

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #59

Reporting Period: October 1 to December 31, 2016

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Executive Summary

Since 1999, the Wide Area Augmentation System (WAAS) Test Team at the Federal Aviation Administration (FAA) William J. Hughes Technical Center has reported Global Positioning System (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 #59 provides WAAS-performance data from the October 1 through December 31, 2016 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 WAAS system support modification cutover began August 2015 with the first WAAS system upgrade to G3 receivers on September 4, 2015 in Seattle, WA. This was done in preparation for a full constellation of dual civil frequency GPS satellites (L1/L5). The WAAS system upgrade to G3 receivers was completed on May 17, 2016.

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, Atlantic City, and Arcata—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)	Atlantic City 1.228 meters	Salt Lake City 0.634 meters	Goose Bay 0.799 meters	Bethel 0.587 meters
95% Vertical Accuracy (VPL <= 50 meters)	Miami 1.624 meters	Salt Lake City 0.797 meters	Barrow 1.352 meters	Bethel 1.029 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 99.99%	Multiple Sites 100%	Barrow 99.99%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Oakland 99.38%	Multiple Sites 100%	Barrow 99.02%
99% HPL	Atlantic City 16.61 meters	Denver 10.82 meters	Goose Bay 20.99 meters	Juneau 13.16 meters
99% VPL	Arcata 30.62 meters	Kansas 18.92 meters	Barrow 34.23 meters	Fairbanks 24.22 meters

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) monitors the Wide Area Augmentation System (WAAS) and Global Positioning System (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 as well as improves GPS position accuracy and availability within the WAAS coverage area.

The objectives of this report are as listed below:

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 the 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 utilizes the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN)-135 (CRW), PRN-138 (CRE), and PRN-133 (AMR). CRE and CRW GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service. As of January 18, 2015, the AMR GEO indefinitely discontinued non-precision approach (NPA) ranging service.

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

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 receiver 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 1-1 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

Table 1-2 PA Evaluation Sites

	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	90	7746620
Atlantic City	91	7905306
Grand Forks	91	7843388
Oklahoma City	87	7473996
WAAS:		
Albuquerque	92	7948156
Anchorage	92	7947524
Atlanta	92	7940775
Barrow	92	7944946
Bethel	92	7948156
Billings	92	7948080
Boston	92	7947829
Chicago	92	7944864
Cleveland	92	7920171
Cold Bay	92	7947904
Dallas	92	7944831
Denver	92	7943433
Fairbanks	92	7946990
Gander	92	7945360
Goose Bay	92	7947855
Houston	92	7940485
Iqaluit	92	7945964
Jacksonville	92	7947780
Juneau	92	7947000
Kansas City	92	7944925
Kotzebue	92	7926179
Los Angeles	92	7933778
Memphis	92	7947958
Merida	92	7944928
Mexico City	92	7944666
Miami	92	7943755
Minneapolis	92	7946507
New York	92	7947475
Oakland	92	7943049
Puerto Vallarta	92	7942958
Salt Lake City	92	7947604
San Jose Del Cabo	92	7945292
Seattle	92	7941672
Washington DC	92	7932285
Winnipeg	92	7947948

Table 1-3 NPA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7948278
Anchorage	92	7948277
Atlanta	92	7939710
Barrow	92	7947514
Bethel	92	7947484
Billings	92	7947492
Boston	92	7945855
Cleveland	92	7948275
Cold Bay	92	7948085
Fairbanks	92	7941822
Gander	92	7946477
Honolulu	92	7948276
Houston	92	7948277
Iqaluit	92	7947549
Juneau	92	7948116
Kansas City	92	7948277
Kotzebue	92	7922511
Los Angeles	92	7938514
Merida	92	7917804
Miami	92	7947926
Minneapolis	92	7948152
Oakland	92	7948275
Salt Lake City	92	7948262
San Jose Del Cabo	92	7943113
San Juan	92	7948256
Seattle	92	7948269
Tapachula	92	7909728
Washington DC	92	7933469

The report is divided by the performance category, as listed below:

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 these requirements are extracted from the FAA Specification FAA-E-2892C and FAA Specification 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 Hazardously Misleading Information (HMI)	< 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 (Kp) index 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 GEO uplink subsystem (GUS) switchovers, which are transitions from one GEO uplink site to the other GEO uplink site.

Table 1-5 Events

Start Date	End Date	Location/Satellites	Service Affected	Event Description
10/13/2016	10/13/2016	GEO135,Napa (APC)	LPV200_Alaska, LPV200_Canada	The uplink for the CRW GEO, GEO 135, switched from the Napa uplink site to the Littleton uplink site at 08:09:01 GMT. This caused a 7 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize from PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDREs along with high GIVEs (see event 13535) caused moderate degradation of: (1) LPV200 service coverage in Alaska from 11:23 GMT to 11:55 GMT, and from 15:52 GMT to 16:25 GMT; and (2) LPV200 service coverage in Canada from 15:31 GMT to 15:54 GMT and from 17:08 GMT to 17:59 GMT. TOW 374958-374966 Please see plot(s): LPV200_10/13/2016_Cov vs Time Alaska_10/13/2016 Cov vs Time Canada_10/13/2016
10/13/2016	10/13/2016	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	Local, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. This also caused multiple Alaska sites to drop satellites due to iono scintillation. The elevated GIVEs along with high UDREs on GEO135 (see event 13524) caused moderate degradation of: (1) LPV200 service coverage in Alaska from 11:23 GMT to 11:55 GMT, and from 15:52 GMT to 16:25 GMT; and (2) LPV200 service coverage in Alaska from 15:31 GMT to 15:54 GMT and from 17:08 GMT to 17:59 GMT. Please see plot(s): LPV200_10/13/2016_Cov vs Time Alaska_10/13/2016 Cov vs Time Canada_10/13/2016
10/15/2016	10/15/2016	PRN25	Local	GPS satellite PRN25 ephemeris broadcast reused IODE (equal to 98) within 30 minutes on 10/15/16 at 14:00 GMT. DR 134
10/17/2016	10/17/2016	GEO138,Brewster-B (BRE-B)	LPV200_Canada	The uplink for the CRE GEO, GEO 138, switched from the Brewster-B uplink site to the Woodbine uplink site at 8:01:27 GMT. This caused a 4 second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize from PRN138. This also caused the UDRE for GEO 138 to be elevated. The elevated UDREs caused minor degradation of LPV200 service coverage in Canada from 10:05 GMT to 10:14 GMT, and from 12:22 GMT to 12:30 GMT. TOW 115304-115309
10/17/2016	10/17/2016	PRN135	LPV200_CONUS	A missed maneuver caused PRN 135 to alert to not monitored from 13:04:34 GMT to 14:25:37 GMT. The elevated UDRE for PRN 135 caused moderate degradation of LPV200 service coverage in CONUS from 14:07 GMT to 14:13 GMT. TOW 133491-138354 Please see plot(s): LPV200_10/17/2016

Start Date	End Date	Location/Satellites	Service Affected	Event Description
10/25/2016	10/25/2016	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (Kp = 7) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of: (1) LPV200 service coverage in Alaska from 10:39 GMT to 11:07 GMT and from 15:26 GMT to 15:34 GMT; and (2) LPV200 service coverage in Canada from 01:52 GMT to 02:06 GMT, from 11:42 GMT to 11:58 GMT, and from 22:40 GMT to 23:02 GMT. Please see plot(s): LPV200_10/25/2016_Cov vs Time Alaska 10/25/2016
10/26/2016	10/26/2016	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp = 6) disturbed the ionosphere causing elevated GIVE values. this resulted in minor degradation of the LPV200 service coverage in Canada from about from 02:41 GMT to 02:48 GMT, from 16:49 GMT to 17:07 GMT, from 17:49 GMT to 18:09 GMT, from 19:59 GMT to 20:19 GMT and from 22:53 GMT to 23:02 GMT. Please see plot(s): LPV200_10/26/2016_Cov vs Time Alaska 10/26/2016
10/27/2016	10/27/2016	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Several IGP's from latitudes 70 to 75 and longitudes -90 to -50 were set to Not-Monitored from 15:50 GMT to 16:34 GMT and from 17:45 GMT to 17:50 GMT. The WAAS performance monitor reported at the time IGP's were set to Not-Monitored state that the Iqaluit WRS experience sub-frame reasonability warning and YFB PID Down fault which removed Iqaluit WRS from the WAAS correction processing. The Not-Monitored IGP's caused minor degradation to LPV200 service coverage in Canada from 15:50 GMT until 16:43 GMT. Please see plot(s): LPV200_10/27/2016_Cov vs Time Canada 10/27/2016
11/9/2016	11/9/2016	GEO135, Littleton (APA)	LPV200_CONUS, LPV200_Alaska	The uplink for the CRW GEO, GEO 135, switched from the Littleton uplink site to the Napa uplink site at 8:00:28 GMT. This caused a 4 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of: (1) LPV200 service coverage in CONUS from 12:22 GMT to 12:45 GMT; and (2) LPV200 service coverage in Alaska from 09:46 GMT to 10:03 GMT. TOW 288045-288050 Please see plot(s): LPV200_11/9/2016
11/10/2016	11/10/2016	PRN135	LPV200_CONUS	A missed maneuver caused PRN 135 to alert to "not monitored" from 11:50:07 GMT to 12:51:58 GMT. The elevated UDRE for PRN 135 caused moderate degradation of LPV200 service coverage in CONUS from 12:19 GMT to 12:30 GMT. TOW 388224-391935 (14-15) Please see plot(s): LPV200_11/10/2016

Start Date	End Date	Location/Satellites	Service Affected	Event Description
				Cov vs Time Conus 11/10/2016
11/11/2016	11/11/2016	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (Kp = 5) disturbed the ionosphere causing elevated GIV values. This resulted in minor degradation of the LPV200 service coverage in CONUS from about 12:14 GMT to 12:39 GMT on 11/11. Please see plot(s): LPV200_11/11/2016
11/15/2016	11/15/2016	GEO138,Woodbine (QWE)	LPV200_CONUS, LPV200_Canada	The uplink for the CRE GEO, PRN 138 switched from the Woodbine uplink site to the Brewster-B uplink site at 08:00:07 GMT. This caused a 4 second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. This caused the UDRE for GEO 138 to be elevated. The elevated UDRE for GEO 138 caused minor degradation of: (1) LPV200 service coverage in CONUS from 11:57 GMT to 12:14 GMT; and (2) LPV200 service coverage in Canada from 08:09 GMT to 08:17 GMT and from 10:24 GMT to 10:31 GMT. TOW 201624-201629
11/15/2016	11/15/2016	GEO135,Napa (APC)	LPV200_Canada	The uplink for the CRW GEO, GEO 135, switched from the Napa uplink site to the Littleton uplink site at 17:16:52 GMT. This caused an 4 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of LPV200 service coverage in Canada from 19:04 GMT to 19:18 GMT. TOW 235029-235034
11/26/2016	11/26/2016	GEO135,Littleton (APA)	LPV_Alaska, LPV200_Alaska	The uplink for the CRW GEO, GEO 135, switched from the Littleton uplink site to the Napa uplink site at 12:58:24. This caused an 12 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of: (1) LPV service coverage in Canada from 15:49 GMT to 15:56 GMT; and (2) LPV200 service coverage in Alaska from 15:45 GMT to 16:00 GMT. TOW 565121-565134 Please see plot(s): LPV 11/26/2016 LPV200_11/26/2016 Cov vs Time Alaska 11/26/2016
12/12/2016	12/14/2016	PRN11	LPV200_Alaska, LPV200_Canada	NANU 2016075 The reduction in LPV200 service coverage in Canada and Alaska was due to a GPS NANU on PRN11 (see NANU2016075), which was unusable from 16:19:00 GMT on 12/12 to 16:15:00 GMT on 12/14. The NANU caused minor degradation of: (1) LPV200 service coverage in Canada from 07:48 GMT to 08:01 GMT on 12/13; and (2) LPV200 service coverage in Alaska from 07:30 GMT to 07:37 GMT on

Start Date	End Date	Location/Satellites	Service Affected	Event Description
				12/13. Please see plot(s): LPV200_12/13/2016
12/12/2016	12/12/2016	GEO135,Napa (APC)	LPV200_Alaska	The uplink for the CRW GEO, GEO 135, switched from the Napa uplink site to the Littleton uplink site at 08:00:45. This caused an 4 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of LPV200 service coverage in Alaska from 14:42 GMT to 15:06 GMT. TOW 115262-115267 Please see plot(s): LPV200_12/12/2016
12/23/2016	12/23/2016	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada from 00:56 GMT to 01:14 GMT and from 02:39 GMT to 02:45 GMT. Please see plot(s): LPV200_12/23/2016

Table 1-6 WAAS Upgrades

Start Date	End Date	Location	Event Description
10/19/2016	10/19/2016	 	SSM-47: This system support modification (SSM) upgrades the processors at the NOCC. This upgrade supports the cutover to WAAS Release 1. This upgrade caused a 457 second outage from the NOCC to the FAA Tech Center from 02:17:42 GMT to 02:25:20 GMT TOW 267479-267937
10/19/2016	10/19/2016	Atlanta (CnV)	SSM-47: This system support modification (SSM) upgrades the processors at the ZTL WMS C&V. This upgrade supports the transition to WAAS Release 1.
10/20/2016	10/20/2016	Atlanta (ZTL1), Atlanta (ZTL2), Atlanta (ZTL3)	SSM-47: This system support modification (SSM) upgrades the processors at the ZTL WRS. This upgrade supports the cutover to WAAS Release 1. This upgrade caused a 6833 second outage from the ZTL WRS from 13:39:15 GMT to 15:33:09 GMT.
10/25/2016	10/25/2016	Washington D.C. (CnV)	SSM-47: This system support modification (SSM) upgrades the processors at the ZDC WMC C&V. This upgrade supports the transition to WAAS Release 1.
10/26/2016	10/26/2016	Los Angeles (CnV)	SSM-47: This system support modification (SSM) upgrades the processors at the ZLA WMS C&V. This upgrade supports the cutover to WAAS Release 1.
10/26/2016	10/26/2016	Washington DC (ZDC1), Washington DC (ZDC2),	SSM-47: This system support modification (SSM) upgrades the processors at the ZDC WRS. This upgrade supports the cutover to WAAS Release 1. This upgrade caused a 14655 second outage from

Start Date	End Date	Location	Event Description
		Washington DC (ZDC3)	the ZDC WRS from 13:29:37 GMT to 17:09:39 GMT and from 20:12:02 GMT to 20:36:15 GMT.
10/27/2016	10/27/2016	Los Angeles (ZLA1), Los Angeles (ZLA2), Los Angeles (ZLA3)	SSM-47: This system support modification (SSM) upgrades the processors at the ZLA WRS. This upgrade supports the cutover to WAAS Release 1. This upgrade caused a 8664 second outage from ZLA WRS from 15:57:44 GMT to 18:22:09 GMT.
11/02/2016	11/02/2016	Santa Paula (SZP)	SSM-47: This system support modification (SSM) upgrades the processors at the SZP GUS. This upgrade supports the cutover to WAAS Release 1.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location/Satellites	Service Affected	Event Description
10/1/2016	10/1/2016	Manual	GEO133,Paumalu (HDH)	None	The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 08:09:39 GMT. This caused an 8 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize form PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 547796-547805
10/3/2016	10/3/2016	Manual	GEO133,Santa_Paula (SZP)	None	The uplink for the AMR GEO, GEO 133, switched from the Santa Paula uplink site to the Paumalu uplink site at 18:36:07 GMT. This caused a 4 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize form PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 153384-153389
10/13/2016	10/13/2016	Manual	GEO135,Napa (APC)	LPV200_Alaska, LPV200_Canada	The uplink for the CRW GEO, GEO 135, switched from the Napa uplink site to the Littleton uplink site at 08:09:01 GMT. This caused a 7 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize from PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDREs along with high GIVEs (see event 13535) caused moderate degradation of: (1) LPV200 service coverage in Alaska from 11:23 GMT to 11:55 GMT, and from 15:52 GMT to 16:25 GMT; and (2) LPV200 service coverage in Canada from 15:31 GMT to 15:54 GMT and from 17:08

Start Date	End Date	GUS Switch	Location/Satellites	Service Affected	Event Description
					GMT to 17:59 GMT. TOW 374958-374966 Please see plot(s): LPV200_10/13/2016 Cov vs Time Alaska 10/13/2016 Cov vs Time Canada 10/13/2016
10/17/2016	10/17/2016	Manual	GEO138,Brewster-B (BRE-B)	LPV200_Canada	The uplink for the CRE GEO, GEO 138, switched from the Brewster-B uplink site to the Woodbine uplink site at 8:01:27 GMT. This caused a 4 second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize from PRN138. This also caused the UDRE for GEO 138 to be elevated. The elevated UDREs caused minor degradation of LPV200 service coverage in Canada from 10:05 GMT to 10:14 GMT and from 12:22 GMT to 12:30 GMT. TOW 115304-115309
11/3/2016	11/3/2016	Manual	GEO133,Paumalu (HDH)	None	The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 8:00:41 GMT. This caused an 11 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 374458-374470
11/4/2016	11/4/2016	Manual	GEO133,Santa_Paula (SZP)	None	The uplink for the AMR GEO, GEO 133, switched from the Santa Paula uplink site to the Paumalu uplink site at 21:35:27 GMT. This caused a 16 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize form PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 509744-509761
11/7/2016	11/7/2016	Manual	GEO133,Paumalu (HDH)	None	The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 22:40:33 GMT. This caused a 4 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 168050-168055
11/9/2016	11/9/2016	Manual	GEO135,Littleton (APA)	LPV200_CONUS, LPV200_Alaska	The uplink for the CRW GEO, GEO 135, switched from the Littleton uplink site to the Napa uplink site at 8:00:28

Start Date	End Date	GUS Switch	Location/Satellites	Service Affected	Event Description
					GMT. This caused a 4 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of: (1) LPV200 service coverage in CONUS from 12:22 GMT to 12:45 GMT; and (2) LPV200 service coverage in Alaska from 09:46 GMT to 10:03 GMT. TOW 288045-288050 Please see plot(s): LPV200_11/9/2016
11/15/2016	11/15/2016	Manual	GEO135,Napa (APC)	LPV200_Canada	The uplink for the CRW GEO, GEO 135, switched from the Napa uplink site to the Littleton uplink site at 17:16:52 GMT. This caused a 4 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of LPV200 service coverage in Canada from 19:04 GMT to 19:18 GMT. TOW 235029-235034
11/15/2016	11/15/2016	Manual	GEO138,Woodbine (QWE)	LPV200_CONUS, LPV200_Canada	The uplink for the CRE GEO, PRN 138 switched from the Woodbine uplink site to the Brewster-B uplink site at 08:00:07 GMT. This caused a 4 second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. This caused the UDRE for GEO 138 to be elevated. The elevated UDRE for GEO 138 caused minor degradation of: (1) LPV200 service coverage in CONUS from 11:57 GMT to 12:14 GMT; and (2) LPV200 service coverage in Canada from 08:09 GMT to 08:17 GMT and from 10:24 GMT to 10:31 GMT. TOW 201624-201629
11/15/2016	11/15/2016	Missed Navigation Message	GEO138,Brewster-B (BRE-B), Washington, DC (CnV)	None	The Brewster-B uplink station for the CRE GEO had a C&V source select switch from Washington D.C. to Atlanta D.C. at 12:33 GMT. TOW 218056-218058
11/26/2016	11/26/2016	Manual	GEO135,Littleton (APA)	LPV_Alaska, LPV200_Alaska	The uplink for the CRW GEO, GEO 135, switched from the Littleton uplink site to the Napa uplink site at 12:58:24. This caused a 12 second outage of the GEO 135 broadcast and also caused the

Start Date	End Date	GUS Switch	Location/Satellites	Service Affected	Event Description
					<p>WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of: (1) LPV service coverage in Canada from 15:49 GMT to 15:56 GMT; and (2) LPV200 service coverage in Alaska from 15:45 GMT to 16:00 GMT. TOW 565121-565134</p> <p>Please see plot(s): LPV_11/26/2016 LPV200_11/26/2016 Cov vs Time Alaska 11/26/2016</p>
12/1/2016	12/1/2016	Manual	GEO133,Santa_Paula (SZP)	None	<p>The uplink for the AMR GEO, GEO 133, switched from the Santa Paula uplink site to the Paumalu uplink site at 9:04:48 GMT. This caused a 4 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 378305-378310</p>
12/8/2016	12/8/2016	Faulted	GEO133,Paumalu (HDH)	None	<p>The uplink for the AMR GEO, GEO 133, switched from the Paumalu uplink site to the Santa Paula uplink site at 08:22:16 GMT. This caused a 14 second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. This also caused the UDRE for GEO 133 to be elevated. TOW 375753-375768</p>
12/12/2016	12/12/2016	Manual	GEO135,Napa (APC)	LPV200_Alaska	<p>The uplink for the CRW GEO, GEO 135, switched from the Napa uplink site to the Littleton uplink site at 08:00:45. This caused a 4 second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. This also caused the UDRE for GEO 135 to be elevated. The elevated UDRE for GEO 135 caused minor degradation of LPV200 service coverage in Alaska from 14:42 GMT to 15:06 GMT. TOW 115262-115267</p> <p>Please see plot(s): LPV200_12/12/2016</p>

1.2 Report Overview

Section 2 provides the observed Localizer Performance with Vertical Guidance (LPV) and non-precision approach (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 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 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 provides the summary of the Hazardous Misleading Information (HMI) analysis as well as a safety margin index for each receiver. This section also shows update rates of WAAS messages transmitted from CRE, CRW, and AMR.

Section 6 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 provides the GEO ranging performance for CRE and CRW.

Section 8 provides the WAAS LPV availability and outages at selected airports.

Section 9 provides the assessment of WAAS code noise and multipath (CNMP) bounding for 114 WAAS receivers.

Section 10 provides surveyed positions of all Wide-Area Reference Equipment (WRE) as well as 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 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 utilizing the GPS/WAAS position solution tool to compute a RTCA DO-229D weighted least squares user navigation solution, and WAAS horizontal and vertical protection levels (HPL and 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 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 LNAV/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 as below:

- The maximum 95% CONUS horizontal LPV error was 1.228 meters observed at Atlantic City.
- The maximum 95% CONUS vertical LPV error was 1.624 meters observed at Miami.
- The minimum 95% CONUS horizontal LPV errors was 0.634 meters observed at Salt Lake City.
- The minimum 95% CONUS vertical LPV error was 0.797 meters observed at Salt Lake City.

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 3.217 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 8.716 meters observed at Honolulu.
- The minimum 95% horizontal error was 0.871 meters observed at Barrow.
- The minimum 99.999% horizontal error was 2.358 meters observed at Bethel.

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 3.628 meters occurred at Iqaluit and maximum vertical LPV error was 5.730 meters occurred at Barrow.

Figures 2-1 through 2-3 show the daily LPV 95% horizontal accuracy at the PA evaluation sites, and Figures 2-4 through 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 Figures 2-1 through 2-6 are listed below.

- October 13, 2016—Position errors in CONUS, Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.414 meters and 2.779 meters at Iqaluit and Mexico City, respectively. The Kp index range was 6.
- October 25, 2016—Position errors in Alaska and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 1.064 meters and 1.684 meters at Iqaluit. The Kp index was 7.
- November 10-11, 2016—Position errors in CONUS, Alaska, Canada, and Mexico City were elevated. The maximum 95% horizontal and vertical LPV errors were 1.644 meters and 2.901 meters at Atlantic City and Mexico City, respectively. The Kp index was 4 and 5.
- December 8-9, 2016—Position errors in CONUS, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.583 meters and 3.318 meters at Atlantic City and Mexico City, respectively. The Kp index was 4 and 5.

Figures 2-7 and 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 October 2, 13, and 25; November 10-11 and 24-25; and December 8-9 and 23.

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 VPE versus VPL and 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 2D 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 - $(HPL/6.0)$ and vertical - $(VPL/5.33)$; (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.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40m) (Meters)	Horizontal (HAL=556m) (Meters)	Vertical (VAL=50m) (Meters)	Percentage in PA mode (%)	SPS Accuracy	
					95% Horizontal (Meters)	95% Vertical (Meters)
Arcata	1.098	1.098	1.012	100	*	*
Atlantic City	1.228	1.228	1.490	100	*	*
Grand Forks	0.969	0.969	1.252	100	*	*
Oklahoma City	0.811	0.811	1.001	100	*	*
Albuquerque	0.672	0.672	0.883	100	*	*
Anchorage	0.600	0.600	1.249	100	1.671	3.621
Atlanta	0.779	0.779	1.258	100	1.929	3.522
Barrow	0.630	0.630	1.352	99.99946	1.483	4.166
Bethel	0.587	0.587	1.029	100	1.830	3.477
Billings	0.772	0.772	0.906	100	2.072	3.297
Boston	0.878	0.878	0.898	100	*	*
Chicago	0.910	0.910	0.890	100	2.070	3.401
Cleveland	0.832	0.832	1.006	100	*	*
Cold Bay	0.627	0.627	1.127	100	*	*
Dallas	0.714	0.714	1.272	100	1.383	4.101
Denver	0.697	0.697	0.834	100	*	*
Fairbanks	0.588	0.588	1.181	100	*	*
Gander	0.837	0.837	1.057	100	1.916	3.532
Goose Bay	0.799	0.799	0.907	100	1.368	4.238
Houston	0.784	0.784	1.477	100	1.709	4.252
Iqaluit	0.943	0.943	1.234	100	*	*
Jacksonville	0.798	0.798	1.508	100	1.788	3.803
Juneau	0.620	0.620	1.077	100	1.921	3.420
Kansas City	0.677	0.677	0.971	100	*	*
Kotzebue	0.628	0.628	1.218	99.99946	1.783	4.228
Los Angeles	0.874	0.874	1.224	100	1.781	3.702
Memphis	0.761	0.761	1.109	100	1.713	3.831
Merida	0.714	0.714	1.669	100	2.076	3.442
Mexico City	0.639	0.639	2.773	100	*	*
Miami	0.908	0.908	1.624	100	*	*
Minneapolis	0.757	0.757	0.832	100	*	*
New York	0.835	0.835	0.997	100	*	*
Oakland	0.697	0.697	1.095	100	*	*
Puerto Vallarta	0.689	0.689	1.521	100	1.671	3.621
Salt Lake City	0.634	0.634	0.797	100	1.929	3.522
San Jose Del Cabo	0.903	0.903	1.707	100	1.483	4.166
Seattle	0.736	0.736	0.812	100	1.830	3.477
Washington DC	0.861	0.861	1.152	100	2.072	3.297
Winnipeg	0.732	0.732	1.013	100	*	*

* = SPS Data not processed

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

Location	95% Horizontal (meters)	99.999% Horizontal (meters)	Percentage in NPA mode (%)	Maximum Horizontal Error
Albuquerque	1.099	3.974	100	4.150
Anchorage	1.096	2.641	100	2.769
Atlanta	1.372	3.294	100	3.494
Barrow	0.871	2.582	100	3.535
Bethel	1.232	2.358	100	2.534
Billings	1.624	2.841	100	3.111
Boston	1.710	3.578	100	3.710
Cleveland	1.569	3.590	100	3.777
Cold Bay	1.258	2.405	100	2.526
Fairbanks	0.930	2.495	100	2.643
Gander	1.557	3.290	100	3.446
Honolulu	3.217	8.716	100	8.909
Houston	1.489	3.745	100	3.915
Iqaluit	1.316	3.516	100	3.605
Juneau	1.100	2.800	100	2.991
Kansas City	1.269	3.896	100	4.827
Kotzebue	0.910	2.379	100	2.772
Los Angeles	1.455	3.672	100	3.861
Merida	1.291	4.201	100	4.419
Miami	1.432	3.530	100	3.686
Minneapolis	1.524	3.104	100	3.337
Oakland	1.211	2.971	100	3.111
Salt Lake City	1.247	2.736	100	2.960
San Jose Del Cabo	1.296	4.202	100	4.465
San Juan	1.484	6.993	100	7.253
Seattle	1.359	2.627	100	2.913
Tapachula	1.799	6.253	100	6.531
Washington DC	1.684	4.266	100	4.458

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL	Vertical Maximum Ratio
Arcata	2.540	0.184	0.236	4.820	0.157	0.165
Atlantic City	2.417	0.216	0.223	4.244	0.228	0.230
Grand Forks	2.165	0.195	0.197	3.141	0.177	0.177
Oklahoma City	1.768	0.175	0.198	2.385	0.116	0.157
Albuquerque	1.603	0.169	0.182	2.463	0.136	0.142
Anchorage	1.895	0.126	0.135	4.838	0.252	0.252
Atlanta	1.614	0.165	0.175	2.501	0.150	0.165
Barrow	2.785	0.180	0.180	5.730	0.161	0.211
Bethel	1.910	0.125	0.135	2.545	0.120	0.122
Billings	1.879	0.146	0.176	2.625	0.128	0.160
Boston	1.637	0.148	0.148	2.519	0.123	0.135
Chicago	1.773	0.150	0.186	2.572	0.227	0.227
Cleveland	1.766	0.166	0.179	2.810	0.141	0.157
Cold Bay	1.753	0.075	0.098	2.656	0.102	0.116
Dallas	1.439	0.162	0.173	2.670	0.160	0.204
Denver	1.461	0.133	0.158	2.407	0.123	0.134
Fairbanks	2.449	0.137	0.208	4.296	0.213	0.213
Gander	2.085	0.107	0.116	2.780	0.102	0.120
Goose Bay	2.100	0.140	0.143	3.385	0.140	0.140
Houston	1.754	0.181	0.192	3.254	0.223	0.223
Iqaluit	3.268	0.149	0.190	5.095	0.224	0.224
Jacksonville	1.601	0.138	0.164	2.885	0.168	0.196
Juneau	1.931	0.131	0.142	3.759	0.210	0.210
Kansas City	1.618	0.172	0.172	2.572	0.136	0.167
Kotzebue	2.239	0.165	0.177	4.617	0.189	0.214
Los Angeles	1.941	0.174	0.174	2.699	0.132	0.142
Memphis	1.824	0.193	0.197	2.502	0.123	0.178
Merida	1.662	0.073	0.141	4.353	0.107	0.169
Mexico City	1.577	0.053	0.111	4.222	0.101	0.185
Miami	2.067	0.053	0.169	4.011	0.112	0.172
Minneapolis	1.599	0.119	0.171	2.265	0.150	0.150
New York	2.772	0.174	0.174	5.627	0.118	0.137
Oakland	1.799	0.131	0.133	2.448	0.063	0.130
Puerto Vallarta	1.716	0.060	0.096	3.185	0.118	0.127
Salt Lake City	1.442	0.115	0.148	2.315	0.102	0.127
San Jose Del Cabo	1.905	0.138	0.148	3.487	0.139	0.154
Seattle	1.906	0.181	0.181	2.338	0.106	0.130
Washington DC	1.832	0.162	0.188	2.375	0.119	0.169
Winnipeg	1.527	0.110	0.140	2.969	0.193	0.193

