RGNL	NJ	LP	0	100	0	100	0	100
4N1	GREENWOOD LAKE	NJ	LP	0	100	0	100	0	100
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	100	0	100	0	100
CDW	ESSEX COUNTY	NJ	LPV	0	100	0	100	0	100
EWR	NEWARK LIBERTY INTL	NJ	LPV200	0	100	0	100	1	99.999
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	LPV	0	100	0	100	0	100
N12	LAKEWOOD	NJ	LP	0	100	0	100	0	100
N14	FLYING W	NJ	LPV	0	100	0	100	0	100
N40	SKY MANOR	NJ	LP	0	100	0	100	0	100
TEB	TETERBORO	NJ	LPV	0	100	0	100	1	99.999
TTN	TRENTON MERCER	NJ	LPV	0	100	0	100	0	100
VAY	SOUTH JERSEY RGNL	NJ	LP	0	100	0	100	0	100
WWD	CAPE MAY COUNTY	NJ	LPV	0	100	0	100	0	100
CYDF	DEER LAKE	NL	LPV	0	100	0	100	3	99.994
LFVM	MIQUELON	NL	LPV	0	100	0	100	4	99.967
LFVP	ST PIERRE	NL	LPV	0	100	0	100	4	99.963
0E0	MORIARTY MUNICIPAL	NM	LPV	0	100	0	100	0	100
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	0	100	0	100	1	99.998
AEG	DOUBLE EAGLE II	NM	LPV200	0	100	0	100	2	99.998
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	0	100	0	100	0	100
ATS	ARTESIA MUNICIPAL	NM	LPV200	0	100	0	100	0	100
CAO	CLAYTON MUNICIPAL ARPK	NM	LPV	0	100	0	100	0	100
CNM	CAVERN CITY AIR TRML	NM	LPV200	0	100	0	100	0	100
CVN	CLOVIS MUNICIPAL	NM	LPV200	0	100	0	100	0	100
DMN	DEMING MUNICIPAL	NM	LPV	0	100	42	99.981	83	99.895
E06	LEA COUNTY-ZIP FRANKLIN MEMORI	NM	LPV	0	100	0	100	0	100
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	2	99.986
HOB	LEA COUNTY RGNL	NM	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LAM	LOS ALAMOS	NM	LP	0	100	0	100	1	99.999
LRU	LAS CRUCES INTL	NM	LPV200	0	100	0	100	10	99.996
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	0	100	1	99.999
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	100	0	100	0	100
SAF	SANTA FE MUNICIPAL	NM	LPV200	0	100	0	100	0	100
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	100	0	100	0	100
SVC	GRANT COUNTY	NM	LPV	0	100	28	99.989	84	99.848
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	0	100	0	100	1	99.995
CYEV	INUVIK	NT	LPV	0	100	0	100	1	99.981
05U	EUREKA	NV	LP	0	100	0	100	2	99.993
67L	MESQUITE	NV	LP	0	100	0	100	1	99.992
BAM	BATTLE MOUNTAIN	NV	LPV	0	100	0	100	2	99.997
CXP	CARSON	NV	LP	0	100	0	100	4	99.966
ELY	ELY ARPT /YELLAND FLD/	NV	LPV	0	100	0	100	1	99.997
HTH	HAWTHORNE INDUSTRIAL	NV	LP	0	100	0	100	3	99.966
LAS	MC CARRAN INTL	NV	LPV	0	100	0	100	3	99.969
LOL	DERBY FIELD	NV	LPV	0	100	0	100	4	99.980
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	4	99.967
RTS	RENO/STEAD	NV	LPV	0	100	0	100	4	99.967
SPZ	SILVER SPRINGS	NV	LPV	0	100	0	100	4	99.968
TPH	TONOPAH	NV	LP	0	100	0	100	3	99.968
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	2	99.995
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	1	99.997
20N	KINGSTON-ULSTER	NY	LPV	0	100	0	100	1	99.998
44N	SKY ACRES	NY	LPV	0	100	0	100	1	99.997
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	100	0	100	1	99.998
5B2	SARATOGA COUNTY	NY	LPV	0	100	0	100	1	99.996
5G0	LE ROY	NY	LP	0	100	0	100	0	100
9G0	BUFFALO AIRFIELD	NY	LP	0	100	0	100	0	100
9G3	AKRON	NY	LP	0	100	0	100	0	100
ALB	ALBANY INTL	NY	LPV200	0	100	0	100	1	99.997
ART	WATERTOWN INTL	NY	LPV200	0	100	0	100	0	100
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	0	100	0	100	0	100
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	100	0	100	0	100
ELZ	WELLSVILLE MUNICIPAL ARPT`TARANTINE	NY	LPV200	0	100	0	100	0	100
FOK	FRANCIS S GABRESKI	NY	LPV200	0	100	0	100	1	99.993
FRG	REPUBLIC	NY	LPV200	0	100	0	100	1	99.995
FZY	OSWEGO COUNTY	NY	LPV	0	100	0	100	0	100
GFL	FLOYD BENNETT MEMORIAL	NY	LPV200	0	100	0	100	1	99.994
GVQ	GENESEE COUNTY	NY	LPV200	0	100	0	100	1	99.999
HPN	WESTCHESTER COUNTY	NY	LPV	0	100	0	100	1	99.997
HTF	HORNELL MUNICIPAL	NY	LPV	0	100	0	100	0	100
HTO	EAST HAMPTON	NY	LPV	0	100	0	100	1	99.993
HWV	BROOKHAVEN	NY	LPV	0	100	0	100	1	99.994
IAG	NIAGARA FALLS INTL	NY	LPV	0	100	0	100	1	99.999
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	100	0	100	1	99.994
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	100	0	100	0	100
IUA	CANANDAIGUA	NY	LPV	0	100	0	100	0	100
JFK	JOHN F KENNEDY INTL	NY	LPV200	0	100	0	100	1	99.998
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	100	0	100	0	100
K09	PISECO	NY	LP	0	100	0	100	0	100
LGA	LAGUARDIA	NY	LPV	0	100	0	100	1	99.999
MAL	MALONE-DUFORT	NY	LPV	0	100	0	100	0	100
MGJ	ORANGE COUNTY	NY	LPV	0	100	0	100	1	99.999
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	1	99.998
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	0	100
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	0	100
PEO	PENN YAN	NY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
POU	HUDSON VALLEY RGNL	NY	LPV	0	100	0	100	1	99.998
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	1	99.998
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	1	99.999
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	100	0	100	0	100
VGC	HAMILTON MUNICIPAL	NY	LPV	0	100	0	100	0	100
0G6	WILLIAMS COUNTY	OH	LPV	0	100	0	100	0	100
10G	HOLMES COUNTY	OH	LP	0	100	0	100	0	100
16G	SENECA COUNTY	OH	LPV	0	100	0	100	0	100
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	0	100	0	100	0	100
1G0	WOOD COUNTY	OH	LPV	0	100	0	100	0	100
1G3	KENT STATE UNIV	OH	LPV	0	100	0	100	0	100
2G2	JEFFERSON COUNTY AIRPARK	OH	LPV	0	100	0	100	0	100
4G5	MONROE COUNTY	OH	LP	0	100	0	100	0	100
4I3	KNOX COUNTY	OH	LPV200	0	100	0	100	0	100
5A1	NORWALK-HURON COUNTY	OH	LP	0	100	0	100	0	100
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	100	0	100	0	100
7G8	GEAUGA COUNTY	OH	LP	0	100	0	100	0	100
AKR	AKRON FULTON INTL	OH	LP	0	100	0	100	0	100
AOH	LIMA ALLEN COUNTY	OH	LPV200	0	100	0	100	0	100
AXV	NEIL ARMSTRONG	OH	LPV	0	100	0	100	0	100
BJJ	WAYNE COUNTY	OH	LPV	0	100	0	100	0	100
BKL	BURKE LAKEFRONT	OH	LPV	0	100	0	100	0	100
CAK	AKRON-CANTON RGNL	OH	LPV200	0	100	0	100	0	100
CDI	CAMBRIDGE MUNICIPAL	OH	LP	0	100	0	100	0	100
CGF	CUYAHOGA COUNTY	OH	LPV200	0	100	0	100	0	100
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	0	100
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	0	100	0	100	0	100
CQA	LAKEFIELD	OH	LPV	0	100	0	100	0	100
CYO	PICKAWAY COUNTY MEMORIAL	OH	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	100	0	100	0	100
DLZ	DELAWARE MUNICIPAL - JIM MOORE FIEL	OH	LPV	0	100	0	100	0	100
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	0	100
EOP	PIKE COUNTY	OH	LP	0	100	0	100	0	100
FDY	FINDLAY	OH	LPV	0	100	0	100	0	100
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	100	0	100	0	100
GQQ	GALION MUNICIPAL	OH	LP	0	100	0	100	0	100
HAO	BUTLER CO RGNL-HOGAN FIELD	OH	LPV	0	100	0	100	0	100
HOC	HIGHLAND COUNTY	OH	LP	0	100	0	100	0	100
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	0	100
I10	NOBLE COUNTY	OH	LP	0	100	0	100	0	100
I19	GREENE COUNTY-LEWIS A JACKSON	OH	LPV	0	100	0	100	0	100
I40	RICHARD DOWNING	OH	LPV	0	100	0	100	0	100
I66	CLINTON FIELD	OH	LPV	0	100	0	100	0	100
I68	WARREN COUNTY/JOHN LANE FIELD	OH	LPV	0	100	0	100	0	100
I69	CLERMONT COUNTY	OH	LP	0	100	0	100	0	100
I74	GRIMES FIELD	OH	LPV	0	100	0	100	0	100
ILN	WILMINGTON AIR PARK	OH	LPV200	0	100	0	100	0	100
LCK	RICKENBACKER INTL	OH	LPV200	0	100	0	100	0	100
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	100	0	100	0	100
LNN	WILLOUGHBY LOST NATION MUNICIPAL	OH	LPV	0	100	0	100	0	100
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	100	0	100	0	100
LUK	CINCINNATI MUNICIPAL AIRPORT LUNKEN	OH	LPV	0	100	0	100	0	100
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	100	0	100	0	100
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	100	0	100	0	100
MNN	MARION MUNICIPAL	OH	LPV	0	100	0	100	0	100
MRT	UNION COUNTY	OH	LP	0	100	0	100	0	100
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	0	100
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	0	100
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	0	100
PCW	ERIE-OTTAWA INTL	OH	LPV	0	100	0	100	0	100
PHD	HARRY CLEVER FIELD	OH	LP	0	100	0	100	0	100
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	0	100	0	100	0	100
POV	PORTAGE COUNTY	OH	LPV	0	100	0	100	0	100
RZT	ROSS COUNTY	OH	LPV	0	100	0	100	0	100
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	100	0	100	0	100
SCA	SIDNEY MUNICIPAL	OH	LPV	0	100	0	100	0	100
SGH	SPRINGFIELD-BECKLEY MUNICIPAL	OH	LPV200	0	100	0	100	0	100
TDZ	TOLEDO EXECUTIVE	OH	LPV	0	100	0	100	0	100
TOL	TOLEDO EXPRESS	OH	LPV200	0	100	0	100	0	100
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	100	0	100	0	100
TZR	BOLTON FIELD	OH	LPV	0	100	0	100	0	100
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	0	100
USE	FULTON COUNTY	OH	LPV	0	100	0	100	0	100
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	0	100
VES	DARKE COUNTY	OH	LPV	0	100	0	100	0	100
VTA	NEWARK-HEATH	OH	LP	0	100	0	100	0	100
YNG	YOUNGSTOWN-WARREN RGNL	OH	LPV	0	100	0	100	0	100
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	0	100	0	100	0	100
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	100	0	100	0	100
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	0	100	0	100	0	100
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	0	100
2K4	SCOTT FIELD	OK	LPV	0	100	0	100	0	100
4O4	MC CURTAIN COUNTY RGNL	OK	LP	0	100	0	100	0	100
6K4	FAIRVIEW MUNICIPAL	OK	LPV	0	100	0	100	0	100
80F	ANTLERS MUNICIPAL	OK	LPV	0	100	0	100	0	100
ADH	ADA RGNL	OK	LPV	0	100	0	100	0	100
ADM	ARDMORE MUNICIPAL	OK	LPV	0	100	0	100	0	100
AVK	ALVA RGNL	OK	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	100	0	100	0	100
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	100	0	100	0	100
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	100	0	100	0	100
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	100	0	100	0	100
CLK	CLINTON RGNL	OK	LPV	0	100	0	100	0	100
CSM	CLINTON-SHERMAN	OK	LPV200	0	100	0	100	0	100
CUH	CUSHING MUNICIPAL	OK	LPV	0	100	0	100	0	100
DUA	DURANT RGNL - EAKER FIELD	OK	LPV	0	100	0	100	0	100
DUC	HALLIBURTON FIELD	OK	LPV200	0	100	0	100	0	100
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	100	0	100	0	100
F22	PERRY MUNICIPAL	OK	LPV	0	100	0	100	0	100
FDR	FREDERICK RGNL	OK	LPV200	0	100	0	100	0	100
GCM	CLAREMORE RGNL	OK	LPV	0	100	0	100	0	100
GMJ	GROVE MUNICIPAL	OK	LPV	0	100	0	100	0	100
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	100	0	100	0	100
GUY	GUYMON MUNICIPAL	OK	LPV	0	100	0	100	0	100
GZL	STIGLER RGNL	OK	LPV	0	100	0	100	0	100
H71	MID-AMERICA INDUSTRIAL	OK	LPV	0	100	0	100	0	100
HBR	HOBART RGNL	OK	LPV	0	100	0	100	0	100
HHW	STAN STAMPER MUNICIPAL	OK	LPV	0	100	0	100	0	100
HSD	SUNDANCE	OK	LPV	0	100	0	100	0	100
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	0	100	0	100	0	100
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	0	100	0	100	0	100
MLC	MC ALESTER RGNL	OK	LPV	0	100	0	100	0	100
OJA	THOMAS P STAFFORD	OK	LPV	0	100	0	100	0	100
OKC	WILL ROGERS WORLD	OK	LPV200	0	100	0	100	0	100
OKM	OKMULGEE RGNL	OK	LPV200	0	100	0	100	0	100
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	0	100	0	100	0	100
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	0	100	0	100	0	100
PNC	PONCA CITY RGNL	OK	LPV	0	100	0	100	0	100
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	100	0	100	0	100
PWA	WILEY POST	OK	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	0	100
RVS	RICHARD LLOYD JONES JR	OK	LPV200	0	100	0	100	0	100
SNL	SHAWNEE RGNL	OK	LPV200	0	100	0	100	0	100
SWO	STILLWATER RGNL	OK	LPV200	0	100	0	100	0	100
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	100	0	100	0	100
TUL	TULSA INTL	OK	LPV200	0	100	0	100	0	100
WDG	ENID WOODRING RGNL	OK	LPV200	0	100	0	100	0	100
WWR	WEST WOODWARD	OK	LPV	0	100	0	100	0	100
CNS7	KINCARDINE	ON	LPV	0	100	0	100	0	100
CYHD	DRYDEN REGIONAL	ON	LPV	0	100	0	100	0	100
CYKF	KITCHENER / WATERLOO	ON	LPV	0	100	0	100	0	100
CYOW	OTTAWA / MACDONALDCARTIER INTL	ON	LPV	0	100	0	100	0	100
CYQT	THUNDER BAY	ON	LPV	0	100	0	100	0	100
CYTS	TIMMINS / VICTOR M POWER	ON	LPV	0	100	0	100	0	100
CYXL	SIOUX LOOKOUT	ON	LPV	0	100	0	100	0	100
3S8	GRANTS PASS	OR	LP	0	100	0	100	6	99.950
77S	HOBBY FIELD	OR	LPV	0	100	0	100	4	99.975
AST	ASTORIA RGNL	OR	LPV	0	100	0	100	1	99.999
BDN	BEND MUNICIPAL	OR	LPV	0	100	0	100	3	99.987
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	0	100
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	2	99.984
EUG	MAHLON SWEET FIELD	OR	LPV200	0	100	0	100	5	99.978
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	100	0	100	0	100
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	100	0	100	1	99.994
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	100	0	100	0	100
LKV	LAKE COUNTY	OR	LPV	0	100	0	100	3	99.982
LMT	CRATER LAKE-KLAMATH RGNL	OR	LPV	0	100	0	100	4	99.971
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	2	99.992
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	0	100
ONP	NEWPORT MUNICIPAL	OR	LPV	0	100	0	100	2	99.985
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	6	99.957