Figure 2-1 LPV 95% Horizontal Accuracy

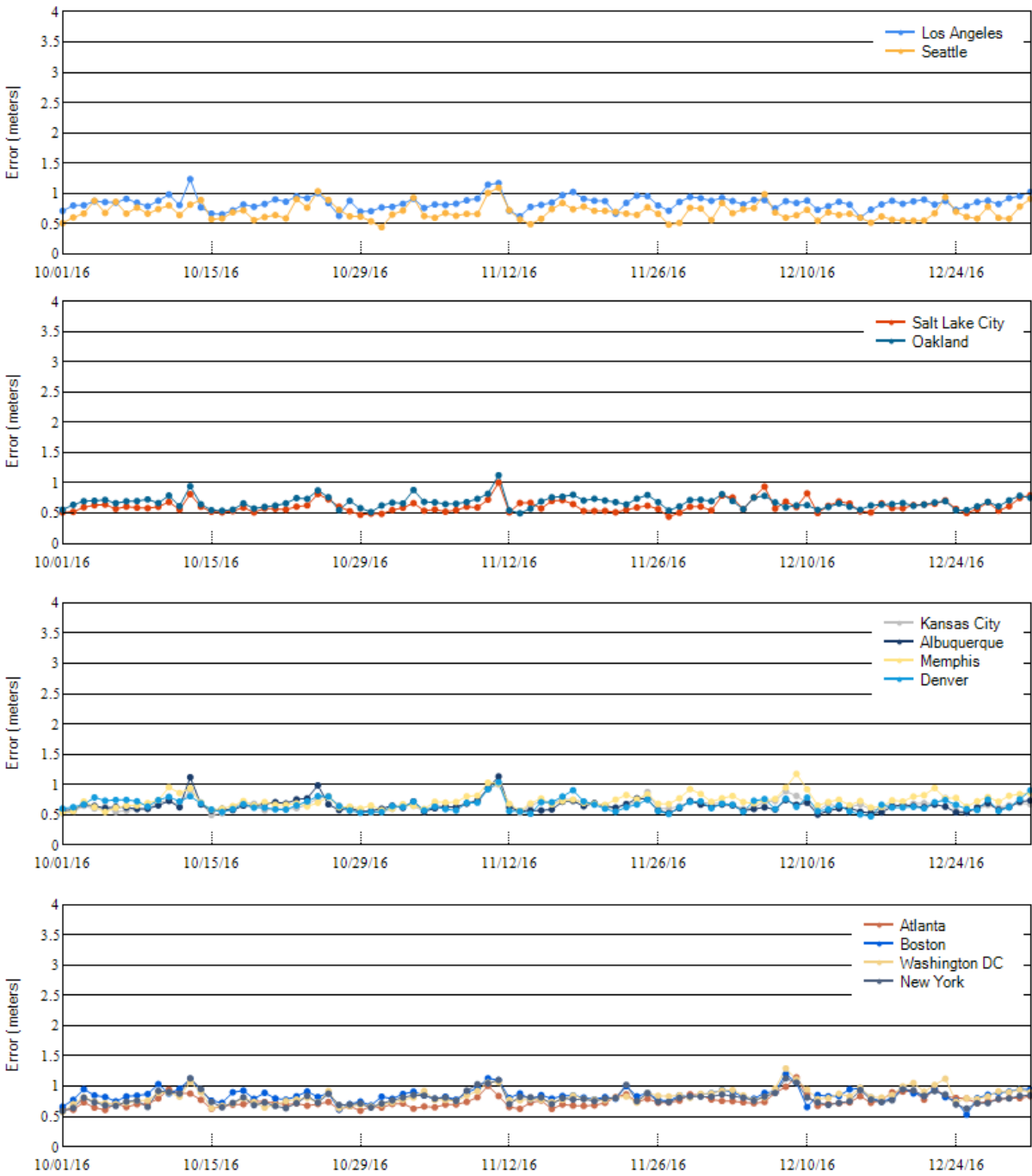


Figure 2-2 LPV 95% Horizontal Accuracy

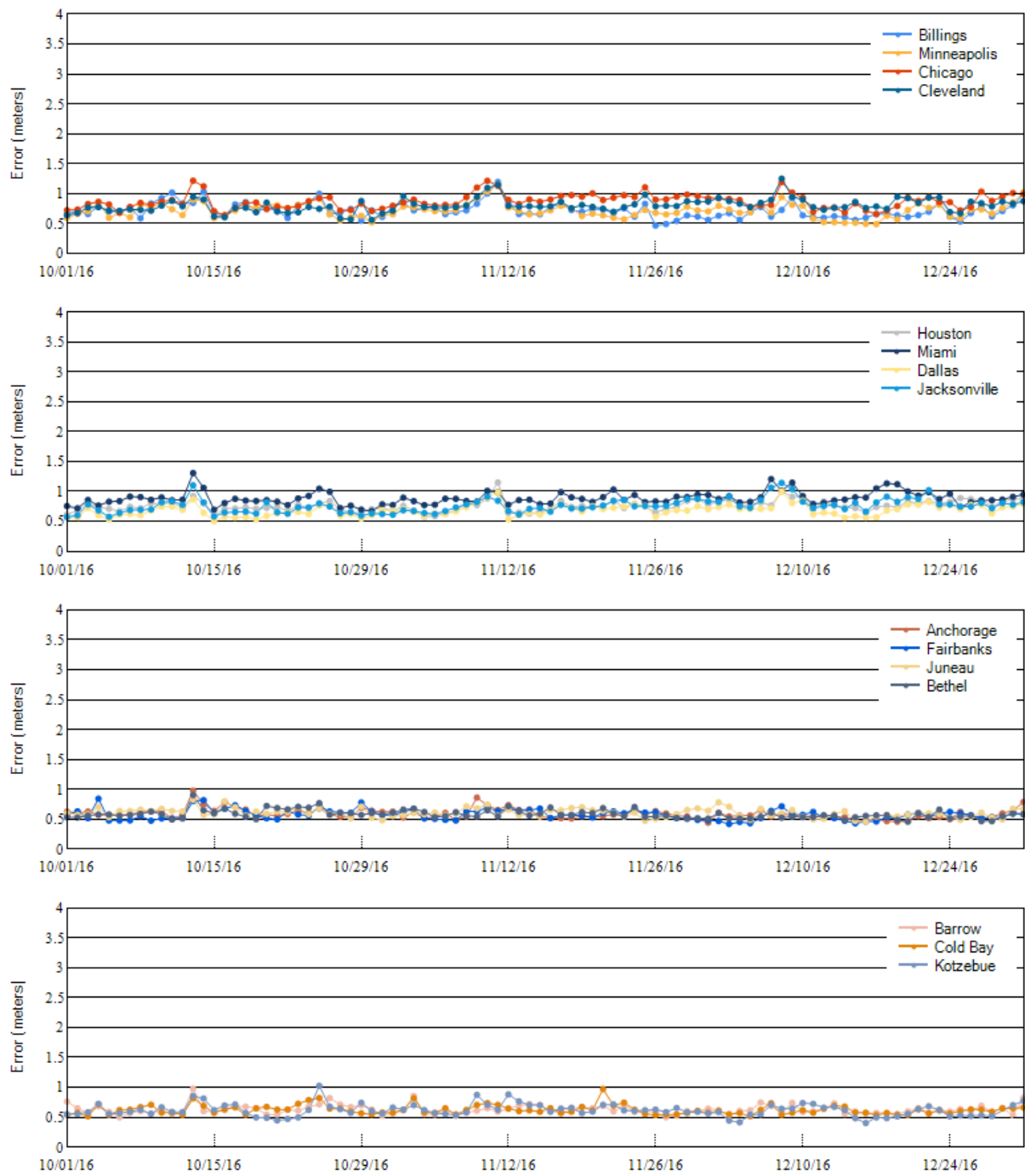


Figure 2-3 LPV 95% Horizontal Accuracy

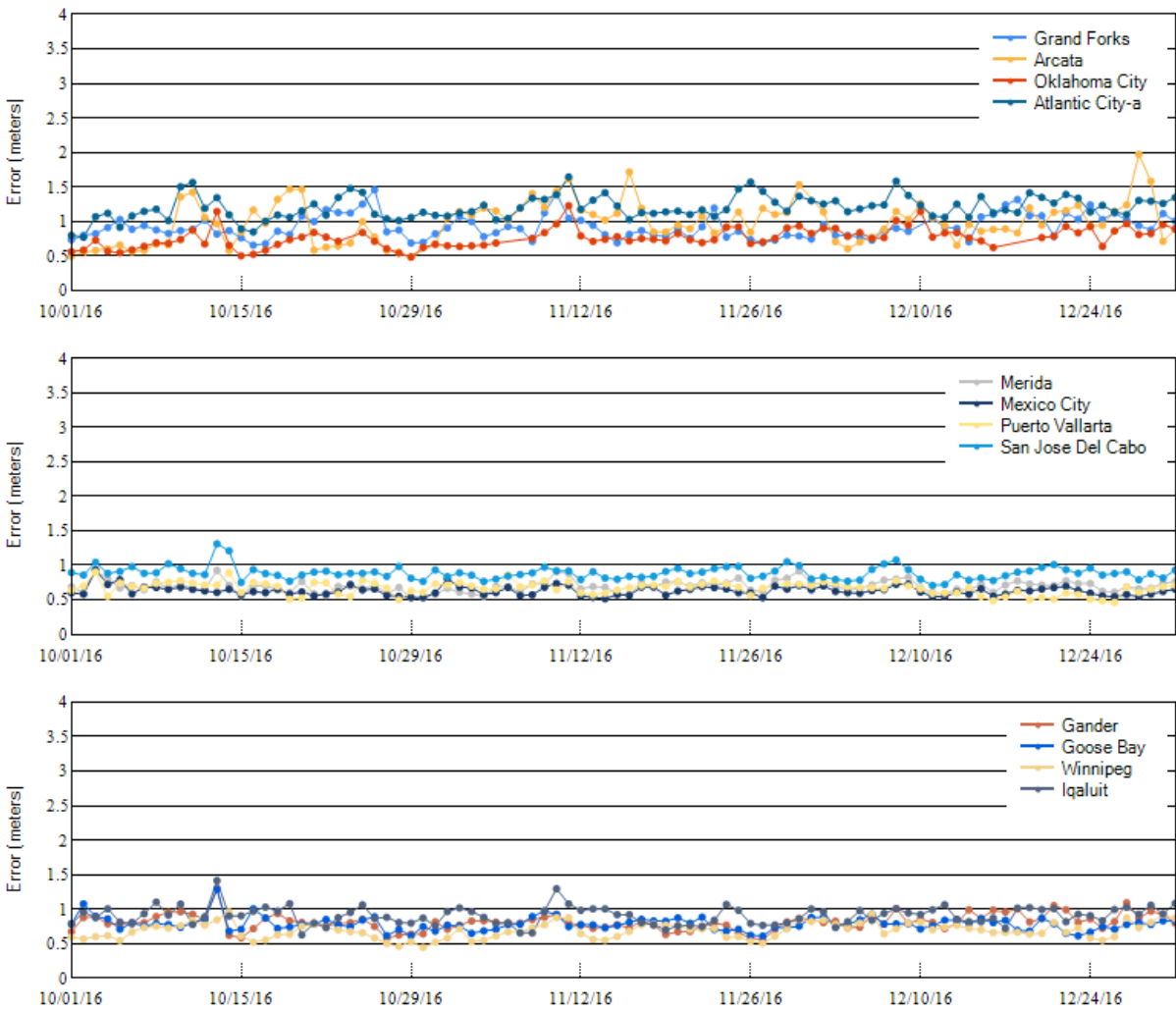


Figure 2-4 LPV 95% Vertical Accuracy

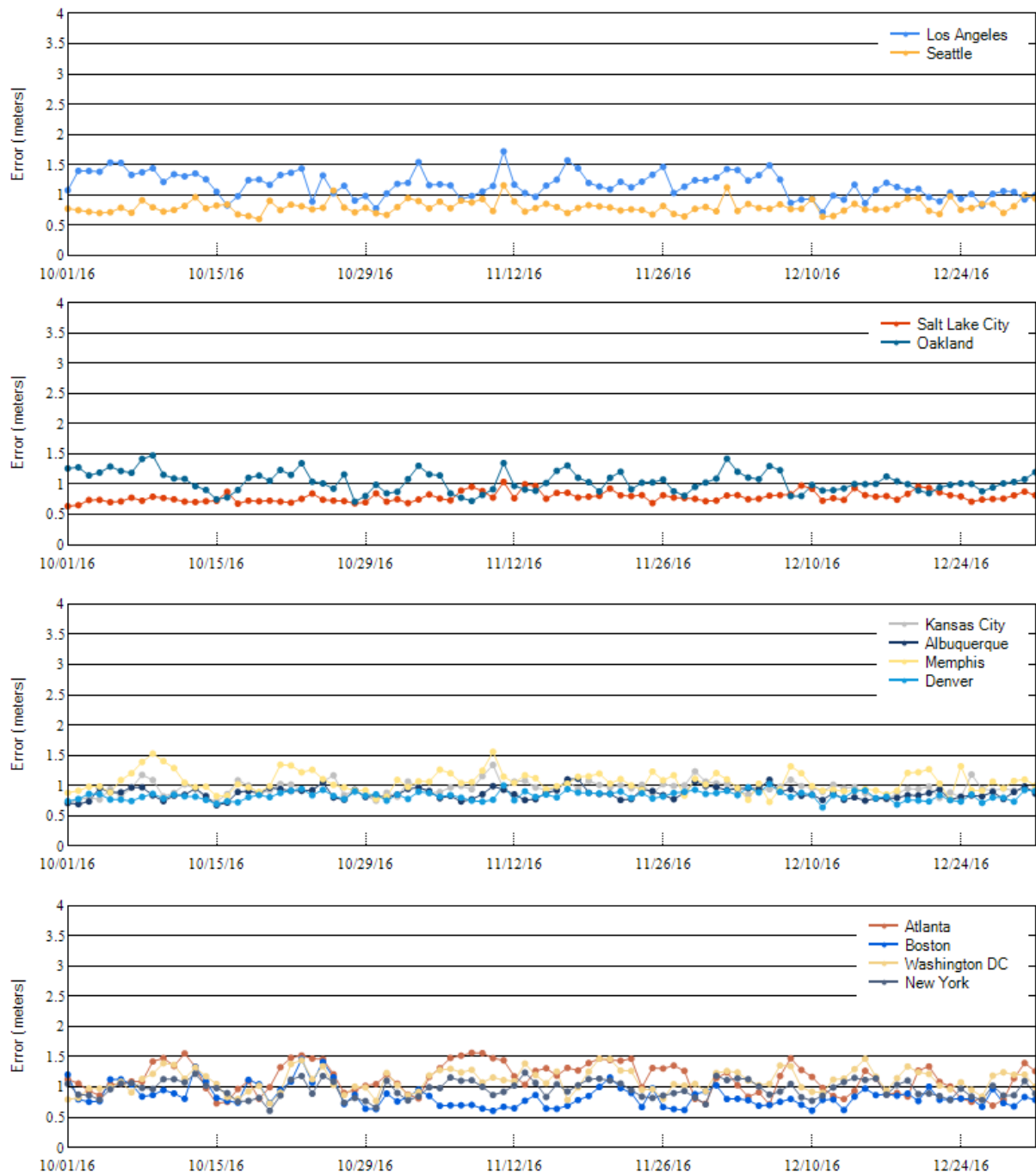


Figure 2-5 LPV 95% Vertical Accuracy

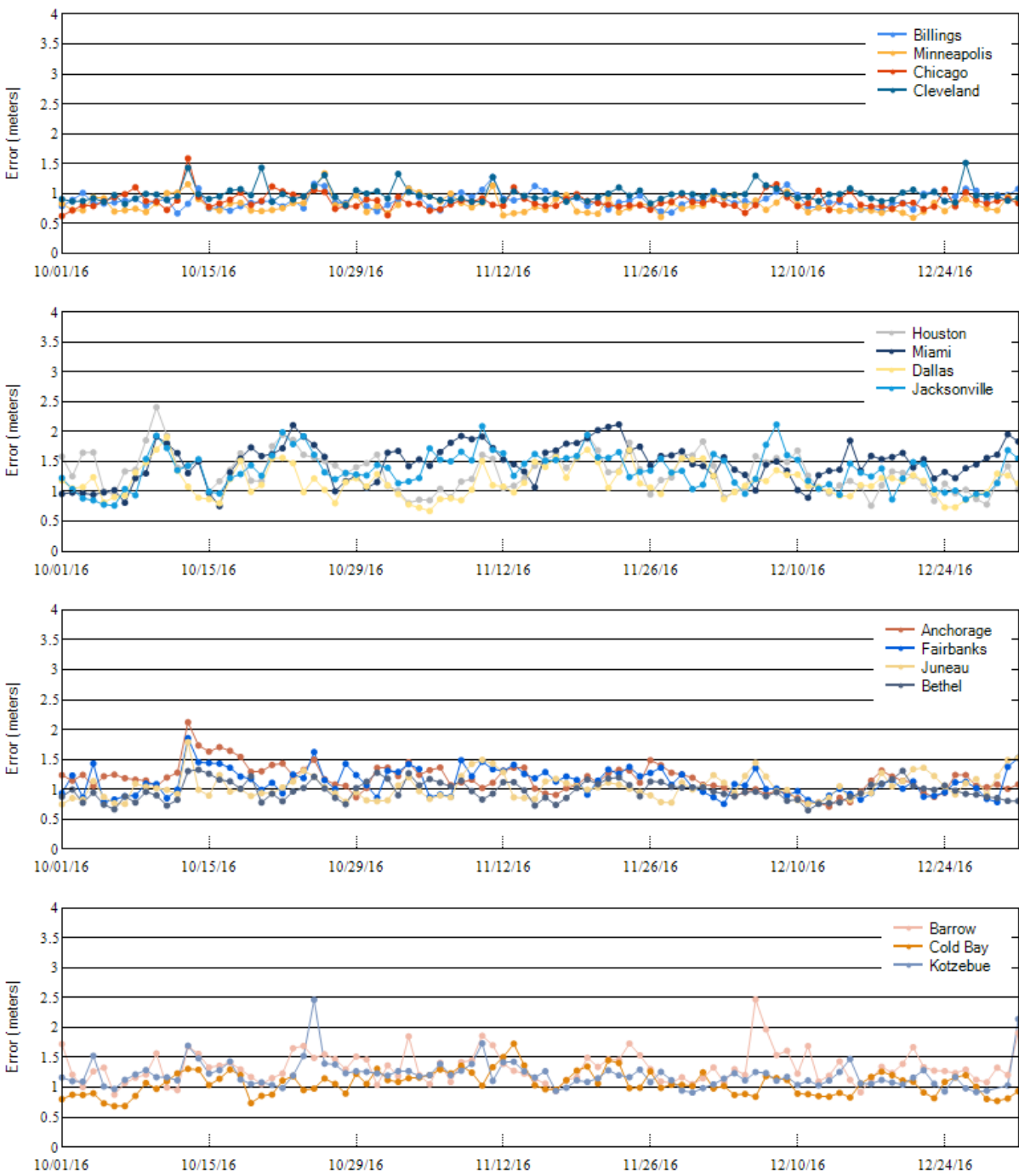


Figure 2-6 LPV 95% Vertical Accuracy

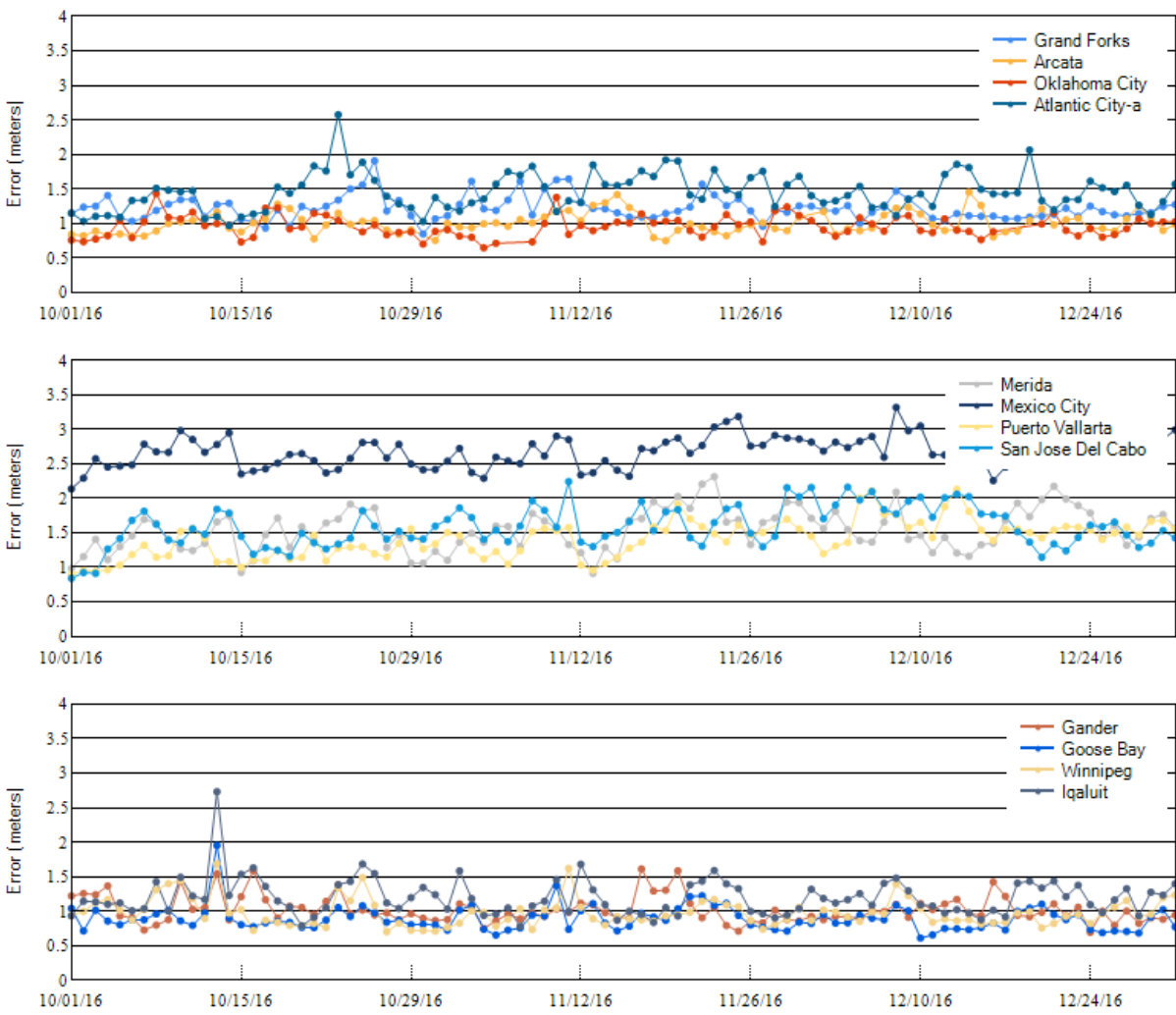


Figure 2-7 NPA 95% Horizontal Accuracy

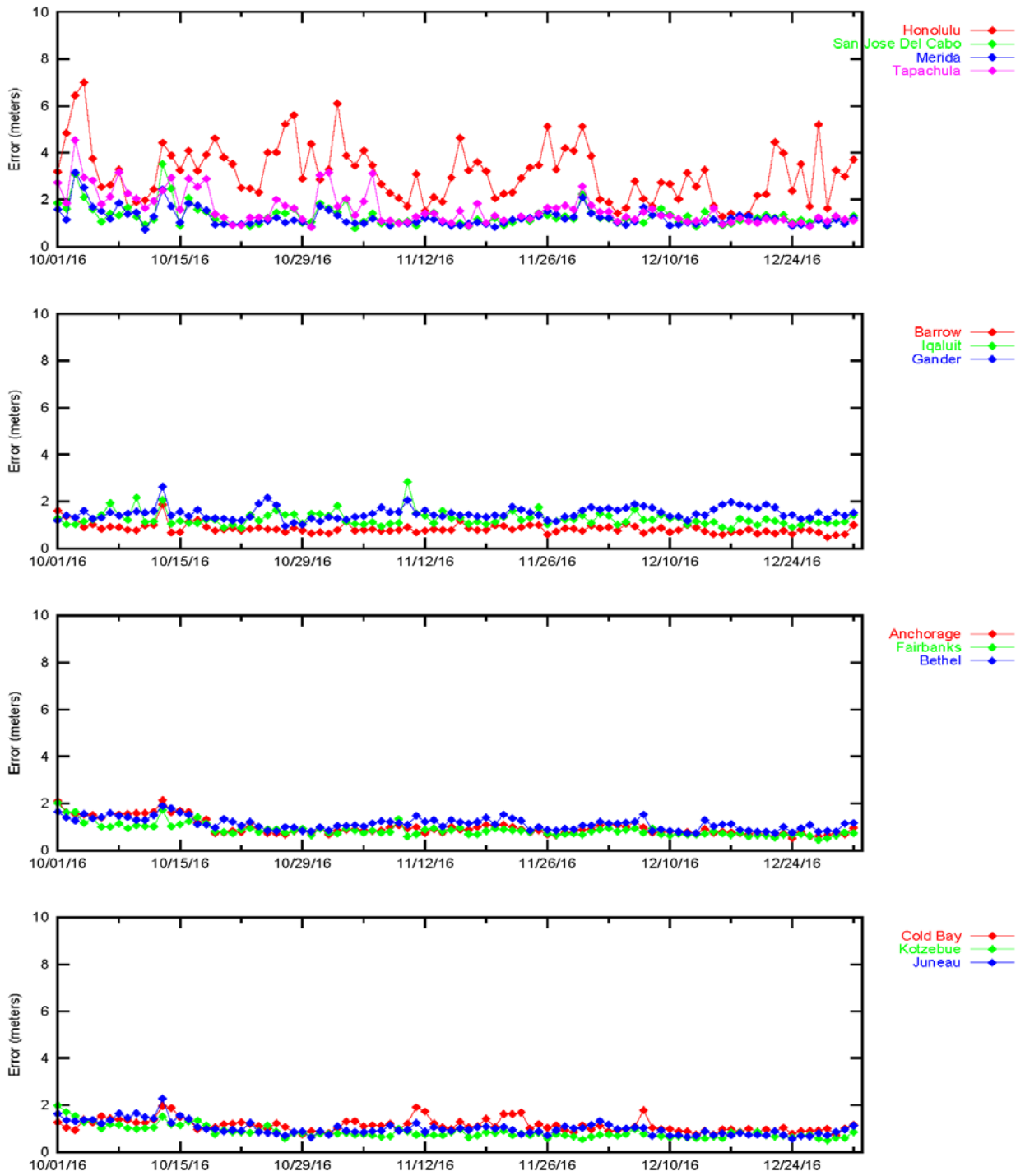


Figure 2-8 NPA 95% Horizontal Accuracy

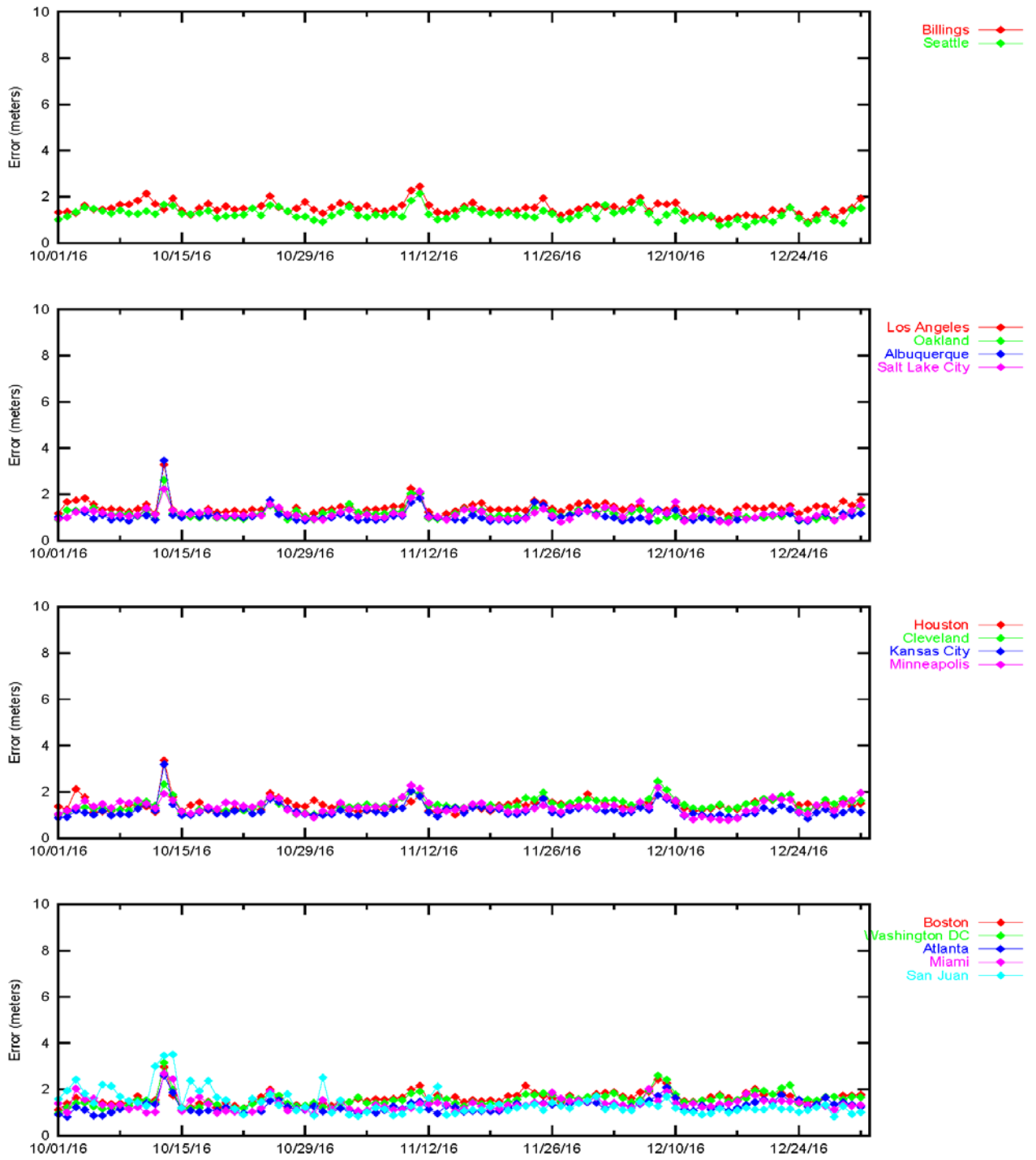


Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

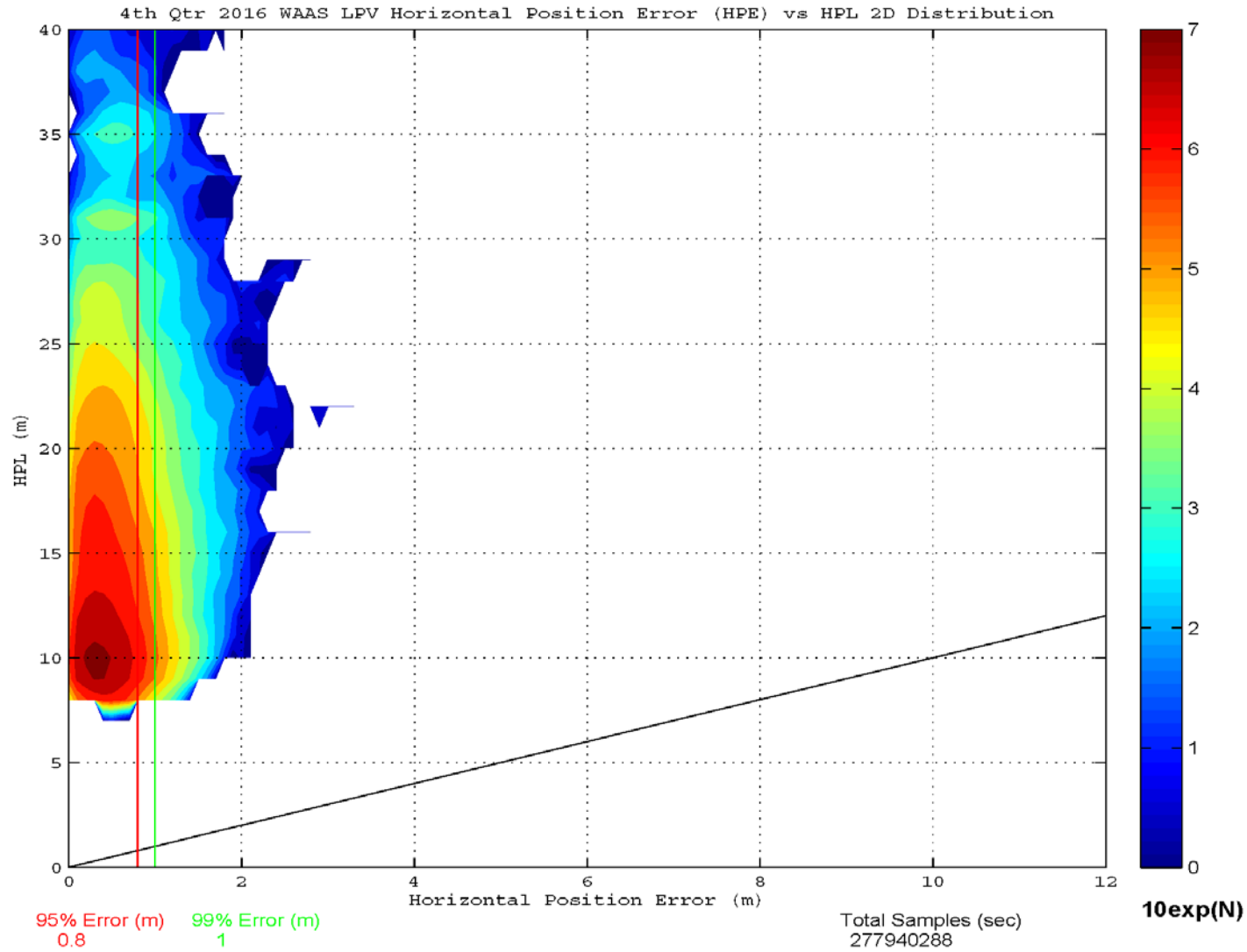


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

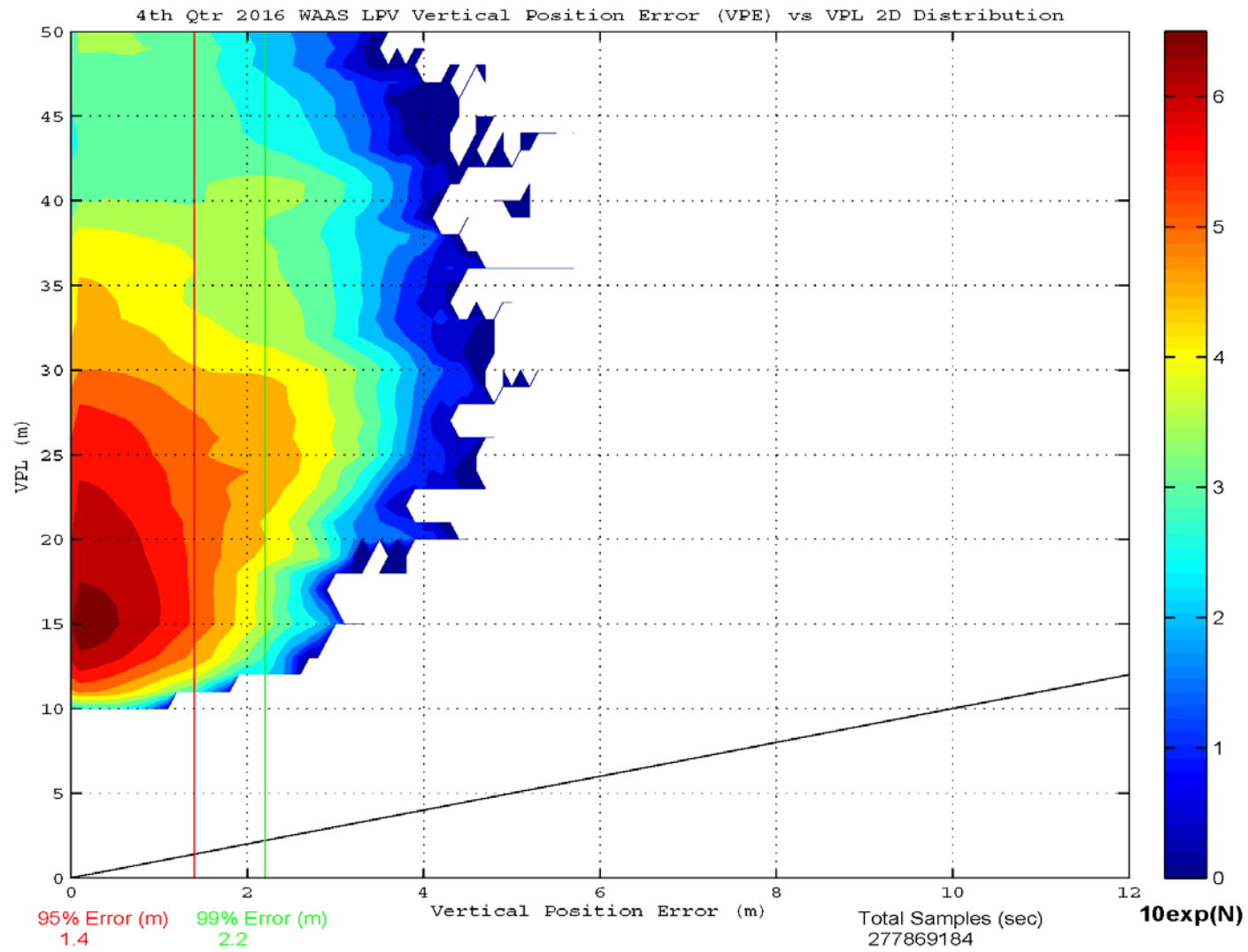


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

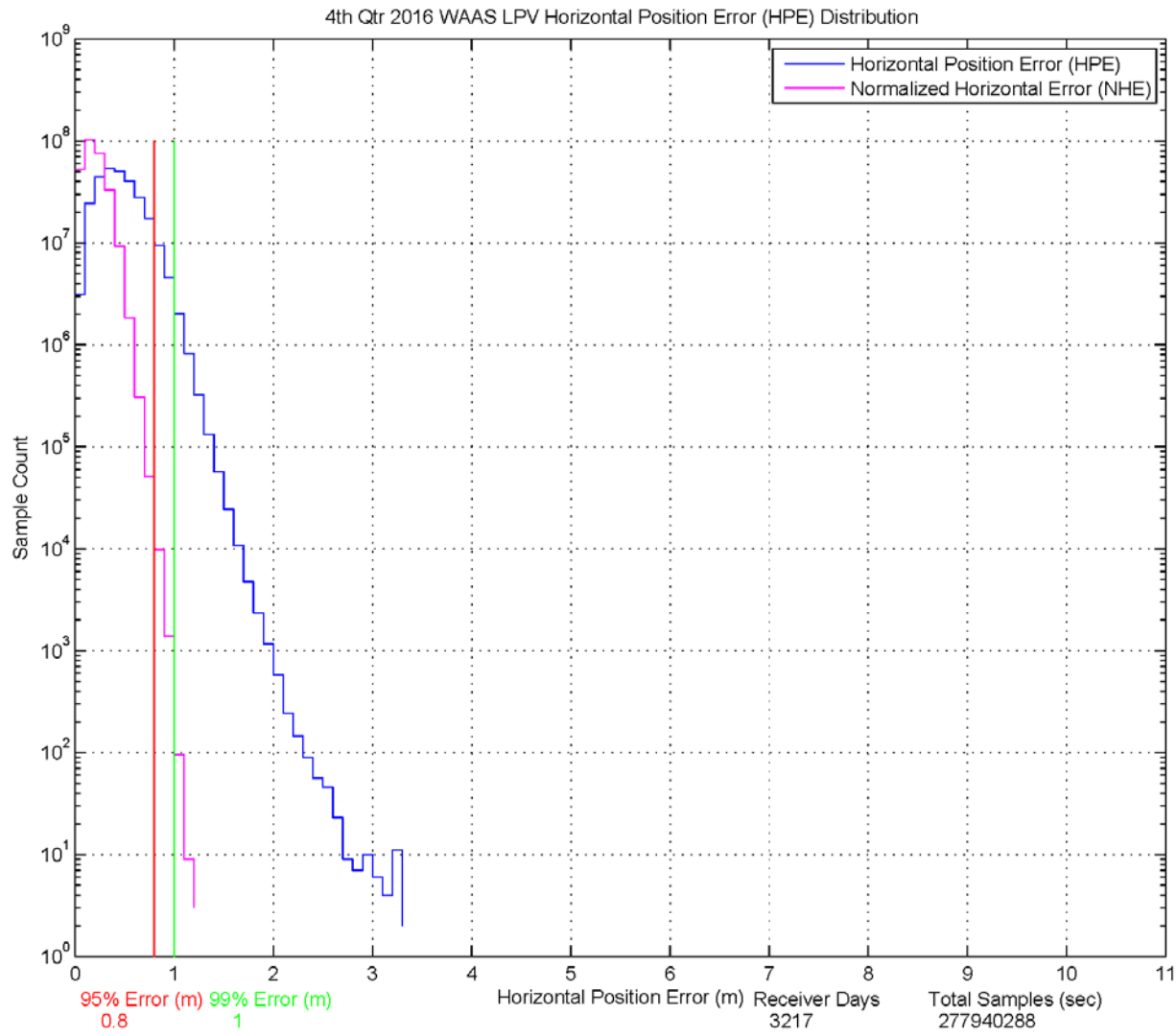
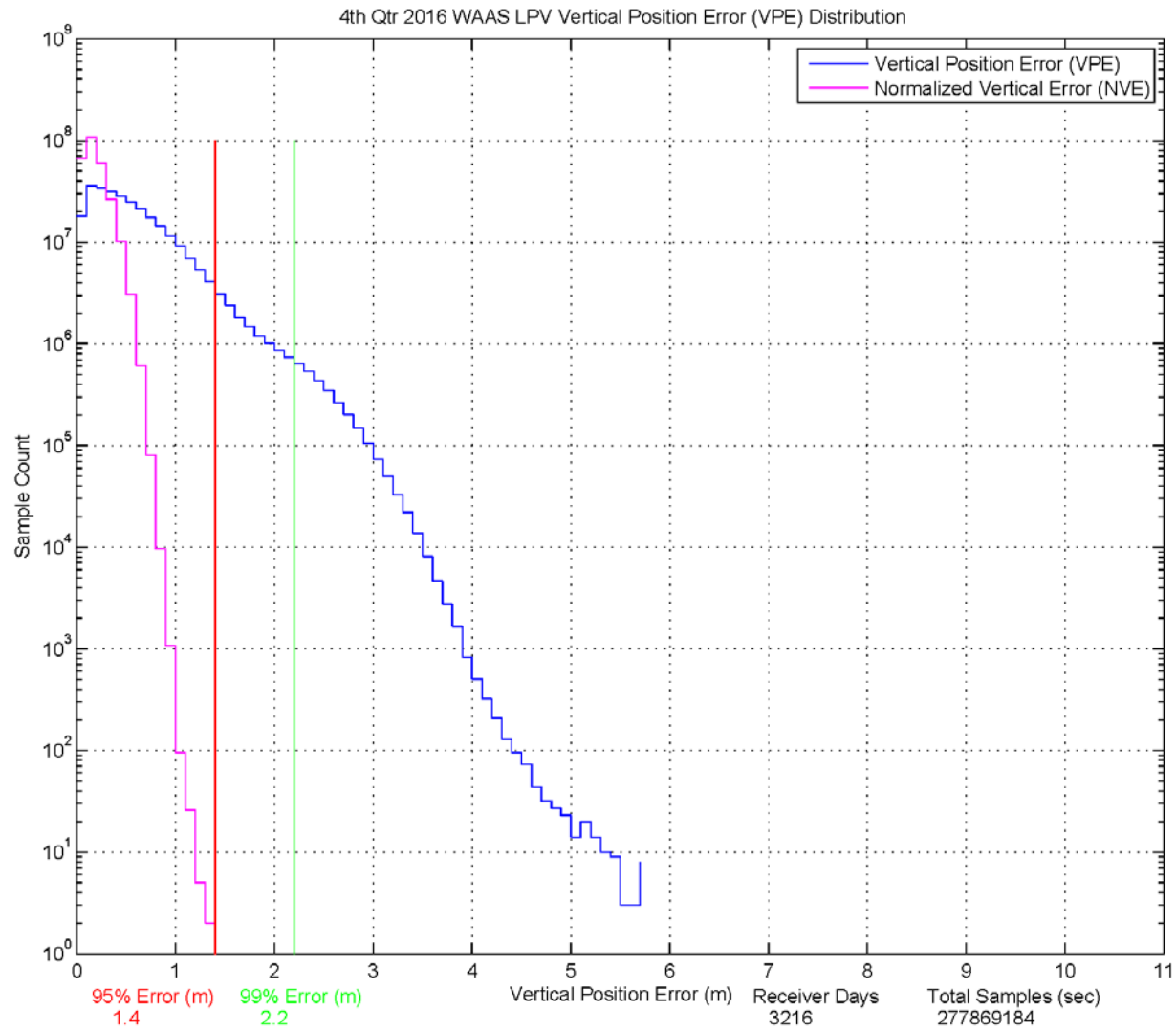


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



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). The maximum and minimum VPL and HPL for this reporting period are listed as below:

- The maximum 99% CONUS HPL was 15.866 meters observed at Arcata
- The maximum 99% CONUS VPL was 31.779 meters observed at Oakland
- The minimum 99% CONUS HPL was 10.82 meters observed at Denver
- The minimum 99% CONUS VPL was 18.924 meters observed at Kansas City
- The maximum 99% Alaska HPL was 20.228 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 34.234 meters observed at Barrow
- The minimum 99% Alaska HPL was 13.155 meters observed at Juneau
- The minimum 99% Alaska VPL was 22.393 meters observed at Juneau

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 3-4 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.

Availability of NPA service is evaluated by monitoring the WAAS HPL at receiver locations. Service is available when the HPL is less than HAL of 556 meters. The service is unavailable when HPL exceeds the HAL or when 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 3-3 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.

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 listed below.

- October 7 – Local RFI at Boston caused a reduction and eventual loss of space vehicle (SV) tracking. The outage occurred from 17:32 GMT to 17:33 GMT
- October 12 – Local RFI at Miami caused a reduction and eventual loss of SV tracking. The outage occurred from 16:13 GMT to 16:14 GMT
- October 13 – Geomagnetic activity caused elevated GIVE values, which reduced LPV200 availability in Alaska and Canada.
- October 17 – A GUS Switchover on CRE caused a reduction in LPV200 availability in Canada.
- October 19 – Local RFI at Miami caused a reduction and eventual loss of SV tracking. The outage occurred from 15:32 GMT to 15:33 GMT

- October 20 – Local RFI at Miami caused a reduction and eventual loss of SV tracking. The outage occurred from 14:31 GMT to 14:32 GMT
- October 27 – Several IGP's were set to Not-Monitored from 15:50 GMT to 16:34 GMT and from 17:45 GMT to 17:50 GMT. At that time, Iqaluit experienced a sub-frame reasonability warning which removed it from WAAS correction Processing. This caused a reduction in LPV200 availability in Canada.
- November 9 – A GUS Switchover on CRW caused a reduction in LPV200 availability in Alaska and Canada
- November 10 – A missed maneuver caused an alert to Not-Monitored and raised UDRE on PRN 135 causing a reduction in LPV200 availability in CONUS
- November 22 – Local RFI at Miami caused a reduction and eventual loss of SV tracking. The outage occurred from 18:18 GMT to 18:20 GMT
- November 22 – Local RFI at Boston caused a reduction and eventual loss of SV tracking. The outage occurred from 18:58 GMT to 18:59 GMT
- November 26 – A GUS Switchover on CRW caused a reduction in LPV and LPV200 availability in Alaska
- November 30 – Local RFI at Miami caused a reduction and eventual loss of SV tracking. The outage occurred from 19:01 GMT to 19:02 GMT
- December 3 – Local RFI at New York caused a reduction and eventual loss of SV tracking. The outage occurred from 12:42 GMT to 12:47 GMT
- December 9 – Local RFI at New York caused a reduction and eventual loss of SV tracking. The outage occurred from 02:54 GMT to 02:56 GMT
- December 12-14 – Satellite Maintenance caused elevated UDREs on PRN-11 and reduced LPV200 availability in Alaska and Canada on December 13th

Table 3-1 99% Protection Level

Location	99% HPL (meters)	99% VPL (meters)	Percentage in PA mode
Arcata	15.866	30.622	100
Atlantic City	15.614	23.303	100
Grand Forks	13.798	21.932	100
Oklahoma City	11.011	19.436	100
Albuquerque	10.909	19.624	100
Anchorage	13.636	22.926	100
Atlanta	12.684	21.157	100
Barrow	16.172	34.234	99.99946
Bethel	15.393	26.837	100
Billings	12.187	19.224	100
Boston	14.018	20.545	100
Chicago	11.809	20.115	100
Cleveland	15.397	22.686	100
Cold Bay	20.228	29.531	100
Dallas	11.071	19.502	100
Denver	10.820	20.088	100
Fairbanks	13.359	24.220	100
Gander	24.874	35.434	100
Goose Bay	20.999	25.945	100
Houston	11.251	20.991	100
Iqaluit	29.146	37.466	100
Jacksonville	12.473	24.104	100
Juneau	13.155	22.393	100
Kansas City	10.980	18.924	100
Kotzebue	15.441	30.341	99.99946
Los Angeles	14.365	26.624	100
Memphis	11.865	20.007	100
Merida	19.604	36.356	100
Mexico City	23.775	40.761	100
Miami	13.302	26.737	100
Minneapolis	12.533	20.156	100
New York	13.445	20.914	100
Oakland	14.816	31.779	100
Puerto Vallarta	23.320	49.543	100
Salt Lake City	11.712	20.594	100
San Jose Del Cabo	22.208	45.482	100
Seattle	13.614	22.335	100
Washington DC	14.454	22.717	100
Winnipeg	13.711	20.809	100

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	99.92
Atlantic City	100	100	100
Grand Forks	100	100	100
Oklahoma City	100	100	100
Albuquerque	100	100	100
Anchorage	100	100	100
Atlanta	100	100	100
Barrow	100	99.99	99.02
Bethel	100	100	100
Billings	100	100	100
Boston	100	100	100
Chicago	100	100	100
Cleveland	100	100	100
Cold Bay	100	100	100
Dallas	100	100	100
Denver	100	100	100
Fairbanks	100	100	99.99
Gander	100	100	98.62
Goose Bay	100	100	100
Houston	100	100	100
Iqaluit	99.97	99.96	95.98
Jacksonville	100	100	100
Juneau	100	100	100
Kansas City	100	100	100
Kotzebue	100	100	99.89
Los Angeles	100	100	100
Memphis	100	100	100
Merida	100	100	98.15
Mexico City	100	99.95	94.73
Miami	100	100	99.97
Minneapolis	100	100	100
New York	100	100	99.99
Oakland	100	100	99.38
Puerto Vallarta	100	98.78	93.15
Salt Lake City	100	100	100
San Jose Del Cabo	100	99.83	94.68
Seattle	100	100	100
Washington DC	100	100	100
Winnipeg	100	100	100

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

Location	NPA Availability (Excluding RAIM/FDE)
Albuquerque	1
Anchorage	1
Atlanta	1
Barrow	1
Bethel	1
Billings	1
Boston	1
Cleveland	1
Cold Bay	1
Fairbanks	1
Gander	1
Honolulu	1
Houston	1
Iqaluit	1
Juneau	1
Kansas City	1
Kotzebue	1
Los Angeles	1
Merida	1
Miami	1
Minneapolis	1
Oakland	1
Salt Lake City	1
San Jose Del Cabo	1
San Juan	1
Seattle	1
Tapachula	1
Washington DC	1

Table 3-4 LPV and LPV200 Outage Rate (Per 150 sec approach)

Location	LP Outages	LP Outage Rates	LPV Outages	LPV Outage Rates	LPV200 Outages	LPV200 Outage Rates
Arcata	0	0	0	0	33	0.000639
Atlantic City	0	0	0	0	0	0
Grand Forks	0	0	0	0	0	0
Oklahoma City	0	0	0	0	0	0
Albuquerque	0	0	0	0	0	0
Anchorage	0	0	0	0	0	0
Atlanta	0	0	0	0	0	0
Barrow	2	0.000038	6	0.000113	138	0.002631
Bethel	0	0	0	0	0	0
Billings	0	0	0	0	0	0
Boston	1	0.000019	1	0.000019	2	0.000038
Chicago	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0
Cold Bay	0	0	0	0	2	0.000038
Dallas	0	0	0	0	0	0
Denver	0	0	0	0	0	0
Fairbanks	0	0	1	0.000019	7	0.000132
Gander	0	0	0	0	185	0.003541
Goose Bay	0	0	0	0	1	0.000019
Houston	0	0	0	0	0	0
Iqaluit	7	0.000132	12	0.000227	318	0.006254
Jacksonville	0	0	0	0	0	0
Juneau	0	0	0	0	0	0
Kansas City	0	0	0	0	0	0
Kotzebue	2	0.000038	4	0.000076	23	0.000436
Los Angeles	0	0	0	0	1	0.000019
Memphis	0	0	0	0	0	0
Merida	0	0	0	0	248	0.004771
Mexico City	0	0	22	0.000416	359	0.007155
Miami	2	0.000038	3	0.000057	10	0.000189
Minneapolis	0	0	0	0	0	0
New York	2	0.000038	2	0.000038	4	0.000076
Oakland	0	0	0	0	92	0.001748
Puerto Vallarta	0	0	100	0.001912	432	0.008758
Salt Lake City	0	0	0	0	0	0
San Jose Del Cabo	0	0	66	0.001248	332	0.00662
Seattle	0	0	0	0	0	0
Washington DC	0	0	0	0	0	0
Winnipeg	0	0	0	0	0	0

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

Location	NPA Outages	NPA Outage Rates
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	0	0
Bethel	0	0
Billings	0	0
Boston	0	0
Cleveland	0	0
Cold Bay	0	0
Fairbanks	0	0
Gander	0	0
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0
Kotzebue	0	0
Los Angeles	0	0
Merida	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