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	0	100	0	100	0	100
PDX	PORTLAND INTL	OR	LPV200	0	100	0	100	1	99.995
RDM	ROBERTS FIELD	OR	LPV200	0	100	0	100	2	99.989
S33	MADRAS MUNICIPALCIPAL	OR	LPV	0	100	0	100	2	99.994
S39	PRINEVILLE	OR	LP	0	100	0	100	2	99.990
SLE	MCNARY FLD	OR	LPV200	0	100	0	100	2	99.990
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	100	0	100	1	99.996
UAO	AURORA STATE	OR	LPV	0	100	0	100	1	99.993
22N	JAKE ARNER MEMORIAL	PA	LP	0	100	0	100	0	100
29D	GROVE CITY	PA	LP	0	100	0	100	0	100
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	0	100
6G1	TITUSVILLE	PA	LPV	0	100	0	100	0	100
6P7	MCVILLE	PA	LP	0	100	0	100	0	100
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	0	100
8N8	DANVILLE	PA	LP	0	100	0	100	0	100
9D4	DECK	PA	LPV	0	100	0	100	0	100
ABE	LEHIGH VALLEY INTL	PA	LPV200	0	100	0	100	0	100
AFJ	WASHINGTON COUNTY	PA	LPV200	0	100	0	100	0	100
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	0	100
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	100	0	100	0	100
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	0	100	0	100	0	100
AXQ	CLARION COUNTY	PA	LPV	0	100	0	100	0	100
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	0	100
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	0	100	0	100	0	100
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	0	100
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	0	100
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	0	100
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	0	100	0	100	0	100
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	100	0	100	0	100
FKL	VENANGO RGNL	PA	LPV	0	100	0	100	0	100
FWQ	ROSTRAVER	PA	LPV	0	100	0	100	0	100
GKJ	PORT MEADVILLE	PA	LP	0	100	0	100	0	100
HMZ	BEDFORD COUNTY	PA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HZL	HAZLETON RGNL	PA	LPV	0	100	0	100	0	100
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	0	100	0	100	0	100
IPT	WILLIAMSPORT RGNL	PA	LPV	0	100	0	100	0	100
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA	PA	LPV200	0	100	0	100	0	100
LBE	ARNOLD PALMER RGNL	PA	LPV200	0	100	0	100	0	100
LNS	LANCASTER	PA	LPV200	0	100	0	100	0	100
LOM	WINGS FIELD	PA	LPV	0	100	0	100	0	100
MDT	HARRISBURG INTL	PA	LPV	0	100	0	100	0	100
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	0	100	0	100	0	100
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	100	0	100	0	100
N38	WELLSBORO JOHNSTON	PA	LP	0	100	0	100	0	100
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	100	0	100	0	100
N96	BELLEFONTE	PA	LPV	0	100	0	100	0	100
OQN	BRANDYWINE	PA	LP	0	100	0	100	0	100
OYM	ST MARYS MUNICIPAL	PA	LPV	0	100	0	100	0	100
PHL	PHILADELPHIA INTL	PA	LPV200	0	100	0	100	0	100
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	0	100
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	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
SEG	PENN VALLEY	PA	LP	0	100	0	100	0	100
THV	YORK	PA	LP	0	100	0	100	0	100
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	100	0	100	0	100
UKT	QUAKERTOWN	PA	LP	0	100	0	100	0	100
UNV	UNIVERSITY PARK	PA	LPV200	0	100	0	100	0	100
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	0	100	0	100	0	100
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	100	0	100	0	100
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	100	0	100	0	100
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	0	100	0	100	0	100
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	1	99.997
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	0	100
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	0	100
CYYY	MONTJOLI	QC	LPV	0	100	0	100	0	100
BID	BLOCK ISLAND STATE	RI	LPV	0	100	0	100	1	99.994
OQU	QUONSET STATE	RI	LPV200	0	100	0	100	1	99.994
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	0	100	0	100	1	99.994
SFZ	NORTH CENTRAL STATE	RI	LPV	0	100	0	100	1	99.995
35A	UNION COUNTY` TROY SHELTON FIE	SC	LP	0	100	0	100	0	100
6J0	LEXINGTON COUNTY	SC	LPV	0	100	0	100	0	100
AIK	AIKEN RGNL	SC	LPV200	0	100	0	100	0	100
AND	ANDERSON RGNL	SC	LPV200	0	100	0	100	0	100
AQX	ALLENDALE COUNTY	SC	LPV	0	100	0	100	0	100
ARW	BEAUFORT COUNTY	SC	LPV200	0	100	0	100	0	100
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	0	100	0	100	0	100
BNL	BARNWELL RGNL	SC	LPV	0	100	0	100	0	100
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	100	0	100	0	100
CDN	WOODWARD FIELD	SC	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	100	0	100	0	100
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	100	0	100	0	100
CKI	WILLIAMSBURG RGNL	SC	LPV	0	100	0	100	0	100
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FI	SC	LPV	0	100	0	100	0	100
CRE	GRAND STRAND	SC	LPV200	0	100	0	100	0	100
CUB	JIM HAMILTON L B OWENS	SC	LPV	0	100	0	100	0	100
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	100	0	100	0	100
DYB	SUMMERVILLE	SC	LPV200	0	100	0	100	0	100
FDW	FAIRFIELD COUNTY	SC	LPV	0	100	0	100	0	100
FLO	FLORENCE RGNL	SC	LPV	0	100	0	100	0	100
GGE	GEORGETOWN COUNTY	SC	LPV	0	100	0	100	0	100
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	100	0	100	0	100
GRD	GREENWOOD COUNTY	SC	LPV	0	100	0	100	0	100
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	0	100	0	100	0	100
GYH	DONALDSON FIELD	SC	LPV	0	100	0	100	0	100
HVS	HARTSVILLE RGNL	SC	LPV	0	100	0	100	0	100
HXD	HILTON HEAD	SC	LPV	0	100	0	100	6	99.997
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	100	0	100	0	100
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	100	0	100	0	100
LKR	LANCASTER COUNTY-MC WHIRTER FI	SC	LPV200	0	100	0	100	0	100
LQK	PICKENS COUNTY	SC	LPV	0	100	0	100	0	100
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	100	0	100	0	100
LUX	LAURENS COUNTY	SC	LPV	0	100	0	100	0	100
MAO	MARION COUNTY	SC	LPV	0	100	0	100	0	100
MKS	BERKELEY COUNTY	SC	LPV	0	100	0	100	0	100
MYR	MYRTLE BEACH INTL	SC	LPV200	0	100	0	100	0	100
OGB	ORANGEBURG MUNICIPAL	SC	LPV	0	100	0	100	0	100
PYG	PAGELAND	SC	LPV	0	100	0	100	0	100
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	100	0	100	0	100
SMS	SUMTER	SC	LPV200	0	100	0	100	0	100
SPA	SPARTANBURG DOWNTOWN MEMORIAL/	SC	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UDG	DARLINGTON COUNTY	SC	LPV	0	100	0	100	0	100
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	0	100	0	100	0	100
0D8	GETTYSBURG MUNICIPAL	SD	LP	0	100	0	100	0	100
49B	STURGIS MUNICIPAL	SD	LPV	0	100	0	100	0	100
4X4	WESSINGTON SPRINGS	SD	LP	0	100	0	100	0	100
8D3	SISSETON MUNICIPAL	SD	LPV	0	100	0	100	0	100
8D7	CLARK COUNTY	SD	LP	0	100	0	100	0	100
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	0	100	0	100
98D	ONIDA MUNICIPAL	SD	LP	0	100	0	100	0	100
9D0	HIGHMORE MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	0	100	0	100	0	100
9V6	MARTIN MUNICIPAL	SD	LPV	0	100	0	100	0	100
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	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
IEN	PINE RIDGE	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
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	0	100
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
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	0	100
CYKJ	KEY LAKE	SK	LPV	0	100	0	100	0	100
0A3	SMITHVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
0M3	JOHN A BAKER FLD	TN	LP	0	100	0	100	0	100
0M4	BENTON COUNTY	TN	LPV	0	100	0	100	0	100
0M5	HUMPHREYS COUNTY	TN	LP	0	100	0	100	0	100
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	100	0	100	0	100
1M5	PORTLAND MUNICIPAL	TN	LPV	0	100	0	100	0	100
2A0	MARK ANTON	TN	LPV	0	100	0	100	0	100
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	0	100	0	100	0	100
2M8	CHARLES W BAKER	TN	LPV	0	100	0	100	12	99.995
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	0	100	0	100	0	100
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	100	0	100	0	100
8A3	LIVINGSTON MUNICIPAL	TN	LP	0	100	0	100	0	100
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	100	0	100	0	100
BNA	NASHVILLE INTL	TN	LPV200	0	100	0	100	0	100
CHA	LOVELL FIELD	TN	LPV200	0	100	0	100	0	100
CKV	OUTLAW FIELD	TN	LPV	0	100	0	100	0	100
CSV	CROSSVILLE MEMORIAL-WHITSON FI	TN	LPV200	0	100	0	100	0	100
DYR	DYERSBURG RGNL	TN	LPV	0	100	0	100	0	100
FYE	FAYETTE COUNTY	TN	LPV	0	100	0	100	19	99.992
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
GCY	GREENEVILLE-GREENE COUNTY MUNICIPAL	TN	LPV	0	100	0	100	0	100
GHM	CENTERVILLE MUNICIPAL	TN	LP	0	100	0	100	0	100
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	100	0	100	0	100
GZS	ABERNATHY FIELD	TN	LPV	0	100	0	100	0	100
HZD	CARROLL COUNTY	TN	LPV	0	100	0	100	0	100
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	0	100	0	100	0	100
JWN	JOHN C TUNE	TN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LUG	ELLINGTON	TN	LPV	0	100	0	100	0	100
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	0	100	14	99.994
M08	WILLIAM L WHITEHURST FIELD	TN	LP	0	100	0	100	18	99.993
M53	HUMBOLDT MUNICIPAL	TN	LPV	0	100	0	100	0	100
M54	LEBANON MUNICIPAL	TN	LPV	0	100	0	100	0	100
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	100	0	100	0	100
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	100	0	100	0	100
MEM	MEMPHIS INTL	TN	LPV200	0	100	0	100	22	99.991
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	100	0	100	0	100
MMI	MCMINN COUNTY	TN	LPV	0	100	0	100	0	100
MNV	MONROE COUNTY	TN	LPV	0	100	0	100	0	100
MOR	MOORE-MURRELL	TN	LPV	0	100	0	100	0	100
MQY	SMYRNA	TN	LPV200	0	100	0	100	0	100
MRC	MAURY COUNTY	TN	LPV	0	100	0	100	0	100
NQA	MILLINGTON-MEMPHIS	TN	LPV200	0	100	0	100	10	99.996
PHT	HENRY COUNTY	TN	LPV200	0	100	0	100	0	100
PVE	BEECH RIVER RGNL	TN	LPV	0	100	0	100	0	100
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	100	0	100	0	100
RNC	WARREN COUNTY MEMORIAL	TN	LPV	0	100	0	100	0	100
RVN	HAWKINS COUNTY	TN	LP	0	100	0	100	0	100
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	0	100	0	100	0	100
SCX	SCOTT MUNICIPAL	TN	LPV	0	100	0	100	0	100
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	0	100	8	99.997
SRB	UPPER CUMBERLAND RGNL	TN	LPV	0	100	0	100	0	100
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
SZY	ROBERT SIBLEY	TN	LPV	0	100	0	100	12	99.995
TGC	GIBSON COUNTY	TN	LP	0	100	0	100	0	100
THA	TULLAHOMA RGNL ARPT/WM NORTHER	TN	LPV	0	100	0	100	0	100
TRI	TRI-CITIES	TN	LPV200	0	100	0	100	0	100
TYS	MC GHEE TYSON	TN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	100	0	100	0	100
XNX	SUMNER COUNTY RGNL	TN	LPV	0	100	0	100	0	100
0F2	BOWIE MUNICIPAL	TX	LPV	0	100	0	100	0	100
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	0	100	0	100
2R9	KARNES COUNTY	TX	LP	0	100	0	100	0	100
3R9	LAKEWAY AIRPARK	TX	LP	0	100	0	100	0	100
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	100	0	100	0	100
41F	FLOYDADA MUNICIPAL	TX	LP	0	100	0	100	0	100
45R	HAWTHORNE FIELD	TX	LP	0	100	0	100	1	99.999
4T2	KENNETH COPELAND	TX	LPV	0	100	0	100	0	100
50R	LOCKHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
5C1	BOERNE STAGE FIELD	TX	LP	0	100	0	100	0	100
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	100	0	100	0	100
60R	NAVASOTA MUNICIPAL	TX	LPV	0	100	0	100	0	100
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	100	0	100	0	100
77F	WINTERS MUNICIPAL	TX	LP	0	100	0	100	0	100
8F3	CROSBYTON MUNICIPAL	TX	LP	0	100	0	100	0	100
ABI	ABILENE RGNL	TX	LPV200	0	100	0	100	0	100
ACT	WACO RGNL	TX	LPV200	0	100	0	100	0	100
ADS	ADDISON	TX	LPV	0	100	0	100	0	100
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	100	0	100	0	100
ALI	ALICE INTL	TX	LPV	0	100	0	100	0	100
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	100	0	100	0	100
ARM	WHARTON RGNL	TX	LPV	0	100	0	100	0	100
ASL	HARRISON COUNTY	TX	LPV	0	100	0	100	0	100
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	100	0	100	0	100
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	100	0	100	0	100
BAZ	NEW BRAUNFELS RGNL	TX	LPV	0	100	0	100	0	100
BBD	CURTIS FIELD	TX	LPV	0	100	0	100	0	100
BEA	BEEVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
BFE	TERRY COUNTY	TX	LPV	0	100	0	100	0	100
BGD	HUTCHINSON COUNTY	TX	LPV	0	100	0	100	0	100
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	0	100
BKS	BROOKS COUNTY	TX	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BMT	BEAUMONT MUNICIPAL	TX	LPV	0	100	0	100	5	99.998
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	0	100	0	100
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	22	99.990
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	0	100	0	100	0	100
BWD	BROWNWOOD RGNL	TX	LPV	0	100	0	100	0	100
BYY	BAY CITY RGNL	TX	LPV	0	100	0	100	0	100
CDS	CHILDRESS MUNICIPAL	TX	LPV200	0	100	0	100	0	100
CFD	COULTER FIELD	TX	LPV	0	100	0	100	0	100
CLL	EASTERWOOD FIELD	TX	LPV200	0	100	0	100	0	100
CNW	TSTC WACO	TX	LPV200	0	100	0	100	0	100
COM	COLEMAN MUNICIPAL	TX	LPV	0	100	0	100	0	100
COT	COTULLA-LA SALLE COUNTY	TX	LPV	0	100	0	100	0	100
CPT	CLEBURNE RGNL	TX	LPV	0	100	0	100	0	100
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	100	0	100	0	100
CVB	CASTROVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
CWC	KICKAPOO DOWNTOWN	TX	LPV	0	100	0	100	0	100
CXO	CONROE-NORTH HOUSTON RGNL	TX	LPV200	0	100	0	100	0	100
CZT	DIMMIT COUNTY	TX	LPV	0	100	0	100	0	100
DAL	DALLAS LOVE FIELD	TX	LPV200	0	100	0	100	0	100
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	0	100	0	100	0	100
DHT	DALHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
DKR	HOUSTON COUNTY	TX	LP	0	100	0	100	0	100
DRT	DEL RIO INTL	TX	LPV	0	100	0	100	0	100
DTO	DENTON ENTERPRISE	TX	LPV200	0	100	0	100	0	100
DUX	MOORE COUNTY	TX	LPV200	0	100	0	100	0	100
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	100	0	100	0	100
E01	ROY HURD MEMORIAL	TX	LP	0	100	0	100	0	100
E11	ANDREWS COUNTY	TX	LPV	0	100	0	100	0	100
E19	GRUVER MUNICIPAL	TX	LP	0	100	0	100	0	100
E30	BRUCE FIELD	TX	LPV	0	100	0	100	0	100
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	0	100	0	100
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	100	0	100	0	100
EFD	ELLINGTON	TX	LPV200	0	100	0	100	0	100
ELA	EAGLE LAKE	TX	LP	0	100	0	100	0	100
ELP	EL PASO INTL	TX	LP	0	100	0	100	0	100
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	0	100	0	100	0	100
ETN	EASTLAND MUNICIPAL	TX	LP	0	100	0	100	0	100
F00	JONES FIELD	TX	LPV	0	100	0	100	0	100
F05	WILBARGER COUNTY	TX	LPV	0	100	0	100	0	100
F49	SLATON MUNICIPAL	TX	LPV	0	100	0	100	0	100
F98	YOAKUM COUNTY	TX	LPV	0	100	0	100	0	100
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	0	100	0	100	0	100
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	100	0	100	0	100
FWS	FORT WORTH SPINKS	TX	LPV200	0	100	0	100	0	100
GDJ	GRANBURY RGNL	TX	LPV	0	100	0	100	0	100
GGG	EAST TEXAS RGNL	TX	LPV	0	100	0	100	0	100
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	100	0	100	0	100
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	100	0	100	1	99.999
GNC	GAINES COUNTY	TX	LPV	0	100	0	100	0	100
GRK	ROBERT GRAY AAF	TX	LPV200	0	100	0	100	0	100
GTU	GEORGETOWN MUNICIPAL	TX	LPV	0	100	0	100	0	100
GVT	MAJORS	TX	LPV200	0	100	0	100	0	100
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	100	0	100	0	100
HBV	JIM HOGG COUNTY	TX	LPV	0	100	0	100	0	100
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	0	100	0	100	0	100
HHF	HEMPHILL COUNTY	TX	LPV	0	100	0	100	0	100
HOU	WILLIAM P HOBBY	TX	LPV200	0	100	0	100	0	100
HQZ	MESQUITE METRO	TX	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HRL	VALLEY INTL	TX	LPV200	0	100	0	100	0	100
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	100	0	100	0	100
HYI	SAN MARCOS RGNL	TX	LPV200	0	100	0	100	0	100
IAH	GEORGE BUSH INTERCONTINENTAL/H	TX	LPV200	0	100	0	100	0	100
IKG	KLEBERG COUNTY	TX	LPV	0	100	0	100	0	100
ILE	SKYLARK FIELD	TX	LPV200	0	100	0	100	0	100
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	100	0	100	0	100
INK	WINKLER COUNTY	TX	LPV200	0	100	0	100	0	100
IWS	WEST HOUSTON	TX	LP	0	100	0	100	0	100
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	100	0	100	0	100
JSO	CHEROKEE COUNTY	TX	LPV	0	100	0	100	0	100
JWY	MID-WAY RGNL	TX	LPV200	0	100	0	100	0	100
JXI	FOX STEPHENS FIELD - GILMER MU	TX	LP	0	100	0	100	0	100
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	100	0	100	0	100
LBX	TEXAS GULF COAST RGNL	TX	LPV	0	100	0	100	0	100
LFK	ANGELINA COUNTY	TX	LPV	0	100	0	100	0	100
LHB	HEARNE MUNICIPAL	TX	LPV200	0	100	0	100	0	100
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	0	100	0	100	0	100
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	100	0	100	0	100
LNC	LANCASTER RGNL	TX	LPV200	0	100	0	100	0	100
LRD	LAREDO INTL	TX	LPV200	0	100	0	100	0	100
LUD	DECATUR MUNICIPAL	TX	LPV	0	100	0	100	0	100
LUV	LAMESA MUNICIPAL	TX	LPV200	0	100	0	100	0	100
LVJ	PEARLAND RGNL	TX	LPV	0	100	0	100	0	100
LXY	MEXIA-LIMESTONE CO	TX	LP	0	100	0	100	0	100
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	0	100	0	100	0	100
MDD	MIDLAND AIRPARK	TX	LPV	0	100	0	100	0	100
MFE	MC ALLEN MILLER INTL	TX	LPV200	0	100	0	100	0	100
MKN	COMANCHE COUNTY-CITY	TX	LPV	0	100	0	100	0	100
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	100	0	100	0	100
MWL	MINERAL WELLS	TX	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	0	100	0	100	0	100
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	100	0	100	0	100
ONY	OLNEY MUNICIPAL	TX	LPV	0	100	0	100	0	100
ORG	ORANGE COUNTY	TX	LPV	0	100	0	100	33	99.982
PEQ	PECOS MUNICIPAL	TX	LPV200	0	100	0	100	0	100
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	100	0	100	0	100
PKV	CALHOUN COUNTY	TX	LPV	0	100	0	100	0	100
PPA	PERRY LEFORS FIELD	TX	LPV	0	100	0	100	0	100
PRX	COX FIELD	TX	LPV	0	100	0	100	0	100
PSX	PALACIOS MUNICIPAL	TX	LPV	0	100	0	100	0	100
PVW	HALE COUNTY	TX	LPV	0	100	0	100	0	100
PWG	MC GREGOR EXECUTIVE	TX	LPV	0	100	0	100	0	100
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	0	100	0	100	0	100
RAS	MUSTANG BEACH	TX	LPV	0	100	0	100	0	100
RBD	DALLAS EXECUTIVE	TX	LPV200	0	100	0	100	0	100
RBO	NUECES COUNTY	TX	LPV	0	100	0	100	0	100
RKP	ARANSAS CO	TX	LPV	0	100	0	100	0	100
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LPV	0	100	0	100	0	100
SAT	SAN ANTONIO INTL	TX	LPV200	0	100	0	100	0	100
SGR	SUGAR LAND RGNL	TX	LPV200	0	100	0	100	0	100
SJT	SAN ANGELO RGNL/MATHIS FIELD	TX	LPV	0	100	0	100	0	100
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV	0	100	0	100	0	100
SNK	WINSTON FIELD	TX	LPV200	0	100	0	100	0	100
SWI	SHERMAN MUNICIPAL	TX	LP	0	100	0	100	0	100
SWW	AVENGER FIELD	TX	LPV	0	100	0	100	0	100
T23	ALBANY MUNICIPAL	TX	LPV	0	100	0	100	0	100
T41	LA PORTE MUNICIPAL	TX	LPV	0	100	0	100	0	100
T74	TAYLOR MUNICIPAL	TX	LPV	0	100	0	100	0	100
T78	LIBERTY MUNICIPAL	TX	LP	0	100	0	100	0	100
T82	GILLESPIE COUNTY	TX	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TDW	TRADEWIND	TX	LPV	0	100	0	100	0	100
TFP	MCCAMPBELL-PORTER	TX	LPV	0	100	0	100	0	100
TKI	MCKINNEY NATIONAL	TX	LPV200	0	100	0	100	0	100
TME	HOUSTON EXECUTIVE	TX	LPV	0	100	0	100	0	100
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	0	100	0	100	0	100
TRL	TERRELL MUNICIPAL	TX	LPV	0	100	0	100	0	100
TX2	CHASE FIELD INDUSTRIAL	TX	LPV	0	100	0	100	0	100
TXW	MID VALLEY	TX	LPV	0	100	0	100	0	100
TYR	TYLER POUNDS RGNL	TX	LPV200	0	100	0	100	0	100
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
VCT	VICTORIA RGNL	TX	LPV200	0	100	0	100	0	100
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	100	0	100	0	100
41U	MANTI-EPHRAIM	UT	LPV	0	100	0	100	0	100
74V	ROOSEVELT MUNICIPAL	UT	LPV	0	100	0	100	0	100
BCE	BRYCE CANYON	UT	LPV	0	100	0	100	1	99.998
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	0	100	2	99.995
BMC	BRIGHAM CITY RGNL	UT	LP	0	100	0	100	0	100
CDC	CEDAR CITY RGNL	UT	LPV	0	100	0	100	1	99.996
CNY	CANYONLANDS FIELD	UT	LP	0	100	0	100	1	99.998
DTA	DELTA MUNICIPAL	UT	LP	0	100	0	100	0	100
ENV	WENDOVER	UT	LPV	0	100	0	100	0	100
FOM	FILLMORE MUNICIPAL	UT	LPV	0	100	0	100	0	100
LGU	LOGAN-CACHE	UT	LPV	0	100	0	100	0	100
OGD	OGDEN-HINCKLEY	UT	LPV	0	100	0	100	0	100
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	0	100	0	100	0	100
PVU	PROVO MUNICIPAL	UT	LPV200	0	100	0	100	0	100
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	0	100	0	100
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	1	99.994
SLC	SALT LAKE CITY INTL	UT	LPV200	0	100	0	100	0	100
SPK	SPANISH FORK ARPT SPRINGVILLE-	UT	LP	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
U42	SOUTH VALLEY RGNL	UT	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	0	100	1	99.998
VEL	VERNAL RGNL	UT	LPV	0	100	0	100	1	99.998
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	0	100
0VG	LEE COUNTY	VA	LPV	0	100	0	100	0	100
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	0	100
BCB	VIRGINIA TECH/MONTGOMERY EXECU	VA	LPV	0	100	0	100	0	100
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	0	100	0	100	0	100
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	0	100	0	100	0	100
CJR	CULPEPER RGNL	VA	LPV	0	100	0	100	0	100
CPK	CHESAPEAKE RGNL	VA	LPV200	0	100	0	100	0	100
DAN	DANVILLE RGNL	VA	LPV200	0	100	0	100	0	100
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	0	100	0	100	0	100
FCI	RICHMOND EXECUTIVE-CHESTERFIEL	VA	LPV	0	100	0	100	0	100
FKN	FRANKLIN MUNICIPAL-JOHN BEVERLY ROS	VA	LPV	0	100	0	100	0	100
FVX	FARMVILLE RGNL	VA	LPV	0	100	0	100	0	100
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	100	0	100	0	100
HLX	TWIN COUNTY	VA	LPV	0	100	0	100	0	100
HSP	INGALLS FIELD	VA	LPV	0	100	0	100	0	100
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	100	0	100	0	100
JFZ	TAZEWELL COUNTY	VA	LPV	0	100	0	100	0	100
JYO	LEESBURG EXECUTIVE	VA	LPV	0	100	0	100	0	100
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	0	100	0	100	0	100
LNP	LONESOME PINE	VA	LPV	0	100	0	100	0	100
LUA	LURAY CAVERNS	VA	LP	0	100	0	100	0	100
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	0	100	0	100	0	100
MFV	ACCOMACK COUNTY	VA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	100	0	100	0	100
MTV	BLUE RIDGE	VA	LPV	0	100	0	100	0	100
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	100	0	100	0	100
OKV	WINCHESTER RGNL	VA	LPV200	0	100	0	100	0	100
ORF	NORFOLK INTL	VA	LPV200	0	100	0	100	0	100
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	0	100	0	100	0	100
PSK	NEW RIVER VALLEY	VA	LPV200	0	100	0	100	0	100
PTB	DINWIDDIE COUNTY	VA	LPV	0	100	0	100	0	100
PVG	HAMPTON ROADS EXECUTIVE	VA	LPV200	0	100	0	100	0	100
RIC	RICHMOND INTL	VA	LPV200	0	100	0	100	0	100
RMN	STAFFORD RGNL	VA	LPV	0	100	0	100	0	100
ROA	ROANOKE-BLACKSBURG RGNL/WOODRU	VA	LPV	0	100	0	100	0	100
SFQ	SUFFOLK EXECUTIVE	VA	LPV	0	100	0	100	0	100
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	0	100
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	100	0	100	0	100
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	0	100
W96	NEW KENT COUNTY	VA	LP	0	100	0	100	0	100
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	0	100	0	100	0	100
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	100	0	100	0	100
BTV	BURLINGTON INTL	VT	LPV200	0	100	0	100	0	100
EFK	NORTHEAST KINGDOM INTL	VT	LP	0	100	0	100	1	99.999
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	100	0	100	0	100
MPV	EDWARD F KNAPP STATE	VT	LPV	0	100	0	100	1	99.994
MVL	MORRISVILLE-STOWE STATE	VT	LPV	0	100	0	100	1	99.999
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	0	100	0	100	1	99.994
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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
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	LPV200	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	1	99.999
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
61C	FORT ATKINSON MUNICIPAL	WI	LP	0	100	0	100	0	100
82C	MAUSTON-NEW LISBON UNION	WI	LP	0	100	0	100	0	100
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	100	0	100	0	100
AHH	AMERY MUNICIPAL	WI	LP	0	100	0	100	0	100
AIG	LANGLADE COUNTY	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
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
C47	PORTAGE MUNICIPAL	WI	LP	0	100	0	100	0	100
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
CMY	SPARTA/FORT MC COY	WI	LPV	0	100	0	100	0	100
CWA	CENTRAL WISCONSIN	WI	LPV200	0	100	0	100	0	100
DLL	BARABOO-WISCONSIN DELLS RGNL	WI	LPV	0	100	0	100	0	100
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	100	0	100	0	100
EGV	EAGLE RIVER UNION	WI	LPV	0	100	0	100	0	100
ENW	KENOSHA RGNL	WI	LPV200	0	100	0	100	0	100
ETB	WEST BEND MUNICIPAL	WI	LPV	0	100	0	100	0	100
EZS	SHAWANO MUNICIPAL	WI	LPV	0	100	0	100	0	100
FLD	FOND DU LAC COUNTY	WI	LPV	0	100	0	100	0	100
GRB	GREEN BAY-AUSTIN STRAUBEL INTL	WI	LPV200	0	100	0	100	0	100
GTG	GRANTSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
HXF	HARTFORD MUNICIPAL	WI	LPV	0	100	0	100	0	100
HYR	SAWYER COUNTY	WI	LPV	0	100	0	100	0	100
ISW	ALEXANDER FIELD SOUTH WOOD COU	WI	LPV	0	100	0	100	0	100
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	0	100	0	100	0	100
LNR	TRI-COUNTY RGNL	WI	LPV	0	100	0	100	0	100
LSE	LA CROSSE RGNL	WI	LPV	0	100	0	100	0	100
LUM	MENOMONIE MUNICIPAL-SCORE FIELD	WI	LPV	0	100	0	100	0	100
MDZ	TAYLOR COUNTY	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	100	0	100	0	100
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	100	0	100	0	100
MRJ	IOWA COUNTY	WI	LPV200	0	100	0	100	0	100
MSN	DANE COUNTY RGNL-TRUAX FIELD	WI	LPV200	0	100	0	100	0	100
MTW	MANITOWOC COUNTY	WI	LPV200	0	100	0	100	0	100
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	100	0	100	0	100
OCQ	OCONTO-J DOUGLAS BAKE MUNICIPAL	WI	LP	0	100	0	100	0	100
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	0	100	0	100	0	100
OSH	WITTMAN RGNL	WI	LPV200	0	100	0	100	0	100
OVS	BOSCOBEL	WI	LPV	0	100	0	100	0	100
PBH	PRICE COUNTY	WI	LPV	0	100	0	100	0	100
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	100	0	100	0	100
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
RAC	BATTEN INTL	WI	LPV	0	100	0	100	0	100
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	LPV200	0	100	0	100	0	100
RRL	MERRILL MUNICIPAL	WI	LPV	0	100	0	100	0	100
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	0	100	0	100	0	100
STE	STEVENS POINT MUNICIPAL	WI	LPV	0	100	0	100	0	100
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	100	0	100	0	100
SUW	RICHARD I BONG	WI	LP	0	100	0	100	0	100
TKV	TOMAHAWK RGNL	WI	LP	0	100	0	100	0	100
UBE	CUMBERLAND MUNICIPAL	WI	LPV	0	100	0	100	0	100
UES	WAUKESHA COUNTY	WI	LPV200	0	100	0	100	0	100
UNU	DODGE COUNTY	WI	LPV	0	100	0	100	0	100
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y50	WAUTOMA MUNICIPAL	WI	LP	0	100	0	100	0	100
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
Y72	BLOYER FIELD	WI	LP	0	100	0	100	0	100
3I2	MASON COUNTY	WV	LPV	0	100	0	100	0	100
6L4	LOGAN COUNTY	WV	LPV	0	100	0	100	0	100
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	100	0	100	0	100
BLF	MERCER COUNTY	WV	LPV	0	100	0	100	0	100
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	0	100
CRW	YEAGER	WV	LPV200	0	100	0	100	0	100
HLG	WHEELING OHIO CO	WV	LPV200	0	100	0	100	0	100
HTS	TRI-STATE/MILTON J FERGUSON FI	WV	LPV200	0	100	0	100	0	100
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	0	100
LWB	GREENBRIER VALLEY	WV	LPV	0	100	0	100	0	100
MGW	MORGANTOWN MUNICIPAL-WALTER L BILL	WV	LPV200	0	100	0	100	0	100
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	0	100	0	100	0	100
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	100	0	100	0	100
USW	BOGGS FIELD	WV	LPV	0	100	0	100	0	100
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	0	100
W35	POTOMAC AIRPARK	WV	LP	0	100	0	100	0	100
W99	GRANT COUNTY	WV	LPV	0	100	0	100	0	100
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	1	99.997
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	0	100
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	1	99.992
CYS	CHEYENNE RGNL/JERRY OLSON FIEL	WY	LPV200	0	100	0	100	1	99.998
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	1	99.995
DWX	DIXON	WY	LP	0	100	0	100	1	99.994
ECS	MONDELL FIELD	WY	LPV	0	100	0	100	1	99.999
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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	100	0	100	1	99.998
GEY	SOUTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	1	99.998
HSG	HOT SPRINGS COUNTY	WY	LPV	0	100	0	100	0	100
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	0	100
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	1	99.996
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	99.999
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	0	100	0	100	1	99.997
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	100	0	100	1	99.993
SAA	SHIVELY FIELD	WY	LPV	0	100	0	100	1	99.992
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	1	99.999
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
W43	HULETT MUNICIPAL	WY	LPV	0	100	0	100	0	100
WRL	WORLAND MUNICIPAL	WY	LPV	0	100	0	100	0	100
CYQH	WATSON LAKE	YT	LPV	0	100	0	100	0	100
CYXY	WHITEHORSE/ERIK NIELSEN INTL	YT	LPV	0	100	0	100	1	99.999

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

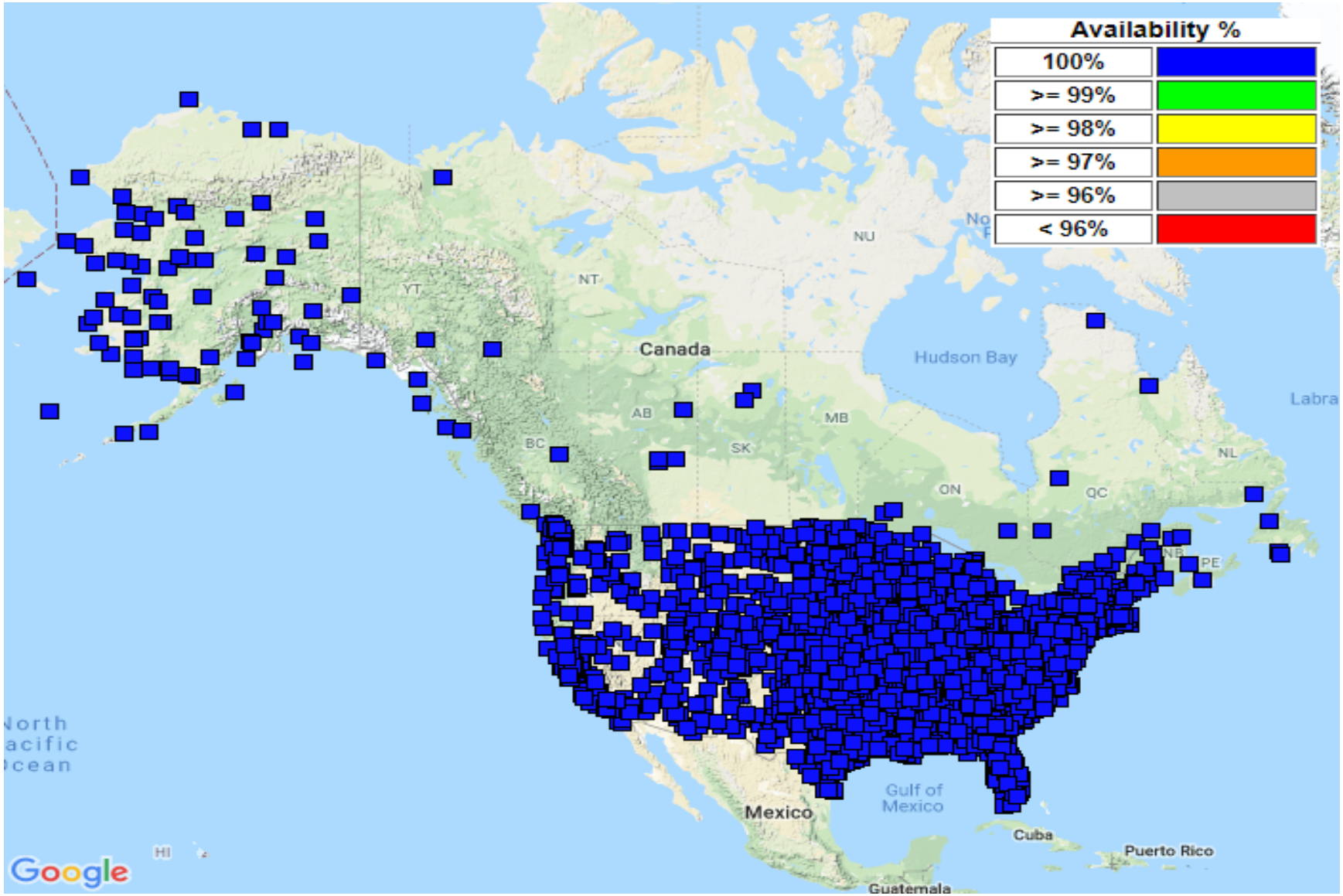


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV IAPs

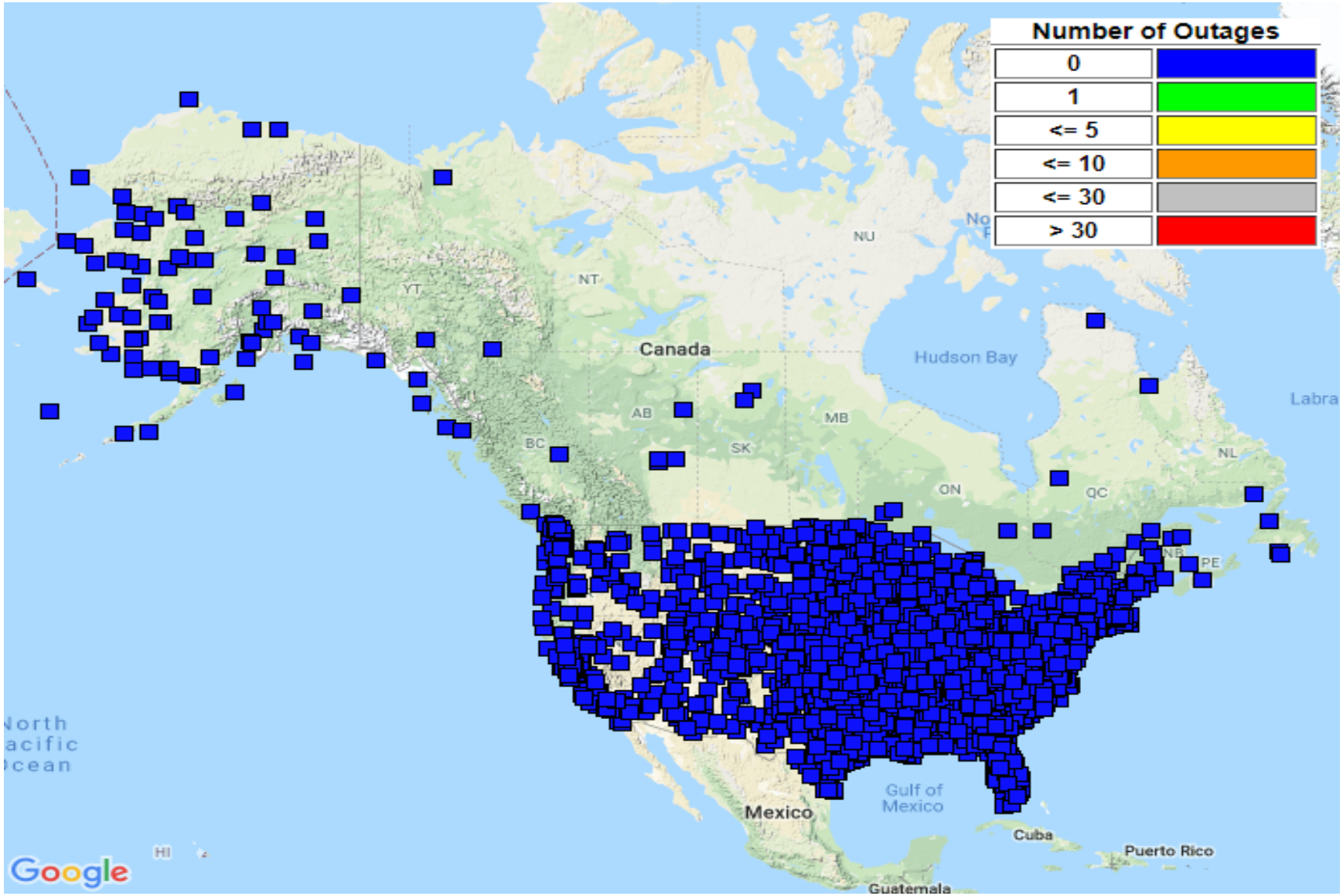


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV IAPs

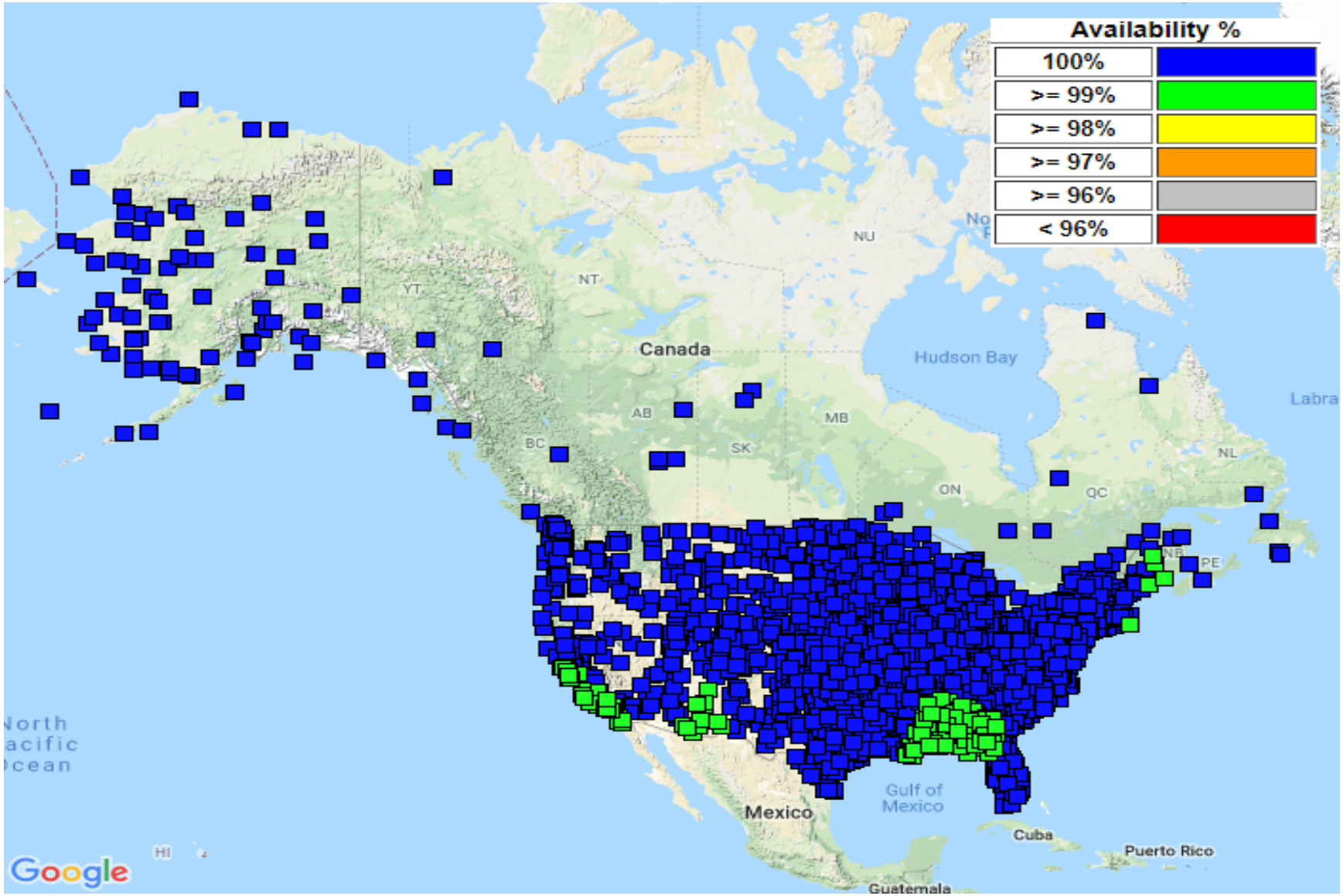


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV IAPs

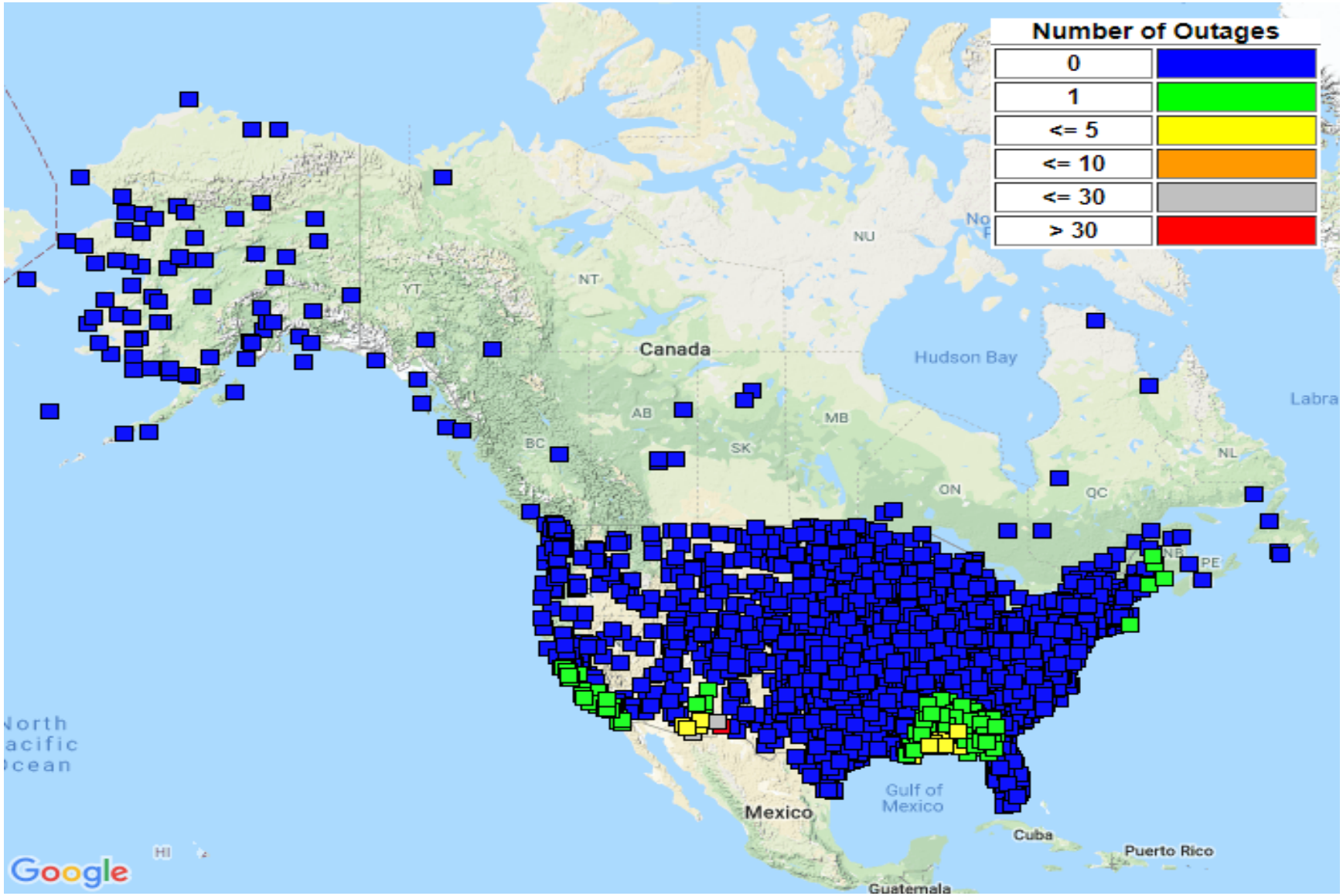


Figure 8-5 WAAS LPV200 Availability at Airports in the US and Canada with GPS RNAV IAPs

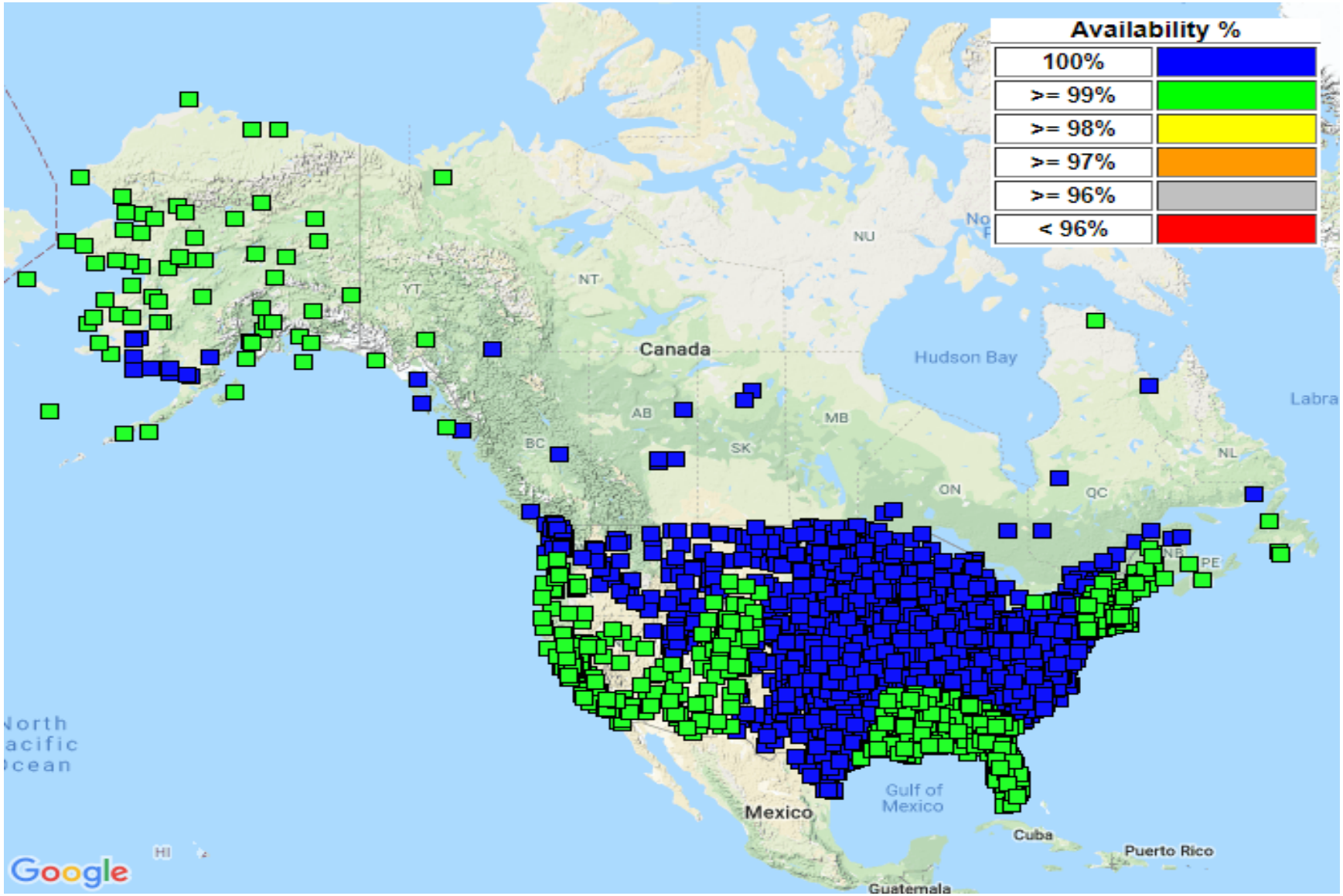
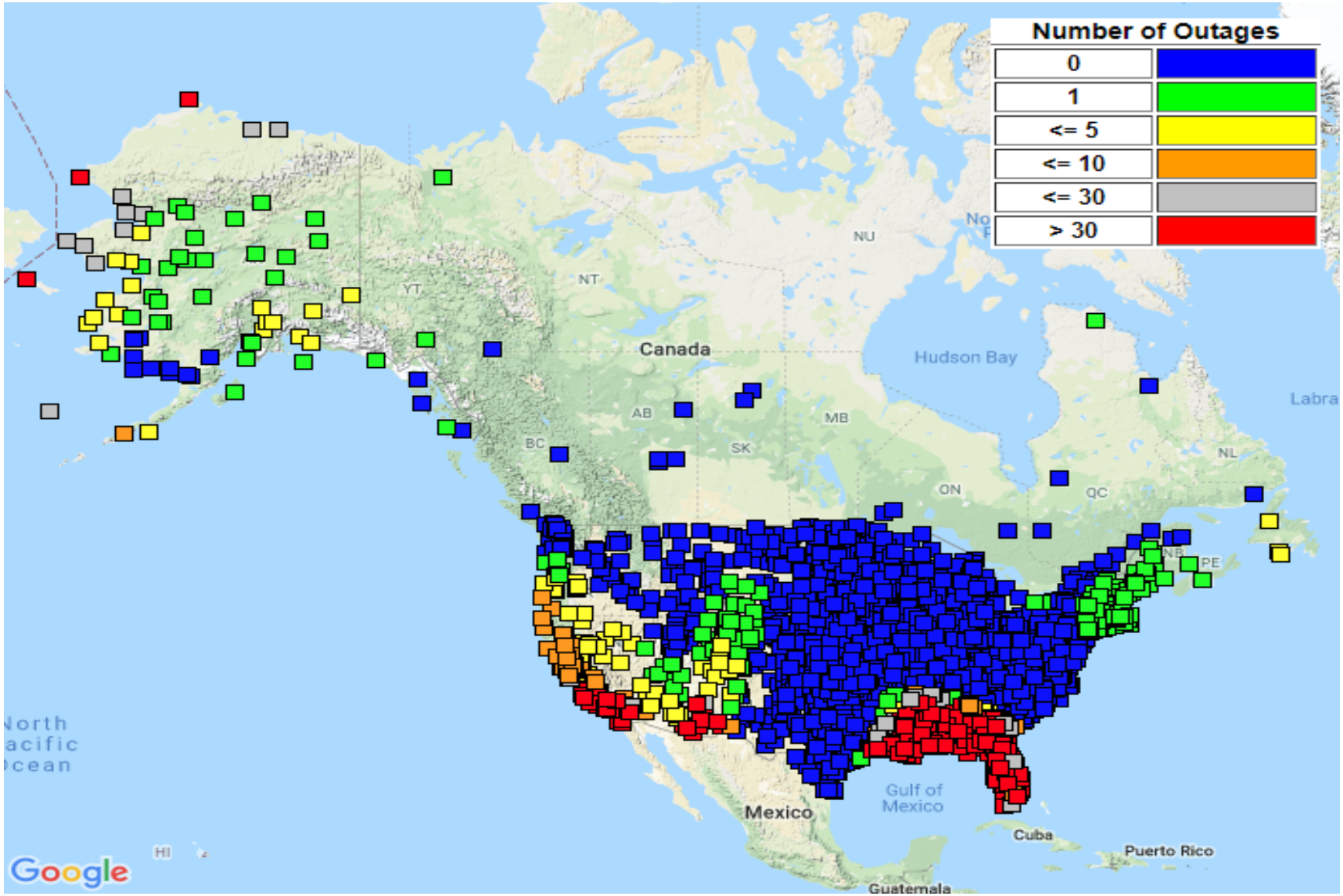


Figure 8-6 WAAS LPV200 Outages at Airports in the US and Canada with GPS RNAV IAPs



9.0 WAAS CNMP BOUNDING ANALYSIS

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

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

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

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

Figure 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19
Albuquerque	A												
	B												
	C												
Anchorage	A												
	B												
	C												
Atlanta	A												
	B												
	C												
Barrow	A												
	B												
	C												
Bethel	A												
	B												
	C												
Billings	A												
	B												
	C												
Boston	A												
	B												
	C												
Chicago	A												
	B												
	C												
Cleveland	A												
	B												
	C												
Cold Bay	A												
	B												
	C												
Dallas	A												
	B												
	C												
Denver	A												
	B												
	C												
Fairbanks	A												
	B												
	C												
Gander	A												
	B												
	C												
Goose Bay	A												
	B												
	C												
Honolulu	A												
	B												
	C												
Houston	A												
	B												
	C												
Iqaluit	A									-			
	B												
	C												
Jacksonville	A												
	B												
	C												

WAAS Site	WRE	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19
Juneau	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kansas City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kotzebue	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Los Angeles	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Memphis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Merida	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Mexico City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Miami	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Minneapolis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
New York	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Oakland	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Puerto Vallarta	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Salt Lake City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Jose Del Cabo	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Juan	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Seattle	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Tapachula	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Washington, DC	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Winnipeg	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•

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

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 24 hour sets on 10/01/19. 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 National Geodetic Survey (NGS) Online Positioning User Service (OPUS) and the Canadian Spatial Reference System (CSRS) Precise Point Positioning (PPP) service. The IGS08 reference frame is used for the OPUS solutions. A value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing of the data.