Figure 3-1 LPV Instantaneous Availability

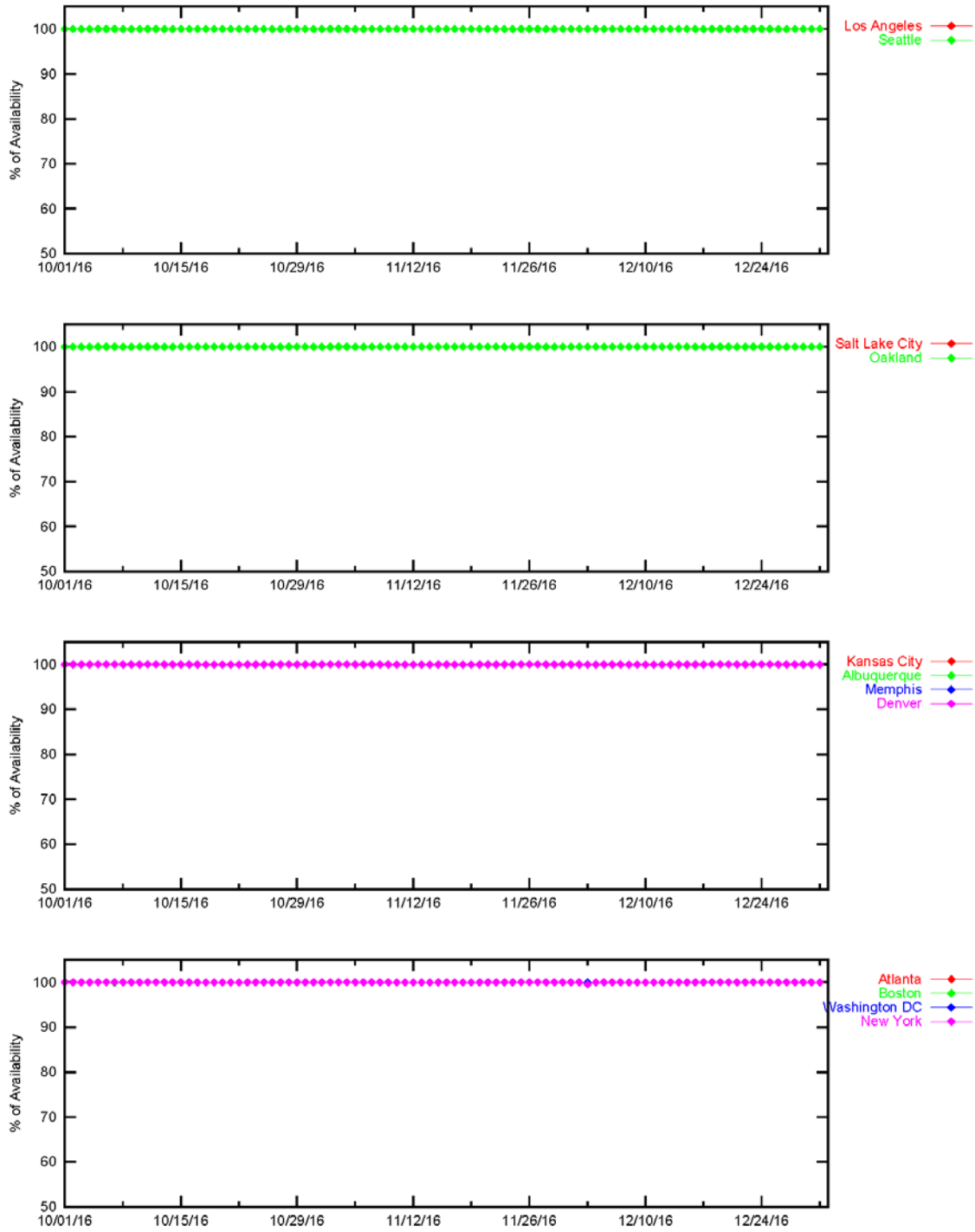


Figure 3-2 LPV Instantaneous Availability

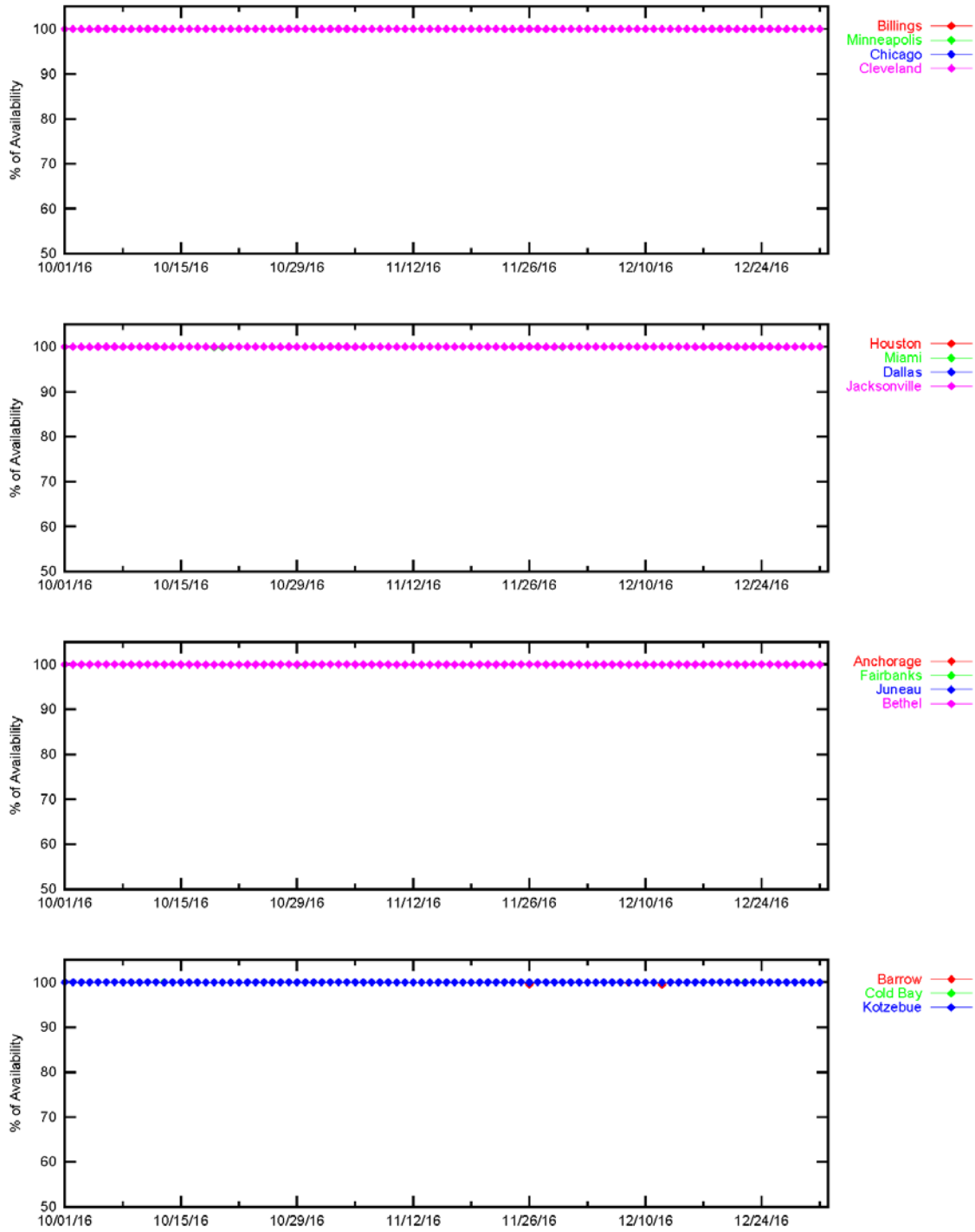


Figure 3-3 LPV Instantaneous Availability

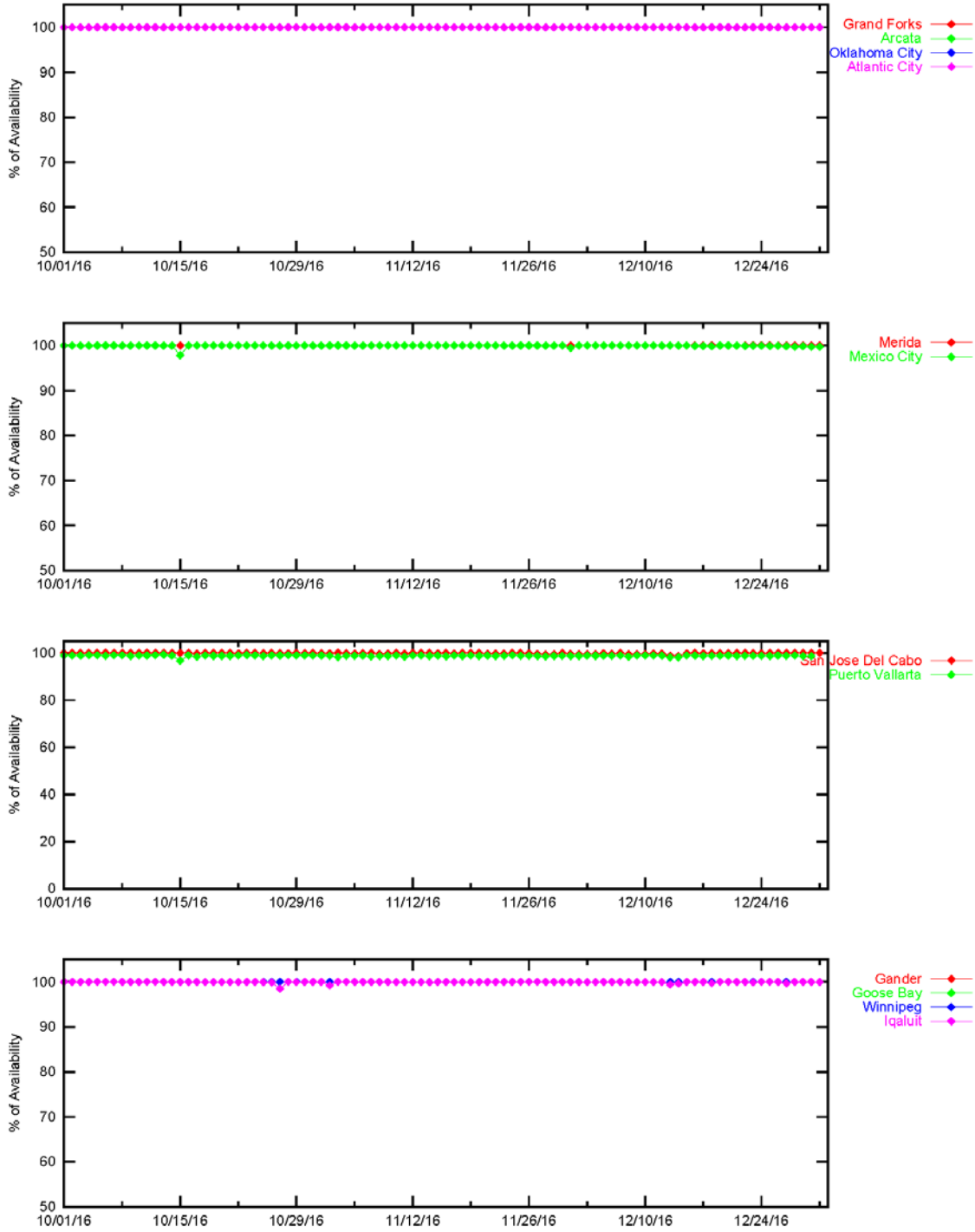


Figure 3-4 LPV200 Instantaneous Availability

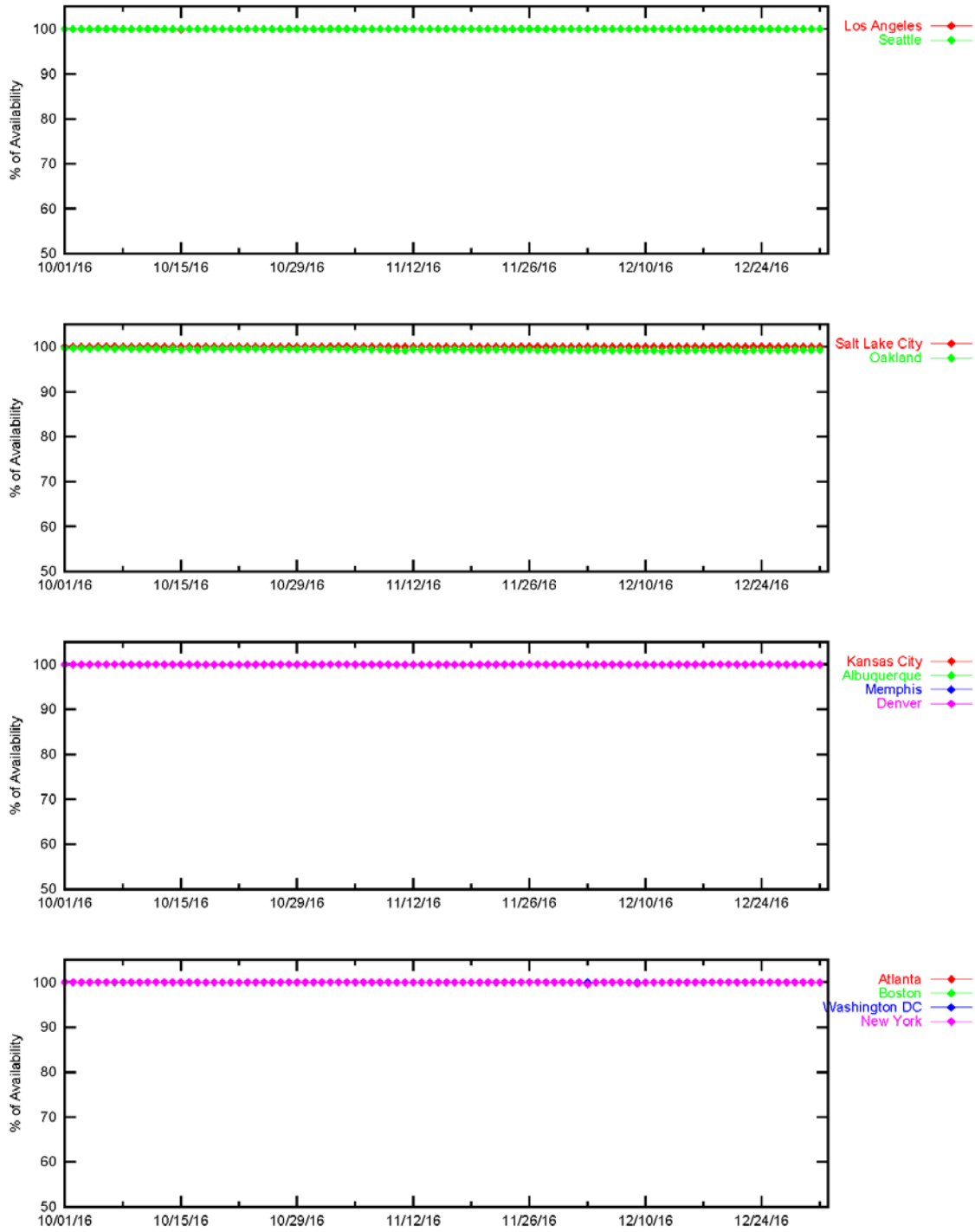


Figure 3-5 LPV200 Instantaneous Availability

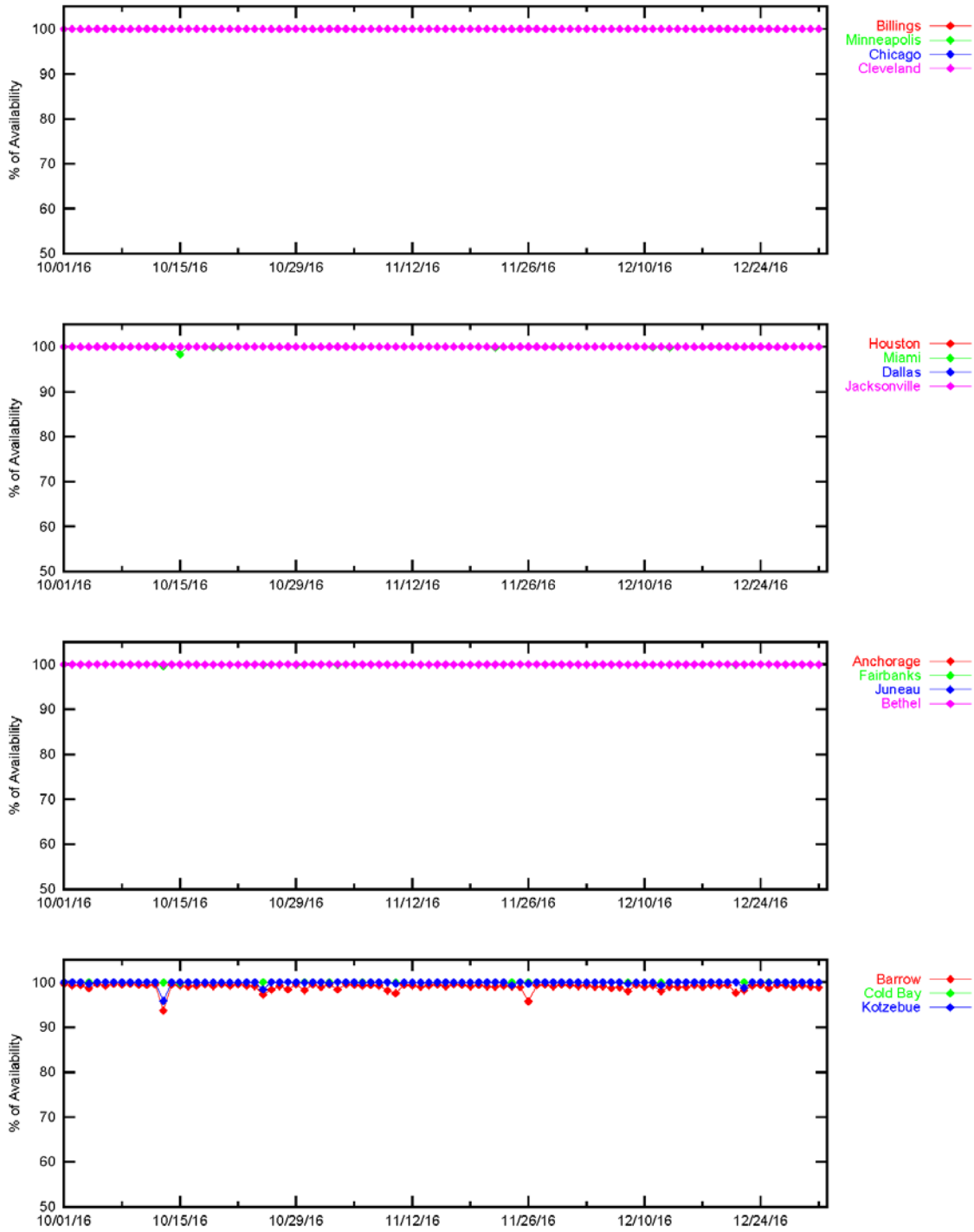


Figure 3-6 LPV200 Instantaneous Availability

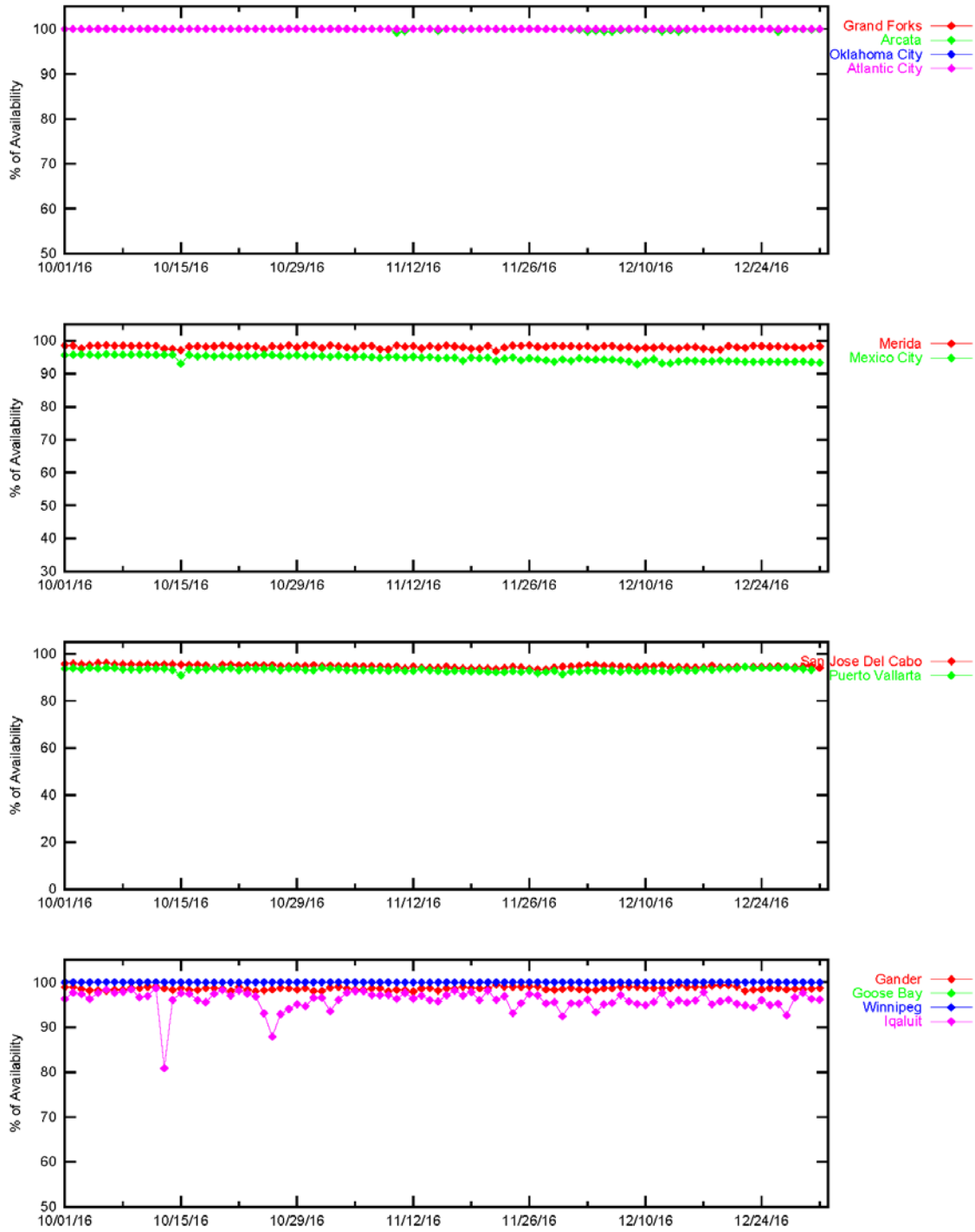


Figure 3-7 LPV Outages

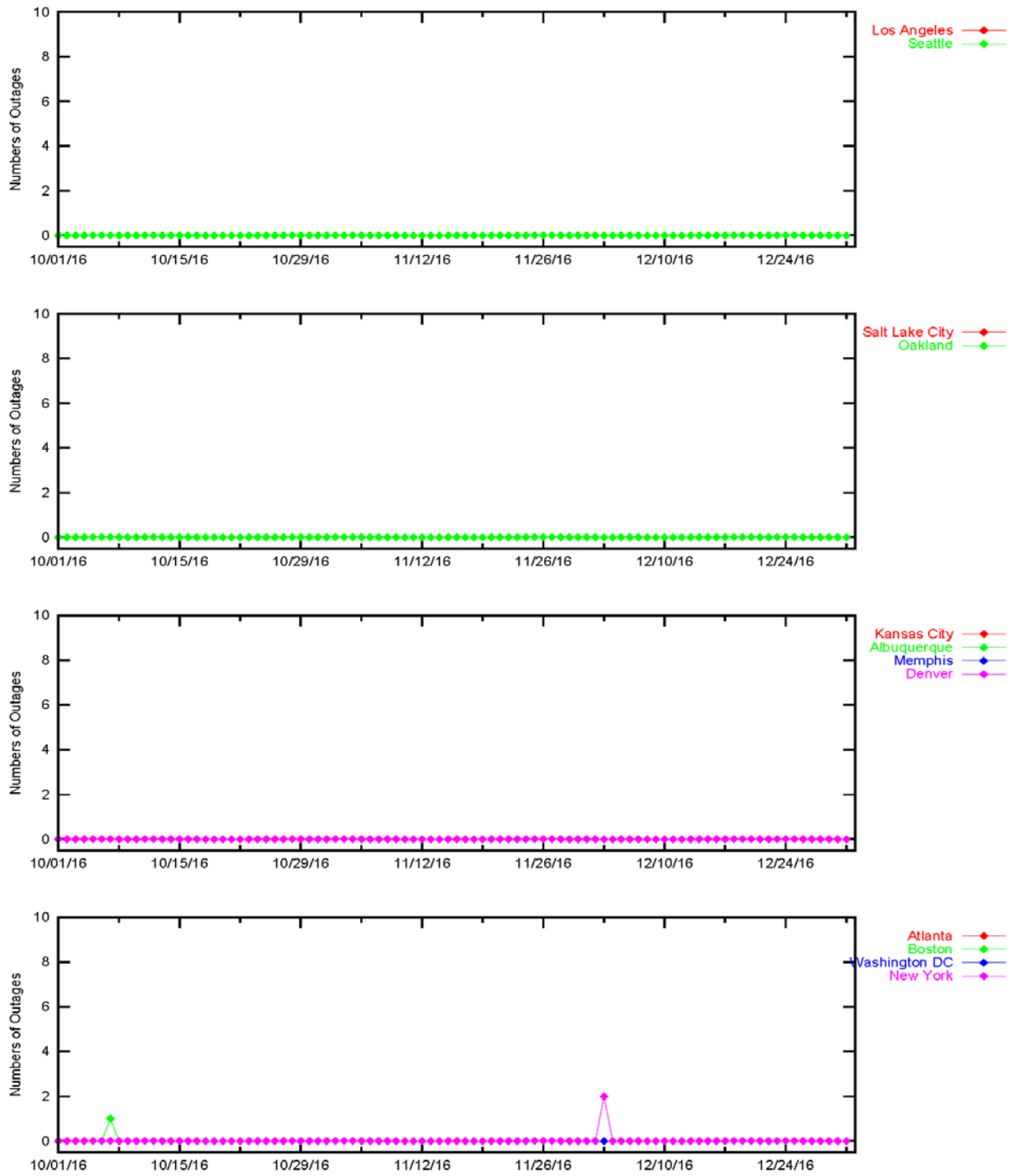


Figure 3-8 LPV Outages

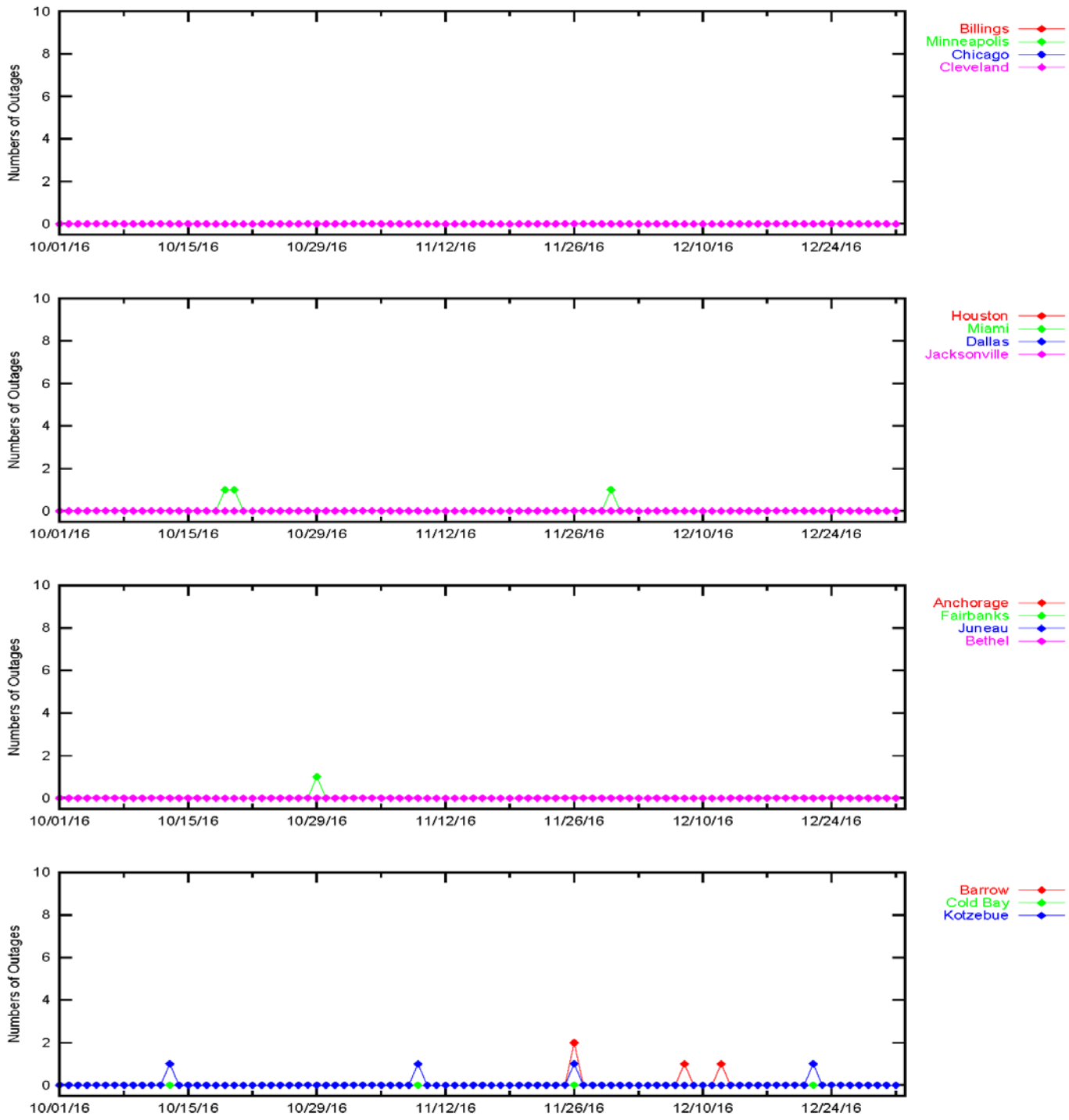


Figure 3-9 LPV Outages

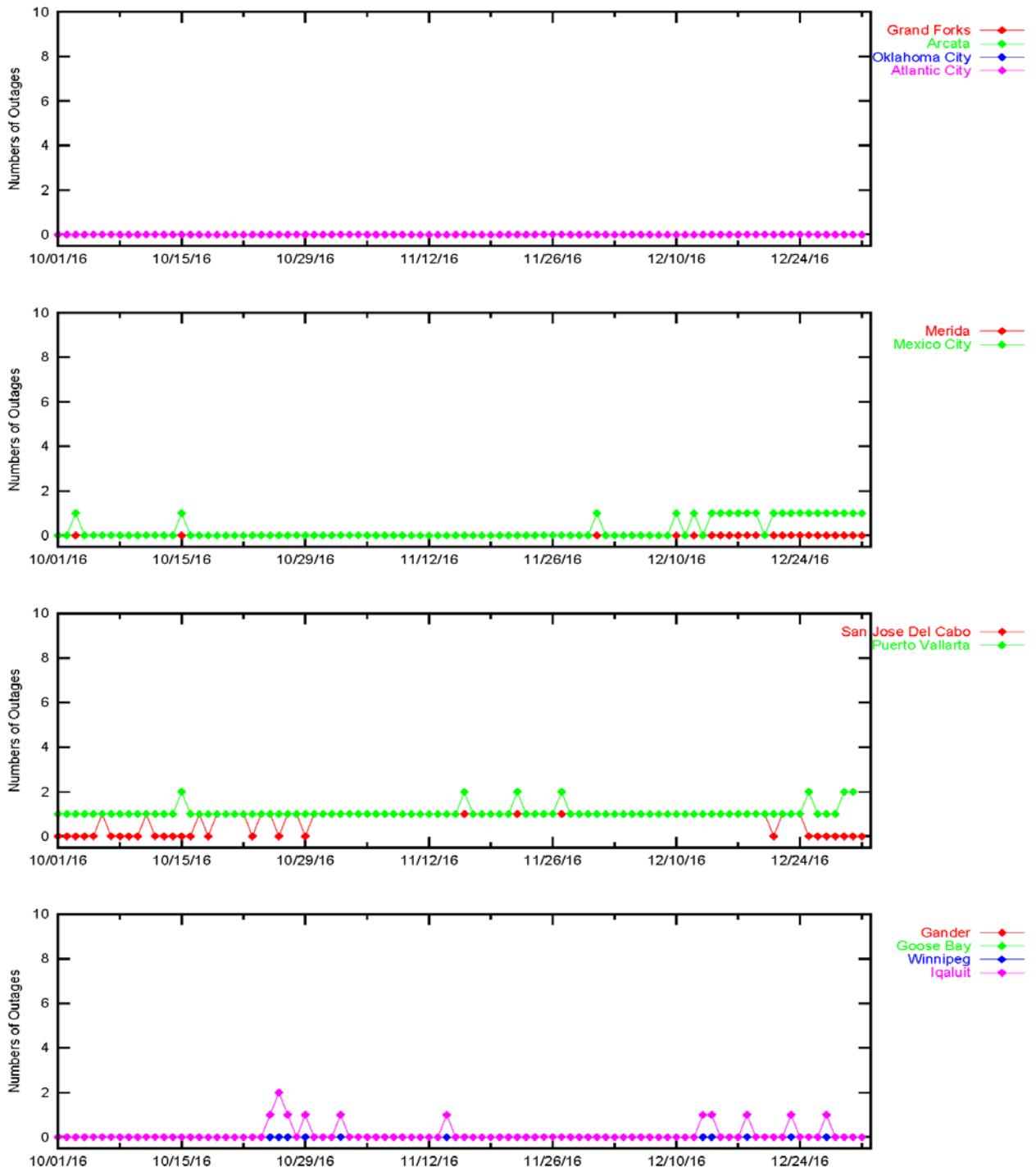


Figure 3-10 LPV200 Outages

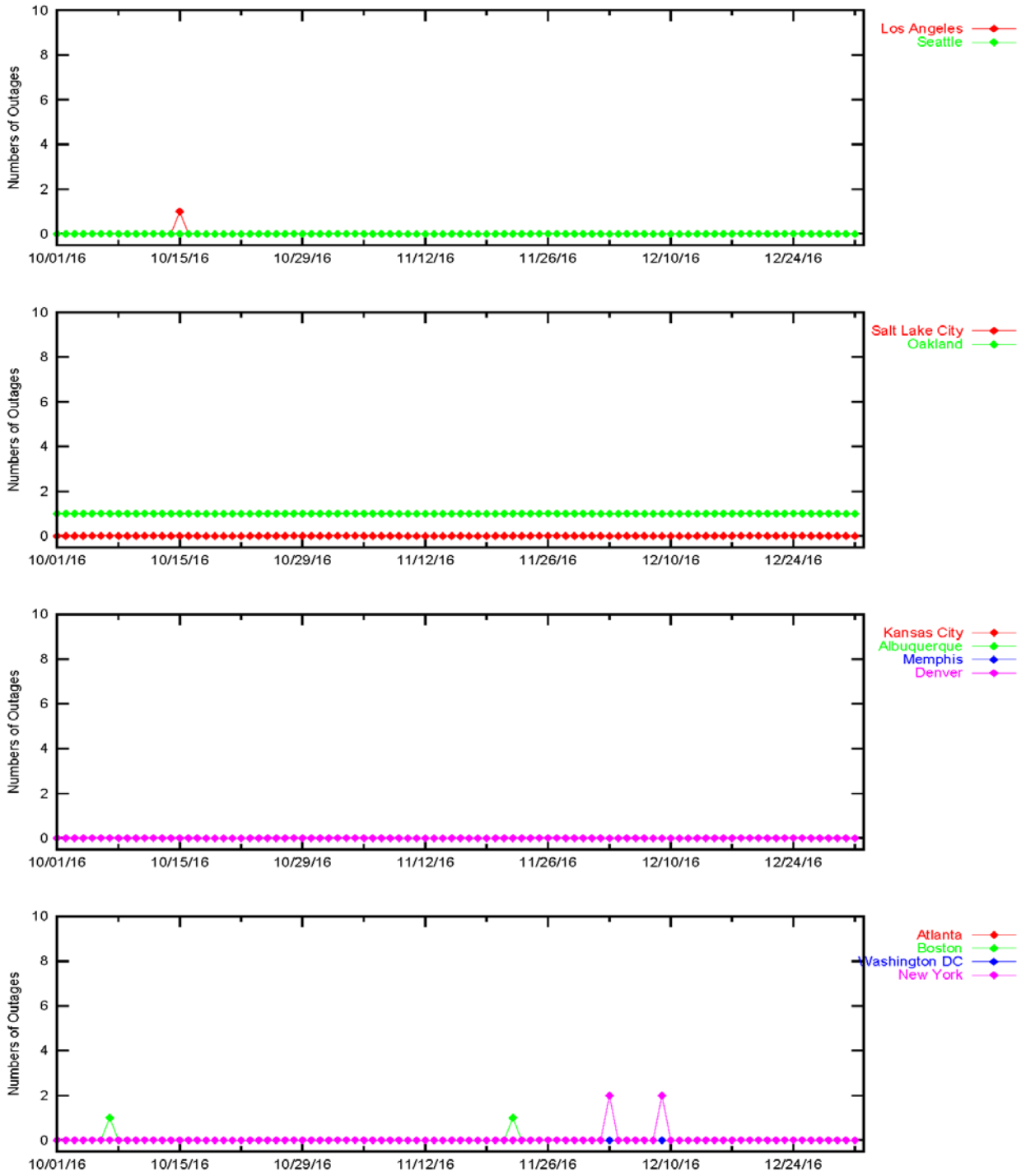


Figure 3-11 LPV200 Outages

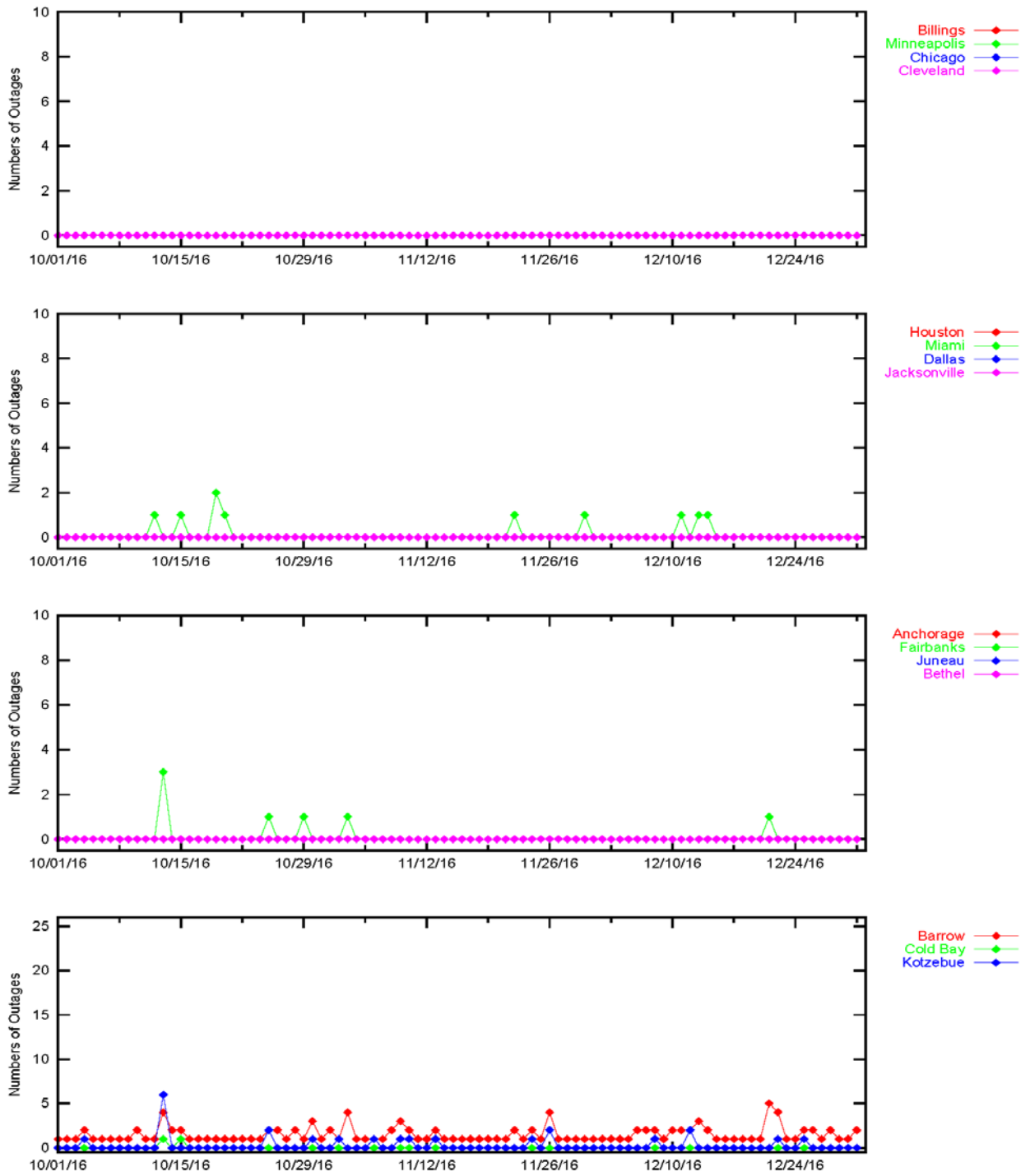
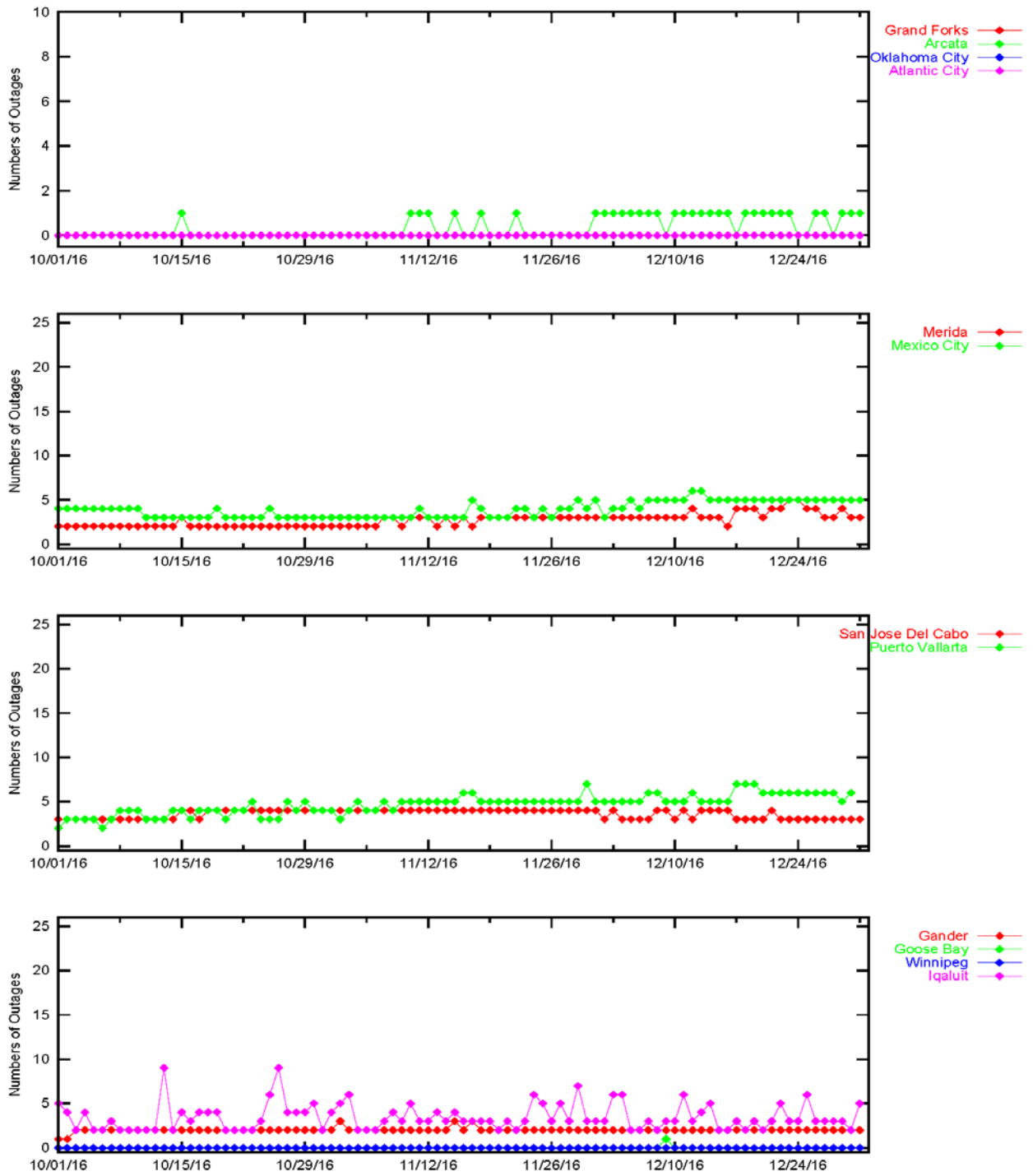


Figure 3-12 LPV200 Outages



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 one-degree spacing over the PA service volume, while for NPA coverage, the protection levels were calculated at 30-second intervals at five-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 4-6 shows the daily LPV and LPV200 CONUS coverage, Figure 4-7 shows the daily LPV Alaska coverage at 99% availability and ionosphere Kp index values, and Figure 4-8 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.

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 4-4 shows the rollup RNP 0.1 coverage and Figure 4-5 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.

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 listed below.

- October 13 – Geomagnetic activity caused elevated GIVE values, which reduced LPV200 coverage in Alaska and Canada.
- October 17 – A GUS Switchover on CRE caused a reduction in LPV200 coverage in Canada.
- October 27 – Several IGP's were set to Not-Monitored from 15:50 GMT to 16:34 GMT and from 17:45 GMT to 17:50 GMT. At that time, Iqaluit experienced a sub-frame reasonability warning which removed it from WAAS correction Processing. This caused a reduction in LPV200 coverage in Canada.
- November 9 – A GUS Switchover on CRW caused a reduction in LPV200 coverage in Alaska and Canada
- November 10 – A missed maneuver caused an alert to Not-Monitored and raised UDRE on PRN 135 causing a reduction in LPV200 coverage in CONUS
- November 26 – A GUS Switchover on CRW caused a reduction in LPV and LPV200 coverage in Alaska
- December 12-14 – Satellite Maintenance caused elevated UDREs on PRN-11 and reduced LPV200 coverage in Alaska and Canada on December 13th

Figure 4-1 LP North America Coverage for the Quarter

WAAS LP Coverage Contours
October 1 - December 31, 2016

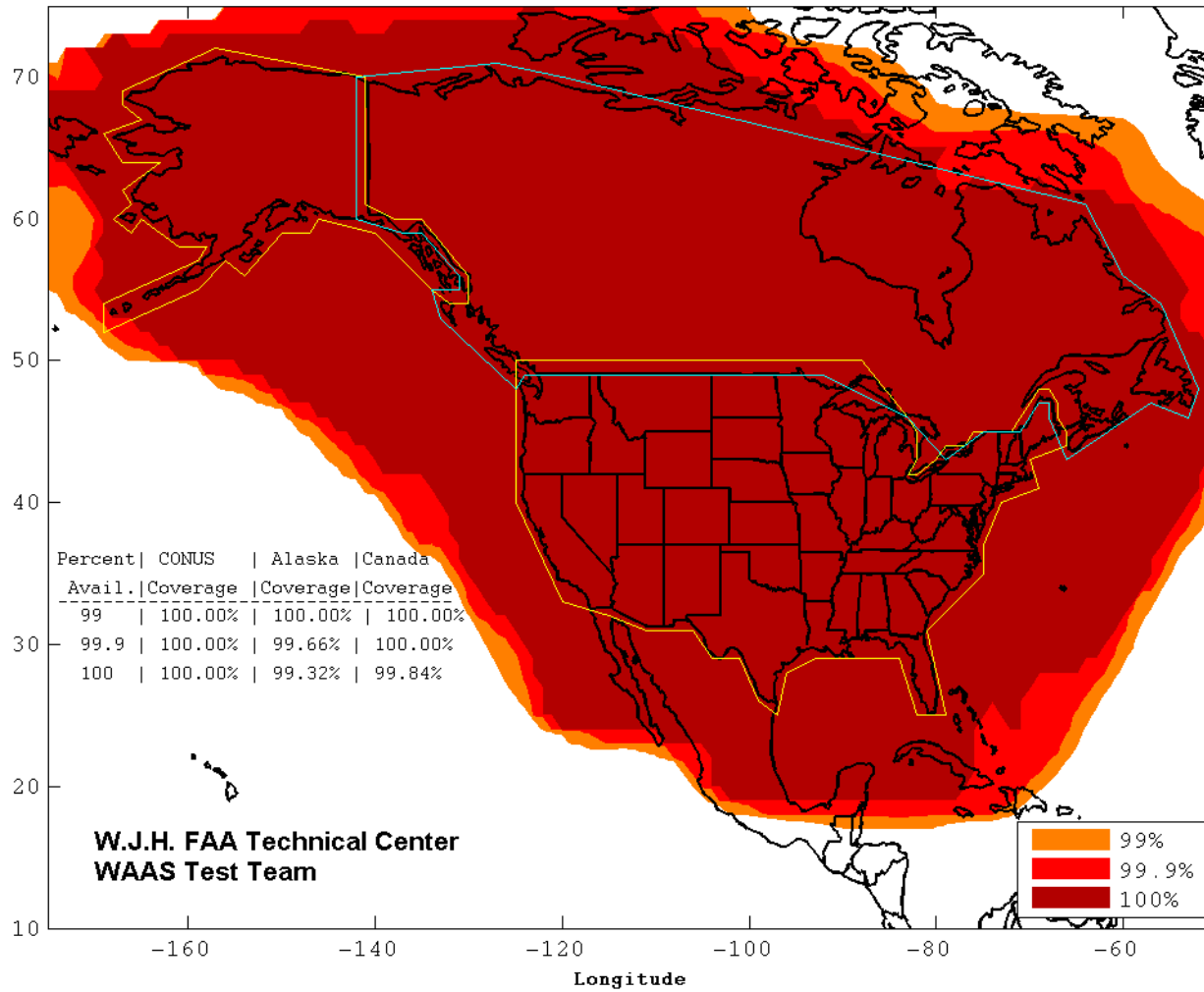


Figure 4-2 LPV North America Coverage for the Quarter

WAAS LPV Coverage Contours
October 1 - December 31, 2016

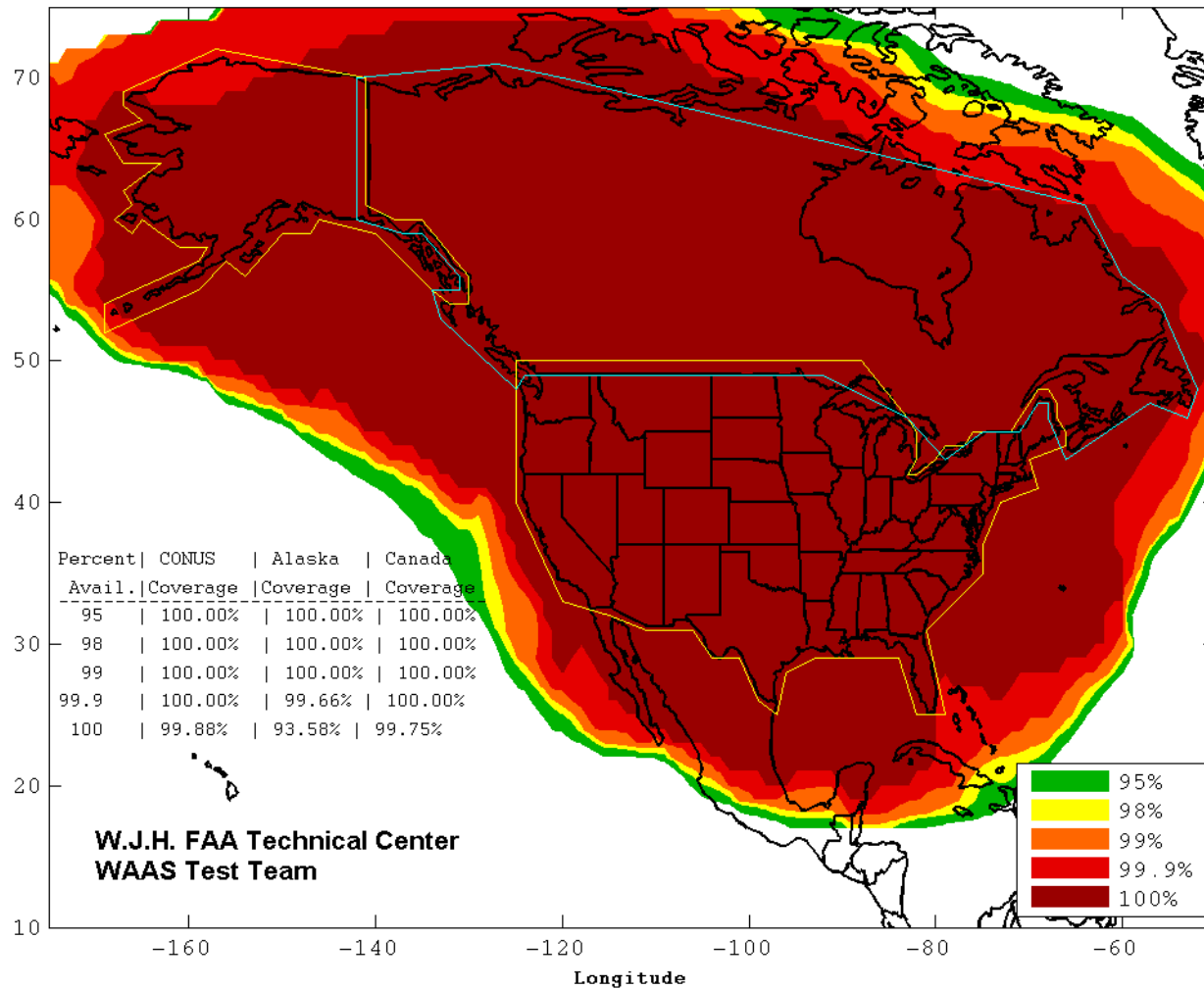


Figure 4-3 LPV200 North America Coverage for the Quarter

WAAS LPV200 Coverage Contours
October 1 - December 31, 2016

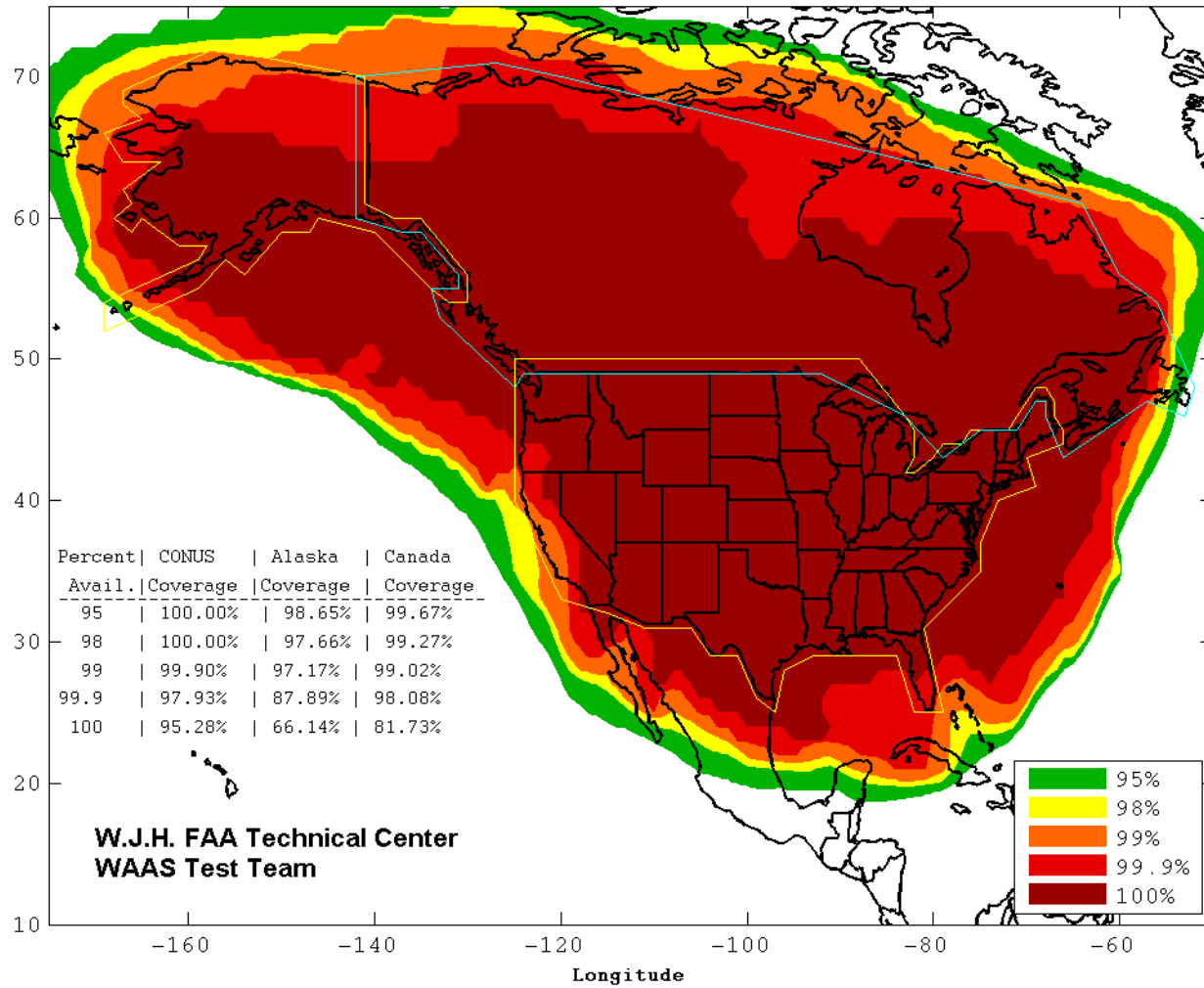


Figure 4-4 RNP 0.1 Coverage for the Quarter

WAAS RNP 0.1 Coverage Contours
October 1 - December 31, 2016

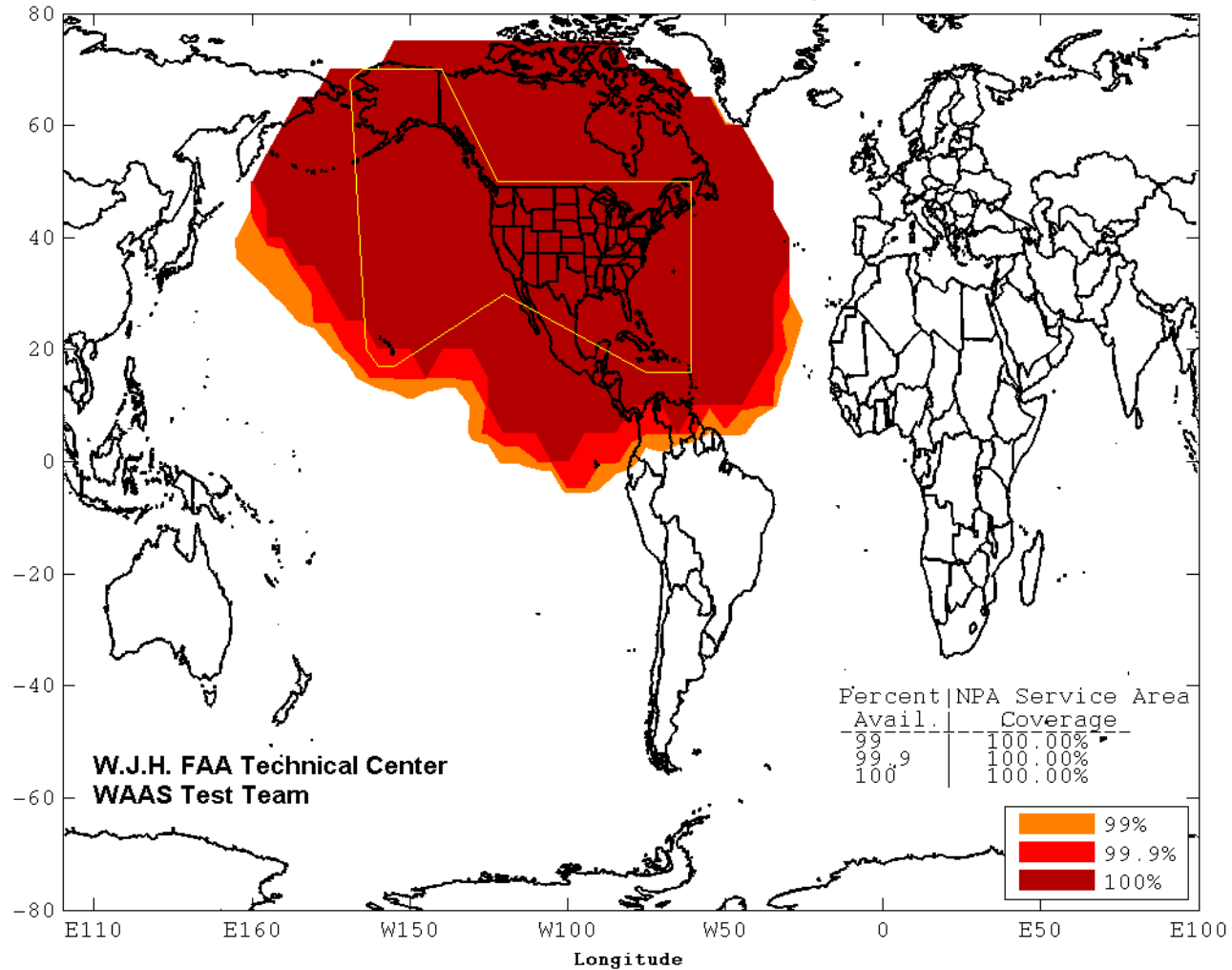
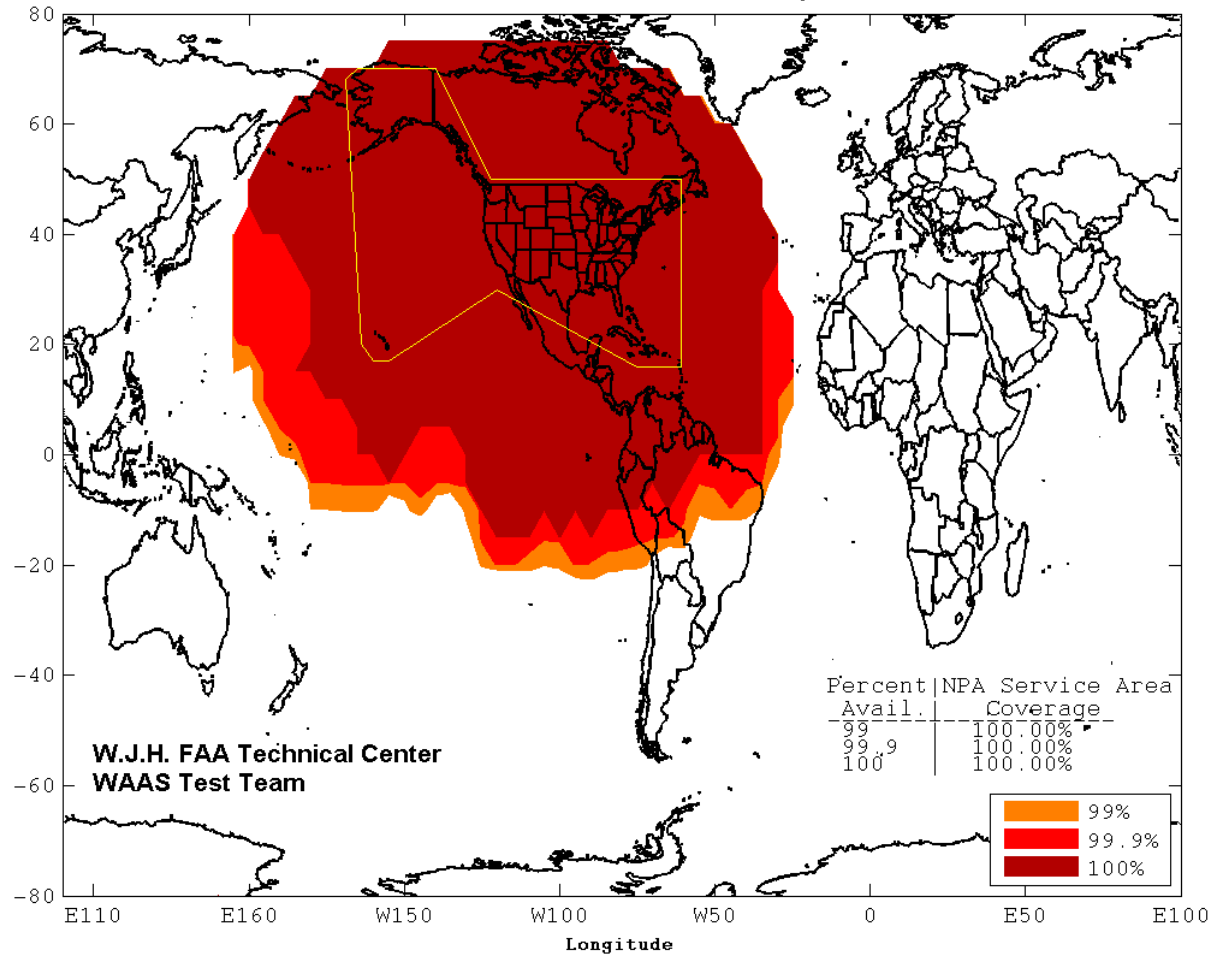


Figure 4-5 RNP 0.3 Coverage for the Quarter

WAAS RNP 0.3 Coverage Contours
October 1 – December 31, 2016



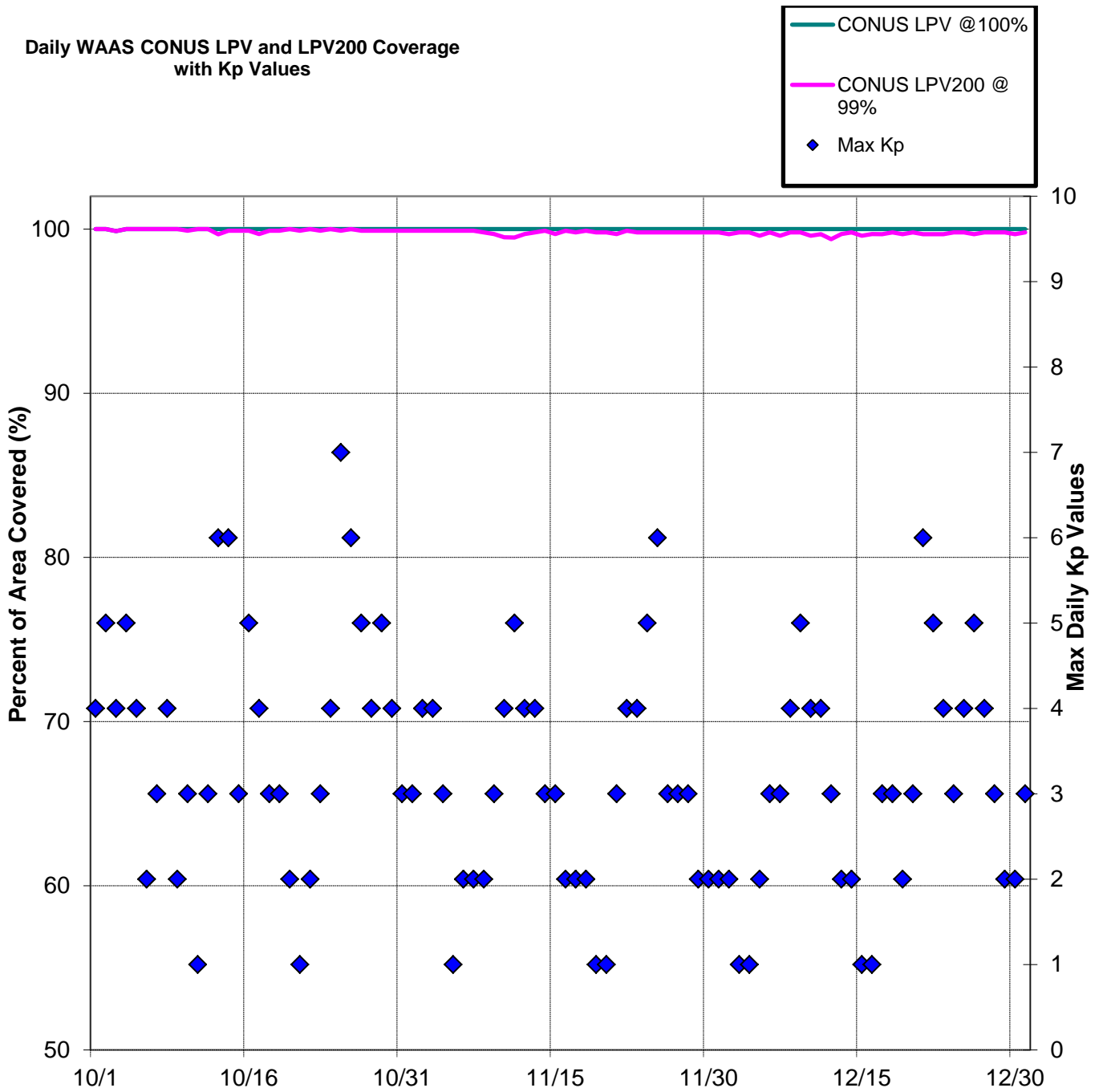


Figure 4-6 Daily LPV and LPV200 CONUS Coverage

Daily WAAS Alaska LPV and LPV200 Coverage (99% Availability) with Kp Values

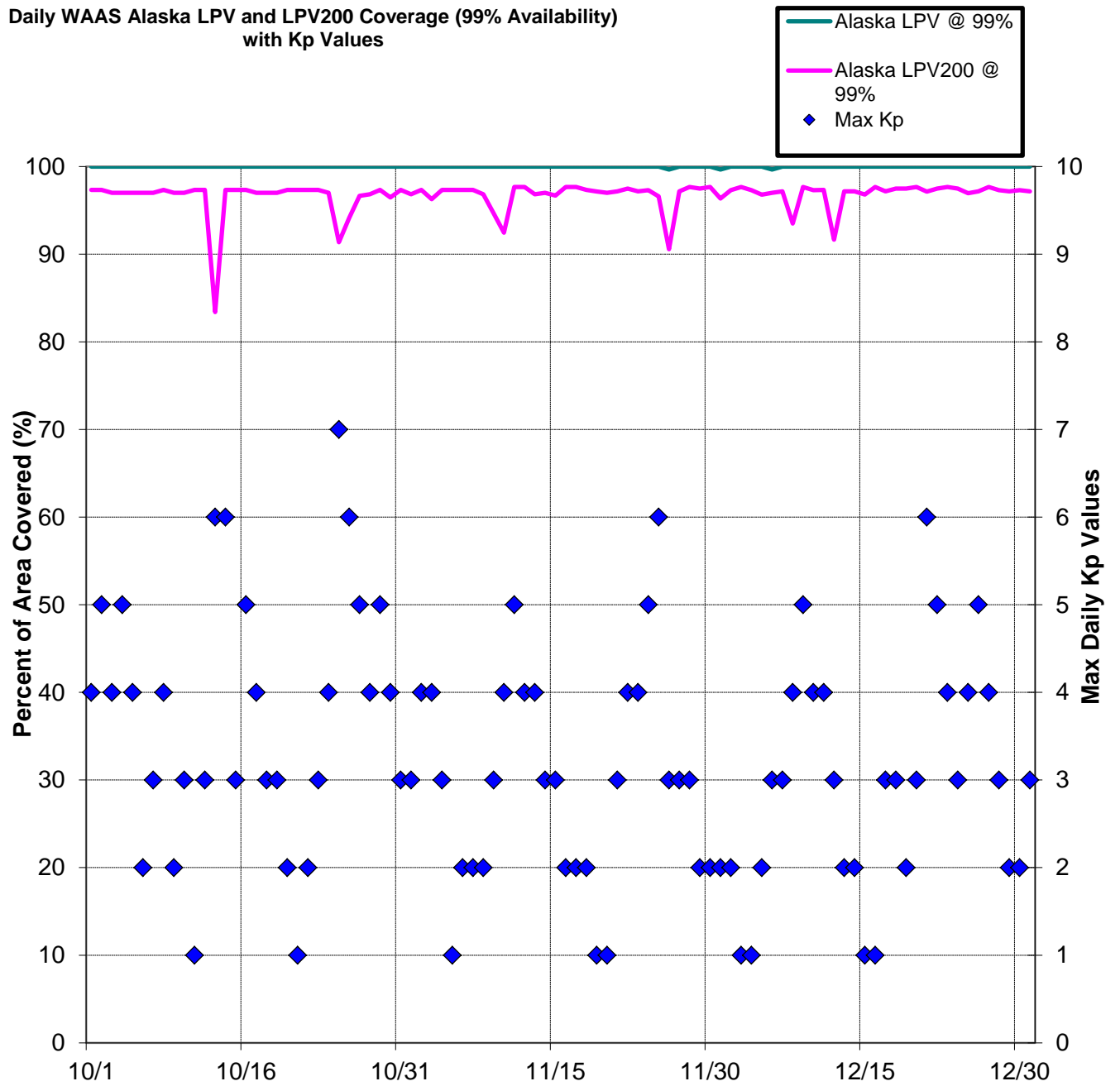


Figure 4-7 Daily LPV and LPV200 CONUS Coverage

Daily WAAS Canada LPV and LPV200 Coverage (99% Availability) with Kp Values

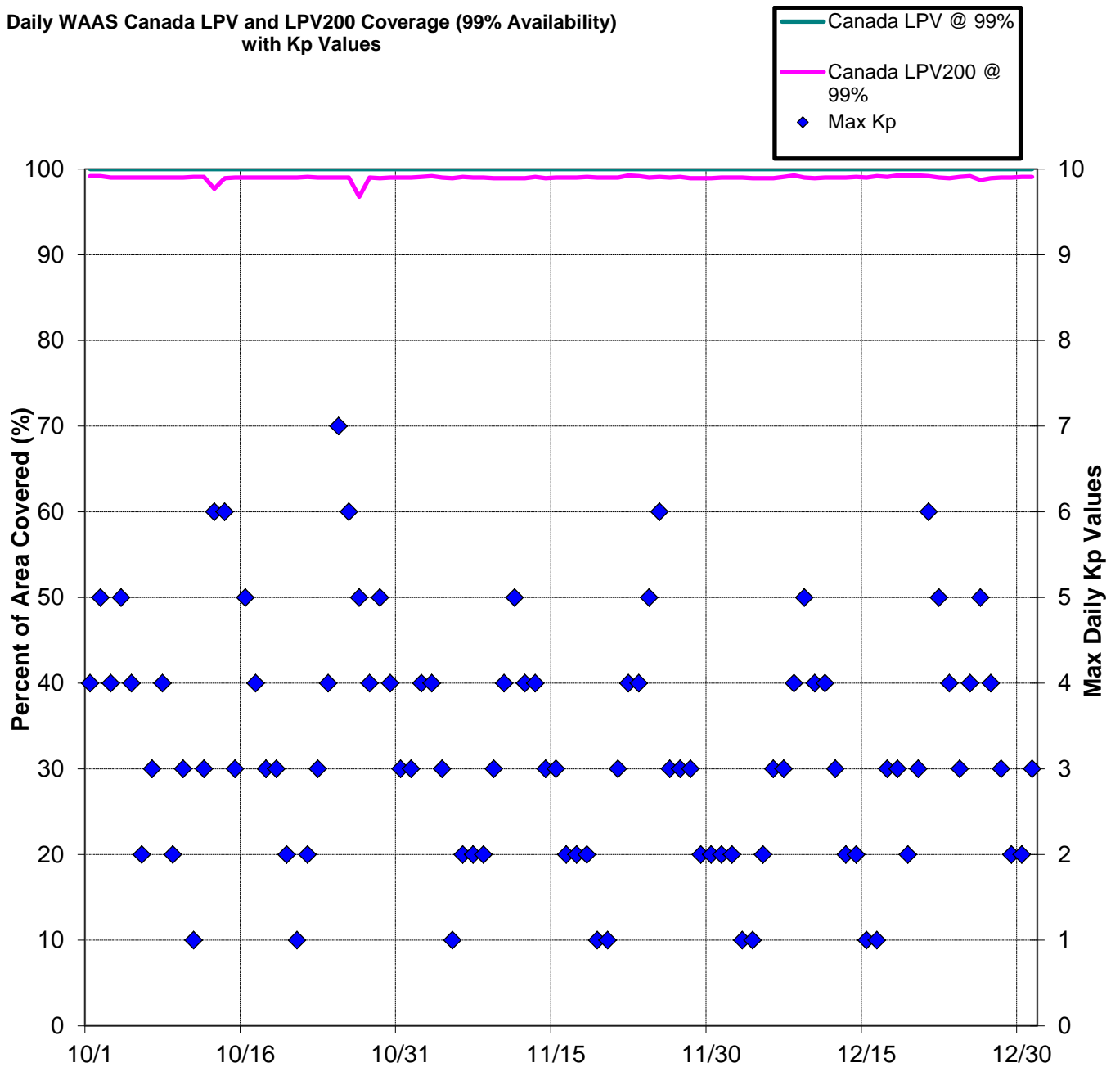


Figure 4-8 Daily LPV and LPV200 Alaska Coverage

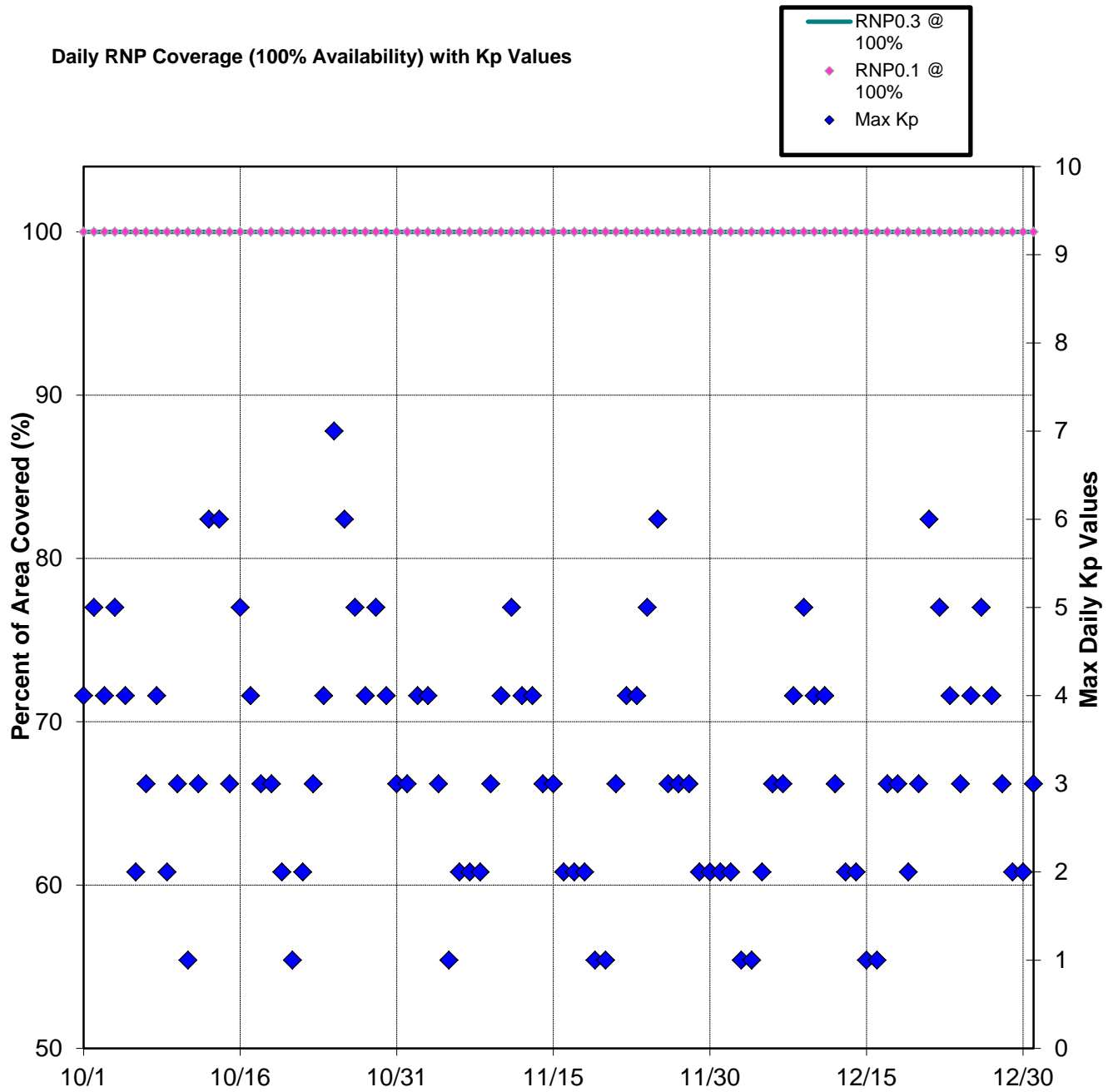


Figure 4-9 Daily LPV and LPV200 Canada Coverage

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.

Figure 5-1 lists the safety margin index and the number of HMI events. For this reporting period, the lowest safety margin index is 3.97 at Anchorage and there were no HMI events. There has not been an HMI event since WAAS was made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Safety Index		Number of HMIs
	Horizontal	Vertical	
Arcata	5.45	6.35	0
Atlantic City	4.62	4.39	0
Grand Forks	5.13	5.63	0
Oklahoma City	5.73	8.63	0
Albuquerque	5.92	7.34	0
Anchorage	7.95	3.97	0
Atlanta	6.06	6.68	0
Barrow	5.55	6.23	0
Bethel	8.10	8.33	0
Billings	6.85	7.84	0
Boston	6.78	8.12	0
Chicago	6.66	4.41	0
Cleveland	6.02	7.07	0
Cold Bay	13.361	9.83	0
Dallas	6.18	6.24	0
Denver	7.51	8.13	0
Fairbanks	7.28	4.69	0
Gander	9.39	9.82	0
Goose Bay	7.12	7.14	0
Houston	5.52	4.49	0
Iqaluit	6.72	4.46	0
Jacksonville	7.22	5.97	0
Juneau	7.64	4.77	0
Kansas City	5.82	7.37	0
Kotzebue	6.06	5.28	0
Los Angeles	5.76	7.58	0
Memphis	5.18	8.15	0
Merida	13.77	9.35	0
Mexico City	19.03	9.87	0
Miami	18.99	8.90	0
Minneapolis	8.42	6.67	0
New York	5.74	8.50	0
Oakland	7.65	15.78	0
Puerto Vallarta	16.79	8.44	0
Salt Lake City	8.713	9.80	0
San Jose Del Cabo	7.24	7.19	0
Seattle	5.52	9.48	0
Washington DC	6.16	8.40	0
Winnipeg	9.09	5.17	0

5.2 Broadcast Alerts

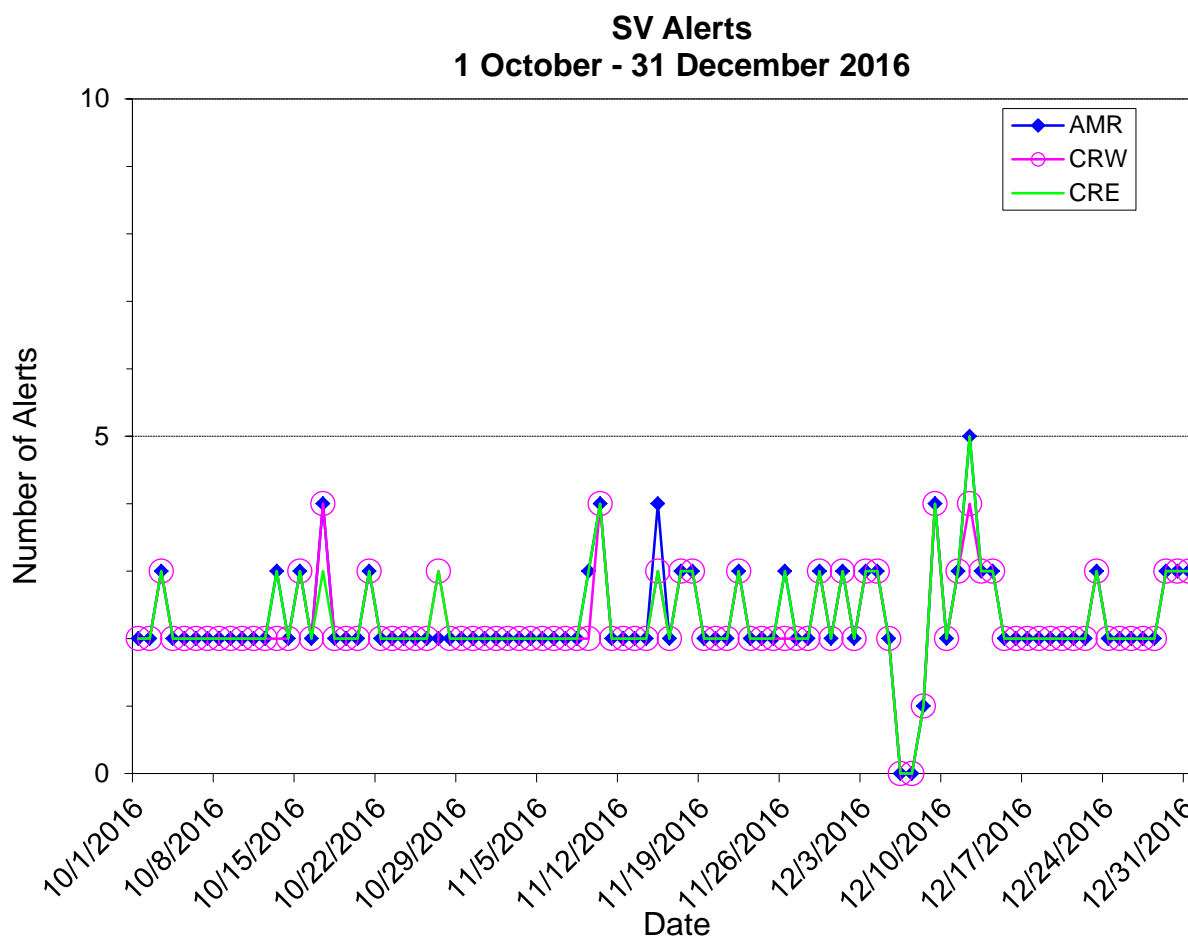
The WAAS transmits alert messages for user protection when the active WAAS corrections are no longer bound by the UDREs. Alerts increase the UDRE for one or more PRNs, which can reduce the weighting of the satellite or exclude the satellite from the navigation solution. An increase in UDREs after an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

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. CRE C&V source select to ZTL after SSM 45 upgrade caused CRE re-initialization and elevated PRN-135 and PRN-138 UDREs reported by CRE

Table 5-2 WAAS SV Alert

Message Type	Number of Alerts			Average Alerts Per Day		
	AMR	CRW	CRE	AMR	CRW	CRE
2	193	194	194	2.0978	2.1087	2.1087
3	5	5	5	0.0543	0.0543	0.0543
4	12	7	10	0.1304	0.0761	0.1087
5	0	0	0	0.0000	0.0000	0.0000
6	0	0	0	0.0000	0.0000	0.0000
24	0	0	0	0.0000	0.0000	0.0000
26	0	0	0	0.0000	0.0000	0.0000
Total Alerts	210	206	209	2.2826	2.2391	2.2717
Days in Service	92	92	92			

Figure 5-1 SV Daily Alert Trend



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

Accurate and current calculations of user position are dependent upon 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.