The OPUS-reported RMS quality metrics were 2.5 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 16.0 mm or less. The OPUS and CSRS surveys agreed to an average of 1.5 cm with a standard deviation of 6.5 mm. The maximum of difference was 4.12 cm for Honolulu Thread B (ZHN2).

The OPUS positions were compared to the WAAS SSM 53 Field Coordinates which were surveyed in October 2017. The OPUS surveys agree with the WAAS SSM 53 Field Coordinates to an average of 2.50 cm. The maximum difference excluding Mexico City was 6.9 cm at Anchorage Thread A (ZAN1).

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 04/02/2017

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
BET1	-2965385.174	-972576.632	5543892.826	60.7879142	161.8417255	52.181
BET2	-2965385.944	-972580.355	5543891.767	60.7878947	161.841665	52.18
BET3	-2965388.51	-972577.485	5543890.899	60.7878788	161.8417297	52.176
BIL1	-1416445.972	-4223577.011	4550862.09	45.8037063	108.5397242	1112.215
BIL2	-1416450.053	-4223574.867	4550862.818	45.8037156	108.5397827	1112.225
BIL3	-1416441.672	-4223574.266	4550865.948	45.8037561	108.539683	1112.214
BRW1	-1886759.053	-809058.697	6018494.423	71.2827636	156.7899253	15.564
BRW2	-1886756.466	-809055.958	6018495.603	71.2827964	156.7899671	15.572
BRW3	-1886755.374	-809059.738	6018495.421	71.2827917	156.7898581	15.556
CDB1	-3484099.182	-1084748.773	5213678.552	55.1923728	162.7064054	49.703
CDB2	-3484105.816	-1084741.577	5213675.603	55.1923268	162.7065443	49.676
CDB3	-3484112.098	-1084734.804	5213672.855	55.1922833	162.7066751	49.694
FAI1	-2304741.952	-1448715.332	5748843.695	64.8096288	147.8473415	150.007
FAI2	-2304741.492	-1448706.524	5748846.091	64.8096792	147.8474933	150.014
FAI3	-2304732.973	-1448707.461	5748849.252	64.8097458	147.8473812	150.017
JNU1	-2354255.067	-2388549.695	5407043.155	58.3625736	134.5857086	16.216
JNU2	-2354252.983	-2388565.808	5407036.99	58.3624681	134.58549	16.22
JNU3	-2354239.77	-2388568.664	5407041.454	58.3625444	134.585295	16.222
MMD1	35070.357	-5959686.658	2264365.763	20.9319093	89.6628413	29.109
MMD2	35065.432	-5959687.032	2264364.982	20.9319016	89.6628887	29.152
MMD3	35065.095	-5959685.229	2264369.636	20.9319466	89.6628918	29.129
MMX1	-948700.838	-5943933.697	2109212.09	19.4316541	99.0683901	2233.574
MMX2	-948696.404	-5943933.522	2109214.517	19.4316774	99.0683486	2233.559
MMX3	-948705.268	-5943933.89	2109209.673	19.4316308	99.0684314	2233.608
MPR1	-1570142.261	-5759530.59	2238184.752	20.6790033	105.2492036	10.974
MPR2	-1570139.436	-5759530.1	2238188.797	20.6790414	105.2491787	11.265
MPR3	-1570143.544	-5759527.985	2238190.565	20.6790594	105.249222	10.991
MSD1	-1979520.061	-5523222.896	2493106.948	23.1604483	109.7176517	104.317
MSD2	-1979521.621	-5523225.186	2493100.526	23.1603855	109.7176585	104.257
MSD3	-1979526.067	-5523221.946	2493104.211	23.1604216	109.7177101	104.281
MTP1	-254854.384	-6162909.148	1617805.09	14.7913662	92.3679995	54.932
MTP2	-254850.776	-6162910.17	1617801.637	14.7913341	92.3679656	54.893
MTP3	-254855.548	-6162910.274	1617800.113	14.79132	92.3680098	54.795
OTZ1	-2396056.157	-750356.201	5843502.433	66.8873307	162.611373	10.865
OTZ2	-2396052.983	-750354.371	5843503.95	66.8873655	162.6113912	10.857
OTZ3	-2396052.964	-750358.31	5843503.464	66.8873543	162.6113053	10.865
YFB1	1035381.32	-2634289.659	5696539.581	63.7314909	68.543186	10.051
YFB2	1035372.114	-2634296.085	5696538.218	63.7314645	68.543407	9.985
YFB3	1035366.034	-2634306.845	5696534.449	63.7313869	68.5436012	10.053
YQX1	2430424.531	-3419640.417	4788223.886	48.9664906	54.5976335	146.893
YQX2	2430432.476	-3419639.073	4788220.835	48.9664488	54.5975344	146.894
YQX3	2430440.374	-3419637.705	4788217.825	48.9664076	54.5974357	146.895
YWG1	-520164.509	-4083475.975	4855843.009	49.9005738	97.2593994	222.11
YWG2	-520150.64	-4083468.911	4855850.404	49.9006769	97.2592203	222.124
YWG3	-520152.512	-4083478.029	4855842.58	49.9005677	97.2592301	222.118
YYR1	1885341.306	-3321428.381	5091171.716	53.3086477	60.41947	37.871
YYR2	1885344.268	-3321419.903	5091176.13	53.308714	60.4193686	37.879
YYR3	1885339.984	-3321413.084	5091182.129	53.3088042	60.419374	37.882
ZAB1	-1488636.936	-5003946.541	3654557.683	35.1735751	106.5673508	1620.134
ZAB2	-1488631.596	-5003948.218	3654557.652	35.1735744	106.5672894	1620.185
ZAB3	-1488632.377	-5003950.804	3654553.799	35.173532	106.5672895	1620.174
ZAN1	-2659536.741	-1549114.711	5567750.744	61.2292013	149.7802528	80.708
ZAN2	-2659548.5	-1549110.762	5567746.24	61.2291176	149.7804265	80.694

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZAN3	-2659541.45	-1549106.633	5567750.729	61.2292012	149.7804268	80.697
ZAU1	138704.013	-4761244.134	4227763.926	41.7826581	88.3313379	195.876
ZAU2	138704.276	-4761248.751	4227758.76	41.7825957	88.3313364	195.881
ZAU3	138710.981	-4761248.49	4227758.847	41.7825966	88.3312557	195.89
ZBW1	1490299.117	-4448983.181	4306010.516	42.7357208	71.4804271	39.111
ZBW2	1490304.233	-4448981.178	4306010.866	42.7357248	71.4803601	39.147
ZBW3	1490305.94	-4448984.797	4306006.551	42.735672	71.4803544	39.137
ZDC1	1069125.666	-4839598.989	4001126.522	39.1015961	77.5427476	80.058
ZDC2	1069128.06	-4839603.616	4001120.313	39.1015241	77.5427321	80.049
ZDC3	1069123.962	-4839602.705	4001122.511	39.1015496	77.5427761	80.059
ZDV1	-1273628.707	-4711375.568	4094890.079	40.1873029	105.1272255	1541.349
ZDV2	-1273623.003	-4711377.083	4094890.092	40.1873032	105.1271562	1541.338
ZDV3	-1273625.016	-4711380.28	4094885.804	40.1872527	105.1271692	1541.33
ZFW1	-659983.28	-5324060.784	3438276.46	32.8306496	97.0664726	155.627
ZFW2	-659988.552	-5324063.323	3438271.46	32.8305962	97.0665252	155.578
ZFW3	-659983.577	-5324063.863	3438271.67	32.8305982	97.0664717	155.628
ZHN1	-5508637.214	-2234492.874	2303722.435	21.3129925	157.9208319	24.703
ZHN2	-5508656.38	-2234483.197	2303687.193	21.3126496	157.9209877	25.051
ZHN3	-5508647.779	-2234497.12	2303694.281	21.3127182	157.9208322	25.078
ZHU1	-513864.547	-5506451.65	3166720.437	29.9618963	95.3314271	10.79
ZHU2	-513867.195	-5506455.047	3166714.272	29.9618318	95.3314512	10.854
ZHU3	-513873.474	-5506457.689	3166708.675	29.9617735	95.3315134	10.844
ZJX1	772646.366	-5434462.189	3237231.755	30.6988598	81.9081859	2.133
ZJX2	772649.696	-5434463.746	3237228.36	30.6988242	81.9081538	2.128
ZJX3	772645.629	-5434466.172	3237225.248	30.6987916	81.9081994	2.113
ZKC1	-415247.609	-4954556.381	3982161.103	38.8801593	94.7908349	305.89
ZKC2	-415231.214	-4954557.701	3982161.158	38.88016	94.7906454	305.882
ZKC3	-415237.336	-4954561.051	3982155.962	38.8801018	94.7907124	305.617
ZLA1	-2474410.084	-4637294.531	3602183.567	34.6035187	118.0838974	763.502
ZLA2	-2474404.804	-4637297.335	3602183.574	34.6035188	118.0838322	763.496
ZLA3	-2474411.418	-4637297.027	3602179.6	34.6034748	118.0838974	763.579
ZLC1	-1808273.327	-4486410.801	4145302.979	40.7860429	111.9521789	1287.423
ZLC2	-1808274.715	-4486414.429	4145298.482	40.7859894	111.9521781	1287.426
ZLC3	-1808270.511	-4486416.132	4145298.485	40.7859894	111.9521244	1287.434
ZMA1	966042.23	-5662999.818	2761581.523	25.8246125	80.3191905	-7.592
ZMA2	966029.259	-5662999.115	2761586.009	25.8246602	80.3193168	-8.225
ZMA3	966037.337	-5662997.955	2761586.36	25.8246622	80.3192355	-7.879
ZME1	4070.801	-5226189.311	3644028.428	35.0673941	89.955371	68.617
ZME2	4070.831	-5226186.758	3644032.542	35.0674376	89.9553706	68.891
ZME3	4064.636	-5226186.63	3644032.695	35.0674395	89.9554386	68.871
ZMP1	-249978.484	-4539297.493	4458955.03	44.6374631	93.1520868	262.638
ZMP2	-249972.679	-4539297.836	4458955.033	44.637463	93.1520135	262.657
ZMP3	-249973.776	-4539302.109	4458950.552	44.637407	93.1520243	262.587
ZNY1	1406144.535	-4627343.989	4144322.076	40.7843288	73.0971668	6.444
ZNY2	1406146.334	-4627347.024	4144317.299	40.7842761	73.0971569	5.918
ZNY3	1406140.773	-4627348.678	4144317.334	40.7842766	73.0972256	5.915
ZOA1	-2684437.019	-4293337.27	3865351.917	37.5430545	122.01595	-3.498
ZOA2	-2684434.01	-4293341.348	3865349.49	37.5430269	122.0158967	-3.5
ZOA3	-2684438.38	-4293342.219	3865345.628	37.5429825	122.0159334	-3.431
ZOB1	650770.081	-4754715.655	4187420.743	41.2971546	82.2064459	223.653
ZOB2	650777.761	-4754714.832	4187422.763	41.2971669	82.2063537	225.156
ZOB3	650776.09	-4754719.658	4187414.972	41.2970871	82.2063813	223.437
ZSE1	-2308930.336	-3668169.664	4663526.437	47.2869928	122.1883736	82.086
ZSE2	-2308934.73	-3668175.213	4663520.031	47.2869073	122.1883837	82.153
ZSE3	-2308935.791	-3668179.488	4663516.09	47.2868556	122.1883655	82.095

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZSU1	2462589.464	-5529372.075	2003724.552	18.4313365	65.9934764	-28.103
ZSU2	2462587.531	-5529377.441	2003712.26	18.4312194	65.9935138	-28.085
ZSU3	2462594.161	-5529375.185	2003710.182	18.4311998	65.9934477	-28.138
ZTL1	529840.325	-5305248.82	3489342.859	33.3796886	84.2967269	261.142
ZTL2	529846.702	-5305247.975	3489343.143	33.3796918	84.2966578	261.125
ZTL3	529847.386	-5305251.418	3489337.91	33.3796351	84.2966541	261.163

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

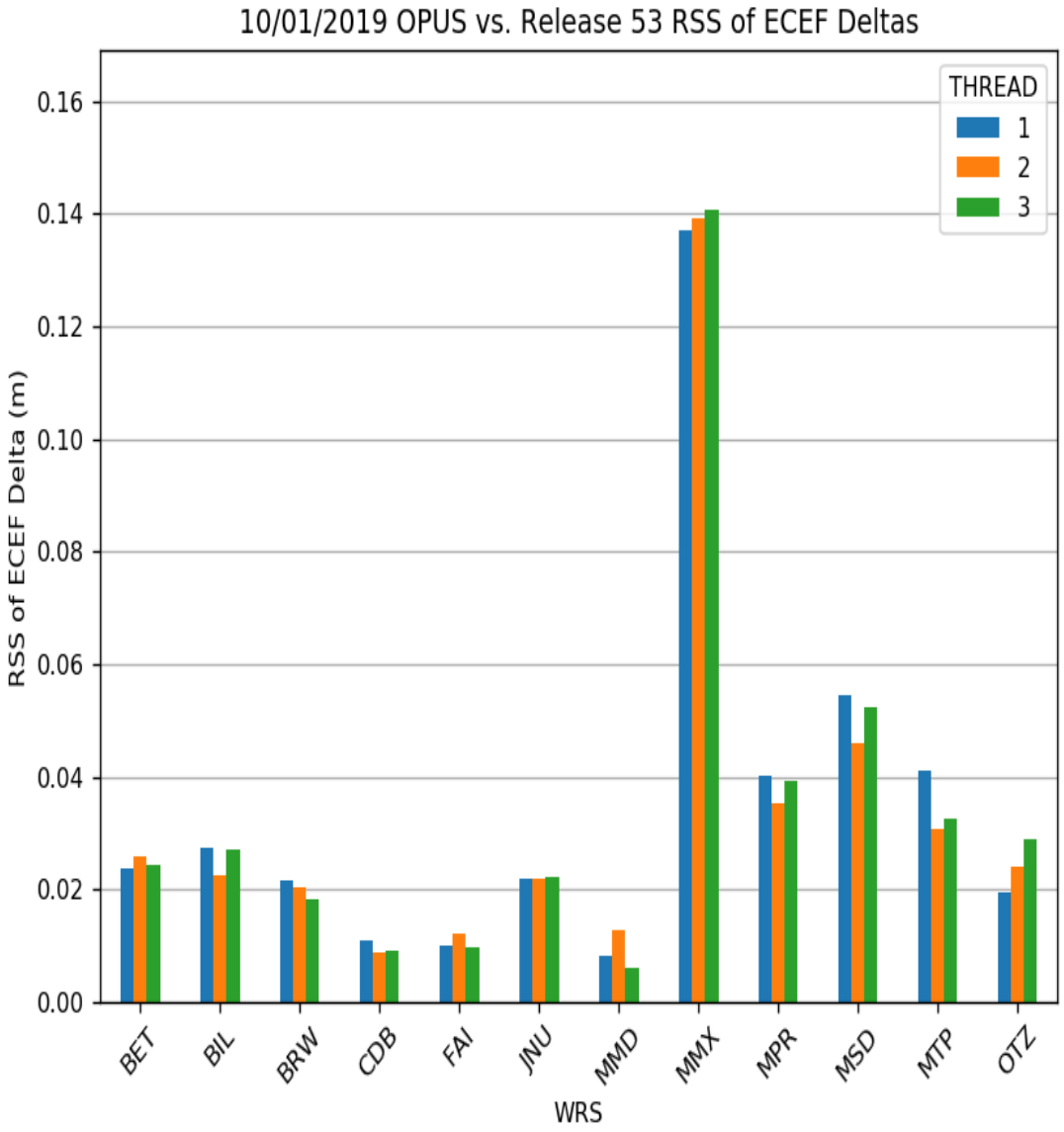


Figure 10-2 Build WE7.164c Antenna Positions Deltas OPUS Survey

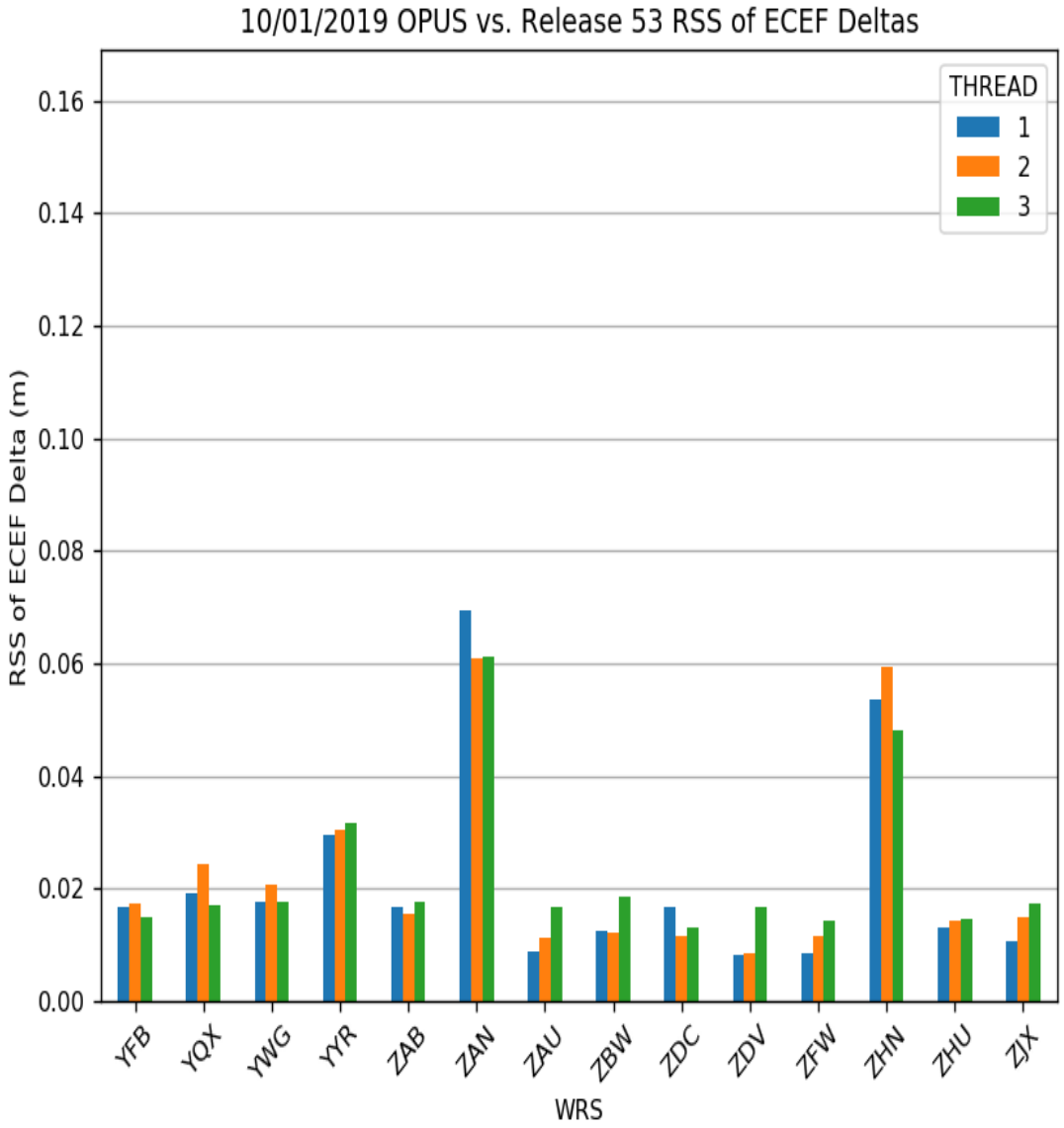


Figure 10-3 Build WE7.164c Antenna Positions Deltas OPUS Survey

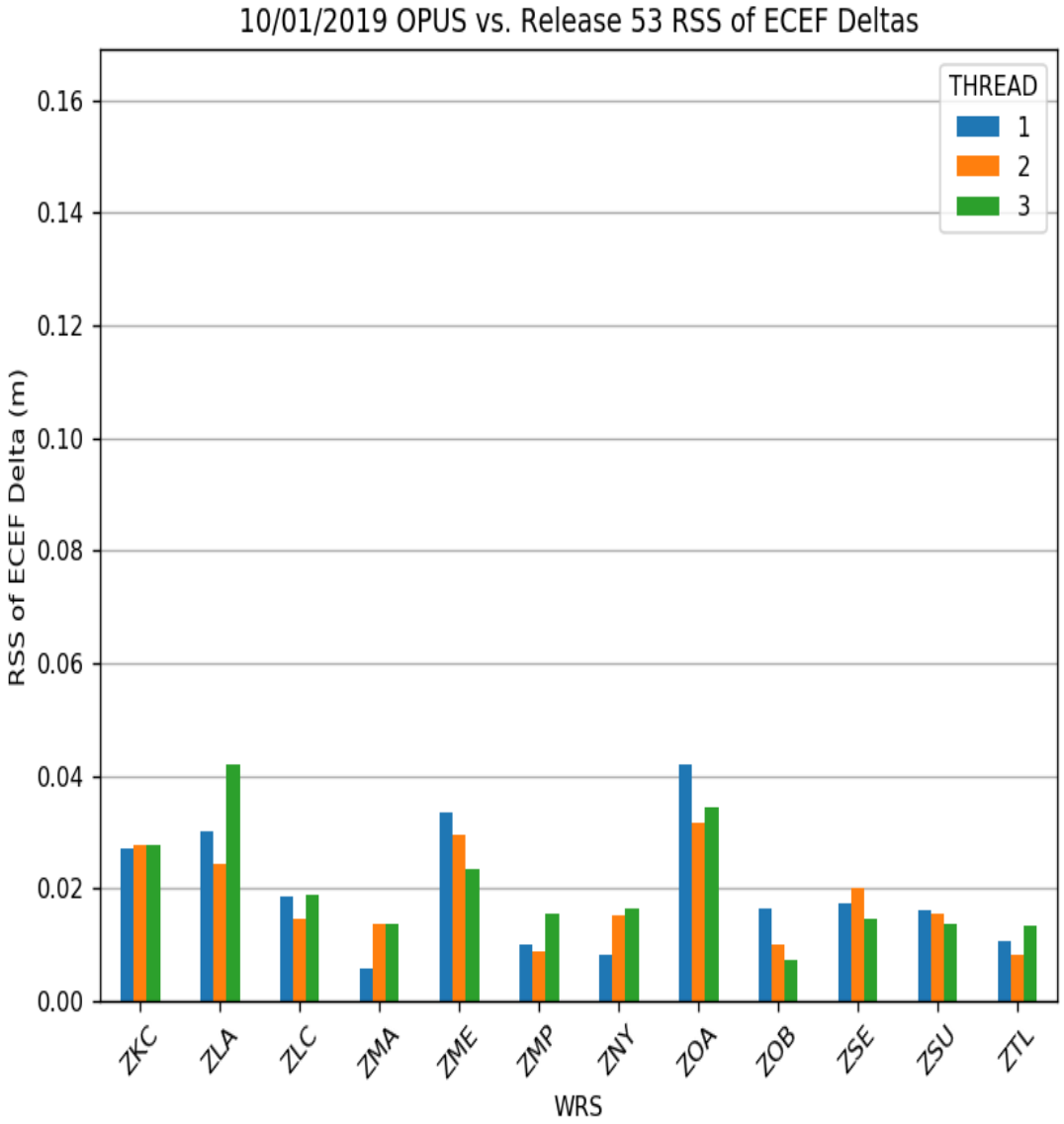


Figure 10-4 OPUS Survey Overall RMS Qualities

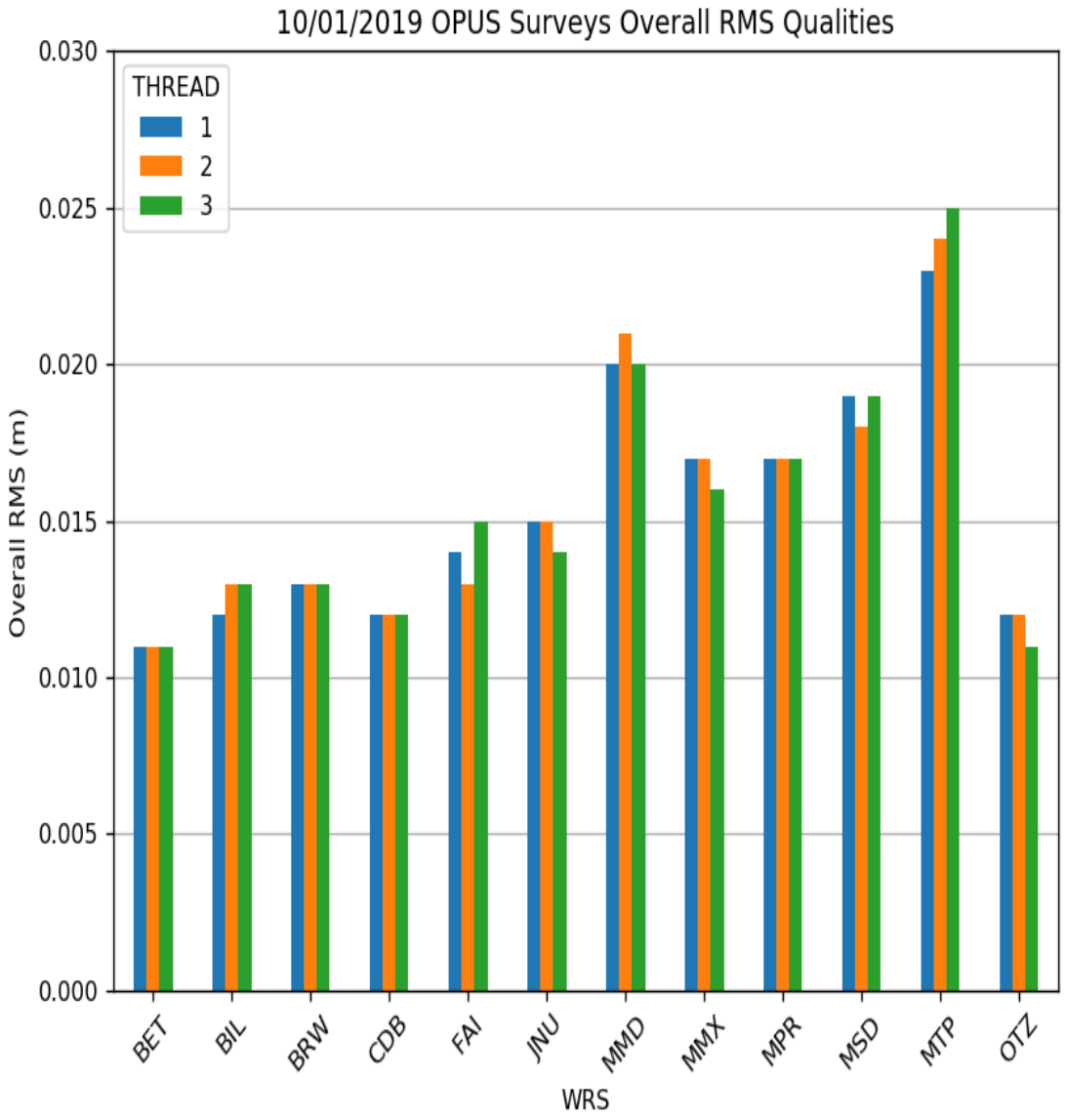


Figure 10-5 OPUS Survey Overall RMS Qualities

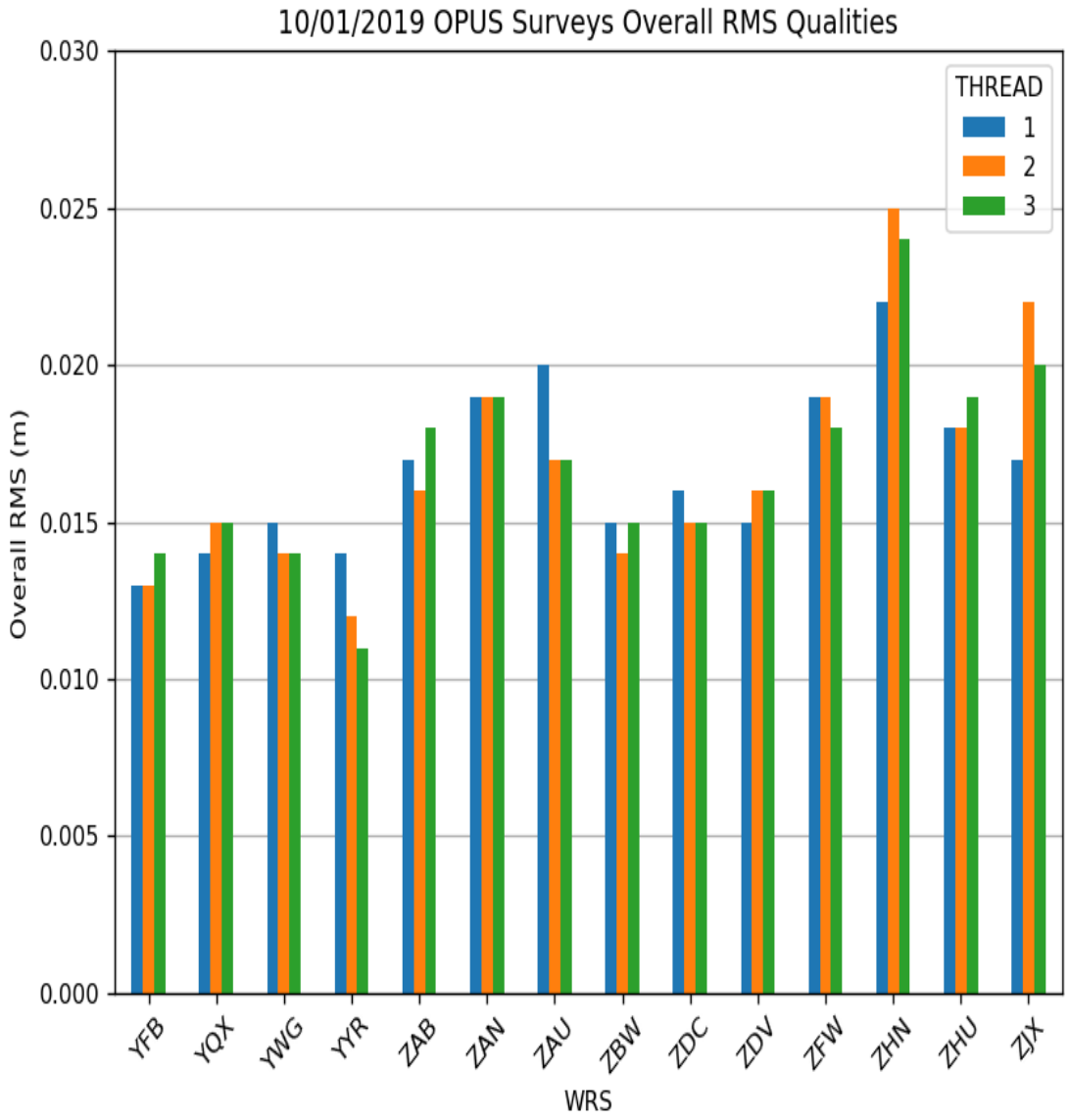
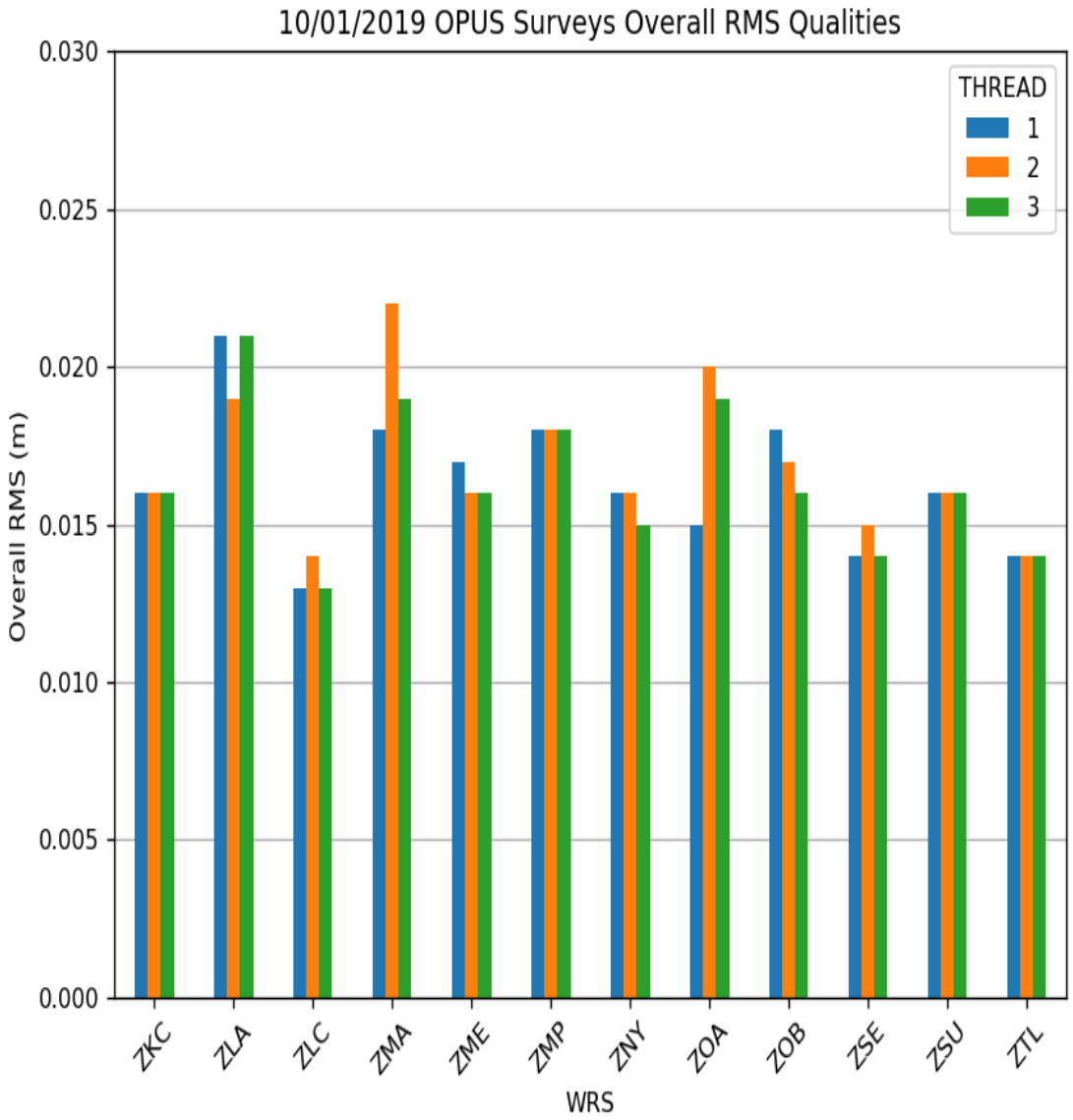