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

For this quarter, statistics reported for late messages were mainly caused by GEO SIS outages, GUS switchovers, and SV alerts; excluding message type 7 and 10. Furthermore, the delay of message types 7 and 10 had little or no impact on user performance and safety, and were not caused by GEO SIS outages, GUS switchovers, or SV alerts.

Table 5-4 through Table 5-8 show statistics for fast correction, long correction, ephemeris covariance, ionosphere correction, and ionospheric mask message rates broadcasted on AMR GEO. Table 5-9 through Table 5-13 show statistics for message rates broadcasted on CRW GEO. Table 5-14 through Table 5-18 show statistics for message rates broadcasted on CRE GEO.

Table 5-3 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

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

Message Type	On Time	Late	Max Late Length (seconds)
1	101959	2	138
2	1325334	24	18
3	1324745	44	18
4	1324779	34	18
7	95775	9	140
9	93145	2	186
10	95746	8	190
17	31314	1	378

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

SV	On Time	Late	Max Late Length (seconds)
1	49692	1	166
2	47759	1	162
3	48571	1	151
5	47902	0	0
6	47895	0	0
7	47358	1	182
8	48810	2	179
9	47822	0	0
10	47601	1	166
11	48302	3	175
12	47651	0	0
13	49187	0	0
14	47230	1	167
15	48230	0	0
16	48202	0	0
17	47399	1	162
18	47269	0	0
19	46633	2	180
20	47097	0	0
21	47864	1	182
22	49053	1	179
23	47578	0	0
24	49787	1	163
25	49270	1	180
26	48563	2	180
27	49339	1	175
28	48173	0	0
29	47537	0	0
30	47147	1	172
31	48369	0	0
32	46843	1	166

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

SV	On Time	Late	Max Late Length (seconds)
1	40836	1	205
2	39236	0	0
3	39905	1	158
5	39301	2	205
6	39289	2	208
7	38837	2	208
8	40051	0	0
9	39288	0	0
10	39100	1	128
11	39709	0	0
12	39126	2	206
13	40420	1	208
14	38775	2	206
15	39549	0	0
16	39540	1	141
17	38965	3	206
18	38801	0	0
19	38258	0	0
20	38678	0	0
21	39303	0	0
22	40284	3	208
23	39131	0	0
24	40857	2	208
25	40479	0	0
26	39856	0	0
27	40551	0	0
28	39580	2	205
29	39048	2	205
30	38691	0	0
31	39665	1	152
32	38469	0	0
135	76196	2	210
138	76406	4	210

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27600	4	471
0	1	27597	6	576
0	2	27595	4	576
1	0	27588	4	576
1	1	27614	3	576
1	2	27604	2	363
1	3	27598	3	576
1	4	27596	3	376
2	0	27602	6	576
2	1	27603	3	352
2	2	27600	2	352
2	3	27605	2	304
2	4	27598	1	306
3	0	27609	2	302
3	1	27614	1	301
3	2	27591	7	576
9	0	27608	5	452
9	1	27606	3	483
9	2	27606	2	495
9	3	27596	4	476
9	4	27611	4	576
9	5	27601	3	464
9	6	27592	4	447

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

Band	On Time	Late	Max Late Length (seconds)
0	35506	1	306
1	35498	1	353
2	35485	0	0
3	35494	1	339
9	35500	0	0

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

Message Type	On Time	Late	Max Late Length (seconds)
1	99498	3	163
2	1325339	21	21
3	1324756	37	27
4	1324772	31	24
7	93317	9	178
9	93149	1	160
10	93317	9	127
17	31069	4	525

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

SV	On Time	Late	Max Late Length (seconds)
1	49702	0	0
2	47764	0	0
3	48567	0	0
5	47910	0	0
6	47889	1	165
7	47359	1	166
8	48810	1	179
9	47821	0	0
10	47607	0	0
11	48313	0	0
12	47654	0	0
13	49183	0	0
14	47236	0	0
15	48229	0	0
16	48207	0	0
17	47408	0	0
18	47254	0	0
19	46636	1	178
20	47104	0	0
21	47870	0	0
22	49059	1	179
23	47579	0	0
24	49784	0	0
25	49258	1	175
26	48564	0	0
27	49338	0	0
28	48177	0	0
29	47539	0	0
30	47151	0	0
31	48365	0	0
32	46849	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40837	0	0
2	39227	1	210
3	39920	0	0
5	39297	1	212
6	39284	2	206
7	38845	2	208
8	40051	0	0
9	39292	0	0
10	39104	1	144
11	39698	1	206
12	39125	1	210
13	40403	3	212
14	38789	0	0
15	39549	0	0
16	39562	1	128
17	38974	1	187
18	38798	2	208
19	38252	3	210
20	38698	0	0
21	39297	1	131
22	40292	2	154
23	39111	0	0
24	40877	1	150
25	40482	1	143
26	39872	0	0
27	40543	0	0
28	39599	2	144
29	39047	0	0
30	38693	0	0
31	39662	0	0
32	38447	2	187
135	76228	1	4304
138	76393	0	0

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27611	3	352
0	1	27588	8	513
0	2	27603	6	538
1	0	27592	5	512
1	1	27605	4	501
1	2	27608	5	490
1	3	27591	6	579
1	4	27610	3	577
2	0	27596	5	577
2	1	27608	2	343
2	2	27590	4	384
2	3	27606	4	383
2	4	27594	8	361
3	0	27594	4	371
3	1	27610	4	372
3	2	27604	5	379
9	0	27591	6	354
9	1	27616	4	577
9	2	27601	3	577
9	3	27588	2	305
9	4	27608	2	305
9	5	27614	0	0
9	6	27596	2	305

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

Band	On Time	Late	Max Late Length (seconds)
0	35156	0	0
1	35184	2	423
2	35179	1	328
3	35137	2	424
9	35131	2	466

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

Message Type	On Time	Late	Max Late Length (seconds)
1	100684	0	0
2	1325352	16	13
3	1324763	35	14
4	1324800	24	10
7	94522	6	127
9	93150	0	0
10	94481	11	127
17	31179	1	401

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

SV	On Time	Late	Max Late Length (seconds)
1	49689	0	0
2	47761	0	0
3	48565	0	0
5	47911	0	0
6	47889	0	0
7	47362	0	0
8	48803	1	179
9	47815	0	0
10	47603	1	179
11	48307	0	0
12	47656	0	0
13	49184	0	0
14	47238	1	163
15	48225	0	0
16	48204	0	0
17	47404	0	0
18	47265	0	0
19	46637	0	0
20	47099	0	0
21	47877	0	0
22	49061	1	179
23	47578	1	174
24	49805	0	0
25	49264	0	0
26	48567	0	0
27	49340	0	0
28	48177	0	0
29	47536	0	0
30	47149	0	0
31	48362	0	0
32	46840	0	0

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

SV	On Time	Late	Max Late Length (seconds)
1	40849	0	0
2	39228	0	0
3	39924	0	0
5	39302	0	0
6	39278	1	192
7	38852	1	202
8	40058	1	136
9	39283	1	173
10	39094	0	0
11	39716	0	0
12	39121	0	0
13	40404	1	144
14	38798	0	0
15	39550	0	0
16	39557	0	0
17	38956	1	178
18	38801	1	122
19	38260	2	208
20	38696	0	0
21	39314	0	0
22	40283	0	0
23	39108	0	0
24	40858	2	160
25	40459	0	0
26	39849	0	0
27	40542	2	160
28	39600	2	156
29	39050	0	0
30	38708	1	129
31	39672	1	128
32	38473	2	192
135	76232	0	0
138	76413	1	170

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

Band	Block	On Time	Late	Max Late Length (seconds)
0	0	27604	2	377
0	1	27621	4	540
0	2	27586	3	528
1	0	27602	1	354
1	1	27608	2	342
1	2	27612	2	341
1	3	27594	4	339
1	4	27592	6	337
2	0	27601	4	371
2	1	27604	2	367
2	2	27596	2	355
2	3	27612	3	353
2	4	27610	1	366
3	0	27598	1	371
3	1	27602	4	367
3	2	27604	6	349
9	0	27597	5	371
9	1	27593	4	544
9	2	27604	5	508
9	3	27602	4	349
9	4	27598	4	377
9	5	27607	3	371
9	6	27611	3	367

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

Band	On Time	Late	Max Late Length (seconds)
0	35315	1	343
1	35365	1	346
2	35346	1	305
3	35326	0	0
9	35341	1	414

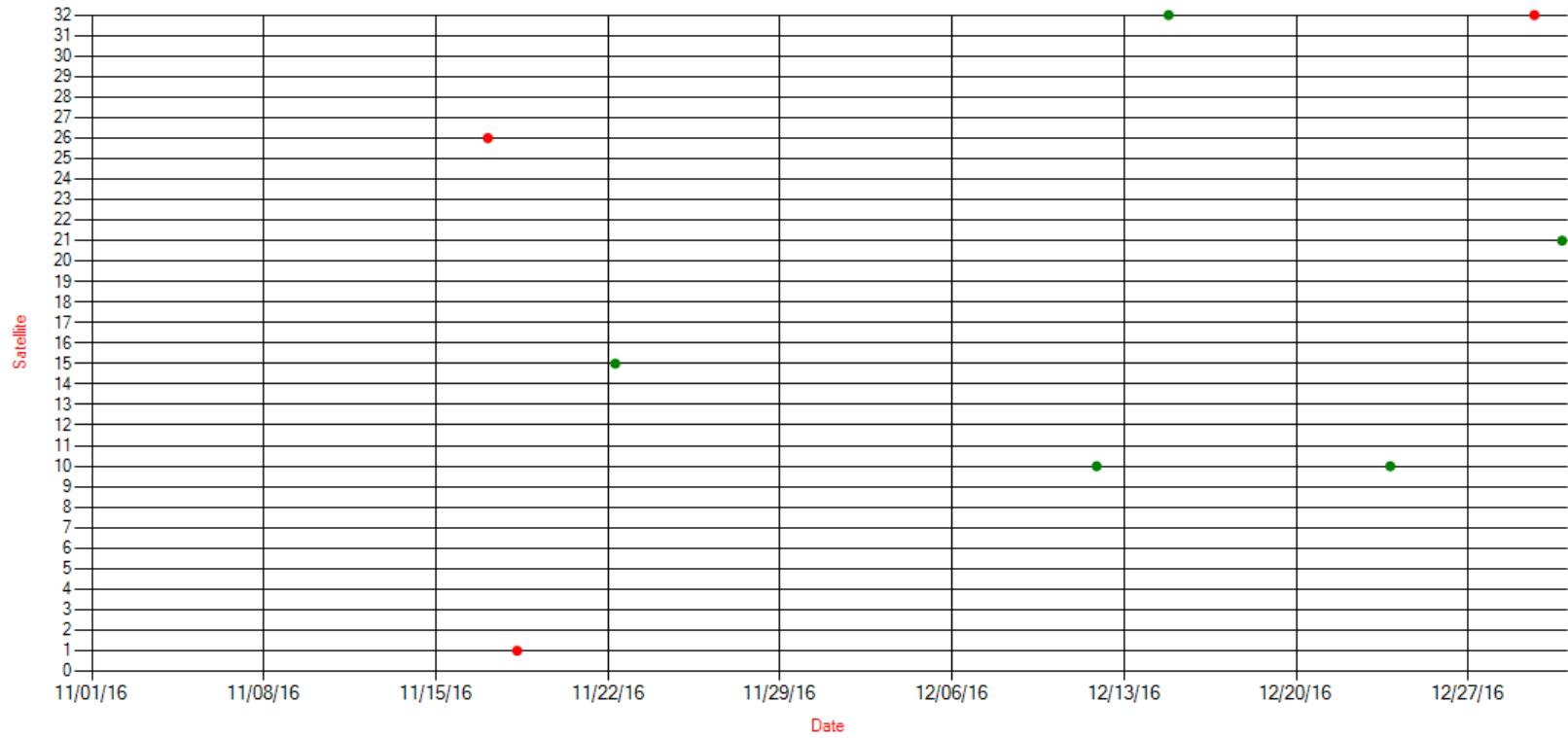
5.4 Satellite Glitches

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 the satellite glitches visible to WAAS during the quarter. Glitches are categorized into three severity levels: (1) Severity One glitches cause a significant number of the receivers to simultaneously report bad subframe parity, (2) Severity Two glitches cause all of the receivers to report bad subframe parity data and some receivers to also have cycle slips and/or lose tracking of L2 and/or L1, and (3) Severity Three glitches cause all of the receivers to lose track of both L1 and L2 data. Note, the tool used to perform this Satellite Glitch Analysis also reports times when more than 14 GPS satellites are in view for some of the WAAS reference stations. The NovAtel WAAS G3 receiver is only capable of tracking 14 GPS satellites at a given time, and GPS users may also experience this condition.

Figure 5-2 SV Glitch Trend

Satellite Glitch Events
Severity: Green = 1; Blue = 2; Red = 3



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.

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.

For this reporting period, most satellite range errors were bounded at least 99.9% of the time by UDRE. Other unbounded errors (i.e., errors bounded less than 100% of the time) were due to geomagnetic activity, noise, and/or multipath. PRN-4 was unavailable for the quarter.

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

Site → SV ↓	Billings		Albuquerque		Boston		Washington DC		Houston		Kansas City	
	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)
1*	0.785	100	1.331	100	0.869	100	1.514	100	1.343	100	1.307	100
2	1.101	100	1.455	100	1.286	100	1.453	100	1.286	100	1.301	100
3*	0.761	100	1.471	100	1.265	100	1.465	100	1.764	100	1.967	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	1.106	100	1.055	100	1.280	100	1.312	100	1.074	100	1.292	100
6*	1.037	100	1.344	100	1.063	100	1.259	100	1.283	100	1.911	100
7	1.081	100	1.098	100	0.975	100	0.992	100	1.342	100	1.113	100
8*	1.061	100	1.226	100	0.955	100	0.894	100	1.231	100	1.389	100
9*	0.964	100	0.960	100	0.976	100	1.361	100	1.310	100	1.603	100
10	1.486	100	0.707	100	1.117	100	1.215	100	0.991	100	0.859	100
11	0.850	100	1.501	100	1.172	100	1.591	100	1.141	100	1.405	100
12	1.076	100	1.239	100	2.185	100	1.128	100	1.221	100	1.125	100
13	1.184	100	1.382	100	1.066	100	1.184	100	1.088	100	1.084	100
14	1.219	100	1.244	100	0.833	100	1.506	100	1.500	100	2.071	100
15	0.943	100	1.152	100	0.920	100	1.299	100	1.258	100	1.283	100
16	1.718	100	1.431	100	0.811	100	1.318	100	1.160	100	1.263	100
17	1.848	100	1.063	100	1.446	100	1.055	100	1.389	100	1.447	100
18	0.898	100	1.184	100	1.047	100	1.595	100	1.122	100	1.568	100
19	1.014	100	1.546	100	0.857	100	1.159	100	1.327	100	1.582	100
20	1.155	100	1.154	100	1.353	100	1.414	100	1.806	100	1.448	100
21	0.843	100	1.147	100	1.081	100	1.598	100	1.083	100	1.491	100
22	1.454	100	1.168	100	1.036	100	1.588	100	1.563	100	1.168	100
23	0.891	100	1.473	100	1.203	100	1.521	100	1.945	100	1.437	100
24*	1.045	100	1.210	100	0.902	100	1.157	100	1.086	100	1.313	100
25*	1.166	100	1.269	100	1.027	100	1.095	100	1.700	100	1.077	100
26*	1.216	100	1.273	100	1.360	100	1.480	100	1.176	100	1.192	100
27*	1.079	100	1.829	100	1.104	100	1.169	100	1.151	100	1.313	100
28	1.601	100	1.332	100	0.979	100	1.213	100	1.211	100	1.817	100
29	1.494	100	1.041	100	0.873	100	1.049	100	1.119	100	1.309	100
30*	0.877	100	1.214	100	1.008	100	1.027	100	1.209	100	1.209	100
31	1.069	100	1.404	100	1.018	100	1.490	100	1.289	100	1.859	100
32	1.338	100	0.676	100	1.025	100	1.268	100	2.222	100	0.989	100
135	2.109	100	1.508	100	2.314	100	2.156	100	2.504	100	1.694	100
138	1.351	100	1.273	100	1.648	100	1.754	100	1.545	100	1.771	100

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

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

Site → SV ↓	Los Angeles		Salt Lake City		Miami		Minneapolis		Atlanta		Juneau	
	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)	95% Range Error	3.29 Sigma Bounding(%)
1*	1.693	100	1.052	100	1.291	100	0.896	100	1.398	100	0.83	100
2	1.473	100	1.053	100	1.141	100	0.981	100	1.364	100	1.209	100
3*	1.514	100	1.197	100	1.625	100	0.785	100	1.823	100	0.881	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	1.316	100	0.89	100	0.939	100	0.99	100	1.132	100	1.285	100
6*	1.732	100	1.004	100	1.218	100	0.806	100	1.335	100	0.976	100
7	1.318	100	1.028	100	2.109	100	0.86	100	1.19	100	1.275	100
8*	1.629	100	1.12	100	1.157	100	1.091	100	1.088	100	1.15	100
9*	1.382	100	0.764	100	0.893	100	0.933	100	1.236	100	0.874	100
10	0.826	100	1.042	100	1.154	100	0.926	100	1.075	100	1.33	100
11	1.301	100	1.001	100	1.242	100	1.084	100	1.633	100	0.958	100
12	1.065	100	1.104	100	1.458	100	2.064	100	1.065	100	1.371	100
13	1.144	100	0.889	100	1.319	100	0.929	100	1.15	100	1.17	100
14	1.064	100	1.218	100	1.134	100	0.848	100	1.367	100	0.916	100
15	1.318	100	0.818	100	1.067	100	1.56	100	1.201	100	1.161	100
16	1.564	100	0.948	100	1.364	100	0.911	100	1.455	100	0.83	100
17	1.314	100	0.892	100	1.876	100	0.802	100	1.177	100	0.988	100
18	1.244	100	1.499	100	1.359	100	1.126	100	1.531	100	1.199	100
19	1.395	100	1.107	100	1.318	100	0.753	100	1.281	100	1.12	100
20	1.255	100	1.051	100	1.185	100	0.932	100	1.313	100	1.248	100
21	1.106	100	0.874	100	1.525	100	0.742	100	1.307	100	0.931	100
22	1.451	100	0.923	100	1.363	100	0.938	100	1.195	100	1.212	100
23	1.742	100	0.824	100	0.981	100	0.799	100	1.647	100	0.887	100
24*	1.281	100	1.628	100	1.004	100	1.094	100	1.121	100	1.345	100
25*	1.005	100	1.198	100	1.082	100	0.982	100	1.508	100	1.367	100
26*	2.015	100	1.18	100	1.609	100	1.178	100	1.468	100	1.082	100
27*	1.402	100	0.848	100	1.282	100	1.74	100	1.316	100	1.062	100
28	1.576	100	0.988	100	1.983	100	1.139	100	1.288	100	1.402	100
29	1.133	100	1.727	100	0.937	100	1.281	100	1.278	100	1.735	100
30*	1.446	100	0.726	100	0.884	100	1.169	100	1.189	100	0.954	100
31	1.593	100	0.979	100	1.464	100	0.634	100	1.525	100	1.25	100
32	0.727	100	1.24	100	1.049	100	1.239	100	0.738	100	1.519	100
135	1.802	100	1.636	100	1.691	100	2.183	100	2.342	100	1.391	100
138	2.703	100	1.635	100	2.043	100	1.978	100	1.385	100	1.641	100

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

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

Site →	Billings		Albuquerque		Boston		Washington DC		Houston		Kansas City	
	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)
1	0.381	100	0.633	100	0.497	100	0.711	100	0.536	100	0.532	100
2	0.491	100	0.911	100	0.545	100	0.739	100	0.656	100	0.662	100
3	0.334	100	0.879	100	0.561	100	0.604	100	0.576	100	0.894	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.628	100	0.613	100	0.601	100	0.538	100	0.806	100	0.466	100
6	0.578	100	0.724	100	0.431	100	0.679	100	0.617	100	0.912	100
7	0.603	100	0.679	100	0.497	100	0.461	100	0.679	100	0.548	100
8	0.516	100	0.631	100	0.613	100	0.371	100	1.108	100	0.571	100
9	0.519	100	0.643	100	0.494	100	0.653	100	0.510	100	0.797	100
10	0.827	100	0.348	100	0.615	100	0.374	100	0.694	100	0.336	100
11	0.292	100	0.670	100	0.410	100	0.451	100	0.513	100	0.508	100
12	0.501	100	0.678	100	0.741	100	0.369	100	0.497	100	0.496	100
13	0.338	100	0.632	100	0.509	100	0.430	100	0.485	100	0.426	100
14	0.517	100	0.648	100	0.553	100	0.499	100	0.582	100	1.019	100
15	0.411	100	0.544	100	0.567	100	0.528	100	0.791	100	0.625	100
16	0.718	100	0.692	100	0.411	100	0.558	100	0.782	100	0.537	100
17	1.265	100	0.779	100	0.916	100	0.462	100	0.611	100	0.598	100
18	0.510	100	0.681	100	0.428	100	0.676	100	0.411	100	0.503	100
19	0.623	100	0.846	100	0.592	100	0.497	100	0.680	100	0.726	100
20	0.554	100	0.724	100	0.631	100	0.584	100	1.018	100	0.622	100
21	0.488	100	0.850	100	0.549	100	0.947	100	0.536	100	0.734	100
22	0.604	100	0.409	100	0.355	100	0.550	100	0.579	100	0.396	100
23	0.498	100	1.042	100	0.678	100	0.909	100	1.014	100	0.770	100
24	0.438	100	0.594	100	0.407	100	0.395	100	0.521	100	0.460	100
25	0.364	100	0.668	100	0.331	100	0.279	100	0.693	100	0.329	100
26	0.322	100	0.530	100	0.404	100	0.503	100	0.773	100	0.491	100
27	0.325	100	0.796	100	0.506	100	0.508	100	0.522	100	0.544	100
28	1.284	100	0.790	100	0.495	100	0.644	100	0.440	100	1.047	100
29	0.541	100	0.434	100	0.424	100	0.480	100	0.726	100	0.554	100
30	0.461	100	0.807	100	0.543	100	0.757	100	0.505	100	0.639	100
31	0.511	100	0.669	100	0.304	100	0.521	100	0.740	100	0.949	100
32	0.976	100	0.528	100	0.754	100	0.507	100	1.384	100	0.565	100

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

Site → SV ↓	Los Angeles		Salt Lake City		Miami		Minneapolis		Atlanta		Juneau	
	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)	95% Iono Error	3.29 Sigma Bounding(%)
1	0.885	100	0.397	100	0.585	100	0.398	100	0.801	100	0.452	100
2	0.773	100	0.459	100	0.507	100	0.481	100	0.884	100	0.428	100
3	0.461	100	0.531	100	0.548	100	0.422	100	0.897	100	0.366	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.829	100	0.528	100	0.534	100	0.397	100	0.657	100	0.474	100
6	0.861	100	0.518	100	0.758	100	0.396	100	0.860	100	0.388	100
7	0.411	100	0.494	100	1.148	100	0.446	100	0.730	100	0.521	100
8	0.722	100	0.455	100	0.698	100	0.503	100	0.499	100	0.553	100
9	0.541	100	0.448	100	0.538	100	0.412	100	0.793	100	0.459	100
10	0.309	100	0.590	100	0.707	100	0.743	100	0.435	100	0.741	100
11	0.607	100	0.356	100	0.394	100	0.473	100	0.651	100	0.352	100
12	0.316	100	0.634	100	0.560	100	0.689	100	0.600	100	0.585	100
13	0.474	100	0.314	100	0.554	100	0.395	100	0.761	100	0.507	100
14	0.378	100	0.824	100	0.512	100	0.401	100	0.624	100	0.429	100
15	0.480	100	0.277	100	0.507	100	0.582	100	0.669	100	0.418	100
16	0.677	100	0.325	100	0.460	100	0.347	100	0.677	100	0.373	100
17	0.585	100	0.518	100	0.905	100	0.381	100	0.647	100	0.445	100
18	0.637	100	0.767	100	0.622	100	0.463	100	0.801	100	0.486	100
19	0.676	100	0.499	100	0.681	100	0.437	100	0.711	100	0.532	100
20	0.584	100	0.407	100	0.586	100	0.405	100	0.699	100	0.494	100
21	0.578	100	0.395	100	0.729	100	0.369	100	0.796	100	0.446	100
22	0.533	100	0.510	100	0.633	100	0.324	100	0.573	100	0.623	100
23	0.778	100	0.388	100	0.657	100	0.396	100	1.021	100	0.489	100
24	0.590	100	0.573	100	0.439	100	0.441	100	0.532	100	0.501	100
25	0.343	100	0.474	100	0.536	100	0.373	100	0.737	100	0.399	100
26	0.968	100	0.317	100	0.503	100	0.507	100	0.693	100	0.397	100
27	0.501	100	0.290	100	0.529	100	0.682	100	0.702	100	0.561	100
28	0.743	100	0.435	100	0.936	100	0.453	100	0.841	100	0.507	100
29	0.452	100	0.801	100	0.670	100	0.623	100	0.797	100	0.611	100
30	0.549	100	0.324	100	0.541	100	0.466	100	0.828	100	0.351	100
31	0.669	100	0.455	100	0.740	100	0.310	100	0.756	100	0.454	100
32	0.515	100	0.872	100	0.874	100	0.987	100	0.540	100	0.972	100

Figure 6-1 95% Range Error (PRN-1 – PRN-16) – Washington D.C.

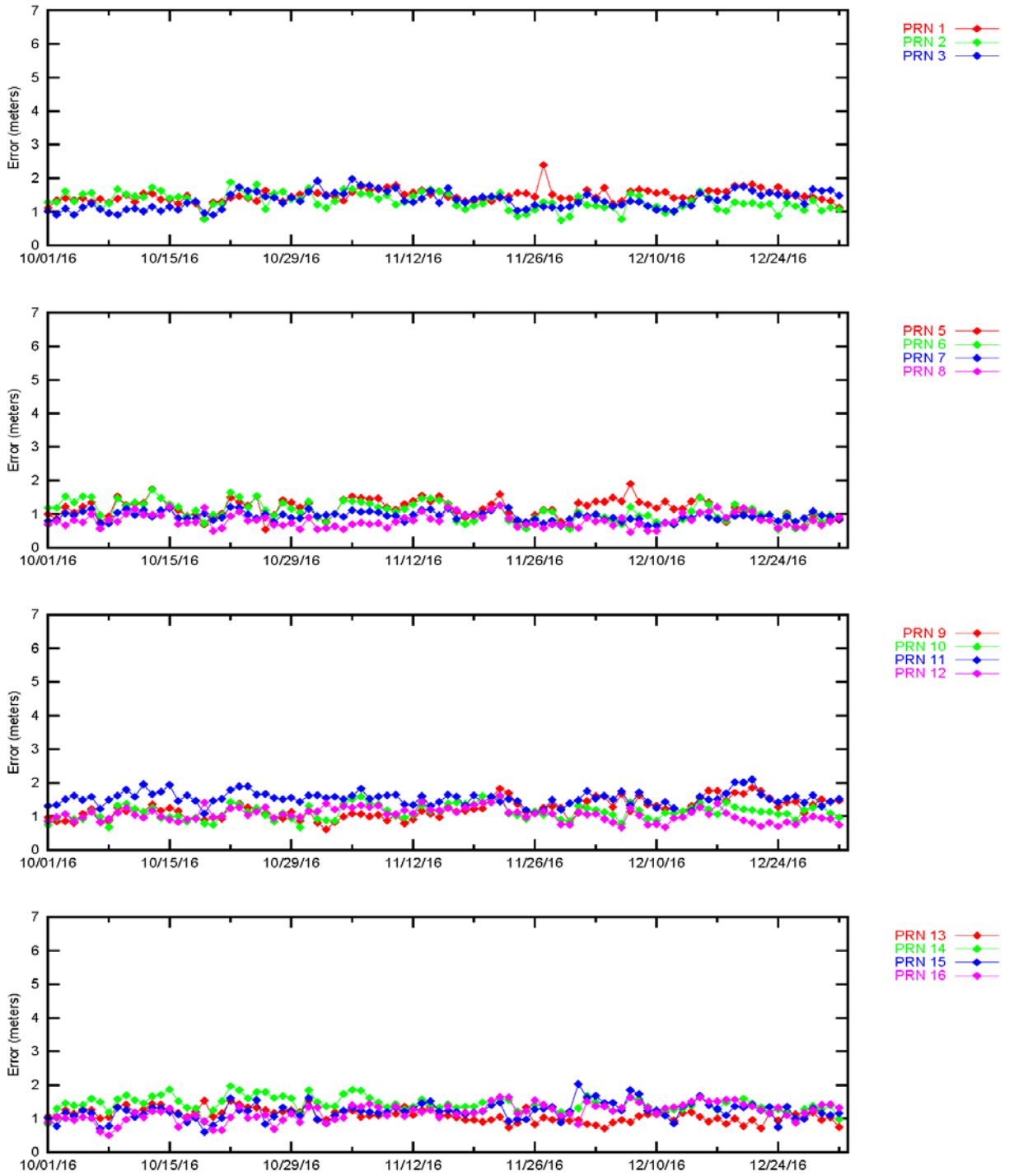


Figure 6-2 95% Range Error (PRN-17 – PRN-32) – Washington D.C.

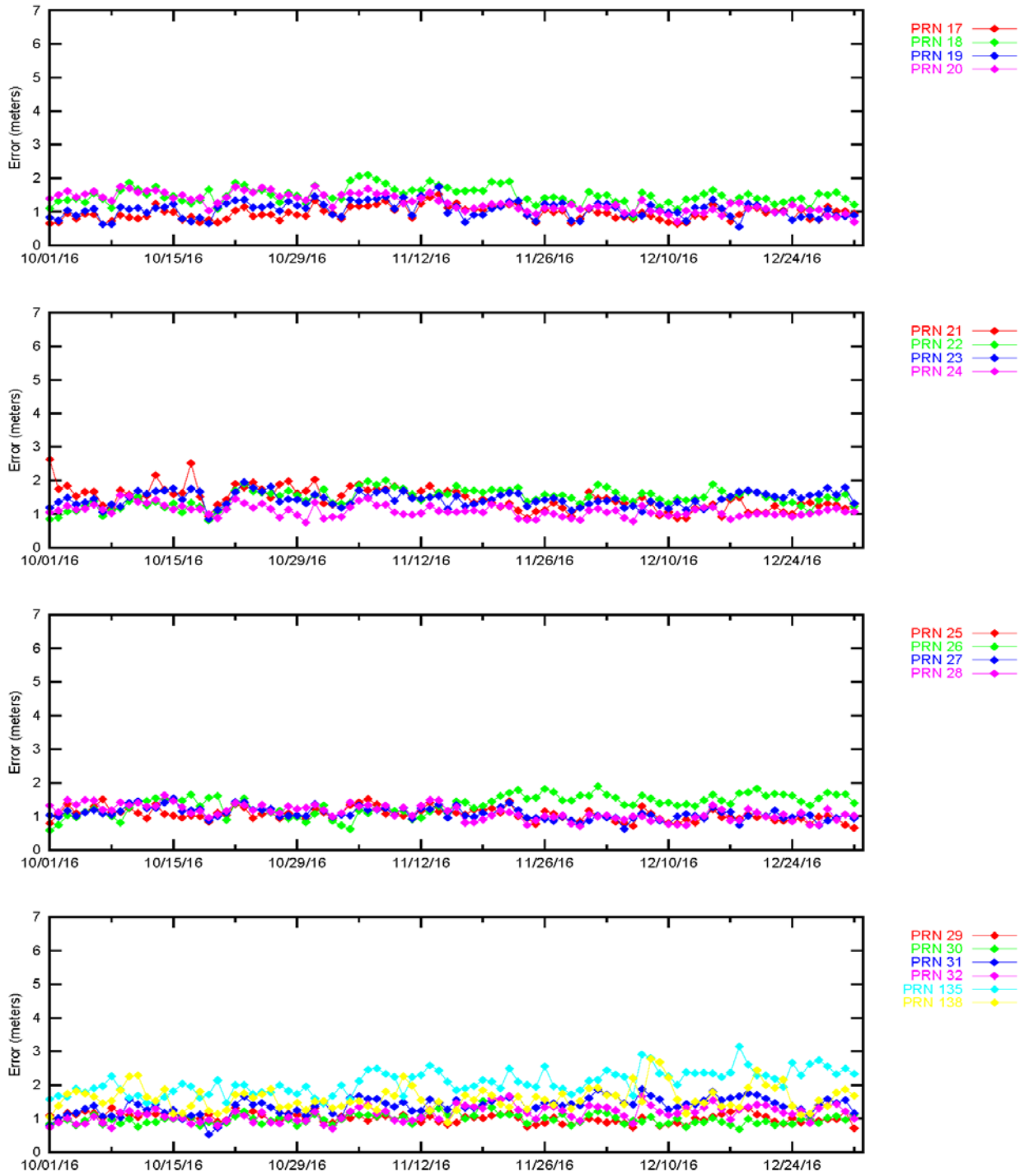


Figure 6-3 95% Ionospheric Error (PRN-1 – PRN-16) – Washington D.C.

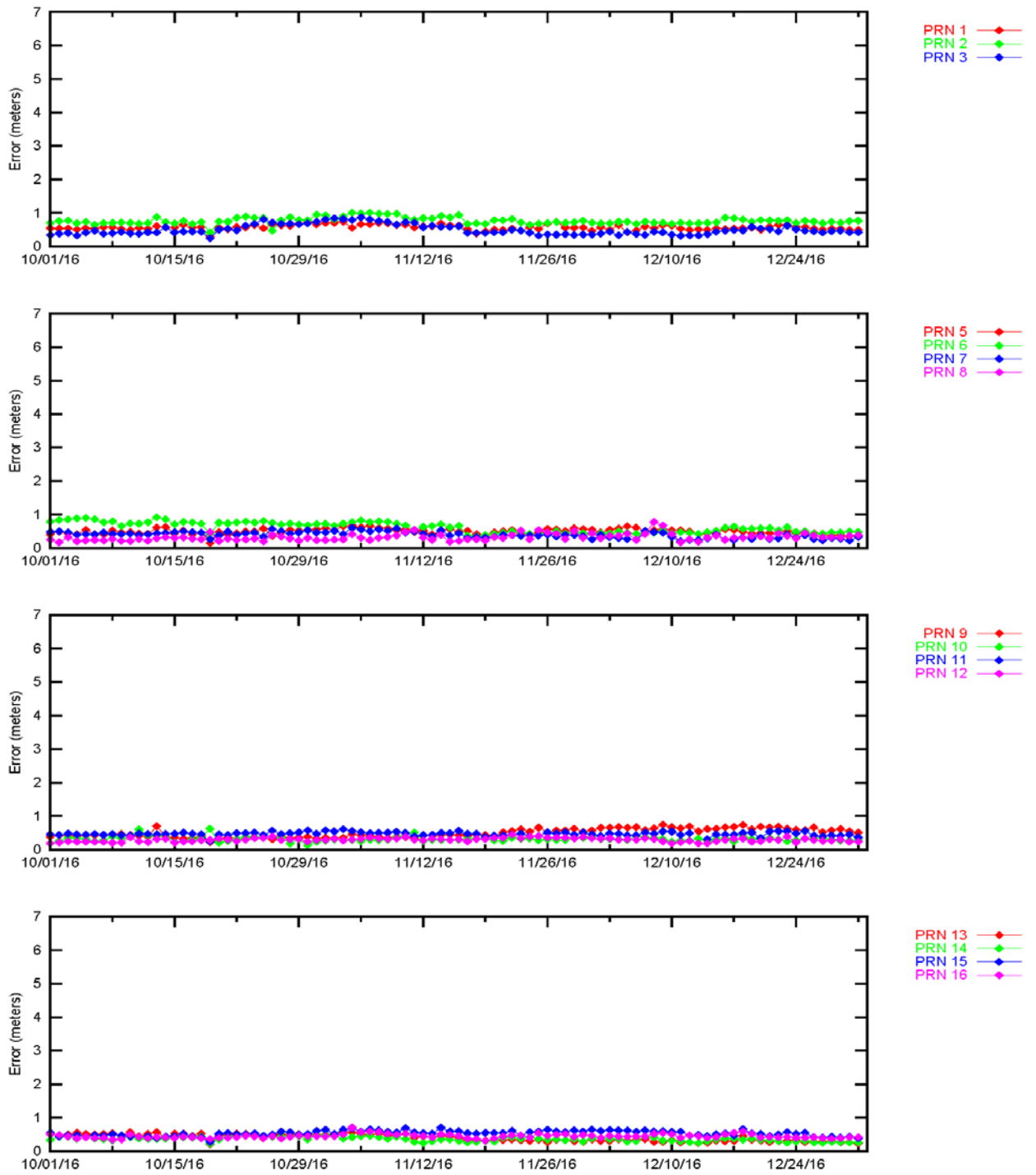
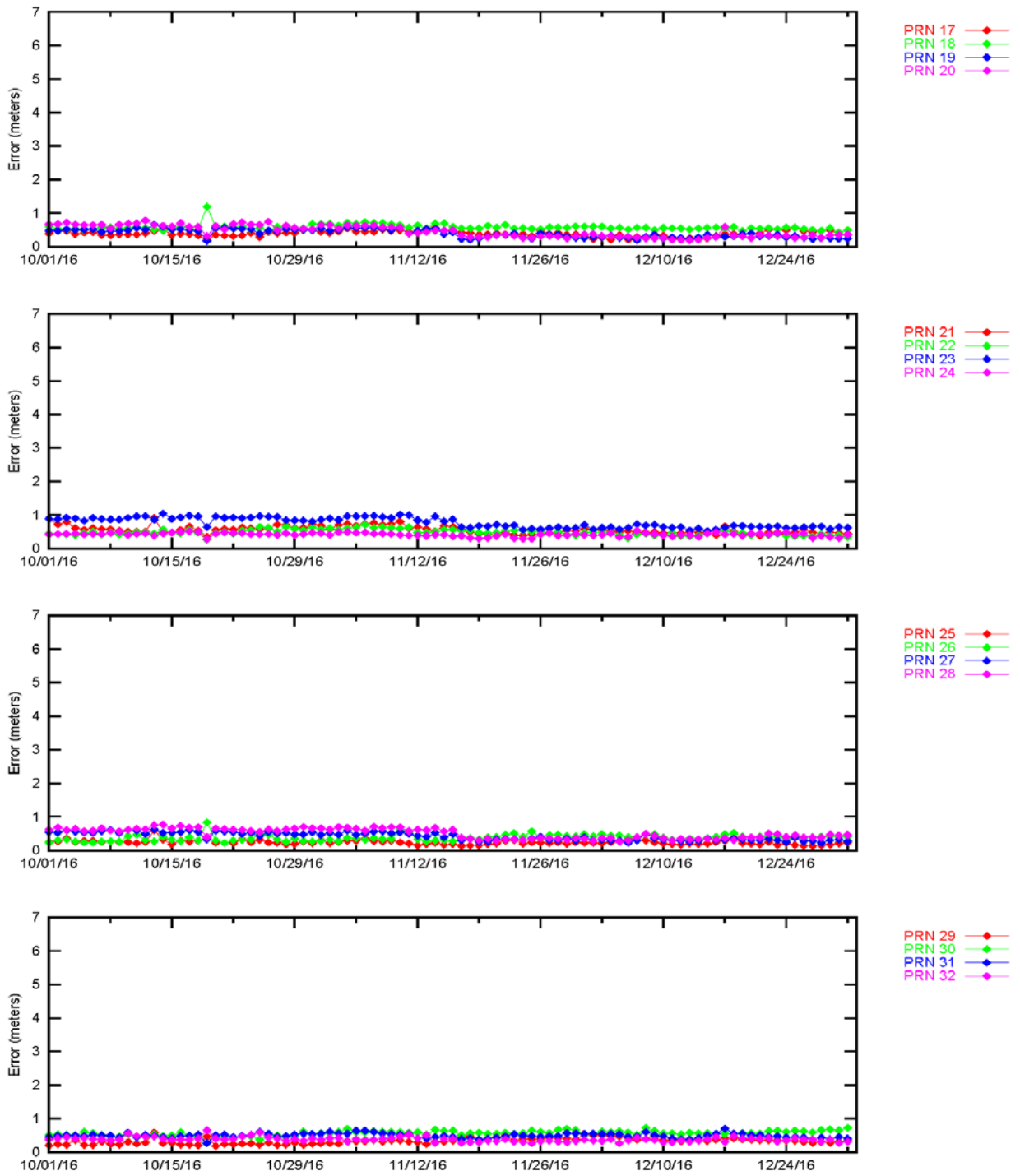


Figure 6-4 95% Ionospheric Error (PRN-17 - PRN-32) – Washington D.C.



7.0 GEO RANGING PERFORMANCE

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

Table 7-1 shows the GEO PA and NPA ranging availability as well as the percentage of time the GEO UDRE was set to “Not Monitored” and “Do Not Use.” Figure 7-1 and Figure 7-2 show the trend of CRW GEO PA and CRE GEO PA ranging availability, respectively. Figure 7-3 shows the trend of AMR GEO NPA ranging availability.

The reductions in CRW GEO PA and CRE GEO PA ranging availability were due to GUS switchovers (see Figure 7-1 and Figure 7-2). Refer to Table 1-7 for detailed information on the GUS switchovers for this reporting period. Figure 7-3 shows AMR GEO NPA ranging was unavailable for this quarter. On July 18, 2015, the UDRE for AMR was indefinitely set to “Not Monitored,” which meant users can use WAAS corrections without the ranging capabilities.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
CRW 135	CRW	99.57	0.06	0.27	0.11
CRW 135	CRE	99.82	0.02	0.13	0.03
CRW 135	AMR	0.00	0.00	100.00	0.00
CRE 138	CRW	99.56	0.06	0.27	0.11
CRE 138	CRE	99.82	0.02	0.13	0.03
CRE 138	AMR	0.00	0.00	100.00	0.00
AMR 133	CRW	99.56	0.06	0.27	0.11
AMR 133	CRE	99.82	0.02	0.13	0.03
AMR 133	AMR	0.00	0.00	100.00	0.00

Figure 7-1 Daily PA CRW GEO Ranging Availability Trend

CRW PA-Ranging Performance reported by AMR, CRW, and CRE
1 October - 31 December 2016

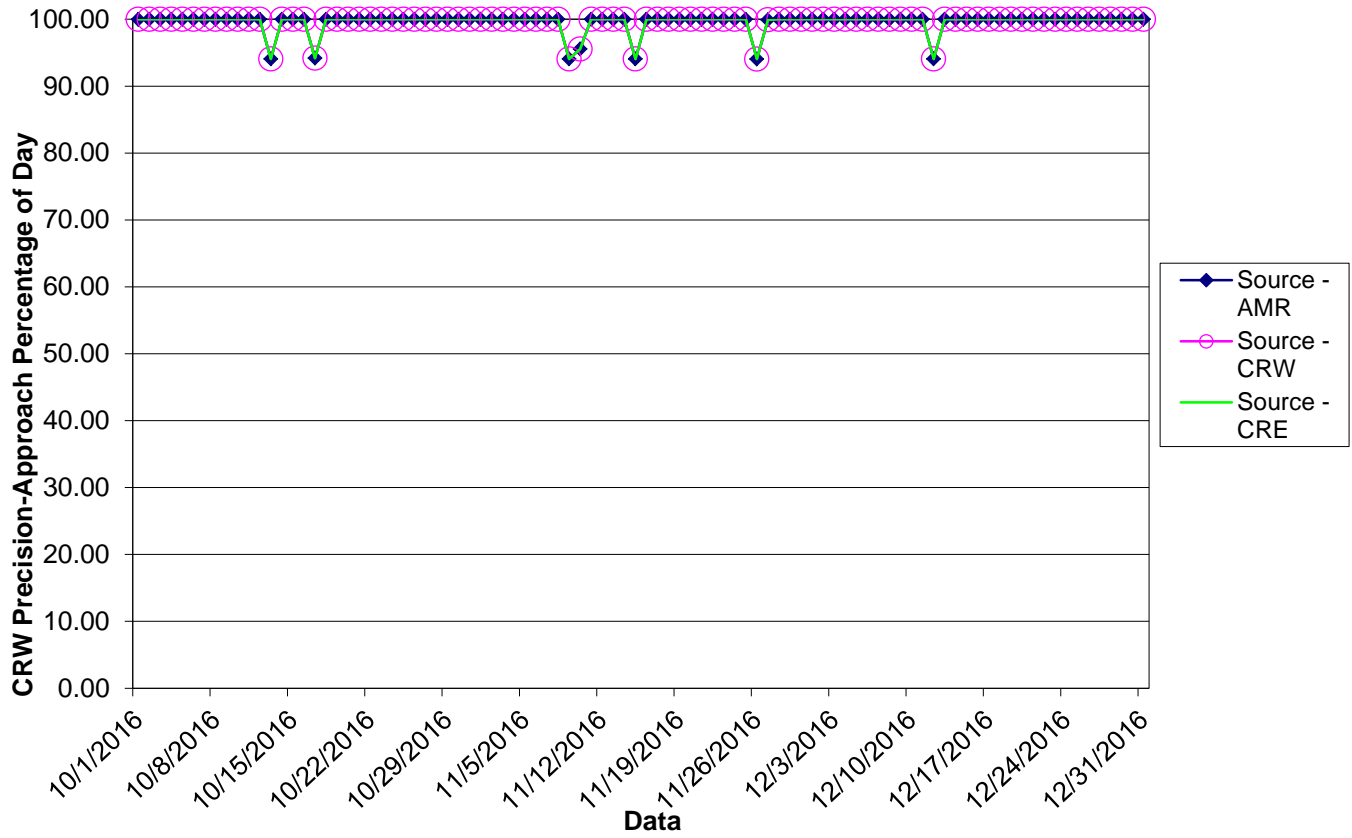


Figure 7-2 Daily PA CRE GEO Ranging Availability Trend

CRE PA-Ranging Performance reported by AMR, CRW, and CRE
1 October - 31 December 2016

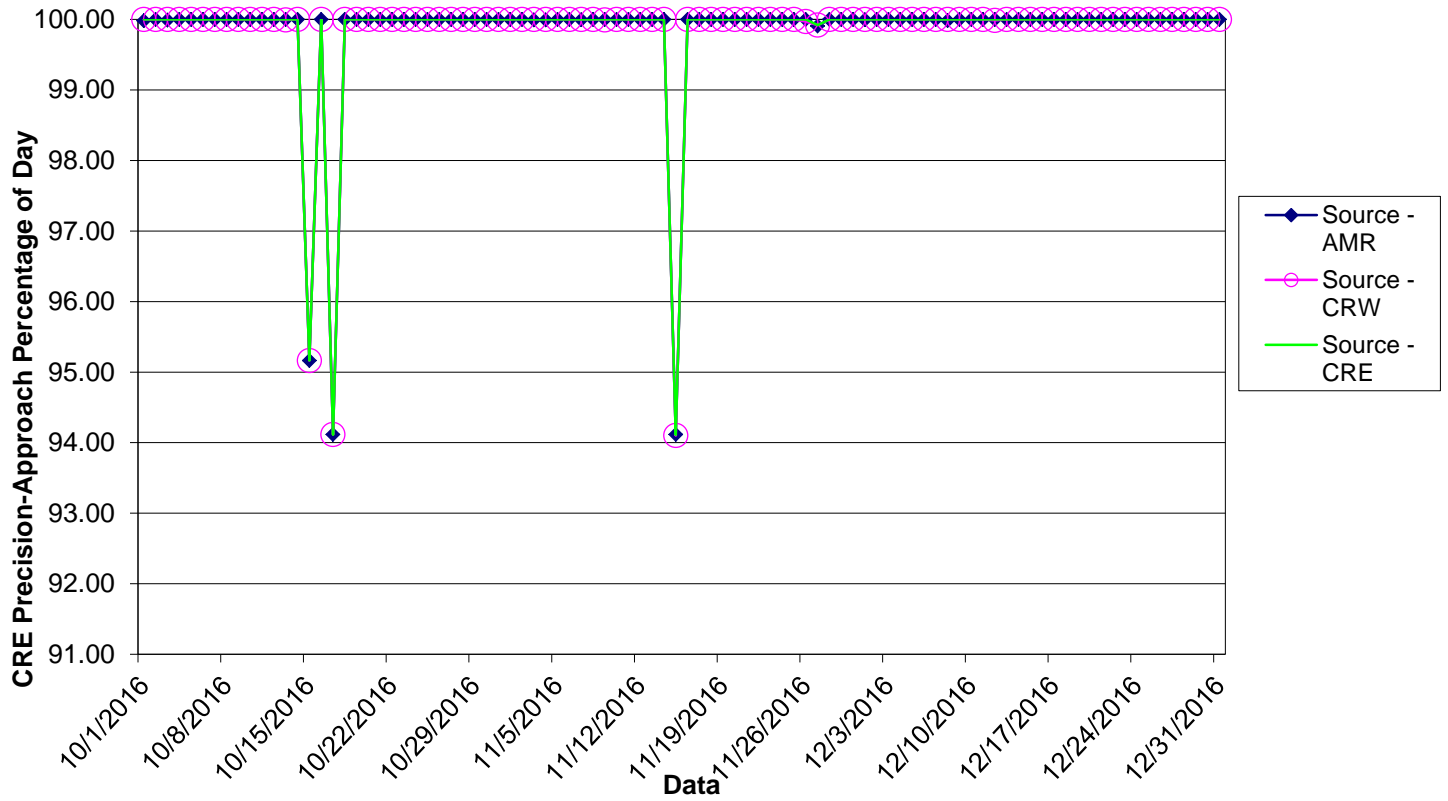
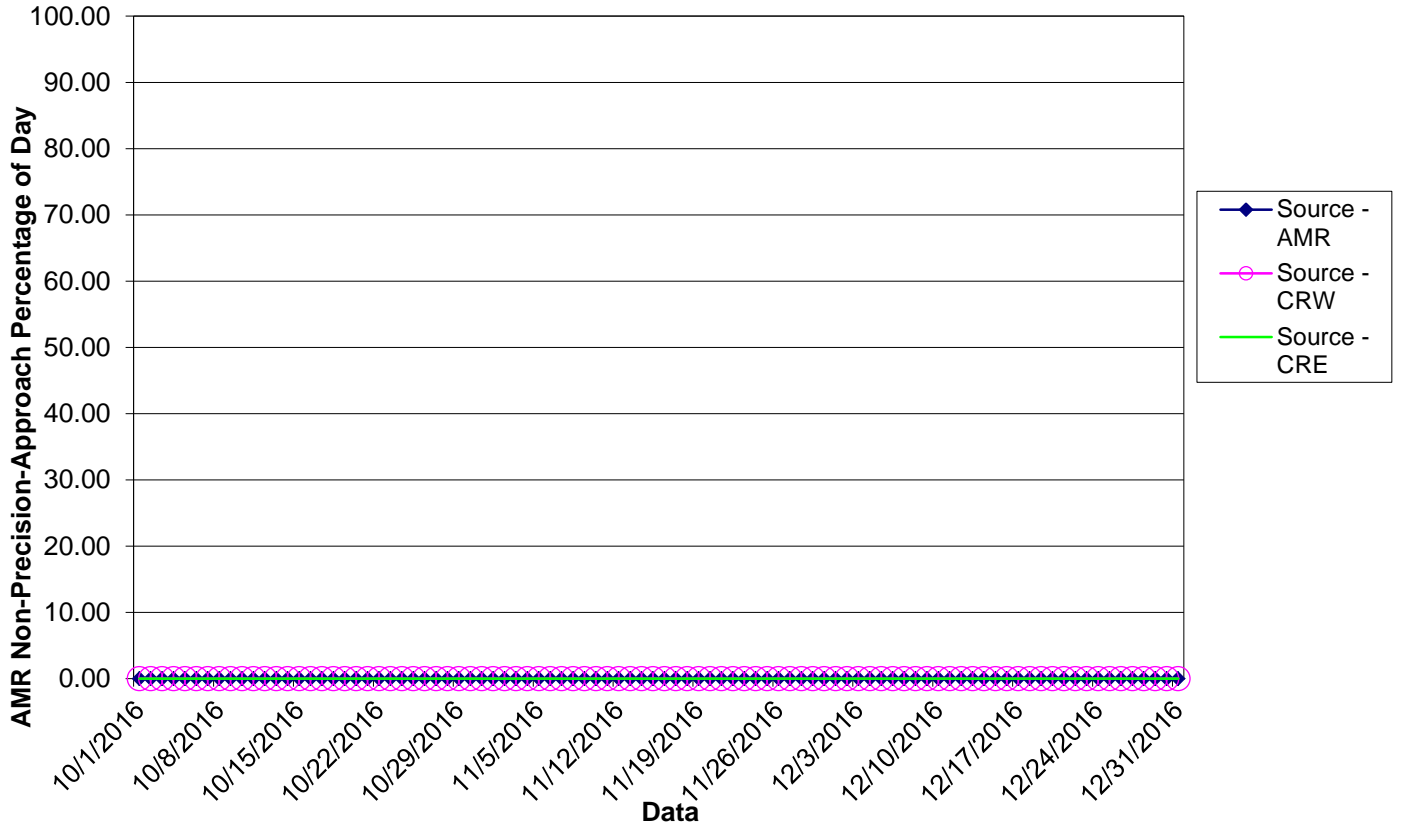


Figure 7-3 Daily NPA AMR GEO Ranging Availability Trend

**AMR NPA-Ranging Performance reported by AMR, CRW, and CRE
1 October - 31 December 2016**



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 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/>.

The interactive web page can be accessed by entering the web address into an Internet browser, selecting the current quarter from the drop-down menu on the upper left corner, and clicking “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” display WAAS availability for US airports with GPS RNAV IAPs; not selecting “Show all Airports” display only airports with approved LPV approaches are displayed, as shown in Table 8-1.