Figure 10-6 OPUS Survey Overall RMS Qualities



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

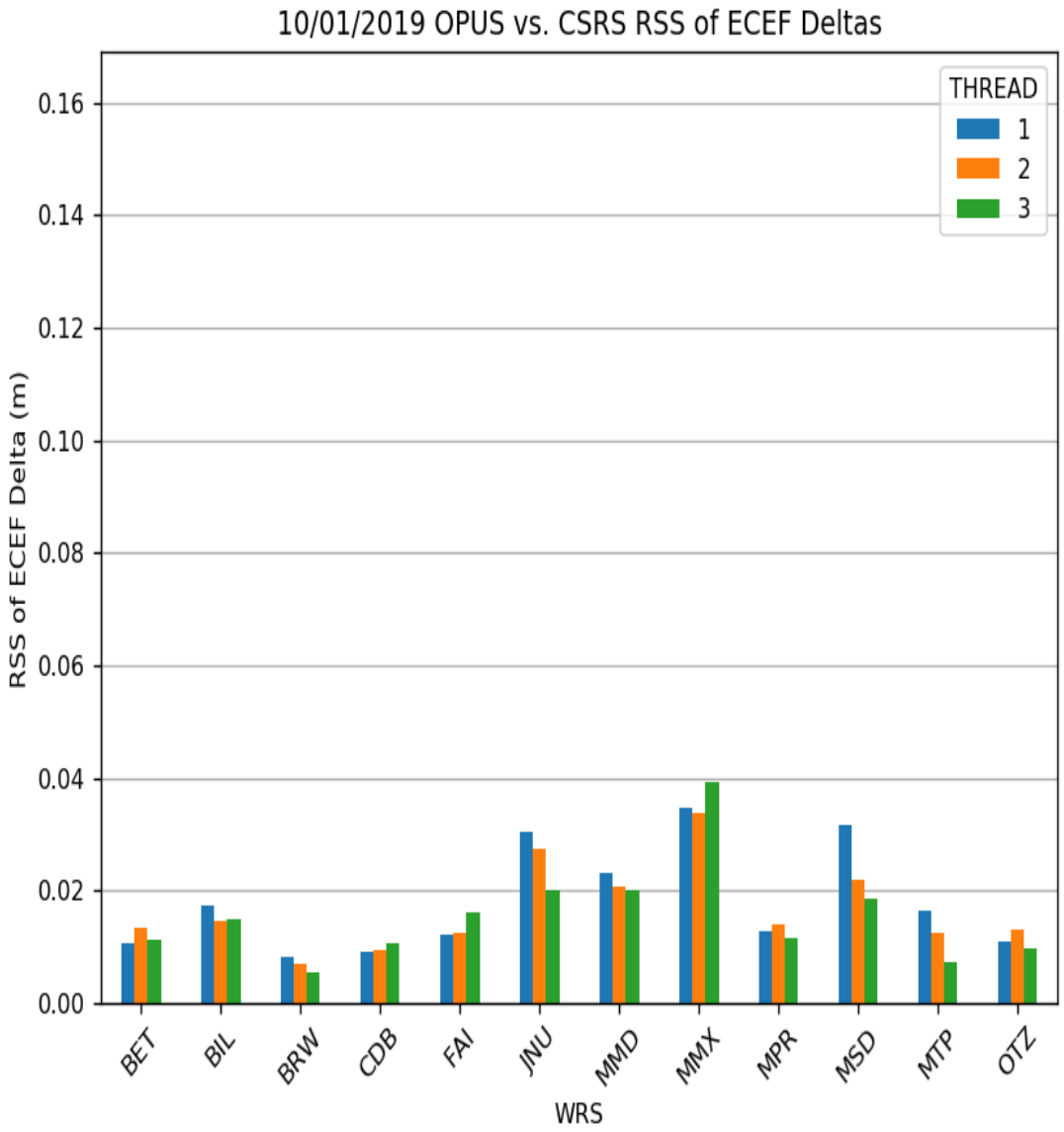


Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

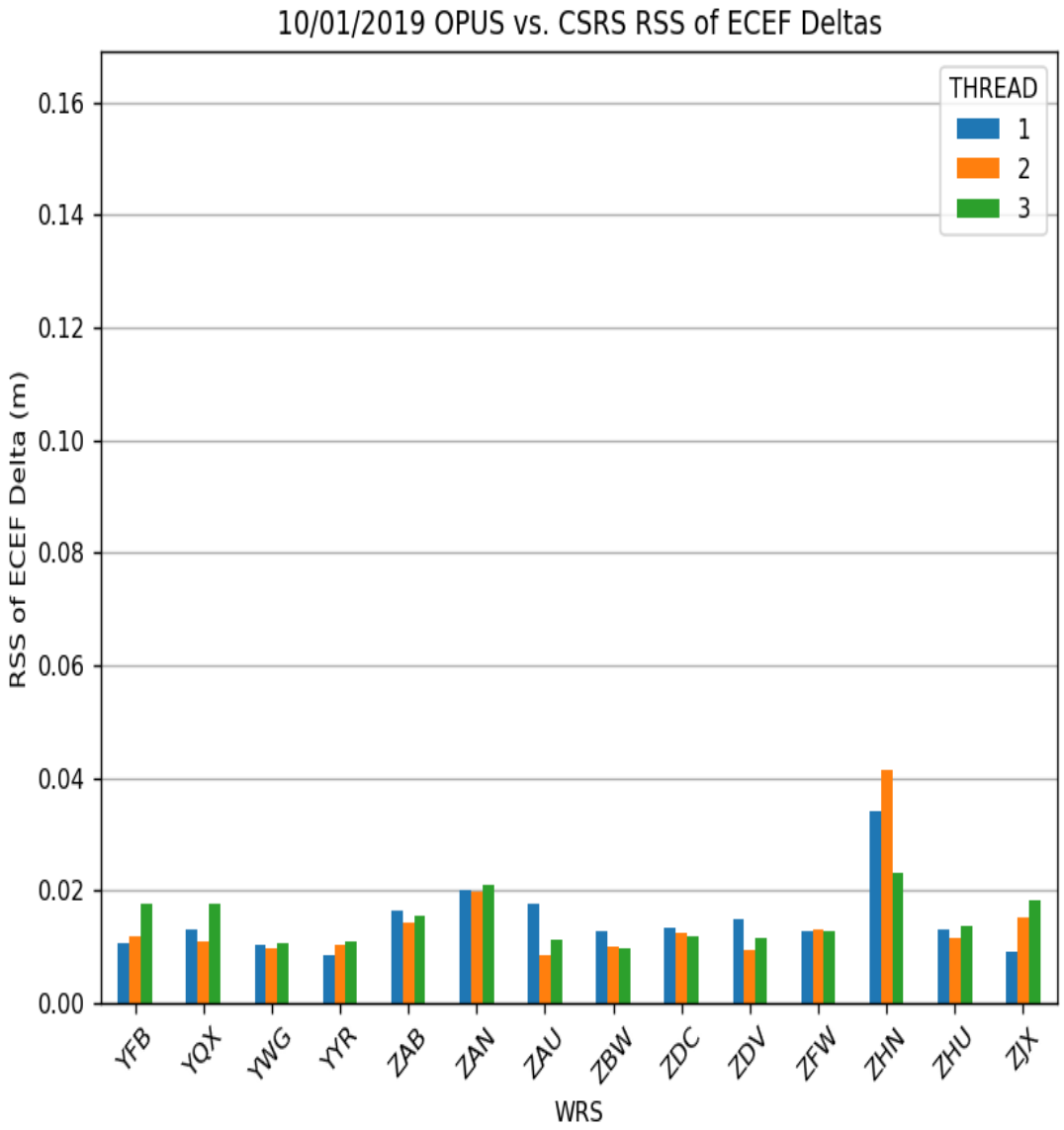


Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

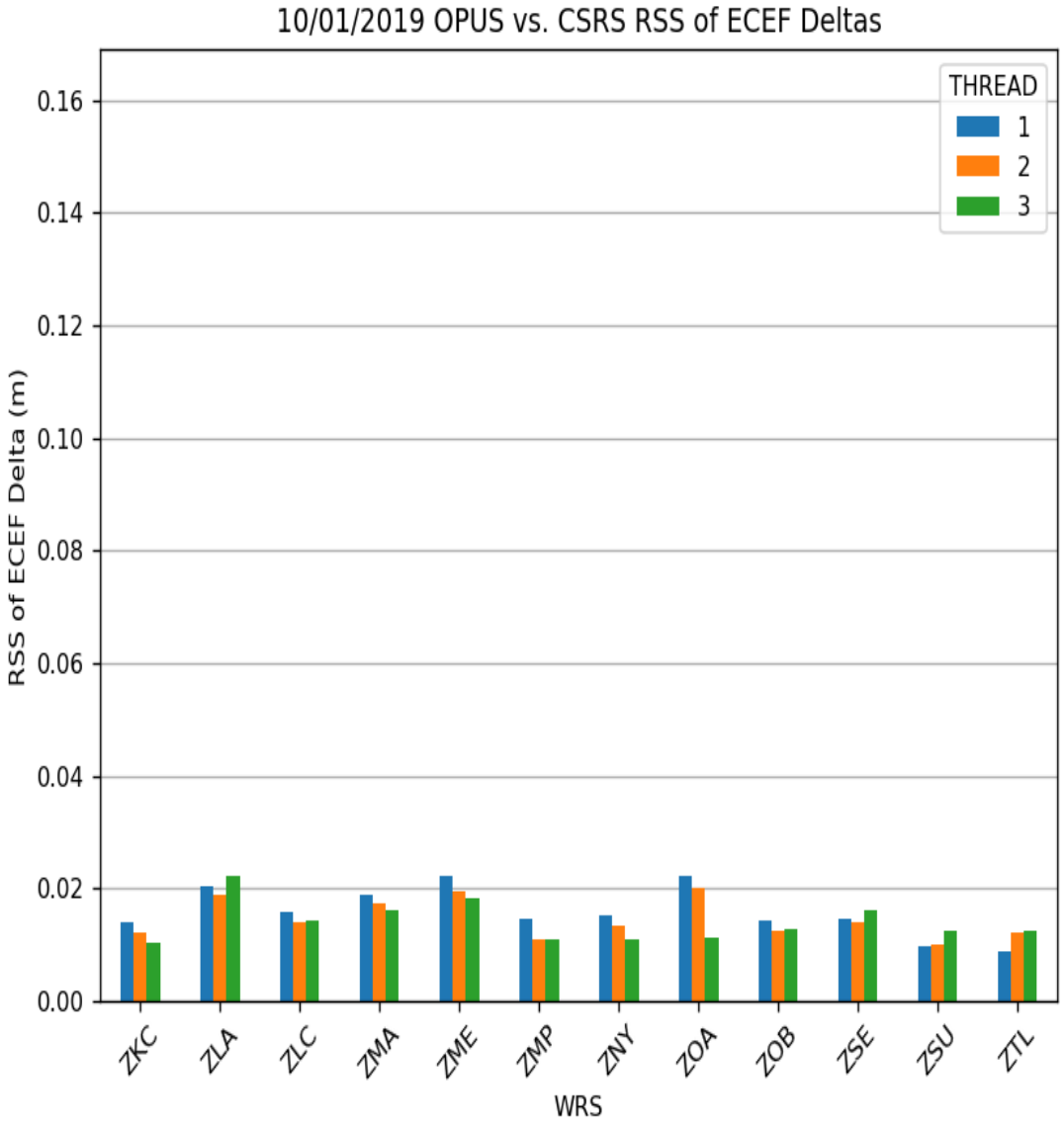


Figure 10-10 CSRS Survey Qualities

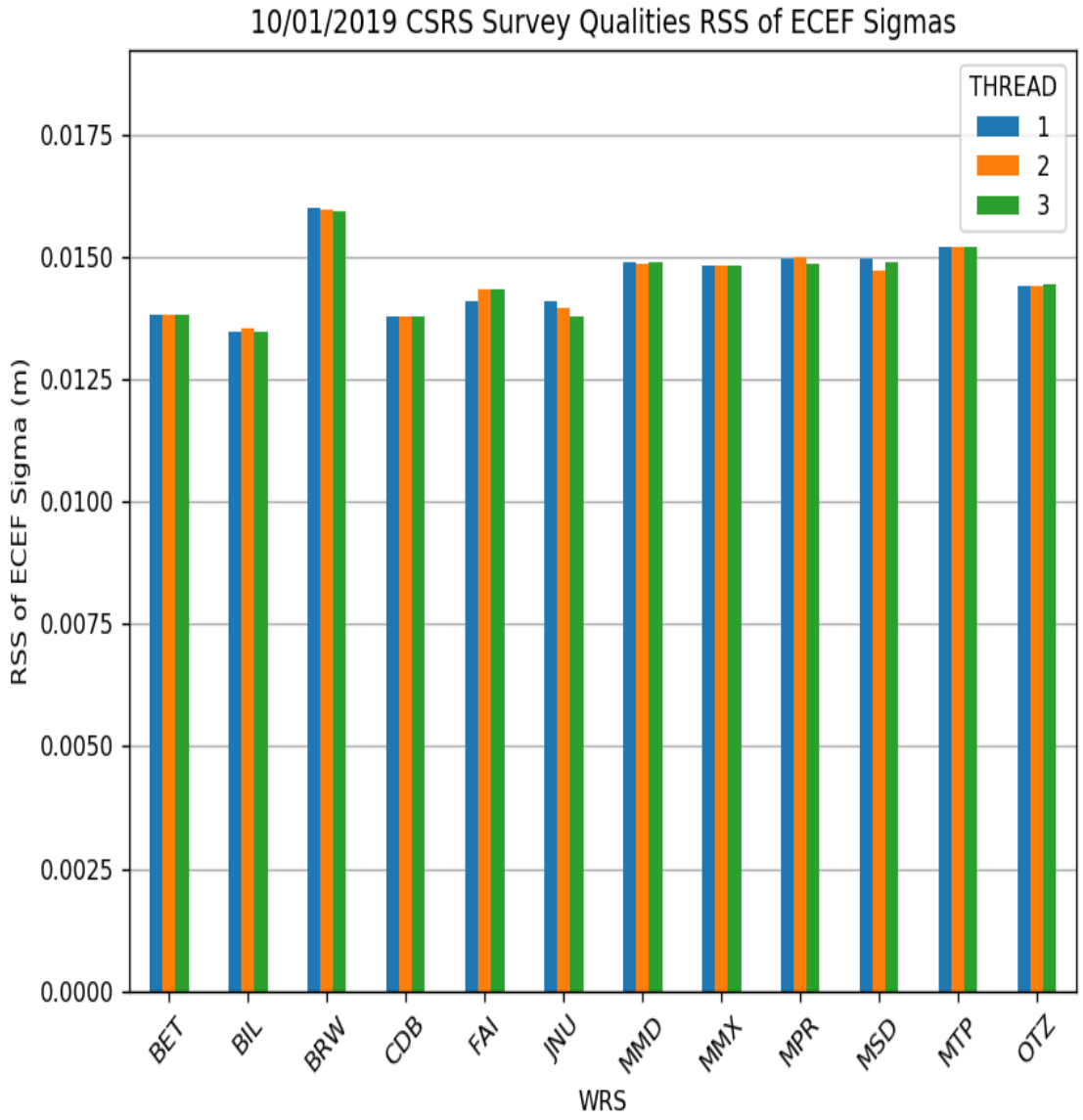


Figure 10-11 CSRS Survey Qualities

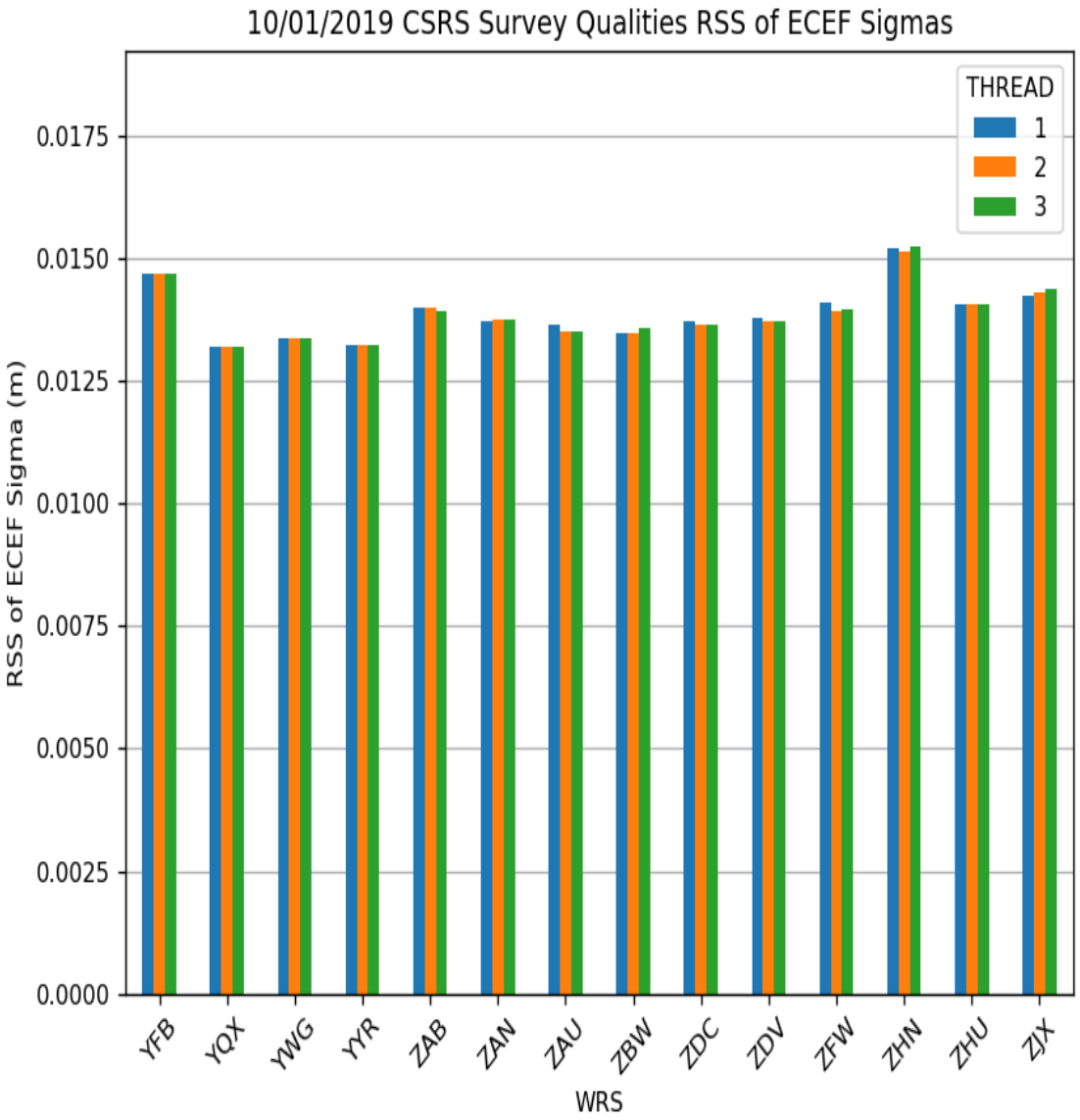
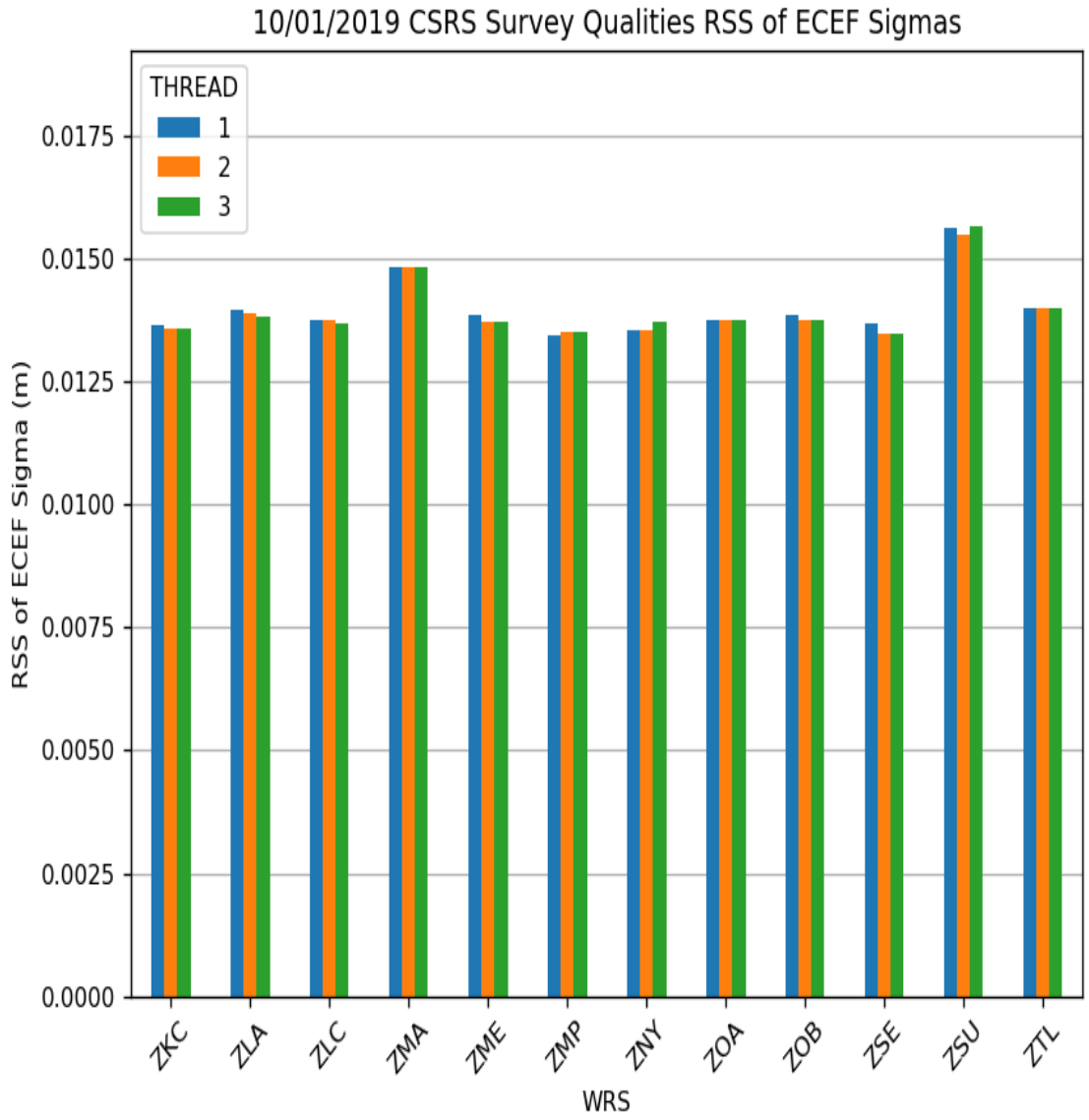


Figure 10-12 CSRS Survey Qualities



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.

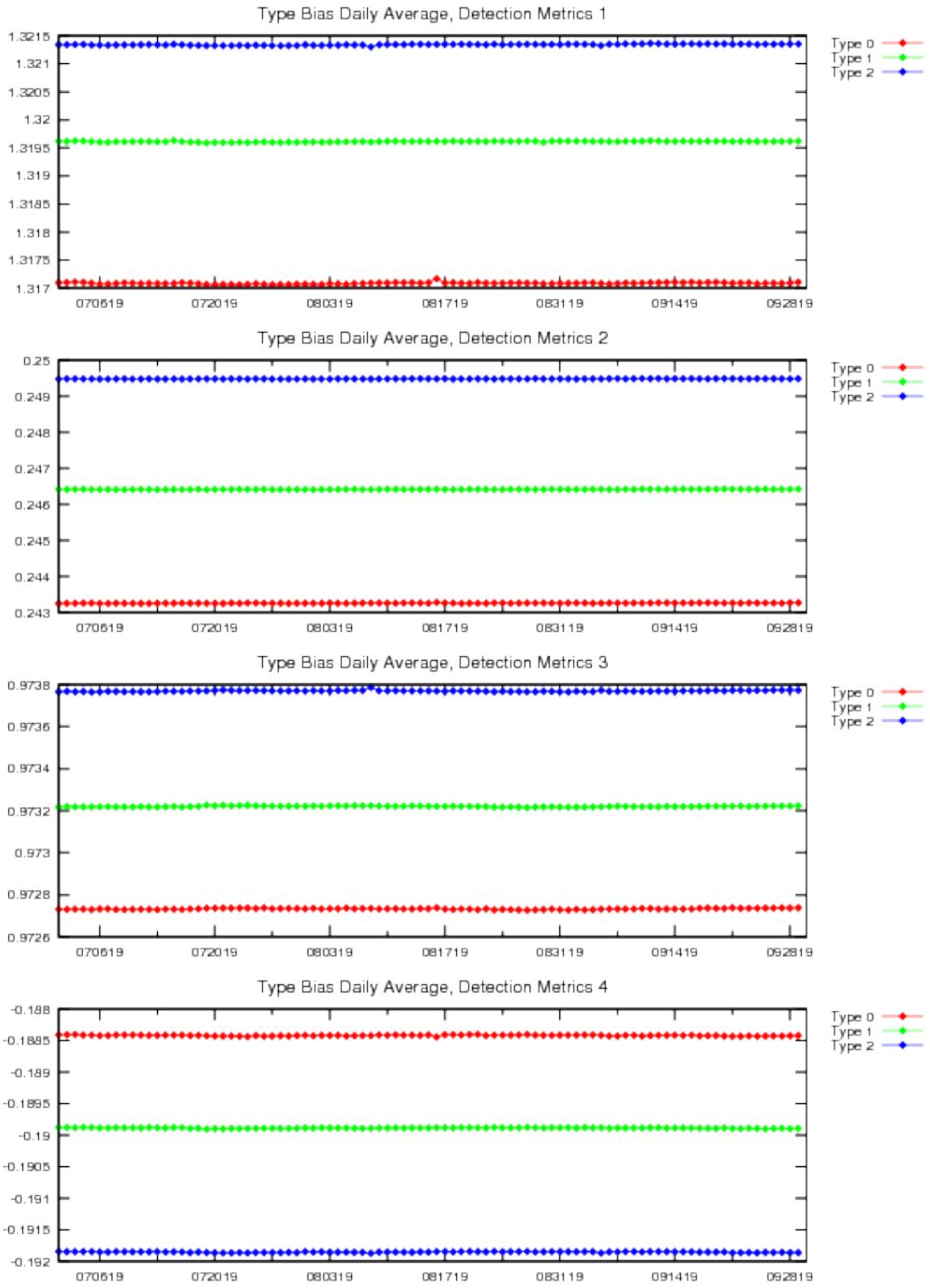
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31709	1.31961	1.32134
DM 2	0.243259	0.246418	0.249486
DM 3	0.972733	0.973221	0.973769
DM 4	-0.188419	-0.189886	-0.191853

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31966	1.32184	1.32354
DM 2	0.241624	0.244845	0.247987
DM 3	0.973039	0.973551	0.974114
DM 4	-0.186953	-0.188647	-0.190669

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 follows: (1) the maximum average for DM1 is 0.0011703 observed on PRN11, (2) the maximum average for DM2 is 0.0002083 observed on PRN23, (3) the maximum average for DM3 is 0.0002054 observed on PRN29, (4) the maximum average for DM4 is 0.0004904 observed on PRN23.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000256418	6.43582e-05	5.77198e-05	0.000112211
2	0.000533442	0.000155626	7.1344e-05	0.000157333
3	0.000163713	4.66769e-05	5.24231e-05	0.000110075
4				
5	0.000203157	5.29264e-05	0.000138256	0.000131958
6	0.000523803	0.000101158	8.40352e-05	0.000118148
7	0.000171634	0.000113211	5.96571e-05	9.5444e-05
8	0.000438127	0.000117108	8.88352e-05	0.000138392
9	0.00019252	5.05176e-05	0.000121568	0.000209396
10	0.000179656	4.82176e-05	8.90901e-05	0.000198621
11	0.00117028	0.000202745	9.82407e-05	0.000283793
12	0.0001585	4.1922e-05	9.00418e-05	0.000101089
13	0.00051514	4.51692e-05	6.01165e-05	0.00025759
14	0.000775344	0.000146735	4.97253e-05	0.000193957
15	0.000266412	8.54681e-05	5.08088e-05	0.000109278
16	0.000166385	5.41769e-05	0.000106079	0.000213948
17	0.000212304	6.56956e-05	4.7944e-05	8.58418e-05
18	0.000191599	8.30516e-05	6.30692e-05	0.00011112
19	0.000601024	0.000198226	0.000103579	0.000117005
20	0.000173041	6.31253e-05	6.53462e-05	0.000141958
21	0.000333933	7.11451e-05	8.2989e-05	0.00043947
22	0.000157133	4.16462e-05	8.94505e-05	0.000263246
23	0.00108621	0.000208279	0.000128833	0.000490371
24	0.000216407	6.55846e-05	0.000147062	0.00021562
25	0.000603933	0.000104912	4.91956e-05	0.000218487
26	0.000257116	0.000105437	5.74275e-05	0.000138778
27	0.000430185	0.00018082	0.000119408	0.000245307
28	0.0001874	4.9211e-05	6.25571e-05	0.000103263
29	0.000262255	8.97231e-05	0.000205438	0.000345373
30	0.000223129	6.63527e-05	6.97352e-05	0.000102096
31	0.000328823	0.000116938	5.30187e-05	0.000158891
32	0.000182975	4.88956e-05	7.74352e-05	0.000122141

Figure 11-2 PRN Bias Average for the Quarter

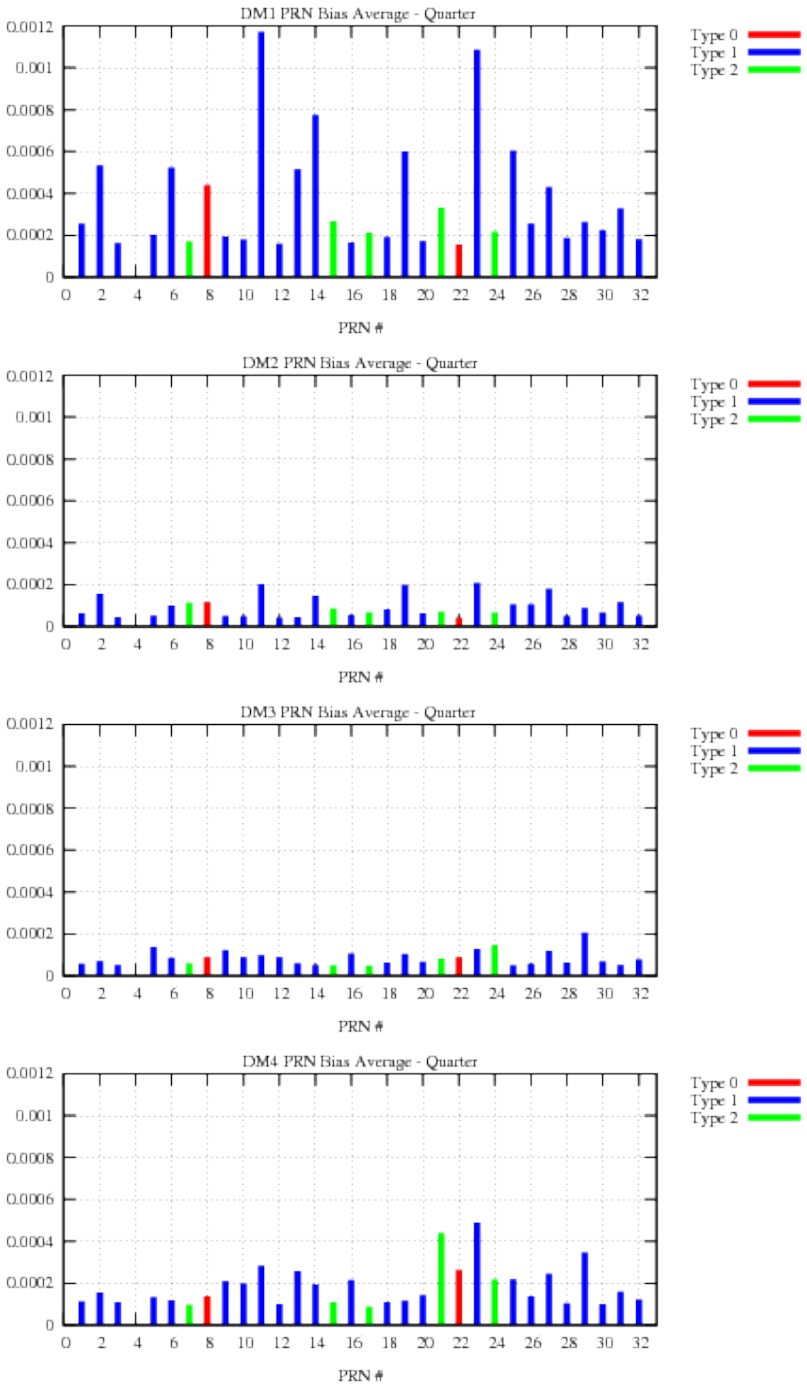


Figure 11-3 to Figure 11-10 show the daily PRN bias for each PRN, for four detection metrics. Small bumps were due to NANU's.

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

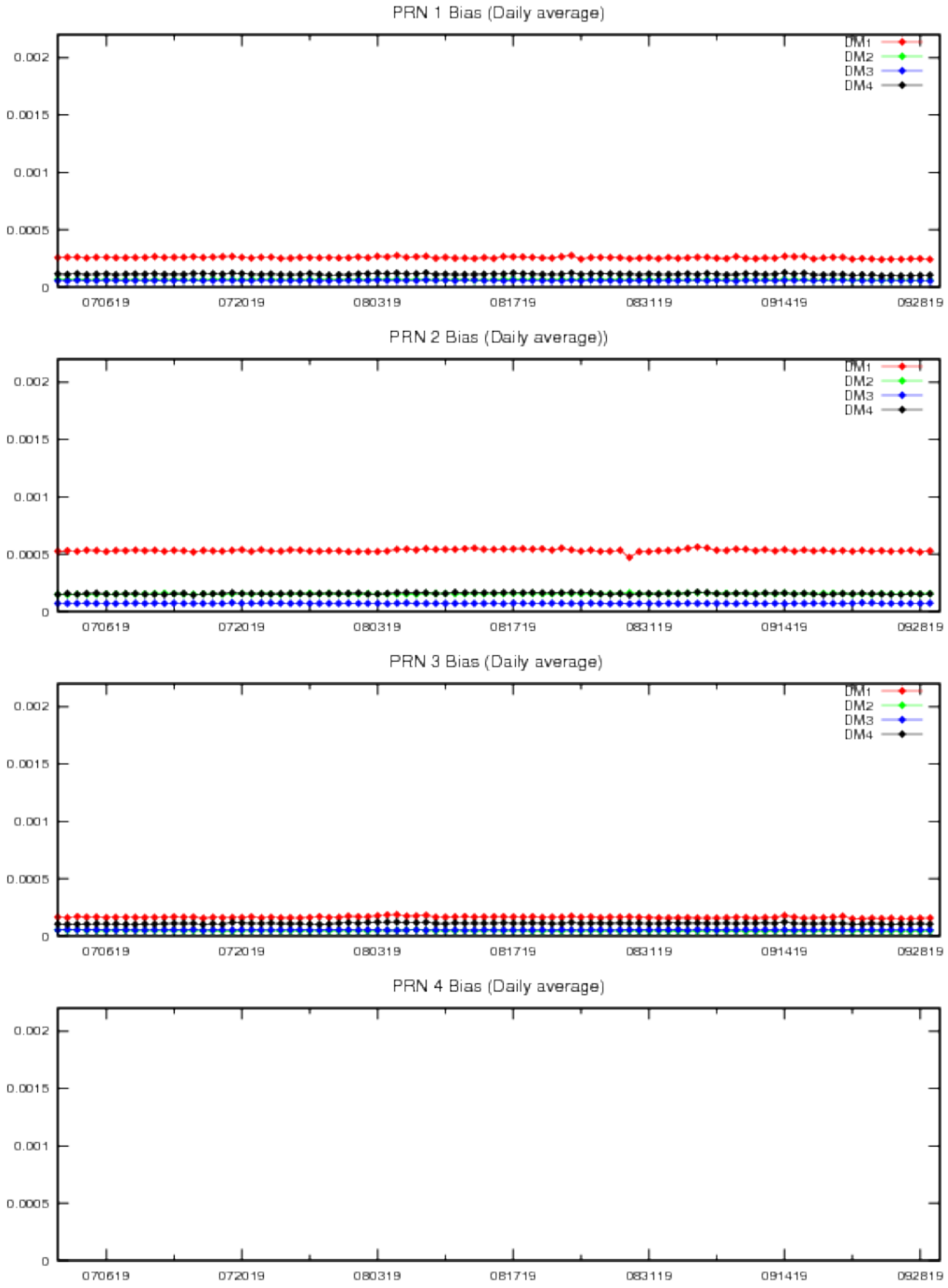


Figure 11-4 PRN Bias Average Trend (PRN5 – PRN8)

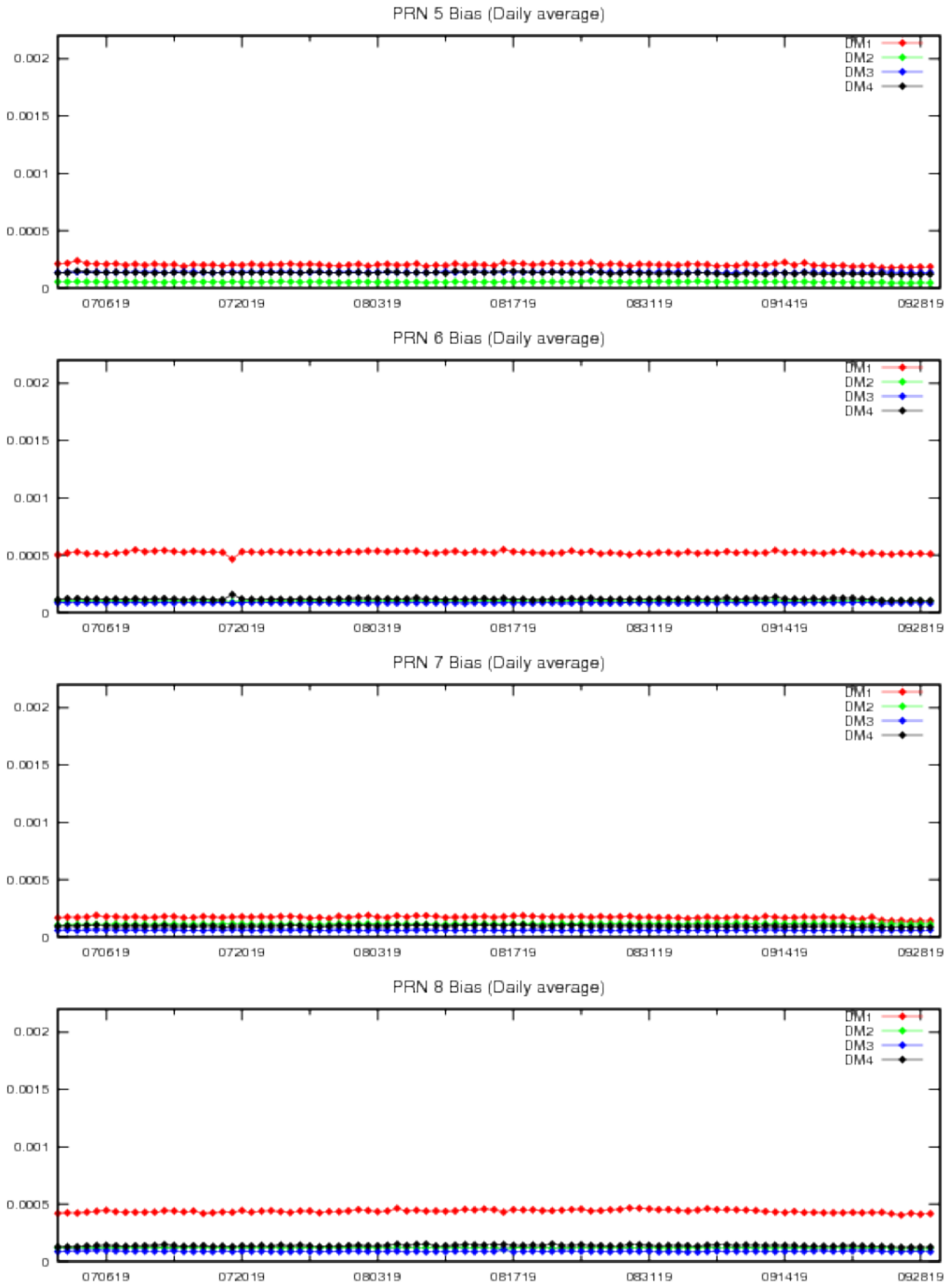


Figure 11-5 PRN Bias Average Trend (PRN9 – PRN12)

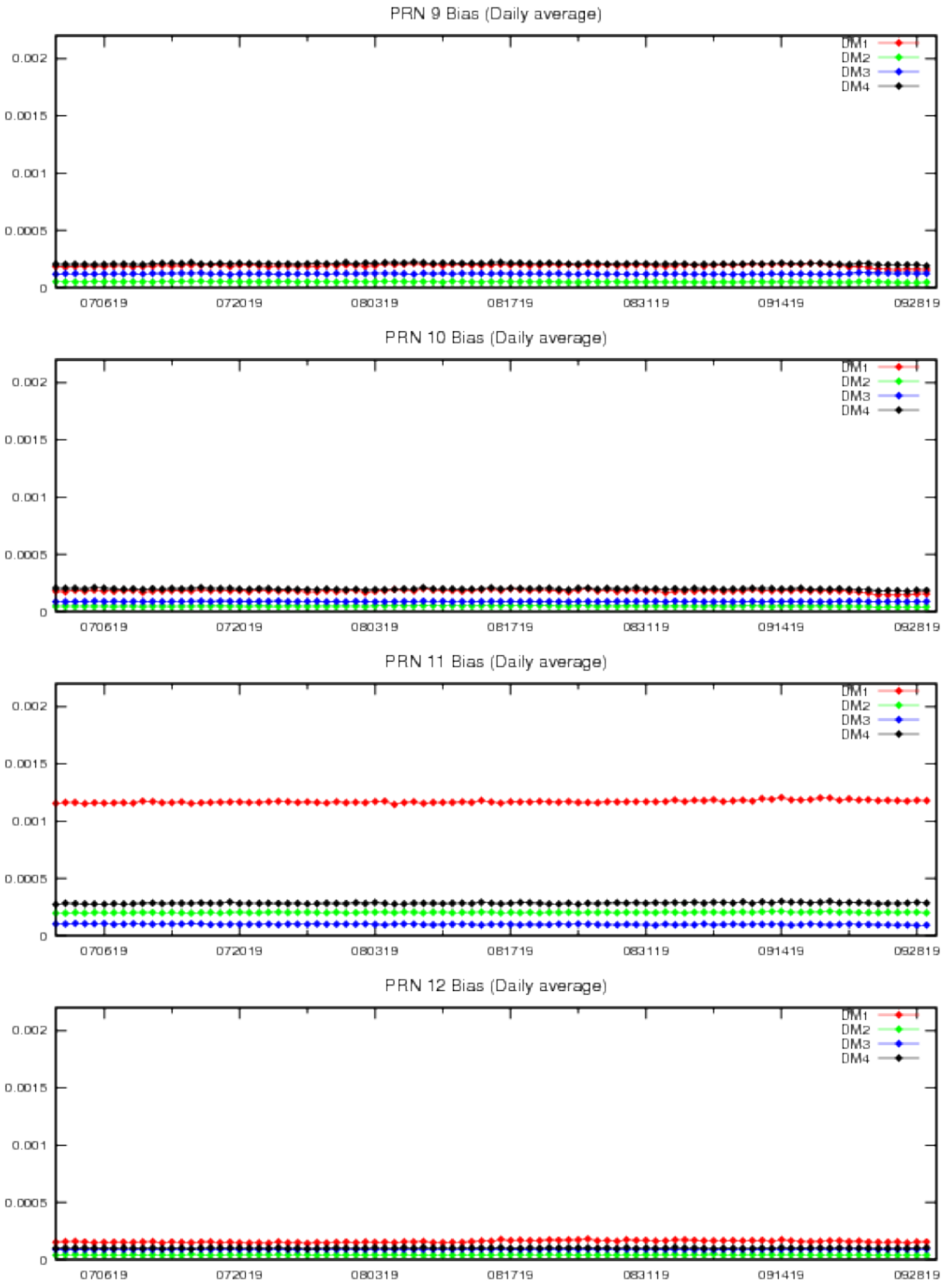


Figure 11-6 PRN Bias Average Trend (PRN13 – PRN16)

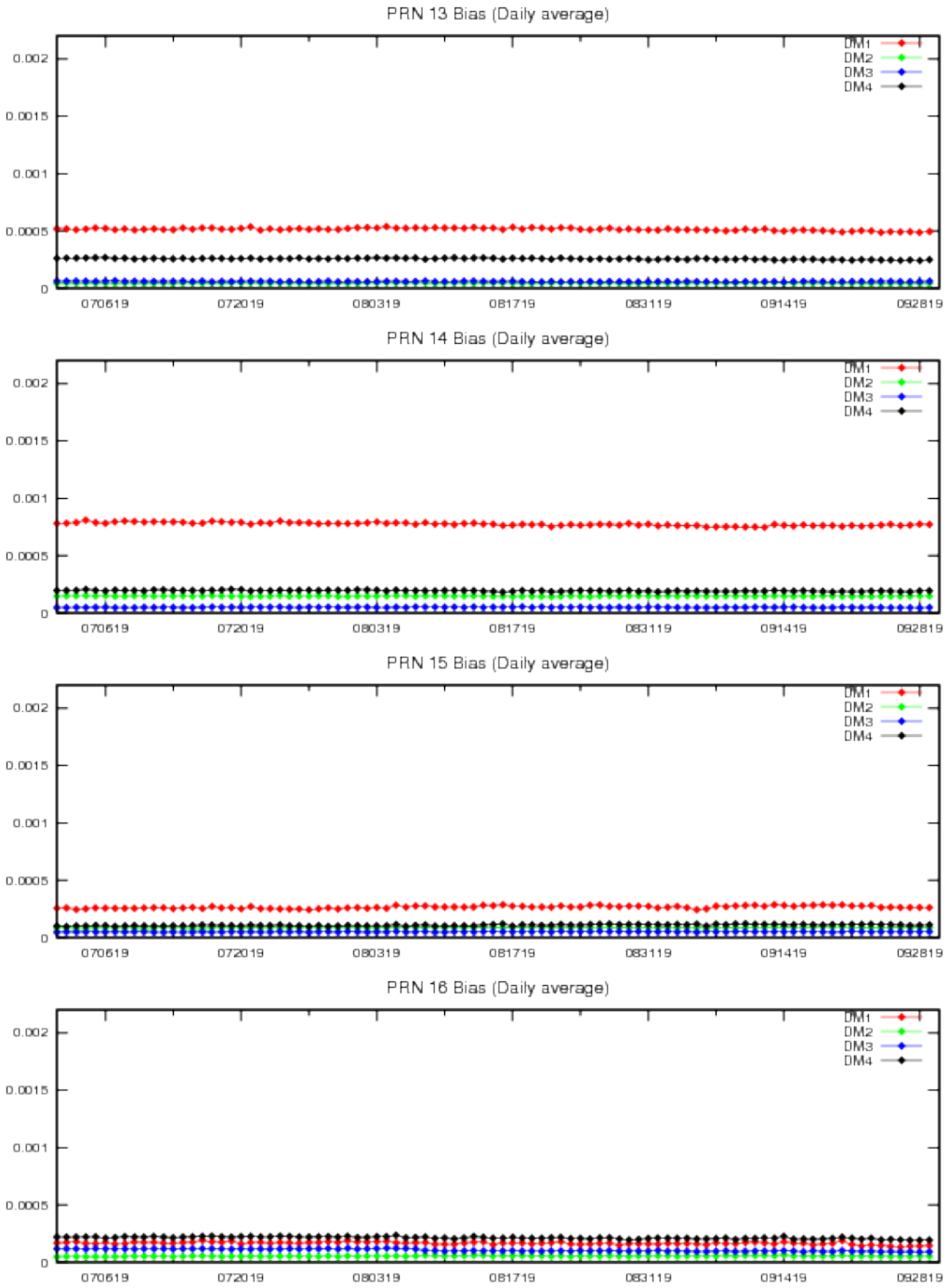


Figure 11-7 PRN Bias Average Trend (PRN17 – PRN20)

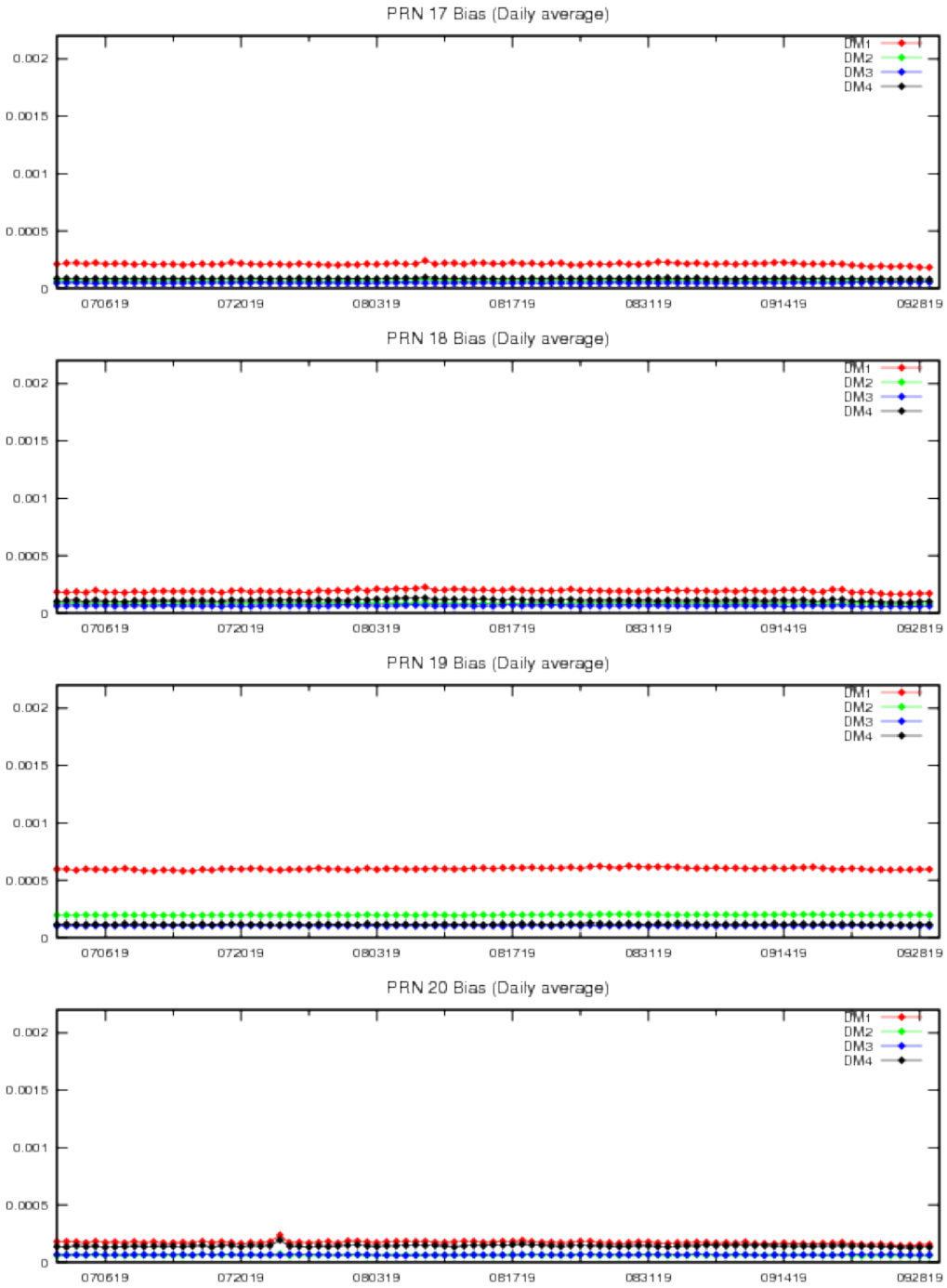


Figure 11-8 PRN Bias Average Trend (PRN21 – PRN24)

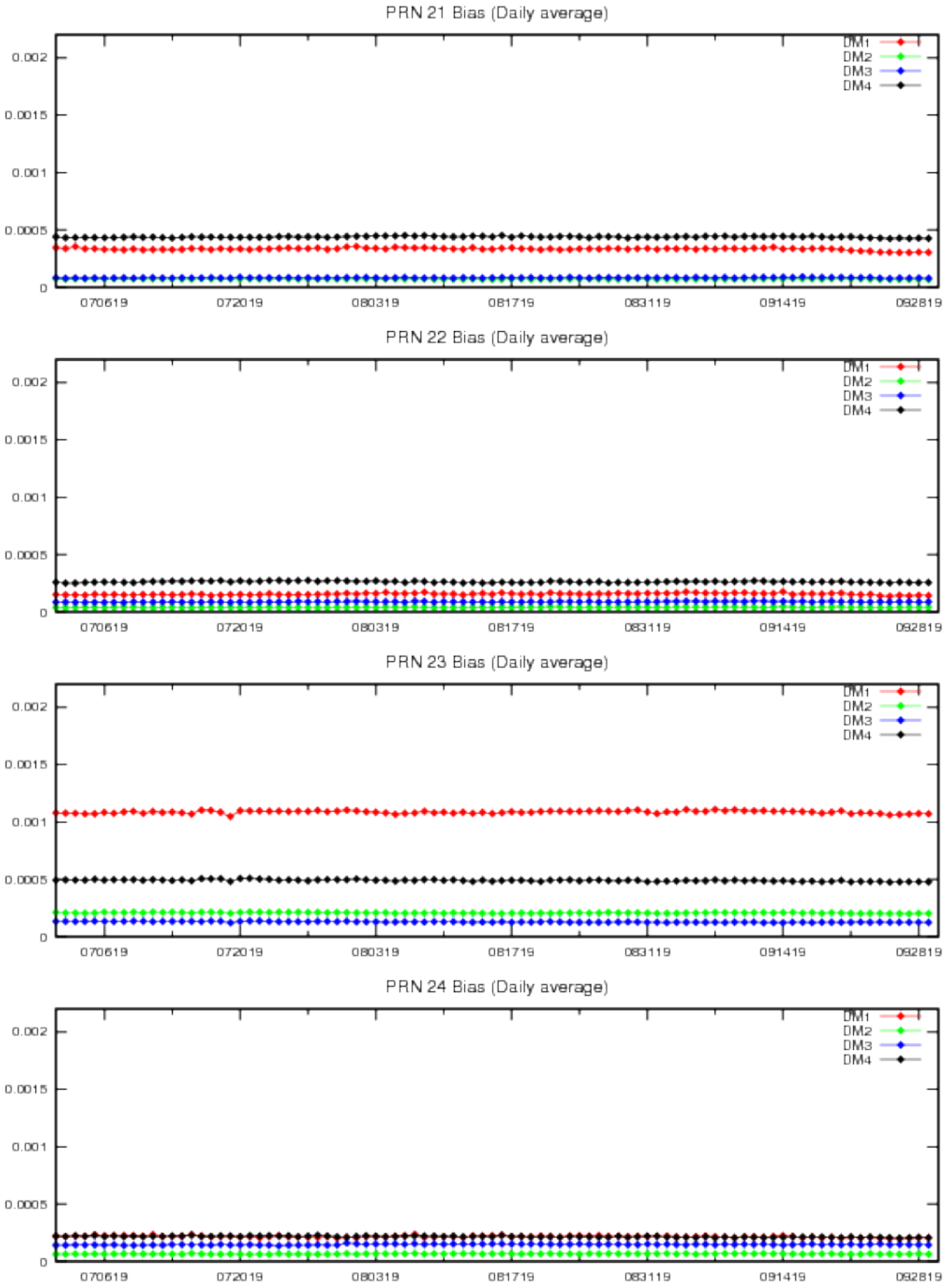


Figure 11-9 PRN Bias Average Trend (PRN25 – PRN28)

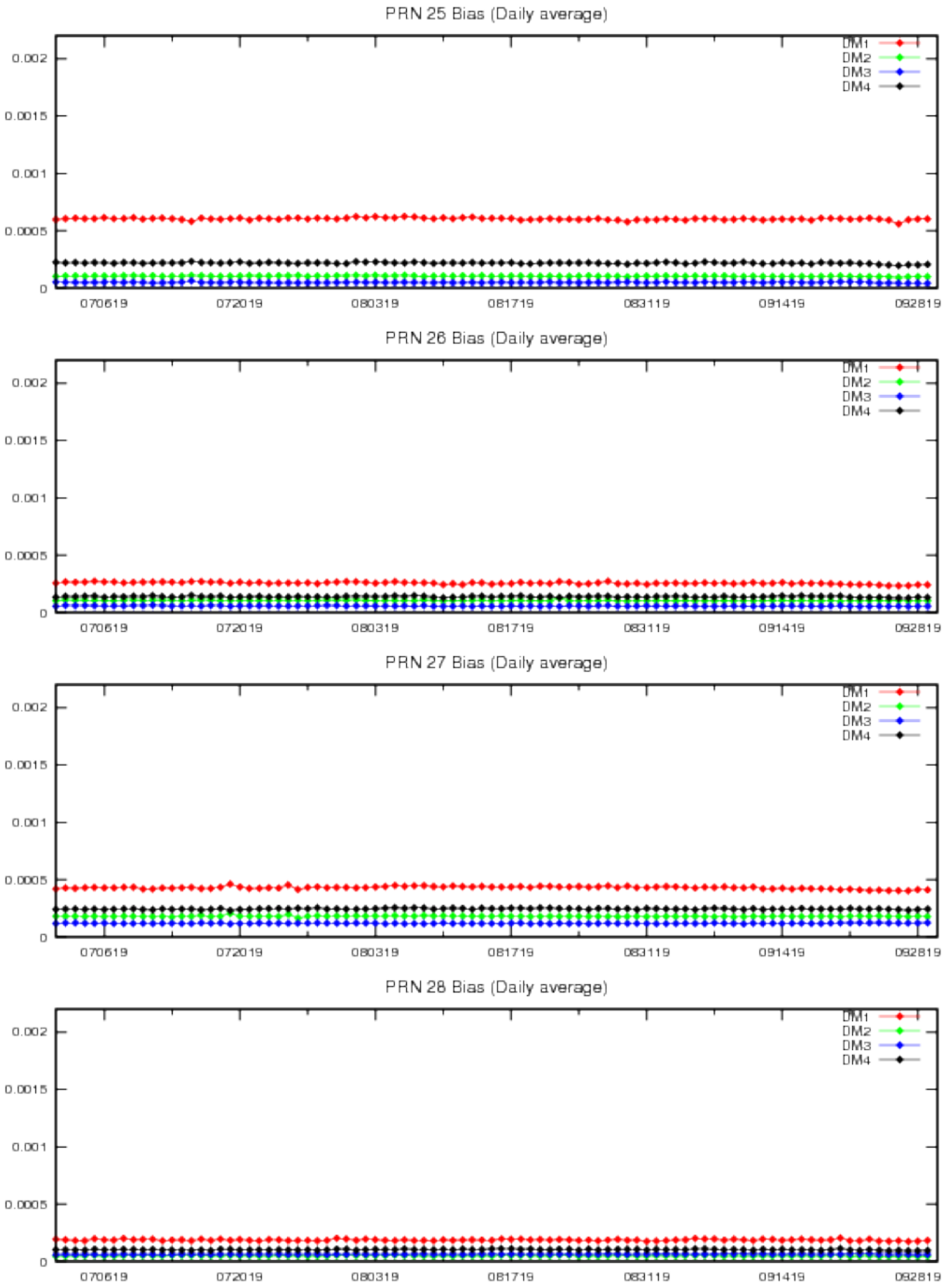
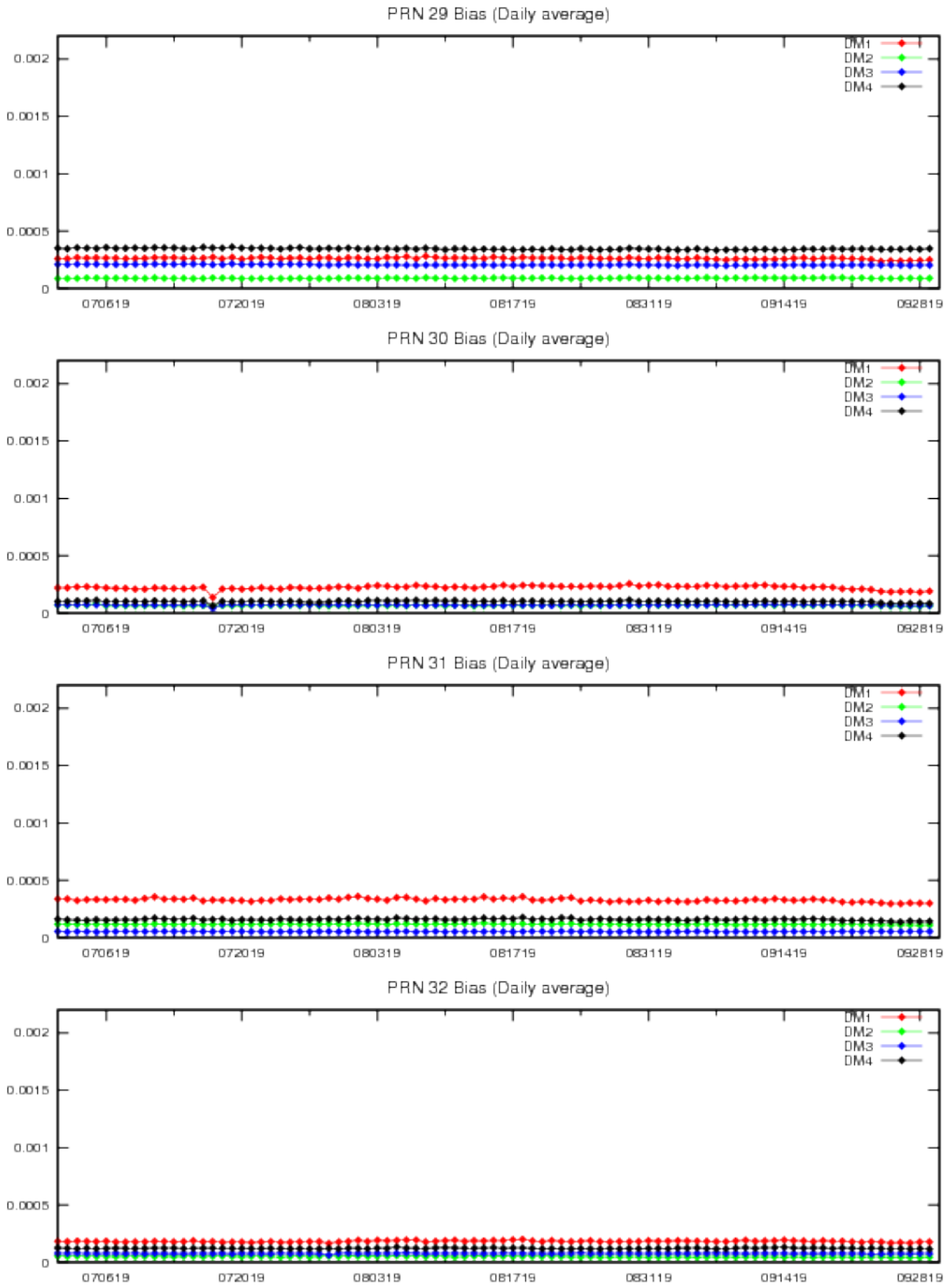


Figure 11-10 PRN Bias Average Trend (PRN29 – PRN32)



11.4 SQM Trips

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

Appendix A: Glossary and Acronyms

General Terms and Definitions

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

AMR. GEO PRN133

APC. Antenna phase center

ARP. Antenna reference point

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

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

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

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

CRE. GEO PRN138

CRW. GEO PRN135

CSRS. Canadian Spatial Reference System

DM. Detection metrics

DR. Discrepancy Report.