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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 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	0	100
6A8	ALLAKAKET	AK	LP	0	100	0	100	2	99.9985
7KA	TATITLEK	AK	LP	0	100	0	100	0	100
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	0	100
AKN	KING SALMON	AK	LPV	0	100	0	100	0	100
AKW	KLAWOCK	AK	LP	0	100	0	100	0	100
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	0	100
AQH	QUINHAGAK	AK	LPV	0	100	0	100	0	100
AQT	NUIQSUT	AK	LPV	0	100	0	100	15	99.9675
BET	BETHEL	AK	LPV200	0	100	0	100	0	100
BRW	WILEY POST-WILL ROGERS MEMORIA	AK	LPV	0	100	2	99.9898	111	99.1942
CDB	COLD BAY	AK	LPV200	0	100	0	100	1	99.994
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	0	100
CEM	CENTRAL	AK	LP	0	100	0	100	2	99.9989
CLP	CLARKS POINT	AK	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CXF	COLDFOOT	AK	LP	0	100	0	100	2	99.9921
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	0	100	0	100	7	99.9755
DLG	DILLINGHAM	AK	LPV	0	100	0	100	0	100
ELI	ELIM	AK	LPV	0	100	0	100	0	100
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	0	100
ENM	EMMONAK	AK	LPV	0	100	0	100	0	100
FAI	FAIRBANKS INTL	AK	LPV200	0	100	0	100	0	100
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	0	100
GAM	GAMBELL	AK	LPV	0	100	0	100	159	99.1135
GKN	GULKANA	AK	LPV	0	100	0	100	0	100
GST	GUSTAVUS	AK	LP	0	100	0	100	0	100
HLA	HUSLIA	AK	LPV	0	100	0	100	0	100
HOM	HOMER	AK	LPV	0	100	0	100	0	100
HPB	HOOPER BAY	AK	LP	0	100	0	100	0	100
ILI	ILIAMNA	AK	LPV	0	100	0	100	0	100
IYS	WASILLA	AK	LPV	0	100	0	100	0	100
KAL	KALTAG	AK	LPV	0	100	0	100	0	100
KSM	ST MARY'S	AK	LPV200	0	100	0	100	0	100
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	0	100
KTS	BREVIG MISSION	AK	LPV	0	100	0	100	8	99.9562
KWT	KWETHLUK	AK	LPV	0	100	0	100	0	100
KYU	KOYUKUK	AK	LPV	0	100	0	100	0	100
MCG	MC GRATH	AK	LP	0	100	0	100	0	100
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	0	100
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	0	100
OME	NOME	AK	LPV	0	100	0	100	3	99.9808
OOK	TOKSOOK BAY	AK	LP	0	100	0	100	0	100
ORT	NORTHWAY	AK	LP	0	100	0	100	0	100
OTZ	RALPH WIEN MEMORIAL	AK	LPV	0	100	0	100	6	99.9634
PAQ	PALMER MUNICIPAL	AK	LP	0	100	0	100	0	100
PHO	POINT HOPE	AK	LPV	0	100	0	100	91	99.6886
RBY	RUBY	AK	LPV	0	100	0	100	0	100
SCC	DEADHORSE	AK	LPV	0	100	0	100	40	99.9234
SCM	SCAMMON BAY	AK	LP	0	100	0	100	0	100
SHG	SHUNGNAK	AK	LP	0	100	0	100	1	99.9996
SHX	SHAGELUK	AK	LPV	0	100	0	100	0	100
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	0	100
SMK	ST MICHAEL	AK	LPV	0	100	0	100	0	100
SXQ	SOLDOTNA	AK	LP	0	100	0	100	0	100
UNK	UNALAKLEET	AK	LP	0	100	0	100	0	100
WLK	SELAWIK	AK	LPV	0	100	0	100	0	100
WMO	WHITE MOUNTAIN	AK	LP	0	100	0	100	0	100
WNA	NAPAKIAK	AK	LPV	0	100	0	100	0	100
YAK	YAKUTAT	AK	LPV200	0	100	0	100	0	100
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	100	0	100	0	100
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	0	100	0	100
0R1	ATMORE MUNICIPAL	AL	LP	0	100	0	100	0	100
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
12J	BREWTON MUNICIPAL	AL	LPV	0	100	0	100	0	100
1M4	POSEY FIELD	AL	LPV	0	100	0	100	0	100
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	100	0	100	0	100
2R5	ST ELMO	AL	LPV	0	100	0	100	0	100
33J	GENEVA MUNICIPAL	AL	LP	0	100	0	100	0	100
3M8	NORTH PICKENS	AL	LP	0	100	0	100	0	100
4A9	ISBELL FIELD	AL	LPV	0	100	0	100	0	100
5R1	ROY WILCOX	AL	LP	0	100	0	100	0	100
5R4	FOLEY MUNICIPAL	AL	LPV	0	100	0	100	0	100
71J	BLACKWELL FIELD	AL	LPV	0	100	0	100	0	100
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	0	100	0	100	0	100
8A0	ALBERTVILLE RGNL-THOMAS J BRUM	AL	LPV	0	100	0	100	0	100
9A4	COURTLAND	AL	LPV200	0	100	0	100	0	100
A08	VAIDEN FIELD	AL	LPV	0	100	0	100	0	100
ALX	THOMAS C RUSSELL FLD	AL	LPV	0	100	0	100	0	100
ANB	ANNISTON RGNL	AL	LPV	0	100	0	100	0	100
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	100	0	100	0	100
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	100	0	100	0	100
BFM	MOBILE DOWNTOWN	AL	LPV200	0	100	0	100	0	100
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	0	100	0	100	0	100
CMD	CULLMAN RGNL-FOLSOM FIELD	AL	LPV	0	100	0	100	0	100
CQF	H L SONNY CALLAHAN	AL	LPV200	0	100	0	100	0	100
DCU	PRYOR FIELD RGNL	AL	LPV200	0	100	0	100	0	100
DHN	DOTHAN RGNL	AL	LPV200	0	100	0	100	0	100
DYA	DEMOPOLIS RGNL	AL	LPV	0	100	0	100	0	100
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	100	0	100	0	100
EET	SHELBY COUNTY	AL	LPV	0	100	0	100	0	100
EKY	BESSEMER	AL	LPV	0	100	0	100	0	100
EUF	WEEDON FIELD	AL	LPV	0	100	0	100	0	100
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	100	0	100	0	100
GZH	MIDDLETON FIELD	AL	LP	0	100	0	100	0	100
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	100	0	100	0	100
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	0	100	0	100	0	100
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	100	0	100	0	100
JKA	JACK EDWARDS	AL	LPV200	0	100	0	100	0	100
M95	RICHARD ARTHUR FIELD	AL	LPV	0	100	0	100	0	100
MDQ	HUNTSVILLE EXECUTIVE AIRPORT T	AL	LPV200	0	100	0	100	0	100
MGM	MONTGOMERY RGNL (DANNELLY FIEL	AL	LPV200	0	100	0	100	0	100
MOB	MOBILE RGNL	AL	LPV200	0	100	0	100	0	100
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	0	100	0	100
PLR	ST CLAIR COUNTY	AL	LPV	0	100	0	100	0	100
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	0	100	0	100	0	100
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	100	0	100	0	100
SEM	CRAIG FIELD	AL	LPV200	0	100	0	100	0	100
TCL	TUSCALOOSA RGNL	AL	LPV	0	100	0	100	0	100
TOI	TROY MUNICIPAL AIRPORT AT N KENNETH	AL	LPV	0	100	0	100	0	100
0M0	BILLY FREE MUNICIPAL	AR	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	0	100	0	100
4M3	CARLISLE MUNICIPAL	AR	LPV	0	100	0	100	0	100
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	0	100	0	100
7M1	MC GEHEE MUNICIPAL	AR	LP	0	100	0	100	0	100
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	LPV200	0	100	0	100	0	100
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	0	100
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	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
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	0	100
M18	HOPE MUNICIPAL	AR	LP	0	100	0	100	0	100
M19	NEWPORT 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	0	100
PBF	GRIDER FIELD	AR	LPV	0	100	0	100	0	100
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	AR	LPV	0	100	0	100	0	100
SLG	SMITH FIELD	AR	LPV	0	100	0	100	0	100
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	0	100	0	100
SUZ	SALINE COUNTY RGNL	AR	LPV	0	100	0	100	0	100
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	0	100	0	100
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	0	100	0	100
FFZ	FALCON FLD	AZ	LP	0	100	0	100	0	100
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	0	100	0	100
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	0	100
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	0	100	0	100
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	0	100
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	0	100
IGM	KINGMAN	AZ	LPV	0	100	0	100	0	100
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	0	100	0	100
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	0	100
P33	COCHISE COUNTY	AZ	LPV	0	100	0	100	0	100
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	0	100
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	0	100	0	100
PRC	ERNEST A LOVE FIELD	AZ	LPV200	0	100	0	100	0	100
RQE	WINDOW ROCK	AZ	LP	0	100	0	100	0	100
SAD	SAFFORD RGNL	AZ	LPV	0	100	0	100	0	100
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	100	0	100	0	100
SOW	SHOW LOW RGNL	AZ	LPV	0	100	0	100	0	100
TUS	TUCSON INTL	AZ	LPV	0	100	0	100	0	100
CYBL	CAMPBELL RIVER	BC	LPV	0	100	0	100	0	100
CYCD	NANAIMO	BC	LPV	0	100	0	100	0	100
CYVR	VANCOUVER INTL	BC	LPV	0	100	0	100	0	100
CYXS	PRINCE GEORGE	BC	LPV	0	100	0	100	0	100
CYYJ	VICTORIA INTL	BC	LPV	0	100	0	100	0	100
CZBB	VANCOUVER / BOUNDARY BAY	BC	LPV	0	100	0	100	0	100
AAT	ALTURAS MUNICIPAL	CA	LPV	0	100	0	100	0	100
ACV	ARCATA	CA	LPV200	0	100	0	100	35	99.9234
APC	NAPA COUNTY	CA	LPV	0	100	0	100	92	99.338
APV	APPLE VALLEY	CA	LPV	0	100	0	100	0	100
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	1	99.9977
BFL	MEADOWS FIELD	CA	LPV200	0	100	0	100	48	99.9487
BLH	BLYTHE	CA	LP	0	100	0	100	0	100
C83	BYRON	CA	LPV	0	100	0	100	92	99.4988
CCB	CABLE	CA	LP	0	100	0	100	0	100
CCR	BUCHANAN FIELD	CA	LPV	0	100	0	100	92	99.3712
CEC	JACK MC NAMARA FIELD	CA	LPV	0	100	0	100	40	99.9317
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	0	100
CMA	CAMARILLO	CA	LPV	0	100	0	100	55	99.9253
CNO	CHINO	CA	LPV	0	100	0	100	0	100
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	0	100	0	100
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	0	100	92	99.441
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	0	100
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	63	99.7022
F70	FRENCH VALLEY	CA	LPV	0	100	0	100	0	100
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	52	99.9068
HAF	HALF MOON BAY	CA	LPV	0	100	0	100	92	99.1519
HHR	JACK NORTHROP FIELD/HAWTHORNE	CA	LPV	0	100	0	100	5	99.9981
HWD	HAYWARD EXECUTIVE	CA	LPV	0	100	0	100	92	99.2912
L35	BIG BEAR CITY	CA	LP	0	100	0	100	0	100
LAX	LOS ANGELES INTL	CA	LPV	0	100	0	100	10	99.9962
LGB	LONG BEACH /DAUGHERTY FIELD/	CA	LPV	0	100	0	100	0	100
LHM	LINCOLN RGNL/KARL HARDER FIELD	CA	LPV200	0	100	0	100	2	99.9974
LLR	LITTLE RIVER	CA	LP	0	100	0	100	92	99.1519
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	0	100	92	99.6309
LVK	LIVERMORE MUNICIPAL	CA	LPV	0	100	0	100	92	99.4059
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	67	99.8449
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	100	0	100	80	99.7803

Airport Id	Airport Name	State/Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
MER	CASTLE	CA	LPV200	0	100	0	100	78	99.7815
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	24	99.9509
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	100	0	100	55	99.9279
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	100	0	100	89	99.7098
MRY	MONTEREY RGNL	CA	LPV	0	100	0	100	92	99.2863
MYF	MONTGOMERY FIELD	CA	LPV200	0	100	0	100	0	100
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	1	99.9977
O02	NERVINO	CA	LPV	0	100	0	100	0	100
O27	OAKDALE	CA	LPV	0	100	0	100	72	99.7898
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	92	99.2248
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	92	99.569
OAK	METROPOLITAN OAKLAND INTL	CA	LPV200	0	100	0	100	92	99.2652
ONT	ONTARIO INTL	CA	LPV	0	100	0	100	0	100
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	0	100
OXR	OXNARD	CA	LPV	0	100	0	100	62	99.9053
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	0	100	0	100
POC	BRACKETT FIELD	CA	LPV	0	100	0	100	0	100
PRB	PASO ROBLES MUNICIPAL	CA	LPV200	0	100	0	100	92	99.5773
PVF	PLACERVILLE	CA	LPV	0	100	0	100	1	99.9977
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	0	100	0	100
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	1	99.9989
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	0	100
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	0	100	92	99.3474
SAC	SACRAMENTO EXECUTIVE	CA	LPV	0	100	0	100	53	99.8094
SAN	SAN DIEGO INTL	CA	LPV	0	100	0	100	0	100
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	0	100	92	99.7452
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	0	100	92	99.5479
SCK	STOCKTON METROPOLITAN	CA	LPV	0	100	0	100	88	99.6709
SDM	BROWN FIELD MUNICIPAL	CA	LPV200	0	100	0	100	0	100
SEE	GILLESPIE FIELD	CA	LP	0	100	0	100	0	100
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	0	100	92	99.2033
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	0	100	92	99.3188
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	30	99.937
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	0	100	92	99.5822
SNA	JOHN WAYNE AIRPORT-ORANGE COUN	CA	LPV200	0	100	0	100	0	100
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	0	100	92	99.3641
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	92	99.1965
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	92	99.5384
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	0	100
TOA	ZAMPERINI FIELD	CA	LPV	0	100	0	100	4	99.9985
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	0	100
VCB	NUT TREE	CA	LPV	0	100	0	100	92	99.5267
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	0	100	0	100
VIS	VISALIA MUNICIPAL	CA	LPV200	0	100	0	100	50	99.9355
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	0	100	1	99.9996
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	100	0	100	2	99.9974
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	0	100	92	99.3312
1V6	FREMONT COUNTY	CO	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	0	100	0	100	0	100
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	0	100	0	100
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	0	100	0	100
APA	CENTENNIAL	CO	LPV200	0	100	0	100	0	100
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	100	0	100	0	100
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	0	100	0	100
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	0	100
FMM	FORT MORGAN MUNICIPAL	CO	LP	0	100	0	100	0	100
FNL	FORT COLLINS-LOVELAND MUNICIPAL	CO	LPV200	0	100	0	100	0	100
FTG	FRONT RANGE	CO	LPV200	0	100	0	100	0	100
GJT	GRAND JUNCTION REGIONAL	CO	LPV200	0	100	0	100	0	100
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	0	100
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	0	100
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	0	100
LAA	LAMAR MUNICIPAL	CO	LPV	0	100	0	100	0	100
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	0	100
LMO	VANCE BRAND	CO	LPV	0	100	0	100	0	100
MTJ	MONTROSE RGNL	CO	LPV	0	100	0	100	0	100
PUB	PUEBLO MEMORIAL	CO	LPV200	0	100	0	100	0	100
RIL	GARFIELD COUNTY RGNL	CO	LPV	0	100	0	100	0	100
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	0	100
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	0	100
4B8	ROBERTSON FIELD	CT	LP	0	100	0	100	0	100
BDL	BRADLEY INTL	CT	LPV200	0	100	0	100	0	100
GON	GROTON-NEW LONDON	CT	LPV	0	100	0	100	0	100
HVN	TWEED-NEW HAVEN	CT	LPV	0	100	0	100	0	100
IJD	WINDHAM	CT	LP	0	100	0	100	0	100
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	0	100	0	100	0	100
OXC	WATERBURY-OXFORD	CT	LPV	0	100	0	100	0	100
DCA	RONALD REAGAN WASHINGTON NATIO	DC	LPV	0	100	0	100	0	100
HEF	MANASSAS RGNL/HARRY P DAVIS FI	DC	LPV	0	100	0	100	0	100
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	100	0	100	0	100
33N	DELAWARE AIRPARK	DE	LP	0	100	0	100	0	100
EVY	SUMMIT	DE	LPV	0	100	0	100	0	100
GED	DELAWARE COASTAL	DE	LPV	0	100	0	100	0	100
ILG	NEW CASTLE	DE	LPV	0	100	0	100	0	100
1J0	TRI-COUNTY	FL	LP	0	100	0	100	0	100
24J	SUWANNEE COUNTY	FL	LPV	0	100	0	100	0	100
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	0	100
40J	PERRY-FOLEY	FL	LPV	0	100	0	100	0	100
54J	DEFUNIAK SPRINGS	FL	LP	0	100	0	100	0	100
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	0	100	0	100
APF	NAPLES MUNICIPAL	FL	LPV	0	100	0	100	3	99.9955
AVO	AVON PARK EXECUTIVE	FL	LPV	0	100	0	100	0	100
BCT	BOCA RATON	FL	LPV	0	100	0	100	1	99.9996
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BOW	BARTOW MUNICIPAL	FL	LPV	0	100	0	100	0	100
CEW	BOB SIKES	FL	LPV	0	100	0	100	0	100
CGC	CRYSTAL RIVER-CAPTAIN TOM DAVI	FL	LP	0	100	0	100	0	100
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	0	100	0	100
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	0	100
CRG	JACKSONVILLE EXECUTIVE AT CRAI	FL	LPV200	0	100	0	100	0	100
CTY	CROSS CITY	FL	LPV	0	100	0	100	0	100
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	0	100
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FI	FL	LPV	0	100	0	100	0	100
DTS	DESTIN EXECUTIVE	FL	LPV	0	100	0	100	0	100
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	0	100	0	100
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	0	100
EYW	KEY WEST INTL	FL	LPV	0	100	0	100	3	99.9879
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	0	100	1	99.9996
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	0	100	0	100
FIN	FLAGLER COUNTY	FL	LPV	0	100	0	100	0	100
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV	0	100	0	100	2	99.9981
FMY	PAGE FIELD	FL	LPV	0	100	0	100	3	99.9985
FPR	ST LUCIE COUNTY INTL	FL	LPV	0	100	0	100	1	99.9996
FXE	FORT LAUDERDALE EXECUTIVE	FL	LPV200	0	100	0	100	2	99.9992
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	100	0	100	0	100
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	0	100
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	0	100
IMM	IMMOKALEE RGNL	FL	LPV	0	100	0	100	3	99.9985
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	0	100
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	0	100
LAL	LAKELAND LINDER RGNL	FL	LPV200	0	100	0	100	0	100
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	0	100	0	100
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	0	100
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	0	100	2	99.9992
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	0	100
MIA	MIAMI INTL	FL	LPV200	0	100	0	100	3	99.9966
MKY	MARCO ISLAND	FL	LPV	0	100	0	100	3	99.9943
MLB	MELBOURNE INTL	FL	LPV200	0	100	0	100	0	100
MTH	THE FLORIDA KEYS MARATHON	FL	LPV	0	100	0	100	3	99.9883
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	0	100	1	99.9996
OCF	OCALA INTL-JIM TAYLOR FIELD	FL	LPV200	0	100	0	100	0	100
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	0	100
OPF	OPA-LOCKA EXECUTIVE	FL	LPV200	0	100	0	100	3	99.9974
ORL	EXECUTIVE	FL	LPV200	0	100	0	100	0	100
PBI	PALM BEACH INTL	FL	LPV200	0	100	0	100	1	99.9996
PCM	PLANT CITY	FL	LPV	0	100	0	100	0	100
PGD	PUNTA GORDA	FL	LPV200	0	100	0	100	0	100
PHK	PALM BEACH CO GLADES	FL	LPV	0	100	0	100	1	99.9996
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	0	100	0	100
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	0	100	5	99.9981
PNS	PENSACOLA INTL	FL	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	0	100	3	99.9981
SEF	SEBRING RGNL	FL	LPV	0	100	0	100	0	100
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	0	100
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	0	100
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	0	100	0	100
SUA	WITHAM FIELD	FL	LPV	0	100	0	100	1	99.9996
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	0	100
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	0	100	0	100
TMB	MIAMI EXECUTIVE	FL	LPV200	0	100	0	100	3	99.9958
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	0	100	3	99.9955
TPA	TAMPA INTL	FL	LPV200	0	100	0	100	0	100
TPF	PETER O KNIGHT	FL	LP	0	100	0	100	0	100
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	0	100
VDF	TAMPA EXECUTIVE	FL	LPV	0	100	0	100	0	100
VNC	VENICE MUNICIPAL	FL	LP	0	100	0	100	0	100
VQQ	CECIL	FL	LPV200	0	100	0	100	0	100
VRB	VERO BEACH MUNICIPAL	FL	LPV200	0	100	0	100	1	99.9996
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	0	100	0	100
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	0	100	2	99.9992
X23	UMATILLA MUNICIPAL	FL	LP	0	100	0	100	0	100
X26	SEBASTIAN MUNICIPAL	FL	LP	0	100	0	100	1	99.9996
X35	MARION COUNTY	FL	LP	0	100	0	100	0	100
X50	MASSEY RANCH AIRPARK	FL	LP	0	100	0	100	0	100
X51	HOMESTEAD GENERAL AVIATION	FL	LPV	0	100	0	100	3	99.9943
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	0	100	0	100
09J	JEKYLL ISLAND	GA	LPV200	0	100	0	100	0	100
15J	COOK COUNTY	GA	LPV	0	100	0	100	0	100
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	0	100	0	100
18A	FRANKLIN COUNTY	GA	LPV	0	100	0	100	0	100
19A	JACKSON COUNTY	GA	LPV	0	100	0	100	0	100
2J5	MILLEN	GA	LPV	0	100	0	100	0	100
3J7	GREENE COUNTY RGNL	GA	LPV	0	100	0	100	0	100
48A	COCHRAN	GA	LPV	0	100	0	100	0	100
4A4	POLK COUNTY AIRPORT- CORNELIUS	GA	LPV	0	100	0	100	0	100
4J1	BRANTLEY COUNTY	GA	LPV	0	100	0	100	0	100
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	0	100	0	100
52A	MADISON MUNICIPAL	GA	LP	0	100	0	100	0	100
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	0	100	0	100
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	100	0	100	0	100
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	0	100	0	100
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	0	100	0	100
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	0	100	0	100
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	0	100	0	100
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	0	100	0	100	0	100
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	0	100	0	100
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	0	100	0	100
BIJ	EARLY COUNTY	GA	LPV	0	100	0	100	0	100
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	0	100	0	100
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	0	100	0	100
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	0	100	0	100
CNI	CHEROKEE COUNTY	GA	LPV	0	100	0	100	0	100
CSG	COLUMBUS	GA	LPV	0	100	0	100	0	100
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	0	100	0	100
CVC	COVINGTON MUNICIPAL	GA	LPV	0	100	0	100	0	100
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	100	0	100	0	100
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	0	100	0	100
CZL	TOM B DAVID FLD	GA	LPV	0	100	0	100	0	100
D73	MONROE-WALTON COUNTY	GA	LP	0	100	0	100	0	100
DNN	DALTON MUNICIPAL	GA	LPV	0	100	0	100	0	100
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	0	100	0	100
EBA	ELBERT COUNTY-PATZ FIELD	GA	LP	0	100	0	100	0	100
EZM	HEART OF GEORGIA RGNL	GA	LPV200	0	100	0	100	0	100
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV200	0	100	0	100	0	100
FTY	FULTON COUNTY AIRPORT-BROWN FI	GA	LPV	0	100	0	100	0	100
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	0	100	0	100
GVL	LEE GILMER MEMORIAL	GA	LPV	0	100	0	100	0	100
HOE	HOMERVILLE	GA	LPV	0	100	0	100	0	100
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	100	0	100	0	100
IYY	WASHINGTON-WILKES COUNTY	GA	LPV	0	100	0	100	0	100
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	0	100	0	100
JYL	PLANTATION ARPK	GA	LPV	0	100	0	100	0	100
JZP	PICKENS COUNTY	GA	LPV	0	100	0	100	0	100
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	100	0	100	0	100
LZU	GWINNETT COUNTY - BRISCOE FIEL	GA	LPV200	0	100	0	100	0	100
MAC	MACON DOWNTOWN	GA	LP	0	100	0	100	0	100
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	100	0	100	0	100
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	0	100	0	100
MLJ	BALDWIN COUNTY	GA	LPV	0	100	0	100	0	100
MQW	TELFAIR-WHEELER	GA	LPV	0	100	0	100	0	100
OKZ	KAOLIN FIELD	GA	LPV	0	100	0	100	0	100
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	0	100	0	100
PIM	HARRIS COUNTY	GA	LPV	0	100	0	100	0	100
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	100	0	100	0	100
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	0	100	0	100
RMG	RICHARD B RUSSELL REGIONAL - J	GA	LPV	0	100	0	100	0	100
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	0	100	0	100	0	100
RYY	COBB COUNTY-MC COLLUM FIELD	GA	LPV200	0	100	0	100	0	100
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	100	0	100	0	100
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	100	0	100	0	100
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	100	0	100	0	100
TMA	HENRY TIFT MYERS	GA	LPV	0	100	0	100	0	100
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
TVI	THOMASVILLE RGNL	GA	LPV	0	100	0	100	0	100
VDI	VIDALIA RGNL	GA	LPV200	0	100	0	100	0	100
VLD	VALDOSTA RGNL	GA	LPV	0	100	0	100	0	100
VPC	CARTERSVILLE	GA	LPV	0	100	0	100	0	100
WDR	BARROW COUNTY	GA	LPV	0	100	0	100	0	100
4C8	ALBIA MUNICIPAL	IA	LPV	0	100	0	100	0	100
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	100	0	100	0	100
ALO	WATERLOO RGNL	IA	LPV	0	100	0	100	0	100
AMW	AMES MUNICIPAL	IA	LPV	0	100	0	100	0	100
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
BNW	BOONE MUNICIPAL	IA	LPV	0	100	0	100	0	100
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	100	0	100	0	100
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	100	0	100	0	100
CID	THE EASTERN IOWA	IA	LPV200	0	100	0	100	0	100
CIN	ARTHUR N NEU	IA	LPV	0	100	0	100	0	100
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
CSQ	CRESTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
CWI	CLINTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
DBQ	DUBUQUE RGNL	IA	LPV200	0	100	0	100	0	100
DEH	DECORAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
DNS	DENISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
DSM	DES MOINES INTL	IA	LPV	0	100	0	100	0	100
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	100	0	100	0	100
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	0	100	0	100	0	100
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	100	0	100	0	100
EOK	KEOKUK MUNICIPAL	IA	LPV	0	100	0	100	0	100
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
FOD	FORT DODGE RGNL	IA	LPV200	0	100	0	100	0	100
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
GCT	GUTHRIE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
GGI	GRINNELL RGNL	IA	LPV	0	100	0	100	0	100
HPT	HAMPTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
I75	OSCEOLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ICL	SCHENCK FIELD	IA	LPV	0	100	0	100	0	100
IFA	IOWA FALLS MUNICIPAL	IA	LPV	0	100	0	100	0	100
IIB	INDEPENDENCE MUNICIPAL	IA	LP	0	100	0	100	0	100
IKV	ANKENY RGNL	IA	LPV	0	100	0	100	0	100
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
LRJ	LE MARS MUNICIPAL	IA	LPV	0	100	0	100	0	100
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	0	100	0	100	0	100
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	100	0	100	0	100
MUT	MUSCATINE MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MXO	MONTICELLO RGNL	IA	LP	0	100	0	100	0	100
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	100	0	100	0	100
OQW	MAQUOKETA MUNICIPAL	IA	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
OTM	OTTUMWA RGNL	IA	LPV	0	100	0	100	0	100
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
PEA	PELLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	100	0	100	0	100
PRO	PERRY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
RDK	RED OAK MUNICIPAL	IA	LPV	0	100	0	100	0	100
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
SHL	SHELDON MUNICIPAL	IA	LPV	0	100	0	100	0	100
SKI	SAC CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	100	0	100	0	100
SPW	SPENCER MUNICIPAL	IA	LPV200	0	100	0	100	0	100
SUX	SIOUX GATEWAY/COL BUD DAY FIEL	IA	LPV200	0	100	0	100	0	100
TNU	NEWTON MUNICIPAL-EARL JOHNSON FIELD	IA	LPV	0	100	0	100	0	100
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	100	0	100	0	100
VTI	VINTON VETERANS MEMORIAL ARPK	IA	LPV	0	100	0	100	0	100
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV	0	100	0	100	0	100
COE	COEUR D'ALENE - PAPPY BOYINGTO	ID	LPV200	0	100	0	100	0	100
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	100	0	100	0	100
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	100	0	100	0	100
GNG	GOODING MUNICIPAL	ID	LPV	0	100	0	100	0	100
IDA	IDAHO FALLS RGNL	ID	LPV200	0	100	0	100	0	100
JER	JEROME COUNTY	ID	LPV	0	100	0	100	0	100
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	100	0	100	0	100
MAN	NAMPA MUNICIPAL	ID	LPV	0	100	0	100	0	100
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	0	100
PIH	POCATELLO RGNL	ID	LPV200	0	100	0	100	0	100
TWF	JOSLIN FIELD - MAGIC VALLEY RG	ID	LPV200	0	100	0	100	0	100
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	100	0	100	0	100
1H2	EFFINGHAM COUNTY MEMORIAL	IL	LPV	0	100	0	100	0	100
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	100	0	100	0	100
3MY	MOUNT HAWLEY AUXILIARY	IL	LP	0	100	0	100	0	100
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	100	0	100	0	100
ALN	ST LOUIS RGNL	IL	LPV200	0	100	0	100	0	100
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	0	100
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	100	0	100	0	100
BMI	CENTRAL IL RGNL ARPT AT BLOOMI	IL	LPV	0	100	0	100	0	100
C15	PEKIN MUNICIPAL	IL	LPV	0	100	0	100	0	100
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	0	100	0	100	0	100
C75	MARSHALL COUNTY	IL	LP	0	100	0	100	0	100
CIR	CAIRO RGNL	IL	LP	0	100	0	100	0	100
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	100	0	100	0	100
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	100	0	100	0	100
CTK	INGERSOLL	IL	LPV	0	100	0	100	0	100
CUL	CARMI MUNICIPAL	IL	LP	0	100	0	100	0	100
DEC	DECATUR	IL	LPV200	0	100	0	100	0	100
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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
HSB	HARRISBURG-RALEIGH	IL	LPV	0	100	0	100	0	100
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IGQ	LANSING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IKK	GREATER KANKAKEE	IL	LPV200	0	100	0	100	0	100
LOT	LEWIS UNIVERSITY	IL	LPV200	0	100	0	100	0	100
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	100	0	100	0	100
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	100	0	100	0	100
MLI	QUAD CITY INTL	IL	LPV200	0	100	0	100	0	100
MQB	MACOMB MUNICIPAL	IL	LPV200	0	100	0	100	0	100
MTO	COLES COUNTY MEMORIAL	IL	LPV	0	100	0	100	0	100
MVN	MOUNT VERNON	IL	LPV	0	100	0	100	0	100
MWA	WILLIAMSON COUNTY RGNL	IL	LPV200	0	100	0	100	0	100
OLY	OLNEY-NOBLE	IL	LPV	0	100	0	100	0	100
ORD	CHICAGO O'HARE INTL	IL	LPV200	0	100	0	100	0	100
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	0	100	0	100	0	100
PJY	PINCKNEYVILLE-DU QUOIN	IL	LPV	0	100	0	100	0	100
PNT	PONTIAC MUNICIPAL	IL	LPV	0	100	0	100	0	100
PWK	CHICAGO EXECUTIVE	IL	LPV	0	100	0	100	0	100
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	100	0	100	0	100
RPJ	ROCHELLE MUNICIPAL AIRPORT-KORITZ F	IL	LPV200	0	100	0	100	0	100
RSV	CRAWFORD CO	IL	LPV	0	100	0	100	0	100
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	0	100	0	100	0	100
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	0	100
SLO	SALEM-LECKRONE	IL	LPV200	0	100	0	100	0	100
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	100	0	100	0	100
SQI	WHITESIDE CO ARPT-JOS H BITTOR	IL	LPV	0	100	0	100	0	100
TIP	RANTOUL NATL AVN CNTR-FRANK EL	IL	LPV	0	100	0	100	0	100
UGN	WAUKEGAN RGNL	IL	LPV	0	100	0	100	0	100
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	0	100	0	100	0	100
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	0	100	0	100	0	100
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	0	100	0	100	0	100
4I7	PUTNAM COUNTY RGNL	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
CEV	METTEL FIELD	IN	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
DCY	DAVISS 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	LOGANSPOUT/CASS COUNTY	IN	LPV200	0	100	0	100	0	100
GSH	GOSHEN MUNICIPAL	IN	LPV	0	100	0	100	0	100
GWB	DE KALB COUNTY	IN	LPV	0	100	0	100	0	100
GYG	GARY/CHICAGO INTL	IN	LPV200	0	100	0	100	0	100
HFY	GREENWOOD MUNICIPAL	IN	LPV	0	100	0	100	0	100
HNB	HUNTINGBURG	IN	LPV	0	100	0	100	0	100
HUF	TERRE HAUTE INTL-HULMAN FIELD	IN	LPV200	0	100	0	100	0	100
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	0	100
IMS	MADISON MUNICIPAL	IN	LPV	0	100	0	100	0	100
IND	INDIANAPOLIS INTL	IN	LPV200	0	100	0	100	0	100
JVY	CLARK RGNL	IN	LPV200	0	100	0	100	0	100
LAF	PURDUE UNIVERSITY	IN	LPV	0	100	0	100	0	100
MCX	WHITE COUNTY	IN	LP	0	100	0	100	0	100
MIE	DELAWARE COUNTY RGNL	IN	LPV	0	100	0	100	0	100
MQJ	INDIANAPOLIS RGNL	IN	LPV200	0	100	0	100	0	100
MZZ	MARION MUNICIPAL	IN	LPV	0	100	0	100	0	100
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	100	0	100	0	100
OVO	NORTH VERNON	IN	LPV	0	100	0	100	0	100
OXI	STARKE COUNTY	IN	LPV	0	100	0	100	0	100
PLD	PORTLAND MUNICIPAL	IN	LPV	0	100	0	100	0	100
PPO	LA PORTE MUNICIPAL	IN	LPV	0	100	0	100	0	100
RCR	FULTON COUNTY	IN	LPV	0	100	0	100	0	100
RID	RICHMOND MUNICIPAL	IN	LPV200	0	100	0	100	0	100
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	0	100
SBN	SOUTH BEND INTL	IN	LPV	0	100	0	100	0	100
SER	FREEMAN MUNICIPAL	IN	LPV	0	100	0	100	0	100
SIV	SULLIVAN COUNTY	IN	LPV	0	100	0	100	0	100
SMD	SMITH FIELD	IN	LPV	0	100	0	100	0	100
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
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	0	100
AAO	COLONEL JAMES JABARA	KS	LPV	0	100	0	100	0	100
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	0	100
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	0	100
BEC	BEECH FACTORY	KS	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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	LPV	0	100	0	100	0	100
EGT	WELLINGTON MUNICIPAL	KS	LPV	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	FORBES FIELD	KS	LPV	0	100	0	100	0	100
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	100	0	100	0	100
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	100	0	100	0	100
GCK	GARDEN CITY RGNL	KS	LPV	0	100	0	100	0	100
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	0	100	0	100	0	100
HLC	HILL CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
HQG	HUGOTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
HRU	HERINGTON RGNL	KS	LPV	0	100	0	100	0	100
HUT	HUTCHINSON RGNL	KS	LPV	0	100	0	100	0	100
HYS	HAYS RGNL	KS	LPV200	0	100	0	100	0	100
ICT	WICHITA DWIGHT D EISENHOWER NA	KS	LPV200	0	100	0	100	0	100
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	0	100	0	100	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
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
MHK	MANHATTAN RGNL	KS	LPV200	0	100	0	100	0	100
MPR	MC PHERSON	KS	LPV	0	100	0	100	0	100
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
NRN	NORTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	0	100
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	0	100
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	100	0	100	0	100
OWI	OTTAWA MUNICIPAL	KS	LPV	0	100	0	100	0	100
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
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV200	0	100	0	100	0	100
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
UKL	COFFEY COUNTY	KS	LPV	0	100	0	100	0	100
ULS	ULYSSES	KS	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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 - MARS	KY	LPV200	0	100	0	100	0	100
2I0	MADISONVILLE RGNL	KY	LPV	0	100	0	100	0	100
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	0	100	0	100	0	100
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	0	100	0	100	0	100
5M9	MARION-CRITTENDEN COUNTY	KY	LPV	0	100	0	100	0	100
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LP	0	100	0	100	0	100
AAS	TAYLOR COUNTY	KY	LPV	0	100	0	100	0	100
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
I39	MADISON	KY	LPV200	0	100	0	100	0	100
IOB	MOUNT STERLING-MONTGOMERY COUN	KY	LPV	0	100	0	100	0	100
JQD	OHIO COUNTY	KY	LPV	0	100	0	100	0	100
K24	RUSSELL COUNTY	KY	LPV	0	100	0	100	0	100
K62	GENE SNYDER	KY	LP	0	100	0	100	0	100
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	100	0	100	0	100
LEX	BLUE GRASS	KY	LPV	0	100	0	100	0	100
LOU	BOWMAN FIELD	KY	LPV	0	100	0	100	0	100
LOZ	LONDON-CORBIN ARPT-MAGEE FIELD	KY	LPV	0	100	0	100	0	100
M21	MUHLENBERG COUNTY	KY	LP	0	100	0	100	0	100
M25	MAYFIELD GRAVES COUNTY	KY	LPV	0	100	0	100	0	100
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	0	100	0	100	0	100
PAH	BARKLEY RGNL	KY	LPV	0	100	0	100	0	100
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
1L0	ST JOHN THE BAPTIST PARISH	LA	LPV	0	100	0	100	0	100
3R4	HART	LA	LPV	0	100	0	100	0	100
3R7	JENNINGS	LA	LPV	0	100	0	100	0	100
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
ACP	ALLEN PARISH	LA	LPV	0	100	0	100	0	100
AEX	ALEXANDRIA INTL	LA	LPV200	0	100	0	100	0	100
ARA	ACADIANA RGNL	LA	LPV	0	100	0	100	0	100
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	100	0	100	0	100
BTR	BATON ROUGE METROPOLITAN` RYAN	LA	LPV200	0	100	0	100	0	100
BXA	GEORGE R CARR MEMORIAL AIR FLD	LA	LPV	0	100	0	100	0	100
CWF	CHENNAULT INTL	LA	LPV200	0	100	0	100	0	100
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	100	0	100	0	100
ESF	ESLER RGNL	LA	LPV200	0	100	0	100	0	100
F88	JONESBORO	LA	LP	0	100	0	100	0	100
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	0	100	0	100	0	100
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	100	0	100	0	100
HUM	HOUMA-TERREBONNE	LA	LPV200	0	100	0	100	0	100
HZR	FALSE RIVER RGNL	LA	LPV	0	100	0	100	0	100
IER	NATCHITOCES RGNL	LA	LPV	0	100	0	100	0	100
IYA	ABBEVILLE CHRIS CRUSTA MEMORIA	LA	LPV	0	100	0	100	0	100
L38	LOUISIANA RGNL	LA	LPV	0	100	0	100	0	100
L39	LEESVILLE	LA	LPV	0	100	0	100	0	100
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	0	100
LFT	LAFAYETTE RGNL/PAUL FOURNET FI	LA	LPV	0	100	0	100	0	100
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	100	0	100	0	100
MLU	MONROE RGNL	LA	LPV200	0	100	0	100	0	100
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	0	100	0	100	0	100
NEW	LAKEFRONT	LA	LPV	0	100	0	100	0	100
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	100	0	100	0	100
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	100	0	100	0	100
RSN	RUSTON RGNL	LA	LPV	0	100	0	100	0	100
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	LPV	0	100	0	100	0	100
UXL	SOUTHLAND FIELD	LA	LPV	0	100	0	100	0	100
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	100	0	100	0	100
BAF	WESTFIELD-BARNES RGNL	MA	LPV	0	100	0	100	0	100
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	100	0	100	0	100
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	0	100	0	100	0	100
BVY	BEVERLY MUNICIPAL	MA	LPV	0	100	0	100	0	100
EWB	NEW BEDFORD RGNL	MA	LPV200	0	100	0	100	0	100
GBR	WALTER J KOLADZA	MA	LP	0	100	0	100	0	100
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	0	100	0	100	0	100
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLAN	MA	LPV200	0	100	0	100	0	100
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	100	0	100	0	100
MVY	MARTHA'S VINEYARD	MA	LPV200	0	100	0	100	0	100
ORE	ORANGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ORH	WORCESTER RGNL	MA	LPV200	0	100	0	100	0	100
OWD	NORWOOD MEMORIAL	MA	LPV	0	100	0	100	0	100
PSF	PITTSFIELD MUNICIPAL	MA	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	0	100
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	0	100
2W5	MARYLAND	MD	LP	0	100	0	100	0	100
2W6	ST MARY'S COUNTY RGNL	MD	LPV	0	100	0	100	0	100
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	0	100	0	100	0	100
CBE	GREATER CUMBERLAND RGNL	MD	LP	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	LPV	0	100	0	100	0	100
FDK	FREDERICK MUNICIPAL	MD	LPV	0	100	0	100	0	100
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	100	0	100	0	100
HGR	HAGERSTOWN RGNL-RICHARD A HENS	MD	LPV200	0	100	0	100	0	100
MTN	MARTIN STATE	MD	LPV	0	100	0	100	0	100
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	100	0	100	0	100
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	0	100	0	100	0	100
1B0	DEXTER RGNL	ME	LP	0	100	0	100	0	100
81B	OXFORD COUNTY RGNL	ME	LP	0	100	0	100	0	100
AUG	AUGUSTA STATE	ME	LPV200	0	100	0	100	0	100
BGR	BANGOR INTL	ME	LPV	0	100	0	100	0	100
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	100	0	100	0	100
BST	BELFAST MUNICIPAL	ME	LPV	0	100	0	100	0	100
BXM	BRUNSWICK EXECUTIVE	ME	LPV	0	100	0	100	0	100
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV	0	100	0	100	0	100
HUL	HOULTON INTL	ME	LP	0	100	0	100	0	100
IZG	EASTERN SLOPES RGNL	ME	LPV	0	100	0	100	0	100
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	0	100	0	100	0	100
LRG	LINCOLN RGNL	ME	LP	0	100	0	100	0	100
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	100	0	100	0	100
PQI	NORTHERN MAINE RGNL ARPT AT PR	ME	LPV200	0	100	0	100	0	100
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	100	0	100	0	100
RKD	KNOX COUNTY RGNL	ME	LPV	0	100	0	100	0	100
SFM	SANFORD SEACOAST RGNL	ME	LPV200	0	100	0	100	0	100
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	100	0	100	0	100
48D	CLARE MUNICIPAL	MI	LP	0	100	0	100	0	100
4D0	ABRAMS MUNICIPAL	MI	LP	0	100	0	100	0	100
6Y1	BOIS BLANC ISLAND	MI	LP	0	100	0	100	0	100
77G	MARLETTE	MI	LPV	0	100	0	100	0	100
9D9	HASTINGS	MI	LPV	0	100	0	100	0	100
ACB	ANTRIM COUNTY	MI	LPV	0	100	0	100	0	100
ADG	LENAAWEE COUNTY	MI	LPV	0	100	0	100	0	100
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	0	100	0	100	0	100
APN	ALPENA COUNTY RGNL	MI	LPV	0	100	0	100	0	100
ARB	ANN ARBOR MUNICIPAL	MI	LPV	0	100	0	100	0	100
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV	0	100	0	100	0	100
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	0	100
BIV	WEST MICHIGAN RGNL	MI	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BTL	W K KELLOGG	MI	LPV200	0	100	0	100	0	100
CAD	WEXFORD COUNTY	MI	LPV200	0	100	0	100	0	100
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	100	0	100	0	100
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	100	0	100	0	100
D95	DUPONT-LAPEER	MI	LP	0	100	0	100	0	100
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	100	0	100	0	100
DTW	DETROIT METROPOLITAN WAYNE COU	MI	LPV200	0	100	0	100	0	100
ERY	LUCE COUNTY	MI	LPV	0	100	0	100	0	100
ESC	DELTA COUNTY	MI	LPV200	0	100	0	100	0	100
FFX	FREMONT MUNICIPAL	MI	LPV	0	100	0	100	0	100
FNT	BISHOP INTL	MI	LPV200	0	100	0	100	0	100
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	0	100	0	100	0	100
GLR	GAYLORD RGNL	MI	LPV	0	100	0	100	0	100
GRR	GERALD R FORD INTL	MI	LPV200	0	100	0	100	0	100
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	0	100	0	100	0	100
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV	0	100	0	100	0	100
IKW	JACK BARSTOW	MI	LPV	0	100	0	100	0	100
IMT	FORD	MI	LPV	0	100	0	100	0	100
IRS	KIRSCH MUNICIPAL	MI	LPV	0	100	0	100	0	100
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	100	0	100	0	100
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	100	0	100	0	100
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	LPV200	0	100	0	100	0	100
JYM	HILLSDALE MUNICIPAL	MI	LPV	0	100	0	100	0	100
LAN	CAPITAL REGION INTL	MI	LPV200	0	100	0	100	0	100
LDM	MASON COUNTY	MI	LPV	0	100	0	100	0	100
MBL	MANISTEE CO-BLACKER	MI	LPV200	0	100	0	100	0	100
MBS	MBS INTL	MI	LPV200	0	100	0	100	0	100
MCD	MACKINAC ISLAND	MI	LPV	0	100	0	100	0	100
MKG	MUSKEGON COUNTY	MI	LPV200	0	100	0	100	0	100
MNM	MENOMINEE-MARINETTE TWIN COUNT	MI	LPV200	0	100	0	100	0	100
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	0	100	0	100	0	100
N98	BOYNE CITY MUNICIPAL	MI	LP	0	100	0	100	0	100
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
OSC	OSCODA-WURTSMITH	MI	LPV200	0	100	0	100	0	100
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	0	100	0	100	0	100
PHN	ST CLAIR COUNTY INTL	MI	LPV200	0	100	0	100	0	100
PLN	PELLSTON RGNL AIRPORT OF EMMET	MI	LPV200	0	100	0	100	0	100
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	100	0	100	0	100
RMY	BROOKS FIELD	MI	LP	0	100	0	100	0	100
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
RQB	ROBEN-HOOD	MI	LPV200	0	100	0	100	0	100
SAW	SAWYER INTL	MI	LPV200	0	100	0	100	0	100
SLH	CHEBOYGAN COUNTY	MI	LPV	0	100	0	100	0	100
TEW	MASON JEWETT FIELD	MI	LP	0	100	0	100	0	100
TTF	CUSTER	MI	LPV	0	100	0	100	0	100
TVC	CHERRY CAPITAL	MI	LPV200	0	100	0	100	0	100
YIP	WILLOW RUN	MI	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
16D	PERHAM MUNICIPAL	MN	LPV	0	100	0	100	0	100
3N8	MAHNOMEN COUNTY	MN	LPV	0	100	0	100	0	100
ACQ	WASECA MUNICIPAL	MN	LPV	0	100	0	100	0	100
ADC	WADENA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AIT	AITKIN MUNICIPAL-STEVE KURTZ FIELD	MN	LPV	0	100	0	100	0	100
ANE	ANOKA COUNTY-BLAINE ARPT(JANES	MN	LPV	0	100	0	100	0	100
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	100	0	100	0	100
AXN	CHANDLER FIELD	MN	LPV	0	100	0	100	0	100
BBB	BENSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
BDE	BAUDETTE INTL	MN	LPV	0	100	0	100	0	100
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV200	0	100	0	100	0	100
BJI	BEMIDJI RGNL	MN	LPV200	0	100	0	100	0	100
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	100	0	100	0	100
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	100	0	100	0	100
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	100	0	100	0	100
CKN	CROOKSTON MUNICIPAL KIRKWOOD FLD	MN	LPV	0	100	0	100	0	100
CNB	MYERS FIELD	MN	LPV	0	100	0	100	0	100
COQ	CLOQUET CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
CQM	COOK MUNICIPAL	MN	LP	0	100	0	100	0	100
D39	SAUK CENTRE MUNICIPAL	MN	LPV	0	100	0	100	0	100
D42	SPRINGFIELD MUNICIPAL	MN	LP	0	100	0	100	0	100
DLH	DULUTH INTL	MN	LPV200	0	100	0	100	0	100
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	0	100	0	100	0	100
DVP	SLAYTON MUNICIPAL	MN	LP	0	100	0	100	0	100
DXX	LAC QUI PARLE COUNTY	MN	LPV200	0	100	0	100	0	100
ELO	ELY MUNICIPAL	MN	LPV200	0	100	0	100	0	100
ETH	WHEATON MUNICIPAL	MN	LP	0	100	0	100	0	100
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	0	100	0	100	0	100
FBL	FARIBAULT MUNICIPAL	MN	LPV	0	100	0	100	0	100
FCM	FLYING CLOUD	MN	LPV200	0	100	0	100	0	100
FFM	FERGUS FALLS MUNICIPAL-EINAR MICKEL	MN	LPV200	0	100	0	100	0	100
FKA	FILLMORE COUNTY	MN	LPV	0	100	0	100	0	100
FOZ	BIGFORK MUNICIPAL	MN	LP	0	100	0	100	0	100
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	100	0	100	0	100
FSE	FOSSTON MUNICIPAL	MN	LP	0	100	0	100	0	100
GHW	GLENWOOD MUNICIPAL	MN	LPV	0	100	0	100	0	100
GPZ	GRAND RAPIDS/ITASCA CO-GORDON	MN	LPV	0	100	0	100	0	100
GYL	GLENCOE MUNICIPAL	MN	LPV	0	100	0	100	0	100
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	0	100	0	100	0	100
HCO	HALLOCK MUNICIPAL	MN	LPV	0	100	0	100	0	100
HIB	RANGE RGNL	MN	LPV200	0	100	0	100	0	100
INL	FALLS INTL-EINARSON FIELD	MN	LPV	0	100	0	100	0	100
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	100	0	100	0	100
JMR	MORA MUNICIPAL	MN	LPV	0	100	0	100	0	100
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	100	0	100	0	100
LVN	AIRLAKE	MN	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	0	100	0	100	0	100
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	100	0	100	0	100
MGG	MAPLE LAKE MUNICIPAL	MN	LP	0	100	0	100	0	100
MJQ	JACKSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
MKT	MANKATO RGNL	MN	LPV200	0	100	0	100	0	100
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	0	100	0	100	0	100
MOX	MORRIS MUNICIPAL - CHARLIE SCHMIDT	MN	LPV	0	100	0	100	0	100
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	0	100	0	100	0	100
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	0	100	0	100	0	100
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	0	100	0	100	0	100
ORB	ORR RGNL	MN	LP	0	100	0	100	0	100
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	100	0	100	0	100
OWA	OWATONNA DEGNER RGNL	MN	LPV200	0	100	0	100	0	100
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	0	100	0	100	0	100
PQN	PIPESTONE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
RGK	RED WING RGNL	MN	LPV200	0	100	0	100	0	100
ROS	RUSH CITY RGNL	MN	LPV	0	100	0	100	0	100
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIEL	MN	LPV	0	100	0	100	0	100
RRT	WARROAD INTL MEMORIAL	MN	LPV	0	100	0	100	0	100
RST	ROCHESTER INTL	MN	LPV200	0	100	0	100	0	100
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	100	0	100	0	100
SAZ	STAPLES MUNICIPAL	MN	LPV	0	100	0	100	0	100
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LP	0	100	0	100	0	100
STC	ST CLOUD RGNL	MN	LPV200	0	100	0	100	0	100
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	100	0	100	0	100
TOB	DODGE CENTER	MN	LPV	0	100	0	100	0	100
TVF	THIEF RIVER FALLS RGNL	MN	LPV	0	100	0	100	0	100
TWM	RICHARD B HELGESON	MN	LPV	0	100	0	100	0	100
ULM	NEW ULM MUNICIPAL	MN	LPV200	0	100	0	100	0	100
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIEL	MN	LP	0	100	0	100	0	100
Y49	WALKER MUNICIPAL	MN	LP	0	100	0	100	0	100
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	0	100	0	100	0	100
03D	MEMPHIS MEMORIAL	MO	LPV	0	100	0	100	0	100
1H0	CREVE COEUR	MO	LPV	0	100	0	100	0	100
1MO	MOUNTAIN GROVE MEMORIAL	MO	LP	0	100	0	100	0	100
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	100	0	100	0	100
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	0	100
8WC	WASHINGTON COUNTY	MO	LPV	0	100	0	100	0	100
94K	CASSVILLE MUNICIPAL	MO	LPV	0	100	0	100	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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
COU	COLUMBIA RGNL	MO	LPV	0	100	0	100	0	100
DMO	SEDALIA RGNL	MO	LPV	0	100	0	100	0	100
DXE	DEXTER MUNICIPAL	MO	LPV	0	100	0	100	0	100
EIW	COUNTY MEMORIAL	MO	LPV	0	100	0	100	0	100
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	100	0	100	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
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
K02	PERRYVILLE MUNICIPAL	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-POWER 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	LPV200	0	100	0	100	0	100
MNF	MOUNTAIN VIEW	MO	LP	0	100	0	100	0	100
MO3	STOCKTON MUNICIPAL	MO	LP	0	100	0	100	0	100
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
MYJ	MEXICO MEMORIAL	MO	LPV	0	100	0	100	0	100
NVD	NEVADA MUNICIPAL	MO	LPV200	0	100	0	100	0	100
OZS	CAMDENTON MEMORIAL-LAKE RGNL	MO	LPV	0	100	0	100	0	100
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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV200	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	LAMBERT-ST LOUIS INTL	MO	LPV200	0	100	0	100	0	100
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	100	0	100	0	100
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	0	100	0	100	0	100
TKX	KENNETT MEMORIAL	MO	LPV	0	100	0	100	0	100
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	0	100
UBX	CUBA MUNICIPAL	MO	LPV	0	100	0	100	0	100
UNO	WEST PLAINS RGNL	MO	LPV	0	100	0	100	0	100
UUV	SULLIVAN RGNL	MO	LPV	0	100	0	100	0	100
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	100	0	100	0	100
VIH	ROLLA NATIONAL	MO	LPV200	0	100	0	100	0	100
0R0	COLUMBIA-MARION COUNTY	MS	LPV	0	100	0	100	0	100
17M	MAGEE MUNICIPAL	MS	LP	0	100	0	100	0	100
5A4	OKOLONA MUNICIPAL-RICHARD STOVALL F	MS	LPV	0	100	0	100	0	100
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	0	100	0	100
87I	YAZOO COUNTY	MS	LPV	0	100	0	100	0	100
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	0	100	0	100
CKM	FLETCHER FIELD	MS	LPV	0	100	0	100	0	100
CRX	ROSCOE TURNER	MS	LPV200	0	100	0	100	0	100
GLH	GREENVILLE MID-DELTA	MS	LPV200	0	100	0	100	0	100
GNF	GRENADA MUNICIPAL	MS	LPV200	0	100	0	100	0	100
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	100	0	100	0	100
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	0	100	0	100
GWO	GREENWOOD-LEFLORE	MS	LPV	0	100	0	100	0	100
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	0	100	0	100	0	100
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADA	MS	LPV200	0	100	0	100	0	100
HKS	HAWKINS FIELD	MS	LPV	0	100	0	100	0	100
HSA	STENNIS INTL	MS	LPV200	0	100	0	100	0	100
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	100	0	100	0	100
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	0	100	0	100	0	100
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	100	0	100	0	100
LMS	LOUISVILLE WINSTON COUNTY	MS	LPV	0	100	0	100	0	100
LUL	HESLER-NOBLE FIELD	MS	LPV	0	100	0	100	0	100
M40	MONROE COUNTY	MS	LPV	0	100	0	100	0	100
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	0	100	0	100	0	100
MBO	BRUCE CAMPBELL FIELD	MS	LP	0	100	0	100	0	100
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV	0	100	0	100	0	100
MEI	KEY FIELD	MS	LPV200	0	100	0	100	0	100
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	100	0	100	0	100
MMS	SELFS	MS	LPV	0	100	0	100	0	100
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	0	100	0	100
OLV	OLIVE BRANCH	MS	LPV200	0	100	0	100	0	100
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	100	0	100	0	100
PMU	PANOLA COUNTY	MS	LPV	0	100	0	100	0	100
PQL	TRENT LOTT INTL	MS	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	100	0	100	0	100
STF	GEORGE M BRYAN	MS	LPV200	0	100	0	100	0	100
TUP	TUPELO RGNL	MS	LPV200	0	100	0	100	0	100
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	0	100	0	100
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	0	100	0	100
VKS	VICKSBURG MUNICIPAL	MS	LP	0	100	0	100	0	100
1S3	TILLITT FIELD	MT	LPV	0	100	0	100	0	100
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	0	100	0	100
6S8	LAUREL MUNICIPAL	MT	LPV	0	100	0	100	0	100
7S0	RONAN	MT	LPV	0	100	0	100	0	100
BHK	BAKER MUNICIPAL	MT	LPV	0	100	0	100	0	100
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	100	0	100	0	100
BTM	BERT MOONEY	MT	LPV	0	100	0	100	0	100
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	0	100	0	100	0	100
CTB	CUT BANK INTL	MT	LPV200	0	100	0	100	0	100
DLN	DILLON	MT	LPV	0	100	0	100	0	100
EKS	ENNIS - BIG SKY	MT	LPV	0	100	0	100	0	100
GDV	DAWSON COMMUNICIPALTY	MT	LPV	0	100	0	100	0	100
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	0	100	0	100	0	100
GPI	GLACIER PARK INTL	MT	LPV	0	100	0	100	0	100
GTF	GREAT FALLS INTL	MT	LPV200	0	100	0	100	0	100
HLN	HELENA RGNL	MT	LPV	0	100	0	100	0	100
HVR	HAVRE CITY-COUNTY	MT	LPV	0	100	0	100	0	100
LVM	MISSION FIELD	MT	LP	0	100	0	100	0	100
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	0	100	0	100	0	100
M75	MALTA	MT	LP	0	100	0	100	0	100
MLS	FRANK WILEY FIELD	MT	LPV	0	100	0	100	0	100
MSO	MISSOULA INTL	MT	LPV	0	100	0	100	0	100
OLF	L M CLAYTON	MT	LPV200	0	100	0	100	0	100
PO1	POPLAR MUNICIPAL	MT	LPV200	0	100	0	100	0	100
PWD	SHER-WOOD	MT	LPV200	0	100	0	100	0	100
RPX	ROUNDUP	MT	LPV	0	100	0	100	0	100
SBX	SHELBY	MT	LPV	0	100	0	100	0	100
SDY	SIDNEY-RICHLAND MUNICIPAL	MT	LPV	0	100	0	100	0	100
WYS	YELLOWSTONE	MT	LPV200	0	100	0	100	0	100
CYCL	CHARLO	NB	LPV	0	100	0	100	0	100
CYQM	MONCTON INTL	NB	LPV	0	100	0	100	0	100
43A	MONTGOMERY COUNTY	NC	LP	0	100	0	100	0	100
ACZ	HENDERSON FIELD	NC	LPV	0	100	0	100	0	100
AFP	ANSON COUNTY -JEFF CLOUD FIE	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	LPV	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
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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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	LPV	0	100	0	100	0	100
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	100	0	100	0	100
EXX	DAVIDSON COUNTY	NC	LPV	0	100	0	100	0	100
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	0	100	0	100	0	100
FAY	FAYETTEVILLE RGNL/GRANNIS FIEL	NC	LPV200	0	100	0	100	0	100
FQD	RUTHERFORD CO - MARCHMAN FIELD	NC	LPV	0	100	0	100	0	100
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	100	0	100	0	100
GWV	WAYNE EXECUTIVE JETPORT	NC	LPV200	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	LINCOLN-TON-LINCOLN COUNTY RGNL	NC	LPV	0	100	0	100	0	100
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	0	100	0	100	0	100
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	0	100
JNX	JOHNSTON REGIONAL	NC	LPV	0	100	0	100	0	100
JQF	CONCORD RGNL	NC	LPV	0	100	0	100	0	100
LBT	LUMBERTON RGNL	NC	LPV	0	100	0	100	0	100
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	0	100	0	100	0	100
MCZ	MARTIN COUNTY	NC	LPV	0	100	0	100	0	100
MEB	LAURINBURG-MAXTON	NC	LPV200	0	100	0	100	0	100
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	0	100
MRH	MICHAEL J SMITH FIELD	NC	LP	0	100	0	100	0	100
MRN	FOOTHILLS REGIONAL	NC	LPV200	0	100	0	100	0	100
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	100	0	100	0	100
OAJ	ALBERT J ELLIS	NC	LPV200	0	100	0	100	0	100
OCW	WASHINGTON-WARREN	NC	LPV	0	100	0	100	0	100
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	0	100
PGV	PITT-GREENVILLE	NC	LPV	0	100	0	100	0	100
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	100	0	100	0	100
RCZ	RICHMOND COUNTY	NC	LPV	0	100	0	100	0	100
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	100	0	100	0	100
RUQ	ROWAN COUNTY	NC	LPV200	0	100	0	100	0	100
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	0	100	0	100	0	100
SCR	SILER CITY MUNICIPAL	NC	LPV	0	100	0	100	0	100
SOP	MOORE COUNTY	NC	LPV200	0	100	0	100	0	100
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	0	100	0	100	0	100
SVH	STATESVILLE RGNL	NC	LPV200	0	100	0	100	0	100
TDF	PERSON COUNTY	NC	LPV200	0	100	0	100	0	100
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	0	100	0	100	0	100
VUJ	STANLY COUNTY	NC	LPV200	0	100	0	100	0	100
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	0	100	0	100	0	100
ZEF	ELKIN MUNICIPAL	NC	LP	0	100	0	100	0	100
06D	ROLLA MUNICIPAL	ND	LPV	0	100	0	100	0	100
2C8	CAVALIER MUNICIPAL	ND	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
3H4	HILLSBORO MUNICIPAL	ND	LPV	0	100	0	100	0	100
46D	CARRINGTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
51D	EDGELEY MUNICIPAL	ND	LPV	0	100	0	100	0	100
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	100	0	100	0	100
7L2	LINTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
9D7	CANDO MUNICIPAL	ND	LPV	0	100	0	100	0	100
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	100	0	100	0	100
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	100	0	100	0	100
BWP	HARRY STERN	ND	LPV	0	100	0	100	0	100
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	100	0	100	0	100
D55	ROBERTSON FIELD	ND	LPV	0	100	0	100	0	100
D60	TIOGA MUNICIPAL	ND	LPV	0	100	0	100	0	100
DIK	DICKINSON - THEODORE ROOSEVELT	ND	LPV200	0	100	0	100	0	100
DVL	DEVILS LAKE RGNL	ND	LPV200	0	100	0	100	0	100
FAR	HECTOR INTL	ND	LPV200	0	100	0	100	0	100
GAF	HUTSON FIELD	ND	LPV	0	100	0	100	0	100
GFK	GRAND FORKS INTL	ND	LPV	0	100	0	100	0	100
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV200	0	100	0	100	0	100
HZE	MERCER COUNTY RGNL	ND	LPV	0	100	0	100	0	100
ISN	SLOULIN FLD INTL	ND	LPV200	0	100	0	100	0	100
JMS	JAMESTOWN RGNL	ND	LPV200	0	100	0	100	0	100
K74	ROBERT ODEGAARD FIELD	ND	LP	0	100	0	100	0	100
MOT	MINOT INTL	ND	LPV	0	100	0	100	0	100
RUG	RUGBY MUNICIPAL	ND	LP	0	100	0	100	0	100
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	100	0	100	0	100
Y19	MANDAN MUNICIPAL	ND	LPV	0	100	0	100	0	100
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	0	100	0	100	0	100
08K	HARVARD STATE	NE	LPV	0	100	0	100	0	100
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	0	100	0	100	0	100
0C4	PENDER MUNICIPAL	NE	LPV	0	100	0	100	0	100
0F4	LOUP CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
0G3	TECUMSEH MUNICIPAL	NE	LPV	0	100	0	100	0	100
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	100	0	100	0	100
12K	SUPERIOR MUNICIPAL	NE	LPV	0	100	0	100	0	100
47V	CURTIS MUNICIPAL	NE	LPV	0	100	0	100	0	100
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	0	100
4V9	ANTELOPE COUNTY	NE	LPV	0	100	0	100	0	100
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	100	0	100	0	100
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	100	0	100	0	100
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	100	0	100	0	100
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
9V5	MODISETT	NE	LPV	0	100	0	100	0	100
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
AHQ	WAHOO MUNICIPAL	NE	LPV	0	100	0	100	0	100
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
ANW	AINSWORTH RGNL	NE	LPV200	0	100	0	100	0	100
AUH	AURORA MUNICIPAL - AL POTTER FIELD	NE	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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
BUB	CRAM FIELD	NE	LPV	0	100	0	100	0	100
BVN	ALBION MUNICIPAL	NE	LPV	0	100	0	100	0	100
CDR	CHADRON MUNICIPAL	NE	LPV200	0	100	0	100	0	100
CEK	CRETE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	0	100
EAR	KEARNEY RGNL	NE	LPV200	0	100	0	100	0	100
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	100	0	100	0	100
FET	FREMONT MUNICIPAL	NE	LPV	0	100	0	100	0	100
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	100	0	100	0	100
FNB	BRENNER FIELD	NE	LPV	0	100	0	100	0	100
GGF	GRANT MUNICIPAL	NE	LPV	0	100	0	100	0	100
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	100	0	100	0	100
GRN	GORDON MUNICIPAL	NE	LPV	0	100	0	100	0	100
HDE	BREWSTER FIELD	NE	LPV	0	100	0	100	0	100
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	0	100
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	100	0	100	0	100
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	0	100
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	LPV	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
VTN	MILLER FIELD	NE	LPV	0	100	0	100	0	100
ASH	BOIRE FIELD	NH	LPV200	0	100	0	100	0	100
CON	CONCORD MUNICIPAL	NH	LPV	0	100	0	100	0	100
DAW	SKYHAVEN	NH	LPV	0	100	0	100	0	100
EEN	DILLANT-HOPKINS	NH	LPV	0	100	0	100	0	100
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	100	0	100	0	100
LCI	LACONIA MUNICIPAL	NH	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
LEB	LEBANON MUNICIPAL	NH	LPV	0	100	0	100	0	100
MHT	MANCHESTER	NH	LPV200	0	100	0	100	0	100
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	100	0	100	0	100
47N	CENTRAL JERSEY RGNL	NJ	LP	0	100	0	100	0	100
4N1	GREENWOOD LAKE	NJ	LP	0	100	0	100	0	100
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	100	0	100	0	100
CDW	ESSEX COUNTY	NJ	LPV	0	100	0	100	0	100
EWR	NEWARK LIBERTY INTL	NJ	LPV	0	100	0	100	0	100
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
MJX	OCEAN COUNTY	NJ	LPV	0	100	0	100	0	100
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
N14	FLYING W	NJ	LPV	0	100	0	100	0	100
N40	SKY MANOR	NJ	LP	0	100	0	100	0	100
TEB	TETERBORO	NJ	LPV	0	100	0	100	0	100
TTN	TRENTON MERCER	NJ	LPV200	0	100	0	100	0	100
VAY	SOUTH JERSEY RGNL	NJ	LP	0	100	0	100	0	100
WWD	CAPE MAY COUNTY	NJ	LPV	0	100	0	100	0	100
CYDF	DEER LAKE	NL	LPV	0	100	0	100	0	100
ATS	ARTESIA MUNICIPAL	NM	LPV	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	0	100	0	100
E06	LEA COUNTY-ZIP FRANKLIN MEMORI	NM	LPV	0	100	0	100	0	100
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	0	100
HOB	LEA COUNTY RGNL	NM	LPV	0	100	0	100	0	100
LAM	LOS ALAMOS	NM	LP	0	100	0	100	0	100
LRU	LAS CRUCES INTL	NM	LPV	0	100	0	100	0	100
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	0	100	0	100
ROW	ROSWELL INTL AIR CENTER	NM	LPV	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	0	100	0	100
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	0	100	0	100	0	100
CYEV	INUVIK	NT	LPV	0	100	0	100	15	99.986
05U	EUREKA	NV	LP	0	100	0	100	0	100
CXP	CARSON	NV	LP	0	100	0	100	0	100
ELY	ELY ARPT /YELLAND FLD/	NV	LPV	0	100	0	100	0	100
LAS	MC CARRAN INTL	NV	LPV	0	100	0	100	0	100
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	0	100
RTS	RENO/STEAD	NV	LPV	0	100	0	100	0	100
TPH	TONOPAH	NV	LP	0	100	0	100	0	100
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	0	100
06N	RANDALL	NY	LP	0	100	0	100	0	100
0G7	FINGER LAKES RGNL	NY	LPV	0	100	0	100	0	100
1B1	COLUMBIA COUNTY	NY	LPV	0	100	0	100	0	100
20N	KINGSTON-ULSTER	NY	LPV	0	100	0	100	0	100
44N	SKY ACRES	NY	LPV	0	100	0	100	0	100
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
5B2	SARATOGA COUNTY	NY	LPV	0	100	0	100	0	100
5G0	LE ROY	NY	LP	0	100	0	100	0	100
9G0	BUFFALO AIRFIELD	NY	LP	0	100	0	100	0	100
9G3	AKRON	NY	LP	0	100	0	100	0	100
ALB	ALBANY INTL	NY	LPV200	0	100	0	100	0	100
ART	WATERTOWN INTL	NY	LPV200	0	100	0	100	0	100
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	0	100	0	100	0	100
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	100	0	100	0	100
D38	CANANDAIGUA	NY	LPV	0	100	0	100	0	100
DKK	CHAUTAUQUA COUNTY/DUNKIRK	NY	LP	0	100	0	100	0	100
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	100	0	100	0	100
ELZ	WELLSVILLE MUNICIPAL ARPT TARANTINE	NY	LPV	0	100	0	100	0	100
FOK	FRANCIS S GABRESKI	NY	LPV200	0	100	0	100	0	100
FRG	REPUBLIC	NY	LPV200	0	100	0	100	0	100
FZY	OSWEGO COUNTY	NY	LPV	0	100	0	100	0	100
GFL	FLOYD BENNETT MEMORIAL	NY	LPV	0	100	0	100	0	100
GVQ	GENESEE COUNTY	NY	LPV200	0	100	0	100	0	100
HPN	WESTCHESTER COUNTY	NY	LPV	0	100	0	100	0	100
HTF	HORNELL MUNICIPAL	NY	LPV	0	100	0	100	0	100
HTO	EAST HAMPTON	NY	LPV	0	100	0	100	0	100
HWV	BROOKHAVEN	NY	LPV	0	100	0	100	0	100
IAG	NIAGARA FALLS INTL	NY	LPV	0	100	0	100	0	100
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	100	0	100	0	100
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	100	0	100	0	100
JFK	JOHN F KENNEDY INTL	NY	LPV200	0	100	0	100	0	100
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	100	0	100	0	100
K09	PISECO	NY	LP	0	100	0	100	0	100
LGA	LAGUARDIA	NY	LPV	0	100	0	100	0	100
MAL	MALONE-DUFORT	NY	LPV	0	100	0	100	0	100
MGJ	ORANGE COUNTY	NY	LPV	0	100	0	100	0	100
MSS	MASSENA INTL-RICHARDS FIELD	NY	LPV	0	100	0	100	0	100
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	100	0	100	0	100
N23	SIDNEY MUNICIPAL	NY	LP	0	100	0	100	0	100
N66	ONEONTA MUNICIPAL	NY	LPV	0	100	0	100	0	100
NY0	FULTON COUNTY	NY	LPV	0	100	0	100	0	100
OGS	OGDENSBURG INTL	NY	LPV	0	100	0	100	0	100
OIC	LT WARREN EATON	NY	LP	0	100	0	100	0	100
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	100	0	100	0	100
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	0	100
PEO	PENN YAN	NY	LPV	0	100	0	100	0	100
POU	DUTCHESS COUNTY	NY	LPV	0	100	0	100	0	100
RME	GRIFFISS INTL	NY	LPV200	0	100	0	100	0	100
ROC	GREATER ROCHESTER INTL	NY	LPV200	0	100	0	100	0	100
SCH	SCHENECTADY COUNTY	NY	LPV200	0	100	0	100	0	100
SDC	WILLIAMSON-SODUS	NY	LPV	0	100	0	100	0	100
SLK	ADIRONDACK RGNL	NY	LPV200	0	100	0	100	0	100
SWF	STEWART INTL	NY	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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
1G0	WOOD COUNTY	OH	LPV	0	100	0	100	0	100
1G3	KENT STATE UNIV	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	LPV	0	100	0	100	0	100
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	0	100
CMH	PORT COLUMBUS INTL	OH	LPV200	0	100	0	100	0	100
CQA	LAKEFIELD	OH	LPV	0	100	0	100	0	100
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	100	0	100	0	100
DLZ	DELAWARE MUNICIPAL - JIM MOORE FIEL	OH	LPV	0	100	0	100	0	100
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	0	100
EOP	PIKE COUNTY	OH	LP	0	100	0	100	0	100
FDY	FINDLAY	OH	LPV	0	100	0	100	0	100
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	100	0	100	0	100
GQQ	GALION MUNICIPAL	OH	LP	0	100	0	100	0	100
HAO	BUTLER CO RGNL-HOGAN FIELD	OH	LPV	0	100	0	100	0	100
HOC	HIGHLAND COUNTY	OH	LP	0	100	0	100	0	100
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	0	100
I19	GREENE COUNTY-LEWIS A JACKSON	OH	LPV	0	100	0	100	0	100
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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
MRT	UNION COUNTY	OH	LP	0	100	0	100	0	100
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	0	100	0	100	0	100
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	0	100
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	0	100
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	0	100
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	LP	0	100	0	100	0	100
TOL	TOLEDO EXPRESS	OH	LPV200	0	100	0	100	0	100
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	100	0	100	0	100
TZR	BOLTON FIELD	OH	LPV200	0	100	0	100	0	100
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	0	100
USE	FULTON COUNTY	OH	LPV	0	100	0	100	0	100
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	0	100
YNG	YOUNGSTOWN-WARREN RGNL	OH	LPV	0	100	0	100	0	100
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	100	0	100	0	100
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	0	100
80F	ANTLERS MUNICIPAL	OK	LPV	0	100	0	100	0	100
ADH	ADA MUNICIPAL	OK	LPV	0	100	0	100	0	100
ADM	ARDMORE MUNICIPAL	OK	LPV200	0	100	0	100	0	100
AVK	ALVA RGNL	OK	LPV	0	100	0	100	0	100
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	LPV200	0	100	0	100	0	100
CSM	CLINTON-SHERMAN	OK	LPV200	0	100	0	100	0	100
DUA	DURANT RGNL - EAKER FIELD	OK	LPV	0	100	0	100	0	100
DUC	HALLIBURTON FIELD	OK	LPV	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
HBR	HOBART RGNL	OK	LPV	0	100	0	100	0	100
HSD	SUNDANCE	OK	LPV	0	100	0	100	0	100
MKO	DAVIS FIELD	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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
OKC	WILL ROGERS WORLD	OK	LPV200	0	100	0	100	0	100
OKM	OKMULGEE RGNL	OK	LPV	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
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	0	100
RVS	RICHARD LLOYD JONES JR	OK	LPV	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
AST	ASTORIA RGNL	OR	LPV	0	100	0	100	0	100
BDN	BEND MUNICIPAL	OR	LPV	0	100	0	100	0	100
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	0	100
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	0	100
EUG	MAHLON SWEET FIELD	OR	LPV200	0	100	0	100	0	100
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	100	0	100	0	100
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	100	0	100	0	100
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	100	0	100	0	100
LKV	LAKE COUNTY	OR	LPV	0	100	0	100	0	100
LMT	KLAMATH FALLS	OR	LPV	0	100	0	100	0	100
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	0	100
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	0	100
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	0	100
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	0	100	0	100	0	100
PDX	PORTLAND INTL	OR	LPV200	0	100	0	100	0	100
RDM	ROBERTS FIELD	OR	LPV200	0	100	0	100	0	100
S33	MADRAS MUNICIPALCIPAL	OR	LPV	0	100	0	100	0	100
S39	PRINEVILLE	OR	LP	0	100	0	100	0	100
SLE	MCNARY FLD	OR	LPV200	0	100	0	100	0	100
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	100	0	100	0	100
UAO	AURORA STATE	OR	LPV	0	100	0	100	0	100
22N	JAKE ARNER MEMORIAL	PA	LP	0	100	0	100	0	100
29D	GROVE CITY	PA	LP	0	100	0	100	0	100
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	0	100
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	0	100
8N8	DANVILLE	PA	LP	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
9D4	DECK	PA	LPV	0	100	0	100	0	100
ABE	LEHIGH VALLEY INTL	PA	LPV200	0	100	0	100	0	100
AFJ	WASHINGTON COUNTY	PA	LPV200	0	100	0	100	0	100
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	0	100
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	100	0	100	0	100
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	0	100	0	100	0	100
AXQ	CLARION COUNTY	PA	LPV	0	100	0	100	0	100
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	0	100
BTP	BUTLER COUNTY/K W SCHOLTER FIE	PA	LPV	0	100	0	100	0	100
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	0	100
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	0	100
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	0	100
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
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	LPV	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	LPV	0	100	0	100	0	100
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	0	100
PNE	NORTHEAST PHILADELPHIA	PA	LPV	0	100	0	100	0	100
PSB	MID-STATE	PA	LPV	0	100	0	100	0	100
PTW	HERITAGE FIELD	PA	LPV	0	100	0	100	0	100
RDG	READING RGNL/CARL A SPAATZ FIE	PA	LPV	0	100	0	100	0	100
RVL	MIFFLIN COUNTY	PA	LPV	0	100	0	100	0	100
THV	YORK	PA	LP	0	100	0	100	0	100
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	100	0	100	0	100
UKT	QUAKERTOWN	PA	LP	0	100	0	100	0	100
UNV	UNIVERSITY PARK	PA	LPV200	0	100	0	100	0	100
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	0	100	0	100	0	100
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	0	100
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	100	0	100	0	100
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	100	0	100	0	100
ZER	SCHUYLKILL COUNTY /JOE ZERBEY/	PA	LPV200	0	100	0	100	0	100
CPN8	OPINACA	QC	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
CSR3	VICTORIAVILLE	QC	LPV	0	100	0	100	0	100
CTP9	KATTINIQ / DONALDSON	QC	LPV	0	100	0	100	2	99.9875
CYFY	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	KUUJUAQ	QC	LPV	0	100	0	100	3	99.9932
CYYY	MONTJOLI	QC	LPV	0	100	0	100	0	100
BID	BLOCK ISLAND STATE	RI	LPV	0	100	0	100	0	100
OQU	QUONSET STATE	RI	LPV	0	100	0	100	0	100
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	0	100	0	100	0	100
SFZ	NORTH CENTRAL STATE	RI	LPV	0	100	0	100	0	100
35A	UNION COUNTY TROY SHELTON FIE	SC	LP	0	100	0	100	0	100
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	100	0	100	0	100
AIK	AIKEN MUNICIPAL	SC	LPV200	0	100	0	100	0	100
AND	ANDERSON RGNL	SC	LPV200	0	100	0	100	0	100
AQX	ALLENDALE COUNTY	SC	LPV	0	100	0	100	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
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	100	0	100	0	100
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	100	0	100	0	100
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FI	SC	LPV	0	100	0	100	0	100
CRE	GRAND STRAND	SC	LPV200	0	100	0	100	0	100
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	100	0	100	0	100
DYB	SUMMERVILLE	SC	LPV200	0	100	0	100	0	100
FDW	FAIRFIELD COUNTY	SC	LPV	0	100	0	100	0	100
FLO	FLORENCE RGNL	SC	LPV	0	100	0	100	0	100
GGE	GEORGETOWN COUNTY	SC	LPV	0	100	0	100	0	100
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	100	0	100	0	100
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	0	100	0	100	0	100
GYH	DONALDSON FIELD	SC	LPV	0	100	0	100	0	100
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	100	0	100	0	100
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	100	0	100	0	100
LKR	LANCASTER COUNTY-MC WHIRTER FI	SC	LPV200	0	100	0	100	0	100
LQK	PICKENS COUNTY	SC	LPV	0	100	0	100	0	100
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	100	0	100	0	100
LUX	LAURENS COUNTY	SC	LPV	0	100	0	100	0	100
MAO	MARION COUNTY	SC	LPV	0	100	0	100	0	100
MKS	BERKELEY COUNTY	SC	LPV	0	100	0	100	0	100
MYR	MYRTLE BEACH INTL	SC	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	0	100	0	100	0	100
RBW	LOWCOUNTRY RGNL	SC	LPV	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
UDG	DARLINGTON COUNTY JETPORT	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
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	0	100	0	100	0	100
ABR	ABERDEEN RGNL	SD	LPV200	0	100	0	100	0	100
AGZ	WAGNER MUNICIPAL	SD	LPV	0	100	0	100	0	100
ATY	WATERTOWN RGNL	SD	LPV200	0	100	0	100	0	100
BKX	BROOKINGS RGNL	SD	LPV200	0	100	0	100	0	100
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	0	100	0	100	0	100
FSD	JOE FOSS FIELD	SD	LPV200	0	100	0	100	0	100
HON	HURON RGNL	SD	LPV200	0	100	0	100	0	100
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	100	0	100	0	100
ICR	WINNER RGNL	SD	LPV	0	100	0	100	0	100
LEM	LEMMON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	100	0	100	0	100
MDS	MADISON MUNICIPAL	SD	LPV	0	100	0	100	0	100
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
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	0	100
3A2	NEW TAZEVELL 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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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	0	100
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
GCV	GREENEVILLE-GREENE COUNTY MUNICIPAL	TN	LPV	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	CAMPBELL COUNTY	TN	LP	0	100	0	100	0	100
JWN	JOHN C TUNE	TN	LPV	0	100	0	100	0	100
LUG	ELLINGTON	TN	LPV	0	100	0	100	0	100
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	0	100	0	100
M08	WILLIAM L WHITEHURST FIELD	TN	LP	0	100	0	100	0	100
M33	SUMNER COUNTY RGNL	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	0	100
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 RGNL JETPORT	TN	LPV200	0	100	0	100	0	100
PHT	HENRY COUNTY	TN	LPV200	0	100	0	100	0	100
PVE	BEECH RIVER RGNL	TN	LPV	0	100	0	100	0	100
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	100	0	100	0	100
RNC	WARREN COUNTY MEMORIAL	TN	LPV	0	100	0	100	0	100
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	0	100	0	100	0	100
SCX	SCOTT MUNICIPAL	TN	LPV	0	100	0	100	0	100
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	0	100	0	100
SRB	UPPER CUMBERLAND RGNL	TN	LPV200	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	0	100
THA	TULLAHOMA RGNL ARPT/WM NORTHER	TN	LPV	0	100	0	100	0	100
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	0	100	0	100	0	100
TYS	MC GHEE TYSON	TN	LPV200	0	100	0	100	0	100
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	100	0	100	0	100
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	0	100	0	100
2F5	LAMESA MUNICIPAL	TX	LP	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
45R	HAWTHORNE FIELD	TX	LP	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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	0	100
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	0	100	0	100
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	0	100
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 MUNICIPAL	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
CXO	LONE STAR EXECUTIVE	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	LP	0	100	0	100	0	100
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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
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	0	100
GNC	GAINES COUNTY	TX	LPV	0	100	0	100	0	100
GRK	ROBERT GRAY AAF	TX	LPV200	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
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 REGIONAL	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
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	LPV200	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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
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	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	LPV	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
OCH	A L MANGHAM JR RGNL	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	0	100
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	LPV	0	100	0	100	0	100
RBO	NUECES COUNTY	TX	LP	0	100	0	100	0	100
RKP	ARANSAS CO	TX	LPV	0	100	0	100	0	100
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LP	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	LPV200	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
T59	WHEELER MUNICIPAL	TX	LP	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
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
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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
BCE	BRYCE CANYON	UT	LPV	0	100	0	100	0	100
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	0	100	0	100
BMC	BRIGHAM CITY	UT	LP	0	100	0	100	0	100
DTA	DELTA MUNICIPAL	UT	LP	0	100	0	100	0	100
ENV	WENDOVER	UT	LPV	0	100	0	100	0	100
FOM	FILLMORE MUNICIPAL	UT	LPV	0	100	0	100	0	100
LGU	LOGAN-CACHE	UT	LPV	0	100	0	100	0	100
OGD	OGDEN-HINCKLEY	UT	LPV	0	100	0	100	0	100
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	0	100	0	100	0	100
PVU	PROVO MUNICIPAL	UT	LPV200	0	100	0	100	0	100
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	0	100	0	100
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	0	100
SLC	SALT LAKE CITY INTL	UT	LPV200	0	100	0	100	0	100
TVY	BOLINDER FIELD-TOOELE VALLEY	UT	LPV200	0	100	0	100	0	100
U14	NEPHI MUNICIPAL	UT	LPV	0	100	0	100	0	100
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	0	100	0	100
VEL	VERNAL RGNL	UT	LP	0	100	0	100	0	100
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	0	100
0VG	LEE COUNTY	VA	LPV	0	100	0	100	0	100
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	0	100
BCB	VIRGINIA TECH/MONTGOMERY EXECU	VA	LPV	0	100	0	100	0	100
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	0	100	0	100	0	100
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	0	100	0	100	0	100
CJR	CULPEPER RGNL	VA	LPV	0	100	0	100	0	100
CPK	CHESAPEAKE RGNL	VA	LPV200	0	100	0	100	0	100
DAN	DANVILLE RGNL	VA	LPV200	0	100	0	100	0	100
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV200	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
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	100	0	100	0	100
MTV	BLUE RIDGE	VA	LPV	0	100	0	100	0	100
OPF	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

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
PSK	NEW RIVER VALLEY	VA	LPV200	0	100	0	100	0	100
PTB	DINWIDDIE COUNTY	VA	LPV	0	100	0	100	0	100
PVG	HAMPTON ROADS EXECUTIVE	VA	LPV200	0	100	0	100	0	100
RIC	RICHMOND INTL	VA	LPV200	0	100	0	100	0	100
RMN	STAFFORD RGNL	VA	LPV	0	100	0	100	0	100
ROA	ROANOKE-BLACKSBURG RGNL/WOODRU	VA	LPV	0	100	0	100	0	100
SFQ	SUFFOLK EXECUTIVE	VA	LPV	0	100	0	100	0	100
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	0	100
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	100	0	100	0	100
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	0	100
W96	NEW KENT COUNTY	VA	LP	0	100	0	100	0	100
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	0	100	0	100	0	100
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	100	0	100	0	100
BTV	BURLINGTON INTL	VT	LPV200	0	100	0	100	0	100
EFK	NEWPORT STATE	VT	LP	0	100	0	100	0	100
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	100	0	100	0	100
MPV	EDWARD F KNAPP STATE	VT	LPV	0	100	0	100	0	100
MVL	MORRISVILLE-STOWE STATE	VT	LP	0	100	0	100	0	100
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	0	100	0	100	0	100
ALW	WALLA WALLA RGNL	WA	LPV200	0	100	0	100	0	100
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	100	0	100	0	100
BLI	BELLINGHAM INTL	WA	LPV200	0	100	0	100	0	100
BVS	SKAGIT RGNL	WA	LPV	0	100	0	100	0	100
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	100	0	100	0	100
CLS	CHEHALIS-CENTRALIA	WA	LPV	0	100	0	100	0	100
DEW	DEER PARK	WA	LPV	0	100	0	100	0	100
EPH	EPHRATA MUNICIPAL	WA	LPV	0	100	0	100	0	100
FHR	FRIDAY HARBOR	WA	LPV	0	100	0	100	0	100
GEG	SPOKANE INTL	WA	LPV200	0	100	0	100	0	100
HQM	BOWERMAN	WA	LPV200	0	100	0	100	0	100
MWH	GRANT CO INTL	WA	LPV200	0	100	0	100	0	100
OLM	OLYMPIA RGNL	WA	LPV	0	100	0	100	0	100
ORS	ORCAS ISLAND	WA	LP	0	100	0	100	0	100
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	0	100	0	100	0	100
PLU	PIERCE COUNTY - THUN FIELD	WA	LPV	0	100	0	100	0	100
PSC	TRI-CITIES	WA	LPV200	0	100	0	100	0	100
PWT	BREMERTON NATIONAL	WA	LPV200	0	100	0	100	0	100
RLD	RICHLAND	WA	LPV	0	100	0	100	0	100
RNT	RENTON MUNICIPAL	WA	LPV	0	100	0	100	0	100
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	100	0	100	0	100
SFF	FELTS FIELD	WA	LPV	0	100	0	100	0	100
SHN	SANDERSON FIELD	WA	LPV	0	100	0	100	0	100
TDO	ED CARLSON MEMORIAL FIELD - SO	WA	LPV	0	100	0	100	0	100
TIW	TACOMA NARROWS	WA	LPV	0	100	0	100	0	100
YKM	YAKIMA AIR TERMINAL/MCALLISTER	WA	LPV200	0	100	0	100	0	100
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
57C	EAST TROY MUNICIPAL	WI	LPV	0	100	0	100	0	100
82C	MAUSTON-NEW LISBON UNION	WI	LP	0	100	0	100	0	100

Airport Id	Airport Name	State/Provence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	100	0	100	0	100
AHH	AMERY MUNICIPAL	WI	LP	0	100	0	100	0	100
AIG	LANGLADE COUNTY	WI	LPV	0	100	0	100	0	100
ARV	LAKELAND/NOBLE F LEE MEMORIAL	WI	LPV	0	100	0	100	0	100
ASX	JOHN F KENNEDY MEMORIAL	WI	LPV	0	100	0	100	0	100
ATW	APPLETON INTL	WI	LPV200	0	100	0	100	0	100
AUW	WAUSAU DOWNTOWN	WI	LPV200	0	100	0	100	0	100
BCK	BLACK RIVER FALLS AREA	WI	LPV	0	100	0	100	0	100
BUU	BURLINGTON MUNICIPAL	WI	LP	0	100	0	100	0	100
C29	MIDDLETON MUNICIPAL - MOREY FIELD	WI	LPV	0	100	0	100	0	100
C35	REEDSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
CMY	SPARTA/FORT MC COY	WI	LPV	0	100	0	100	0	100
CWA	CENTRAL WISCONSIN	WI	LPV200	0	100	0	100	0	100
DLL	BARABOO WISCONSIN DELLS	WI	LPV	0	100	0	100	0	100
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	100	0	100	0	100
EGV	EAGLE RIVER UNION	WI	LPV	0	100	0	100	0	100
ENW	KENOSHA RGNL	WI	LPV200	0	100	0	100	0	100
ETB	WEST BEND MUNICIPAL	WI	LPV	0	100	0	100	0	100
EZS	SHAWANO MUNICIPAL	WI	LPV	0	100	0	100	0	100
FLD	FOND DU LAC COUNTY	WI	LPV	0	100	0	100	0	100
GRB	AUSTIN STRAUBEL INTL	WI	LPV200	0	100	0	100	0	100
GTG	GRANTSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
HXF	HARTFORD MUNICIPAL	WI	LPV	0	100	0	100	0	100
HYR	SAWYER COUNTY	WI	LPV	0	100	0	100	0	100
ISW	ALEXANDER FIELD SOUTH WOOD COU	WI	LPV	0	100	0	100	0	100
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	0	100	0	100	0	100
LNR	TRI-COUNTY RGNL	WI	LPV	0	100	0	100	0	100
LSE	LA CROSSE RGNL	WI	LPV	0	100	0	100	0	100
LUM	MENOMONIE MUNICIPAL-SCORE FIELD	WI	LPV	0	100	0	100	0	100
MDZ	TAYLOR COUNTY	WI	LPV	0	100	0	100	0	100
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	100	0	100	0	100
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	100	0	100	0	100
MRJ	IOWA COUNTY	WI	LPV200	0	100	0	100	0	100
MSN	DANE COUNTY RGNL-TRUAX FIELD	WI	LPV200	0	100	0	100	0	100
MTW	MANITOWOC COUNTY	WI	LPV200	0	100	0	100	0	100
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	100	0	100	0	100
OCQ	OCONTO-J DOUGLAS BAKE MUNICIPAL	WI	LP	0	100	0	100	0	100
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	0	100	0	100	0	100
OSH	WITTMAN RGNL	WI	LPV200	0	100	0	100	0	100
OVS	BOSCOBEL	WI	LPV	0	100	0	100	0	100
PBH	PRICE COUNTY	WI	LPV	0	100	0	100	0	100
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	100	0	100	0	100
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
RAC	JOHN H BATTEN	WI	LPV	0	100	0	100	0	100
RCX	RUSK COUNTY	WI	LPV	0	100	0	100	0	100
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	0	100	0	100	0	100
RNH	NEW RICHMOND RGNL	WI	LPV	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RPD	RICE LAKE RGNL - CARL'S FIELD	WI	LPV	0	100	0	100	0	100
RRL	MERRILL MUNICIPAL	WI	LPV	0	100	0	100	0	100
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	0	100	0	100	0	100
STE	STEVENS POINT MUNICIPAL	WI	LPV200	0	100	0	100	0	100
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	100	0	100	0	100
SUW	RICHARD I BONG	WI	LP	0	100	0	100	0	100
TKV	TOMAHAWK RGNL	WI	LP	0	100	0	100	0	100
UES	WAUKESHA COUNTY	WI	LPV200	0	100	0	100	0	100
UNU	DODGE COUNTY	WI	LPV	0	100	0	100	0	100
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y50	WAUTOMA MUNICIPAL	WI	LP	0	100	0	100	0	100
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	0	100	0	100	0	100
3I2	MASON COUNTY	WV	LPV	0	100	0	100	0	100
6L4	LOGAN COUNTY	WV	LPV	0	100	0	100	0	100
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	100	0	100	0	100
BLF	MERCER COUNTY	WV	LPV	0	100	0	100	0	100
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	0	100
CRW	YEAGER	WV	LPV200	0	100	0	100	0	100
HLG	WHEELING OHIO CO	WV	LPV200	0	100	0	100	0	100
HTS	TRI-STATE/MILTON J FERGUSON FI	WV	LPV200	0	100	0	100	0	100
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	0	100
LWB	GREENBRIER VALLEY	WV	LPV	0	100	0	100	0	100
MGW	MORGANTOWN MUNICIPAL-WALTER L BILL	WV	LPV200	0	100	0	100	0	100
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	0	100	0	100	0	100
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	100	0	100	0	100
SXL	SUMMERSVILLE	WV	LP	0	100	0	100	0	100
USW	BOGGS FIELD	WV	LPV	0	100	0	100	0	100
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	0	100
W99	GRANT COUNTY	WV	LP	0	100	0	100	0	100
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	0	100
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	0	100
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	0	100
CYS	CHEYENNE RGNL/JERRY OLSON FIEL	WY	LPV	0	100	0	100	0	100
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	0	100
ECS	MONDELL FIELD	WY	LPV	0	100	0	100	0	100
EMM	KEMMERER MUNICIPAL	WY	LPV	0	100	0	100	0	100
EVW	EVANSTON-UINTA COUNTY BURNS FI	WY	LPV	0	100	0	100	0	100
FBR	FORT BRIDGER	WY	LP	0	100	0	100	0	100
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	100	0	100	0	100
GEY	SOUTH BIG HORN COUNTY	WY	LP	0	100	0	100	0	100
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	0	100
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	0	100
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	0	100
PNA	RALPH WENZ FIELD	WY	LPV	0	100	0	100	0	100
POY	POWELL MUNICIPAL	WY	LPV	0	100	0	100	0	100
RIW	RIVERTON RGNL	WY	LPV200	0	100	0	100	0	100
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	0	100	0	100	0	100

Airport Id	Airport Name	State/Providence	Service	LP Outages	LP Avail	LPV Outages	LPV Avail	LPV 200 Outages	LPV 200 Avail
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	100	0	100	0	100
SAA	SHIVELY FIELD	WY	LPV	0	100	0	100	0	100
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	0	100
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
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	0	100

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

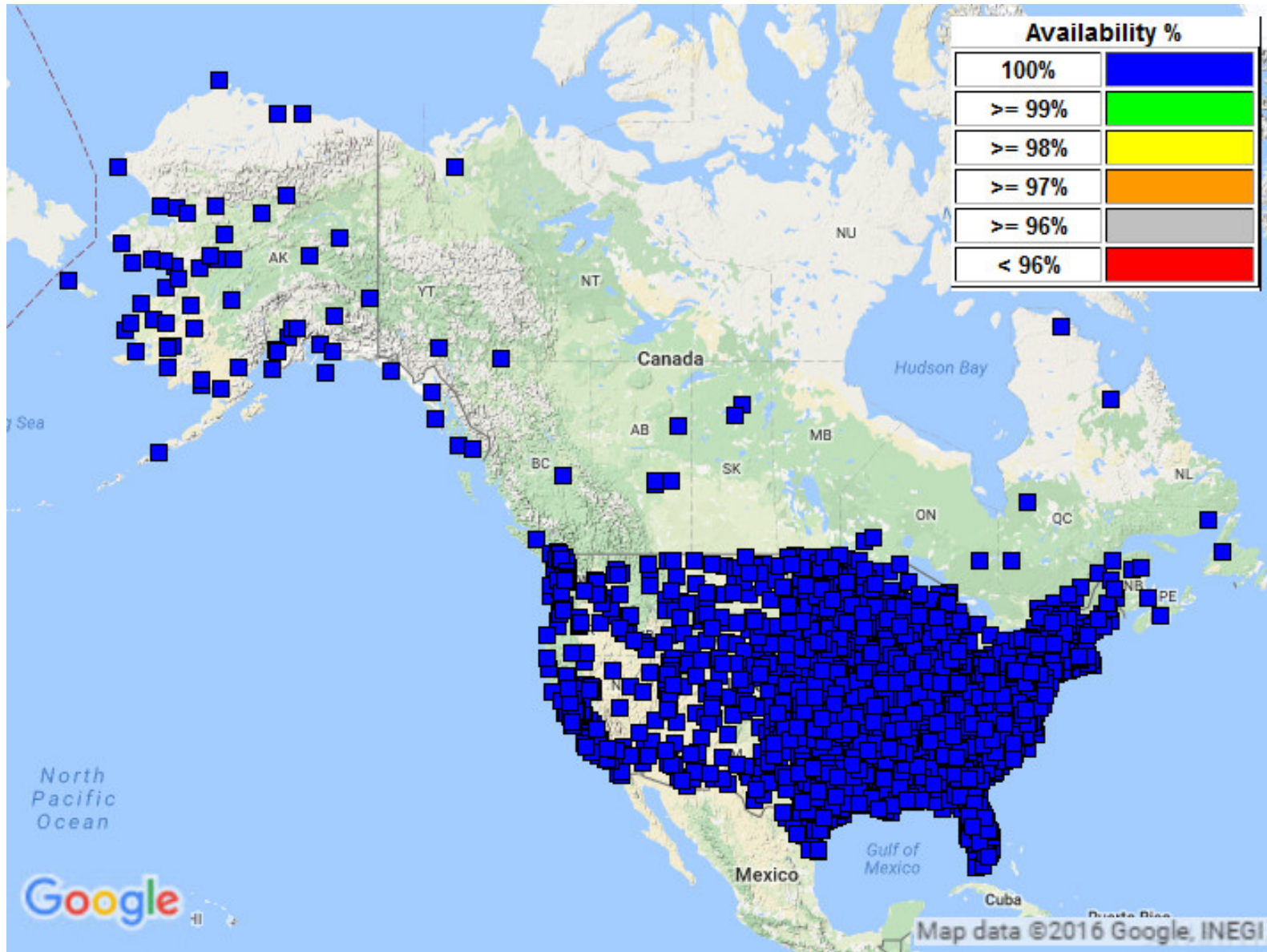


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV IAPs

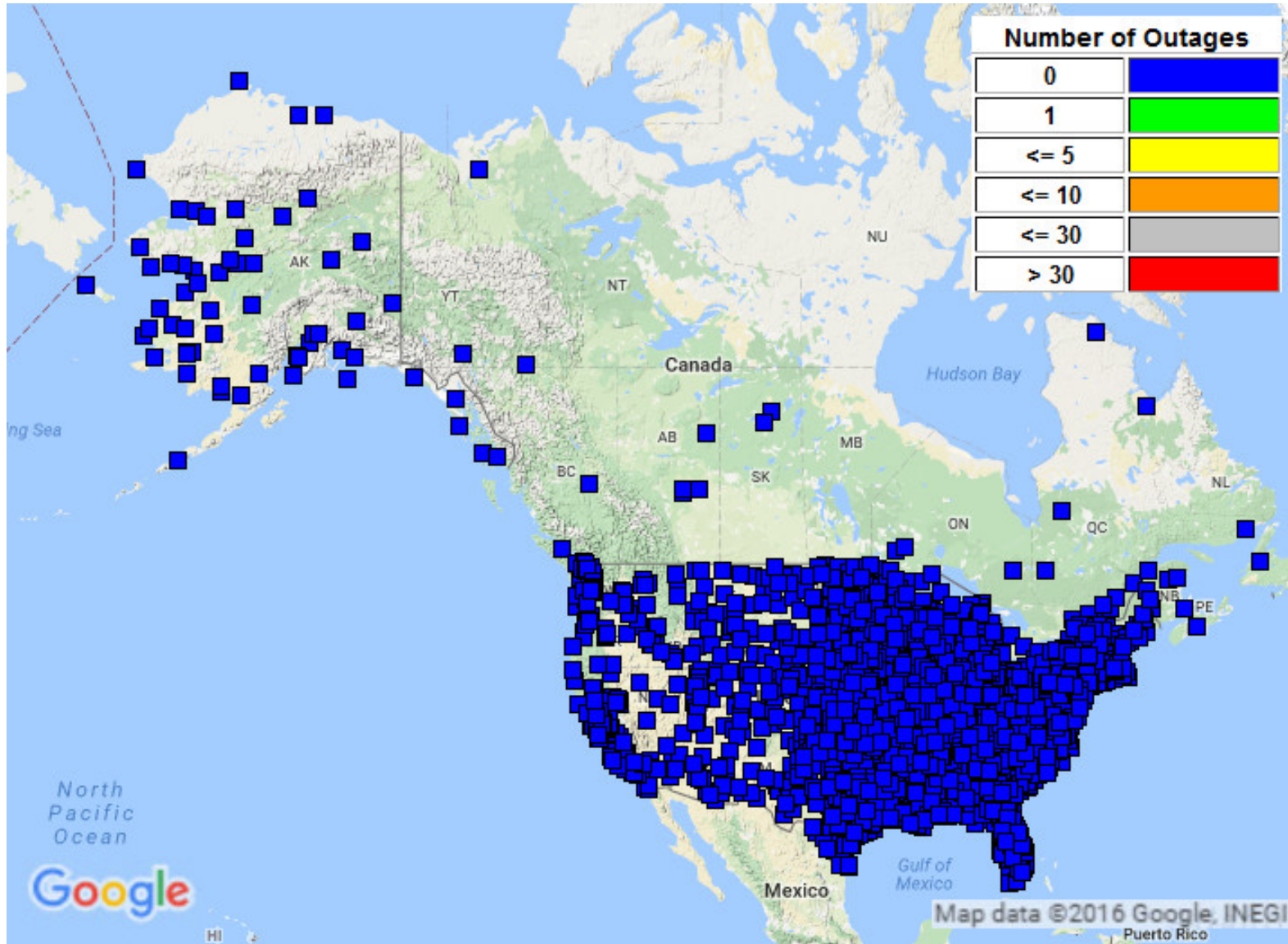


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV IAPs

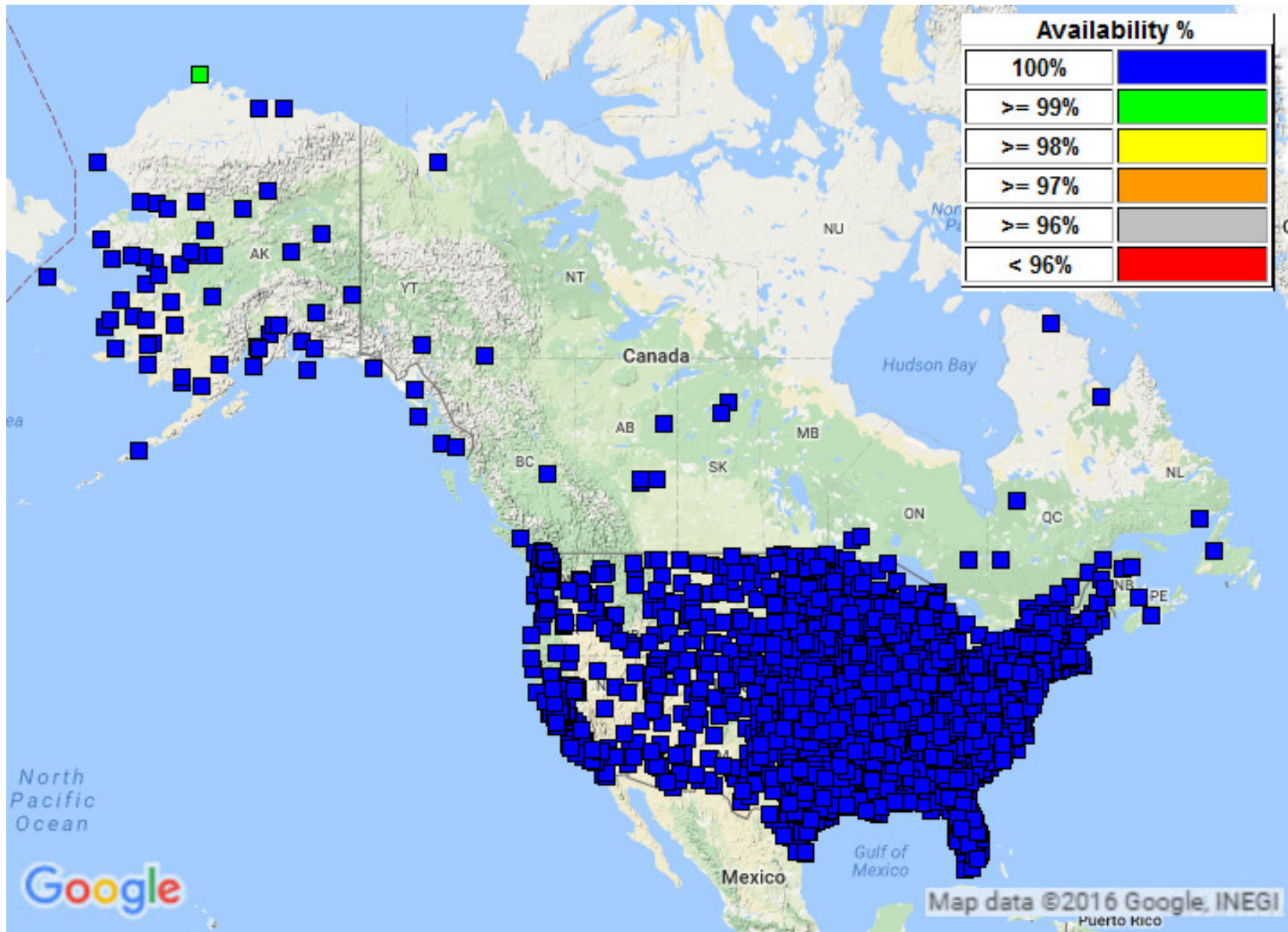


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV IAPs

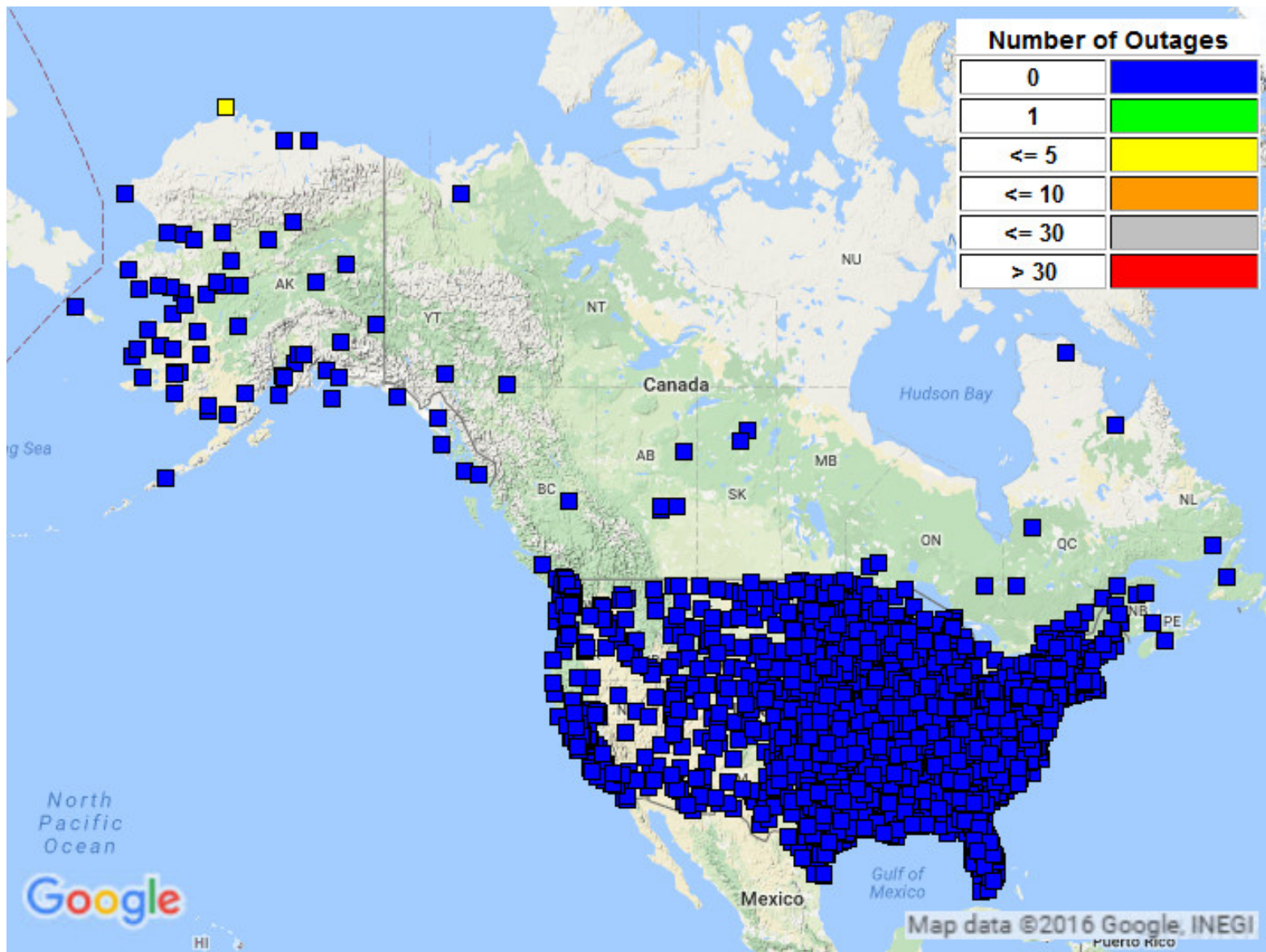


Figure 8-5 WAAS LPV200 Availability at Airports in the US and Canada with GPS RNAV IAPs

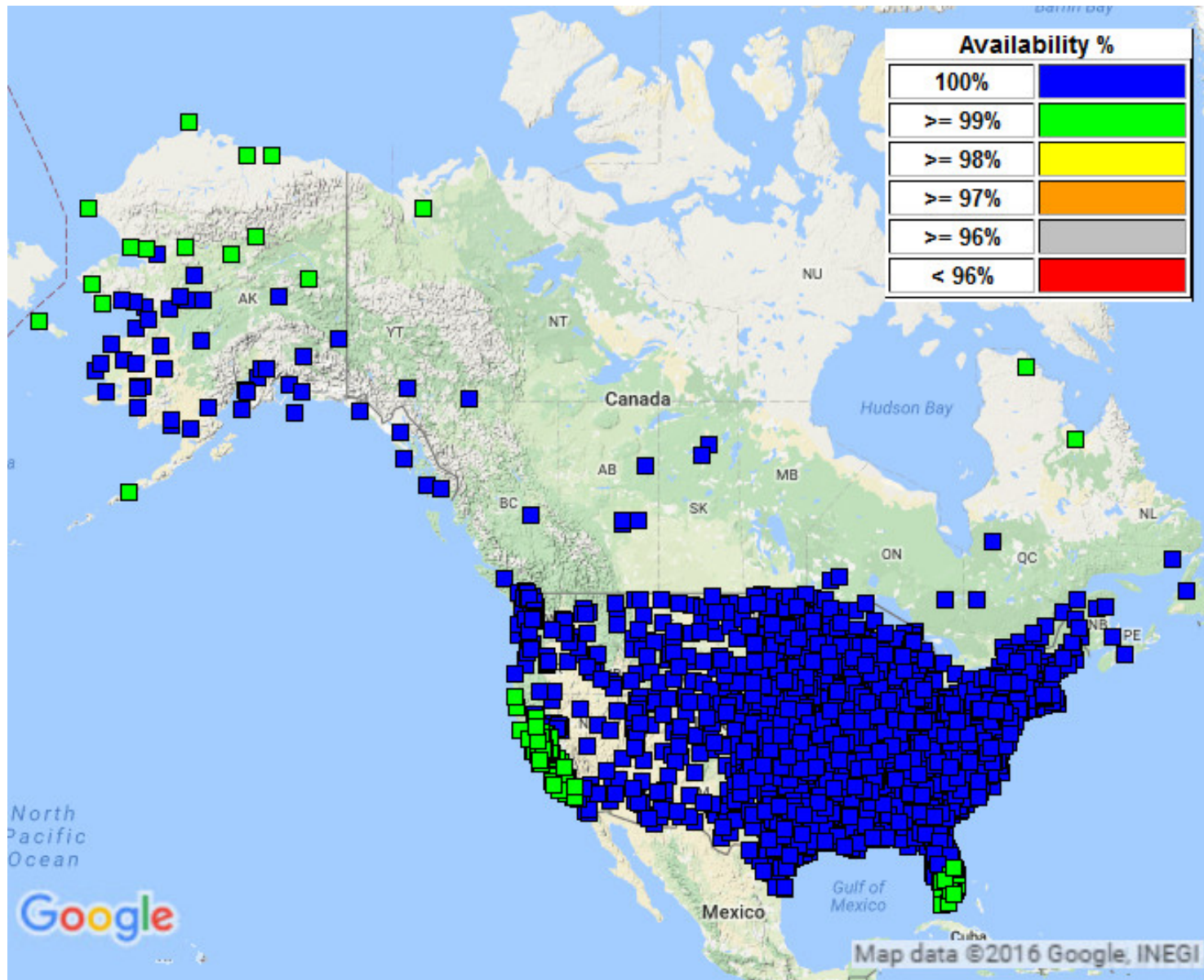
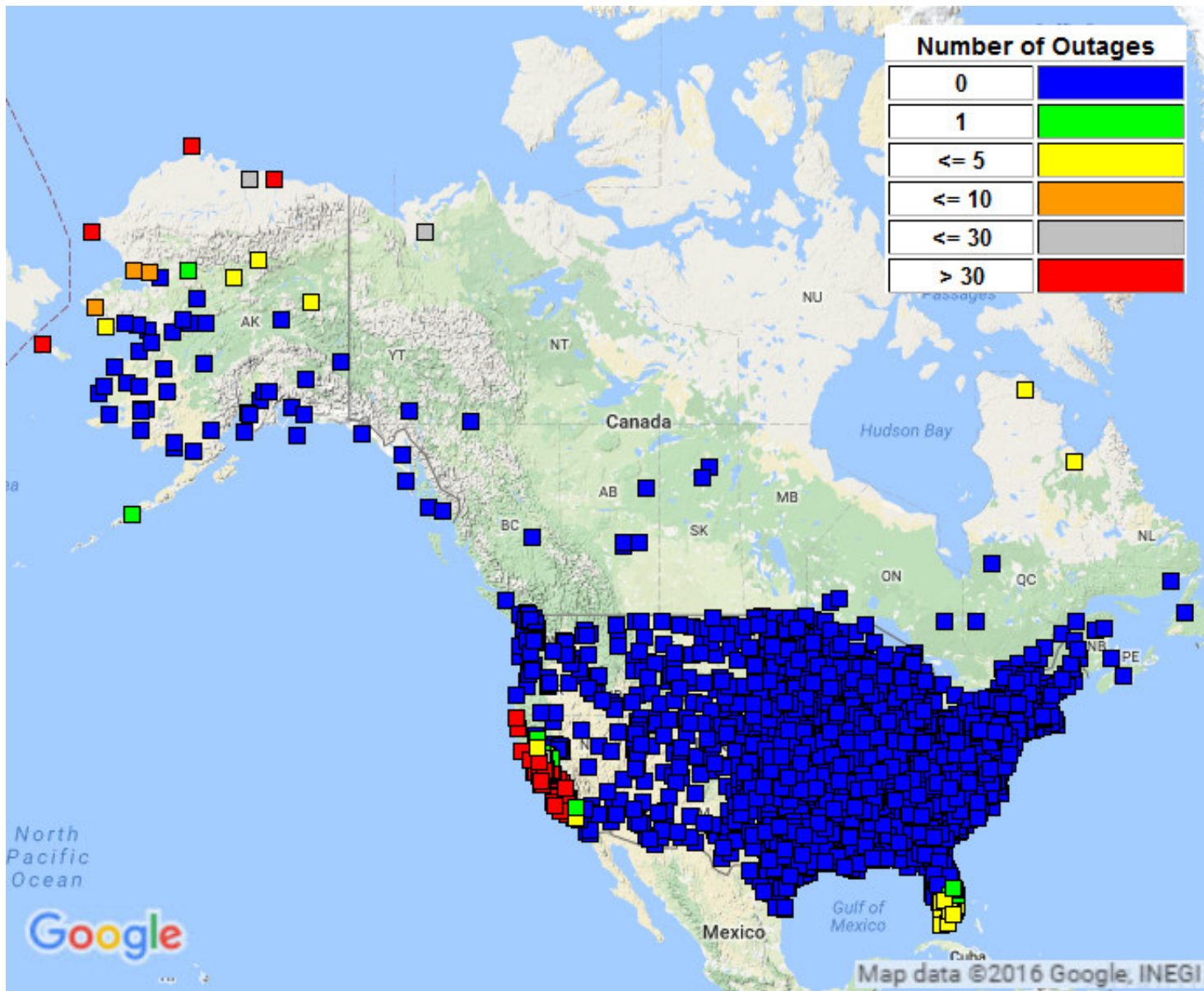


Figure 8-6 WAAS LPV200 Outages at Airports in the US and Canada with GPS RNAV IAPs



9.0 WAAS CODE NOISE AND MULTIPATH 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 in order 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 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 in length are used for this analysis. The WAAS dual frequency cycle slip detector algorithm is used to detect any discontinuities in the carrier phase.