ECEF. Earth-centered, Earth-fixed.

FAA. Federal Aviation Administration

FD. Fault Detection

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

GEO. Geostationary satellite

GMT. Greenwich Mean Time

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

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

GUS. Ground uplink station

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

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

HPE. Horizontal position error

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

IAP. Instrument Approach Procedures

IGS. International GPS Service.

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

Kp. Planetary index

LNAV. Lateral navigation

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

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

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

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

NAS. National Airspace System

Navigation Message. Message structure designed to carry navigation data.

NGS. National Geodetic Survey

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

NTSB. National Satellite Test Bed

OCONUS. Outside Contiguous United States

OPUS. Online Positioning Use Server

PAN. Performance Analysis Network

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

PPP. Precise Point Positioning.

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

PRN. Pseudo-random noise

RAIM. Receiver autonomous integrity monitoring

RFI. Radio frequency interference

RNAV. Area navigation

RNP. Required Navigation Performance

RSS. Residual sum of squares.

SBAS. Space Based Augmentation System

SIS. Signal in space

SM9. GEO PRN131

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

SSM. System support modification

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

SV. Space vehicle.

SVN. Space Vehicle Number.

TOW. Time of GPS week

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

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

VPE. Vertical position error

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

VNAV. Vertical navigation

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

WIPP. WAAS Integrity Performance Panel

WJHTC. William J. Hughes Technical Center

WRE. Wide-Area Reference Equipment

WRS. WAAS reference station

Appendix B: Additional Coverage Plots

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

Figure B-1 98% CONUS LP Availability Contour

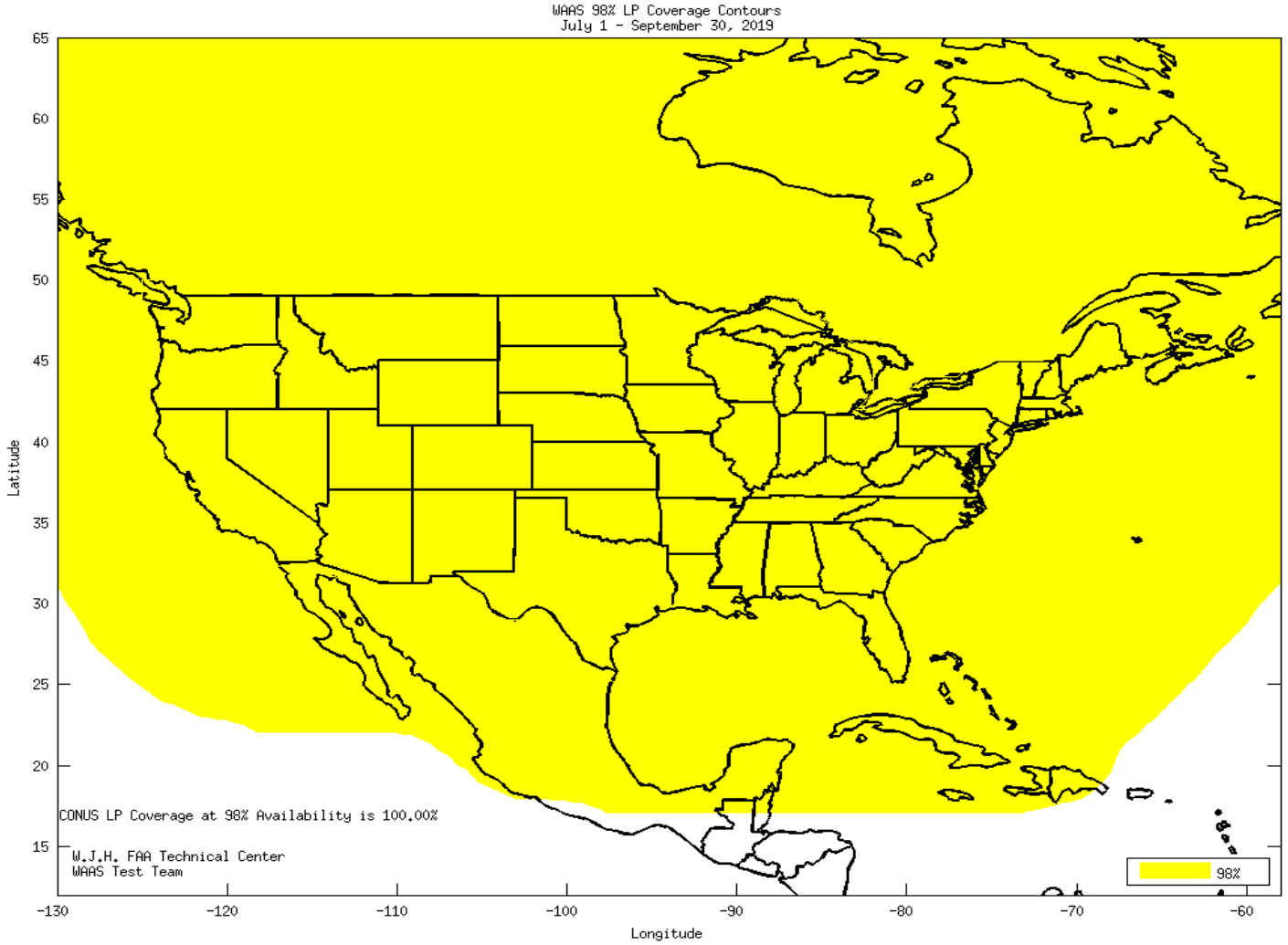


Figure B-2 98% Alaska LP Availability Contour

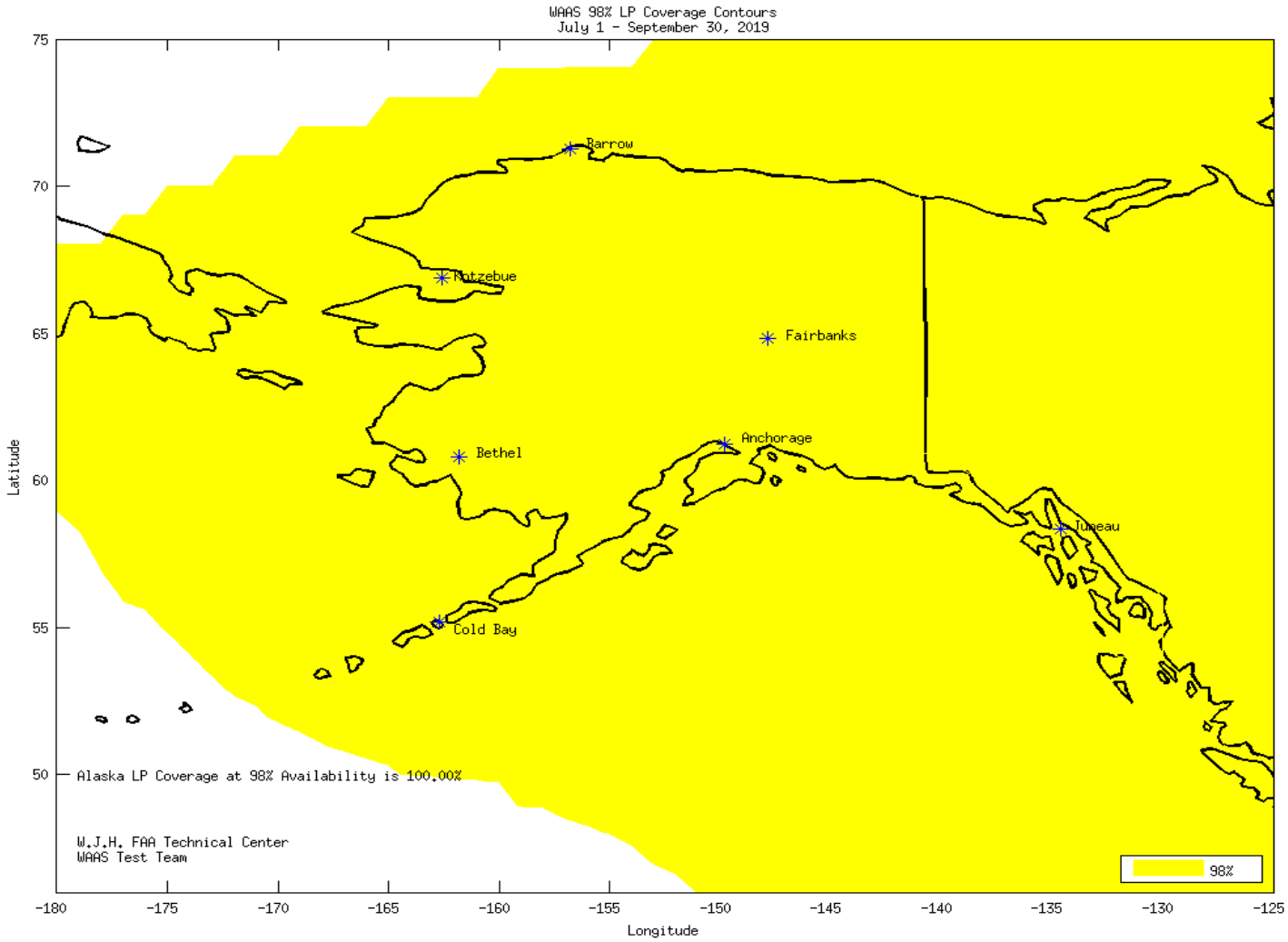


Figure B-3 98% CONUS LPV Availability Contour

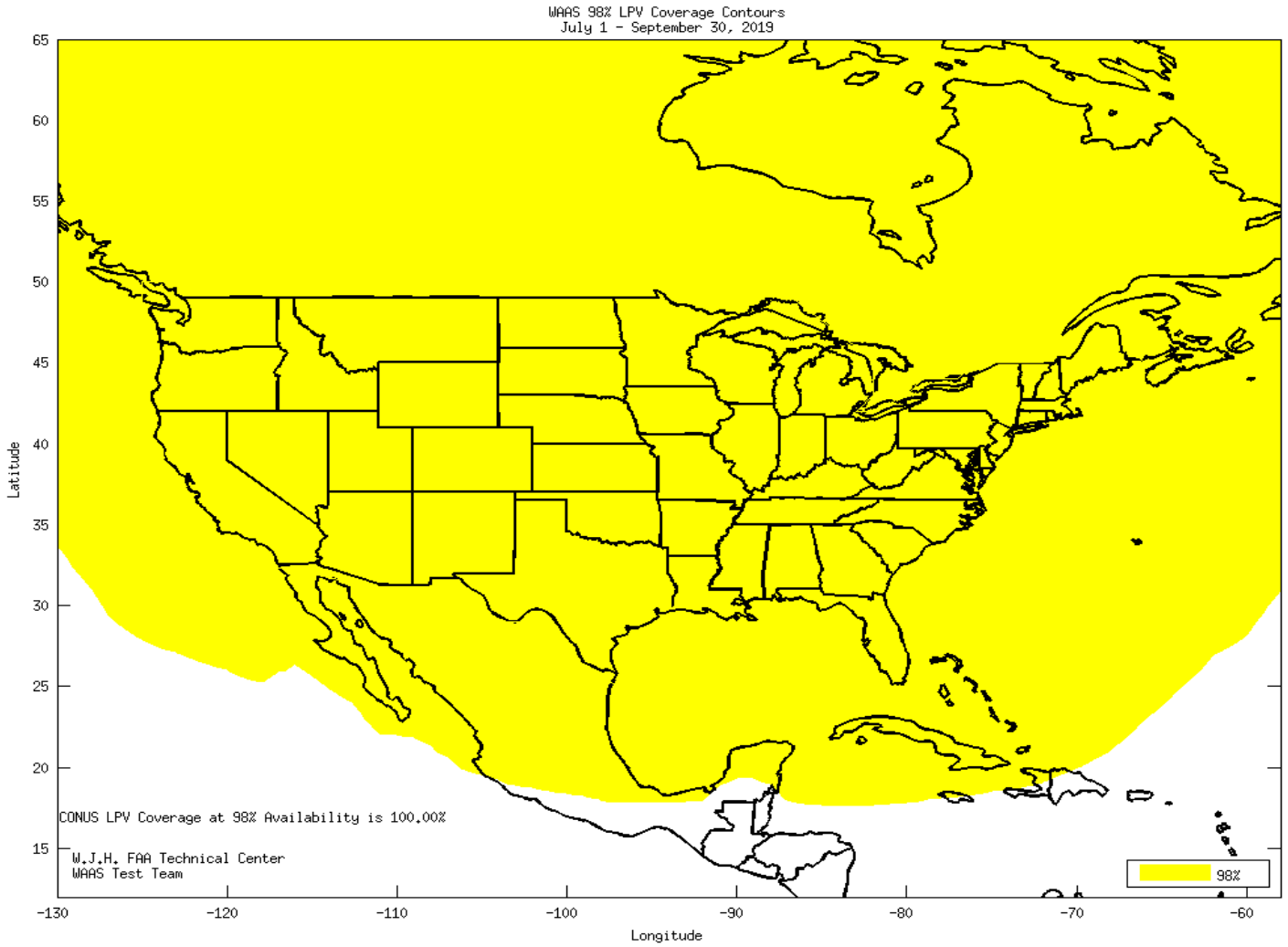


Figure B-4 98% Alaska LPV Availability Contour

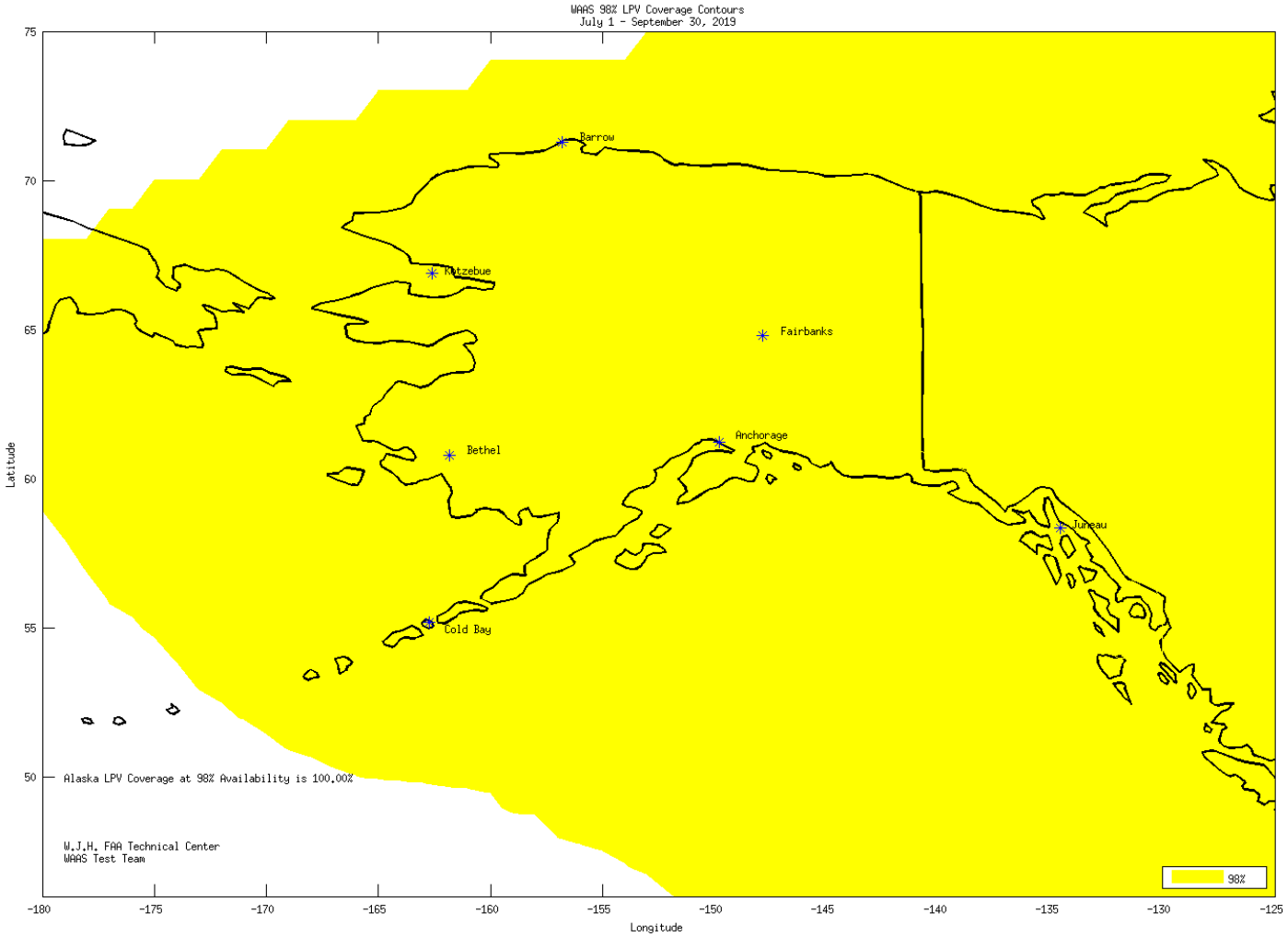


Figure B-5 98% CONUS LPV200 Availability Contour

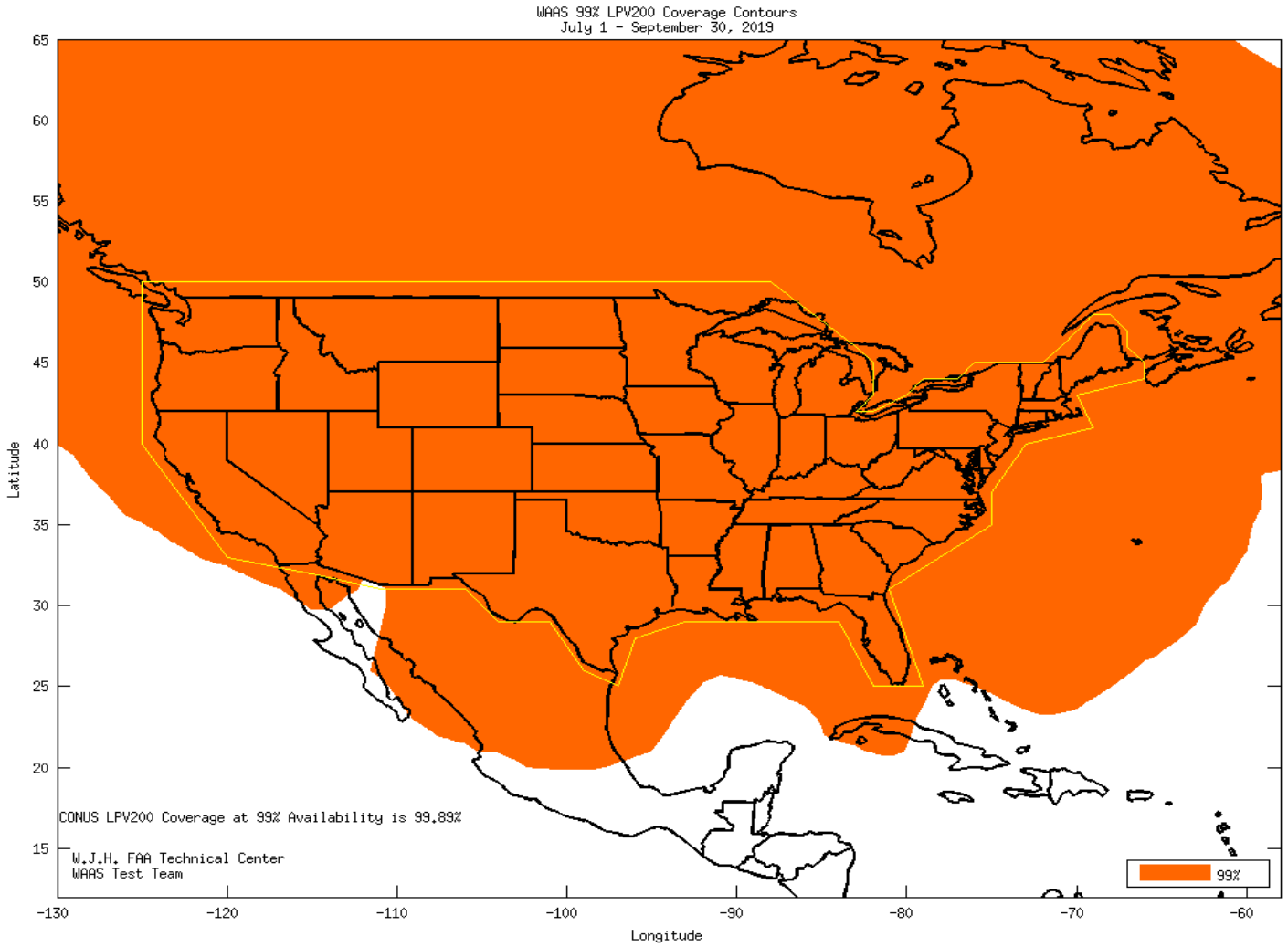


Figure B-6 98% Alaska LPV200 Availability Contour