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

Table 9-1 CNMP Bounding Statistics

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

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

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

10.0 WAAS REFERENCE STATION (WRS) ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 24 hour sets on 01/02/17. Each WAAS WRS has three independent threads of WRE: (1) Thread A is also referred to as Thread 1, (2) Thread B is also referred to as Thread 2, and (3) Thread C is referred to as Thread 3.

Duplicate surveys were performed using both the 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 less than 2.3cm. The CSRS surveys' RSSs of the reported ECEF sigmas were less than 10 mm. The OPUS and CSRS surveys agreed to an average of 1.4 cm with a standard deviation of 6.4 mm. The maximum of difference was 3.19 cm for thread 3 at Houston, TX.

The OPUS positions were compared to the positions in the currently fielded WAAS software Build W7.134 which was fielded starting in September 2016. The OPUS surveys agree with the Build W7.134 to better or equal to 6.3 cm for most sites. Outliers include Fairbanks, which after undergoing roof repairs had antennas remounted saw a maximum difference of 8.6 cm on Thread C (FAI3); and Mexico City which, due to rapid subsidence, saw a maximum difference of 18.1 cm on Thread C (MMX3). Removing outliers, the maximum difference was 6.3 cm at San Jose Del Cabo Thread A (MSD1). The antenna positions are interpolated forward in time.

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

Figure 10-1 to Figure 10-3 show the RSS of the ECEF differences between the OPUS survey antenna phase center locations and the locations in the Build W7.134 software. Figure 10-4 to Figure 10-6 show the OPUS surveys overall RMS quality indications.

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

Table 10-1 WAAS Antenna Positions (OPUS IGS08) as of 01/02/2017

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
BET1	-2965385.106	-972576.624	5543892.843	60.78791478	-161.8417253	52.163
BET2	-2965385.875	-972580.347	5543891.786	60.78789534	-161.8416647	52.164
BET3	-2965388.441	-972577.478	5543890.918	60.78787944	-161.8417295	52.16
BIL1	-1416445.93	-4223577.008	4550862.117	45.80370658	-108.5397237	1112.223
BIL2	-1416450.01	-4223574.866	4550862.841	45.80371585	-108.5397822	1112.231
BIL3	-1416441.63	-4223574.263	4550865.974	45.80375637	-108.5396825	1112.221
BRW1	-1886758.982	-809058.651	6018494.455	71.28276444	-156.7899257	15.567
BRW2	-1886756.397	-809055.91	6018495.634	71.28279717	-156.7899676	15.575
BRW3	-1886755.304	-809059.691	6018495.456	71.28279254	-156.7898586	15.562
CDB1	-3484099.118	-1084748.78	5213678.586	55.19237346	-162.706405	49.697
CDB2	-3484105.762	-1084741.585	5213675.644	55.19232737	-162.7065439	49.681
CDB3	-3484112.034	-1084734.817	5213672.896	55.19228395	-162.7066746	49.695
FAI1	-2304741.884	-1448715.3	5748843.711	64.80962952	-147.8473413	149.99
FAI2	-2304741.425	-1448706.502	5748846.116	64.80967985	-147.847493	150.008
FAI3	-2304732.906	-1448707.437	5748849.273	64.8097464	-147.8473809	150.007
HNL1	-5508637.146	-2234493.031	2303722.338	21.3129917	-157.9208302	24.664
HNL2	-5508656.318	-2234483.355	2303687.095	21.31264879	-157.9209861	25.017
HNL3	-5508647.724	-2234497.284	2303694.188	21.31271742	-157.9208305	25.054
JNU1	-2354254.976	-2388549.666	5407043.137	58.36257419	-134.5857078	16.157
JNU2	-2354252.893	-2388565.781	5407036.976	58.36246862	-134.5854892	16.164
JNU3	-2354239.673	-2388568.631	5407041.433	58.36254503	-134.5852942	16.156
MMD1	35070.39	-5959686.672	2264365.774	20.93190931	-89.66284098	29.126
MMD2	35065.459	-5959687.034	2264364.99	20.93190162	-89.6628884	29.157
MMD3	35065.125	-5959685.248	2264369.643	20.93194664	-89.66289151	29.15
MMX1	-948700.946	-5943934.425	2109212.318	19.43165381	-99.06838999	2234.344
MMX2	-948696.518	-5943934.258	2109214.73	19.43167694	-99.06834861	2234.332
MMX3	-948705.379	-5943934.615	2109209.894	19.4316305	-99.06843137	2234.373
MPR1	-1570142.243	-5759530.58	2238184.754	20.67900336	-105.2492035	10.961
MPR2	-1570139.417	-5759530.089	2238188.799	20.67904143	-105.2491786	11.251
MPR3	-1570143.525	-5759527.965	2238190.567	20.67905946	-105.249222	10.969
MSD1	-1979519.937	-5523222.903	2493106.886	23.16044794	-109.7176505	104.26
MSD2	-1979521.5	-5523225.243	2493100.487	23.16038512	-109.7176572	104.253
MSD3	-1979525.95	-5523221.974	2493104.157	23.16042118	-109.7177089	104.248
MTP1	-254854.378	-6162909.154	1617805.073	14.79136609	-92.36799942	54.933
MTP2	-254850.758	-6162910.191	1617801.641	14.79133405	-92.36796542	54.914
MTP3	-254855.536	-6162910.288	1617800.12	14.79132008	-92.36800973	54.81
OTZ1	-2396056.089	-750356.181	5843502.488	66.88733148	-162.611373	10.888
OTZ2	-2396052.91	-750354.341	5843504.008	66.88736639	-162.6113913	10.879

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
OTZ3	-2396052.891	-750358.28	5843503.518	66.8873551	-162.6113054	10.884
YFB1	1035381.365	-2634289.65	5696539.563	63.73149079	-68.54318505	10.038
YFB2	1035372.163	-2634296.063	5696538.198	63.73146443	-68.5434059	9.966
YFB3	1035366.09	-2634306.824	5696534.427	63.73138676	-68.54359999	10.034
YQX1	2430424.571	-3419640.403	4788223.857	48.96649034	-54.59763295	146.879
YQX2	2430432.529	-3419639.058	4788220.799	48.96644846	-54.59753372	146.879
YQX3	2430440.429	-3419637.697	4788217.791	48.96640718	-54.59743501	146.886
YWG1	-520164.453	-4083475.95	4855843.029	49.90057414	-97.25939867	222.105
YWG2	-520150.585	-4083468.89	4855850.418	49.90067714	-97.25921961	222.117
YWG3	-520152.457	-4083478.009	4855842.6	49.90056804	-97.25922942	222.116
YXR1	1885341.356	-3321428.375	5091171.694	53.30864746	-60.4194693	37.865
YXR2	1885344.317	-3321419.892	5091176.108	53.30871378	-60.41936784	37.87
YXR3	1885340.042	-3321413.077	5091182.105	53.30880388	-60.41937315	37.876
ZAB1	-1488636.889	-5003946.53	3654557.689	35.17357523	-106.5673503	1620.118
ZAB2	-1488631.554	-5003948.222	3654557.667	35.17357455	-106.5672889	1620.187
ZAB3	-1488632.332	-5003950.806	3654553.815	35.17353217	-106.567289	1620.174
ZAN1	-2659536.723	-1549114.765	5567750.753	61.22920128	-149.7802517	80.722
ZAN2	-2659548.477	-1549110.811	5567746.264	61.22911765	-149.7804254	80.717
ZAN3	-2659541.426	-1549106.686	5567750.735	61.22920122	-149.7804257	80.705
ZAU1	138704.06	-4761244.14	4227763.93	41.78265806	-88.33133736	195.885
ZAU2	138704.321	-4761248.758	4227758.77	41.78259568	-88.33133584	195.894
ZAU3	138711.026	-4761248.499	4227758.851	41.78259661	-88.33125513	195.901
ZBW1	1490299.162	-4448983.173	4306010.506	42.73572067	-71.48042654	39.109
ZBW2	1490304.277	-4448981.168	4306010.857	42.73572468	-71.48035954	39.144
ZBW3	1490305.985	-4448984.79	4306006.544	42.73567186	-71.48035381	39.138
ZDC1	1069125.708	-4839598.996	4001126.518	39.10159599	-77.54274717	80.068
ZDC2	1069128.107	-4839603.625	4001120.312	39.10152399	-77.54273164	80.063
ZDC3	1069124.006	-4839602.713	4001122.507	39.10154942	-77.54277566	80.07
ZDV1	-1273628.659	-4711375.563	4094890.097	40.18730317	-105.1272249	1541.348
ZDV2	-1273622.957	-4711377.082	4094890.114	40.18730341	-105.1271557	1541.342
ZDV3	-1273624.966	-4711380.277	4094885.819	40.1872529	-105.1271686	1541.327
ZFW1	-659983.23	-5324060.77	3438276.461	32.83064966	-97.06647213	155.611
ZFW2	-659988.504	-5324063.321	3438271.465	32.83059626	-97.06652468	155.574
ZFW3	-659983.528	-5324063.852	3438271.673	32.83059825	-97.06647124	155.616
ZHU1	-513864.509	-5506451.687	3166720.462	29.96189633	-95.33142668	10.831
ZHU2	-513867.15	-5506455.071	3166714.289	29.9618318	-95.33145066	10.88
ZHU3	-513873.438	-5506457.733	3166708.705	29.96177359	-95.33151296	10.894
ZJX1	772646.402	-5434462.188	3237231.746	30.69885971	-81.90818554	2.132
ZJX2	772649.728	-5434463.742	3237228.35	30.69882413	-81.90815345	2.124
ZJX3	772645.664	-5434466.174	3237225.243	30.69879158	-81.90819903	2.116

WRE	X(m)	Y(m)	Z(m)	Latitude	Longitude	H(m)
ZKC1	-415247.565	-4954556.388	3982161.109	38.88015934	-94.79083439	305.896
ZKC2	-415231.172	-4954557.712	3982161.165	38.88016002	-94.79064486	305.892
ZKC3	-415237.291	-4954561.059	3982155.97	38.88010184	-94.79071191	305.626
ZLA1	-2474410.016	-4637294.587	3602183.55	34.60351851	-118.0838965	763.507
ZLA2	-2474404.744	-4637297.395	3602183.569	34.60351868	-118.0838314	763.514
ZLA3	-2474411.349	-4637297.063	3602179.577	34.60347464	-118.0838966	763.565
ZLC1	-1808273.271	-4486410.814	4145302.996	40.78604306	-111.9521782	1287.427
ZLC2	-1808274.664	-4486414.425	4145298.51	40.78598972	-111.9521775	1287.427
ZLC3	-1808270.46	-4486416.14	4145298.506	40.78598958	-111.9521238	1287.439
ZMA1	966042.263	-5662999.804	2761581.502	25.82461232	-80.31919013	-7.609
ZMA2	966029.289	-5662999.115	2761585.987	25.82466001	-80.31931653	-8.23
ZMA3	966037.368	-5662997.956	2761586.342	25.82466204	-80.31923516	-7.881
ZME1	4070.844	-5226189.304	3644028.423	35.06739408	-89.95537052	68.609
ZME2	4070.873	-5226186.745	3644032.543	35.06743772	-89.95537018	68.881
ZME3	4064.679	-5226186.623	3644032.694	35.06743949	-89.95543808	68.864
ZMP1	-249978.441	-4539297.502	4458955.052	44.63746323	-93.15208623	262.658
ZMP2	-249972.637	-4539297.843	4458955.054	44.63746311	-93.15201296	262.675
ZMP3	-249973.735	-4539302.121	4458950.577	44.63740705	-93.15202381	262.612
ZNY1	1406144.579	-4627343.992	4144322.07	40.78432872	-73.09716635	6.452
ZNY2	1406146.375	-4627347.019	4144317.286	40.78427599	-73.09715642	5.915
ZNY3	1406140.816	-4627348.676	4144317.328	40.78427646	-73.09722514	5.919
ZOA1	-2684436.941	-4293337.327	3865351.894	37.54305426	-122.0159489	-3.506
ZOA2	-2684433.935	-4293341.405	3865349.471	37.54302672	-122.0158956	-3.505
ZOA3	-2684438.307	-4293342.278	3865345.609	37.54298234	-122.0159323	-3.433
ZOB1	650770.13	-4754715.662	4187420.753	41.29715457	-82.20644535	223.67
ZOB2	650777.809	-4754714.835	4187422.77	41.2971669	-82.20635318	225.168
ZOB3	650776.142	-4754719.667	4187414.986	41.29708714	-82.20638072	223.458
ZSE1	-2308930.3	-3668169.676	4663526.46	47.28699305	-122.1883732	82.097
ZSE2	-2308934.695	-3668175.216	4663520.048	47.28690747	-122.1883833	82.154
ZSE3	-2308935.748	-3668179.486	4663516.1	47.28685579	-122.188365	82.085
ZSU1	2462589.462	-5529372.1	2003724.512	18.43133612	-65.99347648	-28.095
ZSU2	2462587.53	-5529377.457	2003712.216	18.43121899	-65.99351382	-28.086
ZSU3	2462594.16	-5529375.213	2003710.144	18.43119939	-65.99344785	-28.127
ZTL1	529840.355	-5305248.824	3489342.861	33.37968863	-84.29672654	261.149
ZTL2	529846.73	-5305247.976	3489343.142	33.37969179	-84.29665746	261.128
ZTL3	529847.413	-5305251.417	3489337.909	33.37963507	-84.29665384	261.164

Figure 10-1 Build W7.134 Antenna Positions Deltas OPUS Survey

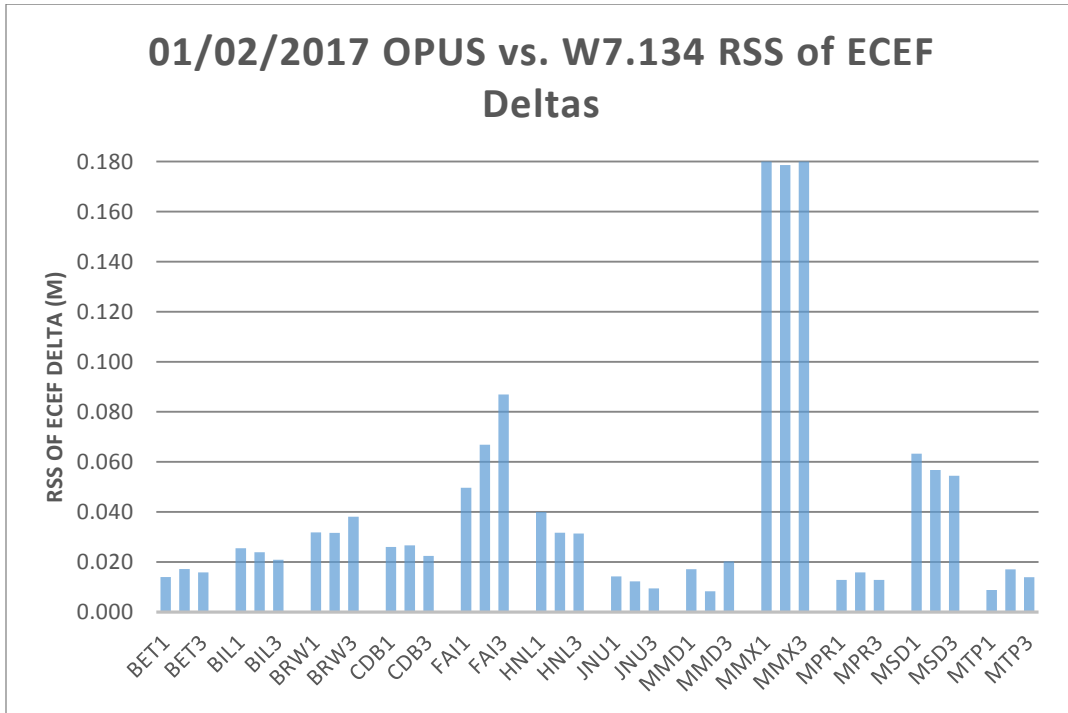


Figure 10-2 Build W7.134 Antenna Positions Deltas OPUS Survey

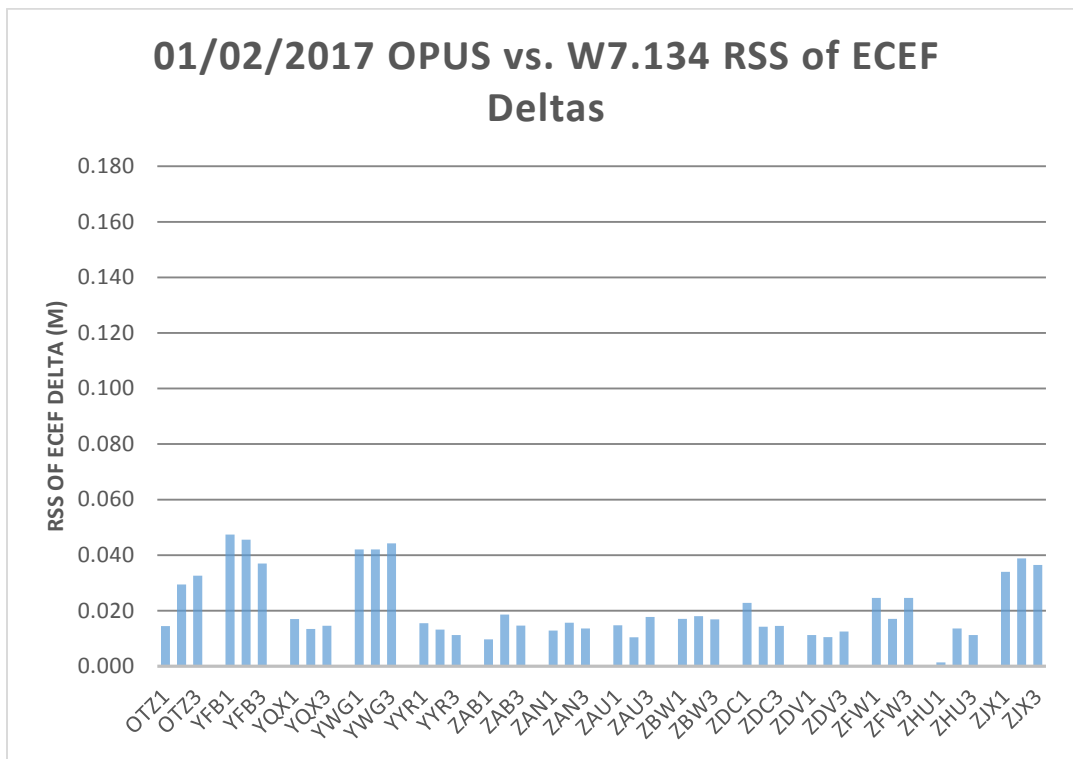


Figure 10-3 Build W7.134 Antenna Positions Deltas OPUS Survey

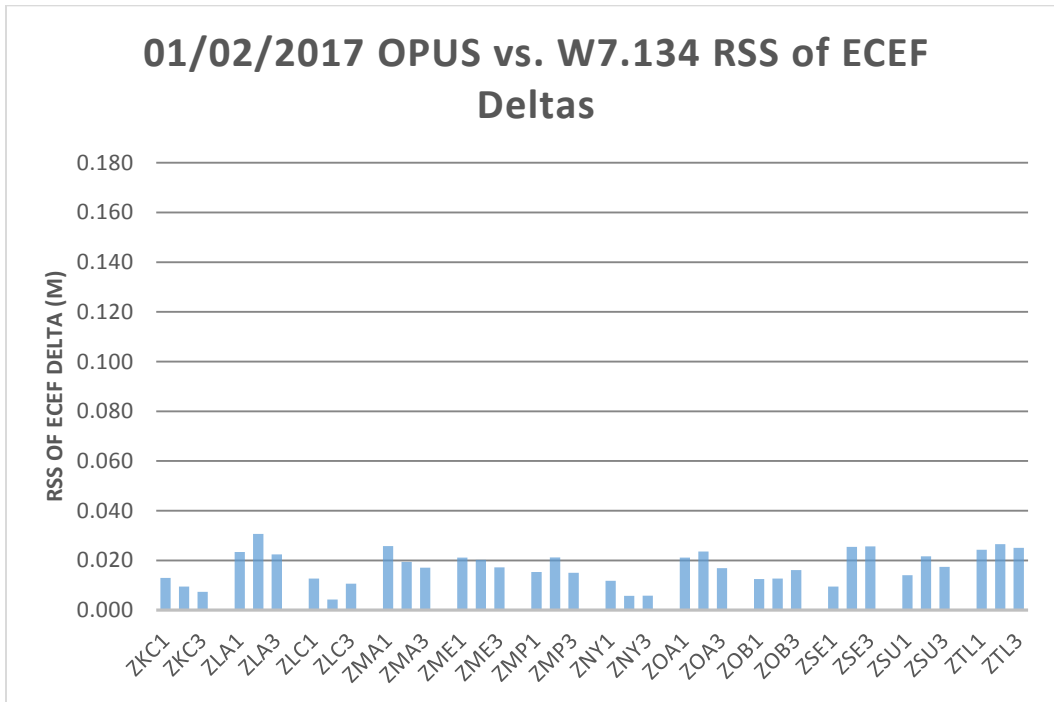


Figure 10-4 OPUS Survey Overall RMS Qualities

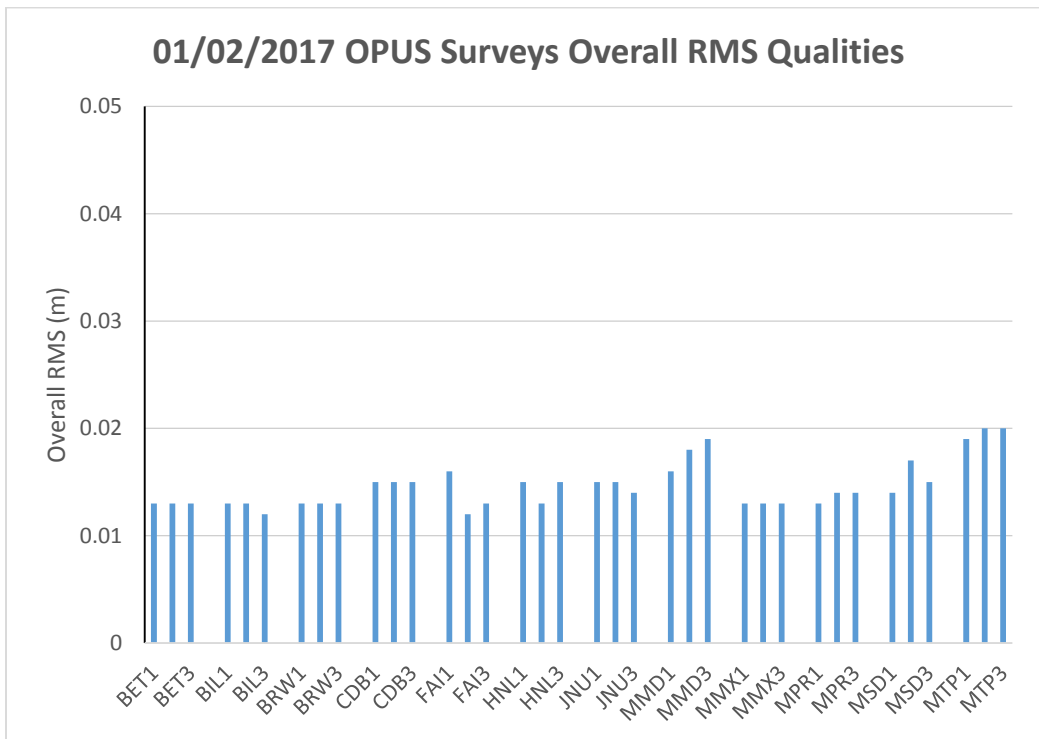


Figure 10-5 OPUS Survey Overall RMS Qualities

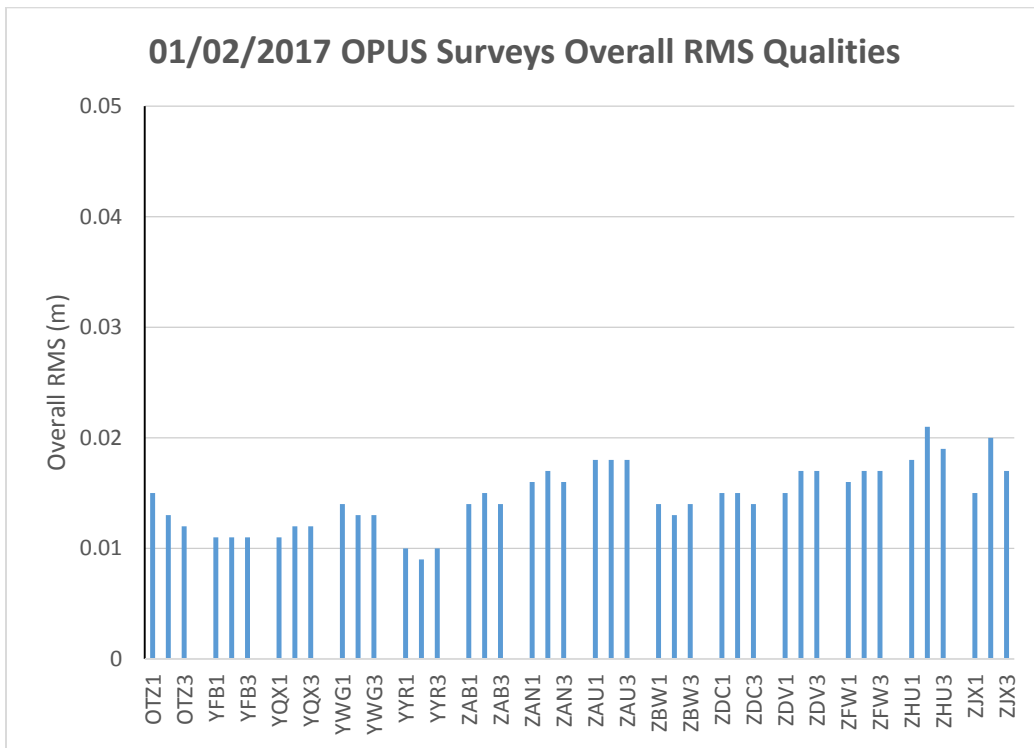


Figure 10-6 OPUS Survey Overall RMS Qualities

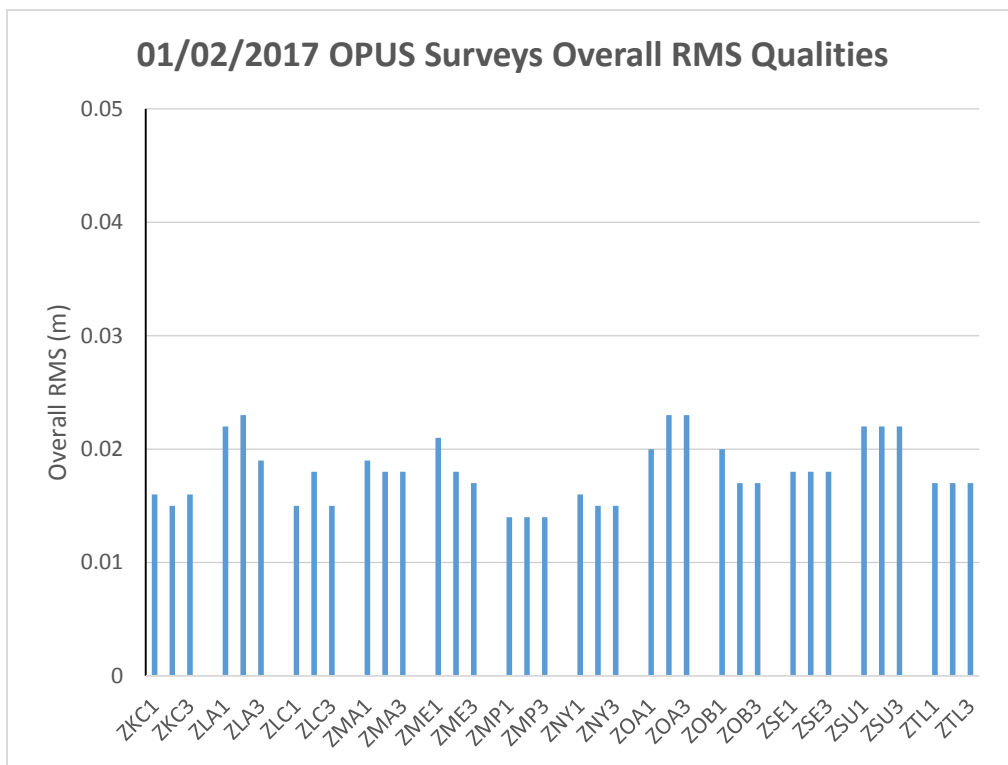


Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

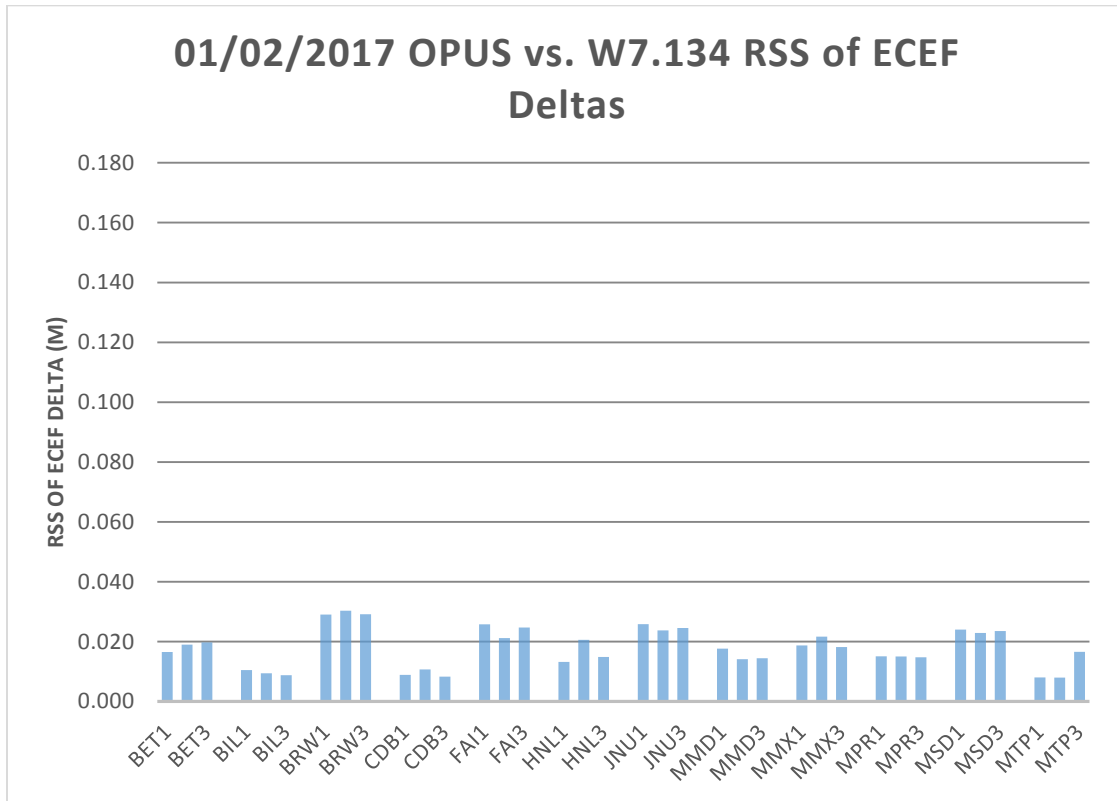


Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

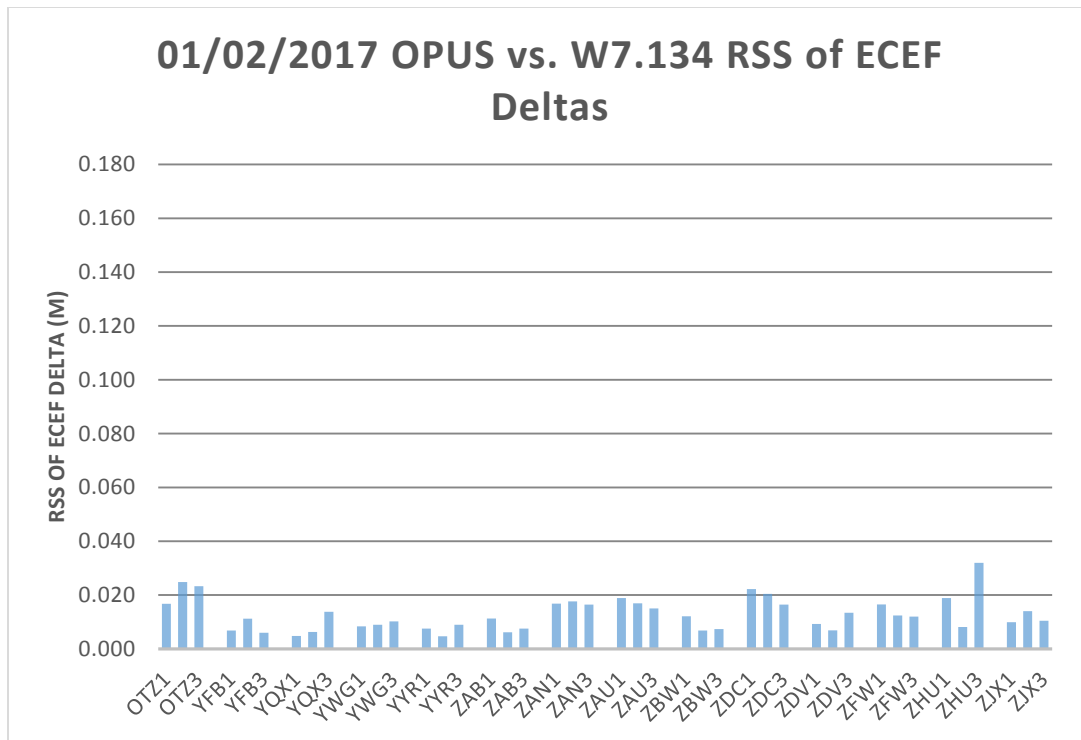


Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

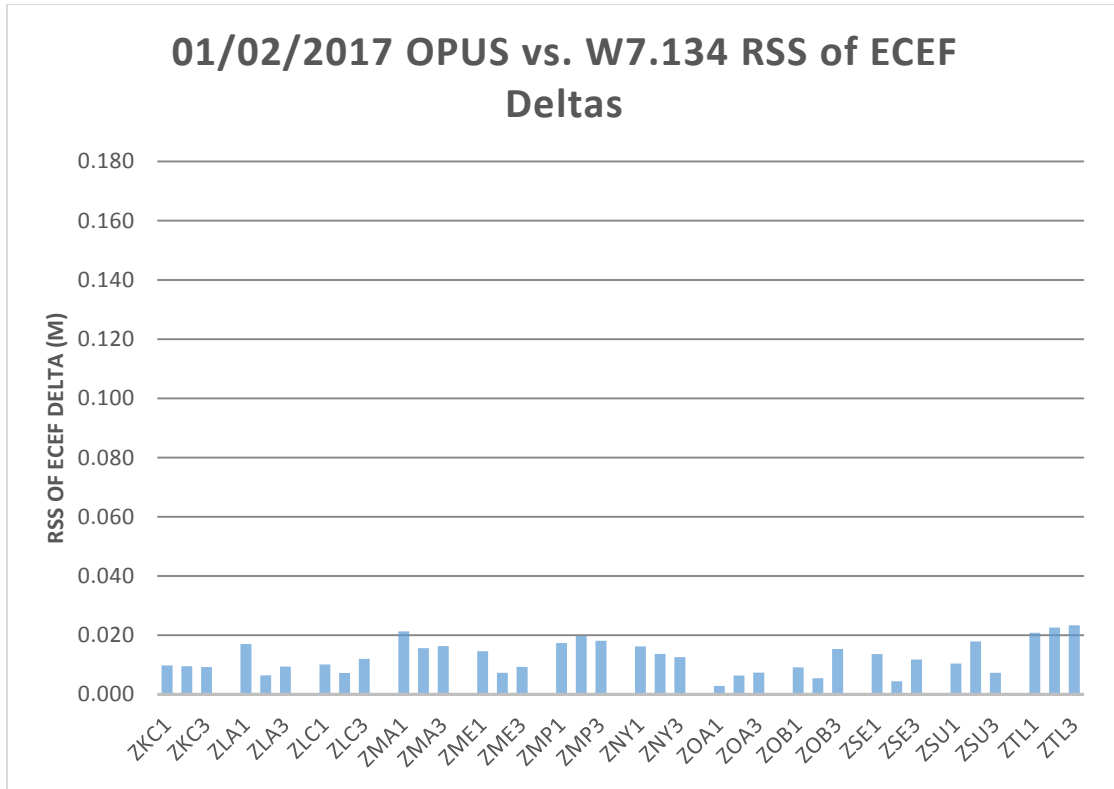


Figure 10-10 CSRS Survey Qualities

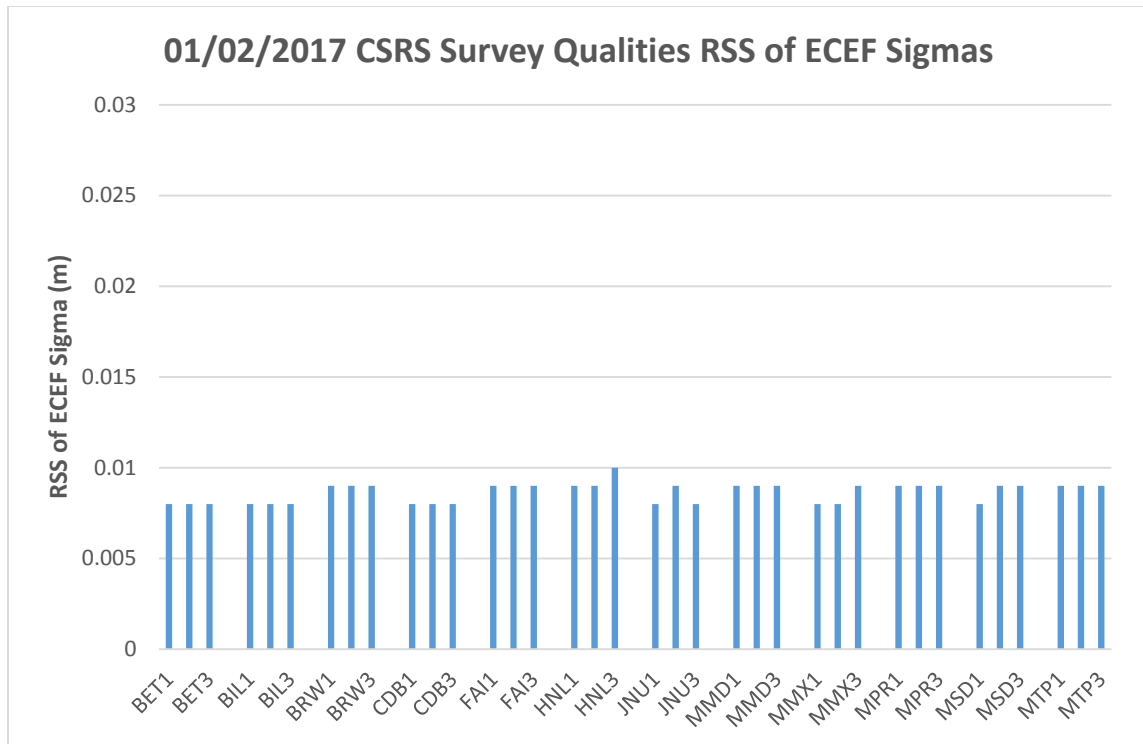


Figure 10-11 CSRS Survey Qualities

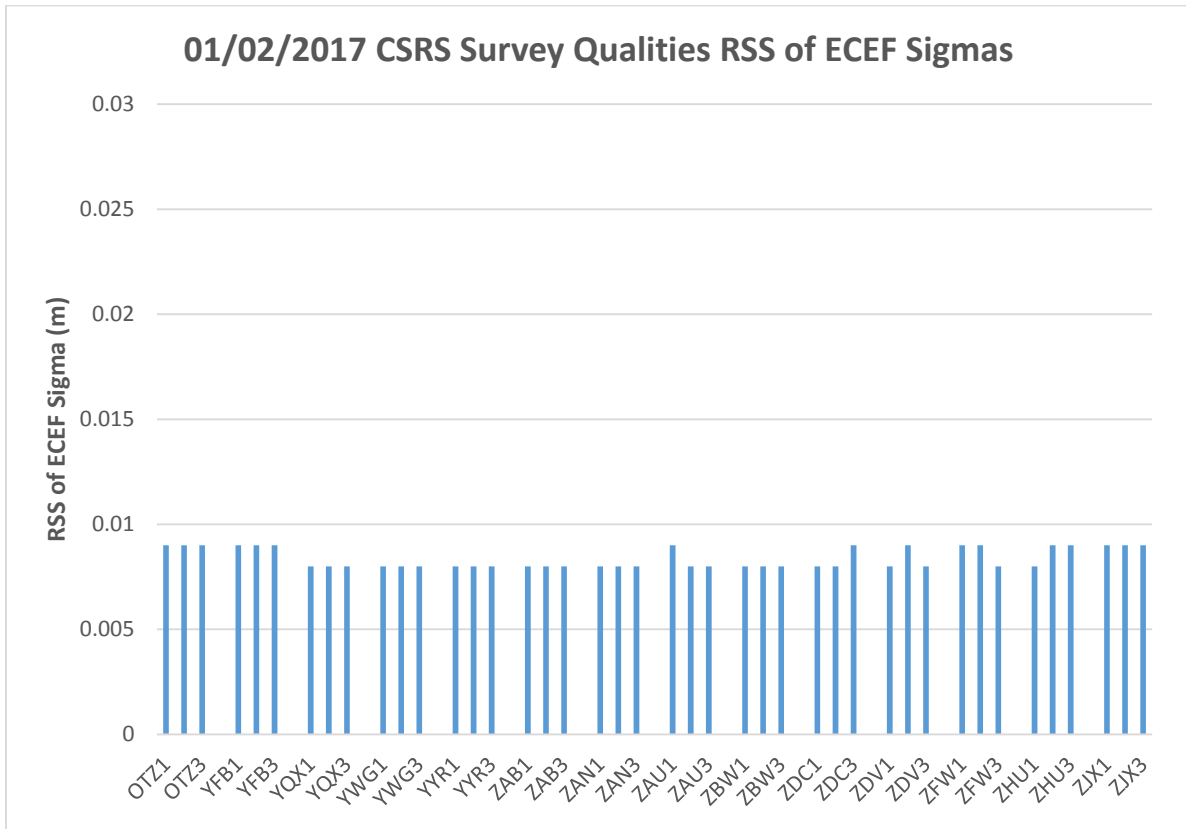
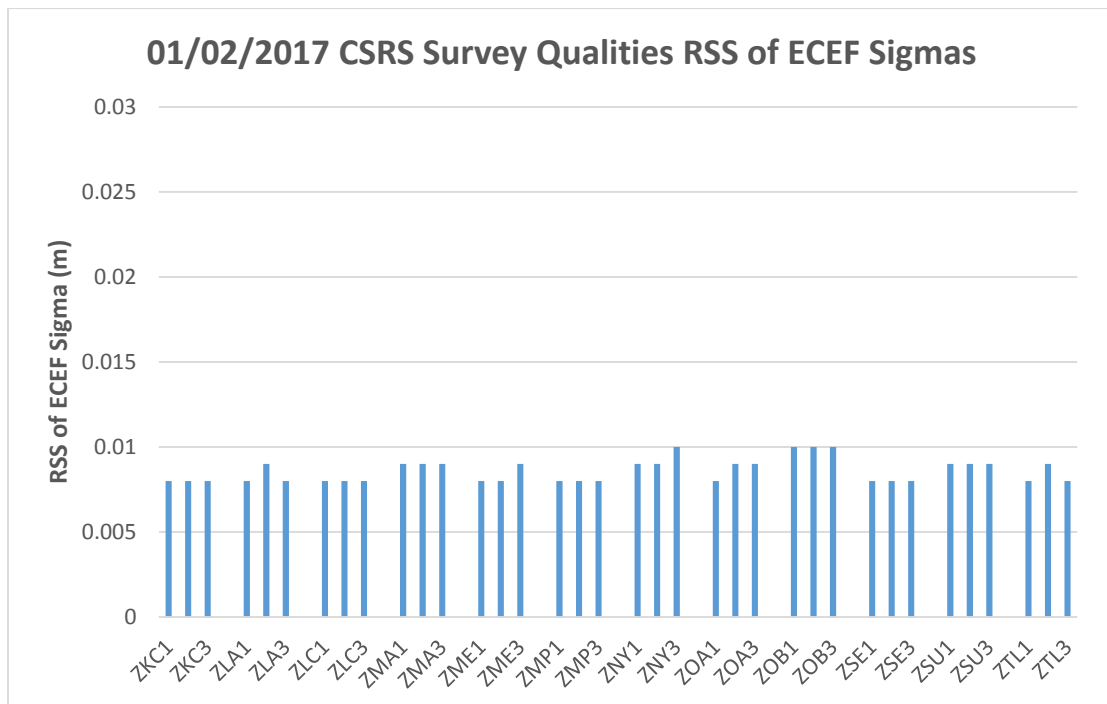


Figure 10-12 CSRS Survey Qualities



11.0 SIGNAL QUALITY MONITOR (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.

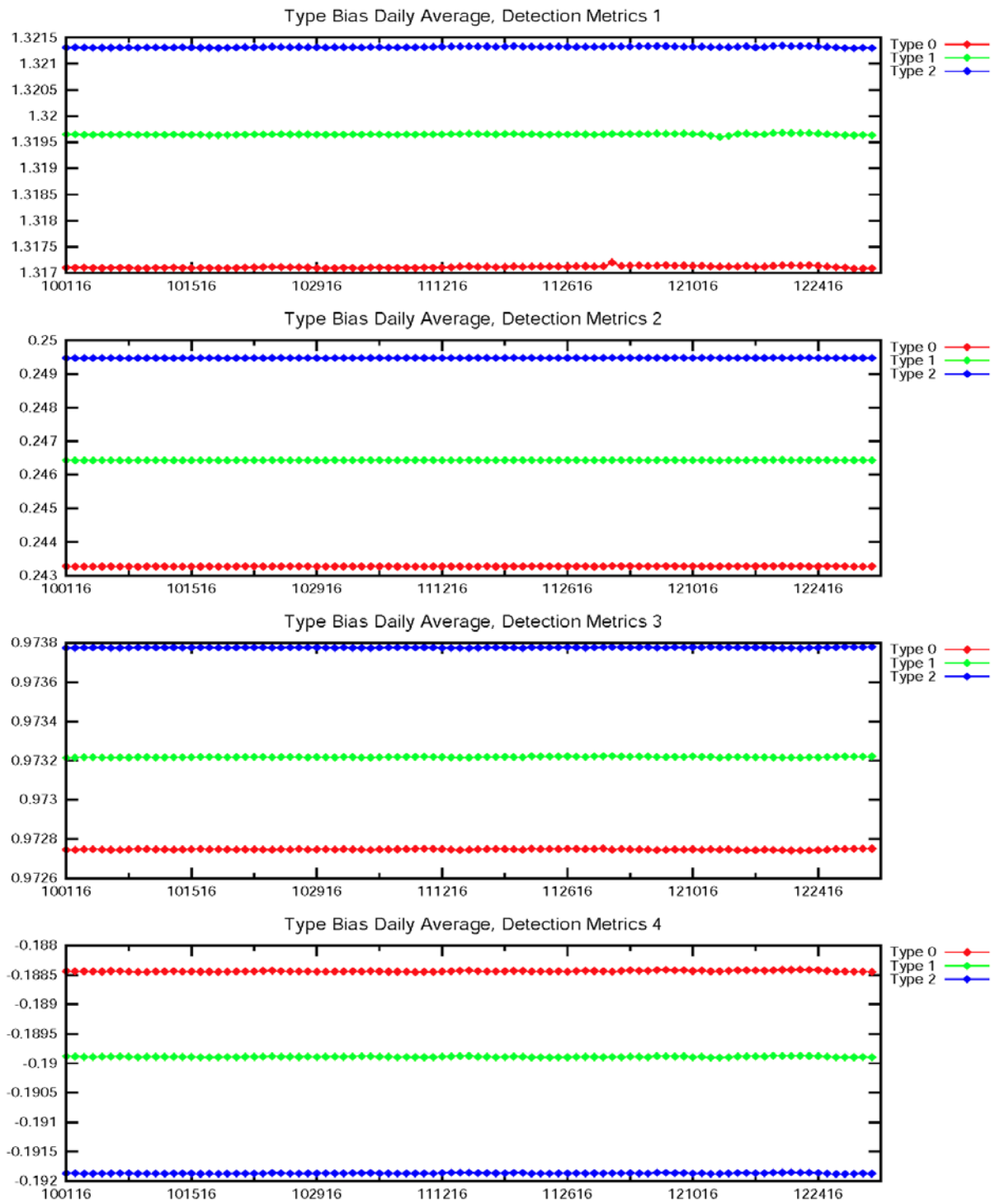
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3171100	1.3196500	1.3213200
DM 2	0.2432740	0.2464310	0.2494740
DM 3	0.9727470	0.9732180	0.9737760
DM 4	-0.1884340	-0.1898900	-0.1918690

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3204800	1.3225500	1.3242400
DM 2	0.2410890	0.2443280	0.2474970
DM 3	0.9731380	0.9736590	0.9742250
DM 4	-0.1864790	-0.1882470	-0.1902840

Figure 11-1 Type Bias Average Trend



11.3 PRN Bias

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

Table 11-4 and Figure 11-2 show the rollup PRN bias averages for the quarter with the maximum values for each detection metrics as followed: (1) the maximum average for DM1 is 0.0011570 observed on PRN-11, (2) the maximum average for DM2 is 0.0002304 observed on PRN-23, (3) the maximum average for DM3 is 0.0001842 observed on PRN-29, (4) the maximum average for DM4 is 0.0005058 observed on PRN-22.

Figure 11-3 to Figure 11-10 provide the daily PRN bias for each PRN, for four detection metrics. Small bumps were due to NANUs.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM1	DM2	DM3	DM4
1	0.0002844	0.0000504	0.0000451	0.0000914
2	0.0005684	0.0001888	0.0000685	0.0001193
3	0.0001442	0.0000409	0.0000497	0.0001006
4	Offline	Offline	Offline	Offline
5	0.0001952	0.0000393	0.0001307	0.0001166
6	0.0006046	0.0001116	0.0000702	0.0000903
7	0.0001829	0.0001062	0.0000524	0.0002436
8	0.0008269	0.0001154	0.0001101	0.0003821
9	0.0001844	0.0000378	0.0001245	0.0003104
10	0.0001626	0.0000452	0.0000820	0.0001334
11	0.0011570	0.0002155	0.0001078	0.0002234
12	0.0001570	0.0000355	0.0001067	0.0001057
13	0.0005188	0.0000650	0.0000508	0.0001988
14	0.0008002	0.0001664	0.0000460	0.0001427
15	0.0002903	0.0001224	0.0000443	0.0002578
16	0.0001539	0.0000381	0.0001176	0.0002608
17	0.0002560	0.0001342	0.0000489	0.0002040
18	0.0007122	0.0001801	0.0001045	0.0002350
19	0.0006347	0.0002304	0.0001010	0.0000836
20	0.0001479	0.0000803	0.0000513	0.0001814
21	0.0002516	0.0001100	0.0000892	0.0002089
22	0.0003881	0.0002207	0.0000970	0.0005058
23	0.0011114	0.0002304	0.0001183	0.0004464
24	0.0001589	0.0001815	0.0001429	0.0000984
25	0.0004995	0.0000610	0.0000500	0.0002549
26	0.0002229	0.0001030	0.0000460	0.0001496
27	0.0005224	0.0002288	0.0001288	0.0002865
28	0.0003250	0.0000585	0.0000746	0.0000995
29	0.0002035	0.0000858	0.0001842	0.0002715
30	0.0001946	0.0000545	0.0000580	0.0001421
31	0.0003734	0.0000868	0.0000567	0.0002519
32	0.0001590	0.0000333	0.0000865	0.0000925

Figure 11-2 PRN Bias Average for the Quarter

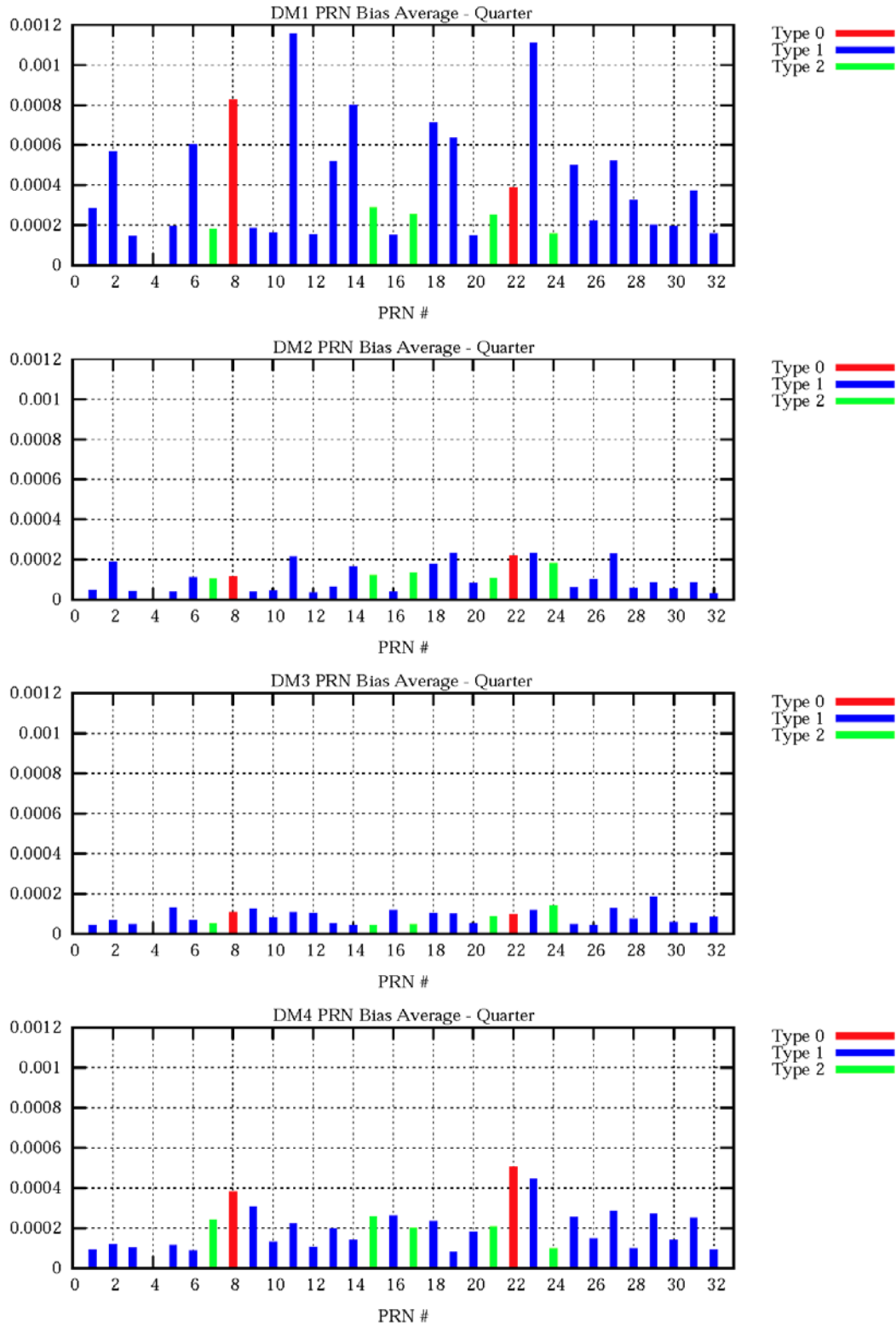


Figure 11-3 PRN Bias Average Trend (PRN-1 – PRN-4)

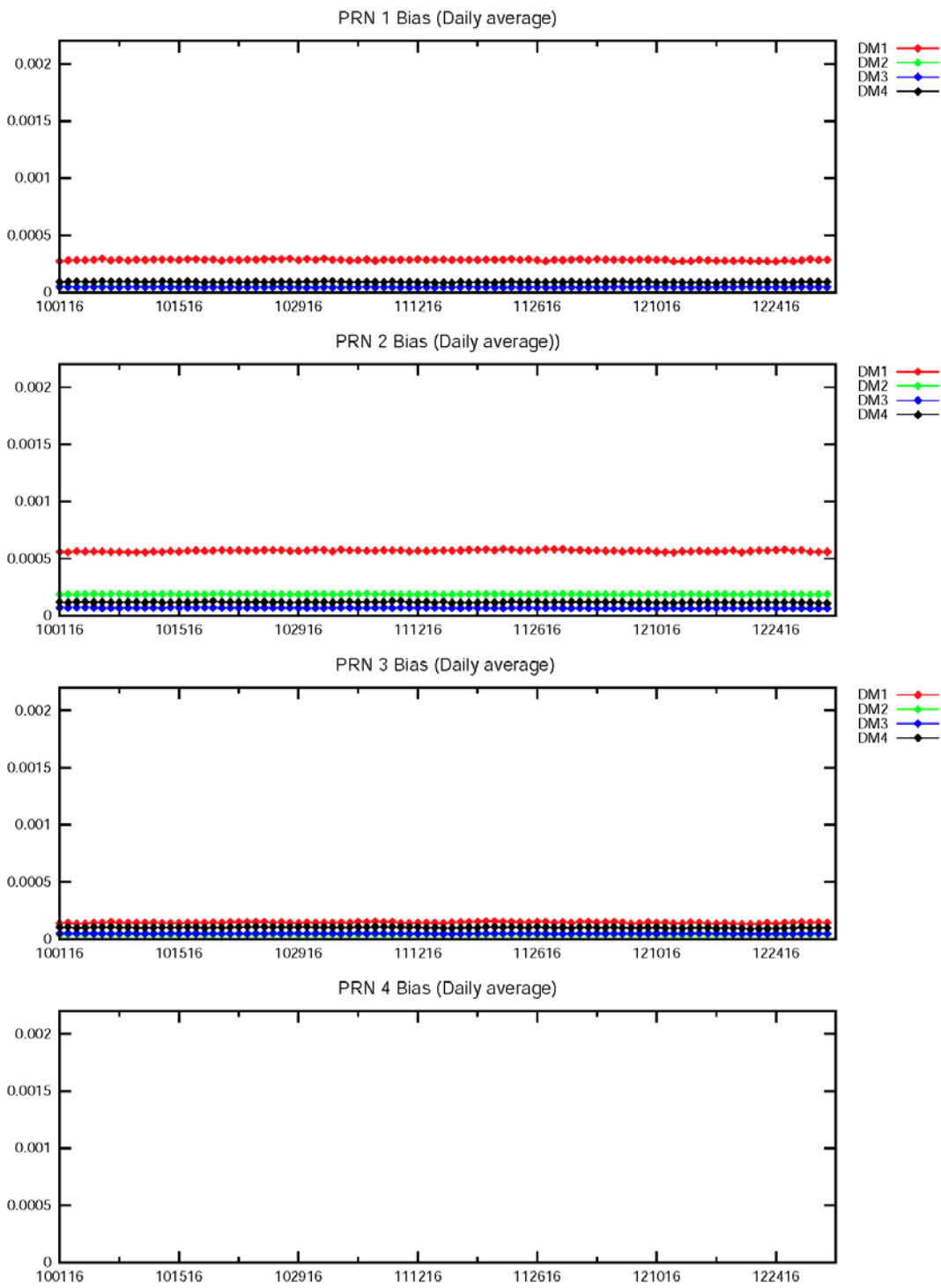


Figure 11-4 PRN Bias Average Trend (PRN-5 – PRN-8)

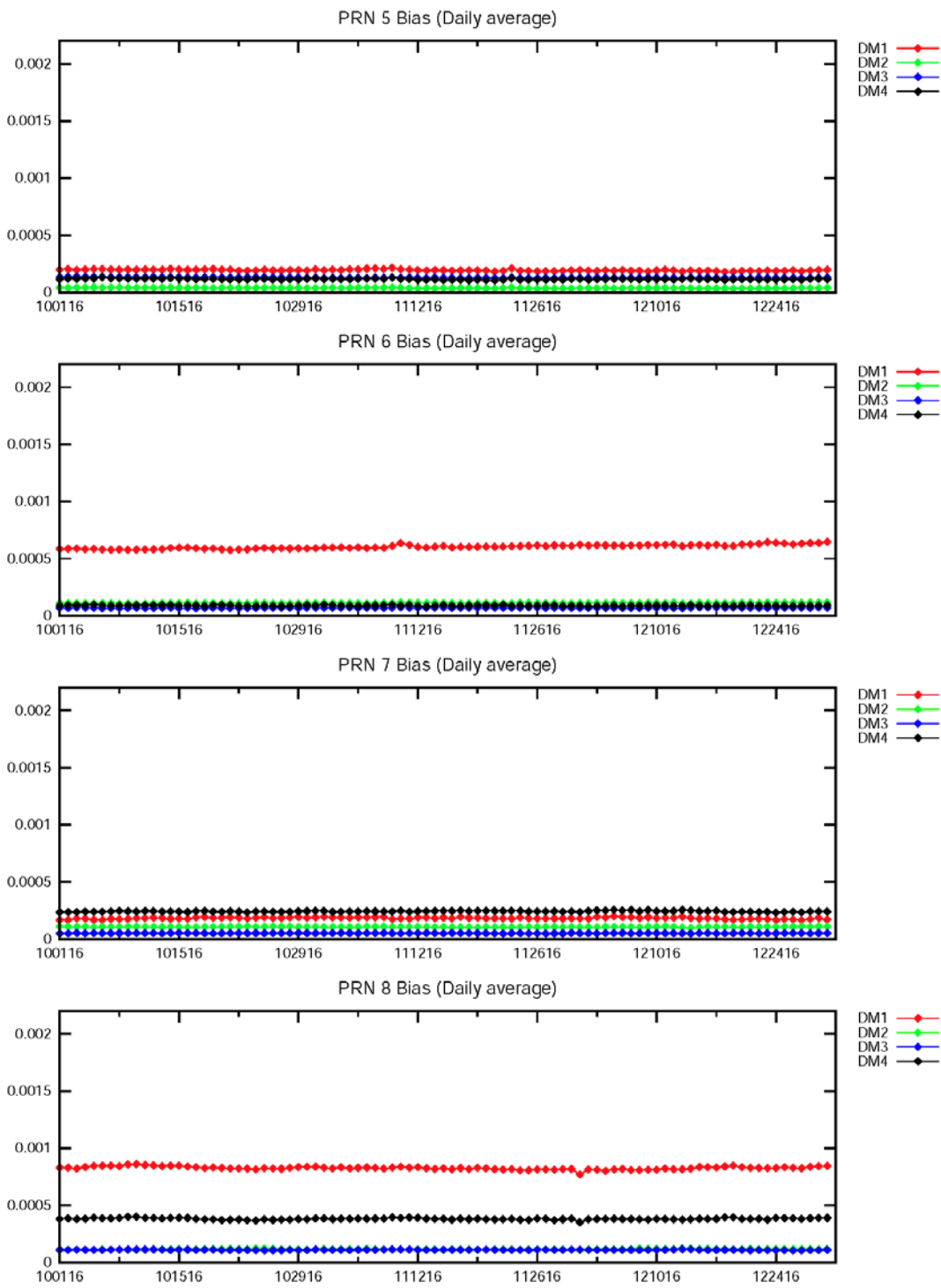


Figure 11-5 PRN Bias Average Trend (PRN-9 – PRN-12)

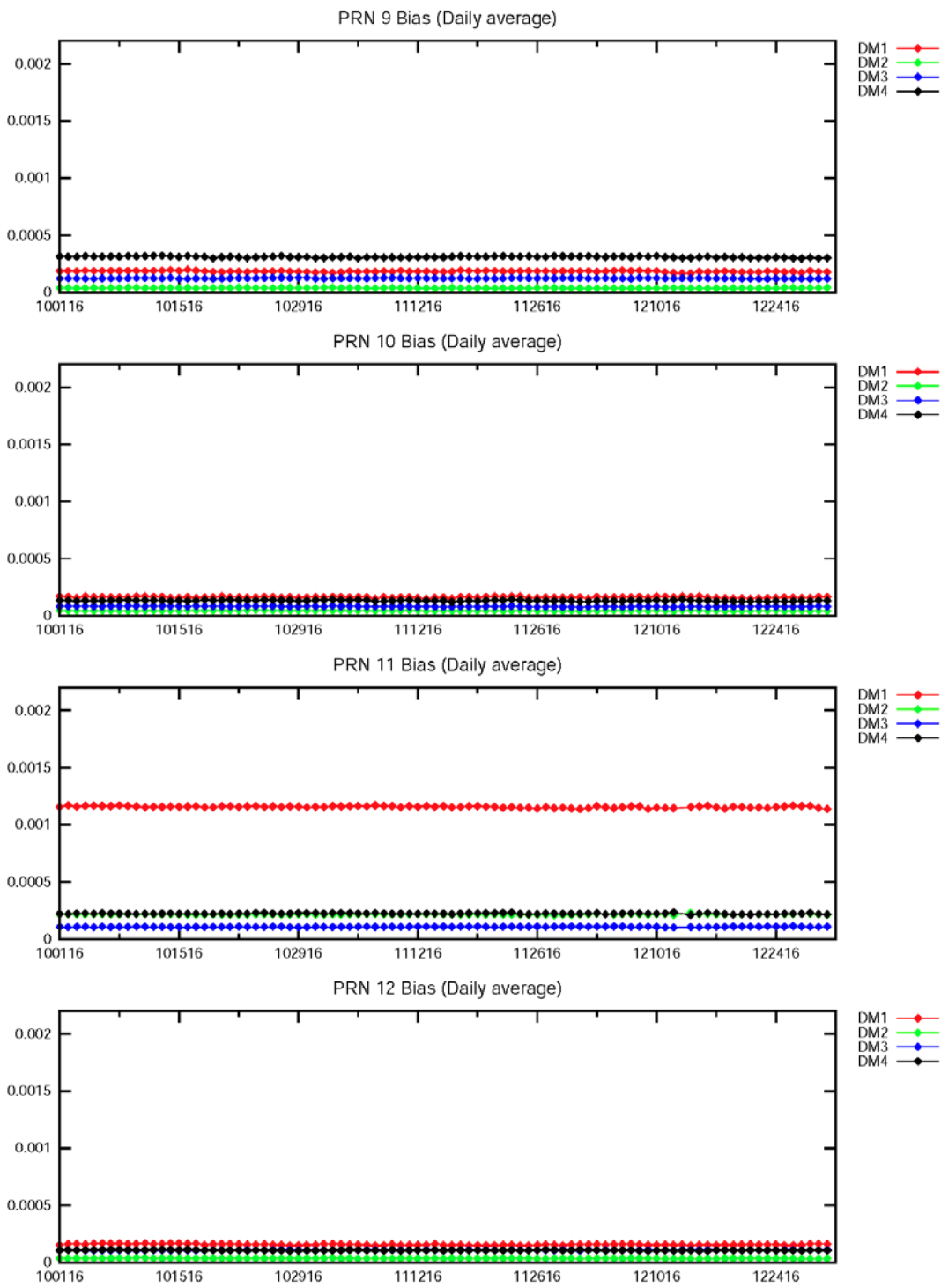


Figure 11-6 PRN Bias Average Trend (PRN-13 – PRN-16)

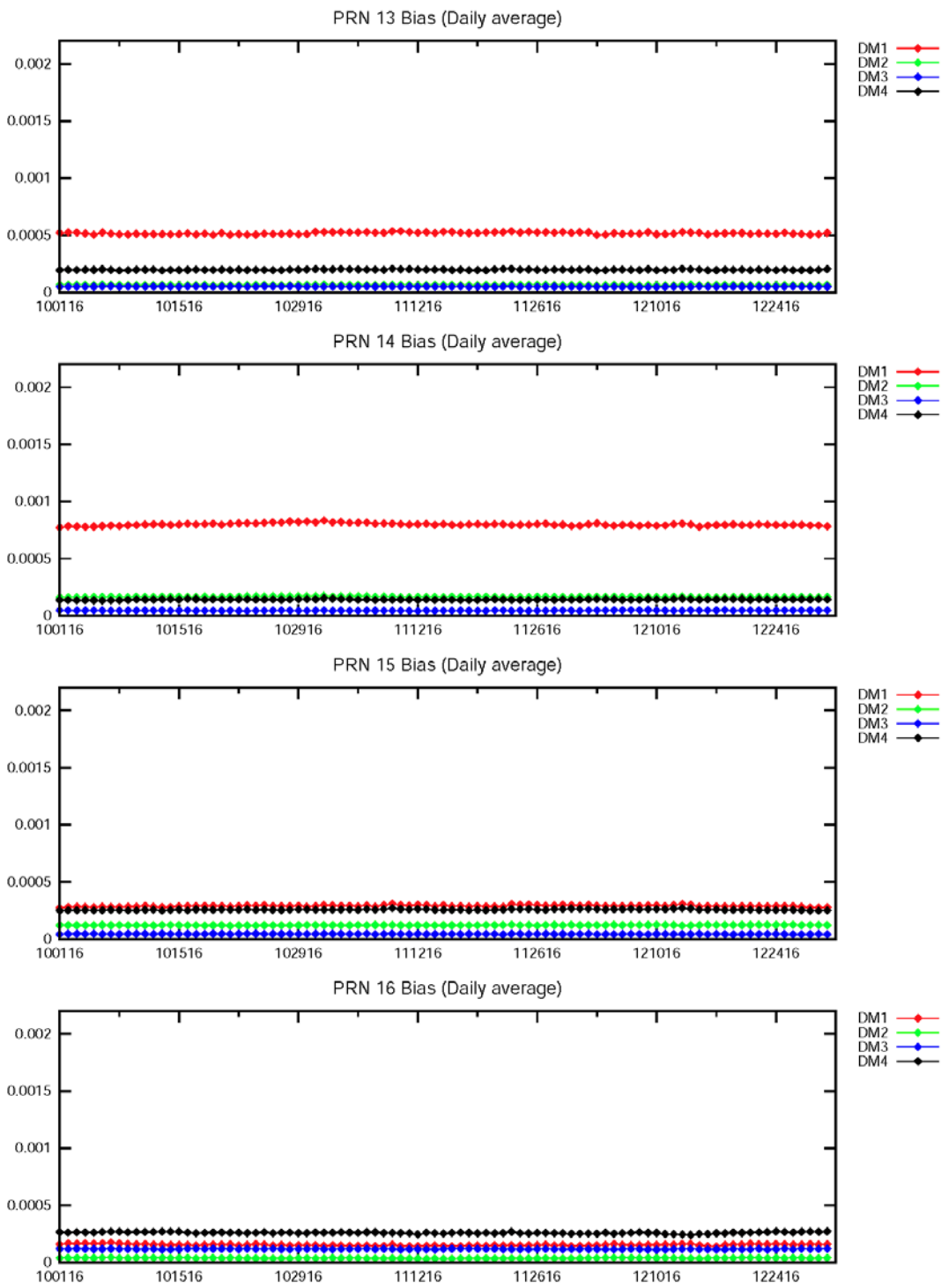


Figure 11-7 PRN Bias Average Trend (PRN-17 – PRN-20)

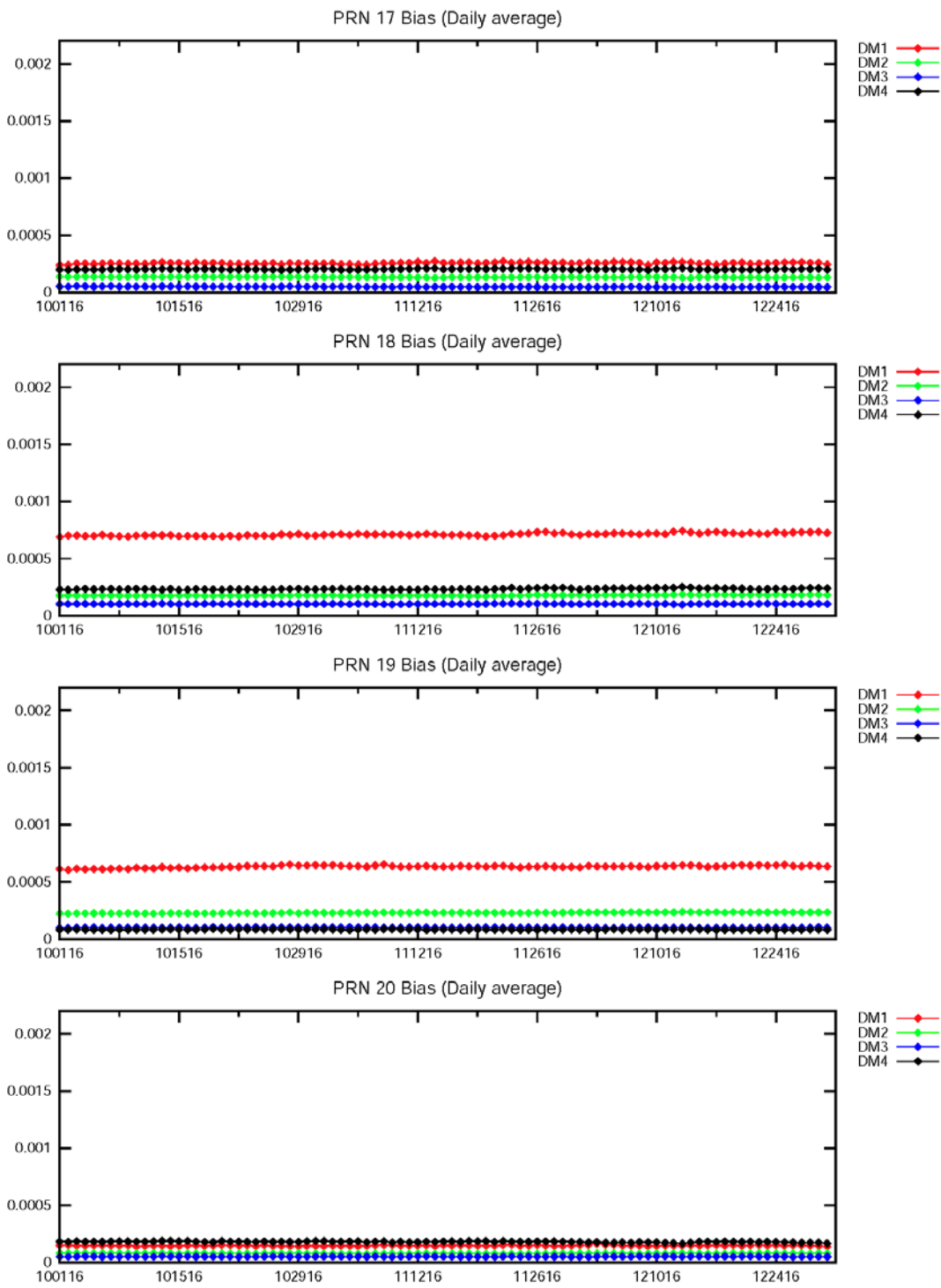


Figure 11-8 PRN Bias Average Trend (PRN-21 – PRN-24)

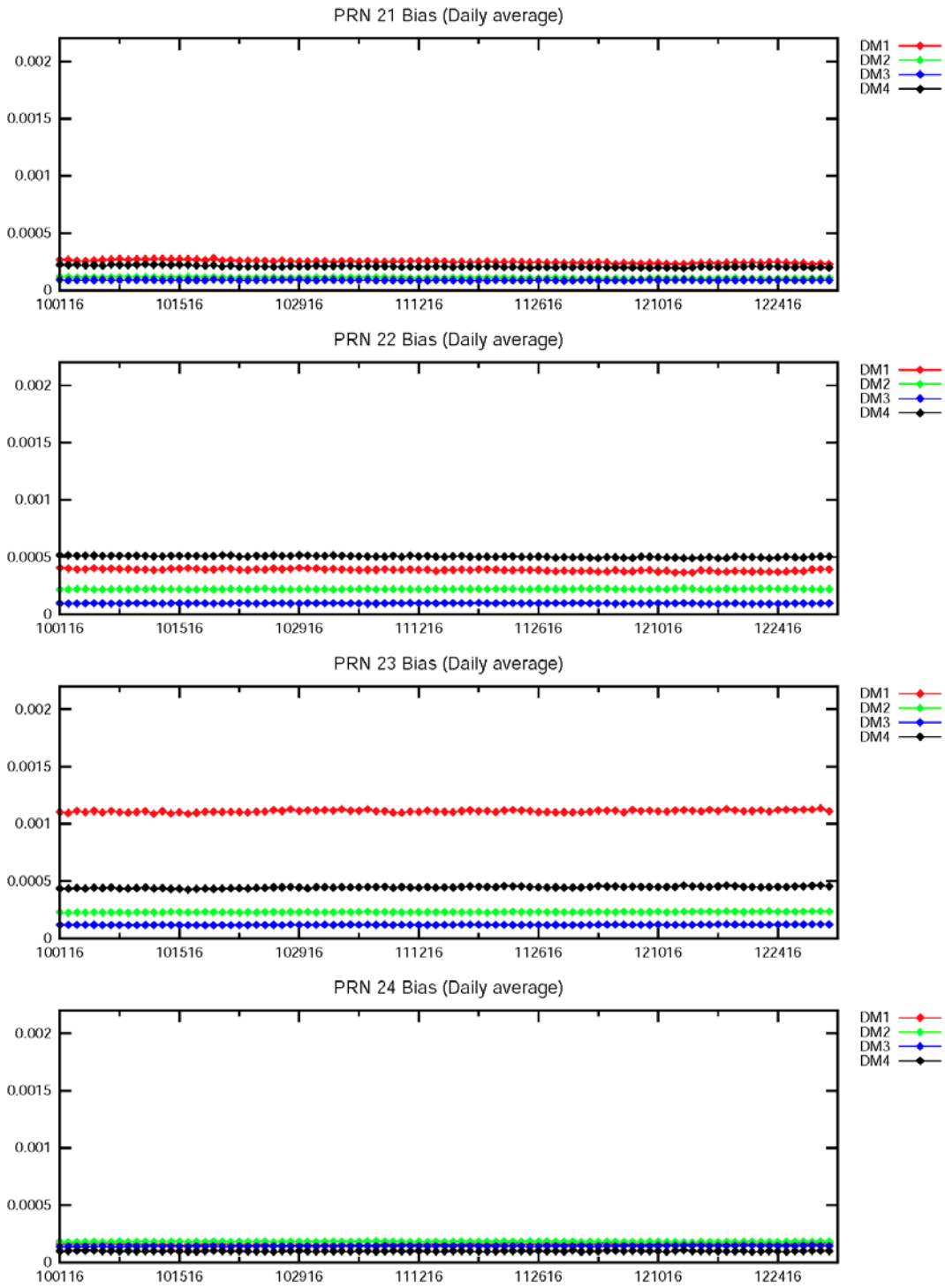


Figure 11-9 PRN Bias Average Trend (PRN-25 – PRN-28)

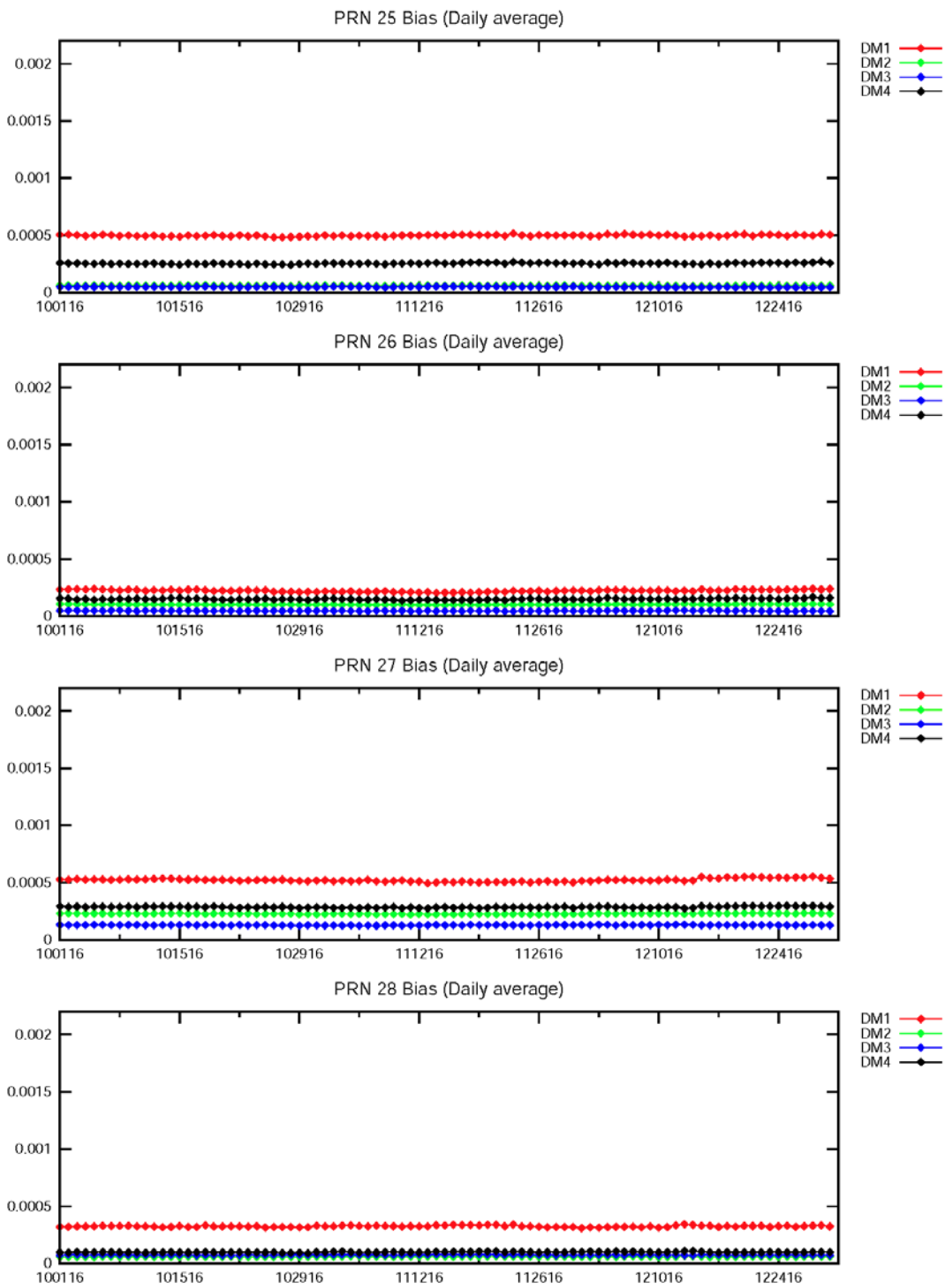
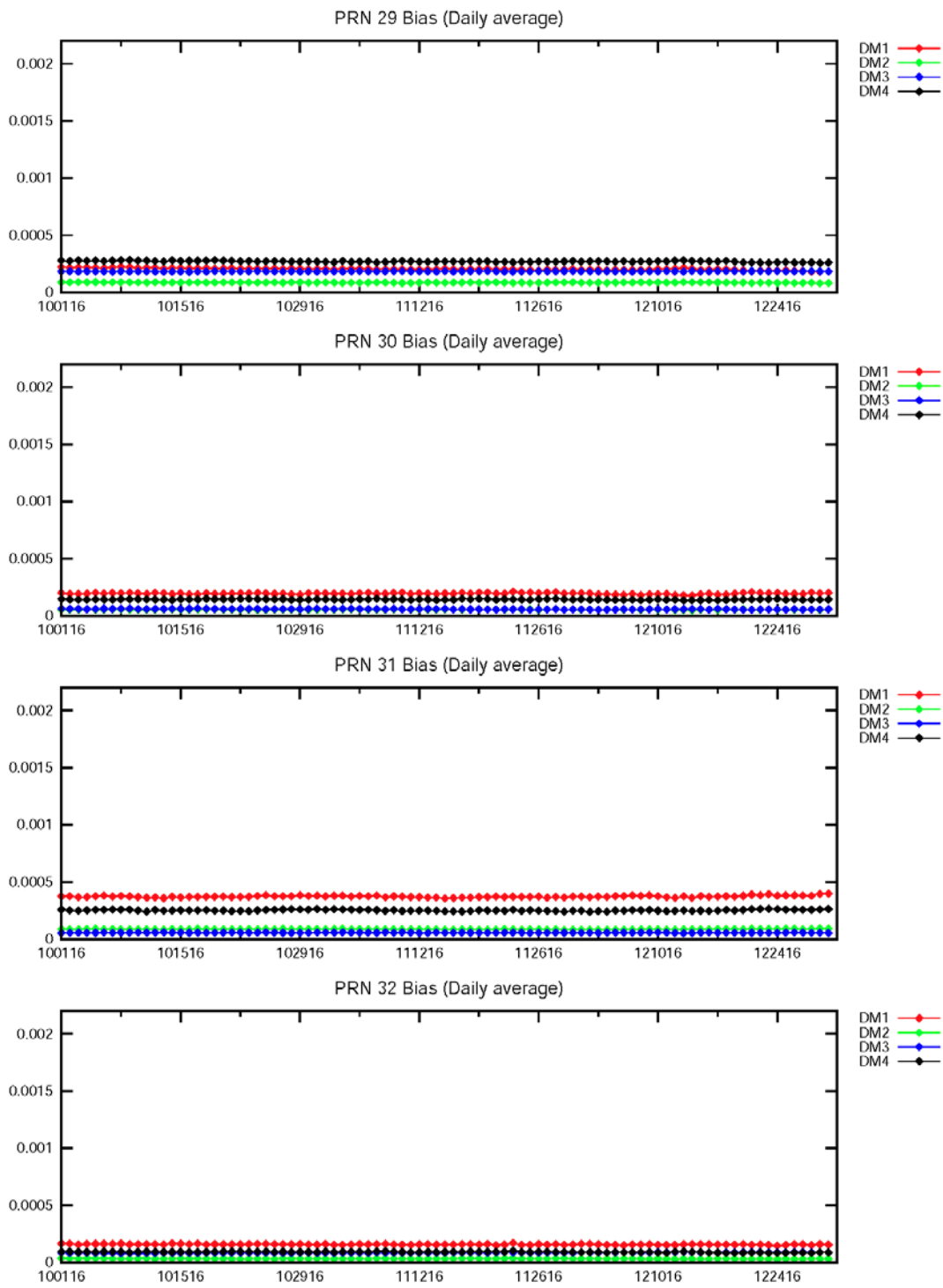


Figure 11-10 PRN Bias Average Trend (PRN-29 – PRN-32)



11.4 SQM Trips

A SQM trip occurs when the estimated deformation exceeds threshold. There were no SQM trips for this quarter.

Appendix A: Glossary and Acronyms

General Terms and Definitions

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

AMR. GEO PRN-133.

APC. Antenna Phase Center.

ARP. Antenna Reference Point.

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

C&V. The Correction and Verification Subsystem.

CNMP. Code Noise and Multipath.

CONUS. Continental United States.

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

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

CRE. GEO PRN-138.

CRW. GEO PRN-135.

CSRS. Canadian Spatial Reference System.

Dilution of Precision (DOP). The magnifying effect on GPS position error induced by mapping GPS ranging errors into position through the position solution. The DOP may be represented in any user local coordinate desired. Examples are HDOP for local horizontal, VDOP for local vertical, PDOP for all three coordinates, and TDOP for time.

DM. Detection Metrics.

DR. Discrepancy Report.

ECEF. Earth-Centered, Earth-Fixed.

FAA. Federal Aviation Administration.

FD. Fault Detection.

Fault Detection and Exclusion (FDE). Fault detection and exclusion is 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.

Global Positioning System (GPS). 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.

Grid Ionospheric Vertical Error (GIVE). GIVEs indicate the accuracy of ionospheric vertical delay correction at a geographically defined ionospheric grid point (IGP). WAAS transmits one GIVE for each IGP in the mask.

GUS. GEO Uplink System.

Hazardous Misleading Information (HMI). Hazardous misleading information is 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).

Horizontal Alert Limit (HAL). The Horizontal Alert Limit (HAL) is 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 $1-10^{-7}$ 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.

Horizontal Protection Level (HPL). The Horizontal Protection Level is 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 upon the error estimates provided by WAAS.

IAP. Instrument Approach Procedures

IGS. International GPS Service.

Ionospheric Grid Point (IGP). IGP is a geographically defined point for which the WAAS provides the vertical ionospheric delay.

Kp. Planetary Index.

LNAV. Lateral Navigation.

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

LPV. Localizer Performance with Vertical Guidance. LPV is 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. LPV200 is a WAAS operational service level with a HAL equal to 40 meters and a VAL equal to 35 meters.

MOPS. Minimum Operational Performance Standards.

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.

Non-Precision Approach (NPA) Navigation Mode. The 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 Report.

PID. Programmable Indicator Data.

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.

Precision Approach (PA) Navigation Mode. The 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.

Selective Availability. Protection technique employed by the DOD to deny full system accuracy to unauthorized users.

SBAS. Space Based Augmentation System.

SIS. Signal in Space

Signal Quality Monitor (SQM). SQM 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.

Standard Positioning Service (SPS). 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.

TCS. Terrestrial Communications Subsystem.

TOW. Time of GPS Week.

User Differential Range Error (UDRE). UDRE's indicate the accuracy of combined fast and slow error corrections. WAAS transmits one UDRE for each satellite in the mask.

Vertical Alert Limit (VAL). The Vertical Alert Limit is 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 $1-10^{-7}$ 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.

Vertical Protection Level (VPL). The Vertical Protection Level is 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.

Wide Area Augmentation System (WAAS). The WAAS is 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, as well as 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 in order 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.

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

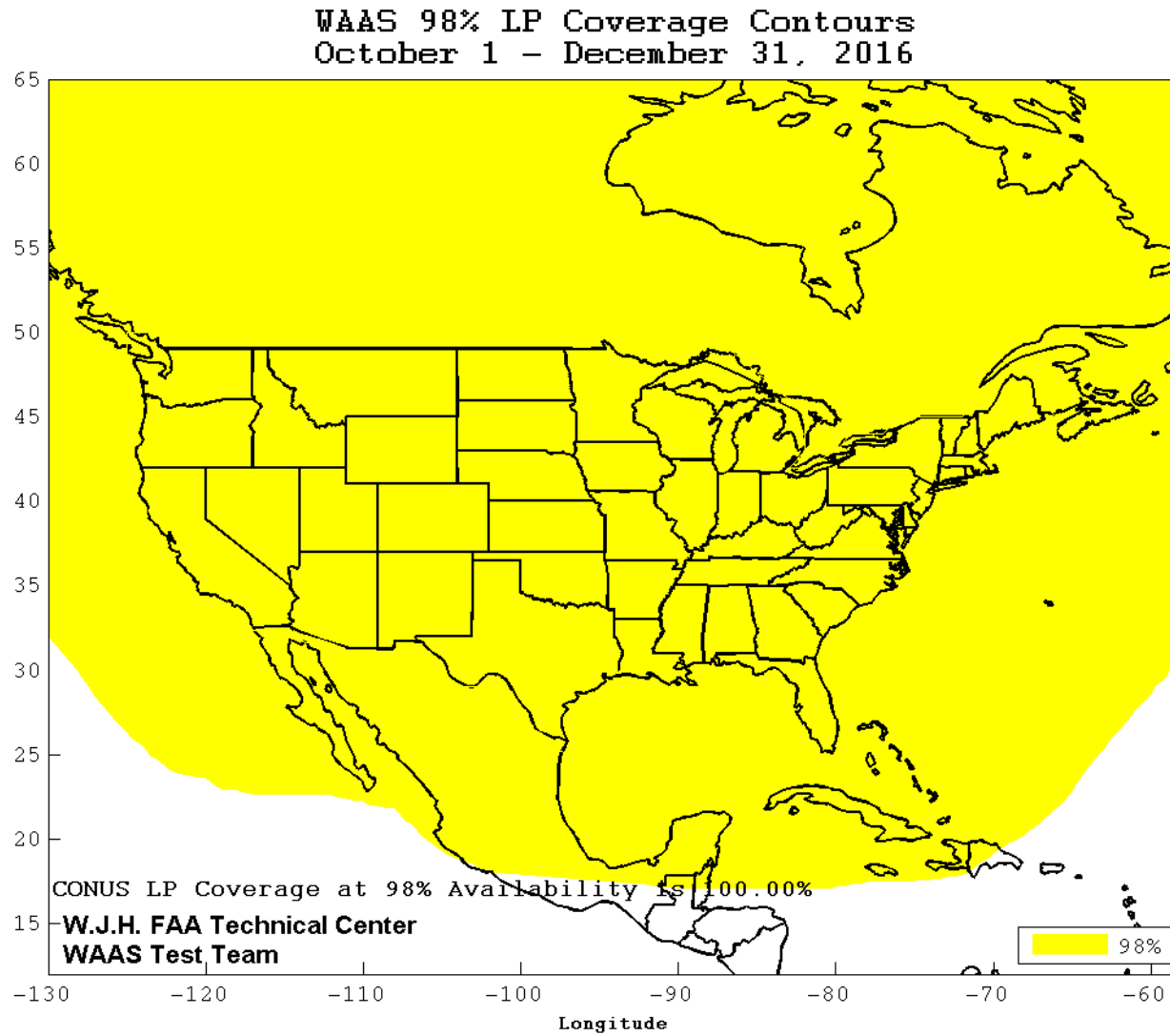


Figure B-2. 98% Alaska LP Availability Contour

WAAS 98% LP Coverage Contours
October 1 - December 31, 2016

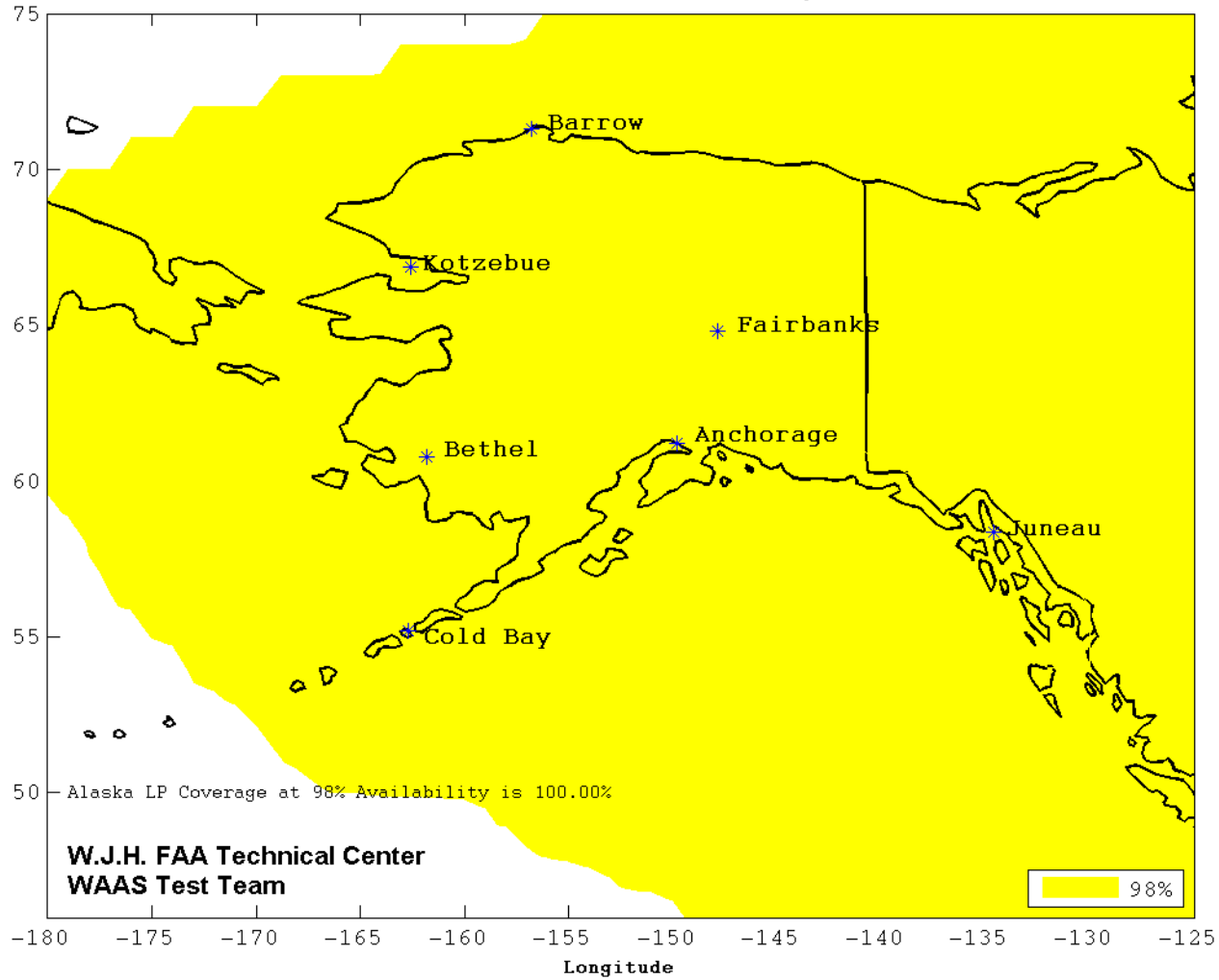


Figure B-3. 98% CONUS LPV Availability Contour

WAAS 98% LPV Coverage Contours
October 1 - December 31, 2016

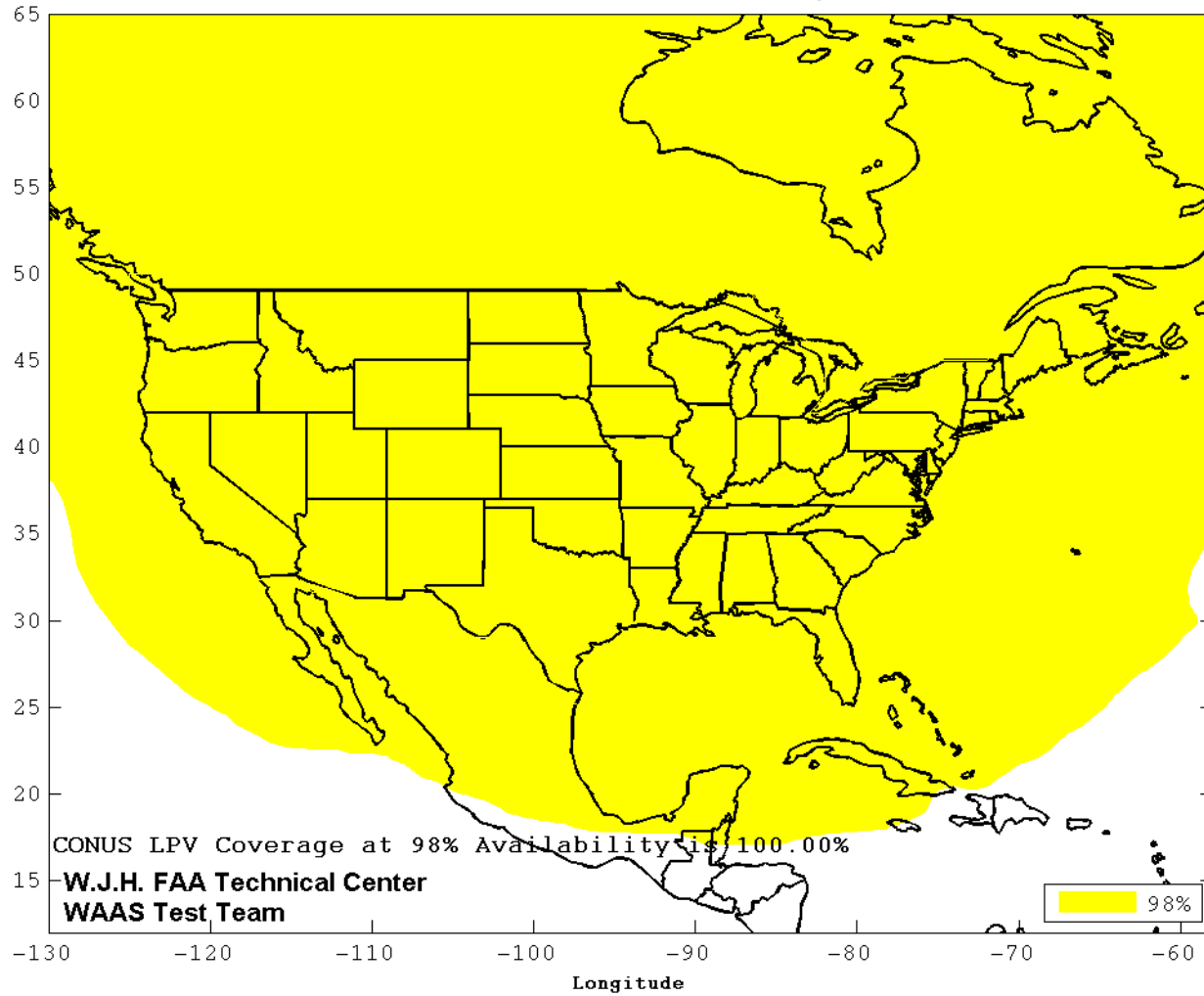


Figure B-4. 98% Alaska LPV Availability Contour

WAAS 98% LPV Coverage Contours
October 1 - December 31, 2016

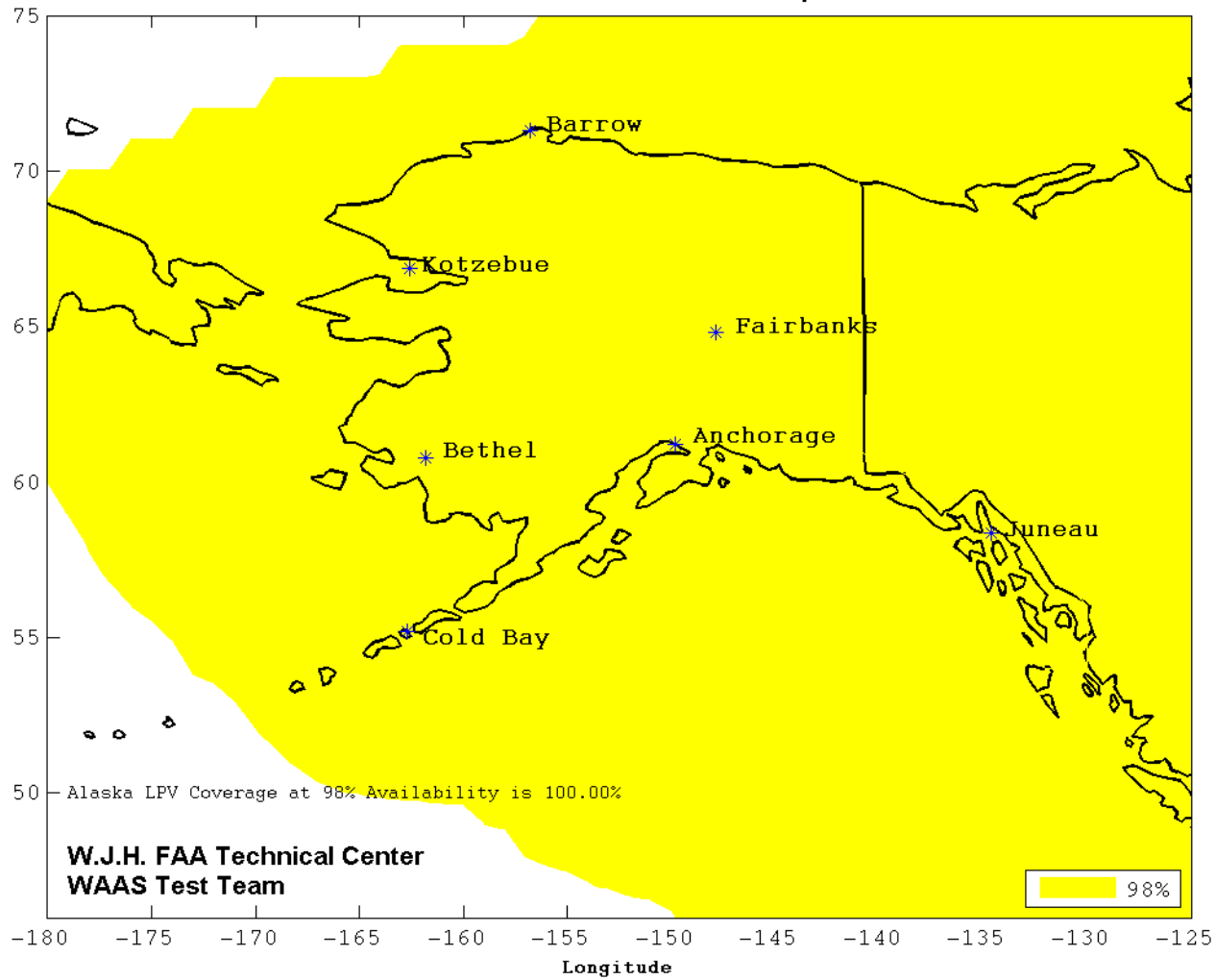


Figure B-5. 99% CONUS LPV200 Availability Contour

WAAS 99% LPV200 Coverage Contours
October 1 - December 31, 2016

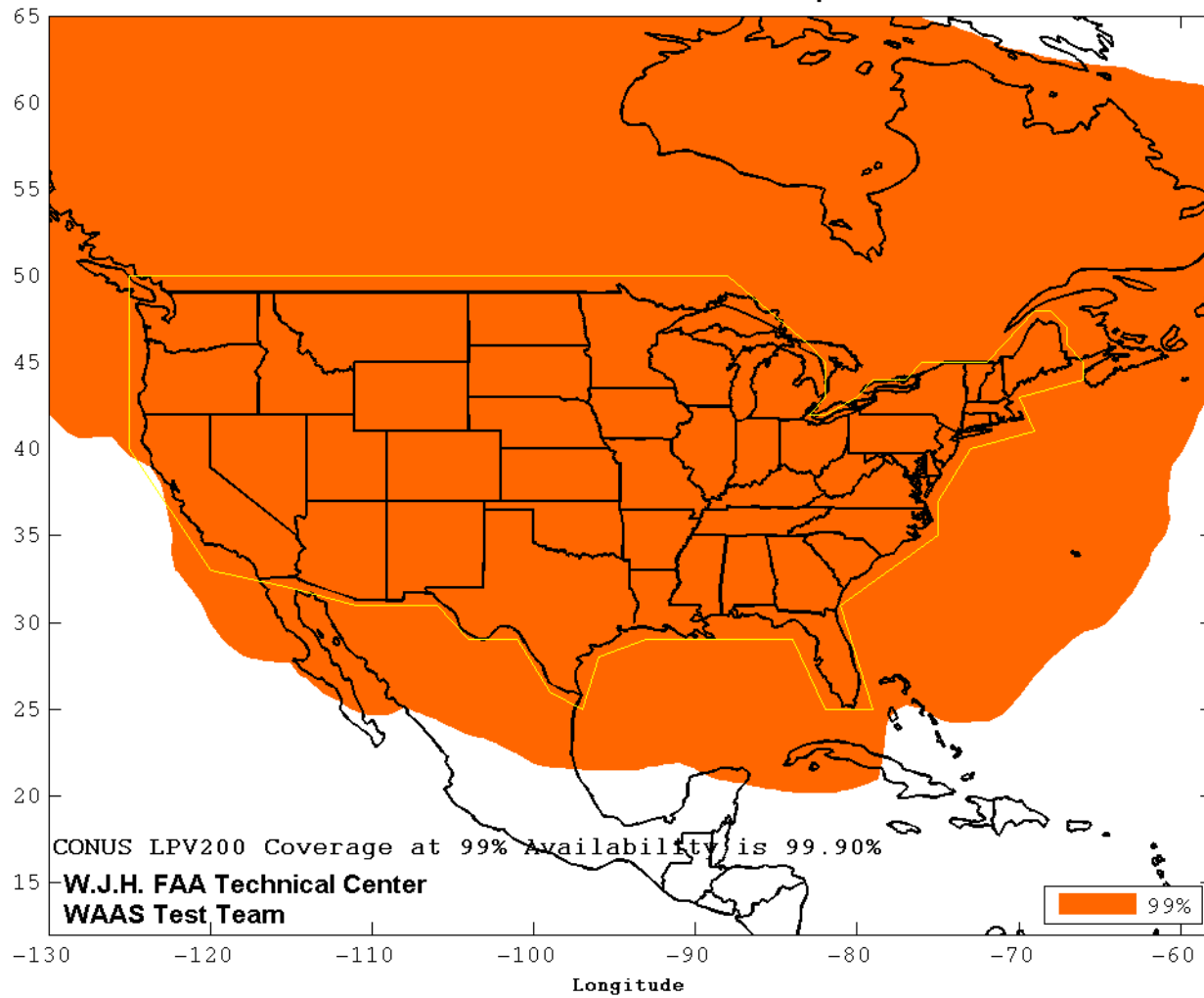


Figure B-6. 99% Alaska LPV200 Availability Contour

